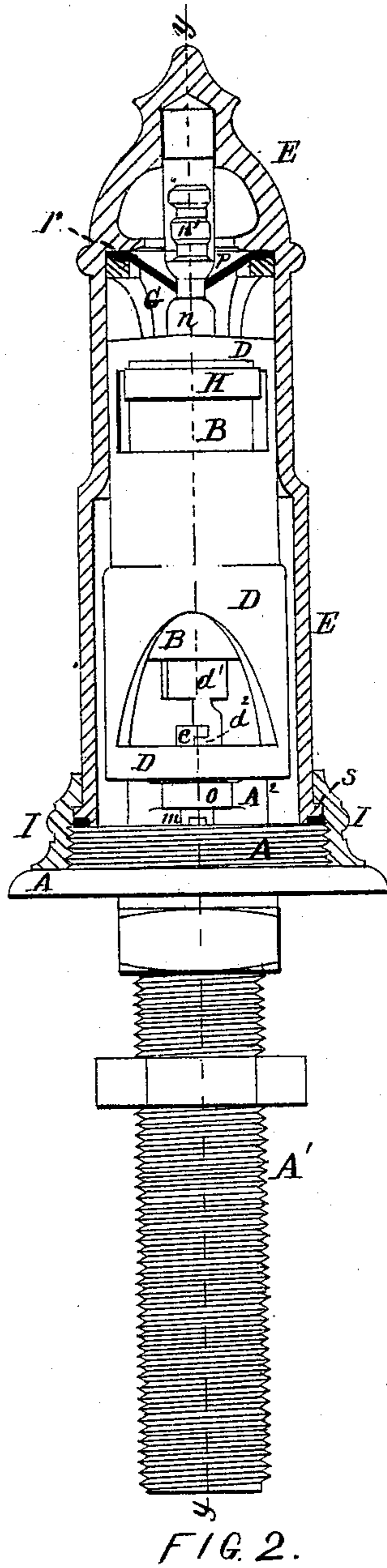
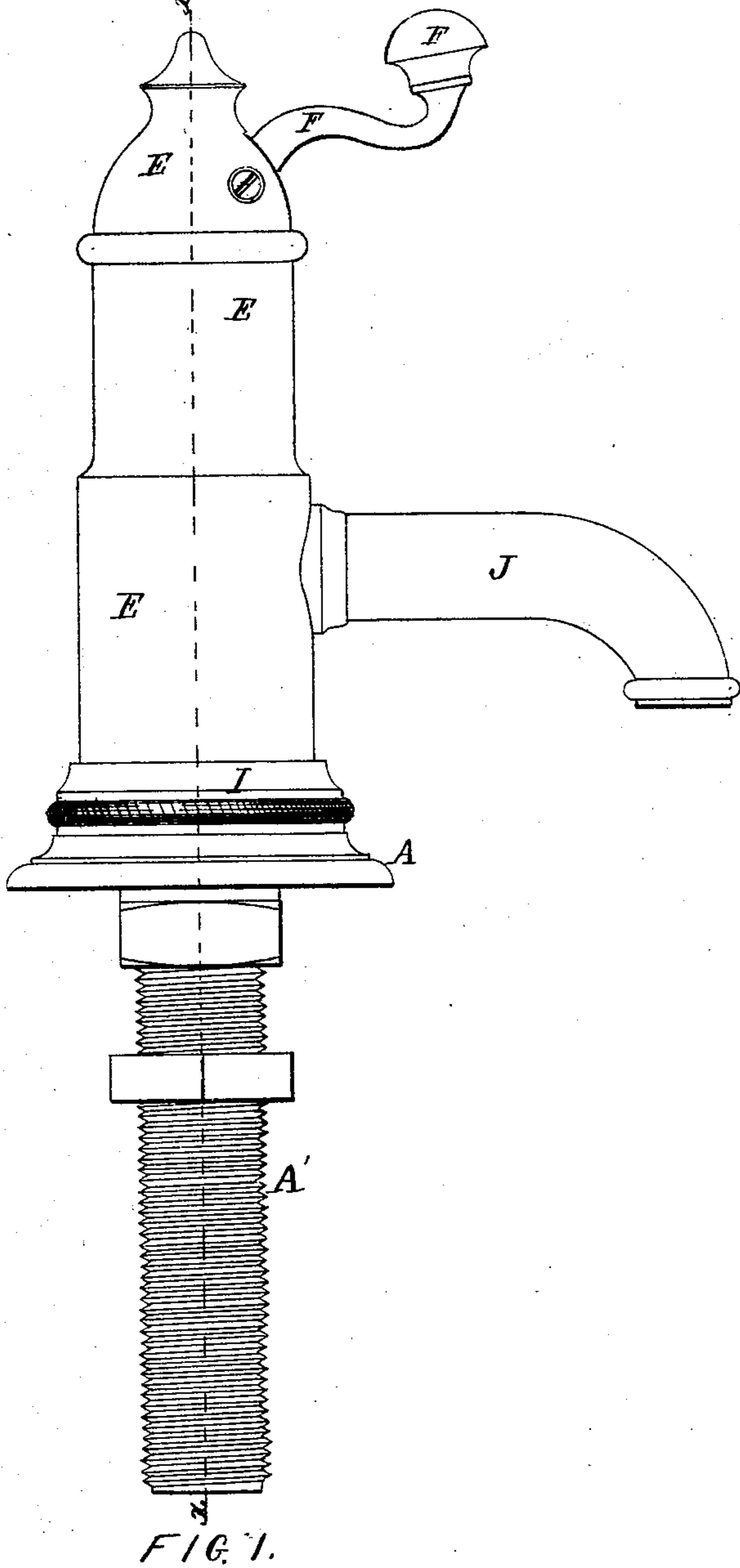


