

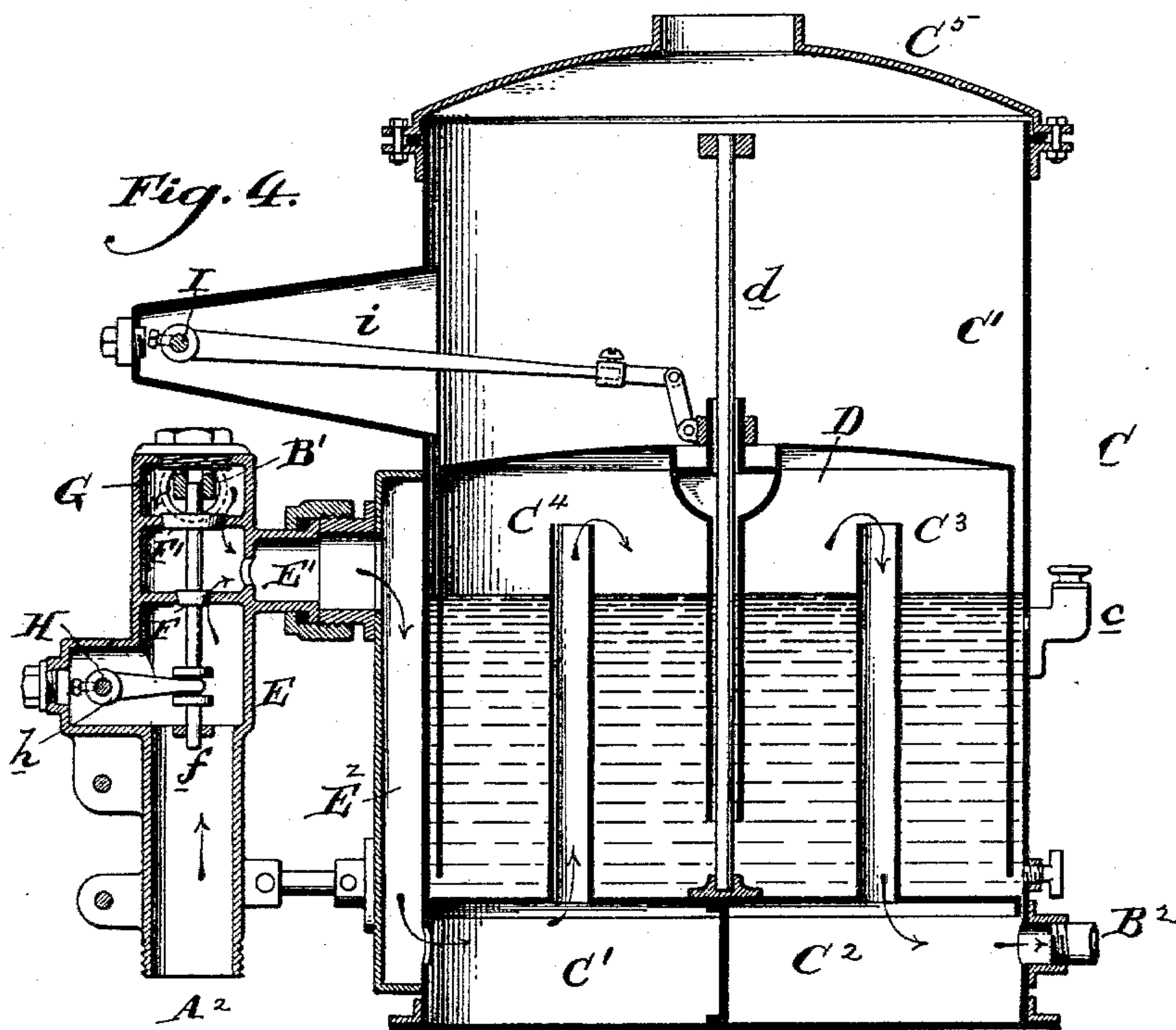
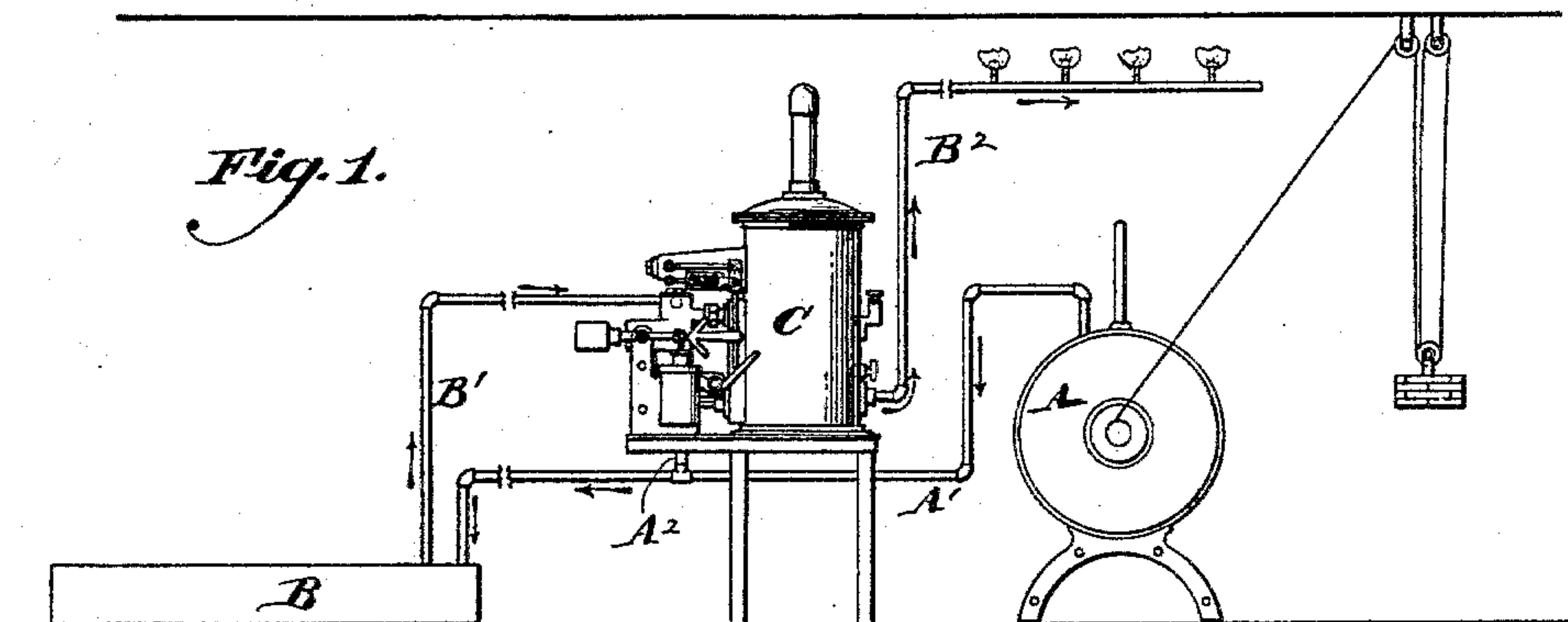
(No Model.)

