

No. 662,546.

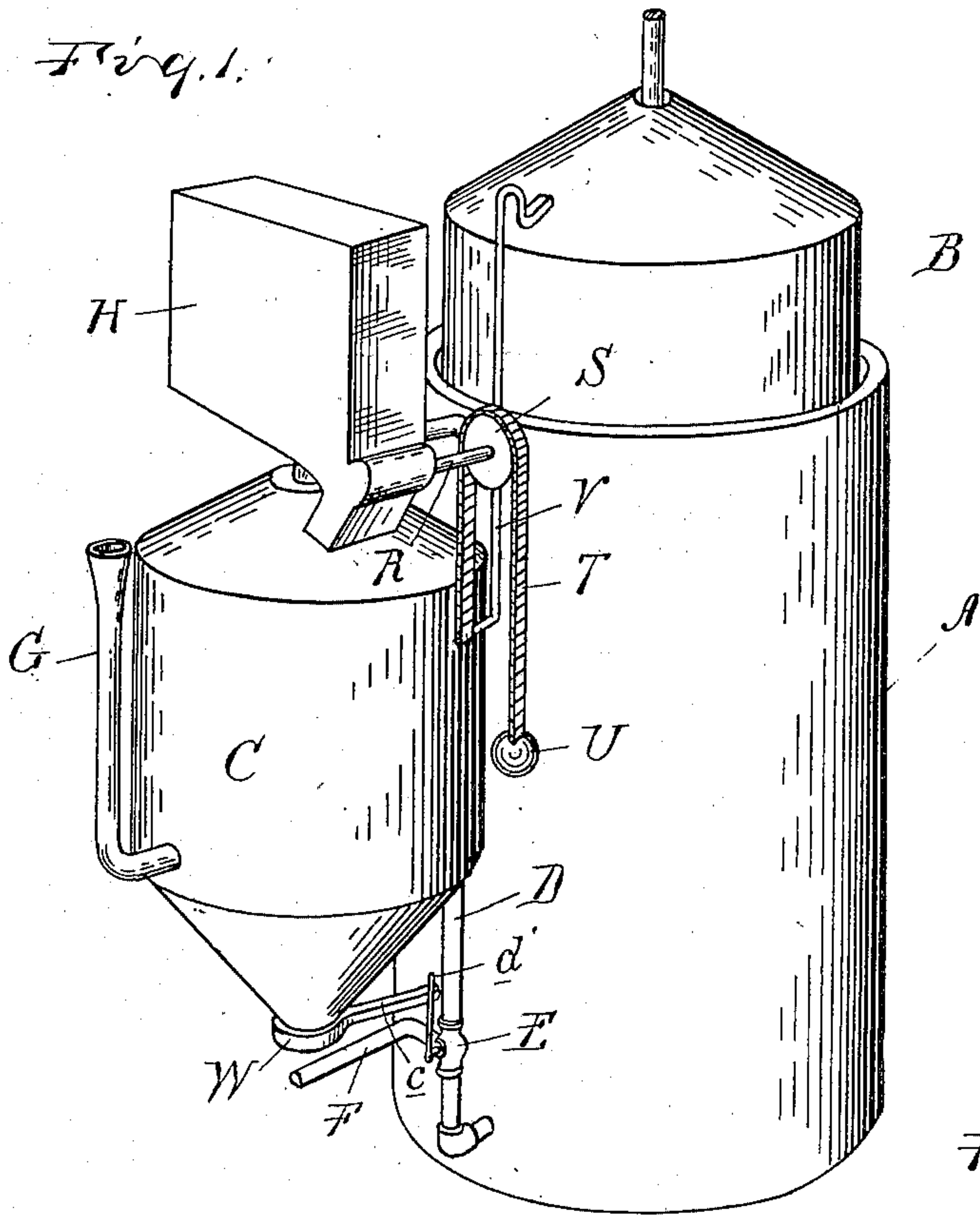
Patented Nov. 27, 1900.

