No. 624,099. Patented May 2, 1899.

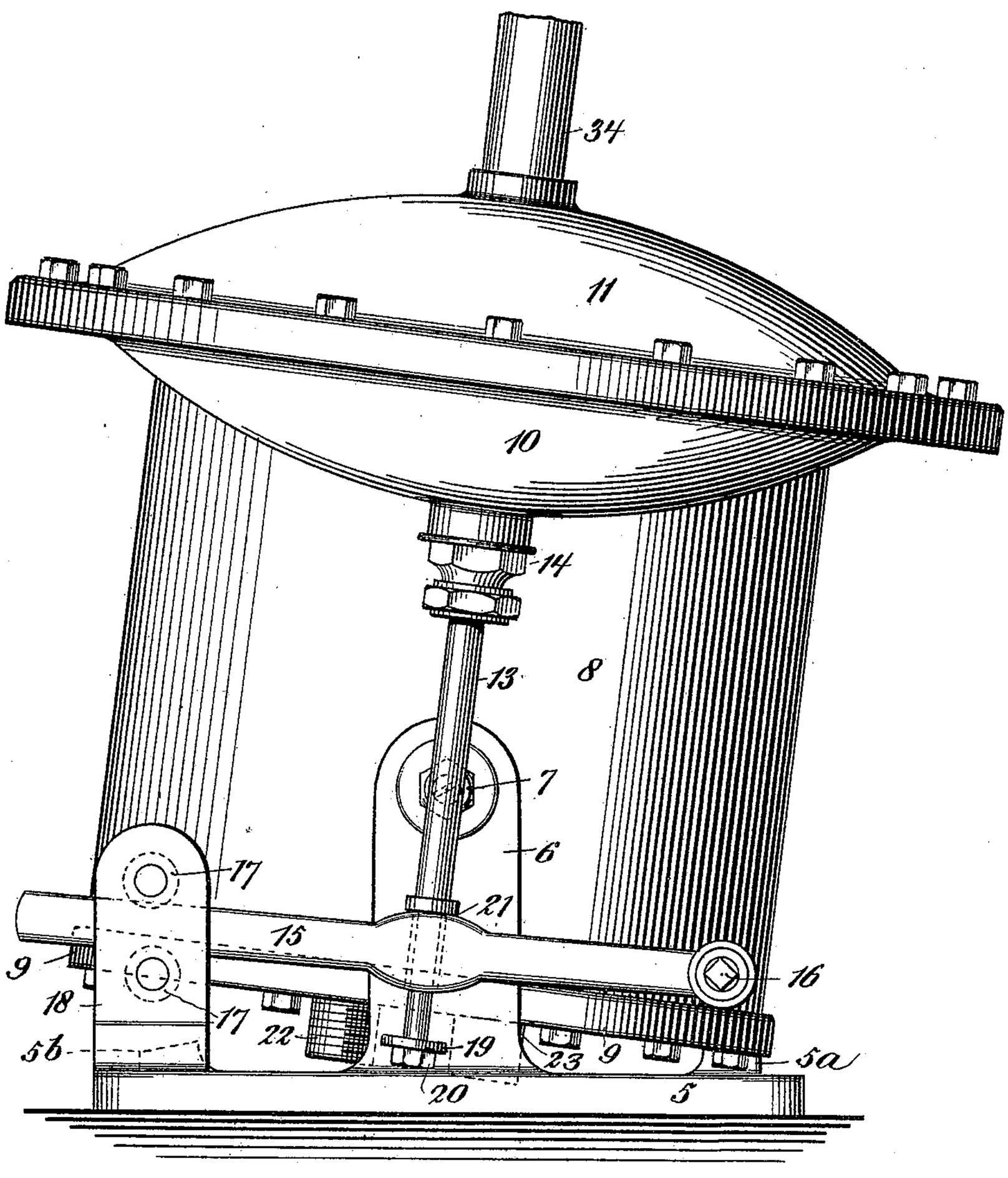
A. ROESCH.

PUMP FOR COMPRESSING AIR.