2 Sheets—Sheet 1.

E. MEREDITH.
GAS AND AIR MIXER.

No. 593,276.

Patented Nov. 9, 1897.



Witnesses.

Henry D. Dwyer
Thos. H. Evans

Inventor.

Edmund Meredith

By *Thos. H. Evans*

Attorney.

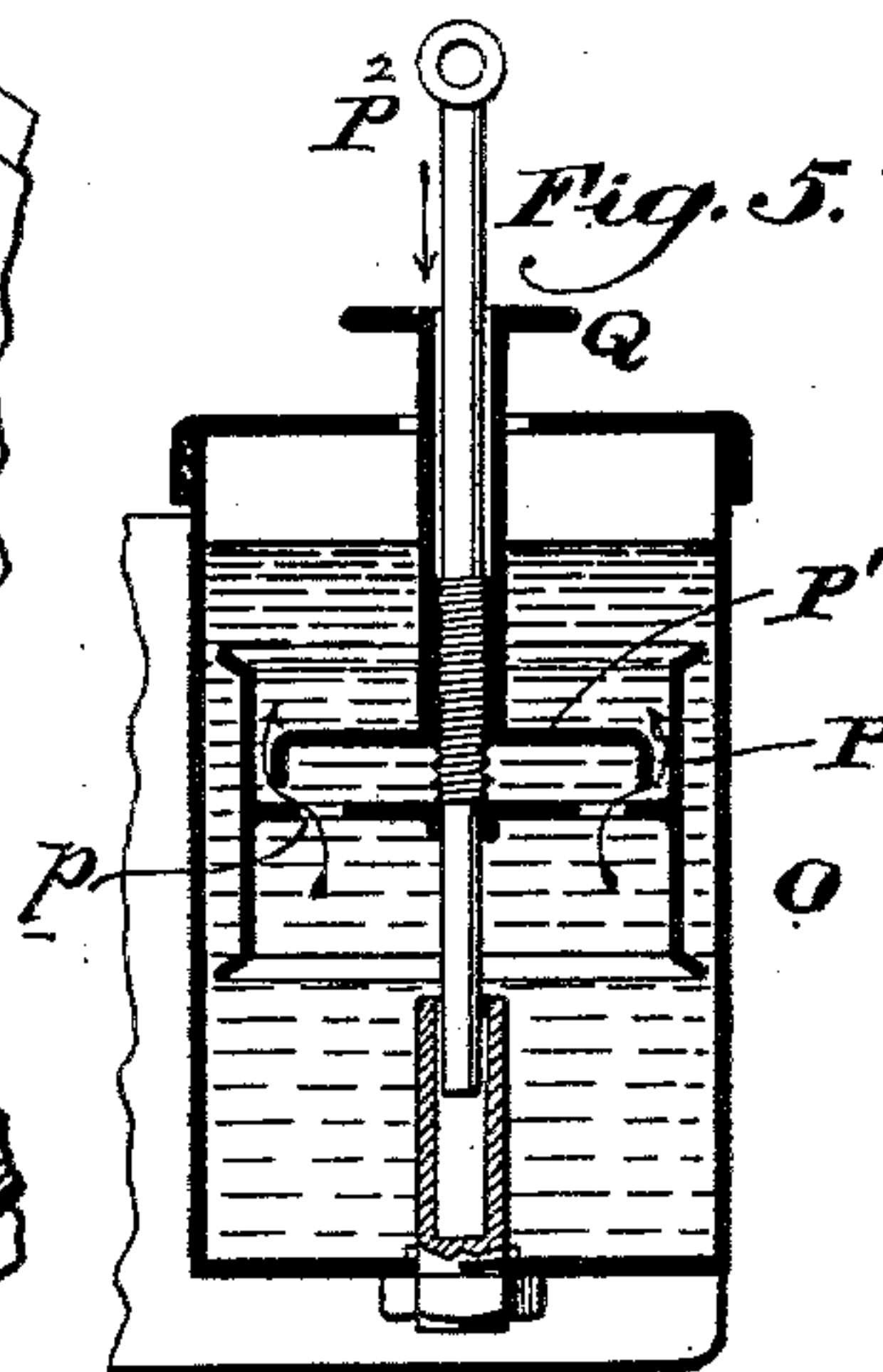
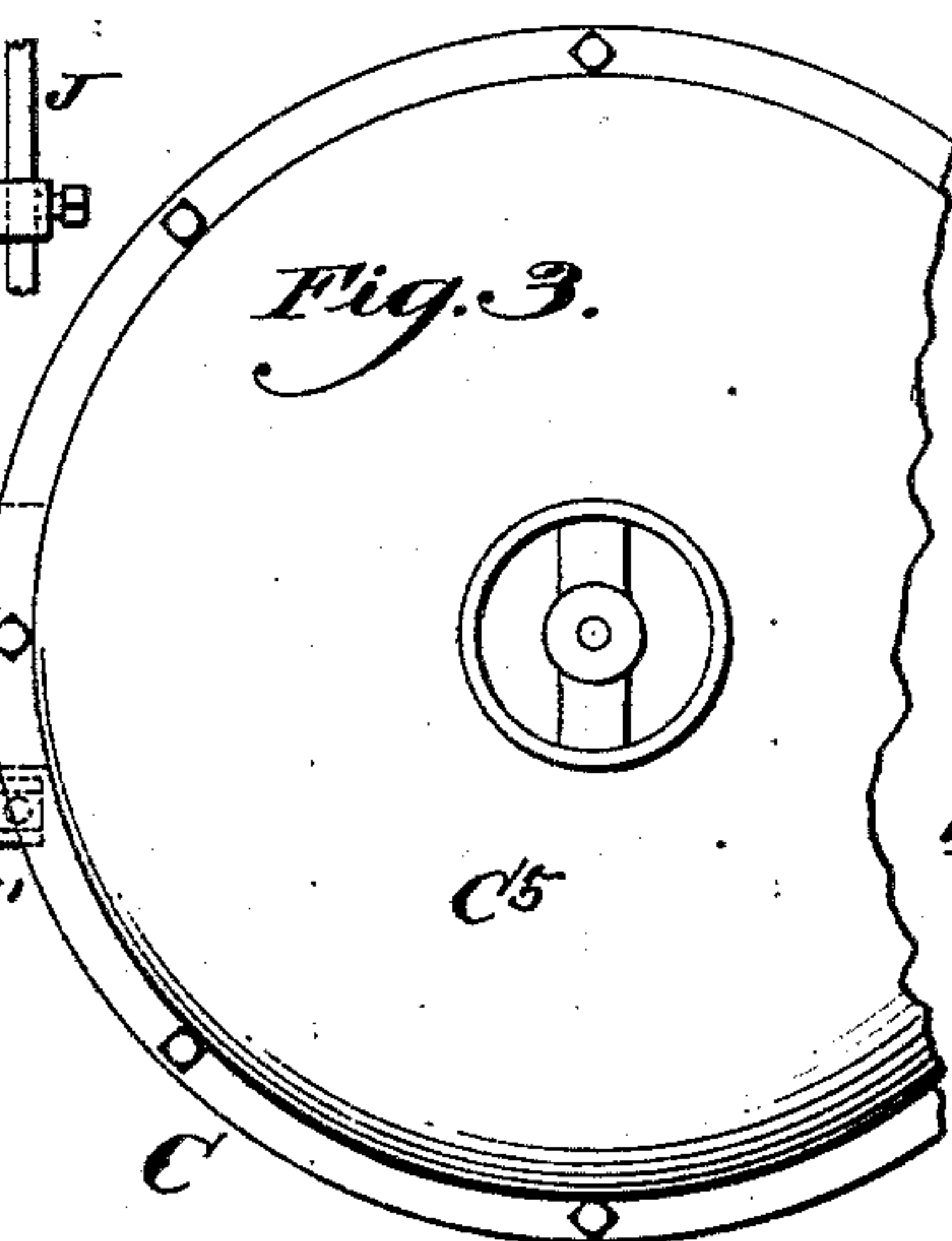
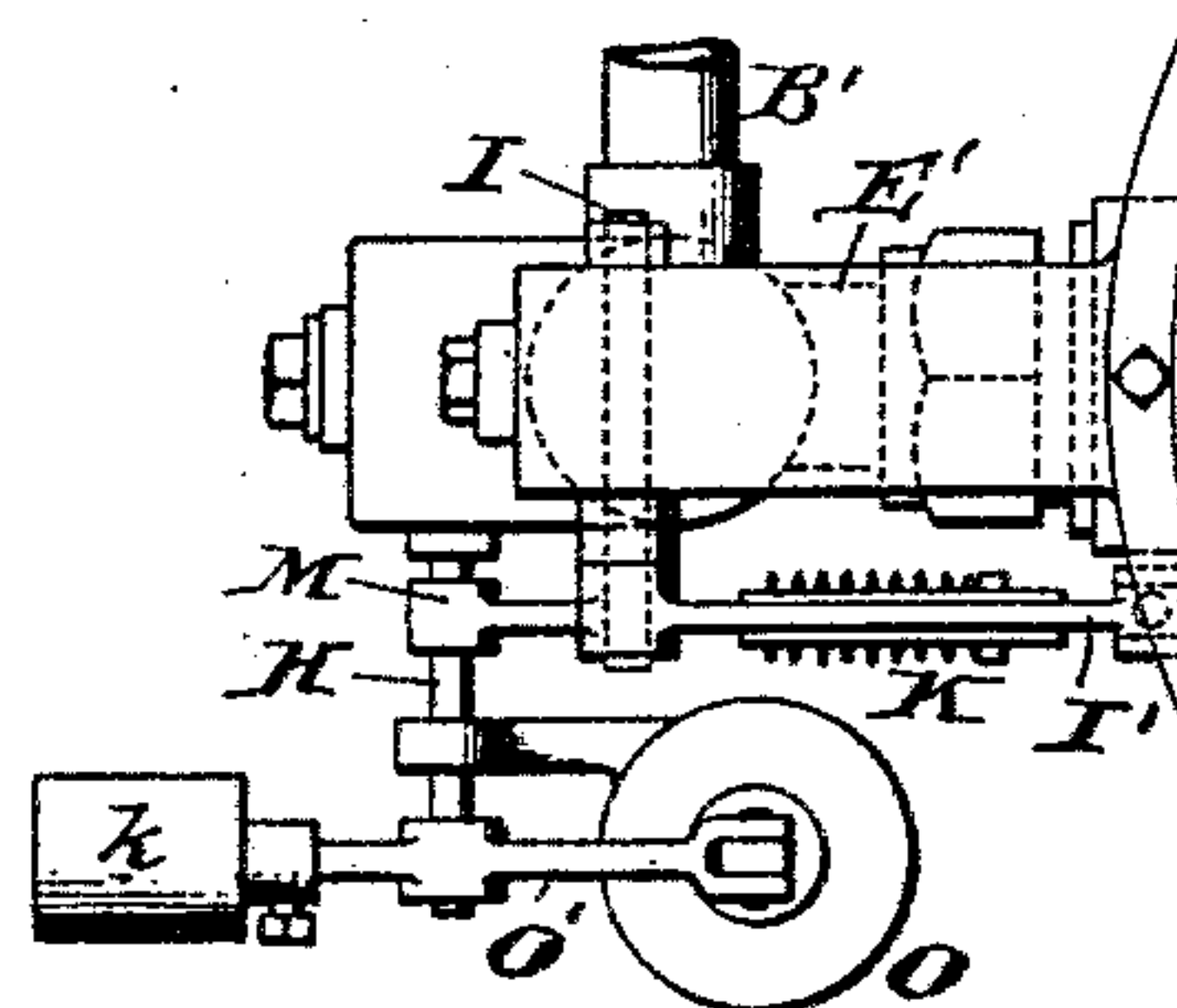
