O. T. EARLE.

Stop-Cock.

2 Sheets--Sheet 1.

No. 167,751.

Patented Sept. 14, 1875.

Fig 1.

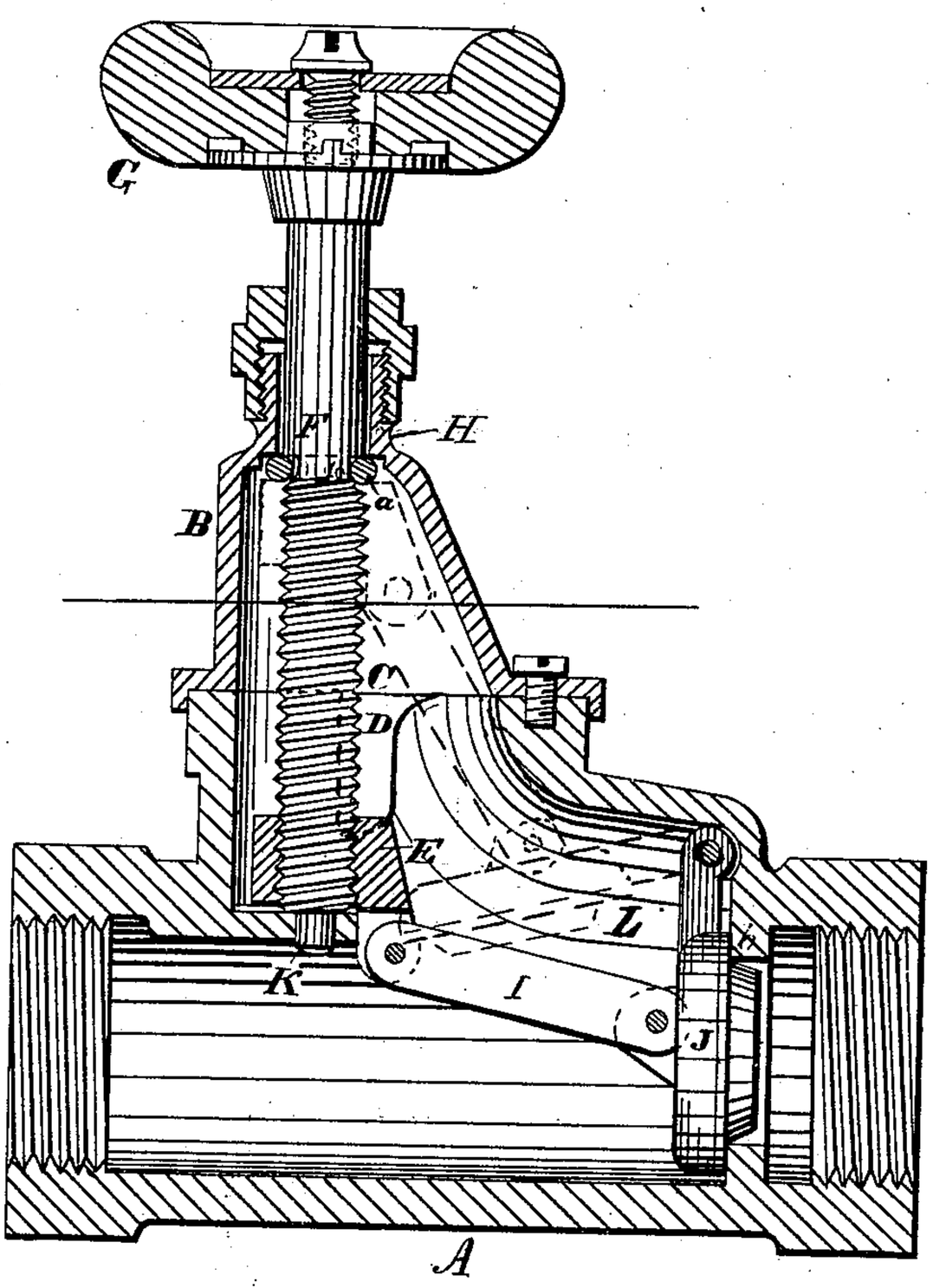
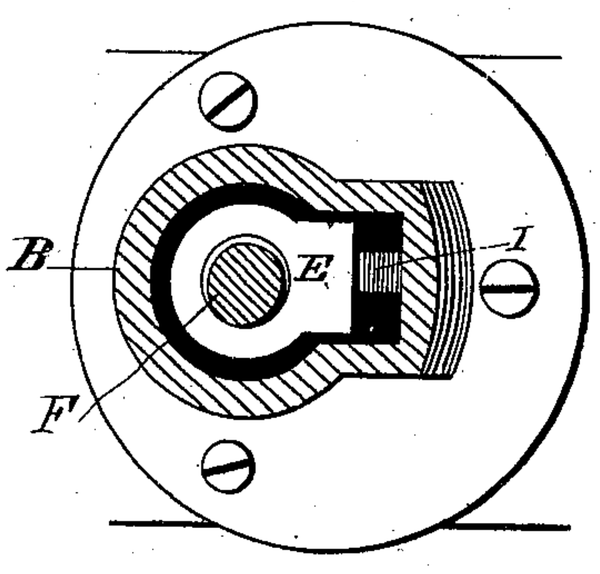


