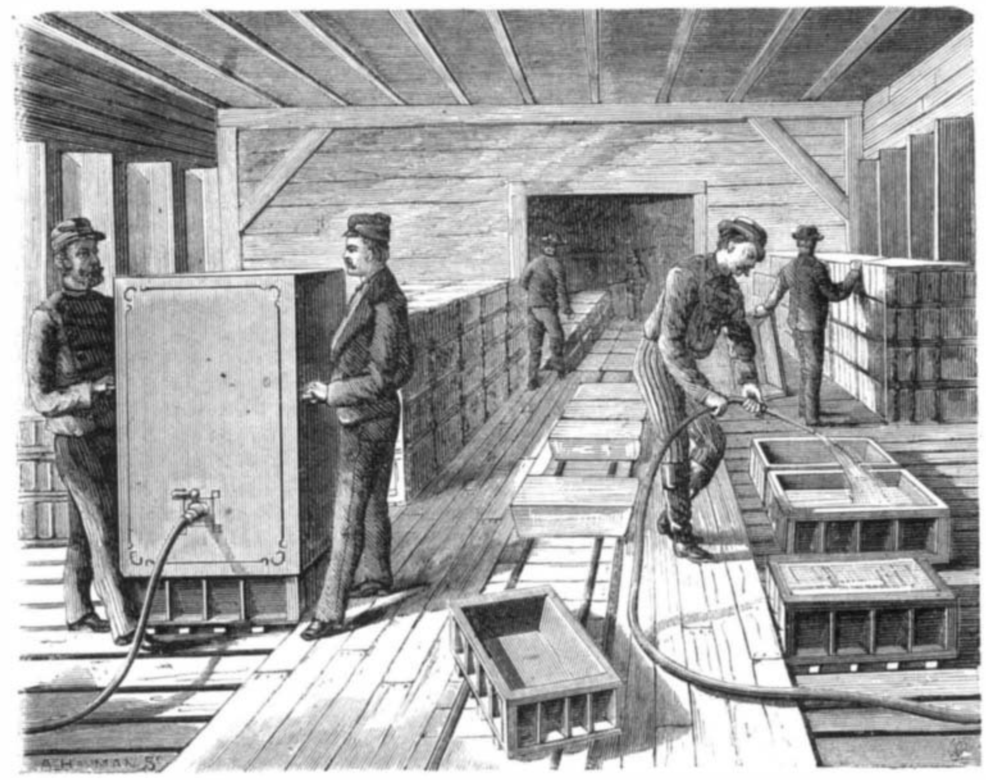
NEW ICE MAKING PROCESS.

Cool subjects, during hot weather, have an appropriateness peculiarly their own. Hence the reader will doubtless, during the present heated term, experience a refreshing satisfaction in not only perusing the following account of a new and simple manner of manufacturing ice, but in contemplating the annexed engraving of workmen engaged in that refrigerating occupation.

The process is one which is calculated to render the user independent of the monopolies which now control the ice supply, by affording a simple means whereby every one, having the requisite facilities, may easily manufacture his own ice, or enough to maintain as large a trade in the commodity as may be desired.

The prominent feature of the plan is that no pond or river is necessary. The requirements, however, are a good supply of water; a rough, strong frame building, open on all sides, for a freezing house, provided with suitable shutters which may be opened to allow the free passage of any light breeze; a well constructed ice house for storing the ice, and some simple appliances, which we proceed to describe.

In the wooden cribs or frames, shown in our engraving, are placed tanks made of strong cotton canvas especially woven for the purpose. These are filled with water, and are placed in piles of four each, as represented on the left, thus exposing a larger surface of water to the action of the atmosphere. They are then left until their contents become thoroughly frozen. In order to detach the blocks of ice, a cover is provided which is inverted over the set of four tanks, and steam admitted into it for a few moments. The cover is then removed, when the ice blocks may be readily turned out of the boxes. The latter are made with sides sloping inward toward the bottom, in order to facilitate the above operation, and are of such a size as to be readily handled, while containing the ice, by two men.



