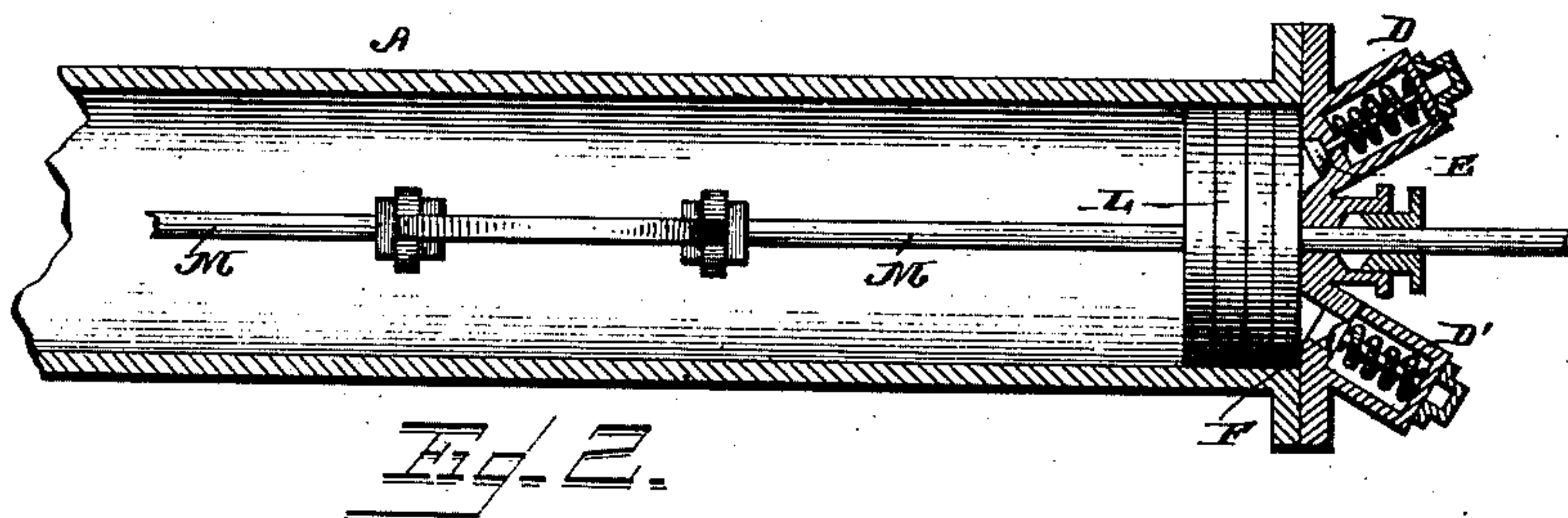
