

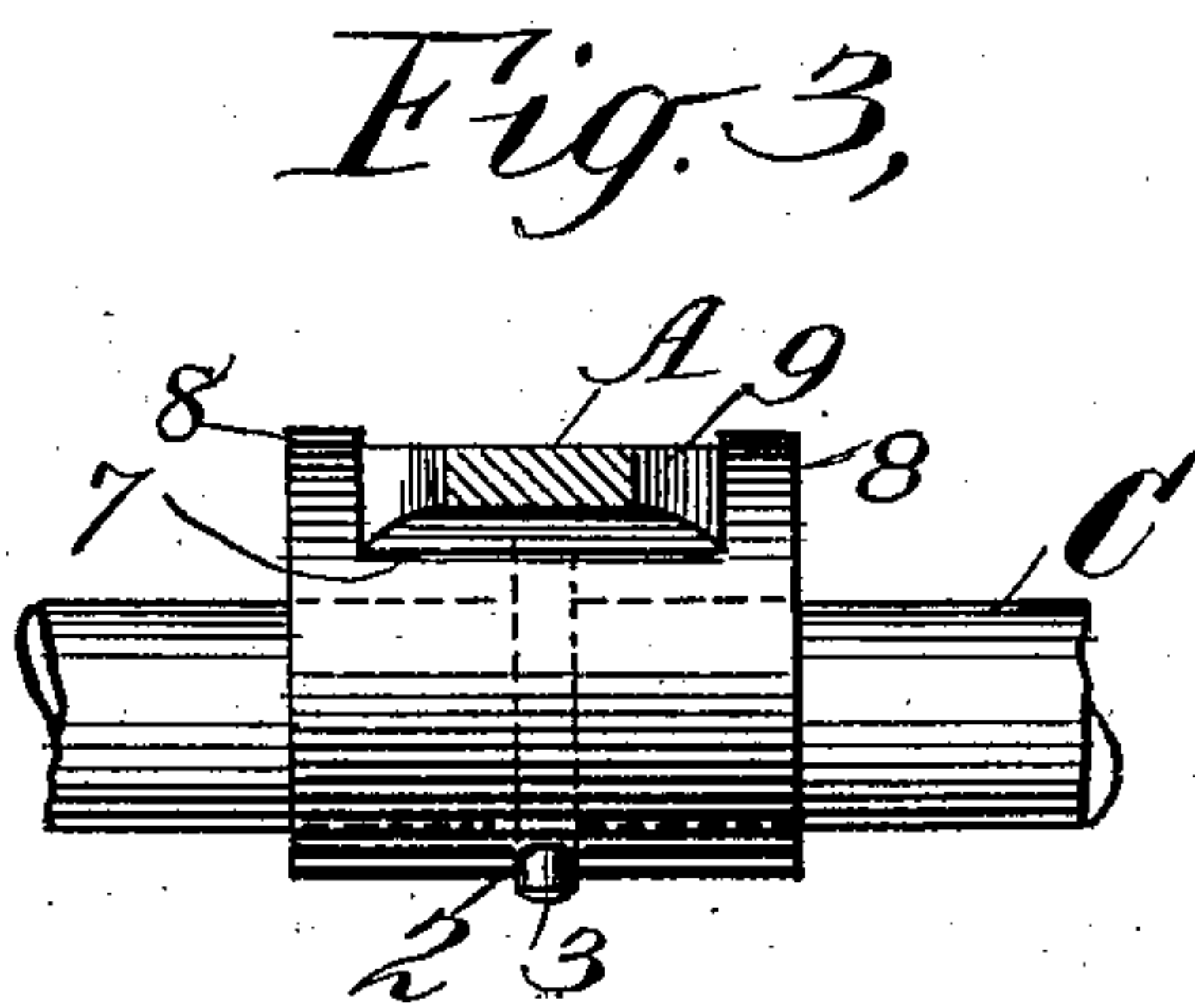
