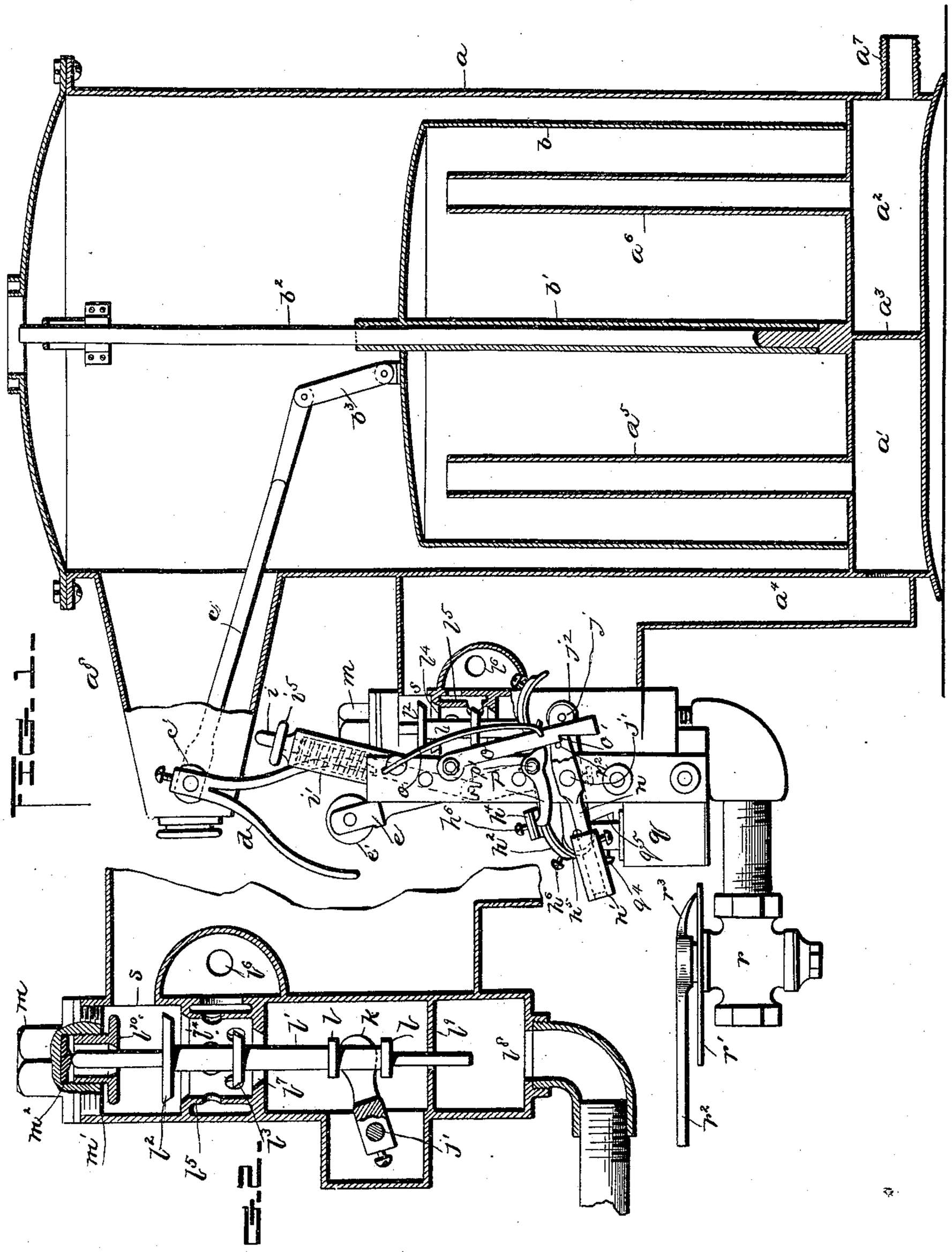
(No Model.) 3 Sheets—Sheet 1.

E. MEREDITH.

GAS AND AIR MIXER.

