No. 654,484. Patented July 24, 1900.

O. NYGREN.

CHECK VALVE.

(Application filed Mar. 31, 1900.)

(No Model.)

Fig. 1.

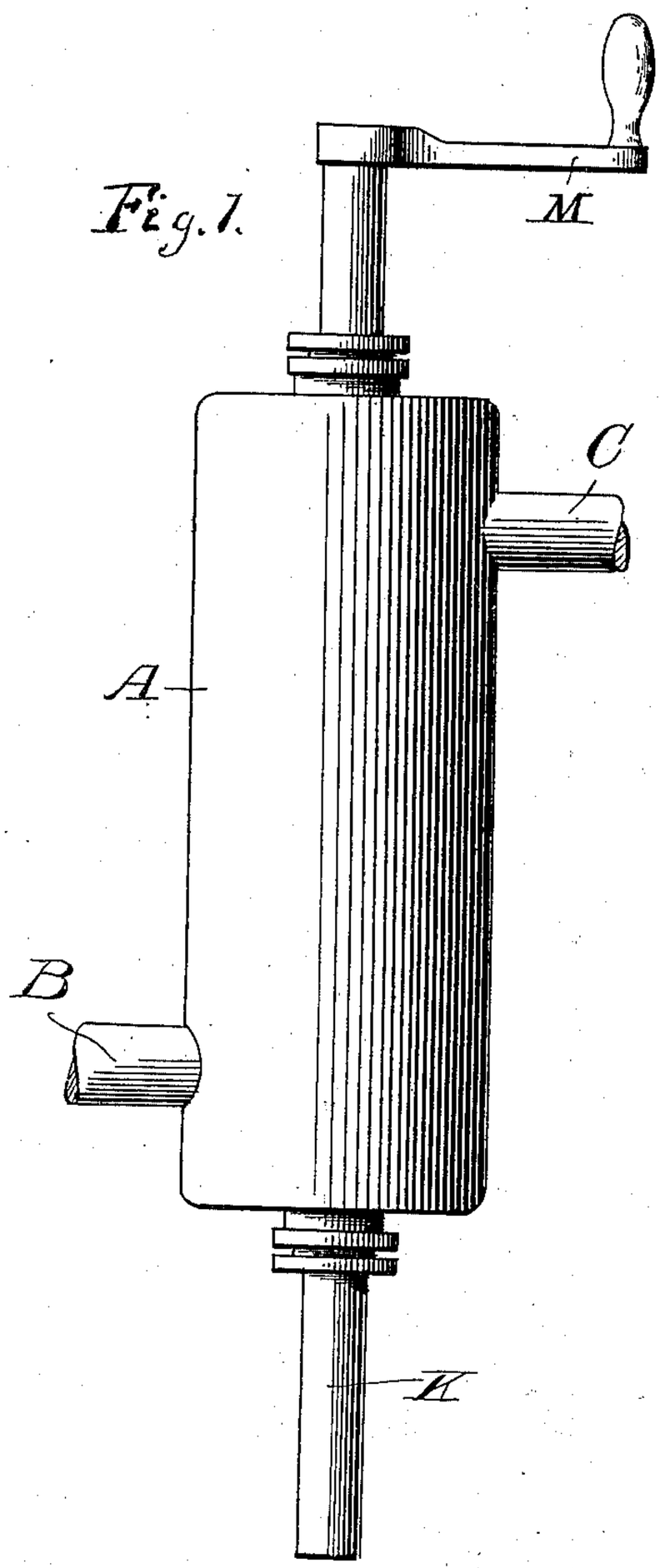
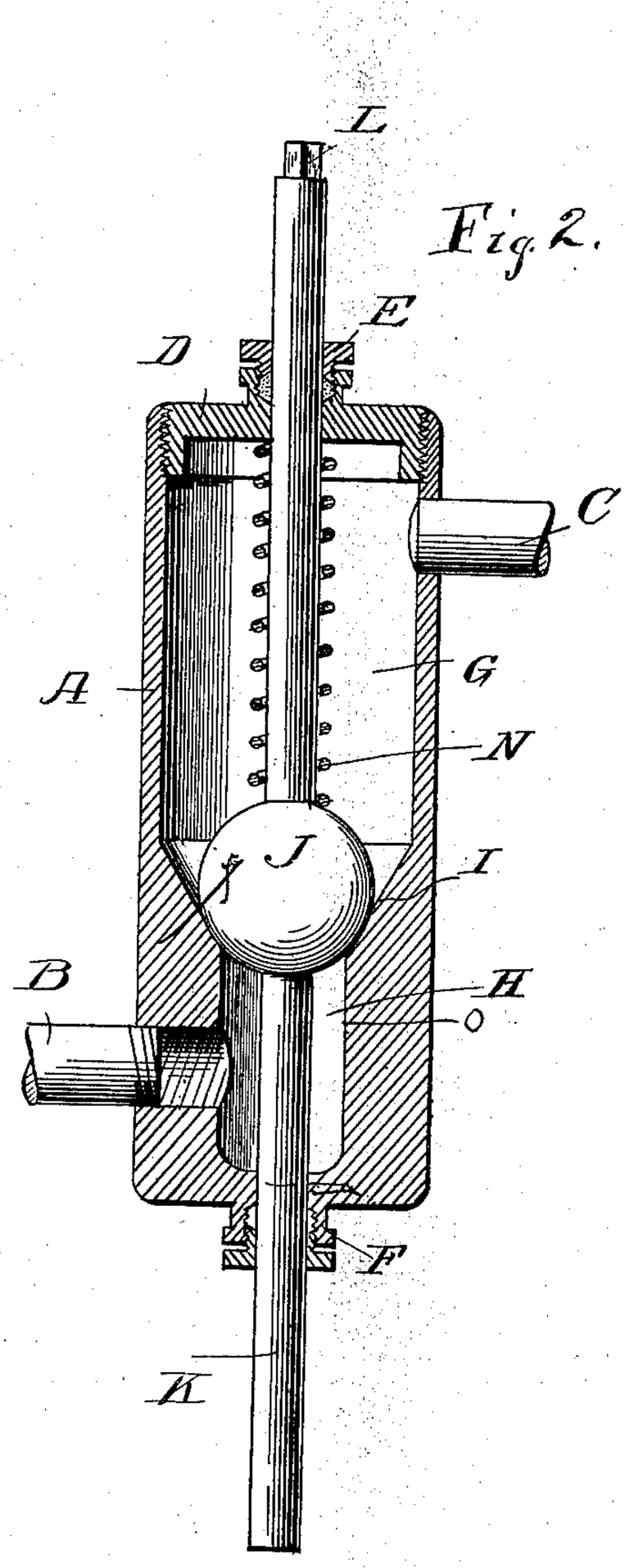


