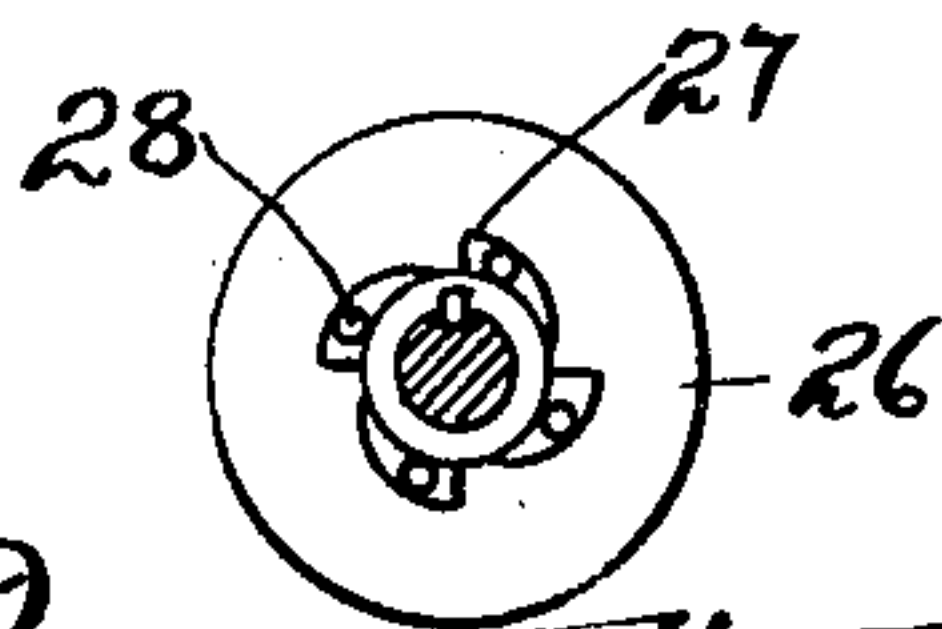
