

(No Model.)

R. M. LAFFERTY.

VALVE.

No. 374,544.

Patented Dec. 6, 1887.

Fig. 1.

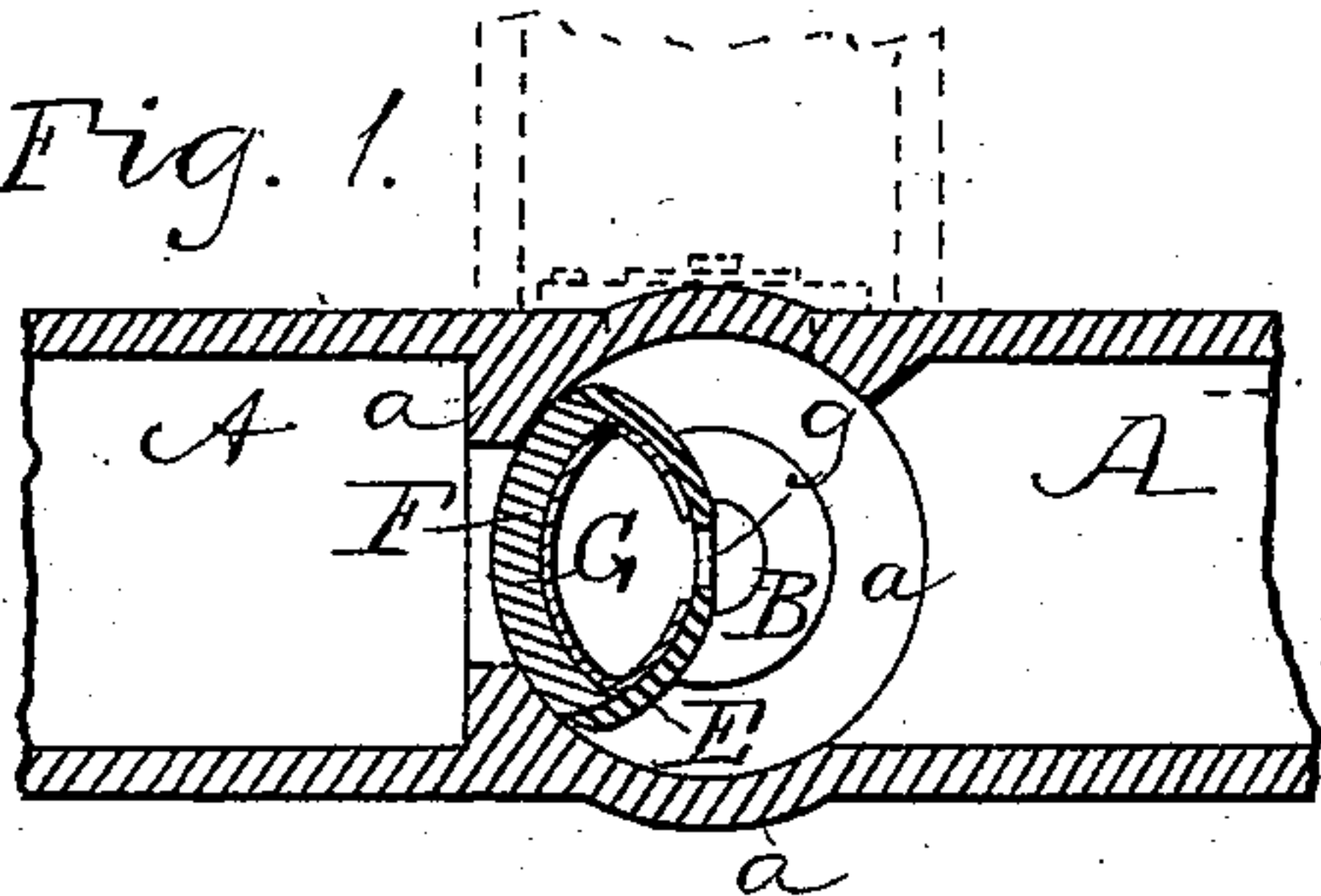


Fig. 2.