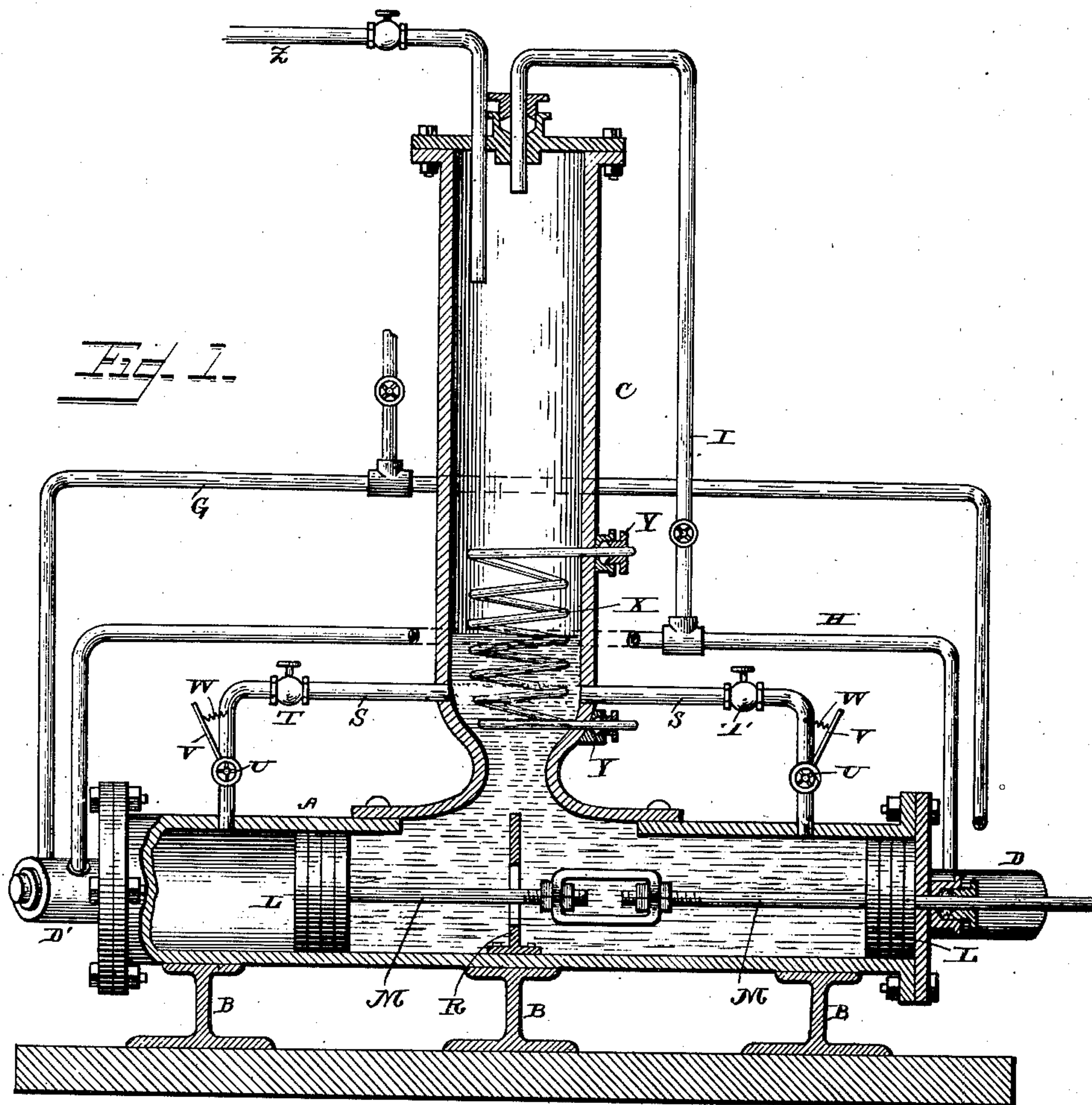