H. B. LEACH.
Faucets.

No. 146,922.

Patented Jan. 27, 1874.



Witnesses.
N. C. Lombard
L. A. Wood.

Inventor.
Henry B. Leach

H. B. LEACH.
Faucets.

No. 146,922.

Patented Jan. 27, 1874.

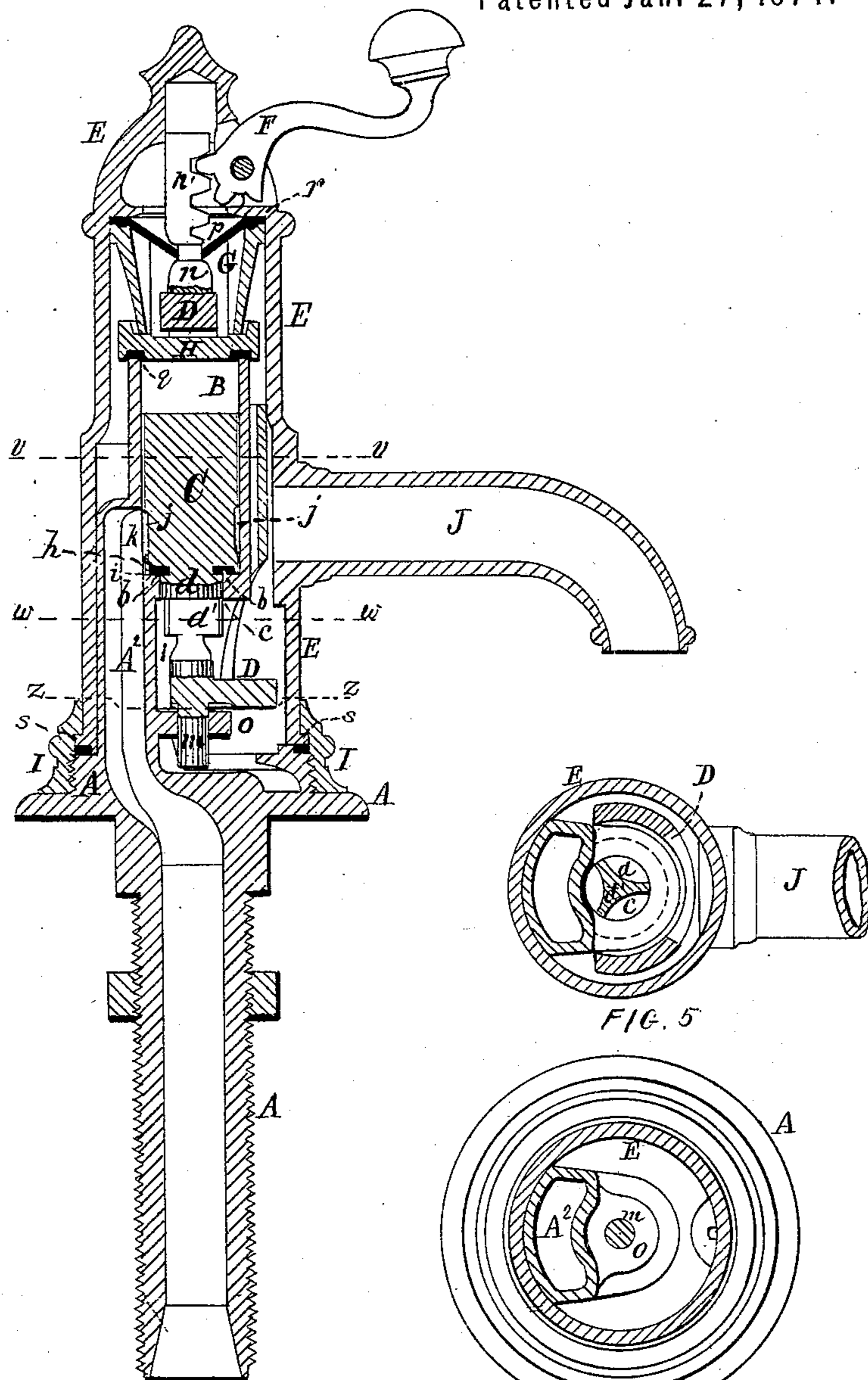


FIG. 3.

