

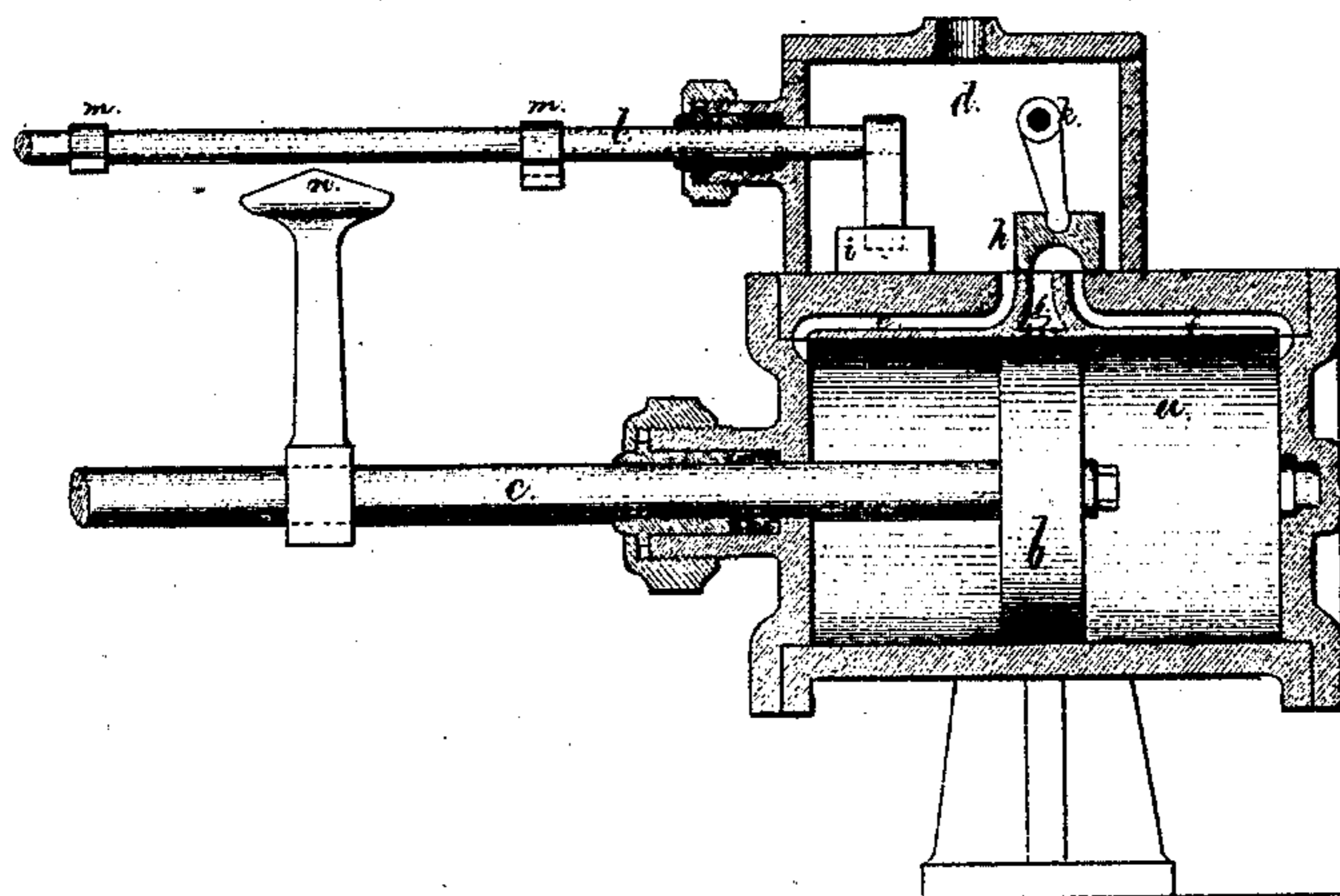
*J. W. Hopkins,*

*Cut Off Valve.*

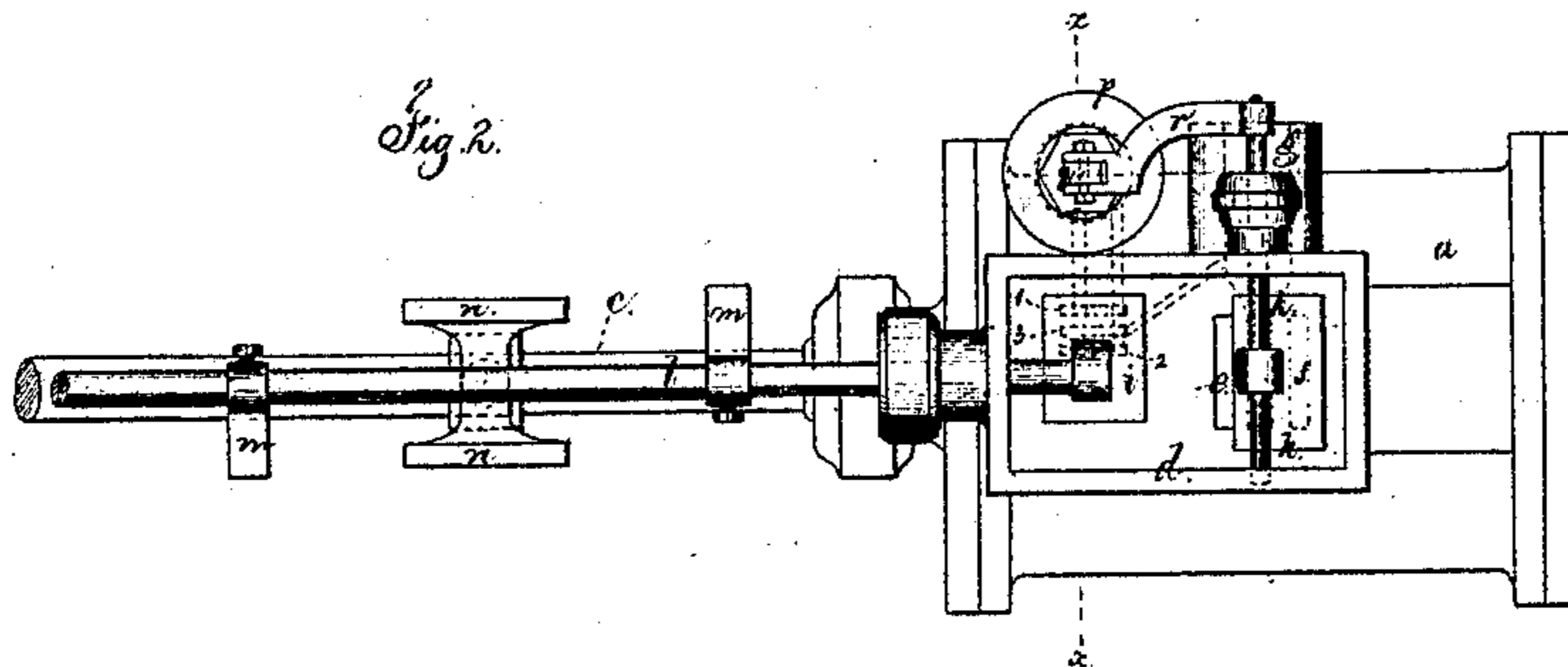
*No 94750.*