(No Model.)

T. L. RANKIN.
GAS PUMP FOR ICE MAKING MACHINES.

No. 405,503.

Patented June 18, 1889.



WITNESSES

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THOMAS L. RANKIN, OF PHILADELPHIA, PENNSYLVANIA.

GAS-PUMP FOR ICE-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 405,503, dated June 18, 1889.

Application filed January 28, 1888. Renewed March 29, 1889. Serial No. 305,335. (No model.)

To all whom it may concern:

Be it known that I, THOMAS L. RANKIN, of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Gas-Pumps for Ice-Making Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 represents a vertical sectional view of my improved pump. Fig. 2 represents a detached longitudinal sectional view of the pump-cylinder, showing the induction and eduction valves thereof.

This invention relates to certain improvements in gas-pumping machinery especially designed for use in that class of ice-machines in which the refrigeration is produced by the expansion of ammonia; and it has for its objects to provide for more thoroughly and effectively lubricating the pistons of the pump and for cooling the oil employed for the purpose, as more fully hereinafter specified. These objects I attain by the means illustrated in the accompanying drawings, in which—

Letter A indicates the cylinder of the pump, which in the present instance is mounted horizontally upon the supports B, but which may be mounted vertically in any convenient manner. Midway between the ends of the cylinder is an opening, and the cylinder at said opening is provided with a stand-pipe C, which is flanged at its lower end and bolted or otherwise secured to the cylinder. In the present instance it rises vertically at right angles to the pump-cylinder; but in case the pump-cylinder is arranged vertically the stand-pipe will be provided with a curve at its lower end and will extend vertically and parallel with said pump-cylinder. At each end the pump-cylinder is provided with valve-chests D D', provided with automatically-acting puppet or other valves E F, one chest at each end of said cylinder connecting with the induction-pipe G, and the other at each end with the eduction-pipe H, leading by means of a pipe I to the upper part of the stand-pipe C.

The letter L indicates the pistons of the

pump, one located and moving at each side of the central opening in the pump-cylinder. The said pistons are mounted on the piston-rods M, which are connected with each other by an adjustable connection. Midway between the ends of the pump-cylinder is located a deflector R, which has a central opening, through which the piston-rods and their connection work, the object of which will be hereinafter specified.

The letter S indicates a pipe leading into the cylinder at each side of the central opening leading to the stand-pipe and provided with stop-cocks or valves T, and also with valves U, the latter of which are held in a normal position by means of the levers or arms V and springs W, for the purpose hereinafter explained.

In the lower part of the stand-pipe is located a coiled pipe X, the ends of which extend outward through suitable packing-boxes Y, and which connect with a water or gas supply, by means of which a current may be made to circulate through said coils for the purpose of cooling the oil in the stand-pipe and cylinder.

The letter Z indicates the pipes leading to the condenser.

The operation of my improved machine is as follows: The space between the pistons and leading to the stand-pipe is filled with oil, which packs the pistons, preventing any escape of gas between them and the cylinder, while at the same time it lubricates the pistons. During the reciprocation of the pistons the pipe S permits a portion of the oil at each stroke of the pistons to enter the cylinder between one of the pistons and the end of said cylinder, in order to insure thorough lubrication of the piston. This is accomplished by means of the arms or levers V, which are actuated alternately. The valves U in pipe S are preferably arranged to be automatically operated by means of tappets connected with the motor, but not shown in the drawings, which operates the pump. The quantity of oil admitted is regulated by means of the valves. It will be observed that the high pressure is on the inside of the pistons and the low pressure on the outside of the pistons or between the same and the heads of the cylinder. The difference of pressure, it is evident, will force the oil to the low-pressure side when the valves

V are opened without the employment of pumps or other forcing devices. The valves may be so set as to inject the oil on the compression-stroke of the pump. The ammonia gas is forced from the stand-pipe through the pipe Z to the condenser.

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

10 1. The combination, with the cylinder having a central opening communicating with a stand-pipe, of the deflecting-plate located therein below the opening leading to the stand-pipe to insure the proper circulation of the
15 oil, substantially as specified.

2. The combination of the cylinder A, the connected pistons L L therein, the stand-pipe communicating therewith, and the valved pipe S, supplying oil to the cylinder between its
20 heads and the piston, with the valved boxes at the cylinder-heads, respectively, having induction and eduction pipes connecting with the same, all constructed and arranged substantially in the manner and for the purpose
25 described.

3. The combination of the cylinder, the stand-pipe centrally connected thereto, and the cooling-coil in said pipe with the deflecting-plate secured centrally in said cylinder and the adjustably-connected pistons, all constructed and arranged substantially as and
30 for the purpose described.

4. The combination of the cylinder, the stand-pipe communicating therewith, and the induction and eduction pipes and valves with
35 the deflecting-plate, the pistons arranged on opposite sides of said plate, and the connections between said pistons for moving them together, all constructed and arranged substantially in the manner and for the purpose
40 described.

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

THOMAS L. RANKIN.

Witnesses:

T. H. ALEXANDER,
M. P. CALLAN.