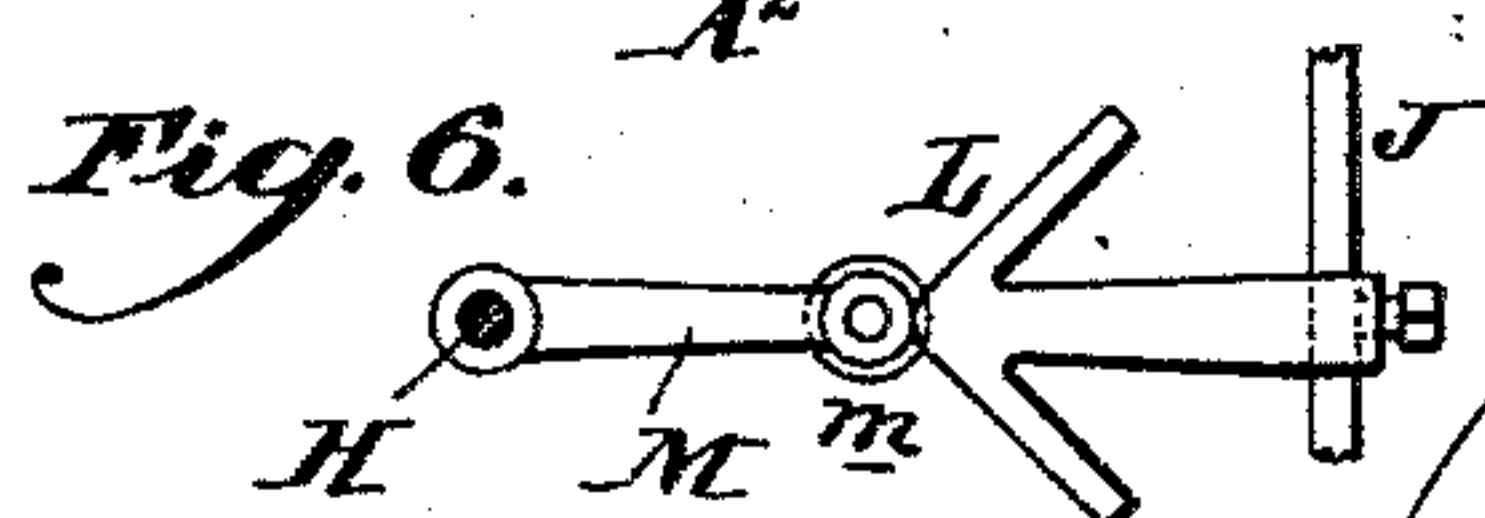
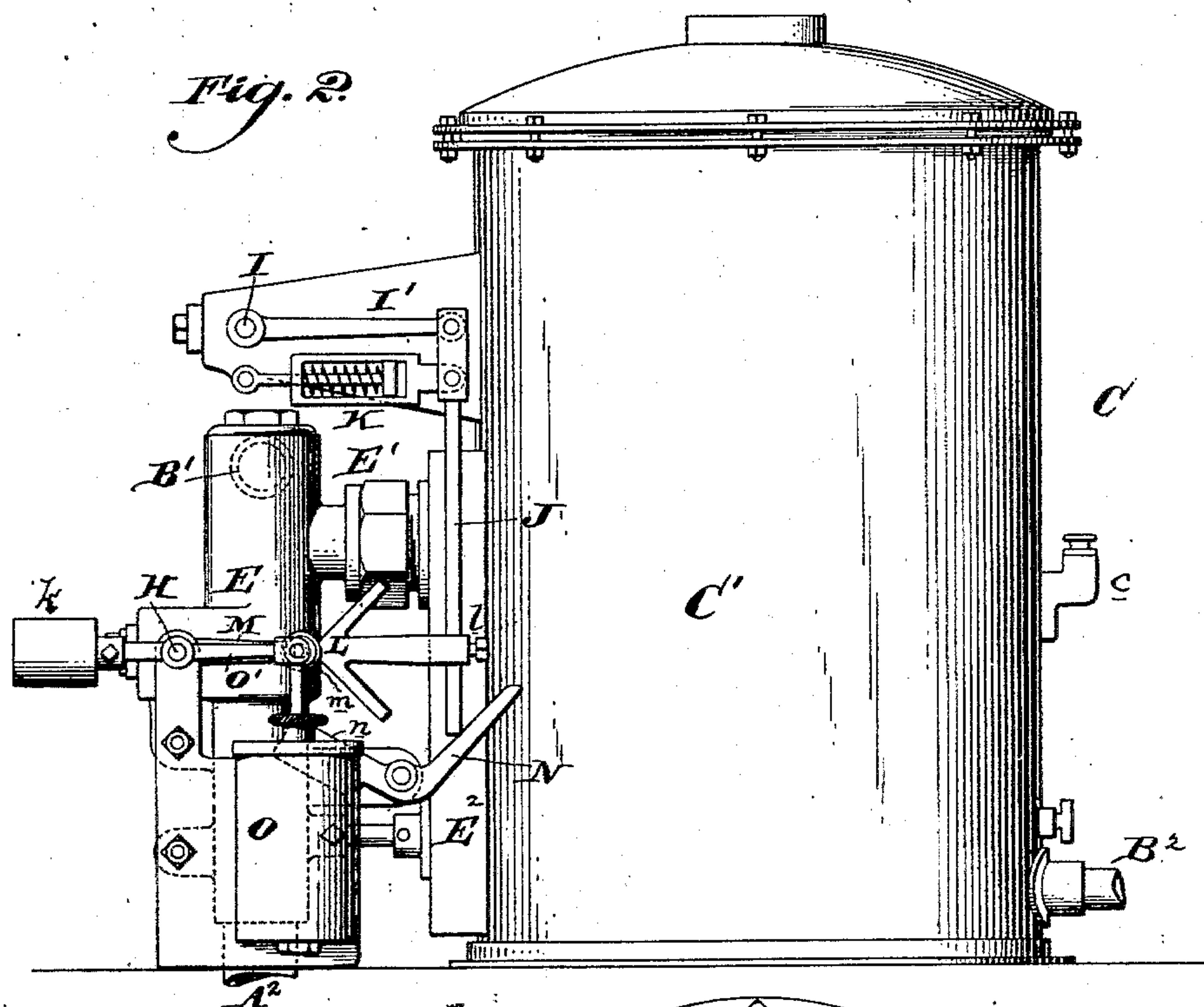
(No Model.)

