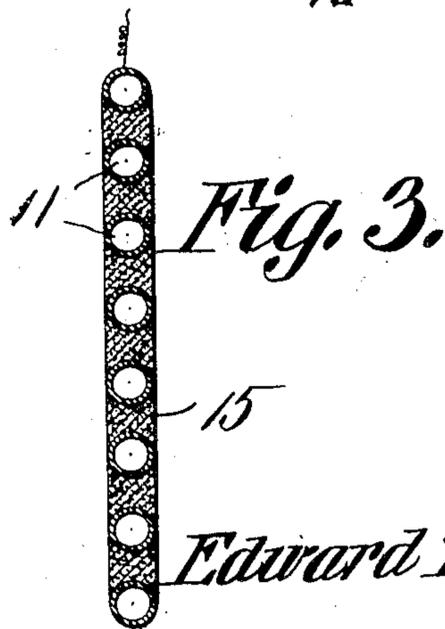
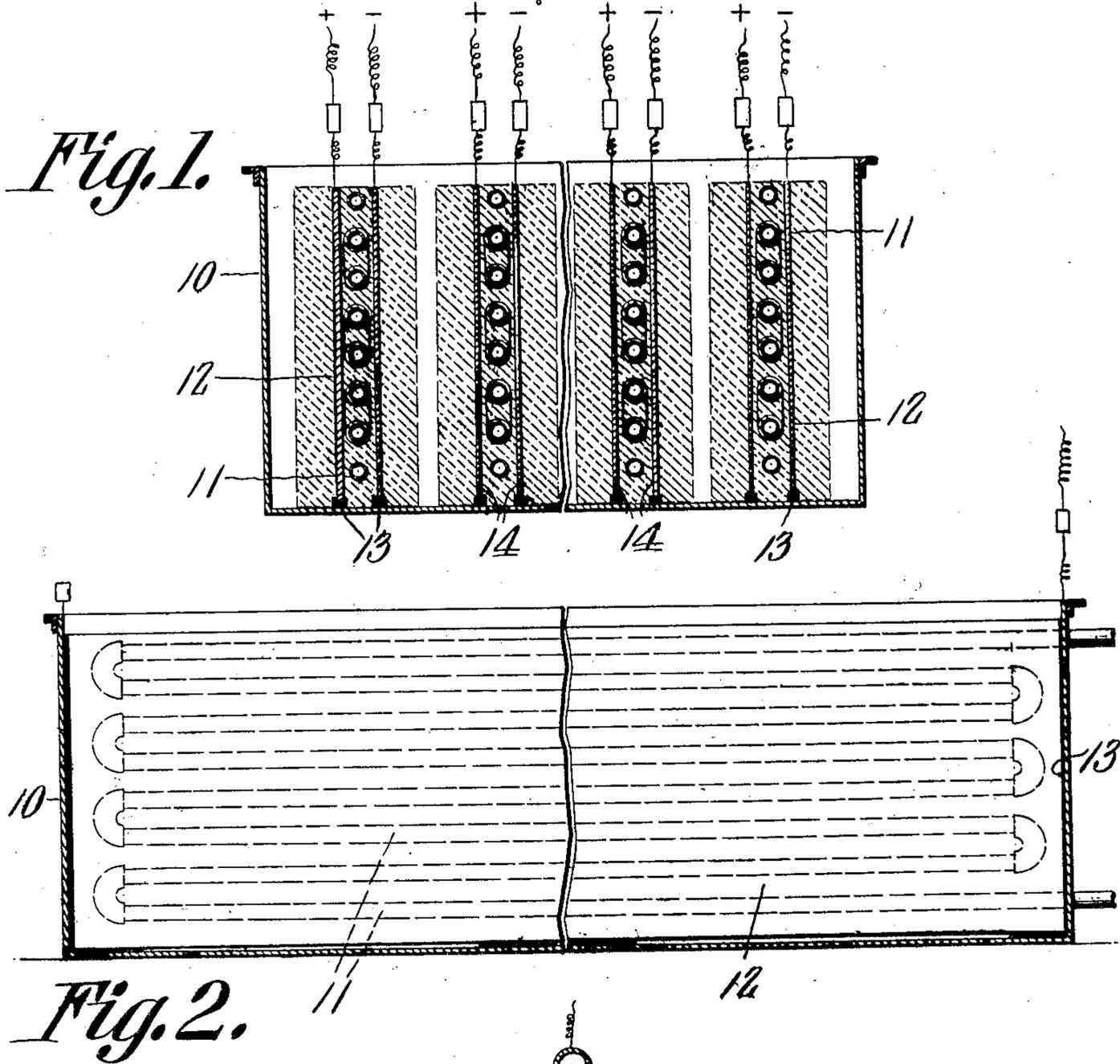


No. 882,224.

PATENTED MAR. 17, 1908.

E. T. WILLIAMS.  
ICE MAKING APPARATUS.  
APPLICATION FILED JULY 28, 1906.



WITNESSES:  
*E. J. Stewart*  
*J. W. Parker*

*Edward T. Williams*  
INVENTORS  
By *Chas Snowlee*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

EDWARD T. WILLIAMS, OF NEW YORK, N. Y.

