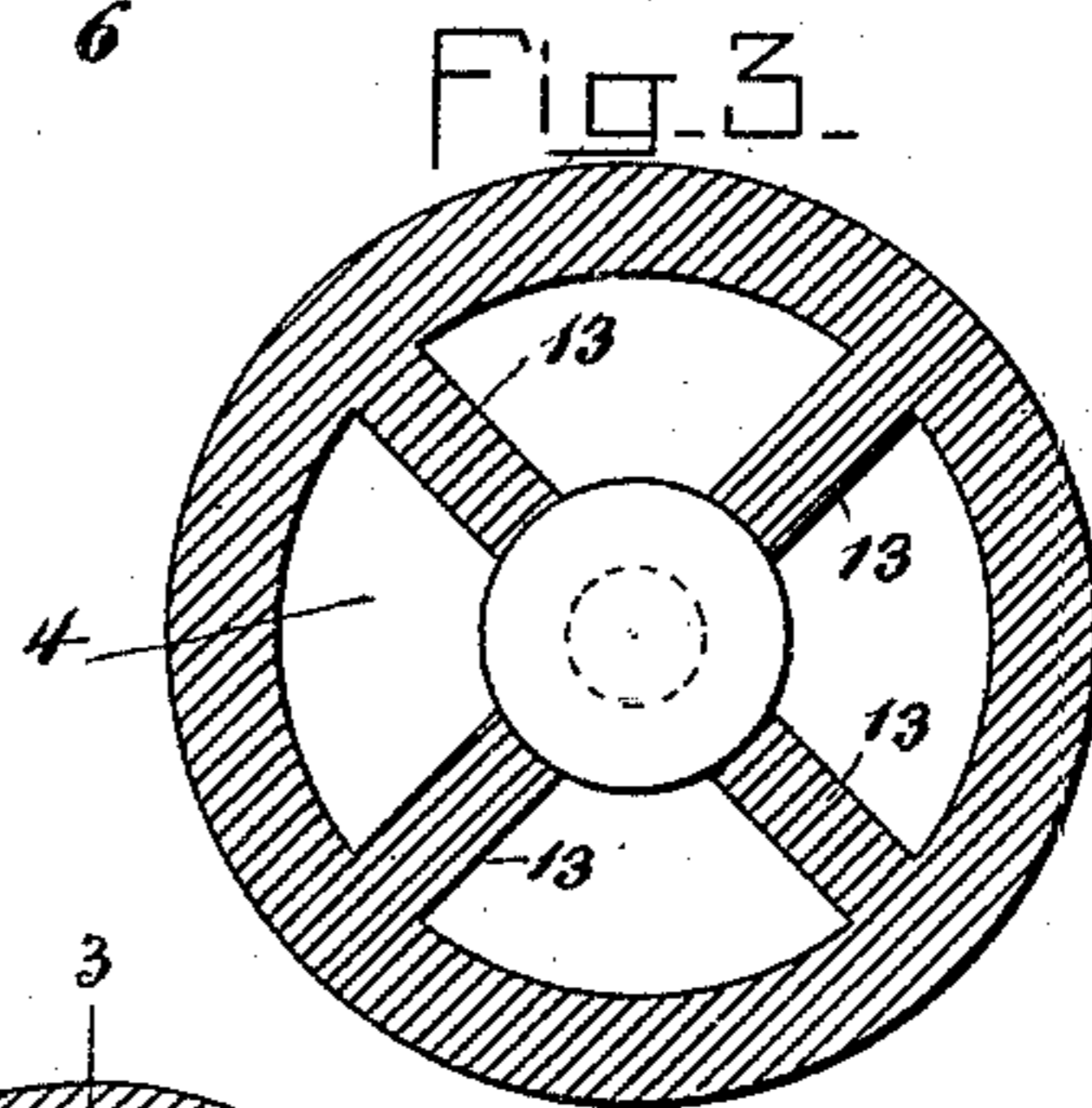
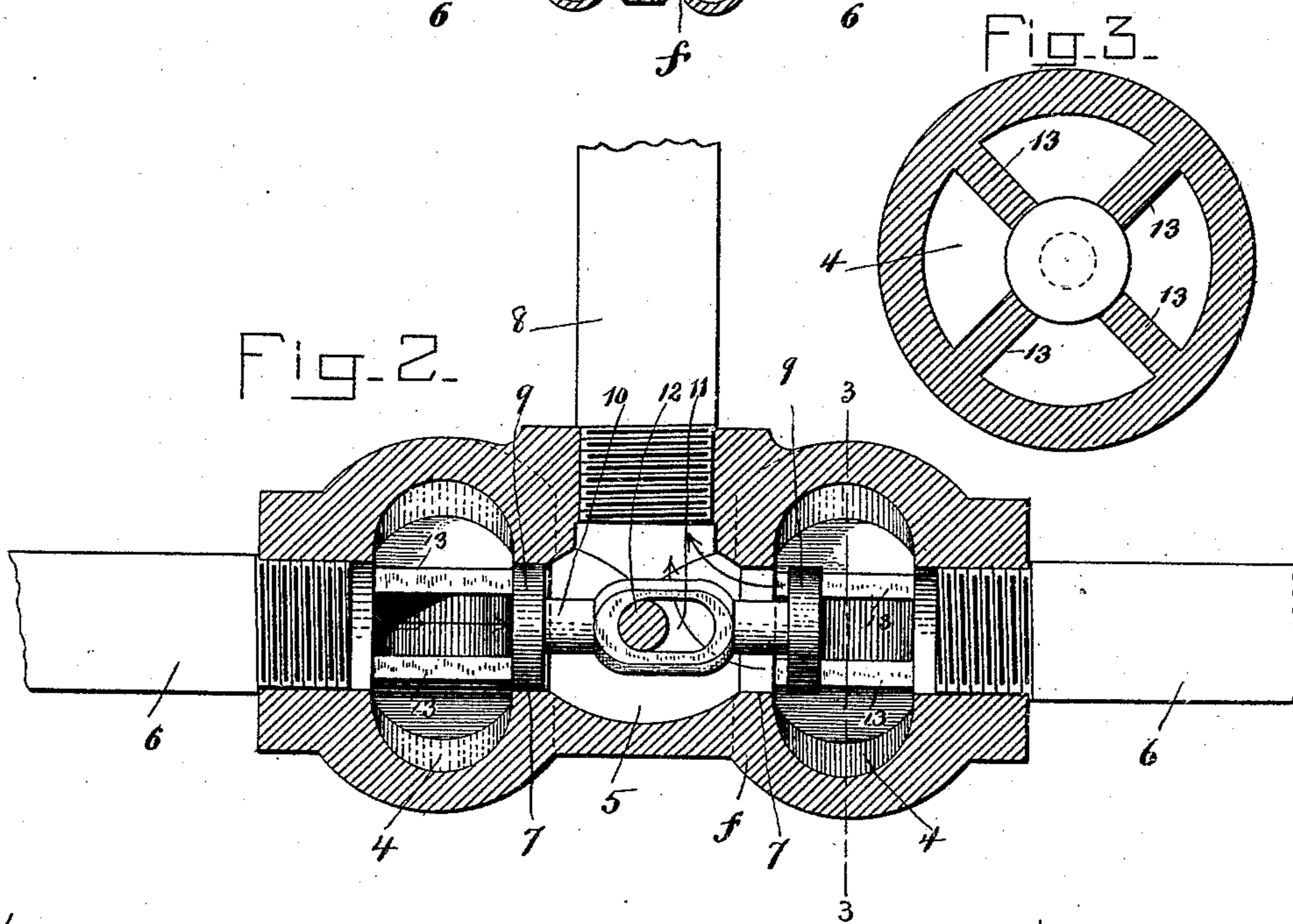