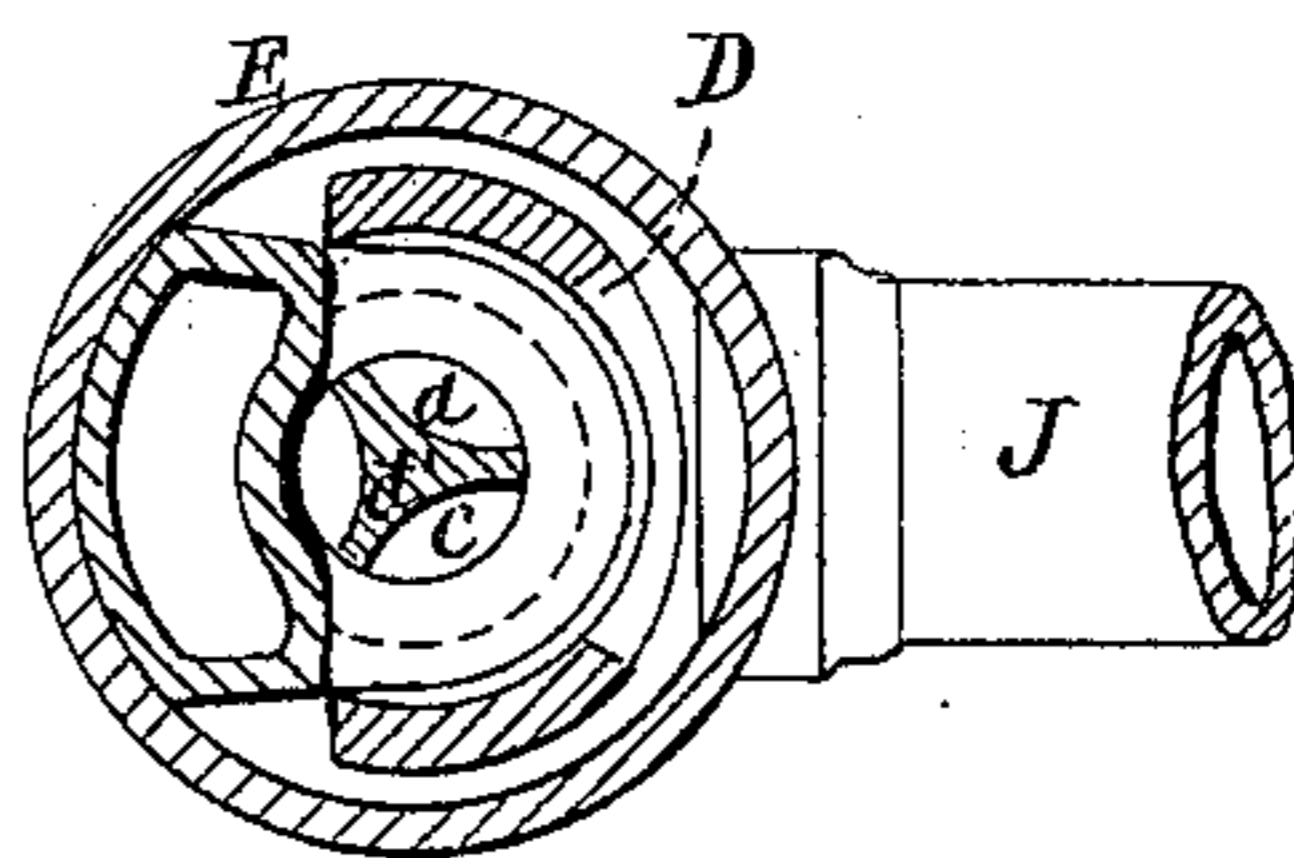


FIG. 5.

