

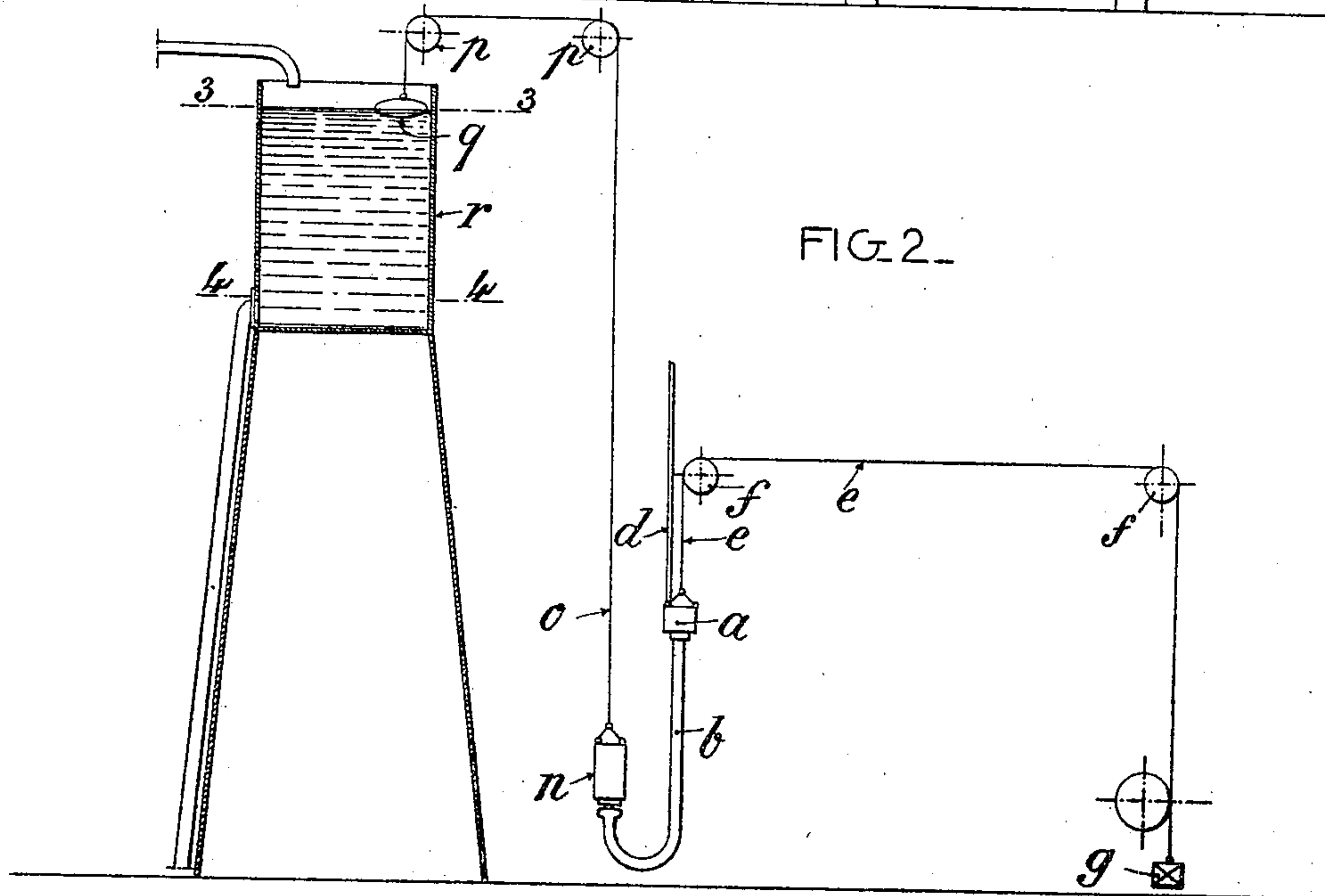
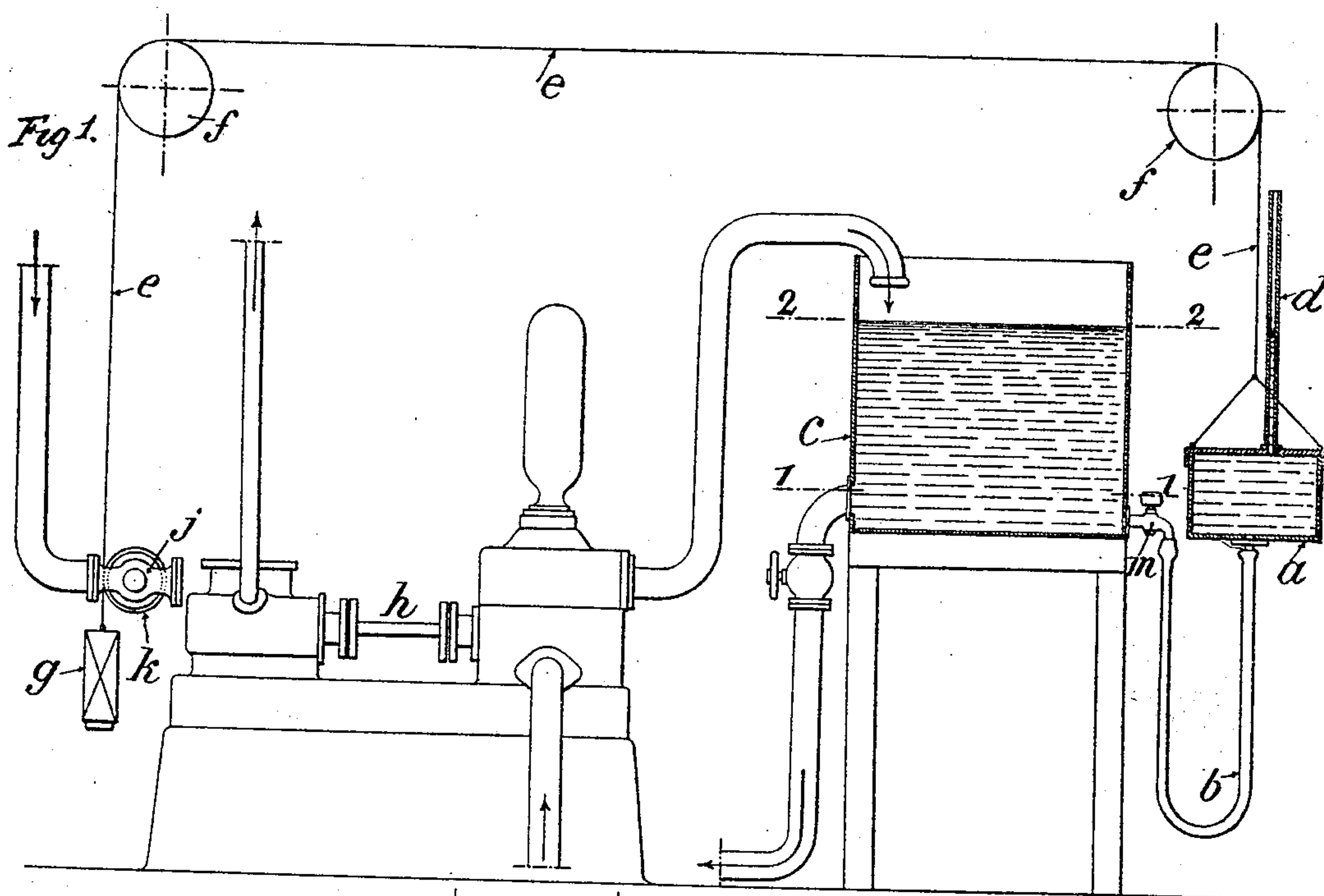
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PATENTED DEC. 26, 1905.