Fig 2.



Witnesses:

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Jno. D. Patten

Inventor:

Oscar T. Earle

2 Sheets--Sheet 2.

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Fig. 3.

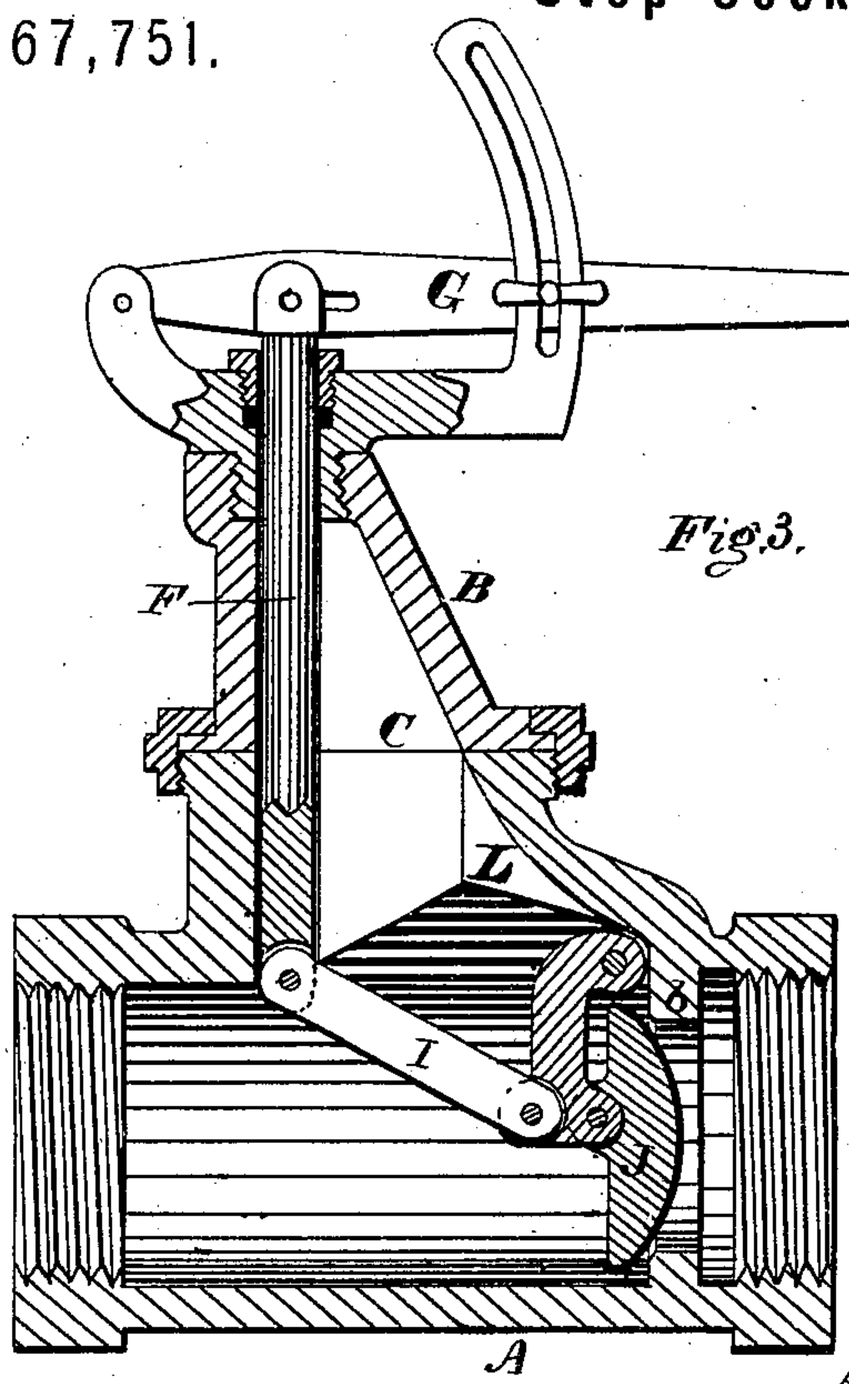


Fig. 5.

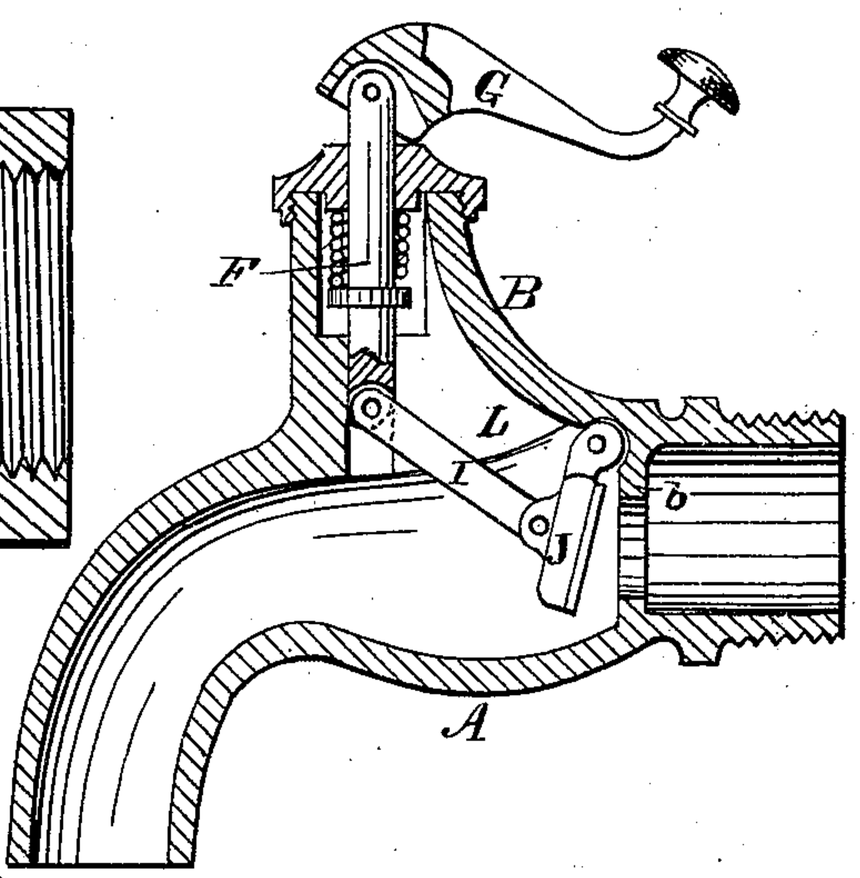
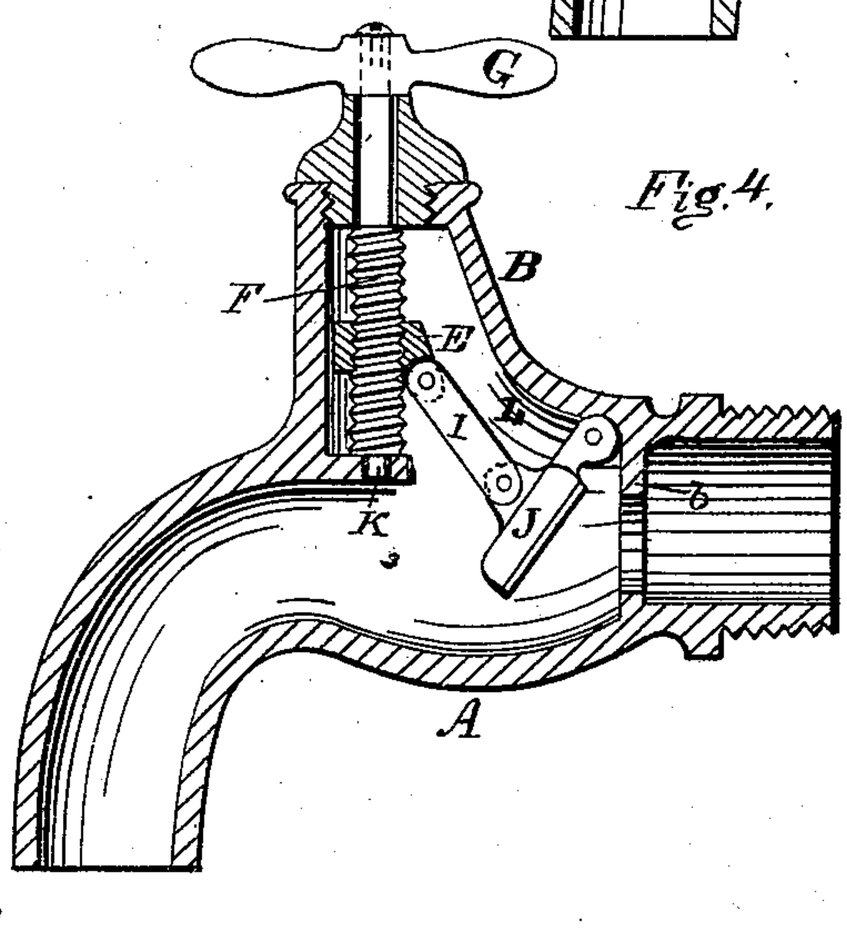


