

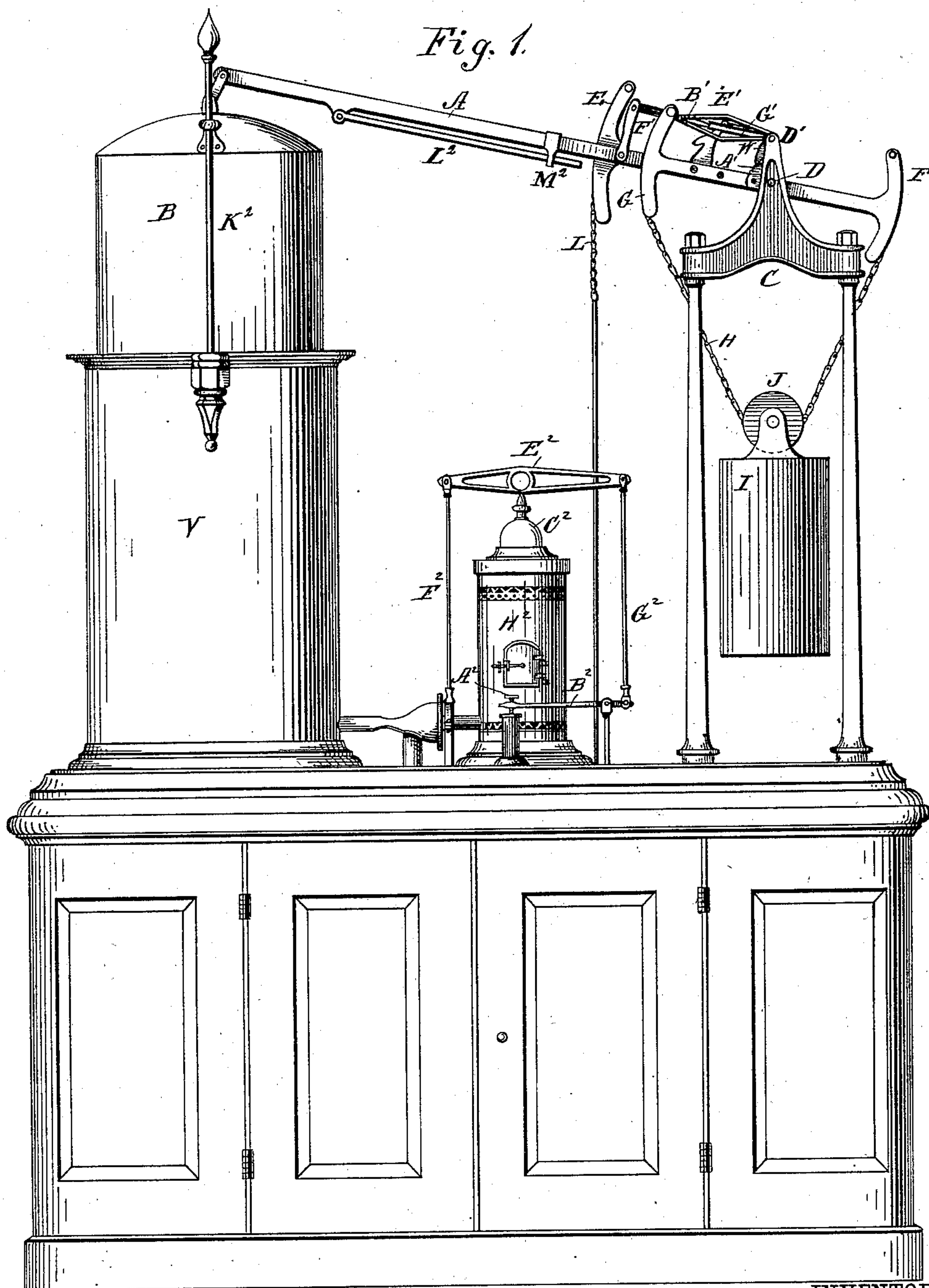
(No Model.)

5 Sheets—Sheet 1.

A. & T. HENNING.  
GAS MAKING MACHINE.

No. 305,308.

Patented Sept. 16, 1884.



WITNESSES:

*Thos Houghton.*  
*A. G. Lyne.*

INVENTOR:

*A. Henning*  
*T. Henning*  
BY *Wm. L.*  
ATTORNEYS.

(No Model.)

