

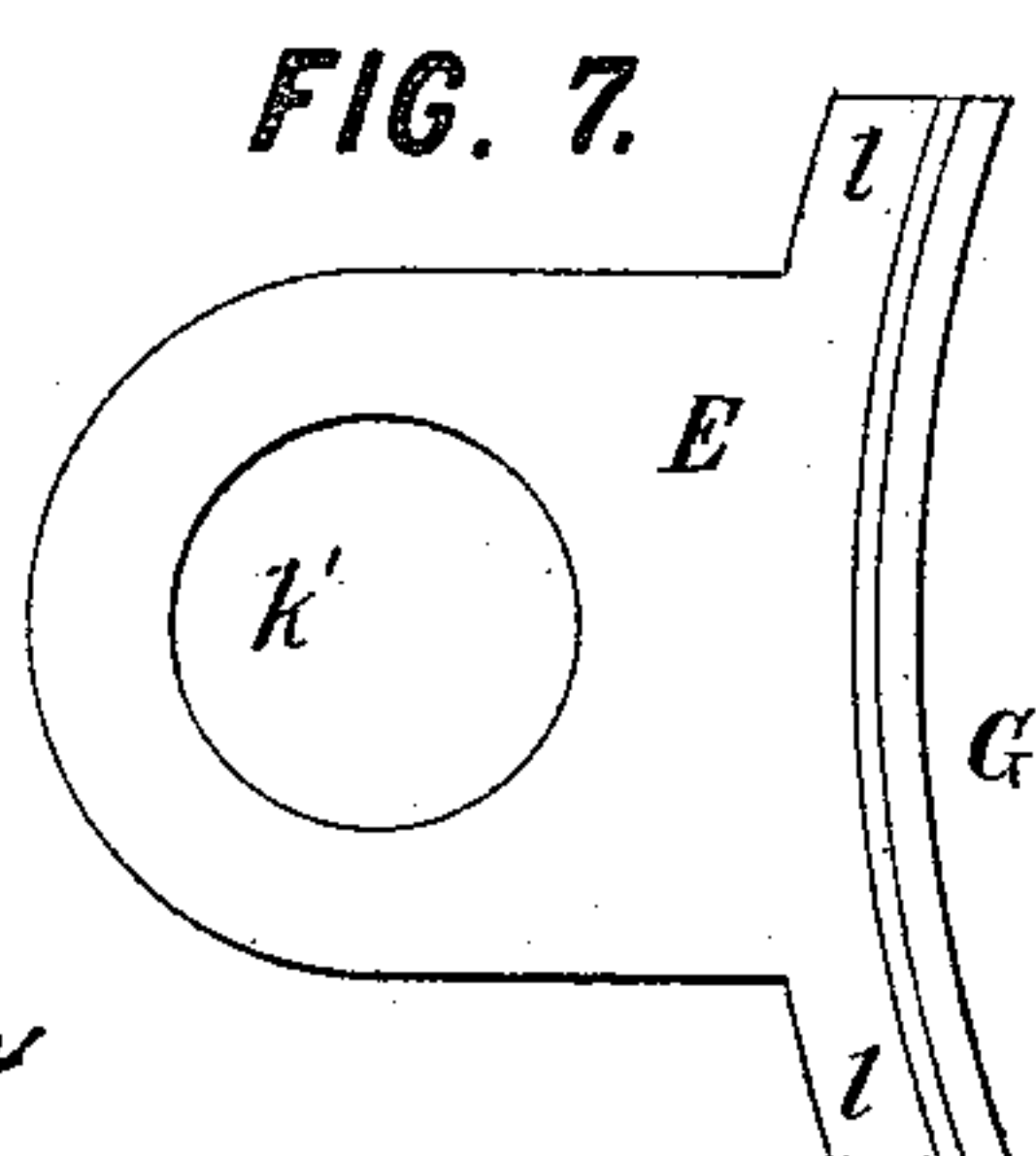
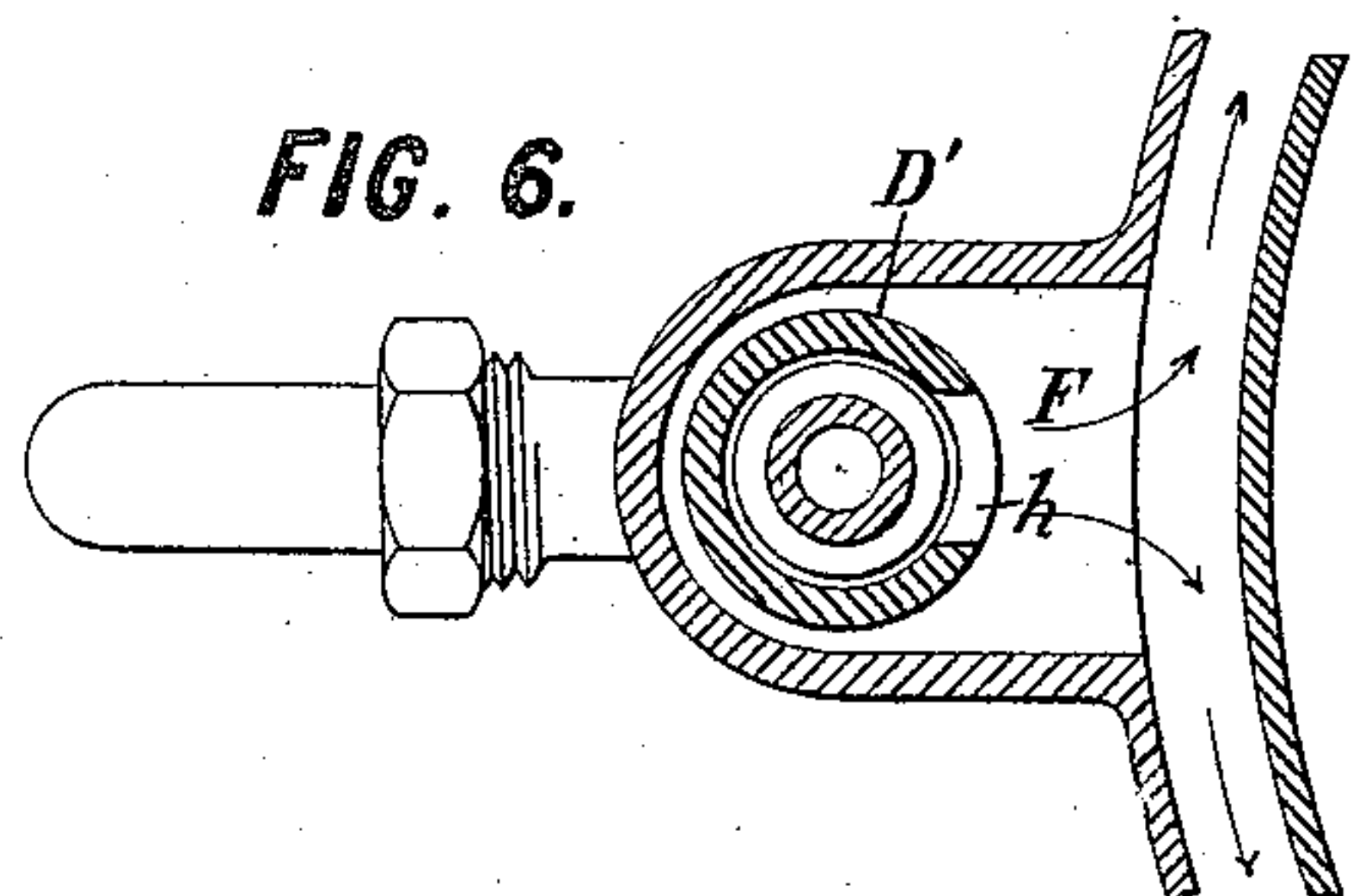
