ICE MANUFACTURE.

MESSRS. EDITORS.—It has been a question, for many years, whether ice could be economically manufactured for domestic purposes, and as yet, no solution of the matter has been made public.

In our business we use large quantities of ice; and the last winter being a mild one, we failed to harvest our usual crop, and as "necessity is the mother of invention," we were constrained to make the attempt to supply our wants by artificial means; a plain statement of the course pursued to accomplish the object may possibly possess some public interest, and we therefore make a condensed report of our proceedings.

The well-known process of abstracting heat by vaporization of some volatile liquid was the basis of our experiments, and hydro-chloric ether seemed the best adapted to the purpose, but we were not able to obtain a sufficient quantity, and the only resource left was to use the much inferior agent, common or sulphuric ether. The prospect of success was much diminished in consequence of being confined to the less volatile liquid, but careful investigation led to the belief that it might be made to answer the destined purpose. Our plan or device was this, we procured a metal cylinder of the size required for our business, with an air-tight compartment around the whole circumference, ¾ inch wide, similar to a steam jacket; the cylinder was open at the top, and intended for the reception of the liquid to be frozen. A leaden pipe communicates with the upper end of the steam-jacket at one extremity, and with an entrance aperture of a rotary pump, prepared for this purpose, at the other. Another leaden pipe was attached to the exit aperture of the pump, and was carried in a spiral through a tank of water, like the condensing worm of a distillery, and thence, at the bottom into a condensing chamber, fitted with an escape cock, and containing a self-acting valve. From near the bottom of the condensing chamber another pipe led through the cover and back into the jacket. The whole apparatus described was made completely air-tight. The jacket was then charged with sulphuric ether. The pump was started and the escape cock in the condenser left open until the ether vapor had expelled the air, when it was closed, and the vapor drawn from the cylinder was condensed in the worm and the condensing chamber, and returned in liquid form to the cylinder thus keeping up a constant circuit, abstracting the heat from the cylinder and discharging it in the water surrounding the worm. The mechanism and process are exceedingly simple, but it required much thought to perfect this apparatus and make the necessary investigations.

Those familiar with this branch of science will readily perceive it is an easy matter to calculate the quantity of vapor it would require, theoretically, to freeze a gallon of water; and it will be apparent that, since ether boils, in vacuo, at 44° Fahr. below zero, a temperature of at least 15° below zero could be obtained by this process under favorable circumstances, and at no other loss than that of working the pump. We found the apparatus to work admirably, and with a small cylinder unprotected from the air, we caused water to freeze readily, and the thermometer, indicated 15°; but on a large scale, adapted exclusively for our business operations, there was so much surface necessarily exposed to the warm air and such a large body to freeze at one time, that the pump we used was not sufficient to draw of the vapor with such rapidity as to suit our purpose, and the expense being too great to venture on a new trial, we abandoned the project, and depended on the natural production for supplying our wants. We are satisfied that the princple adapted was sound, and the device we used may be made available for manufacturing ice with economy, and will eventually be brought into use, perhaps, by some enterprising Yankee. Sulphurous acid or hydrochloric ether, would either of them be a far better agent than the one we used, as at a low temperature the same bulk of vapor would carry off a much greater quantity of heat.

Such an apparatus for ocean steamers would undoubtedly be of much value, if it could be made to work satisfactorily, and we think it might be made to answer the proposed purpose. M. & C. PAINTER.

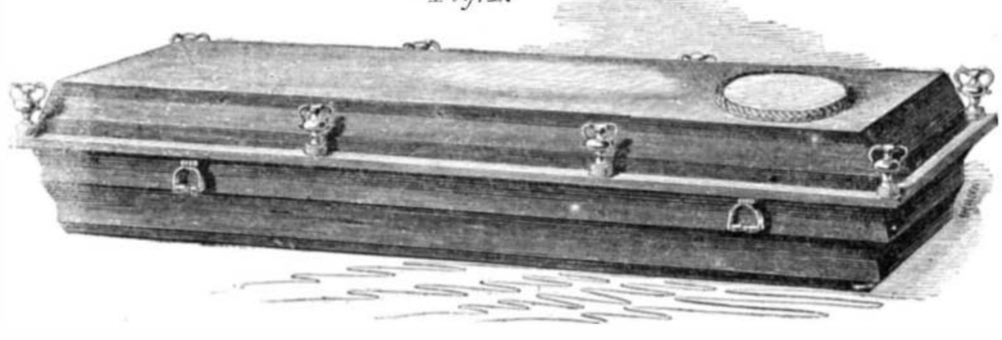
Owing's Mills, Md., Oct. 18, 1859.

IMPROVEMENT IN COFFINS.

The annexed views illustrate an improvement in coffins invented by Dr. H. Marshall of Cincinnati, Ohio, and patented on October 4, 1859.