(Application filed Dec. 29, 1897.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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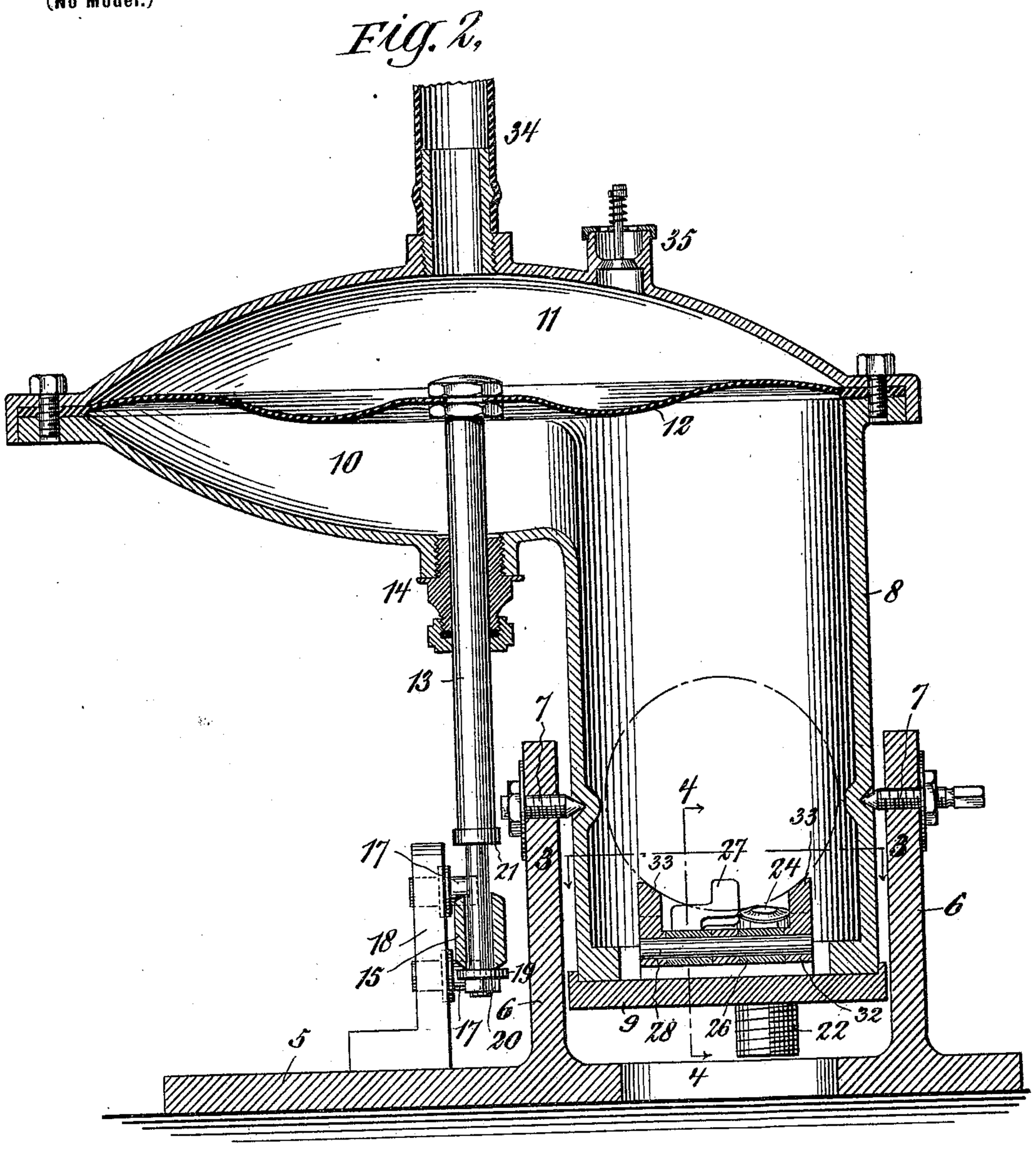
3 Sheets—Sheet 2.

