

No. 683,933.

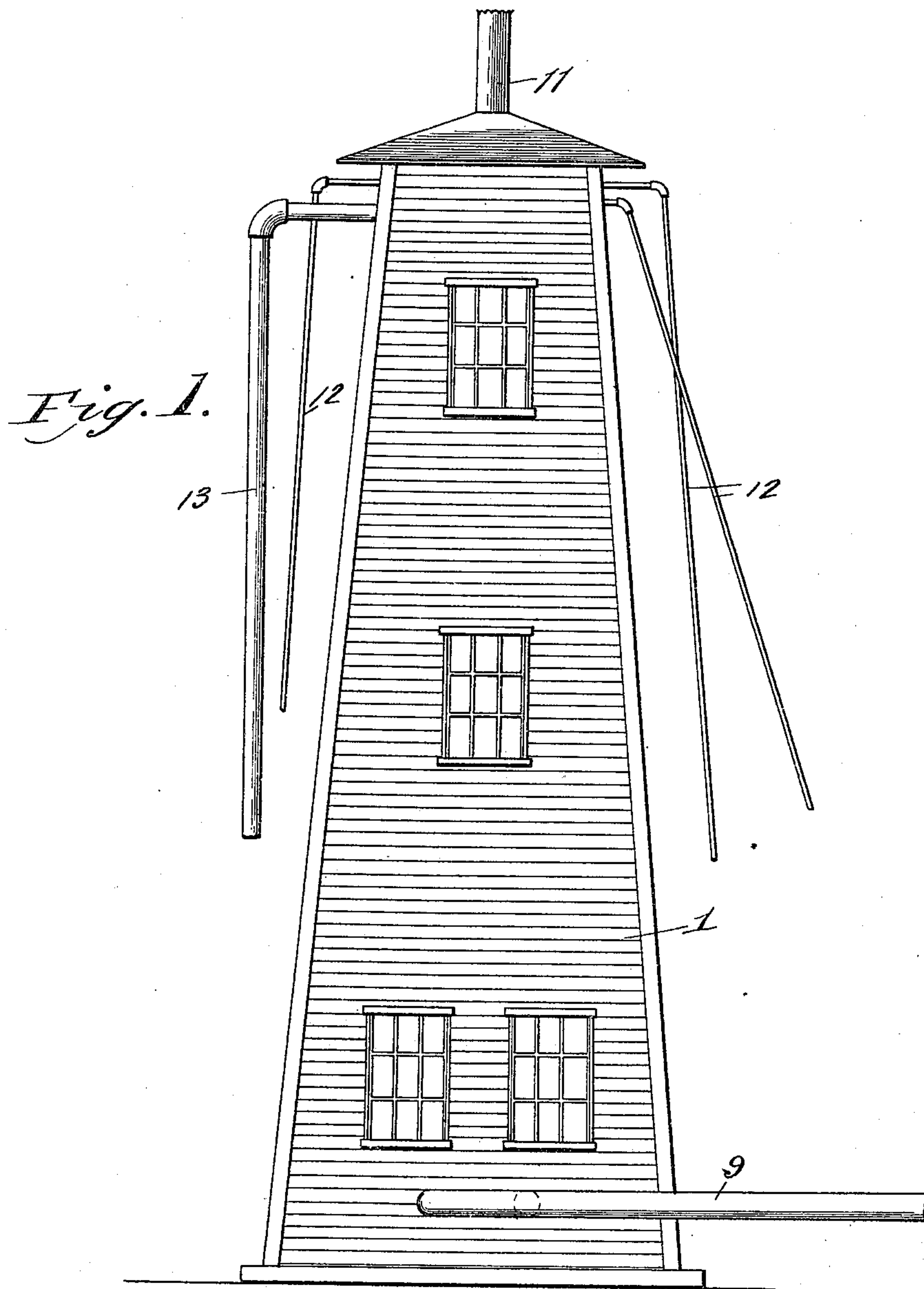
Patented Oct. 8, 1901.