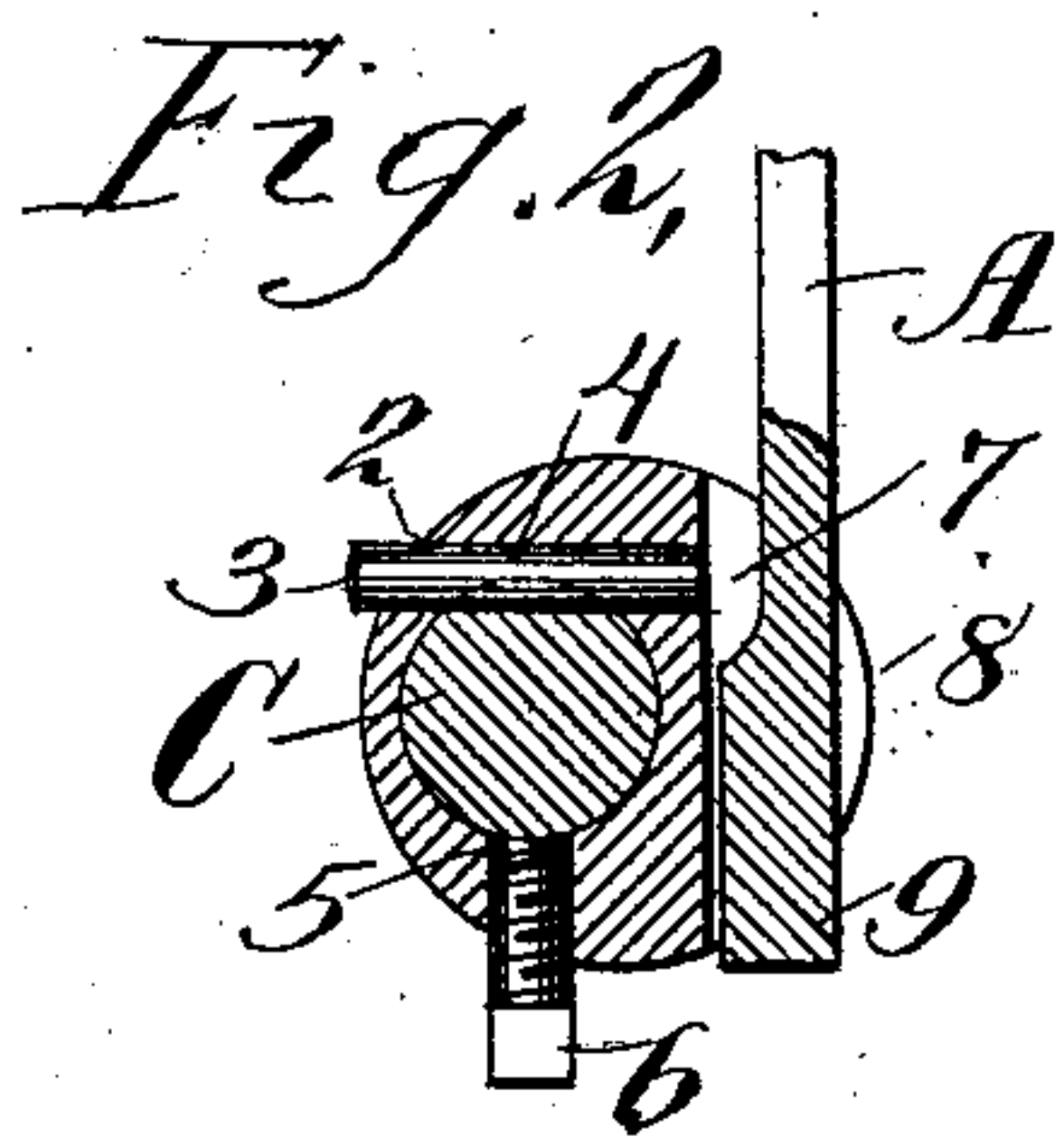