5 Sheets—Sheet 2.

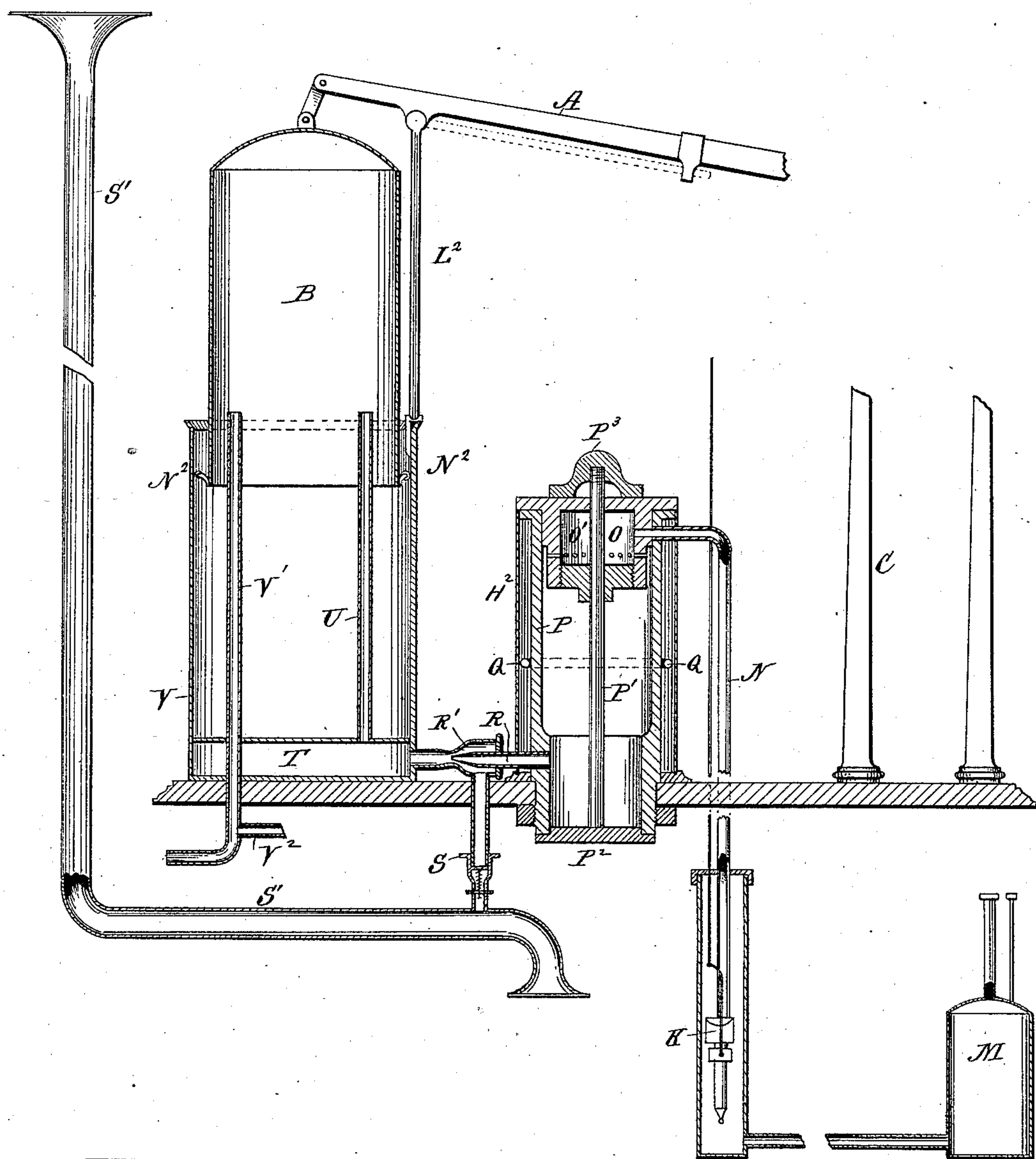
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*Fig. 2.*



WITNESSES:

*Thos. Houghton.*

*A. G. Lyne.*

INVENTOR:

*A. Henning*

*T. Henning*

BY *Munroe & Co.*

ATTORNEYS.

(No Model.)

5 Sheets—Sheet 3.

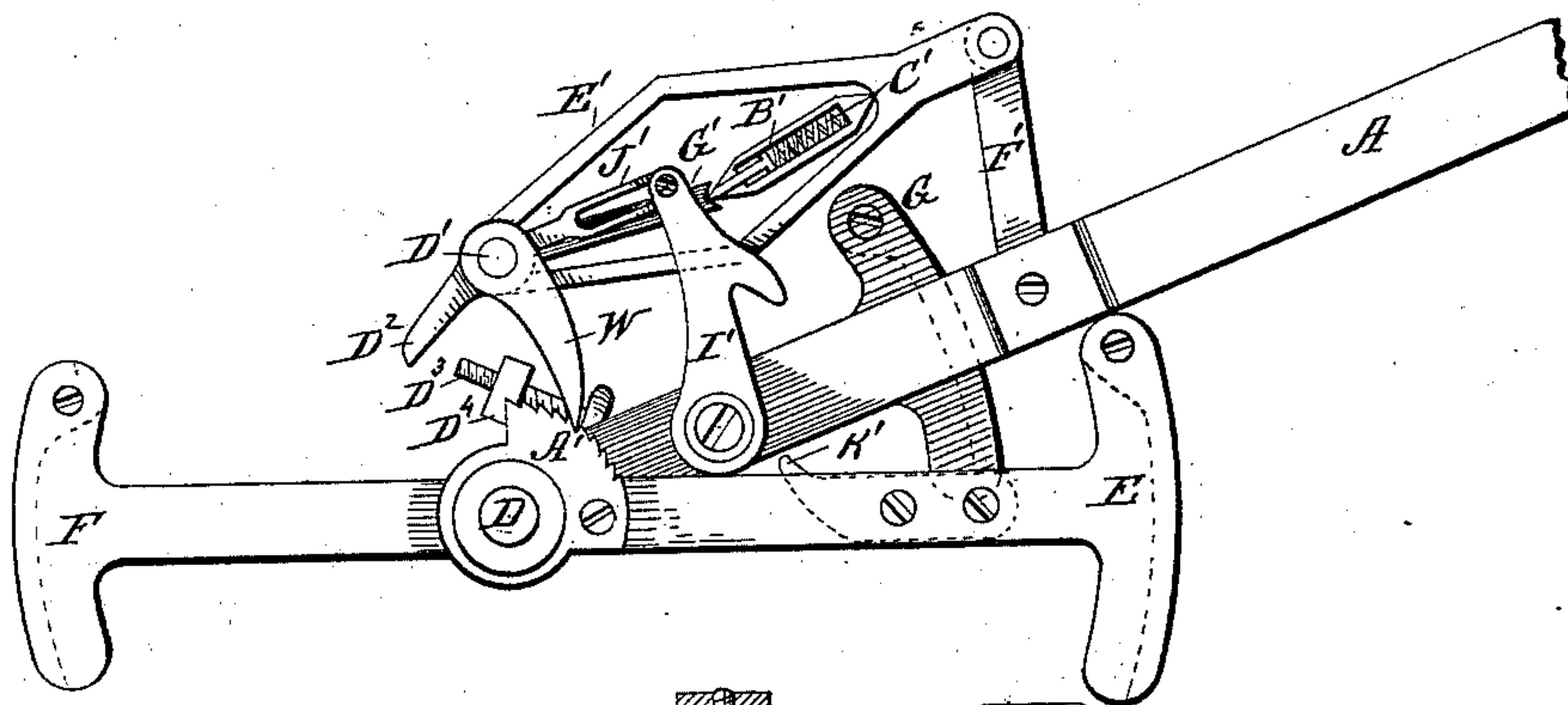
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*Fig. 3.*