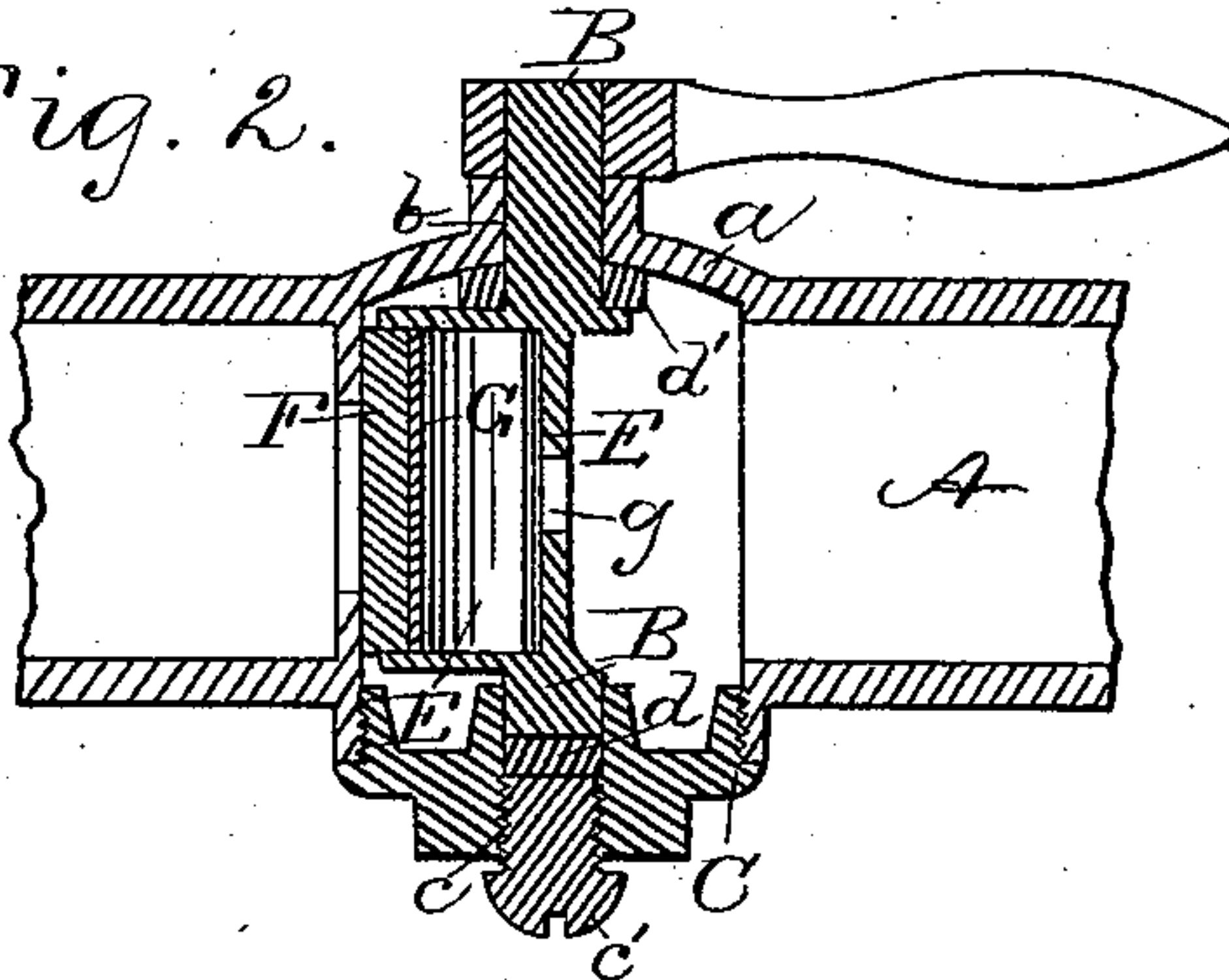


Fig. 3.