Fig. 2,



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No. 624,099. Patented May 2, 1899.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 3,

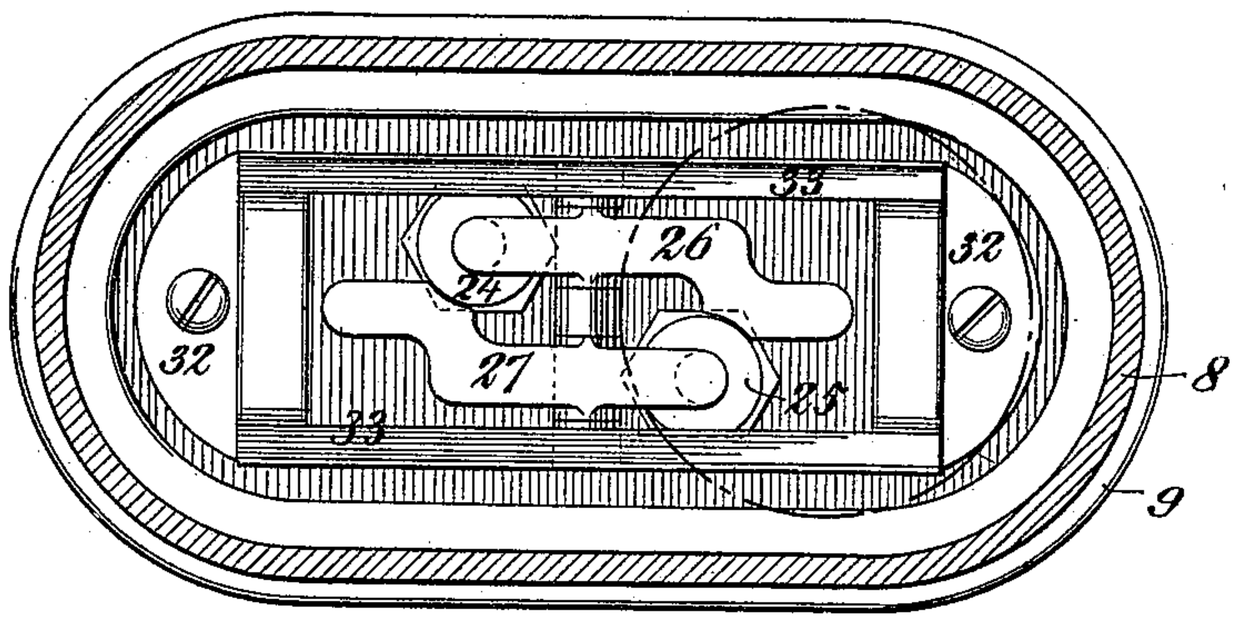
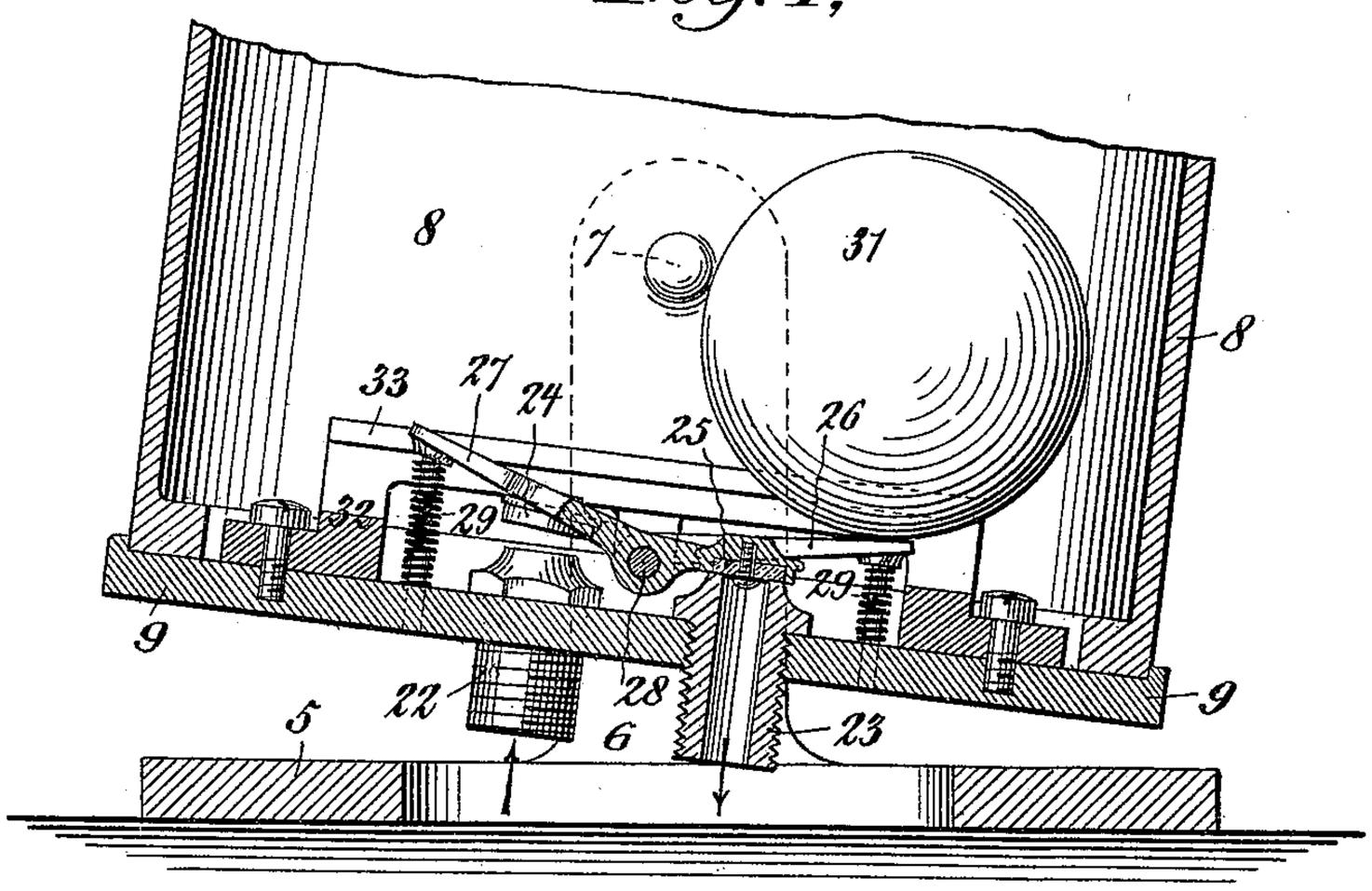