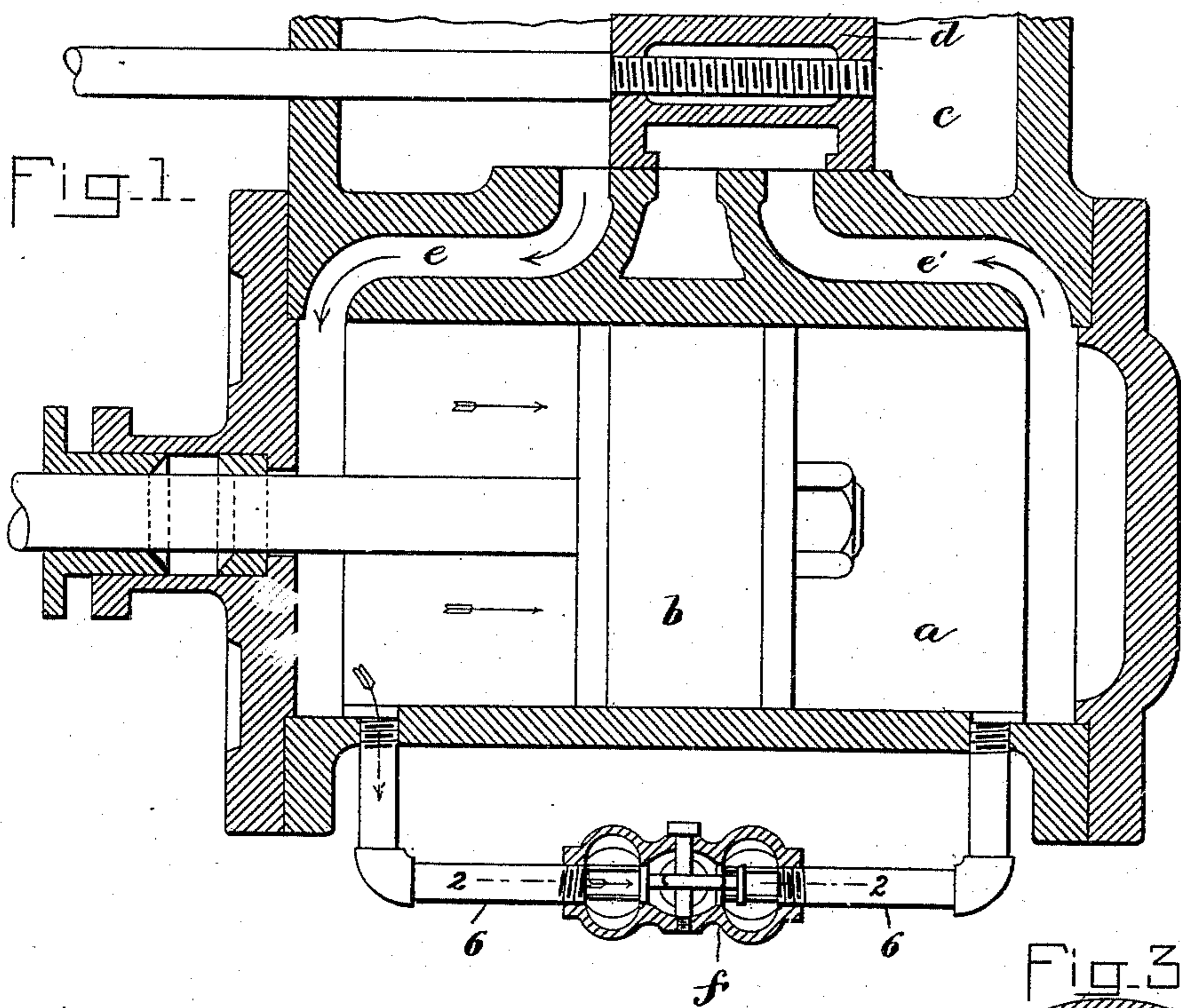


