

KELLER AND HENDERSON'S ICE-MAKING APPARATUS.

Messrs. Charles M. Keller and James Henderson, of this city, have recently invented an apparatus for making ice, by means of which they claim that ice may be produced either in the city or country, in unlimited quantities, with smaller capital and at less cost than it can be produced by any of the large companies who now supply it from lakes, ponds, and rivers. The only requisites are the apparatus, pure water, and the atmosphere below the freezing point. Blocks of a uniform size and weight can be made convenient for transportation, sale, and use, and distributed to the consumer without the trouble of weighing, or loss by breaking or melting.

This invention combines the action of heat by radiation, conduction, and evaporation to a number of water and metallic surfaces by the atmosphere, when below the freezing point.

The application is effected by placing water in cast-iron or other metallic vessels, with either rough or corrugated surfaces, about twelve inches square, varying from two to eight inches deep, made rather smaller at bottom than at the top, to facilitate removal of the ice. These vessels are suspended by their rims, and filled with water; the cold of the atmosphere, acting with almost equal effect on the bottom and the sides, converts the water into solid blocks of ice with great rapidity, and at times when none can be formed upon ponds. The effect may be increased by making a central hollow space in the vessel, rising from the bottom to the level of the top surface, thus making more surfaces for the air to act upon.

The frames in which the vessels are placed are made upright, with spaces about six inches or more apart, for suspending the vessels by their rims; this may be hung on trunnions so as to revolve and discharge the ice.

Vessels may be formed of the same size with a projection from the bottom to within from one to three inches of the top surface, so that when the vessel is filled the water will cover this projection to this depth. When it is frozen on the top about an inch thick the block may be removed and placed on a frame with bottom uppermost, to finish freezing, and the vessel may be refilled; in this way a larger number of blocks can be produced from one vessel than if they remained in it until frozen solid. Another advantage is gained by the expansion of the water within the partially frozen block in freezing, filling up the space made in the block by the projection in the pan. The block also freezes faster because the surface of ice is a better radiator than one of metal.

In locations where there is not much frost it will be found advantageous to use artificial currents of air to aid in the operation. These can be produced by working the vessels in the frames rapidly through the air, or the air forced over them by means of a rotating fan or other blowing apparatus, the effect being the same whether the air passes through them or they are passed through it. Another mode of producing an artificial current of air is to construct the side of the building, where the freezing operation is carried on, with movable boarding mounted on frames, so that an opening and closing action is communicated to the boards in order to create a draught of air through the building.

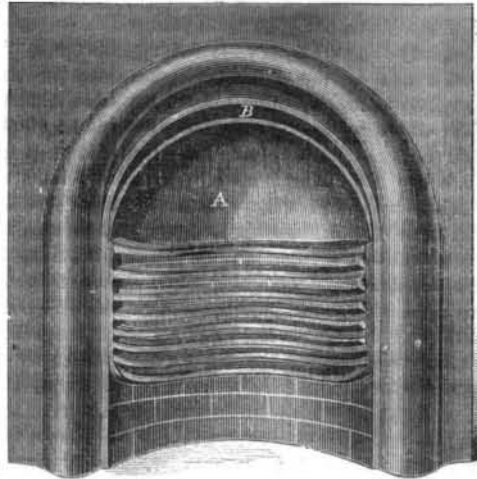
The inventors say that it has been found, by careful estimates, that the ice can be produced and stored away in the city of New York, with present rates of labor, at a cost not to exceed 50 cents per ton, and in localities convenient for distribution. The apparatus may be seen at No. 218 Fulton street, Room No. 4, New York.

METALLIC TITANIUM.—Within the past few months titanium metal is stated to have been obtained in considerable quantities in Birmingham, by reduction with sodium, the resulting powder being fused into compact masses of large size; the similarity of titanium and iron is striking. Little doubt is entertained that ere long the new metal will be produced at about the price of silver, in which case many practical applications could, probably, be found for it. The metal is largely disseminated in nature, so that once introduced a constant supply could be depended on.

HABERMEHL'S ELIPTIC GRATE.

The grate illustrated herewith is a recent invention intended to economize fuel by properly burning it. It is no exaggeration to say that one-half the coal put on fires is wasted from defective combustion in the stove, furnace, or grate, and that instead of changing into ashes, almost impalpable to the touch,

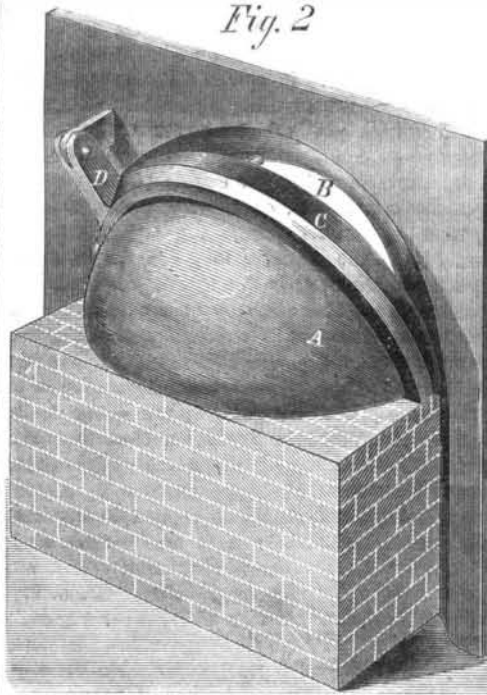
Fig. 1



it is converted into heaps of cinders or coke. At the present prices of fuel, any thing tending to save it will certainly be an acquisition.