W. H. A. HALSALL.
COOLING TOWER.

(Application filed Dec. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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J. W. Garner

W. H. A. Halsall, Inventor.
by *C. A. Snow & Co.*
Attorneys

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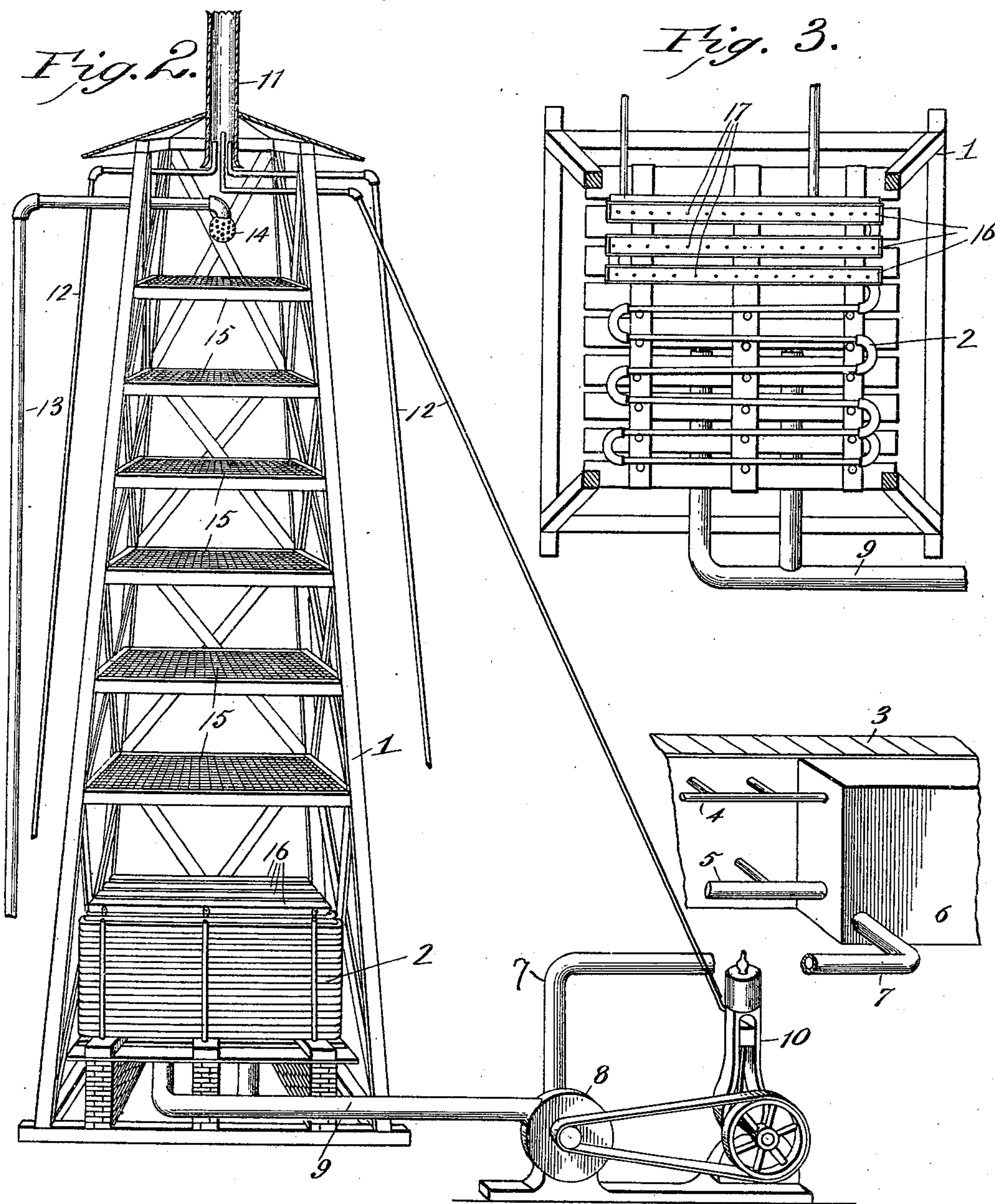
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UNITED STATES PATENT OFFICE.

WILLIAM H. A. HALSALL, OF CHARLESTON, SOUTH CAROLINA, ASSIGNOR OF
ONE-HALF TO SAMUEL LAPHAM, OF SAME PLACE.

COOLING-TOWER.

SPECIFICATION forming part of Letters Patent No. 683,933, dated October 8, 1901.

Application filed December 24, 1900. Serial No. 40,959. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. A. HALSALL, a citizen of the United States, residing at Charleston, in the county of Charleston and State of South Carolina, have invented a new and useful Cooling-Tower, of which the following is a specification.

My invention is an improved cooling-tower especially designed for lowering the temperature of the cooling-coils of an ice-making plant, in which coils the ammonia-gas is liquefied; and it consists in the peculiar construction and combination of devices hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is an elevation of a cooling-tower embodying my improvements. Fig. 2 is a sectional perspective view of the same and of portions of an ice-making plant. Fig. 3 is a sectional plan view of the same, taken on a plane above the cooling-coils.