No. 447,784. Patented Mar. 10, 1891.



WITNESSES:

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(No Model.) 3 Sheets—Sheet 2.

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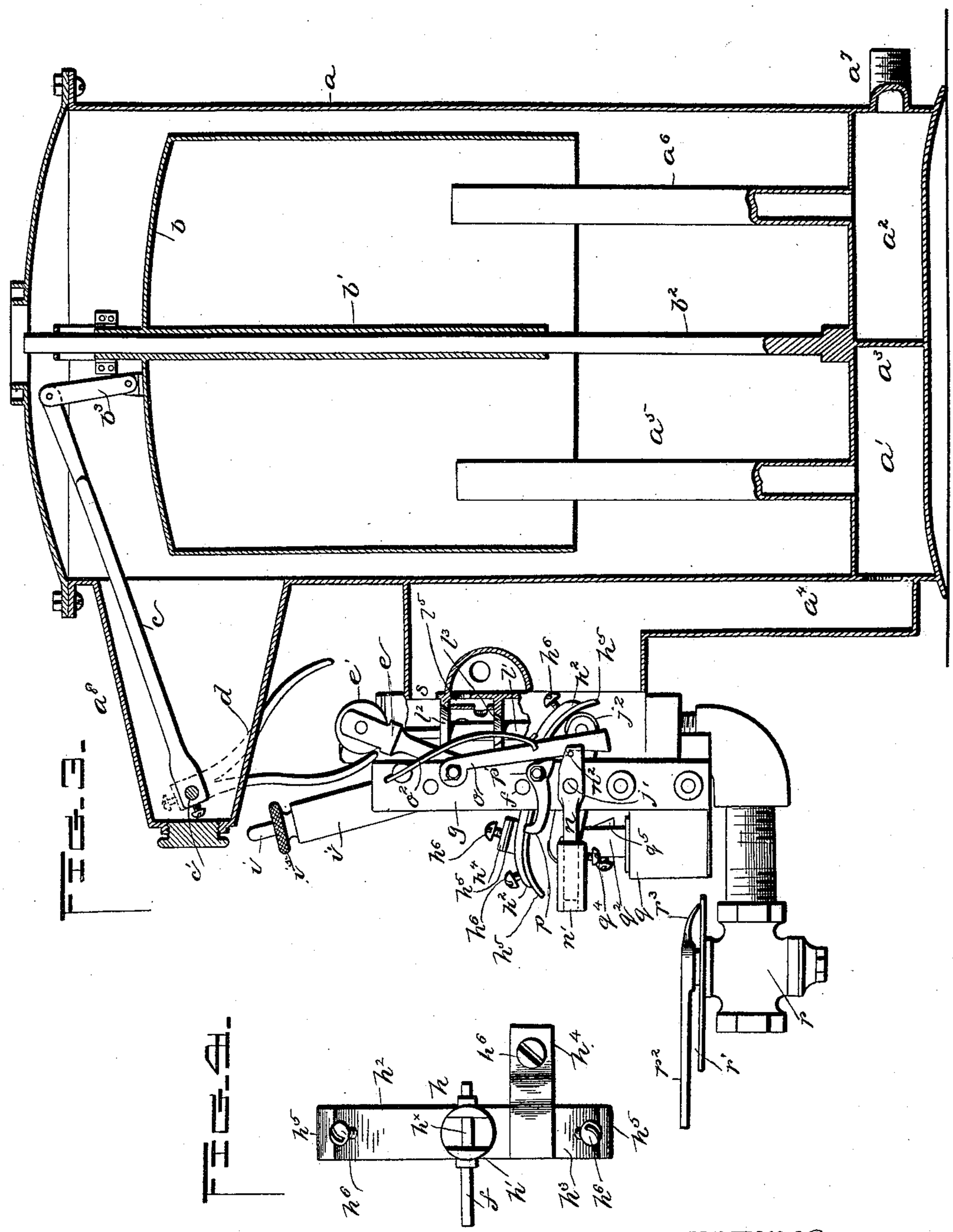

FIG. 3.