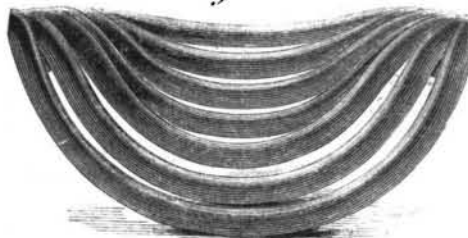
The grate here shown has been well tried and not found wanting. As an experiment it has been successful. It is difficult to give a clear idea of the shape of this grate, nevertheless it is easy to understand that the bars are not placed one over the other vertically, as in common grates, but that each is set a little behind, as in the view from the bottom, Fig.

Fig. 2



3. This exposes the fuel to the air very perfectly, allows it to be thoroughly mixed with the incandescent fuel, and does not crowd the coal into a compact mass. By this arrangement of the bars, also, a perfect draft is obtained, at the same time the fuel is not allowed to drop out half burned.

Fig. 3



The fire back, A, Fig. 1, is made of fire-clay, and is concave—this being the best form, the inventor claims, to radiate heat—and the semicircular opening, B, above, gives a long narrow throat which, we are assured, accelerates the draught greatly. This

throat latch, C, Fig. 2, is very conveniently arranged to open or shut. It is connected to a lever, D, which operates from the front, so that the old-fashioned abomination, in the shape of a flat piece of cast iron, is done away with.

As we stated before, this grate has proved highly satisfactory in Wheeling, Va., and is now in use there in many houses. The inventor states that he has introduced it in rooms where the chimneys formerly smoked, and that the evil was cured thereby.

The grate is manufactured by Henry Anshutz, proprietor of the Lafayette Foundry, Pittsburgh, Pa.; and the inventor, John Habermehl, of the same place, wishes to enter into arrangements with other parties.

The invention was patented through the Scientific American Patent Agency, May 30, 1865.

Explaining Government Securities.

Thompson's *Bank Note Reporter* gives the following explanation of the Government securities which we doubt not will interest many of our readers:—

"The 7-30 Treasury Notes have three years to run from their dates. The first series is dated Aug. 15, 1864; the second series, June 15, 1865; and the third series, July 15, 1865.

"When due, these notes are payable in money or they are fundable into a 5-20-year bond bearing six per cent in gold. It is optional with the holders of the notes whether to fund them or take the money. The interest is payable every six months from the date of the notes. The amount of the different dates or series is as follows:—

| | |
|--------------------------|---------------|
| Aug. 15, 1st series..... | \$300,000,000 |
| June 15, 2d series..... | 300,000,000 |
| July 15, 3d series..... | 230,000,000 |
| Total..... | \$830,000,000 |

"Consequently, the interest on the June notes is payable Dec. 15th; on the July notes, Jan. 15th; and on the Aug. notes, Feb. 15th.

"The 5-20-year six per cent bonds are of three issues, payable after five years from their date. The Government has the option to pay them off or to let them run to maturity, which is twenty years from their date. Observe that the Government can act at any time on this option after the first five years from date. It is this feature of the bonds that gives the name of 5-20s. They all bear six per cent interest in gold, payable May and November:—

| | |
|--------------------------------------|---------------|
| First, series (old), dated 1862..... | \$514,780,500 |
| Second series (new), dated 1864.... | 100,000,000 |
| Third series (newest), dated 1865.. | 55,000,000 |

"From the conditions above set forth it is plain that the 'new' and 'newest' issues are the most desirable bonds. The 'old' issues are bought to fill foreign orders with, and this is the only reason why they bring a better price.

"The bonds of 1881 have till that year to run with no power on the part of the Government to pay them off before they mature. They bear six per cent interest in gold, payable Jan. and July. The total of these bonds is \$198,746,400.

"The 10-40 five per cent bonds are called 10-40s because the Government can pay them off at any time after ten years from their date, which is March 1, 1864. They bear gold interest, payable March and September.

"Compound interest notes have become a desirable investment. There are a good many issues of these notes—we give a table of them:—

| Date | Maturity | Interest at 6% p-ct. earned | Market price |
|----------------|----------------|-----------------------------|--------------|
| June 10, 1864. | June 10, 1867. | 8½ per ct. | 105 @ 105½ |
| July 15, 1864. | July 15, 1867. | 8½ per ct. | 104½ @ 104½ |
| Aug. 15, 1864. | Aug. 15, 1867. | 7½ per ct. | 103½ @ 104 |
| Oct. 15, 1864. | Oct. 15, 1867. | 6½ per ct. | 102½ @ 103 |
| Dec. 15, 1864. | Dec. 15, 1867. | 5½ per ct. | 101½ @ 102 |

"Of the notes dated in 1864, there are about 145 millions outstanding; and there are some 25 millions dated in 1865, but these latter do not as yet bear much premium."

THE body of an average-sized man presents a surface of about 2,160 square inches, or fifteen square feet, and consequently sustains at the sea level a total atmospheric pressure of 34,400 pounds, or nearly 14 tons and a half.

PROF. SCHMID, of the University of Jena, has calculated the weight of the atmosphere, omitting its watery vapor and carbonated hydrogen, at 612,469,861,187,051 tons.