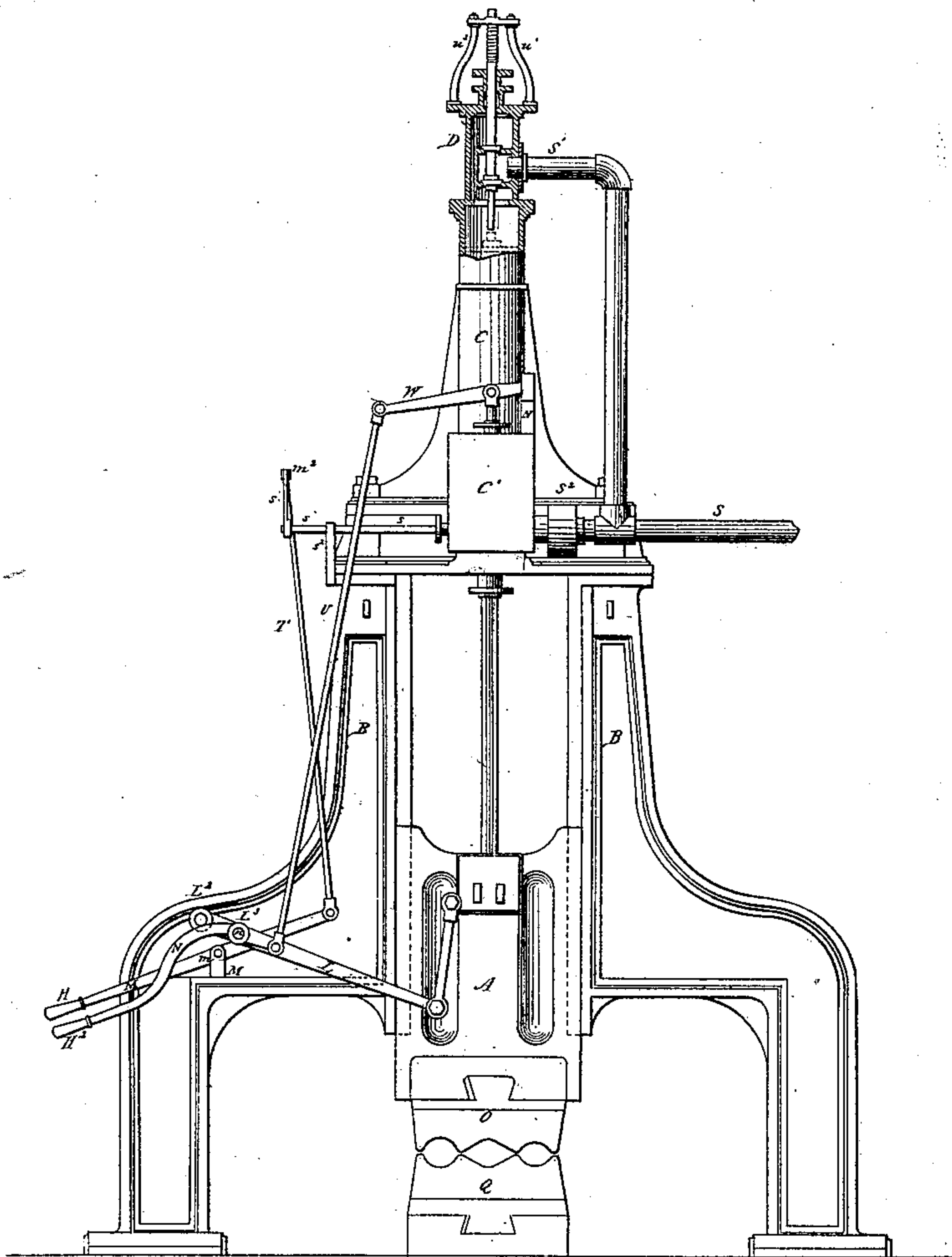


*H. Hamilton,*  
*Steam Hammer.*

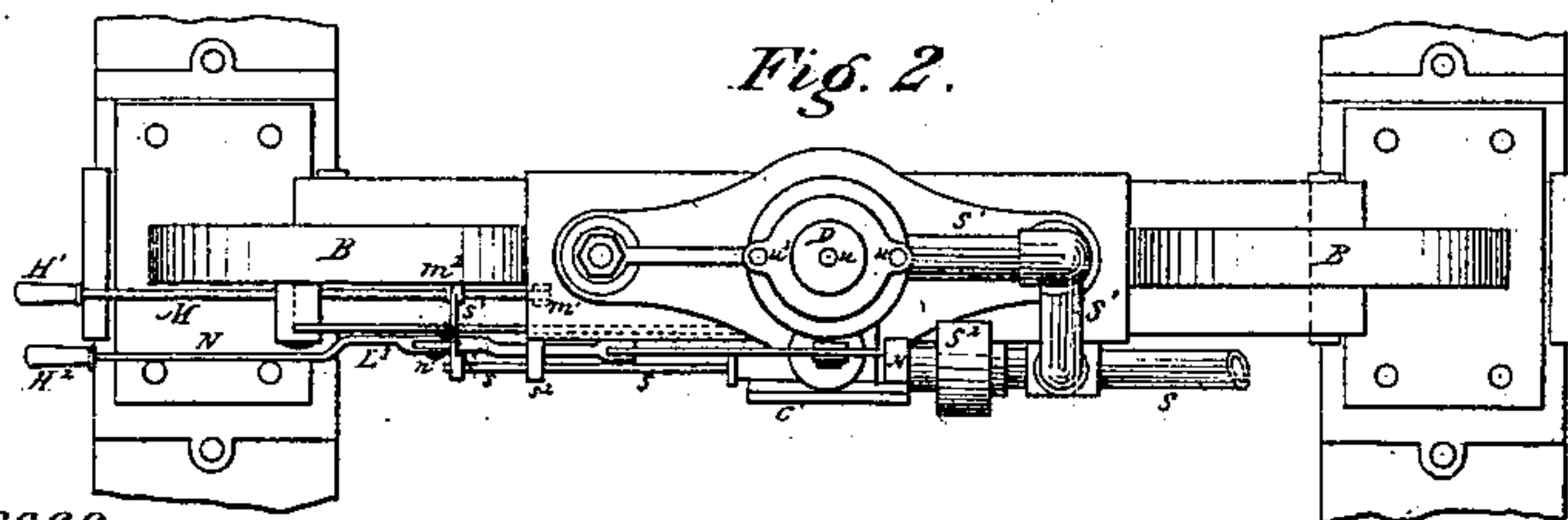
*N<sup>o</sup> 53,442.*

*Patented Mar. 27, 1866.*

*Fig. 1.*



*Fig. 2.*



*Witnesses*

*Robt S. Norton*  
*James M. Taylor*

*Inventor.*

*Hugh Hamilton*

# UNITED STATES PATENT OFFICE.

HUGH HAMILTON, OF NEWBURG, NEW YORK.

## IMPROVEMENT IN VALVE-GEARS FOR STEAM-HAMMERS.

Specification forming part of Letters Patent No. 53,442, dated March 27, 1866.

*To all whom it may concern:*

Be it known that I, HUGH HAMILTON, of Newburg, in the county of Orange and State of New York, have invented a new and useful Improvement on the Valve-Gearing of Steam-Hammers, and a new mode of using single-acting steam-hammers as double-acting when required; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a top view of a direct-acting steam-hammer.

A is the hammer-head or ram; B B, the jaws of the hammer; C, the steam-cylinder; C', the steam-chest; S, the main steam-pipe leading from the boiler to the steam-chest; S', a branch steam-pipe leading to a separate steam-chest, D', on top of the steam-cylinder C. S<sup>2</sup> represents the throttle-valve chest. The valve inside is movable by the rod s s, lever s', and rod T, connected to the one end of lever M. O and Q represent the top and bottom dies; R, the piston-rod connecting the ram A with the steam-piston.

The lever L, the fulcrum of which is the point L<sup>2</sup>, fastened to the jaw B, is connected on the other end, L', by a bolt, b, to the connecting-link K, which is fastened by screw a to the ram A of the steam-hammer. Some distance from the fulcrum L<sup>2</sup>, in the point L<sup>3</sup>, is secured another lever, N, to lever L by a pin, n, which is the fulcrum of lever N. To the one end of lever N is connected a rod, U U, which again takes hold of the lever W on its end n<sup>2</sup>. This lever W serves to move the slide-valve inside the steam-chest C' by the valve-stem w, and has its fulcrum in a small slot of a piece, N, bolted for this purpose to the valve-chest.

