

No. 747,417.

PATENTED DEC. 22, 1903.

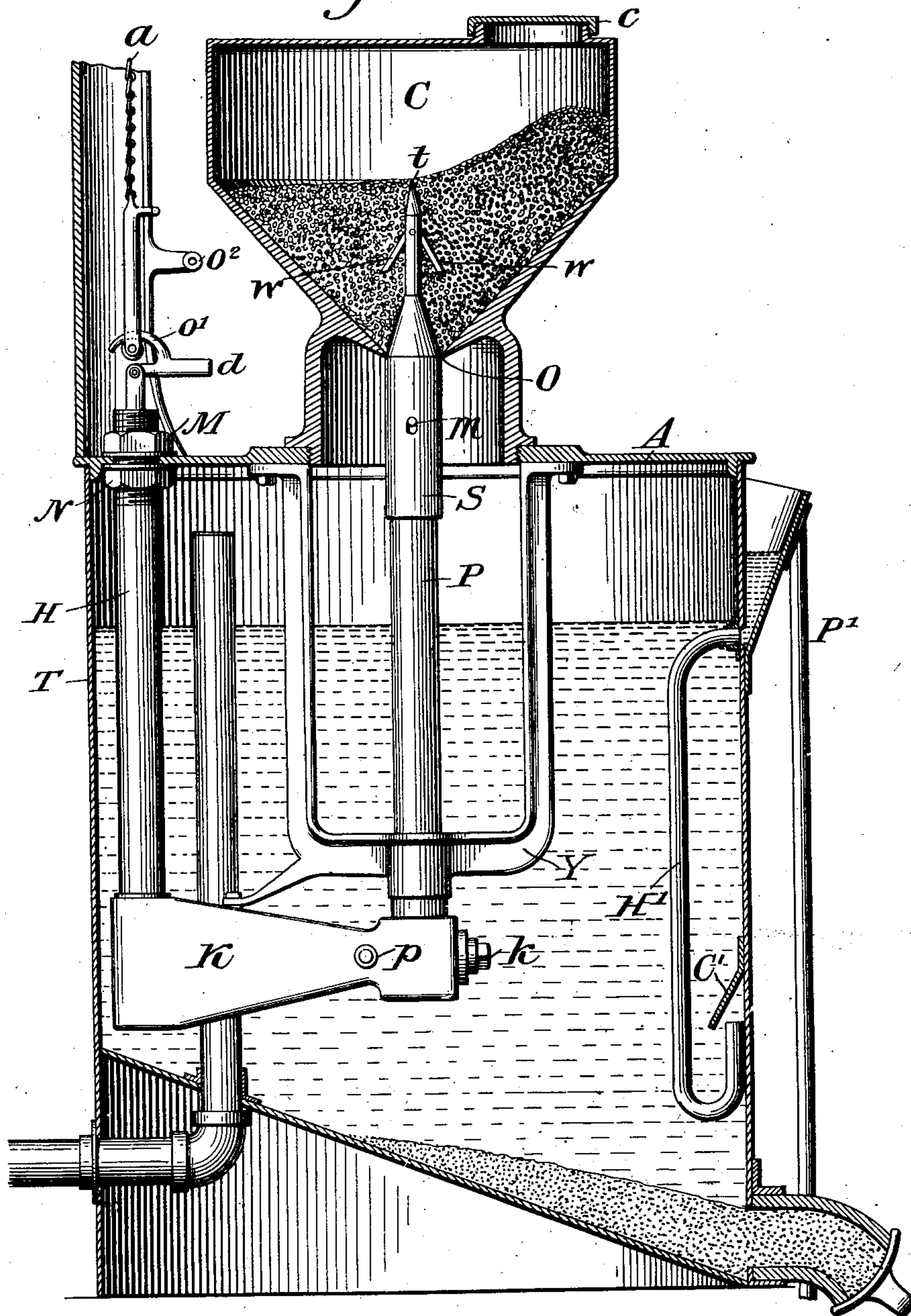
W. C. J. GUILFORD.  
ACETYLENE GAS GENERATOR.

