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HOW TO HARVEST ICE

Gifford Wood Cox

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How to Harvest Ice



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Nos. 51-52 No. Market St.
BOSTON, MASS.

WESTERN HEADQUARTERS
No. 123 No. Jefferson St.
CHICAGO, ILL.

Factories
HUDSON, N. Y.

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FOREWORD.

THREE quarters of a century spans the commercial development of the natural ice industry. Once an article of luxury and used in small quantities it is now one of the most important of every day necessities. In its annual harvest and distribution it requires an investment of millions of dollars and the services of hundreds of thousands of men.

Extending over that entire period we have been affiliated with the iceman in all parts of the country. In no small degree his hardship and failures, as well as his prosperity, have been shared by us. With such a common interest between us, co-operation has naturally resulted and where improved tools and apparatus could be used to advantage we have always worked toward increasing the productivity of his labor.

On account of this familiarity with the methods employed in different parts of the country we each year receive many letters asking for advice. Some of these inquiries, as may be expected, are from those unacquainted with the ice business. To furnish the information desired in full and yet concise form, this pamphlet was first issued over thirty years ago. The present enlarged edition indicates some of the many improvements which have taken place during that time.

As the operations vary so greatly in different sections, only a general view of the subjects is possible within the limits of these pages. It is hoped, however, that the suggestions offered may be found of interest to the reader, helping him to some degree at least in performing the work with system and economy. Where more extended advice is desired on any detail of harvesting, we are very glad to hear from our customers and thus be able to place our experience more directly at their service.

The numbers, used in this book, in naming Ice Tools, are those to be found in our General Catalog of Ice Handling Machinery and Tools.

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The Natural Ice Business.

The conditions necessary for the formation of natural ice are most widely distributed. As these requisites are chiefly the gift of Nature, requiring the expense of but little preliminary development, the cost of the ice in its native state is almost nothing. When harvested, stored and distributed by the use of approved methods and appliances, it therefore has an immense advantage over the ice produced by mechanical refrigeration.



Fig. 1. Field Scene.

Competition with manufactured ice has been most beneficial for the natural ice industry. Greater effort is now put forth to harvest the purest ice obtainable, to prevent any contamination on its way to the consumer, and to market only that which is clean in appearance and regular in form. By giving attention to these details, the most exacting requirements of the public are met, and the natural ice business in any community is placed on the firmest foundation possible.

Investigations by the most competent scientists have done much to increase confidence in the purity of natural ice. It has been proven most conclusively that holding ice in storage for a number of months destroys all germs which may have been present on the field.

Simple as the ice business may seem, it is composed of a large number of details, and economy in obtaining a crop requires careful attention to each. The importance of suitable facilities for preparing



Fig. 1. Elevator Conveyor Apron.

and cutting the field and for quickly and cheaply housing the ice are so well appreciated that no arguments in their favor are necessary.



Fig. 2. Field Scene.

Time is often the factor which determines whether a crop shall be secured or lost. A breaking up of the field may leave the poorly-equipped harvester with one-half or one-fourth a crop, while his more up-to-date competitor is fully prepared for another season's trade.

The housing of nothing but marketable ice is now accepted by the most progressive harvesters as absolutely essential to economy. A cake of ice on the field is practically raw material with but little value. When placed in the house, its worth has been increased as a result of the labor expended upon it; and when on the delivery wagon ready for the customer, it is more valuable still. As the dealer's interest is best served by delivering nothing but regularly-shaped cakes of good ice, the elimination of all defective or unsalable pieces can be done at the smallest actual cost before it reaches the interior of the house. While this is better than to remove the waste later, the most economical plan is to so conduct the field operations that the number of defective cakes is reduced to a minimum. The saving due to such a procedure will be very evident, since the creation of any waste material whatever represents a certain amount of labor which is a total loss.



Fig. 4. Field Scene.

The ice should be of good quality and of suitable depth to allow for surface dressing, thus leaving it the most desirable thickness for cutting to supply the trade. Careful attention to the grooving and calking makes the barring off easy, and the regular cakes thus obtained are more easily handled, pack better in the house, and cut up with small waste when delivered to the customer.

Ice from different parts of the field may vary several inches in thickness, and if the cutting extends over a period of two or three weeks the ice will often make that amount during the harvest. The use of a planer on the incline removes all surface impurities, reduces the cakes to a uniform size, makes the storing easier, greatly reduces the amount of waste ice going into the house, and cuts down the expense of removing the ice tremendously.

One harvester following these lines may house 5,000 tons of ice a day, nearly all of which is salable and first-class, while another harvester giving little attention to the details will put up one-half as much with the same daily expense of operation, his crop including a large amount of ice which is either of an inferior quality or absolute waste. On account of the importance of doing each part of the work in the most economical manner, the various harvesting operations are described in the following chapters.

Size and Location of House.

From his knowledge of the market to be supplied, the harvester is usually able to estimate how much ice can be sold to advantage each season. The addition to this amount of 20% to 40%, as the conditions may warrant, to cover the shrinkage, will indicate the house capacity

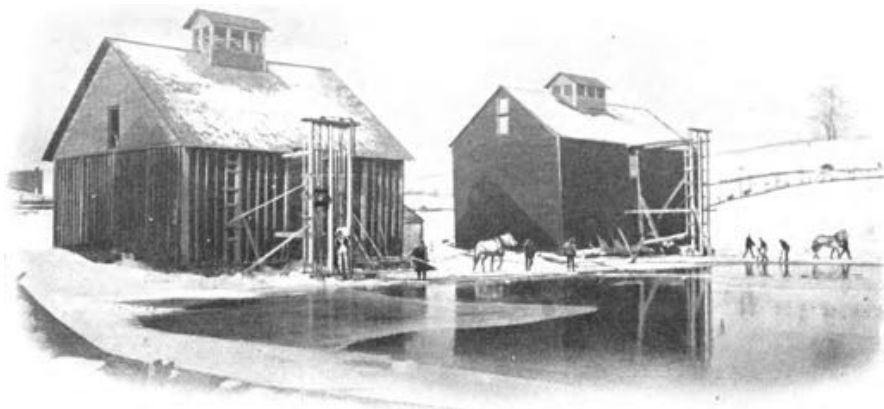


Fig. 5. Housing a Small Crop.

necessary for a season's requirements. A cubic foot of ice weighs about 58 pounds, or measures nearly 35 cubic feet to the ton. The latter figure, however, cannot be used in calculating the marketable tonnage of a house, on account of the large amount of waste space existing between the cakes as they should be and are usually stored. The capacity of most houses is now estimated on a basis of one ton for every 45 cubic feet of house volume, measured inside the rooms, as a fair measurement for buyer and seller, although a few harvesters do not make so much allowance.

In selecting a suitable location, the demands of an increasing business should be thoroughly considered and the larger capacity which this may necessitate. The original building should be so placed that future extensions are possible without costly grading or expensive additions to the elevating apparatus. Too often the former receives proper attention, but not the latter, and an increase of several

new rooms requires either much additional machinery or getting the ice into these rooms under most unfavorable conditions.

Convenience in taking the ice out in the summer is an important factor affecting economy. The house floor is generally located at, or near, the ground level. With the wagon or car-loading platform three or four feet above this level, as is the common arrangement, the last few layers taken out must be pulled up a chute by hand or by chain conveyor, resulting, of course, in slower loading and additional expense. If not too expensive, houses should be built with their floors level with the loading platforms, with the latter the necessary distance above track or roadway for easy loading.

House Construction.

Wood is at present the most commonly used material for ice-house construction. Concrete has been employed to some extent with favorable results, and the almost total elimination of fire risk is such a



Fig. 6. Starting Chisel, No. 455.

strong recommendation for this type of house that its popularity will constantly increase.



Fig. 7. Tapping Bar, No. 452.

Some wooden houses are constructed with single studding, others with a double row of posts — the air space, packing and other insulating features varying as well. The line to be followed in any given



Fig. 8. Scraping Scene.

case depends very largely upon the local conditions. The construction of an expensive house, warranted in one locality, might be the poorest kind of an investment in another. We have a large assortment of working drawings for houses of all sizes from the smallest to the largest, and these are included free of charge with the elevator drawings.

Size of Ice Cakes.

The size of cakes to be harvested should be selected to give the least amount of waste possible when cutting up for the trade. It is also desirable to house a cake of standard dimensions requiring no special tools or machinery. The prevailing sizes in the United States are 22 x 32, 20 or 22 x 28, 22 x 42 or 44, and 44 x 44, the latter size being cut only in Eastern Massachusetts and New Hampshire. A common size with the smaller harvesters is 22 x 22 inches, while some find even smaller cakes more desirable.

The foregoing points are preliminary to the work of harvesting, which may be divided into three parts, viz.: field work; hoisting into the house, and packing and removing; each of which will be briefly described in the following pages.

Size of Field.

The area laid out should be large enough, if possible, to fill the house with a single cutting. The general practice is to allow one acre of field with a thickness of 12 inches for each 1,000 tons of ice to be cut. This is under favorable conditions. It is well to make the field somewhat larger, to provide for soft weather, and considerable additional area should be added for windrows if a large surface is to be scraped.

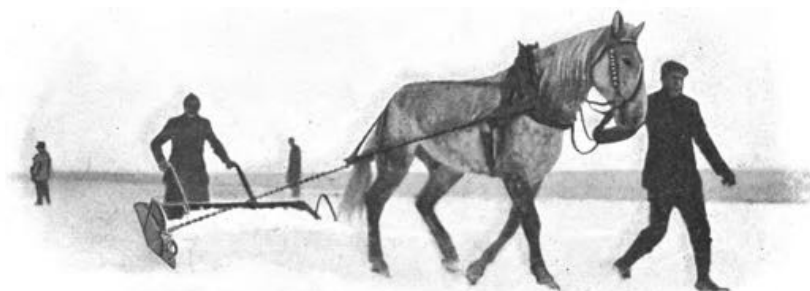


Fig. 9. Use of the Boston Scraper.

Wetting Down.

It is seldom that a field of ice freezes to the desired thickness without having one or more falls of snow upon it, and as a result the harvester is nearly always called upon to handle this snow in one way or another before marking out the field. The first snow often comes when the ice is too thin to bear scraping, and if the weight of the snow is insufficient to sink the ice, the custom of tapping, or wetting down, is now very generally practiced. This should be done when all the indications are favorable for freezing the moistened snow solid. If the top only of the snow water freezes, forming a crust, and more snow should fall, there would be a space of water underneath the dry snow which would not readily freeze, and scraping would be impossible. A windy day should not be chosen on account of the drifting.

It is well known that a thick layer of snow on a field greatly retards the formation of the ice. Converting this into snow ice assists in making and also prevents dust and other impurities from being melted into the surface during a spell of soft weather. Cinders penetrate sap ice much less readily than solid ice.

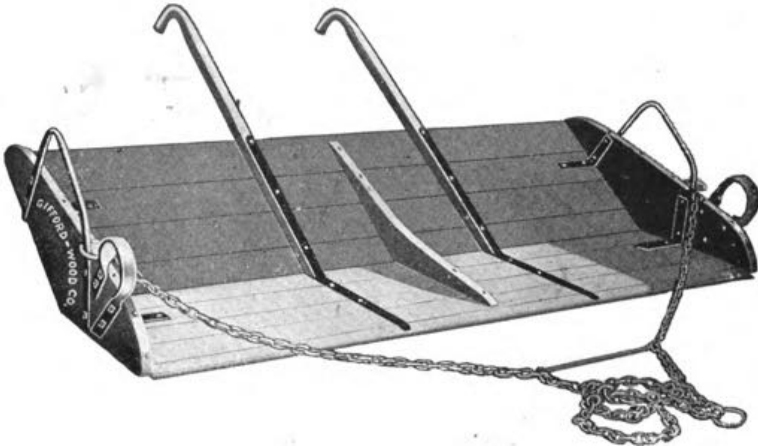


Fig. 10. Eight-foot Boston Scraper, No. 235.

Flooding the first two or three snows is a good protection against honeycombing by warm weather, and a coating of snow ice will also make the ice tougher and less liable to breakage through all of the subsequent operations.

The best reason for tapping where ice is handled by an incline elevator is the economy gained. An Elevator Planer will easily remove any amount of sap ice, and it has been proven by harvesters that the cost of wetting down and disposing of the chips made by the Elevator Planer is not more than 5% of the expense of scraping. This will be referred to in later chapters.

To wet down, a gang of men, each provided with a narrow-bladed chisel and spaced at regular intervals in a row, proceeds across the field punching holes in the ice as the men advance. Judgment should be used in the spacing of these holes, the distance apart varying from six to ten feet, as the conditions may warrant; the number and size of holes being such as to insure a thorough saturation of the snow.

A number of different tools are used for this work. If a small hole is desired on thin ice, the Ring Handle Needle Bar, No. 484 — see Fig. 51 — is the best. For thicker ice, a chisel-shaped tool is required. Some harvesters use the curved-bladed Starting Chisel, No. 465, illustrated in Fig. 6, although a better tool is the Ring Handle Tapping Bar, No. 482, shown in Fig. 7, which is made especially for this purpose, and cuts a smaller hole.

Scraping.

The operation of scraping is so costly that it should only be done when it is not feasible to wet down. The use of a horse scraper is a necessity when the ice is thick enough and the fall of snow too light for wetting down to advantage. If the ice has not reached the desired thickness, a light snow should be removed by scraper. Under these conditions it is the cheapest method available, and the field will then ice much more rapidly than while protected by a snow blanket.

If the field is small all snow should be scraped to the shore. Where an extensive area is to be cleared, this is, of course, impracticable, owing to the distance that it would be necessary to draw the



Fig. 11. Scraping Scene.

loads. The field is then divided off into sections, the snow from each being piled in dumps or windrows between them. When this plan is followed, greater acreage must be allowed, as considerable space is covered by the dumps. These are generally run at right angles to the main canal through which the ice is floated to the elevator. As the weight of the snow in these piles is usually great enough to cause the ice underneath to settle below the general level of the field, a plow

groove is sometimes made along the side of the windrows, which prevents flooding the cutting area. The dumps are located some 300 feet apart, leaving a good 250-foot field between them.

The scraper most extensively used is the "dust pan," or Boston Scraper, No. 284-5. Its extreme simplicity makes it inexpensive, yet effective, and very easy to operate. One of these scrapers is shown in action in Fig. 9, the implement only being illustrated in Fig. 10. It is made in two widths, No. 284 being 6-foot and No. 285 8-foot. Although the 6-foot size is nominally a one-horse scraper, two horses should be used if the snows are heavy.

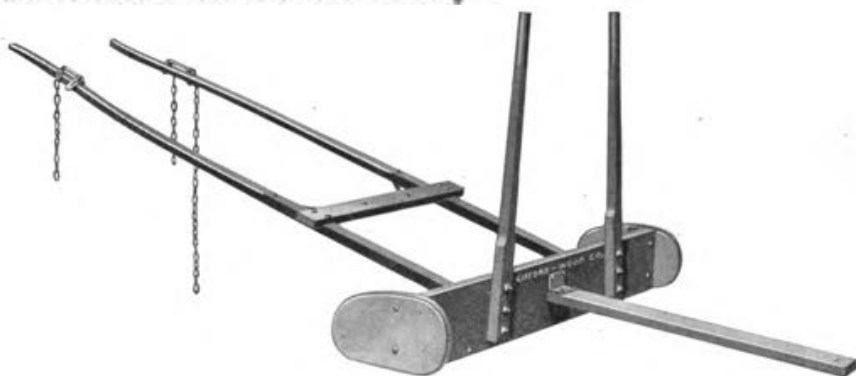


Fig. 12. Six-foot Clearing-off Scraper, No. 292.

The Clearing-off Scraper — see Fig. 12 — is made in three widths, 6-foot, No. 292; 7-foot, No. 293, and 8-foot, No. 294. It is used for removing light snows, plow chips, or for collecting the small furrows sometimes left by the large scraper.

Field Cultivating.

If the means of carrying the ice from the field to the house does not permit the use of the Incline Planer, field cultivating is the only method of removing snow ice or other objectionable material from the top before packing. There are cases, however, when field cultivating is to be recommended, even though the ice may later be cleaned up on



Fig. 13. Ordinary Field Planer, No. 279.

the elevator incline. Very frequently the weather is not severe enough to make ice rapidly. At such times the removal of a cutting of snow ice does much toward securing the desired thickness.

Another scheme is often practiced to secure an earlier harvest. The entire field is marked out with grooves running in one direction

as if the cutting operations were to follow. These grooves, generally made to a depth of three inches, allow the cold air to penetrate the body of the ice with a noticeable increase in its thickness. If the water of the pond or lake is naturally still, the motion given it by working the field also helps in the freezing.

Cultivating.

In the use of the Ordinary Field Planer, No. 279, shown in Fig. 13, the field is laid out with the marker; the spacing of the grooves being an inch or so less than the width of the planer, or at least no wider than the planer. This is an inexpensive article and is very largely used by the smaller harvesters.



Fig. 14. Perfection Field Planer, No. 270.

The Perfection Field Planer, No. 270, illustrated in Fig. 14, is a larger and much more efficient tool. With it no preliminary grooving is necessary, and a cut forty inches in width may be taken. With two



Fig. 15. Use of Field Cultivator.

good horses on the pole three inches of ice may be removed, a lesser amount being obtained when so desired by means of the gauge levers on both sides. The chips are run into a furrow by the scraper attachment, shown in Fig. 14, and may afterward be removed from the field in the same manner as snow. The use of the Field Cultivator is illustrated in Fig. 15.

Measuring Thickness.

This should be done at frequent intervals so that the harvester is at all times familiar with the conditions in any part of the field. The



Fig. 16. Measuring Rod, No. 512.

rapidity with which ice makes varies considerably in different portions of the field. The tools used are the Ice Auger, No. 510, and the Measuring Rod, No. 512, shown in Figs. 16 and 17.



Fig. 17. Ice Auger, No. 510.

As the thickness of the ice approaches the desired amount, the next step is —

Lining out the Field.

To run the first line through the proposed field a stake is placed at each end as a guide. A long plank, tested as a "straight edge," is put in line with the stakes and the cutting tool run along its side, after which the plank is pushed forward and the groove extended. The best tool for this work is the 6-inch Hand Plow, No. 409, shown in Fig. 18. Drawing the first line is well illustrated in Fig. 19, and that the groove may properly serve as a guide for the teeth of the Horse Marker it should be $\frac{1}{4}$ inch to $\frac{1}{2}$ inch in depth. Some simply stretch a long line and run the Hand Plow just clear of it.



Fig. 18. Hand Plow, 6-inch, No. 409.

The Line Marker, No. 500, shown in Fig. 20, is used as a substitute for the Hand Plow for small operations.

In laying out the cross lines care should be taken to run the first at right angles to the groove already made. A large wooden square should be used and will avoid marking out the diamond-shaped cakes



Fig. 19. Use of Hand Plow.

sometimes resulting from careless methods. Such a square can be easily made as follows: Attach two 10-foot boards with a single nail near one end of each; mark off a distance of eight feet on the edge of



Fig. 20. Line Marker, No. 500.

one board and six feet on the edge of the other; then place a third board, serving as a "stay lath," diagonally across the two, adjusting the latter until the two marks are diagonally ten feet apart in a straight line. The boards may then be nailed together solidly to form the desired right angle. Such a square is shown in the background of Fig. 19.

Marking Out.

After "lining out the field," the marking and plowing is next to be done. Whether the operations are to be on the largest scale, requiring several sets of Markers and Plows, or on a scale not as large, requiring one Marker only and one or more Plows; or small enough to be done by a combination Marker and Plow called a Swing Guide Plow; the procedure following the lining out is the same in all cases.

The teeth of the Marker or the Plow to be used in marking out are run in the shallow groove made by the Hand Plow or the Line Marker, and the trip is made across the field either without the Guide attached, or with the Guide running loosely on the surface of the ice with its handle thrown out of notch. In this manner the first groove $2\frac{1}{2}$ or 3 inches deep is obtained. The first cross-groove is made in the same manner, and these two grooves form the basis of the subsequent marking out.

The Swing Guide, whether attached to the Marker or to a Plow, is a gauge, or spacer, for obtaining uniformity in the distance between the grooves. If the cakes are to be square, as 44 x 44 inches, or 22 x 22 inches, the Guide is made for one width only; but if longer in one direction than in the other, as 22 x 32 inches, or 22 x 28 inches, either two separate guides are used, or a guide that is adjustable for both widths. Two separate guides are naturally more rigid than an Adjustable Guide; but the latter is certainly very convenient and is, therefore, the more popular.



Fig. 21. Patent Perfection Marker, No. 330.

In making the next parallel line, the Swing Guide is placed in the groove first made, and the teeth cut a new groove. At the end of the line the Guide is swung to the opposite side by its handle and the marking out is continued in the same manner. In making each cut with the marking-out implement, particular care should be taken to hold it in a vertical position, as otherwise the groove is started on an angle and will be so continued by the following trips, resulting in

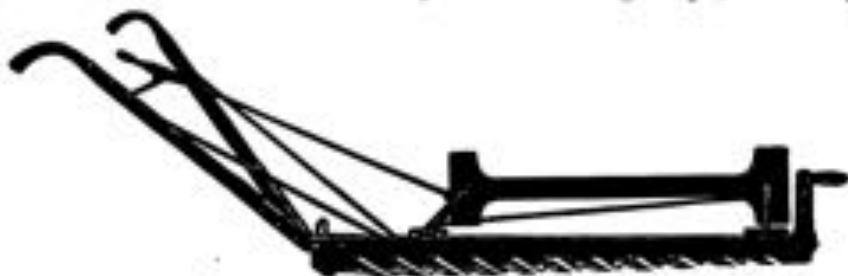


Fig. 22. Four-inch Marker with Swing Guide No. 355.

ill-shaped cakes. Fig. 22 illustrates the Solid-tooth Marker with 22-inch Swing Guide attached, No. 355, and Fig. 21 the style we call the Perfection Marker, which is fitted with inserted teeth, by the use of which the depth of the Marker is not reduced by filing. This latter feature will be described more fully under paragraph "Perfection Markers and Plows."

Plowing Down.

For largest operations, one or more complete sets of grooving implements is a necessity. Each set should include one or two Markers for the first cuts, Plows with increasing depth depending upon the thickest ice which can be anticipated. The deepest tool should

be able to cut fully two-thirds the thickness of the ice without bringing the Plow-back down to the groove. The importance of deep plowing is fully recognized by the experienced harvester, as it is one of the first requisites in obtaining regular cakes; otherwise, in barring off,



Fig. 23. Six-inch 9-tooth Plow, No. 371.

the seams may break unevenly, and thus produce cakes having "lips" or "flanges."

If, for instance, the ice is 12 to 14 inches thick, each set of machines employed should contain, besides its one or two Markers, a 6-inch



Fig. 24. Eight-inch Patent Perfection Plow, 8-tooth, No. 338.

9-tooth Plow, No. 337 or No. 371, the No. 371 is shown in Fig. 23; an 8-inch 8-tooth Plow, No. 338 or No. 374, see Fig. 24 for 338 and Fig. 25 for No. 374, and a 10-inch 6-tooth Plow, No. 339 or No. 377, Fig. 26 illustrates No. 377. For ice 15 inches thick, add to each set a 12-inch



Fig. 25. Eight-inch Plow, 8-tooth, No. 374.

5-tooth Plow, No. 340 or No. 379, No. 379 is shown in Fig. 27. Fourteen-inch and 16-inch Plows, No. 381 and No. 382, are used for still thicker ice, and we also make an 18-inch, No. 383.

A view on the field in which a good number of these tools is in use is given in Fig. 28.

Market teeth are gauged to cut a width of groove of $\frac{1}{16}$ of an inch; the teeth of 6-inch, 8-inch, and 10-inch. Plows are each slightly narrower, and on a 12-inch Plow the width is but $\frac{1}{8}$ of an inch. Plows must, therefore, always be run in the order of their depths.



Fig. 26. Ten-inch Plow, 6-tooth, No. 377.

The feed given to ice-plow teeth is such that each tooth makes a cut of $\frac{1}{4}$ inch. Thus, one trip with an 11-toothed Marker will cut a groove $2\frac{1}{2}$ or 3 inches deep; a 9-toothed Plow, $2\frac{1}{4}$ inches at each trip; an 8-toothed Plow, 2 inches, etc.

Perfection Markers and Plows.

A style of Markers and Plows, very popular with many advanced harvesters, is the Patent Perfection, or inserted tooth variety, shown by Figs. 21 and 24. This line is made in all sizes from Marker to 12-inch Plow. Owing to its construction, this type is somewhat more expensive than the solid tooth kind, but its advantages more than



Fig. 27. Twelve-inch Plow, 5-tooth, No. 379.

outweigh the extra cost with the mechanically inclined operator. Each tooth is made in two pieces, the larger part being firmly bolted to the Plow-back while the other is adjustable and carries the cutting edge; yet, when locked, they are as solid as if one piece. A broken point on

any tooth is easily remedied by regrinding this piece and readjusting; whereas with the solid tooth Plow, either a new tooth would be



Fig. 18. Plowing and Marking Scene.

required or it would be necessary to do a large amount of filing to level the points properly. Another great advantage is that the implements always retain their full depth.

Smaller Operations.

Where a full set of Markers and Plows are not needed for the amount of ice to be harvested, a good combination would include a Marker, 8-inch 8-tooth, and 10-inch 6-tooth Plows, and in this case it would be well to have the 8-inch 8-tooth Plow supplied with a Swing Guide, to be used only when the regular Marker may become tempo-



Fig. 19. Use of the Plow.

rarily dulled by stones. Of, if two plows in addition to the Marker are not needed, a 9-inch 7-tooth Plow, No. 376, will answer well for

12 or 13-inch ice. All our plows are made to follow themselves in successive cuts without binding, although naturally a succession of graded plows will run rather more easily. Figure 29 shows a single plow in operation.

Marking and Plowing with One Tool.

For harvesting a small crop, the ice man will find a single Plow with Swing Guide entirely practicable. Although Guides are sometimes attached to Plows as deep as 12 inches, we do not recommend

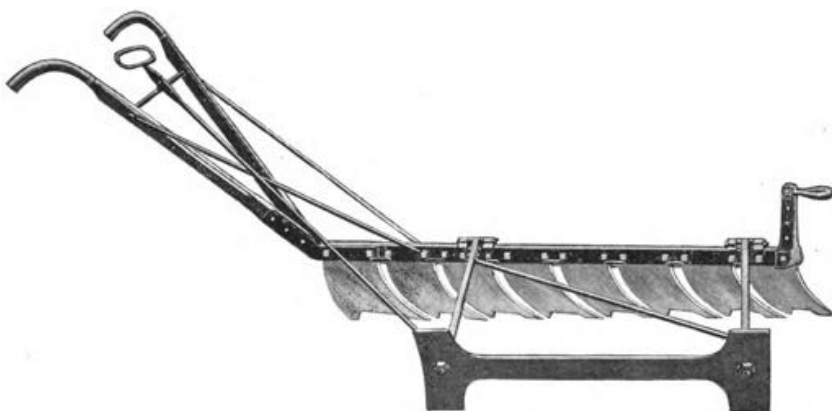


Fig. 30. Eight-inch Plow with Swing Guide, 7-tooth, No. 388.

the Swing Guide combination for a Plow deeper than 9 inches. Marking out cannot be done as straight with a deep Plow and Guide, and a long tooth will naturally cut more slowly than a short and more rigid one. Although the cutting as done in this way is a little slower than with a full complement of tools, it is incomparably superior to the old style method of sawing, as a horse and plow will do work equivalent to what a large number of men can accomplish at sawing. No one who cuts 100 tons of ice can afford to be without a good ice plow.



Fig. 31. Plow Rope, No. 412.

For those who want the best for long, continued service, the high-grade style of Plow and Guide shown in Fig. 30 is to be most highly recommended, as it is of the finest quality in all respects.

Plow Ropes for use on Markers and all Plows should be at least 8 feet long between whiffletree and Plow in order to prevent the front teeth being lifted from their work by the draft. One end at least should be provided with patent sister hooks, as illustrated in Fig. 31. We always carry a stock of these for the convenience of our customers.

Dairymen's Plows.

The great demand for a Plow for wide serviceability for small harvesters has resulted in a complete and less expensive line known as the "Ice King." This popular type is made in three depths, 8, 10 and 12-inch, each provided with a clearing and 5 cutting teeth, blued, and made with or without guides, and with guides of both non-adjust-



Fig. 32. Dairymen's "Ice King" Plow with Adjustable Swing Guide, No. 320.

able and of adjustable patterns. We supply these in large numbers to dairymen, farmers, and others harvesting from 50 to 1,000 tons. The substantial construction is well shown in Fig. 32, illustrating No. 320 Plow with Adjustable Guide. Send for special circulars of this line.

Ice Sawing Machine.

We occasionally have inquiries as to the economy of cutting ice with a circular saw driven by some form of motor, such as a gasoline engine. Where experiments on this class of apparatus have been made we have investigated the results carefully, but the machines up to this time have not been commercially practicable. The cost of such a power-driven outfit at the present stage of development would be well-nigh prohibitive, amounting to several times that of a full set of Marker and Horse Plows, which latter would cut fully as much ice in a given period. Simplicity in all details of his harvesting equipment is required by the ice man, and unless the work can be done much more cheaply he will not find it to his advantage to use a far more complicated and expensive tool.

Outline of Cutting.

A little system in laying out the various cutting operations will not only greatly increase the ease of harvesting, but will much more than pay for itself in the economy secured. The ice is detached from the field in pieces usually known as floats, which are made of suitable size for convenience in handling. If the field is at considerable distance from the house, the floats are made of large size, as the ice in this form may be more easily drawn to the point where it is to be divided into strips and subdivided again into single cakes.

The main channel through the field should be of ample size for the passage of these floats, and the best arrangement for cutting up is secured if this main channel and the single-cake or house channel are at right angles to one another. The advantages of these conditions will be mentioned later.

The house channel should be opened up on the day preceding the running of ice up the incline, and after a considerable surface has been marked and plowed. The channel should be at least eight inches wider than the single cakes. To cut this out, plow the two grooves on either side as deep as possible, slanting the grooves slightly so the strip will be a little wider at the bottom than at the top, saw both grooves through,



Fig. 33. Opening the Channel.

and then sink the strip after breaking it into pieces of suitable size. Some dealers harvest these cakes, but time is gained by making ready for a faster run. Figure 33 well illustrates opening the channel and sinking the pieces.

Sinking the Header.

This is really the same process as opening the channel, but as the extension of the house channel becomes the end, or head, of the main channel, which is at a right angle to it, the pieces which are sunk are called "the header." Then too, another header, at a right angle to the house channel, has to be sunk on the shore side of the main channel, which is plowed, sawed on a slight taper perpendicularly so it can be sunk without binding, and the pieces pushed under the edge of the field which is not to be harvested. Cutting out the header referred to is shown at A B C D in Fig. 34.

All of the deep plowing near the header should be completed before breaking it out, so that it will not be necessary to bring the horses near open water. The Saws used vary in length from 4 feet to 5½ feet, but the 5-foot, No. 422, shown in Fig. 35, is most commonly used.



Fig. 34. Sinking the Header.

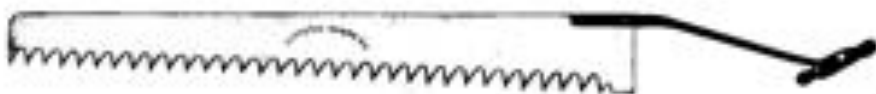


Fig. 35. Five-foot Saw, No. 437.

Calking.



Fig. 36. Use of Calking Bar.

Before exposing any plowed seams to open water, even in the work of opening channels and sinking headers, the work of calking, shown in Fig. 36, is a most important detail of harvesting, as care and thoroughness at this point will save an immense amount of labor in subsequent operations. If the plow grooves are left open, water readily enters and may run throughout the field. Cold weather at this time would freeze the grooves up again, making replowing necessary. To avoid the possibility of this additional work all grooves on the field exposed to the water as well as those on all sides of every float should be properly calked before the floats are detached. The Hollow Handle Calking Bar, No. 457, shown in Fig. 37, is generally used. The grooves should be cleaned out to the bottom by giving the bar a side motion, before any tamping of the chips is done, as otherwise an opening may exist at the bottom through which the water will pass. Thoroughness in this detail is very important; and as a further emphasis it may

here be mentioned that incomplete calking is responsible for a very large part of the poor ice which is placed in storage. This should be very carefully watched throughout the entire harvest whenever freezing weather exists.



Fig. 37. Calking Bar, Hollow Handle, No. 437.

Barring off the Floats.

With the two headers on one end and on one side of a float open, the third side is sawed, as shown at AB in Fig. 38. The only operation then necessary to separate the float from the field is to bar off on the line BC in Fig. 38. This float groove along which the break is to be



Fig. 38. Sawing at End of Float.

made and also the grooves to be sawed should be plowed one or two cuts deeper than other parts of the field. The best tool for barring off is the Two-tined Splitting Fork, one form of which, No. 443, is shown in Fig. 39. It is made in different weights and with either knob or ring handle. The tines are so shaped as to wedge at the top of the groove, at the same time striking at the bottom if the groove is of



Fig. 39. Splitting Fork, Ring Handle, No. 443.

average depth. The blow starts a seam at the bottom, and by repeating these thrusts at spaces of a few feet the groove will soon open and the float separate from the field. A little experience will enable one to quickly determine by the dull cracking sound at what intervals the blows should be made. This operation is well illustrated in Fig. 40.

The Lynn Splitting Bar, No. 446, see Fig. 41, is preferred by some to the Two-tined Splitting Bar. If the ice is not thick, however, so that the grooves are plowed to a depth of about six inches only, the

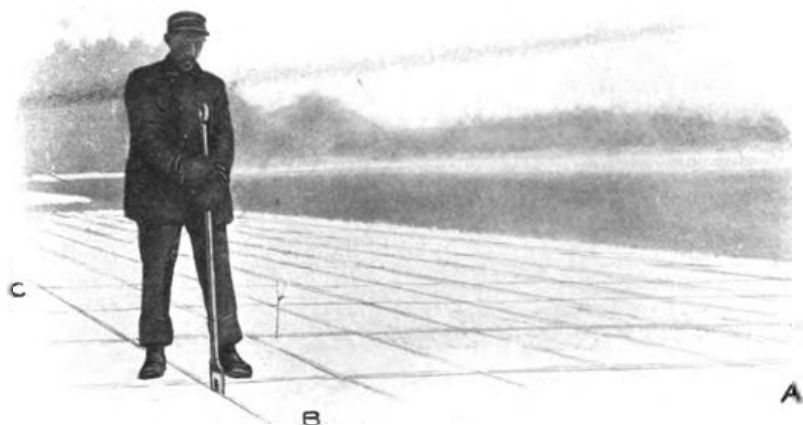


Fig. 40. Barrage off the Floats.

Four-tined Fork Bar, No. 449, see Fig. 42, may be successfully employed as the tines are made of the proper taper for shallow grooves.



Fig. 41. Splitting Bar, Lynn Type, No. 446.

The size of floats vary with different harvesters. The object of floating sheets of ice from the field to the elevator channel instead of towing single strips or cakes is merely because it saves men, is therefore cheaper, and makes more rapid housing possible.

The floats are now drawn toward the house channel or slip to be separated into strips. This work is often done by men using 12, 14, 16 or 18-foot Ice Hooks, as shown in Figs. 43 and 44. Some harvesters,



Fig. 42. Fork Bar, Ring Handle, 4-tined, No. 449.

however, prefer to use horses for this work, in which case the No. 438 Towing Hook, Fig. 45, is used, as it can be applied to the surface of the float at any desired point. This is attached at the end of a long rope, the length being sufficient to allow the horse to walk some distance back from the edge of the channel. In some cases small steam or gasoline launches are used, towing several floats together. To prevent waves washing over floats in rough water some harvesters place corner



Fig. 43. Towing Hook, No. 438.

boards along their weather sides. Figure 44 well shows the right angle relation between the main channel and the house channel, and the way the latter is provided with a temporary platform.



Fig. 43. Bringing Floats to Elevator.

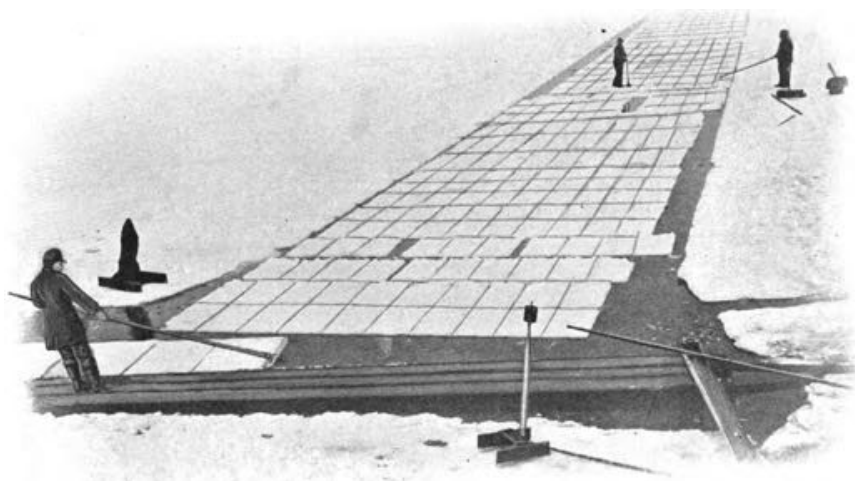


Fig. 44. Main Channel with House Channel at Right Angles.

Barring off the Strips.

As the floats approach the house, or elevator channel, strips extending across the full width of the floats are broken off, which operation is shown in Fig. 46. The tool best adapted for this work is



Fig. 45. Barring off Strips.

the Three-tined Needle Bar, No. 486, Fig. 47, although some use the older-fashioned, No. 451, Three-tined Fork Bar, Fig. 48. The strips



Fig. 47. Three-tined Needle Bar, Ring Handle, No. 486.



Fig. 48. Three-tined Fork Bar, Ring Handle, No. 451.

are now run into the house channel or elevator slip, ordinary Ice Hooks, 5, 6 or 8-foot long, Fig. 49, being used for their handling.

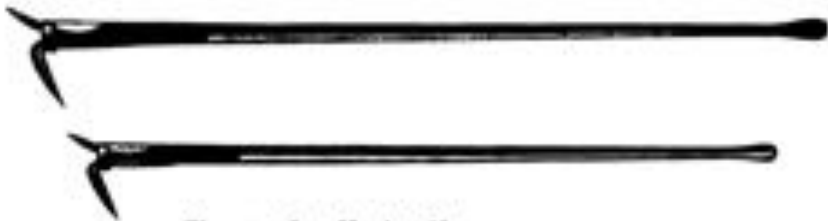


Fig. 49. Ice Hooks, No. 530 or 530 1-a.

The best harvesters, taking ice from lakes, have wooden platforms built on either side of the elevator channel, as shown in Fig. 50.

Dividing into Cakes.

Feeding the strips into the elevator channel is illustrated in Fig. 50, but Fig. 51 shows much better the detail of breaking up into the individual cakes. The shortness of the groove makes a light tool

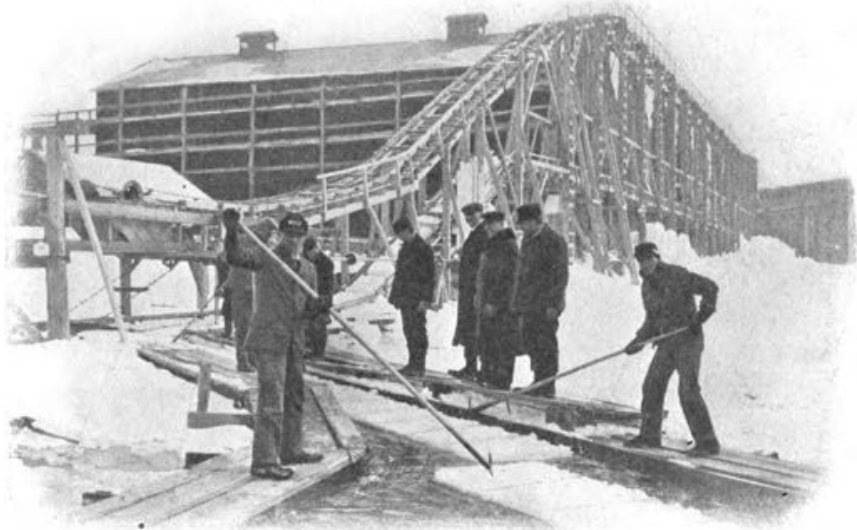


Fig. 50. Feeding Ice to the House Channel.

desirable, and there are several which may be used to advantage, depending upon the condition of the ice.

If the grooves are frozen up, the No. 486 Three-tined Needle Bar, Fig. 47, is the best tool. For grooves frozen less hard, the No. 485



Fig. 51. Dividing into Single Cakes.

Two-tined Needle Bar, Fig. 52, is excellent. The No. 480 Saw Toothed Chisel, Fig. 53, has some friends; the No. 482 Tapping Bar, Fig. 7, is



Fig. 52. Two-tined Needle Bar, Ring Handle, No. 483.

used; also the No. 476 or No. 477 Splitting Chisel, Fig. 54; and for high platform work, the 6-foot No. 490 Canal Chisel, which has a blade like the No. 476 Splitting Chisel.



Fig. 53. Saw Tooth Chisel, Ring Handle, No. 481.

If the calking has been thoroughly done and the grooves are dry, the No. 484 Canal Needle Bar, Fig. 55, also known as the Single-tined Needle Bar, is more generally employed than any other, as it is very light. Whichever is used, a single blow should sever the cake from the strip.



Fig. 54. Splitting Chisel, Ring Handle, No. 476.

Chips of ice and slush are apt to collect in the elevator channel, and the No. 505 Scoop Net, Fig. 56, is used for clearing out this obstruction. Sieve Shovels are also quite popular for this purpose.



Fig. 55. Canal Needle Bar, No. 484.

The cakes are now ready to be removed from the water and run into the house, or to a loading platform for transportation. The No.



Fig. 56. Scoop Net, No. 505.

502 Elevator Fork, Fig. 57, is designed especially for feeding the cakes to the elevator, the two pushing points giving better control of the ice than the ordinary Ice Hook.

Elevating Apparatus.

Success in the rapid and economical harvesting of a crop of ice depends to a very great extent upon the means of handling it between



Fig. 57. Elevator Fork, No. 502.

the single cake canal and the house. Energetic and systematic methods on the field are good so far as they go, but the best results

can only be obtained by continuing these until the ice is placed in storage. This article is intended to refer more especially to the field operations and the tools commonly used, and therefore only a brief outline of the elevating apparatus will be given. Complete catalogues are issued by us each year in which all standard and many special elevators are illustrated and their construction explained, as well as



Fig. 59. Pole Grapple, No. 433.



Fig. 58. Jack Grapple, No. 435.

a detailed description of all tools. We are very glad to mail these to any one interested, also to supplement such information with suggestions and estimates when the opportunity is given us.

Small Harvesters.

The smaller harvester is now as keenly aware of the need of suitable apparatus as is his neighbor engaged in a more extensive business.



Fig. 60.

Self-Lubricating Upper Gin, No. 710.



Fig. 61.

Self-Lubricating Lower Gin No. 711.

Those who are content with no machinery whatever get along with the old-fashioned Grapples shown in Figs. 58 and 59 for incline work. For this work, good, metalline-bushed gin wheels, which need no oiling, are much to be preferred to common cast-iron wheels. See Figs. 60 and 61.

The Single and Double Gig Elevators, the latter of which is shown in Fig. 62, are convenient appliances, as they will handle a sufficient

amount of ice, and no power other than that of horses is necessary. As many as seven cakes a minute may be raised by the Double Gig Elevator, and a little estimating will show that a fair-sized house may be quickly filled by its aid.

A machine very popular with the smaller harvester is the Perpendicular Elevator, Fig. 63. This may be operated by a gasoline engine and will lift twelve cakes per minute to any height desired. It is especially popular with the dairying firms, several of the largest in the country having one at each of their widely separated plants.

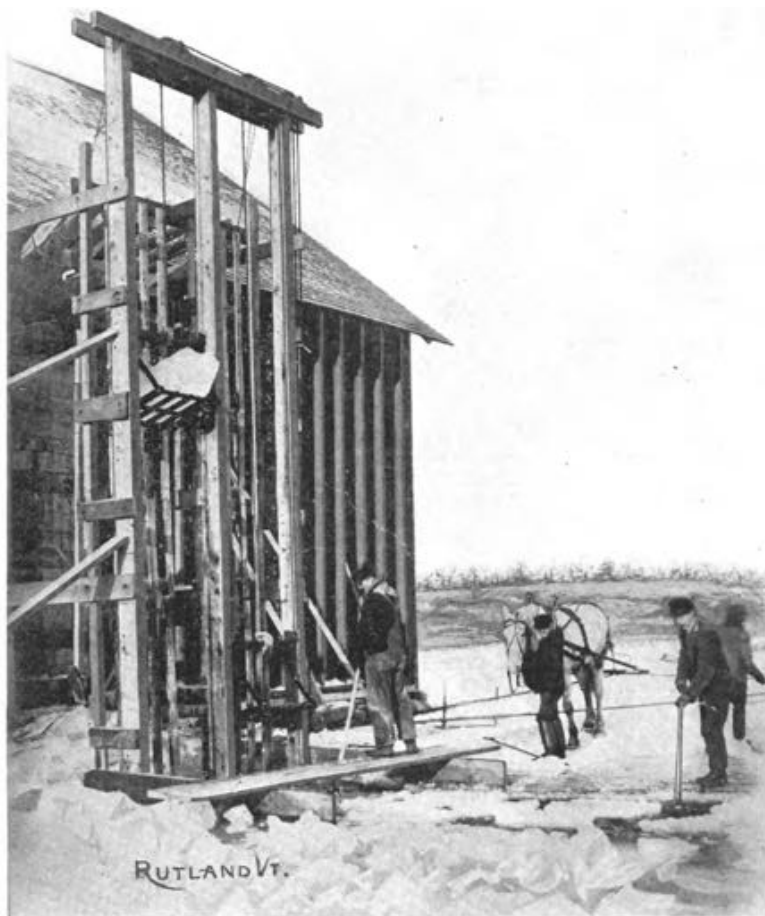


Fig. 6a. Double Gig Elevator.

When the house capacity is greater, the elevator should be of the Incline variety. More ice may be handled in a given time, and there are also other advantages which recommend it for consideration. The Incline Elevator makes the use of an Elevator Planer possible, which cannot be adapted to any vertical-lift machine. The low cost of making the snow into snow ice and planing off on the incline has already been referred to under the heading of "Wetting Down," page 11.

Some of the advantages of the planing will be mentioned in the next section.