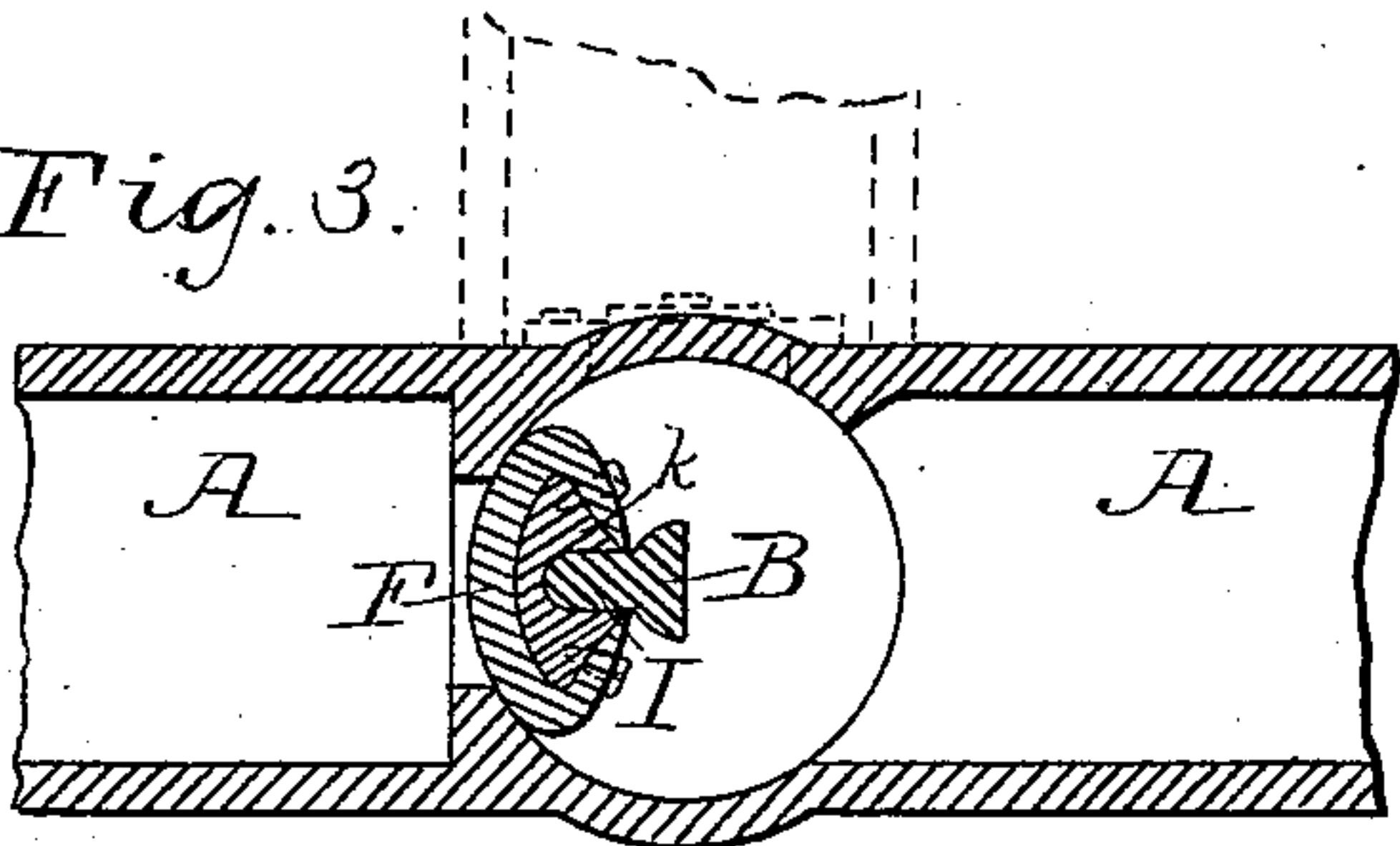


Fig. 4.