L. NEU.

AUTOMATIC LEVEL CONTROLLER.

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WITNESSES :

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AUTOMATIC LEVEL-CONTROLLER.

No. 808,471.

Specification of Letters Patent.

Patented Dec. 26, 1905.

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To all whom it may concern:

Be it known that I, LUCIEN NEU, engineer, a citizen of the Republic of France, residing at 60 Rue Brule Maison, Lille, Department of Nord, in the Republic of France, have invented certain new and useful Improvements in Automatic Level-Controllers, of which the following is a specification.

This invention relates to a device intended to produce the automatic starting and stopping of apparatuses for forcing liquids or other fluids, such as water-raisers, gas-compressors, and the like.

In a forcing installation it is often desirable that the level of the liquid in the reservoir fed by the raising apparatus or the pressure of the gas in the reservoir fed by the compressing apparatus, the case being the same for other apparatuses, shall be constant or at least maintained between determined limits. This result can be obtained by the opening and the closing of a cock or other such like part distributing the motive power to the forcing apparatus or by a clutch controlling the transmission of motive power to the said apparatus, and the present invention has for its purpose to produce such an operation in such a manner that the distributing member or the clutch when once started in one direction or the other shall be obliged to complete its movement rapidly and shall not be capable of remaining at the half-stroke.

For this purpose the invention consists in connecting by a flexible tube the lower part of a reservoir on the bottom of which it is required to maintain the pressure between determined limits with a recipient movable vertically, which is kept in equilibrium by a suitable counterweight and which is connected with the member distributing the motive power in such a manner as to cause the same to move with itself, the said recipient being closed and having an upwardly-extending tube open to the atmosphere. A liquid is placed in the reservoir and is capable of passing through the flexible pipe and into the movable recipient to rise therein to a greater or less extent, according to the position of the recipient and the pressure in the reservoir. The apparatus is so set or regulated that when the recipient is empty, or partially so, the action of the counterweight becomes preponderant and produces the operation of the distributing member. Inversely, when the recipient is full, or partially so, its weight

overcomes the action of the counterweight and determines the opposite operation of the distributing member.

The accompanying drawings illustrate, by way of example, several applications of the object of this invention.

Figure 1 shows a device for controlling a steam-pump for feeding a water-reservoir, and Fig. 2 shows a modified form of the said device.

In Fig. 1, *a* designates a movable recipient, the bottom of which is connected by a flexible pipe *b* with the lower part of a fixed reservoir *c* and the top of which carries a tube *d*, extending upward and opening into the atmosphere. The said recipient is suspended to a chain or cord *e*, which passes over the pulleys *f* and supports a counterweight *g*. The reservoir *c* is in this example fed with water by a steam-pump *h*, of which the inlet-cock *j* for the steam is controlled or operated by the chain *e*, the latter being wound around a pulley *k*, which acts directly on the key of the cock. When the reservoir *c* is full and the recipient *a*, which is also full, is at the lower end of its stroke, the counterweight is lifted and the cock *j* is closed, so that the pump is at rest. When on account of the consumption of the water of the reservoir *c* the level of the water reaches a certain height 1 1, the recipient *a* is partly emptied and its weight decreases sufficiently to allow the action of the counterweight *g* to become preponderant and to bring about the opening of the cock, the recipient *a* being lifted at the same time. As this lifting movement takes place the water passes from the recipient *a* into the reservoir *c*, so that the weight of the said recipient *a* decreases more and more and that the counterweight *g* acquires an increasing amount of power as the cock is being turned, so that there is no fear of the cock stopping before being completely open. The limitation of the movement may be produced by means of stops, (not shown,) which act on the cock or the pulley, the counterweight, the chain, the recipient, or on any operative part connected with one of these members. When once the cock *j* is opened, the pump starts and fills the reservoir. When the level of the water comes to 2 2, the recipient *a* is partly filled, and its weight becomes sufficient to make the counterweight move up, and thus produce the closing of the cock *j*. In moving downward the recipient *a* becomes entirely full, so that

its weight increases as the cock is closing. The danger of an incomplete closing of the cock *j* is thus avoided. When once the closing is effected, the pump stops, and the level in the reservoir can move downward as consumption of the water goes on in order to again bring about the operation just described when the said level comes to 1 1. A regulator-cock *m*, arranged in the pipe *b*, allows of regulating the speed of the water passing toward the recipient *a* or from the latter, and consequently to regulate the acceleration of the movement of the cock at each operation.