*Patented, Sept. 14, 1869.*

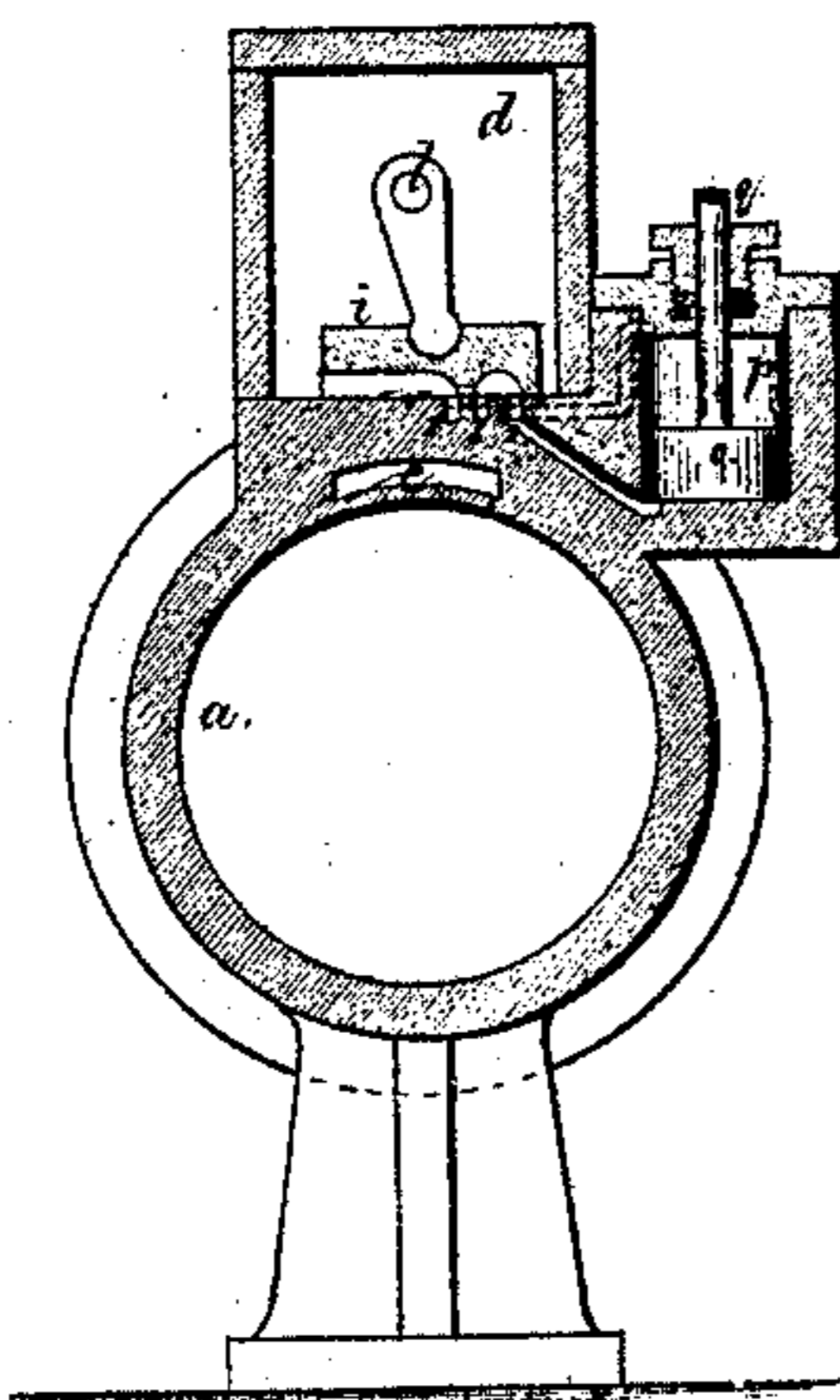
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Joseph W. Hopkins*

