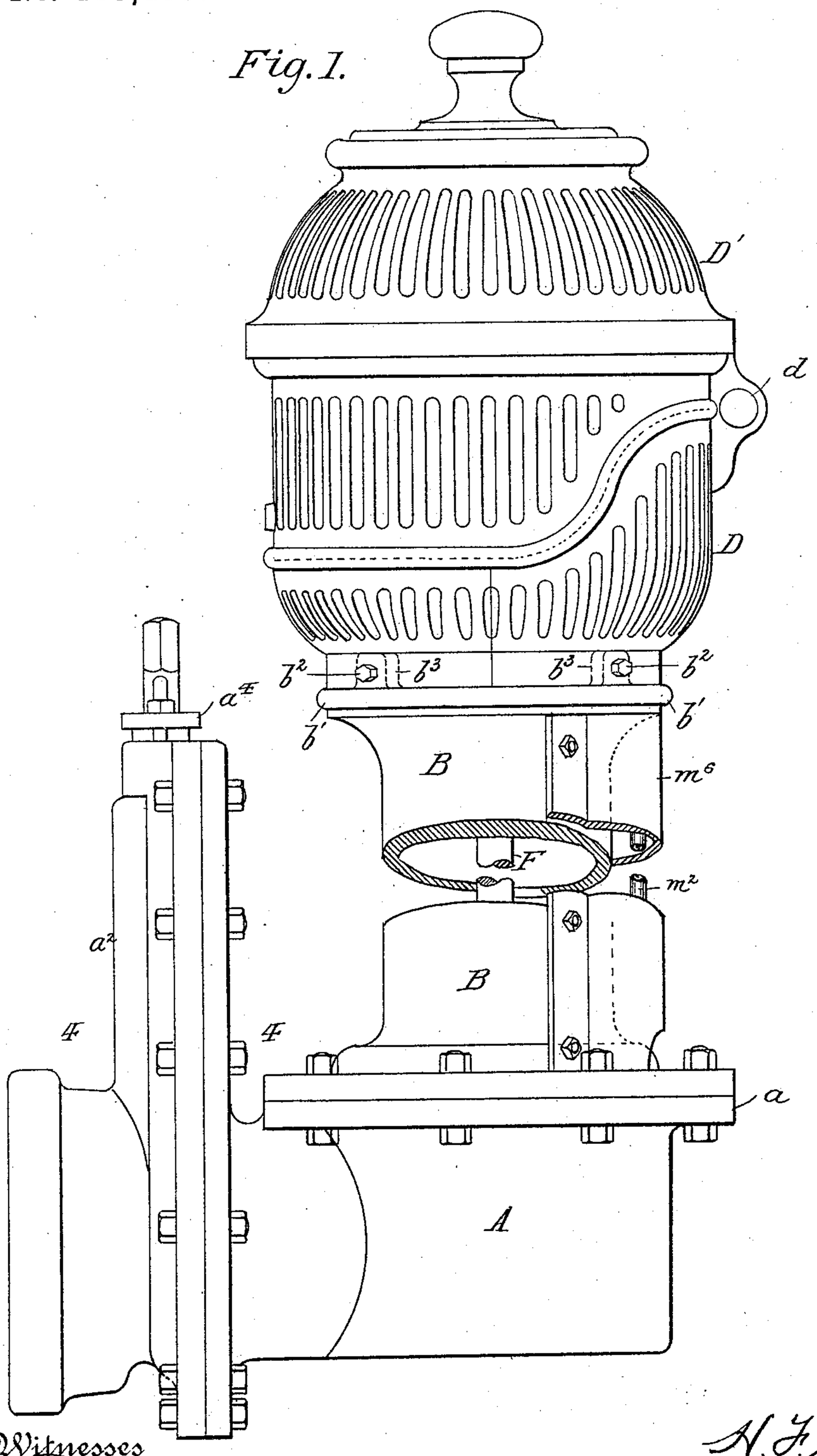
(No Model.) 3 Sheets—Sheet 1.

H. F. HAYDEN.

FIRE HYDRANT.