Fig. 4,



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UNITED STATES PATENT OFFICE.

ALFRED ROESCH, OF BRIDGEPORT, CONNECTICUT.

PUMP FOR COMPRESSING AIR.

SPECIFICATION forming part of Letters Patent No. 624,099, dated May 2, 1899.

Application filed December 29, 1897. Serial No. 664,425. (No model.)

To all whom it may concern:

Be it known that I, ALFRED ROESCH, a citizen of the United States, residing at Bridgeport, in the county of Fairfield, in the State of Connecticut, have invented a new and useful Improvement in Pumps for Compressing Air, of which the following is a specification.

My invention relates to pumps for compressing air of the single-acting or intermittent type.

It consists of means for pumping and compressing air through power derived from an ordinary water-supply, such as may be obtained in a dwelling-house; and the object of my invention is to thus utilize a source of power always at hand, the use of which will cause little or no expense, for the purpose of storing up a supply of compressed air for operating the air-controlled valves of a heating system or for other purposes, as may be desired.

My invention further consists in certain novel details of construction and combination of parts, as shall hereinafter be more fully described.

I will now proceed to describe a pump embodying my invention and will then point out the novel features in claims.

Figure 1 is a front view of an air-pump embodying my invention. Fig. 2 is a central vertical section of same with certain parts in slightly different position to that shown in Fig. 1. Fig. 3 is a horizontal section of certain parts, the plane of the section being 3 3 of Fig. 2. Fig. 4 is a vertical section on the plane of the line 4 4, Fig. 2, the parts, however, being in the same position as Fig. 1.

Similar reference characters designate corresponding parts in all the figures.