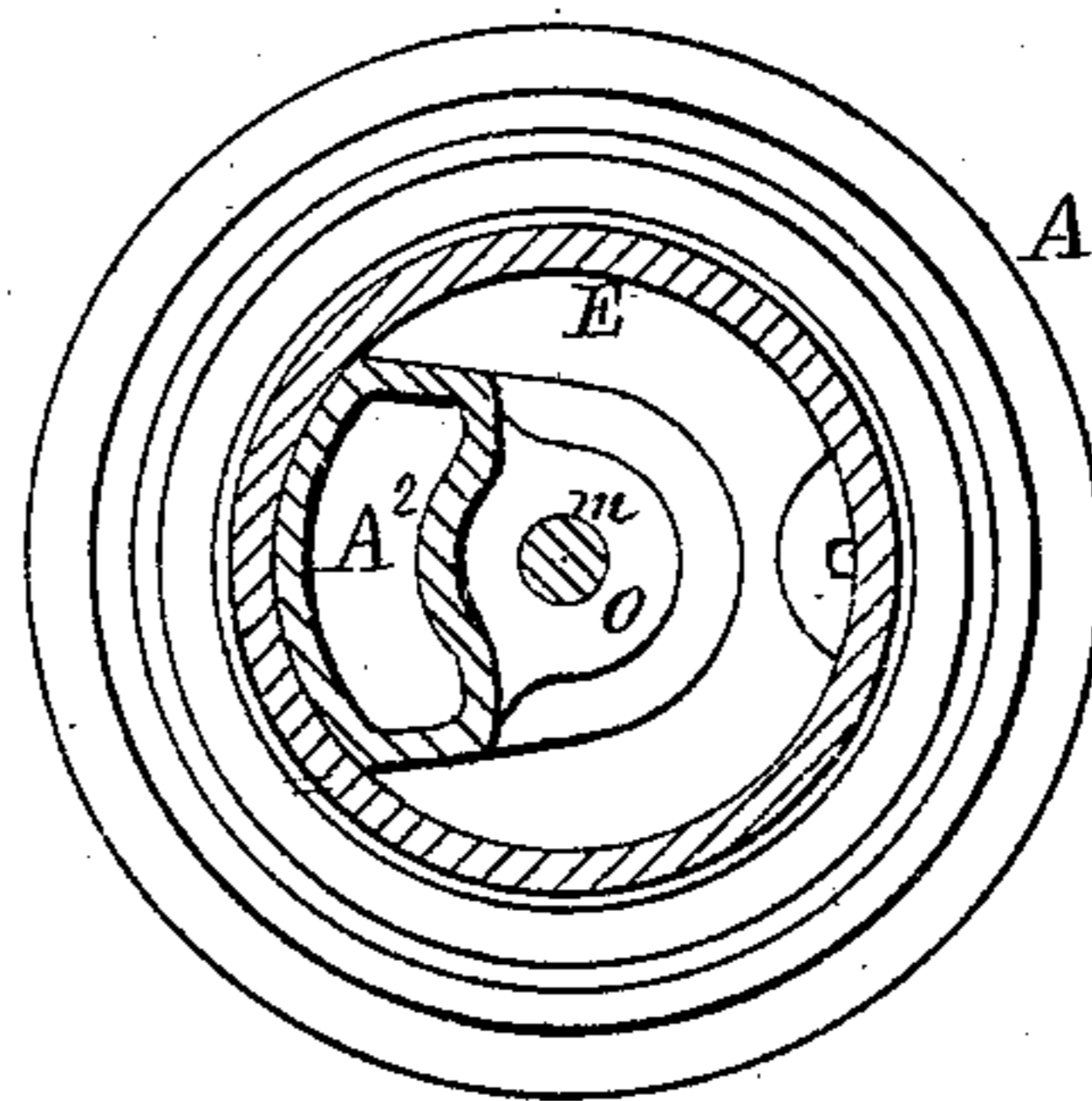


FIG. 4.

