

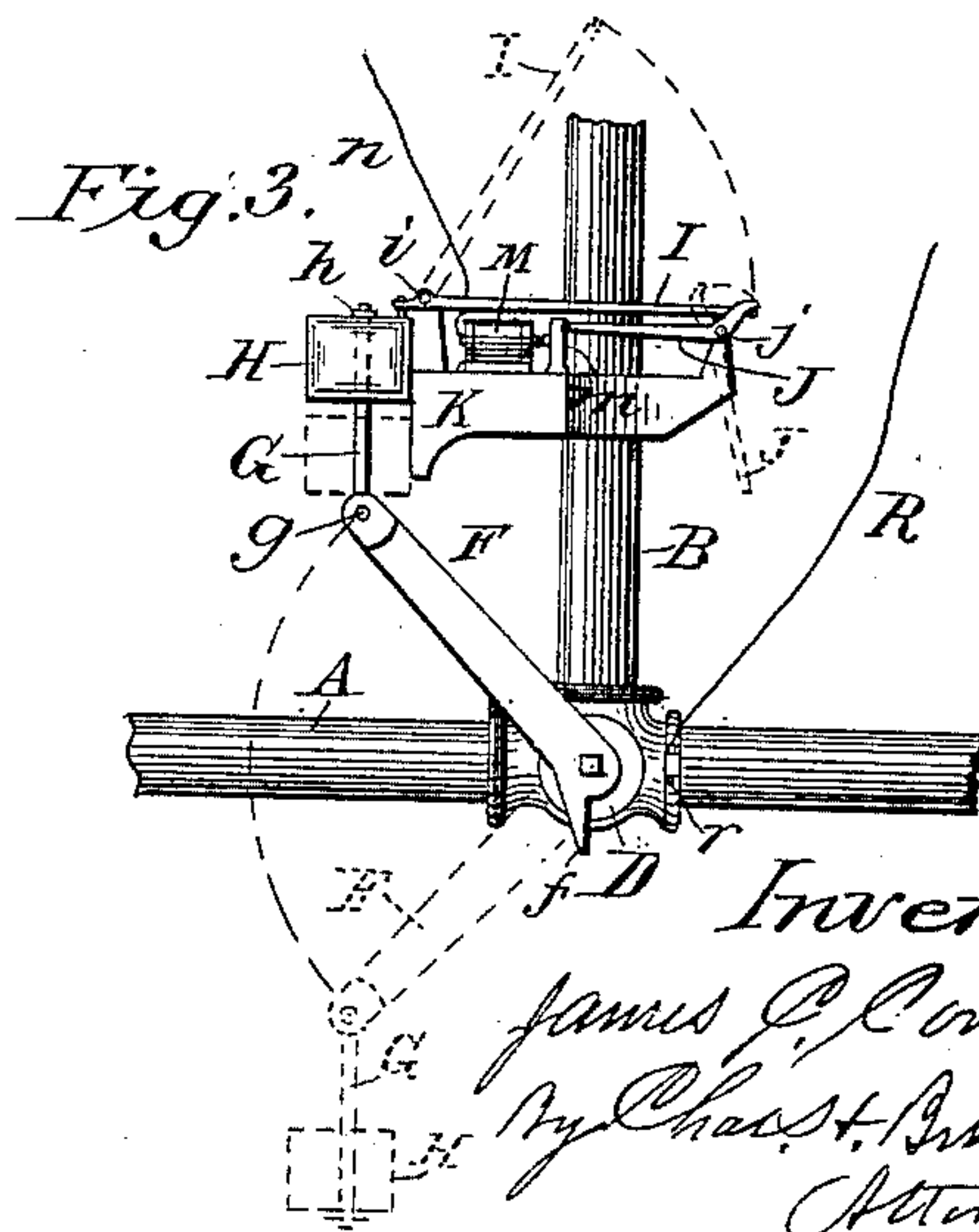
