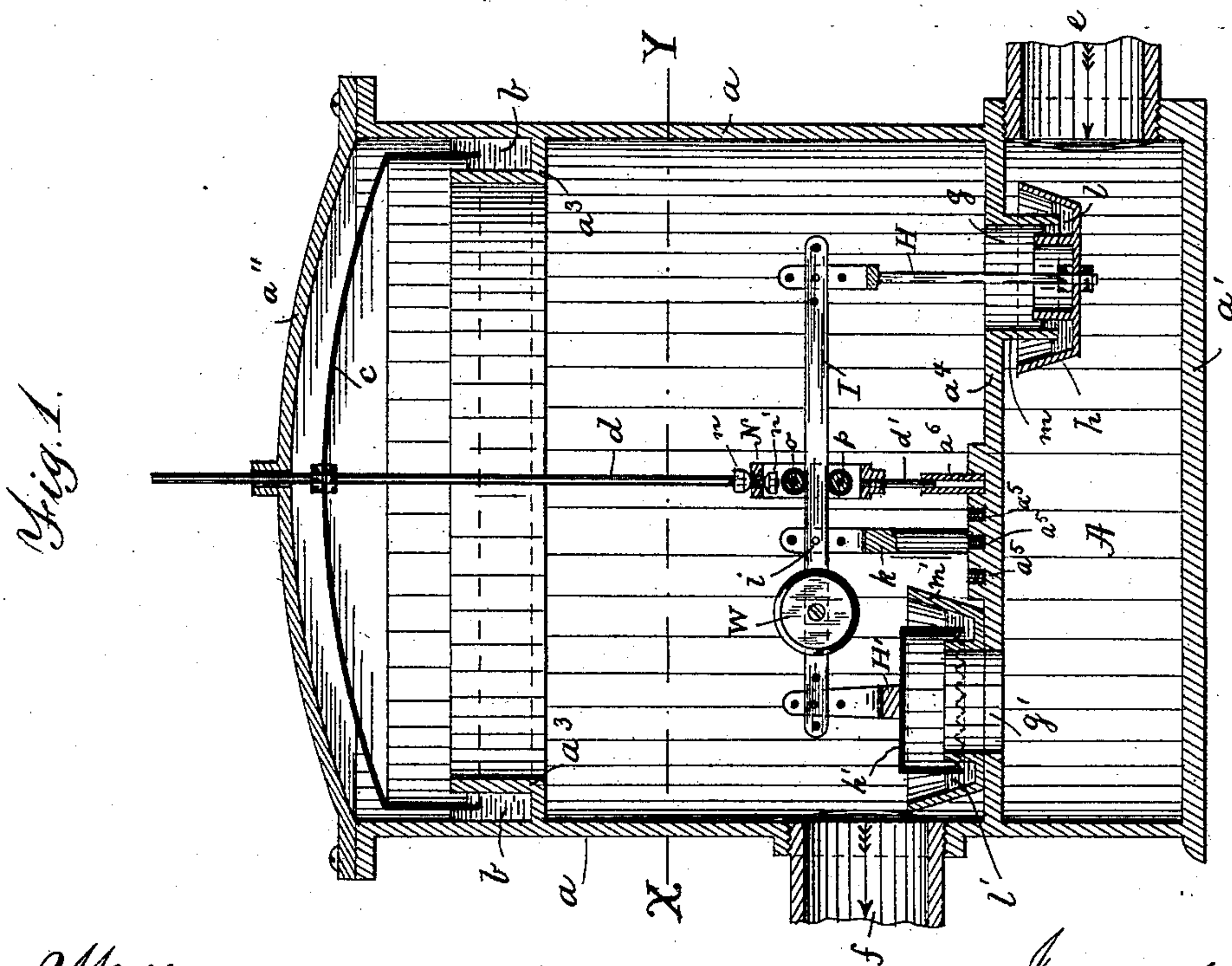
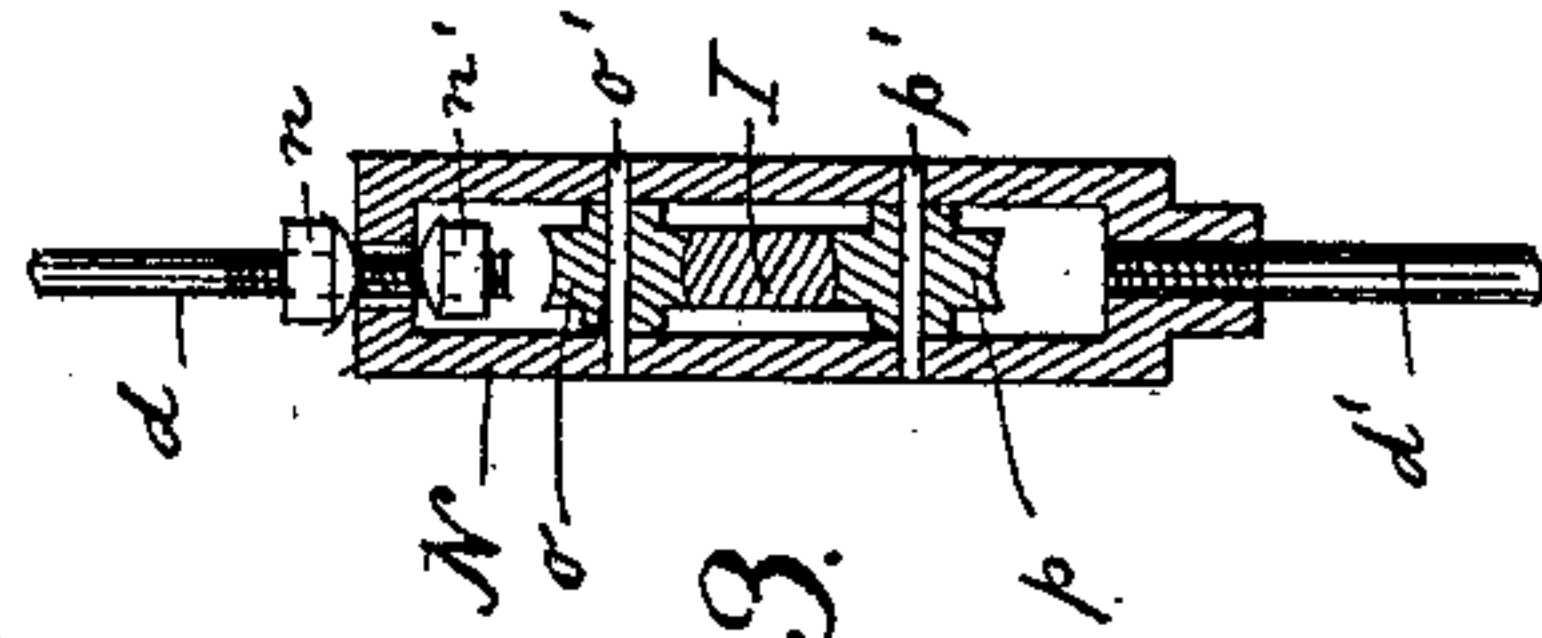
