No. 757,119. PATENTED APR. 12, 1904.

R. M. HUGHES.

FLUID PRESSURE CUT-OFF AND ALARM.

APPLICATION FILED FEB. 2, 1904.

NO MODEL.

Fig. 1.

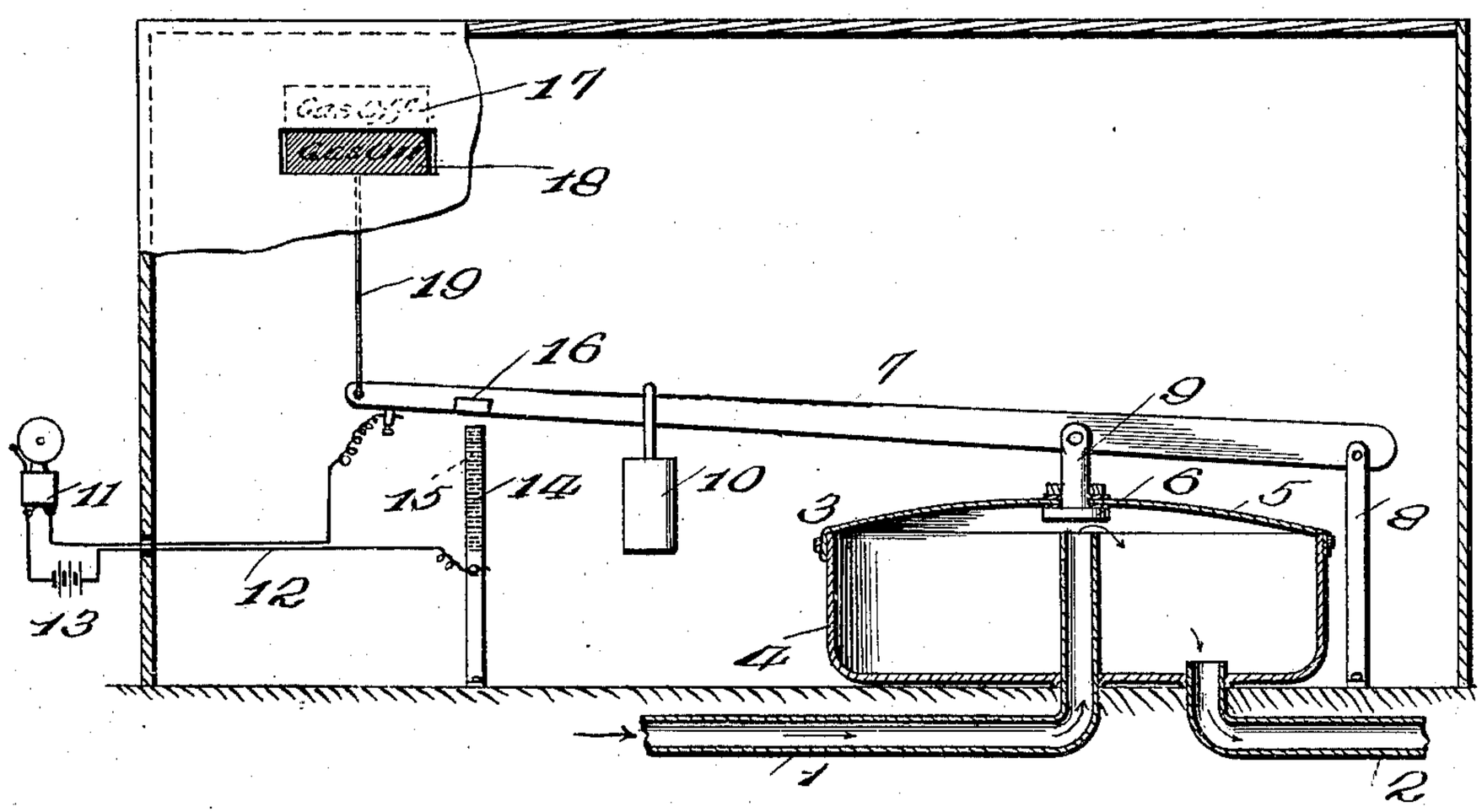


Fig. 2.