FIG. 4.

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(No Model.) 3 Sheets—Sheet 3

E. MEREDITH.

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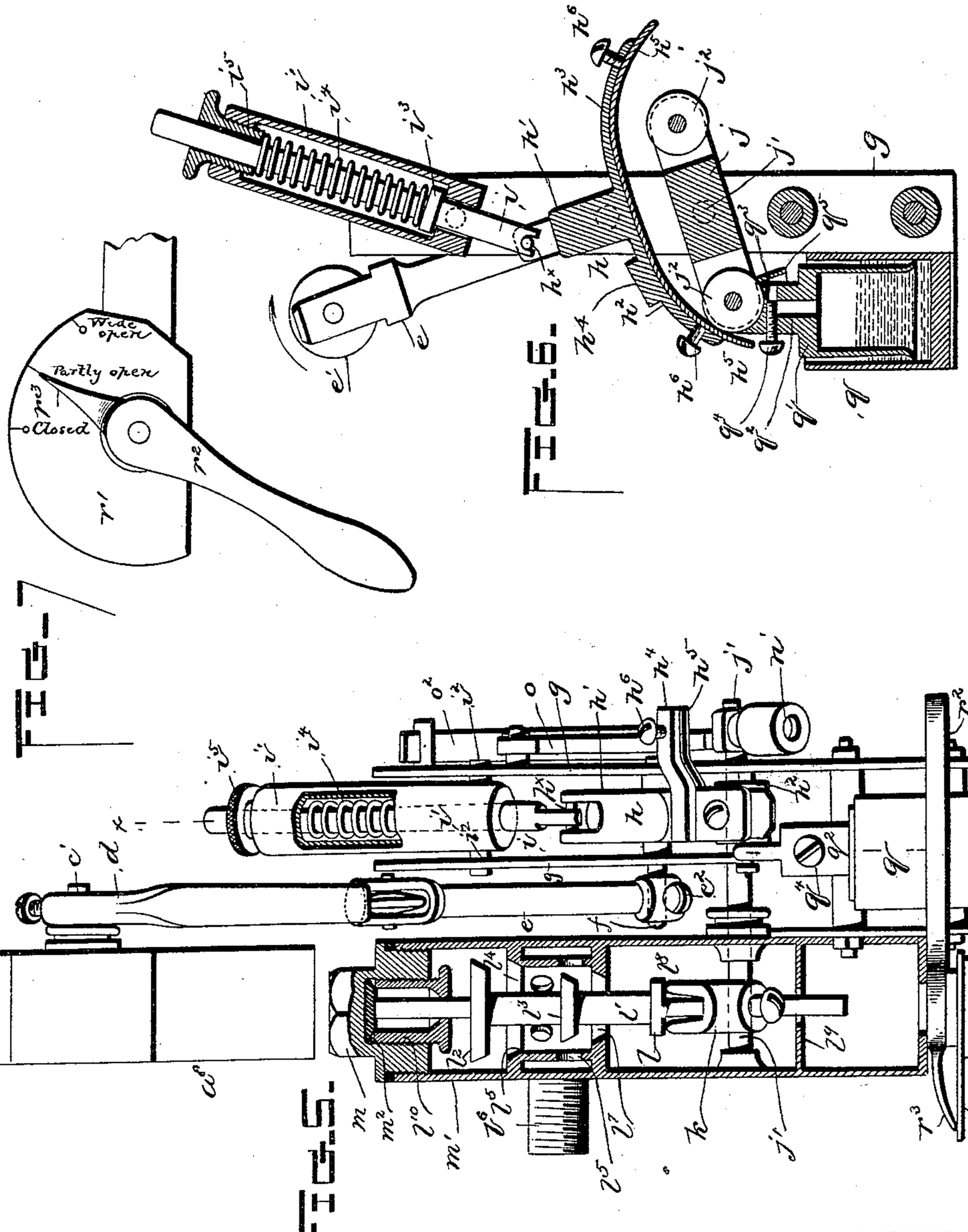

FIG. 1.

