

No. 715,574.

Patented Dec. 9, 1902.

J. E. HAARMANN.  
COOLING APPARATUS.  
(Application filed Jan. 8, 1902.)

(No Model.)

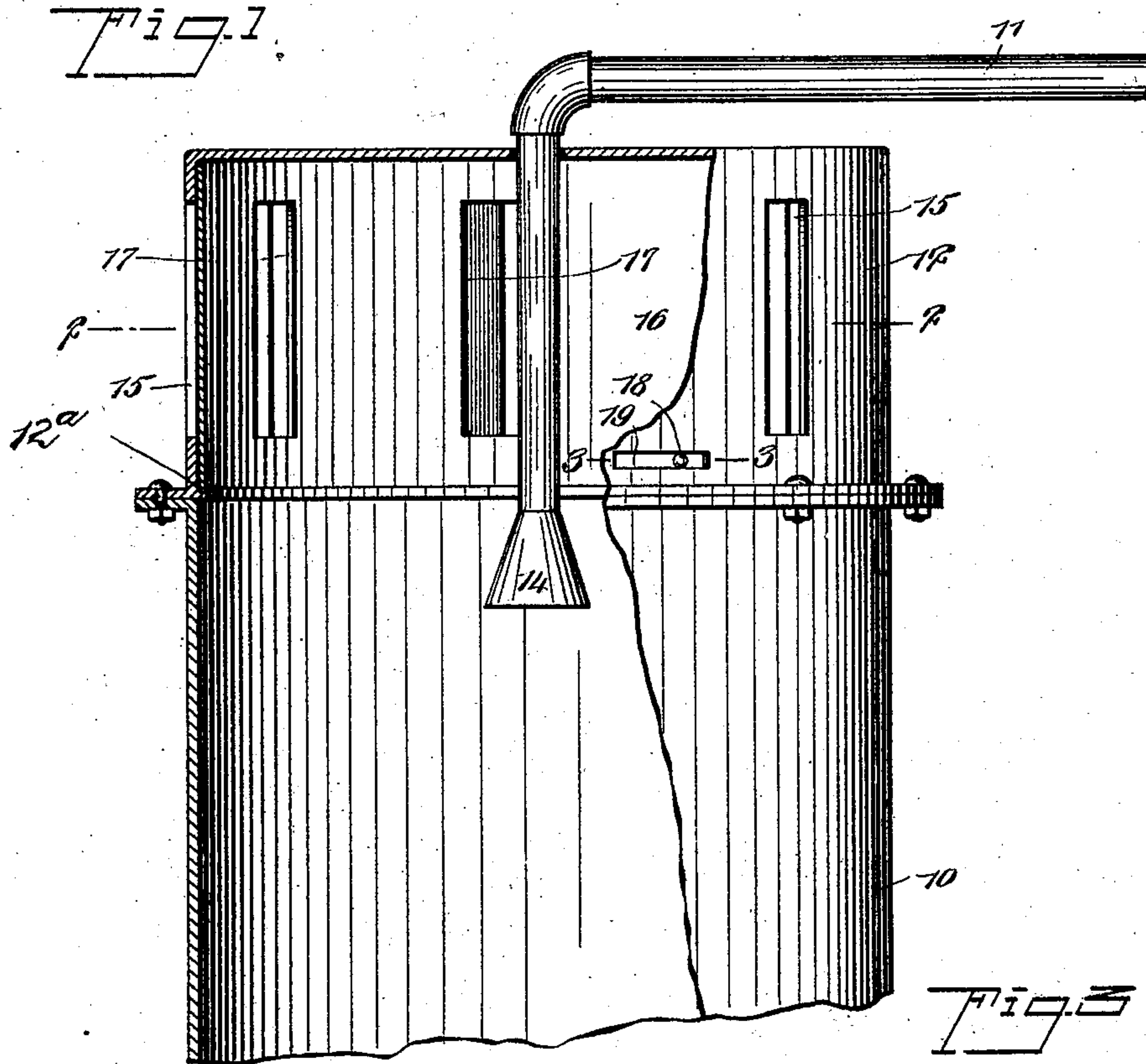
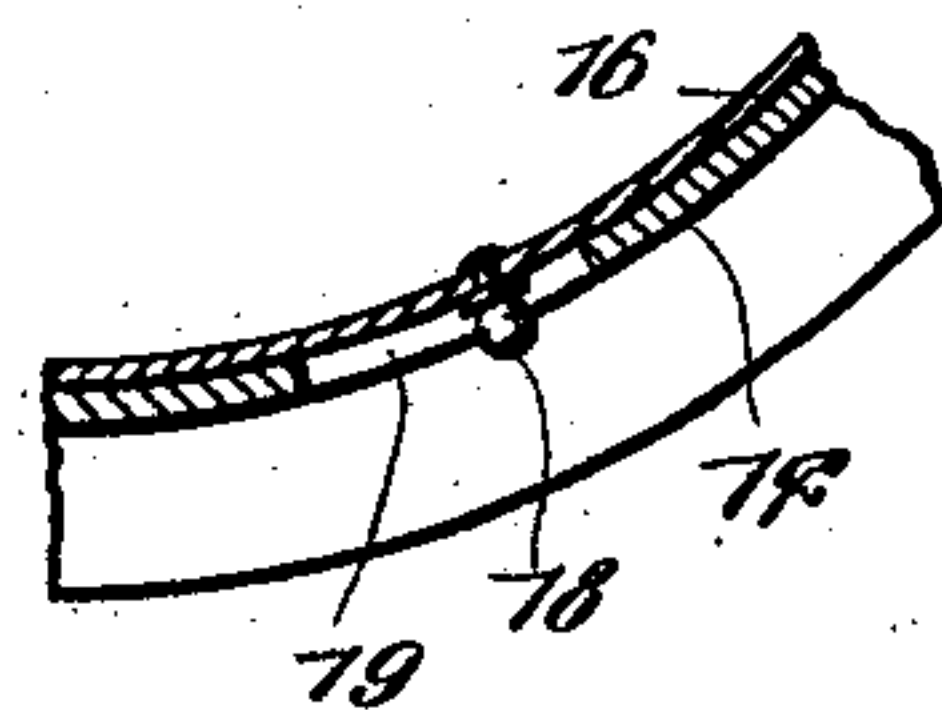
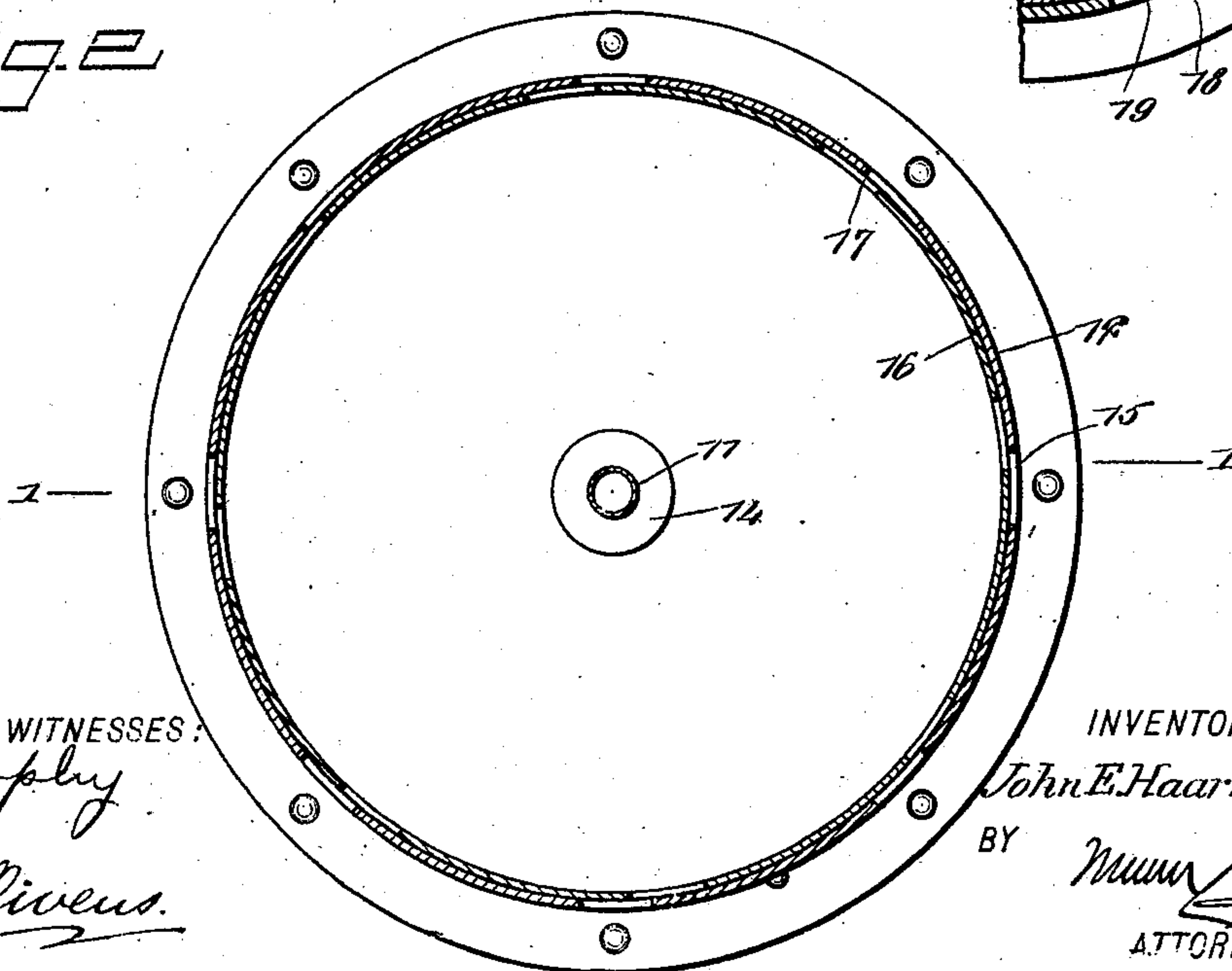