2 Sheets—Sheet 2.

E. MEREDITH.
GAS AND AIR MIXER.

No. 593,276.

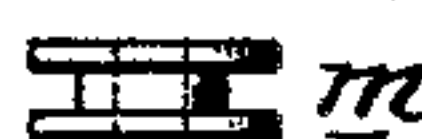
Patented Nov. 9, 1897.



Witnesses.

Henry D. ...
Wm. H. ...

Fig. 7.



Inventor,

Edmund Meredith

By [Signature]

Attorney.

UNITED STATES PATENT OFFICE.

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

GAS AND AIR MIXER.

SPECIFICATION forming part of Letters Patent No. 593,276, dated November 9, 1897.

Application filed February 27, 1897. Serial No. 625,402. (No model.)

To all whom it may concern:

Be it known that I, EDMUND MEREDITH, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Gas and Air Mixers, of which the following is a specification.

My invention has reference to gas and air mixers for gas apparatus; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

My improvements comprehend certain devices which automatically mix predetermined quantities of air and gas together prior to consumption at the burners to avoid smoking with ordinary burners, and is more particularly intended for use in connection with vapor-generators wherein a blower forces air through a carbureter and the resultant vapor-gas is then led to the burners.

My invention relates more specifically to the details of construction of the mixer wherein the valves are automatically controlled at intervals and wherein the opening and closing of the valves take place rapidly and at the extreme movements of the bell of the mixer.

My invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is an elevation of a gas apparatus, showing my improved gas-mixer. Fig. 2 is an enlarged side elevation of my improved mixer. Fig. 3 is a plan view of same. Fig. 4 is a sectional elevation of same. Fig. 5 is a sectional elevation of the dash-pot. Fig. 6 is an elevation of the tripping devices for rapidly shifting the valves, and Fig. 7 is a plan view of the trip-roller.

A is the ordinary well-known blower, from which air is led by a pipe A' and delivered to a carbureter B, of any suitable construction, containing, as is customary, means for presenting a hydrocarbon fluid to the incoming air. The vapor or carbureted air produced passes by pipe B' into the mixer C, which mixes with the said vapor a certain predetermined quantity of air, and the resultant diluted vapor passes by pipe B² to the burners or place of consumption. The air which

is delivered to the mixer for diluting the carbureted gas enters the mixer by a pipe A² leading from the air-pipe A'.