*Fig. 4.*

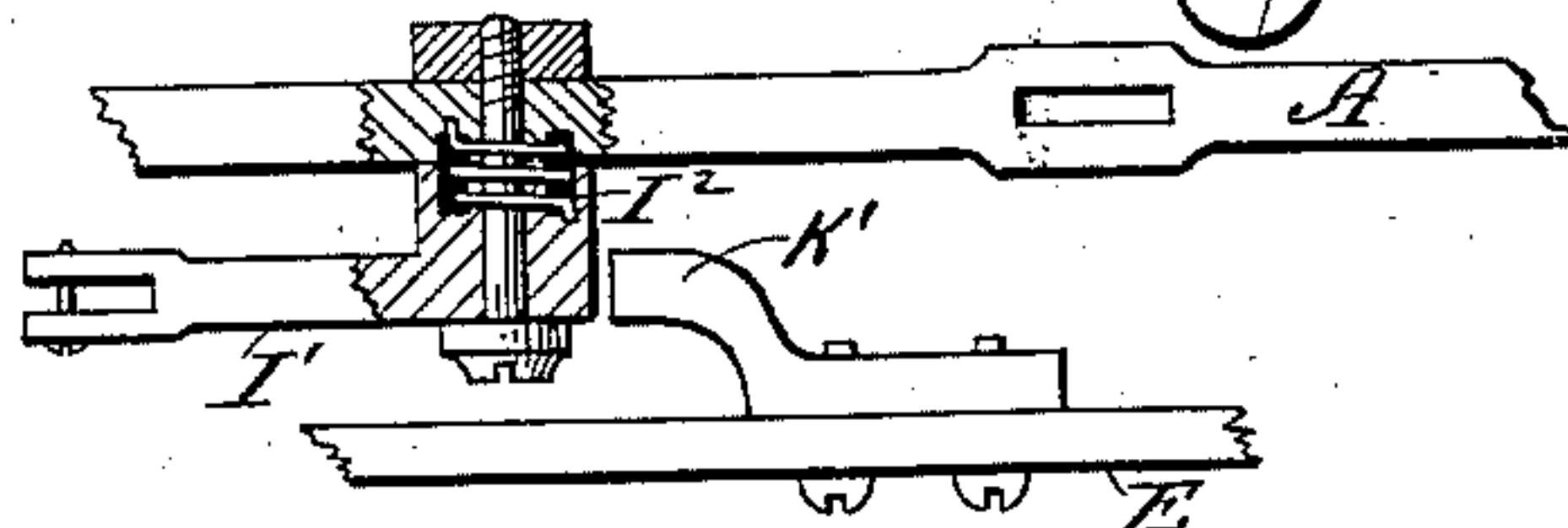
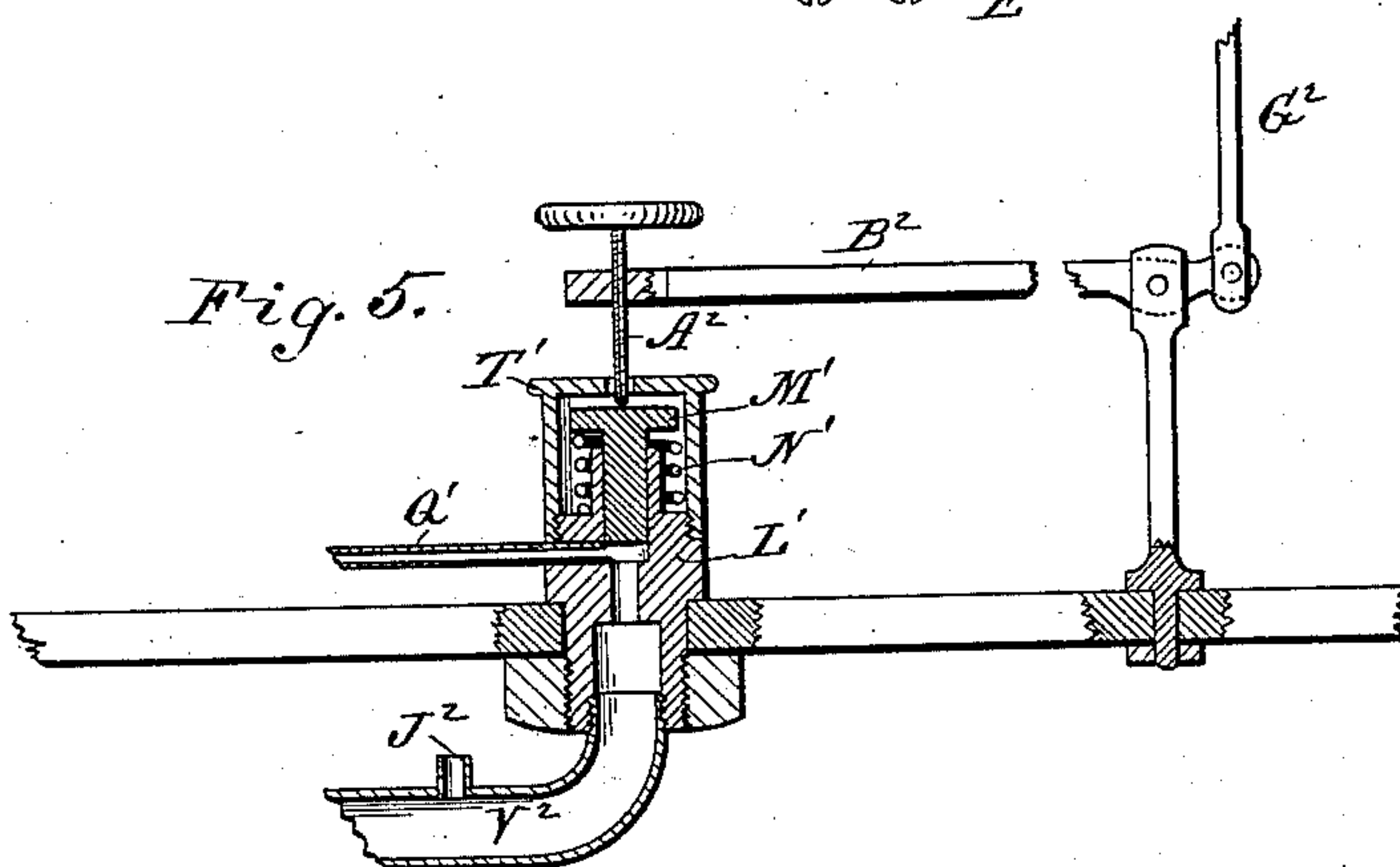