Fig. 2.



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UNITED STATES PATENT OFFICE.

OSCAR NYGREN, OF LAKE CITY, MINNESOTA.

CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 654,484, dated July 24, 1900.

Application filed March 31, 1900. Serial No. 10,981. (No model.)

To all whom it may concern:

Be it known that I, OSCAR NYGREN, a citizen of the United States, residing at Lake City, in the county of Wabasha and State of Minnesota, have invented certain new and useful Improvements in Check-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to check-valves for use in pumps, injectors, and in any other situation in which such valves are applicable.

In the practical use of check-valves I have discovered several objections to the constructions now in general use. Very often a grain of sand or other substance becomes lodged between the valve and its seat, causing the valve to leak, and in all constructions of check-valves with which I am acquainted such an accident requires that the engine or pump be stopped and the valve taken apart before the obstruction can be removed. Another objection is that the valve-seat has been usually made thin and will soon wear through. Another objection I have encountered is that when the valve and seat have been in use for some time they have been worn irregularly, and consequently caused to leak, necessitating, as in the removal of obstructions, the removal of the valve, the consequent stopping of the engine or pump, and the use of special grinding-tools made to fit the particular valve or seat. Another objection is that the check-valves usually have either no guide-stems or only one guide-stem usually seated in a short bearing, a consequence of such construction being that as the valve wears the stem also wears, resulting in an irregular or wabbling movement.

