No. 629,359. Patented July 25, 1899.

W. W. HARRIS.

APPARATUS FOR CHARGING REFRIGERATING APPARATUS WITH AMMONIA SOLUTION.

(Application filed Apr. 26, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

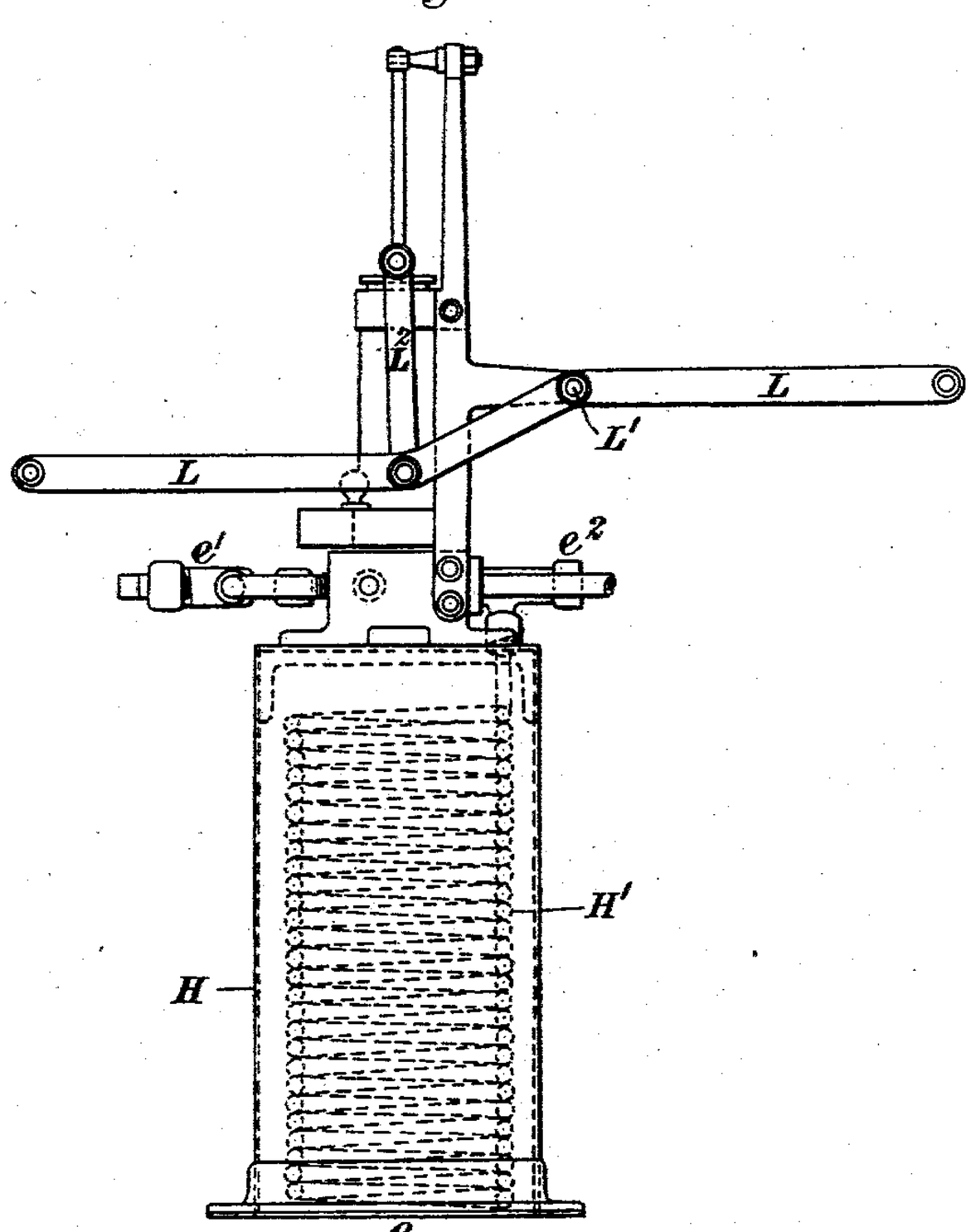
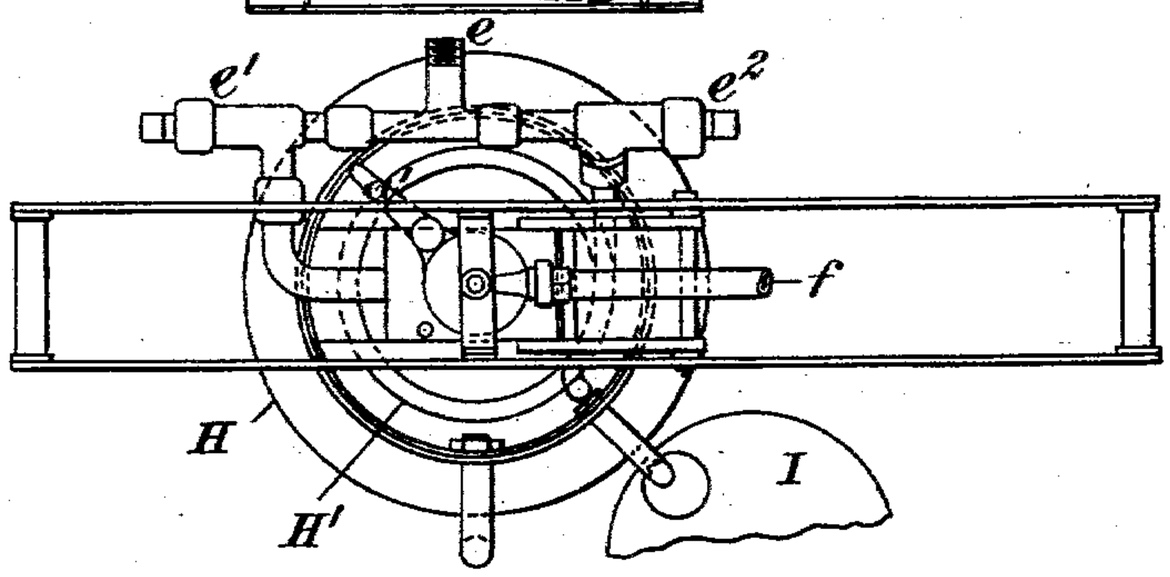