C. PUDDEFOOT.  
ACETYLENE GAS GENERATOR.

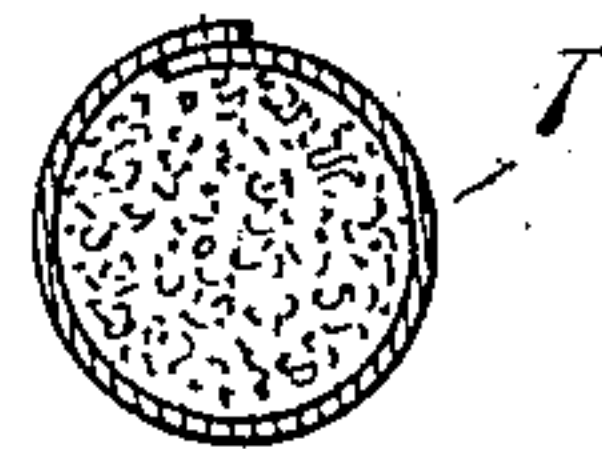
(Application filed Aug. 12, 1899.)

(No Model.)

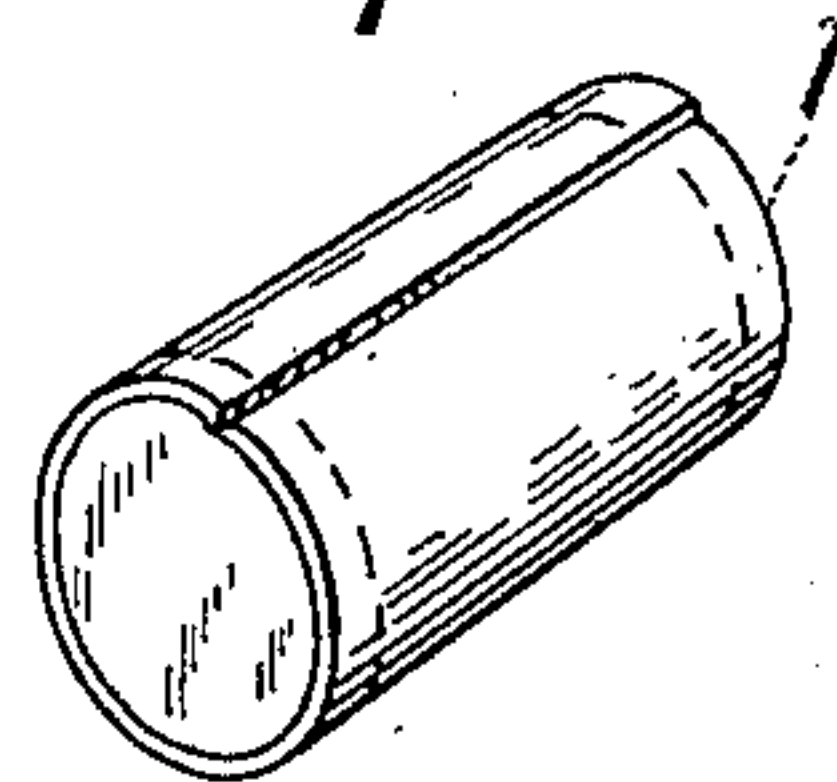
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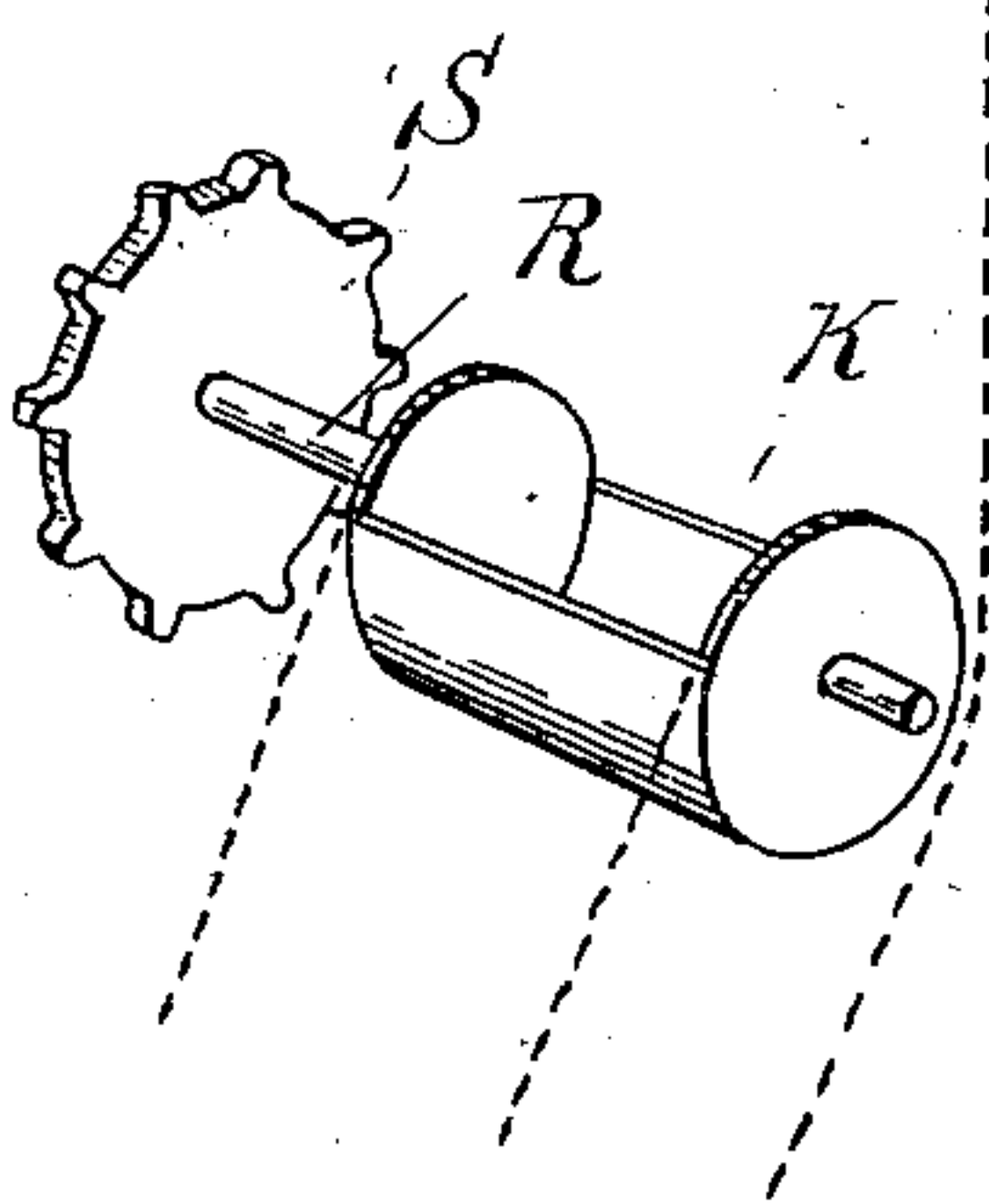
*Fig. 7.*