Fig. 4.



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UNITED STATES PATENT OFFICE.

OSCAR T. EARLE, OF NORWALK, CONNECTICUT.

IMPROVEMENT IN STOP-COCKS.

Specification forming part of Letters Patent No. **167,751**, dated September 14, 1875; application filed September 11, 1875.

To all whom it may concern:

Be it known that I, OSCAR T. EARLE, of Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Stop-Cocks; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

It is a well-known fact, and particularly to manufacturers and users of stop-cocks and valves of the common construction, that a difficulty occurs in keeping them tight for any great length of time for several reasons, viz: In valves or cocks having a sliding or twisting motion when closing upon their seats, (and more especially is this the case where the water is muddy or gritty,) small particles of the sand or grit work their way into the valve and lodge around the valve-seat and its recesses, and attach themselves to the valve-face, thereby cutting or grinding it in such a manner as to render it worthless. The same difficulty arises in the use of the well-known common globe-valve and compression bib-cock. When the valve or cock is being turned to its seat it receives the same grinding and cutting motion, thus quickly destroying its seat; and in using the common plug-cock is the same difficulty encountered, besides an additional and more serious objection, which is the jarring slam or concussion of the water in the pipes consequent on the sudden closing of the cock, which oftentimes bursts the pipes and fractures their connections, causing thereby great damage to property and buildings, as well as delays in business operations. To remedy these defects, and at the same time provide a simple, cheap, and durable stop cock or valve for every purpose when cocks are used to close the water-way through pipes, &c., and more especially when a clear and unobstructed passage is required, is the object of my invention; and it consists in combining within a stop-cock certain devices which operate to move the valve very slowly at the commencement of opening and closing the same, and impart a quick and rapid motion after a partial opening is obtained, continuing until a full and free discharge is reached; and it also consists in operating a hinged valve by means of a connecting-rod attached to a nut mounted upon a spindle, one end of which spindle is journaled in a step or support, against which the end of the connecting-rod and its projecting fastening on the nut bears when the valve is forced to its seat. The said spindle is also provided with a groove formed to receive a collar placed at the proper distance from the step or journal to arrest the travel of the nut and valve with its connections, and also preventing the spindle from rising out of its step or journal when the closing strain is brought to bear upon it, thus firmly securing the valve-spindle and its connections, and rendering the same easily operated, as will be more fully hereinafter explained. It is also important on some occasions that an automatic or self-closing cock should be used, giving a ready and rapid flow of water when required, and at the same time allow its gradual introduction and stoppage, thereby preventing the bursting of hose, pipes, and connections, but affording when full open a free and unobstructed water-way. This will be made evident by reference to the drawings and following description, in which—

Figure 1 represents a vertical longitudinal section; Fig. 2, transverse section on line *x x* of Fig. 1; Fig. 3, a modification of my invention as applied to throttle, whistle, and other valves; Fig. 4, a modification as applied to common cocks and faucets, and Fig. 5 a modification as applied to automatic or self-closing cocks.