5 designates a base having standards 6 6, in which are mounted adjustable cone-centers 7 7.

8 designates a hollow casing having a cap or cover 9 suitably bolted thereto at its lower end and having an enlarged top, said enlarged top being provided with a flange around the upper extremity. A dome-shaped hood 11 is bolted to said flange and forms the top cover or closure to the said hollow casing. The casing is mounted upon the cone-centers 7 7, and is adapted to have a limited rocking or tilting motion, as will be hereinafter more fully described. Between the dome-shaped hood and the enlarged top of the hollow casing there is provided a diaphragm 12. Attached to the center of the diaphragm is a rod 13, which passes downwardly out of the enlarged top of the casing through a suitable stuffing-box 14 provided therein.

15 designates a lever pivotally connected with the casing at 16 and fulcrumed between two antifriction-rollers 17 17, mounted upon a bracket 18, secured to the base-plate 5. The end of rod 13 passes through an orifice in about the center of the lever, and at its lowest extremity has a shoulder 19 and a locking-nut 20. It is also provided with a shoulder 21, which at certain times comes in contact with the upper portion of the lever. The lever has rounded bearing portions in the middle thereof on both upper and lower sides, as shown.

As shown more clearly in Fig. 4, the casing is provided through the cap or cover 9 with an intake 22 and a discharge 23. The intake and discharge are for the purpose of admitting and discharging water to and from the interior of the hollow casing, which water, as it comes under ordinary pressure from the water-main or other source of supply, is the motive power for operating the pump.

24 is the intake-valve, and 25 the discharge-valve. The valve 24 is mounted upon a lever 26, and the valve 25 upon a lever 27. The levers 26 and 27 are each loosely mounted or pivoted on a rod 28, secured in a frame 32, attached to the cover 9, and are under spring tension through springs 29 29, adapted to keep them closed at all times.

31 designates a weighted ball to roll upon tracks 33 33, with which the frame 32 is provided. Referring more particularly to Fig. 4, the said ball is adapted to roll from the position in which it is shown in such figure to a similar position upon the opposite side of the center of the casing when the said casing shall have been tilted in the opposite direction. In the position as shown it is bearing on the end of the lever 26, which carries the valve 24. The weight of the ball is more than sufficient to overbalance the tension of the spring, and the valve 24 is thus kept open. If the casing, however, be tilted in the opposite direction, the ball will roll along the tracks 33,

away from the lever 26, and thus permit the valve 24 to be closed under the influence of the spring 29. The further movement of the ball will depress end of lever 27, thus opening the discharge or drain valve 25.

The intake and discharge nipples 22 and 23 are provided with valve-seats at their upper ends, as shown.

5^a and 5^b are stops to limit the tilting of the casing 9.

34 is an air-discharge, which will be connected with a suitable air-reservoir (not shown) and in this discharge-pipe, or somewhere intermediate of the hood 11 and the air-reservoir, there must be provided an ordinary check-valve or non-return valve. This also is not shown, as it is no part of the invention and is well known and in common use.

35 designates an air-inlet valve, here shown as located in the hood 11, but which may be located elsewhere, as in a branch of the discharge-pipe, if desired.

The operation of the device is as follows: The water-intake is first connected with a source of supply by a flexible tube or other suitable connection with an ordinary faucet or a branch from the water-pipe in a building, and the discharge 23 is connected to a drain in any suitable manner. The parts now being in the position substantially as shown in Figs. 1 and 4, the ball 31 will be holding the intake-valve 24 open and water will flow into the interior of the hollow casing 8. In rising, the water will gradually raise the diaphragm 12 (which diaphragm it will be understood was in its lowermost position to start with, it being shown in an intermediate position in Fig. 2) and in raising the diaphragm will force the air above it through the discharge-pipe 34 to the air-reservoir. (Not shown.) As the diaphragm is raised the rod 13 will gradually ascend; but owing to the space between the shoulder 19 and the lower side of the lever 15 the said rod will not cause any movement of the operating parts until the "lost motion" shall have been taken up and the diaphragm and rod raised sufficiently high enough to cause the shoulder 19 to engage the lever 15. A continued movement of the diaphragm 12 and rod 13 will gradually raise the said lever and by reason of its connection with the casing at 16 will cause the said casing to tilt in the opposite direction until stopped by the limiting-stop 5^b. Upon the casing tilting in the opposite direction the ball 3, as before explained, will roll over to the other side of the center of the casing, closing the water-intake and opening the discharge or drain. The water will now empty through the discharge or drain, and the suction of the same will lower the diaphragm 12. The rod 13 will consequently descend, and when the lost motion has been taken up correspondingly as before the shoulder 21 will come in contact with the lever 15, and the casing and the parts connected thereto will be tilted back into the first position, as shown in Figs. 1 and 4 of the drawings. During the drain of the water and the consequent descent of the diaphragm 12 air will be taken in through the air-valve 35, which air will be compressed at the next stroke, as will be readily understood, the operation of the valve and the check-valve before mentioned being precisely the same as in any single-acting pump or compressor.

