J. Watt.

Valve Gear of Steam Hammer.

No. 50,407 Patented Oct 10. 1865.

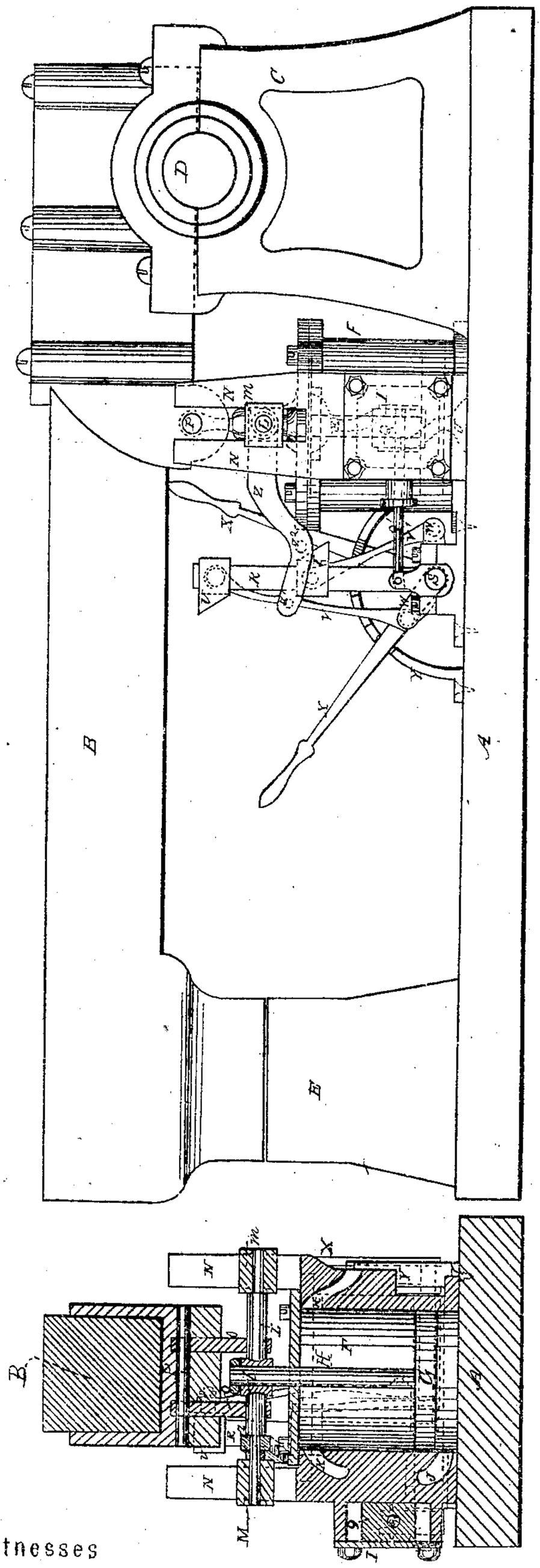

Fig. 2

Fig. 1

Witnesses

C B Forbush

M. P Fillmore

Inventor:

James Watt

UNITED STATES PATENT OFFICE.

JAMES WATT, OF BUFFALO, NEW YORK.

IMPROVEMENT IN THE VALVE-GEAR OF STEAM-HAMMERS.

Specification forming part of Letters Patent No. **50,407**, dated October 10, 1865.

To all whom it may concern:

Be it known that I, JAMES WATT, of the city of Buffalo, county of Erie, and State of New York, have invented Improvements in Steam-Hammers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a transverse section, passing through the piston-cylinder and steam-chest. Fig. II is a longitudinal elevation.

Letters of like name and kind refer to like parts in each of the figures.

The nature of this invention relates, first, to a mode of adjusting the valve-gear of steam-hammers so as instantly to take or cut off steam at any part of the stroke; second, to using the exhaust-steam upon the piston in a manner to increase the force of the blow.

A represents the bed or foundation upon which the operating parts are supported; B, steam-hammer. This is jointed or hinged to the standard C by a hinge-bolt or shaft, as shown at D. E, anvil; F, piston-cylinder; G, piston-head; H, piston-rod; I, steam-chest; J, steam-port leading from the steam-chest and passing under the piston-head; K K′, exhaust-ports leading from the steam-chest directly over the piston-head, so that the force of the exhaust will be exerted on the piston-head, and by reason of such force or pressure increase the force of the blow given by the hammer; L, shaft which connects with the piston-rod, as shown at *l′*. The ends of this shaft are supported in journal-boxes *m*, which journal-boxes move up and down in appropriate slots made in the uprights N.

O are connecting-rods, which connect this shaft with the hammer by means of the hinge-shaft P. The shaft P has appropriate hinge-connection with the under side of the hammer, so that the connection of the hammer with the piston is complete. Q, steam-valve—an ordinary slide-valve; Q′, rod which connects the steam-valve with the cam-shaft S.

R is a cam-lever, which is rigidly connected with the shaft S and projects upwardly and supports the cams T U. These cams are so constructed as to slide up and down upon this lever as may be required for placing them at any desired point for cutting off the steam. Each of these cams is connected with the shaft S by means of the connecting-rods V V′ and short arms W. One of the short arms W is connected with the shaft S, and the other connects with a sleeve which slides over a portion of said shaft. One of the operating-levers X is connected with the shaft S, and the other is connected to the sleeve over said shaft, so that the operator, by moving one of the levers X, moves the cam connected therewith, by which means either cam may be moved and placed and held at any point desired for cutting off the stroke.

Y is a bent bar with notches therein for holding the levers X securely at such point as they may be placed.

Z is an arm, which is connected firmly with the shaft L and projects therefrom and moves up and down with said shaft and piston-rod. There are two pins, Z′ Z², which project from this arm, and are so fixed as to come in contact with the cams at whatever point they may be placed.

By means of the connections already described it will be seen that one of these cams operates the steam-valve to cut off and the other to exhaust steam.

It will also be noticed that the operator can change the position of the cams instantly and place them just where he desires, and hence has a perfect and instant control over the hammer to control each blow for thick or thin iron, long or short blows, without any loss of time.

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

1. The arrangement of the cams T U, with their connections, so that they may be placed and used in such position as to insure the taking and cutting off of steam instantly at any part of the movement of the hammer, substantially as set forth.

2. The exhaust-ports K K′, so arranged that the exhaust-steam may be led directly from the steam-chest over the piston-head, and thereby increase the force of the blow given by the hammer, substantially as described.

JAMES WATT.

Witnesses:

M. P. FILLMORE,

E. B. FORBUSH.