APPLICATION FILED JAN. 12, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



Witnesses:

*F. R. Casson*

*Alice Robinson*

Inventor:

*William C. J. Guilford*

*by Almon Robinson*

*att'y*

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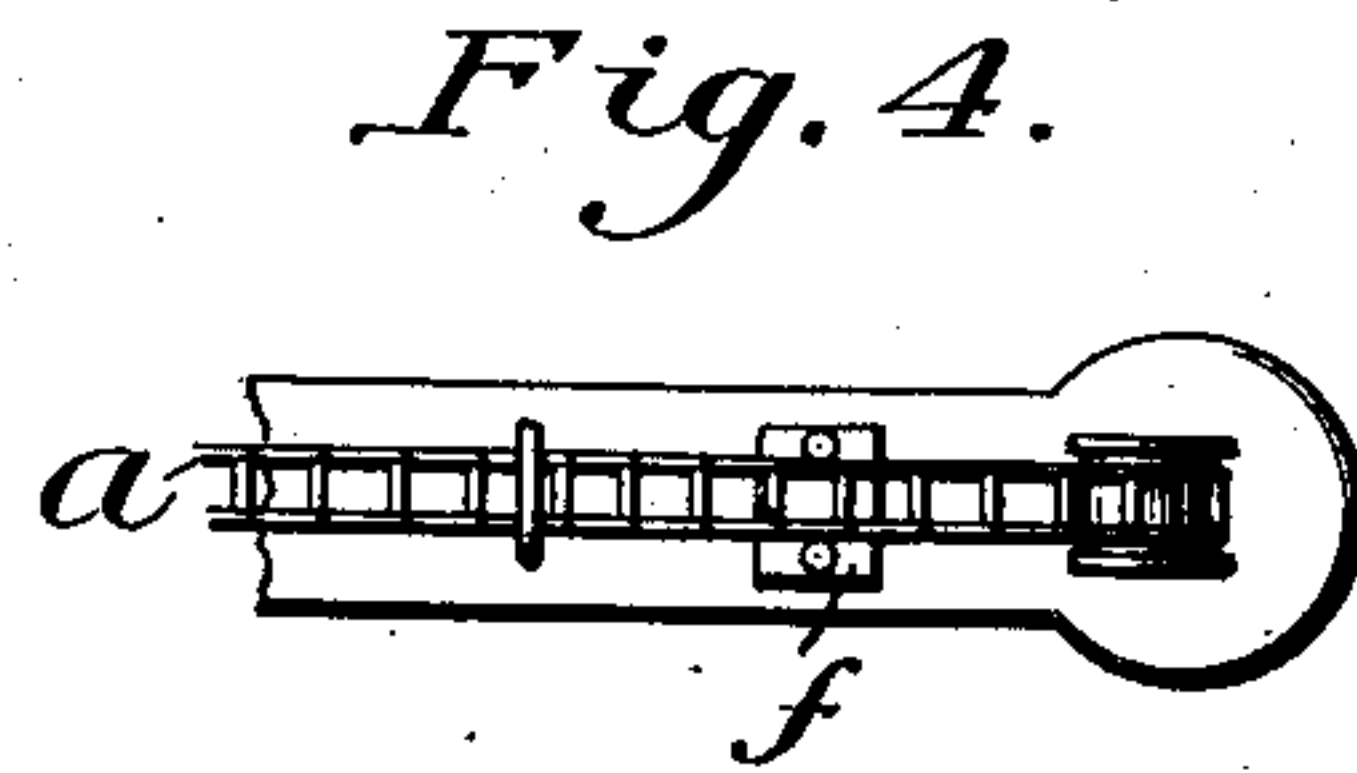
