

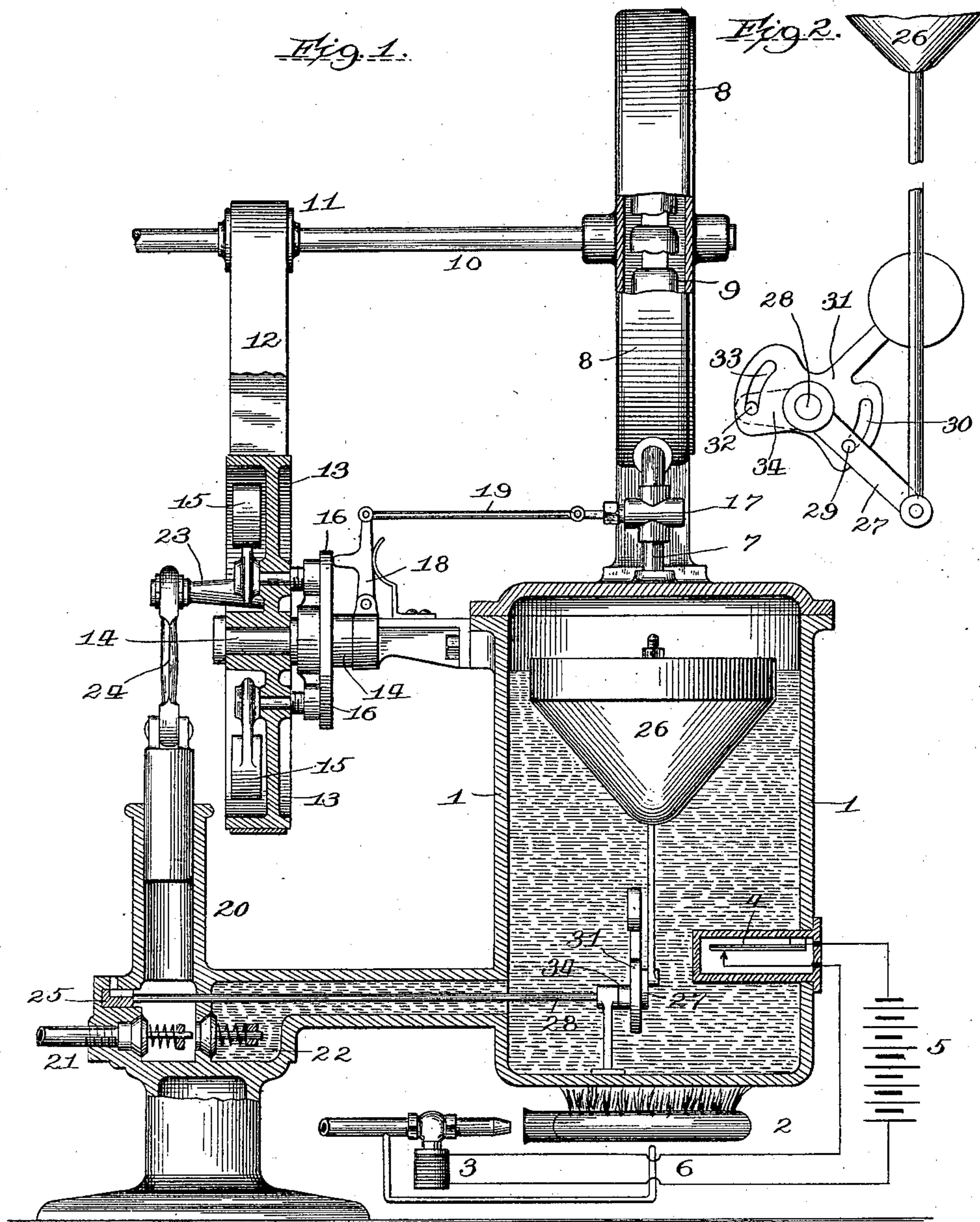
No. 658,239.

Patented Sept. 18, 1900.

C. J. COLEMAN.
AUTOMATIC FEED WATER REGULATOR.

(Application filed Oct. 27, 1899.)

(No Model.)



Attest:

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AUTOMATIC FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 658,239, dated September 18, 1900.

Application filed October 27, 1899. Serial No. 734,968. (No model.)

To all whom it may concern:

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Feed-Water Regulators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to that class of automatically-controlled motive-power systems in which an elastic vapor, such as steam, affords the operating pressure of the system.

The object of the present improvement is to provide a simple and efficient motive-power apparatus in which the feed of the water or other supply to the generator is controlled and regulated in an automatic manner, as will hereinafter more fully appear, and be more particularly pointed out in the claims. I attain such object by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a motive-power apparatus embodying the present invention, and Fig. 2 an enlarged fragmentary side elevation of the operating mechanism of the air-valve of the present improvement.

Similar numerals of reference indicate like parts in both views.

Referring to the drawings, 1 represents the pressure-generator or boiler, in which steam or other analogous vapor is generated; 2, a burner beneath such generator, preferably a fuel-gas burner of any usual and suitable type, the supply of fuel-gas to which is controlled by an electromagnetically-actuated valve 3, the electromotive circuit of which is in turn controlled by a thermostat 4, arranged within the influence of the generator and adapted with a rise in temperature in the generator above a predetermined point to open the electromotive circuit of the battery 5 and electromagnet of the valve 3 to permit the valve to close and shut off the supply of fuel-gas to the burner either in whole or in part and with a fall in the temperature in the generator below such predetermined point to

close the electromotive circuit and cause the valve to open to permit an added supply of fuel-gas to pass to the burner and in this manner maintain a substantially-even temperature within the generator with a corresponding uniform degree of pressure.

