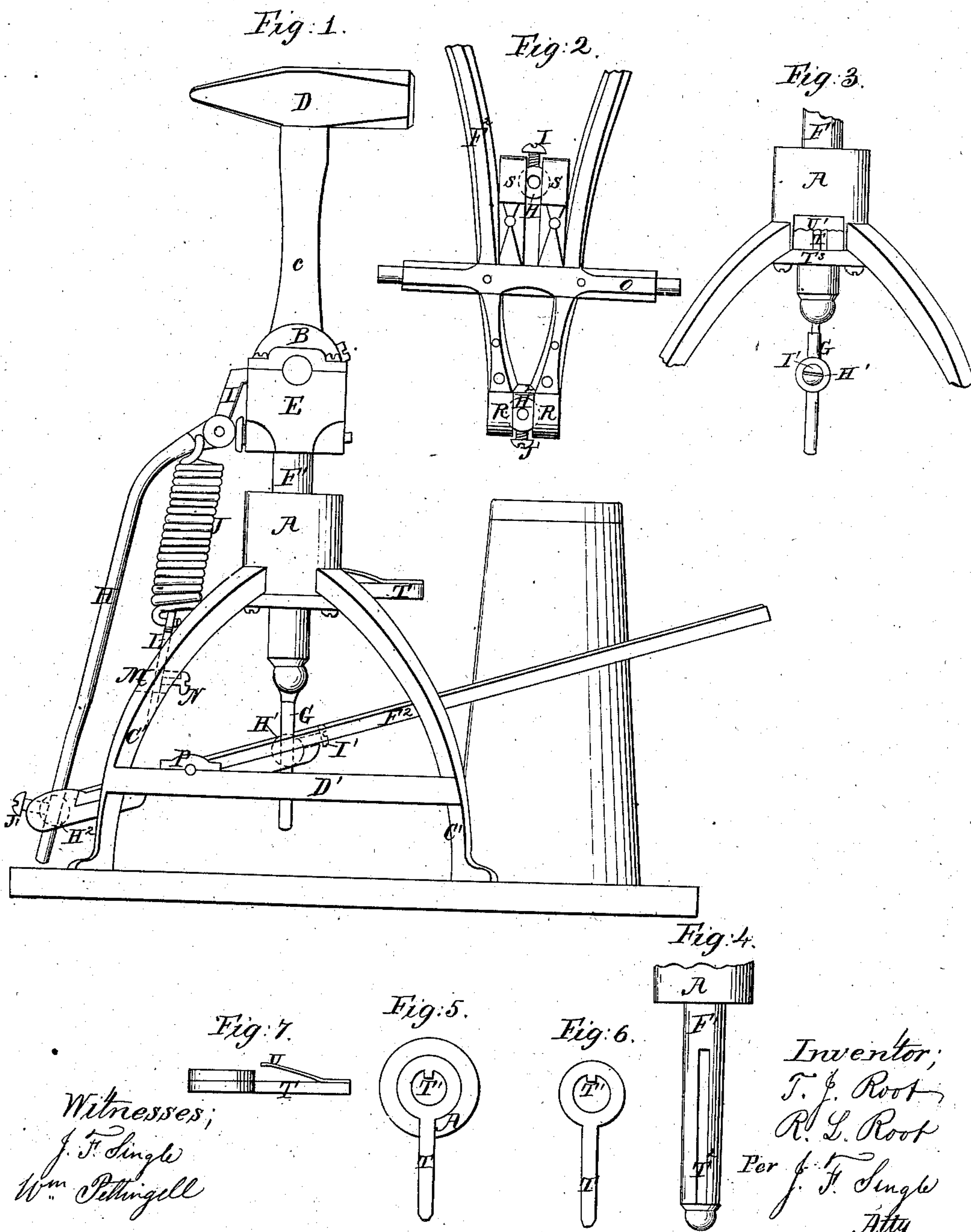


T. J. & R. L. Root.

Trip Hammer.

Nº 67,913.

Patented Aug. 20, 1867.



United States Patent Office.

T. J. ROOT AND R. L. ROOT, OF ANDOVER, OHIO, ASSIGNORS TO THOMAS J. ROOT, OF THE SAME PLACE.

Letters Patent No. 67,913, dated August 20, 1867.

IMPROVED TRIP-HAMMER.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that we, T. J. ROOT and R. L. ROOT, both of Andover, in the county of Ashtabula, and State of Ohio, have invented certain new and useful additional improvements in the Trip-Hammer for blacksmiths' use, for which Letters Patent of the United States were granted to the said T. J. Root on the 7th of February, 1865; and we do hereby declare that the following is a full and exact description of the said improvements, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the whole machine.

Figure 2 a top view of the treadle arrangement for operating the same.

Figure 3 represents the body of the machine with a portion of the legs which support it, showing a portion of the vertical shaft and the vibrating arm, hereafter referred to.

Figure 4 exhibits said vertical shaft with the longitudinal groove therein, as will be explained, and

Figures 5, 6, and 7 are the details of the setting-lever, hereafter referred to, figs. 5 and 6 being top views, and fig. 7 an elevation.