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 715,574, dated December 9, 1902.

Application filed January 8, 1902. Serial No. 88,823. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. HAARMANN, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented a new and Improved Cooling Apparatus, of which the following is a full, clear, and exact description.

This invention relates to an apparatus for cooling fluids, particularly liquid or semiliquid substances. It is especially adapted for use in distilleries, starch and sugar factories, breweries, glucose-works, and other manufacturing factories where material is cooked or boiled.

This specification is a specific description of one form of the invention, while the claims are definitions of the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an elevational view with parts in section on the line 1 1 of Fig. 2. Fig. 2 is a sectional view on the line 2 2 of Fig. 1, and Fig. 3 is a detail section on the line 3 3 of Fig. 1.

10 indicates a stand-pipe or hollow column, which may be of any length and form desired and which is open at its lower end to lead off the material passing therethrough.

11 indicates a pipe passing from the cookers or apparatus in which the fluid is heated. This pipe passes down through a cap 12, fastened rigidly on the upper end of the pipe 10, and the pipe 11 is provided with a funnel-shaped or flared discharge end 14, so as to cause the fluid as it passes from the pipe to be spread or sprayed out throughout the entire area of the enlarged cooling-pipe 10. The cap 12 is provided with a number of orifices 15 therein, through which air is adapted to be drawn into the pipe 10, and also has an annular internal bead 12<sup>a</sup> near its bottom. Within the cap is arranged an annular regulating-ring 16, which rests loosely on the bead and in which are formed openings 17, adapted to register with the openings 15 in the cap 12.

18 indicates a knob connected to this ring 16 and projecting through a slot 19 in the cap 12. By means of this knob the ring 16 may

be turned so as to regulate the size of the air-inlet openings of the apparatus.

In operation the heated liquid passing through and discharged from the pipe 11 will spread out in the enlarged cooling-pipe 10 and will pass down the same. This will induce currents of air to enter through openings in the cap 12 into the cooling-pipe 10 and to be drawn down through the same into the liquid. Thus a steady current of air is drawn in with the liquid and the liquid is spread or divided, so that the air may exert its cooling influence upon all the particles of the liquid.

If desired, additional air-inlet openings may be formed at various points along the length of the cooling-pipe, thus increasing the cooling effect. I have not illustrated this arrangement, since it will be obvious to skilled mechanics. Also the air-inlet may be omitted entirely and the cooling done by contact with the sides of the pipe.

Various changes in the form and details of my invention may be resorted to at will without departing from the spirit of my invention. Hence I consider myself entitled to all forms of the invention as may lie within the intent of my claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus for cooling liquids, comprising an elongated body portion or cooling-chamber open at each end, a cap fastened to the upper end of said body portion and having at its lower portion an annular interior bead, and having air-inlet openings in its vertical side, an orificed regulator-band located in the cap and bearing on the said bead thereof and movable in the cap to regulate the admission of air, means extending to the outside of the cap to facilitate the operation of the regulator-band, and a liquid-supply pipe passing through the top of the cap into the same and discharging into the body portion longitudinally thereof.

2. An apparatus for cooling liquids, comprising an elongated body portion or cooling-chamber, a cap fastened to and communicating with the upper end of the same, said cap

5 having a closed top and orifices in its vertical sides, a vertically-disposed orificed regulator-band movably carried in the cap and lying against the orificed sides of the cap, for the purpose specified, and a liquid-supply pipe passing through the top of the cap and extending downward into the upper end of the body portion or cooling-chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN E. HAARMANN.

Witnesses:

HARRY G. JORDAN,  
BYRON R. HASTINGS.