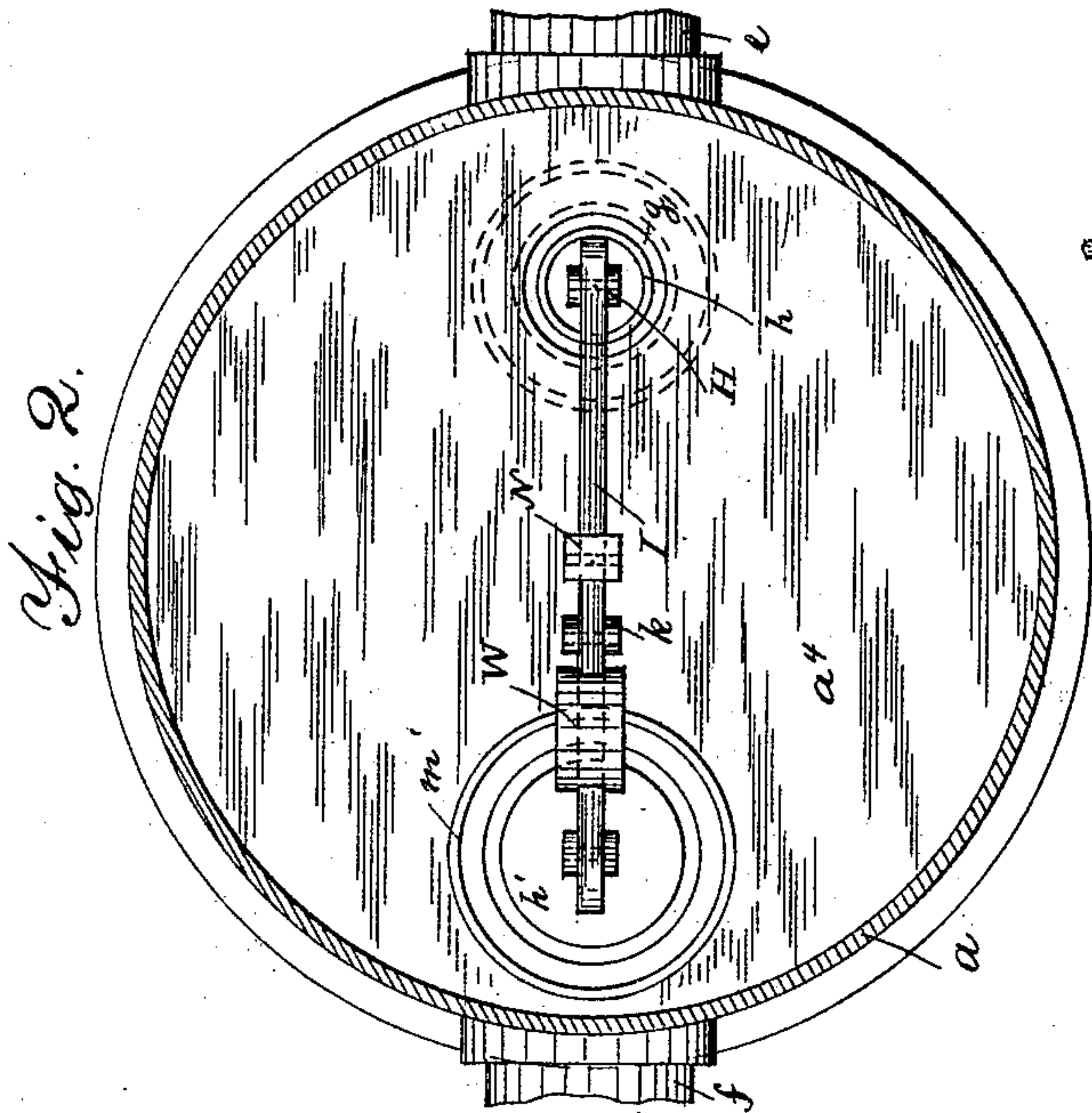