The same letters of reference indicate similar parts in all the figures.

Our said improvements consist of the following:

First. Supporting the rock-shaft or rock-head B, of the original machine, in a vibrating head provided with a vertical shaft, instead of the stationary head before used, and connecting said vibrating shaft, by means of a vibrating rod attached thereto, to the treadle by which the hammer is operated.

Second. The application of a lever arrangement to the said vibrating shaft, so that the hammer-head can be moved laterally, right or left, to cause it to strike on any part of the anvil.

Third. The application of the ball-and-socket joint to the bearings of the said vibrating rod and rod H of the first machine, so that when said vibrating shaft is turned right and left, as before stated, the bearings will work in unison therewith, thus obviating strain or binding of the said bearings.

Fourth. Arranging the bearings of the said vibrating rod and rod H on either side of the fulcrum of the treadle, and in such manner that the one or the other can be shortened or lengthened with respect to said fulcrum, for the purpose of balancing or equalizing the motion of the treadle so as to cause it to be worked with as little effort on the part of the operator as may be necessary.

The following description will enable others skilled in the art to construct and use our said improved machine.

A, fig. 1, is the body of the machine supported on four legs. O' D' are two ties (one only seen) placed between each pair of legs, one opposite the other, on the lower part of the machine. E, is a head attached to a vertical shaft, F'. On the upper part of the said head is the rock-shaft or rock-head B of the former machine, carrying the hammer-handle C of the hammer D. On the lower part of said shaft F', fig. 3, is a vibrating rod, G. Said rod has the ball of a ball-and-socket bearing H' fitted to it, so as to be shifted up or down, and to which it is retained by a set-screw, I'. H, fig. 1, is the lengthened rod of the original machine. On its lower end is fitted, in like manner, a similar ball, H², and is also retained in place by a set-screw, J'. The upper end of said rod is connected with the bent arm I, as before. The spiral spring J, instead of enclosing the rod H, as in the other machine, is placed between it and the body A, and is attached at its lower end to a short rod, L, which passes through a hole in a tie, M, shown by the dotted lines, in which it is secured by a set-screw, N. The upper part of said spring is connected with the top of the arm H, as seen. T, fig. 1, is a short lever. Its construction is shown in fig. 6. Inside its annular portion is a projection, T'. On the shaft F', of the vibrating head E, is a longitudinal groove, T², fitting the said projection T'. In the under side of the body A is a sunk circular recess (not shown) which receives the said annular portion of the lever T, and is confined therein by a plate, T³, fig. 3. Said lever will now be free to work right and left, as may be desired, retaining its set position by means of the spring U, catching in the toothed plate U'. The treadle F², fig. 2, is supported in journal-boxes, P, on the pair of ties D', fig. 1, by a rock-shaft O, fig. 2. On each side of said rock-shaft O are placed the bearings (R R and S S) of the balls of the vibrating rod G, and the lengthened rod H, and consist of boxes with opposite concave depressions fitting said balls. The said bearings R R and S S are arranged so as they

can be shifted towards or from the rock-shaft O for the purpose of adjustment, and are secured by means of set-screws, as seen.

The machine is operated by the foot of the workman applied to the treadle. It is put in order for general work by first adjusting the relative distances of the bearings R R and S S from the fulcrum of the treadle. In the next place the vibrating arm G and arm H are to be adjusted by moving them up and down in the balls, and securing them in their respective places by the set-screws I' and J' in such manner as to allow the face of the hammer to nearly touch the face of the anvil. The coiled spring J is then adjusted by the rod L and set-screw N, so as to impart to it the necessary tension for carrying up and sustaining the hammer and treadle after striking the blow. The machine thus set will be in condition for general work, as before stated, that is, for striking on material of medium thickness. But when extra thicknesses, say four inches, are to be operated on, the rods G and H will then have to be adjusted in the way described, so as to have the force of the blow at that distance from the anvil. By turning the lever T horizontally it will be seen that the hammer can be made to strike several inches to the right or left of the centre of the anvil, and that the movement of the ball-and-socket bearings will conform to this change, thereby obviating any strain or undue friction. Another advantage of the head E is that of giving momentum and percussion to the descending blow of the hammer by means of its gravity. The short or bent arm I of the rock-head B possesses, as will be seen, a lever-power in connection with the rod H as it rises, in throwing the hammer down with additional force.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. We claim the vibrating head E, grooved vertical shaft F¹, and vibrating rod G, in combination with the rock-head B and treadle F², as and for the purpose specified.
2. The lever T, constructed as described, grooved shaft F¹, toothed plate U', recess in head A, as described, and plate T³, in combination with the vibrating rod G, ball H¹, set-screw I', and bearings S, arranged so as to operate as and for the purpose specified.
3. The ball H² and set-screw J', (applied to the rod H,) bearings R, and treadle F², in combination with the subject-matter of the second claim, as herein stated.
4. The combination of the adjustable bearings R R and S S, vibrating rod G, and rod H, with the rock-shaft O and treadle F², so as to operate substantially in the manner and for the purpose specified.

T. J. ROOT,
R. L. ROOT.

Witnesses:

J. F. SINGLE,
M. S. HARVEY.