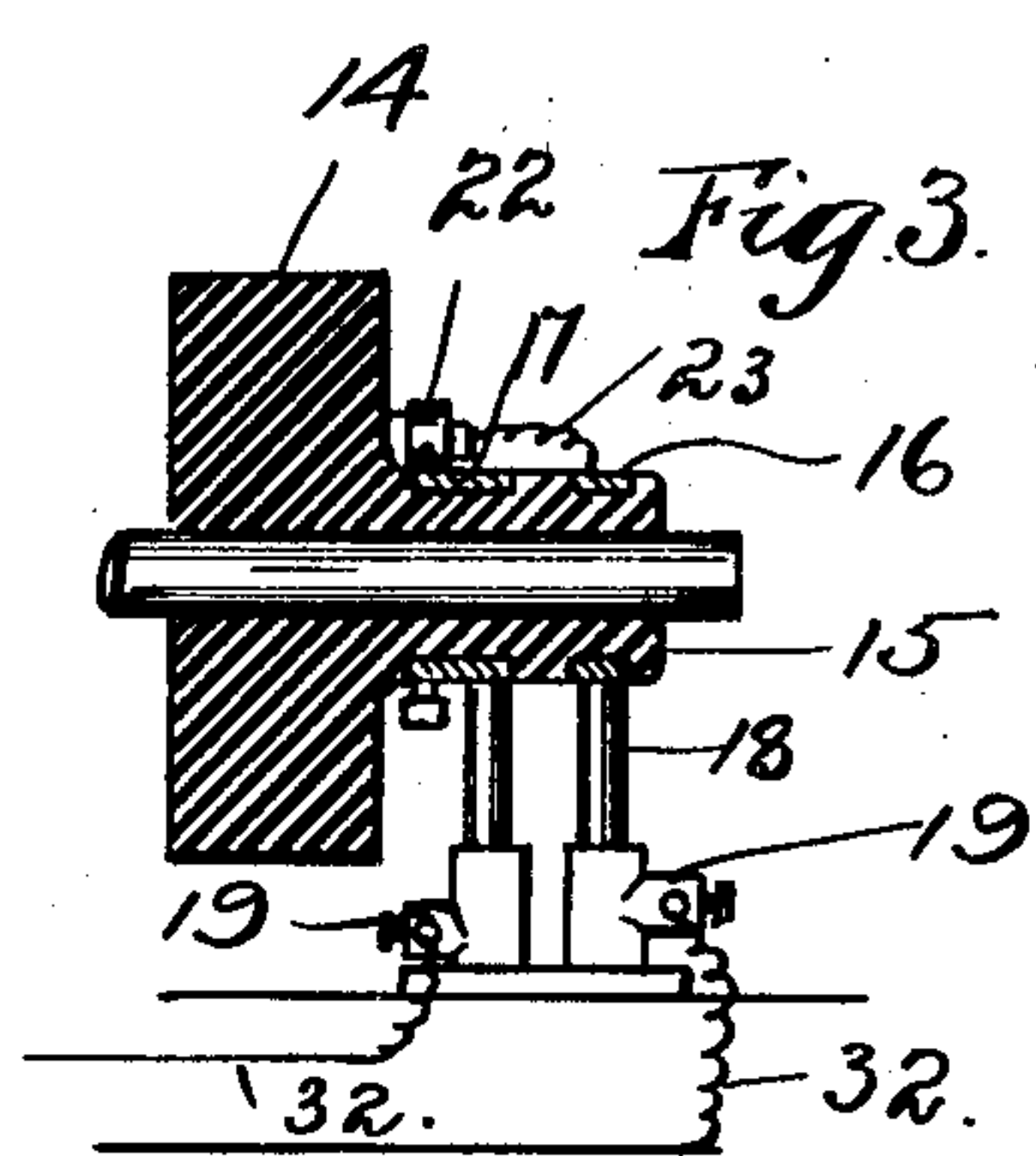
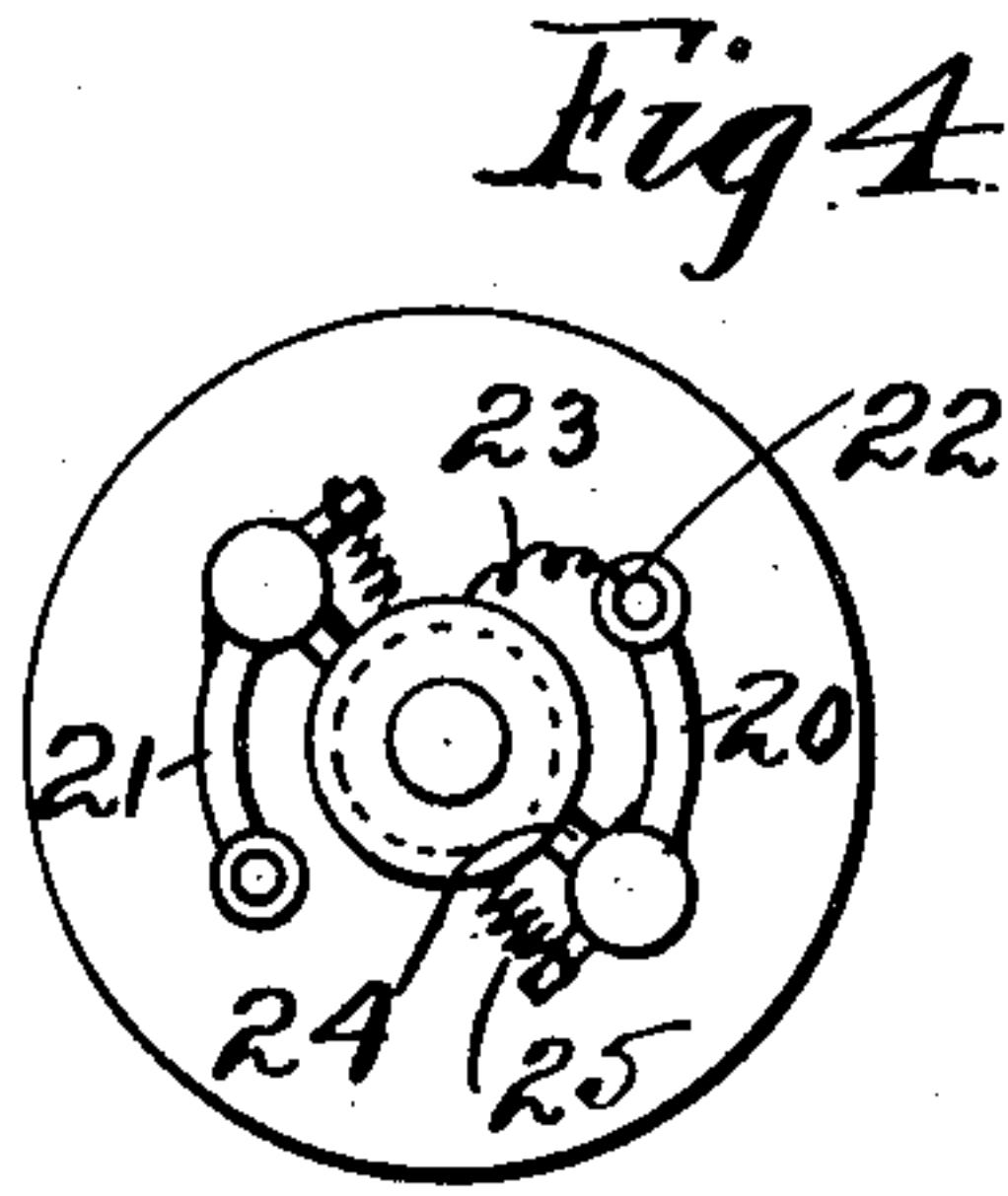