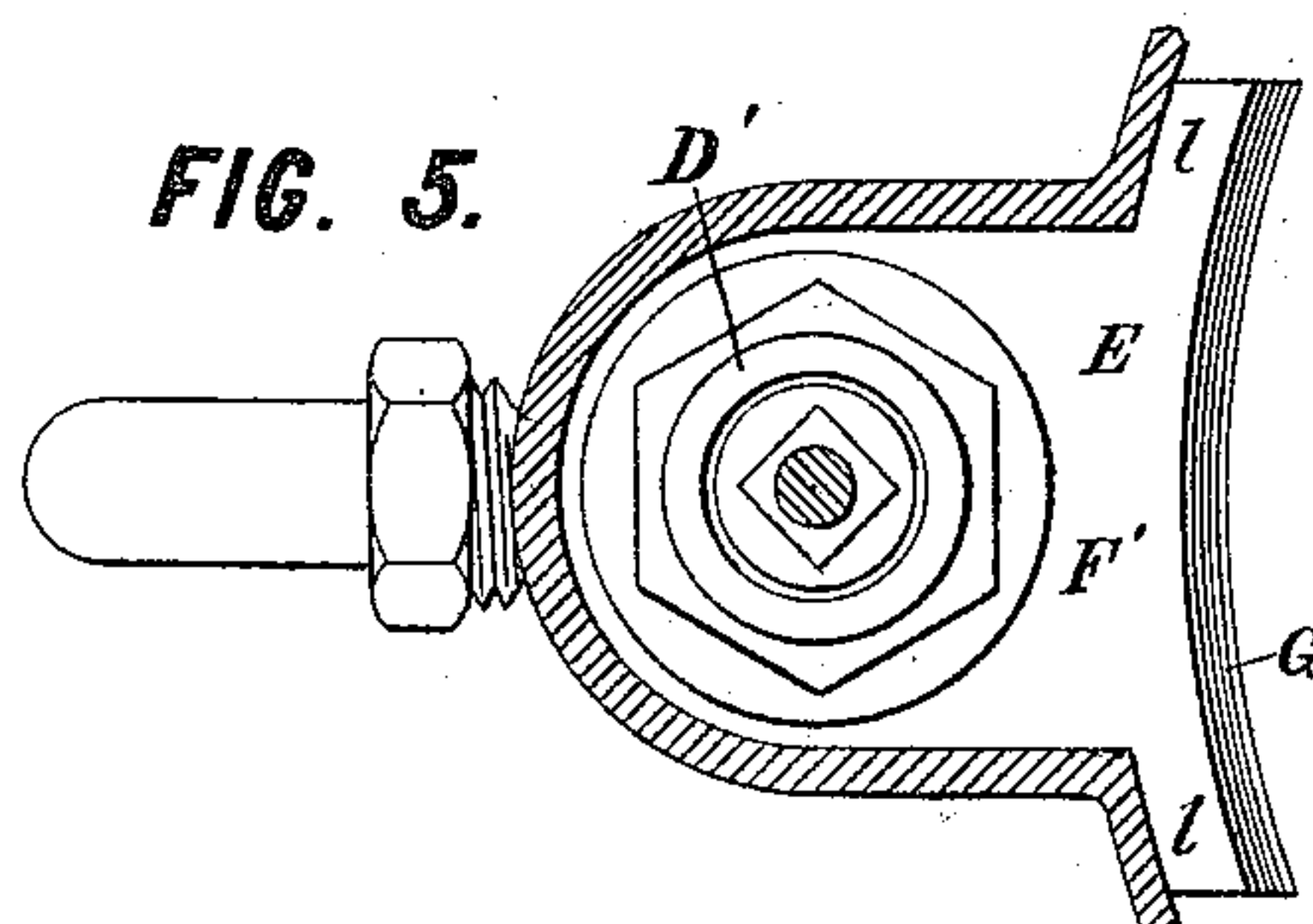
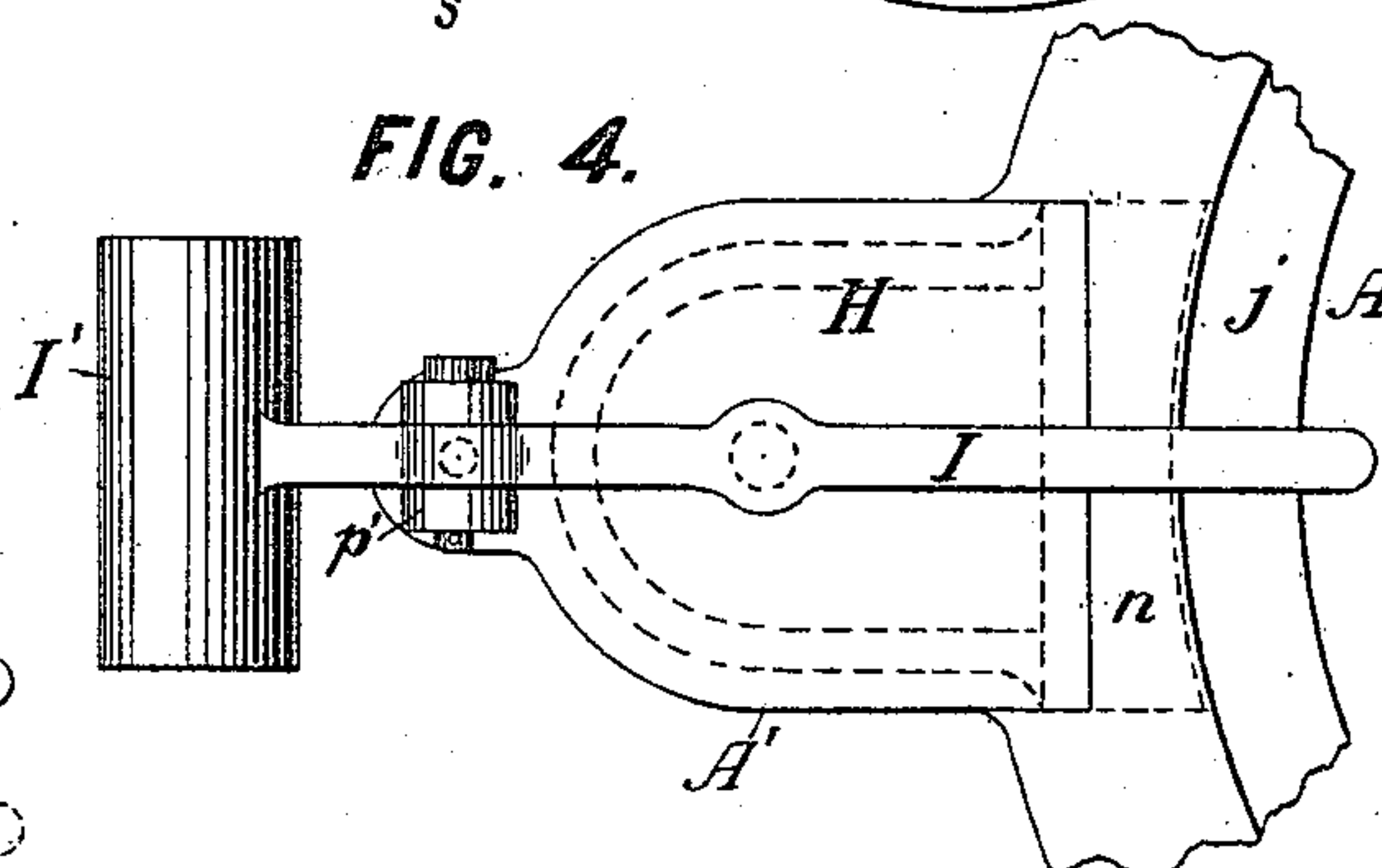
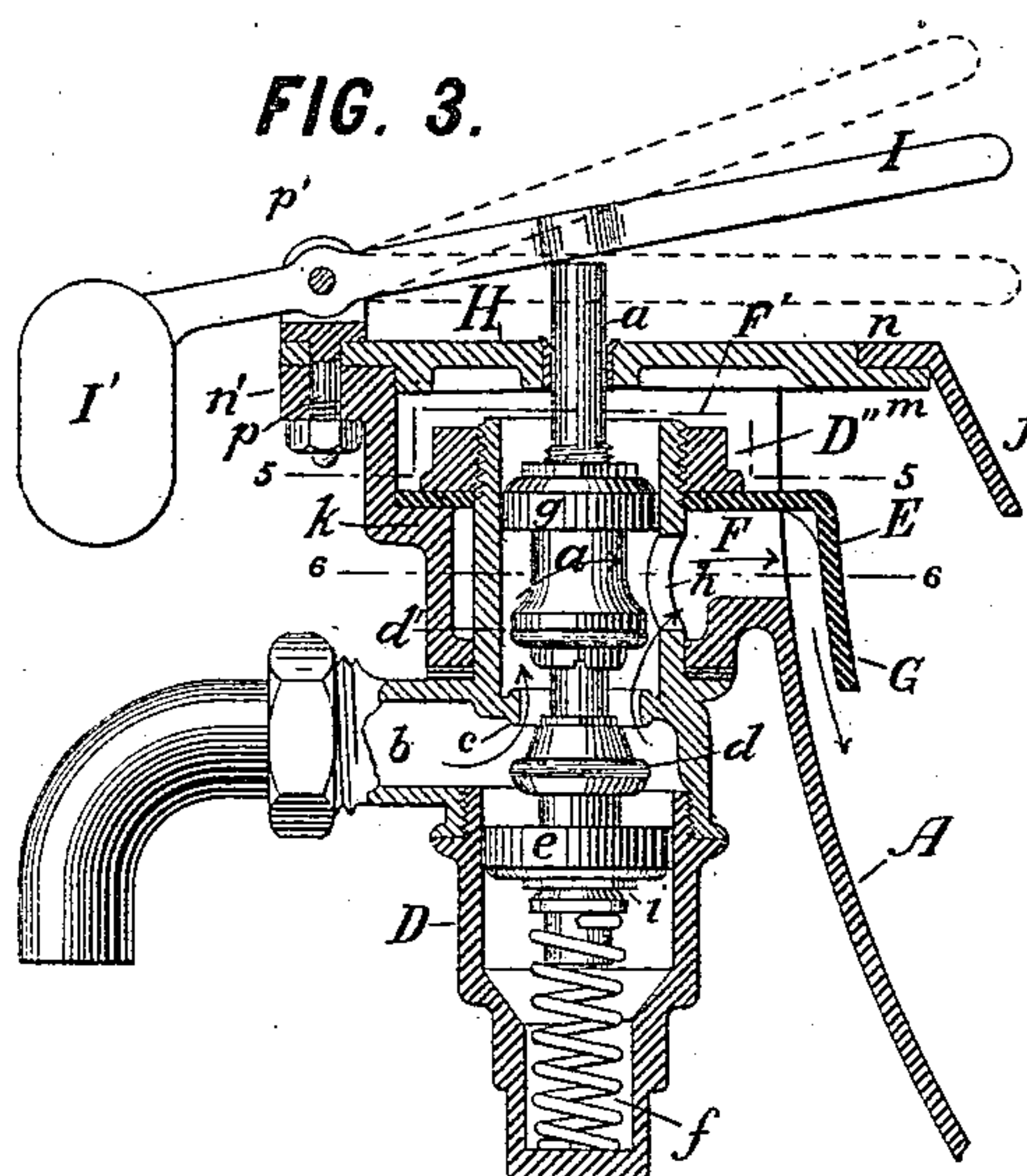