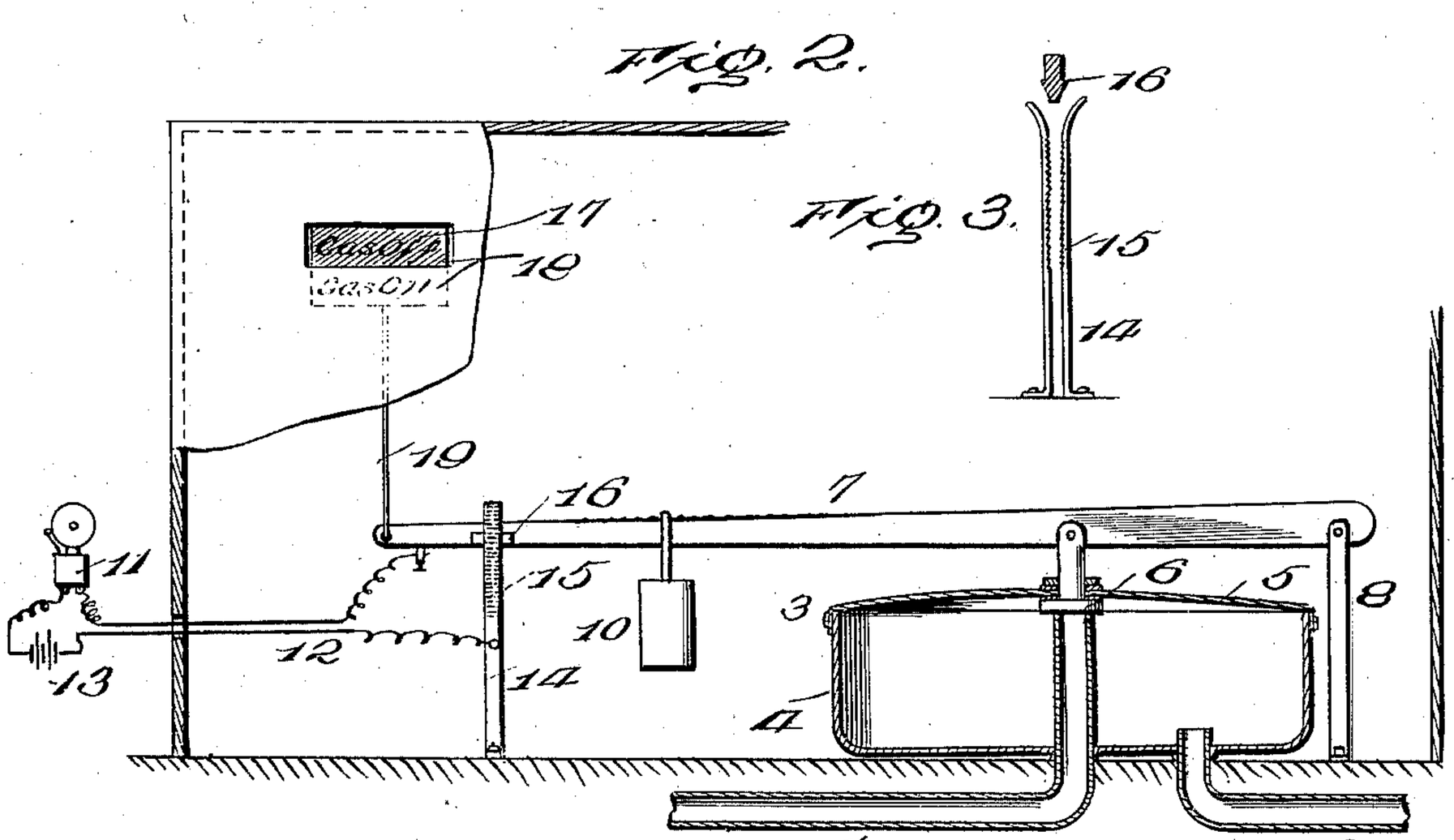
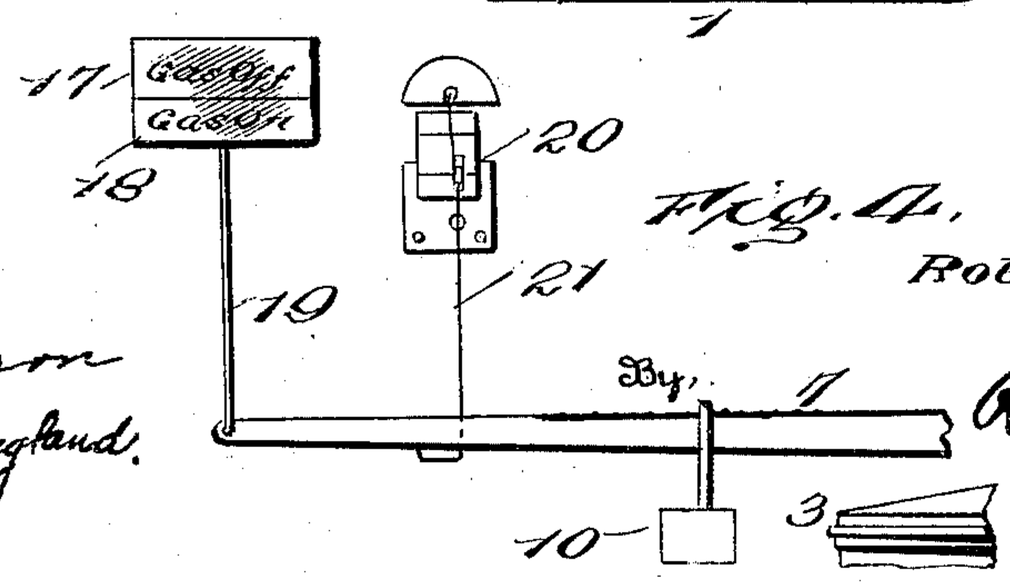