(No Model.)

W. C. ROSSNEY.
GAS REGULATOR.

No. 411,063

Patented Sept. 17, 1889.



Witnesses.
Selma R. Schelin.
Henry Chadbourne.

Inventor.
William C. Rossney.
by Alvan Andren his atty.

UNITED STATES PATENT OFFICE.

WILLIAM C. ROSSNEY, OF HYDE PARK, ASSIGNOR OF TWO-THIRDS TO
WILLIAM THRELKELD AND CHARLES L. HUNT, OF BOSTON, MASSA-
CHUSETTS.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 411,063, dated September 17, 1889.

Application filed October 2, 1888. Serial No. 287,013. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. ROSSNEY, a citizen of the United States, and a resident of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Gas-Regulators, of which the following, taken in connection with the accompanying drawings, is a specification.

10 This invention relates to improvements in gas-regulators for the purpose of automatically regulating and controlling the supply of gas delivered to the burners independent of the pressure in the gas-main or supply-pipe leading from it to the regulator; and the present invention is an improvement on the patents granted to me July 6, 1886, Nos. 344,989 and 344,990, in each of which is shown a single valve adapted to open upwardly against the gas-pressure in the main or gas-supply pipe leading to the said valve.

The invention is carried out as follows, reference being had to the accompanying drawings, wherein—

25 Figure 1 represents a vertical section of my improved gas-regulator, some of the parts being shown in elevation. Fig. 2 represents a cross-section on the line X Y, shown in Fig. 1; and Fig. 3 represents an enlarged detail sectional view of the yoke by which the gas-holder rod is connected to the valve-lever.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

35 In the drawings, *a* represents the body or casing of the regulator, having base or bottom *a'* and detachable cover *a''*.