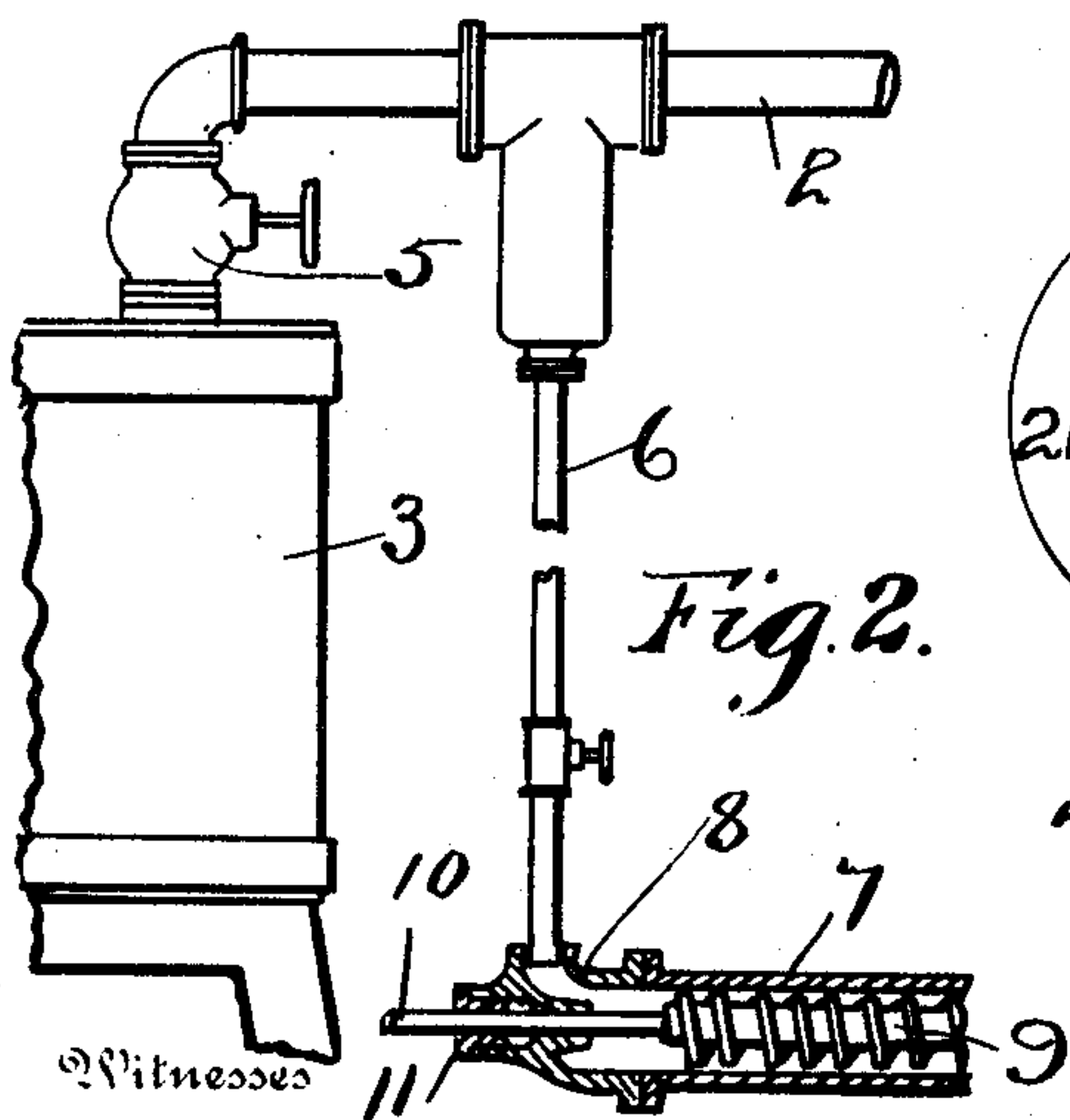
