

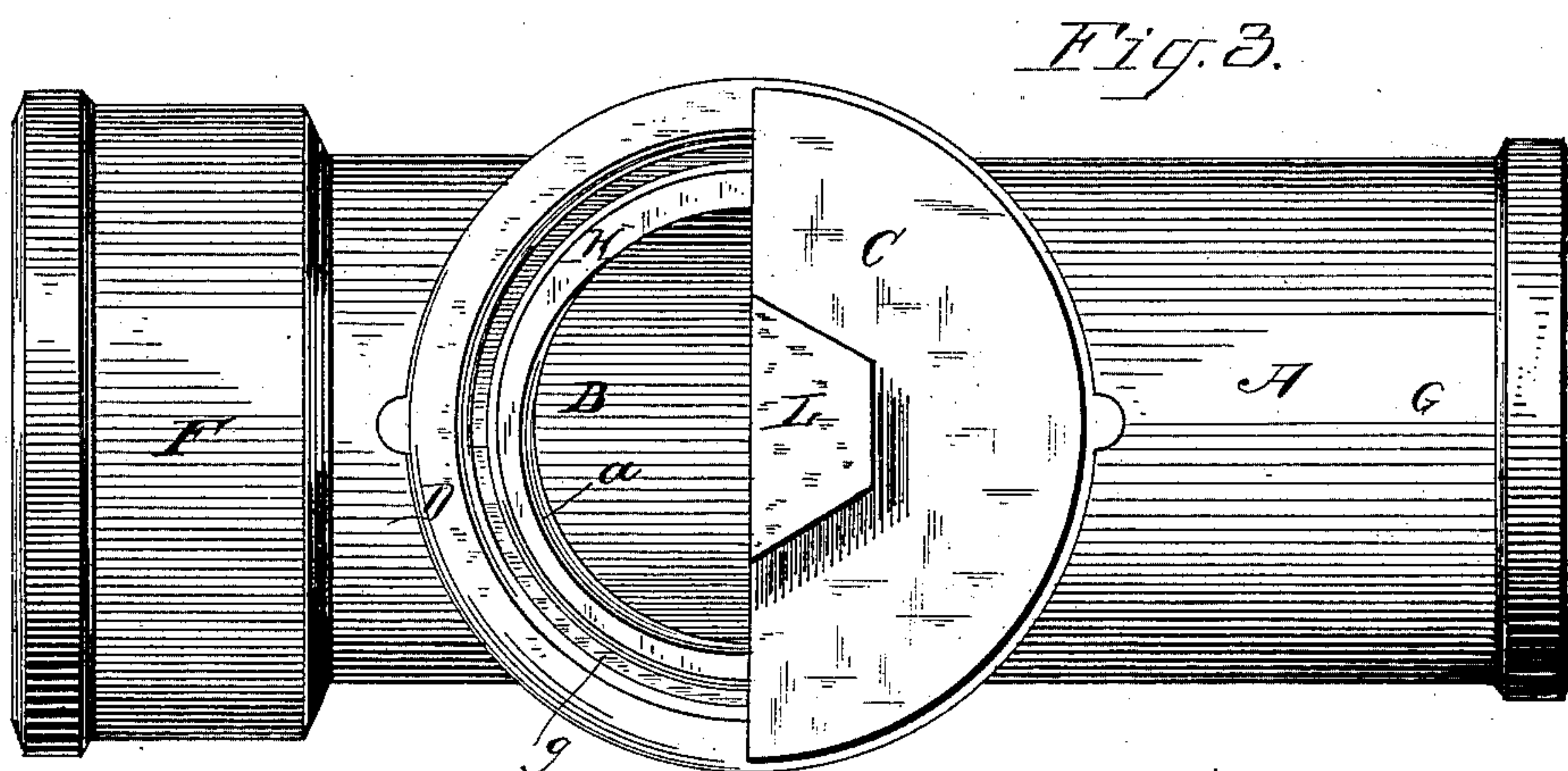