On the interior of the casing *a* is an annular cylinder *a³*, containing mercury or quicksilver *b*, in the same manner as shown in my aforesaid patents.

c is the gas-holder, made in the form of an inverted cup, the lower edge of which is sealed in the liquid *b* in the cylinder *a³*.

45 The cover *a''* has a central perforation, in which is loosely guided the rod *d*, that is adjustably secured to the gas-holder *c* in a gas-tight manner.

a⁴ is a horizontal division-wall in the body

a, and between it and the bottom *a'* is the valve-box A, as shown in Fig. 1.

e is the gas-supply pipe leading from the gas-main or other gas-supply to the valve-box A, and *f* is the delivery-pipe leading from the case *a* to the burners.

55 *g g'* are perforations in the valve-box cover or division-wall *a⁴*, which perforations are adapted to be closed by means of a pair of balance-valves *h* and *h'*, the stems or rods *H H'* of which are suitably connected to the lever I, that is pivoted at *i* to the rod or standard *k*, that is secured in a suitable manner to the valve-box cover *a⁴*. To the lever I is adjustably secured the weight W, for the purpose of balancing the valves *h* and *h'*. 65 The rod or bearing *k* is preferably screwed into one of the screw-threaded recesses *a⁵ a⁵* in the top of the valve-box cover *a⁴*, so as to adjust it relative to the valves as may be desired.

70 The valves *h* and *h'* are preferably liquid seated, but may be hard seated, if so desired, without departing from the essence of my invention.

The valve *h'* is shown as made in the form of an inverted cup, the lower edge of which is shown as closed in the mercury or quicksilver *l'* contained in the cup-shaped valve-seat *m'*. The valve *h* is shown as being made in the form of a cup containing mercury or quicksilver *l*, and as said valve is raised the stationary valve-seat *m* is caused to be sealed in the liquid *l* contained in said cup-shaped valve *h*. 75

I desire to state that I do not wish to confine myself to any particular construction of the said balance or equilibrium valves, as they may be liquid seated or hard seated, although in practice I prefer to use liquid-seated valves, as shown in the drawings. 85

The gas-holder spindle *d* is jointed in its lower end to the valve-lever I in the following manner:

90 N is a slotted frame or yoke, to the upper end of which the gas-holder spindle *d* is loosely connected or swiveled, so as to permit the gas-holder *c* and its spindle *d* to turn around more or less independent of the said yoke or

frame N, and for this purpose any suitable swivel-connection may be used between said rod and the yoke or frame N. In the drawings, Figs. 1 and 3, I have shown the lower
 5 end of the rod d as projecting loosely through a vertical perforation in the upper end of the yoke or frame N, with nuts or collars n n' secured to the said rod d above and below the upper wall of the yoke N; but I wish to
 10 state that I do not desire to confine myself to this precise swivel-connection, as any suitable connecting mechanism may be used without departing from the essence of my invention.

To the lower end of the yoke N is secured
 15 the spindle d' , that is guided in the vertical pipe or guide a^6 , secured in a suitable manner to the division-wall a^4 , as shown in Fig. 1.

The lever I projects loosely through the slot-
 20 ted frame or yoke N, and above and below said lever are located the anti-friction rollers o and p , that are loosely journaled on the pins o' and p' , passing through the sides of the said yoke N, as shown in Fig. 3.

It will thus be seen that the vertical move-
 25 ment of the gas-holder c and its spindle d is communicated directly to the lever I and its valves h and h' , and the object of thus connecting the gas-holder to the weighted lever is to automatically compensate for the varia-
 30 tions in the displacement of the liquid seal b in the cylinder a^3 during the rise and fall of the said gas-holder c , and thus cause the valves to be automatically balanced during such variations in the positions of the said gas-
 35 holder.