The elevators are variously designated as Side Feed, Undershot and Overshot, depending upon the method of delivering the ice cakes

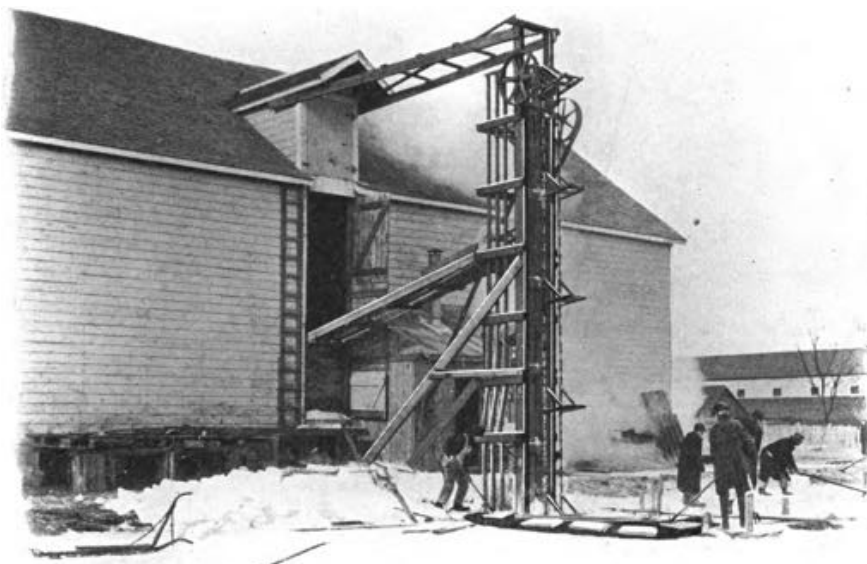


Fig. 63. Perpendicular Elevator.

to the feeding end or "apron." With the smaller houses the ice may be run by gravity direct from such an incline into storage.

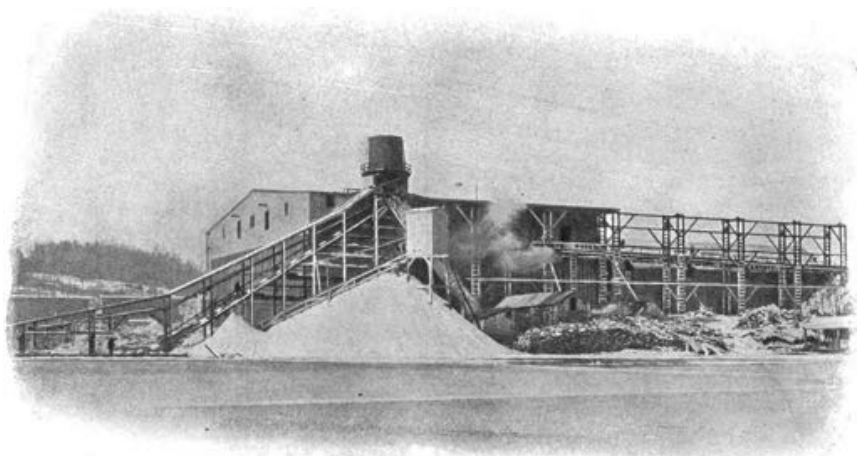


Fig. 64. Incline Elevator and Gallery Conveyor

Larger Harvesters.

Where the house consists of a number of rooms with doors in a row, an adjustable gallery conveys the ice from the elevator along the side of the house, a portion being switched into each door. This gallery is raised as the rooms are filled. If the length exceeds 100 feet it is generally provided with a conveyor chain for insuring a uniform delivery of the ice. The largest houses are usually equipped with the Elevator Conveyor, which has the advantage of a continuous double

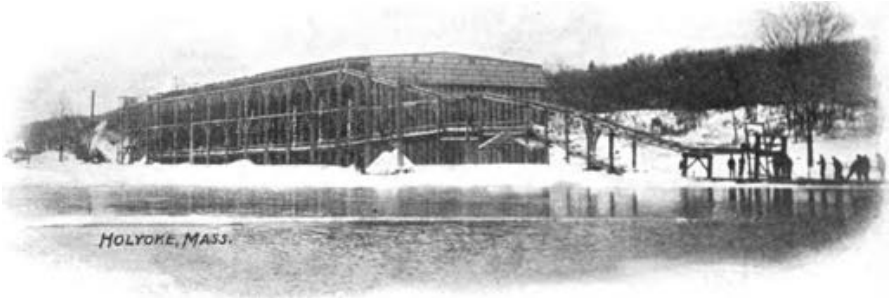


Fig. 65. Elevator Conveyor.

chain carrying each cake from the water to the various doors. Both Incline Elevator and Elevator Conveyor are shown in Figs 64 and 65.

Almost any kind of power may be used on these elevators, providing it is reliable. In the earlier days steam was almost universal, as there was scarcely ever any other power available. The electric motor is now often employed, and the extensive use of electricity has led to its application in many cases. When the combinations are favorable, it has much to recommend it over any other power. The first cost of the machinery needed is much less, no licensed engineer is required, while the actual cost of the power itself is in most cases no more than with steam.

Planing on the Incline.

This has already been mentioned on page 13 as the most inexpensive means of taking care of snow which may fall on the field. There are other reasons in addition which are of much greater importance to the harvester, and some of which would recommend planing even when there has been no snowfall.

Cleanliness in harvesting methods is one of the most valuable assets the iceman can have. The public appreciates a superior article in ice as well as in any other line. Where there is an opportunity of making a choice, ice taken from good water, cleaned of any surface impurities and delivered in a satisfactory shape will take preference over ice lacking these qualities. Even if the field has no snow-ice whatever, the surface must contain impurities of one form or another before it reaches the house.

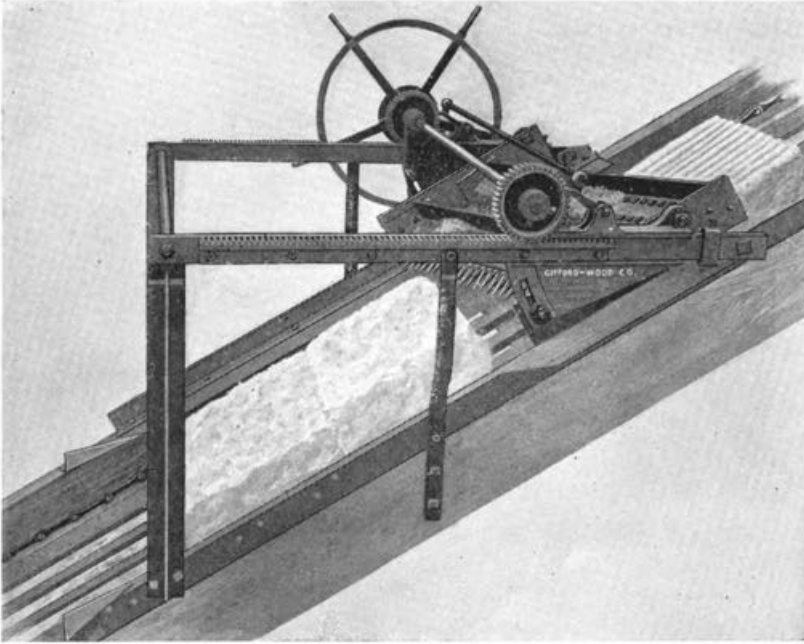


Fig. 66. Eureka Elevator Planer, Movable Carriage Style, No. 252.

The removal of one-half or one inch will take this objectionable matter with it and will accomplish much in favorably advertising the product.

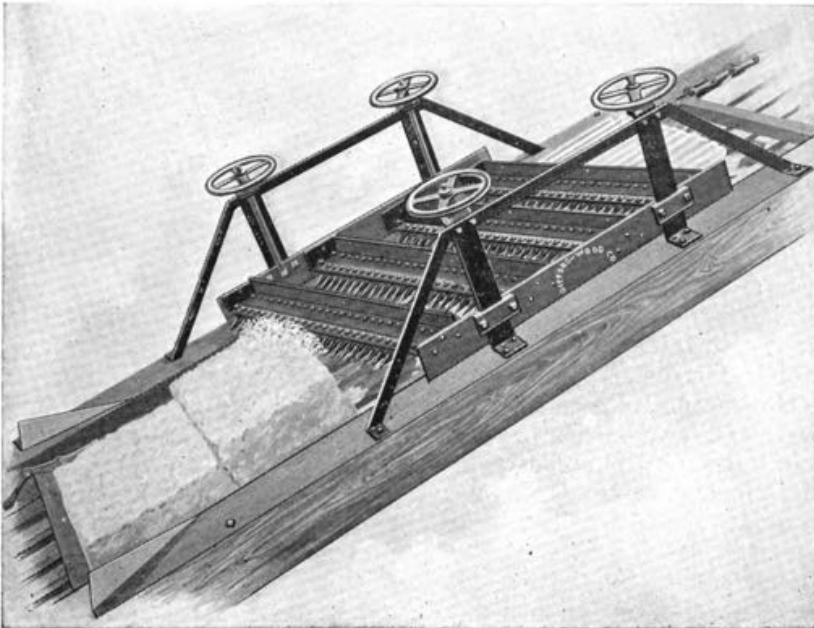


Fig. 67. Eureka Elevator Planer, Stationary Style (Adjustable), No. 254C.

The point which may appeal most strongly to the practical iceman is the ease in packing. Ice that is taken at the same time from different parts of the field may vary considerably in thickness. By making this uniform, level floors are secured in the house and the storing is done much more rapidly. The corrugations separate the blocks, the smooth bottom of one resting on the points of the one below. This treatment makes it easy to take the ice out, and greatly reduces the cost from getting out unplanned ice which has become frozen together.

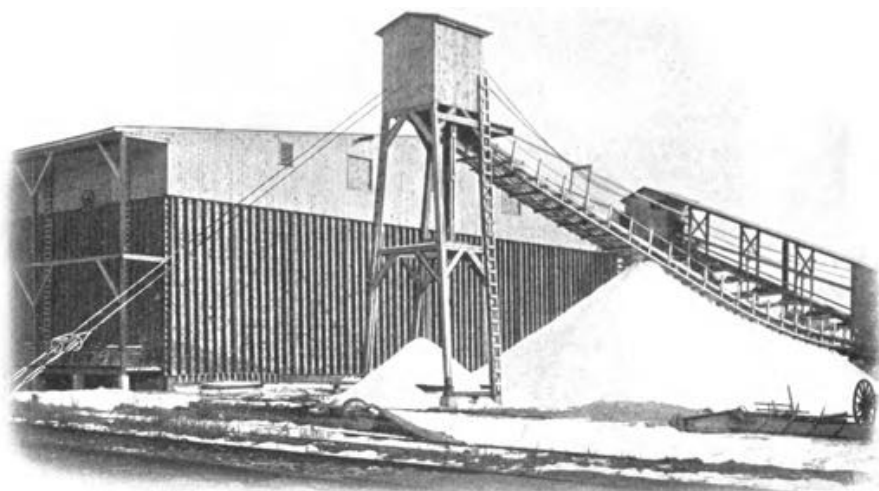


Fig. 68. Suspension Type Chip Conveyor.

By far the greater advantage to be gained from the use of a good, solid Planer with plenty of knife-bars is the storing of cakes of uniform thickness and weight. In deciding upon the size of cake, the trade to be supplied should, of course, be considered. By so doing a length, width and also thickness may be selected which will allow the necessary retail cutting and still give the least amount of waste possible. Attention to this point followed by equal care in throwing out all defective cakes before they reach storage will greatly increase the value of the house contents, as the sales records will show.

The most common thickness desired in different parts of the country is $12\frac{1}{2}$ or 13 inches, and to obtain the advantages referred to the Planer is set for this at the beginning of the season. Filling a large house generally requires two or three weeks, and the field may increase in thickness 6 inches during that time. This means that during the latter part of the harvest 5 or 6 inches must be removed from all the ice, and to take off 8 or 10 inches is not uncommon.



Fig. 69. Handling Chips with Water.

There are two general types of Planers at present in use: the Movable Carriage and the Stationary Knife type. The former, as the name indicates, is so arranged that the cut may be varied instantly and is generally used where the ice is to be corrugated only. Observe Fig. 66.

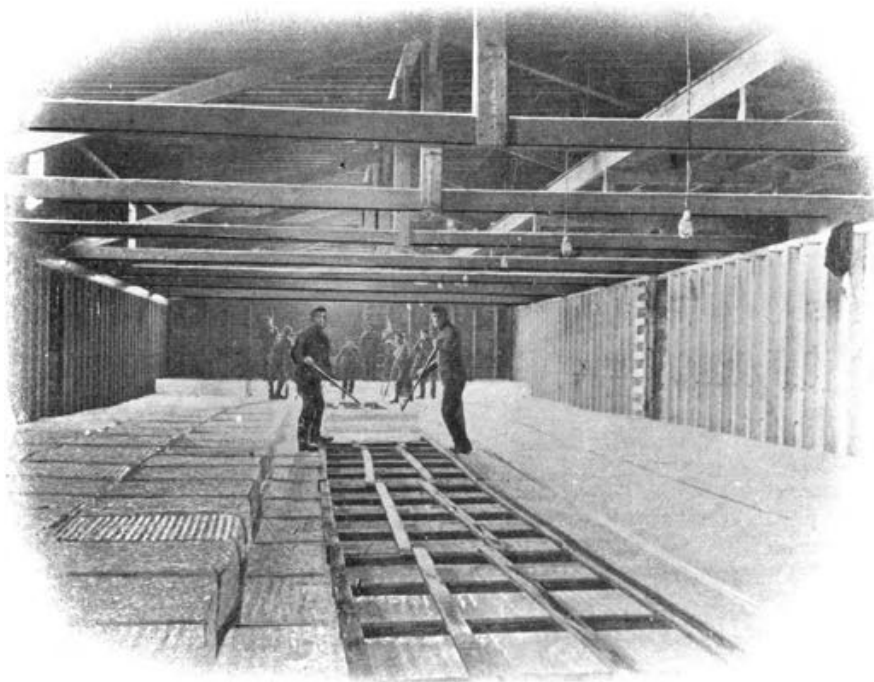


Fig. 70. Use of House Runa.

The Stationary Knife Planer is a natural result of the practice of planing an entire crop to one thickness, and indeed is to be generally recommended, even if frequently readjusted for changes in thickness. In very cold sections of the country where the field may reach a thickness of 20 or 24 inches before the houses are filled, eight or ten knife-bars are necessary. A Four Knife-bar Planer is shown in Fig. 67.

The large amount of chips made by the Planer must be quickly and cheaply removed. A small cut will result in but few chips and these can be readily handled by a horse Scraper, but in the course of a large harvest, 5,000 or 10,000 tons, or even a greater amount of chips is not uncommon. It needs no argument to show that an army of men with horse Scrapers would be necessary to handle this, the cost of which work would be enormous.

To reduce this expense to a minimum, any one of a number of power appliances may be used. The Chip Conveyor, driven either independently or from the main elevator, is very generally employed, and a Suspension type of Conveyor is shown in Fig. 68. Another efficient method is to float the chips by means of a stream of water delivered to a trough beneath the Planer. This is illustrated in Fig. 69. In some cases the location of the elevator is such that the natural flow of a stream may be utilized for this purpose, but the conditions making this possible are extremely rare.

Housing.

Figure 70 illustrates the interior of a house when nearly filled with 44 x 44-inch ice. Wooden Runs and Skids, as shown in Figs. 71 and 72, convey the ice from the Elevator or Gallery outside the door as far as possible in the house, sufficient slope being given for running to any part of the room with little effort by the men. For this work ordinary Ice Hooks constitute the larger part of the tool equipment, and some use the No. 565 Drag, or Stowing Tongs with long handles, see Fig.



Fig. 71. Wooden Run, with Sides, No. 730.

77, in housing operations as well as in taking ice out. The Gallery, if an Adjustable one, should be only enough higher than the floor level in the room for keeping the ice on the move without using Scratchers. With fixed Galleries, Scratchers are needed for reducing the speed, and considerable back-hauling of the ice will be necessary in packing the end nearer the doors. The chips made by Scratchers in the house should be frequently shoveled out of doors.

Packing on the Flat.

The most common practice of packing is to store the ice on the flat, and the cakes when so placed should have a space of from two to four inches between them, except the two top tiers, which should be tight.

In spacing ice, the "straightener," or man who adjusts the rows of cakes, uses either the No. 465 Starting Chisel, Fig. 6, or the No. 458 Bar Chisel, Fig. 80, as a steel bar is much safer than to attempt sys-



Fig. 72. Four-slat T-iron Skid, No. 726.

tematic spacing with an Ice Hook. Figure 73 is a fine illustration of most excellent packing on the flat.

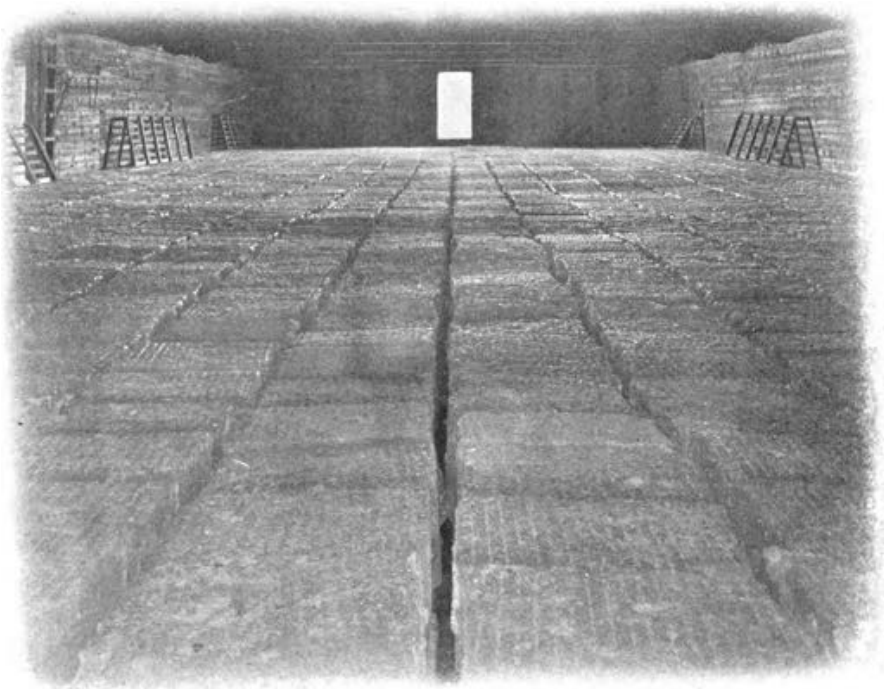


Fig. 73. Interior of House Showing Corrugation by Elevator Planes.

To prevent shifting following meltage, the tiers should be tied together once every sixth or eighth layer by breaking joints. Where the cakes are oblong in form, some harvesters reverse the arrangement in each layer, thus breaking joints on each tier.



Fig. 74. Patent Floor Shaver, No. 470.

After completing each layer, and before starting another, the surface is dressed down, if the cakes are of uneven thickness, by using either the No. 470 Floor Shaver, shown in Fig. 74, or the 470½ Floor

Leveler, Fig. 75. The latter, however, is such a rapid cutter that it is more useful in evening the ragged surface of layers of ice when packed on edge.



Fig. 75. Floc Leveler. No. 470 1-2.

Packing on Edge.

In parts of the country where ice harvested in winter is thin, or when the cakes must necessarily be housed in thicknesses of wide varia-



Fig. 76.
Eastern Edging-up
Tongs, No. 551.



Fig. 77.
Drag or Stowing
Tongs, No. 555.



Fig. 78.
Utah Edging-up
Tongs, No. 55a.

tion, it is a common practice to pack the ice on edge. By this means the floors are kept level, and in case this ice is taken out in the summer at a slow rate, the meltage takes place on the edges of the cakes instead of on their flat surfaces. Tools used for edging ice are usually the

No. 561 or 561½ Eastern Edging-up Tongs, which span the entire cake, Fig. 76, or the Utah Edging-up Tongs with less span, which grasp the cake on the side with one point and on the top with the other, Fig. 78. The No. 470½ Floor Leveler, Fig. 75, above referred to, is adapted to



Fig. 80. Bar Chisel, No. 438.

rapid work in smoothing off lips, or flangers, caused by imperfect breaking in the process of harvesting, and which will make a very rough floor unless trimmed down.



Fig. 81. Summer Bar, Curved Blade, Heavy, No. 460.

As most of the meltage in a house is at the top, the ice should be thoroughly covered as soon as filled. Any one of a variety of materials is used. Hay, straw, sawdust and wood shavings are the most common, hay being generally preferred. Whatever covering is used, it should be dry to serve well as an insulator.

Taking out in Summer.

In locating the house due attention is given to removal of the ice in the summer time. The doors and platform should be so placed that



Fig. 82. Separating Chisel, Knob Handle, No. 495.

the ice may be conveniently lowered and loaded either to wagons or cars.



Fig. 83. House Ice Ax, No. 602.



Fig. 84. Wooden Flat Skid, No. 740.

The No. 458 Bar Chisel, Fig. 80, or one of the styles of Summer Bars, Fig. 79, is used in cutting around the cakes to thoroughly clear the spaces left in packing, such as are shown in Fig. 73.

The No. 465 or No. 466 Starting Chisel, see Fig. 6, now comes in for the use for which it was originally made, in the operation of "striking up," by which the blocks of ice are "started" or separated

Fig. 85. Half Oval Iron, No. 754.

from the layer beneath. Some icemen use the Summer Bar, see Fig. 81, for both cutting around and striking up, as one of the styles has a curved blade.

When ice is packed in blocks 44 x 44 inches, it is necessary that they be divided into cakes of 22 x 22 inches before loading cars or

Fig. 86. Patent V Run Iron, No. 750.

wagons. To make this subdivision the No. 409 6-inch Hand Plow, see Fig. 18, is used. In fact, the Hand Plow was originally invented, over

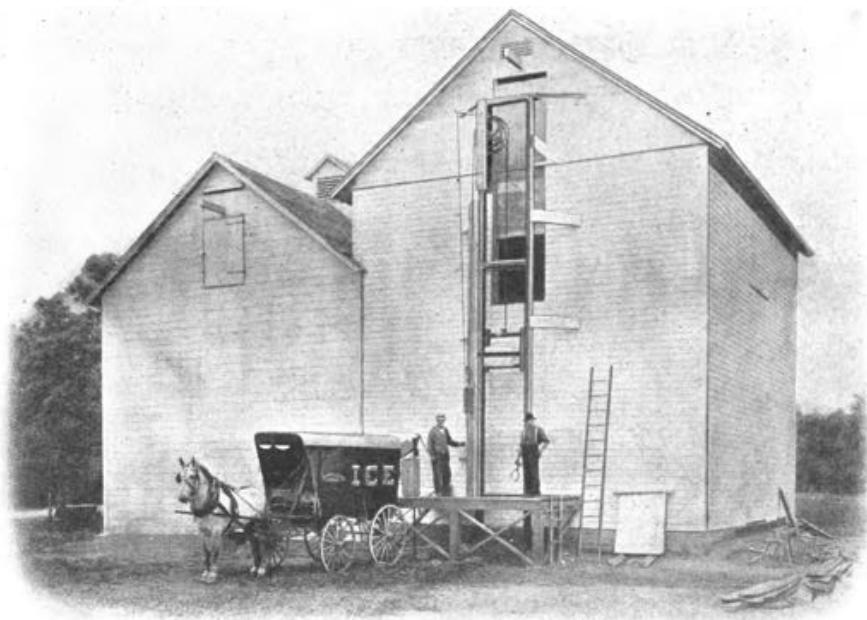


Fig. 87. Gig Lowering Machine.

sixty years ago, for this use, and its employment on the ice field in harvesting operations was secondary.

The No. 495 Separating Chisel, Fig. 82 (also made with a ring handle), which has a long, thin blade, is used in breaking down cakes



Fig. 88. Endless Chain Lowering Machine.

of ice when stored on edge. The No. 601 or No. 602 House Axe, Fig. 83, is also used largely for this work.

The same Skids and Runs, see Figs 71 and 72, used in storing the ice may again be employed in chuting it from any part of the house

to the lowering device outside the door. Large companies usually have a lighter set of Runs for summer use than those used in storing. Wooden Flat Skids, see Fig. 84, are popular as a Run for both purposes, as having no sides, the ice can be pulled off at any point. For Runs having sides, Half Oval Iron, Fig. 85, is used; and for Runs without sides, two of the tracks are ironed with Patent V Run Iron, Fig. 86.

The Gig Lowering Machine shown in Fig. 87 is much used for wagon loading. Where it is necessary to deliver the ice more rapidly to the platform, as in car loading, the Endless Chain Lowering Machine, Fig. 88, is to be recommended. Another device entirely automatic in its working is the Pneumatic Lowering Machine. This, and other appliances, are thoroughly illustrated in our complete catalog, which will be sent on application.



Fig. 89. House Run, No. 720.

In loading wagons the No. 720 House or Wagon Run, 6 feet long, see Fig. 89, is a most useful article which is widely used. In loading cars, the run used is generally 7 feet long, and has stoppers welded on the bottom. See Fig. 90 for illustration of No. 722 Car Run.



Fig. 90. Car Run, No. 722.

Next to securing payment for the commodity, the last chapter of interest to the seller in the history of a cake of ice is —

Delivery to the Customer.

This subject could be written upon at great length. Different conditions exist in different localities. A great variety in styles of Ice Axes, some narrow, some wide, some square and some round-bitted; Ice Tongs, a dozen different kinds of stock styles, to say nothing of many more private patterns; Ice Shavers; Ice Breakers; Hand Ice Saws; Ice Cleavers; Ice Awls, etc., are always kept in stock by us to meet all requirements. Hoisting Blocks; Creepers; Scales or Balances; Wooden Soled Shoes; Rubber Aprons, and many other conveniences are also described and priced in our catalog.

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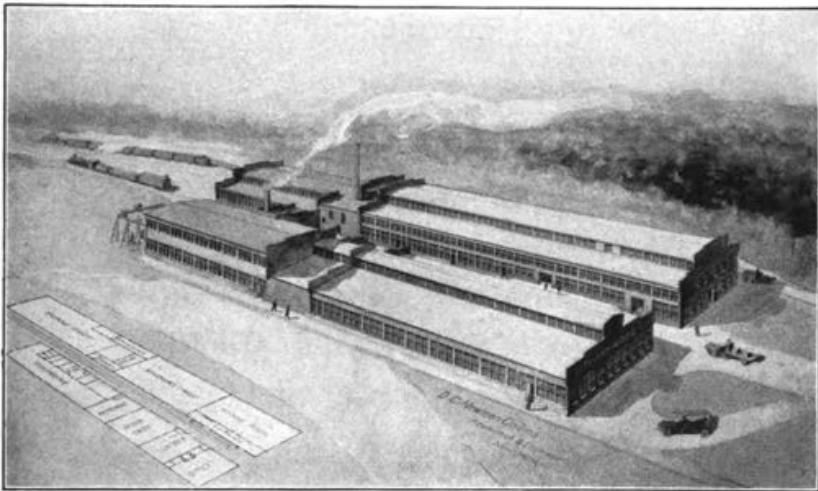


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EXPERIENCE of more than fifty years enables us to furnish designs for machinery equipments, which have been proved by practice, thus precluding any possibility of expensive experimenting. The small details, seemingly unimportant, but which mean economy, are all embodied in our product.

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ARCTIC ICE CO.,
WINNIPEG, MAN.

Elevator-Conveyor; Chip Conveyor in foreground.



Side Feed Elevator-Conveyor.

(Patented May 16th, '94.)

The Elevator-Conveyor is the most economical type of ice harvesting machinery yet devised for a house of over ten thousand tons capacity.

Operation. Two strands of endless chain, connected by wooden hold bars, run from the water up an easy incline along the adjustable galleries to the top of the machinery tower, which is placed at the rear of the house, and then return overhead to the water. Ice is fed to the chain from the side of the water box (Side Feed, see p. 12), is picked up by the hold bars, and carried without transfer or breakage to the doors.

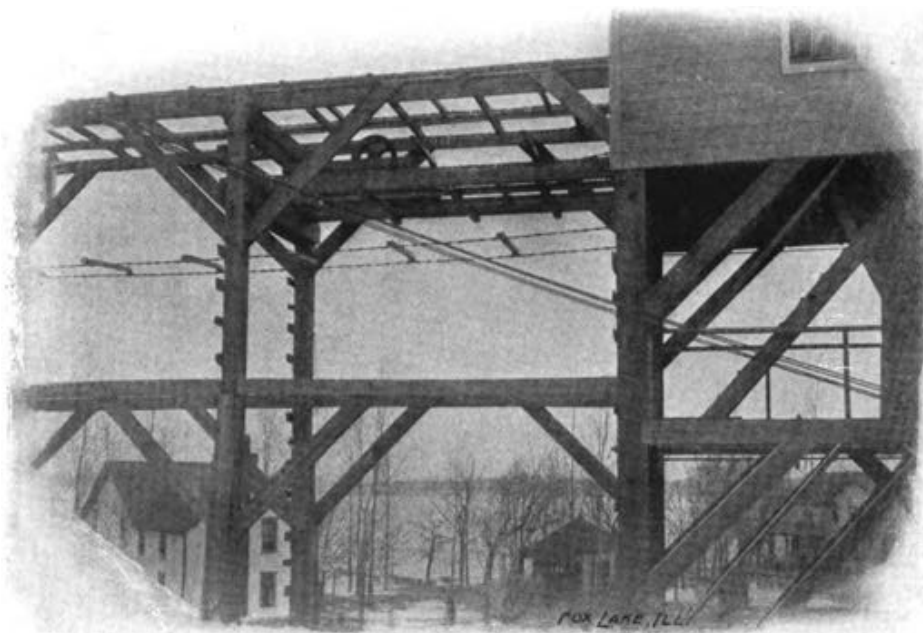
One section of the incline is made telescoping so that it lengthens out as the galleries ascend, keeping the hoist cables plumb and the door chutes at the center of the doors.

Advantages. The men at the doors pull off cakes as desired, and all poor ice is carried to the end of the gallery, where it can be dumped or run by gravity to some out-of-the-way place. The only men required from water to tower are the men at the doors—one at each. The ice blocks are conveyed with absolute regularity, making it easy for the door men to switch them into the doors and for the house men to handle the ice quickly without confusion. The gallery sections can be raised one tier at a time, obviating the necessity of scratchers on the door chutes. This prevents the accumulation of chips and slush that causes so much trouble when taking the ice out. The amount of back hauling to fill the rooms near the doors is minimized, as shorter chutes into the house can be used, thus reducing the number of men required in the rooms.

Capacity. The chain can be run at two hundred feet per minute, giving a capacity, with hold bars five feet apart, of forty bars per minute. This means for ice 22" x 32", eighty cakes per minute, or for ice 22" x 22", one hundred and sixty cakes per minute.



Apron End of Elevator-Conveyor.



Elevator-Conveyor with Tension Carriage at the Tower.

The above views illustrate the latest improved design of Elevator-Conveyor. The traveling tension, which keeps the chain tight, is placed in the tower—out of the way—so arranged that no shortening of the chain is necessary.

At the water the construction is much simplified.

The improved double tread idler wheel, providing great security, is illustrated on page 87, lettered TZ.



Side Feed Elevator-Conveyor.

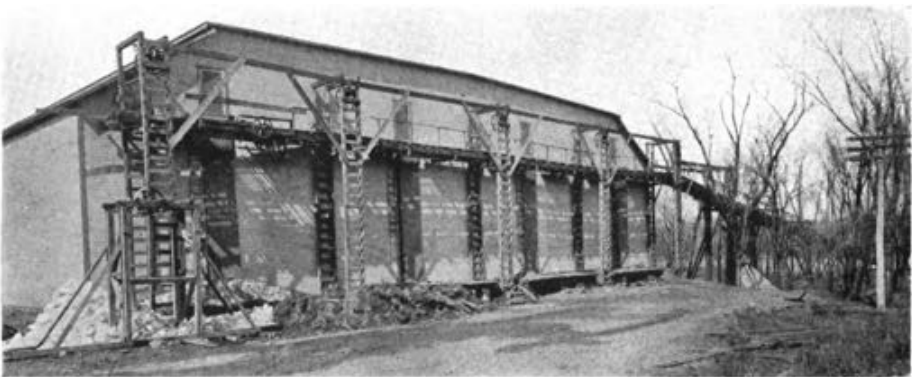


From the house to the feeding point of this Elevator-Conveyor it is four hundred feet. This distance was necessary because of shallow water nearer the shore. The location of the canal for the Side-Feed is distinctly shown. There are but two workmen; the balance of the group is formed of spectators.

GIFFORD-WOOD CO.

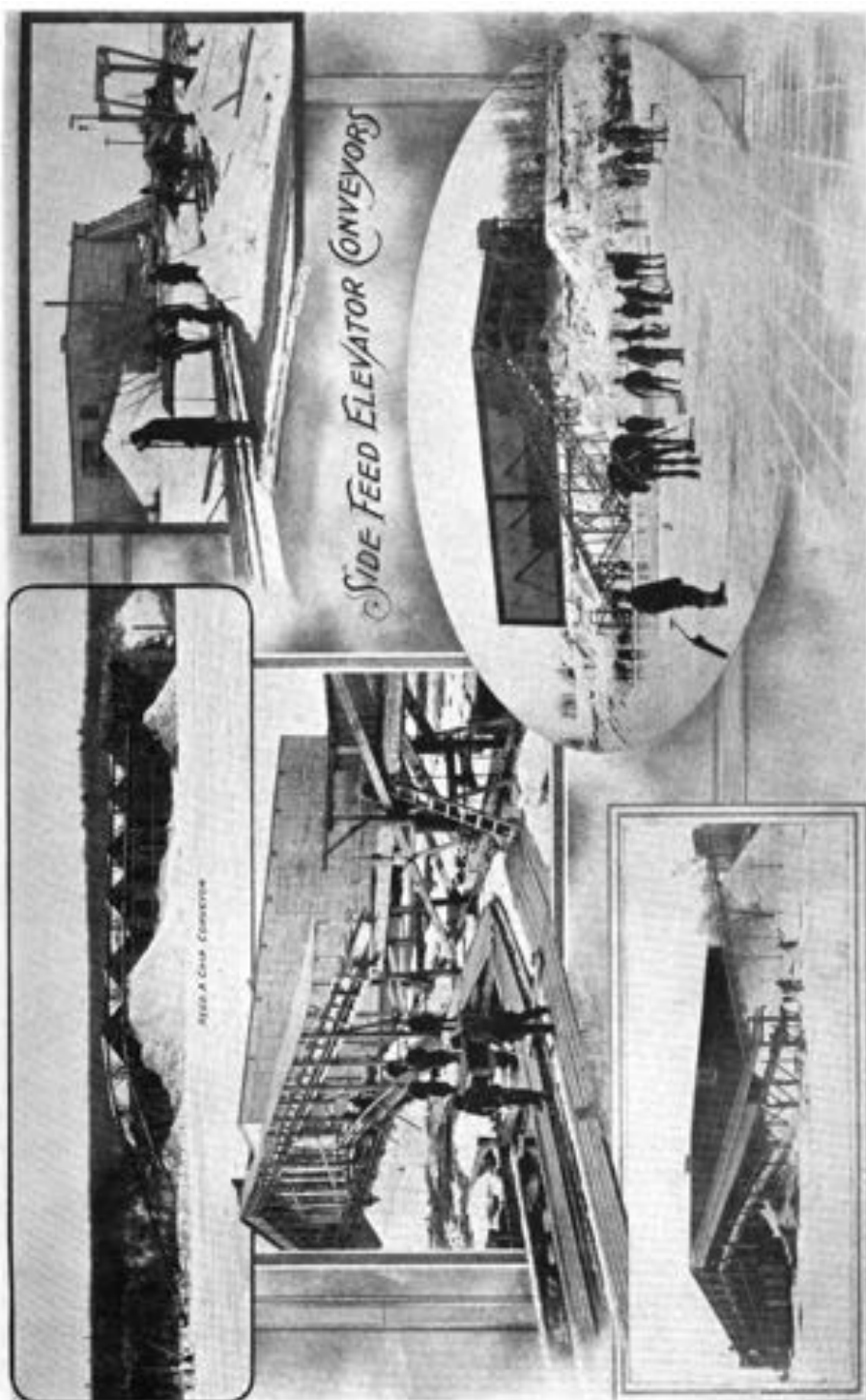


Side Feed Elevator-Conveyor.

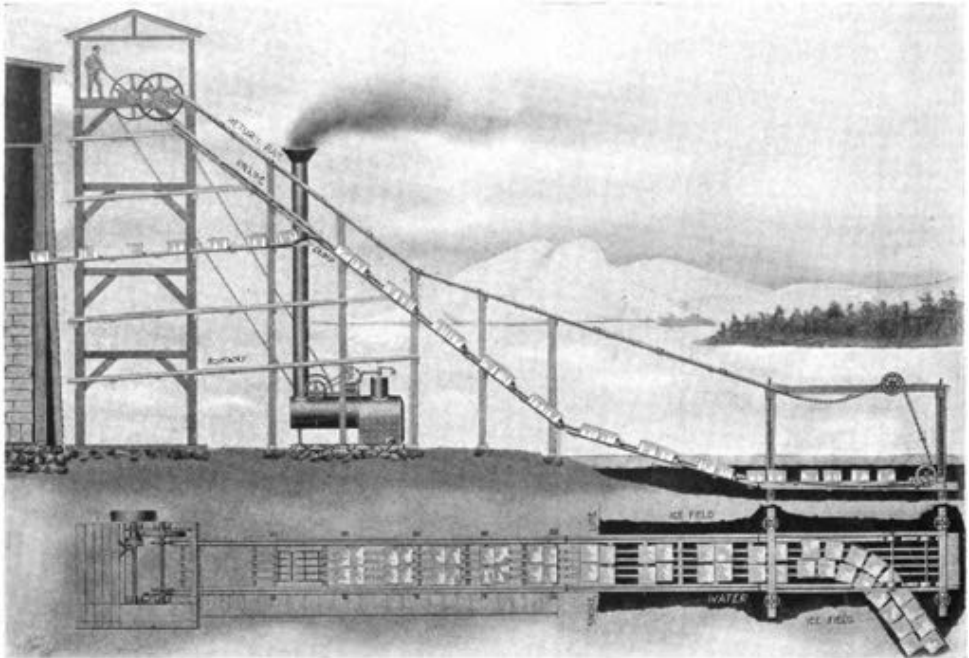


Overshot Elevator-Conveyor — Single Chain.

Where the house is placed some distance from the water, an Overshot Elevator-Conveyor with a single chain and pushing pockets can be used. The initial cost is very small and the operation practicable. A planer is in use at this plant.



Machinery. The Driving Machinery for incline elevators is placed at the top of the tower. The Elevator chain is started and stopped by a friction clutch. Attached to the endless chain at intervals of five or six feet are pockets carrying the oak lags or hold bars which extend across the incline from chain to chain. The ice is pulled up the incline by these hold bars and delivered through the incline on a steel dump or rocker without concussion, and the ice then runs by gravity to the rear of the tower. As the house is filled, the ice is carried up the incline to the next runway by inserting a trap at the opening just used.



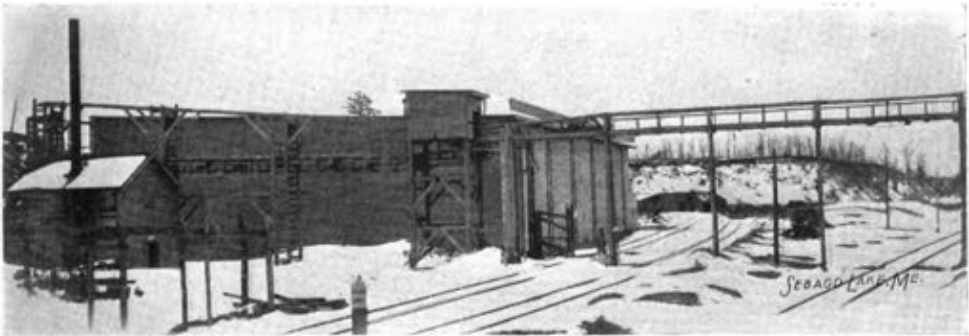
Side Feed Incline Elevator.

Operation. The ice is floated over either side of the water box, guided by a curved plank and gradually assumes the direction of the incline. At the outer end of the water box, the hold bars pass under the ice blocks, but the bars gradually approach the surface, and the blocks are caught by the hold bars and carried up to the dump. The empty chain returns to the water above the carrying chain, making a continuous circuit. To allow for variations of water level and thickness of ice, the apron running from the incline into the water, and the water box which is submerged in the water, are hinged, and they are suspended either by worm gear apron hoists or by lifting screws. (See page 84.)

Capacity. The movement of the carrying chain and the hold bars is always toward the ice house, producing a current in the water in the direction of the moving ice so that the feed is automatic, and the chain will draw the ice from the canal on to the hold bars. Two to four cakes of ice can be fed on each bar, with no labor attendant within thirty feet of the apron, and the Elevator can be speeded at forty hold bars per minute.



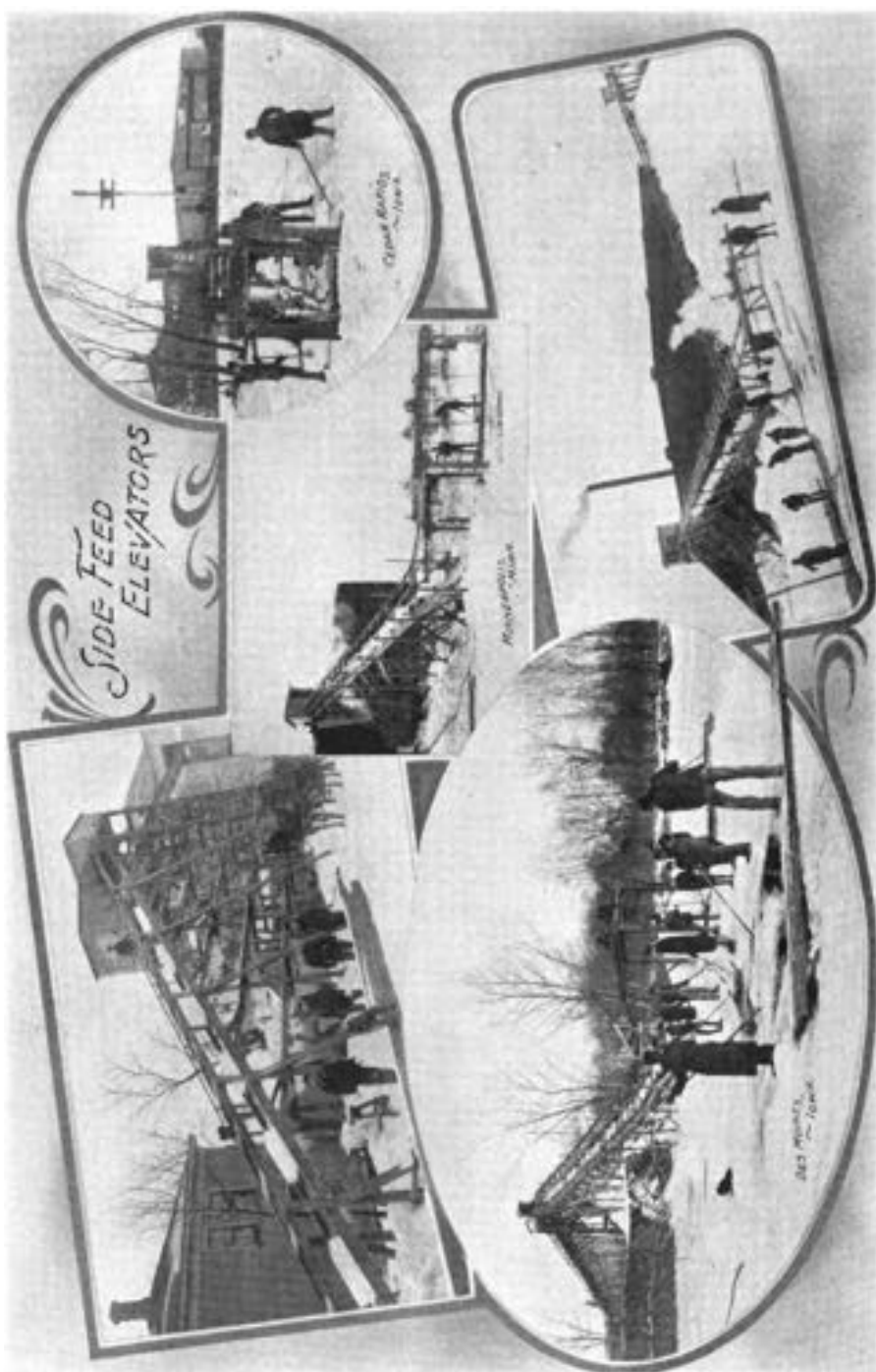
Side Feed Elevator with Gallery Conveyor.

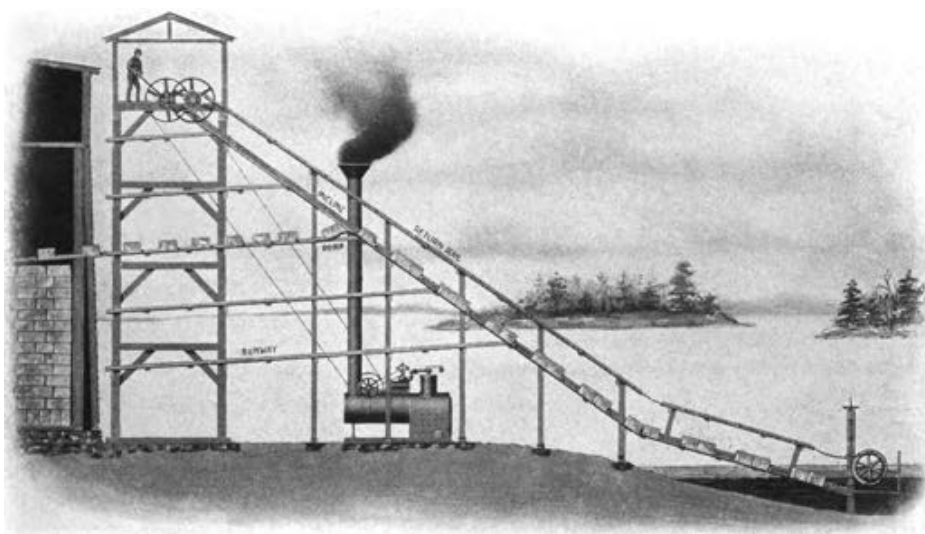


Side Feed Elevator from Lake Over the Tracks.



Side Feed Elevator under Street and through Shed.





Undershot Elevator Incline.

The empty chain returns to the water above the carrying chain. The ice is fed to the hold bars directly through the end, under the water wheel shaft, between the hold bars as they descend around the thirty-six-inch water wheels. These wheels are adjusted so that they are partially under water and the hold bars pick up the ice as it is pushed between the wheels.

Capacity. On account of the nature of the feed, the chain ought not be run much over twenty hold bars per minute, spaced six feet apart.

