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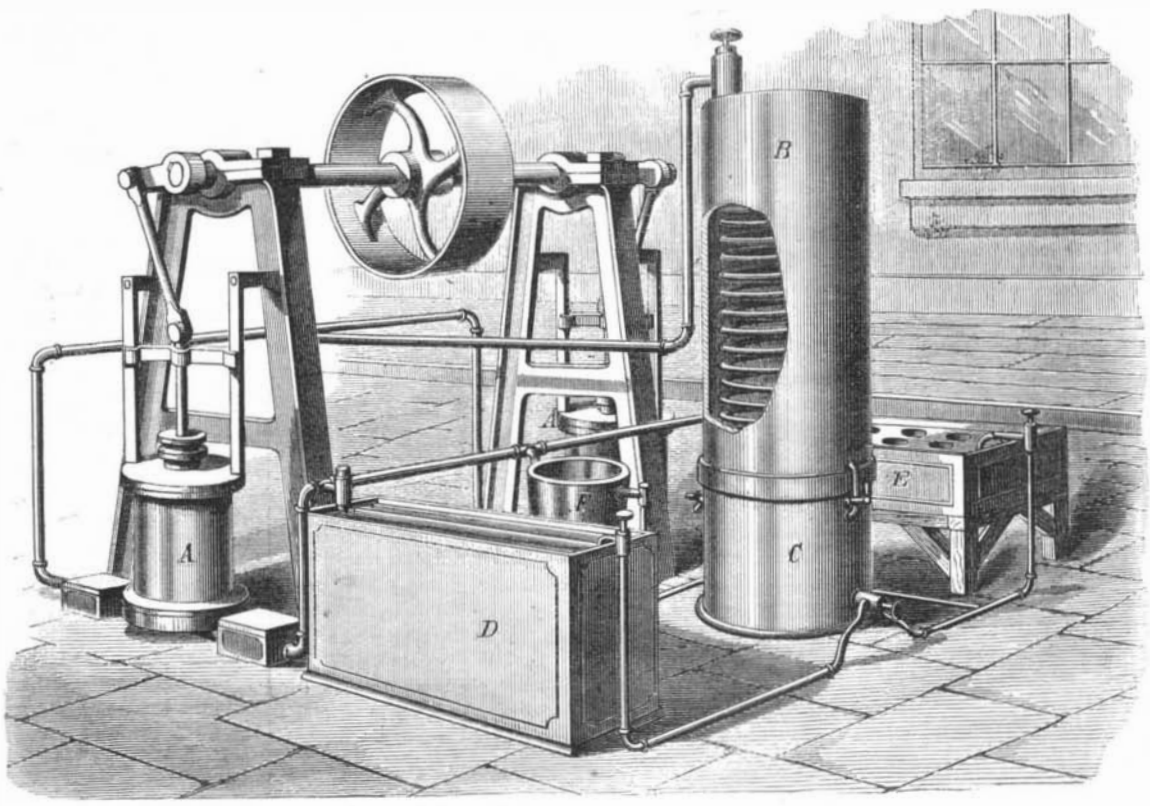
ETHER ICE MACHINE.

The improved ice making machine, illustrated in our engravings, is the invention of Mr. A. Mühl, of San Antonio, Texas, and was patented through the Scientific American Patent Agency, November 28, 1871. The apparatus is of the class in which volatile fluids, such as ether, are used for the freezing liquid, and in which the vaporized ether is again liquefied by means of condensation and pressure, and the improvements made are of a character to insure a ready, sure, and economical reduction of the vapor to a liquid state before it is allowed to reach the freezing vessels.

Fig. 1 gives a perspective view of the machine. At A are the pumps, which are connected with the driving shaft as shown. B is the condenser, which is broken away at the side in the engraving, in order to show the form of the contained worm.