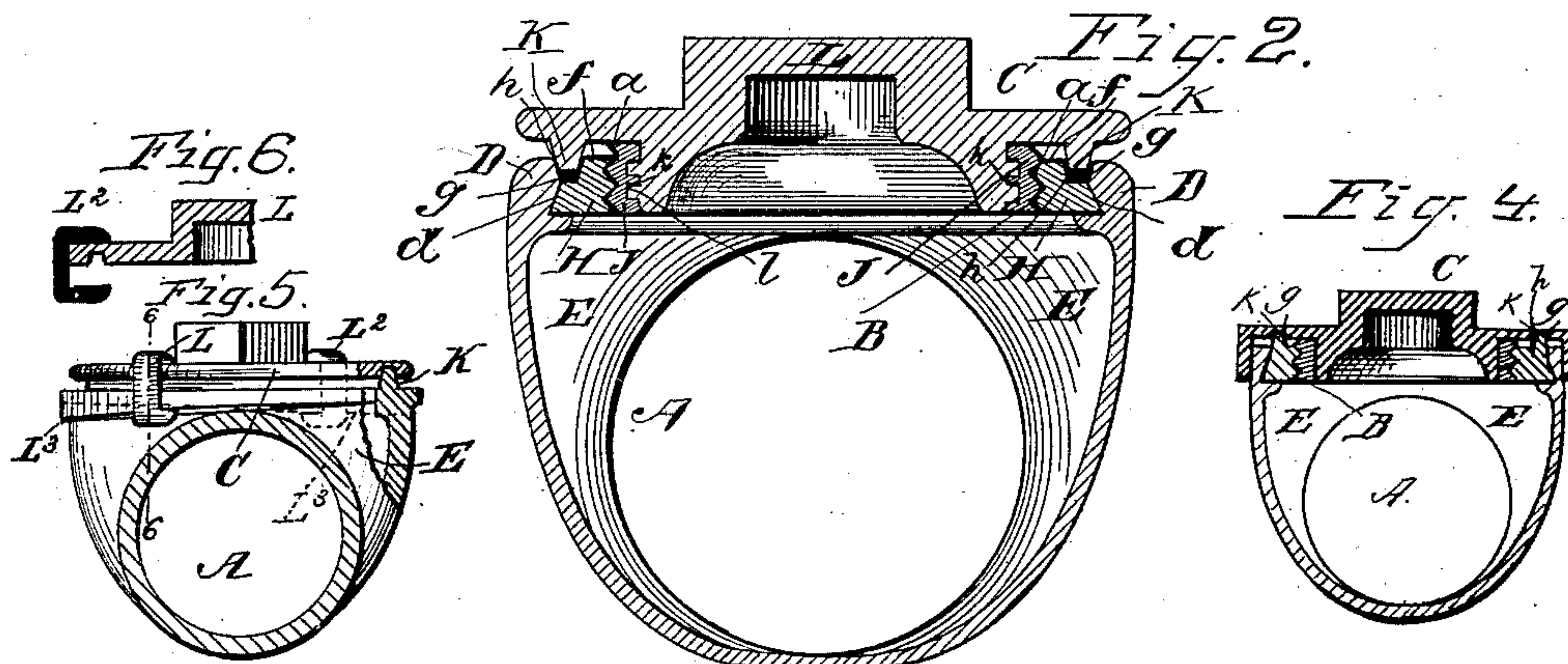