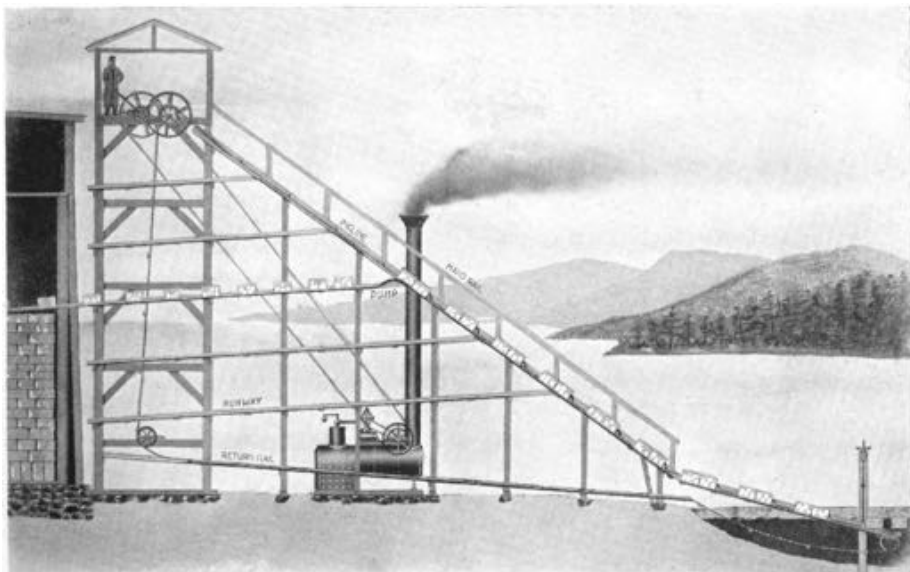


Elevators can be run out any distance from shore necessary to obtain sufficient depth of water.

GIFFORD-WOOD CO.



Undershot Elevators with Elevator Planers.



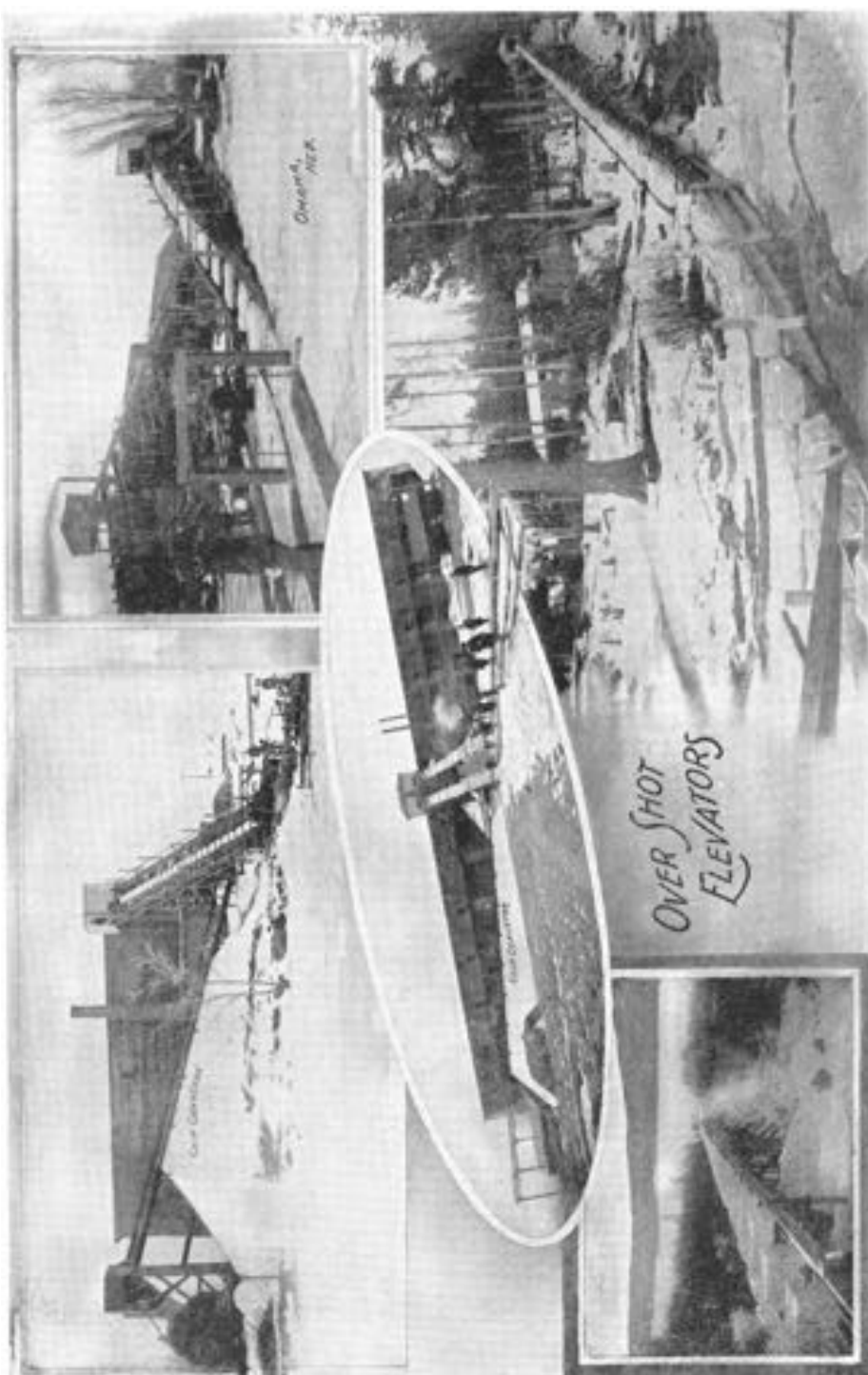
Overshot Elevator Incline.

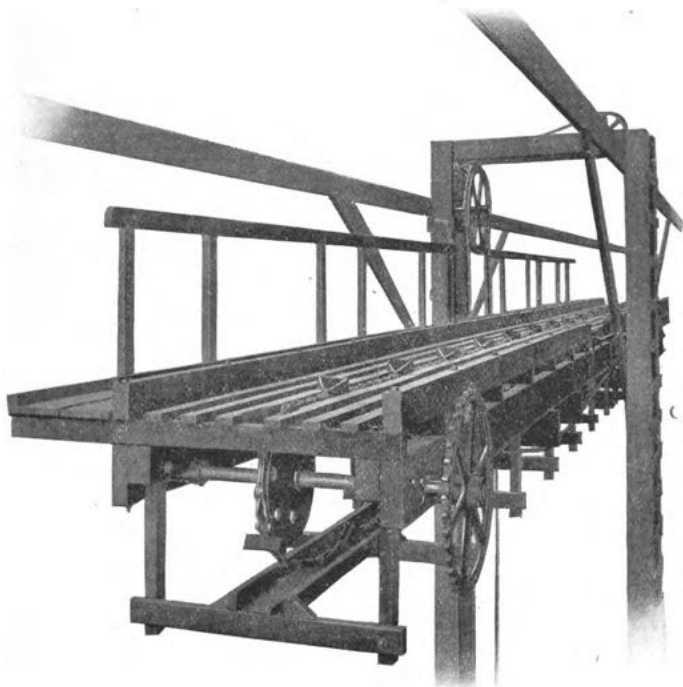
The ice is fed on the apron over the water wheels. The chain passes up the incline and drops from the chain wheels in the tower to a point near the ground, where it is guided by idler wheels, and returns to the apron underneath the incline. The ice blocks are delivered through the incline the same as described on page 12, but it is necessary to curve the runways to guide the ice outside the descending empty chain. The incline and galleries are not, therefore, in line.

The standard speed is one hundred and fifty feet (twenty-five hold bars) per minute.

ICE
TOOL

Overshot Elevator with Gallery Conveyor in the Rear of House.





Gallery Conveyor.

The object of the Gallery Conveyor is to convey the ice positively, as it leaves the elevator, to the house doors along the swinging gallery, thus relying upon gravity as little as possible.

Operation. With the single chain, the ice can be run up or down grade as desired, as pushing-pockets or flights are placed at intervals on the chain. One design extends the chain along the runways to the incline, so that the ice is received by the gallery chain immediately upon leaving the dump. Broken ice is discarded by the door men and carried to the end of the gallery where it is dumped. This chain is independently controlled by a friction clutch. The gallery can be raised tier by tier as the house is filled, thus avoiding the use of scratchers on the house chutes, and allowing the harvesting to continue until noon or night before changing from one runway to the next. It allows the use of shorter door chutes, causes less back hauling, and reduces the number of men required in houses.

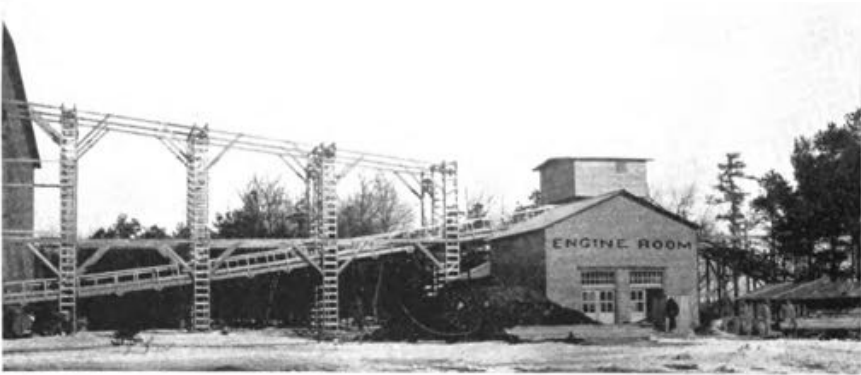
Rope Drive. When the gallery conveyor machinery is driven by rope, the power is transmitted from the top of the elevator tower to the gallery. This driving rope is automatically adjusted as the gallery is raised and requires no attention.

Detachable Chain Drive. The power from the elevator tower to the gallery is transmitted by detachable chain. As the gallery is raised the driving chain is quickly shortened.

Right Angles. Oftentimes it is necessary to run the gallery at an angle to the elevator incline, in which case the ice turns on a circle in the tower and is delivered by gravity from the elevator chain to the gallery conveyor chain. These conveyors can be run at any angle and are driven either by rope, detachable chain, or motor, as desired.

We sell motors at the lowest prices.

GIFFORD-WOOD CO.



Above is illustrated the new plant of the Berkshire Ice Co. at Congamond, Mass., showing a perfect machinery arrangement for economical harvesting. The cost is comparatively low as single chains are used for most of the distance.

The large house, requiring two elevators, is located well back from the water; a half tower is built for the elevators and the galleries extend from a fixed point at the top of the tower through the house, thus eliminating all gravity runs.

The gallery hoists and long chains are hung from the upper plate, doing away with all posts in the alley-way. As the galleries ascend they are made fast to the hanging chains, thus precluding accidents.

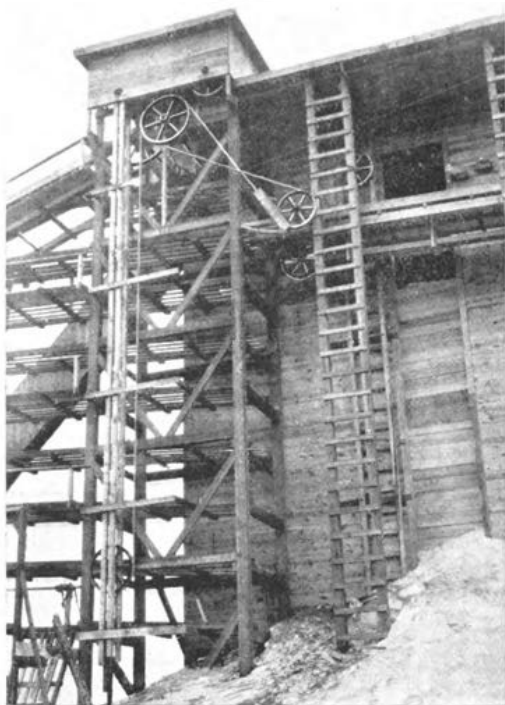


Two Gallery Conveyers between Houses.

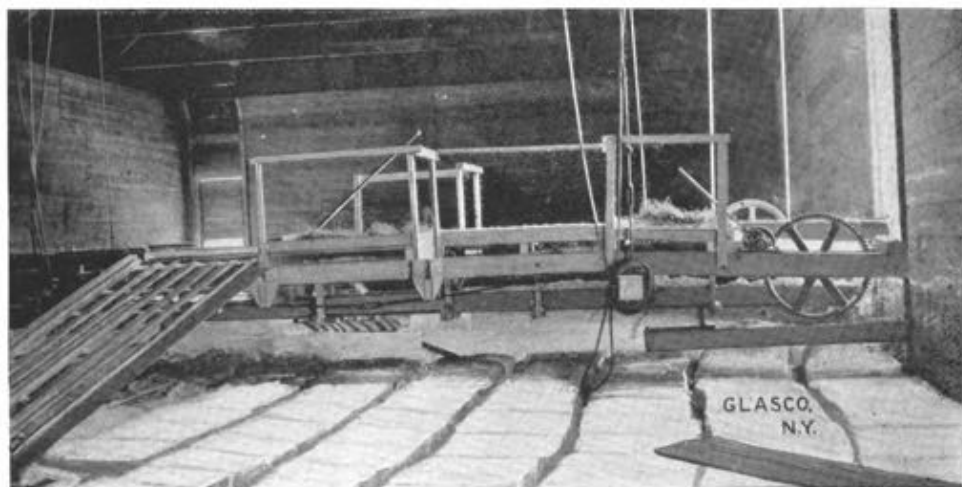


Elevator, Rope Drive Gallery Conveyor and Rope Drive Chip Conveyor.

The run on the gallery is wide and is provided with two single chains with flights side by side.



Gallery Conveyor — Straightaway — Rope Drive.



Rope Drive Gallery Conveyor in Interior of House.



Gallery Conveyor through Center of House.



Gallery Conveyor Driven by a Rope.



Adjustable Gallery Running each way from Overshot Elevators.

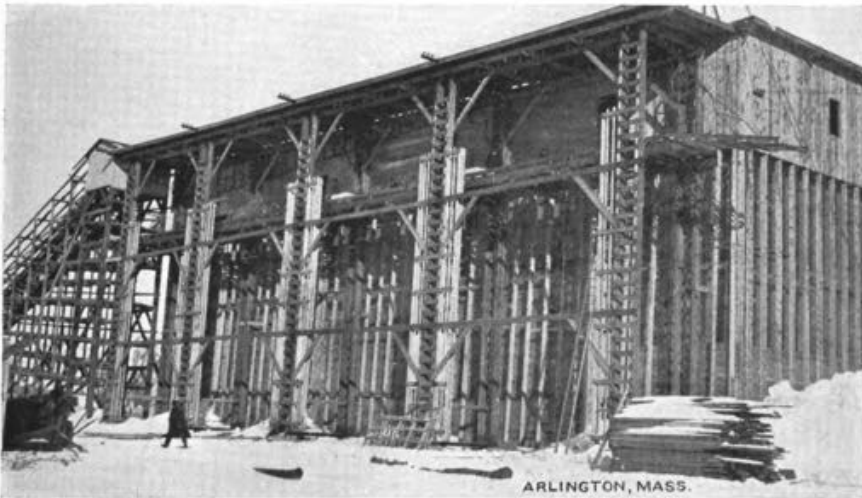
Operation. The single, Adjustable Gallery is raised from one elevator runway to the next, and the ice, running by gravity, is pulled off at the doors as desired. The waste ice passes to the end of the gallery, where it is dumped.

Advantages. The initial cost of this installation is about the same as the several stationary runways, because the cost of the adjustable gallery hoist machinery nearly balances the large additional amount of lumber necessary for stationary runways; but the cost of maintaining the adjustable gallery is very much less. The pitch or inclination of the runway can be adjusted at short notice by the doorman, giving it a greater pitch on soft days and less pitch on freezing days, so that the ice can be delivered to the doors without other labor than the men at the room doors — one at each.

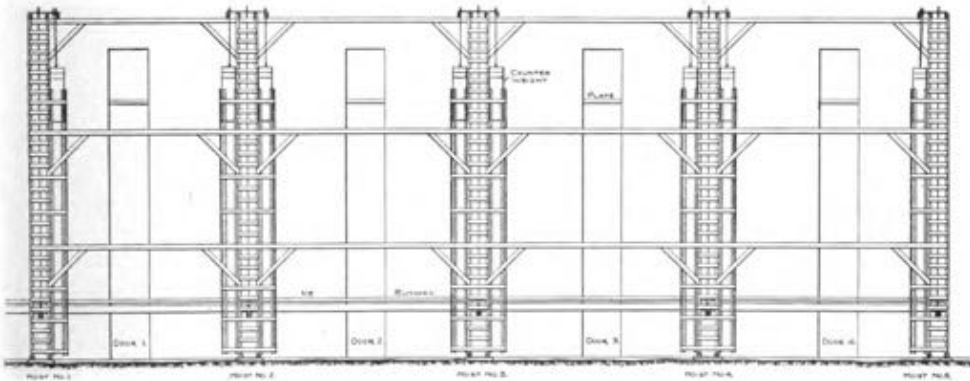
Stationary galleries cannot be built of correct pitch for all days. If built for the average weather, scratchers are necessary to retard the speed of the ice blocks on cold days, and additional men are required to pull the ice on soft days. The adjustable gallery avoids this additional expense. No iceman who has more than one room in his house can afford to be without the adjustable gallery.



Adjustable Gallery with Undershot Elevator.



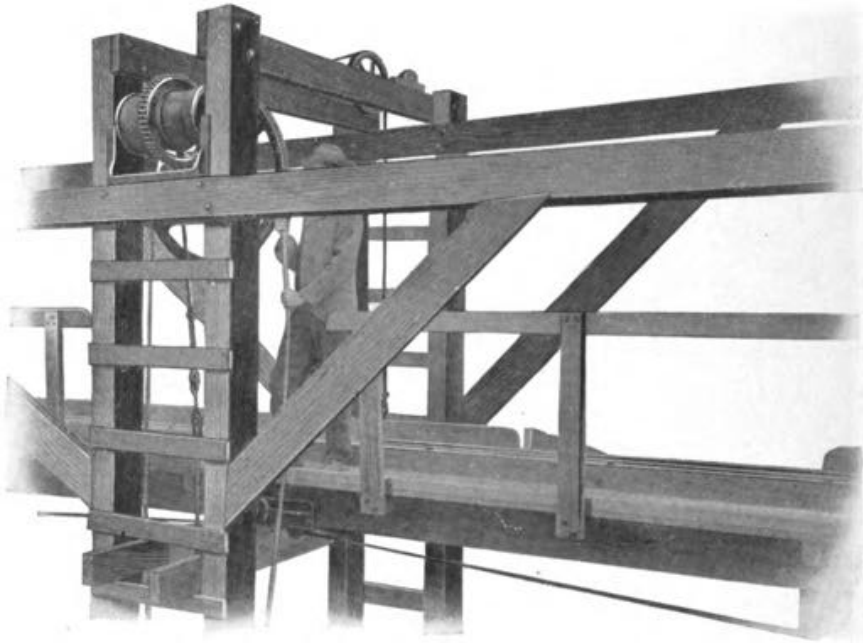
ARLINGTON, MASS.

**Counterweighted Adjustable Gallery.**

It is always well whenever an adjustable gallery is used for the elevator conveyor, gallery conveyor or gravity gallery, to counterbalance the run. Although the gallery hoist is very powerful, and the gallery can be hoisted by one man slowly, the amount of work required is very much reduced when the gallery is counterweighted. The expense is small. Weights can be added to any gallery and labor saved for all adjustments of the run.

The weights which are connected by wire ropes running over sheaves to the run may be hung free but it is preferable to enclose them in slot wells as shown in the cut to prevent accidents.

The counterweights, nearly equivalent in weight to the run itself, provide an efficient safety device, as the strain on the hoisting ropes is much reduced and if perchance anything should give away, the liability of a serious accident would be lessened.



Operating a Gallery Hoist.



Ten-ton Load on Gallery Hoist.

The Gallery Hoist is used with elevator conveyors, gallery conveyors and adjustable galleries. The hoist itself is located at the top of the ladder posts and is made up with a worm and a worm gear, operated by a large manila rope sheave, turning two spirally-grooved drums, which wind up two steel cables. These are fastened to the gallery sections. An endless manila rope is run around the large sheave and by pulling on this rope the gallery is raised. As the rope extends from top to bottom of posts, the door man can at any moment raise or lower the gallery.

One man can easily raise the gallery when full of ice, and the load is always locked.



Car Loader Serving Two Trains.

Operation. This machine is used for winter shipment of ice by cars. It can be made of sufficient length to fill as many cars simultaneously as desired. The preferable arrangement is to run the conveyor between two spurs or switches, as illustrated in the cut above, so that while the men are filling one line of cars on one side, the loaded cars on the other side may be pulled out and the empties switched in.

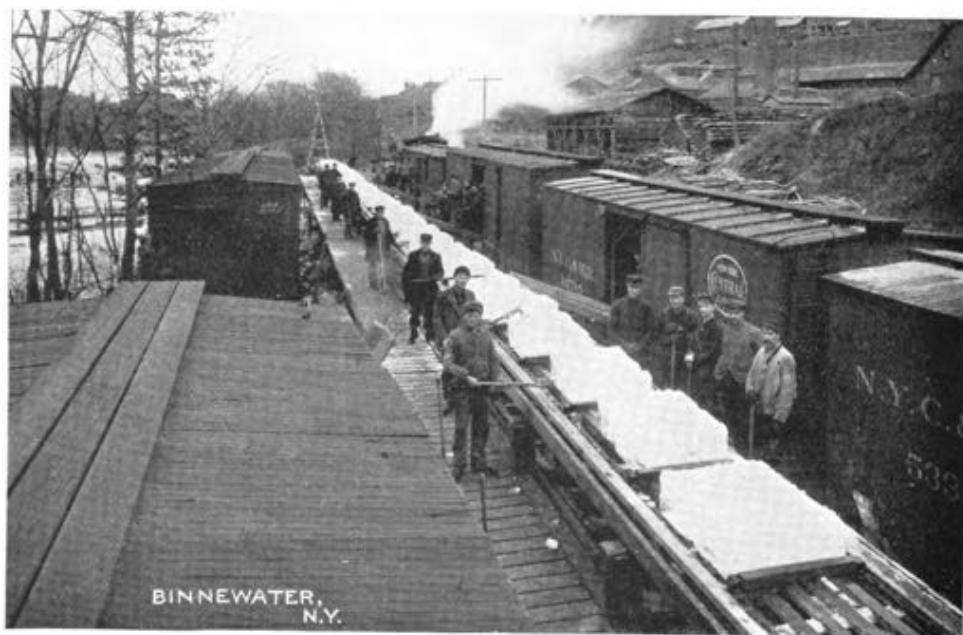
Design. The overshot type, with the empty chain returning underneath, is shown in the cut. Side Feed Car Loaders are being employed more and more. See page 32 for the construction. The runway is raised above the car floor sufficiently to slide all of the ice in by gravity when the cars are filled four or five tiers high. The platform on each side of the run on which the switchmen stand is below the run and level with the car floors. A special construction makes it unnecessary to spot the cars. The elevator planer (see pages 92, 93) can be used.

A very large number of cars can be loaded per day, the number depending principally upon the switching facilities, as the conveyor has almost unlimited capacity.

GIFFORD-WOOD CO.



Car Conveyor — Water End.



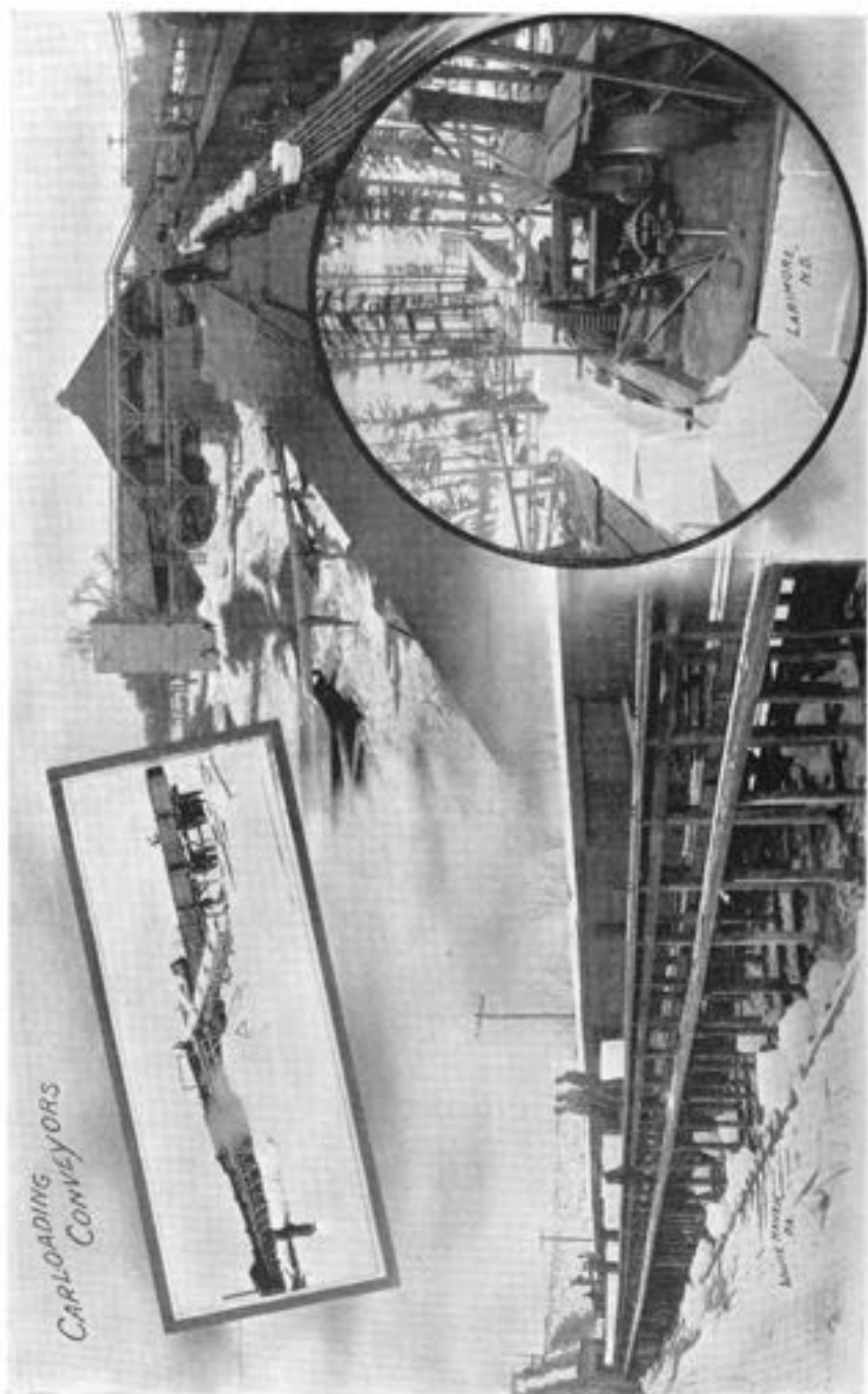
Car Conveyor — Loading End.

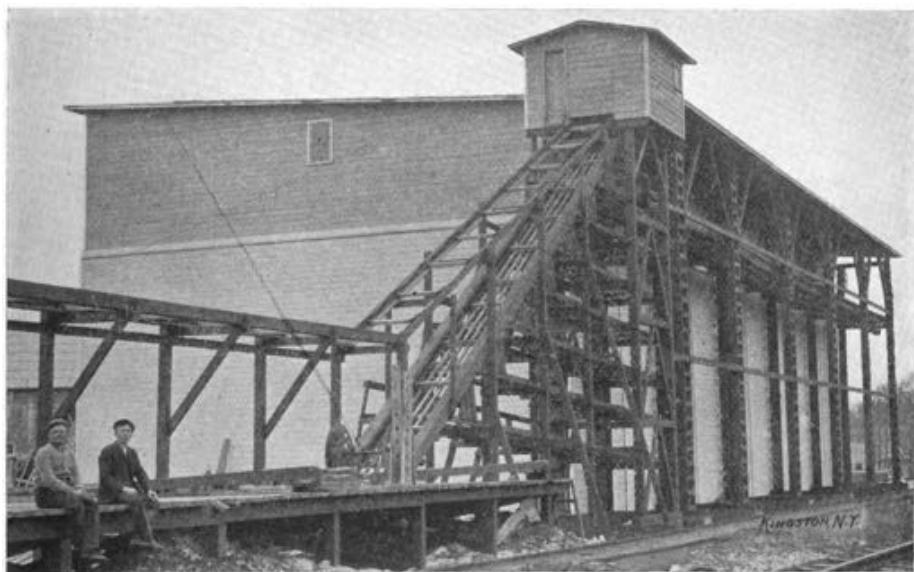
WHITE HAVEN,
PA.

Car Loader — From Water, Over Dam to Cars Below.

BOONE,
IA.

Loading Cars with Track Parallel to Shore.

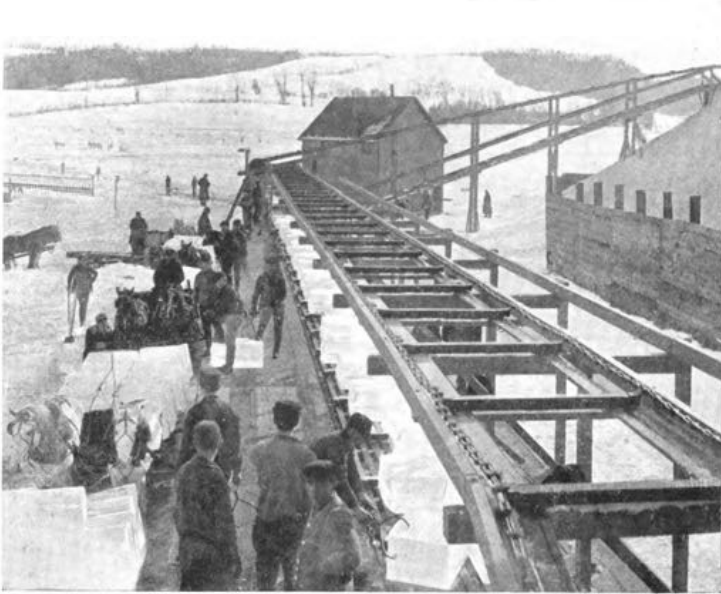




The ice is delivered from the cars to the unloading platform, and to a double chain, which picks the ice up, conveying it horizontally and then hoists it into the house. The platform can be made of suitable length to accommodate any number of cars simultaneously, and can be built on each side of the conveyor to accommodate trains on both sides of the run.



From Cars to House by Elevator and Conveyor.



Wagon or Sleigh Loader.



From Sleighs to House by Side Feed Elevator.

The top cut illustrates a type of Elevator and Conveyor arranged to load simultaneously any number of wagons or sleighs. The ice is hauled a long distance to be elevated into the houses. The above plant is completely equipped, having in addition a Planer and Chip Conveyor.



Wagon Loader.



Water End of Wagon Loader.

Hoisting ice from the lake to load wagons can best be accomplished by machinery, delivering the ice regularly to the platform. The above illustrations show the work in progress on a small scale, while on page 32 the loading is being done on a large scale.



When a small house is situated some distance from the shore, a machinery outfit such as is shown above is very satisfactory. This is the ice house on the estate of S. S. Wheeler, Ampere, N. J.

The run with a single chain is stationary to a point about 30 feet from the house, at which place the run hinges and the ice is delivered to the house at all levels between the sill and the plate. The two separate single chains, one extending from the water to hinge point and the other from the hinge point to the house, are driven by the same motor.



Chip Conveyor — Suspension Type.

Advantages. All ice harvesters should plane their ice (see pages 92, 93). The harvest can be completed more quickly and with less expense by the use of a Planer. Ice having a corrugated surface can be taken out of the house more rapidly, and with a saving of labor.

It is a great mistake to allow chips to accumulate under the Planer. The meltage in the spring causes the incline to be thrown out of line, and large sums are spent every fall, where this practice is followed, in installing new posts and timber. To attempt to take care of any considerable amount of chips by shoveling or employing additional horses with scrapers is very expensive. The Chip Conveyor does away with all these evils.

Operation. The slush and chips from the Planer are carried away by flights or buckets attached to the chain at three-foot intervals. Both single chain and double chain Conveyors are largely employed.

The Conveyor makes its own bed by the chips.

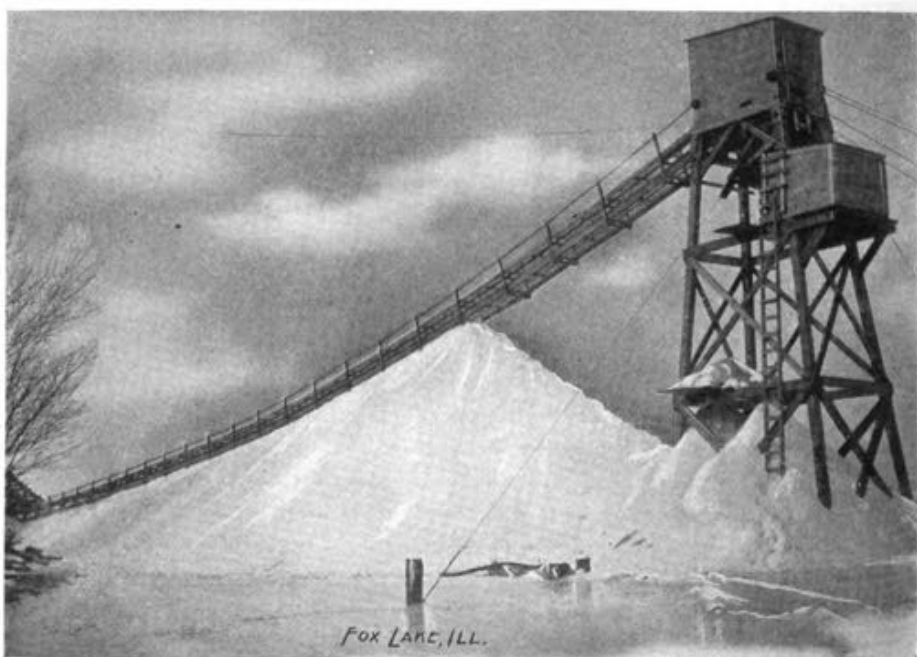
It can be built at any angle whatever to the incline.

Suspension Type. The Suspension Chip Conveyor, by which both carrying and return chains are supported by two steel wire rope cables, is the best style. The initial cost is no greater because the wood post construction is avoided. If the chip pile is on a side hill or partly in water, or if it is in such a position as to make the meltage uneven, this chip pile can list, when melting, as much as it will, and no posts are thrown out of line or broken. The maintenance expense of a Suspension Chip Conveyor is practically nothing.

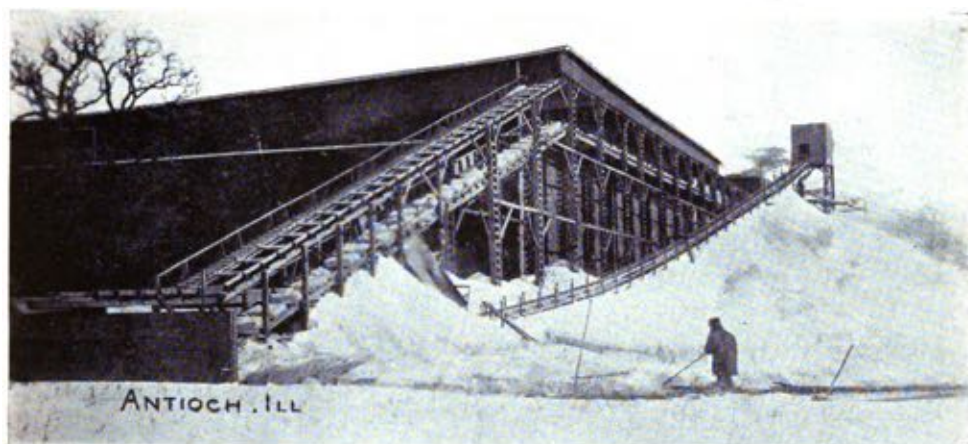
Rope Drive. The objection of an additional engine for the Chip Conveyor has been overcome by the adoption of the Rope Drive, by which a rope is led from the elevator tower over idlers in any direction and to any distance to the Chip Conveyor tower. This is so simple and so inexpensive—no additional source of power being required—that scores of loemen are now using Chip Conveyors who could not afford them before.



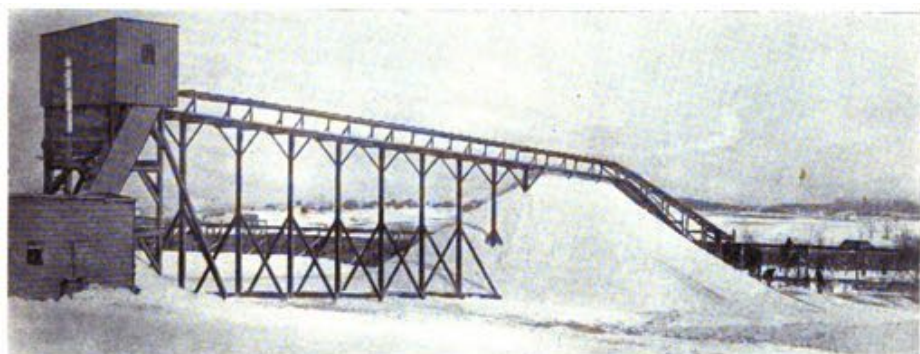
Chip Conveyor: Suspension — Rope Drive from Elevator.



Chip Conveyor: Suspension — Double Chain — Motor Drive.



Chip Conveyor: Suspension — Double Chain — Rope Drive.

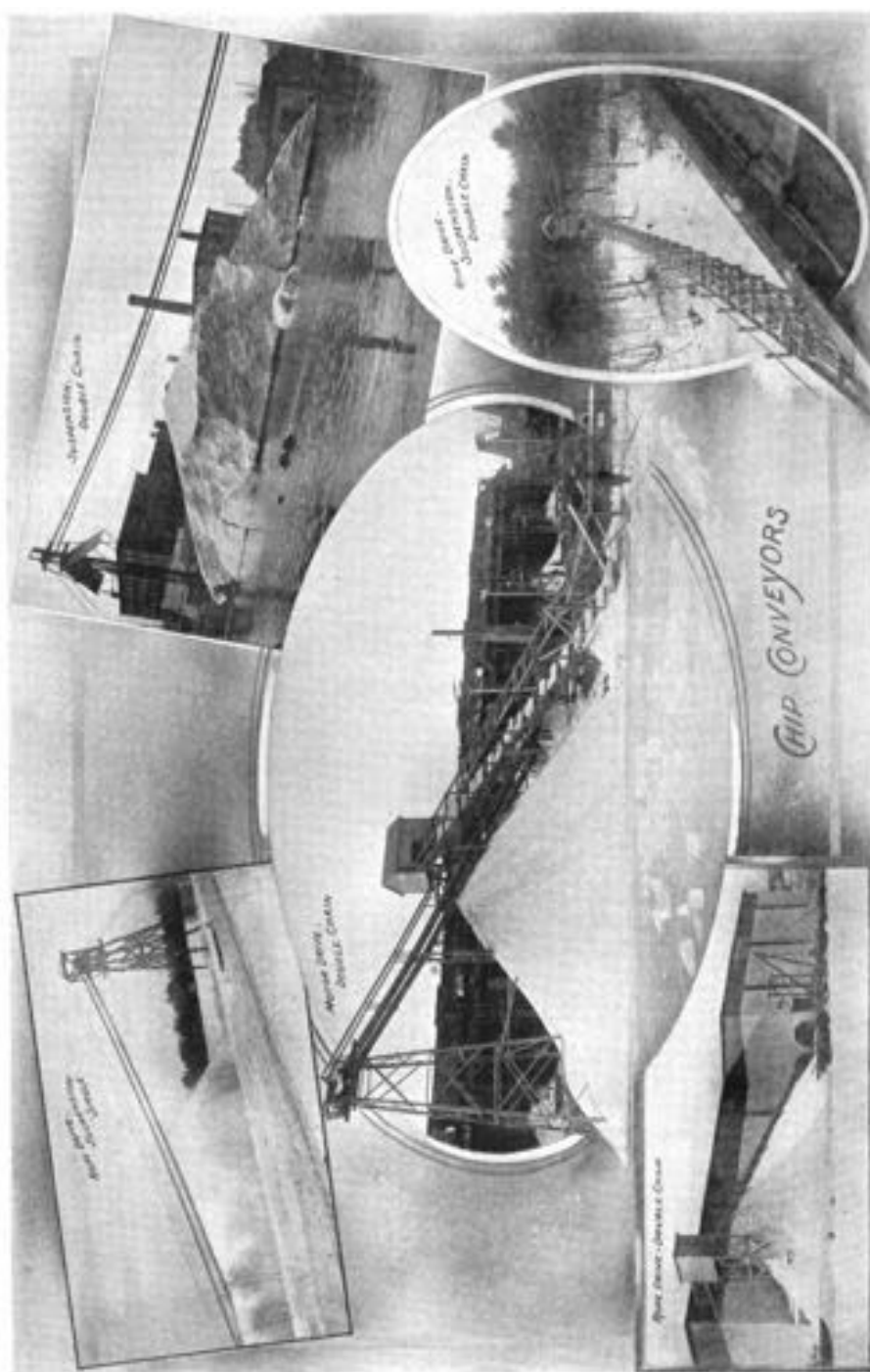


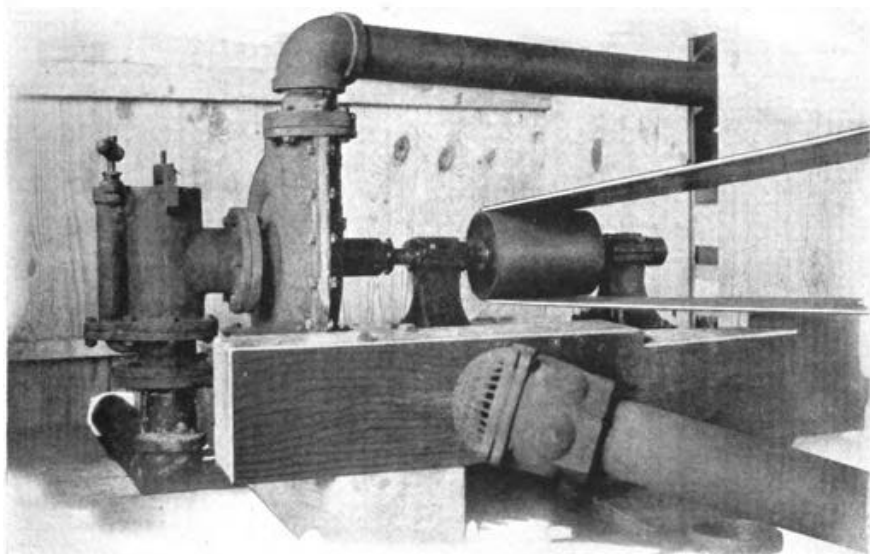
Chip Conveyor: Single Post — Double Chain — Direct Drive.



Chip Conveyor: Double Post — Double Chain — Motor Drive.

GIFFORD-WOOD CO.





Pump for Flushing Chips.

Under certain conditions pumps can be used in connection with galvanized iron chip troughs to flush the chips away from under the planer.

As soon as the pile of chips reaches nearly to the height of the planer, the pump is started, drawing water through the intake, passing through the pump and discharging it into the trough located under the planer.

As the pile of chips is increased in size, the galvanized iron trough is extended by the addition of 8-ft. sections as far as required.

Place the pump as low down as possible, getting it to within five, six, or seven feet of the water level. Always use a foot valve on the water end of the intake, as shown in the foreground of the cut.

The pumps are provided with suction primers, and a foot valve should be used to hold the head when the pump is stopped.

At night the valve should be tripped and the pump drained. Be sure that the entire suction line is air tight.

Do not attach the discharge pipe with a 90° elbow as shown in the illustration. Use a bend or two 45° turns so as to form a curve and allow the water to discharge readily, thus securing the full capacity of the pump. A 90° turn as shown in the cut will reduce greatly the capacity of the pump, sometimes causing it to fail to work. It is well also to extend the discharge line straight up from the pump a couple of feet before putting in the first turn.

A Y section of the trough is also to be recommended, provided with a valve so that the water can be directed into either one side of the Y or the other at will. When making extensions of trough the operator avoids getting wet by extending the dry leg.

GIFFORD-WOOD CO.

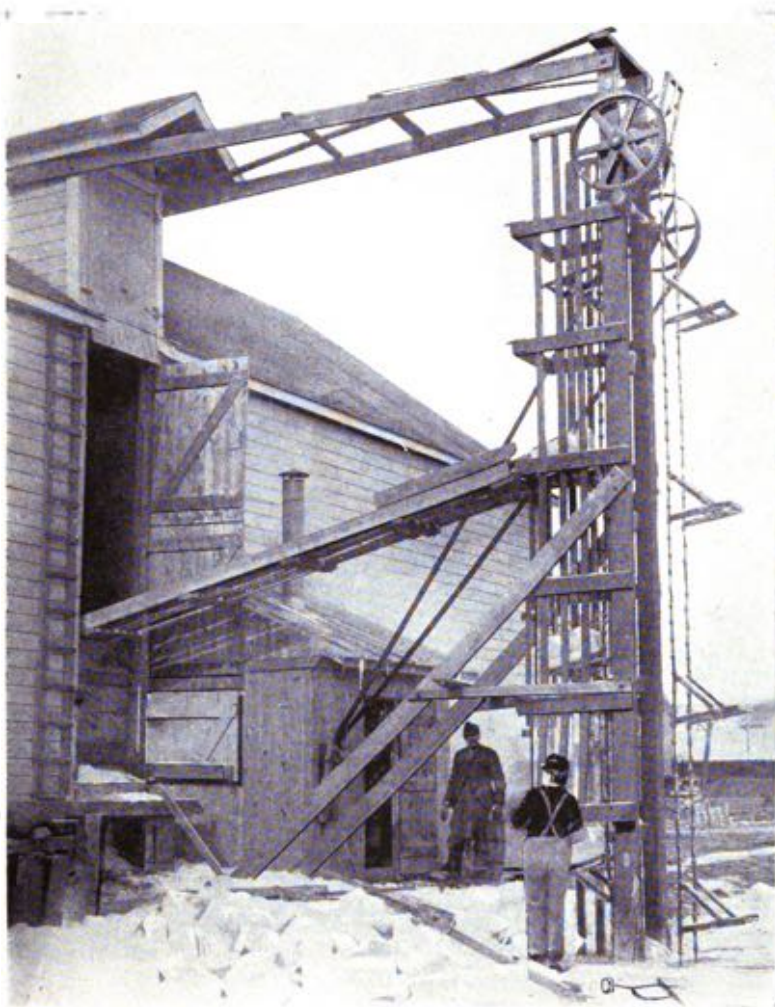


Chip Trough.

Made of galvanized iron in two sizes 8 feet long,
shaped as shown, 20" wide x 8" deep and
30" wide x 8" deep.



Flushing Chips.

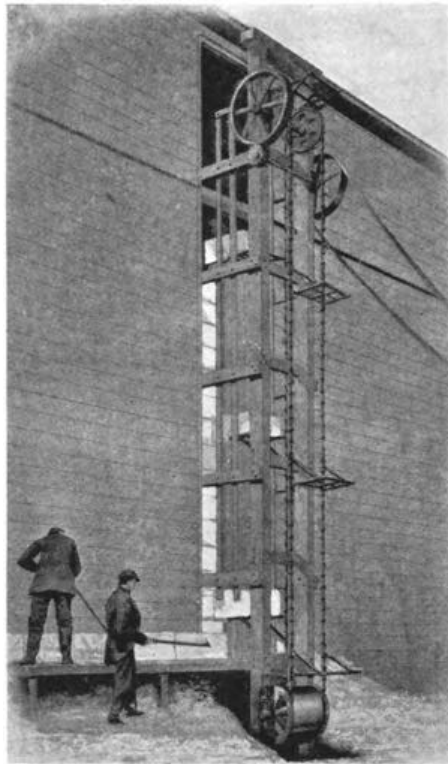


Endless Chain Perpendicular Elevator. Ice from Water.

