

No. 714,410.

Patented Nov. 25, 1902.

C. H. STANTON, P. M. ARMSTRONG & J. H. PROWSE.

VALVE.

(Application filed Mar. 3, 1902.)

(No Model.)

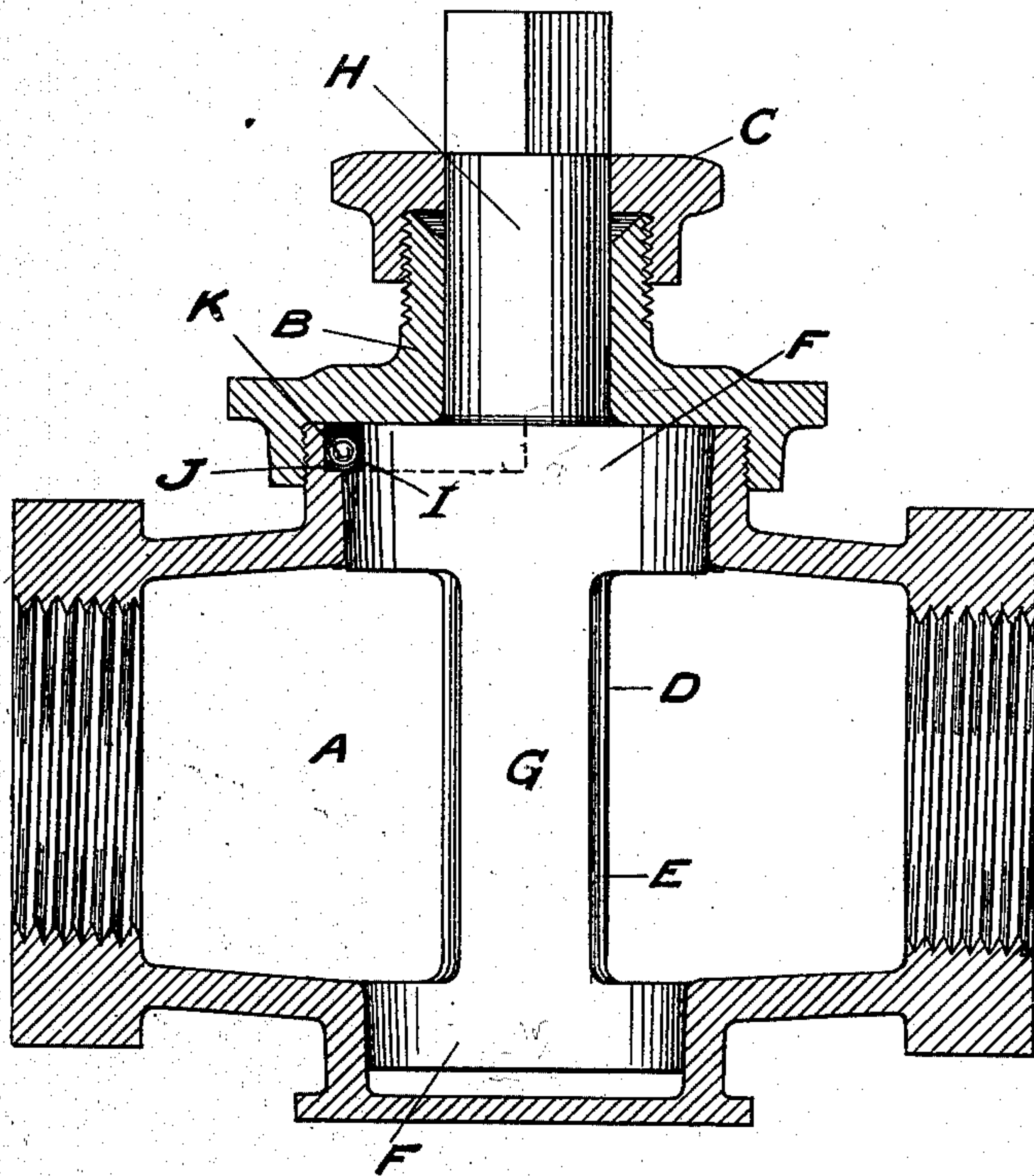


FIG. 1.

