Bonney & Millard,

Steam Hammer.

No. 21,183. Patented Aug. 17, 1858.

Fig: 1.

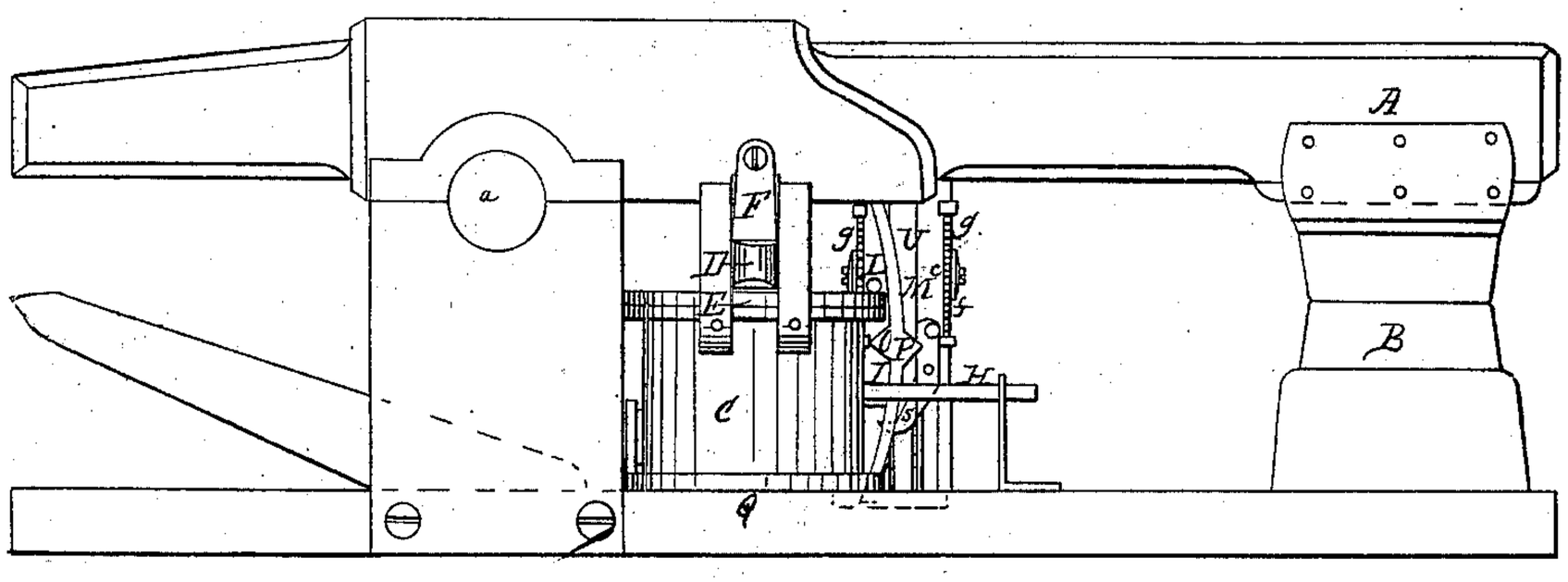


Fig: 2.