The Perpendicular Elevator is a very satisfactory machine for the moderate capacity house, where twelve cakes per minute is as much as can be handled. The low cost makes it popular with the smaller harvesters.

Design. The double endless chain is fitted with brackets at six-foot intervals. The cakes are pushed into the side of the machine and the ascending bracket picks up the ice block, elevates it to the chute, and the ice then runs into the house. A ratchet wheel is supplied to prevent the machine reversing. Springs are provided which aid the discharge so that the ice leaves the machine promptly when it reaches the chute, insuring perfect delivery.

Location. The Elevator may stand adjacent to the house, and often, to get sufficient depth of water, it is placed some feet away, in which case it is braced securely and the ice runs from the machine to the house on a chute.



Endless Chain Perpendicular Elevator. "Dry" Ice from Platform.

This type of Elevator is used when the ice is brought from a distance and elevated into the house. The ice is delivered to the platform and fed into the machine as indicated above, and the operation is just the same as described for the water machine.

Design. A loose hinged flipper is attached to the frame flush with the platform, and just as soon as one bracket lifts a cake of ice, the next block is shoved in and held in place until the arrival of the next bracket, when it also is elevated to the point desired.



Sweep Horse Power.

The Sweep Horse Power is frequently used for driving the lighter Incline Elevators as well as the Perpendicular. The horse is hitched to a twelve-foot sweep arm, and travels in a circle, transmitting power to the sprocket wheel on the Elevator by detachable chain. One, two, three or four horses may be employed as the circumstances require.



Double Gig Elevator.

The Double Gig Elevator is suitable for small capacity houses, as the cost is very low and a horse is used instead of engine or motor.

Capacity. A house can be filled quickly as the average capacity for a medium lift is seven to nine cakes per minute. Five hundred blocks of ice, weighing three hundred pounds each, can be raised per hour.

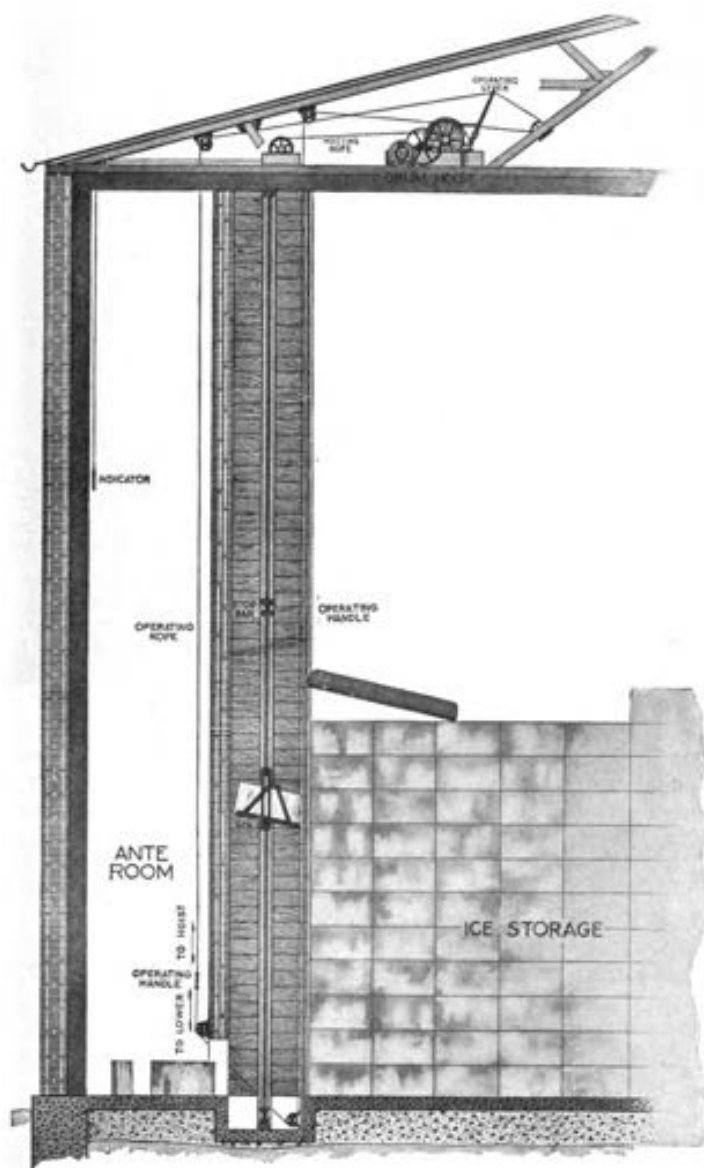
Operation. The gigs slide on maple strips and are checked at the proper point in the ascent by adjustable stop bars clamped to the uprights. As the house is filled, the stop bars are raised and the gigs travel to higher points. As the horse walks out from the elevator, he hoists one gig with its load, and the empty gig drops for another cake. When the horse returns the operation is repeated.

Blue prints showing construction are furnished free of cost upon receipt of order.

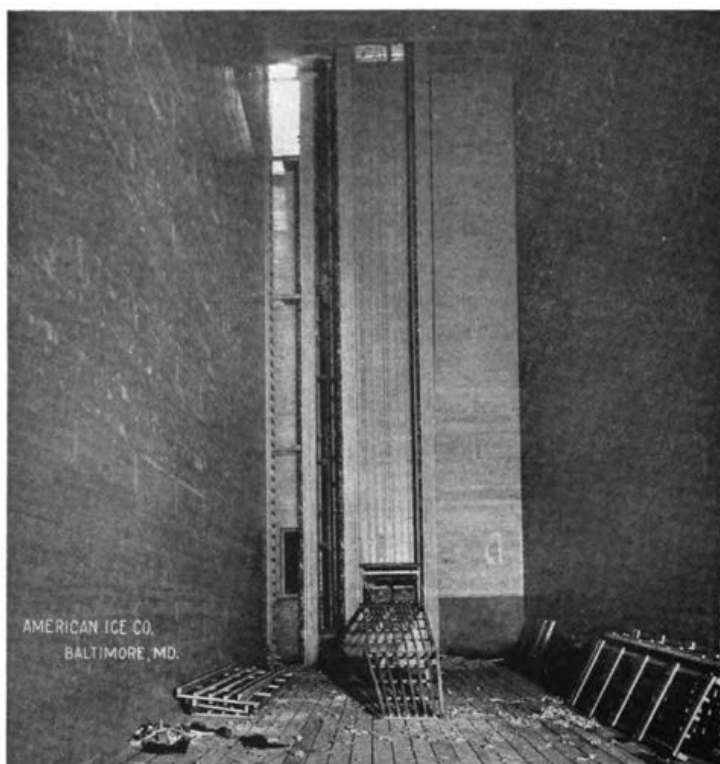


Single Gig Elevator.

In principle, this Elevator is the same as the Double Gig Elevator described on the preceding page, except that the horse hoists when walking in one direction only. It is less expensive than the Double Gig Elevator. The gigs used are illustrated on page 57.



Old Elevator and Lowering Machine.



Gig Elevator and Automatic Lowering Machine.

Gig Elevator. The Straight Face Friction Hoist (page 48) and the End Thrust Friction Hoist (same page) are types of drum hoists designed especially for elevating and lowering manufactured ice, at small initial and operating cost. The location of the drum itself is immaterial, but it is usually placed in the loft.

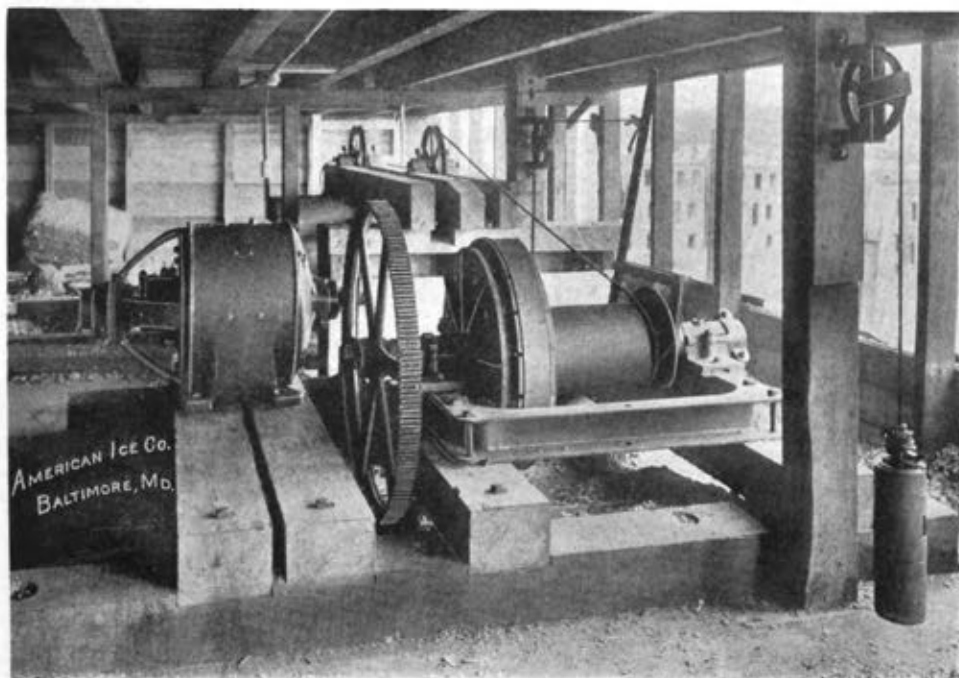
A wire rope is led from the drum over a suitable sheave to a steel gig (see page 61) suspended in a well. This well is built around the space taken up by the gig.

A hand control rope is arranged to operate the hoist from any points desired. The arrangement shown on the preceding page is typical but this elevator can meet any possible conditions. One, two or three cakes of ice, as desired, may be handled simultaneously by the gig.

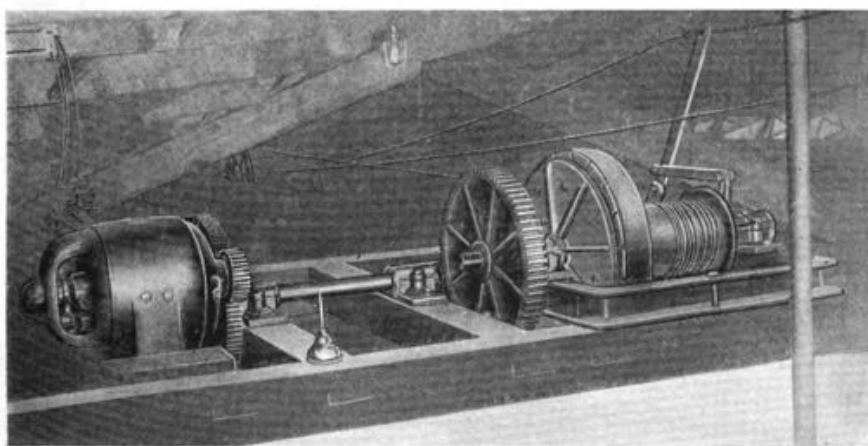
When the ice is pushed into the gig, a pull of the operating rope causes it to ascend. When stopped at the proper point, it discharges its load and the descent of the empty gig is controlled by a brake band.

Lowering. The tilting bottom of the gig makes the feeding and delivery automatic. When lowering, the empty gig may be hoisted by power, its motion being limited by an adjustable stop bar, and the descent of the loaded gig controlled by the brake band, or if preferred, a counterweight is used in conjunction with the hoist and no power is required. This arrangement requires an operator.

Automatic Lowering Machine. In a number of cases the lowering operations are made absolutely automatic by the use of a steel tube in conjunction with this hoist. Such an installation is shown in the cut above. The rope is transferred from the drum to the piston in the tube, resulting in an Automatic Pneumatic Lowering Machine just as described on pages 58 and 59. This arrangement requires no operator.



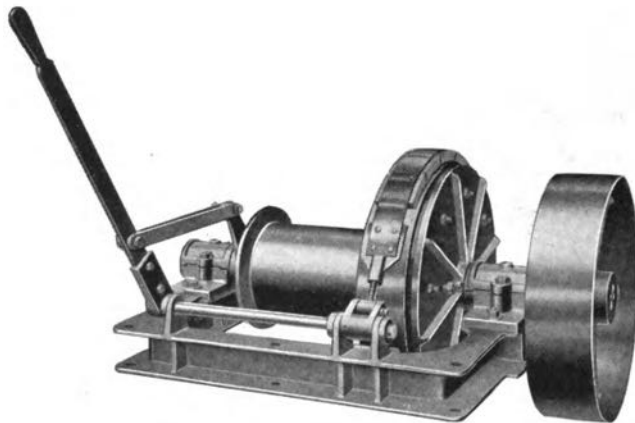
American Ice Co., Baltimore, Md. — Gig Elevator Hoist.



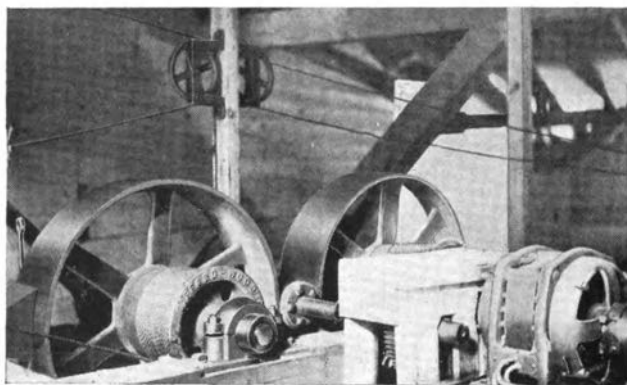
Electric Friction Hoist.



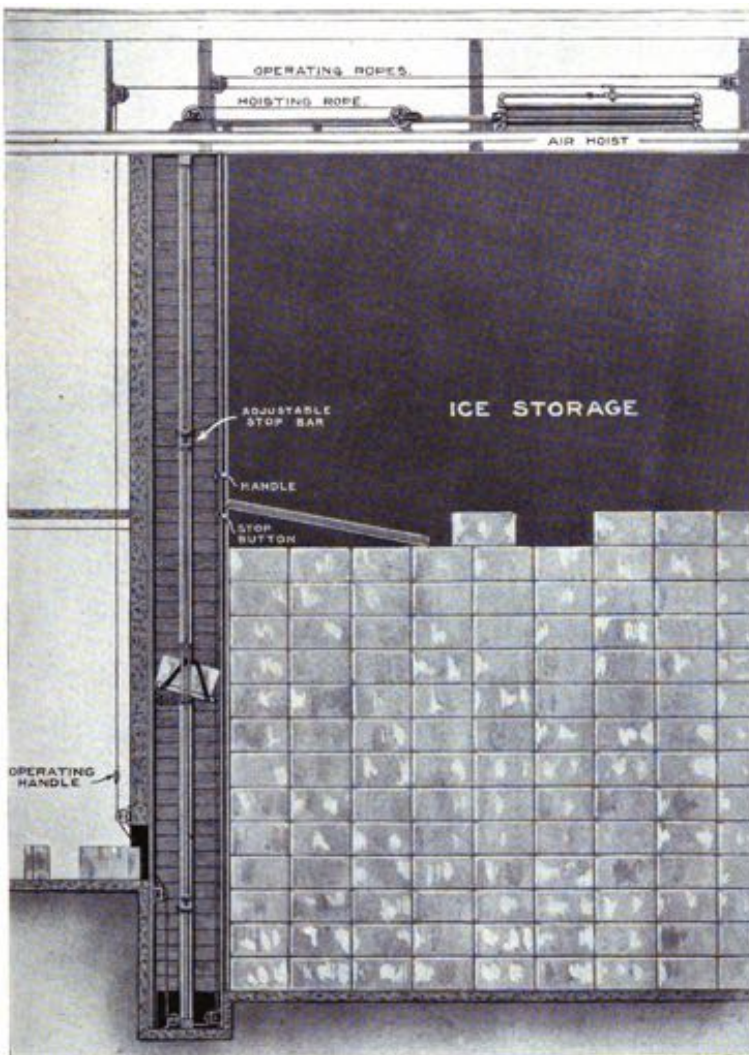
Straight Face Friction Hoist.



End-Thrust Friction Hoist.



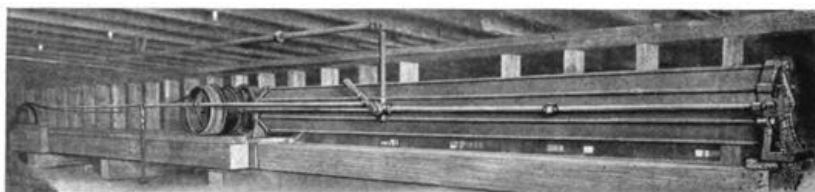
Double Hoist and Motor in Loft of Storage House.



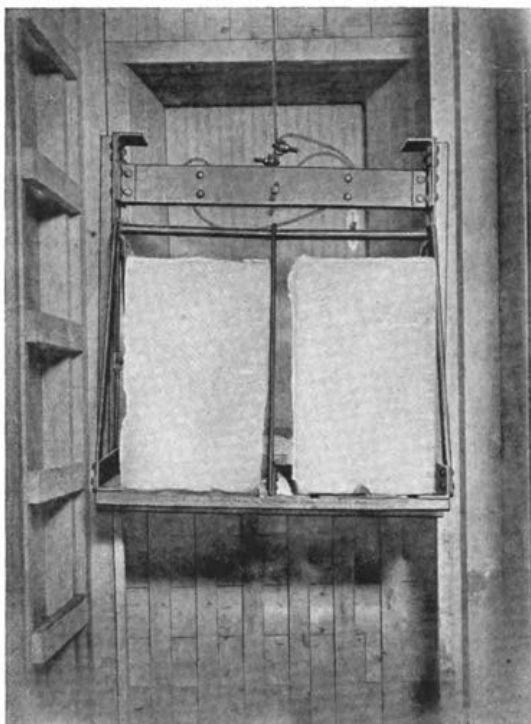
Pneumatic Gig Elevator.

When compressed air is available for hoisting manufactured ice, a pneumatic cylinder is connected up with a single or double gig, as indicated in the cut. The arrangement and operation is the same as that described for the drum hoist gig elevator. (See pages 45 and 46.)

It is better to place the cylinder in the loft to prevent any tendency to freeze, but if the air is thoroughly dried, the cylinder can be located in a refrigerated room.

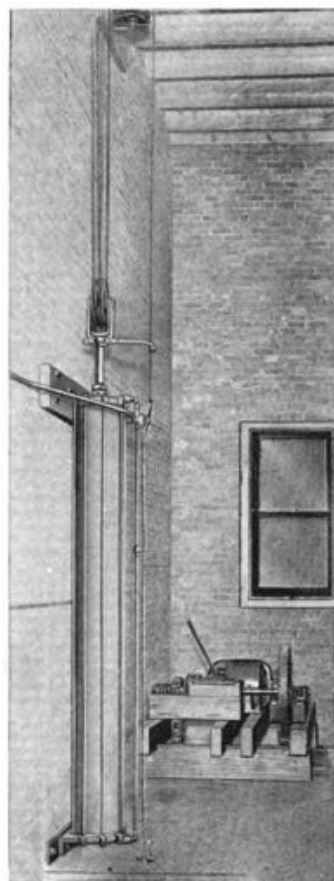


Cylinder in Left over Storage Rooms.



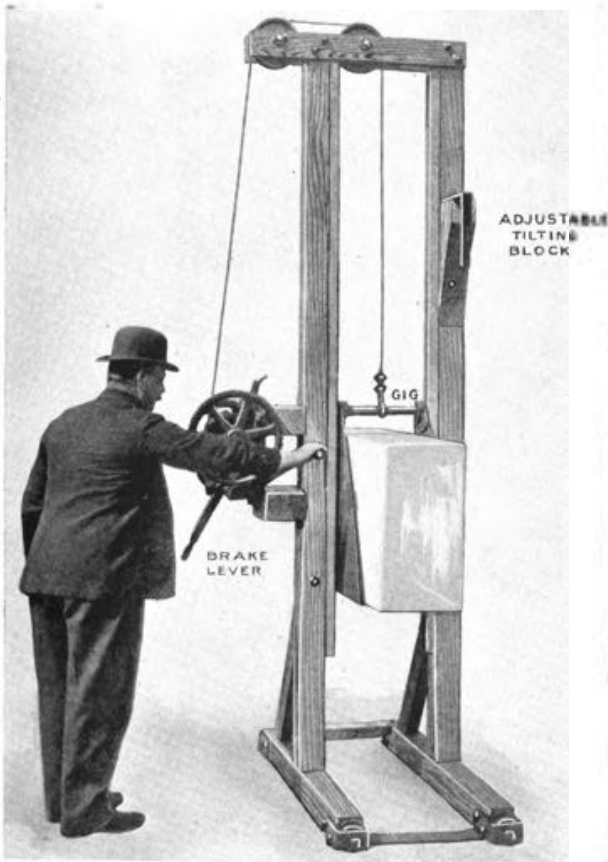
Elevator Well.

A gig with two cakes of plate ice in the well connected to the air cylinder.



Hoist Cylinder in Vertical Position.

The motor shown drives the conveyor illustrated on page 67.

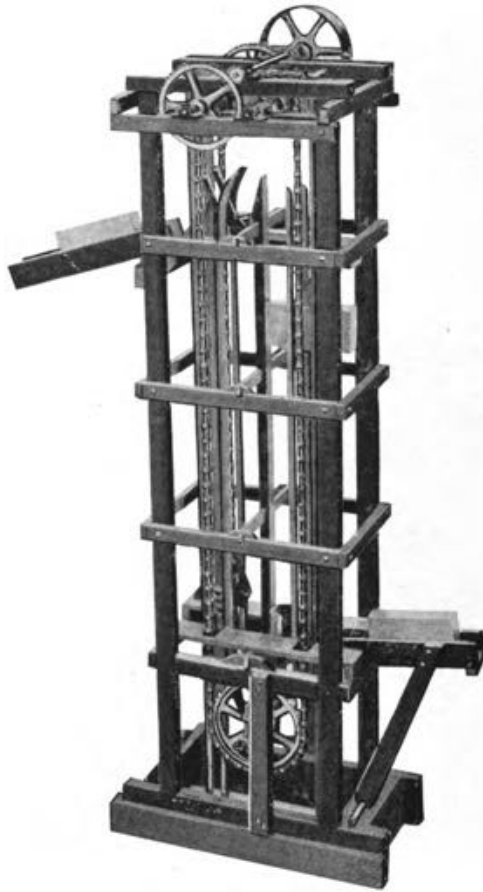


Hand Hoist.

Many manufacturers find use for an elevator and lowering machine for such small amounts of ice that the installation of a power hoist is not warranted.

The full capacity of the day storage is often desired as a surplus and too much labor is required to lift the ice bodily to the second and third tiers. With the above portable self-contained machine one man can stack it easily by moving the hoist over the floor on its rollers and operating the crank. The brake is used for lowering.

A compressed air cylinder with air hose connection can be substituted for the crank arrangement.

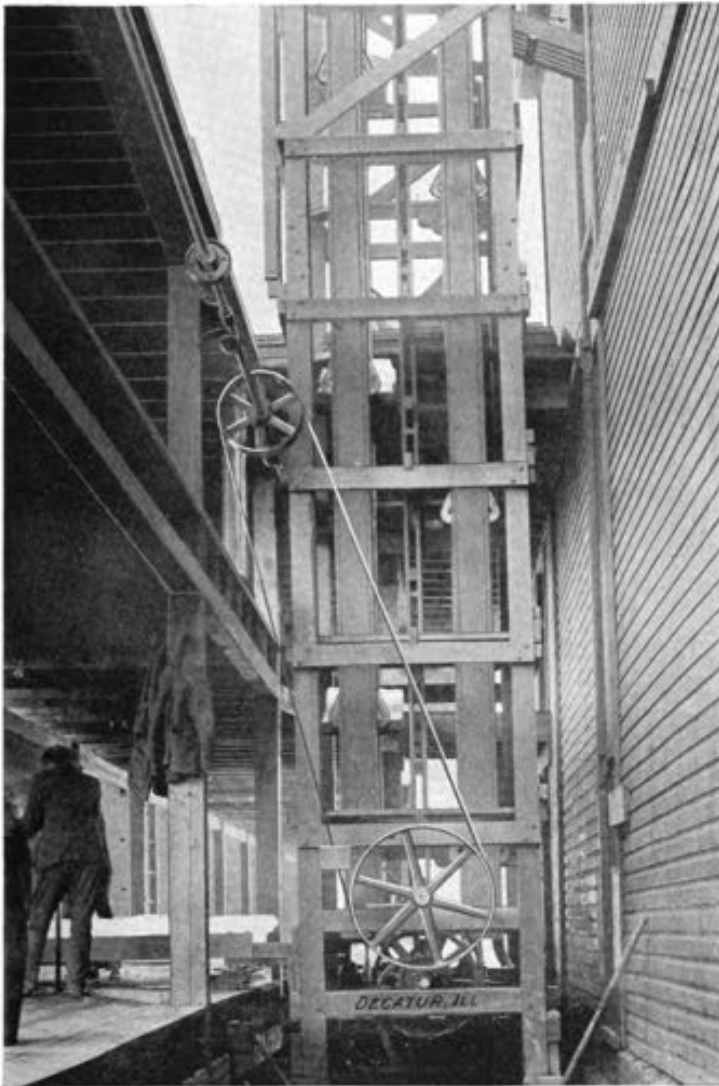


Combined Elevating and Lowering Machine.

This design of machine is used, not only in ice plants to fill and empty storage rooms, but is extensively employed at Car Icing Stations.

Cakes of ice are placed on the receiving bracket fingers, and these hold them in position until they are picked up by structural steel baskets attached to two endless strands of steel riveted chain, by which they are elevated to the top, then lowered on the opposite side of the machine to any desired level, and there the baskets are automatically relieved of their loads.

By reversing the direction of motion, the ice blocks are taken from the house to either the upper or lower platform.



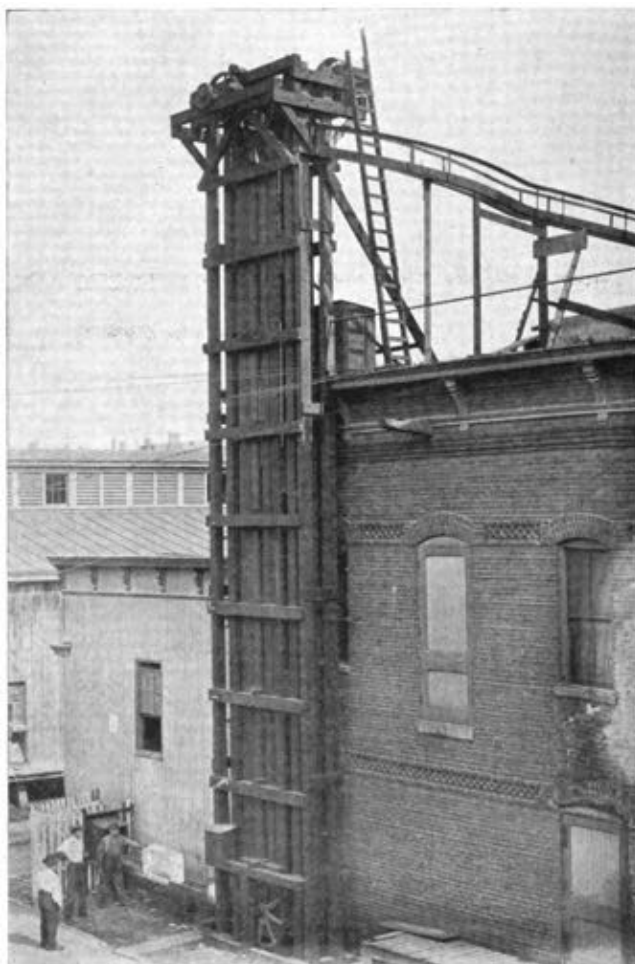
Combined Elevating and Lowering Machine.

Design. This machine is also made to handle dry natural ice, i. e., ice carried to an ice house remote from water, in cars, sleighs or wagons. Its most common application is for car icing stations. The same machine is used to house the ice in winter as it is used for taking the ice out in summer. Often with large houses a machine is placed at each door and is driven by a line shaft or by an independent motor.

Operation. The ice shown in the cut is from cars. Receiving fingers are placed level with the platform.

At the start the discharge fingers are near the bottom of the house, but as the filling proceeds they are raised a few tiers at a time until the house is full.

Lowering. To remove the ice from house the machine and all operations are reversed. Both receiving brackets and discharge fingers are made so that they can be adjusted quickly, hence the ice may be received and delivered from either side at points corresponding in height to both platforms and the amount of ice in the house.



Combined Elevating and Lowering Machine.

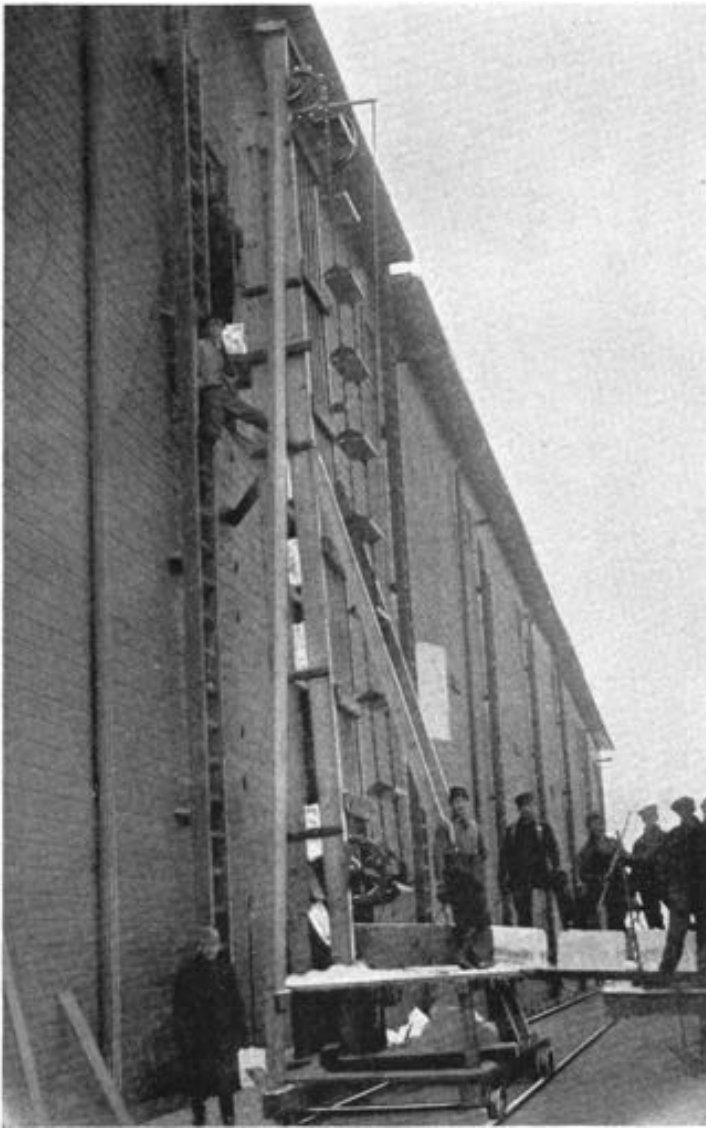
This illustration shows a case of outdoor use where the ice is elevated, then delivered to storage by a gravity run and a pneumatic lowering machine.

When used in the factory, the machine is generally placed in the storage room and fed from the anteroom or vestibule through a small door.

The machinery at the top of the frame may be above the storage room ceiling and refrigerating coils, and the electric motor or other operating power may be situated in the loft.

Its capacity is measured by the requirements, and is generally operated at six to twelve cakes per minute.

The machine may be stopped instantly and the load held at any time.



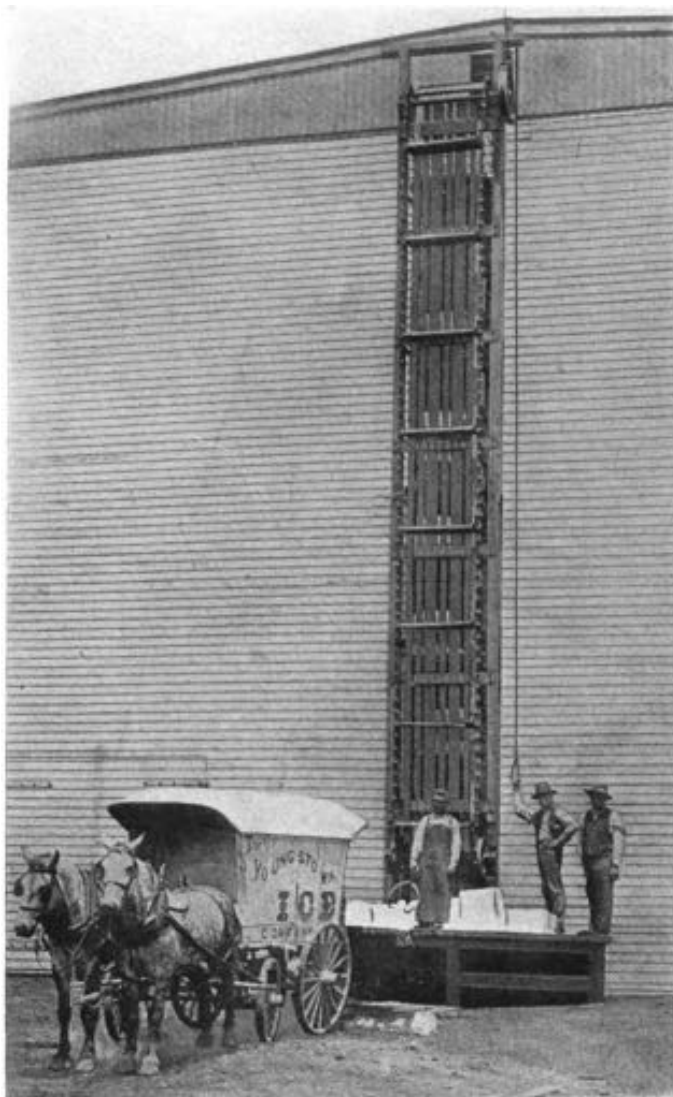
Heavy Adjustable Endless Chain Lowering Machine.

The Endless Chain Lowering Machine has a high capacity and is used for the rapid delivery of ice from the house to cars, boats or wagons.

Operation. The ice blocks are tipped from the house chute on to heavy wooden buckets covered with sheet steel. The guiding slats nearest the house are adjustable for the varying thickness of ice, thereby preventing thin cakes from falling through, uneven pieces from wedging, and allowing the user to lower irregular blocks.

It is so constructed that the brake band is always applied, holding the load, and the lowering is accomplished by pulling a rope, partially releasing the brake.

The base of the machine is provided with heavy axles, bearings and car wheels, making complete trucks, so that it can easily be moved from door to door.



Endless Chain Lowering Machine.

This machine is designed for lighter service than the heavy adjustable type.

Operation. The ice is delivered from the house on to heavy iron-shod wooden buckets between two endless chains. The weight of the ice on the bucket operates the chain. The descent is controlled by a rope led from the brake lever to the platform or into the house.

The chain is allowed to run only enough to place the next bucket in position for receiving its load, and at the same time the movement discharges a cake at the bottom of the machine. The door boards, protected by vertical slats, act as the back of the machine.

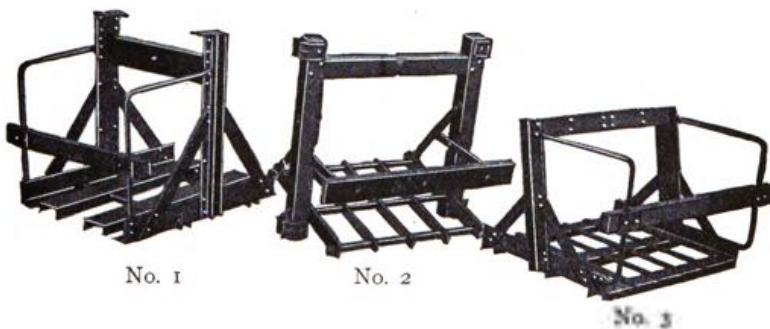
If desired, rollers are provided to place under the sill, to facilitate moving the Lowering Machine from door to door.



Gig Lowering Machine.

Operation. Ice is delivered at any height from the house to the gig and held in position by a hinged gate bar which is automatically lifted as the gig reaches the delivery platform. After the ice slides off, the gig quickly ascends for another cake, being counterbalanced by a weight.

The speed is regulated from the platform or the house by a rope leading from the brake band. The adjustable stop bar clamped between the upright posts prevents the gig from going above the receiving point. It is very economical in use and initial cost. Mounted on rollers if desired to facilitate moving it from door to door.

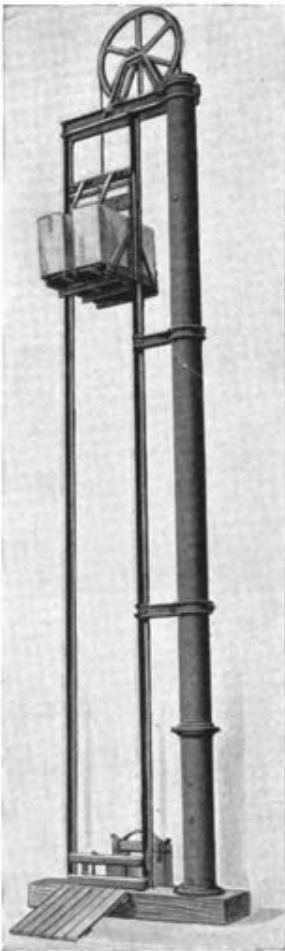


No. 1

No. 2

No. 3

Gigs (see page 64 also).



Two Cakes.



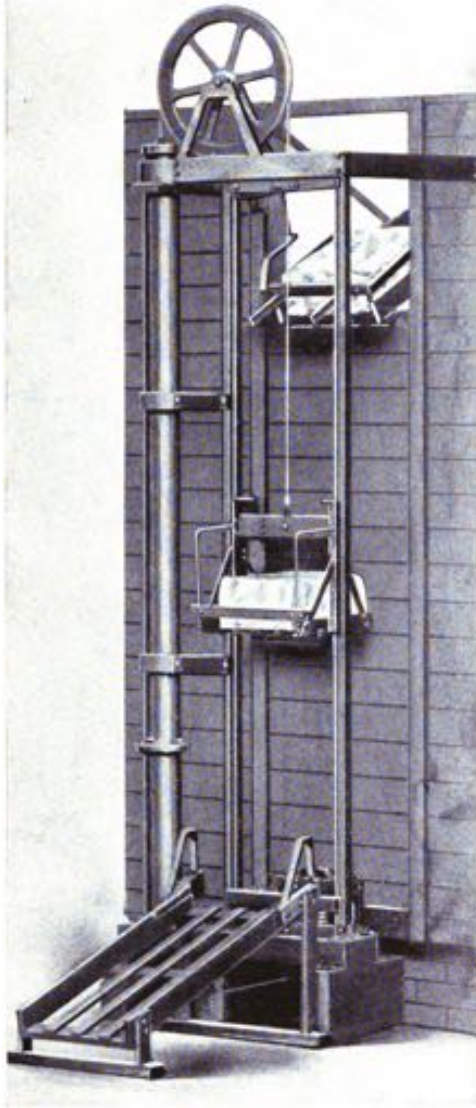
One Cake.

Automatic Pneumatic Lowering Machines. (Patented)

This machine, built entirely of steel, is very substantial and durable.

The gig, which travels in vertical guides, is controlled by a counter weight moving in a steel tube. The valves on the counter weight provide a pneumatic cushion at each end of the travel. This principle allows a very rapid drop of the load and yet the gig is brought to a gradual stop.

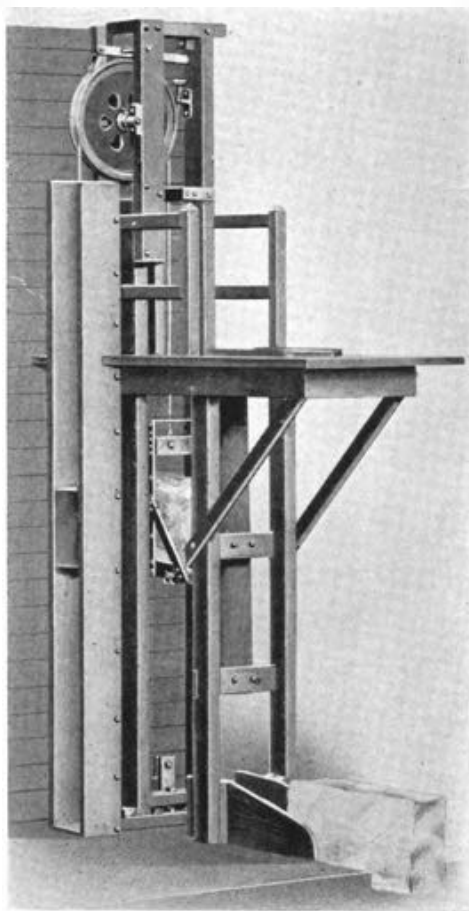
They are in use in at least seventy-five per cent. of the factories of the country.



Automatic Pneumatic Lowering Machine. (Patented)

The machine is entirely automatic in its operation. A safety device at the top retains the ice cake in the chute until the gig is in position to receive it. At the bottom the tilting of the gig results in rapid and smooth delivery of the cake. The ice may be received at any point on either side and may be delivered at any level on either side equally satisfactorily.

The spring buffers which limit the motion of the gig are easily adjustable.



Differential Lowering Machine.

This Lowering Machine is less expensive than the Automatic and is designed for short drops.

The speed is governed by an automatic brake controlling it both in descent and ascent. It will handle one or two cakes at a time as desired. The ice is received, lowered and discharged automatically. By a different arrangement of sheaves the head room can be much reduced.



3



23



9



21



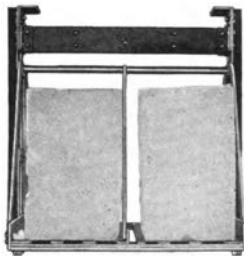
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16



11



33



24



18



14

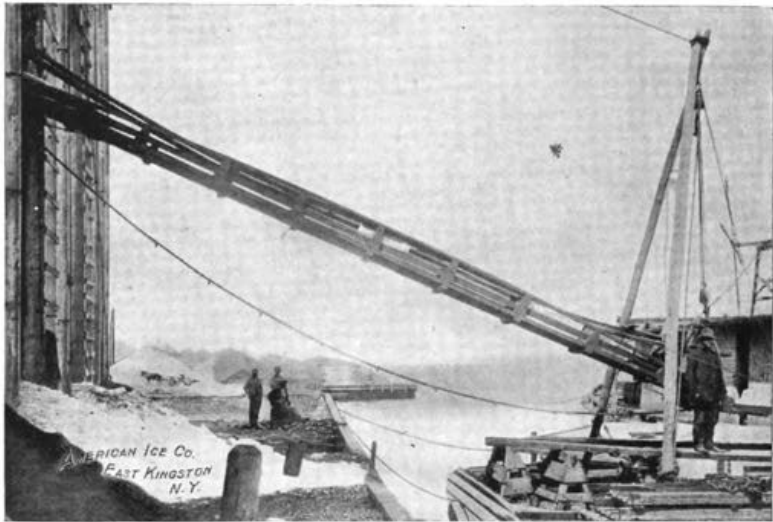


4

Gigs.

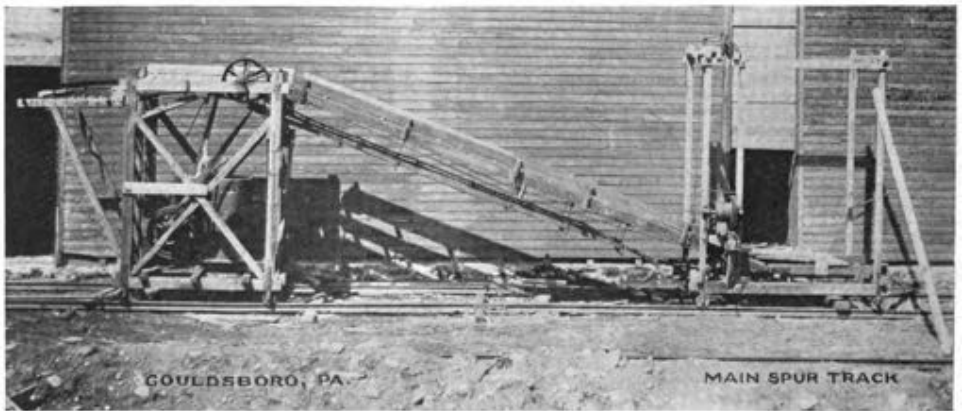
41

ICE
TOOLS



"Merrimac" Lowering Machine.

The "Merrimac" when lowering ice requires no power. It can be inclined at forty-five degrees or even more. A single chain is used and the descent of the ice is controlled by a brake. It is used to lower ice at a very rapid rate from the house to boats, cars or wagons. It can be driven by an engine or motor for removing the bottom tiers from the house.



Bottom Tier Elevator.

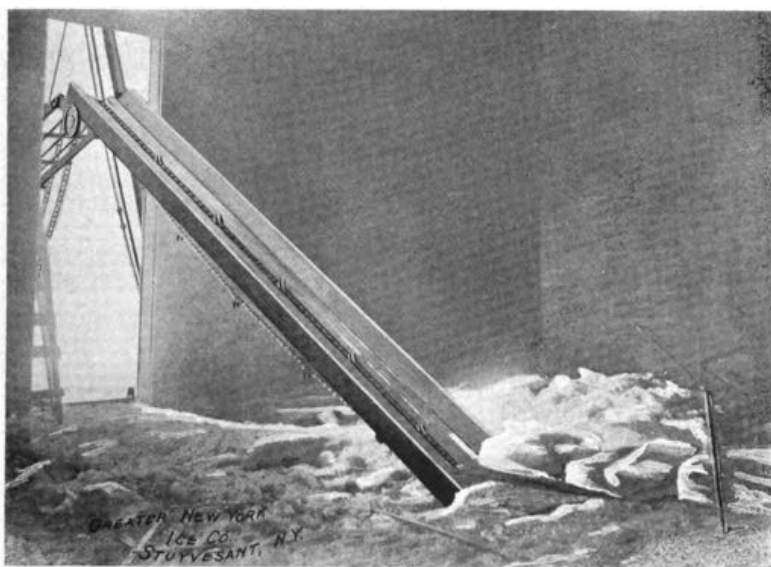
Power is required to elevate from the bottom tiers to the cars or wagons. This machine is moved from door to door on temporary rails adjacent to the house. Ice is pushed from the house on a circle and the elevator, which can be operated by a motor or gasoline engine, lifts the ice to any height desired. When the ice track is some distance away from the house the receiving end only is adjustable, the upper end being stationary, but when the quarters are crowded both ends are made adjustable.