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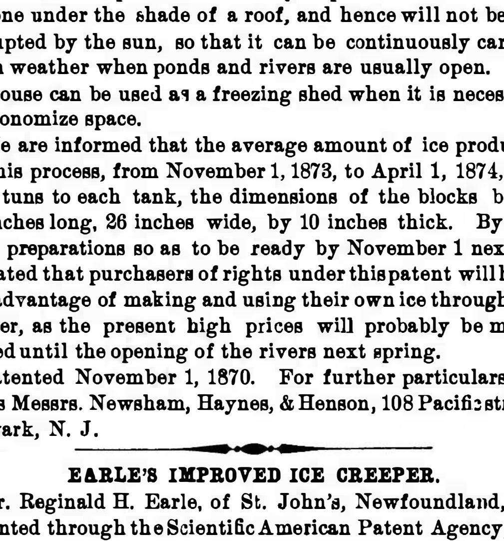
In our engraving the various operations peculiar to the process are clearly depicted. The freezing is done under the shade of a roof, and hence will not be interrupted by the sun, so that it can be continuously carried on in weather when ponds and rivers are usually open. The ice house can be used as a freezing shed when it is necessary to economize space.

We are informed that the average amount of ice produced by this process, from November 1, 1873, to April 1, 1874, was two tuns to each tank, the dimensions of the blocks being 30 inches long, 26 inches wide, by 10 inches thick. By making preparations so as to be ready by November 1 next, it is stated that purchasers of rights under this patent will have the advantage of making and using their own ice through the winter, as the present high prices will probably be maintained until the opening of the rivers next spring.

Patented November 1, 1870. For further particulars address Messrs. Newsham, Haynes, & Henson, 108 Pacific street, Newark, N. J.

EARLE'S IMPROVED ICE CREEPER.

Mr. Reginald H. Earle, of St. John's, Newfoundland, has patented through the Scientific American Patent Agency, December 9, 1873, a novel and simple form of ice creeper, an engraving of which is herewith presented. A patent has also been applied for in Canada through the same medium.



The device consists of two sliding plates, A, Fig. 2, the outer extremities of which are turned up at right angles and are provided on the inside with spikes. The inner ends of these plates are suitably formed to overlap, while the side edge of each enters a groove in a main plate, B, the length of which is about equal to the width of the sole of a boot. Plate, B, has projections on its upper side, which enter slots in, and thereby serve as guides for, plates, A. Through the under side of plate, B, passes a set screw, C, and to the same portion are attached short spikes, D, which take hold of the ice and prevent the wearer from slipping.

In using the invention, the set screw is loosened and the plates, A, drawn outward. The creeper is then placed upon the sole of the boot, as shown in Fig. 1 and the plates, A, are pushed inward, forcing the spikes thereon into the edges of the sole. The set screw, C, is lastly tightened, thus completing the adjustment. For further particulars address the inventor, 216 Water street, St. John's, as above.

Preparation of Ether.

The most efficacious process is to heat to 140° a mixture of 9 parts sulphuric acid at 66° B., and 5 of 90 per cent alcohol, alcohol being allowed to run in so that the level remains constant. By direct firing the vessel is apt to be destroyed, and accidents are rendered likely through the inflammability and volatility of the ether; superheated steam is far more safe as a means of heating, though a little more costly. Iron vessels lined with lead appear to be preferable to copper or lead-lined copper vessels. When the operation is properly conducted, 66 per cent of ether (sp. gr. 0·73) is obtained. For 100 lbs. of ether, ½ lb. sulphuric acid is required.

The crude ether is washed with water and rectified. This washing and rectification may, however, be dispensed with by passing the vapors first through a jacketed receiver, the jacket of which contains water at about 35° (alcohol and water condense in this, but not ether), and next through purifiers containing lumps of quick lime and trays of charcoal or coke soaked in caustic soda and well dried, whereby sulphur dioxide is removed. The purification simultaneously with the preparation is, however, open to several practical objections.

The conditions of success and of a good yield consist in keeping the temperature constant, and the flow of alcohol regular.—*O. Süssenguth.*

Strange Stories Confirmed.

