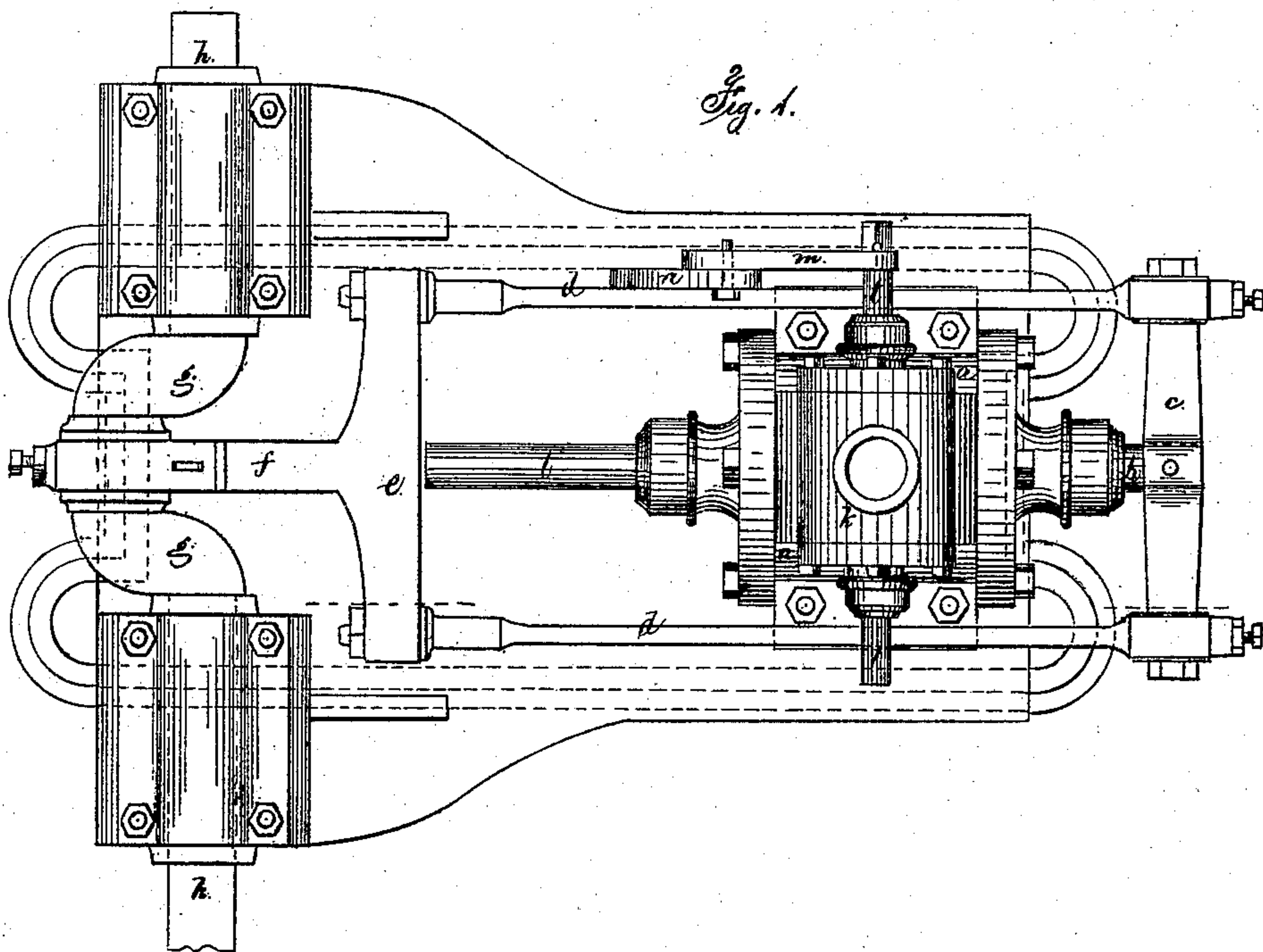