Bottom Tier Elevator.

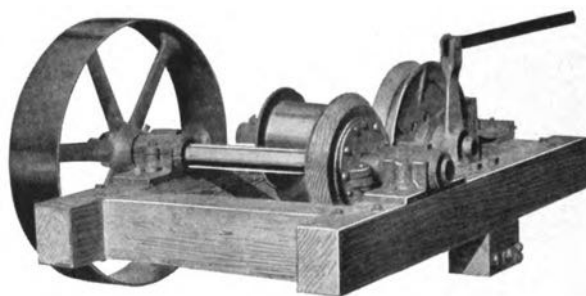
The cut shows an outside elevator operated by an engine, hoisting ice from the lower tiers of the house to a boat. Both ends are adjustable to suit the conditions. A planer can be used if desired.

This effects a great saving in cost over the arduous method of jacking the ice out by men or horse.



Bottom Tier Elevator.

This illustrates the inside use of an elevator for the lowest tiers, suitable particularly where the bottom of the ice is below the doorsill, or where there is but little room outside.



Bridge Hoist.



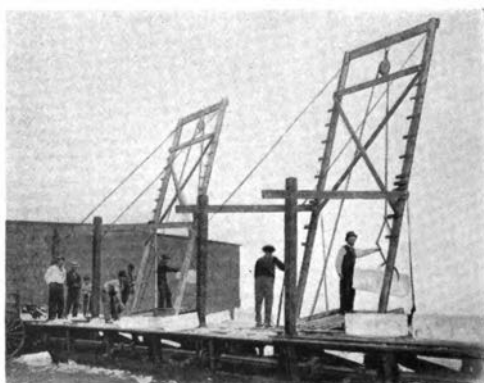
Multiple Bridge Hoists.

Bridge Hoists are used especially for elevating ice from boats.

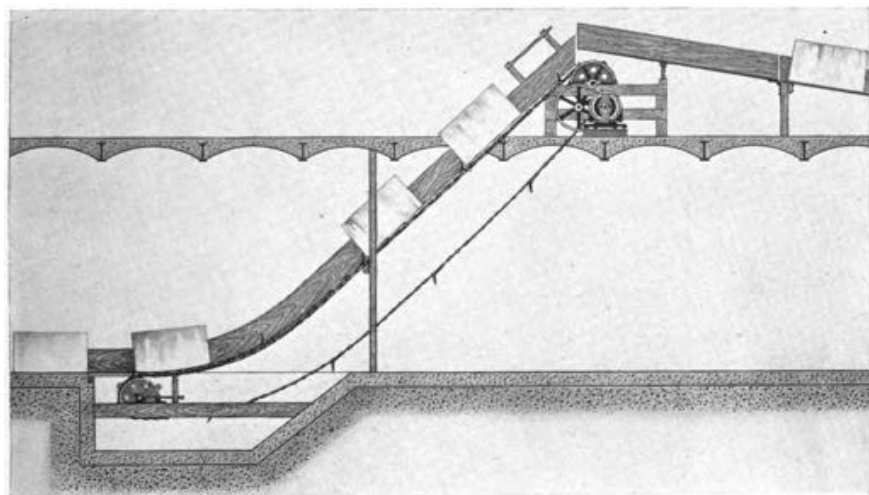
Hoisting Tongs (No. 385, p. 131) are fastened to a rope which is led through suitable blocks to the drum, by which the cakes are quickly hoisted to the wagon platform or bridge.

A line shaft extending under the platform drives the frictions when several hoists are operated simultaneously. The Straight Face Friction Hoist (page 48) is very suitable for this work.

The Power Cost is more economical when the hoists are made up in separate units with motors.



Unloading from Barge.

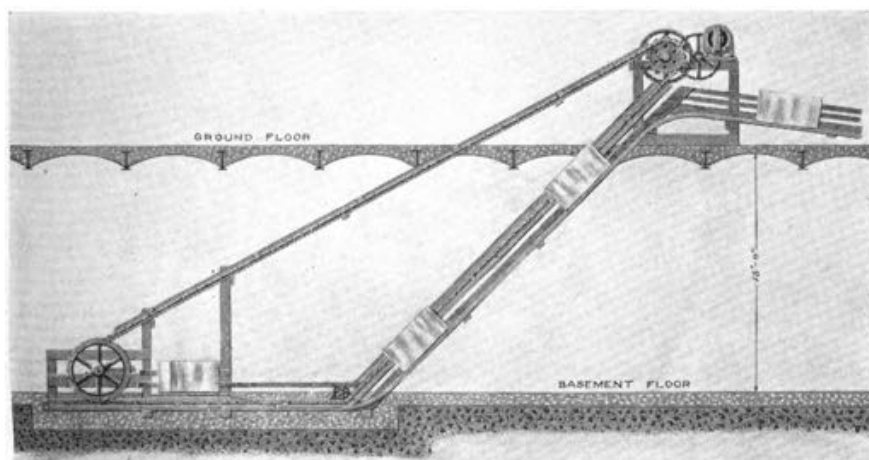


Single Chain Incline Elevator.

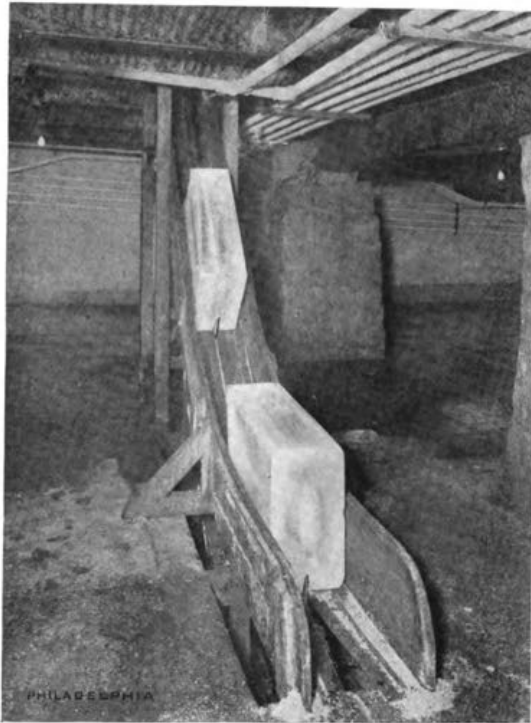
An endless chain provides the most satisfactory means of transferring ice from one elevation to another.

The Single Chain Incline Elevator with flights at proper intervals, where the ice blocks are fed directly over the chain, is illustrated above.

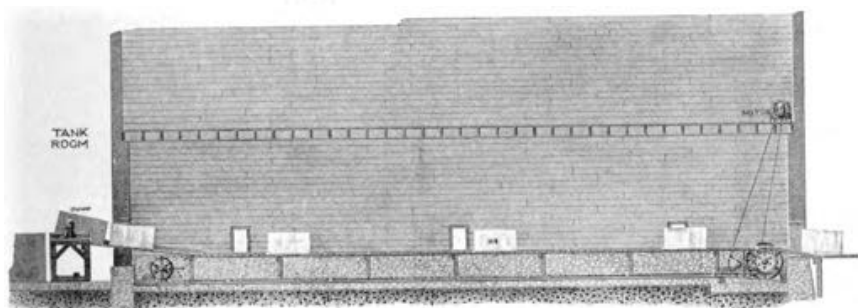
The double chain design with carrying cross bars arranged to receive the cakes automatically from the side, is shown below.



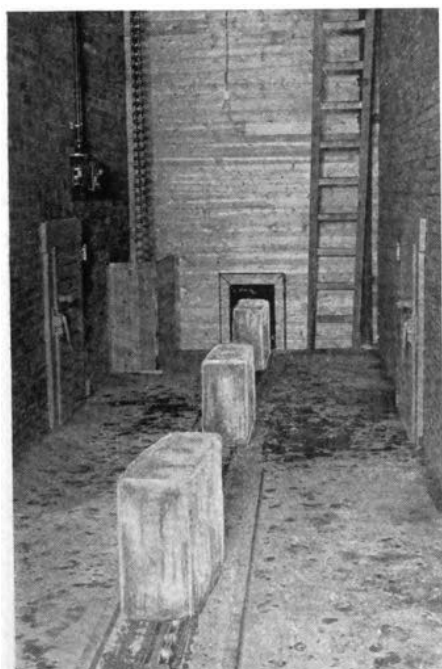
Double Chain Incline Elevator (Side Feed).



Single Chain Incline Elevators.



Single Chain Conveyor.



American Ice Company, New York.

Handling ice by manual labor is expensive. The saving of time and labor quickly pays for the installation of machinery.

A single chain with pushing flights at intervals, carrying ice from the dump to the storage room doors, is shown above. The storage rooms are filled by switching the ice cakes from the conveyor through the doors to the elevators.

When unloading the rooms, the lowering machine delivers the ice to the chain and it is then conveyed any distance to the loading platform.

This application of the endless chain conveyor represents but one of the many possibilities for its use.

Any source of power may be utilized and the transmission effected by belt, chain or gears.

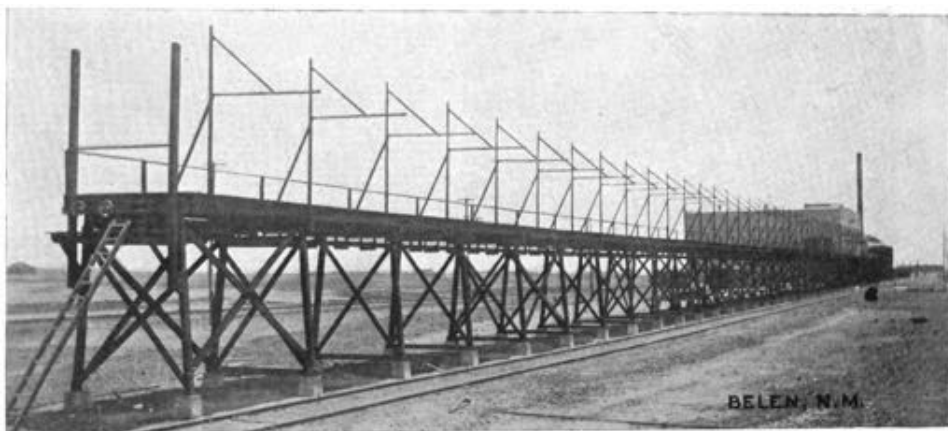
ICE
TOOL



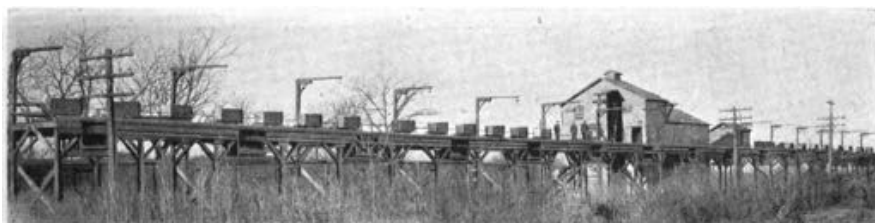
Icing Stations. Icing stations are located at suitable points along the line of railroads for the delivery of block or crushed ice to cars for icing purposes. If the storage house is adjacent to the water or part of the factory, it is filled in the usual way. If not, the hoisting of car ice into the house is best accomplished by a platform conveyor and elevator (see page 31), the "dry" feed Perpendicular Elevator (see page 42), or the machine illustrated in the cut above, viz., the Combined Elevating and Lowering Machine, which is shown more in detail on pages 52, 53 and 54.

Car Icing. The ice is elevated from the houses to the upper platform or crusher by the same machines, in some cases, or by Gig Elevators placed inside the house, operated by Straight Face Friction Hoists or End Thrust Friction Hoists illustrated on page 48.

A lower platform, when provided, is for the delivery of ice from cars to house and of block-ice from house to cars. The upper platform is used for crushed ice handled in carts or for block-ice.



Icing Stations.



Icing Station in Readiness for Train.

Icing Stations. Speed and the saving of labor are the primary objects to be attained.

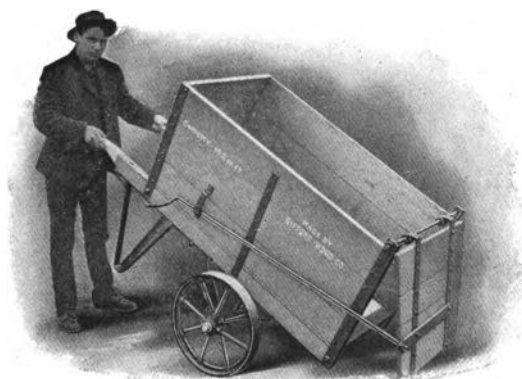
Elevators and conveyors are furnished to elevate the cakes to the crusher or platforms and to convey the ice along either of the platforms, distributing ice rapidly to the entire train.

The ice is carried to all desired points along the platform, or by reversal of the machinery it may be returned to storage.

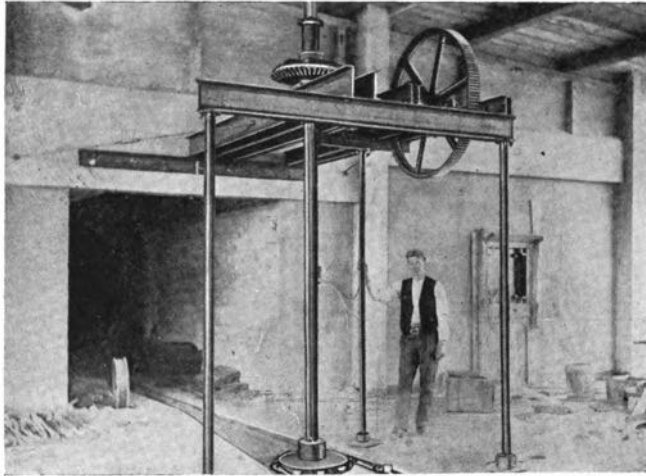
Crushed Ice. When crushed ice is used, it may be crushed first and then elevated by a bucket elevator (see pages 73 and 74) or the entire cakes may be delivered to the crusher (page 148), located at some distance above the platform. The crushed ice drops into a storage hopper or is delivered directly to the ice carts, which are held in readiness for rapid icing upon arrival of the train.

Salt Elevators. Salt is often used with crushed ice and a suitable storage bin should be provided. We supply bucket elevators to elevate the salt from car to bin (see pages 73, 74).

Ice Carts. These are of substantial construction and yet light enough to be easily handled. To prevent wear the bottom is covered with galvanized iron. A sufficient number should be provided to ice the entire train with little or no refilling.



Crushed Ice Cart.



Under certain conditions, where it is impossible to run a chain below the floor, or where the floor cannot be cut, or where it is desired to have one chain run on each side of a platform, it often happens that a single chain can be operated in a horizontal plane, keeping both chains above the floor, by installing vertical drive shafts, placing the chain wheels horizontally and arranging chains, flights, wearing shoes and all machinery to correspond.

This type is more expensive than the usual vertical arrangement and is not to be selected except when special conditions make it more feasible.

The illustration above shows the driving end without motor, of such a conveyor at the plant of the Gate City Ice & Precooling Co., San Bernardino, California.



Icing Cars.



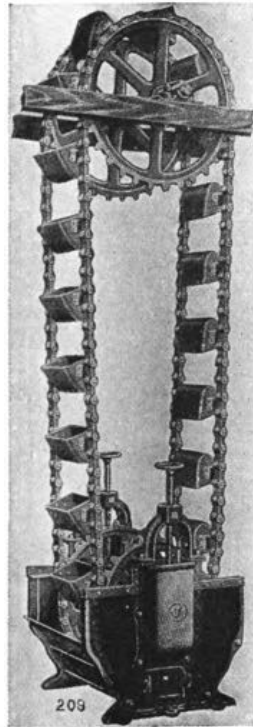
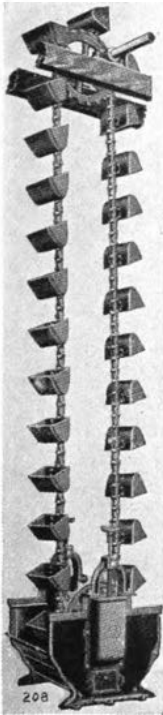
Icing Station.

The plate ice shown in the upper picture comes from the storage rooms through the anteroom, and may be used to load cars as shown; or when icing cars in the top bunkers the blocks are conveyed underground, under a street and then elevated to the icing platform.

GIFFORD-WOOD CO.



Iceing Cars.



Crushed Ice and Salt Elevators.

These illustrations show two types generally used, the double chain for crushed ice, the single chain for either ice or salt. The capacity determines the type. The machinery is strong and durable, the material and shape of the buckets, chain and boots being consistent with the substance handled.

The following page illustrates a typical arrangement for an icing station. The crusher (see page 148) which receives the block-ice either from cars alongside, or from storage by means of the conveyor, is located beneath the platform and delivers crushed ice to the elevator, by which it is carried to storage bins above. In many cases crushers are placed above and discharge directly into bins, being supplied with block ice by gig elevators. (See page 45.)

The salt elevator receives its supply from cars and delivers it to overhead bins. Many trains require both crushed ice for meats and block-ice for fruit. The top icing platform is supplied with especially light, strong, crushed ice carts (see page 69) which are filled from storage bins, pushed to cars, and the contents sluiced into ice boxes. The lower platform handles block-ice only, the conveyor transferring it to either crusher for breaking, or cars for icing. The conveyor is reversible so ice can be returned to storage. Salt boxes are placed on the lower platform at proper intervals for each car, and are replenished during spare time. Convenient receivers like overhead trolley buckets or wheelbarrows are used to transfer salt from the salt-bin to the boxes.

Often combined elevating and lowering machines (see page 53) are used with this arrangement for filling and emptying the houses. Trains deliver ice to the platform where the conveyor transfers it any distance to the machines, which in turn elevate it into the house. By reversing both machines and conveyor, ice is taken from the house to crusher or cars.



Living Station.



COAL HANDLING MACHINERY

Send for our Coal Catalog No. 14



2,000 Ton Pocket, C. B. Kendall, Gardner, Mass.

The Bucket Elevator Conveyor works equally well with anthracite or bituminous coals, and is adapted for any class of service.

The equipment for this pocket consists of an Elevator Conveyor type of machine with a capacity of 40 tons of Anthracite coal per hour, driven by a 10 H. P. motor and silent chain.

The interior view shows the general arrangement of the machinery and system of delivery from the gates to the different bins. Note the tilting chutes under the gates. At the end of each chute is a coal ladder which lowers the coal into the bin without breakage.

The wagons are loaded underneath the pocket. The coal is screened while being delivered to wagons. These screenings are again screened to separate the dust, thus dispensing with all hand work.

Write to us if interested in handling coal.



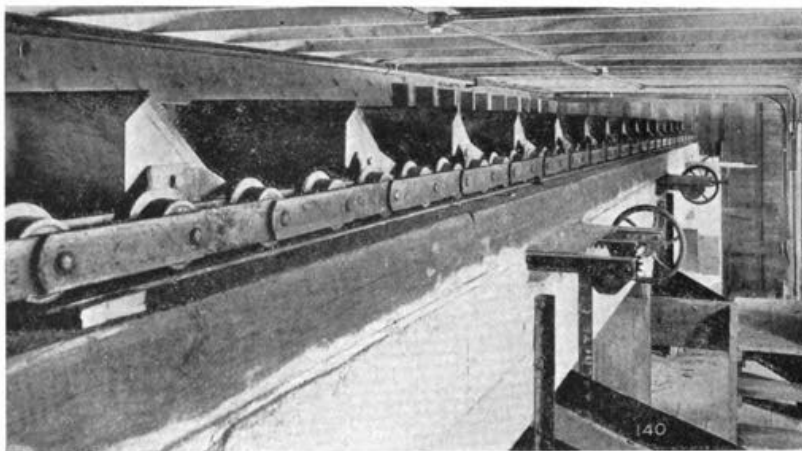
GIFFORD-WOOD CO.

COAL HANDLING MACHINERY

Send for our Catalog No. 14



Coal pocket showing wagon loading chutes.



Distributing Conveyor showing gates.

West End Coal Co., Albany, N. Y.



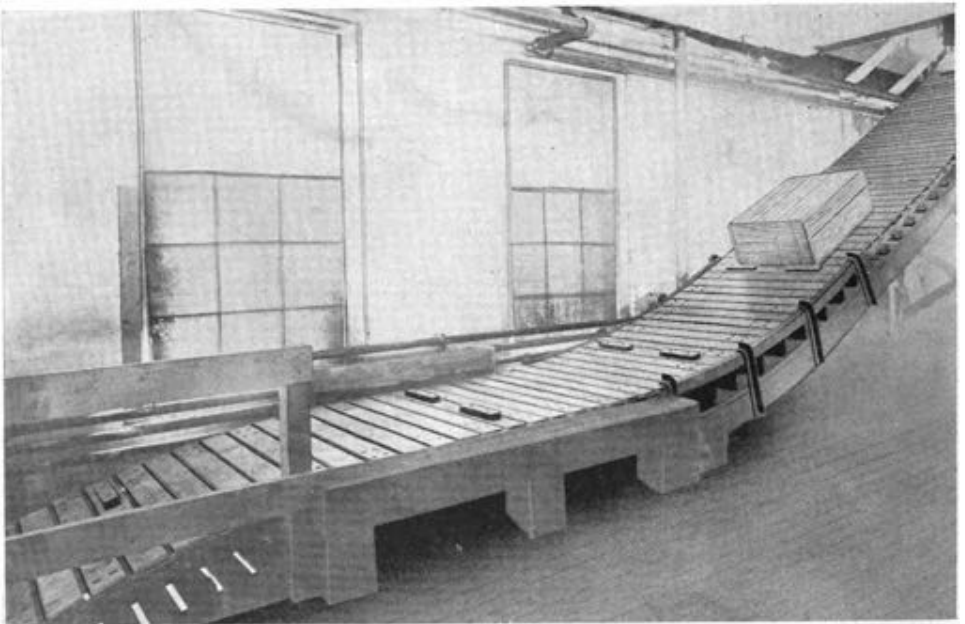
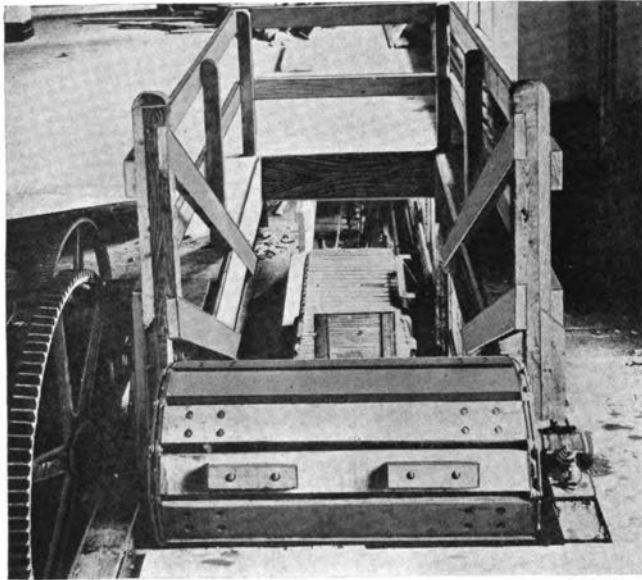
The photographic cuts on this and the following page represent apron or slat elevator conveyors for the economical transfer and handling of miscellaneous size boxes and packages.

These are installed at the large printing establishment of the Nevins-Church Press Co., of Irvington, New York.

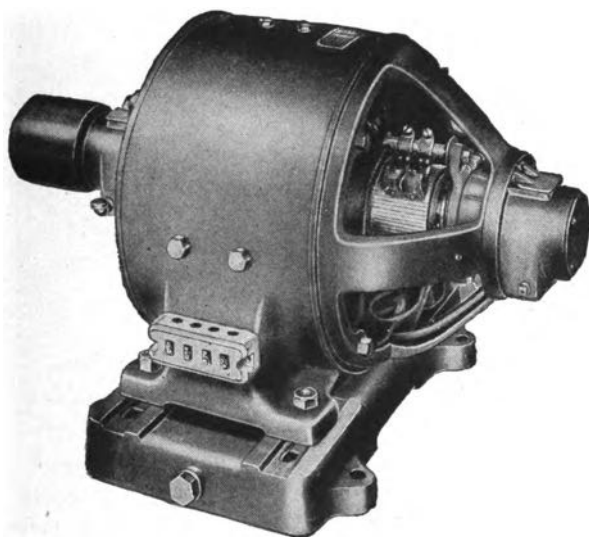
Above is shown the long tunnel conveyor carrying packages, bundles and boxes from the freight car platform under a bank upward to the first floor of the building.

The other cuts show the elevator from first to second and third floors for elevating or returning goods.

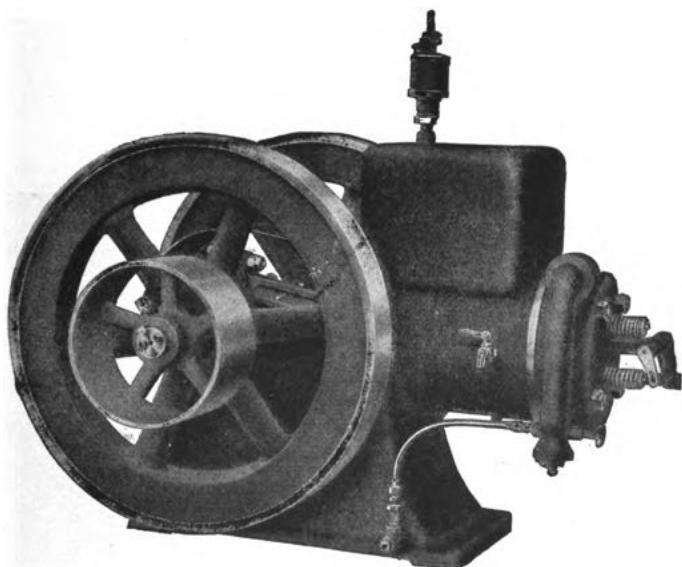
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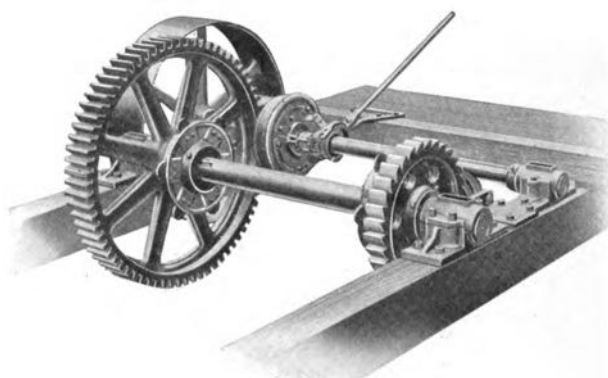


Apron Conveyor.

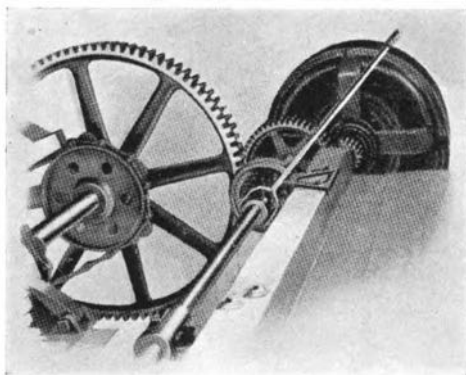


The selection of power for operating elevators is very important. The various items of operating expenses vary in different localities, but generally the electric motor or gasoline engine answers all requirements. The electric motor is to be preferred to any other motive power.





Arrangement of Tower Machinery — Belt Drive.



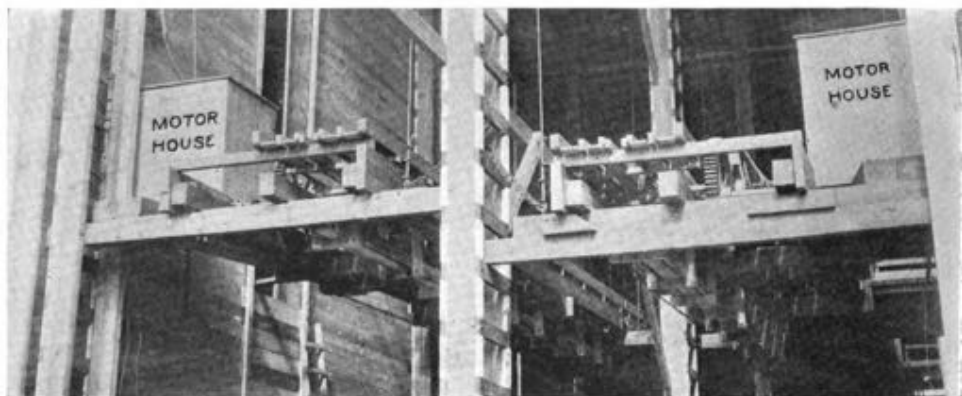
Motor Drive for Elevator.

Drive. Above is the belt drive, for which a standard pulley is furnished.

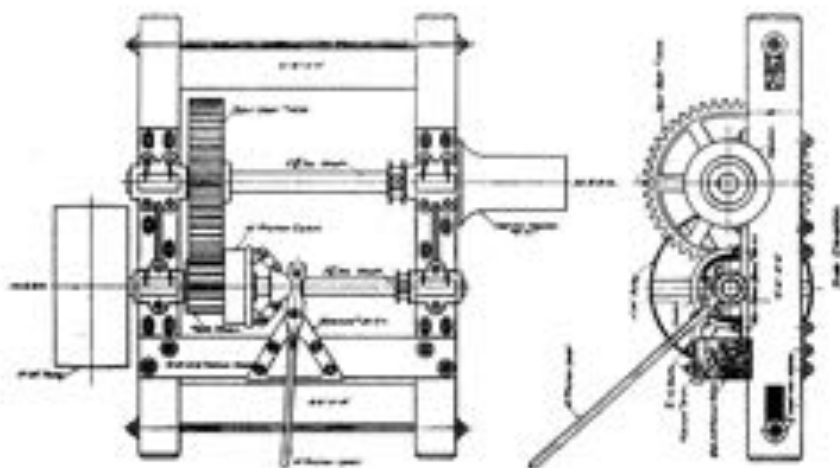
On the left the electric motor drive of an elevator is shown, transmitting power from the motor by gears.

Below are two gallery single chain conveyors operated by motors.

A gallery chain driven by an engine and manila rope is illustrated on page 23. Where an independent drive is used for a gallery and electricity is not available, the drive shown is the best.



Motor Drives for Gallery Conveyors.



Car Puller with Friction Clutch.

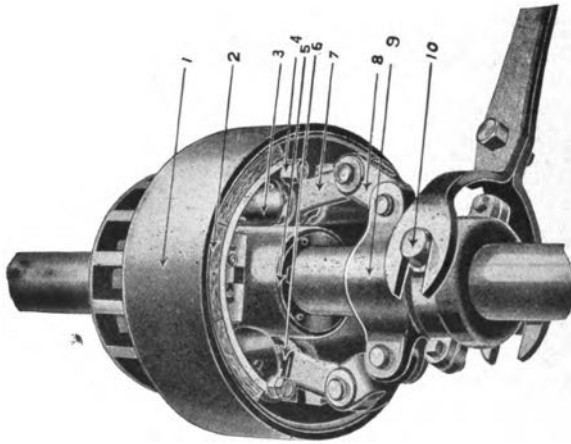
This style of car puller is furnished with a friction clutch attached to a spur pinion. By the use of the friction clutch the car puller is at all times under the absolute control of the operator, thus preventing accidents. The machinery is mounted on a heavy frame, the gears are extra strong, and the bearings are babbitted and furnished with grease cups. The capstan is Cast Iron, turned and polished, giving a smooth surface to the car puller rope, thus reducing the wearing of the rope to a minimum.



The Badger Neverslip Car Mover.

Weight, Complete, 14 lb.

Price, with Extra Spur \$5.00



Screw Friction Clutch. (Patented)

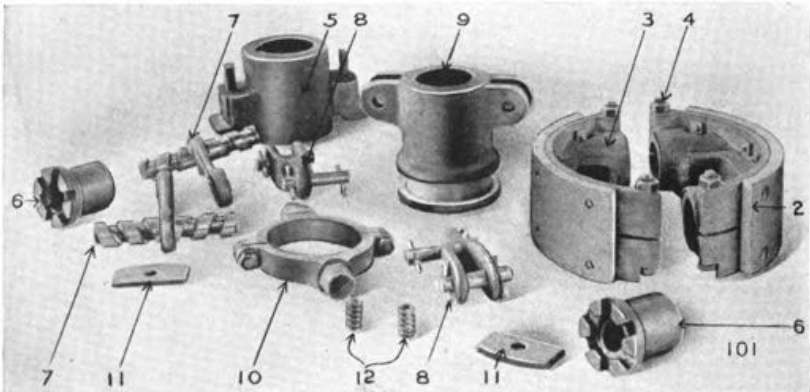
This friction clutch is very powerful and designed particularly for the severe duty of handling ice.

A clutch is included in nearly every equipment, as its use is imperative. A means of instantly stopping the machinery is required, and the advantage of starting with a clutch is apparent.

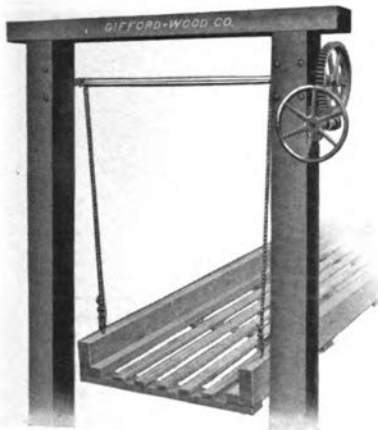
Screw Friction Clutch Parts.

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Drum, with spur pinion attached. 2. Maple lugs, bolted to expanders. 3. Expanders. 4. Clamp bolts. 5. Driving hub, keyed to shaft. 6. Adjustable Nut (brass), inserted in expanders. | <ol style="list-style-type: none"> 7. Lever Screw (brass). 8. Fork Link. 9. Shipping Hub. 10. Shipping Hub Ring. 11. Malleable Plates. 12. Springs. |
|--|---|

Use numbers when telegraphing.

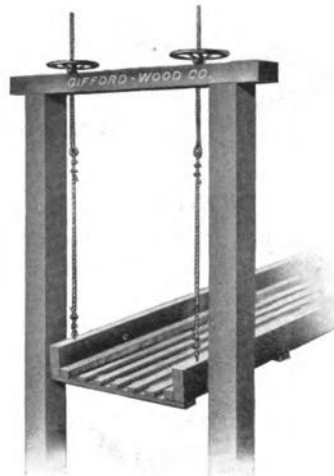


Gifford-Wood Co.'s Screw Friction Clutch.

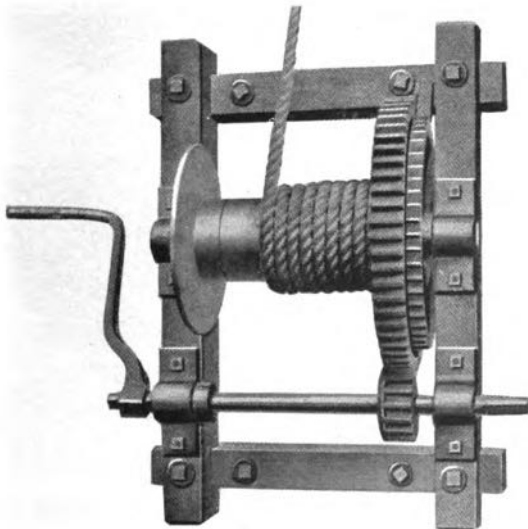


Application of Worm Gear Hoist.

Lifting Screws. Heavy wrought iron nuts are cast in the hand wheels. Two long screws with coarse, square threads are connected to wire ropes of proper length which are attached to eye bolts fastened to the apron stringers.



Application of Lifting Screws.



Hoisting Crab.

Worm Gear Apron Hoist. A very powerful device for adjusting the level of the apron in the water. Even when the water box or apron is full of ice it will easily hoist the load.

A turn of the hand wheel, which is easily accessible, winds the wire ropes around the shaft and lifts the apron or water box out of the water. A reverse turn lowers the load.

Hoisting Crab. Convenient for use in many places. If the current is very strong, tending to move the ice quickly, or if the water is too deep for posts, the Hoisting Crab may be used to advantage.

The apron is supported by a mast and boom with a rope running from the apron-bail to the crab, and the adjustment of level is quickly made by a few turns of the crank. A ratchet wheel holds the load at any point desired.

ICE
TOOL



Return Idler Wheel.

A very superior double flange return idler wheel for conveyors. It is impossible for the chain to leave the wheel.



Chain Lever.

Very handy on the run for holding or connecting the ends of the chains together.



Safety Chain.

No adjustable gallery should be operated without a safety attachment. The chain shown bolted to the runway cross bar, encircling a gallery post with the hook, is the best device in use.



Ice Guard Fender.

Fenders are fitted to the ends of ice-guards of galleries, at the doorways, preventing breakage and jamming of ice cakes.

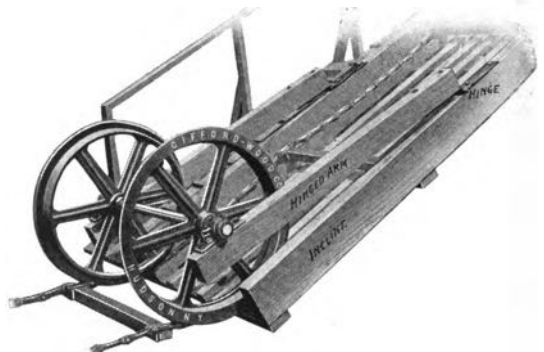


Chain Shoe.

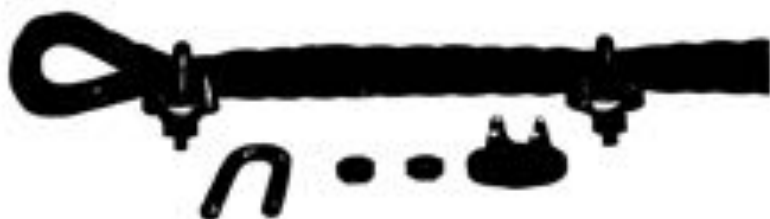
Knuckle Wheels, Angle Wheels, or Chain Shoes are necessary to hold the chain down at the junction of incline and apron, when the incline is steep. Chain Shoes and Angle Wheels are bolted to the stringers, but the Knuckle Wheels are loose and float on hinged arms. These are not included in the price of machinery unless specified.



Angle Wheel.



Knuckle Wheels.



Wire Rope.

All classes and sizes of steel and iron wire rope with thimbles and clips supplied.



Chain. Ice Chain is made up of steel links of high tensile strength, 6" centers, riveted two and two. Supplied according to the duty, in four sizes, with links $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " thick.



Chain Bolts. These are $\frac{1}{4}$ " in diameter, and of different lengths to attach the pockets and flights to the chain. They are measured from under the head to the center of the drilled hole. Each bolt is provided with a washer and cotter pin.



Chain Rivets. Ice Chain Rivets are $\frac{1}{4}$ " in diameter and of various lengths. In ordering, give length from under head to end.



Hold Bars. Selected white oak is used for the Bars. As these are tenoned by machine, all are exactly the same length, which is absolutely essential.



No. 34-1-0



No. 34-1-1



No. 34-1-2



No. 34-1-3



No. 34-2-0



No. 34-2-1



No. 34-2-2



No. 34-2-3



No. 34-3-0



No. 34-3-1



No. 34-3-2



No. 34-3-3



No. 34-4-0



No. 34-4-1



No. 34-4-2



No. 34-4-3



No. 34-5-0



No. 34-5-1

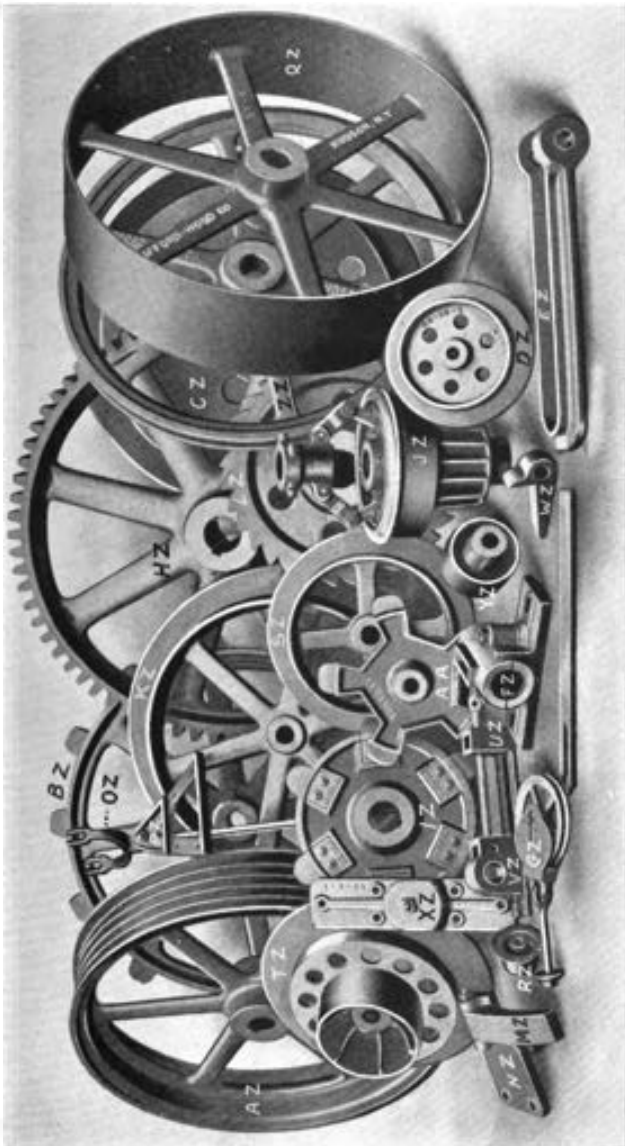


Steel "A" Pocket



Steel "C" Flight

Pockets and Flights.



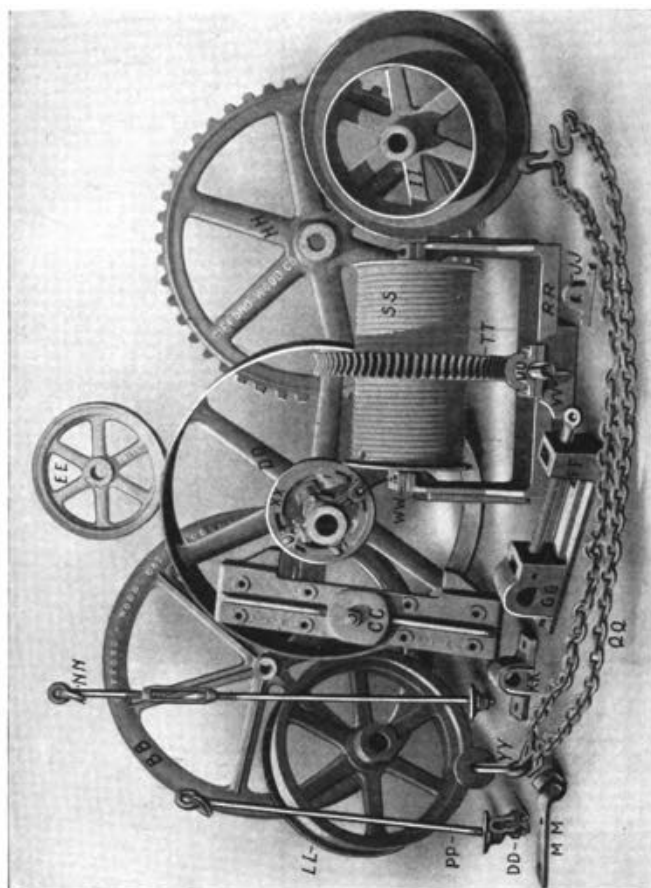
Elevator Parts.

AZ Manila Rope Sheave, 5 Groove
 BZ Chain Wheel, 48" Diameter
 CZ Webbed Flanged Wheel, 40" Dia.
 DZ Flanged Chain Roller
 EZ Tension Yoke
 FZ Pillow Block
 GZ Pulley Block
 HZ Gear
 IZ Chain Wheel, Inserted Teeth

JZ Screw Friction Clutch
 KZ Underbit Apron Wheel
 LZ Ratchet Wheel
 MZ Ratchet Wheel Pawl
 NZ Ratchet Wheel Pawl Stand
 OZ Shipping Lever
 PZ Shipping Lever Fulcrum
 QZ Pulley
 RZ Flanged Roller

SZ Flanged Wheel, 30" Diameter
 TZ Double Tread Flanged Wheel
 UZ Take-up Base
 VZ Take-up Box
 WZ Chain Roller Bearing Block
 XZ Apron Hinge
 YZ Telescoping Section Roller
 ZZ Manila Rope Sheave, 1 Groove
 AA Recessed Angle Wheel

All castings are numbered — when ordering, give the number on the machine part to avoid error; if not, specify the part wanted by using the letters given above.



Elevator Parts.

BB	Hand Rope Sheave 40"	RR	Gallery Hoist Frame
CC	Gallery Hinge	SS	Gallery Hoist Drum
DD	Friction Pulley	TT	Gallery Hoist Worm Gear
EE	Wire Rope Sheave	UU	Gallery Hoist Worm Cap
FF	Take-up Base	VV	Gallery Hoist Worm and Shaft
GG	Take-up Box	WW	Gallery Hoist Frame Cap
HH	Spectet Wheel	XX	Screw Friction Clutch
II	Double Tread Flanged Wheel	YY	Eye Bolt and Cast Washer
JJ	Door Rod Box		
KK	Solid Box		
LL	Double Flanged Wheel		
MM	Double Hook		
NN	Adjustable Gallery Hanger		
OO	Wire Rope Clip		
PP	Gallery Hanger		
QQ	Safety Chain		

All castings are numbered — when ordering, give the number on the machine part to avoid error, if possible; if not, specify the part wanted by using the letters given above.

INDEX.

ELEVATING AND CONVEYING MACHINERY.

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ICE TOOLS

OF QUALITY

FOR the convenience of our customers, we carry large stocks of Ice Tools with the following agencies:

Sickels-Loder Co.,	35 Barclay Street, New York, N. Y.
Standard Scale & Supply Co.,	35 South 4th Street, Philadelphia, Pa.
Standard Scale & Supply Co.,	Pittsburg, Pa.
The Fred W. Wolf Co.,	Atlanta, Ga.
Henry C. Weber & Co.,	Detroit, Mich.
Morley Bros.,	Saginaw, Mich.
Simmons Hardware Co., Inc.,	St. Louis, Mo.
Richards & Conover Hardware Co.,	Kansas City, Mo.
Farwell, Ozmun, Kirk & Co.,	St. Paul, Minn.
W. K. Morison & Co.,	Minneapolis, Minn.
James Morton & Son Co.,	Omaha, Neb.
The George Tritch Hardware Co.,	Denver, Col.
Anaconda Copper Mining Co. (Hdws. Dept.),	Butte, Mont.
The Salt Lake Hardware Co.,	Salt Lake City, Utah.
Holley-Mason Hardware Co.,	Spokane, Wash.
Baker & Hamilton,	San Francisco, Cal.
Baker & Hamilton,	Sacramento, Cal.
Edwin J. Banfield,	120 Adelaide Street, West, Toronto, Can.