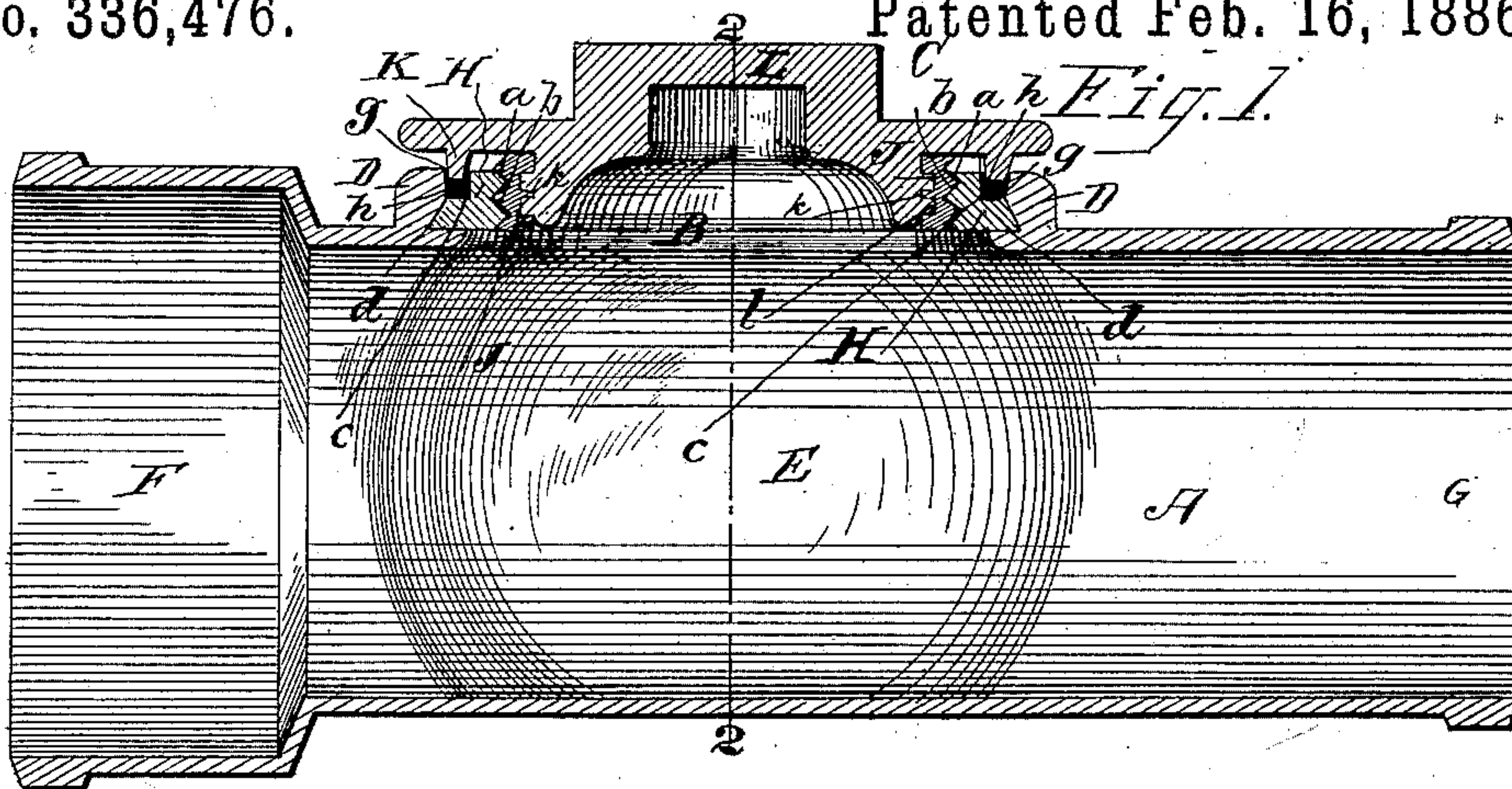
(No Model.)