*Chas. S. Smith*

*Geo. D. Walker.*

*Witness*

# United States Patent Office.

JOSEPH W. HOPKINS, OF BROOKLYN, E. D., NEW YORK, ASSIGNOR  
TO HIMSELF AND WILLIAM H. M. PYE, OF SAME PLACE.

*Letters Patent No. 94,750, dated September 14, 1869.*

## IMPROVEMENT IN VALVES FOR STEAM-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern :*

Be it known that I, JOSEPH W. HOPKINS, of Brooklyn, E. D., in the county of Kings, and State of New York, have invented and made a new and useful Improvement in Valves for Engines; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a vertical longitudinal section of the cylinder and valve-chest;

Figure 2 is the plan of the same, with the cover of the steam-valve removed; and

Figure 3 is a cross-section, at the line *xx* of fig. 2.

Similar marks of reference denote the same parts.

This invention relates to a means for giving motion to the main valve of the engine, by the action of a small secondary valve that is worked by tappets and direct action from the piston-rod.

In valves that are operated by a secondary valve, difficulty frequently arises in constructing the parts so as to be easily accessible for examination, cleansing, or repairs, because the said parts have generally been enclosed within the steam-chest.

My invention is made with a view to obviating these inconveniences, and consists in a secondary valve within the steam-chest, operated by a rock-shaft and moving a piston in a secondary cylinder, in combination with the primary valve and rock-shaft, that are actuated by the piston of the secondary cylinder.

In the drawing—

*a* is the cylinder;

*b*, the piston;

*c*, the piston-rod;

*d*, the steam-chest;

*e* and *f*, the ports; and

*g*, the exhaust.

*h* is the steam-valve, and

*k*, the rock-shaft, for actuating the same.

These parts are of any usual construction or desired

size, and operate in the ordinary manner in admitting steam and exhausting.

Within the steam-chest *d* is the secondary valve *i*, that is operated by a rock-shaft, *l*, and toe, upon which rock-shaft *l* are adjustable arms, *m*, against which the opposite sides of the inclines *n* act alternately, to give said rock-shaft a partial rotation at the ends of the stroke.

The valve *i* is made with side-bearing ribs, in order that it may stand more firmly upon its seat, but the valve-portion proper is at one end, as seen in fig. 3.

In the seat of this valve are three ports, 1, 2, and 3, the first connecting with the bottom of the secondary cylinder *p*, that is placed in a convenient position at the side of the main steam-cylinder *a*, or valve chest.

The port 2 connects with the upper part of the cylinder *p*, and the port 3 leads to the main exhaust *g*.

The piston *o* has a rod, *q*, that is connected with the arm *r* of the main rock-shaft *k*.

It will now be understood that the secondary valve, being small, is operated with but little power, and supplies the steam to the cylinder *p*, and thereby moves the valve *h*, through the medium of the piston *o*, rod *q*, arm *r*, and rock-shaft; and the parts can be adjusted with the greatest accuracy, so as to admit steam to the secondary cylinder at exactly the proper moment, according to the position of the piston of the main engine, the arms *m* being movable for that purpose.

What I claim, and desire to secure by Letters Patent, is—

The secondary valve *i*, actuated by the rock-shaft *l*, in combination with the cylinder *p*, piston *o*, rod *q*, and arm *r*, for operating the valve of the main engine in the manner specified.

In witness whereof, I have hereunto set my signature, this 20th day of July, 1869.

Witnesses: JOSEPH W. HOPKINS.

GEO. D. WALKER,

GEO. T. PINCKNEY.