Fig. 5.



WITNESSES:

Thos. Houghton.  
A. G. Lynch.

INVENTOR:

A. Henning

T. Henning

BY *Mumford*

ATTORNEYS.



(No Model.)

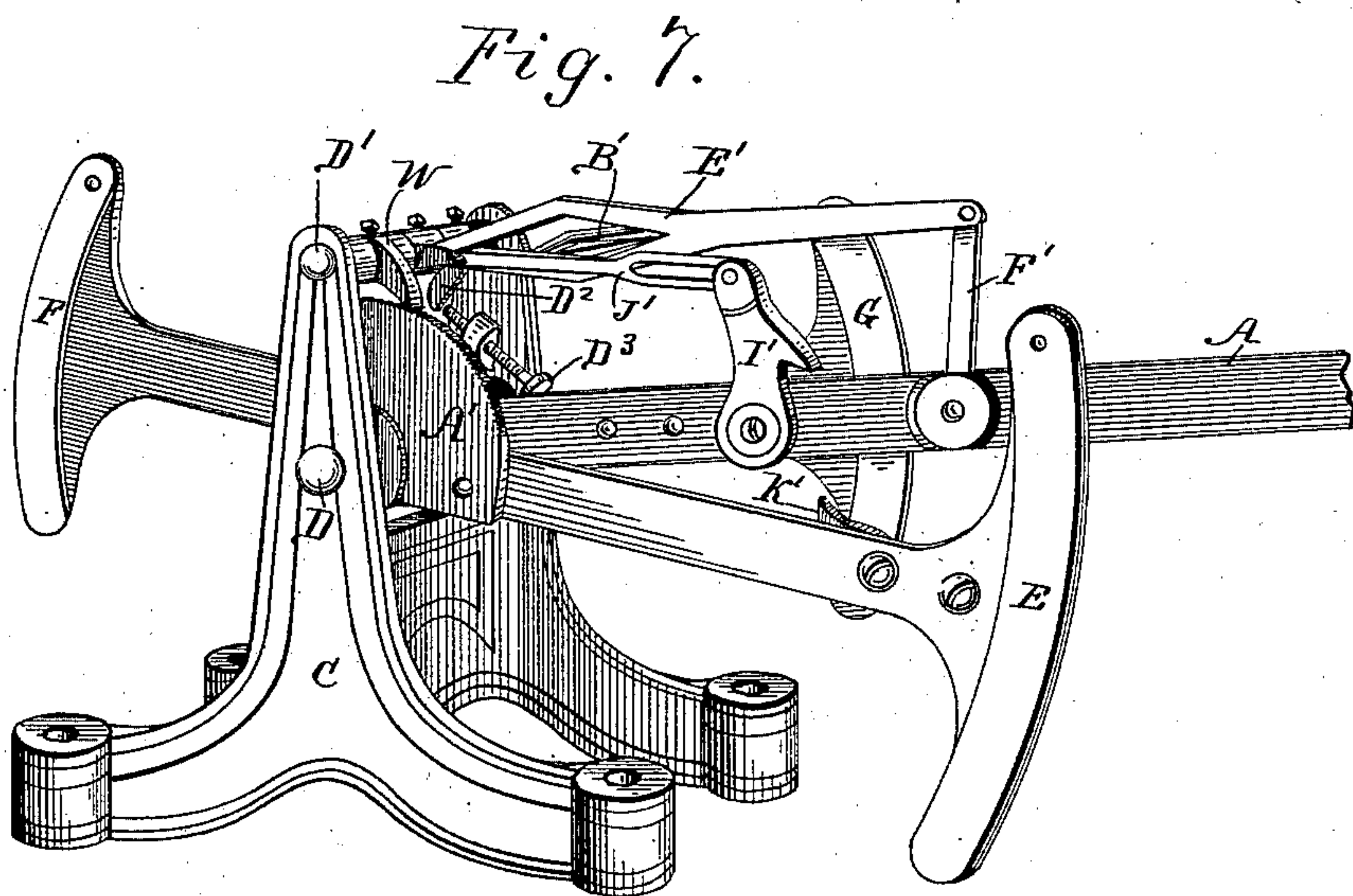
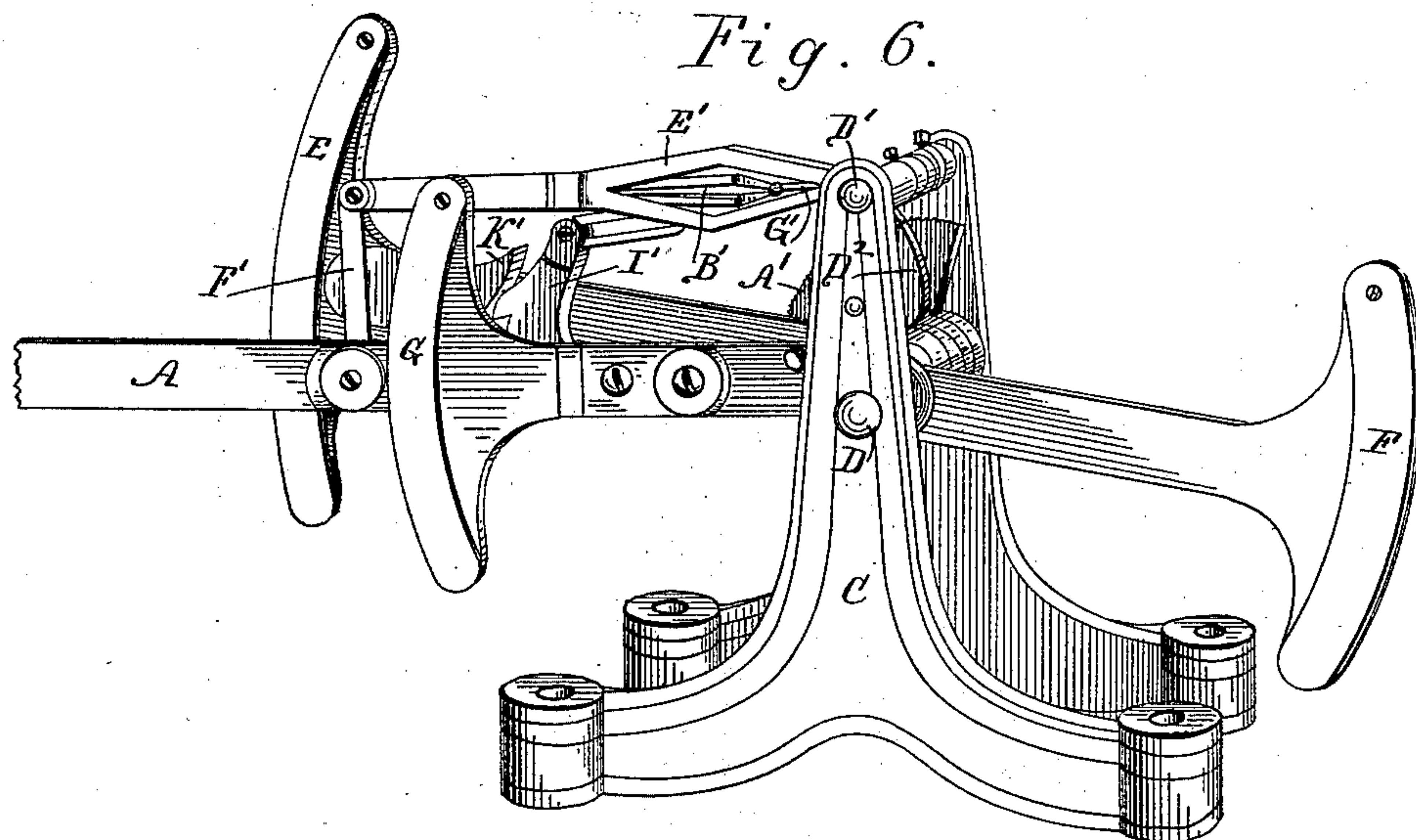
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A. & T. HENNING.

GAS MAKING MACHINE.

No. 305,308.

Patented Sept. 16, 1884.



WITNESSES:

Thos. Houghton.  
A. G. Lyne.

INVENTOR:

A. Henning  
T. Henning  
BY *Munn & Co.*  
ATTORNEYS.

(No Model.)

5 Sheets—Sheet 5.

A. & T. HENNING.  
GAS MAKING MACHINE.

No. 305,308.

Patented Sept. 16, 1884.

Fig. 8.