The device just described permits of maintaining the level of the water in the reservoir *c*, and consequently the pressure at the bottom of the said reservoir, between determined limits corresponding to the lines 1 1, 2 2.

In the device shown in Fig. 2 the letters *a*, *b*, *d*, *e*, *f*, *g*, and *k* have the same meanings as aforesaid; but the recipient *a* is connected by the pipe *b* with a reservoir *n*, which is movable instead of being fixed, the recipient being suspended to a chain *o*. The latter passes over the pulleys *p* and is attached to a float *q*, placed in a fixed water-reservoir *r*, which is fed by a steam-pump, (not shown,) of which *j* designates the inlet-cock for the steam. When the level in *r* is uppermost, as at 3 3, the reservoir *n* is lowermost, *a* is lifted, *g* is lowered, and the cock *j* is closed. If the level moves down to 4 4 in the reservoir *r*, the float carries the reservoir *n* upward. When the latter is a little above the recipient *a*, the latter is being filled, increases in weight, and moves downward in lifting the counterweight *g* and in determining the opening of the cock *j*. The pump then feeds the reservoir *r* and the level comes again to 3 3. The float is lifted and the reservoir *n* is lowered, so that it finishes by being filled at the expense of the recipient *a*. The latter, lightened in weight, is finally lifted by the action of the counterweight *g*, so that the cock *j* is again automatically closed.

In all the cases described the effort which acts on the cock *j* increases as the movement is produced, so that the cock is not liable to remain at the half-stroke.

It will be understood that the means used to connect mechanically the movable recipient *a* with the cock *j* or other motive-power distributor may be varied at will and according to the requirements of the installations. The liquids used may likewise be of any suitable nature. In case the present device is located at a certain distance from the reservoir, the well, or the like in which it is desired to obtain a regulation of the level—as, for exam-

ple, in Fig. 2—any suitable kind of transmission may be used to cause the movable reservoir *n* to act according to the displacements of the level in the distant reservoir.

I claim—

1. An automatic controller comprising the combination of a movable receptacle, a tube communicating with the interior thereof and extending upwardly therefrom, the tube being open to the atmosphere at its upper end, a liquid-reservoir, a flexible means establishing communication between the reservoir and the movable receptacle whereby said movable receptacle may be filled from and emptied into said liquid-reservoir, a counterbalance-weight in connection with the movable receptacle, and a connection between the counterbalance-weight and movable receptacle, said connection serving to transmit the movement of the automatic controller.

2. An automatic controller comprising a movable receptacle, a tube communicating with the interior thereof and rising from the same, the tube being open at its upper end to the atmosphere, a liquid-reservoir, a flexible means establishing communication between said reservoir and said movable receptacle, a counterbalance-weight, and a connection between the counterbalance-weight and movable receptacle, said connection also serving to transmit the movement of the controller.

3. An automatic controller comprising the combination of a movable receptacle, a movable liquid-reservoir, flexible means establishing communication between the two, means for moving the movable liquid-reservoir, a counterbalance-weight for the movable receptacle, and a connection between said receptacle and counterbalance-weight, said connection serving to transmit the movement of the automatic controller.

4. An automatic controller comprising a movable receptacle, a movable liquid-reservoir, a flexible means establishing communication between the two, a second liquid-reservoir, a float operating therein, a connection between the float and the movable liquid-reservoir, a counterbalance-weight for the movable receptacle, and a connection between the counterbalance-weight and said movable receptacle, the second-named connection serving to transmit the movement of the automatic controller.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

LUCIEN NEU.

Witnesses:

JOHN BAKER,
MAURICE ROUX.