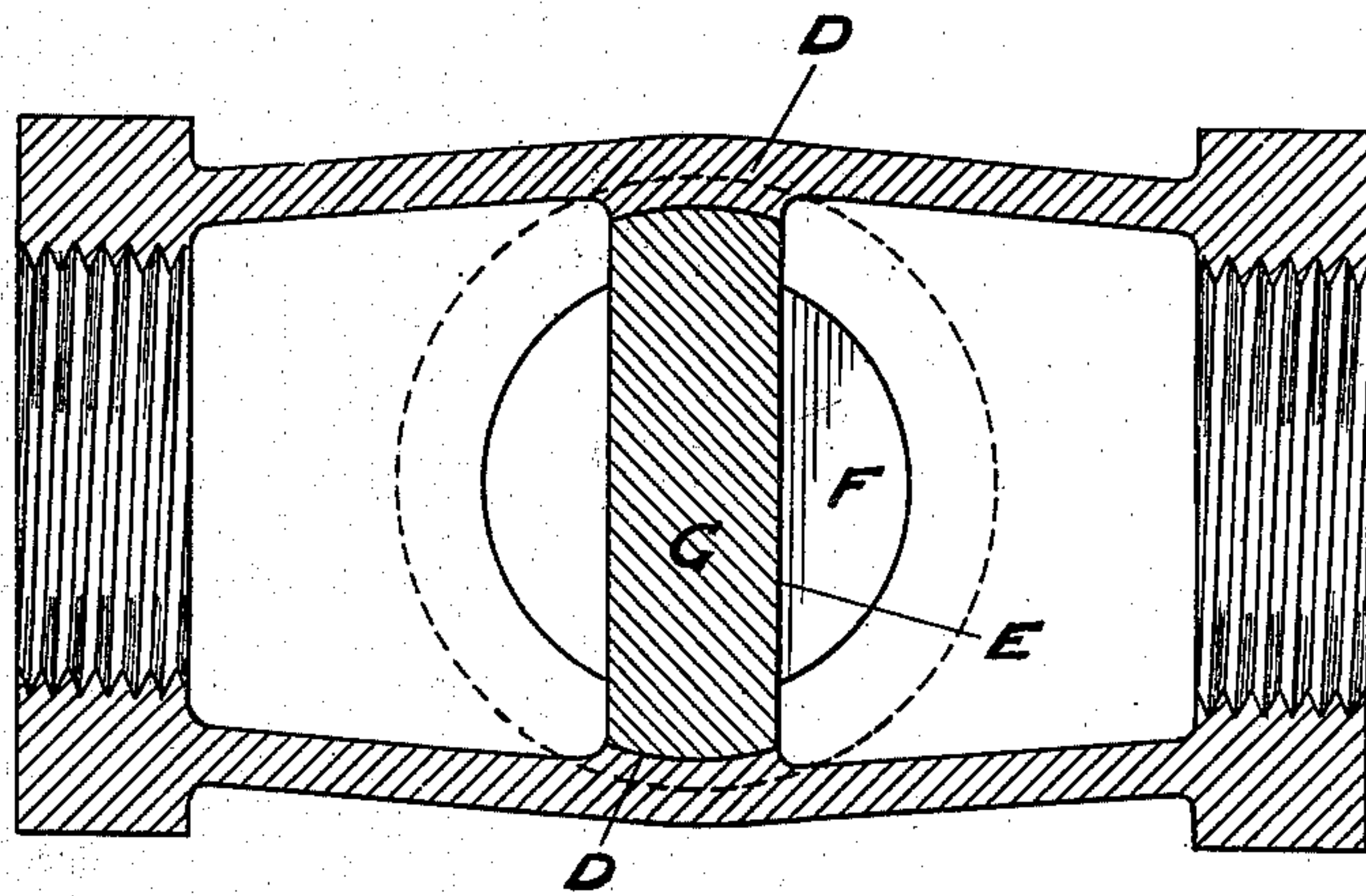


FIG. 2.

WITNESSES

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## VALVE.

SPECIFICATION forming part of Letters Patent No. 714,410, dated November 25, 1902.

Application filed March 3, 1902. Serial No. 96,563. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES HOWELL STANTON, PETER MARCHALL ARMSTRONG, and JAMES HENRY PROWSE, of the city of  
5 Toronto, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Cut-Off Valves, of which the following is a specification.

10 The object of our invention is to devise a cut-off valve in which the faces of both the plug and seats cannot become cut or worn by scale and which will therefore always remain tight; and it consists, essentially, of a plug-  
15 valve in which the middle part of the plug is cut away, leaving circular ends connected by a central web. The ends of the web are of exactly the same width as the raised seats against which they fit, so that scale cannot  
20 accumulate on any portion of the seats while the valve is closed. The seats are raised above the inner surface of the valve-body, or perhaps we might say have sides running at an angle with the faces of the seats. The  
25 best results are obtained when the sides of each seat lie substantially in planes radial from the axis of the plug, as scale collecting on the sides is thus presented to the working  
30 faces of the web at a very inefficient angle for cutting, and the wear on the faces is thus minimized, substantially as hereinafter more specifically described and then definitely claimed.

35 Figure 1 is a vertical section of our improved valve. Fig. 2 is a horizontal section of the same.

In the drawings like letters of reference indicate corresponding parts in both figures.