No. 485,409. Patented Nov. 1, 1892.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

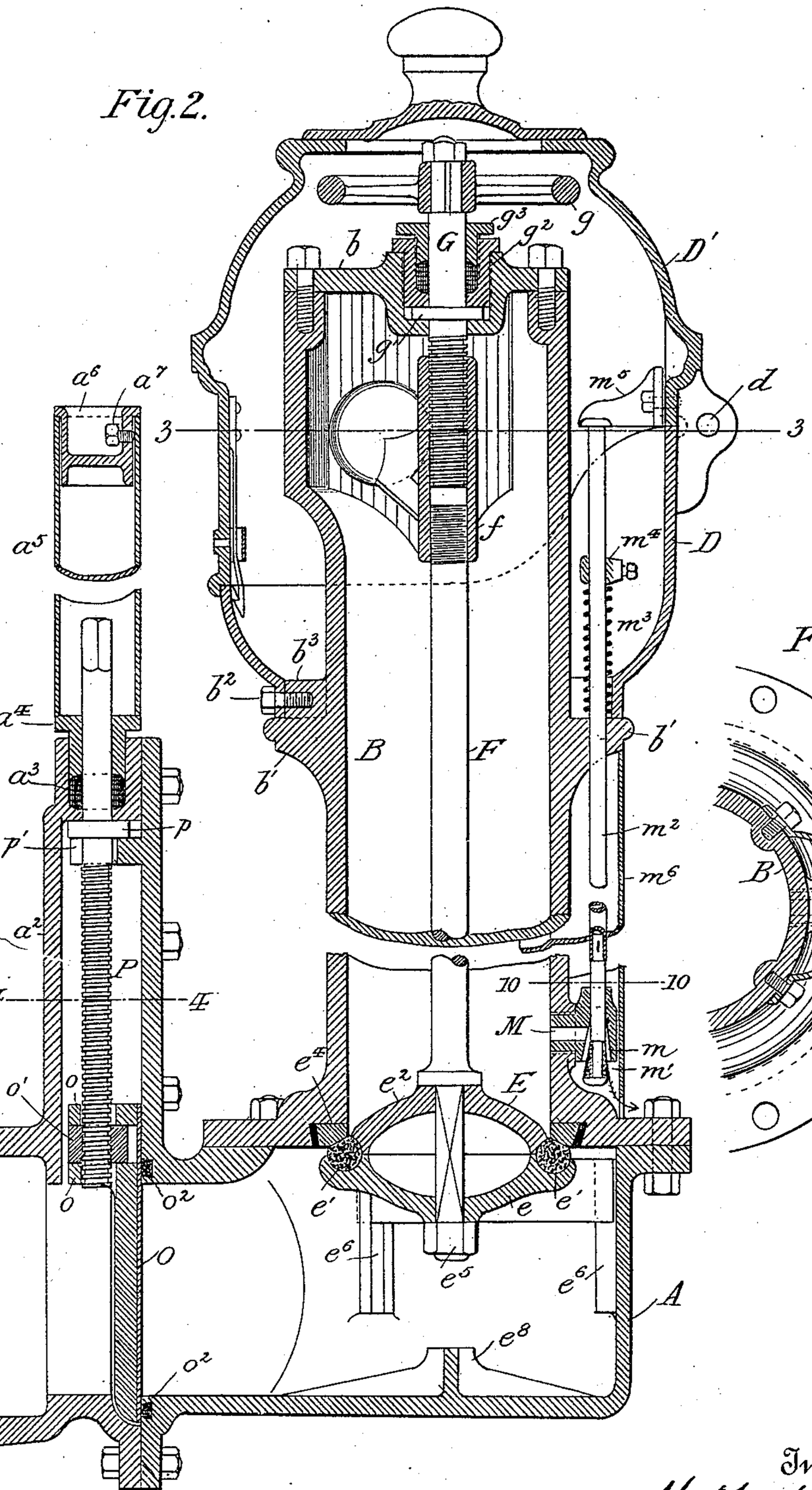
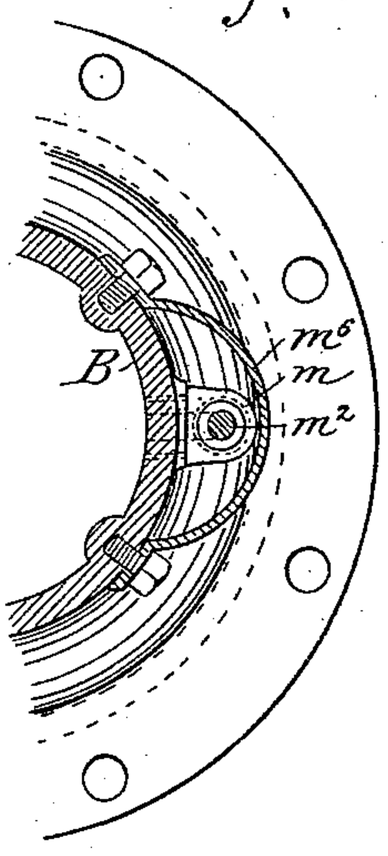


Fig. 10.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 5.