## ICE-MAKING APPARATUS.

No. 882,224.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed July 28, 1906. Serial No. 328,199.

*To all whom it may concern:*

Be it known that I, EDWARD T. WILLIAMS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Ice-Making Apparatus, of which the following is a specification.

This invention relates to mechanism employed for the manufacture of ice, and has for its principal object to reduce the time, labor and expense of harvesting the ice made by the so called "block" system of ice making. This method as ordinarily practiced consists in arranging the ammonia expansion coils directly within the tank of water to be frozen, the ice forming on the pipes until a block of any desired thickness has been made. The ice must then be cut from the pipes, and several methods of accomplishing this are now in use, one consisting in the employment of a cutter mounted on a carriage and having at its lower edge a small pipe which is maintained at high temperature by passing steam therethrough. The cutting frame is lowered and gradually melts the ice at the sides of the pipe. This method is extremely wasteful and requires considerable time.

The principal object of the present invention is to provide means whereby the ice may be very quickly harvested at minimum expense.

A further object of the invention is to provide an ice making machine in which plates are used to shape the sides of the block of ice, and to provide means for raising the temperature of such plates, so that by melting the outer surface of the block of ice, the latter will be automatically detached from the plates and float to the surface.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a sectional elevation of the freezing tank of an ice making apparatus constructed in accordance with the invention. Fig. 2 is a lon-

gitudinal sectional view of the same. Fig. 3 illustrates a slight modification of the invention.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The tank 10 may be of any suitable size and shape, and is filled with water to be frozen into blocks of ice.

Arranged within the tank are vertically disposed coils 11 formed of superposed horizontal runs of tubing through which ammonia is allowed to pass, the ammonia expanding and absorbing the heat from the surrounding water. On each side of each coil is arranged a vertically disposed plate 12 preferably formed of metal which will offer some resistance to the passage of an electric current. The lower edge and the opposite ends of each plate engage with insulating material, as indicated at 13 in order to avoid contact with the bottom and side walls of the tank and prevent the plate and coils coming into contact.

The plates are placed within about one inch of the sides of the coil, so that the conduction of heat from the plates to the ammonia pipes will be reduced by a layer of ice between the plates and pipes, to prevent the heat being carried off by the ammonia faster than it is practicable to supply it by the electric current. The plate offers much less resistance to the passage of heat than the ice does, therefore it will not interfere with the freezing process in the slightest degree.

The adjacent plates are preferably connected in series with a source of electrical energy, and when it is desired to harvest the ice, the switch is closed in order to connect the plate in the circuit. The resistance offered by the plates to the passage of the current is sufficient to raise the temperature of these plates above the freezing point and supply the heat fast enough to make up for the transmission through the ice to the ammonia expansion coils. When the temperature of the plates becomes sufficiently high to release the ice, the buoyancy of the ice will carry it free from the plate, where it may be elevated from the tank by means of suitable hoisting gear in the ordinary manner.

In some cases the space between the tubes which go to form a coil may be closed, so that the tubes, with the filling material will form a practically solid block to divide

blocks of ice. After the water has been frozen, a current of electricity may be sent through the coil itself, and the latter heated to an extent sufficient to cause the release of the blocks, as shown for instance in Fig. 3.

I claim:—

1. In ice making apparatus, a tank, an expansion coil arranged therein, a metal plate arranged at one side of the coil and on which the ice forms during the freezing operation, a source of electrical energy, and means for connecting the plate to the source of energy for the purpose of raising the temperature of the plate and freeing the ice without stopping the flow of the refrigerant through the expansion coil.

2. In ice making apparatus, a tank, a freezing member arranged therein and having means for the circulation of the refrigerant, said member being provided with a solid continuous surface on which the ice forms, and means for passing a current of electricity through a portion of said member to raise the temperature of said solid continuous surface and thus free the ice without stopping the flow of the refrigerant.

3. In ice making apparatus, a tank, an expansion coil arranged therein, a metal plate arranged on each side of the coil and on which the ice forms during the freezing operation, said plates being spaced apart to form an intermediate freezing chamber which communicates with the interior of the

tank, a source of electrical energy, and means for connecting the plates to the source of energy for the purpose of raising the temperature of the plates and freeing the ice without stopping the flow of refrigerant through the coil.

4. In ice making apparatus, a tank, a vertically arranged expansion coil disposed therein, plates arranged on opposite sides of the coil and electrically insulated from the tank, said plates being spaced apart to form an intermediate freezing chamber which communicates with the interior of the tank, a source of electrical energy, and means for connecting the plates to the source of energy to raise the temperature of such plates and free the ice without stopping the flow of refrigerant through the coil.

5. In ice making apparatus, a freezing member including means for the circulation of a refrigerant, and means for passing an electrical current through a portion of said member to thereby heat the same and detach the ice without stopping the flow of the refrigerant.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD T. WILLIAMS.

Witnesses:

FRANK S. DIX,

MABEL O. FAHNESTOCK