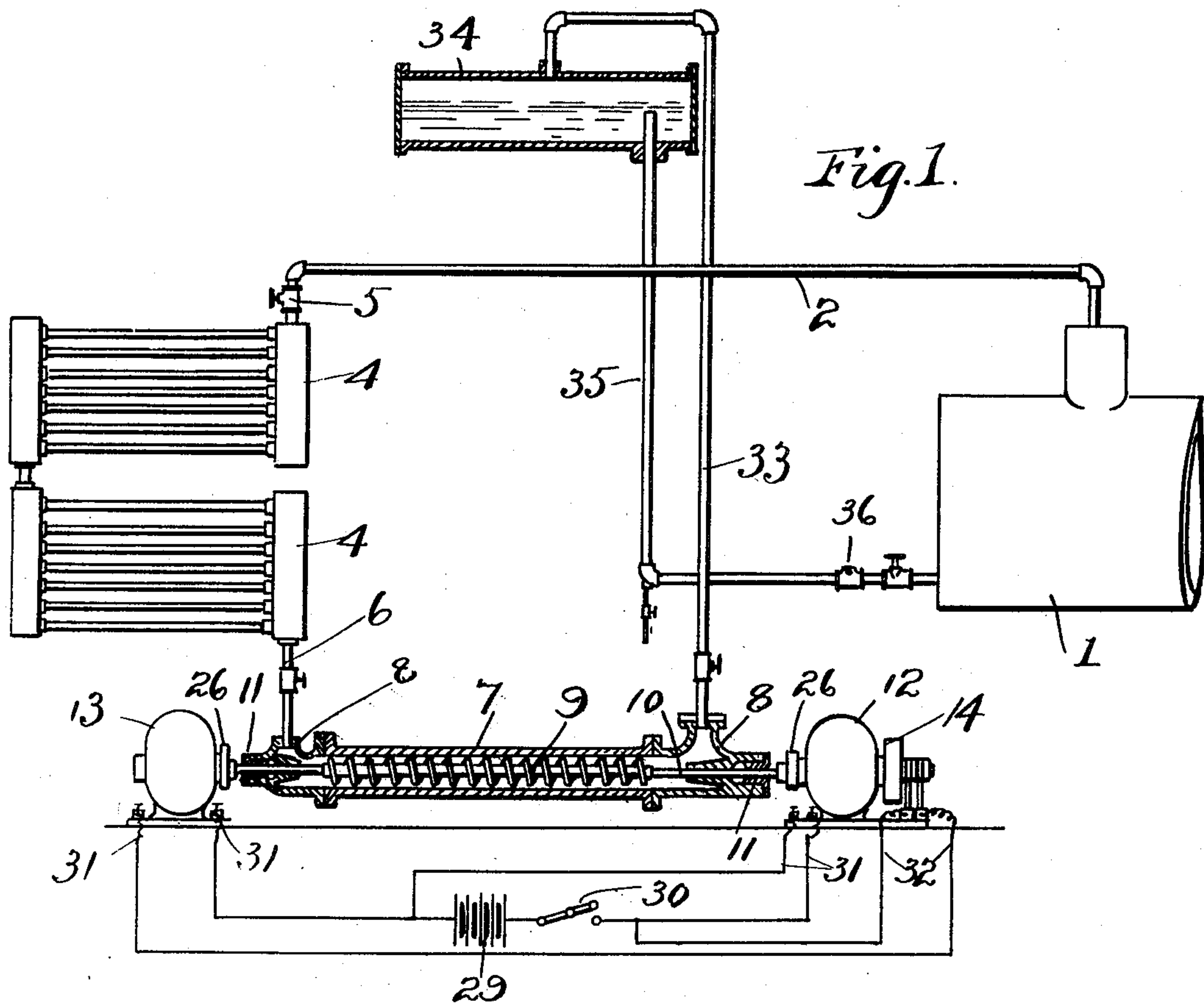