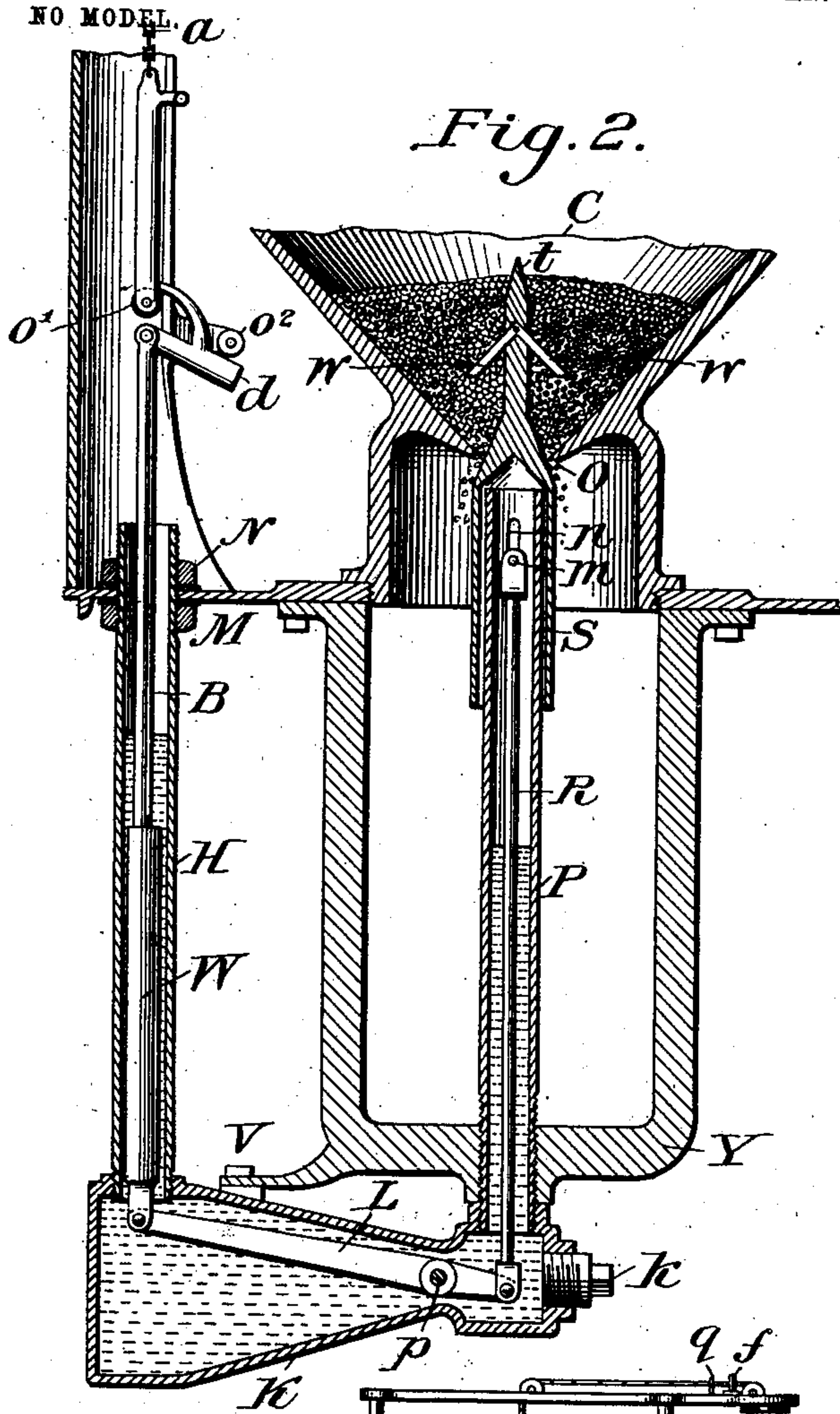
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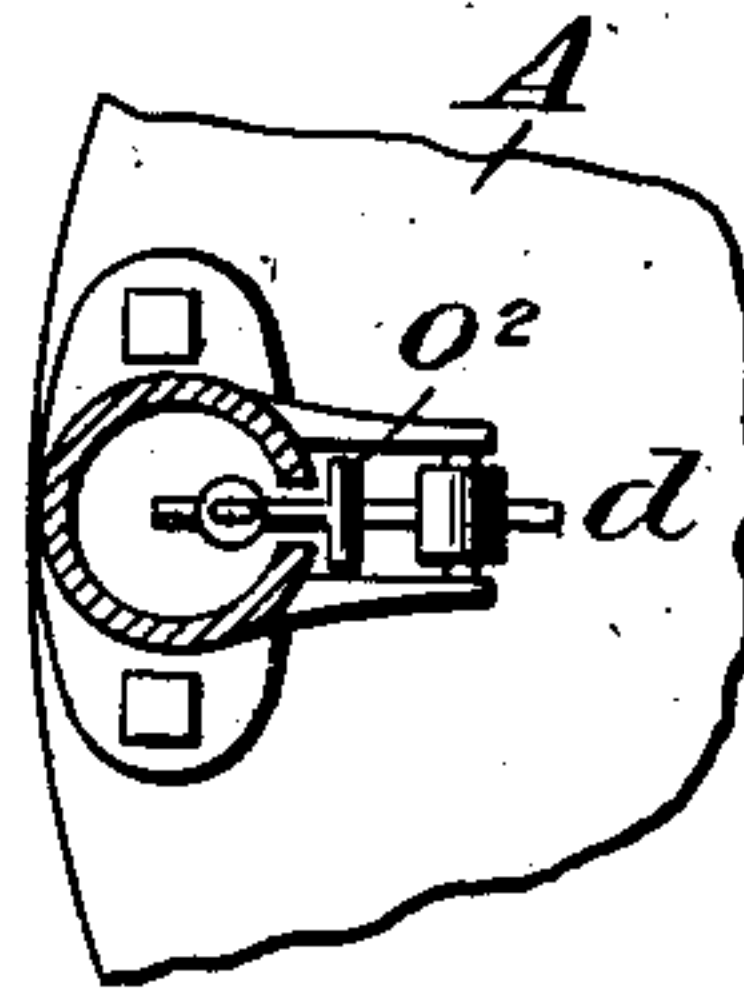
APPLICATION FILED JAN. 12, 1901.