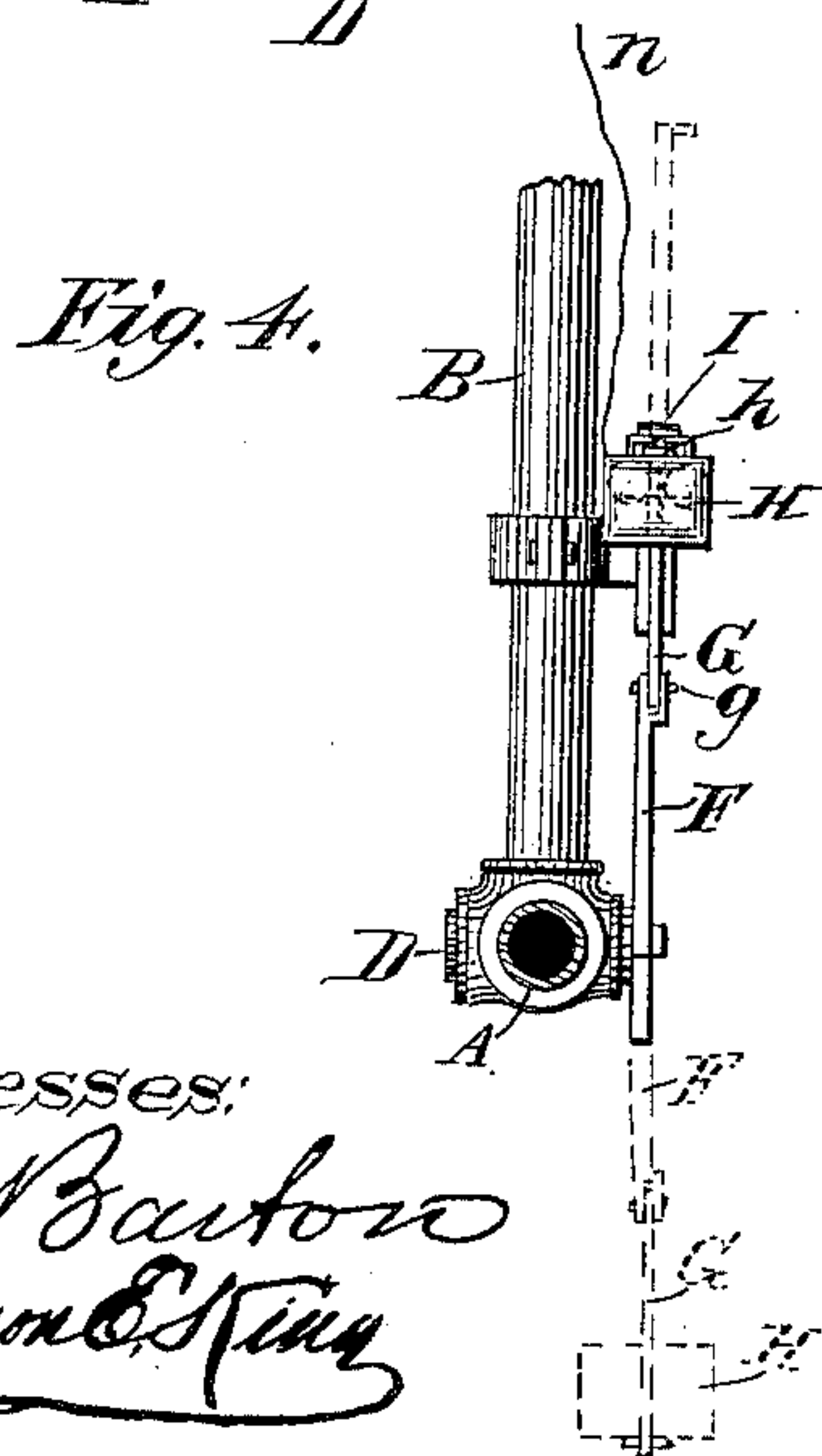
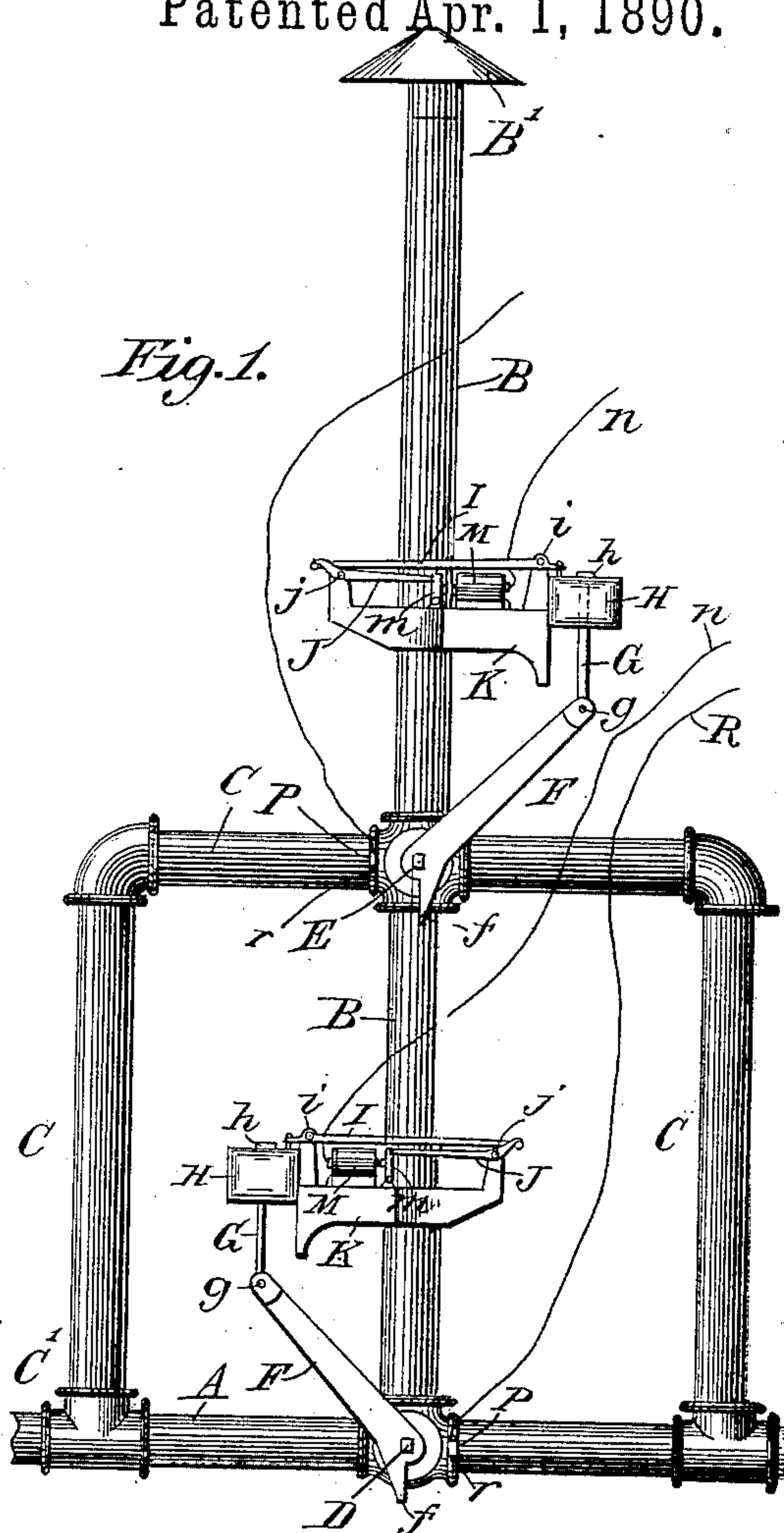