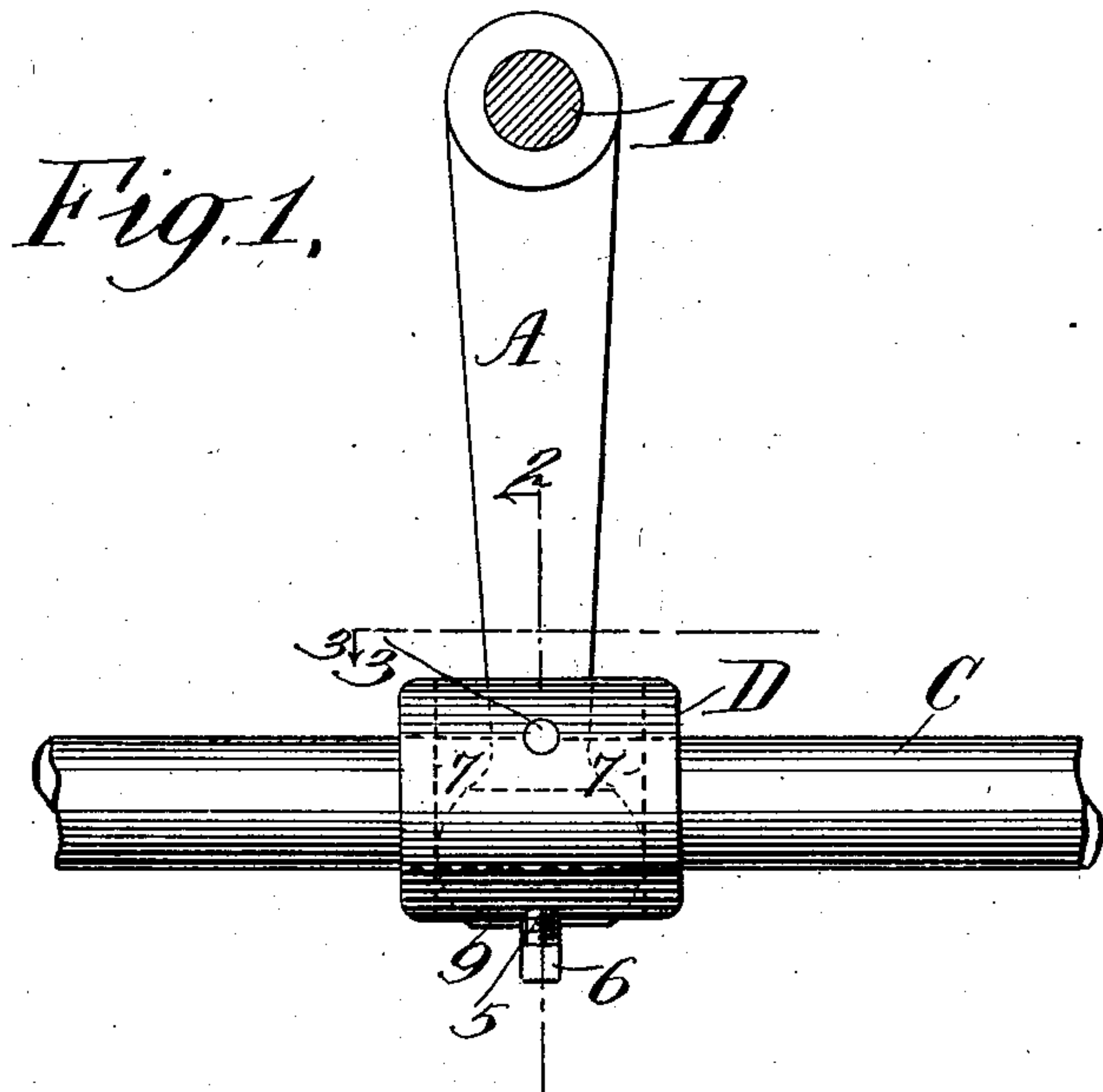
No. 709,940.