6 is a pilot light or burner for relighting the main burner after the same has been accidentally or intentionally extinguished in a continued use of the apparatus.

7 is the outlet-pipe for the motive fluid, connected in the usual tangential manner to the inclosing casing 8 of the momentum-motor wheel 9, which in the form shown in the drawings as illustrative of the present invention is of the bladed or bucketed type, against the buckets or blades of which the motive fluid is discharged in one or more tangential jets to impart rapid rotation thereto, as usual in this type of momentum-motors, and accordingly such particular type of motor may be replaced by any other well-known type of momentum-motor, such as a turbine-motor, without departing from the spirit of this part of the present invention, and in such replacement the discharge-passages from the outlet-pipe 7 will be correspondingly modified, as the judgment of the constructor may suggest.

10 is the power-shaft, to which the momentum-motor heretofore described has direct operative connection.

11 is a belt-pulley on the main shaft, having belt connection 12 with a governor pulley or wheel 13 on the counter-shaft 14, as shown in the drawings. Such governor-pulley may be of any ordinary and usual construction, with the centrifugal governor-weights 15 pivoted to the web of the pulley and adapted to impart a lateral movement to the collar or disk 16, usually by a screw-threaded end of the pivot-studs of said weights engaging similarly-formed sockets in said collar or disk, as illustrated in the drawings. The collar or disk is guided in its movement upon the fixed counter-shaft 14 and in its movement responsive to that of the governor-weights is in turn adapted to impart motion to a throttle-valve 17 in the motive-fluid-outlet pipe 7 through lever-and-link connections 18 and 19 to govern and regulate the speed of the engine, as usual in this class of mechanism.

20 is a single-acting plunger-pump having valved inlet connection 21 with the source of water or other fluid supply for the boiler 1 and a valved outlet-passage 22 connected to the generator 1 and made of some capacity for purposes hereinbefore stated.

23 is a crank-pin carried by the governor wheel or pulley 13 and adapted to impart continuous motion to the pump during the operation of the apparatus through pitman connection 24 with the pump-plunger, as shown.

25 is a semirotary valve arranged in the pump-casing and adapted when in its open position, as shown in the drawings, to provide an open communication between the valve-chamber of the pump and the atmosphere, so that in the operation of the pump with such valve open air alone will be drawn in and exhausted through the valve-opening and a pumping of the feed-water into the boiler prevented.

An automatic operation is imparted to the valve 25 by the following mechanism: 26 is a float arranged within the interior of the boiler or generator 1 and having link connection with an arm 27, loosely journaled on the shaft 28 of the valve. The arm 27 has intermittent operative connection by means of a pin or stud 29 and segmental slot 30 with a weighted arm or lever 31, also loosely journaled on the shaft 28 of the valve, the arrangement being such that the weighted end of the lever will be lifted to a position a little past a perpendicular in a positive manner, so that it will have a falling motion to one side or the other of such perpendicular after a final upward or downward movement of the float and the intermediate operative connections just described.

In the described construction the valve-shaft 28 is located in the connecting passage or duct 22 between the pump and the generator and passes through the wall of the pump in manner shown, the construction being such that the valve-shaft and its operative connections are wholly housed within the generating-chamber and the connecting-duct between the same and the feed-pump, and the necessity of a stuffing-box around such shaft is avoided in a very perfect manner.

The weighted arm or lever 31 has in turn an intermittent operative connection by means of a pin or stud 32 and segmental slot 33 with an arm 34, fixed on the shaft 28 of the valve, the arrangement being such that active engagement between the parts is only had during the falling movement of the weighted le-

ver 31 past the perpendicular, above described.

With the above construction a predetermined movement of the float must take place before a reversal of the valve can take place, and a predetermined lower as well as higher water-level must be attained before the automatic mechanism just described will operate to change the conditions of the feed-water supply.

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

1. In an automatic feed-water regulator, the combination of a vapor-pressure generator, a motor, a feed-pump operated by said motor, a single separating-wall between the generator and pump, means for opening communication between the atmosphere and valve-chamber of the pump, an operating-shaft for such means, and means within the generator for automatically controlling the operation of said shaft, said shaft extending through the said separating-wall.

2. In an automatic feed-water regulator, substantially as herein described, the combination of a vapor-pressure generator, a motor, a feed-pump operated by said motor in a constant manner, a duct connecting the valve-chamber of the pump with the generating-chamber, means for opening communication between the atmosphere and the valve-chamber of the pump, and means wholly within the generator and the connecting-duct for automatically controlling such communication, substantially as set forth.

3. In an automatic feed-water regulator, substantially as herein described, the combination of a vapor-pressure generator, a motor, a feed-pump operated by said motor in a constant manner, a duct connecting the valve-chamber of the pump with the generator, means for opening communication between the atmosphere and the valve-chamber of the pump, and means wholly within the generator, and the connecting-duct for automatically controlling such communication, the same comprising a float, a link, a weighted trip mechanism, and a rock-shaft extending to the means for opening such communication, substantially as set forth.

In testimony whereof witness my hand this 6th day of September, 1899.

CLYDE J. COLEMAN.

In presence of—

ROBERT BURNS,
H. A. NOTT.