2 SHEETS—SHEET 2.

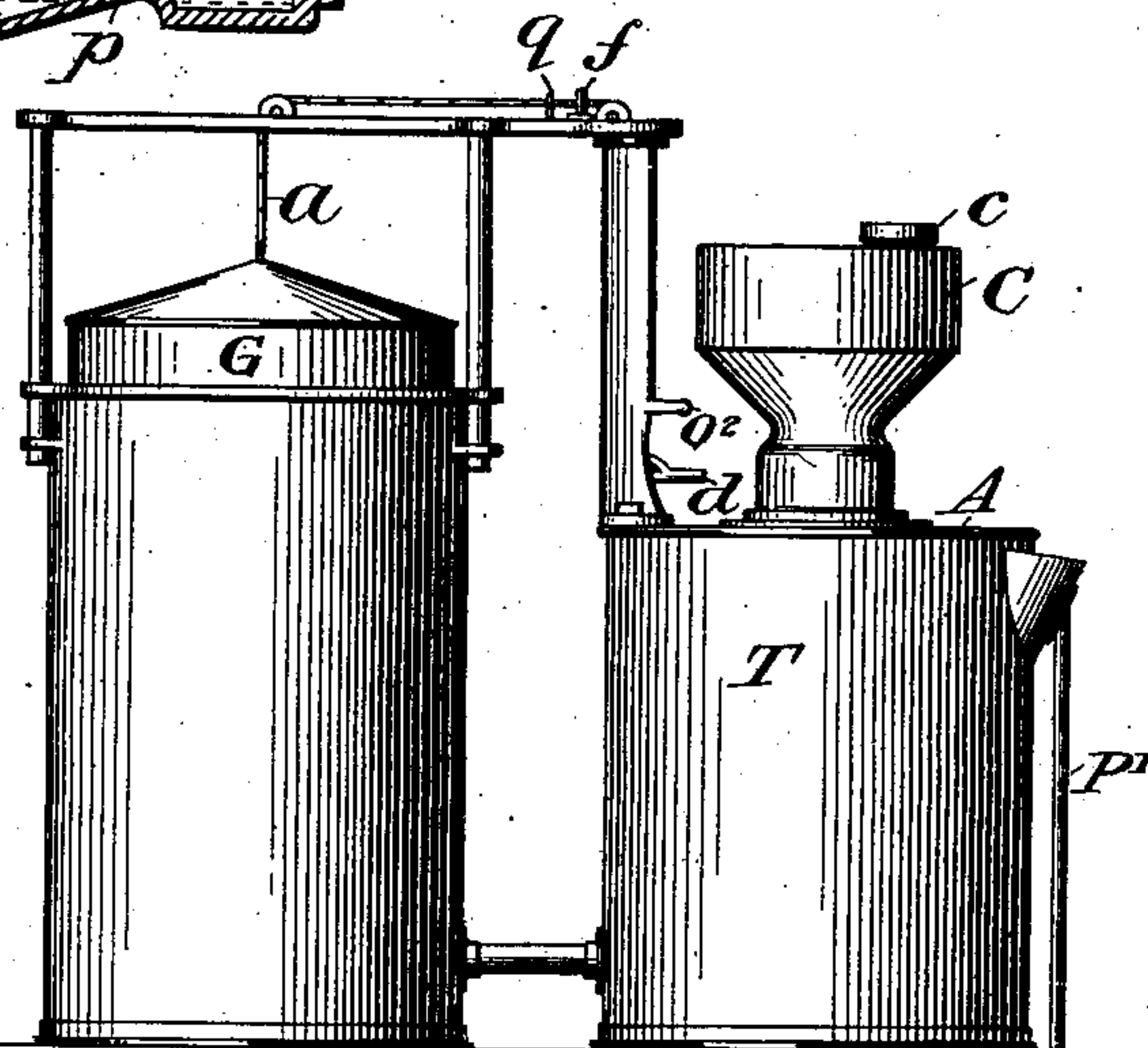
NO MODEL.



*Fig. 5.*



*Fig. 3.*



Witnesses:

Fred R. Casson  
Alice Robinson.

Inventor:

William C. J. Guilford  
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## UNITED STATES PATENT OFFICE.

WILLIAM C. J. GUILFORD, OF HALLOWELL, MAINE.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 747,417, dated December 22, 1903.

Application filed January 12, 1901. Serial No. 42,947. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM C. J. GUILFORD, a citizen of the United States, residing at Hallowell, in the county of Kennebec and State of Maine, have invented certain new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

My invention relates to that class of generators in which calcium carbide is dropped into water. When in the use of such generators many grains of carbide fall close together, heat accumulates and the carbide is imperfectly decomposed, giving gas of poor quality mixed with troublesome tarry compounds. With the generators now in use there is always a greater or less amount of faulty action of this sort, either from defect of the original plan or from the jerky and uncertain action of the mechanism which results from the fouling of the working parts with the adhesive carbide residue or from the sticking of the joints caused by the corrosive action of the fluid in the generator.

The object of my invention is to provide a generating apparatus which shall respond to slight changes of volume in the gas, sifting out a small and gradually-increasing quantity of carbide, and shall remain equally sensitive in its action after long continued use, which shall be, furthermore, less liable to troublesome and dangerous accidents when neglected or carelessly handled.

In the accompanying drawings, Figure 1 is a sectional elevation. Fig. 2 is a sectional detail drawing, showing the carbide-feed mechanism. Fig. 3 is an elevation drawn to a smaller scale, which shows both the generator and the gas-holder. Fig. 4 shows a stop which limits the action of the gas-holder on the carbide feed, and Fig. 5 a releasing-catch for the feed stop-motion.