Patented Sept. 30, 1902.

P. THOMAS,  
VALVE LEVER SPOOL.

(Application filed Dec. 19, 1901.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

PHILIP THOMAS, OF BROOKLYN, NEW YORK, ASSIGNOR TO HENRY R. WORTHINGTON, A CORPORATION OF NEW JERSEY.

## VALVE-LEVER SPOOL.

SPECIFICATION forming part of Letters Patent No. 709,940, dated September 30, 1902.

Application filed December 19, 1901. Serial No. 86,480. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP THOMAS, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Valve-Lever Spools, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide an improved valve-lever spool for connecting the piston-rod to the valve-motion lever in engines in which the valve-movement is operated from the piston-rod—as, for instance, in the well-known duplex pumping-engines, in which each piston-rod moves the valve or valves on the opposite side of the engine through a lever actuated by the piston-rod and a crossover-shaft connected to the valve or valves. I aim especially at the production of such a spool which shall be symmetrical in form and of great strength, simple and light in construction, and which shall be cheap of manufacture and readily and efficiently secured to the piston-rod.

For a full understanding of the invention a detailed description of the same will now be given in connection with the accompanying drawings, forming a part of this specification, showing a construction embodying the invention in its preferred form, and the features forming the invention will then be specifically pointed out in the claims.

In the drawings, Figure 1 is a vertical side elevation of a valve-motion-lever spool and portion of a piston-rod carrying the spool. Fig. 2 is a cross-section on the line 2 of Fig. 1. Fig. 3 is a section on the line 3 of Fig. 1.

Referring to said drawings, A is the valve-motion lever; B, the shaft actuated thereby or stud on which it is mounted; C, the piston-rod, and D the spool, carried by the piston-rod and actuating the lever A. The spool shown consists of a cylindrical piece of metal, such as a piece of shafting, which is bored longitudinally at one side of the center to form the piston-rod opening 1, the center of this opening being in line with the center of the spool, but sufficiently on one side of the center to provide for the thickness of metal on the opposite side required for the valve-lever groove, the piece

of metal forming the spool being of such size relatively to the piston-rod as to secure the required thickness of metal on one side of the piston-rod for the valve-lever groove and on the opposite side for strength of construction without waste of metal. The spool is bored transversely to the opening 1 to form the position-pin opening 2, this opening intersecting the piston-rod opening 1 so that the position-pin 3 will pass through a notch 4 in the piston-rod for positioning the spool on the piston-rod, and at the opposite side of the piston-rod opening 1 the spool is tapped with a screw-threaded opening 5 to receive a set-screw 6, adapted to bear against the piston-rod and lock the spool rigidly on the piston-rod. The side of the spool D on which the required thickness of metal has been secured by setting the piston-rod opening at one side of the spool center is cut away to form the valve-lever groove 7, having at the opposite ends of the spool the ears 8, which groove 7 receives the head 9 of the valve-motion lever A, so that the movement of the spool D with the piston-rod C moves the lever A in opposite directions by the ears 8.

It will be seen that my invention provides a very simple, cheap, light, and strong spool, which may readily and cheaply be formed from a piece of common shafting or other suitable metal. The forming of the piston-rod opening at one side of the center of the cylindrical spool, but with its center in line with the center of the spool, secures with little metal the thickness required for the valve-lever groove and the position-pin and set-screw.

While the spool shown is especially adapted for use in actuating a valve-motion lever from the piston-rod of an engine, it will be understood that it may be used also in actuating other levers from other rods, and the invention, broadly considered, includes such other uses.

What I claim is—

1. A valve-lever spool consisting of a piece of metal with piston-rod opening 1 at one side of the center and groove 7 and ears 8 at the opposite side of the center adapted to receive the valve-lever, substantially as described.

2. A valve-lever spool consisting of a cy-



lindrical piece of metal with piston-rod opening 1 at one side of the center of the spool and with the center of the piston-rod opening in line with the center of the spool, and groove 7 and ears 8 at the opposite side of the center adapted to receive the valve-lever, and having position-pin opening 2 transverse to and intersecting the piston-rod, and a set-screw opening 5 on the opposite side of the piston-rod opening from the position-pin opening, substantially as described.

3. The combination with piston-rod C and valve-lever A, of spool D formed of a piece of metal with piston-rod opening 1 at one side of the center, and groove 7 and ears 8 at the opposite side of the center receiving the valve-lever, and means for securing the spool on the piston-rod, substantially as described.

4. The combination with piston-rod C and valve-lever A, of spool D formed of a cylindrical piece of metal with piston-rod opening 1 at one side of the center of the spool and with the center of the piston-rod opening in

line with the center of the spool, and groove 7 and ears 8 at the opposite side of the center receiving the valve-lever, position-pin 3 passing through opening 2 in the spool and notch 4 in the piston-rod, and set-screw 6 bearing against the piston-rod on the opposite side from the position-pin, substantially as described.

5. A spool for connecting a lever to a reciprocating rod consisting of a cylindrical piece of metal with opening 1 for the rod at one side and in line with the center of the spool, and groove 7 and ears 8 on the opposite side of the center adapted to receive the lever, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PHILIP THOMAS.

Witnesses:

ARNOLD TANZER,  
WM. SCHWANHAUSSER.