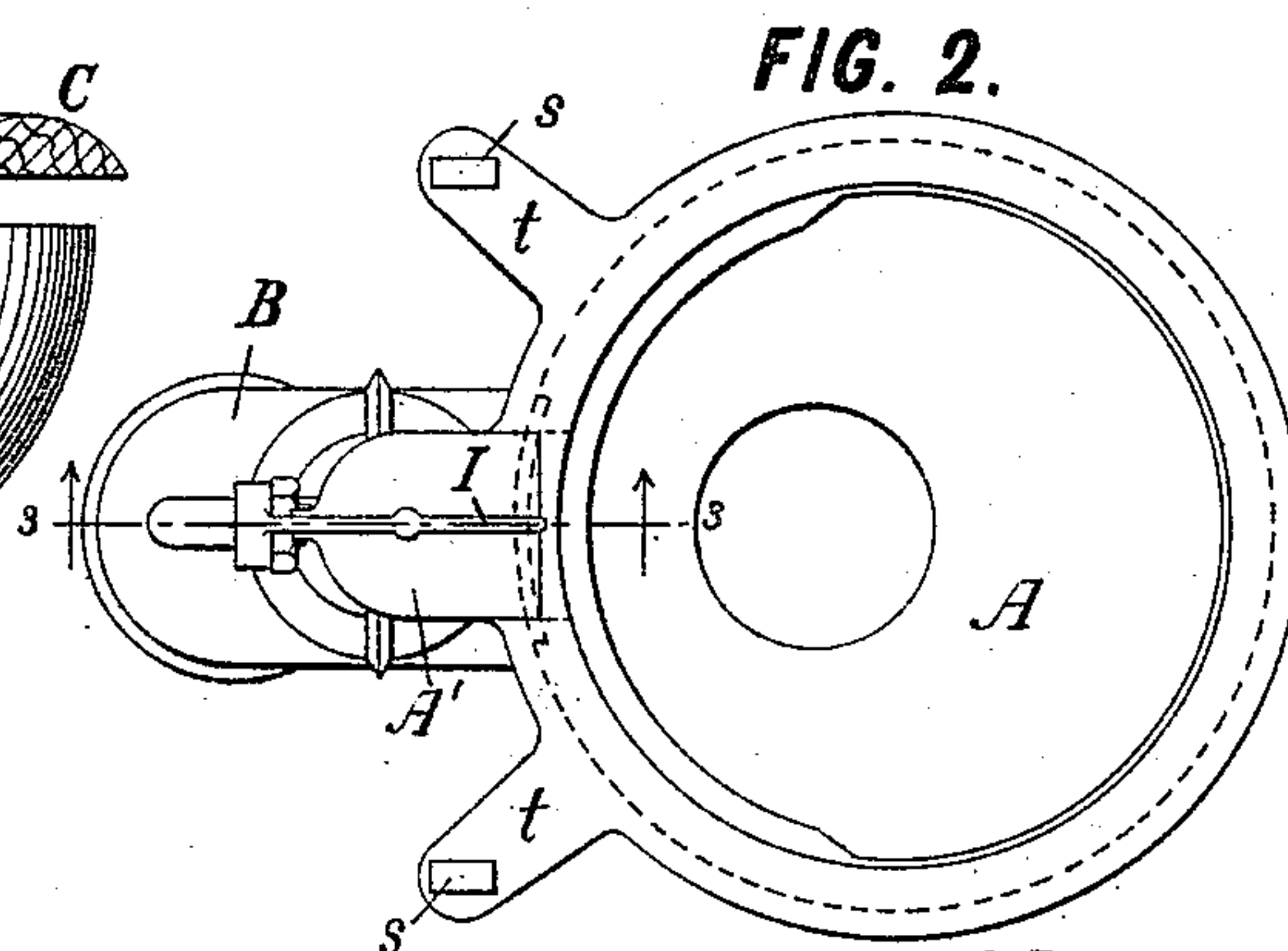
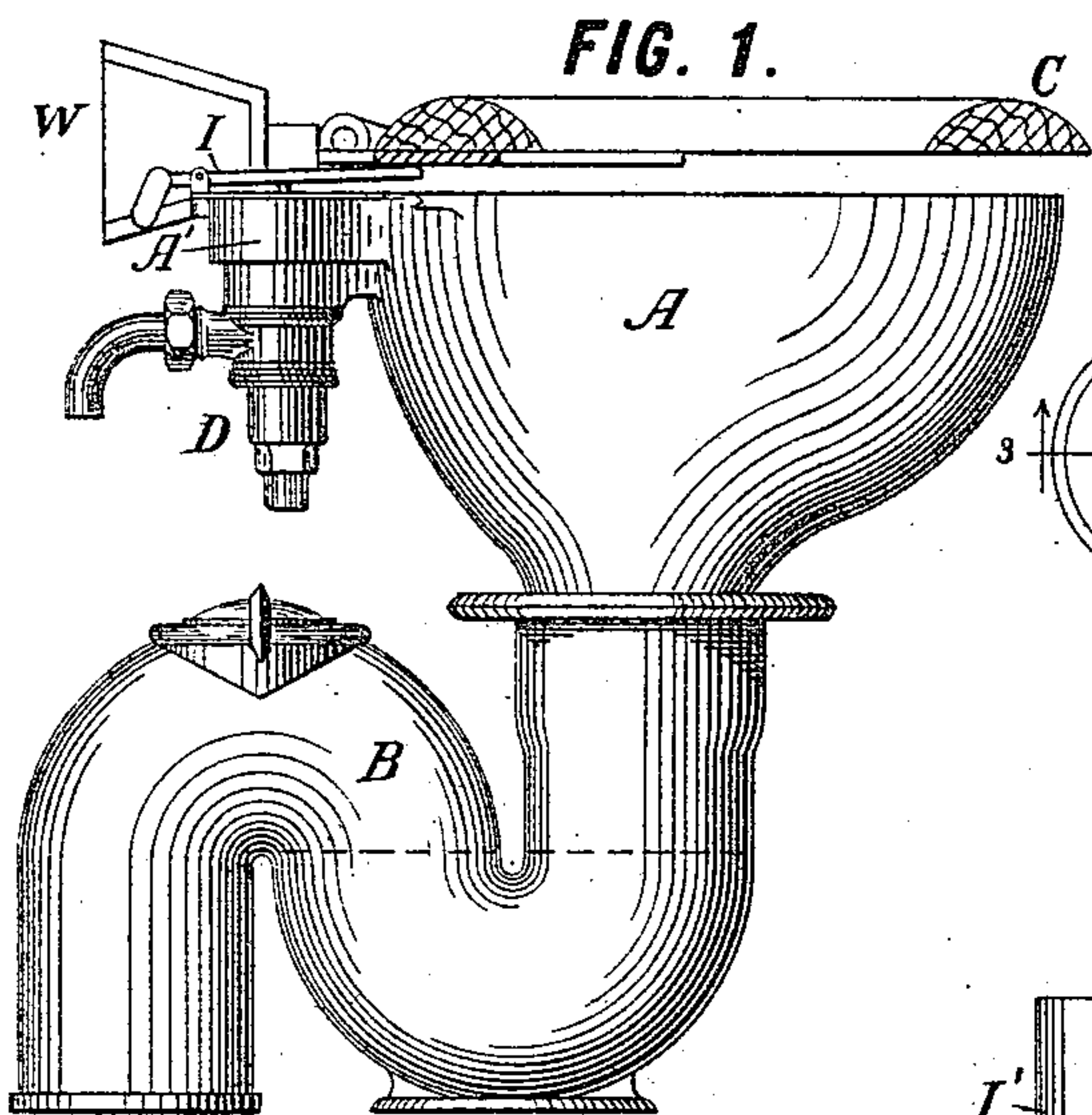
(No Model.)