In the drawings, A is the base, which supports all the working parts of the generator. This base A also serves as a cover for the water-holder T, in which the carbide is decomposed and the acetylene formed. The fact that the working of my device is expected to remain accurately the same through all the accidents of use makes necessary a heavier and more rigid construction of the framework than is usual in apparatus of this sort; but

by attaching all the working parts of my device to the upper and under side of the heavy cast-iron plate A, I relieve the sides and bottom of the water-holder T from the working strain, and thus take away all necessity for heavier construction than is necessary to support the superimposed weight.

The carbide-holder C screws into a hole in the thickened central part of the base-plate A. The lower part of the holder C has the shape of a conical hopper or funnel, terminating in a circular outlet O. The inner surface of the holder C turns back at an angle at the outlet O. This angle should be made as acute as it can safely be made in cast-iron, so as to leave as small a surface as possible for the adherence of carbide residue.

The outlet O is closed by the hollow cylindrical stopper S, which is guided to enter the outlet O by the tubular standard P, on which it slides. The diameter of the stopper S should be enough smaller than that of the outlet O to insure its entering without hitting; but the clearance between must not be large enough to permit a noticeable amount of carbide to sift out. The upper end of S is made sharply conical, so that the carbide will not rest on it, and terminates in the clearer t, from which project two clearer-arms w w. The clearer t with its arms w w are intended to break through and pull down any bridge of carbide that has formed over the outlet, and it is obvious that they may be varied in form and proportions through a wide range without impairing their usefulness as clearers.

The stopper S is raised into place by the lifting-rod R, which is connected with it by the pin m passing through the slot n in the tubular standard P.

The lower end of the rod R is pivoted to the shorter arm of the lever L, and the rod B, carrying the weight W, is pivoted to the longer arm. The lever L is inclosed in the case K, which is made from a single-cored casting.

The lever L is pivoted on the pin p, which passes through the sides of the case K and is inserted in K through an aperture closed by the screw-plug k.

The tube H, inclosing the weight W, screws into a threaded hole in the upper surface of the case K and passing through a hole in the



base-plate A is adjusted and held in place by the nuts M N above and below the plate A, which screw against gas-tight packing. The tubular standard P screws into the other end of the case K and is held in place by the yoke Y, through which it passes and into which it screws.

The case K and the yoke Y are clamped together by bolts or screws, as V. The yoke Y is bolted to the under surface of the plate A and is adjustable to permit of bringing the stopper S accurately in line with the outlet O.

The carbid-holder C is closed at top by a screw-cap *c*, which screws against a packing. The tubular standard P, lever-case K, and tube *h* when joined together are water-tight and protect the inclosed mechanism from the adhesive and corrosive carbid residue. They form an inverted siphon when partly filled with liquid, which is preferably a non-corrosive lubricant, and should rise to a sufficient height to act as a liquid seal under the pressure used.

The weight W should be sufficient to produce a pressure that will crush any grain of carbid that happens to be caught between the corner of the stopper S and the acute edge of the outlet O.

To the upper end of the rod B is pivoted the releasing-hook *d*. This hook should be bent to an arc of a radius slightly less than its distance from the pivot on which it turns, and it hooks over a roller O', which is attached by a chain *a* to the gas-bell G. When the gas-bell G sinks below a predetermined point, the hook *d* strikes the roller O', which pulls it off from O', thereby releasing B from the pull of the chain *a* and permitting the weight W to raise the stopper S into the outlet O. The upward motion of S is limited by the striking of the rod B against the bottom of K, which in this case acts as a stop-motion; but when the stopper S rises into the outlet O from the upward movement of the gas-bell its motion is limited by the striking of the cross-piece *g*, attached to the chain *a*, against the fork *f*. This permits the weight W to hold the chain *a* taut and prevents the hook *d* from loosening.

In the generators in common use there is considerable leakage of impure gas of objectionable odor from the water-charging funnels. I avoid the greater part of this leakage by the use of the charging-tube H', which is curved up at its lower end to form a trap and is protected from the entrance of undecomposed carbid by the roof-shaped cover C', attached to the side of the water-holder T.