Like letters of reference correspond to like parts in all the figures.

A represents the body or barrel of the stop-cock, having an inner annular projection, B′, forming the valve-seat, and a horizontal projection in longitudinal section forming a recess in chamber L of barrel A, in which is hinged or journaled valve J, provided with an elastic facing. B represents a bonnet to chamber L, the inside of which, with the upper portion of barrel A, forms chamber C and L. This bonnet is provided at one end with a bush-chamber, H, forming a gland for attaching the

stuffing-box thereto, and also a guide for the spindle, and having guards D projecting beyond the face of the flange-joint, thereby preventing nut E from turning, and causing an undue strain to be brought upon connecting-rod I, thereby preventing valve J from coming to its seat properly.

F represents the spindle, on one end of which is fastened the usual hand wheel or lever G, and the other end with a journal working in a step, K, the portion of the spindle within the chamber being provided with a screw-thread, on which thread works nut E, which performs an important function in the working of my invention, and with its connections forms the very gist of the invention, as will be hereafter more fully described. This nut E is provided with an inclined projection, forming a knuckle-joint with connecting-rod I, which also is journaled in the same manner to hinged valve J, said valve being provided with similar projections on its back. It will be seen by reference to the drawing that when the valve J is forced to its seat B′ the end of the nut projection, with its attached connecting-rod I, bears firmly against the edge of the horizontal step K, and the other end against the back of the valve J, thus forming a firm, rigid, and substantial brace as long as it is desirable to keep the valve in that position, and also relieving the spindle from unnecessary strain at that point. By this arrangement it is obvious that an elastic valve or seat may be employed with good results. The projecting hinge or valve J may be cast on or secured in any approved manner. It will be seen by reference to the drawings that this hinge, at its journal-bearing, is oblong in cross-section, which allows the valve full and free movement to and from its seat, thereby avoiding all danger of the valve not properly seating itself, and compensate for any lateral wear of the valve-connections. The spindle at the upper termination of the screw is provided with a groove, *a*, in which is inserted a metal ring made in any well-known method, and of any suitable material; but for cheapness and simplicity round wire will fully serve the purpose. The office of this groove and wire ring is to prevent the spindle from rising out of its journaled step and to arrest the upper movements of the follower-nut, whereby the strain of the valve-connections in a vertical position are provided against. The bonnet B may be secured to the chamber L of barrel A by bolts tapped into the metal or body A, shown by Figs. 1 and 2, or a common union-nut, as shown on the modifications at Fig. 3, or bush-nut, as at Fig. 4.

As before observed, Figs. 3, 4, and 5 are modifications, and it is manifest that many such may be made without departing from the spirit of my invention.

In Fig. 3 the construction is similar to that in Fig. 1, the end of the connecting-rod resting against the inner back wall of chamber C, jointed directly to the end of the spindle, the wall forming the support for the pressure against the valve-face, and the upper end of the spindle being connected to a lever which is fulcrumed to an ear or lug extending from and above the valve. This construction is made necessary for valves that require to be rapidly opened and closed. With reference to Fig. 4, it will be seen it is simply a slight variation from those above described, and the same also is Fig. 5.

By making the body A and the bonnet B of the stop-cock of malleable or cast iron, and the working parts of composition, a very cheap and equally durable cock can be produced.

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

1. The combination, in a stop-cock, of the valve J, connecting-rod I, horizontal spindle-step and nut-stop K, nut E, located outside the water-way, and spindle F, substantially as described and shown.

2. The combination, in a stop-valve, of valve J, connecting-rod I, horizontal spindle-step and nut-stop K, nut E, spindle F, ring *a* working in its groove and against the inner and upper wall of bonnet B, guard D, and handle G, all operating in the manner substantially as shown and described.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

OSCAR T. EARLE.

Witnesses:
F. P. MULLOY,
C. H. MOULTON.