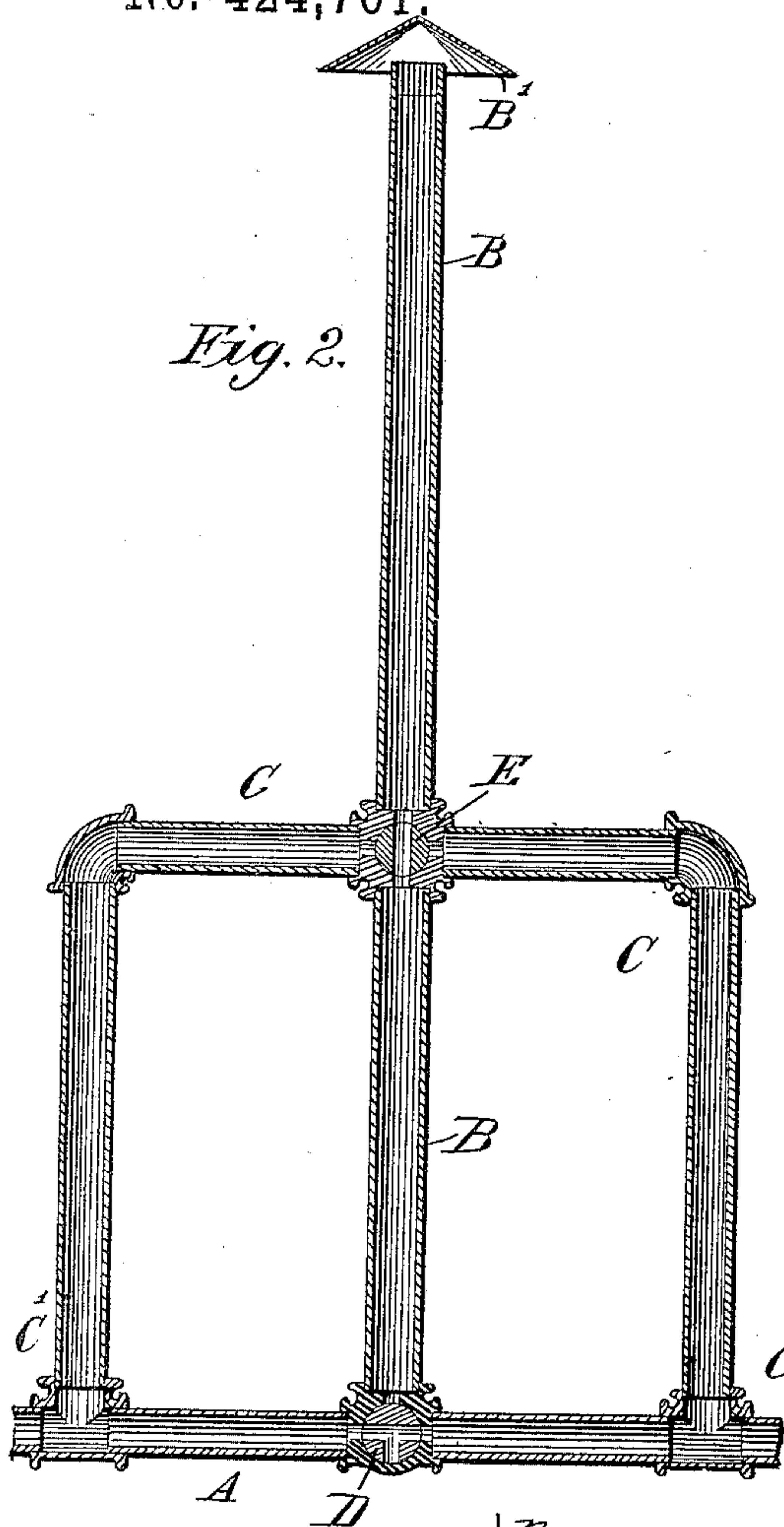
(No Model.)

