Manufacturing Ice.

Ice is not only one of the greatest luxuries for many purposes in hot climates, but it has become one of the most useful and necessary preservatives of fresh meats and vegetables during warm weather. Innumerable have been the efforts made to manufacture ice artificially and economically, so as to obtain it in unlimited quantities in those countries where the demand for it is great; but hitherto all such efforts have been very fruitless. The principle which has formed the base of all ice making operations is the well-known refrigerating quality of volatile fluids, by the expansion of which water placed in their vicinity is robbed of its heat, and reduced to a temperature below the freezing point.

The accompanying engravings represent mechanism for applying this principle, for which a patent has lately been taken out in England by James Harrison, of Geelong, Victoria, and a machine has been operated in London with considerable promises of success. The invention consists partly in the employment of a vessel similar to a boiler, with its tubes placed very close together, as shown by the elevated section of the entire apparatus, Fig. 1. Ether is placed in the spaces between the tubes, and a strong solution of common salt is made to flow in a current through the tubes. This solution is not congealable at the degree of cold required for making ice. It is conducted through boxes or molds, Fig. 2, containing water, and being of a lower temperature than 32°, it freezes the water and converts it into ice. A steam engine is required to produce the exhausting evaporative operation, and one of ten horse-power has been employed in London.

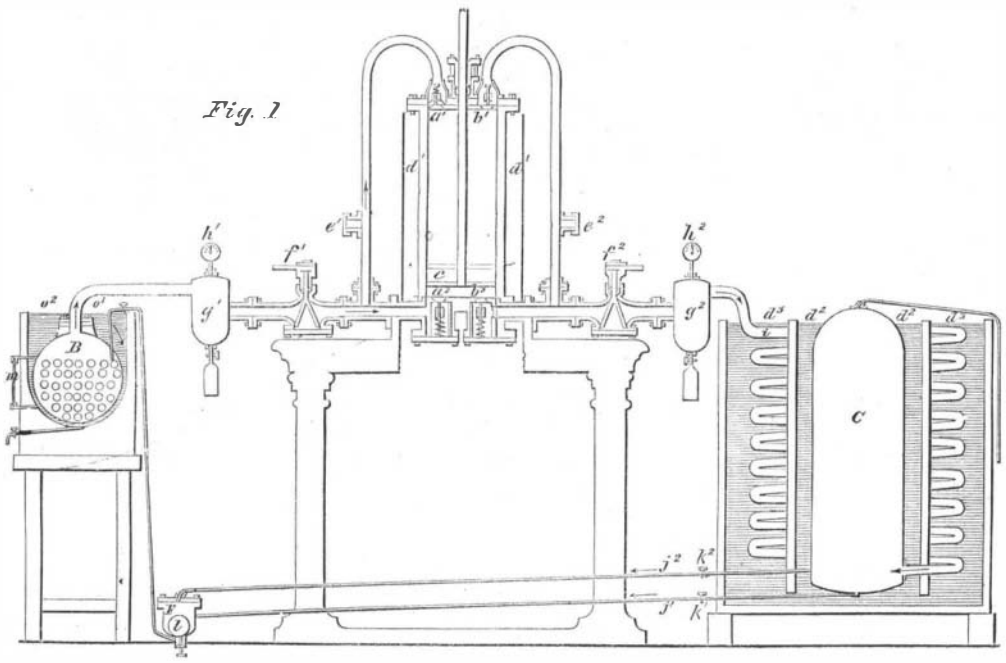

Fig. 1

A vertical pump is placed on the pedestal, and the engine is employed to operate its piston and withdraw the ether from the tubular vessel, B. The vaporized ether is placed into condensers, C, when a stream of cold water on the outside, aided by the pressure inside, reduces it again to a liquid state, to be used over and over again. In this is believed to consist the great economy of the operation, the steam power being the only expense. From the condenser, C, the ether flows back through the passages, F, to B.

The ether, as it evaporates in B, and flows up through the pumps into the condenser, C, carries off a great quantity of heat from a strong solution of common salt in the tubes. The funnel, *n*, is for pouring in the ether. The vaporized ether is drawn off by the pump passing it through the valves, a^1 a^2, and out of it by the valves, b^1 b^2, into the condenser. The piston, *c*, is made to work close to the top and bottom of the cylinders; g^1 8^2, are small copper vessels for receiving the oil used in lubricating the piston. Pressure gages, h^1 h^2, are placed on those vessels. The condensing water passes around the vessel, C, into the spaces, d^2 d^3, containing the worm, *i*, and then up through the overflow pipes. The ether flows back through pipe, j^1, then into the chamber, F. A return pipe, j^2, is for permitting any air that may find access to flow back into C. The cocks, k^1 k^2, are for opening and closing the pipes. India-rubber washers are used at all the joints to make them air-tight, so as to prevent all leakage of ether vapor. By removing the cap, e^1, and shutting cock, f^1, any leak will easily be detected. The surfaces of the tubular vessel, B, is 270 square feet; that of the condensers, C (two or three are used), amount to 260 square feet.

In Fig. 2 the end of the tubular vessel, B, is shown in section, and the strong solution of salt water contained in the tubes (and which is cooled below 32° by the evaporative ether surrounding it) flows, as shown by the arrow, up through the partition, *h*, between a series of inclined mold boxes, 1 2 3 4 5 6, &c., successively, which contain pure water, The very cold saline solution absorbs the heat from the water, and reduces the water below the freezing point, thus forming ice in the wedge-shapen molds. The molds are of tinned copper. The salt solution is returned by a pump, as shown by the arrow, and does duty over again.