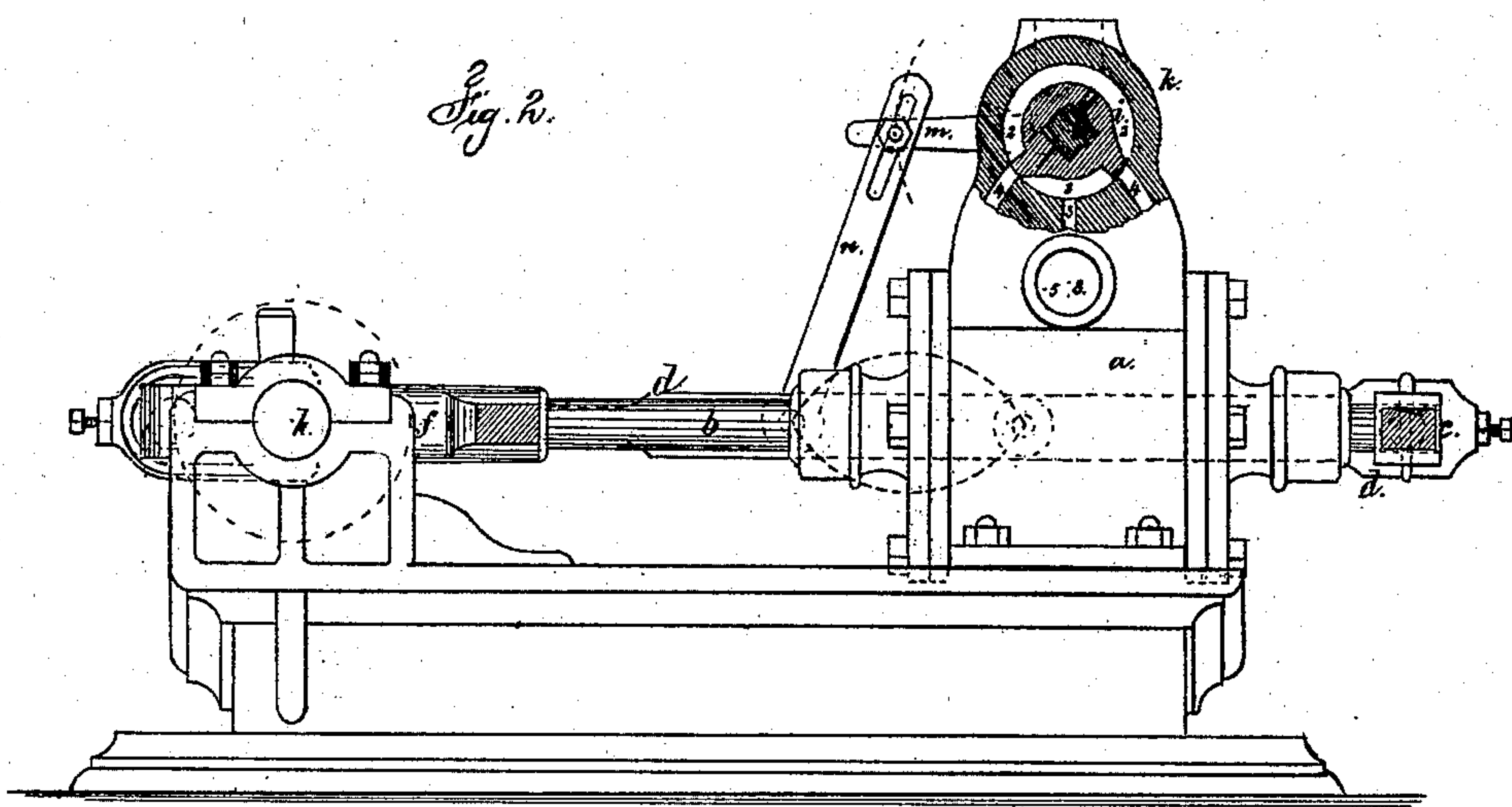