*Fig. 6.*



*Fig. 5.*



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2 Sheets—Sheet 2.

Fig. 2.

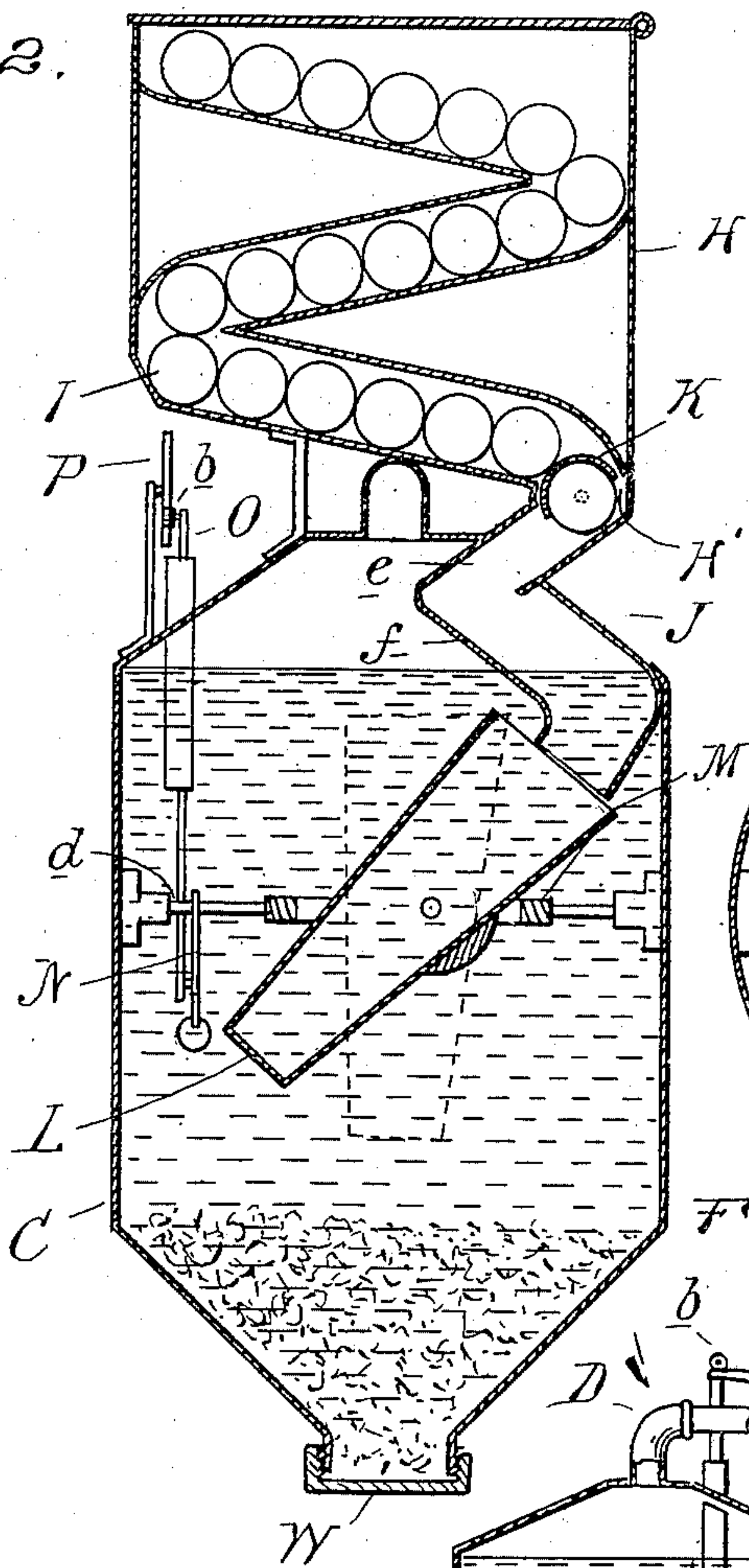


Fig. 3.