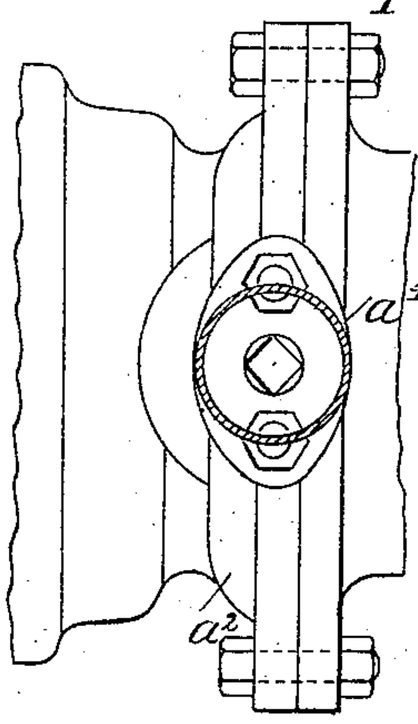


Fig. 3.
on line 3-3.

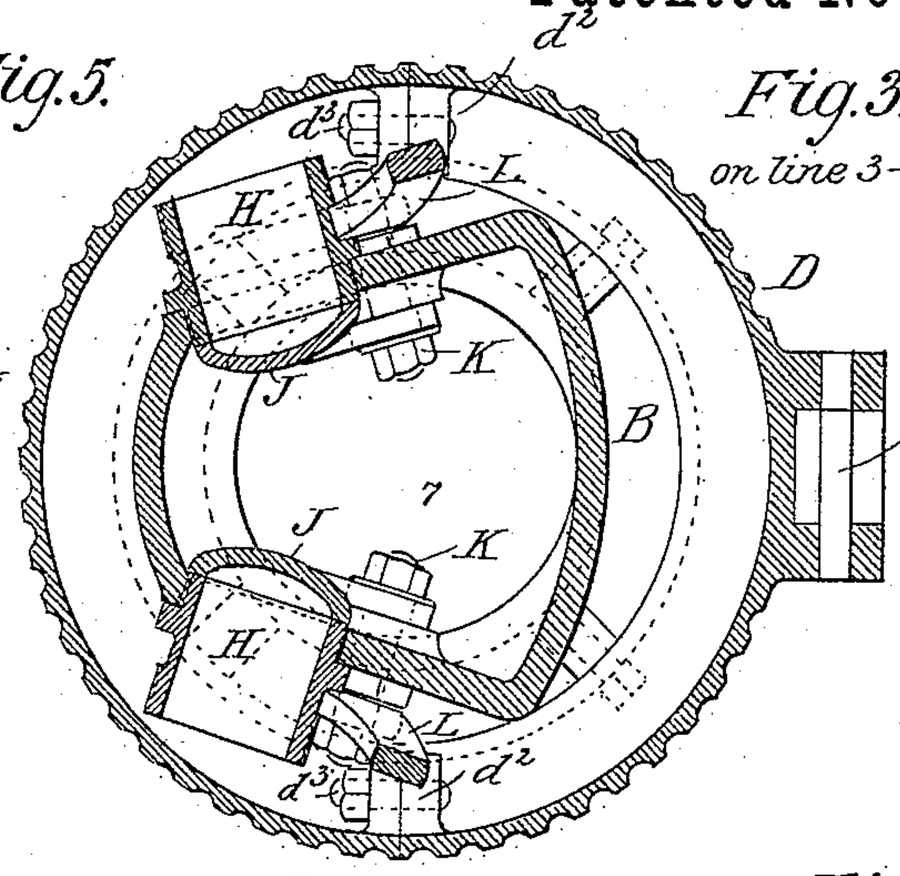


Fig. 9

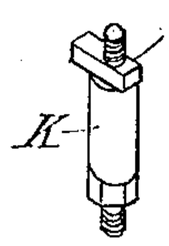


Fig. 6.