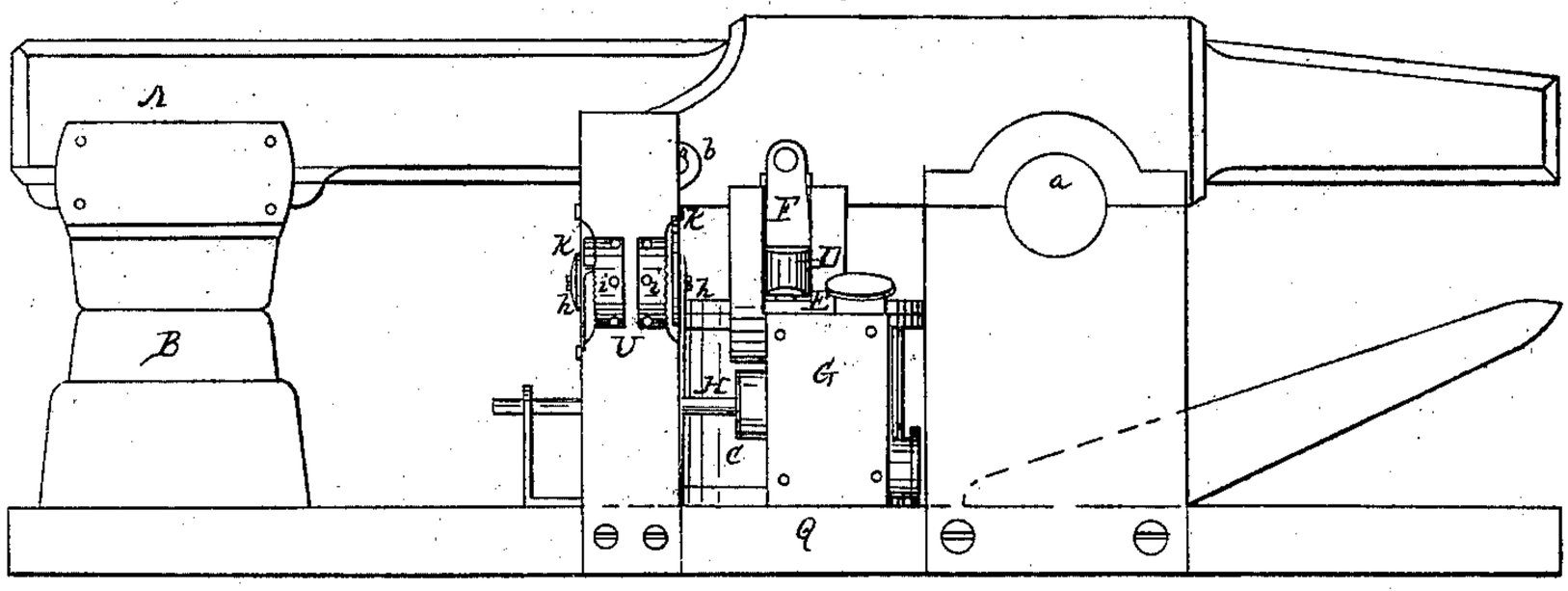


Fig: 3.

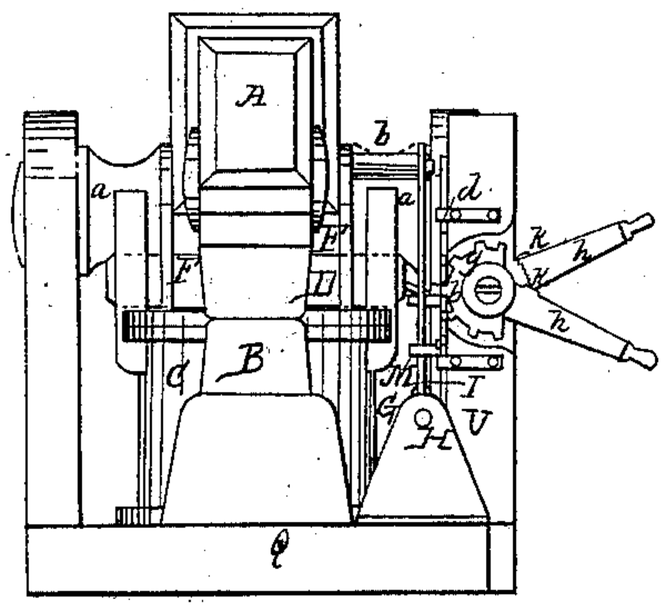
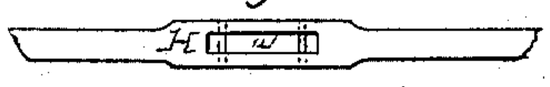


Fig: 4.



UNITED STATES PATENT OFFICE.

J. S. BONNEY, OF HANSON, AND C. W. WILLARD, OF BRIDGEWATER, MASSACHUSETTS.

OPERATING STEAM TRIP-HAMMERS.

Specification of Letters Patent No. 21,183, dated August 17, 1858.