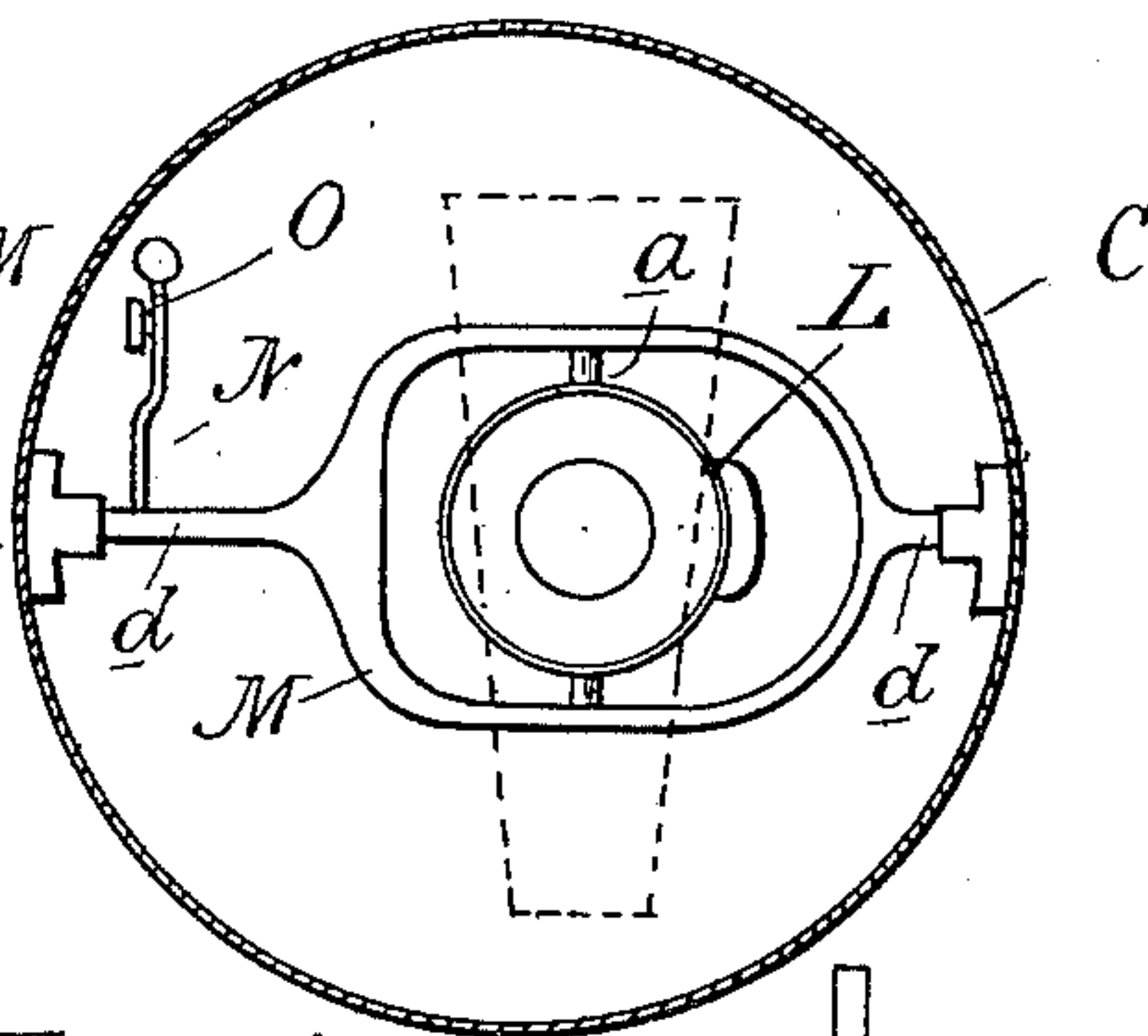