FIG. 2.

FIG. 3.

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UNITED STATES PATENT OFFICE.

EDMUND MEREDITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PENNSYLVANIA GLOBE GAS LIGHT COMPANY, OF SAME PLACE.

GAS AND AIR MIXER.

SPECIFICATION forming part of Letters Patent No. 447,784, dated March 10, 1891.

Application filed November 26, 1890. Serial No. 372,656. (No model.)

To all whom it may concern:

Be it known that I, EDMUND MEREDITH, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Air and Gas Mixers, of which the following is a full, clear, and exact description.

The object of this invention is to provide a device for mixing air and gas to be supplied to burners, the apparatus being a portion of a carburetor plant.

The invention consists of a mixer having a vertically rising and falling holder arranged therein with a proper seal, the said holder being connected with and operating a lever, which in turn is connected with the peculiar valve mechanism of this invention, as will presently appear, whereby as the mixed air and gas enter the holder the said holder is raised and when it reaches its highest position automatically closes the valves and shuts off the supply of air and gas. When the holder descends (as the gas is consumed) and reaches its lowermost position, the valves are automatically opened to admit a fresh supply of air and gas, all as I will proceed now more particularly to set forth and finally claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a sectional elevation of the complete apparatus, showing the holder in its lowermost position and the valves open. Fig. 2 is a vertical section of the valves in the position they occupy when the holder is in the position indicated in Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the holder in its highest position and the valves closed to cut off the supply of air and gas. Fig. 4 is a plan view of the air-inlet cock and its attached indicator. Fig. 5 is a front elevation of the valve mechanism, partly in section, with the parts in the position shown in Fig. 1. Fig. 6 is a vertical section taken in the plane of line $x\,x$, Fig. 5. Fig. 7 is a plan view of the valve-rocking lever.

The mixer a has a bottom chamber divided into the inlet-compartment a' and outlet-compartment a^2 by means of a partition a^3. a^4 is the inlet-channel, a^5 the induction-tube extending from the compartment a' and rising above the seal, and a^6 is the eduction-tube opening into the compartment a^2, and a^7 is the nipple for connection of the distributing-pipe.

b is the holder provided with a guiding-sleeve b', arranged upon a guide-rod b^2, suitably supported and steadied within the mixer a. The holder b is connected by a link b^3 with a lever c arranged upon a rock-shaft c', having bearings in a cap a^8.

The rock-shaft c' is provided with a forked arm d. This forked arm operates in conjunction with a crank e, preferably provided with an anti-friction roller e', which said crank e is fixed, as by a set-screw e^2, to one end of a shaft f. This shaft f is journaled in a frame g, and it carries a four-armed lever h. One arm h' of this lever is provided with a pin $h^\times$, which is engaged by the forked end of a piston i, and the said piston is arranged within a case i', journaled on gudgeons i^2 in the frame g, so as to be capable of receiving a rocking motion therein. The piston i is provided with a collar i^3, against which abuts a spring i^4, the other end of the said spring abutting against a nut i^5, tapped in the end of the casing i', whereby the tension of the spring may be adjusted to provide for placing the proper burden upon the lever h, for a purpose presently appearing. The lever h is provided, also, with the arms h^2 and h^3, in line with one another, and with a fourth arm h^4, arranged substantially at right angles to, or, in other words, projecting laterally from, the arm h^2. The arms h^2, h^3, and h^4 are provided with take-up devices, each consisting, substantially as shown, of a flat piece of spring metal h^5 and an adjusting-screw h^6. This rocking lever h co-operates with the arm j, made fast to the shaft j'. This arm j projects on each side of the shaft j' and terminates in anti-friction rollers j^2, with which the arms h^2 and h^3 alternately come in contact to rock the shaft j'. This shaft j' is provided with a toe k, engaging tappets $l\,l$ on the valve-stem l', to raise and lower said valve-stem as the arm j is actuated by the lever h. The valve-stem l' has the puppet-valves l^2 l^3, which provide for the admission of air and gas. The valve l^2