3 Sheets—Sheet 1.

H. H. CRAIGIE.
WATER CLOSET.

No. 440,755.

Patented Nov. 18, 1890.



WITNESSES:

J. A. Brownell
Geo. E. Brown

INVENTOR:

Hugh H. Craigie

By his Attorneys,

Arthur G. Draser & Co.,

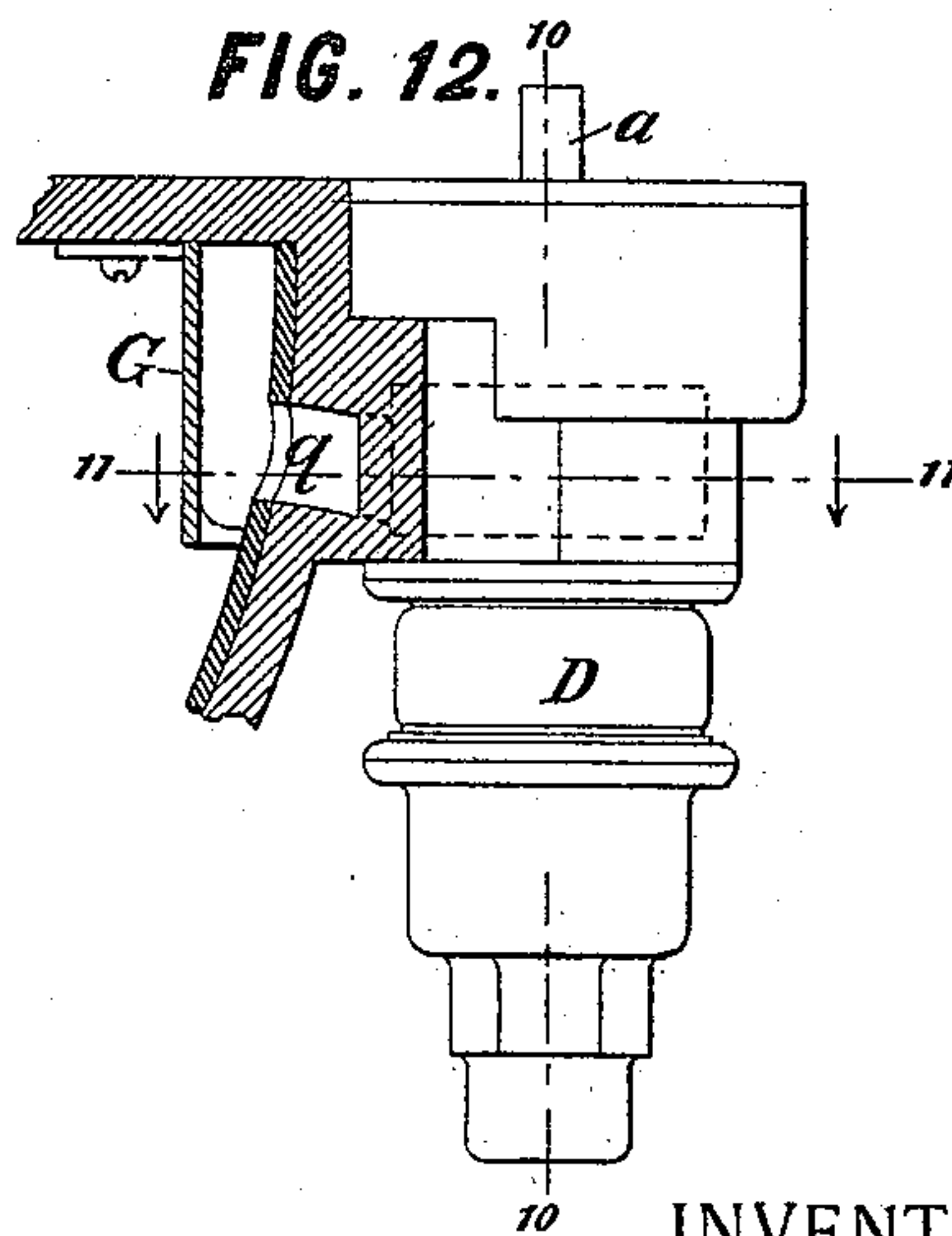
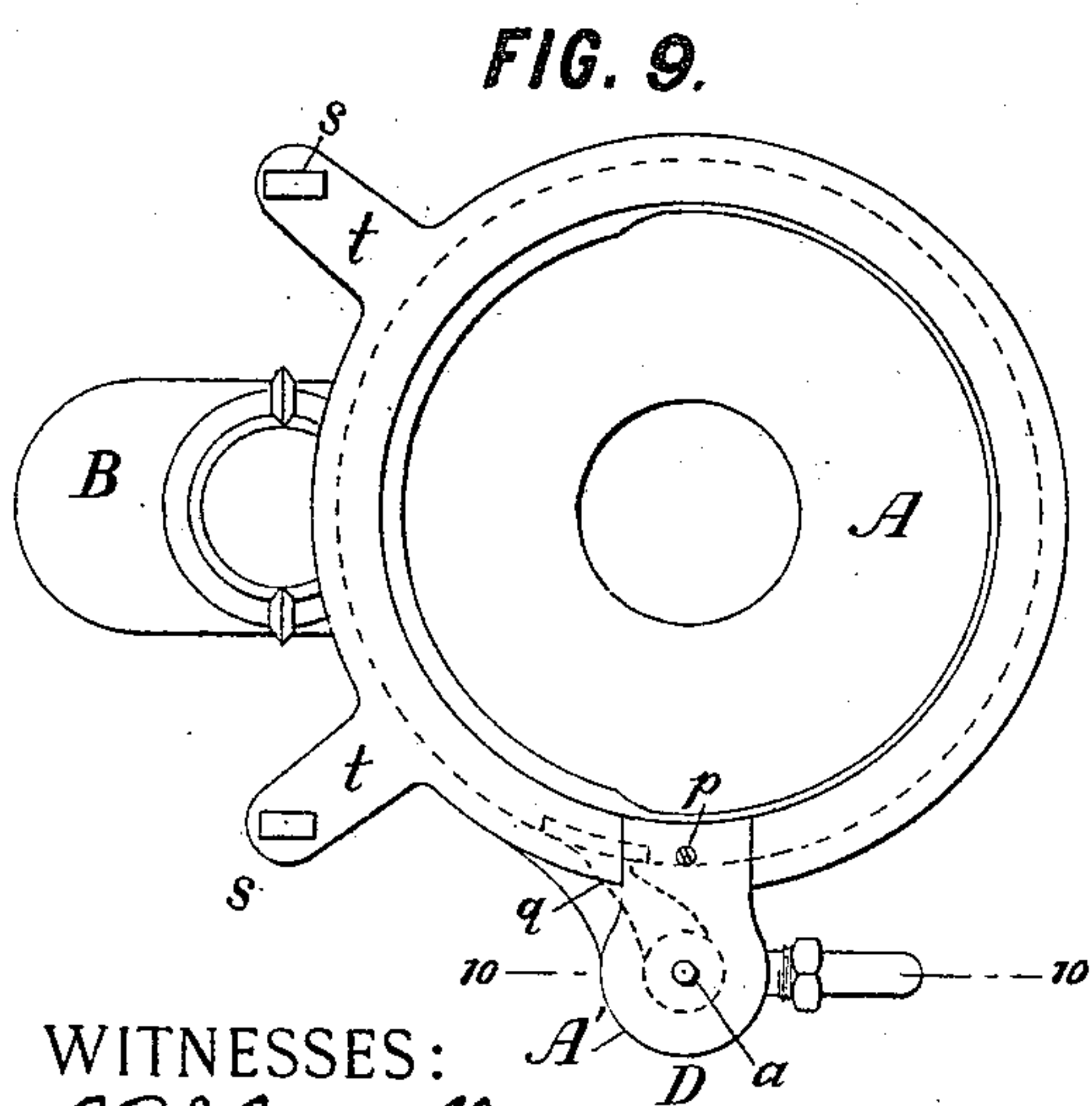
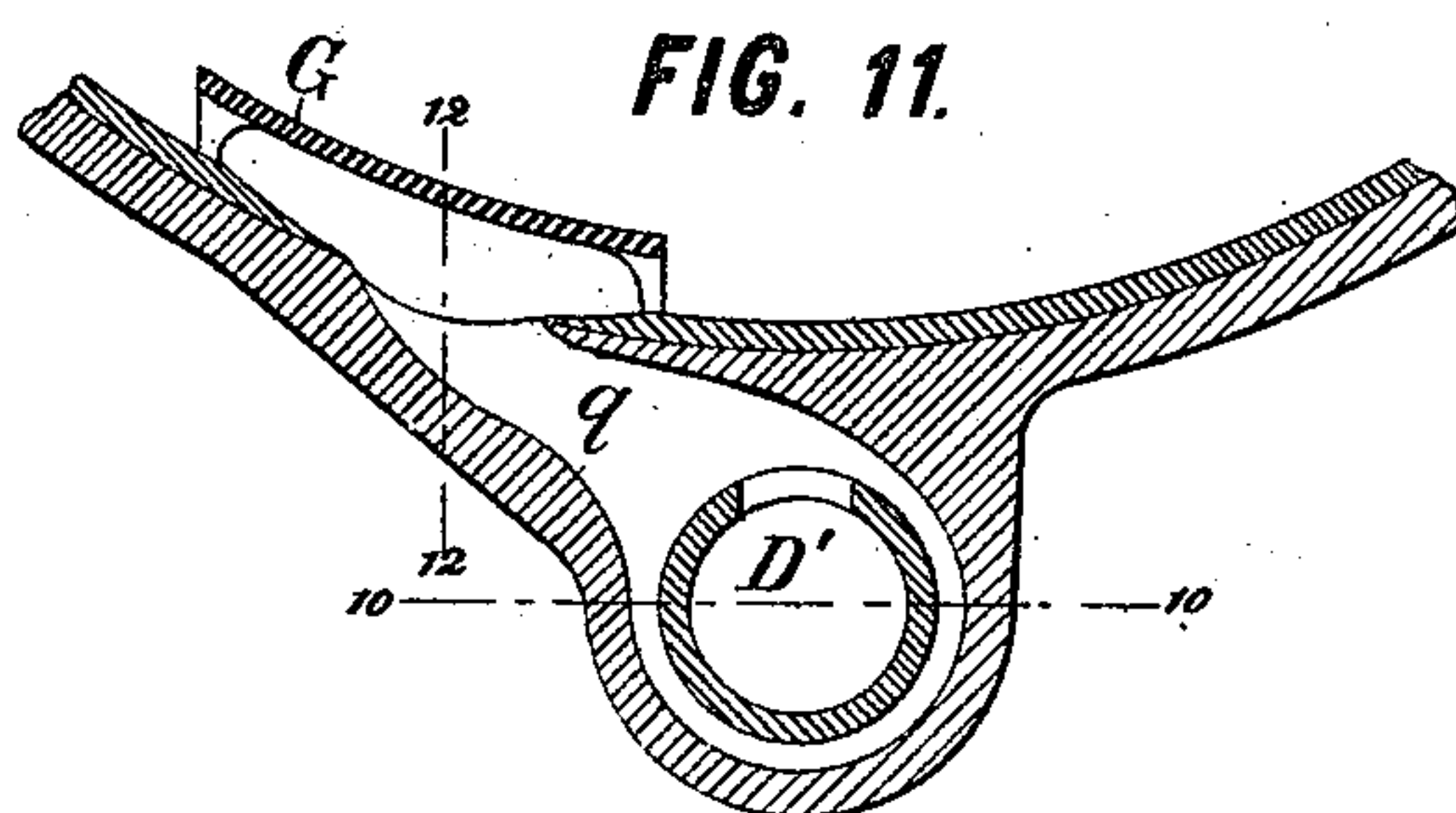
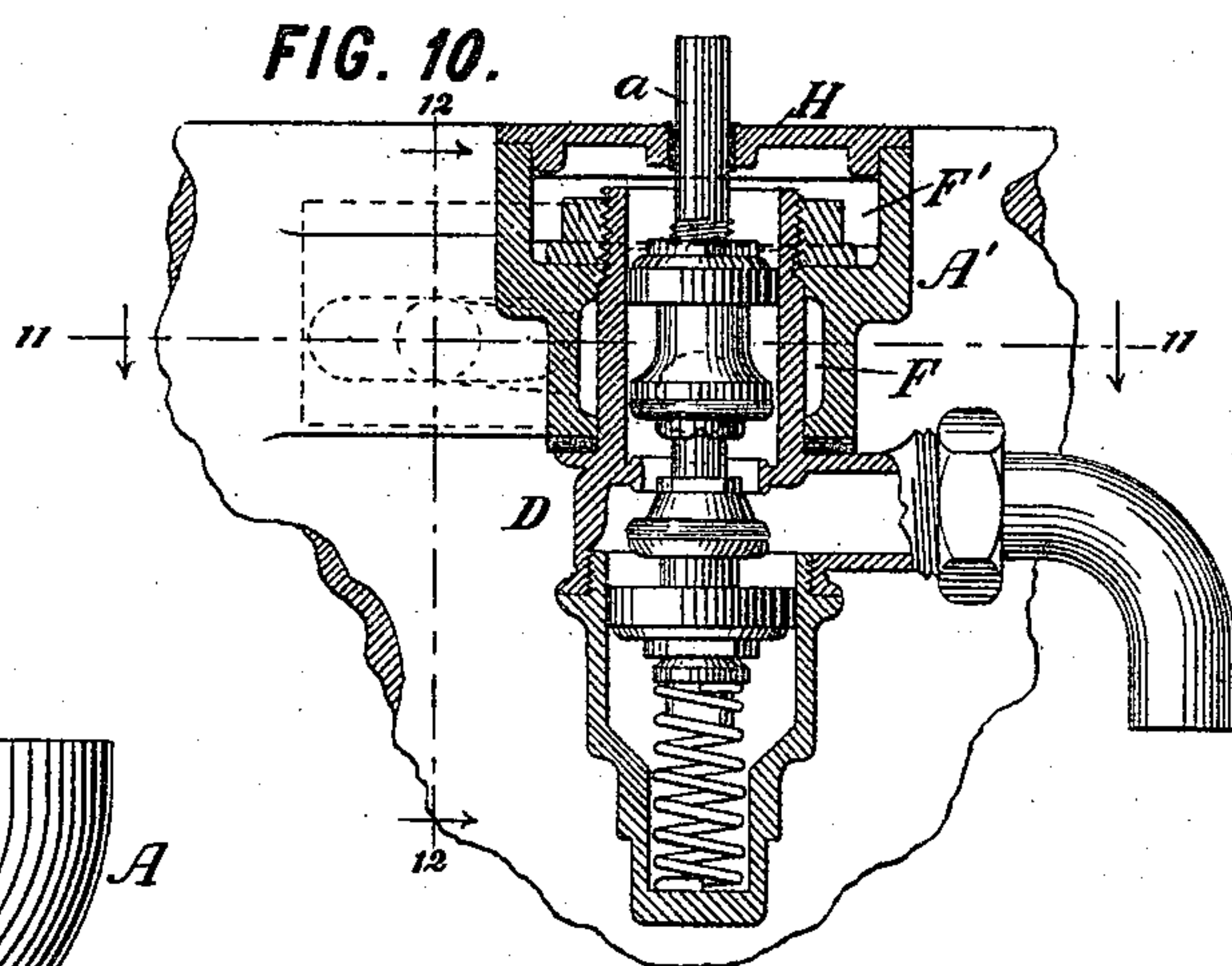
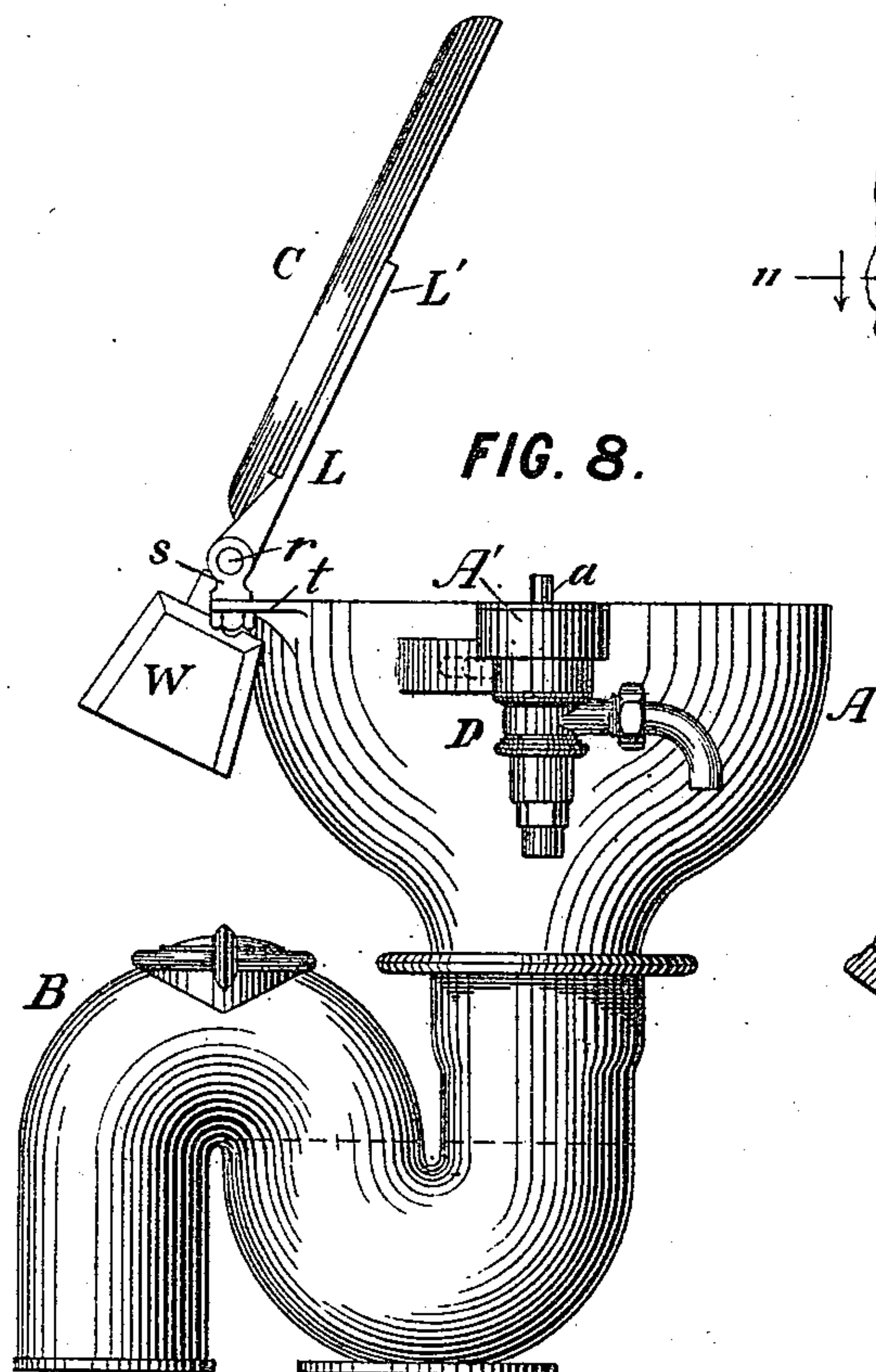
(No Model.)