The pump will continue to operate to compress the air until the pressure in the reservoir shall be in excess of the power derived from the water-supply. The pump will then cease to operate, but will recommence directly the said pressure falls below such amount.

What I claim is—

1. In an air-pump the combination with a hollow casing adapted to tilt or rock a limited distance of a diaphragm fitted in said casing, a water-intake and a water-discharge on one side of said diaphragm, an air inlet and discharge on the other side thereof, and means connected to the diaphragm operating through the movement thereof to tilt or rock the said casing substantially as and for the purpose set forth.

2. In an air-pump the combination with a hollow casing adapted to tilt or rock a limited distance of a diaphragm contained in said casing, a water-intake and a water-discharge communicating with the interior of said casing on one side of said diaphragm, an air inlet and discharge communicating with the other side thereof, and means connected to the diaphragm operated by the movement thereof to tilt or rock the said casing to control the water intake and discharge substantially as specified.

3. In an air-pump the combination with a hollow casing adapted to tilt or rock a limited distance of a diaphragm contained in said casing, a water-intake and a water-discharge communicating with the interior of said casing on one side of said diaphragm, an air inlet and discharge communicating with the other side through means connected with said diaphragm operating to tilt or rock the said casing, valves in said water intake and discharge, and means operated by the tilting of said casing to alternately open and close the valves in said water intake and discharge, substantially as specified.

4. In an air-pump the combination with a hollow casing adapted to tilt or rock a limited distance of a diaphragm contained in said casing, a water-intake and a water-discharge communicating with the interior of said casing on one side of said diaphragm, an air inlet and discharge communicating with the other side thereof, a rod connected to said diaphragm, a lever pivoted to said casing and fulcrumed to a fixed support, a connection between said rod and said lever whereby a movement of the diaphragm will cause a movement of the lever and a consequent tilt-

ing of the casing, valves in said water intake and discharge and means operated by the tilting of the casing to alternately open and close the said valves substantially as specified.

5. In an air-pump the combination with a hollow casing adapted to tilt or rock a limited distance of a diaphragm contained in said casing, a water-intake and a water-discharge communicating with the interior of said casing on one side of said diaphragm, an air inlet and discharge communicating with the other side thereof, means connected with said diaphragm operating to tilt or rock the said casing, valves in said water intake and discharge and a ball or rolling device mounted to roll on tracks in said casing and adapted to open or close the said water intake or discharge valves according to which way the casing is tilted, substantially as specified.

6. In an air-pump the combination with a hollow casing adapted to tilt or rock a limited distance of a diaphragm contained in said casing, a water-intake and a water-discharge communicating with the interior of said casing on one side of said diaphragm, an air inlet and discharge communicating with the other side thereof, a lever pivoted to said casing and fulcrumed to a fixed support, a connection between said diaphragm and said lever whereby the first movement of the diaphragm will not affect the lever, but the final movement of the said diaphragm will cause the lever to be moved and the casing rocked or tilted, and means operated by the rocking or tilting of the casing to control the water discharge or intake, substantially as specified.

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

ALFRED ROESCH.

Witnesses:
JNO. S. PARKER,
JAS. C. CHAPIN.