Our Branch Houses at Boston and Chicago are maintained for the convenience and accommodation of our customers.

Gifford Wood Co.

No. 51-52 North Market Street

Boston, Mass.

Executive Offices
and Factories

Hudson, N. Y.

No. 128 North Jefferson Street

Chicago, Ill.

OUR AIM is to maintain a standard of quality in Ice Tools that none will equal. Prices are uniformly quoted on a basis f. o. b. cars.

Terms are 30 days to customers of record.

Persons with whom we are unacquainted or who have no rating in Bradstreet's Reference Book should accompany order with cash, or give reference to some bank or well-known business house.

If requested, goods will be sent C. O. D.

TELEGRAPH CODE

Cable address: "Gifford, New York."

Orders by telegraph may be condensed by using the code words which are printed in connection with the prices given in this catalog.

Prefix "Freight," "Steamer," "Express," also "Collect," (for C. O. D.), as may be desired.

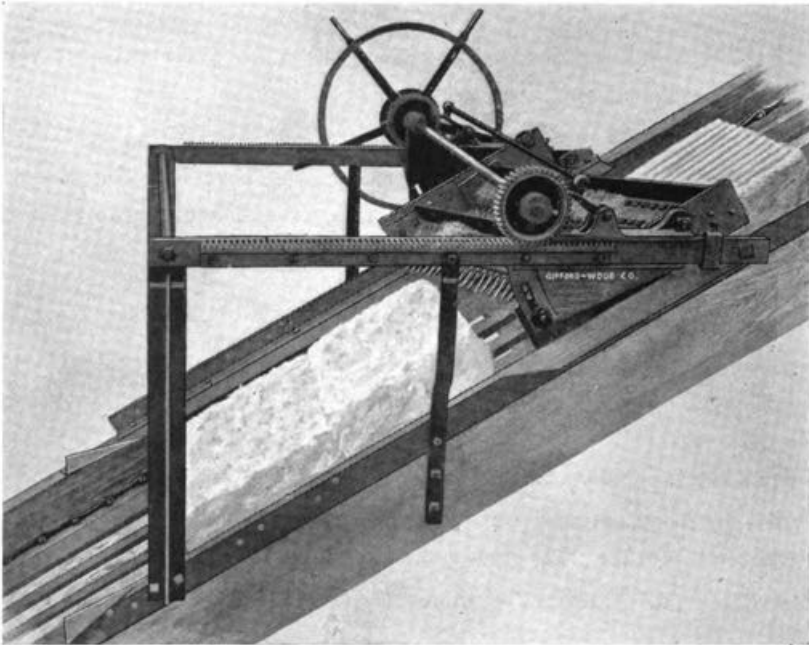
Please specify method of shipment in each case.

When fractions of a dozen, or a few dozen only, are wanted, use the following code words for quantity.

$\frac{1}{12}$ dozen <i>Dais</i> ,	$\frac{7}{12}$ dozen <i>Desert</i> ,	\pm dozen <i>Dragon</i> ,
$\frac{1}{6}$ " <i>Darnel</i> ,	$\frac{2}{3}$ " <i>Despot</i> ,	$\frac{1}{2}$ " <i>Drama</i> ,
$\frac{1}{4}$ " <i>Decay</i> ,	$\frac{2}{3}$ " <i>Dexter</i> ,	$\frac{1}{2}$ " <i>Dryad</i> ,
$\frac{1}{3}$ " <i>Delta</i> ,	$\frac{10}{12}$ " <i>Docket</i> ,	$\frac{1}{4}$ " <i>Duet</i> ,
$\frac{2}{12}$ " <i>Denote</i> ,	$\frac{1}{2}$ " <i>Dolmen</i> ,	$\frac{1}{2}$ " <i>Dulcet</i> ,
$\frac{1}{3}$ " <i>Drust</i> ,	$\frac{1}{4}$ " <i>Domina</i> ,	$\frac{1}{2}$ " <i>Dyke</i> ,

Illustration: "Express Collect Denote Nettle," would order 5-12 dozen 4½ feet Ice Hooks sent C. O. D. by express, and "Freight Dulcet Nettle," would order by freight 5 dozen 4½ feet Ice Hooks.

Red paint has been our prevailing color for years. Others imitate it; so always look for the stamp of "Gifford-Wood Co." on every tool.



Patented March 26, 1901

Eureka Elevator Planer; Movable Carriage Style; Diagonal Cut.

Weight of 2-bar Planer for 42-in. run inside, 500 lbs.; weight of each diagonal knife-bar, 110 lbs.

	Code Word	Each
No. 251. — Eureka Elevator Planers, Movable Carriage, 1 knife	<i>Afair</i>	\$500.00
No. 252. — Eureka Elevator Planers, Movable Carriage, 2 knives	<i>African</i>	125.00

These prices cover Planers for any width of incline up to sixty inches. Prices on Planers in excess of this width quoted on application.

The diagonal cut of the knife-bars is one of the important features of the Eureka Elevator Planer. The shock of attack is thus much reduced, and the planing is more steadily done.

The frame is complete in itself, and the entire structure can be removed bodily on the incline.

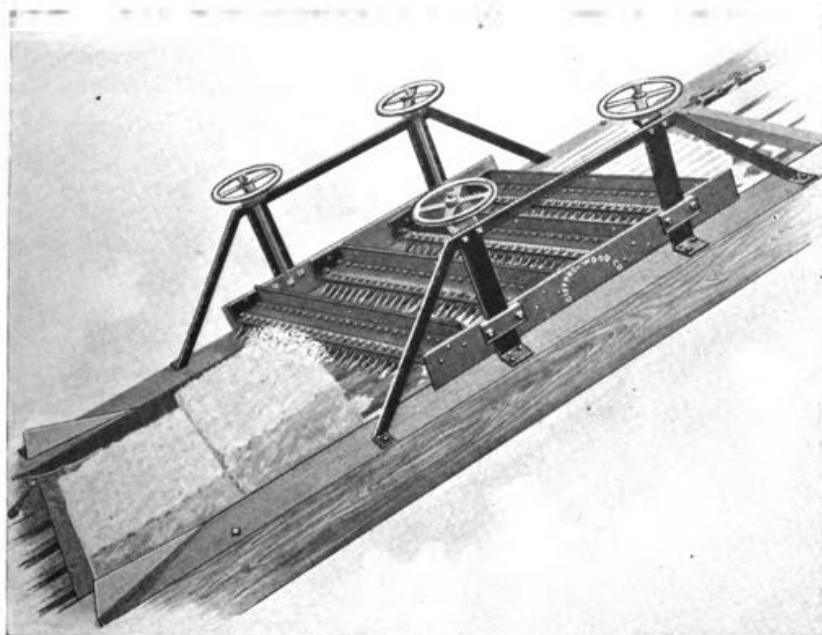
The horizontal racks particularly distinguish the Eureka from other planers, and carry the weight of the carriage and knife-bars. The latter, therefore, do not have to be lifted by the operator.

The Eureka is quick and easy of movement for use in skimming cakes, or when necessary to escape a riding block, and is rigid and positive in action.

Its construction is heavy and substantial—a very important element in ice machinery.

Planing ice is an indispensable operation in order to obtain a suitable product. Nearly all impurities in ice are near its top surface, and should be planed off.

The Stationary Style (yet easily adjustable), shown next page, is to be recommended wherever practicable, as the floors are sure to be level, and good packing is much more cheaply and easily obtained.



Patented March 26, 1901

Eureka Elevator Planer; Stationary Style (Adjustable); Diagonal Cut.

Weight of 6-bar Planer for 44-in. run inside, 1300 lbs.; weight of each diagonal knife-bar, 110 lbs.

	Kind Wood	Each
No. 254A. — Eureka Elevator Planers, Stationary Style, 2 knives	<i>Age</i>	\$125.00
No. 254B. — Eureka Elevator Planers, Stationary Style, 3 knives	<i>Agile</i>	150.00
No. 254C. — Eureka Elevator Planers, Stationary Style, 4 knives	<i>Agree</i>	175.00
No. 254D. — Eureka Elevator Planers, Stationary Style, 5 knives	<i>Ahoy</i>	200.00
No. 254E. — Eureka Elevator Planers, Stationary Style, 6 knives	<i>Aim</i>	225.00
No. 254F. — Eureka Elevator Planers, Stationary Style, 7 knives	<i>Aisle</i>	250.00
No. 254H. — Eureka Elevator Planers, Stationary Style, 8 knives	<i>Alimbo</i>	275.00

These prices cover Planers for any width of incline up to sixty inches. Prices on Planers in excess of this width quoted on application.

Most harvesters now use this style of Planer. Some put in their entire crop planed to one even thickness. This practice makes perfectly level floors and simplifies the retailing business wonderfully. Wholesale shippers of natural ice to markets where manufactured ice is used have a great advantage in furnishing cakes of uniform weight.

Others who cannot afford the waste incidental to reducing the entire crop to one thickness, change the depth of cut from time to time, and yet get the benefit of level floors.

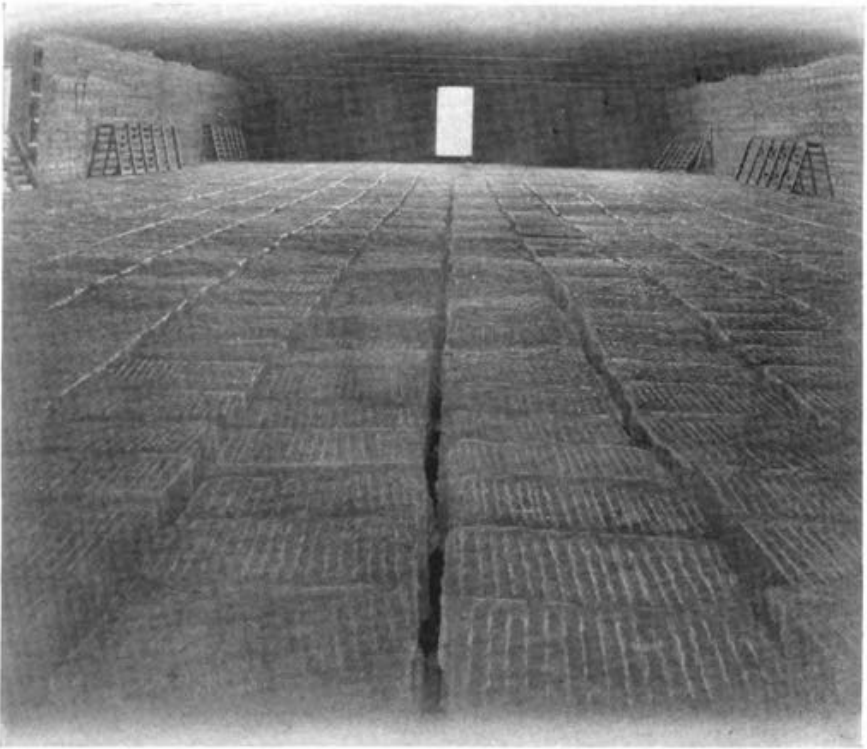
The knife-bars of both styles of Planers (see preceding page), are set to cut one inch to each set of knives, excepting that the rear cut is made $\frac{3}{4}$ inch.

The cheapest way to remove snow falls from the ice-field, when the ice is not too thick, is to wet them down, freeze them and plane at the run.

A large number of five- to eight-knife planers are now in use for the above-named purposes.

Either a good Chip Conveyor (see pages 6, 21, 35, 40) or a pumping outfit (see page 39) is an absolutely necessary accompaniment.

Advise to your customers that you plane off the impure portion of your ice, either on the field or on the incline, or both, and you will influence the choicest and best paying trade in your city.



Planed Ice.

Interior of house. Showing corrugated surface of ice and level floors.

This illustration gives an excellent idea of some of the advantages to be gained by planing ice before storing.

Although for many years none but the larger class of harvesters planed their ice, it is now a rare thing to find anyone engaged in this industry that attempts to put in a crop of ice before planing either on the field or on the incline.

Ice treated in this manner gives a cake of uniform thickness, the floors of the house are at all times level, allowing more ice to be stored and at far less expense; fewer men are required in the house and the ice is handled quicker and with greater ease.

The corrugated surface tends to keep the cakes from becoming frozen together and which allows them to be separated more easily and without breaking when removed.

By adopting this method all surface dirt is removed, which appeals very strongly to the consumer, who always patronizes the dealer selling good clean ice.



Pat. Eureka Flanged Tooth.
Test-Head Bolt.



Section of Eureka Cutter Bar.

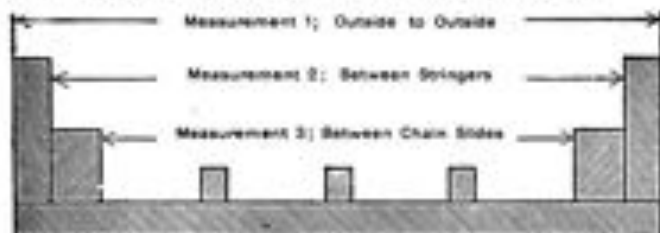
No.	Description	Code Word	Each
No. 257.	Eureka Cutter Bars, complete (made to measurements sent us)	<i>Black</i>	\$25.00
No. 258.	Patent Eureka Flanged Teeth	<i>Albata</i>	.50
No. 259.	Test-Head Bolts for Flanged Teeth	<i>Albino</i>	.05
No. 262.	Patent Open-Top Teeth	<i>Alder</i>	.30
No. 263.	Patent Wedge Teeth	<i>Alkali</i>	.30
No. 264.	Countersunk Square Head Bolts for Wedge Teeth	<i>Alligate</i>	.05

The Eureka Cutter Bar, fitted with Flanged Teeth, makes an absolutely first-class knife, which is unequalled. We drill each bar so that a flash-board can be bolted to its back, to prevent chips from falling on to the corrugated cakes.

Patent Eureka Flanged Teeth are best quality tool-steel and are finely tempered.

Grind the teeth only on the top side, leaving the bottom side straight.

Every tooth is independent, needing only two Test-Head Bolts to fasten it firmly. The bolts need only to be loosened to remove a tooth, or to set it forward.



When ordering a Planer, state whether your elevator is an Incline Elevator or an Elevator Conveyor, and the size cakes you cut.

If an Incline Elevator, please give measurements 1, 2 and 3, shown on diagram above. It is well also to state the pitch of your incline — the number of inches it rises in a horizontal foot.

If an Elevator Conveyor, we need measurements 1 and 2.



Pat. Open Top Tooth.



Pat. Wedge Tooth. C. & S. Square-Head Bolt.

These teeth were used on a former pattern of Knife Bar, and are illustrated to aid in ordering repairs.



Eureka Planer Brush.

No.	Description	Code Word	Each
No. 266.	Planer Brushes, 36 in., best quality wire	<i>Allison</i>	\$7.00
No. 267.	Planer Brushes, 46 in., best quality wire	<i>Allcock</i>	8.50
No. 268.	Planer Brushes, 56 in., best quality wire	<i>Allpath</i>	10.00

Eureka Planer Brushes made of best quality wire or fibre.

The reinforced backs extend a sufficient distance beyond the fibre to allow for attaching to the Planer. By their use the blocks of ice are swept clean before entering the house.



Perfection Field Planer, fitted with Eureka Cutter Bar and Patent Flanged Teeth.

Weight, with one knife, 320 lbs.

	Code Word	Price
No. 270. — Perfection Field Planers, with one 40-in. Patent Eureka Cutter-Bar and Pole and with Reversible Track Clearer	<i>Allet</i>	\$75.00
No. 271. — Perfection Field Planers, with one 40-in. Pat. Eureka Cutter-Bar and Pole, and with Stationary Clearing Wings, not Reversible	<i>Allude</i>	70.00
(Greaser and whiffletrees are not included)		
No. 274. — Extra 40-in. Patent Eureka Cutter-Bars, complete with Patent Eureka Flanged Teeth	<i>Alpaca</i>	25.00
No. 258. — Extra Patent Eureka Flanged Teeth (p. 95)	<i>Albata</i>	.60
No. 259. — Extra Tent-Head Bolts for Flanged Teeth	<i>Albino</i>	.05

The Perfection Field Planer, or Cultivator, has a great advantage over the Ordinary Field Planer, shown on page 97, in that no *grooving* by the marker is required before operating it. It is provided with independent runners which are raised by the operator at will, so that one will rest on the uncut surface, allowing the knife to cut to such depth as is desired, while the other runner is dropped to the level of the knife and rests on the planed portion, thus making a perfect joint with the previous cutting.

A pair of good horses will plane off, at a single trip, from two to three inches in depth, and the full width of 40 inches.

For cutting off drifted bunches of sap ice, the Perfection Planer is invaluable. The levers can be manipulated at will when in use, and the chip can be graded from nothing to the deepest cut.

The Reversible Track Clearer leaves a good path to travel in for the plow horse which follows in the planed part.

The Stationary Clearing Wings naturally leave a much narrower path.

PERFECTION STREET ICE LEVELER

Invaluable for Cities and Street Railways.

Used as the best and most economical method of cutting away ridges of ice between street railway car tracks and leveling streets.

Ask the Superintendent of your Highway Department to send for illustrated circular of our 875-pound Street Ice Leveler, fitted with our Patent Eureka Teeth.



Ordinary Field Planer.

Weight, with one knife and case, 120 lbs.

Patent Eureka 22-in.
Knife-Bar, complete.

Weight, boxed, 20 lbs.

	Code Word	Each
No. 279. — Ordinary Field Planers, 22 in. wide, with one Patent Eureka Knife-Bar, complete	<i>Alcove</i>	\$35.00
No. 279½. — Patent Eureka Knife-Bars, complete for 22-in. Ordinary Field Planer	<i>Alternate</i>	15.00
No. 282. — Patent Eureka Knife-Bars, complete, for 22-in. Old-Style Planer (*)	<i>Ambuscade</i>	15.00
No. 360. — Adjustable Depth-Gauges for Markers, with Bolts (see page 85)	<i>Amenity</i>	1.00
No. 258. — Eureka Flanged Planer Teeth (page 95)	<i>Albata</i>	.60
No. 259. — Tent-Head Bolts for Flanged Teeth	<i>Albino</i>	.05

The Ordinary Field Planer is made with a first-class Patent Eureka Knife-Bar having adjustable *teeth* of best tool-steel quality, finely tempered, which can be set forward as they wear, and it can be recommended to small harvesters who do not feel like making the investment for the Perfection Planer, shown on page 96.

Mark out the field of ice in parallel grooves, taking care to hold the Marker (or the Swing Guide Flow, as it may be) so that the grooves will surely be closer together than 22 inches, and then no binding can occur as would be the case were the grooves wider apart than 22 inches. Some use a guide an inch or more narrower when marking for a Planer.

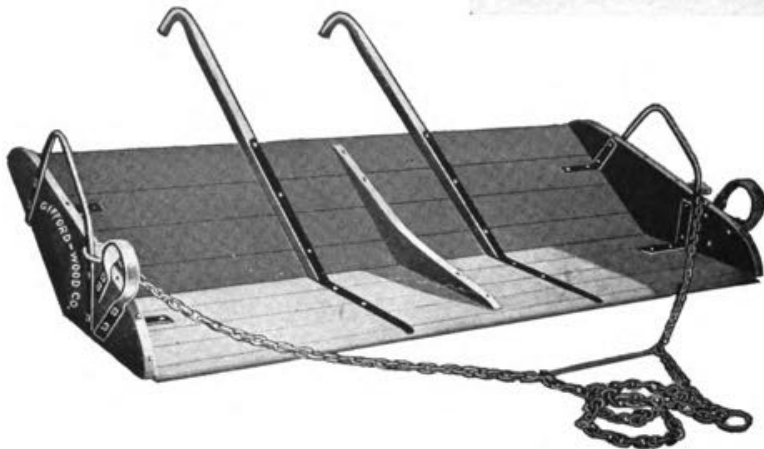
Set the *Adjustable Depth-Gauge* of the Marker (see page 106) so that the latter will groove the exact depth desired to plane off.

Set the *knife of the Planer* even with the bottom of the sides of the Planer. The knife will thus cut the Marker grooves completely, and make a perfect lap.

* If an extra Patent Eureka Knife-Bar is wanted for our No. 280 Old-Style Field Planer, be careful to order a "No. 282 Knife-Bar" (code word, *Ambuscade*), as a No. 279½ Knife-Bar for the new-pattern Ordinary Field Planer would be one-half inch too short for the old-style welded-frame Planer, here shown.



No. 280. Old-Style Field Planer.



Boston Snow Scraper.

Weight of 6-ft. scraper without chain, 215 lbs.

Weight of 8-ft. scraper without chain, 245 lbs.

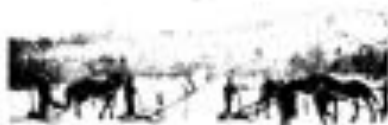
	Code Word	Each
No. 284. — Boston Scrapers (chains not included), 6 feet long . . .	<i>Ample</i>	\$15.00
No. 285. — Boston Scrapers (chains not included), 8 feet long . . .	<i>Amaze</i>	16.50
No. 288. — Chains, for 6-ft. Boston Scrapers, weight, 20 lbs. . . .	<i>Apartment</i>	2.00
No. 289. — Chains, for 8-ft. Boston Scrapers, weight, 23 lbs. . . .	<i>Aperture</i>	2.25

This style is the most effective and popular scraper in use. Many large ice companies who have had extended experience with expensive patented scrapers now use no other kind than the Boston for all depths of snow and planer chips.

Made in a most thorough manner with matched lumber, oak throughout, heavily ironed, and painted two coats.

The handles are long enough to prevent the operator from stooping.

Three-eighth-inch chains are preferred to ropes. The loose rings to which they are fastened slip along the draw irons in dumping and the draft helps to reverse the scraper. The scraper handles when inverted rest upon the iron cross-rod between the chains.



Clearing-off Scraper.

Weight of 8-ft. with shafts, 120 lbs.

	Code Word	Each
No. 222. — Clearing-off Scrapers, 6 feet long, with shafts	<i>Aport</i>	\$17.00
No. 234. — Clearing-off Scrapers, 8 feet long, with shafts	<i>Appear</i>	18.00
No. 258. — Shafts only, for Clearing-off Scrapers	<i>Append</i>	6.50

The Clearing-off Scraper is an old, standard type that will always have friends, as it is convenient for scraping light snows, plow chips, and for cleaning up after the scrapers employed in removing heavy snows.

These Scrapers should be used with shafts, as they are under better control and more easily kept in the right path.

The ends are strengthened with stiff angle irons and made in a thorough manner throughout.



Dairyman's "Ice King" Plow.

8-in. 5 Teeth, with Non-Adjustable Swing Guide and clearing tooth.

Weight, with case, 105 lbs.

	Code Word	Each
No. 315. — 8-in. "Ice Kings," 5 cutting teeth and clearing tooth, with 22-in. Swing Guide	<i>Apricot</i>	\$25.00
No. 316. — 10-in. "Ice Kings," 5 cutting teeth and clearing tooth, with 22-in. Swing Guide	<i>Apropos</i>	30.00
No. 317. — 12-in. "Ice Kings," 5 cutting teeth and clearing tooth, with 22-in. Swing Guide	<i>Apsis</i>	35.00
No. 318. — 8-in. "Ice Kings," without Guide	<i>Aqueduct</i>	20.00
No. 318½. — 10-in. "Ice Kings," without Guide	<i>Arbiter</i>	25.00
No. 319. — 12-in. "Ice Kings," without Guide	<i>Arbor</i>	30.00

Plows No. 318-319, without Guides, cannot be used for marking out, and are only for plowing down.

Dairyman's "Ice King" Plows, No. 315-322, are not intended for those who harvest ice as a business, being designed expressly for

Dairyman, Creameries, Butchers, Country Gentlemen and Farmers.

The "Ice King" is made after the plan of the higher priced and finer grade icemen's Plows, and was introduced by us some years ago in response to an urgent demand for an implement decidedly superior to various types of cheap Ice Plows on the market.

It is not expected that the "Ice King," at nearly one-half the cost, can equal the best quality tool-steel Plows for service, but we guarantee them superior to other Plows of similar grade.

The solid steel teeth are not polished as in the icemen's Plows, but are left blue. The Guide is substantially made and is stiff and strong, and the Plow has only to be kept properly sharpened to cut rapidly and well.

When grooves, made the day before, become partially frozen during the night and it becomes necessary to re-open them, the "Ice King" can be conveniently handled to do this difficult work.



Dairyman's "Ice King" Plow.

8-in. 5 Teeth, with Patent Adjustable Swing Guide and clearing tooth.

Weight, with case, 120 lbs.

	Code Word	Each
No. 320. — 8-in. "Ice Kings," 5 cutting teeth and clearing tooth, with 14 to 22-in. Patent Adjustable Swing Guide	<i>Arbutus</i>	\$28.00
No. 321. — 10-in. "Ice Kings," 5 cutting teeth and clearing tooth, with 14 to 22-in. Patent Adjustable Swing Guide	<i>Arch</i>	33.00
No. 322. — 12-in. "Ice Kings," 5 cutting teeth and clearing tooth, with Patent Adjustable Swing Guide (<i>made to order only</i>)	<i>Archery</i>	38.00

Our new Patent Adjustable Swing Guide for the Dairyman's "Ice King" is a perfect arrangement for those who need to cut more than one size of cakes.

The stock sizes are drilled to mark ice 14, 16, 18, 20 and 22 inches. Other sizes made to order.

For customers who always cut the same sized square cake, we recommend the Nos. 315, 316 and 317 styles, as non-adjustable guides are naturally firmer.

Swing Guides on plows must only be used when marking out the field of ice, and the plow must not run twice in the same groove with the guide on.

Mark out the field as described on page 85 and remove the Guide when plowing down.

We file the "Ice King" with a feed to cut 1½-inch at a draft for a light horse, but it can be filed in a few moments to feed more for a heavier horse.

A horse in four runs, at a pace of three miles an hour, would cut the equivalent of a groove 6 inches deep and 66 feet long in one minute, thus equaling the sawing capacity of fifty men in 12-inch ice for the same time.

The "Ice King" will, therefore, save its cost in a short time.

Every Plow is provided with a wooden case to protect the teeth.

Directions for Sharpening Plows on page 132.

MARKERS AND PLOWS OF HIGHEST GRADE

The teeth of our high-grade Markers and Plows are made from the best of tool steel, and are tempered for hard service. Their shape, width of cut—being graded for different depths (see page 149)—and their finish, all have a bearing on their ease of operation and the efficiency of their work.

Many details contribute to produce the standard machines of our make, which are so well known among ice-harvesters of all countries.



Patent Runner for Plows.



Showing Patent Runner.
Attached to Plow.

Patent Runners can be attached to old plows, and will cause them to groove to their full depth.

Our new plows have a combination high standard and runner, which, in connection with the extra large chip spaces cut in the beams, allows them to cut clear down without sticking and throwing over.



Showing Handle-Guard Attached to Handle.

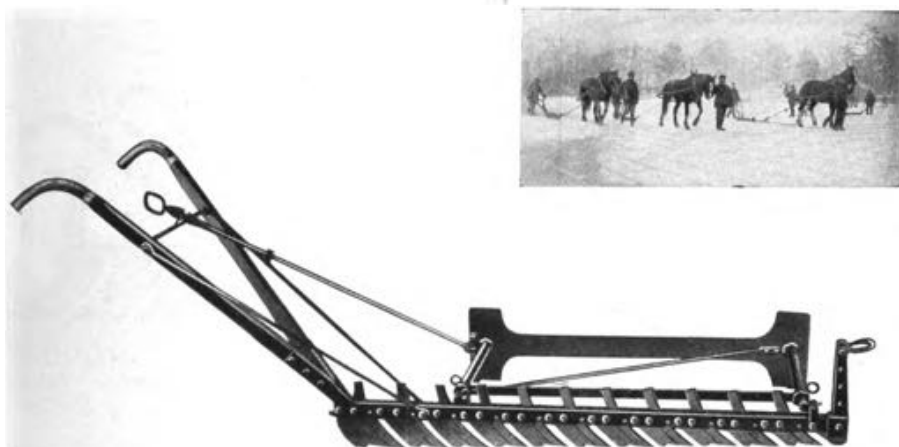
Handle-Guards put on the handles of Markers and Plows prevent wearing when implements are inverted. A substantial case is furnished with every Marker and Plow.



Ice Tool File.

Ice Tool Files are made of the very best steel, and are used for filing Plows, Markers, Hooks, Tonges, etc.

	Code Word	Each
No. 325. — Combination Filing Gauges, showing Standard Scale of Plow Points (see pages 149-152)	<i>Ardent</i>	\$0.25
<i>For use of Filing Gauge, see page 151.</i>		
No. 326. — Patent Runners for Plows, with set screws	<i>Arena</i>	1.00
No. 327. — Ice Tool Files—12-in. Made	<i>Argil</i>	2.50
No. 328. — Handle-Guards for Marker and Plow Handles	<i>Argus</i>	.25
No. 329. — Handles for Markers and Plows, complete with Handle- Guards	<i>Ariac</i>	1.50



Patent Perfection Marker, 11 cutting teeth, with 22 x 32 in. Patent Extension Guide.

	Code Word	Each
No. 330. — 3½-in. Patent Perfection Markers, 11 cutting teeth, with 22-in. Swing Guide	<i>Armolet</i>	\$70.00
No. 332. — 3½-in. Patent Perfection Markers, 11 cutting teeth, with 22 x 32-in. Patent Extension Guide	<i>Army</i>	73.00
*No. 334. — 22 x 32-in. Patent Extension Guide for Patent Perfection Markers, without Guide Connections	<i>Arrack</i>	10.50
No. 335. — 44-in. Guides for Patent Perfection Markers with Solid forged double-brace (not adjustable)	<i>Arrant</i>	10.00
No. 336. — Perfection Teeth, for markers	<i>Array</i>	2.00

Inserted-Tooth Ice Flows and Markers do not reduce in depth by wear when kept properly filed and set, and, as a bruised point can easily be sharpened and then be quickly set to its proper level, they have steadily grown in favor, being more economical for large harvesters, and more convenient in case of damage for smaller ice-gatherers.

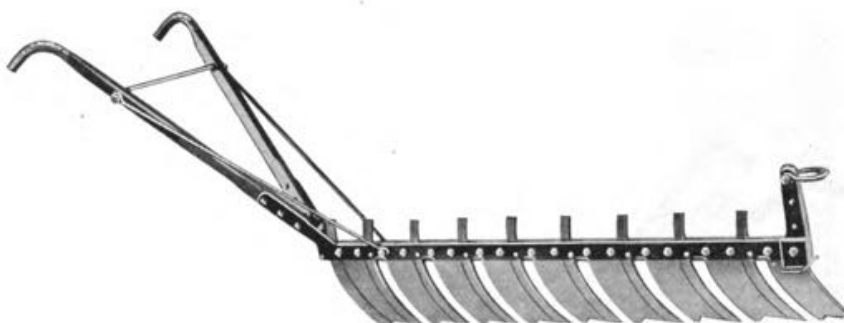
The inserted teeth used in our Perfection Flows and Markers are fitted so nicely (see page 104), and the fastening is so positive in its binding power, that the teeth are as firm as if they were solid. Duplicate teeth always on hand.

The New Patent Extension Guide is the strongest Guide when extended that has ever been put out. (See further description on page 110.)

In cutting 22 x 32-in. cakes, the Extension Guide is much more convenient than two guides, unless the latter are to be permanently attached to two separate Markers, in which case we recommend two solid guides.

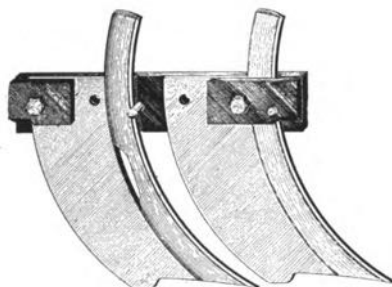
Each Marker has an Adjustable Depth Gauge by which any desired change in cutting depth can be instantly regulated.

*Patent Extension Guides for Solid-Tooth Markers and general remarks on the use of Markers on page 103.



6-in. Patent Perfection Plow, 8 Teeth, with Patent Hind Heel.

	Code Word	Each
No. 337. — 6-in. Patent Perfection Plows, 9 cutting teeth	<i>Arrogate</i>	\$58.00
No. 338. — 8-in. Patent Perfection Plows, 8 cutting teeth	<i>Aracael</i>	60.00
No. 339. — 10-in. Patent Perfection Plows, 6 cutting teeth	<i>Artful</i>	61.00
No. 340. — 12-in. Patent Perfection Plows, 5 cutting teeth	<i>Artichoke</i>	62.00
No. 341. — 8-in. Patent Perfection Plows, 8 teeth, with Patent Extension Guide, 22 x 32 in.	<i>Asphalt</i>	72.00
No. 344. — 10-in. Patent Perfection Plows, 6 teeth, with Patent Extension Guide, 22 x 32 in.	<i>Aspire</i>	73.00
No. 345. — 12-in. Patent Perfection Plows, 5 teeth, with Patent Extension Guide, 22 x 32 in.	<i>Assay</i>	74.00
No. 347. — Perfection Teeth, for 6-in. Plows	<i>Aster</i>	2.50
No. 348. — Perfection Teeth, for 8-in. Plows	<i>Astern</i>	2.75
No. 349. — Perfection Teeth, for 10-in. Plows	<i>Atlantic</i>	3.25
No. 350. — Perfection Teeth, for 12-in. Plows	<i>Atlas</i>	3.75

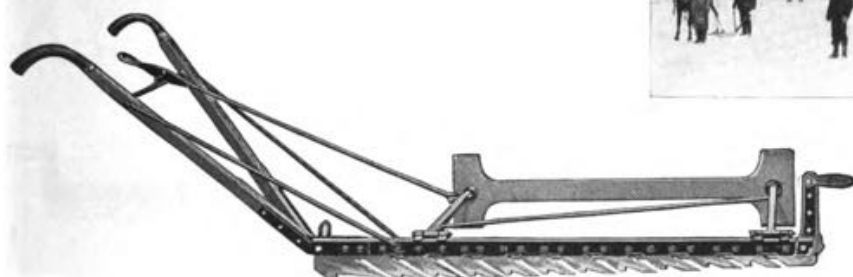


**Showing taper bolt holding
blade in position.**

The advantages of adjustable or inserted teeth in Plows and Markers are referred to on the preceding page, and their popularity for many years warrants the name "Perfection."

The Patent Hind Heel is a very important feature of these Plows, as the feed of the Plow can be instantly changed, without filing, by means of one taper bolt at the rear end of the beam.

The cut shows the adjustment. The main body of the tooth is rigidly bolted to the plow back. In front of this, joined by tongue and groove, is the adjustable cutting blade, firmly clamped in position by a taper bolt—the most simple and effective fastener yet placed on the market.



Marker with Swing Guide.

Weight, complete, with cast, 145 lbs.

	Code Word	Each
No. 355. — 4-in. Markers, 11 cutting teeth, with 22-in. Swing Guide, complete	Form	\$58.00
No. 356. — 4-in. Markers, 11 cutting teeth, with one 22-in. and one 32-in. Swing Guides	Feast	66.00
No. 359. — 4-in. Markers, 11 cutting teeth, with Patent Extension Swing Guide, 22 x 32 in.	Federal	61.00
No. 360. — Adjustable Depth Gauges for Markers, with Bolts (see page 97)	Amenity	1.00

Markers are used to mark out the field of ice into squares preparatory to grooving with the Plows.

* No. 362. — Swing Guides, any single width, 16-in. to 28-in. (not adjustable), without Guide Connections	Flag	\$7.50
* No. 363. — Swing Guides, any single width, 30-in. to 36-in. (not adjustable), without Guide Connections	Flame	8.00
* No. 364. — Swing Guides, any single width, 40-in. to 44-in., with solid forged double brace (not adjustable) no con.	Flap	10.00
* No. 365. — Patent Extension Swing Guides, 22 x 32 in., no con.	Fog	10.50
No. 366. — Patent Extension Swing Guides (see page 110), in other sizes than No. 365, extra above price of Nos. 362, 363 and 364, without Guide Connections	Forage	3.00

FIG. In ordering an Extension Guide separate from its Marker, be sure to state whether it is for Perfection style with inserted teeth, or for Solid-tooth Marker, as the attachment is entirely different.

Make a straight line, 4-inch deep, with a No. 408 Hand Plow (or a No. 500 Line Marker), using a straight edge, then run the Marker teeth in this line across the field, thus marking the first groove. The Marker Guide, placed in the groove thus cut, regulates the distance for the teeth to cut a second groove parallel to the first.

Every Marker of our make Depth-Gauge, by which to regulate changes in the condition of case it is desired to plane off use of the Field Planers shown

These Depth-Gauges can not now provided with



Depth-Gauge.

is provided with an Adjustable ulate the depths of the grooves the ice may require, and in a light surface of ice by the on pages 96, 97.

also be attached to old mark- them.

	Code Word	Each
No. 360. — Adjustable Depth-Gauges for Markers, with bolts	Amenity	\$1.00

*The prices given for Extra Guides do not embrace Guide Connections as the set attached to the Marker for its regular guide is sufficient for additional guides. Connections (No. 360) are ordered on page 100.



Groove Clearer, 10 Teeth.

Weight, with case, 113 lbs.

No. 369. — 5-in. Groove Clearers, 10 cutting teeth	Code Word <i>Fortress</i>	Each \$50.00
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When grooves become partly frozen during the night, so that ordinary Plows cannot be run in them, this Groove Clearer will successfully free them to its full depth, or to the depth set by the depth-gauge.



Plow, 6 in., 9 Teeth.

Weight, with case, 113 lbs.

No. 371. — 6-in. Plows, 9 cutting teeth	Code Word <i>Fossil</i>	Each \$48.00
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Plow, 7 in., 7 Teeth.

Weight, 6-in., with case, 100 lbs.; 7-in., 105 lbs.

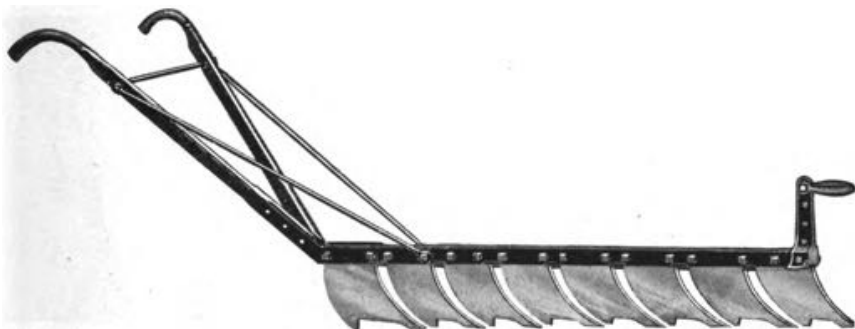
No. 372. — 6-in. Plows, 7 cutting teeth	Code Word <i>Gable</i>	Each \$42.00
No. 373. — 7-in. Plows, 7 cutting teeth	<i>Gallant</i>	44.00



Plow, 8 in., 8 Teeth.

Weight, with case, 113 lbs.

No. 374.—8-in. Plows, 8 cutting teeth	Code Word Gallop	Each \$50.00
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Plow, 8 in., 7 Teeth.

Weight, with case, 115 lbs.

No. 375.—8-in. Plows, 7 cutting teeth	Code Word Garden	Each \$48.00
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Plow, 9 in., 7 Teeth.

Weight, with case, 120 lbs.

No. 376.—9-in. Plows, 7 cutting teeth	Code Word Garland	Each \$51.00
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Plow, 10 in., 6 Teeth.

Weight, with case, 125 lbs.

No.	Code Word	Each
No. 377. — 10-in. Plows, 6 cutting teeth	Garrett	\$53.00



Plow, 12 in., 5 Teeth.

Weight, 12-in., with case, 131 lbs.; 14-in., 147 lbs.; 16-in., 160 lbs.

No.	Code Word	Each
No. 379. — 12-in. 5 cutting teeth	Garrett	\$58.00
No. 381. — 14-in. 5 cutting teeth	Gale	65.00
No. 382. — 16-in. 5 cutting teeth	Gen	70.00
No. 383. — 18-in. 5 cutting teeth	General	75.00

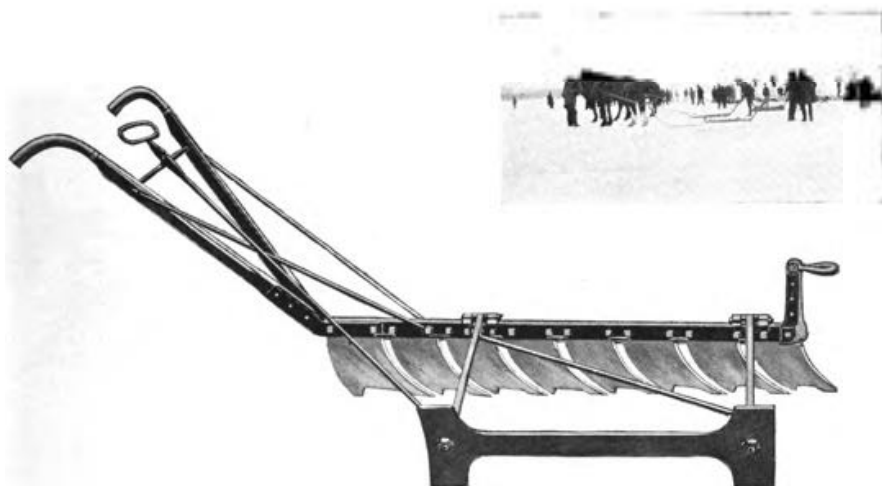
Plain Plows—plows without guides—are used to follow in the groove made by the marker, and are graded in cutting widths. (See page 149.)

A full set for large operations consists of a marker, 6-in., 8-in., 10-in., and 12-in. plows, engaging five horses at once. This list can be doubled or trebled, or increased in markers for very extensive and rapid work, or it can be reduced to any extent consistent with the needs of the harvester.

All our plows will cut easily to their full depth (see page 102). In ordering, select as shallow plows as will answer. They are stiffer, have more teeth, cut a wider groove and will cut faster than deeper plows.

Ice will break without difficulty if grooved to one-half its thickness; but it is much better for the harvester to groove at least two-thirds through if he is particular about having the cakes split true, without "lips." The head-lines, grooved for detaching floats, are usually made deeper than other grooves.

Note—Plow Ropes, Nos. 419-423, (page 111) should be 7 or 8 feet long.



Plow, 8 in., 7 Teeth, with Swing Guide.

	Code Word	Each
No. 385. — 6-in. Plows, 7 cutting teeth, with 22-in. Swing Guide (weight, with case, 135 lbs.)	Genus	\$50.50
No. 386. — 7-in. Plows, 7 cutting teeth, with 22-in. Swing Guide (weight, with case, 140 lbs.)	Ginger	52.50
No. 388. — 8-in. Plows, 7 cutting teeth, with 22-in. Swing Guide (weight, with case, 150 lbs.)	Glen	56.50
No. 388A. — 8-in. Plows, 8 cutting teeth, with 22-in. Swing Guide (weight, with case, 150 lbs.)	Glide	58.50
No. 389. — 9-in. Plows, 7 cutting teeth, with 22-in. Swing Guide (weight, with case, 155 lbs.)	Globe	59.50
No. 391. — 10-in. Plows, 6 cutting teeth, with 22-in. Swing Guide (weight, with case, 160 lbs.)	Goldfish	61.50
No. 393. — 12-in. Plows, 5 cutting teeth, with 22-in. Swing Guide (weight, with case, 170 lbs.)	Griddle	66.50

When two Guides for one Plow are wanted, in order that two-sized cakes may be cut, the prices for the additional Guides will be as follows:

	Code Word	Each
No. 396. — Swing Guides, any single width, 16-in. to 28-in., without Connections	Grill	\$7.50
No. 397. — Swing Guides, any single width, 30-in. to 36-in., without Connections	Griddle	8.00

It is not practicable to use Guides wider than 36 inches on Plows, as the plow-beam is much higher above the ice than a marker-beam.

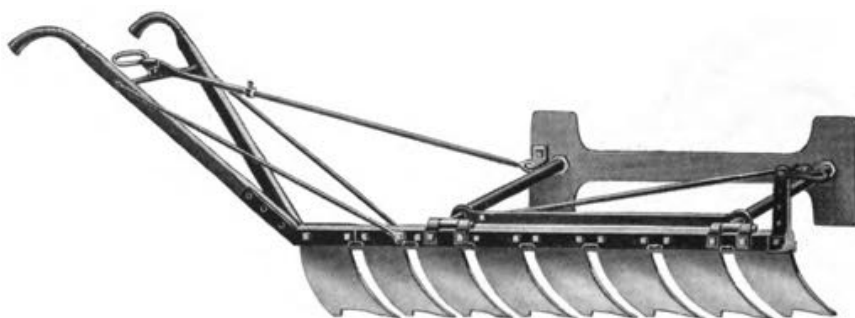
	Code Word	Per Set
No. 399. — Connections for Guides, including notched cross-bar	Gunner	\$2.00

Connections with cross-bar are only needed when it is required to attach a complete Swing Guide to a Plow which was made without a Guide and which has only a plain cross-bar between the handles. They consist of a notched cross-bar to go between the plow-handles in which to lock the guide-handle, four crotched hinges, four bolts for the hinges, and two bolts for attaching the Swing Guide to the hinges.

In ordering a Guide for a Plow, the correct depth of the Plow must be given.

A Plow with Swing Guide attached is a device for combining a Swing Guide Marker and Plow. For dealers who put up small quantities of ice, it is a convenient and less expensive arrangement.

Do not expect a Plow with Guide to equal the Marker in results. The marker cuts deeper at a draft, and, being shallow and more rigid, is capable of doing straighter work than a Plow with Guide. We recommend the use of the Marker and one or more Plows, and the full benefit of the gradation in cutting-width is then obtained. (See pages 108 and 149.)



Plow, 9 in., with Patent Extension Swing Guide.

	Code Word	Each
No. 400. — 6-in. Plows, 7 cutting teeth, with 22-in. x 32-in. Patent Extension Swing Guide	<i>Habit</i>	\$53.50
No. 400½. — 7-in. Plows, 7 cutting teeth, with 22-in. x 32-in. Patent Extension Swing Guide	<i>Hackman</i>	55.50
No. 401. — 8-in. Plows, 7 cutting teeth, with 22-in. x 32-in. Patent Extension Swing Guide	<i>Handicap</i>	59.50
No. 401½. — 9-in. Plows, 7 cutting teeth, with 22-in. x 32-in. Patent Extension Swing Guide	<i>Halter</i>	62.50
No. 402. — 10-in. Plows, 6 cutting teeth, with 22-in. x 32-in. Patent Extension Swing Guide	<i>Hammock</i>	64.50
No. 403. — 12-in. Plows, 5 cutting teeth, with 22-in. x 32-in. Patent Extension Swing Guide	<i>Harmony</i>	69.50
No. 404. — Patent Extension Guides, 22-in. x 32-in., without Connections	<i>Helot</i>	10.50

Patent Extension Guides other than 22 x 32 in. made to order.

In ordering a Guide for a Plow which is not sent to factory to be fitted, it is absolutely necessary that the correct depth of the plow be given.