3 Sheets—Sheet 2.

H. H. CRAIGIE.
WATER CLOSET.

No. 440,755.

Patented Nov. 18, 1890.



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3 Sheets—Sheet 3.

H. H. CRAIGIE.
WATER CLOSET.

No. 440,755.

Patented Nov. 18, 1890.

FIG. 13.

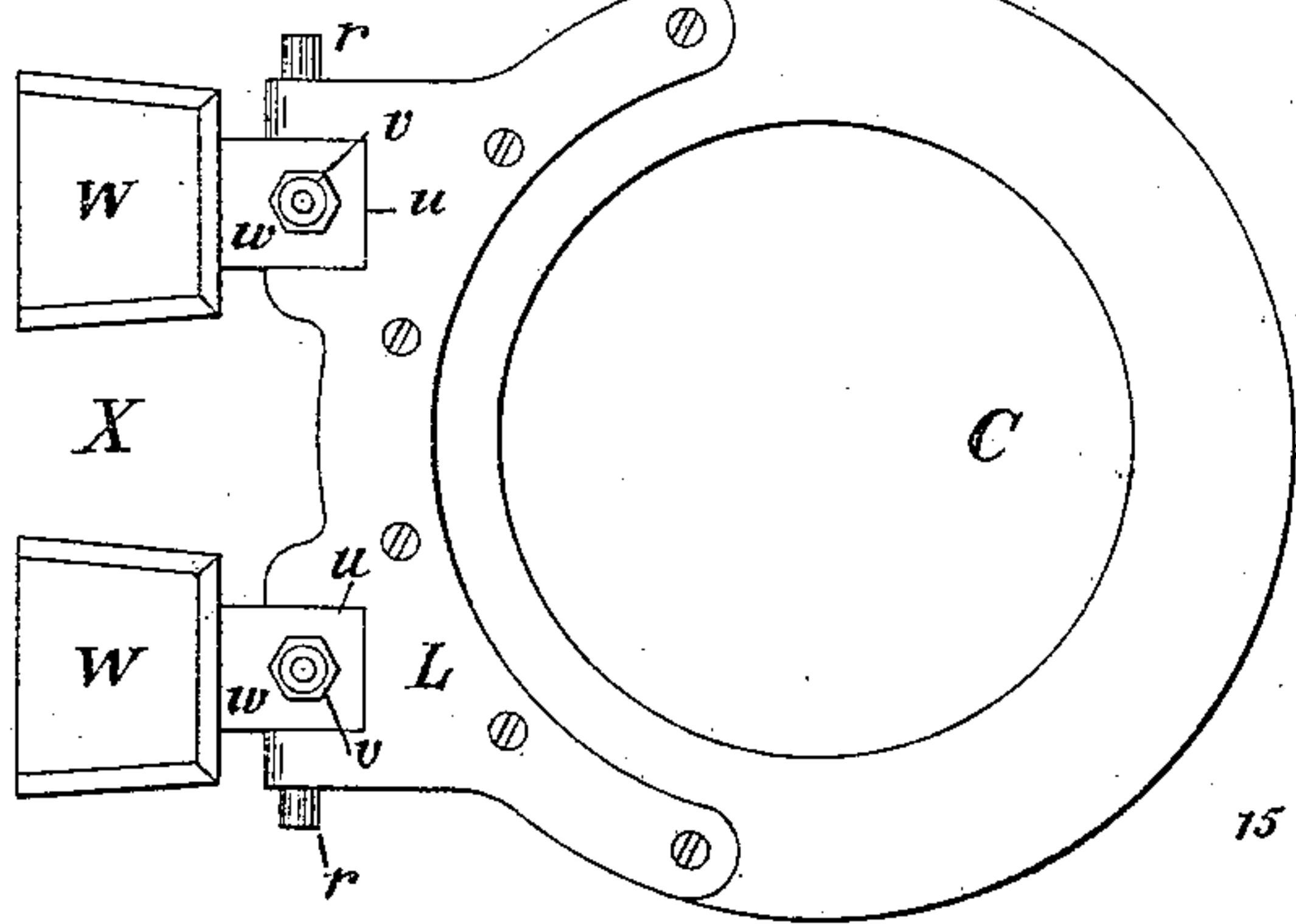


FIG. 14.

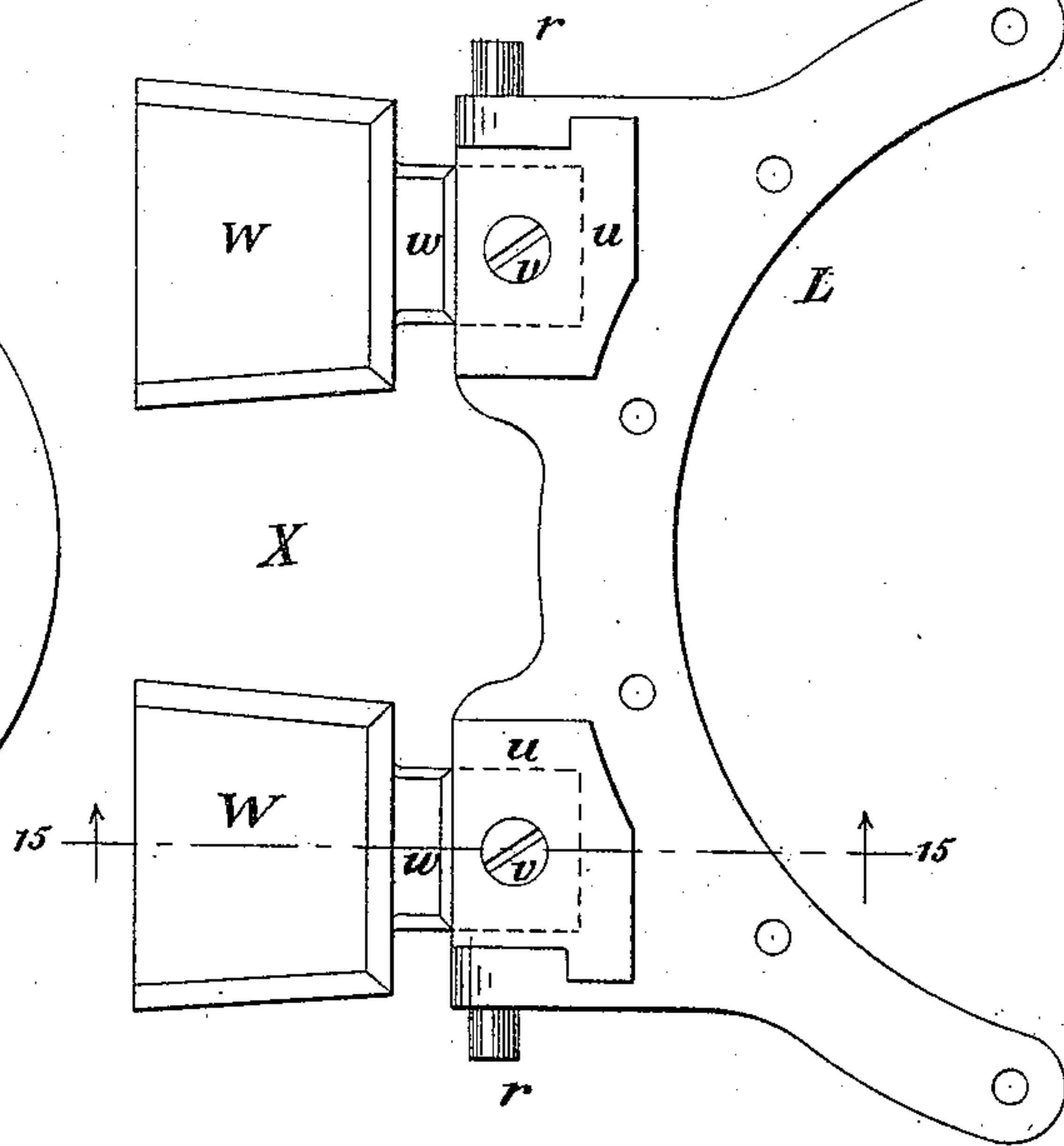


FIG. 16.

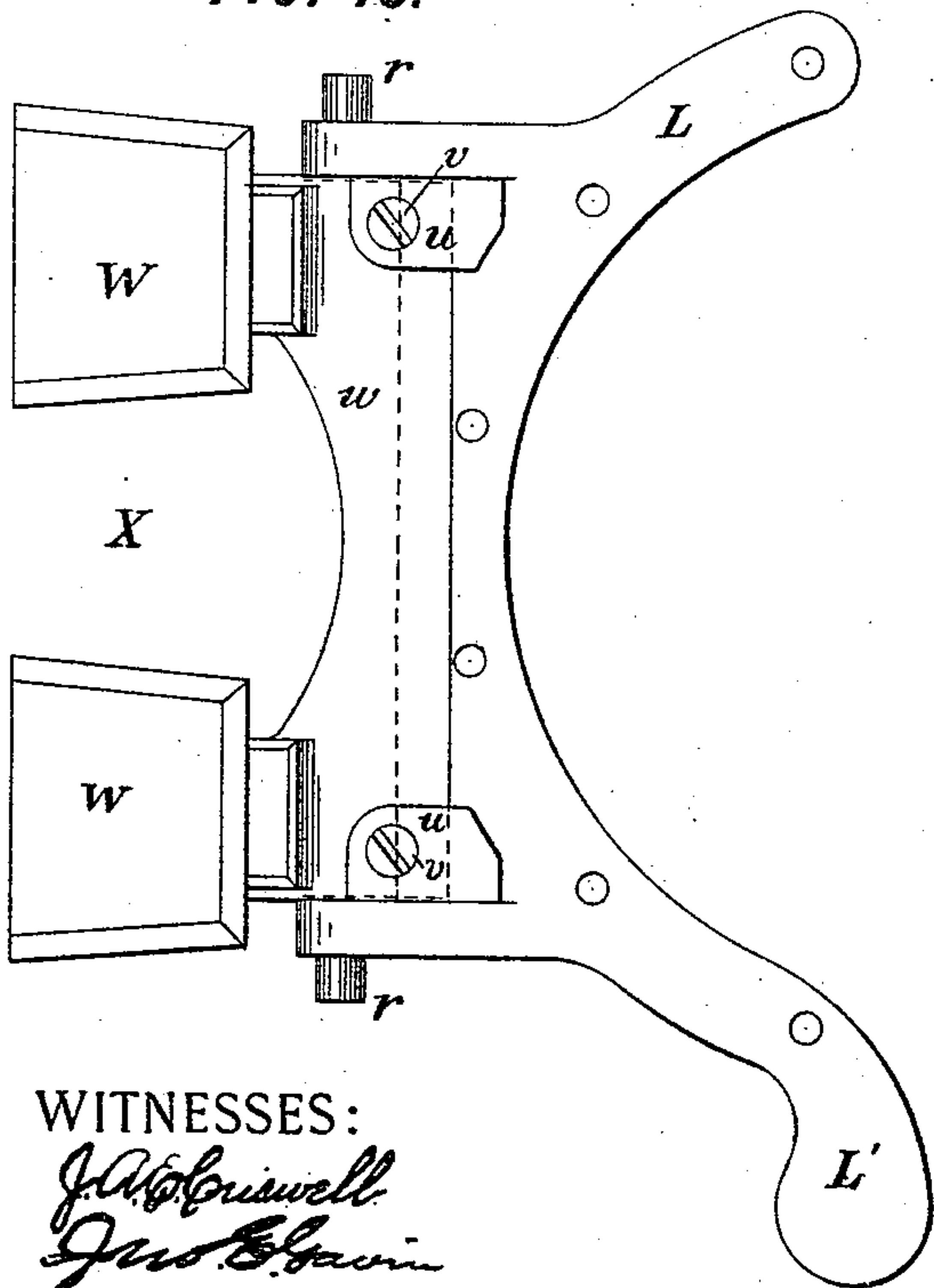
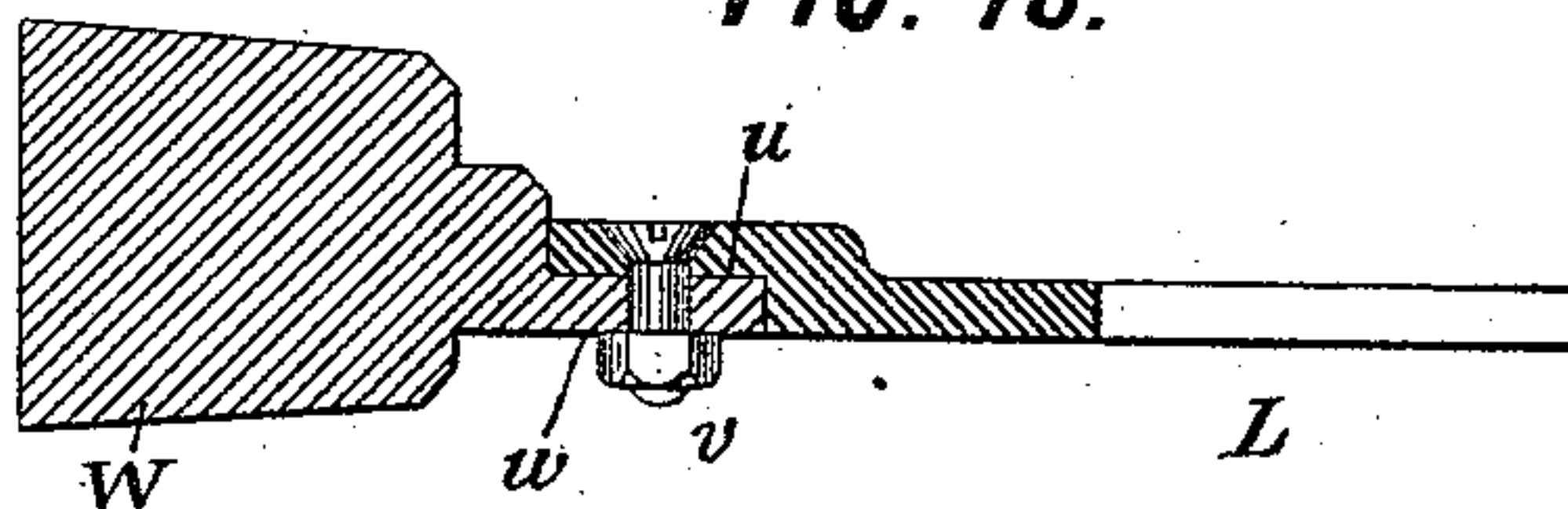