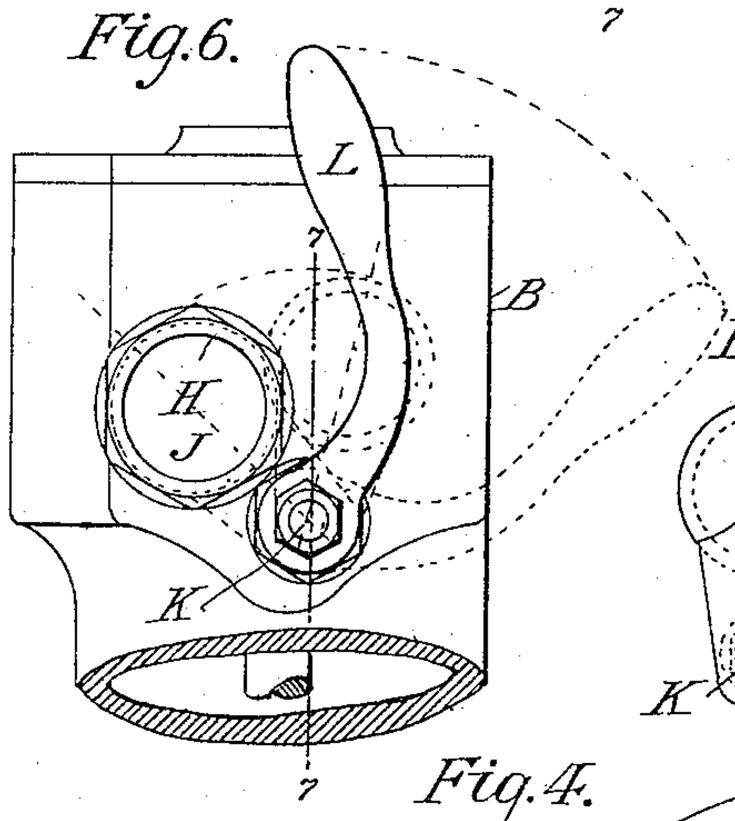


Fig. 8.

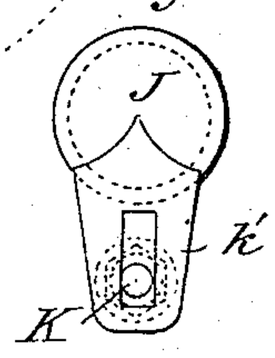


Fig. 7.
on line 7-7.