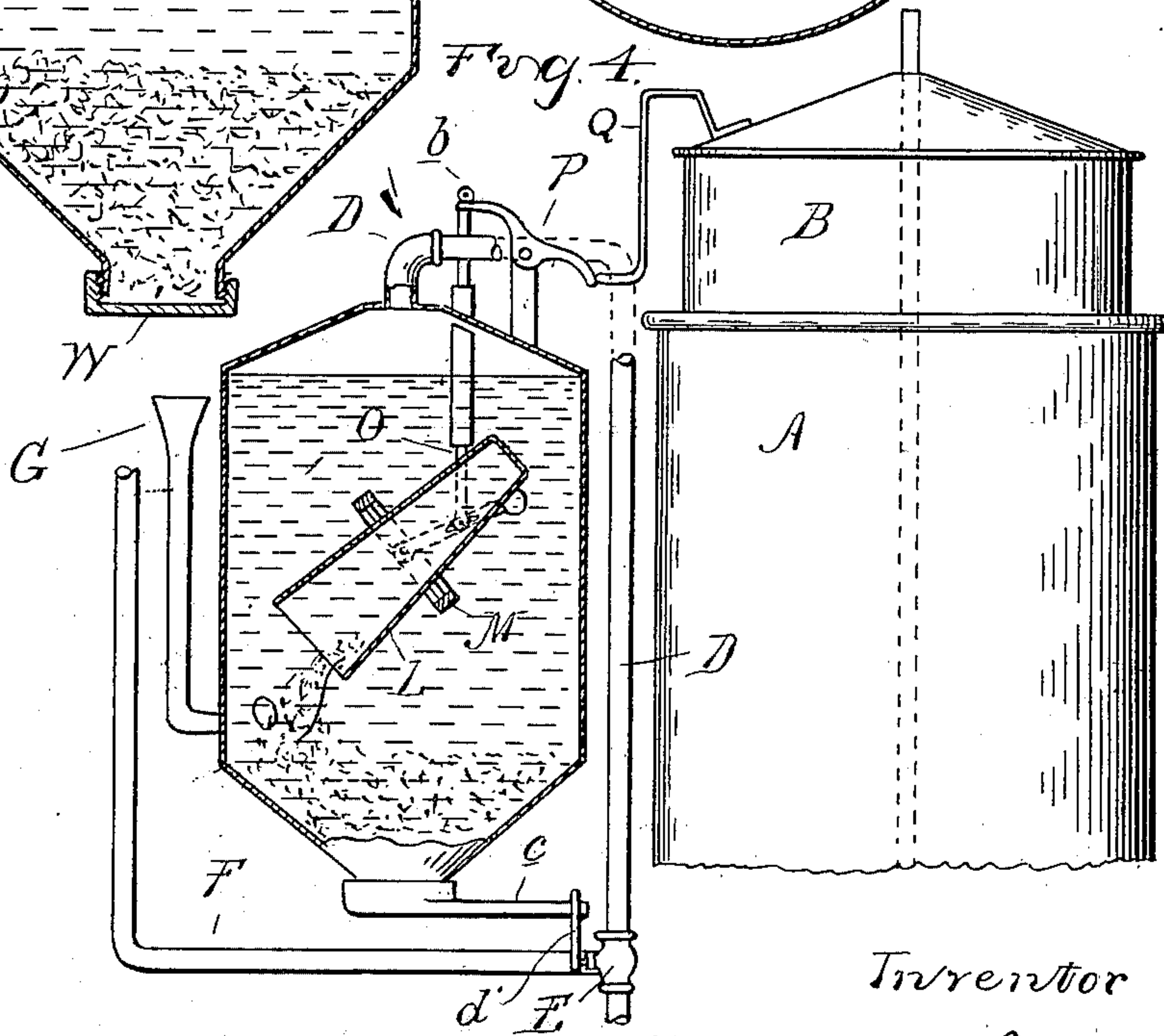