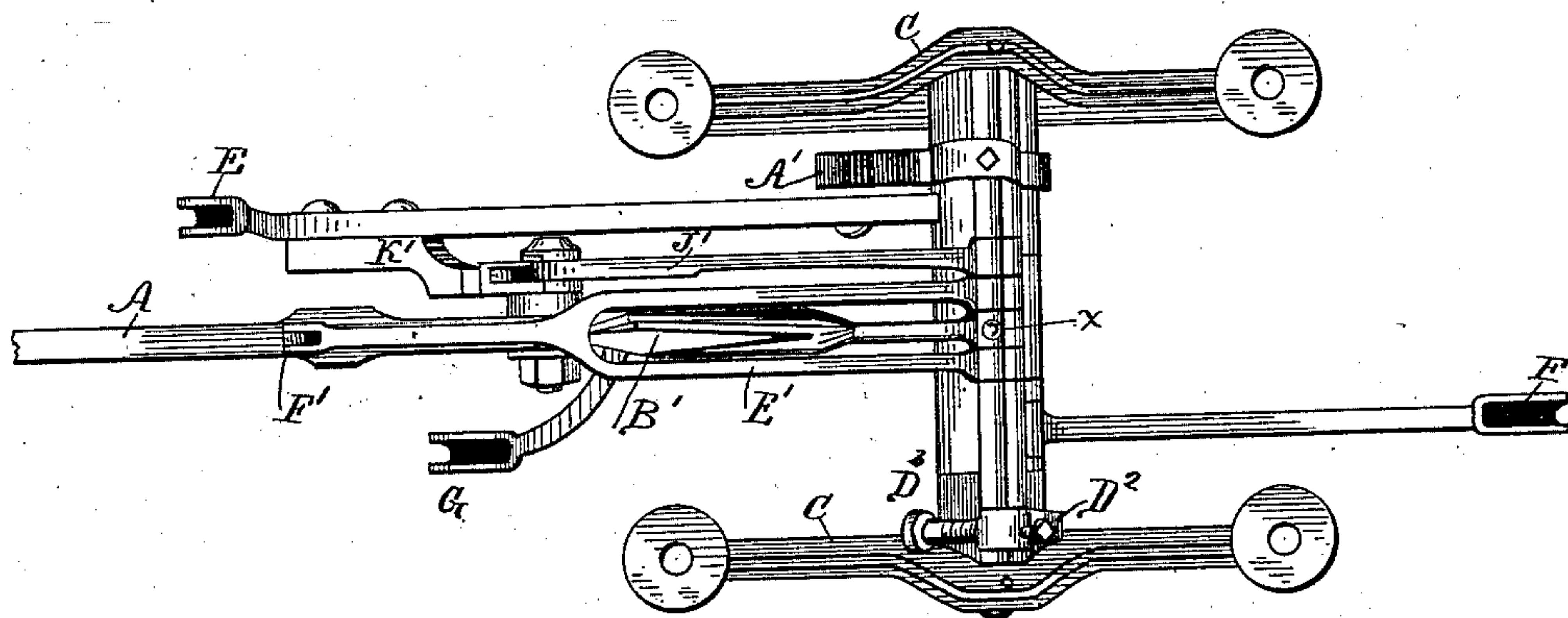
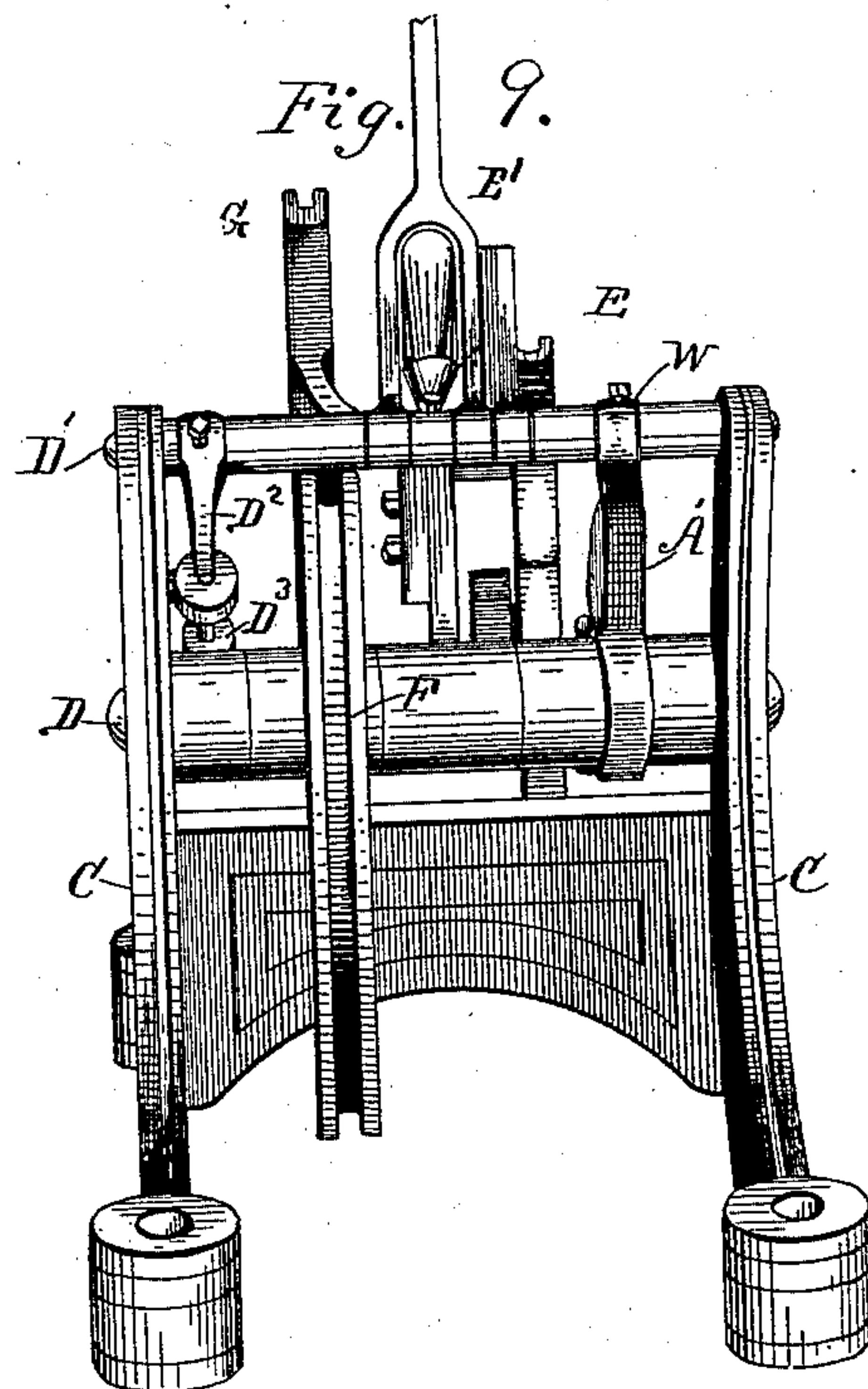


Fig. 9.