To all whom it may concern:

Be it known that we, JOSEPH S. BONNEY, of Hanson, and CHARLES W. WILLARD, of Bridgewater, in the county of Plymouth and State of Massachusetts, have invented an Improved Mechanism for Operating the Valves of the Steam-Cylinders of Trip-Hammers; and we do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figures 1, and 2, are side elevations of a trip hammer and its steam engine furnished with our invention. Fig. 3, is a front elevation of the same.

On the twelfth day of August, A. D. 1856, Letters Patent of the United States of America, numbered 15,539, were granted to Charles W. and John P. Willard for an "Improvement in the valve gear for steam hammers." Our present invention may be said to be an improvement on the combination covered by such patent, and it consists in a peculiar arrangement of a curved swinging bar or lever, cams and bearers together and with the valve rod of the valve of the steam chest.

In the drawings, A, exhibits the trip hammer which is supported so as to turn vertically in the ordinary manner and toward and away from an anvil B, its supporting journals being shown at, *a*, *a*, in the drawings.

C, is the steam cylinder of the hammer, the cross head, D, of the piston rod, E, of the said cylinder being jointed to the shank or helve of the hammer by connecting links F, F. G, see Fig. 2, denotes the valve chest of said steam cylinder, the valve rod of the said chest being also seen at, H. It slides horizontally and is furnished with a vertical slot, *a'*, (see Fig. 4, which is a top view of said rod,) such slot being for the reception of a curved lever or bar, I, which hangs downward from an arm *b*, extending from the shank of the triphammer. The lever I, turns freely on the said arm and in a vertical plane passing through the axis of the valve rod. Furthermore, the said lever, I, carries two cams, O, P, which project from opposite sides of it as shown in Fig. 1, and operate in connection with two adjustable bearers, L, M, between which the lever, I, is arranged. These bearers consist of projections from two slide plates, *c*, *d*, which are arranged on the inside surface of a post, U, and provided with means by which they may be moved and adjusted vertically and independently of one another.

In the drawings, each of the plates is represented as furnished with a rack, *f*, operating in connection with a toothed sector, *g*, affixed to a spring lever, *h*. This lever has a curved rack, *i*, arranged in rear of it, a tooth or projection, *k*, from the lever being made to enter the rack. By means of such mechanism, the vertical elevation of the bearer of the slide thereof may be adjusted as circumstances may require. Furthermore, one of the slide plates is furnished with a hooked stop, *s*, which extends downward and under the other slide plate as shown in Fig. 1, the same being to prevent the bearers from being moved so near together as to render it difficult or impossible for the cams, O, P, to pass between them.

During the reciprocating movement of the trip hammer, the lever, I, will be raised and depressed so as to bring its cams against the bearers in a manner to produce a swinging motion of the pendulous lever, I, such as will cause a reciprocating rectilinear motion of the valve rod. As the bearers of the cams are each adjustable independently of the other, and to any desirable altitude, we not only have a means of operating the valve whatever may be the thickness of an article placed on the anvil, but of regulating the elevation of the hammer above such article, such being effected by placing the cams nearer to or farther apart from each other, and at such distances above the base plate, Q, of the hammer as may be necessary.

The advantages of our present arrangement over the patented combination, as hereinbefore referred to are, first, the mechanism is much simplified; second, it operates better as we get rid of the bad effects of short leverage of the retractor against its lever; third, a shorter stroke of the hammer can be made, and we can work it with less expenditure of power; fourth, the action of the mechanism is smoother and the noise is much less.

We do not claim the combination of a bent rocker lever, an actuator and two adjustable cams applied together and to a valve rod and trip hammer as represented in the specification and drawings of the aforesaid patent, but

What we do claim is—

Our improved arrangement and application of the parts, the same consisting not only in having a curved pendulous lever to extend from the hammer shank or a projection therefrom and play through and in the valve rod as described, but in arranging and applying cams and adjustable bearers with respect to the said lever and to operate together and produce a reciprocating motion of the lever essentially in manner and for the purpose as specified.

In testimony whereof we have hereunto set our signatures.

JOSEPH S. BONNEY.
CHAS. W. WILLARD.

Witnesses:
JOSHUA E. CRANE,
DAVID PERKINS.