P. W. DOHERTY.

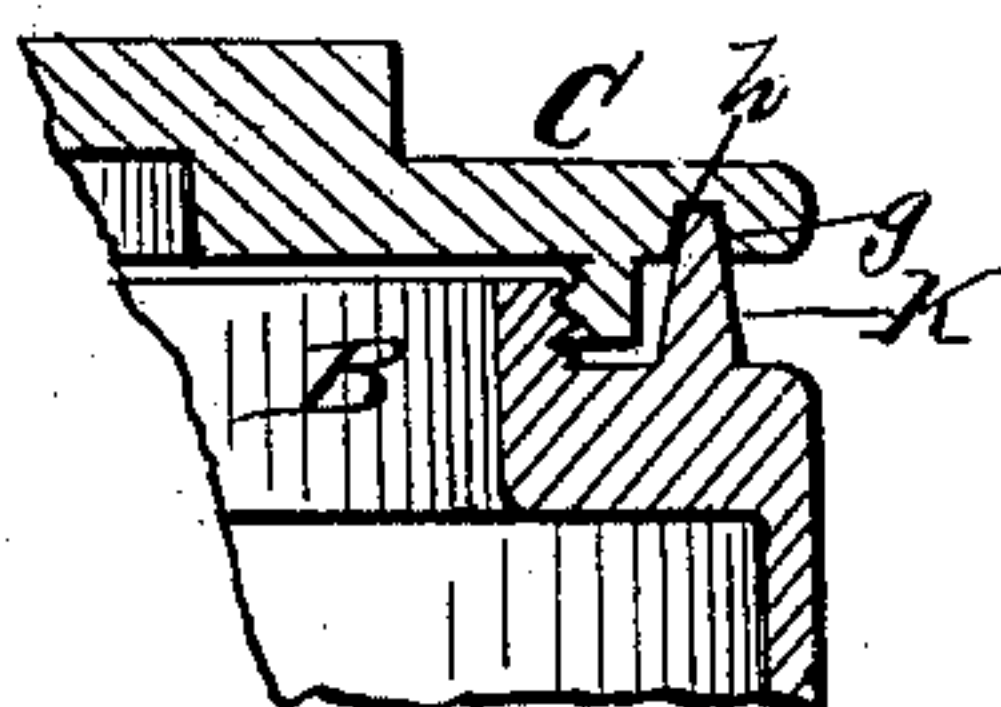
SOIL OR DRAIN PIPE.

No. 336,476.

Patented Feb. 16, 1886.



Witnesses *Fig. 7.*  
Wm. J. Bellows  
Klaas Scott



P. M. Doherty,  
Inventor  
per Brown Bros.  
Attorneys



# UNITED STATES PATENT OFFICE.

PATRICK W. DOHERTY, OF BOSTON, MASSACHUSETTS.

## SOIL OR DRAIN PIPE.

SPECIFICATION forming part of Letters Patent No. 336,476, dated February 16, 1886.

Application filed January 15, 1885. Serial No. 153,002. (No model.)

### *To all whom it may concern:*

Be it known that I, PATRICK W. DOHERTY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Soil or Drain Pipes, &c., of which the following is a full, clear, and exact description.

In the pipes and traps of various kinds used in the water and drainage systems of dwelling-houses and other buildings hand or clean-out holes are provided at various points, through which to enter them to clean them from time to time. These hand-holes are closed with a cover or plug, which is adapted to be removed and replaced at pleasure, and is intended to be sealed at its joint with the pipe or trap against leakage of gases, &c. It is to the formation of these hand-holes and to the construction of them and of their cover for closing and sealing them that this invention pertains; and to that end it consists, first, of a hand-hole for entering a soil, waste, or drain pipe, trap, &c., which is located in one side of the pipe, in combination with an enlargement of the pipe at either one or both, preferably both, sides of said hole, whereby greater space in the pipe and facility are afforded for the cleaning out of the pipe with the hand or otherwise; second, of a hand-hole for entering a soil, waste, or drain pipe, trap, &c., made of cast-iron, in combination with a cover or lid for said hand-hole, constructed with male and female screw-threads, or equivalent devices—such as engaging lugs—for the attachment of the cover to the hand-opening of the pipe to close said opening, and having one or both thereof made of a separate piece, preferably of a non-corrosive material—such as brass or other suitable metal—properly secured in position; third, in a hand-hole for entering a soil, waste, or drain pipe, trap, &c., provided with a cover or lid for closing said hand-hole, either one or both of which (one being sufficient) is provided with a screw-threaded ring or collar, or equivalent devices—such as interlocking lugs—preferably of a non-corrosive metal—such as brass or other suitable metal—which is made separate from the cover or the pipe, as the case may be, and is attached to it by casting the metal of which the pipe or cover—iron, for instance—is made about and to said ring, which ring is of suitable construction, as the pipe or