The latter communicates, through the pipe seen on the outer casing of the condenser, with the reservoir, C, below. At D, E, and F, are freezing vessels of various forms. The system of pipe connections between the pumps, condenser, and freezing vessels, by which the volatile fluid is kept circulating through the machine, will be understood by inspecting the engraving. The general operation may be described in a few words. Each pump, as its piston rises, draws in from the freezing vessels the ether which has been vaporized by the heat abstracted from the water or other liquids contained in them; as its piston descends, the vapor of the ether is forced into the worm of the condenser and thence into the reservoir, C, into which it falls in a liquid state; it then passes into the freezing vessels, where it is reconverted into vapor, and from them back into the pumps. The pumps have their induction pipes provided with suction valves (see Fig. 4) and their eduction pipes with exhaust valves.



MUHL'S ETHER ICE MACHINE.

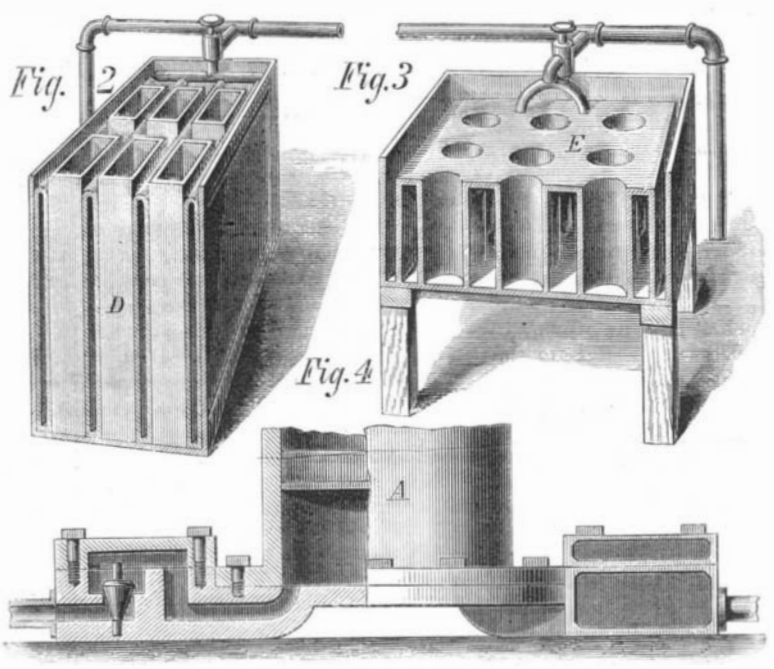
It has been customary to make the worm, which is the principal agent by which the vapor is reduced to a liquid, of a pipe of uniform cross section throughout, but this method was objectionable for the following reasons: If a small pipe was used, it was difficult to force the vapor through fast enough, and an unnecessary amount of power was consumed without effect. On the other hand, if the pipe was of the customary size—from one to two inches in diameter—only the layer of vapor immediately in contact, or nearly so, with its sides, was condensed, and the remaining uncondensed portion was discharged into the reservoir, there to be condensed at the expense of considerable power; or was, perhaps, caused to enter the freezing vessel before condensation was effected, and thereby defeat the object intended.

To obviate these difficulties the inventor uses, in this machine, a worm composed of pipes of several different sizes. Several coils of the large pipe, say of one inch and a half in diameter, are used at the point of entry, and are followed by coils of inch, half inch, and quarter inch, by the last of which the exit is made. By this means no resistance is offered to the passage of the vapor at its commencement, and all parts of its body are afterwards brought sufficiently near the sides of the pipe to insure its condensation before the reservoir is entered. Thus power is saved, and the full effect of the freezing apparatus developed.

The condenser, B, is kept full of running water while the machine is in operation, and the action of the latter is regulated and kept under complete control by the aid of various valves and stop cocks attached thereto.

Three kinds of freezing vessels are shown in our engravings. The one at D, shown in detail in Fig. 2, contains cans, in which blocks of ice are produced. These cans stand between hollow metallic partitions, through which the freezer passes. The vessel, E, seen also in Fig. 3, is provided with receptacles for holding bottles or other small vessels, around which the other circulates. That at F is of conical form and has double walls for the passage of the ether. Within it may be placed a vessel containing the article to be frozen.

The machine has been in successful operation in Texas since 1867. Further informarion on the subject may be obtained by addressing E. Fixary, P. O. Box 350, New Orleans, La., or C. L. Gogin, 87 Custom House street, same city, or A. Mühl, Waco, Texas.