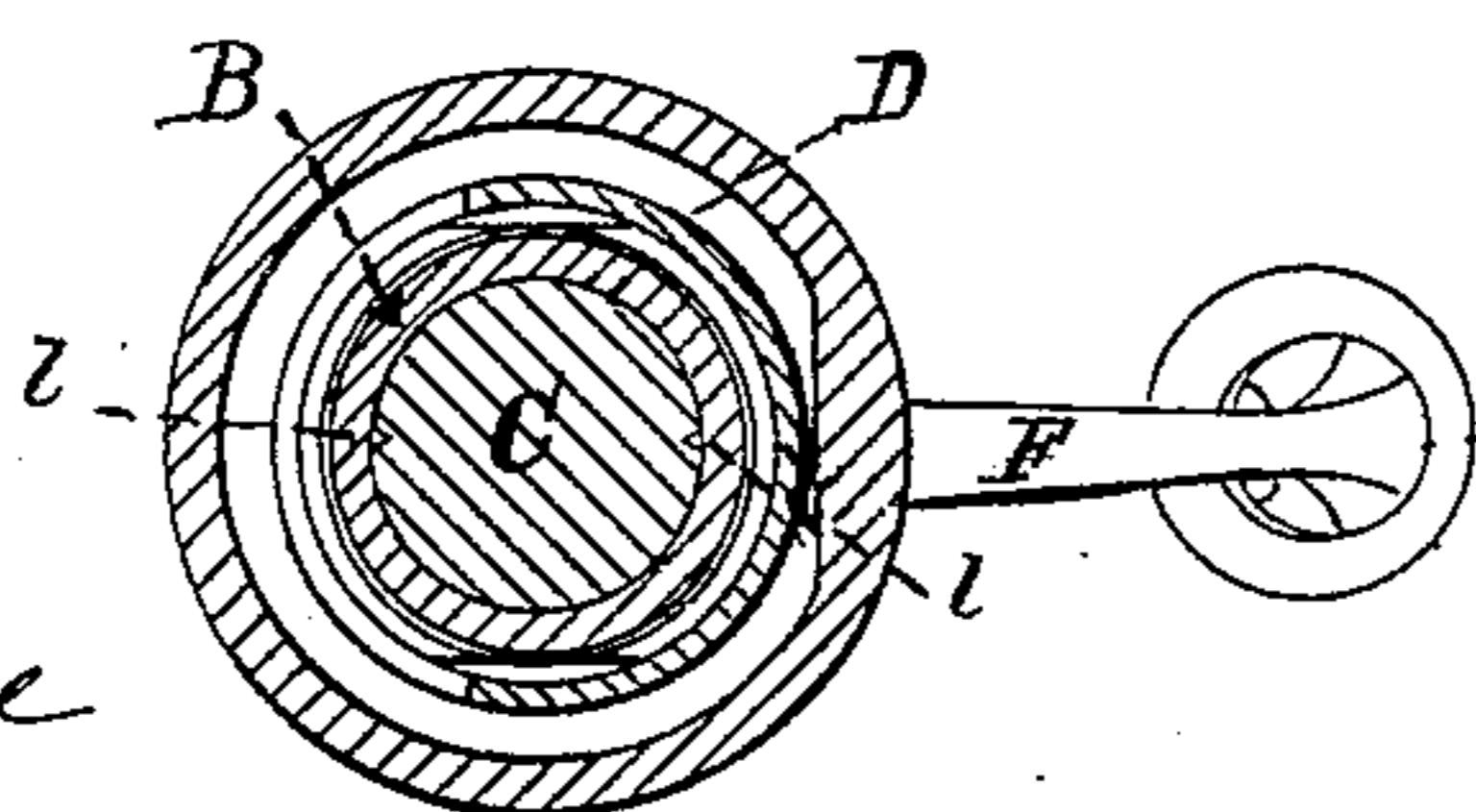


FIG. 6.

Witnesses.
N. C. Lombard
L. A. Wood.

Inventor.
Henry B. Leach

UNITED STATES PATENT OFFICE.

HENRY B. LEACH, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN FAUCETS.

Specification forming part of Letters Patent No. **146,922**, dated January 27, 1874; application filed December 27, 1873.

To all whom it may concern:

Be it known that I, HENRY B. LEACH, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Faucets, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to that class of faucets in which the valve is closed by the combined action of gravitation and the pressure of the water acting directly thereon; and it consists, first, in the use of a piston-valve fitted to move up and down in a cylinder arranged concentric to the valve-seat, and the outlet-passage through the same, said valve or piston being provided with a cylindrical extension from its lower end, turned to loosely fit the opening in the valve-seat, so that the valve will have to be raised some distance before the port is opened for the purpose of displacing the water above the piston in said cylinder, as a means of controlling the speed with which the valve will close, and to prevent "water-hammer," as will be more fully described. My invention further consists in providing said piston-valve with a circumferential groove; or making said valve of a reduced diameter near its lower end and opposite to the inlet-passage through the side of the cylinder, and also turning the remainder of the length thereof so as to loosely fit the cylinder, or forming therein one or more slight vertical grooves, extending to the top of said piston, so that the water may find its way to the chamber above said piston, and force the valve onto its seat with a speed proportionate to the size of said grooves or the space around the valve. My invention further consists in a farther extension of said valve or its stem in a downward direction, and coupling the same to the lifting device below its seat, as will be described. It also consists in the use of a double valve-rod or stirrup, embracing and partially surrounding said cylinder, and provided with a central guide rod or pin at either end, and coupled to the valve-stem below its seat, and arranged to be operated by a segment of a gear, or its equivalent, acting upon its upper end above said cylinder, and its piston-valve. My invention further consists in the use of a loose head or cover to the top of the valve-cylinder, provided with a packing-ring, and held