40 A is the body of the valve, of ordinary construction and suitably recessed to receive the taper-plug E. This plug is held in position in the ordinary manner by means of the screw-cap B and packing C. The plug E, it  
45 will be noticed, is circular at the ends; but the central portion is cut away on each side, leaving the web G. The faces of the ends of this web are less in width than the diameter of the central passage of the valve, so that  
50 when the plug is turned to a position at right angles to the position shown in the drawings a clear passage-way for water or steam is left

at each side of the web. The faces of the ends of the web work against the valve-seats D D at the opposite sides of the body or casing. These seats, it will be seen, are of exactly the same width as the ends of the web  
55 of the plug, so that when the plug is in the position shown in the drawings there is no part of the surface of either valve-seat exposed to the action of water, so that scale cannot form thereon. It will further be noticed  
60 that the valve-seats D D are raised above the inner surface of the body of the valve—that is to say, each seat has well-defined sides running back from the working face of the seat  
65 at such an angle that scale forming on the sides is presented toward the opposed face of the end of the web of the plug at a very inefficient angle for cutting the ends of the web of the plug. We prefer that these sides should  
70 lie substantially in planes radial from the center of the plug, though they might vary somewhat on either side of such plane without materially spoiling the working of the valve. We might here explain that the chief difficulty  
75 in making a plug-valve which will remain tight after it has been in use some time in connection with a steam-boiler lies in the fact that scale forms on all the exposed parts of the interior of the valve while the latter is  
80 in a closed position. When the plug is operated, this scale with all ordinary valves cuts the working faces and soon produces leakage. We have overcome this difficulty by the following features of construction. In the first  
85 place the working faces of the web of the plug and the valve-seats are of exactly the same width, so that no scale can form upon them. Scale, however, does form on the sides of the valve-seats, extending over onto the sides of  
90 the plug in a continuous sheet if the valve be left closed for some time. If now the plug be turned, this scale is broken at the point of juncture between the sides of the plug and the valve-seats, and a rough jagged edge of  
95 extremely hard scale is left attached to the sides, which cuts and scores the working faces of the ends of the web unless the valve-seat be raised and its sides set substantially at the angle already described. It is well known  
100 that if one hard substance is to cut another it must be set so that its cutting edge is at



an acute angle to the surface to be cut, as exemplified in the position of a plane-iron. We find, therefore, that with the sides of the valve-seat set at the angle described the scale does not cut the wearing-faces of the web of the plug both on account of the angle at which it is thus presented to the ends of the web and on account of the comparative ease with which the movement of the plug when the valve is opened will strip the scale away from the point of juncture between the web and the seats, and thus leave little or no scale to act on the ends of the web. As a matter of fact we find in practice that when our valve is used as a boiler blow-off it remains unimpaired for months, while blow-off valves of ordinary types will become leaky in the course of a very few weeks. It will be seen on reference to Fig. 1 that the taper-plug E is provided with a stem H, of ordinary construction, having its projecting end square to receive a wrench for opening and closing the valve. A groove is cut at the top circular portion of the plug opposite a small groove J in the body of the valve, the channel thus formed being designed to receive a ball K, which runs therein and forms a stop to prevent the plug being turned beyond the position to properly close it; but we claim nothing for this particular construction.

What we claim as our invention is—

1. In a cut-off valve a taper-plug having circular ends connected by a web in combination with a valve-body adapted to receive the said plug and provided with raised valve-seats, one at each side of its central passage, of the same width as the ends of the said web, substantially as described.

2. In a cut-off valve a taper-plug having circular ends connected by a web, the ends of the web being less in width than the diameter of the central passage of the valve in combination with a valve-body adapted to receive

the said plug and provided with raised valve-seats, one at each side of its central passage of the same width as the ends of the said web substantially as described.

3. In a cut-off valve a taper-plug having circular ends connected by a web in combination with a valve-body adapted to receive the said plug and provided with raised valve-seats, one at each side of its central passage, of the same width as the ends of the said web, the sides of the seats lying substantially in planes radial from the axis of the plug substantially as described.

4. In a cut-off valve a taper-plug having circular ends connected by a web, the ends of the web being less in width than the diameter of the central passage of the valve, in combination with a valve-body adapted to receive the said plug and provided with raised valve-seats of the same width as the ends of the said web, the sides of the seats being substantially in planes radial from the axis of the plug, substantially as described.

5. In a cut-off valve a taper-plug having circular ends connected by a web, the ends of the web being less in width than the diameter of the central passage of the valve, in combination with a valve-body adapted to receive the said plug and provided with raised valve-seats of the same width as the ends of the said web each side of each seat joining the face at an angle which will not give scale forming on the side an effective cutting angle against the end of the web engaging the face substantially as described.

Dated at Toronto, February 10, 1902.

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Witnesses:

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