The object of this invention is to provide a check-valve of a construction in which all of these objections are overcome; and to this end the invention consists in an improved check-valve the construction, arrangement, and combination of the parts of which will be hereinafter fully described and the particular points of novelty set forth in the claim.

In the accompanying drawings, Figure 1 represents my improved check-valve in elevation, the inlet and outlet pipes being broken away. Fig. 2 represents the invention in longitudinal section with the valve and stem in elevation.

Corresponding parts are indicated by the same letters of reference in both figures.

Referring to the drawings by letters, A indicates the valve-casing, which is preferably arranged vertically and is provided with an inlet-pipe B near the bottom and an outlet-pipe C near the top, which pipes preferably, but not necessarily, lead into and from opposite sides of the casing. The upper end of the casing consists of a removable head D, while the lower end is preferably integral with the casing, these heads being provided with openings in vertical alinement with each other and with suitable stuffing-boxes E and F. In the interior of the casing are formed an upper cylindrical chamber G and a lower cylindrical chamber H of less diameter, a valve-seat I, frusto-conical in form, connecting the two cylindrical chambers.

J indicates the valve, preferably in the form of a ball, of less diameter than the upper cylindrical chamber G and of greater diameter than the lower cylindrical chamber H, and consequently of a proper diameter to lodge in the valve-seat I. The valve J is rigidly mounted upon or it may be integral with a long stem K, which passes through the openings in both the upper and lower heads of the valve-casing and projects above and below said casing, being of angular or other suitable form L at its upper end to receive a crank or other handle M, as indicated in Fig. 1. Surrounding the stem K is a spiral spring N, having its lower bearing against the valve J and its upper bearing against the removable head D, by virtue of which arrangement its force is normally exerted upon the valve to maintain it in the seat I, the strength of the spring being adjustable by screwing the head D inward or outward, as may be desired.

It will be observed that the wall O of the lower cylindrical chamber H forms a continuation of the valve-seat.

In the practical operation of the invention the liquid or fluid passing through the valve enters through the pipe B and when under

sufficient pressure raises the valve off its seat, passes into the upper chamber G, and out of the exit-pipe C.

By reason of the projection of the stem through the casing-heads any obstruction which may lodge between the valve and its seat may be removed by manipulating the valve upward and downward by grasping the stem above or below the casing. By reason of the walls O of the lower chamber forming, as it were, an extension of the material of the valve-seat the seat may be ground many times without destroying its utility, as would be the case if said seat were of less thickness or extent. The valve or the valve-seat, or both, will preferably be made of brass or some material softer than iron, so that when the valve or seat become slightly worn they may be caused to fit again by placing the crank or handle M upon the upper end of the stem and rotating the valve, in the meantime pressing the valve forcibly against the seat. In this way the valve may be used a much longer time without the necessity of grinding and, as before stated, may be ground a large number of times before its utility is exhausted. By reason of the valve-stem being extended through the top and bottom of the casing it is given a bearing at a considerable distance above and below the valve, the result of which is that the proper vertical movement of the valve will be maintained for a much longer time than in a valve without a stem or with but a single stem above or below.

While I have specifically described the construction and arrangement of the various parts, it will be obvious to those skilled in the art that slight changes may be made therein without affecting the limit or scope of the invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

A check-valve comprising a cylindrical casing provided with two cylindrical chambers of different diameters in line with each other, and a valve-seat connecting the adjacent ends of the walls of said chambers, in combination with a valve-stem projecting through the ends of the casing and centrally through said chambers, a valve rigid on said stem, a spring for normally seating the valve, and means, outside of the casing, for turning the valve-stem and valve and simultaneously pressing the valve into its seat, substantially as described.

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

OSCAR NYGREN.

Witnesses:

GEORGE H. HAMMOND,

W. C. WISE.