J. C. CONROY.

CUT-OFF AND RELIEF APPARATUS FOR GAS MAINS.

No. 424,761.

Patented Apr. 1, 1890.



Witnesses:

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UNITED STATES PATENT OFFICE.

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CUT-OFF AND RELIEF APPARATUS FOR GAS-MAINS.

SPECIFICATION forming part of Letters Patent No. 424,761, dated April 1, 1890.

Application filed March 23, 1889. Serial No. 304,546. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. CONROY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Cut-Off and Relief Apparatus for Gas-Mains, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The objects of my present invention are, first, to provide a simple and convenient means for shutting off gas by control of an electrical circuit or equivalent connection from a line or section of piping and for relieving the cut-off line from pressure immediately when the passage in the main is closed; second, to provide means for immediately, if desirable, letting on the gas after it has been cut off and for closing the escape-passage, and, third, to provide, in combination with the gas-main, an automatic shut-off, an escapement-way, and a by-pass having a valve for closing the escapement-way and opening said by-pass; also, in combination with such improved apparatus, to afford facilities for controlling the operation of the same from the gas-office. These objects I attain by mechanism the nature and operation of which are herein explained, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a side view illustrating an arrangement of pipes, valves, and valve-operating mechanism in accordance with my invention. Fig. 2 is a longitudinal central section through the pipes and valves. Fig. 3 is a side view of the valve-operating mechanism, with dotted lines showing the action thereof; and Fig. 4 is an end view of the same.

Referring to parts, A denotes the gas-main or line of pipe through which the gas normally flows.

B indicates an escape or relief pipe connected at its lower end with said main and its upper end extending to a suitable position

for safely discharging the gas into the air, said upper end being open and covered by a hood or cowl B'.