firmly in place upon said cylinder by means of a bifurcated bolster resting thereon, and the outer casing pressing upon said bolster when the whole is screwed together, as will be described. My invention also consists in the use of a rubber diaphragm, attached by its center to the upper guide-rod of the stirrup or double valve-rod, and by its outer edges confined between the upper surface of the bolster and the outer casing, to serve as a packing, to prevent a possible leakage of water from the chamber inclosed by the outer casing, and, at the same time, allow of a free up-and-down movement of the stirrup or double valve-rod. It further consists in the combination of the valve-cylinder, having formed therein the valve-seat and outlet-passage through and concentric to the same, cast in one piece with the base, the screw-shank by which the faucet is secured in place, and a standard for supporting said cylinder, and through which a passage for the water is made, leading from the hole in the shank to the cylinder, which it enters at at one side near its bottom. My invention further consists in securing the whole together by means of an outside casing, inclosing all the working parts but the operating lever, and held in place by means of a screw-coupling ring, screwing onto a thread provided for the purpose on the base of the faucet, and drawing all the fixed parts firmly together. My invention further consists in a peculiar application of the packing-ring to the valve, which will be further described.

In the drawings, Figure 1 is a side elevation of my improved faucet. Fig. 2 is a vertical section of the outer casing, the bolster, and the rubber diaphragm, on line *xx* on Fig. 1, and showing the remaining parts in front elevation. Fig. 3 is a central vertical section on line *yy* on Fig. 2. Fig. 4 is a transverse section on line *zz* on Fig. 3, looking down. Fig. 5 is a transverse section on line *ww*, looking up; and Fig. 6 is a transverse section on line *vv* on Fig. 3, looking up.

A is a base-flange, provided with an exterior screw-thread, *a*, and projecting downward from the center of said flange is the threaded stem *A*¹, by which the faucet is to be secured in position, and to which the supply-pipe is to be secured in the usual manner. From the upper

side of said flange, and upon one side of its center, rises the flat or segmental tube A^2 . The base A , stem A^1 , tube A^2 , and cylinder B are cast in one piece, and are hollow, a clear passage extending from end to end of the varying forms in cross-section, as seen in Figs. 4, 5, and 6, and as seen in vertical section in Fig. 3. The cylinder B is placed directly above, and in line with, the stem A^1 , and has formed in its lower end the valve-seat, consisting of a thin metallic ring, b , surrounding the valve-orifice c . C is a weighted valve, fitted to move up and down in the cylinder B , and provided with the cylindrical extension d from its lower end, made to fit loosely the orifice c , and a further extension of trefoil shape in cross-section, as seen at d^1 , to serve as a guide when the valve is raised, and at the same time allow the free passage of the water through the orifice c . The valve-stem is extended still farther downward, and terminates in a hook, d^2 , which engages with a corresponding hook, e , on the stirrup or double valve-rod D . The lower face of the valve C is provided with a rubber packing-ring, h , sprung into a groove sunk into the underface of said valve, and extending laterally toward the axis of said valve, into a groove formed in the periphery of the extension d , as shown in Fig. 3, said packing-ring being held in position by the extension d projecting over its inner edge, while its outer portion rests upon the valve-seat b when the valve is closed, the outer edge of said packing-ring being protected from injurious action of the water thereon when the valve is open by the inclosing-rim of metal i on the outer lower corner of said valve. The valve C is also provided with the circumferential groove j of reduced diameter near its lower end, and opposite the inlet-passage k , and with one or more vertical grooves, l , extending to the top of the valve, through which the water will pass to the upper side of the valve, and by its pressure thereon cause the valve to descend when the hand is removed from the lever. The speed with which the valve will descend will depend upon the size of the grooves l , and the chamber above the valve, or the amount of water displaced therefrom in raising the valve. D is a stirrup, partially inclosing the cylinder B , and extending above and below the same, as seen in Figs. 2 and 3, and provided with a guide-pin, m , at its lower end, and a corresponding guide-pin, n , at its upper end, said pins being arranged concentric with the axis of the valve and its cylinder. The pin m has a bearing in the ear o , cast upon the inner side of the tube A^2 , and the pin or stem n has a bearing in the upper portion of the outer casing E , and is provided with cogs or teeth n' upon one side, into which the teeth formed upon the inner end of the lever F mesh, by a movement of which the stirrup may be raised, and by its movement lift the valve and open the passage c . A portion of the stem n is necked in, or reduced in diameter, over which is drawn the