cover is so cast to make an interlock between them to secure it against accidental movement or displacement in use; fourth, of a hand-hole for entering a soil, waste, or drain pipe, trap, &c., and of a cover or lid constructed with a flange or lip to enter said hand-hole, and constructed, the one with a groove or recess for receiving a packing—such as india-rubber or other suitable material—and the other with a flange or lip to enter said packing-receiving groove.

In the accompanying drawings this invention is illustrated with a section of an iron soil or waste pipe, otherwise of ordinary construction, and Figure 1 is a central longitudinal vertical section. Fig. 2 is a cross-section on line 2 2, Fig. 1. Fig. 3 is a plan view with half of the cover removed. Fig. 4 is a view in modification. Fig. 5 is a cross-section, and Fig. 6 is a detail section, thereof; and Fig. 7 is a cross-section, enlarged in detail, all showing modifications hereinafter described.

In the drawings, A is a section of a soil or waste pipe, as usual made of cast-iron or of any othersuitable material. B is the hand-opening, and C is the cover or lid. The hand-opening, as shown, is made round and extends outward through a circular riser or rim, D, of the pipe, which exteriorly is made with a female screw-thread, *a*, to receive the male screw-thread *b* on the outside of the circular flange or rim projecting from the outside face of the cover or lid. The pipe at each side of the hand-opening is made with an enlargement or bulge, E, each of a similar rounding shape, running lengthwise of the sides of the pipes and corresponding exteriorly in direction and curve to the outer edge or periphery of the riser D, which surrounds the hand-opening, and the two enlargements meet and coincide with the pipe itself at the side thereof directly opposite to the hand-opening. This bulge or enlargement of the pipe permits the making of a hand-hole in the pipe of increased diameter, and also gives increased space in the pipe and at the hand-opening for the movement of the hand in cleaning out the pipe, and the extreme external diameter of the bulge can be in excess without interference with the setting of the pipe, &c., of the extreme external diameter of the regular hub or enlargement F at one end of the pipe for the reception of the smaller end, as at G of



the section shown of another section of the pipe.

The female screw-thread of the hand-opening is in a ring, H, of metal—malleable or wrought iron, for example—and this ring on its exterior edge is made of angular shape, as at *d*, and it is secured in place in the pipe by casting the pipe about and around its angular edge, and, again, the outer surface, *f*, of the ring H has an annular depression, *c*, making, with the riser D of the pipe and as the pipe is cast, an annular groove or recess, *g*, surrounding the hand-opening B, for the reception of a packing-ring, *h*, of leather, india-rubber, or a packing of any other suitable material.

The male screw-thread *b* of the cover C is in a ring, J, of metal, brass, or other non-corrosive metal or material, and this ring J interiorly has a series of pins or studs, *k*, and it is secured in place upon the cover by casting it (the cover) upon and against its inner side, *l*, provided with the pins or studs. The studs fasten the screw-threaded ring to the cover and prevent its accidental movement or displacement in use, and by making the ring of a non-corrosive metal or material—such as brass—the threads of the cover are always free for being worked in the threads of the hand-opening, and the same would be true were the threads of the hand-opening in lieu of those of the cover made of brass or other non-corrosive metal or material, or were both threads so made.

The pins or studs *k* on the ring J may be dispensed with and depressions or cavities substituted for them, or both pins or depressions may be used.