Another trouble with water-charging funnels is the accidental overflow which is sometimes caused by the accumulation of carbid residue and by irregular action. To avoid this, I attach a waste-pipe P' at a point corresponding to the gas-pressure used.

When I wish to make use of my invention, I place a charge of carbid in the carbid-holder C, fill the water-holder T to the height shown,

seal the gas-bell G with water in the usual manner, and pour into the inverted siphon H K P a sufficient amount of non-corrosive lubricant to act as a liquid seal against the pressure of gas desired. I then by lifting the rod B a very little shake down a small amount of carbid, which is decomposed by the water. As soon as the resulting gas has lifted the gas-bell G to a sufficient height I hook the rod B to the chain *a*. If the lights are now turned on, the gas-bell G will fall, and as soon as the chain *a* is drawn taut it will begin to lift the weight W and lower the stopper S. At the slightest motion a small amount of carbid, which is caught between the sharp edge of the outlet O and the upper edge of the stopper S, will sift out, and the resulting gas will lift the bell G and replace the stopper S if the gas exceeds the amount being consumed. If it does not equal the amount, the stopper S will continue to move downward until sufficient gas is generated to raise the bell G and the stopper S, the clearer *t* and clearer-arms *w* stirring the carbid and leaving it so placed that it will sift out on the first returning downward motion. If the generation of the gas exceeds the demand, the gas-bell G will continue to rise after the stopper S has closed the outlet O, the cross-piece *g* will strike against the fork *f*, and the part of the chain *a* near the generator will be held taut by the weight W.

As a result of the construction hereinbefore specified the motion of the stopper will always respond to slight changes in the volume of gas and will rarely carry the gas-bell G much above the stopper-closing point. When the supply of carbid is exhausted, the falling bell G will lift the rod B until the hook *d* strikes the roller O' and is pulled off from the roller O', when the weight W falls and raises the stopper S into the outlet O. A leakage of gas which is greater than the generator can supply will bring about the same result, and it is obvious that if it is at any time desirable to put the generator out of action without waiting for it to stop automatically the releasing-hook *d* can be tripped by hand.

Having now fully described my invention and the manner of using it, what I claim, and desire to secure by Letters Patent, is—

1. In an acetylene-gas generator, the combination of a carbid-holder which has a funnel-shaped bottom terminating in a sharp-edged outlet, a pointed stopper which enters the outlet from below and is separated from its edges by an annular opening that is bridged by the grains of carbid used, a guide for the pointed stopper which holds it free from contact with the outlet edge, a weight and a mechanical connection between the weight and the stopper which transmits to the stopper an upward motion into the outlet; all as and for the purpose set forth.

2. In an acetylene-gas generator, a carbid-holder having a funnel-shaped bottom termi-



5 nating in a sharp-edged outlet, a stopper which enters the carbid-holder from below and is separated from the edges of the outlet by an annular opening that is bridged by the grains of carbid used, a vertical guide which holds the stopper free from contact with the carbid-holder, a rising and falling gas-bell, speed-reducing mechanism interposed between the gas-bell and the stopper, and a stop which limits the upward motion of the stopper to the point at which it closes the outlet, all combined with each other substantially as and for the purpose set forth.

15 3. In an acetylene-gas generator the combination of a carbid-holder having a funnel-shaped bottom terminating in a circular outlet, a hollow cylindrical stopper smaller than the outlet, a vertical tube concentric with the circular outlet and corresponding in size with the interior of the hollow stopper which slides thereon and is guided thereby, a lifting-rod for the stopper which is inclosed by the tube, a pin passing through slots in the tube and connecting the stopper with the lifting-rod, 20 means of imparting motion to the lifting-rod corresponding in direction with that of the gas-holder and a stop which prevents the lifting-rod from lifting the stopper higher than necessary to close the outlet; all as and for the purpose set forth.

30 4. In an acetylene-gas generator a carbid-holder having an opening at its lowest point, a hollow stopper which moves freely into the opening, a vertical guide-tube on which the stopper slides, a lifting-rod for the stopper, a lever to which the lower end of the lifting-rod is attached, a weight acting on the lever to lift the stopper and a stop which limits the downward motion of the weight and frees the lever from its action; all combined with each other as and for the purpose set forth.