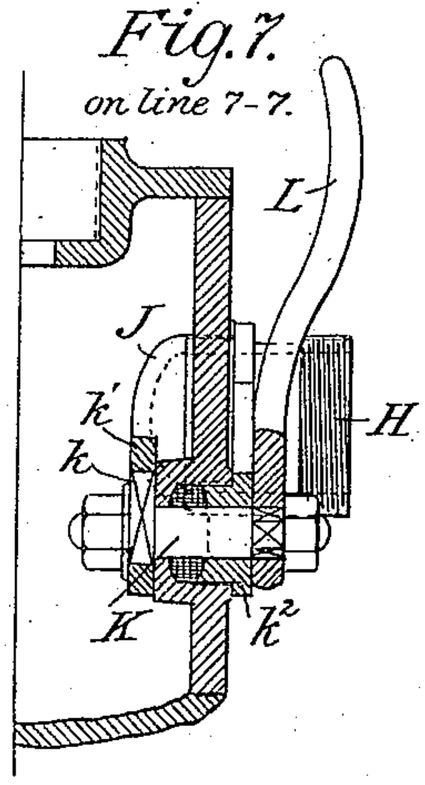
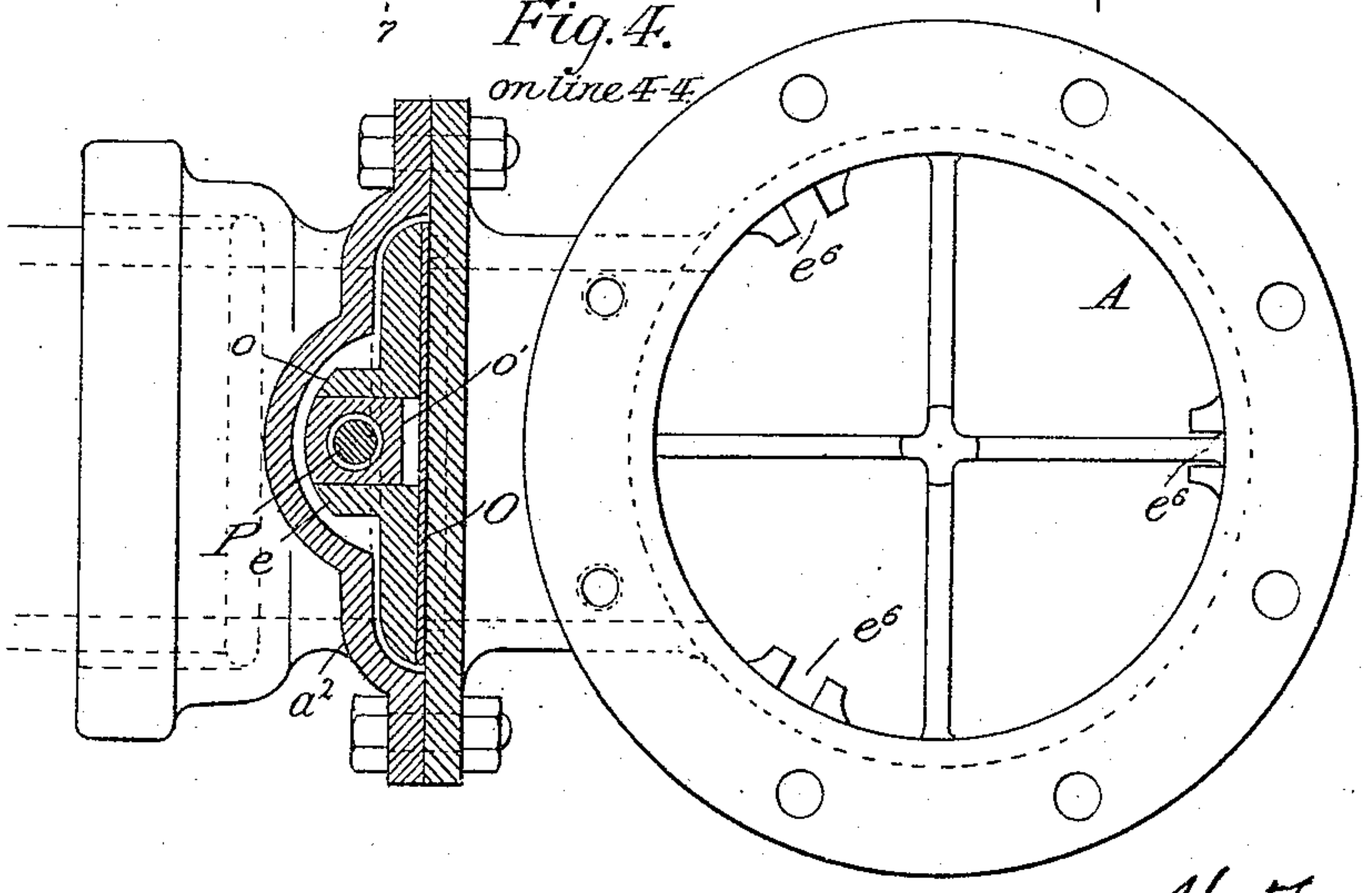


Fig. 4.
on line 4-4.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY F. HAYDEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

FIRE-HYDRANT.

SPECIFICATION forming part of Letters Patent No. 485,409, dated November 1, 1892.

Application filed October 27, 1891. Serial No. 409,992. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. HAYDEN, of Washington, District of Columbia, have invented a new and useful Improvement in Fire-Hydrants, of which the following is a specification.

This invention relates to that class of fire-hydrants or fire-plugs which, being connected with the street-mains, are provided with a plurality of outlet necks or nozzles for the attachment of hose thereto.

The invention consists in various improvements in a hydrant of this character designed to render it simple and durable in construction and the operation of its parts easy and effective for the purpose of actuating the main valve, shutting off connection with the street when the main valve is to be repaired or moved, and the opening or closing of individual necks or nozzles when subjected to the high pressure of water.