E. P. HOLLY.
IMPELLING DEVICE FOR CIRCULATING SYSTEMS.
APPLICATION FILED MAR. 22, 1904.

917,070.

Patented Apr. 6, 1909.



Witnesses
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Fig. 5.

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UNITED STATES PATENT OFFICE.

EDGAR P. HOLLY, OF ROXBURY, MASSACHUSETTS, ASSIGNOR TO HOLLY STEAM ENGINEERING COMPANY, A CORPORATION OF RHODE ISLAND.

IMPELLING DEVICE FOR CIRCULATING SYSTEMS.

No. 917,070.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed March 22, 1904. Serial No. 199,411.

To all whom it may concern:

Be it known that I, EDGAR P. HOLLY, a resident of Roxbury, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Impelling Devices for Circulating Systems; 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 numerals of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in impelling devices for gravity return or circulating systems.

The invention has for its object the production of a simple and inexpensive means for operating an impelling device and to provide a supplemental or emergency motor therefor, whereby uniform circulation is secured and delays incident to breakdowns are avoided.

The invention is readily adapted for use in any circulating system such as is used for the circulation of hot or cold water, ammonia, brine or any gases or liquids for either heating or cooling processes and it is also applied to water return systems for steam generators to stimulate the circulation through its pipe when conditions are such that its application is found desirable.

In the ordinary gravity return system the water and moist steam are drawn from the steam pipe or other source where it has been condensed, and swept through the receiver and up the riser into the separator above. Here the water drops and the steam rises to the top of the separator where it condenses slightly, causing the pressure in said separator to be a little less than that in the receiver, thus inducing the highly saturated steam to pass up the riser into said separator. This separator is set above the water line, in the steam generator, 27 inches for each pound difference in pressure, between that in said generator and the lowest pressure in the system. This elevation overcomes the difference in pressure by gravity and the water flows back into said generator by its own weight, thus maintaining a complete circulation through the system.