has a seat l^4 at the top of a perforated annular chamber l^5, communicating with the gas-inlet l^6, and the valve l^3 has a seat l^7 in a wall or septum in the air-chamber l^8. The valve-stem l' has a bottom guide l^9, and has a top guide l^{10}, the latter consisting, as shown, of a screw tapped into the nut m, which serves as the upper closure for the valve case or shell m'. A cushion m^2, of rubber or other soft stuff, is placed in the nut m, and held therein by the screw l^{10} to prevent undue jarring of the valves as they are lifted by the toe k.

The shaft j' is provided with an arm n, on which is arranged a weight n'. This arm is forked at its rear end and provided with a cross-pin n^2. A latch o is pivoted to the frame g, and has an offset or shoulder o' to engage the pin n^2 to lock the valves (when the holder has risen to its highest position and thereby closed the valves) to hold said valves from opening until the holder has descended sufficiently to open the valves positively. A spring o^2 serves to hold the latch o in such engagement.

A tripping device p is pivoted at p' to the frame g, and one end projects into the path of movement of the laterally-projecting arm h^4 of the lever h, while its other end extends rearwardly into the line of movement of the latch o.

In order further to cushion the valves and their tripping mechanism, I have connected with the arm j a dash-pot q. The piston q' of this dash-pot has a longitudinally-perforated stem q^2, and this longitudinal perforation is intersected by a lateral opening q^3, the size of which is controlled by a screw-valve q^4. The hood q^5 is placed over this opening q^3. The dash-pot, by preference, is supplied with glycerine. As the piston descends, air escapes through the opening q^3, gradually or with difficulty, according to the extent of opening allotted by means of the adjustment of the screw q^4, and as the piston ascends the partial vacuum formed thereby sucks in the air through the opening q^3.

I provide the valve r in the air-inlet with an indicator-plate r', having suitable marks to show, for example, that the valve is wide open, partly open, or entirely closed, and I provide the operating-handle r^2 of this valve with a pointer r^3 to co-operate with the indicator-plate r'.

The operation is as follows: As the holder is emptying it will by gravity fall into the position indicated in Fig. 1, and in so doing will cause the valves to open and the valve-operating mechanism to take the several positions indicated in Fig. 1. As the holder rises it rocks the arm d, and as said holder attains about a third of the distance of its elevation the said arm d comes in contact with the anti-friction roller e' of the crank e and begins to move the said crank, the lever h, and the spring-plunger i, the direction of movement of the said crank e being indicated by the arrow in Fig. 6. As the holder continues to rise and the parts move, the crank e and plunger i will pass a vertical line in opposite directions, and the pressure of the spring i^4 will be sufficient, after such vertical line has been passed, to act upon the arm h' and shift the lever h from the position shown in Figs. 1, 5, and 6 to that shown in Fig. 3. The valves will then be closed and the supply of air and gas cut off, and then as the gas is consumed the holder will descend and a reverse operation of the parts will take place. The air coming in through the cock r and the gas coming in through the inlet l^6 will mingle in the annular chamber l^5 and pass thence through the seat l^4 out at the opening s into the channel a^4, and thence into the compartment a' through the tube a^5 into the holder. As the holder is completing its descent and the lever h has been tripped, its lateral arm h^4 will move the tripping device p to disengage the latch o from the pin n^2 to allow the operation of the shaft j'. I provide this latch o to insure the closed position of the valves until just before the holder has completed its descent. Were it not for this latch the jarring caused by street-travel and otherwise produced would have a tendency to influence the movement of the valves at improper times; but with this latch the proper position of the valves is always insured. Weighting the arm n insures the rocking of the shaft j' when said arm has been released.