The invention also consists in the details of construction and combinations of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of my improved hydrant as it appears when closed, portions of the stand-pipe being broken away to reduce the size of the drawing. Fig. 2 is a vertical central section through the hydrant. Fig. 3 is a horizontal section on the line 3 3 of Fig. 2. Fig. 4 is a top plan view of the base portion of the hydrant with the cut-off valve in section on the line 4 4, Figs. 1 and 2. Fig. 5 is a top plan view of the parts for operating the cut-off valve. Fig. 6 is a front elevation showing one of the nozzles and the adjacent parts, including its valve. Fig. 7 is a vertical section on the line 7 7 of Figs. 3 and 5. Fig. 8 is a perspective view of one of the nozzle-valves. Fig. 9 is a perspective view of the crank-spindle for operating the same. Fig. 10 is a horizontal cross-section on the line 10 10 of Fig. 2, showing the drainage-valve connections.

The body of the hydrant consists principally of the following parts: The base-chamber A, having at one side a flanged mouth for connection with the water-main and at the top an opening surrounded by a horizontal flange *a*, which receives and supports the lower end of the stand-pipe or body B, which is made of tubular form and closed at the top by a cap-plate *b*, secured thereto by vertical tap-bolts. The upper end of the stand-pipe or body is inclosed by a head or casing consisting of the lower stationary part D and the upper part or cap D′, connected thereto on one side by a hinge *d*. The lower section D of the casing is divided vertically into two parts, which are applied around the stand-pipe, their lower ends being seated on a flange or collar *b′* and secured by tap-bolts b^2 to lugs or projections b^3, formed integral with the stand-pipe. This mode of attachment, while simple and inexpensive, serves to secure the lower portion of the casing firmly to the stand-pipe. The lower sections of the casing are also provided, as shown in Fig. 3, with internal lugs d^2, connected by through-bolts d^3.

E represents the main valve, consisting of a lower plate *e*, provided in its upper face near the periphery with a semicircular groove containing a rubber or other elastic packing-ring *e′*, which is confined in place by a second plate e^2, overlying its inner edge, the form and arrangement of the parts being such that although the packing is firmly confined between the two plates its upper outer surface is exposed in order that it may contact and form a closed joint with the brass or other metal ring e^4, fixed in the lower end of the stand-pipe and having a beveled under face to receive the packing. The two valve-plates are carried by the lower end of the valve-rod F, provided with a shoulder to form a bearing for the upper plate and with a nut e^5 on the lower end, confining the plates in place and holding them together to secure the packing. Should the upper bearing-surface of the packing-ring e^4, which lies against the valve-seat when the valve is closed, become worn or otherwise injured to prevent the valve from being tightly closed, the ring may be taken out of its seat and reversed or turned over to present a new and uninjured surface to the valve-seat. The lower valve-plate is provided with radially-extending arms, the outer ends of which slide in vertically-grooved ribs e^6, cast on the inner walls of the base-section A, whereby the valve is accurately guided in a vertical direction and prevented from rotating. The upper end of the valve-rod is screwed, keyed, or otherwise rigidly fixed

within a sleeve *f*, the upper end of which is threaded internally to receive the lower end of an operating-screw G, which is projected upward through the cap-plate *b* and provided with an operating-wheel *g*, the screw serving when turned to raise or lower the main valve. The downward-opening movement of the valve is limited by a projection e^8, cast in the bottom of the base-chamber, so as to prevent the accidental disconnection of the screw at the top. The screw is provided with a peripheral collar *g'*, seated in a recess in the top of the cap-plate and confined by a collar g^2, screwed into place above it, in order to prevent vertical play of the screw. The collar g^2 is in turn recessed to receive a packing and a collar g^3 to confine the same in place, the construction being similar to that of an ordinary stuffing-box or gland.

The stand-pipe is provided near its upper end with outlet-necks H, the upper ends of which are suitably formed to permit the connection of a hose therewith. These necks, instead of being attached as heretofore, are provided with peripheral flanges threaded at their inner ends and screwed into the walls of the stand-pipe from the outside, so that their flanges have a firm bearing against its outer surface.

Instead of constructing the upper end of the stand-pipe of cylindrical form, as usual, I construct it of a sector form in cross-section, with two flat vertical walls standing at a slight angle to each other, as shown in Fig. 3, so that the two necks projecting from these walls in opposite directions will both project the streams issuing therefrom into the street beyond the curb-line. This construction, which prevents the streams from being thrown upon the sidewalk or tree-boxes, is a matter of importance in connection with the customary flushing of the mains, which is effected by opening the hydrant and allowing the water to escape freely therefrom. The flattening of the sides of the stand-pipe is also advantageous in that it permits the necks to be set inward, so as to afford ample space for them and for valve-operating levers, to be presently described, without unduly increasing the size of the casing.