K is an annular flange or lip in the inner face of the cover and in position to enter the packing-groove *g*, surrounding the hand-opening. The cover C on its outer face is provided with a square or other polygonal-shaped knob or projection, L, to receive a wrench or other tool for turning the cover in and out of the screw-thread hand-opening B of the pipe. The side enlargements of the pipe, as before stated, enable a hand-opening of increased diameter to be made in the pipe, and to an extent sufficient to secure the greatest facility and freedom in the cleaning out of the pipe when the cover to the hand-opening is removed, and this feature of the invention is applicable to square-shaped as well as round-shaped hand-openings.

The construction of the hand-opening and of its cover for attachment by screwing the one into the other is a most secure and desirable mode of fastening the cover in place, and combined with a construction for packing the cover between it and the pipe, substantially as described, it enables the joint of the cover and pipe to be most perfectly sealed against the escape of foul or sewer gases, or other leakage from the pipe at said joint.

A receiving-groove, *g*, for packing *h*, may be made in the cover B and the entering flange K on the pipe A, instead of the groove in the

pipe and the flange on the cover, as has been particularly described, and still secure, practically, the same result, and again, the flange and groove may be dispensed with, and flat surfaces left between the cover and pipe to be packed in any suitable manner, but it is preferable to use the groove and flange; and, again, the cover may lap over the outer edge of the riser B on the pipe. (See Fig. 4.)

The hand-opening, as also the other features making up this invention, all substantially as herein described, can be used in all kinds of drain, soil, and waste pipes and traps—as, for instance, in bends, eighths, quarters, halves, double-hub, long, or return, in branches of T shape, or of a single or double Y shape, in cross-heads, in offsets, in traps running or of S shape, &c., and it is not intended to limit the invention in any of these regards.

The entering of the cover into the hand-opening acts, in connection with the packing between the cover and pipe around the hand-opening, all substantially as described, to increase the efficiency and reliability of sealing the joint of the cover and pipe against escape of obnoxious and offensive gases and other leakage from the pipe, &c.

It is preferable to make the enlargement of the pipe described on opposite sides of the hand-hole; but it may be made only on one side of the hand-hole, and the cover and riser about the hand-opening may be constructed for the former to be screwed over and upon the outside of the latter, in lieu of upon the inside, as has been particularly described. (See Fig. 7.)

Lugs  $L^2 L^3$ , Figs. 5 and 6, for engaging with each other, may be used upon the cover and in the hand-opening, in lieu of screw-threads, as herein particularly described, or other well-known forms of construction which will allow the cover to be turned into the opening, and as so turned therein made secure against accidental escape, may be used.

And again, while this invention has been herein particularly shown and described in detail as having the cover attached to the pipe at the hand-opening by turning it into said opening, it is obvious that the invention herein described is as applicable to covers and hand-openings which are adapted for the cover to be attached to the hand-openings by turning it on the outside of the wall of the pipe surrounding the hand-opening, Figs. 5 and 6.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a section of waste, soil, and other like pipes, having a hub or enlargement, E, to receive interiorly the end of another section, a hand-hole or clean-out opening, B, through one side of the pipe, and an enlargement or bulge, E, thereof, of the same direction as the inner wall or periphery of said opening, the bulge of larger diameter than the pipe, and it and said opening of unequal diameters, in combination with an attachable and detachable



cover to said opening, substantially as described, for the purpose specified.

2. In waste, soil, and other pipes and traps made of cast-iron, a hand-hole or clean-out opening, B, and a cast-iron cover, C, therefor, constructed to be turned onto the pipe, and the contiguous face or faces of a non-corrosive metal—such as brass—separately made and attached, substantially as described, for the purpose specified.

3. In waste, soil, and other pipes and traps made of cast-iron, a hand-hole or clean-out opening, B, and a cast-iron cover, C, therefor,

constructed to be turned onto the pipe, and the contiguous face or faces of a non-corrosive metal, in combination with a packing-receiving groove, *g*, and flange K, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PATRICK W. DOHERTY.

Witnesses:

ALBERT W. BROWN,  
WM. S. BELLOWS.