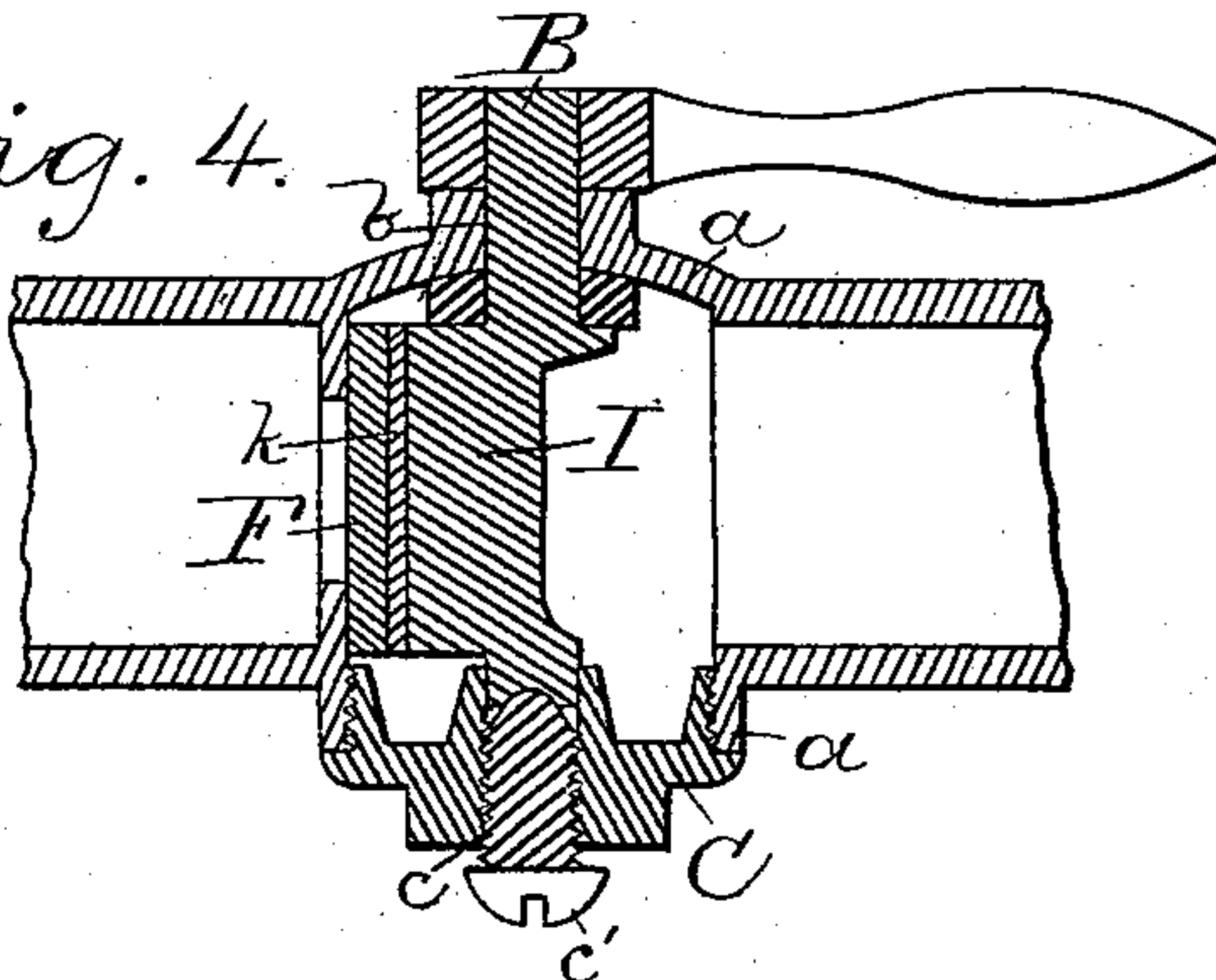


Fig. 5.