Separating Silver from Copper.

R. Palm prepared the nitrate of silver from small Russian coins containing a considerable percentage of copper. A rapid separation was necessary, and the utensils generally employed in effecting this separation of the two metals were wanting. Under these circumstances he restored to concentrated nitric acid, the different behavior of the two metals to the acid producing the separation.

The solution of the coin is evaporated to the consistency of a thick, oily liquid; it is then mixed with concentrated nitric acid (free from hydrochloric acid), when the silver salt will be precipitated in a crystalline form, while the copper remains in solution. The precipitate, which still has a blueish cast from adhering copper, is easily freed from it by washing it three or four times with concentrated nitric acid; it becomes then perfectly white and free from copper. The acid which still adheres to the silver salt evaporates by drying. It is absolutely necessary that the solution of the two metals is only evaporated to the oily consistency; for when we evaporate to dryness, the copper will adhere so firmly to the silver that it can only be separated from it with difficulty. The more concentrated the nitric acid, the more complete will be the precipitation; but even a specific gravity of 1·250 will answer. For every part of solution of the metals, three to four parts of nitric acid are necessary.

Flower Gardens and Pleasure Grounds.

A writer in *The American Farmer*, a first class agricultural monthly, published by Samuel Sands & Sons, Baltimore, Md., says: "Unfortunately for those who delight in rural summer retreats, and take delight in Flora's offerings, the months of July and August are meager in trees and shrubs which produce flowers at that period; this lack does not arise because the necessary articles are unattainable, but rather that attention has not been drawn to them; and to this end we will here enumerate a few, promising to enlarge the list at no very distant date. As shrubs we have, first, the *Clethora utnifolia*, whose flowers are white and fragrant; hight of bush, 4 to 6 feet. Then there is the free growing *Vitix Agnus Castus*, better known as the chaste tree, and of which there are two varieties, one of them blue and the other pale lilac, both of which should be in every collection of any pretension. *Hydrangea quercifolia* has large branches of greenish white flowers, and lobed leaves like those of an oak, and is a conspicuous and well marked article; and so is its congener *H nivea*, with white flowers and entire leaves, which are green on the upper and snow white on the under surface; both attain a hight of 3 to 6 feet. *Buddlea Lindleyana*, which grows from 6 to 8 feet high, is a very desirable bush, and should be more planted, producing, as it does, during most of the summer months, its long pendant spikes of blue flowers which come admirably into play when making up a table bouquet; to this we would add another beauty, namely, *Ceanothus thyrsiflora*, bearing flowers like an ostrich feather, of a pale blue color. *Spiræa callosa, S. callosa alba*, the first bearing pink and the latter white flowers, deserve a place here as well as in every garden.

Belonging to the small tree kind, we recommend *Kolreuteria paniculata*, or balloon tree, as some people call it, which bears yellow blossoms on long erect spikes; and as a suitable companion to this plant *Lagerstremeria indica*, of which there are three or four varieties, one bearing pink, another purple, and a third bearing scarlet flowers we have also got the white flowering kind, but cannot vouch for the latter proving hardy; in truth, all of the varieties require protection during the winter north of Baltimore, yet there is no plant that will better repay a little care than this same *crape myrtle*. The *althea* is a very popular tree or bush, and it embraces a great many varieties, both single and double flowered; but apart from the value of the flowers, there are two or three kinds very attractive by their variegated foliage, which latter feature in floricultural productions has of late years claimed more prominence than we think it deserves. While bringing forward to the light the above desirable trees and shrubs, we would, with great respect, remember as seasonable the Virginia and Chinese trumpet flower; the first so well adapted to cover stumps of trees or old walls gone into decay, the last just the thing to plant against a summer house, or as a solitary bush on a lawn, where its robust growth will soon produce a stem strong enough to support its head erect. A new plan of growing the wisteria is to train it to a stake, six feet high, and when it reaches the top, head it off. The second year, or the third, it will support itself and form an umbrella shaped head, with hanging flowers.

In looking over files of the Melbourne (Australia) *Leader*, we observe that there is considerable activity among inventors in that distant but enterprising colony. Several patents are granted every week, and improvements are the order of the day.