In order that the delivery of the water may be controlled through each neck or nozzle independently, I mount inside of the stand-pipe opposite each neck a valve J, arranged to swing across and against the inner end of the neck, which forms a seat or bearing therefor. Each of these valves is mounted in the inner end of a rock-shaft K, which is projected through the side wall of the stand-pipe to the outside and there provided with a hand-lever L, by turning which the valve may be carried positively over or away from the inner end of the neck. Each of the rock shafts or spindles K is formed, as shown in Fig. 9, with a cross-arm or crank *k*, which is seated loosely in a slotted arm *k'* on the valve-plate, as shown in Fig. 8, a nut being applied to the inner end to retain the valve in place, the parts being so fitted as to allow the valve a slight freedom of movement upon the shaft in order that it may seat itself accurately and tightly against the neck under the influence of the internal water-pressure. Each of the shafts K passes through a gland or stuffing-box k^2, by which the leakage of water is prevented.

It is to be noted that the valve and the operating-lever are applied directly to opposite ends of the rock-shaft, so that a positive motion is secured and the necessity for the use of the customary intermediate parts avoided. The levers L are made of a suitable length and extended upward in a slightly-curved form, as plainly shown in Fig. 6, the shape of the stand-pipe allowing them to be made of such length and size that the upper lever may readily apply power sufficient to open and close the valve under the most extreme pressures encountered in practice. When the valve is closed, the lever encounters the neck, which serves as a stop therefor, and when it is opened the lever encounters and its movement is arrested by the casing. Thus it is that the motion of the lever and valve is properly limited without the employment of special stop devices therefor.

For the purpose of automatically draining the water from the stand-pipe when the main valve is closed I provide near the foot of the stand-pipe a drainage-opening M, having at the outer end a conical mouth or seat *m* to receive a rubber valve *m'* on the lower end of a vertical rod or spindle m^2. This rod is extended upward loosely through the flange on the stand-pipe and provided at the upper end with an encircling lifting-spring m^3, acting against an adjustable collar m^4, fastened by a set-screw. The spring acts to close the valve and keep the same closed whenever the hydrant is in action. The opening of the valve is automatically effected when the lid is closed by means of an arm m^5, bolted to the lid near the hinge in position to act upon and depress the upper end of the rod, as plainly shown in Fig. 2. The lower end of the rod lying outside of the stand-pipe is covered and protected by a sheathing m^6, bolted to the stand-pipe, as shown in Figs. 2 and 10.

In order that the admission of water to the hydrant may be wholly cut off without shuting the water off from the main whenever the internal parts of the hydrant are to be inspected or repaired, I provide a cut-off or gate valve O, located in the base-chamber between the main valve and the inlet-neck. This valve is in the form of a flat plate and is provided at the upper edge with ears *o*, embracing a nut *o'* on the lower end of a vertical screw P, which extends upward through the top of a chamber or well a^2, rising from the base-chamber of the body. The base is provided with an annular packing-ring o^2, encircling the inlet-throat and serving as a seat or bearing for the inner surface of the

valve, which is preferably faced with brass or other non-corrosive metal. By turning the screw in the proper direction the valve is drawn upward out of the the base into the upper chamber, where it ordinarily remains. During the closing movement of the valve and until the valves beyond are opened the water-pressure is equal on its two sides, so that it may be closed with ease. When the valves beyond it are open, so as to destroy the equilibrium, the pressure of the water from the main will force the valve O tightly to its seat. This fact permits me to construct the valve and its operating parts in an inexpensive manner and without careful fitting. It allows the various parts to be given such looseness or freedom as to avoid the possibility of their rusting fast or being rendered inoperative by the accumulation of sediment therein. The screw is provided with a peripheral collar p, which rests upon underlying supporting-lugs p', which are cast on the base portion of the hydrant. The extreme end of the base-chamber, including the neck to receive the main, and the front wall of the chamber a^2 are cast in a separate piece from the remaining portion of the base-chamber suitably flanged and bolted thereto. This front portion is adapted to encircle the upper end of the screw and fit down upon its collar p to prevent the screw from moving endwise. The upper end of the portion a^2 is recessed around the screw to receive packing a^3, which is confined by a gland or collar a^4, screwed down in place thereon. This collar also supports an uprising tube a^5, which incloses and protects the upper end of the screw. The top of the tube a^5 is provided with a removable plug a^6, held in place by a screw a^7. This plug, which serves to prevent the entrance of foreign matter and also to prevent ignorant and malicious persons from gaining access to the screw p, so as to operate the cut-off valve, may be readily removed by means of a wrench when the cut-off is operated.