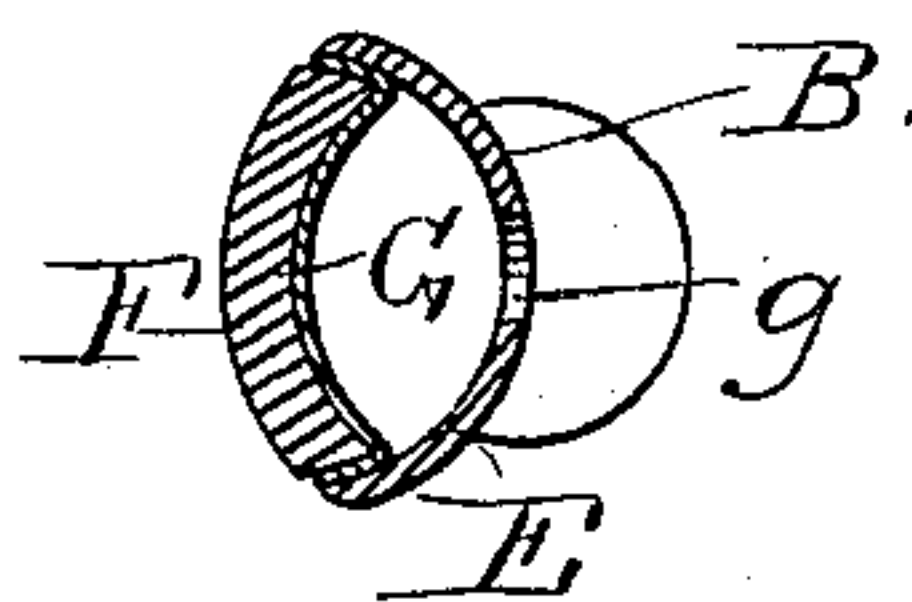
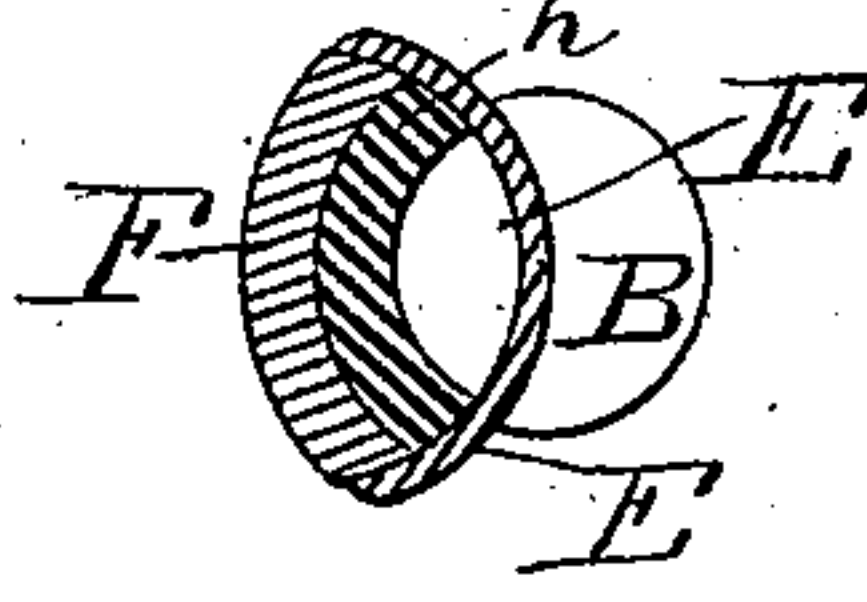


Fig. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## VALVE.

SPECIFICATION forming part of Letters Patent No. 374,544, dated December 6, 1887.

Application filed January 29, 1887. Serial No. 225,838. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT M. LAFFERTY, of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and letters of reference marked thereon, forming part of this specification.

My invention relates to improvements in valves for faucets and cocks used in connection with water or steam pipes, whereby a metal contact between the valve and its seat—whereby the wear is increased and the possibility of leakage greatly enhanced—is avoided; and, further, such improvements that the valve-spindle is kept well packed at all times, substantially as hereinafter described and as illustrated in the drawings, in which—

Figure 1 is a longitudinal vertical section of my invention. Fig. 2 is a transverse horizontal section thereof. Figs. 3 and 4 show a transverse vertical and a transverse horizontal view, respectively, of a modification thereof; and Figs. 5 and 6 show cross-sections of modified forms of the valve proper.

Reference being had to the drawings, A represents a section of pipe, showing a boss, *a*, in which is a circular valve-seat, the center of which is transverse to the longitudinal center of pipe A, although preferably on the same plane therewith. One end of this boss is closed, with the exception of a circular aperture, *b*, which furnishes bearings for the end of the valve-spindle B, on the outer projecting end of which the handle for turning the valve is affixed. The other end of this boss *a* extends a slight distance beyond the plane of the side of pipe A, is open, and has its inner circumference screw-threaded, as shown. Screwing into this open tapped end of said boss *a* is a screw plug or cap, C, which is provided with a central aperture, *c*, in transverse alignment with aperture *b*, and having its circumference adjacent to its inner end smooth, so as to furnish a bearing for the contiguous end of valve-spindle B, whereas the circumference adjacent to the outer end thereof is screw-threaded to receive the set-screw *c'*. The contiguous end of the valve-spindle B, which has its bearings in aperture *c*, is sufficiently short

to permit a suitable disk, *d*, of leather or other suitable material, to be inserted therein between it and the end of set-screw *c'*. Surrounding the other end of the spindle B, about where it enters aperture *b*, and between the closed end of said boss and the valve-holding devices, is a washer, *d'*, of leather or other suitable material. It will thus be apparent that when set-screw *c'* is manipulated it compresses washer *d'* and disk *d* and packs the bearings of the spindle, making it perfectly tight.