We will suppose that the gas-holder c is in its highest position, the valves h h' closed, and the lever I in the horizontal position, as shown in Fig. 1. If, now, the pressure within the
 40 gas-holder should be reduced by the consumption of the gas passing out through the pipe f , that leads to the burners, the gas-holder c will commence to move downward, thereby causing the lever I to swing on its fulcrum
 45 i until the valves h h' are opened, when the gas from the pipe e and valve-box A will pass into the body a and out through the pipe f , that leads to the burners, and will continue so to do as long as the consumption of gas is
 50 equal to the supply. When, however, the consumption is reduced by the shutting off of one or more burners, the holder c will rise, and by so doing it will cause the lever I to be returned to its horizontal position (shown in
 55 Fig. 1) and consequent gradual closing of the valves h h' , thereby shutting off the supply of gas from the pipe e .

During the downward movement of the holder c its annular lower edge displaces a
 60 certain quantity of the mercury b , and consequently reduces the weight of said holder; but such reduction in weight is compensated for by the increased leverage on which the said holder acts on the lever I during the
 65 downward motion of the valve h , for it will be noticed that as the valve h is lowered the distance between the fulcrum i and that part

of the lever I on which the rollers o p act is increased, thus making the static force of the holder c on the weighted lever I and its valves
 70 equal during the various positions of said parts and compensating for the displacement of the liquid b during the downward motion of the holder c .

When the holder c rises, its weight is in-
 75 creased by the sinking of the mercury seal b , and such increase is compensated for by the reduction of the leverage on the lever I, on which the yoke or frame N acts, until the normal closed position of the valves is reached,
 80 and so on.

It will also be noticed that the balanced valves h and h' are opened and closed entirely independent of the pressure in the valve-box
 85 A or in the supply-pipe e , the movement of said valves being controlled by the rise and fall of the gas-holder c , according to the consumption of the gas at the burners.

What I wish to secure by Letters Patent,
 90 and claim, is—

1. In a gas-regulator, a case or body having a liquid-seated gas-holder arranged within it and having its stem connected to a pivoted lever, combined with a pair of balanced valves
 95 arranged on opposite sides of the said gas-holder stem, substantially as and for the purpose set forth.

2. In a gas-regulator, the case or body a , having arranged within it a liquid-seated gas-
 100 holder and a pair of balanced valves, combined with a lever pivoted to the fulcrum or post k and to the said valves and connecting mechanism between said lever and the gas-
 105 holder, said valves and their connecting mechanism being all contained within and inclosed by the gas-holder or bell, substantially as and for the purpose set forth.

3. In a gas-regulator, the body a , having arranged within it the liquid-seated gas-holder
 110 c , and a pivoted lever connected to a pair of balanced valves, as described, said lever being loosely connected to the stem of the gas-holder by the medium of the yoke N, in which the said valve-actuating lever is free to
 115 adjust itself during the vertical movement of the gas-holder, so as to automatically change the leverage of said lever, as described, for the purpose of compensating for variations in the displacement of the liquid seal for the
 120 gas-holder, said valves and their connecting mechanism being all contained within and inclosed by the gas-holder or bell, substantially as and for the purpose set forth.

4. In a gas-regulator, the body a , having arranged within it the liquid-seated gas-holder
 125 c , a pair of balanced valves pivoted to the lever I, said lever being pivoted to the stationary fulcrum or post k , as described, in combination with the yoke N, swiveled to the
 130 gas-holder stem and provided with the anti-friction rollers o p and the lower guide a^6 , substantially as and for the purpose set forth.

5. In a gas-regulator, the body a , having arranged within its upper end the liquid-seated

gas-holder *c*, and having a valve-box *A* in its lower end, with a perforated plate or diaphragm *a*⁴ between said parts, combined with a pair of balanced valves connected together and to the gas-holder by means of the weighted lever *I*, pivoted to the stationary post or fulcrum *k*, said valves and their connecting mechanism being all contained within and inclosed by the gas-holder or bell, substantially as and for the purpose set forth.

6. In a gas-regulator, the case or body *a*, having valve-box *A* and supply and delivery pipes *e f*, as described, combined with a pair of balanced valves connected together by means of a pivoted lever and a liquid-seated

gas-holder arranged within said case or body, said gas-holder having its stem loosely connected to the valve-lever, said valves and their connecting mechanism being all contained within and inclosed by the gas-holder or bell, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 13th day of September, A. D. 1888.

WILLIAM C. ROSSNEY.

Witnesses:

ALBAN ANDRÉN,
SELMA R. SCHELIN.