(No Model.)

W. L. & W. C. DODGE.
CYLINDER COCK.

No. 445,979.

Patented Feb. 10, 1891.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM L. DODGE AND WILLIAM C. DODGE, OF HAVERHILL, MASSACHUSETTS; SAID WILLIAM L. DODGE ASSIGNOR TO ORIN E. MICKEL, OF SAME PLACE.

CYLINDER-COCK.

SPECIFICATION forming part of Letters Patent No. 445,979, dated February 10, 1891.

Application filed June 2, 1890. Serial No. 353,942. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM L. DODGE and WILLIAM C. DODGE, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Cylinder-Cocks, of which the following is a specification.

This invention relates to cocks which are used to permit the escape of water of condensation from steam-cylinders generally, and particularly to that class of cylinder-cocks which are operated automatically by the movement of the piston in the cylinder in contradistinction to the more common type, in which each cock is opened and closed by a movement of the engineer or fireman through devices connecting the cylinder-cocks with the cab of a locomotive.

The invention has for its object to provide a simple and effective automatic cylinder-cock; and it consists in the improved construction which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of the cylinder and steam-chest of a locomotive-engine and a cylinder-cock embodying my improvements connected with the cylinder. Fig. 2 represents an enlarged section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 2.

The same letters and figures of reference indicate the same parts in all the figures.