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT M. HUGHES, OF CADIZ, OHIO, ASSIGNOR OF ONE-HALF TO FRANK H. ATKINSON, OF CADIZ, OHIO.

FLUID-PRESSURE CUT-OFF AND ALARM.

SPECIFICATION forming part of Letters Patent No. 757,119, dated April 12, 1904.

Application filed February 2, 1904. Serial No. 191,751. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. HUGHES, a citizen of the United States, residing at Cadiz, in the county of Harrison and State of Ohio, have invented certain new and useful Improvements in Fluid-Pressure Cut-Offs and Alarms, of which the following is a specification.

Consumers of gas for illuminating and heating, either or both, depending for their supply upon natural gas run great risk from casualties due to the stoppage of the flow of gas and the reëstablishment of the flow after the cause has been remedied. Particularly is this the case if the burners or outlets are open when the flow ceases and are not closed or relighted when the supply is reëstablished.

While the invention is particularly adapted for service-pipes in connection with gas-wells, it may be advantageously used with pipes or mains supplied with manufactured gas or charged with liquid or fluid, so as to give warning when the normal conditions are disturbed.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a cut-off and alarm embodying the invention, showing the position of the parts when the flow is established. Fig. 2 is a view similar to Fig. 1, showing the disposition of the parts when the flow has been stopped. Fig. 3 is a detail view of the spring-standards comprising the catch, showing more clearly the relation of the lever, stops carried thereby, and the toothed portions of said standards. Fig. 4 is a detail view of a modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The supply-pipe is indicated at 1 and the distributing-pipe at 2. The cut-off is indicated at 3 and comprises the casing 4, diaphragm 5, and valve 6, the latter being attached to and movable with the diaphragm. The supply-pipe 1 extends into the casing 4 and terminates in about the plane of its upper edge, so as to be closed by the valve 6 when the diaphragm is loose or relieved from internal pressure. The casing 4 may be of any construction, and the diaphragm 5, of rubber or other suitable material, is secured at its outer edge to the casing 4 in any substantial manner so as to provide a tight joint. The distributing-pipe 2 connects with the bottom portion of the casing 4 and connects with the various burners and fixtures provided for consumption of the gas.

A lever 7 is pivoted at one end to a post or support 8 and has the stem 9 of valve 6 connected thereto. A bob-weight 10 is adjustable upon the lever 7 according to the pressure of gas or other fluid to be controlled. When the gas has an uninterrupted flow through the cut-off, the diaphragm 5 is pressed upward and the valve 6 is held away from the upper end of the supply-pipe 1; but the instant the flow of gas ceases the diaphragm 5 relaxes or settles under the combined weight of the parts 6, 7, and 10 and the valve 6 becomes seated upon or closes against the upper end of the supply-pipe 1 and prevents escape of the gas therefrom in the event of the pressure being reëstablished. The downward movement of the outer or free end of the lever 7 is utilized to set off an alarm, so as to give warning and apprise the occupants that the flow of gas has been stopped, so that the various outlets along the distributing-pipe 2 may be closed to prevent escape of the gas into rooms or apartments when the flow shall have been reëstablished.