Fig. 4.



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# UNITED STATES PATENT OFFICE.

CHARLES PUDDEFOOT, OF DETROIT, MICHIGAN.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 662,546, dated November 27, 1900.

Application filed August 12, 1899. Serial No. 726,988. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES PUDDEFOOT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Apparatus for Manufacturing Acetylene Gas, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to the process of manufacture of acetylene gas; and it is the object of the invention to provide means whereby the gas may be generated as needed without the necessity of employing cumbersome apparatus and by which all danger of overgeneration is avoided.

In the present state of the art various forms of acetylene-gas generators have been devised which conform to two general types. In the one the supply of water is controlled and in the other the quantity of calcium carbide is regulated. It has been found, however, in the practical operation of machines of both types that great difficulty has been experienced in regulating the generation of gas. This is due to the fact that in the first type of machines it is difficult to accurately gage the quantity of water admitted into the generator, so as to prevent all danger of overgeneration—that is, the generation of a greater quantity of gas than the holder can carry or the slow generation of gas when the apparatus is not in use. Machines of the second type, where the carbide is fed into the water in measured quantities, have also been subject to the same objection of overgeneration. This is because the generation of gas will take place whenever the carbide is exposed to air containing moisture, and thus if the carbide to be used is stored within the generator it is difficult or impossible to prevent the moist air in said generator from coming in contact therewith and causing the generation of gas. If, on the other hand, the carbide is stored without the generator-casing and is introduced therein when needed, the difficulty has been to introduce the carbide without permitting the escape of gas. The attempt has been made to pass the carbide into the generator through valve-controlled passages; but the results obtained have not been satisfactory. Again, the carbide has been introduced through

an entering-passage containing hydrocarbon oil or other non-decomposable liquid; but this form of apparatus is necessarily complicated and has also proved unsatisfactory.

It is the object of my invention to overcome these objections; and the invention consists in the peculiar construction, arrangement, and combination of parts, as hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of the apparatus which I preferably employ. Fig. 2 is a vertical central section through the generator-casing and carbide-storage chamber. Fig. 3 is a horizontal section through the generator-casing, showing the submerged receptacle in its vertical position. Fig. 4 is a view, partly in elevation and partly in vertical central section, taken in a plane at right angles to the section-plane of Fig. 2. Fig. 5 is a perspective view of the controlling device for the carbide charges. Fig. 6 is a perspective view of one of the cartridges in which the carbide charges are stored. Fig. 7 is a cross-section thereof.