The temperature of the cooling surfaces in this machine has been reduced as low as 23°. In fifteen minutes ice is formed one-quarter of an inch thick; in one hour an inch thick. The principles of refrigeration by evaporation and the condensation of recovery of this ether, in this apparatus, are easily comprehended. It requires full experiments to determine the economy of thus manufacturing ice, but the practicability of it is beyond all dispute. Such a machine as this is not only capable of making ice in hot weather, but it may be applied to cool air to a very low temperature for hospitals. It is also adapted for rendering water very cold without actually freezing it, and it may be carried to the top of a building and made to flow down through a pipe to form a most grateful and cooling cascade in warm apartments.

ARTIFICIAL FORMATION OF ICE.

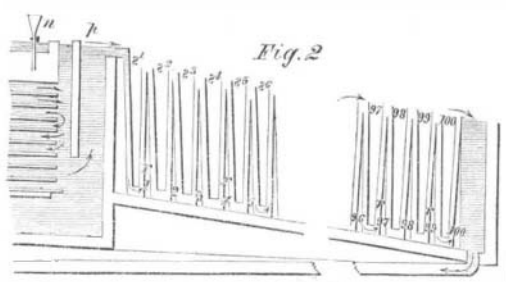

Fig. 2

RECENT AMERICAN INVENTIONS.

Polishing Stone.—Ezra H. Lewis, of Wilbur, N. Y., is the patentee of an improved machine for the above object. His invention consists in using, in connection with a horizontal rotating polishing bed, a vibrating or reciprocating bar, which is placed on the bed, and arranged to operate in connection therewith so as to give a vibratory movement to the stone while the same is being acted upon by the rotating polisher, and thereby cause the stone to be polished more rapidly and perfectly than hitherto, and also enable stones of a given size to be properly acted upon and polished by a smaller polisher than usual.

Constructing Iron Vessels.—The object of this invention is to obtain a mode of constructing iron vessels of navigation that will be much simpler, more economical, more durable, and which will enable vessels to be constructed with less weight of metal than usual. The invention, by B. F. Babbitt, of New York city, consists in the use of metal plates or bars, united or otherwise connected in a reticular manner, the plates or bars being bent or curved so as to form the framework of the hull, and the interstices of the framework filled with sulphur, the latter being poured into the interstices in a fused state, so as to completely fill the interstices and form a solid mass, rendering the hull of the vessel stiff and firm, and also protecting the metal from oxydation, as the sulphur covers the metal, and the former is not affected by either air or water.

Gas Retort.—This invention consists in the construction of a retort for making illuminating gas from resin, oil or other substance which can be introduced in a liquid state, with two upright chambers side by side, one of which, having the feed pipe attached, contains a series of partitions inclined longitudinally in opposite directions alternately, and provided with openings to allow the liquid substance to run from one to the other, from the top to the bottom of the series, so that all may be converted into gas or vapor before passing by an opening near the bottom, to the other chamber, to which is connected the outlet pipe, and in which the decomposition of the vapors is completed. The credit of this invention is due to A. K. Tupper, of Pontiac, Mich.

Veneer Saw.—The object of this invention is to saw veneers and their stuff from wood and ivory with a saw that will perform the work with a much narrower kerf than hitherto, and thereby effect a saving in stock.—To effect this result, L. B. Southworth, of Deep River, Conn., has patented an invention in which the usual "set" which is given saw teeth is avoided, and the latter are expanded or made of chisel form, and have their upper edges provided with a double basil.

Trachea Tube.—The object of this invention is to administer expectorant medicines directly to the trachea or to the nasal organs, so that in catarrhal affections, where the membrane of the throat is inflamed, the proper expectorant or anti-phlogistic remedies may be administered in proper quantities to the parts so affected, without bringing those remedies in contact with the mouth or tongue, as hitherto. The invention consists in a curved tube having a flat flaring double-throated portion formed on one end, the throats of which communicate with the hole through the tube, and a curved mouth piece screwed on the opposite end of the tube, so that this piece can be turned in a proper direction for directing the flaring portion either to the nasal organs or to the trachea. B. Segnitz, of New York city, is the patentee of the above invention.

HAVELOCKS A FAILURE.—Complaints are beginning to be made that havelocks are a failure. The dazzling white renders them conspicuous as marks for the enemy. They flap about the ears and face, interfere with the aim of the wearer, and prevent him from hearing the orders of the commanding officer. A substitute is mentioned which consists of a cork lining to be put into the top of the hat or cap, which keeps the head cool, on the principle that ice is kept in an ice-house by surrounding it with non-conducting substances.—*Exchange.*

There is no necessity for making havelocks with great ear-flaps. The back of the neck, extending down the spine should be covered, but that is all. Thin cork would make a good lining for a havelock, and it may be applied so as to render it a life-preserver when soldiers are crossing rivers.

SOLDIERS' FEET IN MARCHING.—A correspondent sends the following receipt for making an excellent composition for anointing the feet of soldiers during long marches. Take equal parts of gum camphor, olive oil and pure beeswax, and mix them together, warm until they are united and become a salve. At night wash the feet well, dry them, then apply this salve, and put on clean stockings and sleep with them on. Next day the feet will be in excellent train for marching. Our correspondent proved the great value of this receipt in a journey across the plains to California in 1852.