Fig. 2.



Witnesses
A. M. Parkins.
E. A. Babcock

Inventor
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Fig. 3.

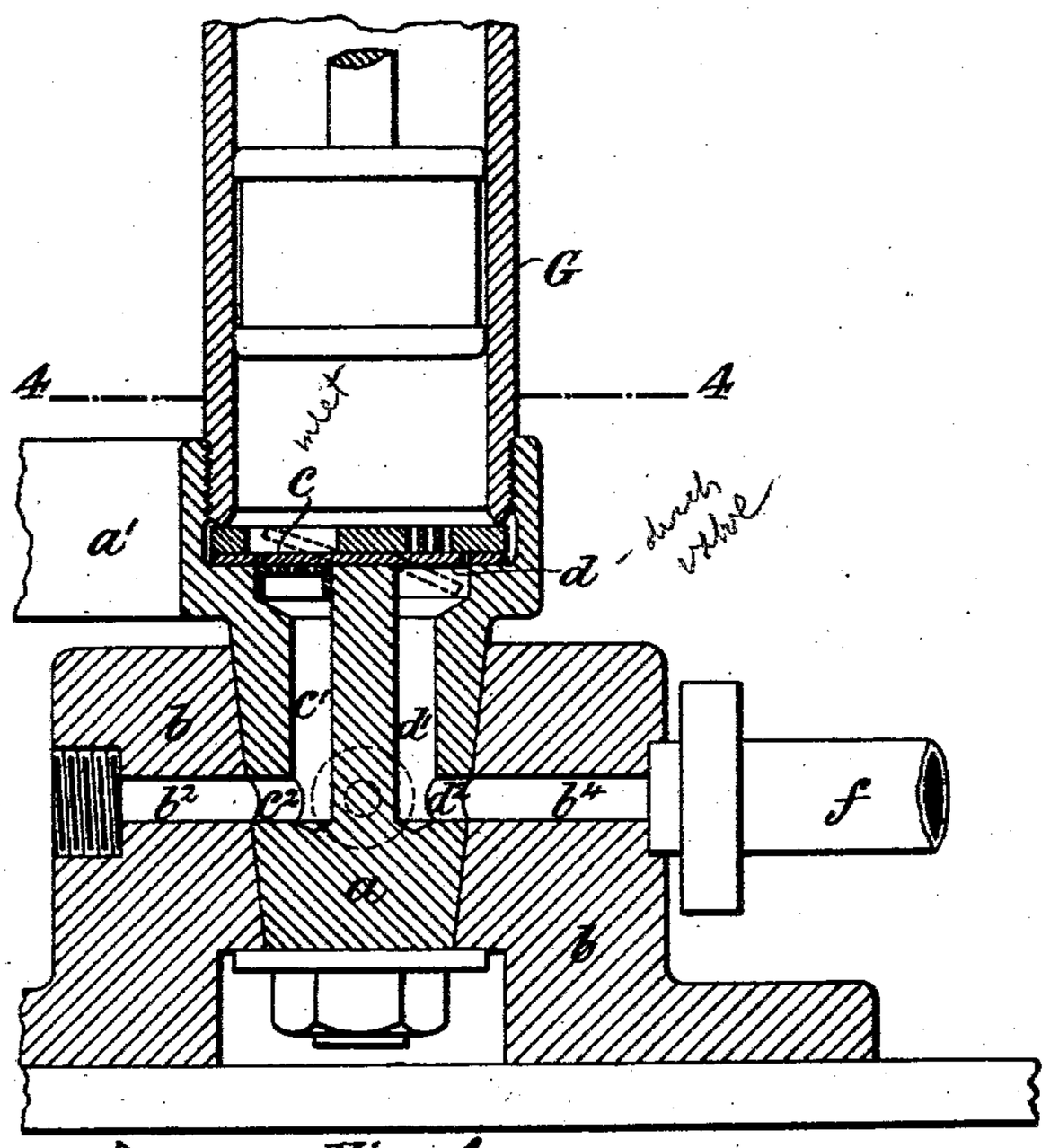
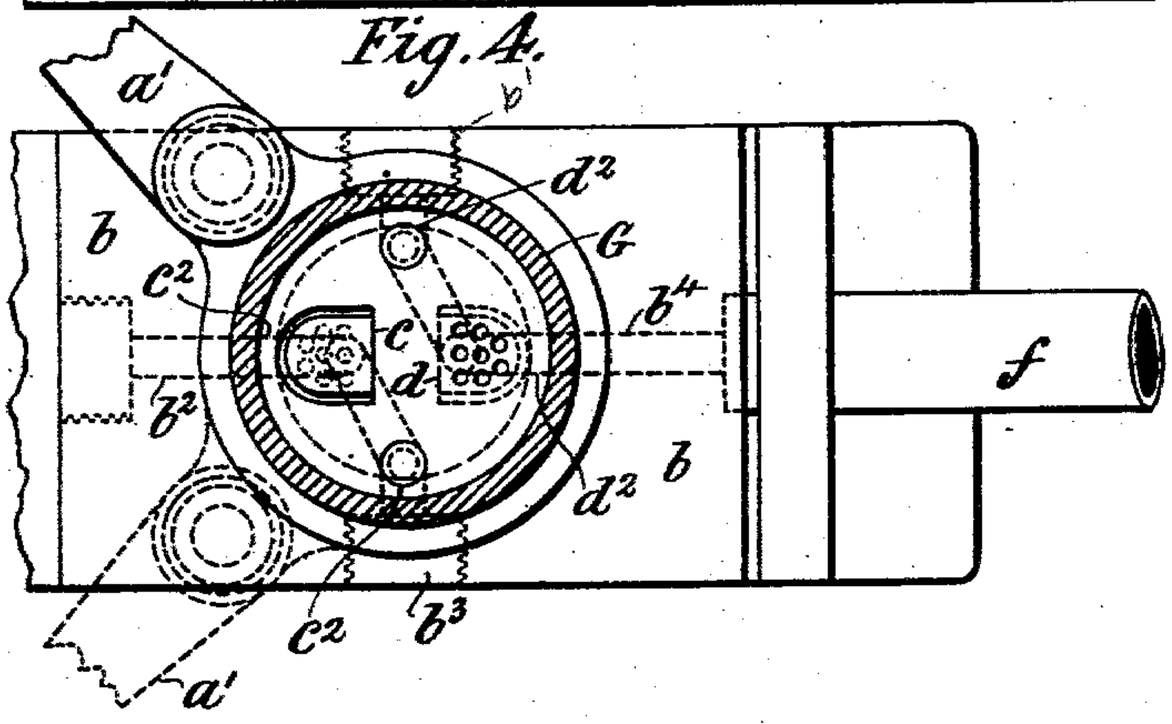


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM WALLINGTON HARRIS, OF LONDON, ENGLAND, ASSIGNOR TO PAUL PFLEIDERER, OF SAME PLACE.

APPARATUS FOR CHARGING REFRIGERATING APPARATUS WITH AMMONIA SOLUTION.

SPECIFICATION forming part of Letters Patent No. 629,359, dated July 25, 1899.