The valve-seat e^4, the facing of the valve O, the valve-seat m, and the sleeve f should all be constructed of brass, gun-metal, or other non-corrosive metal.

It is to be observed that when either the cut-off valve O or the main valve is closed the removal of the cap-plate b will give access to the interior of the stand-pipe and to the valves J, allowing them to be inspected, adjusted, or repaired without difficulty.

Referring again to the main valve E, it is to be noted that when open the packing e' exposes a rounded upper surface, over which the water flows to and fro and on which there is no liability of sedimentary matters lodging in such manner as to prevent the tight closing of the valve.

Referring to the cap or cover d', it is to be noted that it is provided with a heavy projecting knob at the top and that its hinge is located in such manner that when the top is opened and thrown back the knob will rest upon the sidewalk, and thus support and limit the backward motion of the cap, thus preventing that breakage of the hinge which frequently occurs in hydrants of ordinary construction, which are without means for supporting the cap when it is thrown open.

Having thus described my invention, what I claim is—

1. In a fire-hydrant, the combination, with the stand-pipe provided with a lateral outlet or nozzle, of a shaft extending through the stand-pipe, a lever-handle fixed to the outer end of said shaft, a cross-head fixed to its inner end, a valve-plate provided with an opening of larger dimensions than those of the cross-head and applied to the same to turn therewith, and a fastening device to hold said valve-plate in place, whereby the valve-plate is compelled to turn with the shaft, but is capable of a limited play at its inner end transversely of the shaft in a vertical and horizontal direction and also longitudinally of the same.

2. In a fire-hydrant, in combination with the stand-pipe provided with a valve-seat in its base, the main valve comprising two plates e e^2, having in their contiguous peripheral faces annular grooves, an annular packing-ring seated in said grooves and clamped between the plates, with its upper surface exposed to the valve-seat, a valve-stem connected to said plates, and means, substantially as described, for operating the same.

3. In a fire-hydrant, in combination with the stand-pipe provided with a valve-seat in its base, a main valve comprising a lower supporting-plate having in its peripheral edge a curved channel, an upper plate provided in its peripheral edge with a correspondingly-formed channel, and a packing-ring of circular form in cross-section seated in said channels and clamped between the plates, with its upper edge exposed to the valve-seat, a valve-stem extending through said plates, and a fastening device applied to the stem beneath the lower plate and serving to hold the parts together.

4. In combination with the stand-pipe having the flattened sides and outlet-necks, the external casing, the valves to close the necks, their horizontal rock-shafts, and the operating-handles arranged to contact alternately with the necks and the casing to limit the motion of the valves.

5. In a fire-hydrant, the combination, with the stand-pipe and its main valve, of a base-chamber provided with a vertical valve-seat, an outlet-neck made separate from and attached to the base-chamber, a gate between the said base-chamber and inlet-neck, and a chamber to receive the gate when the latter is opened, the said chamber being made in two parts, one of which is integral with the base-chamber and the other with the inlet-neck, substantially as shown and described.

6. In a fire-hydrant, the combination, with the stand-pipe and its main valve, of a base-

chamber provided with a vertical valve-seat, an inlet-neck made separate from and attached to the base-chamber, a gate between the base-chamber and inlet-neck, a chamber to receive the gate when the latter is opened, the said chamber being made in two parts, one of which is integral with the base-chamber and the other with the inlet-neck, and a screw for operating the gate, supported between the parts of said chamber, substantially as shown and described.

7. In a hydrant, and in combination with the valve-operating screw, its support, and the encircling gland or collar A^4, the inclosing tube A^5, fixed upon and sustained by the collar, and the removable plug seated in the top of the tube and secured by a lateral screw located in a cavity in the plug, as described.

In testimony whereof I hereunto set my hand, this 21st day of October, 1891, in the presence of two attesting witnesses.

HENRY F. HAYDEN.

Witnesses:
P. T. DODGE,
W. R. KENNEDY.