In battleships and other places where the space above the steam generator or boilers is limited, it is impossible to get the necessary elevation to overcome this difference in pres-

sure in the system. I have therefore found it necessary under such conditions to insert into the system the mechanical means above described to overcome this difference in pressure and insure the return of the water of condensation to the steam generator.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:—Figure 1—shows my impelling device with the case in section and connected to a return system for stimulating the action of the highly saturated steam and water through said system, to be returned to the generator, the system being shown as applied to steam radiators used for heating purposes. Fig. 2—represents the device as attached to the steam piping of an engine to receive the water of condensation and entrainment from said pipe and return it to the generator. Fig. 3—is an enlarged detail of one end of the motor shaft and pulley illustrating the electrical connections necessary to start the motor on the left end of the shaft when the one on the right end stops. Fig. 4—is an end view of the same showing the arms operated by centrifugal force for making and breaking the electrical connections. Fig. 5—shows the roll clutch by which the motors may be connected with the screw shaft and by which one may be automatically disconnected from said shaft when it stops running.

Referring to the drawings 1 is the steam generator which may be of any desired form or type, from the steam dome of which extends the steam pipe 2. This pipe may extend direct to the engine cylinder 3 (see Fig. 2) or it may have any desired number of branches and connect to a series of radiator steam coils 4—4 as illustrated in Fig. 1, or any other steam using device.

At 5 is the usual valve for shutting off the supply of steam from the radiator or the engine. The exhaust from said radiators is led through pipe 6 into the chamber 7, where the impelling device is located. This chamber 7 is preferably constructed of a piece of pipe with a head 8—8 secured to each end thereof by any desirable means. The helix or screw 9, is mounted on shaft 10 to turn freely in said chamber, and preferably with-

out contact with its inner surface, said shaft extending out through stuffing boxes 11—11 on either end of the heads.

At 12 and 13 are small electric motors both of which are so arranged that if for any cause motor 12 should stop running then motor 13 would immediately and automatically start up and connect itself to shaft 10 and continue driving the same in the manner hereinafter described.

The saturated steam after having passed through the chamber 7 is forced up the riser 33 where it is deposited in the separator 34 above. This separator is shown as being set in a horizontal position so as to take up as little vertical space as possible when such space is limited.

At 35 is the return pipe which conducts the water back to the generator through the check valve 36.

At 14 is a pulley or disk of non-conducting material having a hub 15 extending out therefrom (see Fig. 3). Around this hub are two bands of conducting material 16 and 17 insulated from each other. At 18—18 are two contact fingers which connect the binding posts 19—19 with said bands. On this pulley 14 is pivotally mounted a pair of arms 20 and 21. The arm 20 is connected from its pivoting point 22 with the band 16 on the hub by the wire 23, (see Fig. 3) while the opposite end of said arm makes a connection to the band 17 through the contact point 24 when the pulley is at rest and said arm is drawn down by the spring 25 against said band, thus completing the electrical circuit and the motor on the opposite end of the shaft is started up. The arm 21 is an exact duplication of arm 20 and serves only to balance the pulley when running. Each of the motors is supplied with a roll or ball clutch such as illustrated in Fig. 5. The construction and operation of which is as follows:—