FIG. 15.



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UNITED STATES PATENT OFFICE.

HUGH H. CRAIGIE, OF STAMFORD, CONNECTICUT.

WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 440,755, dated November 18, 1890.

Application filed July 11, 1888. Serial No. 279,618. (No model.)

To all whom it may concern:

Be it known that I, HUGH H. CRAIGIE, of Stamford, Fairfield county, Connecticut, have invented certain new and useful Improvements in Hopper Water-Closets, of which the following is a specification.

This invention relates more particularly to the class of closets known in the trade as "swing-seat hoppers," but is in part applicable also to other kinds of closets. The invention pertains in part to the construction by which the valve is made to discharge water into the bowl, in part to means for operating the valve from the seat, and in part to means for counterweighting the seat in order that when the closet is not in use the seat shall swing up.

The water-closet bowl, which may be an iron bowl connected with a short trap, according to the construction well known as applied to short-hopper closets, is constructed with a flushing rim or fan at its top and with an exterior chamber or pocket or large hollow lug at one side, the interior of which chamber communicates through a suitable passage or opening with the interior of the bowl, near the top thereof, so that the flushing-water discharged into said chamber will flow therefrom into the bowl and be directed into the flushing-rim or against the fan, as the case may be. The flushing-water is admitted through a self-closing valve of the class known to the trade as a "variable chamber-valve." This valve is coupled to the said exterior chamber, and is constructed to discharge the water inside of said chamber, while its stem passes out through the top of the chamber in order to be acted upon by the seat or other means for operating it. Thus any water that may leak past the usual packing around the stem will be discharged within the chamber and flow thence into the bowl. In the preferred construction the chamber is divided into two portions or compartments by means of a diaphragm, the lower compartment receiving the water flowing from the valve through its outlet and conducting this water into the bowl, while the upper compartment serves to receive any leakage from around the valve-stem and to conduct it also to the bowl. Preferably the two compartments are divided by a diaphragm consisting of a removable

plate, by the removal of which access may be gained to the lower compartment, and preferably, also, this plate is extended into the bowl and turned downwardly therein opposite the inlet opening or compartment in order to form a fan for deflecting the entering flushing-water.

In the case of a swing-seat hopper the valve may be placed at one side, so that the seat, when it is pressed down, shall force in the valve-stem and operate the valve. In the preferred construction, however, the valve is placed at the back, and is operated from the seat through the medium of an interposed lever.

The seat is counterweighted by means of two separate weights rigidly attached to its hinge-plate by screws and bolts or otherwise, so that they may be removed when a seat that is not counterweighted is desired. The two weights are separated far enough to leave space between them for the flushing-valve, or (in case of a closet that is operated from an overhead tank) for the pipe by which connection is made with the tank.

Figures 1 to 7, inclusive, and 13 to 15, inclusive, of the accompanying drawings illustrate the preferred construction. The remaining figures illustrate modifications.

Fig. 1 is a side elevation of my improved closet in its preferred form, the seat being shown in vertical mid-section. Fig. 2 is a plan of the closet with the seat removed. Fig. 3 is a vertical section of the flushing-valve and adjacent parts in the plane of the line 3 3 in Fig. 2. Fig. 4 is a plan of the parts shown in Fig. 3. Fig. 5 is a horizontal section thereof cut in the plane of the line 5 5 in Fig. 3. Fig. 6 is a horizontal section cut in the plane of the line 6 6 in Fig. 3. Fig. 7 is an inverted plan of the removable partition plate or diaphragm. Fig. 8 is a side elevation of a modified construction of closet. Fig. 9 is a plan thereof. Fig. 10 is a section of the valve and adjacent parts, cut in the plane of the lines 10 10 in Figs. 9, 11, and 12. Fig. 11 is a horizontal section cut in the plane of the lines 11 11 in Figs. 10 and 12. Fig. 12 is a vertical section cut in the plane of the lines 12 12 in Figs. 10 and 11. Fig. 13 is an under side plan of the seat removed. Fig. 14 is a top plan of the seat-frame and counter-weights. Fig. 15

is a vertical section thereof in the plane of the line 15 15 in Fig. 14. Fig. 16 is a plan view corresponding to Fig. 14 and showing a modified construction.

5 Figs. 1, 2, 8, 9, and 13 are on a reduced scale. Figs. 3 to 7, inclusive, and 10 to 12, inclusive, are upon a considerable larger scale, and Figs. 14, 15, and 16 are upon a scale intermediate of the two scales on which the
10 other figures are drawn.

Referring to the figures, let A designate the bowl of the closet and B the trap forming the outlet thereof, and which is connected to the soil-pipe in the usual manner. The bowl and
15 trap will usually be constructed of iron and enameled interiorly.

C designates the seat, which is counter-weighted, so that when not in use it flies up to the position shown in Fig. 8.

20 D designates the flushing-valve, which is a self-seating valve of the class known as a "variable chamber-valve."

The bowl A is formed on one side with an exterior chamber or pocket or large hollow lug
25 A', the interior of which communicates with the interior of the bowl and which is preferably cast in one piece therewith. This chamber is preferably cylindrical, or approximately so, and arranged with a vertical axis, as shown,
30 although this is not essential. The chamber is divided by a horizontal partition or diaphragm E into two compartments—a lower one F and an upper one F'. The chamber is formed with a large hole in its bottom, into
35 which the upper part D' of the valve D is thrust and is fastened by screwing upon it a nut D'', which is screwed down tight against the diaphragm E.

The upper part D' of the shell of the flushing-valve D is made tubular and projects upwardly from the valve-seat concentrically with the axis of the valve-stem *a*, which extends within it. Otherwise the valve D is of the usual construction, having an inlet *b*, a
45 double-sided seat *c*, two valves *d d'* on opposite sides of said seat, a cup-leather piston *e*, to cause the valve to close slowly, a spring *f* for closing the valve, and a cup-leather packing *g* around the valve-stem for preventing
50 leakage. Normally the valve *d* is pressed against the seat by the spring and shuts off the water, but when the stem is pressed down this valve is unseated and the valve *d'* is brought against the seat, thereby momentarily admitting a dash of water through the
55 seat into the tube D' and thence out through an opening *h* into the compartment F and thence freely into the bowl. This dash of water constitutes a "forewash" to wet the
60 bowl. When the stem is released, it is pressed upwardly by the spring *f*, which slowly re-seats the valve *d* by the slow leakage of water from the upper to the under side of the piston *e*, as is usual in valves of this class. During this slow closing the water flows through the valve and into the bowl as before, but constitutes a prolonged flush or "afterwash."

The flushing-water in flowing from the compartment F into the bowl encounters a fan G, which deflects it laterally and downwardly and causes it to issue in a thin stream
70 against the surface of the bowl instead of spurting into the bowl. This fan may be variously formed and applied or it may be dispensed with altogether in case the flushing-rim *j* of the bowl extends low enough and is
75 formed of the proper shape to serve the same purpose.