	Code Word	Each
No. 405. — Cases for Plows, well ironed and painted, marker to 7 in.	<i>Help</i>	\$1.25
No. 405½. — Cases for plows, 8 in. to 12 in., inclusive	<i>Helpmate</i>	1.50

All new plows are provided with cases without extra charge.



Hand Plow, 6 in.
Weight, with case, 11 lbs.



	Code Word	Each
No. 408. — 5-in. Hand Plows	<i>Herald</i>	\$16.00
No. 409. — 6-in. Hand Plows	<i>Hercules</i>	16.50
No. 410. — 7-in. Hand Plows	<i>Heron</i>	17.50

Used principally where ice is housed in blocks containing two or more cakes, to groove between the cakes before splitting them apart with Double-Cake Bars when discharging. It is useful also in making the first line on the ice-field, and in finishing out the ends of the grooves made by the horse Plows. Six-inch is the usual size.

A painted case is strapped on every Plow to protect the teeth.

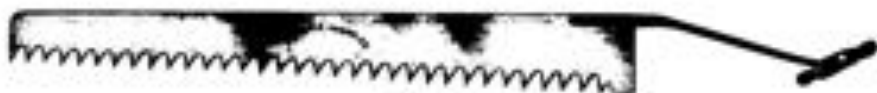
When sharpening, file the teeth to feed $\frac{1}{4}$ -inch each. (See page 152 for method.)



Plow Rope.

Length, 8 feet.

	Code Word	Each
No. 412. — Plow Ropes, thimble one end, Patent Hook other end	<i>Harper</i>	\$1.75
No. 413. — Plow Ropes, Patent Hooks both ends	<i>Harzen</i>	2.00



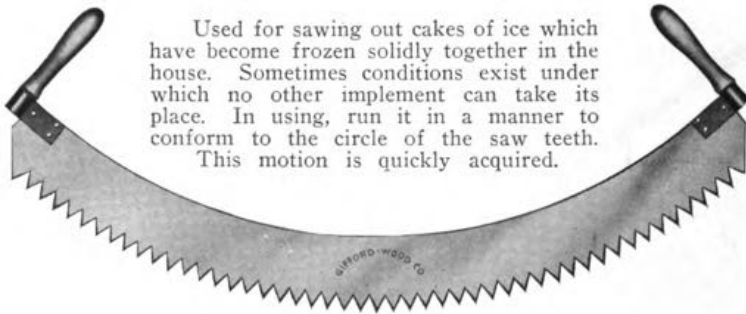
5-ft. Saw.

Weight, with case, 4 ft., 12 $\frac{1}{4}$ lbs.; 4 $\frac{1}{2}$ ft., 13 lbs.; 5 ft., 16 $\frac{1}{4}$ lbs.

	Code Word	Each
No. 420. — Ice Saws, 4 feet, with case	<i>Hockey</i>	\$5.00
No. 421. — Ice Saws, 4 $\frac{1}{2}$ feet, with case	<i>Holland</i>	5.25
No. 422. — Ice Saws, 5 feet, with case	<i>Hole</i>	5.50
No. 423. — Ice Saws, 5 $\frac{1}{2}$ feet, with case	<i>Hood</i>	5.75
No. 424. — Ice Saws, 4 feet, without case	<i>Hop</i>	4.50
No. 425. — Ice Saws, 4 $\frac{1}{2}$ feet, without case	<i>Horse</i>	4.75
No. 427. — Ice Saws, 5 feet, without case	<i>Host</i>	5.00
No. 428. — Ice Saws, 5 $\frac{1}{2}$ feet, without case	<i>Hostile</i>	5.25

"Gifford-Wood Co." Ice Saws are made in the most superior manner, and are not to be compared with the cheaper kinds usually sold. The teeth are extra long, and have a large level, causing them to cut rapidly. The wrought-iron handle is reversible.

GIFFORD-WOOD CO.



Used for sawing out cakes of ice which have become frozen solidly together in the house. Sometimes conditions exist under which no other implement can take its place. In using, run it in a manner to conform to the circle of the saw teeth. This motion is quickly acquired.

Crescent Ice Saw.

Weight, boxed for shipment, 30 lbs.; length, 6½ ft.; depth, 2 ft.; blade, 8 in. wide.

	Code Word	Each
No. 430. — Crescent Ice Saws	<i>Hack</i>	\$8.00



Pole Grapple.

Weight, 15 lbs.; drop, 8 in.; other sizes made to order.



Jack Grapple.

Weight, 29 lbs.; drop, 8 in.

	Code Word	Each
No. 433. — Pole Grapples, with handle	<i>Jacket</i>	\$4.25
No. 434. — Pole Grapples, without handle	<i>Jade</i>	3.75
No. 435. — Handle and Clevis for No. 433 Grapple	<i>Jet</i>	.75
No. 436. — Jack Grapples	<i>Jewel</i>	4.25

Used to draw cakes of ice up an incline by horse or steam power in the absence of Elevator Machinery. Both styles are made of steel. The Pole Grapple is sometimes rigged to return on an overhead wire. The Jack Grapple is preferred by many, being more rigid.



Towing Hook.

Weight, 12 lbs.; length, 2 ft. 10 in.; width, 4 in.

	Code Word	Each
No. 438. — Towing Hooks	<i>Jockey</i>	\$5.00

To fasten into a float of ice when placed on its top surface. Very much more useful than a style that has to reach over the edge.



Splitting Fork, Knob Handle.

Heavy size. Weight, 17½ lbs.; length, 4 ft. 9 in.; tines (outside), 14 in. long.

Light size. Weight, 15 lbs.; length, 4 ft. 6 in.; tines (outside), 12 in. long.

	Code Word	Each
No. 440. — Splitting Forks, Knob Handle, heavy	<i>Label</i>	\$4.25
No. 441. — Splitting Forks, Knob Handle, light	<i>Lace</i>	4.00



Splitting Fork, Ring Handle.

Heavy size. Weight, 18 lbs.; length, 4 ft. 10½ in.; tines (outside), 14 in. long.

Light size. Weight, 15½ lbs.; length, 4 ft. 7½ in.; tines (outside), 12 in. long.

	Code Word	Each
No. 443. — Splitting Forks, Ring Handle, heavy	<i>Ladder</i>	\$4.50
No. 444. — Splitting Forks, Ring Handle, light	<i>Lagoon</i>	4.25

Made with long steel tines, tapered so as to give great wedging power in the plow-grooves without "shelling" the ice. Their weight makes them particularly useful in breaking off floats or large sheets from the ice-field.

The heavy size is designed particularly for use on 14-inch ice, and upward, deeply grooved.

The light size has tines adapted to wedge in grooves plowed but 6 or 7 inches deep.



Splitting Bar, Lynn Type.

Weight, 18½ lbs.; length, 4 ft. 9 in.; tines, 18 in. long.

	Code Word	Each
No. 445. — Splitting Bar, Lynn Type, 3-in. wide	<i>Landon</i>	\$4.25

Made with a solid steel blade.

This is preferred by some to the Splitting Fork for barring off.

GF Red paint has been our prevailing color for years. Others imitate it, so always look for the "Gifford-Wood Co." stamp on all tools.



Fork Bar, Knob Handle, 4 Tined.

Weight, $2\frac{1}{4}$ lbs.; length, 4 ft. 6 in.; fork, 8 in. wide.

No. 448 — 4-Tined Fork Bars, Knob Handle	Code Word <i>Lappel</i>	Each \$4.25
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Fork Bar, Ring Handle, 4 Tined.

Weight, 26 lbs.; length, 4 ft. $1\frac{1}{4}$ in.; fork, 8 in. wide.

No. 449 — 4-Tined Fork Bars, Ring Handle	Code Word <i>Lappel</i>	Each \$4.50
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The 4-Tined Bar is principally used for splitting strips from floes when the ice is light. The tines have the right taper for 6-inch grooves and are not adapted for deep grooves.



Fork Bar, Knob Handle, 3 Tined.

Weight, $2\frac{1}{4}$ lbs.; length, 4 ft. 9 in.; fork, 6 in. wide.

No. 450 — 3-Tined Fork Bars, Knob Handle	Code Word <i>Lark</i>	Each \$4.00
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Fork Bar, Ring Handle, 3 Tined.

Weight, 17 lbs.; length, 4 ft. $10\frac{1}{2}$ in.; fork, 6 in. wide.

No. 451 — 3-Tined Fork Bars, Ring Handle	Code Word <i>Lark</i>	Each \$4.25
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The 3-Tined Bar is lighter, has a longer handle than the 4-Tined, and is better adapted for splitting off single cakes or short strips.

The No. 486 Three-Tined Needle Bar is considered by many a more effective implement.

All our Fork Bar heads are forged from one solid piece of steel and the points are beveled to a sharp edge.



Breaking Bar.

Weight, 15½ lbs.; length, 4 ft. 8 in.; pad, 2¼ in. x 2½ in.; chisel blade, 2½ in. wide.

Code Word Each
Lattice \$3.50

No. 454. — Breaking Bars

This is an early style of barring-off bar. The pad end is blunt, having no sharp edge, and is used for "breaking off" in a groove, but being tapering, is not suitable for calking. The chisel edge is convenient for splitting off single cakes.



Calking Bar, Hollow Handle.

Weight, 8 lbs.; length, 4 ft. 3 in.; blade, 1½ in. x 2½ in.

Code Word Each
Larson \$2.50

No. 457. — Calking Bars, hollow handle, 1 in. diameter

Long triangular blade, for deepest grooves, gas-pipe handle.

Used to calk the ends of the grooves on the field and on the floats before they are detached, with the chips made in grooving, in order to prevent the water from running in and freezing up the grooves.

It is very important that all ends of grooves be well calked, so that the splitting off can be well done without breaking the cakes.

Many harvesters are not particular enough about this, and have too small a supply of Calking Bars.



Calking Bar, Wood Handle.

Weight, 5 lbs.; length, 4 ft. 3 in.; blade, 1½ in. x 2½ in.

Code Word Each
Lar \$2.50

No. 457½. — Calking Bars, wood handle, 1½ in. diameter



Bar Chisel.

Weight, 12½ lbs.; length, 4 ft. 3 in.; blade, 1½ in. x 2½ in.

Code Word Each
Leaf \$3.50

No. 458. — Bar or Packing Chisels, steel handles

Made with a long blade and beveled on one side only. Used to cut around the cakes in getting ice out of the house, and for trimming off any unevenness of the blocks when storing ice in the house, also for spacing and straightening the seams.



Summer Bar, Curved Blade, Heavy.

Weight, 37 lbs.; length, 4 ft. 2 in.; blade, 20 x 1 1/4 in.

	Code Word	Each
No. 460. — Summer Bars, heavy curved blade, polished handle	<i>Lecture</i>	\$5.00
No. 460 1/2. — Summer Bars, heavy, straight blade, polished handle	<i>Ledger</i>	5.00
No. 461. — Summer Bars, heavy, curved blade, painted handle	<i>Legal</i>	4.50
No. 461 1/2. — Summer Bars, heavy, straight blade, painted handle	<i>Legend</i>	4.50

Summer Bars are used in some localities for the double purpose of cutting around and striking up ice in the house.

This heavy size is generally used, and, except on the Hudson River, the straight blade is preferred. Nos. 461 and 461 1/2 are lighter and narrower. All blades are of solid tool steel.



Summer Bar, Curved Blade, Light.

Weight, 26 lbs.; length, 4 ft. 2 in.; blade, 9 x 1 1/4 in.

	Code Word	Each
No. 461. — Summer Bars, light, curved blade, polished handle	<i>Leopard</i>	\$5.00
No. 461 1/2. — Summer Bars, light, straight blade, polished handle	<i>Lettuce</i>	5.00

This lighter style is sometimes preferred. Blades solid tool steel.



Starting Chisel.

Weight, 12 1/2 lbs.; length, 4 ft. 7 in.; blade, 10 x 1 1/2 in.

	Code Word	Each
No. 465. — Starting Chisels (Regular Pattern)	<i>Lexicon</i>	\$3.50

The Starting Chisel, or Striking-Under Bar, is made for the purpose of starting up the blocks of ice in the house after they have been cut around with the Bar Chisel or Summer Bar.

Made of steel throughout, with round handle. The regular pattern has a narrow blade with gradual, upward curve on under side.

This bar is a favorite one for "wetting down" a fall of snow, on account of its curve, although the blade is somewhat wider than the regular No. 482 Tapping Bar.



Starting Chisel, Omaha Pattern.

Weight, 12 1/2 lbs.; length, 4 ft. 7 in.; blade, 10 x 1 1/2 in.

	Code Word	Each
No. 466. — Starting Chisels (Omaha Pattern)	<i>Liberty</i>	\$3.50

Made with decided angle at the head, and with wider blade than regular pattern, perfectly straight on bottom side without upward curve.



Socket Bar Chisel.

Weight, 10 lbs.; length, 4 ft. 10 in.; blade, 12 x 1½ in.

Code Word	Each
Load	\$3.50

No. 468. — Socket Bar Chisels

Similar to a No. 458 Bar Chisel, but with a wooden handle, making it lighter in weight.

No. 469. — Floor Chisels

Lobby	\$3.50
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The Floor Chisel is a Socket Chisel bent at an angle in the shank. Its use has been largely superseded by the No. 470 Floor Shaver.



Patent Floor Shaver.

Weight, 4 lbs.; length, 4 ft. 10 in.; blade, 6 in. wide.

Code Word	Each
Locate	\$2.75

No. 470. — Patent Floor Shavers, 5 teeth

Floor Shavers are very useful in leveling a floor of ice in house or vessel, being bent for convenience in operating.

The toothed, wide edge cuts rapidly and easily, and the patented, rocking blade causes the "feed" to be accurate.



Floor Leveler.

Weight, 15 lbs.; cutting width, 9 in.; length of teeth, 12 in.

Code Word	Each
Lock	\$5.00

No. 469. — Floor Levelers

Our new and improved Floor Leveler is adapted to do rapid work where the ice requires a large amount of leveling to be done. Its weight and construction give it a facility for heavy work that is not equalled by any other tool. It is of particular advantage where ice is packed on edge.



Ice Adz.

Weight, 3 lbs.; width of blade, 6½ in.

No. 471. — Ice Adzes, with toothed edge, handled	Code Word <i>Locust</i>	Each \$4.00
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Ice Adzes are used for leveling ice-floors.



Splitting Chisel, Knob Handle.

Weight, 15½ lbs.; length, 4 ft. 6 in.; blade, 10½ x 3 in.

No. 474. — Splitting Chisels, Knob Handle, steeled blade	Code Word <i>Lodge</i>	Each \$2.25
No. 475. — Splitting Chisels, Knob Handle, all tool steel blade (marked "EXTRA")	<i>Loment</i>	2.50



Splitting Chisel, Ring Handle.

Weight, 14 lbs.; length, 4 ft. 6 in.; blade, 10½ x 3 in.

No. 476. — Splitting Chisels, Ring Handle, steeled blade	Code Word <i>Lotus</i>	Each \$2.50
No. 477. — Splitting Chisels, Ring Handle, all tool steel blade (marked "EXTRA")	<i>Loyal</i>	2.75

Used to split off single cakes either in the canal or on the platform. Handy for general use, with a blade of uniform taper on both sides.



Saw-Tooth Chisel, Ring Handle.

Weight, 14 lbs.; length, 4 ft. 6 in.; blade, 10½ x 3 in.

No. 480. — Saw-Tooth Chisels, Knob Handle, tool steel blade	Code Word <i>Luggage</i>	Each \$2.75
No. 481. — Saw-Tooth Chisels, Ring Handle, tool steel blade	<i>Lunar</i>	3.00

When grooves become frozen, or are of insufficient depth, this type of Splitting Chisel is very effective.



Tapping Bar, Ring Handle.

Weight, 15 lbs.; length, 4 ft. 5 in.; blade, 1 1/4 x 1 1/4 in.

Code Word	Each
Modcap	\$2.50

No. 482. — Tapping Bars, Ring Handle

Especially adapted for wetting down a field of ice after a snow fall, as it has a narrow cutting blade which penetrates the ice easily, leaving a small hole which freezes up quickly.



Canal Needle Bar, Ring Handle.

Weight, Canal size, 10 lbs.; Field size, 15 lbs., length, 4 ft. 1/4 in.

No. 484. — Canal Needle Bars, Ring Handle, 1 in. steel	Code Word	Each
No. 485. — Field Needle Bars, Ring Handle, 1 1/4 in. steel	Magic	\$2.00
	Magnate	2.25

The Canal Needle Bar is a light tool for splitting off cakes in the canal, and where the plow-grooving is well done it is effective.

It will also do most excellent service in sinking a field of ice, as it makes a very small hole.

The Field Needle Bar is made of 1 1/4 inch steel, and is heavy enough for barring off.



Needle Bar, Ring Handle, 2 Tined.

Weight, 15 lbs., length, 4 ft. 1/4 in.

No. 485. — Needle Bars, Ring Handle, 2-Tined	Code Word	Each
	Maid	\$3.50

When plow-grooves are partially frozen, the two oval tines break better than a single-tined bar.



Needle Bar, Ring Handle, 3 Tined.

Weight, 21 1/4 lbs.; length, 4 ft. 1/4 in.

No. 486. — Needle Bars, Ring Handle, 3-Tined	Code Word	Each
No. 487. — Needle Bars, Knob Handle, 3-Tined	Major	\$4.50
	Mallard	4.25

The three oval tines furnish much wedging pressure in the groove, and where the ice is not well plowed, or has become frozen up, it is very effective for separating strips or cakes.

This bar is one of the very best for use on the float or in the canal.



Canal Chisel, Knob Handle.

Weight, 12 lbs.; length, 6 ft.; blade, 10½ x 3 in.

	Code Word	Each
No. 490. — Canal Chisels, Knob Handle, tool steel blade, ½-in. handle	<i>Mallow</i>	\$2.75

The Canal Chisel is of the same type as No. 475 Splitting Chisel, but has a ½-inch steel handle 6 feet long used when the operator stands on a raised platform.



Canal Chisel, Wood Handle.

Weight, 1½ lbs.; length, 7 ft.; blade, 10½ x 3 in.

	Code Word	Each
No. 492. — Canal Chisels, Wood Handle, steeled blade	<i>Malt</i>	\$2.50

Much lighter than the steel handle style, and sometimes preferred when the ice is well grooved.



Canal-Hook Chisel.

Weight, 17½ lbs.; length, 7 ft.; blade, 10½ x 3 in.

	Code Word	Each
No. 494. — Canal-Hook Chisels, steeled blade	<i>Maltree</i>	\$3.00

The Hook Chisel is a Canal Chisel and Ice Hook combined, and has a wooden handle. Made heavy enough for splitting, the hook being secondary in importance.

Harvesters who employ but little help find this combination tool very useful.



Separating Chisel, Knob Handle.

Weight, 11 lbs.; length, 4 ft. 6 in.; blade, 16 x 1½ in.

	Code Word	Each
No. 495. — Separating Chisels, Knob Handle, tool steel blade	<i>Manatee</i>	\$2.75
No. 496. — Separating Chisels, Ring Handle, tool steel blade	<i>Mango</i>	3.00

This Chisel has a long, thin blade, and is for separating cakes of ice in the house when packed on edge.

Some ice factories prefer it to the No. 475 or No. 477 Splitting Chisels on account of its thinner blade.



Double-Cake Bar.

Weight, 12 lbs.; length, 4 ft.; pad, 4½ in. wide.

No. 499. — Double-Cake Bars	Code Word Metal	Each \$2.50
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This bar is made with a steel pad with *blunt edge*.

It is used in summer for sub-dividing large blocks containing two or four cakes which have been grooved in the house by the Hand Plow.

Where rapid loading is necessary, a man uses a bar in each hand.



Line Marker.

Weight, 4 lbs.; length, 4 ft. 8 in.

No. 500. — Line Markers	Code Word Metal	Each \$0.90
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This implement is a simple affair by which a first line one-half inch deep can be made on the ice field, using a straight board as a guide. The marker teeth are run in this shallow mark, thus making the first groove in marking out a field of ice. For those who have no Hand Plow, it serves as a substitute for this purpose.



Elevator Fork.

Length, 4 ft. 7 in.; tines, 6 in. long.

No. 502. — Elevator Forks	Code Word Mildew	Each \$1.50
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This article is deemed better than an Ice Hook for feeding ice to the elevator, as two pushing points give better control of the cake. The hook affords a means of holding back the ice, if necessary.

Handle 6 feet long. Longer handles made to order.



Scoop Net.

Weight, 7 lbs.; handle, 2 ft.; hoop, 2½ in. diam.

No. 505. — Scoop Nets	Code Word Mildew	Each \$3.00
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These are made as light as possible by the use of steel chain.

Used to remove from the water small pieces of ice which obstruct the channel.

It does not freeze and close up the openings, as it is reversed each time it is emptied.



Sieve Shovel.

Weight, 7 lbs.; size of Shovel, 17 x 14 in.

No. 506. — Sieve Shovels, 40-inch handle	Code Word <i>Minor</i>	Each \$1.75
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This wire shovel is very useful in clearing the canal of chips and pieces of ice.



Perforated Ice Scoops.

Weight, 6 lbs.; size of Scoop, 17 in. long by 14 in. wide.

No. 507. — Perforated Ice Scoops, 40-inch handle	Code Word <i>Minor</i>	Each \$1.50
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Although not as quick a strainer as the No. 506 Sieve Shovel, this Scoop will stand harder usage.



Ice Auger.

Weight, 6 lbs.; length, 3 ft. 6 in.

No. 510. — Ice Augers, 18 in.	Code Word <i>Monitor</i>	Each \$3.50
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Used in making holes through which to measure the ice; also to insert pins for stretching lines, towing floats, and for other purposes.



Measuring Rod.

No. 512. — Measuring Rods, polished, numbered to 24 inches	Code Word <i>Monogram</i>	Each \$0.50
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This iron measure catches on the bottom side of the hole made by the Ice Auger and the thickness of the ice is at once shown. Marked off by 1-inch notches.



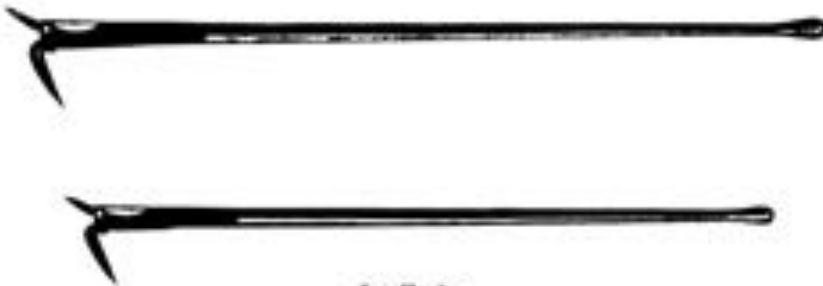
Ice Tool Grapple.

Weight, 1 lbs.; length of springs, 4 ft.

No. 515. — Ice Tools Grapples, without handle	Code Word <i>Morzel</i>	Each \$1.00
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An effective implement for recovering tools which have been dropped into the water. The springs are stiff and will grasp a chisel or any heavy article firmly.

If handles are to be furnished, state length, when ordering. Price of handles extra.



Ice Hooks.

Weight of 4½ ft. Ice Hooks, per dozen, 37 lbs.

Add about 6 lbs. per ft. to get weight per dozen of longer sizes.

Ice Hooks are manufactured of the best stock, and are heavily steeled, making them very stiff and strong.

The Puller or the Pusher can be bent cold to any angle desired.

					Code Word	Per Doz.
No. 520.— Ice Hooks,	3 feet, Boston Pattern	-	-	-	Narrate	\$9.00
	3½ feet, Boston Pattern	-	-	-	Narrow	9.00
	4 feet, Boston Pattern	-	-	-	Native	9.25
	4½ feet, Boston Pattern	-	-	-	Nature	9.50
	5 feet, Boston Pattern	-	-	-	Navigate	10.00
	6 feet, Boston Pattern	-	-	-	Nebula	10.50
	7 feet, Boston Pattern	-	-	-	Neck	11.00
	8 feet, Boston Pattern	-	-	-	Necktie	12.00
	10 feet, Boston Pattern	-	-	-	Nectar	14.00
	12 feet, Boston Pattern	-	-	-	Need	16.00
	14 feet, Boston Pattern	-	-	-	Needle	18.00
	16 feet, Boston Pattern	-	-	-	Needlework	20.00
	18 feet, Boston Pattern	-	-	-	Negation	22.00
No. 520½.— Ice Hooks,	3 feet, New York Pattern	-	-	-	Neglect	9.00
	3½ feet, New York Pattern	-	-	-	Neighbor	9.00
	4 feet, New York Pattern	-	-	-	Nephew	9.25
	4½ feet, New York Pattern	-	-	-	Nettle	9.50
	5 feet, New York Pattern	-	-	-	Nibble	10.00
	6 feet, New York Pattern	-	-	-	Noonday	10.50
	7 feet, New York Pattern	-	-	-	Noise	11.00

Boston Patterns have wide Points—1-inch face—and are most generally used.

New York Pattern have narrow points. (See illustrations on page 125.)

4½-foot Hooks are most commonly employed for use on the runs, in the houses, or in loading wagons, although in some localities 3-foot Hooks are preferred.

3 and 3½-foot Hooks are used for packing ice in contracted quarters.

Canal Hooks, 6 to 8 feet long, are for feeding strips or cakes through the canal.

Floating Hooks, 10 to 18 feet long, are used for floating the large sheets of ice from the field to the canal.

When no length is mentioned by customers ordering Ice Hooks for home use 4½ ft. will be sent unless customer's previous orders are remembered to have been for a different length.

GIFFORD-WOOD CO.



Switching Hook.

Weight per dozen, 36 lbs.

	Code Word	Per Doz.
No. 521. — Switching Hooks, 3 ft. 8 in., D handle	Oakum	\$10.50

This is for use when the Switchman is on the house side of the run. The Switchman can stand or sit, and the relative position of Puller and Pusher requires only a quarter turn of the hand to change from one movement to the other.



Car Ice Hook.

Weight of 4-ft. Car Hooks per dozen, 45 lbs.

	Code Word	Per Doz.
No. 521½. — Car Hooks, 3½ feet	Oar	\$12.00
No. 522. — Car Hooks, 4 feet	Oarman	12.00
No. 523. — Car Hooks, 4½ feet	Oatmeal	12.25

Made the same as regular Ice Hooks, excepting that the Pusher strap-iron extends 18 inches down the handle, to strengthen and protect the wood for car or boat use.



Icing Hook.

Weight of 3-ft. Icing Hooks, wood handles, per dozen, 45 lbs.

Weight of 3-ft. Icing Hooks, pipe handles, per dozen, 225 lbs.

	Code Word	Per Doz.
No. 524½. — Icing Hooks, wood handles, 5 feet over all	Ober	\$21.00
No. 524. — Icing Hooks, wood handles, 5½ feet over all	Obey	21.00
No. 524C. — Icing Hooks, pipe handles, 5 feet over all	Oblong	23.00
No. 524D. — Icing Hooks, pipe handles, 5½ feet over all	Obolar	23.00

These have a square steel splitting-iron or breaker, 6 inches long, in place of a pusher iron. The wood handle is inserted its full size into the socket part of the heavy, solid breaker and hook.

The pipe handles are preferred by many.

Both styles are for breaking up ice cakes when icing cars.



Cant Ice Hook.

Weight of unattached Cant Hooks, per dozen, 10 lbs.

	Code Word	Per Doz.
No. 525. — Cant Ice Hooks, 4-foot handles	Obolar	\$10.00
No. 526. — Cant Ice Hooks, 4½-foot handles	Octagon	10.25
No. 527. — Cant Ice Hooks, unattached	Octave	6.00

The Cant Ice Hook is used to "edge up" ice when packing into houses or barges, and is in favor with some Western packers.

Four-foot handles and right-handed hooks (like engraving) will be sent in the absence of special directions.



Inside View.



Outside View.

Boston Pattern Puller, Wide Point.

Weight, per dozen, 21 lbs.



Inside View.



Outside View.

New York Pattern Puller, Narrow Point.

Weight, per dozen, 20½ lbs.

**Boston Pattern Pusher.**

Weight, per dozen, 5 lbs.

**New York Pattern Pusher.**

Weight, per dozen, 5 lbs.

**Ring.**For 1¼ in. handle and iron.
Weight, 5 to 6 lb.**Rivets, Countersunk Head.**

1½ in. x No. 5 wire; weight, 22 to 24 lb.

**Rivets, Truss Head.**

1½ in. x No. 5 wire; weight, 22 to 24 lb.

	Code Word	Per Doz.
No. 530. — Pullers, for Ice Hooks, Boston Pattern, 1-in. point . . .	<i>Odeon</i>	\$4.50
No. 531. — Pullers, for Ice Hooks, New York Pattern, ¾-in. point . .	<i>Opine</i>	4.50
No. 532. — Pushers (or Shovers), for Ice Hooks, Boston Pattern . .	<i>Orange</i>	2.75
No. 533. — Pushers (or Shovers), for Ice Hooks, New York Pattern . .	<i>Orator</i>	2.75
No. 533½. — Pushers (or Shovers), for Car Ice Hooks, Boston Pattern . .	<i>Oratorio</i>	5.25
No. 534. — Rings, for Ice Hooks	<i>Orbit</i>	.35
No. 535. — Rivets, for Ice Hooks, countersunk head (for both irons)	<i>Oread</i>	.03
No. 537. — Rivets, for Ice Hooks, truss head (for tail of puller) . .	<i>Ornate</i>	.03
No. 538. — Handles, for Ice Hooks	<i>Oval</i>	

Ice Hook Handles are made of best selected second growth ash — and are as fine as can be bought. Send for prices.

No ice tool is put to a more severe test by ice dealers than the Ice Hook. Ours will stand reasonable abuse on the run by the inexperienced, and will meet the most critical exactions of the "old hand," who wants perfect temper and proper shape.



Boston Tongs.

Solid Handle.

Red. Points, $\frac{3}{4}$ in. wide.



Boston Tongs.

Extra Hollow Handle.

Black. Points, $\frac{3}{4}$ in. wide.



Boston Tongs.

Wood Handle.

Black. Points, $\frac{3}{4}$ in. wide.

		Code Word	Per Doz.
No. 540.—	Boston Tongs, solid swell handle, 13 in., 34 lbs. doz.	<i>Pack</i>	\$13.00
	Boston Tongs, solid swell handle, 14½ in., 39 lbs. doz.	<i>Padrone</i>	13.50
	Boston Tongs, solid swell handle, 16½ in., 46 lbs. doz.	<i>Paginal</i>	14.00
	Boston Tongs, solid swell handle, 20 in., 54 lbs. doz.	<i>Paglot</i>	15.00
	Boston Tongs, solid swell handle, 24 in., 62 lbs. doz.	<i>Pagoda</i>	16.00
	Boston Tongs, solid swell handle, 26 in., 68 lbs. doz.	<i>Pallet</i>	17.00
No. 542.—	Boston Extra Tongs, Hollow Handle, 13 in., 32 lbs. doz.	<i>Pancake</i>	17.50
	Boston Extra Tongs, Hollow Handle, 14½ in., 37 lbs. doz.	<i>Panic</i>	18.00
	Boston Extra Tongs, Hollow Handle, 16½ in., 44 lbs. doz.	<i>Panfile</i>	18.50
	Boston Extra Tongs, Hollow Handle, 24 in., 60 lbs. doz.	<i>Parade</i>	20.50
No. 542½.—	Boston Special Tongs, Hollow Handle, 15 in., unpainted	<i>Paradox</i>	18.00
No. 543.—	Boston Tongs, Wood Handle, 13 in., 30 lbs. doz.	<i>Paragon</i>	21.50
	Boston Tongs, Wood Handle, 14½ in., 35 lbs. doz.	<i>Parapet</i>	22.00
	Boston Tongs, Wood Handle, 16½ in., 40 lbs. doz.	<i>Pariel</i>	22.50

Delivery Tongs are the very best models which experience can produce, and their quality cannot be excelled. The points, which are of finest tool steel, are all filed by hand and carefully tempered to hold sharp edges and for long service.

The span is measured when they are open as wide as possible, no allowance being made for the hands.

Boston Tongs, regular grade (painted red), have solid, drop-forged, steel swell handles and bows, and best tool steel points. Boston Tongs have wide, thin points.

Boston Extra Tongs, Hollow Handles, (painted black), have gas-pipe handles $\frac{1}{4}$ -in. diameter. They are very popular and are rapidly taking the place of the regular solid handle tongs, being stiffer and much more comfortable for the hand. Best tool steel is used in the bows and points entire.

Boston Special Tongs have hollow handles of a little larger opening than the Extra, they are always furnished unpainted, and are the exact style used on delivery wagons in Boston and vicinity.

The Extra and Special grades are positively the stiffest kind of tongs that can be made, and are recommended by us very decidedly to all who want absolutely first-class tongs for severe use.

Wood Handle Tongs are made of best quality tool steel.

The Boston Pattern of hand tongs, made in "Solid Handle" and "Hollow Handle" styles, is far more universally used than any other shape. It catches the ice low on the sides, and, having short shanks, raises the cake clear from the ground, bringing the weight close to the hand. On this account the shape is gradually superseding other patterns.



New York Tongs.

Solid Handle.

Red. Narrow Points.



Manhattan Tongs.

Hollow Handle.

Red. Wide Points.



Philadelphia Tongs.

Solid Handle.

Black. Narrow Points.

	Code Wood.	Per Doz.
No. 545. — New York Tongs, solid swell handle, 14½ in., 36 lbs. doz.	<i>Pardon</i>	\$13.00
New York Tongs, solid swell handle, 17 in., 40 lbs. doz.	<i>Parrot</i>	13.50
New York Tongs, solid swell handle, 20 in., 45 lbs. doz.	<i>Parrot</i>	14.00
New York Tongs, solid swell handle, 24 in., 52 lbs. doz.	<i>Parrot</i>	16.00
No. 546. — Manhattan Tongs, hollow handle, 14½ in., 35 lbs. doz.	<i>Parrot</i>	15.00
Manhattan Tongs, hollow handle, 17 in., 39 lbs. doz.	<i>Paste</i>	15.50
Manhattan Tongs, hollow handle, 20 in., 44 lbs. doz.	<i>Paste</i>	16.00
Manhattan Tongs, hollow handle, 24 in., 50 lbs. doz.	<i>Pasture</i>	18.00
No. 547. — Philadelphia Tongs, small size, 14 in., 33 lbs. doz.	<i>Pasture</i>	15.00
Philadelphia Tongs, medium size, 17 in., 37 lbs. doz.	<i>Patent</i>	16.00
Philadelphia Tongs, large size, 23 in., 54 lbs. doz.	<i>Peckway</i>	18.00

New York Tongs have solid swell handles, steel bows, and narrow tool steel points.

Hollow Handle Manhattan Tongs have the Boston Hollow Handles with short shanks, a modified pattern of bows, and wide points.

New York Tongs, when open, do not drop as low on the cake as the Boston.

Philadelphia Tongs have solid swell handles, and best tool steel bows and points entire.



New London Tongs.

Hollow Handle.

Black. Thin Points.



Providence Tongs.

T Handle.

Black. Thin Points.



Car Tongs.

Hollow Handle.

Black. Points 5/8 in. wide.



Milwaukee Tongs.

Hollow Handle.

Thin Points.

	Code Wood	Per Doz.
No. 548. — New London Hollow Handle, 13 in., 32 lbs. doz.	<i>Patron</i>	\$17.50
New London Hollow Handle, 14½ in., 36 lbs. doz.	<i>Pauper</i>	18.00
New London Hollow Handle, 16 in., 40 lbs. doz.	<i>Peach</i>	18.50
No. 549. — Providence Tongs, T Handle, made to order.		
No. 549½. — Milwaukee Tongs, hollow handle, 12 in., black, 48 lbs. doz.	<i>Pearl</i>	15.00
No. 544. — Car or Corner Tongs, hollow handle, 10 in.	<i>Pebble</i>	17.50
Car or Corner Tongs, hollow handle, 12 in.	<i>Pecan</i>	18.00

New London Tongs, made of best tool steel, combine Boston Hollow Handles with Cincinnati shaped bows, having points without heels.

Providence Tongs have T Handles, either of wood or brass as desired.

Car, or Corner, Tongs are used in "carrying ice" by men who grasp each cake at opposite corners, and are stoutly made of best tool steel throughout.

Milwaukee Tongs are very popular in the city from which their name is derived.



Cincinnati Chain Tongs.

Black. Thin Points.



Kansas City Chain Tongs.

Black. Thin Points.



Patent Link Tongs.

Black. Thin Points.

		Code Word.	Per Doz.
No. 550. — Cincinnati Chain Tongs, 10 in., 20 lbs. doz.		<i>Penal</i>	\$11.00
		<i>Pendant</i>	11.50
		<i>Peunton</i>	12.00
No. 550d. — Kansas City Chain Tongs, 10 in., 27 lbs. doz.		<i>Peunback</i>	11.00
		<i>Perck</i>	11.50
		<i>Peril</i>	12.00
No. 551. — Patent Link Tongs, 10 in., 27 lbs. doz.		<i>Perish</i>	11.00
		<i>Permit</i>	11.50
		<i>Perton</i>	12.00

Some users of Chain Tongs like a pipe handle in place of the  open-top style. We furnish these, when ordered, at the same prices.

The Kansas City style is heavier than the Cincinnati pattern, and is more generally used by the ice handlers who like "chain hooks."

Patent Link Tongs are rapidly growing in favor where they are known.



Buffalo Tongs.

Chisel-shaped Points.

Weight, 2 1/4 lbs.



Eastern Edging-up Tongs.

Red. Narrow Points.

Weight, 4 lbs.



Utah Edging-up Tongs.

Red. Narrow Points.

Weight, 4 lbs.

		Code Word	Per Doz.
No. 555. — Buffalo Tongs, 12 in., weight, 28 lbs. doz., black		<i>Perkin</i>	\$13.00
No. 555d. — Buffalo Tongs, 14 in., weight, 32 lbs. doz., black		<i>Perker</i>	13.50
No. 556. — Buffalo Tongs, 12 in., weight, 28 lbs. doz., polished		<i>Picador</i>	18.00
No. 556d. — Buffalo Tongs, 14 in., weight, 32 lbs. doz., polished		<i>Pickaxe</i>	18.50
If wanted with Boston swell handles, add per doz.		<i>Picnic</i>	2.00
No. 561. — Eastern Edging-up Tongs, solid handles, 26 in.		<i>Picure</i>	16.00
No. 561d. — Eastern Edging-up Tongs, hollow handles, 26 in.		<i>Picplant</i>	18.00
No. 562. — Utah Edging-up Tongs, solid handles, 29 in.		<i>Pilgrim</i>	16.00
No. 563. — Utah Edging-up Tongs, hollow handles, 29 in.		<i>Pillar</i>	18.00

Buffalo Tongs have a special, small and narrow, solid handle without swell, adapted to being grasped with the fingers underneath the ring instead of in it.

Edging-up Tongs are used by packers who edge up their ice when stowing.

The Utah pattern catches the cake on the side and top, and is considered a more handy style by some.



Market Tongs.
Single Point.

Red. Points, $\frac{3}{4}$ in. wide.
Weight, $2\frac{1}{4}$ lbs.



Drag or
Stowing Tongs.

Red. Points, $\frac{3}{4}$ in. wide.
Weight, 3 lbs.



Market Tongs.
Double Point.

Red. Broad Points.
Weight, 5 lbs.

	Code Word	Each
No. 578. — Market Tongs, Single Point, 24-inch span	<i>Pillow</i>	\$3.00
No. 579. — Market Tongs, Double Point, 24-inch span	<i>Pimento</i>	3.75

Market Tongs are preferred where the heavier Hoisting Tongs are not required.

	Code Word	Per Doz.
No. 565. — Drag Tongs, solid handles	<i>Pinnacle</i>	\$21.00
No. 564. — Drag Tongs, extra heavy, solid handles	<i>Pippin</i>	22.00

Drag or Stowing Tongs are much used for moving ice in the houses in the summer. The regular pattern has handles which measure 12-inch between rivet and under side of ring.

The stock in the handles of these tongs is of a large size and gives an easy grip.



Lowering Tongs. Single Point.

Red. Points, $\frac{3}{4}$ in. wide. Weight, $1\frac{1}{4}$ lbs.



Lowering Tongs. Double Point.

Red. Broad Points. Weight, 7 lbs.

	Code Word	Each
No. 570. — Lowering Tongs, Single Point, 24-inch span	<i>Pitcher</i>	\$2.00
No. 571. — Lowering Tongs, Single Point, 17-inch span	<i>Placard</i>	2.00
No. 572. — Lowering Tongs, Single Point, 14-inch span	<i>Placid</i>	2.00
No. 574. — Lowering Tongs, Double Point, 24-inch span	<i>Planet</i>	2.75
No. 575. — Lowering Tongs, Double Point, 17-inch span	<i>Plank</i>	2.75
No. 576. — Lowering Tongs, Double Point, 14-inch span	<i>Plaster</i>	2.75

Lowering Tongs are designed for work where only a small space overhead exists.

They will hold firmly if the proper size is selected, and are light to handle.

Use the smallest span you can. The more open the arms, the tighter the grip.

For 11-inch can ice, use the 14-inch size; for 14-inch, the 17-inch size.



Boston Hoisting Tongs.
Adjustable Claw.
Weight, 21½ lbs.



Boston Hoisting Tongs.
Solid Claw.
Weight, 24 lbs.

No. 584 — Adjustable Claw Hoisting Tongs, 30-inch	Code Word	Each
No. 586 — Boston Hoisting Tongs, Solid Claw, 30-inch	<i>Playful</i>	\$5.00
	<i>Plenty</i>	5.00



New York Hoisting Tongs. Solid Claw.
Weight, 21½ lbs.



Plate Ice Tongs.
Weight, 27 lbs.

No. 585 — New York Hoisting Tongs, Solid Claw, 30-inch	Code Word	Each
No. 588 — Plate Ice Tongs, very heavy, 11-inch span	<i>Pleasant</i>	\$5.00
	<i>Pled</i>	15.00

Our Adjustable Claws are forged from steel, and are of skeleton shape, giving a sure grip on uneven surfaces.



House Ice Ax.

Medium: Weight complete, 6½ lbs.; handle, 38 in.; blade, 6 in. wide.

Heavy: Weight complete, 7 lbs.; handle, 40 in.; blade, 6½ in. wide.

Axes are heavily steeled, finely tempered, and are true to their respective patterns.

Our styles are in sufficient variety to cover the demands of most users, but where still different ones are wanted, we are pleased to make them to pattern.

Length of blade is measured from inside of handle to edge of blade.

	Code Word	Per Doz.
No. 604.—House Ice Axes, medium size	<i>Polar</i>	\$35.00
No. 605.—House Ice Axes, heavy size	<i>Police</i>	35.00

The House Ice Ax is used for cutting around cakes in the house instead of No. 458 Bar Chisel or No. 460 Summer Bar, and is particularly adapted to this work where the ice is packed on edge.



Boston Ice Ax.

Weight complete, 4 lbs.; handle, 38 in.; blade,
8 x 2½ in., square edge.



Chicago Ice Ax.

Weight complete, 4 lbs.; handle, 38 in.; blade
8 x 2½ in., round edge.

	Code Word	Per Doz.
No. 604.—Boston Ice Axes, 8 x 1½-inch blade	<i>Police</i>	\$30.00
No. 605.—Chicago Ice Axes, 8 x 2½-inch blade	<i>Poplin</i>	20.00
No. 605½.—Chicago Ice Axes, 8 x 2½-inch blade, "wide-blade Chicago"	<i>Porter</i>	20.00
No. 606.—St. Paul Ice Axes, 8½ x 2½-inch blade, style of No. 605	<i>Parsons</i>	20.00



New York Medium Ice Ax, 3-in.

Weight complete, 4½ lbs.; handle, 28 in.;
blade, 7¼ x 3 in., square edge.



New York Heavy Ice Ax, 3½ in.

Weight complete, 5 lbs.; handle, 30 in.;
blade, 7½ x 3½ in., square edge.

	Code Word	Per Doz.
No. 607. — New York Medium Ice Axes, 7½ x 3-in. blade . . .	<i>Putage</i>	\$20.00
No. 608. — New York Heavy Ice Axes, 7½ x 3½-in. blade . . .	<i>Powder</i>	21.00

The New York Ax has a very wide bit, which, together with the extreme weight causes, in the opinion of many, a straight cut.



Philadelphia Square Head Ice Ax.

Weight complete, 4½ lbs.; handle, 28 in.;
blade, 7¼ x 2½ in.; round edge.



Philadelphia Hook Ice Ax.

Weight complete, 4 lbs.; handle, 28 in.;
blade, 7½ x 2½ in.; round edge.

Heavier Axes made to order.

	Code Word	Per Doz.
No. 610. — Philadelphia Square Head Ice Axes, 2½-in. blade . . .	<i>Frank</i>	\$20.00
No. 611. — Philadelphia Hook Ice Axes, 2½-in. blade . . .	<i>Preclipse</i>	20.00
No. 612. — Philadelphia Hook Ice Axes, 2½-in. blade, 22-in. handle . . .	<i>Preclude</i>	22.00

Philadelphia Hook Ice Axes made with 22-in. knob handles also in stock. The No. 615 Southern Ax, having 22-in. handle, is usually acceptable in place of Philadelphia Hook Axes, with 22-in. handles, as the principal difference is merely that the Southern Ax has blade 2½ in. wide instead of 2½ in.



Southern Ax, Heavy.

Round Edge.
Weight, 3½ lbs.
Handle, 22 in.
Blade, 1½ in. wide.



Southern Ax, Light.

Round Edge.
Weight, 1½ lbs.
Handle, 18 in.
Blade, 1½ in. wide.



Southern Hatchet, Medium.

Square Edge.
Weight, 1½ lbs.
Handle, 16 in.
Blade, 1½ in. wide.

- No. 615. — Southern Axes, Heavy, round edge, 22-in. handle .
No. 616. — Southern Axes, Light, round edge, 18-in. handle .
No. 620. — Southern Hatchets, Medium, square edge, 16-in. handle

Code Word	Per Doz.
<i>Present</i>	\$18.00
<i>Pross</i>	17.00
<i>Pride</i>	16.00



Southern Hatchet, Medium.

Round Edge.
Weight, 1½ lbs.
Handle, 16 in.
Blade, 1½ in. wide.



Washington Hatchet.

Weight, 1½ lbs.
Handle, 14 and 15 in.
Blade, 1½ in. to 2 in. wide.
(Three sizes.)



Southern Hatchet, Light.

Square Edge.
Weight, 1 lb.
Handle, 16 in.
Blade, 1 in. wide.

- No. 621. — Southern Hatchets, Medium, round edge, 16-in. handle
No. 622. — Washington Hatchets, Light, round edge, 6 x 21-in.
blade, 14 or 15-in. handle
No. 623. — Washington Hatchets, Medium, round edge, 6½ x 21-in.
blade, 14 or 15-in. handle
No. 624. — Washington Hatchets, Heavy, round edge, 7 x 3-in. blade
(This size made to order only.)
No. 625. — Southern Hatchets, Light, square edge, 16-in. handle .

