No. 782,060. PATENTED FEB. 7, 1905.

M. ROTHFUSS.

RECIPROCATING VALVE.

APPLICATION FILED AUG. 1, 1903.

FIG. 1.

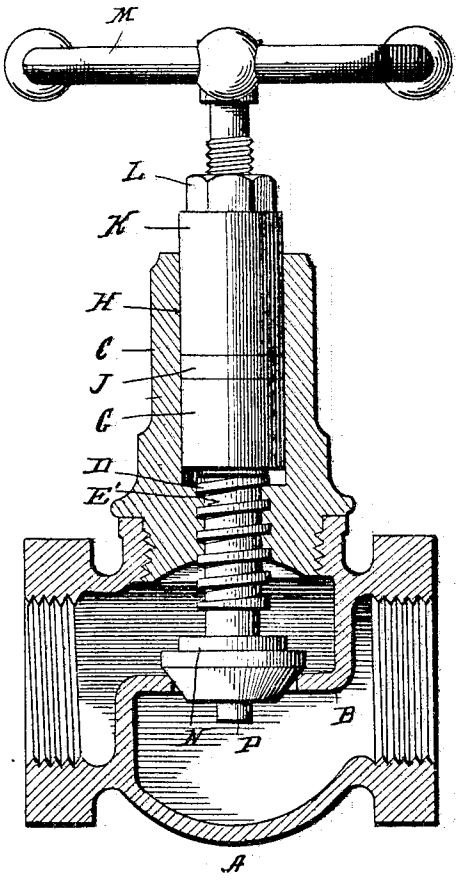


FIG. 2.

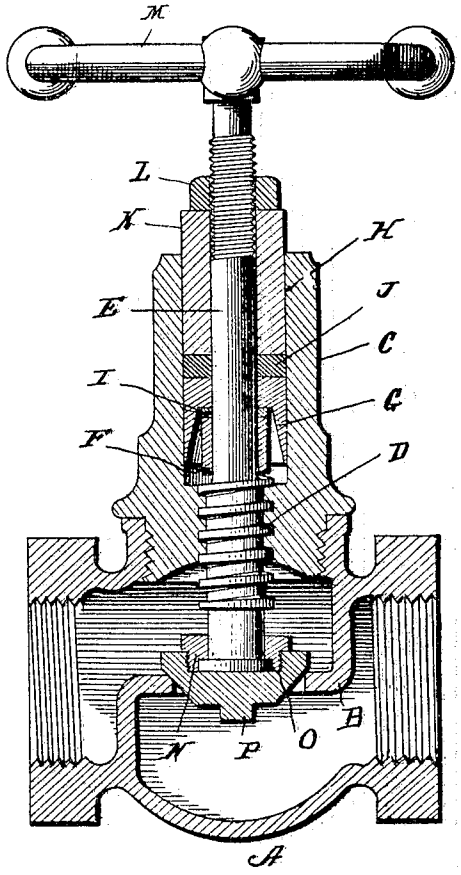


FIG. 3.



FIG. 4.

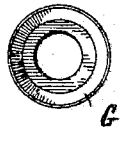


FIG. 5.

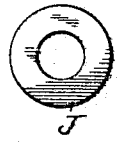
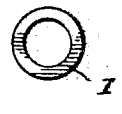


FIG. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

MICHAEL ROTHFUSS, OF WILLIAMSPORT, PENNSYLVANIA.

RECIPROCATING VALVE.

SPECIFICATION forming part of Letters Patent No. 782,060, dated February 7, 1905.

Application filed August 1, 1903. Serial No. 167,842.

To all whom it may concern:

Be it known that I, MICHAEL ROTHFUSS, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Reciprocating Valves, of which the following is a specification.

This invention relates to valves of the class which are opened by the reciprocating movement of a plunger.

The object of the invention is to produce a valve in which the valve stem or spindle shall be self-packing and shall move in a cylindrical casing with little friction and small danger of leakage, whether used with liquids, steam, or gases.

Figure 1 is a longitudinal section of the valve, showing the plug and spindle or stem in elevation. Fig. 2 is a longitudinal section showing plug and spindle-bushing in section. Fig. 3 is a top and Fig. 4 a bottom view of packing-thimble. Fig. 5 is a plan of fibrous washer, and Fig. 6 is a plan of the spindle-collar.