As shown in Figs. 1 and 2, the alarm is of the electric type and consists of an electric bell 11, circuit-wire 12, and battery 13. One

terminal of the wire 12 is connected to the lever 7, and the other terminal is connected to a catch 14. The catch 14 comprises companion spring-standards 15, having their upper ends flared, as indicated most clearly in Fig. 3, and having their inner or opposing sides toothed to make interlocking engagement with stops 16, projected from opposite sides of the lever 7. The stops 16 are electrically connected with the end of the wire attached to the lever 7, and this may be effected by having the lever 7 and stops 16 constructed of metal. When the flow of gas ceases, the outer end of the lever 7 descends and the stops 16 ride upon the toothed portions of the standards 15, which engage therewith and prevent unseating of the valve 6 until the standards 15 shall have been separated to disengage the toothed portions thereof from the stops 16, when the outer end of the lever may be moved upward after the gas has been turned on and is held elevated by the upward pressure of the gas upon the diaphragm 5, whereby the alarm is held open.

In addition to the audible signal a visual signal may be provided, and, as shown, consists of a card or indicator 17, having imprinted thereon the words "Gas off" and "Gas on" or equivalent matter to designate when the pressure has ceased or is acting on the diaphragm of the cut-off so as to hold the valve 6 unseated. A portion of the card or indicator is hidden from view by a shield, which may be a side of the casing provided for housing the working parts of the appliance, said shield or side of the casing having an observation-opening 18, through which one or the other of the words may be read. The card or indicator 17 is connected by wire 19 or analogous means with the lever 7, so as to move therewith.

Instead of the electric alarm indicated in Figs. 1 and 2 a spring-actuated alarm of any variety may be employed, as indicated at 20 in Fig. 4, and a wire 21 therefrom may have a portion extended into the path of the lever 7 to be tripped thereby when the flow of gas ceases, whereby the alarm is released and the same sounded. When the alarm is of the spring-operated type, the lock mechanism may be dispensed with, because the alarm will continue to sound until run down, even though the flow of gas is reëstablished after a moment's cessation, thereby giving warning, so that the outlets may be closed or the gas relighted. It is also contemplated to dispense with the visual signal, and the same may or may not be used, as desired.

Having thus described the invention, what is claimed as new is—

1. In a fluid-pressure cut-off and alarm, the combination of a casing, supply and distributing pipes connected to the casing, a diaphragm forming a side of the casing and confining the pressure and receiving the force thereof, a valve connected to and movable with the diaphragm and adapted to close the supply-pipe when the pressure falls below the normal, a lever connected to and movable with the valve, and audible and visual signals connected to said lever and actuated thereby, substantially as set forth.

2. In a fluid-pressure cut-off and alarm, the combination of a casing, supply and distributing pipes connected to the casing, a diaphragm forming a side of the casing and confining the pressure and receiving the force thereof, a valve connected to and movable with the diaphragm and adapted to close the supply-pipe when the pressure falls below the normal, a lever connected to and movable with the valve, a catch adapted to interlock with the lever and hold the valve seated when the pressure ceases, and an electric alarm-circuit having its terminals connected to, respectively, said lever and catch and closed by the interlocking thereof, substantially as set forth.

3. In a fluid-pressure cut-off and alarm, the combination of a casing, supply and distributing pipes connected to the casing, a diaphragm forming a side of the casing and confining the pressure and receiving the force thereof, a valve connected to and movable with the diaphragm and adapted to close the supply-pipe when the pressure falls below the normal, a lever connected to and movable with the valve, a catch adapted to interlock with the lever and hold the valve seated when the pressure ceases, an electric alarm-circuit having its terminals connected to, respectively, said lever and catch and closed by the interlocking thereof, and an indicator connected to said lever and movable therewith to designate when the pressure is on or off, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT M. HUGHES. [L. S.]

Witnesses:

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