Original application filed October 15, 1898, Serial No. 693,658. Divided and this application filed April 26, 1899. Serial No. 714,538. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WALLINGTON HARRIS, engineer, a subject of the Queen of Great Britain, residing at 43 Regent Square, Grays Inn road, London, England, have invented certain new and useful Improvements in Apparatus for Charging Refrigerating Apparatus with Ammonia Solution, of which the following is a specification.

The apparatus is shown in the drawings hereunto annexed. It is so formed that the pump which forms part of it can be used both for withdrawing air from the interior of the refrigerating apparatus and for subsequently forcing ammonia solution into the combiner.

Figure 1 is a side elevation, and Fig. 2 a plan, of the apparatus. Fig. 3 is a vertical section, on a larger scale, of the lower part of the pump-barrel; and Fig. 4 is a horizontal section on the line 4 4, Fig. 3.

G is the barrel of a vertical pump, and H a tank below the pump, containing a coil of pipe H′. As will be seen from Figs. 3 and 4, the lower part of the pump-barrel has attached to it a conical plug *a*, received into a conical seat in a fixed block *b*. The plug *a* has a handle *a′* extending from it, by which the plug may have a quarter-turn given to it. At the top of the plug are carried the inlet-valve *c* and the delivery-valve *d*, the valve *c* opening upward and the valve *d* downward. The space below the inlet-valve *c* is connected by a passage *c′* with two ports c^2 at right angles to one another in the side of the plug, and similarly the space below the outlet or delivery valve *d* is connected by a passage *d′* with two ports d^2. In the conical seat *b* are four equidistant ports b' b^2 b^3 b^4. The port b' has a pressure-gage (not shown in the drawings) connected to it. The opposite port b^3 is similarly connected with a vacuum-gage. The port b^2 is connected to a pipe *e*, leading from the lower part of the combiner of the refrigerating apparatus which is to be charged with ammonia, and the opposite port b^4 can be connected to a pipe *f*, which is inserted into a vessel K, containing ammonia solution. The pipe *e* is, as shown at Fig. 2, branched at its end, one branch having on it a stop-valve e', being connected with the port b^2 above mentioned, and the other having on it a stop-valve e^2, being connected to the upper end of the coil of pipe H′ in the tank H, above which the pump is mounted. When the stop-cock e^2 is opened and e' closed, water can pass out from the combiner through the coil of pipe H′ and be collected. When the stop-cock e' is opened and e^2 closed and the handle a' on the plug *a* is turned into the position shown by full lines in Fig. 4, the pump can be used for exhausting air and water from the combiner and other parts of the refrigerating apparatus, and when the handle a' has a quarter-turn given to it and is turned into the position shown by dotted lines the pump can be used for drawing ammonia solution from the vessel K and forcing it into the combiner.

L is a lever pivoted at L′, by which a reciprocating to-and-fro movement can be given to the pump-piston.

L^2 is a link passing from the lever to the piston-rod.

This case is a division of my application filed October 15, 1898, Serial No. 693,658.

What I claim is—

1. The combination of a vertical pump, a conical plug at the bottom of the pump-barrel, a corresponding seat in which the plug rests, a port in the conical seat to which a pipe leading from the combiner of a refrigerating apparatus may be coupled, a second port in the conical seat to which a pipe passing into a vessel containing ammonia solution can be coupled, inlet and outlet valves at the bottom of the pump-barrel and passages through the conical plug from below the inlet and outlet valves to ports in its side so situated that the exhaust-valve can be put into connection with one port in the conical valve-seat and the outlet-valves simultaneously put in connection with the other port and so that by giving a partial turn to the pump-barrel the connection can be reversed.

2. The combination of a vertical pump, a tank below it, a cooling-coil contained in the tank, a conical plug extending downward from the bottom of the pump-barrel, a conical seat into which the plug fits, a port in the conical seat to which a pipe having a stop-cock upon it leading from the combiner of the re-

frigerating apparatus may be coupled, a branch on this pipe also having a stop-cock upon it and coupled to the cooling-coil, a second port in the valve-seat to which a pipe passing from a vessel containing ammonia may be coupled, inlet and outlet valves at the bottom of the pump-barrel and passages through the conical plug from below the inlet and outlet valves to ports in its side so situated that the exhaust-valve can be put into connection with one port in the conical valve-seat and the outlet-valve simultaneously put in connection with the other port and so that by giving a partial turn to the pump-barrel the connection can be reversed.

WILLIAM WALLINGTON HARRIS.

Witnesses:
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FRED C. HARRIS.