The ram A is shown in its lowest position. By the handle H' moving upward the throttle-valve opens and lets steam into the steam-chest. The attending man now takes handle H<sup>2</sup>, and by pressing it down lifts the lever W on top of the steam-chest, and by this operation the slide-valve moves upward, opens the steam-port, and the steam pressing below the steam-

piston lifts the hammer-head. As soon as this ram commences to move the lever end L' of lever L follows the upward motion, and in this way the point L<sup>3</sup> follows the same upward movement in a smaller degree. The attending smith has now the whole movement of the hammer in his hand. If this man allows the lever N to follow the upward motion of lever L, the slide-valve will open more and allow the steam to drive the piston with its full pressure to the full height of its stroke, and after the steam escapes the ram will fall down with its full weight; but as soon as the man draws handle H<sup>2</sup> upward he pulls lever W down and the slide-valve shuts the steam-port, thus cutting off the steam at any place, so as to allow the piston to move upward, by the expansion of the steam filling the space below the piston, to the full length of stroke, or to keep the ram suspended at any place he thinks suitable for his work. By good practice the least motion of lever N enables the blacksmith to make a good effect on the motion of the ram. If the smith wants a light blow, and the ram is falling with its full weight, he moves handle H<sup>2</sup> down a little, new steam is going under the piston, sufficient to work as cushion and to effect a light blow or to stop the falling ram in its downward movement at any place he thinks proper for it. By a double-acting steam-hammer this arrangement of levers L and N is more important yet. The stroke of the steam-piston is lengthened or shortened as soon as the smith is moving the handle H<sup>2</sup> one way or the other. He can give quick blows, light or heavy, just as he wants them for the work.

What I claim as my invention is—

The arrangement of levers L and N, in combination with link K and ram A for one, and with rod U U, lever W, and the slide-valve for the other, lever, which enables the blacksmith to work single-acting and double-acting steam-hammers in the easiest possible manner, as described.

HUGH HAMILTON.

In presence of—

JNO. B. J. FENTON,  
JAMES W. TAYLOR.