45 5. In an acetylene-gas generator, a carbid-holder, an outlet at the bottom of the carbid-holder which has a sharp edge formed by the meeting of two conical surfaces, a stopper which rises into the outlet from below until its upper edge is opposite the sharp edge of the outlet, and is separated therefrom by an annular opening which is bridged by the grains of carbid used, a guide which insures that the stopper shall enter the outlet without striking its edge, a weight, a stop limiting the motion of the weight, a gas-bell, and intermediate mechanism connecting the gas-bell, the weight, and the stopper, whereby the weight acts to produce a lifting strain on both the gas-bell and the stopper; all combined with each other as and for the purpose set forth.

60 6. In an acetylene-generator a water-holder, a carbid-holder which rests upon the top of the water-holder and has an outlet at its lowest point, a stopper which rises to close the outlet, a lifting-rod which raises the stopper into place, a guide-tube which incloses the lifting-rod and controls the motion of the stopper, a yoke suspended from the under

side of the top plate of the water-holder, through which the lower end of the guide-tube passes and by which it is held in line 70 with the carbid-holder outlet, a horizontal lever connected with the lifting-rod at one end and with a second vertical rod at the other, a tube inclosing the second rod and passing through the top plate of the water-holder, a chamber which incloses and supports the horizontal lever and is connected with both vertical tubes by a water-tight joint all in combination with each other and with a sufficient amount of inclosed non-corrosive fluid to form a seal against the escape of gas substantially as and for the purpose set forth.

7. In an acetylene-gas generator, a water-holder a cover therefor, a carbid-holder, an opening in the water-holder cover to which the carbid-holder is fitted, a supporting-yoke which is fastened to the under side of the cover at each side of the opening for the carbid-holder and projects therefrom, an outlet 90 to the carbid-holder, a stopper which is of less diameter than the outlet and rises into it, a guide for the stopper, and a socket in the yoke to which the guide is fitted and by which it is held in line with the outlet; all combined with each other substantially as and for the purpose set forth.

8. In an acetylene-gas generator, a carbid-holder having an outlet at its lowest point, a stopper rising into this outlet, a lifting-lever, 100 a rod connecting the stopper to the short arm of the lifting-lever, a weighted rod attached to the other arm of the lifting-lever and rising through the cover of the generator, a gas-bell, a releasing-hook, attached to the upper end of the weighted rod, and a mechanical connection between the gas-bell and the releasing-hook, through which the weight of the gas-bell acts to lift the weighted rod, all in combination with each other substantially 110 as and for the purpose set forth.

9. In an acetylene-gas generator, the combination of a carbid-holder an outlet in the bottom of the carbid-holder, a stopper-rising into the outlet, a lifting-rod for the stopper, 115 a lever by which the lifting-rod is raised, a lever-actuating weight, a lifting-rod for the weight, a releasing-hook pivoted to the upper end of the lifting-rod, a gas-bell, a chain attached to the gas-bell at one end and to the releasing-hook at the other, a pair of guide-pulleys over which the chain runs, and a stop which pulls the releasing-hook from the chain, all substantially as and for the purpose set forth.

10. In an acetylene-gas generator, a gas-bell, a chain attached to the top of the gas-bell which is separable into two parts, a hook connecting the two parts of the chain, a weight suspended from the other end of the chain, a carbid-holder, an outlet in the bottom of the carbid-holder, a stopper rising into the outlet, connecting mechanism which converts the downward motion of the weight into 130

an upward motion of the stopper, a catch  
upon the chain, between the hook and the  
gas-bell and a stop against which the catch  
strikes, and by which the part of the chain  
5 between the catch and the weight is held  
taut; all combined with each other substan-  
tially 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.

WILLIAM C. J. GUILFORD.

Witnesses:

ALMON ROBINSON,

MARGURET N. GUILFORD.