Referring to Fig. 4, it will be observed that the vapor from the pipe B' enters the chamber G and is permitted to pass from said chamber by a valve F' into a chamber E', while the air which enters by pipe A² passes from a chamber E through valve F into the chamber E'. The commingled air and vapor then passes by the flue E² into the chamber C' at the bottom of the mixer proper and escapes above the liquid-level by means of a pipe C⁴. The mixed air and vapor escapes from the mixer proper by a pipe C³ down into a chamber C² and from which it passes into the pipe B², leading to the burners or place of consumption. A small valve or plug c controls the level of the liquid within the gas-mixer C. Working within the vessel C' of the mixer and guided by a central guide-rod d is a vertical reciprocating bell D, which fits above the open ends of the tubes C³ and C⁴.

C⁵ is a lid or cover for the vessel C' and may have an outlet leading to the chimney-flue for the escape of any vapors which may accidentally become liberated.

The valves F F' are secured to the same spindle f and are of the proper diameters to control the desired relative flow of vapor and air. The valve for the air is considerably smaller than the valve for the vapor, and these are preferably ground on a taper, so as to be easily fitted and work properly.

H is a rock-shaft, about which the rocker-arm h is secured, the latter directly operating the valve-rod f. The rock-shaft H extends through the chamber E and has secured to it upon the outside an arm M, at the free end of which is pivoted a grooved roller m.

I is a rock-shaft connected by an arm i with the bell D, and by the reciprocations of which the said rock-shaft I is oscillated or rocked. Secured upon the outside of the rock-shaft I is an arm I', to which is pivoted a vertical bar J, to the lower end of which is adjustably connected at l a V-shaped tripper-cam L, adapted to work in the groove of the roller m. A spring device K operates on the bar J for the purpose of drawing the tripper-cam with more or less pressure against the roller

m. It will now be understood that as the arm *I'* is oscillated under the action of the bell *D* the tripper-cam is moved up or down, and when its point or apex passes above or below the roller *m* the action of the spring *K* instantly draws the tripper-cam toward the rock-shaft *H* and forces the arm *M* downward or upward, as the case may be, with considerable rapidity. In this manner the action of the rock-shaft *H* is intermittent, but the valves are shifted into new positions with considerable rapidity and remain in said positions for a period corresponding to practically the full movement of the bell *D*. From this it will be understood that when the bell *D* rises the tripper-cam *L* is raised to the position shown in Figs. 2 and 6. When the full height is reached, the tripper-cam apex will be slightly above the roller *m*, and when this position is assumed the spring *K* draws the tripper-cam toward the rock-shaft and forces the arm *M* down, which action closes the valves *F F'*. The weight of the bell *D* then forces the vapor into the pipe *B'* and to the burners. As soon as the lowest position of the bell is reached the tripper-cam will have descended to just below the roller *m*, and the spring *K* will again act to move the tripper-cam toward the rock-shaft *H*, but in this instance the arm *M* will be moved upward and the vapor and air admitted to the chamber *E'* together. The incoming mixture of air and vapor raises the bell *D* and the operation is repeated.

N is a counterweighted lever having a considerable weight *n* on one arm and so disposed that the other arm of the lever will act upon the lower end of the bar *J* for the purpose of forcing the tripper-cam *L* into operative position to trip the arm *M* in case the spring *K* should not operate, and, if desired, this lever may be relied upon as the sole means for producing the lateral motion of the tripper-cam in place of being used only as a safety device.

To prevent the valves from opening and closing with excessive force, I provide a dash-pot *O*, arranged to act upon a rocker-arm *O'*, which is secured to the rock-shaft *H* and counterweighted at *k*. The internal construction of the dash-pot is shown in Fig. 5. It consists of a piston *P*, loosely working in the dash-pot cup, which is almost filled with oil, and is secured to the shaft *P²*, pivoted at the top to the arm *O'*. The piston is provided with apertures *p* through it, which may be more or less closed by an adjustable disk *P'*, having an extension screwed upon the shaft *P²* and brought upward above the top of the dash-pot and terminating in an adjustable milled head *Q*. In this manner the disk *P'* is adjustable, so that it may be raised or lowered relatively to the piston-apertures, so as to close the passage for the oil to a greater or less extent, and thus retard to a greater or less degree the downward thrust of the piston. This will prevent a sudden

closing of the valves and the consequent wear which would result therefrom.

While I prefer the construction shown, I do not confine myself to the details thereof, as they may be varied without departing from the spirit of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, and a reciprocating spring-actuated tripping-cam continuously in contact with the arm and operated by the movable holder to quickly and positively open or close the valves at the extreme movements of the holder.

2. In a vapor and air mixer the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, a dash-pot or cushioning device to prevent too sudden closing of the valves, directly operating upon the rock-shaft and a reciprocating spring-actuated tripping-cam continuously in contact with the arm and operated by the movable holder to quickly and positively open or close the valves at the extreme movements of the holder.

3. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, a counterbalanced arm secured to the rock-shaft, a stationary liquid-cylinder, a piston loosely fitting said cylinder and connected to said counterbalanced arm, and a reciprocating spring-actuated tripping-cam making a continuous movement in contact with the arm of the rock-shaft and actuated by the movable holder to quickly open or close the valves at the extreme movements of the holder.

4. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the

flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, an adjustable dash-pot or cushioning device acting upon the rock-shaft to prevent too sudden closing of the valves, and a reciprocating angular tripping-cam operated by the movable holder and a spring to force the cam toward the arm of the rock-shaft to quickly open or close the valves at the extreme movements of the holder.

5. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, and a reciprocating spring-actuated tripping-cam actuated by the movable holder to quickly open or close the valves at the extreme movements of the holder consisting of a V-shaped cam, an oscillating arm actuated by the holder, a hinged bar carried by the oscillating arm and to which the cam is secured, and a spring for pressing the cam toward the arm secured to the rock-shaft.

6. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, a reciprocating spring-actuated tripping-cam actuated by the movable holder to quickly open or close the valves at the extreme movements of the holder, and a weighted lever acting upon the tripping-cam to cause it to press toward the rock-shaft arm to open the valves.

7. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, a reciprocating spring-actuated tripping-cam operated by the movable holder to quickly open or close the valves at the extreme movements of the holder consisting of a V-shaped cam, an oscillating arm actuated by the holder, a hinged bar carried by the oscillating arm and to which the cam is secured, a spring for pressing the cam toward the arm secured to the rock-shaft, and a weighted lever acting upon the tripping-cam to cause it to press toward the rock-shaft arm to open the valves.

8. In a vapor and air mixer, the combina-

tion of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, a reciprocating angular-shaped tripping-cam actuated by the movable holder, and a weighted lever acting upon the tripping-cam to cause it to open the valves through the rock-shaft and arm at the extreme movement of the holder.

9. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft to move the valves, an arm secured to the rock-shaft, a reciprocating angular tripping-cam actuated by the movable holder, a weighted lever acting upon the tripping-cam to cause it to open the valves through the rock-shaft and arm at the extreme movement of the holder, and a dash-pot or cushioning device to prevent too sudden closing of the valves.

10. In a vapor and air mixer, the combination of a movable holder, air and vapor supply pipes, valves for controlling the supply of air and vapor, a trip device for actuating the valves operated by the holder, and a dash-pot or retarding device for retarding the closing of the valves consisting of a stationary cylinder containing a fluid, and a loose piston moving in the cylinder and having downwardly-extending flanges, several passages in the piston at a distance from its center to permit the flow of liquid from below upward, a cup-shaped disk moving with the piston to simultaneously inclose all of the passages to a greater or less extent, and means extending above the liquid to adjust said cup-shaped disk.

11. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe leading from the holder to the burners or place of consumption, vapor and air pipes opening into the passage-way, valves to control the flow of vapor and air from the said pipes, a rock-shaft actuated by the holder, an arm secured to the rock-shaft, a bar hinged to the arm and carrying the V-shaped cam, a spring device K to move the bar in one direction, a rock-shaft to move the valves, and an arm M secured to the rock-shaft having roller *m* acted upon by the cam.

12. In a vapor and air mixer, the combination of a movable holder for receiving and discharging the mixed air and vapor, a passage-way leading to the holder, a pipe lead-

ing from the holder to the burners or place
of consumption, vapor and air pipes opening
into the passage-way, valves to control the
flow of vapor and air from the said pipes, a
5 rock-shaft actuated by the holder, an arm se-
cured to the rock-shaft, a bar hinged to the
arm and carrying the V-shaped cam, a spring
device K to move the bar in one direction, a
10 rock-shaft to move the valves, an arm M se-
cured to the rock-shaft having roller *m* acted
upon by the cam, and a dash-pot or retarding
device to prevent too sudden closing of the
valves acting upon the rock-shaft.

13. In a vapor and air mixer, the combina-
15 tion of a movable holder for receiving and
discharging the mixed air and vapor, a pas-
sage-way leading to the holder, a pipe lead-
ing from the holder to the burners or place

of consumption, vapor and air pipes opening
into the passage-way, valves to control the 20
flow of vapor and air from the said pipes, a
rock-shaft actuated by the holder, an arm se-
cured to the rock-shaft, a bar hinged to the
arm and carrying the V-shaped cam, a spring
device K to move the bar in one direction, a 25
rock-shaft to move the valves, an arm M se-
cured to the rock-shaft having roller *m* acted
upon by the cam, and a pivoted counter-
weighted lever N adapted to force the cam
toward the roller *m* at its lowest position. 30

In testimony of which invention I have
hereunto set my hand.

EDMUND MEREDITH.

Witnesses:

R. M. HUNTER,

R. M. KELLY.