WITNESSES:  
Thos. Houghton.  
A. G. Lyne.

INVENTOR:  
A. Henning  
T. Henning  
BY *Munn & Co.*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

ABEL HENNING AND THOMAS HENNING, OF SACRAMENTO, CALIFORNIA.

## GAS-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 305,308, dated September 16, 1884.

Application filed January 23, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, ABEL HENNING and THOMAS HENNING, of Sacramento, in the county of Sacramento and State of California, have invented a new and useful Improvement in Gas-Making Machines, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

10 The invention consists of the novel construction hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of our gas-making machine. Fig. 2 is a vertical section, partly broken away, showing the interior construction and arrangement of several of the parts. Fig. 3 is a detail view of a part of the mechanism for operating the pump, showing the opposite side of the same from that shown in Fig. 1. Fig. 4 is a plan view of part of the same, being partly in section. Fig. 5 is a vertical section of the valve mechanism for regulating the supply of gas to the heating-burners. Figs. 6, 7, 8, and 9 are additional detail views of the mechanism for operating the pump.

In carrying our invention into effect we provide a lever, A, which is connected at one end to the gas-holder B, and pivoted at the other end in a supporting-frame, C. To the pivotal shaft D, to which the lever is loosely connected, we rigidly attach two arms, E F, extending in opposite directions from each other, and connect the arm F with an arm, G, on the lever by a chain, H, which supports a movable weight, I, by a friction-roller, J. To the arm E is connected the pump-bucket K by means of the chain L. With this construction the action of the weight would tend to deflect the arm F downward and elevate the arm E, thus lifting the bucket K and feeding the gasoline from the tank M through the pipe N to the distributing-chamber O. In order, however, that the gasoline shall be supplied to the generating-chamber only when the gas in the holder has been nearly all consumed and there is room for a new supply, we connect the arms E F with the lever A in such manner that said arms shall be held from oscillation until the lever is moved down by the weight of the sinking gas-holder B, and in order to sink the

bucket in the gasoline before the weight I is allowed to raise it we provide means whereby the lever in its descent shall deflect the arm E downward. To these ends we journal a shaft, D', in the frame C directly above and parallel with the shaft D, and to this shaft D' we rigidly secure a pawl, W, which is adapted to be turned down into engagement with a ratchet-segment, A', rigidly attached to the shaft D, or to the arm E. To the shaft D' is also rigidly attached a socket-piece, G', and to said shaft is loosely connected one end of a frame, E', the opposite end of which is loosely connected to the lever A by a pivoted link, F', while an extensible arm, B', consisting of a pointed shell having an internal spiral spring, C', and a protruding pin actuated by the spring, is so arranged as to form universal joints with the socket-piece G' and with one end of the frame E'. With this construction, when the lever A is moved up to the position shown in Fig. 3, in which the end of the frame E' which is attached to the lever is elevated above the free end of the socket-piece G', the action of the spring C', which is thus thrown out of alignment with the said socket-piece, will deflect the socket-piece downward, oscillating the shaft D' and throwing the pawl W into engagement with the segment A'. In the same manner, when the lever is moved downward, the socket-piece will be deflected upward, throwing the pawl out of engagement with the segment, and allowing the weight I to act upon the arm F, shaft D, and arm E to elevate the bucket K. The shaft D' is provided with a spur, D<sup>2</sup>, which is adapted to strike a set-screw, D<sup>3</sup>, supported in a bracket, D<sup>4</sup>, when the pawl W is lifted out of engagement with the segment A', the object being to limit the upward movement of the pawl.

To the lever A is pivoted a catch, I', which is also connected to the said lever by a spring, I<sup>2</sup>, arranged around the pivot of the catch and having its ends secured to the catch and lever. The upper end of this catch is loosely connected to a slotted arm, J', which is journaled on the shaft D'. With this construction as the lever A moves downward the upper end of catch I' will be gradually drawn toward the shaft D'. The parts are so arranged,



however, that the catch I' in its descent will engage a catch, K', secured to the arm E, and thus cause said arm to be deflected downward to sink the bucket K before the catch I' shall have been drawn out of engagement with the catch K'. When the catch K' is thus released, the weight I, as above explained, will lift the bucket K and supply the distributing-chamber O with gasoline. This chamber is provided with perforations O' in its walls, through which the gasoline shall exude, and is supported in the upper part of a receptacle, P. The receptacles O and P are bolted together by a rod, P', having a plate, P<sup>2</sup>, secured to one of its ends, which serves as a bottom for the receptacle P, and a nut, P<sup>3</sup>, screwing on the other end of the rod at the top of the receptacle O. With this construction the gasoline will flow down and spread over the inner surface of the main receptacle P, from which it will be co-operated by heat supplied by the burners Q, arranged around the outside of the receptacle. As the gas accumulates in the receptacle P, it passes out through the injector R into the chamber R', into which atmospheric air is admitted through the check-valve S, and the carbureted air passes into the chamber T in the tank V and up the pipe U into the gas-holder B. The valve S is located in a branch of a long pipe, S', which latter is extended a suitable distance from the machine at both ends to prevent danger from any escaping gas. A pipe, V', conducts the gas from the gas-holder B to where it is to be consumed.