C indicates a by-pass pipe that connects with the main at opposite sides of the escape-pipe, as at C', and centrally with said relief-pipe, as illustrated.

D indicates a rotating valve or stop-cock located at the junction of the relief-pipe B with the main A, and having a three-way port therethrough. The normal position of the valve D in the main is with its straight ports leading directly through and its third port at the bottom, as shown in Fig. 2.

E indicates a rotating valve or stop-cock located at the junction of the relief-pipe B with the by-pass C and provided with a two-way port. The normal position of the valve E is with its port open in line with the relief-pipe, or with the by-pass closed, as shown in Fig. 2.

Any suitably-arranged mechanism can be employed for operating the respective valves D and E; but I prefer to employ an automatic mechanism which can be controlled from a central station by electric or other suitable connection, and in the present instance I have shown an electrically-actuated mechanism arranged substantially as follows: A lever or arm F is attached to the axis of the valve, and to the outer end of the arm there is connected by a hinge or pivot *g* a link G, that carries a weight H. This weight is preferably loose or free to slide on the link, but retained thereon by a head or nut at *h*. Above the arm and supported by a suitable bracket K, I arrange a trap-lever I, pivoted or fulcrumed at *i*, and having its shorter arm fitted to engage with a loop or detent on the weight H, for sustaining said weight elevated, while the opposite end of said trap-lever I is held down by the escape-lever J. (See full lines, Figs. 3 and 4.) The lever J is fulcrumed at *j*, and is in turn retained by the armature *m* in front of the electro-magnets M, which magnets are connected by wire *n* with the central gas-office, where suitable batteries and circuit breaking and closing apparatus is combined therewith for sending through the mag-

nets M the requisite impulse for moving the armature *m* and releasing the escape-lever J. In connection with the valve or its operating-arm there is provided a lug or finger *f*, that
 5 comes into contact with a stop or projection P, which prevents movement of the valve past the desired position.

The operation is as follows: When the magnet draws back the armature *m*, the escape-
 10 ment-lever J being thereby released, drops down and allows the trap-lever I to swing upward and release the weight H. (See dotted lines, Fig. 3.) The weight then slides down the link G and against the end of the arm F,
 15 thus giving a stroke to start the valve in case it does not move freely. The link, weight, and arm then swing downward, and as the arm descends the link G turns over on its
 20 outward thereon and against the head *h*, thus giving a second blow or shock for insuring the complete movement of the valve.

The valve D is operated when it is desired to cut off the flow of gas through the main.
 25 This instantly closes the main and simultaneously brings one port of the valve into line with the passage of relief-pipe B, thus giving vent therethrough for relieving the pressure in the section cut off.

30 When the valve D has been closed and it is again desired to let on the gas to the cut-off portion of the main, it is done by operating the valve E, which valve closes the passage through the escape-pipe B and opens the pas-
 35 sage through the by-pass pipe C.

The stop-lug P is preferably furnished with contact-points *r*, from which a wire or wires R lead to and connect with an annunciator in the gas-office. The finger *f* completes the
 40 electric circuit at *r* when the weight H falls,

and thus sends back a signal to the gas-office that the valve has properly operated.

It will be understood that I do not in my present application include the particular
 45 construction of the electrically-actuated mechanism for working valves as a special feature of claim, or otherwise than in combination with an arrangement of pipes and valves such as shown.

I claim as my invention, to be secured by
 50 Letters Patent—

1. The combination, substantially as described, of the gas-main, the relief-pipe connected with the main, the by-pass pipe intersecting with and connecting said relief-pipe
 55 at opposite sides with the main, the cock D, disposed in the junction of said relief-pipe with the main, and the cock E, disposed in the junction of said relief-pipe and by-pass pipe, said cocks respectively having ports arranged
 60 for opening and closing the passages there-through in the manner described, for the purpose set forth.

2. The combination, with the gas-main A, of the by-pass pipe C and the relief or escape-
 65 ment pipe connected with said main and intersecting said by-pass pipe, the four-way valve-seat at said intersection having the two-way cock E, the three-way valve D at the
 70 junction of the relief-pipe and main, actuating mechanism for operating said valves, and connections for controlling the same from a distance, substantially as described, for the purpose set forth.

Witness my hand this 11th day of March, 75
 A. D. 1889.

JAMES C. CONROY.

Witnesses:

CHARLES F. CONROY,
 HOWARD E. TROUTMAN.