rubber diaphragm p , the outer edge of which rests upon the upper surface of the bolster G . The office of the diaphragm p is to pack the joint between the chamber surrounding the valve-cylinder, and inclosed by the outer casing, and prevent a possible leakage through the opening around the operating-lever F , while at the same time it allows a free upward-and-downward motion of the stirrup or double valve-rod D . H is a cover or head, for the cylinder B , and provided with the packing-ring q , embedded therein, as shown. G is a bolster, in the form of a ring or short cylinder, with a portion of its height bifurcated, so as to form two legs to admit of its straddling the upper cross-bar of the stirrup D . E is the outer casing, so formed as to inclose all of the internal mechanism, and provided with the shoulder r upon the inside near its upper end, which rests upon the outer edge of the rubber diaphragm p , and also with the lips upon its lower end, and the coupling-ring f provided with an internal screw-thread to fit the external screw-thread formed upon the base flange A , by which the parts are all drawn firmly together, and held in position. J is the outlet-nozzle, attached to the outer casing E .

The operation of my improved faucet is as follows: The water enters the faucet through the hollow stem A^1 and the tube A^2 , filling the space around the valve C in the groove j , and passing through the creases or grooves l fills the chamber above said valve. If, now, the lever F is depressed the teeth upon its inner end, acting upon the teeth in the side of the stem n , will cause the stirrup D and the valve C to be raised until the cylindrical portion of the valve-stem d is above the valve-seat, the upward movement of said valve expelling the water contained in the cylinder above the valve. The valve is now open, and the water flows freely through the orifice c , and thence to and through the outlet-nozzle J , and will continue so to flow till the finger is removed from the lever F , when the weight of the valve and its stirrup, with the pressure of the water upon the upper end of the valve, will cause the valve to gradually descend and close the orifice c and shut off the water. The cylindrical projection d , on the lower end of the valve C , fitting into the orifice c , and cutting off the flow of the water before the face of the valve comes in contact with the valve-seat, and the small passage for the water to enter the cylinder above the valve, effectually prevents all "water hammer."

The valve C may be fitted loosely to the cylinder B , so that the water may pass to the chamber above the valve in a thin film, surrounding said valve, in which case the vertical grooves l may be dispensed with.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The piston-valve C , provided with the cylindrical extension d , in combination with the cylinder B , having its upper end closed,

and provided with the orifice *c* in its lower end, substantially as described.

2. The piston-valve *C*, provided with the circumferential groove *j*, and one or more vertical or longitudinal grooves, *l*, in combination with a cylinder having a closed upper end, an inlet-passage, and an outlet-orifice in its lower end, substantially as described.

3. The stirrup *D*, coupled to the valve below its seat, partially embracing the valve-cylinder, and mounted in bearings at its top and bottom ends concentric with the axis of the cylinder, substantially as described.

4. The stirrup *D*, constructed and arranged as set forth, in combination with the toothed lever *F*, arranged and operating substantially as described.

5. The combination of the cylinder *B*, the loose cover or head *H*, and the bifurcated bol-

ster *G*, arranged and operating substantially as described.

6. The combination of the stirrup *D*, the bifurcated bolster *G*, the rubber diaphragm *p*, and the outer casing *E*, all arranged and operating substantially as described.

7. The base-flange *A*, the screw-shank *A*¹, the tube *A*², and the cylinder *B*, provided with a valve-seat concentric therewith, and an outlet-passage, *c*, all cast in one piece, in combination with an outer casing, *E*, secured thereto by a coupling-ring, *I*, substantially as described.

Executed at Boston this 18th day of December, 1873.

HENRY B. LEACH.

Witnesses:

N. C. LOMBARD,
S. A. WOOD.