Code Word	Per Doz.
<i>Private</i>	\$16.00
<i>Probate</i>	15.00
<i>Proceed</i>	16.00
<i>Profit</i>	15.00

We use the utmost care in making all axes and hatchets to have them meet the highest ideal of the expert driver.

Weights of all ice axes include handle.

Measurements of blades of all axes and hatchets are from inside of handle to edge of blade.

GIFFORD-WOOD CO.



Splitting Awl, Round Handle.



Splitting Awl, Chisel Handle.



Splitting Awl, Pear Handle.

	Code Word	Per Doz.
No. 629. — Splitting Awls, $\frac{1}{4}$ -in. x 4 $\frac{1}{2}$ -in. blade, pear handle . . .	<i>Progress</i>	\$1.00
No. 630. — Splitting Awls, $\frac{1}{4}$ -in. x 6-in. blade, round handle . . .	<i>Promise</i>	1.25
No. 631. — Splitting Awls, $\frac{1}{4}$ -in. x 6-in. blade, brass round handle . . .	<i>Promote</i>	10.00
No. 632. — Splitting Awls, $\frac{1}{4}$ -in. x 6-in. blade, chisel handle . . .	<i>Propeal</i>	1.25
No. 633. — Splitting Awls, $\frac{1}{4}$ -in. x 6-in. blade, pear handle . . .	<i>Prophery</i>	1.25



Ice Awl Sheath.

Made of heavy leather.

Regular Blades, 6 x $\frac{1}{4}$ -in. Larger ones of $\frac{1}{2}$ or $\frac{3}{4}$ -in., steel to order.

The Brass Handle Awls ($\frac{1}{4}$ -in. steel) weight 1 $\frac{1}{2}$ pounds each and the handle is the same shape as our No. 630.

Blades are made of the best steel, finely tempered and are nickel plated.

	Code Word	Per Doz.
No. 634. — Ice Awl Sheaths . . .	<i>Propose</i>	\$3.50

If ordered to be sent by mail, add 3 cents each for postage.



Chipper, Wood Handle.

6-in. x 3-in. blade.



Chipper, Iron Handle.

6-in. x 3-in. blade.

	Code Word	Per Doz.
No. 635. — Ice Chippers, Wood Handle . . .	<i>Prostate</i>	\$10.00
No. 636. — Ice Chippers, Malleable Iron Handle . . .	<i>Protest</i>	8.00

Our Ice Chippers are as fine as it is possible to make and are furnished with either wood or malleable iron handles.



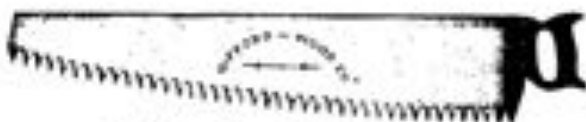
Ice House Saw.

Weight, 6 lbs.; length of blade, 48 in.

Code Word	Each
Protocol	\$2.50

No. 638.—Ice House Saws

This is a useful article where ice-blocks are packed closely and cannot be separated by chisel without breakage.



Hand Saw, Guard Iron-Handle, 30 in.

Weight, 3½ lbs.; blade, 30 in. long.

(No. 640 Wood-Handle Hand Saws, same shaped handle.)

No. 639.—Hand Ice Saws, Wood Handle, 26 in.	Code Word	Each
No. 640.—Hand Ice Saws, Wood Handle, 30 in.	Protect	\$1.20
No. 640d.—Hand Ice Saws, Wood Handle, 36 in.	Provide	1.25
No. 640d.—Hand Ice Saws, Guard Iron-Handle, 26 in.	Provoke	1.40
No. 641.—Hand Ice Saws, Guard Iron-Handle, 30 in.	Proxy	1.20
No. 641.—Hand Ice Saws, Guard Iron-Handle, 30 in.	Prudent	1.25
No. 641d.—Hand Ice Saws, Guard Iron-Handle, 36 in.	Pullit	1.40



Hand Saw, Oval Iron-Handle, 30 in.

Weight, 4½ lbs.; blade, 30 in. long.

No. 641d.—Hand Ice Saws, Oval Iron-Handle, 26 in.	Code Word	Each
No. 642.—Hand Ice Saws, Oval Iron-Handle, 30 in.	Pumice	\$1.20
No. 642d.—Hand Ice Saws, Oval Iron-Handle, 36 in.	Punch	1.25
No. 642d.—Hand Ice Saws, Oval Iron-Handle, 36 in.	Punish	1.40

The 30-inch Hand Saw is the usual ice wagon length, and when no length is given in order, we will send that size.

The iron handles used on our Hand Saws are made of best malleable iron.



Ice Cleaver or Hack.

Weight, 3 lbs.; length of blade, 30 in.

No. 648.—Ice Cleavers, 12 teeth	Code Word	Each
	Purser	\$2.50

These are used by some on wagons in place of the ax.

The end of the blade is sharpened for use in shaving or scraping the ice.



4-Point Shaver, Ring Pipe Handle.

Weight, 4 lbs.; length, 3 ft. 7 in.; blade, 2½ x 4¼ in.

	Code Word	Each
No. 649C. — 4-Point Shavers, Ring Pipe Hdle., beveled both sides	<i>Raccoon</i>	\$1.25
No. 649D. — 4-Point Shavers, Ring Pipe Hdle., beveled one side only	<i>Rack</i>	1.25



5-Point Shaver, Knob Pipe Handle.

Weight, 3½ lbs.; length, 4 ft.; blade, 6½ x 6 in. wide.

	Code Word	Each
No. 649E. — 5-Point Shavers, Knob Pipe Hdle., beveled both sides	<i>Radicat</i>	\$2.00
No. 649F. — 5-Point Shavers, Knob Pipe Hdle., beveled one side only	<i>Radia</i>	2.00



5-Point Shaver, Ring Pipe Handle.

Weight, 3½ lbs.; length, 3 ft. 7 in.; blade, 6½ x 6 in. wide.

	Code Word	Each
No. 649H. — 5-Point Shavers, Ring Pipe Hdle., beveled both sides	<i>Ramble</i>	\$2.00
No. 649J. — 5-Point Shavers, Ring Pipe Hdle., beveled one side only	<i>Rampart</i>	2.00



4-Point Shaver, Long Handle.

Weight, 4 lbs.; length, 3 ft. 11 in.; blade, 2½ x 4¼ in. wide; handle, 1¼ in. diam.

	Code Word	Each
No. 650. — 4-Point Shavers, Long Hdle., regular blade and teeth	<i>Random</i>	\$1.75



4-Point Shaver, Long Handle (Smaller than No. 650).

Weight, 3 lbs.; length, 3 ft. 11 in.; blade, 6½ x 4¼ in. wide; long teeth; handle, 1¼ in. diam.

	Code Word	Each
No. 651. — 4-Point Shavers, Long Hdle., small blade, slim teeth	<i>Runes</i>	\$1.75



4-Point Shaver, D Handle.

Weight, 4½ lbs.; length, 3 ft. 6 in.; blade, 2½ x 4¼ in. wide; handle, 1¼ in. diam.

	Code Word	Each
No. 652. — 4-Point Shavers, D Hdle., regular blade and teeth	<i>Ration</i>	\$1.75



4-Point Shaver, D Handle (Smaller than No. 646).

Weight, $\frac{3}{4}$ lbs.; length, 3 ft. 6 in.; blade, $6\frac{1}{2}$ x $4\frac{1}{2}$ in. wide; long teeth; handle, $\frac{1}{4}$ in. diam.

Code Word

Each

No. 653. — 4-Point Shavers, D Hdle., small blade, slim teeth

Reaver

\$1.75



Chicago 4-Point Shaver, Short D Handle.

Weight, $\frac{1}{4}$ lbs.; length, 4 ft. 3 in.; blade, $2\frac{1}{2}$ x $4\frac{1}{2}$ in.; handle, $\frac{1}{4}$ in. diam.

Code Word

Each

No. 653 $\frac{1}{2}$. — Chicago 4-Point Shavers, Short D Hdle., regular teeth

Rattle

\$3.75



5-Point Shaver, Long Handle.

Weight, $4\frac{1}{2}$ lbs.; length, 4 ft.; blade, $6\frac{1}{2}$ x 6 in. wide; handle, $\frac{1}{4}$ in. diam.

Code Word

Each

No. 654. — 5-Point Shavers, Long Hdle.

Rebellion

\$2.00



5-Point Shaver, D Handle.

Weight, $4\frac{1}{2}$ lbs.; length, 3 ft. 6 in.; blade, $6\frac{1}{2}$ x 6 in. wide; handle, $\frac{1}{4}$ in. diam.

Code Word

Each

No. 655. — 5-Point Shavers, D Hdle.

Revital

\$2.00



7-Point Shaver, Long Handle.

Weight, 5 lbs.; length, 4 ft.; blade, 9 x $3\frac{1}{2}$ in. wide; handle, $\frac{1}{4}$ in. diam.

Code Word

Each

No. 658. — 7-Point Shavers, Long Hdle.

Recoil

\$2.50



7-Point Shaver, D Handle.

Weight, $\frac{5}{8}$ lbs.; length, 3 ft. 6 in.; blade, 9 x $3\frac{1}{2}$ in. wide; handle, $\frac{1}{4}$ in. diam.

Code Word

Each

No. 659. — 7-Point Shavers, D Hdle.

Redolent

\$2.50

Unless otherwise specified in description, all shaver teeth are beveled on one side only.

All our Shaver-blades are made from special steel, carefully tempered, thus producing very superior points.



Fine Tooth Slusher, Knob Handle.

(Slusher teeth beveled on both sides.)

Weight, 3 lbs.; length, 3 ft. 4 in.; blade, 7 x 3 in. wide.

	Code Word	Each
No. 66a. — Fine Tooth Slushers, beveled both sides	<i>Redbird</i>	\$2.00

Slushers have finer teeth than Shavers, but are used for the same purpose.



Breakers, Long Handle.

Weight, 3½ lbs.; length, 4 ft. 2 in.; length of tines, 14 in.; width at points, 3 in.

	Code Word	Each
No. 66b. — Breakers, long handle	<i>Regal</i>	\$3.00



Breakers, D Handle.

Weight, 3¼ lbs.; length, 3 ft. 7 in.; length of tines, 1½ in.; width at points, 3 in.

	Code Word	Each
No. 66c. — Breakers, D handle	<i>Regiment</i>	\$3.00

The Breakers should not be used as a chisel for splitting cakes of ice. The tines are shaped and set for breaking off coarse lumps from the sides of the cake, or for scaling off finer pieces, if desired. They are very popular in fish markets.

Shavers and Slushers are used to shave ice into fine pieces when delivered by the basket for saloon or restaurant use, and for various other purposes.

Shaver teeth are beveled on one side only, unless described otherwise.

The 4-point shavers are in most common use for delivery wagons.

The 5-point Shavers are adapted for larger operations in fish markets and ice cream factories.

Shavers can be "gummed out" after the teeth become stumt from repeated filing, so that the teeth will be as long and slim as when new.

The steel used in all our Shavers and Slushers is especially made for the purpose, and is of extra quality. The points will hold a fine edge.

Please be particular to name exact style by number, when ordering.

When order does not mention kind of Shavers or Breakers, long-handled style will be sent.



Pocket Ice Apron.

Original style.



Pocket Ice Apron.

New style.

	Code Word	Each
No. 670. — Pocket Ice Apron, original style, with harness complete	<i>Remote</i>	\$3.00
No. 671. — Pocket Ice Apron, new style, with harness complete	<i>Remote</i>	3.00

The original style pocket ice apron has been in use for many years. This apron is cut straight across the top, and is held in proper position by a light harness.

The new style pocket apron is cut high in the neck and extends over the shoulders.

This style is much preferred by some, especially by those who carry ice higher up on the shoulders, as it affords more protection than the old style. Both designs are very popular.

Pocket Ice Aprons are made for those who carry ice on the back. When delivery men get accustomed to this method they never return to the "lugging" plan.

By its use the good graces of the housewife are secured, for no drippings reach the floor.

Plain Rubber Aprons.

	Code Word	Each
No. 672. — Plain Rubber Aprons, 42 in. long	<i>Resard</i>	\$1.75
No. 673. — Plain Rubber Aprons, 44 in. long	<i>Repel</i>	1.75
No. 674. — Plain Rubber Aprons, 46 in. long	<i>Rescue</i>	1.75

Plain Aprons are worn in front in the same manner as ordinary aprons.

When size of Plain Apron is not given in order, No. 673 will be sent.

GIFFORD-WOOD CO.



Wooden Sole Shoes, Plain.



Wooden Sole Shoes, Shod.

No. 676A. — Shoes, Plain, Sizes 6, 7, 8, 9, 10, 11, 12

No. 676B. — Shoes, Shod, Sizes 6, 7, 8, 9, 10, 11, 12

Code Word

Resident

Resort

Per Pair

\$1.75

2.00

Both styles are much used in ice-making plants and in natural-ice houses.
Order one size larger than what you regularly wear.



Klondyke Ice Creepers.



Instep Ice Creepers.

No. 677. — Klondyke, or "Hudson River" Ice Creepers

No. 678. — Instep Ice Creepers

Code Word

Riddle

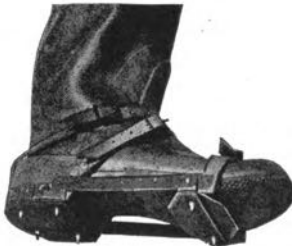
Roostery

Per Pair

\$0.75

.25

Special prices by the dozen pairs. Either style can be worn on overshoes.



Patent Ice Creeper. Style A.



Patent Ice Creeper. Style B.

No. 679A1. — Creepers, heel, 2½ in. wide; foot, 3½ in. wide

No. 679A2. — heel, 3 in. wide; foot, 4 in. wide

No. 679A3. — heel, 3½ in. wide; foot, 4½ in. wide

No. 679A4. — heel, 3½ in. wide; foot, 4½ in. wide

No. 679A5. — Creepers, heel, 3½ in. wide; foot, 4½ in. wide

No. 679B1. — Creepers, heel, 2½ in. wide

No. 679B2. — heel, 3 in. wide

No. 679B3. — heel, 3½ in. wide

No. 679B4. — heel, 3½ in. wide

No. 679B5. — heel, 3½ in. wide

Code Word

Rooster

Roostie

Rotate

Rowel

Rubble

Ruby

Rudiment

Rugate

Rowlet

Rupe

Per Pair

\$1.75

1.75

1.75

1.75

1.75

1.25

1.25

1.25

1.25

1.25

Per Doz.

\$2.10

No. 680. — Extra Points for Creepers

Code Word

Runic

No other creepers on the market can compare with these for comfort. They can be worn on overshoes or rubber boots.

The backs are of leather and will not chafe the shoe, and are light and durable.



Ironclad. Duplex. Straight. Ajax. Mogul. Steel King.
Weight, of lbs. Weight, of lbs. Weight, of lbs. Weight, of lbs. Weight, of lbs. Weight, of lbs.

The "Ironclad" has a malleable iron jacket, and is a reliable scale for a moderate cost.

The "Duplex" has two dial faces and a wrought iron jacket.

The "Straight" Scale is popular where ice is weighed by 1 and 2 pound marks.

The "Ajax" has double springs, which are wound in opposite directions, making it strong, accurate and durable. The indicator cannot rub and the face plate cannot become battered.

The "Mogul" needs no introduction. It is a high grade scale having double springs, wound in opposite directions. The patent interior sliding link prevents overstraining of the springs.

The "Steel King" is a well-known and popular scale.

							Code Word	Each
No. 700. — "Ironclad,"	200 lbs. by	5 lbs.	-	-	-	-	Sabot	\$2.00
	300 lbs. by	5 lbs.	-	-	-	-	Sack	2.50
	400 lbs. by	5 lbs.	-	-	-	-	Saddlebag	2.75
No. 702. — "Duplex,"	200 lbs. by	5 lbs.	-	-	-	-	Salt	2.50
	300 lbs. by	5 lbs.	-	-	-	-	Salute	2.75
	400 lbs. by	5 lbs.	-	-	-	-	Sapper	3.00
No. 704. — "Straight,"	200 lbs. by	2 lbs.	-	-	-	-	Sapwood	3.00
	80 lbs. by	1 lb.	-	-	-	-	Salmot	1.00
	100 lbs. by	1 lb.	-	-	-	-	Savage	1.75
	125 lbs. by	1 lb.	-	-	-	-	Saxon	2.00
	150 lbs. by	1 lb.	-	-	-	-	Seaport	2.50
	200 lbs. by	2 lbs.	-	-	-	-	Seaside	3.00
	250 lbs. by	2 lbs.	-	-	-	-	Section	3.25
No. 706. — "Ajax,"	300 lbs. by	2 lbs.	-	-	-	-	Sedate	3.50
	200 lbs. by	5 lbs.	-	-	-	-	Shallow	4.00
	300 lbs. by	5 lbs.	-	-	-	-	Shatter	4.25
No. 707. — "Mogul,"	400 lbs. by	5 lbs.	-	-	-	-	Shepherd	4.50
	100 lbs. by	5 lbs.	-	-	-	-	Shia	4.75
	200 lbs. by	5 lbs.	-	-	-	-	Shiner	4.75
	300 lbs. by	5 lbs.	-	-	-	-	Shingle	4.75
	350 lbs. by	5 lbs.	-	-	-	-	Ship	5.00
No. 708. — "Steel King,"	400 lbs. by	10 lbs.	-	-	-	-	Shipboard	5.00
	500 lbs. by	10 lbs.	-	-	-	-	Shipmate	5.00
	150 lbs. by	1 lb.	-	-	-	-	Semora	3.00
	200 lbs. by	2 lbs.	-	-	-	-	Sermon	3.00
	300 lbs. by	5 lbs.	-	-	-	-	Serpent	3.25
	400 lbs. by	5 lbs.	-	-	-	-	Shale	3.50
			-	-	-	-		

Repairing scales at reasonable prices.



G-W Refrigerator Blocks.
One Single and One Double.

Distance between hooks, 13 in.
Weight per pair, 34 lbs.



G-W Refrigerator Blocks.
Two Double.

Distance between hooks, 13 in.
Weight per pair, 44 lbs.

	Code Word	Per Pair
No. 709C.—G.-W. Blocks, one single and one double	<i>Regret</i>	\$3.00
No. 709D.—G.-W. Blocks, two double	<i>Relate</i>	3.50

Our new style refrigerator blocks are provided with strap bracket insuring safety in support. This may be removed by wing nut without use of wrench. Roller bearings reduce friction to a minimum and the shortness of the blocks makes it possible to hoist the load close up under the ceiling. Use 1/2-inch diameter rope.



Weed Cutting Saw.

(Showing Section of Saw with Sinker Attached.)
Weight—Saw only, 10 yd. length—22 oz.

This is an extremely effective device for cutting weeds and other undergrowth from bodies of water from which ice is harvested, and is the best method yet devised for the purpose.

The operation of the saw is simple, and is usually done by two persons.

To gain every advantage, the first or young growth of weeds should be cut away, followed by a second cutting in the early Fall; thus leaving a clear body of water from which clean ice may be cut.

	Code Word	Per Yard
No. 709I.—Weed Saw (saw only) any length	<i>Relent</i>	\$1.50
No. 709J.—Sinkers and Clamps	<i>Remark</i>	Per Set \$5.00

As the saw must be sunk to the bottom, we send with each order the necessary sinkers, clamps, etc., unless instructed otherwise.

Send for illustrated and descriptive circular.



Self-Lubricating Upper Gin.

Weight of 12-in. size, 33 lbs.



Self-Lubricating Lower Gin.

Weight of 12-in. size, 39 lbs.

			Code Word	Each
No. 710.—Upper Gins,	8 in., weight 17 lbs.	-	Shack	\$3.25
	10 in., weight 25 lbs.	-	Signal	4.00
	12 in., weight 33 lbs.	-	Silent	5.00
	14 in., weight 45 lbs.	-	Shute	6.00
	16 in., weight 58 lbs.	-	Slogan	7.00
No. 711.—Lower Gins,	8 in., weight 23 lbs.	-	Smoke	3.75
	10 in., weight 31 lbs.	-	Sole	4.50
	12 in., weight 39 lbs.	-	Solitude	5.50
	14 in., weight 50 lbs.	-	Somber	6.50
	16 in., weight 65 lbs.	-	Somire	7.50

These Gins are metaline bushed and can be run at quick speed without the use of oil. They are substantial, always ready for use, and will wear many times longer than wheels with roller bearings.



Self-Lubricating Sheave Wheel.

Weight of 12-in., 19 lbs.

Hole for $\frac{1}{4}$ in. pin.

Anti-Friction Sheave Wheel.

Weight, 24 lbs.; 12 in. diameter; $\frac{1}{4}$ in. thick.Hole for $\frac{1}{4}$ in. pin.

		Code Word	Each
No. 712.—Sheaves,	8 in., $\frac{1}{4}$ in. hole, for 1 to 1 $\frac{1}{2}$ in. rope	Sonola	\$1.25
	10 in., $\frac{1}{4}$ in. hole, for 1 to 1 $\frac{1}{2}$ in. rope	Song	1.75
	12 in., $\frac{1}{4}$ in. hole, for 1 to 1 $\frac{1}{2}$ in. rope	Spar	2.50
	14 in., $\frac{1}{4}$ in. hole, for 1 to 1 $\frac{1}{2}$ in. rope	Spider	3.00
	16 in., $\frac{1}{4}$ in. hole, for 1 to 1 $\frac{1}{2}$ in. rope	Sport	3.75

The usual size is 12-inch.

No. 706.—Anti-Friction Sheave Wheels, 12 in., for 1 in. rope	Spotless	1.25
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House or Wagon Loading Run.

Length of sides, 6 ft.; over all, 7 ft. 6 in.; weight, 75 lbs.

	Code Word	Each
No. 720. — Steel Runs, 6 feet, width 12 in.	<i>Taboret</i>	\$9.00
No. 721. — Steel Runs, 6 feet, width 16 in.	<i>Tactile</i>	9.50

Regular width 12 in. Suitable for 22-in. ice or under.

Extra width 16 in. Suitable for 32-in. ice or under.

These Steel Runs are useful in the houses for loading wagons, and are made with flippers on one end to cause the ice to slide on easily.



Car Run.

Length of sides, 7 ft.; over all, 8 ft. 6 in.; weight, 105 lbs.

	Code Word	Each
No. 722. — Car Runs, 7 feet, width 12 in.	<i>Tadpole</i>	\$12.50
No. 723. — Car Runs, 7 feet, width 16 in.	<i>Taffeta</i>	13.00

Regular width 12 in. Suitable for 22-in. ice or under.

Extra width 16 in. Suitable for 32-in. ice or under.

This style is used for loading cars and has flippers on the delivery as well as on the receiving end.



4-Slat T-Iron Skid, 12 Feet.

Usual Length, 12 ft.; weight, 120 lbs.

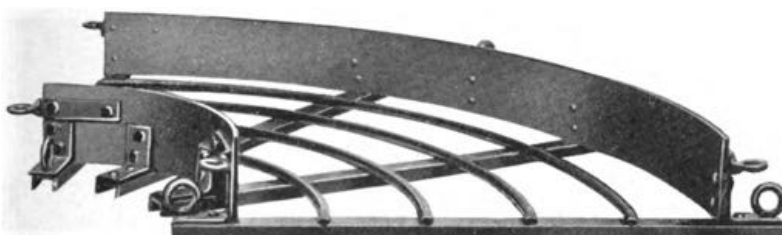
	Code Word	Each
No. 725. — 3-Slat Skids, 8 feet long	<i>Talent</i>	\$5.00
10 feet long	<i>Tallyho</i>	5.50
12 feet long	<i>Tamper</i>	6.25
14 feet long	<i>Tape</i>	7.25
16 feet long	<i>Teapot</i>	8.25
No. 726. — 4-Slat Skids, 8 feet long	<i>Telltale</i>	5.50
10 feet long	<i>Temple</i>	6.00
12 feet long	<i>Truder</i>	7.00
14 feet long	<i>Toad</i>	8.25
16 feet long	<i>Token</i>	9.50

T-Iron Skids are growing in favor for use in houses.

This pattern is made entirely of T-iron.

These skids made with center bars of inverted U-iron to order.

The prevailing 3-slat skids are 17 inches wide, and the 4-slat skids are 22 inches wide. These are, therefore, our stock widths. Special sizes made to order.



Steel Circle Run.

		Code Word	Each
No. 745. — Circle Runs, 28 in. Inside Measurement	- - -	<i>Tamcod</i>	\$25.00
Circle Runs, 30 in. Inside Measurement	- - -	<i>Torpedo</i>	25.00
Circle Runs, 40 in. Inside Measurement	- - -	<i>Torrest</i>	27.50

Constructed wholly of steel, they are light and strong.

In ordering, always give inside measurements of your runs and state whether your connecting irons are on the top or the bottom of your run sides.

When not otherwise instructed, we will fit irons on top to suit 3-in. x 3-in. side pieces.



Wooden Run, with Sides, 12 Feet.

	Weight, 120 lbs.	Code Word	Each
No. 730. — Wooden Runs, 10 feet, 4 battens	- - -	<i>Total</i>	\$10.25
12 feet, 5 battens	- - -	<i>Tetum</i>	12.50
14 feet, 5 battens	- - -	<i>Tetter</i>	14.00
16 feet, 6 battens	- - -	<i>Tench</i>	16.00

Wooden Runs are made of spruce, fitted with hooks and eyes, amply ironed, and painted. Stock width, 28 inches inside, clear.



Wooden Flat Skid, 14 Feet.

	Weight, 120 lbs.	Code Word	Each
No. 740. — Wooden Flat Skids, 12 feet, 4 battens	- - -	<i>Traffic</i>	\$5.50
" 14 feet, 5 battens	- - -	<i>Tramfile</i>	6.75
" 16 feet, 5 battens	- - -	<i>Trap</i>	7.75

The two outside run-strips are ironed with patent V-iron, with dressed ends, and the center one with 1-inch half oval iron, with dressed end.

The outside flat wings slant outward and aid in pulling off.



Hook.

Eye.

	Code Word	Per Pair
No. 734. — Hooks and Eyes for No. 730 Runs (weight per pair, 41 lbs.)	<i>Travel</i>	\$0.50

These are for coupling Runs together which have sides.



Run Switch.

	Code Word	Each
No. 746.—Run Switches for runs 36 inches or under	<i>Treasure</i>	\$10.00
No. 747.—Run Switches for runs 44 inches or under	<i>Trick</i>	11.00

Switches are growing in favor as a labor-saving device on the outside run or adjustable gallery when filling houses.

Made with an eye, to be used for a light counter-weight, if desired.

These switches are sometimes used on inside runs—one ahead of the other, to switch either to the right or the left. Complete runs furnished upon order.

In ordering, always give inside measurement of runs.



Ice Run Iron.

	Weight per ft., 1½ lbs.	Code Word	Per Ft.
No. 750.—Run Iron, drilled, 10 feet, square ends		<i>Tricot</i>	\$0.06
12 feet, square ends		<i>Trig</i>	.06
14 feet, square ends		<i>Trigon</i>	.06
16 feet, square ends		<i>Trinal</i>	.06

This V-pattern Ice Run Iron is largely used. The sharp surface slightly grooves the ice as it passes over it.



Showing ends dressed for use on No. 540 Wooden Flat Skids.

	Code Word	Per Bar
Extra charge, net, for dressing ends	<i>Trine</i>	\$0.05



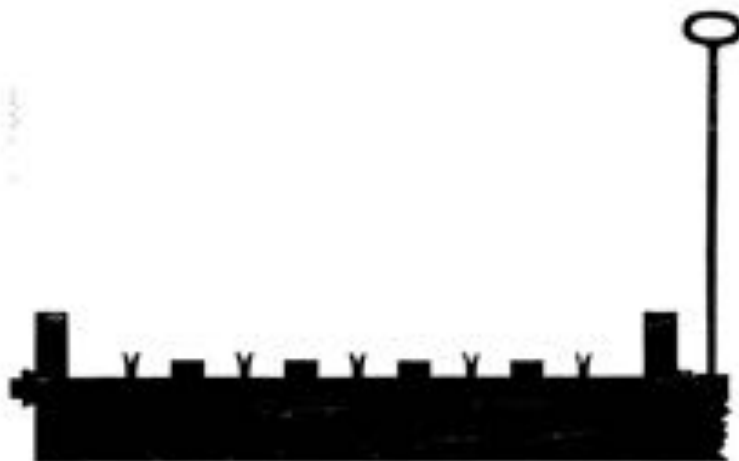
Half Oval Iron.

	Weight per ft., 1 lb.	Code Word	Per Ft.
No. 754.—Half Oval Iron, 1 x ½ in., 10 feet		<i>Trishet</i>	\$0.06
12 feet		<i>Tris</i>	.06
14 feet		<i>Triped</i>	.06
16 feet		<i>Trolley</i>	.06

	Code Word	Per Bar
Extra charge, net, for dressing ends	<i>Trooper</i>	.05

This iron is used on runs made with sides, and on Flat Wooden Skids for the center bar.

In the absence of instructions Square-end Run Iron and Half-oval Iron will be sent.



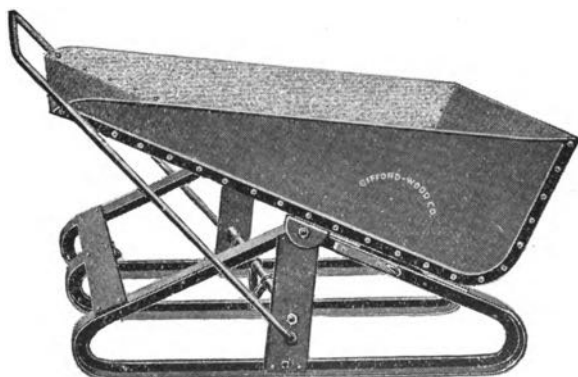
Scraper.

No. 758. — Scrapers, adjustable, for Runs	Code Word <i>Tropic</i>	Each \$7.50
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This device is in use by a number of our customers and can be applied to any gravity run, as it is a most accurate way of snubbing ice under the varying conditions that exist on runs which are not provided with Conveying Machinery.

It is not uncommon to have one near each house door. Several of these Scrapers can be combined to be worked from one lever. Scrapers can easily be removed from one fixed gallery to another while the dump is being changed at the Elevator.

In ordering, give size of side stringers, arrangement and dimensions of slats, and distance between stringers.



Chip Sleigh.

Weight, 150 lbs.; pan, 4 ft. long, 4 ft. wide, 15 in. deep at rear end; capacity, 300 lbs.; runners, 3 ft. 3 in. base.

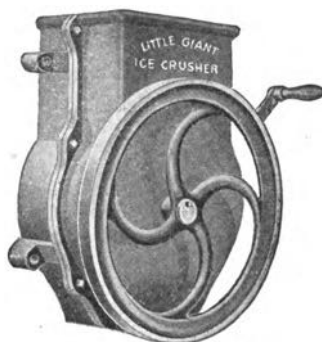
No. 760. — Chip Sleighs	Code Word <i>Trotter</i>	Each \$25.00
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This type of sleigh is the best, and is very strong.

The pan is of heavy shaped steel and supported on three T-shaped steel runners.

Used for gathering up ice debris in the house and dumping it out of the doorway.

Where houses are large and the ice requires much cutting around, it is of great convenience.



Wagon Ice Crusher.

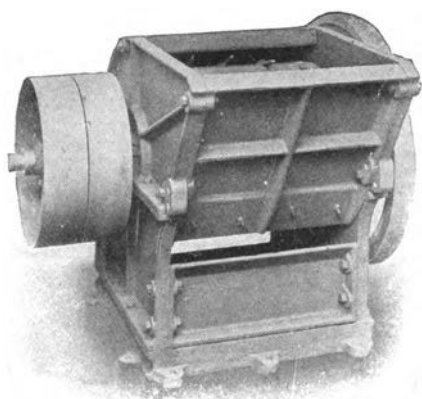
For the side of ice-wagon.

No. 765. — Little Giant Ice Crusher

Each
\$35.00

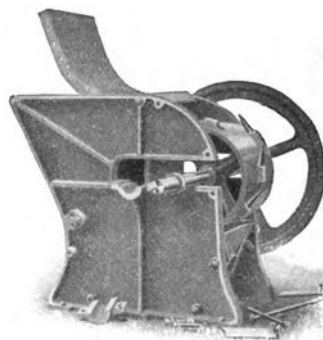
The Wagon Ice Crusher is one of the greatest time and labor-saving devices. As much ice can be broken up in one minute as by hand in fifteen minutes.

(Write for complete illustrated catalog.)



Creasey Ice Breaker.

Capacity, 40 tons per hour,
Shipping weight, 3125 lbs.



Creasey Ice Breaker.

For Hand or Power.
Shipping weight, 900 lbs.

No. 766. — Creasey Ice Breakers, 11 sizes

Each
\$10.50 to \$325.00

Creaseys are distinguished by the use of sharp, pointed, round picks, which shatter the ice, instead of attempting to cut, chip, scrape or crush it. These picks are so attached to the drum that they do not become loose in service, while at the same time they can be removed for sharpening by the mere tap of a hammer. Other valuable features are stiff, strong frames, large shafts and babitted bearings, solid drums, heavy fly wheels, removable and adjustable combs, giving six sizes of ice, and the ability to deliver ice front or rear, as desired.

(Write for complete illustrated catalog.)

REPAIRING ICE TOOLS

Always send repairs of winter tools in the summer, and avoid the fall rush of work at factory and possible freight delays.

All repairs should be sent to factory, at Hudson, N. Y.

We repair all kinds of Ice Tools at lowest prices. It pays the user to get his repairing done at the factory instead of allowing the local blacksmith to do it.

An estimate will be given before undertaking the work, when desired.

Our Ice Plows and Markers, when new, are so forged that the cutting points of the teeth have the proper "gauge" or cutting width that each sized implements should have — the shallow plows cutting slightly wider grooves than the deep plows.

The Standard Scale of gradation is shown by the following diagram:



Section of our No. 303 Filing Gauge (priced on page 101), showing Standard Scale of cutting widths of Markers and Plows.

Plows should, therefore, always be run in the proper order of their depths, so as to reduce side-friction of the teeth to a minimum.

Each plow also, in order to follow itself with greatest possible ease, is forged to have a slight decrease in cutting width as the tooth is worn shorter by repeated sharpenings.

Therefore, users of Markers and Plows should have their machines re-forged from time to time, to keep them to their proper cutting widths, and to have them properly re-tempered for good service.

Re-forging includes re-tempering, cutting out bottoms anew and a thorough re-finishing and painting of the Marker or Plow, making it like a new one excepting in its original depth. It is always a paying investment.

New sets of teeth in Markers or Plows which are worn too shallow to pay for re-forging, will make them equal to new ones. Prices for inserting new sets of marker or plow teeth, with clearing-tooth in plows, making them look like new, filed and painted, ready for use, will be sent, when so requested, on receipt of description of plows, or after the goods have been received by us.

Undrilled sets of teeth for Markers and Plows will have to be sent when Markers and Plows needing new teeth are not sent to us. As the bolt-holes in the new teeth must be exactly accurate so that they will be solidly held, we cannot drill them sufficiently perfect unless they are clamped, before the drilling is done, into the identical beams they are to occupy.

When ordered to send sets of teeth undrilled, we do so at a reduction of \$2.00 per set from prices for the complete work, but customers are always better satisfied to send the beams at least, here, and the complete Plow if practicable.

Always send the Guide with the Marker or Plow, that it may be fitted accurately.

GIFFORD-WOOD CO.

Broken teeth in Markers or Plows can be replaced with new ones. Send the machine to our factory, if possible, as we can put in the new tooth or teeth solidly, and can leave the Plow perfectly true, warranted to work. When this is not practicable, take out the broken parts of the tooth or teeth, and either express them to us, or mail us an *exact diagram* of the tooth entire, including the bolt-holes, made on *thick paper*, and we will return a tooth to fit.

(If paper pattern is sent, cutting a notch in a card,



give the *width of cut* by which fits the points of the teeth of the Plows.)

Gumming-out is done by us by very deep punching, and always pays the user.

Burned Plows, Markers, Chisels, Bars, Tonge, Axes, etc., can usually be made as good as new by working over and by supplying the necessary new parts.

Filing, or sharpening, done at lowest prices.

Chisels, Bars and Axes made as good as new by re-steeling or making new ends.

Ice Hooks can be overhauled, and, by supplying new Pullers, Shovers, or Handles, as needed, can be made into good hooks at less than half the price of new ones.

Ice Tonge can be re-pointed and restored to good condition.

Ice Shavers should have their teeth ground when too short for rapid work.

Mark All Shipments of Goods for Repairs:

Gifford-Wood Co.

Hudson, N. Y.

Be sure that name of shipper is on every package.

When goods are shipped notify Gifford-Wood Co., and send bill of lading or railroad receipt.

Shipping tags, properly addressed, will be sent upon request.

SECOND-HAND ICE TOOLS

We usually have a good assortment of Second-Hand Markers, Plows, Field Planers, Hand Plows and small tools, which come into our hands by way of trade, all of which we make over before selling. We warrant them in good condition.

Also, some excellent Elevator Planers taken in exchange. These bargains should be secured early, for such goods sell readily.

Send for list of Second-Hand Ice Tools.

SUGGESTIONS

On Selecting a Set of Ice-Cutting Tools.

We give below four specimen lists of tools, with brief headings, which, as a supplement to our catalog descriptions, may serve as a basis upon which new firms can form an estimate of their needs for their individual situations.

The lists are not large enough for high rates of speed, or for filling a large number of rooms simultaneously.

We assume that hoisting will be done by gigs or by elevating machinery. Where these means are not employed, Grapples and Gin Wheels will need to be added.

Set No. 1

Suitable for harvesting 100 to 300 tons of ice.

- | | | |
|--|----------------------------------|---|
| 1 No. 303 Ice King Plow.
(Or No. 305 if ice is 14 in. thick.) | 1 No. 427 Calling Bar. | 1 No. 305 Siver Shovel. |
| 1 No. 428 Plow Rope. | 1 No. 428 Bar Chisel. | (Or No. 303 Scoop Net is better.) |
| 1 No. 424 Splitting Forks. | 1 No. 425 King Splitting Chisel. | 1 No. 303 10-ft. Ice Hooks. |
| (Or No. 440 or No. 450 Fork Bar if
grooves are shallow.) | 1 No. 300 Line Marker. | 1 No. 303 24-in. Boston Tongue.
(Or 1/2 doz. No. 303 Drag Tongue.) |

Add Nos. 370, 374, 398, 474, 426, 376, 378, 379, 380, 381, 382, 383, 384 and 385 as needed.

Set No. 2

Suitable for harvesting 1,000 to 2,000 tons of ice.

- | | | |
|--|----------------------------------|-----------------------------|
| 1 No. 301 3-in. Swing Guide Plow, for
ice 12 in. thick.
(Or No. 305 for 14 in. ice, or No. 303
if ice goes to 10 or 12 in.) | 1 No. 427 Calling Bar. | 1 No. 300 Line Marker. |
| 1 No. 428 Plow Rope. | 1 No. 428 Bar Chisel. | 1 No. 305 Siver Shovel. |
| 1 No. 424 Splitting Forks. | 1 No. 425 King Splitting Chisel. | 1 No. 303 20-ft. Ice Hooks. |
| 1 No. 424 Needle Bar. | 1 No. 300 Line Marker. | 1 No. 303 10-ft. Ice Hooks. |
| 1 No. 424 24-in. Boston Tongue.
(Or 1/2 doz. No. 303 Drag Tongue.) | | |

Substitute No. 342 or No. 344 Perfection Plow if preferred; and add Nos. 370, 374, 398, 474, 426, 376, 378, 379, 380, 381, 382, 383, 384 and 385 as needed.

Set No. 3

Suitable for harvesting 2,000 to 5,000 tons of ice.

- | | | |
|---|--|---|
| 1 No. 303 Eureka Elevator Plow. | 1 No. 427 or 429 Hand Plow. | 1 No. 425 24-in. Needle Bars. |
| (Or No. 354A-354H if much surface
is to be removed.) | 1 No. 428 Plow Ropes. | 1 No. 303 Elevator Forks. |
| 1 No. 429 Perfection Ice Cultivator. | 1 No. 429 7-ft. Saws. | 1 No. 303 Scoop Net. |
| 1 No. 424 24-in. Boston Tongue. | 1 No. 424 Splitting Forks. | 1 No. 303 Siver Shovel. |
| 1 No. 311 Marker, 20-in. Sw. Gd. | 1 No. 424 Splitting Forks. | 1 No. 303 Ice Auger. |
| (Or No. 315 or 316 Marker if two
dimensions are to be cut.) | 1 No. 427 Calling Bar. | 1 No. 303 Measure. |
| (Or No. 316 Marker with No. 314
Extra Gd. if 14-in. cakes are to be
run.) | 1 No. 428 Bar Chisel. | 1 No. 303 20-ft. Ice Hooks. |
| 1 No. 374 8-in. 8-tooth Plow. | 1 No. 429 Plow Shaver, or No. 429H
Floor Leveler. | 1 No. 303 10-ft. Ice Hooks. |
| Add 1 No. 315 Marker and 1 No. 316 6-in. Plow, and increase other tools if a hoisting rate of 1,000 tons per day
is to be made. | 1 No. 425 King Splitting Chisel. | 1 No. 303 24-in. Boston Tongue, or No. 303
Drag Tongue if needed.) |
| Add 1 No. 377 10-in. Plow if ice is 12 in. thick; and 1 No. 379 12-in. Plow if ice is 14 or 16 in. thick. | 1 No. 424 Needle Bars. | |
| Substitute No. 342-344 Perfection Markers and Plows if preferred; and add Nos. 374-398, 474, 426, 376, 378, 379, 380, 381, 382, 383, 384 and 385 as needed. | | |

Set No. 4

Suitable for harvesting 10,000 tons from one ice field.

- | | | |
|--|--|---|
| 1 No. 312-314H Eureka Elevator
Plow. | 1 No. 379 12-in. Plow, if thick ice. | 1 No. 425 or 429 Splitting Chisels. |
| 1 No. 429 Perfection Cultivator. | 1 No. 427 or 429 Hand Plow. | 1 No. 424 Needle Bars. |
| 1 No. 424 24-in. Boston Tongue. | 1 No. 428 Plow Ropes. | 1 No. 425 24-in. Needle Bars. |
| 1 No. 315 Marker, 20-in. Gd. | 1 No. 429 7-ft. Saws. | 1 No. 303 Elevator Forks. |
| with the necessary No. 316-
318 extra guide to mark the
second dimension. | 1 No. 424 Splitting Forks. | 1 No. 303 Scoop Net. |
| (If 14-in. cakes are to be cut, E-
ureka Guide 312 or 314 is cannot
be used.) | 1 No. 424 Splitting Forks. | 1 No. 303 Siver Shovel. |
| 1 No. 311 6-in. Plow. | 1 No. 425 12-in. Bar. | 1 No. 310 Ice Auger. |
| 1 No. 312 8-in. Plow. | 1 No. 427 Calling Bar. | 1 No. 303 Measure. |
| 1 No. 377 10-in. Plow. | 1 No. 428 Bar Chisel. | 1 No. 303 20-ft. Ice Hooks. |
| Substitute No. 342-344 Perfection Markers and Plows, if preferred; and add Nos. 374-398, 474, 426, 376, 378, 379, 380, 381, 382, 383, 384 and 385 as needed. | 1 No. 429 Plow Shaver, or No. 429H
Floor Leveler. | 1 No. 303 10-ft. Ice Hooks. |
| | (These will not be needed if ice is
planned to cut even thickness.) | 1 No. 303 24-in. Boston Tongue, or No. 303
Drag Tongue if custom demands.) |

For harvesting 10,000 tons and high rate of speed, usually above 100 tons per day.

High rate of daily in-out demands decided increase in tools required. Rapid harvesting is the most profitable as changes in the weather and heavy snows may be avoided.

In moving ice, leave much space around cakes and pack as to "die" the tiers. The amount of ice you can get out is what counts, and not what can be crammed in.

DIRECTIONS FOR FILING

Ice Plows and Ice Markers Having Solid Teeth.



Illustration No. 1.

First, Level Points.—File the points of the teeth so they will range level, using a long straight-edge for the purpose. The middle points should be well clear of the straight-edge rather than too high.



Illustration No. 2.

Second, Give Feed and Shape Points.—File the heel (A) of each tooth and also the bottom side of each point, so that both will conform to the filing gauge, as shown above. The heel can be filed a little lower if desired, showing a space over A, depending on the hind heel (J) to regulate the total cut.

Never file on the fronts of the teeth in the spaces between them (B), as the practice will produce points like H; and always avoid any tendency to round the bottoms of the points, as at F. The bottom side of each point must be slightly hollowed (as over D), and it will then fit the filing gauge (as over B), and will be sure to cut.



Illustration No. 3.

Third, Total Cut.—File the **Blind Heel** (J) so that when the long straight-edge is held so as to bear on it and on the hind point (J), the front end of the straight-edge (at N) will be raised over the heel of the clearing tooth (the front heel of all) to the mark shown on filing gauge which is numbered to correspond with the number of Cutting Teeth (not counting the clearing tooth) in the plow or marker that is being filed, or to such degree as you wish the plow to cut.

This regulates the total cut of the plow, and even if the heels of the intermediate teeth are filed with more feed, so as to show a space between A and the filing gauge, the blind heel will govern the total cut.

Keep the clearing tooth (L) filed so its blunt point will be the same distance from the straight-edge (K) as is its heel (M).

A good ice plow, filed according to the above directions, cannot fail to cut.

NOTE. The amount of feed above recommended is right for ordinary horses, under general conditions. All our plows will stand more feed if it is desired to put on more team.

To increase the feed, file the blind heel so as to show over the heel of the clearing tooth the cut desired (Illustration No. 3), and see that the feed of the other teeth is slightly increased, to correspond.

To decrease the feed, file a little off each point.

Never file the faces or fronts (B) of the teeth except to merely turn the fine feather-edge toward the ice.

Filing the points is often avoided by rubbing the edges on the upper side with the back of a jack-knife blade in such a way that they will be turned downward, and then "take hold."

If a plow with a good length of rope—seven or eight feet—does not "stay down" forward, and the teeth are sharp, file a little *extra feed* on the heels of the middle teeth, leaving the feed of the rear and front teeth regular, and this will cause the plow to hug down.

Filing Patent Perfection Markers and Plows with Inserted Teeth.

The same general principles apply as are given above for solid tooth plows.

The teeth, however, are never to be filed, as the setting of the points gives the necessary feed.

The Patent Adjustable Blind Heel supplied on all our patent Perfection Plows is an instant regulator.

The points should be kept filed to conform to the shape of the filing gauge.

Combination filing gauge and standard scale of cutting widths priced on page 193, illustrated, page 199.

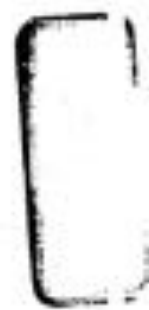
Remark.—By inverting this page, the parallel lines leading back from each point in Illustration No. 3 will show the cutting process of each successive tooth.

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NOTE: Index for Ice Elevating and Conveying Machinery, see page 89.



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no.
Quarto 621.585 G36
Gifford-Wood co.
How to harvest ice



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