A is the gasometer, of any suitable construction and provided with a gas-bell B.

C is the generator-casing, preferably arranged at one side of the gasometer A and secured thereto in any suitable manner. This generator-casing is connected by a pipe D to the gasometer, which pipe is provided with a controlling-valve E, preferably a three-way valve, capable in one position of connecting the generator with an escape-pipe F. The generator-casing is preferably nearly filled with water, which may be introduced through a suitable inlet-pipe G. Above the generator is arranged a receptacle H, in which the charges of carbide are stored. These charges are made in the form of cartridges or incased packages I, such as shown in Figs. 6 and 7 of the drawings. The casing or envelop surrounding the cartridge is so formed as to thoroughly protect the carbide contained therein from the action of air and also form a protection for a brief interval when the cartridge is exposed to water. The envelop or casing is not, however, waterproof, and where exposed to the action of water for more than a very short interval the water will find access to the carbide and will cause the generation of gas sufficient to open the casing. The



material which I preferably employ for forming these envelops is paper or cardboard and the joints between the sections are preferably made by paste or soluble cement. The cartridges I are stored within the receptacle H in such a manner as to feed toward the discharge-opening H' at the lower end of said receptacle. This discharge-opening connects with a passage into the generator-casing, which is formed by the tube or conduit J entering said casing and having its lower end sealed by the water therein.

The passage of the cartridges from the receptacle H into the conduit J is controlled by a gate or valve K, which in the drawings I have shown as a semicylindrical casing arranged in the mouth of the conduit J and adapted in one position to receive a cartridge from the receptacle H and in another position to discharge said cartridge into the conduit J. To prevent danger of wetting this valve or gate due to the splash produced when the cartridge strikes the water, the conduit J is preferably given an angular bend, as shown in the drawings. Beneath the lower end of the conduit J is a receptacle L, adapted to receive the cartridge. This receptacle is submerged in the water within the generator and is so arranged as to be normally beneath the conduit J, but upon receiving the cartridge will automatically turn into a position, such as shown in dotted lines in Fig. 2. In this position the mouth of the receptacle L is moved from beneath the end of the conduit J, so as to direct the gas subsequently generated in said receptacle away from the conduit into the gas-space at the top of the generator-casing. To accomplish this result, the receptacle L is preferably pivotally supported on trunnions *a*, the balance being so adjusted that the receptacle will normally rest in the position shown in full lines, but the weight of the cartridge will turn it into the position shown in dotted lines, Fig. 2. In Fig. 2 of the drawings these trunnions *a* are shown as placed slightly to the right of the axis of the receptacle, so that the cartridge when deposited therein will be thrown farther to the left of said trunnions, thereby causing a slightly-greater movement of the receptacle in tilting. The trunnions *a* are preferably journaled in a frame M, which is also journaled on trunnions *d*, extending at right angles to the trunnions *a*. This frame is connected by a rock-arm N with the rod O, extending out of the casing through a water-sealed passage. Without the casing this rod is connected through suitable mechanism with the bell B of the gasometer, which is adapted upon a certain movement of said bell to raise the rod O and cause the rocking of the frame M. This mechanism I have shown as comprising the lever P, engaging with an antifriction-roll *b* on the rod O, and a rod or arm Q on the bell B, adapted in the movement of said bell to engage with the opposite ends of said lever.

The valve or gate K is provided with an

actuating connection preferably consisting of the stem R, having the sprocket-wheel S secured thereto, with which a sprocket-chain T engages. This sprocket-chain is provided at one end with a weight U and at its opposite end is connected to the rod V, attached to the bell B of the gasometer. The lower end of the casing C is provided with a valve or cap W, adapted to be removed for the purpose of cleaning out the sediment from the generating-chamber. This cap is preferably provided with an arm *c*, extending into the path of the lever *d'* of the valve E, the arrangement being such that the cap W cannot be removed until the valve E is turned in a position to shut off connection between the generator-chamber and the gasometer.