Some months ago, Darwin wrote to his disciple Fritz Müller, now in Brazil, directing his attention to the habits of the leaf-cutting ants. The reply contains a confirmation of Mr. Belt's observations to the effect that these ants do not feed on the leaves they gather in such vast quantities, but on the fungus which grows on the leaves in their underground chambers. On examining the stomachs of these ants, Mr. Müller found no trace of vegetable tissue which might have been derived from the leaves, but only a colorless substance, showing under the microscope some minute globules, "probably the spores of the fungus."

Again, as to the protective partnership between certain plants and their ant inhabitants, Mr. Müller says he has cut down hundreds of *cecropiæ* and never missed the ants, and adds: "I wonder that it had never occurred to me that the trees are protected by the ants; but there can be no doubt that this is really the case, for young plants of *cecropiæ*, not yet inhabited by ants, are often attacked by herbivorous insects."

Manufacture of Chloral Hydrate.

Chloral hydrate is now manufactured on an enormous scale, some German makers supplying over 500 lbs. daily. Chlorine is passed into alcohol of at least 96 per cent. For 120—150 lbs. of alcohol the current of chlorine must be maintained for 12—14 days, in which time the temperature rises to 60°—75°, and the liquid acquires the density of 41° B. The crude product thus obtained is purified by heating it with an equal weight of strong sulphuric acid in copper vessels lined with lead. Considerable quantities of hydrochloric acid escape at first, and afterwards chloral distils at 95°—100°. This distillate is redistilled, collected in glass flasks, and mixed with water; and the hydrate then formed is either poured into large porcelain basins, in which it solidifies in cakes in half an hour, or it is poured into vessels one third full of chloroform, to crystalize.

Rain Water Impurities.

In a recently published work on "Sanitary Arrangements for Dwellings," Mr. Eassie points out the precautions to be adopted by householders in cases where rainfall forms the chief or only source of water supply. Generally it will be found convenient to store rain falling on the roof in an underground tank, formed of brick or concrete, puddled outside with clay and covered inside with Portland cement. But care must be taken that the down spouts conducting the rainfall to the tank do not drain either zinc roofs or lead flats. Even on tile or slate covered roofs, the water will have passed over lead flashings, ridges, hips, and valleys, charging it with a small percentage of lead, but not more than one twentieth of a grain to the gallon. With a greater proportion than this, water becomes dangerous to use, being more or less poisonous. Since rain acquires certain impurities, even while passing through the air, it should always be carefully filtered before being used for drinking or cooking purposes.

In the case of a house supplied with an underground receptacle, filtration could be easily managed, by placing an earth filter on the delivery side of the down spout, at its exit from the tank. An eminent authority on sanitary subjects, Dr. Angus Smith, believes rain water can be so completely filtered through earth as to remove all impurities. Whenever rain water is stored for drinking purposes, the eaves of the roof, troughs, and down spouts should be enameled, and the supply ought to be carried to the tank through glazed earthenware pipes. This prevents leading, but other deleterious ingredients will still remain. In manufacturing towns, soot, oil, and sulphuric acid form some constituents of rain water. With these facts in view, most people will agree with Mr. Eassie, in his conclusion that "generally speaking, rain water should be excluded from the kitchen," although extremely useful in laundries and conservatories.

IMPROVED FURNACE FOR MELTING BRASS.

Mr. Ira D. Bush, of Detroit, Mich., has patented, through the Scientific American Agency, a novel form of furnace for melting brass or other metals, an engraving of which we herewith present. The apparatus is mounted on trunnions in a suitable frame, and is divided interiorly into three compartments by partitions, two of which are shown at A A. B is the crucible, supported by the said partitions, and having a spout running along the top of one of the latter, terminating at C. The furnace cover is detachable, and has a chimney at D. To a central pivot on the furnace bottom is confined the grate plate, shown separately in the foreground. By this means each of the apertures in the lower side of the device is provided with a separate grate; and as all are connected, by turning the plate the air ports may be quickly opened to discharge the cinders and refuse formed during the melting process. A suitable lever connects with one of the bearings for convenience in tilting the furnace.

A SHAFT, weighing 50,000 lbs., and some cranks that weigh 31,000 lbs. each, have just been made at Bridgewater, Massachusetts, for the Fitchburg water works.