The gas for heating the gas-generator is supplied by a branch pipe, V<sup>2</sup>, leading from the pipe V'. Between the pipe V<sup>2</sup> and the burner-pipe Q' is located a valve for regulating the supply of gas to the burners, and thus controlling the heat according to requirement. The valve consists of the socket L', the plug M', and the spiral spring N', which supports the plug. The spring and plug are inclosed in a casing, T', which is provided with an orifice at the top, through which a set-screw, A<sup>2</sup>, supported in a lever, B<sup>2</sup>, is adapted to bear upon the plug to shut off the supply of gas. The operation of the valve is made automatic by the following means: On a cap, C<sup>2</sup>, on top of the gas-generating receptacle P, is fulcrumed a walking-beam, E<sup>2</sup>, one end of which is held from upward movement by a rod, F<sup>2</sup>, while its other end is connected by means of a rod, G<sup>2</sup>, with the lever B<sup>2</sup> at the end opposite to that having the set-screw A<sup>2</sup>. The expansion and contraction of the body of the receptacle P, due to the heat from the burners Q, will oscillate the walking-beam and cause the lever B<sup>2</sup> to close or open the valve. Thus when the heat reaches a certain degree of intensity the expansion of the receptacle P will cause the lever B<sup>2</sup> to press down the plug M' sufficiently to reduce the supply of gas and lower the temperature in the generating-chamber, and likewise the contraction of the receptacle P will again operate the lever B<sup>2</sup>

to open the valve and raise the temperature. In this manner the temperature of the generator is automatically kept nearly uniform.

H<sup>2</sup> is a casing surrounding the gas-generator to confine the heat of the burners Q.

J<sup>2</sup> is a branch pipe leading from the pipe V<sup>2</sup>, which is to be used for a constant burner to relight the burners Q in case they should be extinguished by the operation of the plug M'.

The gas-holder B is provided with guide-rods K<sup>2</sup>, supported at the sides of the tank V, and the lever A is provided with a pivoted prop, L<sup>2</sup>, adapted to rest on the upper rim of the tank V, to relieve the pressure in the holder when the machine is not in use. On starting the machine the prop is to be turned up to the position shown in Fig. 1, and held by a spring-catch, M<sup>2</sup>, on the lever A. The holder moves in contact with the tank V by means of the friction-rollers N<sup>2</sup>, as shown in Fig. 2.

What we claim is—

1. The combination, with the gas-holder and the lever connected to the same, of the arms E F, the weight suspended from the lever and one of said arms, and means for automatically connecting and disconnecting the said lever and arms, substantially as shown and described, whereby the operation of the pump-bucket which is connected to one of said arms shall be regulated by the action of the gas-holder.

2. The combination, with the gas-holder and the lever connected to the same, and having an arm, G, of the rigidly-connected oscillatory arms E F, the weight I, the chain H, connecting arms F G and supporting the weight, and means for automatically connecting and disconnecting the lever and the arm E, substantially as shown and described, whereby the arms E F shall be oscillated to operate the pump-bucket as the holder rises and falls.

3. The combination, with the gas-holder and the lever having the arm G, of the rigidly-connected oscillatory arms E F, the weight I, the chain H, connecting arms F G and supporting the weight, the catches I' K', the pawl W, the ratchet-segment A', connected to the arm E, and means for oscillating the catch I', and pawl W, for connecting and disconnecting the lever A and arm E, and for holding or releasing the said arm, for the purpose specified.

4. The combination, with the gas-holder B and lever A, having arm G, of the independent oscillatory arms E F, rigidly connected together, the weight I, the chain H, connecting arms F G and supporting the said weight, the catch K', secured to arm E, the catch I', pivoted to the lever A and having guide-arm J' and retaining-spring I<sup>2</sup>, substantially as shown and described, whereby the descent of lever A shall cause the catch I' to depress arm E and then release the same, for the purpose specified.

5. The combination, with the gas-holder B



and lever A, having arm G, of the independent oscillatory arms E F, rigidly connected together, the weight I and chain H, the ratchet-segment A', attached to arm E, the shaft D',  
5 carrying pawl W, and socket-piece G', rigidly secured thereto, the oscillating frame E, journaled on shaft D' and connected to lever A, and the extensible arm B', arranged between the socket-piece G' and one end of frame E',  
10 substantially as shown and described, whereby the oscillation of lever A shall elevate or depress the pawl W to release or engage the arm E, for the purpose specified.

6. The combination, with the lever A, of  
15 the frame E', journaled on a shaft, D', located above and parallel with the pivotal shaft of said lever, and connected to said lever by a link, F', the socket-piece G', rigidly secured to shaft D', the extensible arm B', having  
20 an internal spring and a protruding pin, and being arranged in engagement with said piece G' and frame E', the ratchet-segment A', and the stop D<sup>2</sup>, and pawl W, rigidly attached to shaft D' and set-screw D<sup>3</sup>, substantially as and  
25 for the purpose set forth.

7. The combination, with the lever A and

the pawl W and ratchet-segment A', of the spring-actuated extensible arm, the pivoted frame connected to the lever and carrying the said arm, and the socket-piece connected rigidly to the shaft carrying the pawl, and forming a joint with the said arm, substantially as shown and described.

8. The combination of the perforated gasoline-distributing receptacle O, the heating or  
35 generating receptacle P, the casing H<sup>2</sup>, and the burners Q, arranged between receptacle P and casing H<sup>2</sup>, substantially as shown and described.

9. The combination of the distributing-re-  
40 ceptacle O, the heating-receptacle P, supporting the receptacle O in its upper end, the rod or bolt P', having plate P<sup>2</sup>, adapted to close the lower end of receptacle P, and the nut  
45 P<sup>3</sup>, screwing on said rod to bind said parts removably together, substantially as shown and described.

ABEL HENNING.

THOMAS HENNING.

Witnesses:

ED. D. TAYLOR,

S. SOLON HALL.