The disk 26 is provided with a plurality of tapering notches 27 each notch having a square shoulder at one end against which said rolls 28 may freely turn when the shaft rotates in one direction, or when driven by the motor at the opposite end of the shaft. But when motor 12 stops and motor 13 starts to rotate the rolls or balls roll into the tapered portion of the recess and jam against the shaft, causing the clutch on the last named motor to immediately grip the shaft, while the clutch on the motor 12 is automatically released, by the rolls rolling back out of the tapering notch and resting against said square shoulder. The wiring of these motors is illustrated in Fig. 1 in which 29 is the source of current and 30 is the starting switch. At 31—31 are the connections for running the motors and 32—32 are the connections through which the current is transmitted to motor 13 when motor 12 is stopped, which is done as hereinbefore described

through the pivotally hung arm 20. When the circuit is closed at switch 30 the electric current passes to both motors, the circuit to motor 13 being closed through arm 24. It is obvious, however, that arm 20 is quickly thrown out by the centrifugal force developed in the rotation of motor 12, bringing motor 13 to rest almost immediately after starting. The operation of motor 13, as just described, does not have any effect on shaft 10 as said shaft is rotated by motor 12. Motor 13 rotates in the same direction, and hence the clutch 26 of motor 13 will not couple said motor with the shaft. But if for any reason motor 12 stops, the clutch 26 of motor 13 becomes effective and the latter motor at once takes up the work of the disabled motor.

By inserting my mechanically operated impelling device into a system of piping for stimulating the circulation of liquids employed for cooling purposes, it is found unnecessary to use the separator 34 in the system, the act of rotating this device rapidly serves to produce a vigorous circulation through the system and most satisfactory results are obtained.

The construction of this device is the acme of simplicity and its operation as applied to the above mentioned system is much more satisfactory than any form of pump or trap. It will therefore be understood that the broad feature of this invention is not dependent upon the employment of the particular construction of apparatus shown and described for the returning the water of condensation from the steam using devices to the generator, but the arrangement of the system may be modified and re-arranged to produce similar results under other conditions in which the same may be operated. Neither do I wish to be restricted to the precise construction or arrangement of the parts for operating the impelling device, as these details may be modified or re-arranged in various particulars without departing from the spirit and scope of my invention, one practical embodiment of which has been herein illustrated and described without attempting to show all of the various forms and modifications in which my invention might be embodied.

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

1. An impelling device for circulating systems comprising a casing, a rotatable impelling member mounted therein, a plurality of electric driving motors for said member arranged at each end thereof, and centrifugal means controlled by one of said motors for closing the circuit to the other motor when the first mentioned motor stops.

2. An impelling device for circulating systems comprising a casing, a rotatable impelling member mounted therein, a plurality of electric driving motors for said

member arranged at each end thereof, and centrifugal means carried by the shaft of one motor for automatically closing the circuit to the other motor should the first mentioned motor stop.

3. An impelling device for circulating systems comprising a casing, a rotatable impelling member mounted therein, a plurality of driving motors for said member, and a circuit closer for automatically closing the circuit to one motor when the other motor stops, said circuit closer being rendered normally inoperative by the centrifugal force developed in the rotation of the last mentioned motor.

4. An impelling device for circulating systems comprising a casing, a rotatable impelling member mounted therein, a plurality of electric driving motors for said member, and an automatic centrifugally operated circuit closer carried by one motor and controlling the circuit to the other motor, said circuit closer being operated when the first motor stops.

5. An impelling device for circulating systems comprising a casing, a shaft mounted therein and carrying an impelling member,

a driving motor arranged at each end of said shaft, a disk mounted to rotate with said shaft and provided with electrical contacts, said disk being located adjacent one of said motors, and a circuit closer carried by said disk and adapted to automatically close the circuit to the second motor upon the stopping of the first motor.

6. An impelling device for circulating systems comprising a casing, a shaft mounted therein and carrying an impelling member, a driving motor arranged at one end of said shaft, a disk keyed to said shaft adjacent said motor, a second motor arranged at the opposite end of said shaft, and a circuit closer pivotally secured to said disk and provided with a weighted end, whereby the circuit to the second motor is automatically closed upon the stopping of the first motor.

In testimony whereof, I have hereunto set my hand this 18th day of March A. D. 1904.

EDGAR P. HOLLY.

In presence of—

W. H. SPENCER,
HOWARD E. BARLOW.