In the drawings, *a* represents the cylinder of a steam-engine, and *b* represents the piston thereof.

c represents the steam-chest, *d* the valve therein, and *e e'* the ports connecting the opposite ends of the cylinder with the steam-chest, all of the parts above named being of the usual form and arranged in the usual way.

f represents the casing of my improved cylinder-cock, the same being provided with two chambers or enlargements 4 4, and a central chamber 5 between the chambers 4 4.

6 6 represents pipes connecting the chambers 4 4 with the opposite ends of the cylinder *a*, so that water of condensation from either end of the cylinder may pass through one of the pipes 6 to the casing *f*. The cham-

bers 4 4 are connected with the central chamber 5 by means of cylindrical ports or passages 7 7, through which any water of condensation entering either chamber 4 may pass to the central chamber 5, from which it escapes through an outlet-pipe 8, extending through the side of the casing *f* and connecting with the chamber 5.

9 9 represent circular or disk-shaped valves formed to closely fit the passages 7 7, so that when either valve is in the corresponding passage the chamber 5 will be shut off from the chamber 4 at the opposite side of said valve. The valves are connected by a stem 10, said valves and stem being preferably made in a single piece. The stem 10 is of such length that when one valve is in the corresponding passage 7, inclosing the latter, the other valve will project outside of the other passage 7 and occupy a position in the chamber 4, which is connected by the last-named passage 7 with the central chamber 5, so that when communication between the central chamber 5 and either of the chambers 4 is shut off by one of the valves the other chamber 4 will be in communication with the central chamber 5.

The stem 10 is provided with an enlargement between the valves 9 9, and in said enlargement is formed a slot 11, through which passes a stud 12, which is affixed to the casing and passes through the center of the chamber 5. The slot 11 is of such length that it limits the sliding movement of the valves 9 9 in each direction, so that each valve can move inwardly or toward the central chamber no farther than is required to close the passage 7, with which such valve co-operates.

In each chamber 4 are a series of longitudinal guides 13, formed as radial ribs on the interior of the casing, their inner edges being arranged to support the valve 9, that projects into the chamber 4, so that valve 9 is supported on all sides when it projects into the chamber 4 as well as when it occupies a position within the passage 7.

The operation is as follows: Suppose steam to be moving in the direction indicated by the arrow in Fig. 1. A portion of the steam entering the cylinder enters the left-hand end

of the casing *f* through the pipe 6, connecting that end with the cylinder, and forces the valves 9 9 to the position shown in Figs. 1 and 2, one of the valves being thus moved to position to shut off the left-hand end of the cylinder from the central chamber 5 and outlet-passage 8, while the other valve 9 is moved outwardly into the other chamber 4, so that a space exists around it through said chamber 4 and between the guides 13 therein for the passage of the water of condensation from the right-hand end of the cylinder to the central chamber 5 and outlet 8. When the movement of piston *b* is reversed, the contents are reversed in the cylinder-cock, the valve 9, which is shown in the drawings as projecting into the chamber 4, connected with the right-hand end of the cylinder, being moved inwardly into the corresponding passage 7, while the other valve 9 is moved outwardly and opens communication between the left-hand end of the cylinder and the central chamber 5. It will be seen, therefore, that the cylinder-cock is always open at the exhausting end of the cylinder, so that there is always a free escape of the water of condensation without loss of steam from the opposite end of the cylinder.

We are aware that it is not new to construct a cylinder-cock which is operated by the steam-pressure in the cylinder, so that the exhaust end of the cylinder is automatically connected with an escape or outlet for the

water of condensation. Hence we do not claim, broadly, the automatic operation of a cylinder-cock.

We claim—

1. In a cylinder-cock, the combination of the casing *f*, having the receiving-chambers 4 4, the central outlet-chamber 5, connected with the chambers 4 4 by ports or passages 7 7, the guides 13 in the chambers 4 constituting continuations of the passages 7, the valves 9 9 and their connecting-stem 10, and means for limiting the endwise movement of said valves, as set forth.

2. In a cylinder-cock, the combination of the casing *f*, having the receiving-chambers 4 4, the central outlet-chamber 5, connected with the chambers 4 4 by ports or passages 7 7, the guides 13 in the chambers 4, constituting continuations of the passages 7, the valves 9 9 and their connecting-stem 10, said stem having a slot 11 and a fixed stud or pin passing through said slot, the pin and slot being arranged to limit the longitudinal movements of the valves, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 28th day of May, A. D. 1890.

WILLIAM L. DODGE.
WILLIAM C. DODGE.

Witnesses:

MINNIE E. MARCY,
FREDERICK O. RAYMOND.