The parts being constructed as shown and described, the operation of the apparatus is as follows: The receptacle H is filled with carbid-cartridges, which, as shown in the drawings, are preferably arranged on inclined shelves, directing the cartridges toward the mouth H' of the receptacle. The size of each cartridge is such that only sufficient carbid can be contained therein to generate the quantity of gas which the bell B is capable of holding. When one of the cartridges is introduced into the generator-chamber through the conduit J by the operation of the gate K, it will drop into the receptacle L and cause the latter to tilt into the position shown in dotted lines in Fig. 2. In passing through the conduit J the cartridge first falls through the portion *e* and then its direction is changed as it passes through the portion *f*, so that when it strikes the surface of the water it will be impossible for the latter to splash up against the gate K. In passing through the water in the conduit the protecting casing or envelop will prevent the water from coming in contact with the carbid, but as this casing is not impervious to water the cartridge will remain but a short interval in the receptacle before a small quantity of water has passed through the casing and caused the generation of gas. As soon as the gas begins to generate it will force open the casing, which, as described, is preferably secured together by soluble cement, and will expose the entire mass to the action of water. The receptacle L being suspended at a point within the generator-casing considerably above the bottom thereof, the water which is contained in said receptacle will be free from the sediment of previous charges, as such sediment being heavier than water will collect in the lower part of the casing. This will permit the gas to be generated without causing the foaming or frothing which would take place if the fresh carbid were to drop down into the sediment. The gas generated will pass through the pipe D into the gasometer and cause the bell B to rise up and through the connection V will impart movement to the chain T and sprocket S. The turning of the sprocket-wheel will cause the rotation of the gate K into a posi-



tion where another cartridge from the receptacle H will be deposited therein. With the drawing off of gas from the bell B the latter will fall, and in so doing the connection Q will at a certain point come in contact with the lever P and cause a movement thereof which will raise the rod O and cause the rocking of the frame M. This will turn the receptacle L into the position shown in Fig. 4 of the drawings, where it is partially inverted, and will allow the spent carbid, as well as the wrapper of the cartridge, to drop into the bottom of the casing. As soon as this is accomplished the farther downward movement of the bell B will disengage the connection Q from the lever P and permit the return of the receptacle L into its normal position, this return movement being effected either by a spring or preferably by gravity. A farther downward movement of the bell B will turn the gate K into a position where it releases the cartridge held thereby and allows it to pass through the conduit J and into the receptacle in the manner before described. It will thus be seen that after the apparatus is once started the generation of gas will continue as long as cartridges are fed to the gate K, and at the same time the quantity of gas generated by each cartridge is not sufficient to overfill the gas-tank.

When it is desired to remove the sediment collected in the bottom of the generator-chamber, the cap W may be removed; but before this can be accomplished the valve E must of necessity be closed, for the reason that its operating-lever *d'* extends into the path of the handle *c*. Thus if the gasometer contains any gas it will be shut off from the generator-chamber, so as not to escape into the room when the cap W is removed.

What I claim as my invention is—

1. An apparatus for generating acetylene gas comprising a generator-casing having a water-sealed introduction-tube for the carbid

charge, and a submerged receptacle within said casing normally in a position to receive the charge from said introduction-tube and adapted to be automatically tilted by the weight of said charge into a position where the mouth of said receptacle is clear of the mouth of said introduction-tube.

2. An apparatus for generating acetylene gas comprising a generator having a water-sealed introduction-tube for the carbid charge and a submerged receptacle pivotally secured within said generator-casing and counterbalanced to stand normally in an inclined position with its mouth beneath the lower end of said introduction-tube, said receptacle being adapted to be automatically tilted by the weight of the carbide charge therein into a position where its mouth clears said introduction-tube.

3. In an apparatus for generating acetylene gas the combination with a generator-casing having a water-sealed introduction-tube for the carbid charge of a pivoted submerged receptacle within said generator for receiving the carbid charge adapted to be automatically tilted by the weight of said charge, and a supporting-frame for said receptacle adapted to be tilted upon a transverse axis to dump said receptacle.

4. In an apparatus for generating acetylene gas the combination with the generator-casing C, having a water-sealed introduction-tube J, of the submerged receptacle L having the trunnions *a*, the frame M in which said trunnions *a* are journaled having the transverse trunnions *d*, the rock-arm N for said frame, and the operating-rod O substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES PUDDFOOT.

Witnesses:

M. B. O'DOHERTY,  
H. C. SMITH.