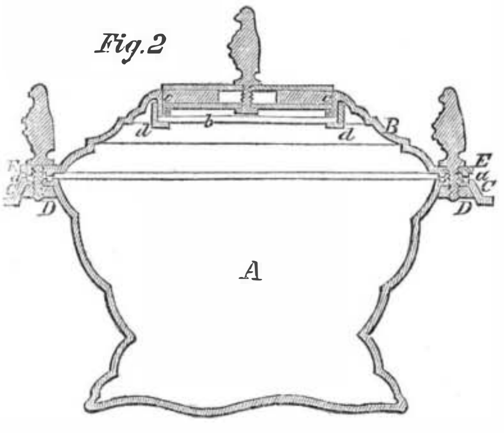
Fig. 1 is a perspective view, and Fig. 2 an end view. The improvement consists in making coffins of corrugated iron, as a substitute for the heavy cast iron coffins at present in use, thus avoiding the great weight and consequent difficulty of handling and transportation. The body of the coffin is made separate from the top, and the two are fastened together by screws which pass through the flanges, C and E, (Fig. 2) and screw into the wrought iron frame, D, which passes around the coffin. The corrugations of the flange, E, of the cover are fastened with their convex surfaces opposite to the concave surfaces of the flange, C, of the body, and a sheet of india-rubber is interposed between the flanges to pack them air-tight.

Fig. 1.



MARSHALL'S PATENT COFFIN.

Fig. 2



The ordinary glass window is provided in the top, B. The glass plate is suspended between an angular flange, c, projecting down from the top, B, all round the window space, and another angular shaped flange, d, screwed or attached to the flange, c, as shown. Thus arranging the window relieves the packing-piece of all upward pressure. To pack the window air-tight, an india-rubber gasket is placed between two plates which are moved apart or brought together by a screw. By inserting the packing device in the window space as shown and driving up the screw, the plates will be caused to compress the rubber and force it edges against the sides of the window space so as to pack it perfectly.

Persons desiring further information in regard to this light air-tight coffin may address the inventor as above.

STEAM FIRE-ENGINE PRIZES.—At the late Pennsylvania State Fair, there was a grand trial of steam fire-engines, and on the 1st inst., the prizes were awarded as follows:—The first premium, a silver horn, worth $250, to the *Hibernia;* second, a silver horn, worth $150, to the *Washington*; third, a gold medal, worth $100, to the *Good Intent;* all steam fire-engine companies of Philadelphia.

ILLUMINATING GAS.

We have recently described the process of making gas; we will now explain what becomes of it when it is burned. Illuminating gas consists almost wholly of carbon and hydrogen, combined in two different proportions. One of these is called carbureted hydrogen, and consists of two gallons of hydrogen combined with one gallon of the vapor of carbon; the three gallons, when combined, condensing, by a curious action which gases sometimes manifest, into precisely the measure of one gallon. In this combination, though the hydrogen is the most bulky, the carbon is the most ponderous, there being two pounds of hydrogen to six pounds of carbon. The other combination of these two substances, which we find in illuminating gas, consists of two gallons of hydrogen and two gallons of the vapor of carbon, all condensed into one gallon. This is called bi-carbureted hydrogen, and, though it constitutes but about 13 per cent of its volume, is the principle source of light in illuminating gas, having the property of precipitating its carbon in small solid particles, which, becoming red hot shine with a bright light. Carbureted hydrogen precipitates its carbon in the same way; but being less dense, the light is much feebler.

The burning of gas, like the burning of everything else, consists simply in combining it with oxygen. The combination of oxygen with the hydrogen forms water, which when heated to the temperature of flame, is of course expanded into steam and invisible; but if we place a cold body in the room, a vessel full of ice for instance, we find this steam condensing into drops on its side. These drops may be collected in a tumbler, and if we taste them we shall find them to be water, though a portion of them may have just been formed by the combination of the oxygen of the air with a part of the gas which issues from the burner.

The combination of the carbon with oxygen forms carbonic acid, a substance which in moderate quantities in the stomach is beneficial, but which taken in large quanties into the lungs produces instant death. Where several jets of gas are burning in a small room, ample provision should be made for ventilation, for the effect of burning the gas is not merely the removal of the oxygen, the life-giving element of the air, but the supplying of its place with a deadly poison.

The quality of gas—its illuminating power—varies very much depending principally upon the proportion of bi-carbureted hydrogen which it contains. Gas made from oil is superior to any made from coal, but oil is too expensive a material for this purpose. A tun of coal (2,000 pounds) will produce about 11,500 cubic feet of gas, amounting, at $2.50 per thousand cubic feet, to $28.75. The business of making it is no doubt profitable.

IMPORTANT NEW PATENT ON SKIRTS.—"A patent was issued on Tuesday last, the 4th inst., to S. H. Doughty, of this city, and others, for what is known as the 'woven skeleton skirt.' This construction of skirt has become very popular, and has been made by a great number of manufacturers in all parts of the country, under the supposition that it was not patentable."

The above paragraph has appeared in several of our city papers. The idea conveyed is that a patent has ust been issued covering, broadly, the manufacture of woven skeleton skirts. This is erroneous as the reader will perceive by an examination of the claims of the patentees, as officially reported and published in our last number. The manufacture of ladies' skirts has become a vast business, and we consider it our privilege of correct the erroneous impressions attempted to be conveyed in this instance.

PERHAPS the largest plate of glass ever produced was one made at the St. Gobain Works in France. The length of the plate was 5.37 meters (18 feet), and it was 3.36 meters (11 feet 9 inches) wide, and 12 millemeters or nearly half an inch thick.