The valve-casing or body portion A is of usual construction, with a partition B, in which the plug P finds its seat. The spindle-guide C, which completes the casing or body, is made attachable to the part A by a screw-thread in the form of valve illustrated. This spindle-guide has a screw-threaded aperture D above the seat for the valve-plug, and the spindle E, screw-threaded at E', passes through this aperture, and by turning the spindle or stem E the plug is advanced toward or lifted from its seat. The spindle-guide is open-ended—that is, it has no cap or cover other than the spindle passing through it. The spindle is thus accessible for repacking, &c., and the condition of the spindle may be seen without removing a screw-cap, as is commonly done. Further, the spindle and its attached packing may be much larger than is usual, thus insuring a wearing-surface of much longer endurance than is common. All the packing is applied to the spindle and moves therewith.

Above the threaded hole D there is a cylindrical chamber H in the spindle-guide, and this chamber H is occupied by a bushing or packing on the spindle, which bushing or packing is of peculiar construction, as will be explained.

A collar or enlargement of the spindle E is shown at F. A thimble G is supported on this collar or enlargement, the lower edge of said thimble being thin and neatly conforming to the interior of chamber H. The upper end of the thimble G has a passage exactly fitted to the part of spindle E which passes through said thimble. The collar or enlargement F supports the thimble from below, and if desirable a washer I may be inserted between the enlargement of the spindle and the bottom or end of the thimble.

Above the thimble a packing-ring J, of fiber or any suitable material, may be inserted. Above this packing a bushing K is secured to the spindle. The bushing neatly fits in the chamber H and is preferably held on the spindle by a nut L, which nut binds the bushing, packing, and thimble tightly to the spindle.

Any suitable handle or lever M may be attached to the spindle for the purpose of turning the same, and thus raising or lowering the plug P, so that the passage through partition B may be opened or closed. Plug P may be held to a head O on the spindle by a sleeve-nut N or in other suitable manner.

Whether the valve is used with liquid or gas, there is a tendency to leakage through the threaded passage D around thread E'. To avoid the necessity of packing very closely about the stem or spindle above this screw, the thimble G is applied as described. Any fluid or gas passing up around the spindle will enter the interior of said thimble, and if there be much internal pressure will expand such thimble, especially at and near the top edge. This causes the thimble to fit snugly in chamber H and prevents leakage around the outside of said thimble, while the packing J prevents leakage through the bottom of the thimble. The bushing K slides easily in the chamber H, and as it has a large surface this bushing will not be worn appreciably by much use of the valve. The outside of thimble G and bushing K (together with packing J, when such is used) forms a smooth piston to work neatly in the chamber H and guide the spindle therein.

The spindle-guide C when removed from the casing or body A takes the spindle and plug with it, and the valve-seat E in the body A is then readily accessible. The spindle is entirely packed and guided in the spindle-guide C and gets its movement for opening and closing the valve from the thread E of the spindle engaging the threaded aperture in the guide C. The upper end of the spindle is passed through the threaded opening from below, and all the packing is attached to the spindle and moves with it. This packing moves in the open-ended chamber H of the spindle-guide C. The packing can be entirely removed and replaced while the valve-plug is held firmly on its seat through the open slot of chamber H, or the entire plug, spindle, and packing can be removed and replaced without in any manner disturbing the body A, which in use is generally attached to pipes screwed into both ends, as is usual with valves of such general character.

What I claim is—

1. The combination with a valve-body having a partition with a seat for the valve-plug, of a valve-spindle casing removably connected to said valve-body and provided with a threaded passage and an open-topped cylindrical chamber above said passage, a valve-spindle having a plug at its lower end and a screw-threaded portion passing through said threaded passage, a thimble attached to the spindle and fitted in said cylindrical chamber and having a thin edge toward the valve-plug, and means for rotating said spindle.

2. The combination with a valve-body having a plug-seat, of a removable spindle-casing having a threaded passage and an open-topped cylindrical chamber above the same, a spindle having a plug at its lower end, a threaded portion passing through said threaded passage, a collar above said passage, a thimble attached to said spindle above the collar, said thimble fitting said chamber and presenting a thin edge downwardly, and auxiliary packing attached to said spindle above said thimble.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL ROTHFUSS.

Witnesses:
J. C. HILL,
B. BERNDT.