D. G. Starkey,

Cut Off Valve.

No. 104,224

Patented June 14, 1870.



Chas. H. Smith
Geo. A. Walcott

David G. Starkey
per Samuel W. Correll atty

United States Patent Office.

DAVID G. STARKEY, OF NEW YORK, N. Y.

Letters Patent No. 104,224, dated June 14, 1870.

IMPROVEMENT IN VALVE-GEAR OF 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, DAVID G. STARKEY, of the city and State of New York, have invented an Improvement in Steam-Engines, and the following is declared to be a correct description of the said invention.

This invention is for increasing the speed of the movement of the valve in opening and closing the ports and lessening the speed in the middle portion of the movement, thereby supplying steam more rapidly at the commencement of the stroke, and, hence, obtaining the full power of the engine.

In the usual movements of the valve by an eccentric the motion is very slow in opening and closing the ports; hence, the steam is "wire-drawn" at the portion where the movement should be the most rapid.

Instead of employing an eccentric or a cam I make use of a link actuated by the lateral movement of the pitman or connecting-rod.

This lateral motion is the most rapid as the crank passes the dead centers; hence, the valve is moved with rapidity in opening and closing the ports, and remains almost stationary while the piston is moving in the middle portions of the stroke.

I mount the piston upon a rod that passes through both heads, so as to form guides, and the cross-head is behind the cylinder, and from this the connecting-rods pass at the sides of the steam-cylinder to a second cross-head and connection to the crank.

In the drawing—

Figure 1 is a plan of my improved engine, and

Figure 2 is an elevation with the valve in section.

a is the steam-cylinder.

b, the piston-rod, connected to the cross-head *c*, and from the ends of said cross-head the two pitmen or connecting-rods *d d* pass along at the sides of the cylinder *a* to the cross-head *e*, from which the rod *f* connects to the crank *g* of the main shaft *h*.

The piston-rod *b* passes entirely through the cylinder *a*, so as to form a guide and dispense with the slides usually provided for the cross-head.

By using the second cross-head *e* and rod *f*, but one crank is required.

Above the cylinder *a* is the steam-chest *k*, containing the cylindrical valve *i*, in which are steam-ways 2 2, and exhaust-way 3, and in the chest are the ports 4 4, to the steam-cylinder and the exhaust-port 5.

The valve *i* is upon the stem *l* that passes through a stuffing-box, and has at the end an arm, *m*, from which the link *n* passes to the pitman or connecting-rod *d*.

The parts are united by joints, so as to allow of a free motion, and the connection between the arm *m* and link *n* should be adjustable, so that the proper position and movement may be obtained.

It will now be understood that when the crank *g* is near the quarter point, and the piston of the engine in the middle portion of its stroke, there is but little movement given to the valve, because there is but little lateral motion to the rods *d*, but, as the crank turns the center, the connecting-rods receive a rapid lateral motion, which motion is transmitted by the link *n* and arm *m* to the valve *i* to open one exhaust and the opposite steam-port with rapidity.

This construction of mechanism is very simple, and the rapid motion is given to the valve at the proper portion of the stroke, and but little motion during that part of the stroke where the steam and exhaust-ports require to be fully open.

In consequence of the arrangement of the connecting-rods, cross-heads and piston-rods, the engine is very compact, and there is no undue strain or wear upon any of the parts.

I do not claim a three-way cock or plug forming the valve for a steam-engine.

What I claim as my invention is—

1. A connection between the pitman or connecting-rod and the valve, substantially as set forth, so that the lateral movement of the said connecting-rod imparts a movement to the valve, as specified.

2. The cylindrical valve *i*, containing the steam and exhaust-ways, in combination with the arm *m*, link *n*, and pitman, arranged and acting substantially as set forth.

3. The arrangement of the connecting-rods *d d f*, cross-heads *c e*, and crank *g*, in the manner specified, in combination with the piston-rod passing through both heads of the cylinder, as and for the purposes specified.

In witness whereof I have hereunto set my signature this 1st day of April, 1870.

D. G. STARKEY.

Witnesses:

HAROLD SERRELL,
GEO. T. PINCKNEY.