Whenever it becomes necessary, as by wear or otherwise, to bring the arms h^2, h^3, and h^4 into closer contact with the parts with which they co-operate, the screws h^6 may be turned down, so as to throw the springs h^5 farther from the arms h^2, h^3, and h^4, and thus nearer to the anti-friction devices j^2 and j^3 and the tripping device p.

What I claim is—

1. In a mixer, an outer casing and a holder arranged therein, valves for controlling the admission of air and gas to said holder, a tripping mechanism interposed between the said holder and valves and operated by the rise and fall of the holder, and comprising a rock-shaft connected with the stem of the valves, a rock lever or arm for moving said shaft, a spring plunger or piston for holding the said rock lever or arm in given position, a crank connected with the pivot or shaft of the said rock lever or arm, and an arm co-operating with said crank and actuated by a rod connected with and moved by the holder, substantially as described.

2. In an air and gas mixer, a holder and puppet-valves interposed between the air and gas inlets and in an air and gas mixing chamber and controlling the admission of mixed air and gas to the mixer, combined with a rock-shaft connected with the stem of the said valves, an arm on said shaft provided with anti-friction devices, a rock-lever having arms to co-operate with the anti-friction devices, a spring-plunger controlling the movement of the said rock-lever, a crank attached

to the shaft or pivot of said rock-lever, and a forked arm co-operating with said crank and deriving its motion from the holder, substantially as and for the purpose described.

3. In an air and gas mixer, a movable holder, a rock-shaft provided with a depending forked arm and a rod connecting the said holder and rock-shaft, combined with valves arranged in a mixing-chamber and providing for the mixing of air and gas and the admission of the mixed air and gas to the holder, a rock-shaft and a connection between it and the common stem of the said valves, an arm on said valve-actuating shaft, a rock-lever for actuating said arm, a spring-plunger for controlling the movement of said rock-lever, a crank on the rock-lever shaft extended into operative connection with the forked arm, and a dash-pot connected with the arm on the valve-operating shaft, substantially as described.

4. In an air and gas mixer, the holder, a rock-shaft, and a rod connecting the said rock-shaft and the holder, valves for permitting the mixing of air and gas and admitting the mixed air and gas to the holder, the valve-actuating shaft, and means, substantially as described, interposed between the rock-shaft and valve-actuating shaft, for operating said valve-actuating shaft, and a shaft-locking device consisting of an arm secured on the valve-actuating shaft and provided with a pin, a latch to engage said pin, and a tripping device for said latch, and means controlled by the holder for actuating the tripping device to disengage the latch and permit of the opening of the valves, substantially as described.

5. In an air and gas mixer, a holder, a rock-shaft, and a rod connecting the said rock-shaft and holder, combined with valves for mixing air and gas and admitting the mixed air and gas to the holder, a rock-shaft for actuating the said valves, a rock-lever provided with arms for rocking the said shaft first in one direction, then in another, and a third and laterally-projecting arm on said rock-lever, means, substantially as described, for holding said rock-lever in position and for moving it, and a locking and unlocking device for the valve-operating shaft, comprising a weighted arm secured on said valve-operating shaft, a latch for engaging it, and a tripping device for disengaging the latch, arranged in the path of movement of the laterally-projecting arm of the rocking lever and actuated by the said laterally-projecting arm as it descends, substantially as described.

6. In an air and gas mixer, a holder, a rock-shaft provided with a depending forked arm, and a rod connecting the two, combined with valves for providing for the mixing of the air and gas and for the admission of the mixed air and gas to the holder, and means actuated by the forked arm to open and close the said valves, and a device for locking the said valves in closed position and for positively unlocking them when desired, comprising a valve-shaft, a weighted arm on said shaft, a latch to engage said arm and prevent it from falling and to retain the valves closed, and a tripping device arranged to be actuated by the valve-moving mechanism to disengage the latch and weighted arm and permit the weighted arm to put in motion the valve-moving mechanism, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of November, A. D. 1890.

EDMUND MEREDITH.

Witnesses:
WM. L. ELKINS, Jr.,
H. HERMAN.