While my improved cooling-tower is adapted for use for a variety of purposes, I herein show and will describe the same as a feature in an ice-making plant wherein the cooling-tower is employed specifically for the purpose of lowering the temperature of the cooling-coils in which the ammonia-gas is liquefied.

In the tower 1, near the base thereof, are the cooling-coils 2. The refrigerating-tank 3 has the inlet-pipe 4 and the outlet-pipe 5 communicating therewith in the usual manner, and said pipes, which conduct liquid at a low temperature, pass through a duct 6, to which air is admitted, the air in the said duct being cooled by the said pipes, as will be understood. A pipe 7 leads from the air-duct 6 to the casing of a fan 8, and a pipe 9 leads from the said casing to a point within the tower, near the base thereof and below the cooling-coils 2. This fan is driven by an engine (indicated at 10) and which may be of any suitable construction, and it will be understood that cold air is admitted to the base of the tower.

In the top of the tower is an eduction-tube 11, which is open at its upper and lower ends, the latter communicating with the interior of the tower. Suitable exhaust-pipes 12, which connect with the engine and pumps, forming

elements of the ice-plant, discharge upward in the lower end of the eduction-tube 11. In Fig. 2 of the drawings one of these pipes 12 is shown as connected with the steam chest or cylinder of the engine 10 to exhaust therefrom. The pumps to which the other pipes 12 are connected are not shown. Any number of these exhaust-pipes 12 may be employed, the function thereof, as will be understood, being to create an upward current of cold air within the cooling-tower.

A water-pipe 13, which leads from a suitable source of water, as a pump or the like, (not here shown,) enters the tower, near the top thereof, and is provided with a spraying-nozzle 14, which is adapted to discharge a shower of water downward in the tower, as will be understood.

Disposed within the tower at suitable distances apart are a series of gratings 15, the meshes of which are of suitable size to break up and atomize the drops of water showered thereon and which descend in opposition to the ascending current of cold air in the tower. By thus atomizing the water the evaporation thereof is very greatly promoted, and hence the cooling of the coils 2 is more efficiently performed, as will be understood.

In order to cause the water to reach all portions of the cooling-coils 2, I provide a series of troughs 16, which are preferably V-shaped in cross-section and are disposed on the respective coils 3 and provided in their bottoms throughout their longitudinal extent with series of perforations 17, through which the water which is collected by the said troughs is conducted directly to and upon the cooling-coils, so that the latter are wetted exteriorly throughout their entire extent and prevented from rusting.

Having thus described my invention, I claim—

1. In apparatus for making artificial ice, a tower having cooling-coils in the lower portion thereof, means to supply air to the base of the tower, means to exhaust air from the upper end of the tower and thereby create an ascending current of air therein, means to shower water downward in the tower, and troughs above said coils to collect the descending water, said troughs being perforated and

discharging onto said coils, substantially as described.

2. The combination of a tower, means to spray liquid downward therein, cooling-coils
5 in the base of the tower, a refrigerating-tank, having pipes through which liquid at a low temperature circulates, a duct through which said pipes pass, said duct being adapted for the admission of air thereto, and lowering the
10 temperature thereof, means to force said cold air from said duct into the base of said tower and means to exhaust air from the top of the tower and thereby cause said cold air to rise through the descending spray of liquid, sub-
15 stantially as described.

3. In apparatus for making artificial ice, the combination of a tower, means to spray liquid downward therein, an eduction-tube at the top of the tower, cooling-coils in the
20 base of the tower, a refrigerating-tank having pipes through which liquid at a low temperature circulates, a duct through which said pipes pass, said duct being adapted for the admission of air thereto and lowering the

temperature thereof, a blower to force said 25 cold air from said duct into the base of said blower, an engine to operate said blower, and an exhaust-tube leading from said engine and discharging upward in said eduction-tube, for the purpose set forth, substantially as de- 30 scribed.

4. The combination of a tower adapted for the escape of air at the top thereof, means to spray liquid downward therein, cooling-coils in the base of the tower, a refrigerating-tank 35 having pipes through which liquid at a low temperature circulates, a duct through which said pipes pass, said duct being adapted for the admission of air thereto, and means to force said cold air from said duct into the 40 base of said tower, substantially as described.

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

WILLIAM H. A. HALSALL.

Witnesses:

E. T. WITHINGTON,
LAURENCE G. KEOGH.