In the construction shown in Figs. 1 to 7 the fan G and partition E are formed both in
80 one plate, which is of the shape best shown in Fig. 7 in inverted plan and in Fig. 3 in section. The plate is of such size as to fit within the chamber A and rest on a ledge *k*, Fig. 3, at the bottom of the upper compartment F' thereof, and it has a hole *k'* formed
85 in it to admit the tubular shell D of the valve through it. When the nut D'' is screwed down, the plate is clamped firmly in place against the flange *k*. The plate is expanded
90 at each side at *l l*, where it enters the bowl, and is thence bent downward to form the fan G.

The chamber A' is formed with an open top, and is closed or roofed over by means of
95 a flat plate H, which is formed with a tongue *m* on its side nearest the center of the bowl, which projects under the top plate *n* of the bowl A, as shown in Figs. 3 and 4, whereby it is fastened down at this end, and on its opposite end it is formed with a perforated ear,
100 which is fastened to an ear *n'* on the chamber A' by a bolt or screw *p*. This bolt is formed at its upper end with two projecting perforated ears, constituting a fork *p'*, in
105 which is fulcrumed a lever I, counterweighted by a weight I' on the outer side of the fulcrum and extending inwardly toward the center of the bowl. This lever rests on top of the valve-stem, and its inner end is encountered
110 by the seat C when the latter is turned down, whereby the lever is pressed down and communicates motion from the seat to the valve-stem to operate the valve. This construction of a lever I intermediate of the valve-stem
115 and seat enables the flushing-valve to be arranged at the rear of the bowl on the side at which the seat is hinged and between the two counter-weights W W, Fig. 13, thereof, whereby it is entirely out of the way and not
120 liable to injury.

The upper end of the tubular portion D' of the valve-shell opens within the compartment F' of the chamber A', which compartment has free communication with the bowl
125 above the fan G. In case any leakage of water should occur past the packing *g*, this leakage will flow over the top of the tube D' and into the compartment F' and thence into the bowl, so that there will be no spurting of water up
130 around the valve-stem and outside of the chamber A' nor any overflow or leakage outside of the closet. Similarly in case any leakage occurs through the valve the water

will run into the bowl from the compartment F.

My invention in its preferred construction as thus far described provides a very simple closet, and one which is of cheap construction and not liable to get out of order and which discharges all leakage either through the valve or around the valve-stem into the bowl instead of permitting it to overflow exteriorly.

The modified construction shown in Figs. 8 to 12 differs from the one already described chiefly in that the valve D and chamber A' are arranged at the side instead of at the rear of the bowl, and the valve-stem *a* is operated upon directly by the seat instead of through the medium of an intervening lever. The valve is of the same construction already described and the chamber A' is cast on the bowl in similar manner, except that the partition or diaphragm separating the lower and upper compartments F and F' is cast in one piece with the chamber A' instead of being a separate plate. The top plate H is fastened by a single screw P, as shown in Fig. 9. The outlet from the compartment F to the bowl extends laterally, as shown at *q* in Fig. 11, and discharges behind a fan G, which may be cast to the bowl or fastened by a screw or otherwise.

The seat C consists of a circular frame of wood, constituting the "seat-plate" or ring, fastened to a metal plate L, constituting the hinge-plate, by screws, as shown. The hinge-plate L is formed with pivot pins or pintles *r r*, projecting to opposite sides, and these pintles turn in eyes *s s*, Fig. 8, which are fastened by screws or nuts to the ends of the bracket-arms *t t*, projecting from the bowl A. There is no novelty in this construction. The seat C is counterweighted by a weight projecting rigidly from the hinge-plate L, as heretofore; but instead of using only a single weight extending to both sides of the middle and casting it integrally with the hinge-plate L, I apply two separate counter-weights W W, spaced to some distance apart, so as to leave a clear space between them in the middle and fastened rigidly and detachably to the hinge-plate L, so that if a counterweighted seat is not desired these weights may be detached without interfering with the pivotal mounting of the seat. To this end the weights W W are formed each with a tang *w*, which enters a socket *u*, formed in one side of the hinge-plate, and into which it is fastened by a screw-bolt *v*, as shown in Figs. 13, 14, and 15. Thus a clear space X is left between the weights for the flushing-valve or (in the case of a closet that is flushed from an overhead tank, as usual) for the usual flushing-pipe through which the water passes to the bowl from an overhead tank.

In the modification shown in Fig. 16 both weights W W are cast on a single plate *w*, which is fastened by screws *v v* to lugs *u u* on the hinge-plate L. When the valve is arranged at the side of the bowl, as in Figs. 8 to

12, the hinge-plate L is constructed with a projecting arm L', as shown in Figs. 8 and 16, for pressing down the valve-stem *a*.

Prior to my invention the seats of swing-seat water-closets have been counterweighted by means either of a rigid weight cast in one piece with the seat-plate, and which, consequently, is not detachable in case it is desired that the seat shall not be counterweighted, or else by means of a weight suspended freely from a hook or eye on the seat-plate, so that it hangs freely and may swing or vibrate. This latter construction, while it admits of the removal of the weight, so that the seat shall be no longer counterpoised, is nevertheless objectionable, because of the loose connection of the weight. This feature is particularly disadvantageous for closets designed for prison use, since the weight may be detached by the prisoner and used as a weapon.

My invention provides counter-weights that may be removed, if desired, but which cannot be removed by a prisoner who does not possess the proper tools.

My invention is susceptible of some modification without departing from its essential features. For example, the plate or diaphragm E might be omitted, thereby constituting the chamber A' a single undivided chamber. Also, any known and suitable construction of variable chamber or self-closing valve may be substituted for the particular construction shown. My invention is also applicable in case a flushing-valve is employed of the kind which remains open only so long as it is held open by the pressing down of the seat; but I do not recommend the use of such valves.

I claim as my invention the following defined novel features and combinations, substantially as hereinbefore set forth, viz:

1. In a water-closet, the combination, with the bowl having a chamber formed on its exterior and divided into two compartments, both communicating with the interior of the bowl, of a flushing-valve in the supply-pipe coupled to said chamber, with its outlet communicating with the lower compartment thereof and with its stem passing through the upper compartment thereof.

2. In a water-closet, the combination, with the bowl having a chamber formed on its exterior and communicating with its interior, of a flushing-valve in the supply-pipe coupled to said chamber and formed with a tubular outlet entering and terminating within said chamber, and having an opening discharging laterally thereinto and with its stem passing axially through said tubular outlet and provided with a packing therein between its discharge-opening and its end, and said stem projecting through the top of said chamber, whereby any leakage past said packing is discharged from the end of said outlet into said chamber and thence into the bowl.

3. The combination, with a water-closet bowl having a chamber formed integrally on

its exterior and communicating with its interior and divided into two compartments, both communicating with its interior, of a flushing-valve in the supply-pipe coupled to said chamber, and with its shell formed with a tubular outlet passing through the lower and into the upper compartment thereof, and formed with a discharge-opening communicating with the lower compartment and with a shoulder abutting against the exterior of said chamber, and said tube screw-threaded on the exterior of its upper end, and a nut screwing on said tube inside said upper compartment to couple the valve to the chamber.

4. The combination, with a water-closet bowl having a chamber formed on its exterior and divided into two compartments, both communicating with its interior, of a flushing-valve in the supply-pipe coupled to said chamber, and with its shell formed with a tubular outlet passing through the lower and into the upper compartment thereof and formed with a discharge-opening communicating with the lower compartment, and its stem arranged axially in said tubular outlet and passing through said chamber.

5. The combination, with a water-closet bowl having a chamber formed on its exterior and communicating with its interior, of a plate in said chamber dividing it into two compartments, and a flushing-valve in the supply-pipe coupled to said chamber, and its shell formed with a tubular outlet projecting through the lower compartment and through a hole in said plate into the upper compartment, and its stem arranged axially in said tubular outlet and passing through said chamber.

6. The combination, with a water-closet bowl having a chamber formed on its exterior, of a plate resting on a ledge in said chamber and dividing the latter into two compartments, and a flushing-valve in the supply-pipe, with its shell formed with a tubular outlet entering said chamber, passing through said opening in said plate, and screw-threaded

on its exterior, and a nut screwing on said tubular outlet against said plate, whereby the valve and plate are clamped in position and the valve is coupled to the chamber.

7. The combination, with a water-closet bowl having a chamber formed on its exterior and communicating with its interior, of a plate inserted in said chamber and dividing it into two compartments projecting into the bowl and extending downwardly therein opposite the outlet from the lower compartment to form a fan, and a flushing-valve in the supply-pipe coupled to said chamber, with its outlet communicating with the lower compartment thereof.

8. The combination, with a water-closet bowl having a chamber formed on its exterior and communicating with its interior, of a top plate *H*, formed with a tongue *m*, adapted to enter beneath the portion *n* of the top of the bowl, and a screw-fastening *p*, for securing the opposite side of the said top plate, and a flushing-valve in the supply-pipe coupled to said chamber, with its outlet communicating with the interior thereof and with its stem passing out through said top plate.

9. In a swing-seat water-closet, the combination, with the seat and a hinge-plate carrying it and pivoted to swing on a horizontal axis, of a separate counter-weight for counterbalancing the seat and hinge-plate, said weight carried by the hinge-plate and rigidly and detachably connected to it.

10. In a swing-seat water-closet, the combination, with the seat-plate formed with two sockets, of two separate weights, each formed with a tang entering one of said sockets, and a fastening for fixing said tang to said seat-plate.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HUGH H. CRAIGIE.

Witnesses:

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JNO. E. GAVIN.