If desired, as shown in Fig. 3, the set-screw *c'* may be of greater length than would be necessary in the construction just described, and could be pointed or otherwise constructed so as to enter a corresponding depression in the contiguous end of the spindle. This latter construction, while practicable, I do not deem as preferable to that shown in Fig. 2.

Preferably made integrant with the ends of spindle B, and projecting laterally therefrom, is a pocket, E. The back and sides of this pocket are segmental in cross-section and extend to near the longitudinal center of spindle B, and preferably are provided at about their center of length with a hole, *e*. The outer edges of pocket E do not project sufficiently far to touch the valve-seat. Placed in this pocket E, between the sides thereof, as shown, is a segmental packing, F, made of leather or other flexible material, which bears against the valve-seat, and is held thereto by such pressure back of it that when it covers the contracted aperture *g* in the valve-seat leading into that part of the pipe it is designed to cut off or supply with water it prevents leakage.

The pressure back of packing F may be generated by the steam or water forcing its way into pocket E through hole *e*; but I prefer something more positive than this. This is accomplished by placing in the pocket the metal packing-spring G, the part of which pressing against the back of the packing F conforms to the shape thereof, and, if desired, has its side edges bent back so as to bear against and conform to the back of the pocket. The spring G, thus constructed, forms a cushion for the packing F and keeps the said packing flush against the valve-seat. If desired, the side edges of spring G may be bent



forward so as to lap over the side edges of packing F; or they may be made without flanges in either direction, simply abutting against the web forming the back and sides of the pocket.

Again, instead of the metal spring G, I could substitute a rubber cushion, *h*, as shown in Fig. 6. Indeed, I prefer this latter construction for creating the elasticity or pressure back of packing F, to make it conform to the shape of its valve-seat and keep it under light pressure, bearing so tightly against the same that leakage is an impossibility.

In Fig. 3 I show a different construction of the valve, wherein the water is alone depended upon to generate the pressure to keep the packing against the valve-seat. In this illustration, as will be observed, I provide the spindle B, between its bearings, with a longitudinal fin, *I*, and provide a block or shoe, *k*, with a longitudinal groove, *i*, in its apex, into which the fin *I* projects, and whose outer surface describes a segment struck from the point of oscillation of the valve and parallel with the curvature of the valve-seat, and having affixed thereto the packing F, in the manner shown. The shoe *k* and packing F have a limited radial movement on fin *I*, and the pressure of the water or steam on the sides of the shoe keeps the packing flush against the valve-seat. By projecting the side edges of the shoe *k* slightly, so as to overlap the side edges of the packing F, the latter need not be permanently secured to the shoe.

The principal feature of my invention is the packing F, conforming to the shape of the valve-seat and pressing against the same sufficiently to prevent leakage. As an oscillating valve, it can be used for steam or water connections, for two-way or three-way cocks, faucets, or even for four-way valves when duplicated. By its use the valve-seat is subject to much less friction and wear, and is kept cleaner than when the valve is metal and has a metal contact with its seat.

What I claim as new is—

1. In a valve, the combination, with a pipe having a valve-seat therein, of a spindle, B, offset between its journaled ends, having a concave pocket formed in the outer surface of said offset, said pocket provided with apertures in its back to permit water thereto, packing F, consisting of a segment of leather, the outer surface of which conforms to the curvature of and bears flush against said valve-seat, which is placed within said pocket so that its side edges bear against the walls of said pocket and close the mouth thereof, and spring G in said pocket back of said packing, which conforms to the contiguous surface of the packing and presses the same outward, as set forth.

2. In a valve, the combination, with a pipe having a transverse valve-seat therein, one end of which is permanently closed, a screw-plug for closing the opposite end thereof, having a central aperture therein in alignment with and affording bearings for one end of the valve-spindle, and a set-screw closing the outer end of said aperture in the plug, of spindle B, journaled in the central aperture of said plug and in suitable bearings in the closed end of the valve-seat, and valve carried by said spindle.

3. In a valve, the combination, with a pipe having a transverse valve-seat therein, one end of which is permanently closed, a screw-plug for closing the opposite end of said valve-seat provided with a central aperture, set-screw *c'*, and packing-disk *d*, of spindle B, journaled in the aperture of the plug and in suitable bearings in the closed end of the valve-seat and the valve, said packing-disk *d* being placed between screw *c'* and the contiguous end of spindle B, as set forth.

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Witnesses:

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