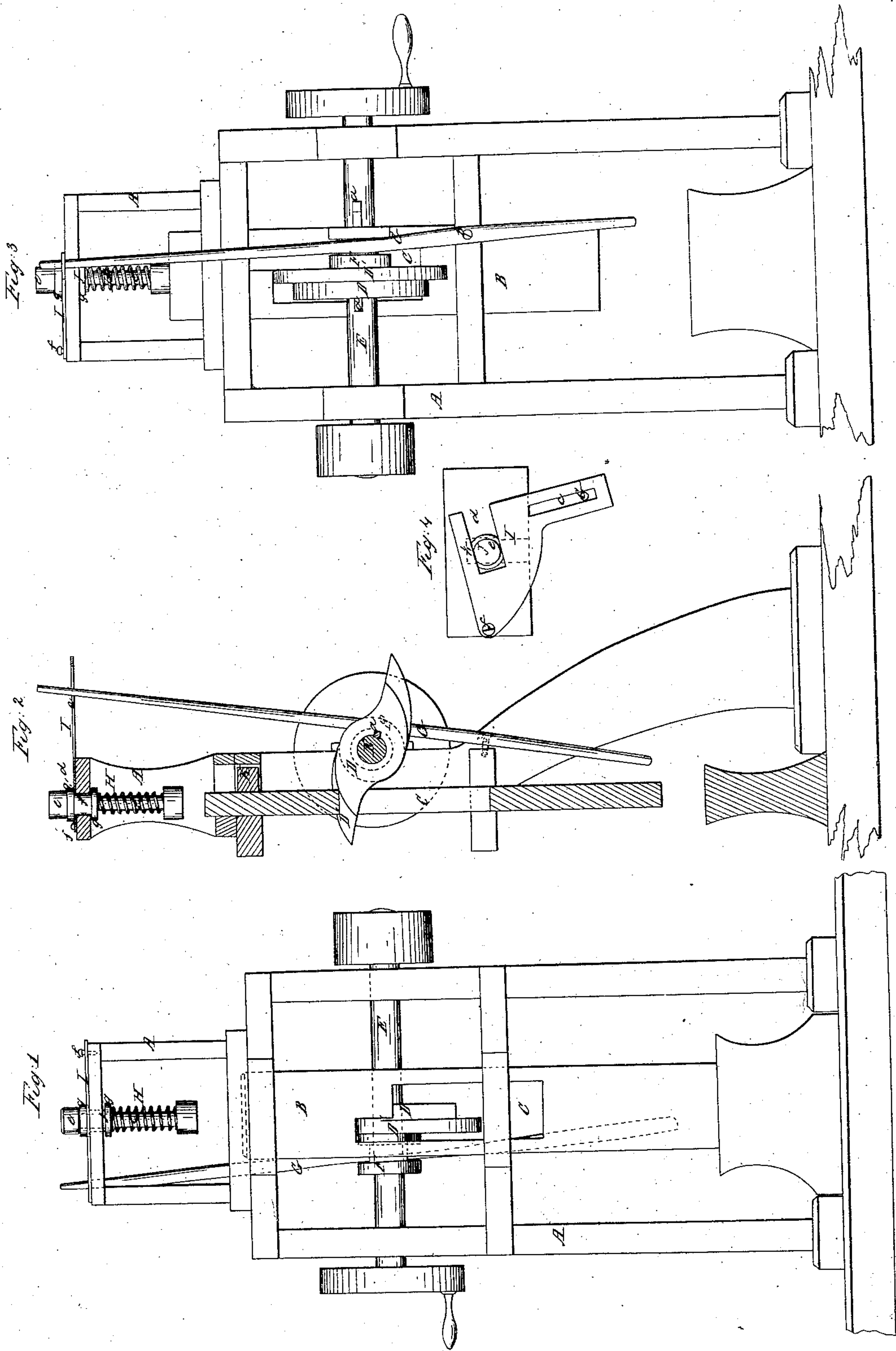


Forrest & Baker.

Oliver.

N<sup>o</sup> 9,462.

Patented Dec. 14, 1852.





# UNITED STATES PATENT OFFICE.

J. C. FORREST AND G. BAKER, OF SCHENECTADY, NEW YORK.

## TRIP-HAMMER.

Specification of Letters Patent No. 9,462, dated December 14, 1852.

*To all whom it may concern:*

Be it known that we, JAMES C. FORREST and GEORGE BAKER, of Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Vertical Trip-Hammers; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of the machine, the hammer being represented resting on the anvil. Fig. 2, is a vertical transverse section of the same, the hammer being shown partly elevated and resting in that position on the smallest of a series of double acting lifters or tappets. When the hammer is lifted by the smallest tappet, a very light blow is obtained. Fig. 3, shows a view of the rear of the machine. This view shows clearly the operation of the tappets, the hammer being shown raised to its highest position and resting on the tip top edge of the largest of the series of "tappets." This view also shows the lever for operating upon and changing the position of the "tappets" and spring which controls the operation of the hammer when the said hammer is working very rapidly. Fig. 4, is a top view of the hook shaped shifter which is secured to the top end of the regulating lever, and which when the said lever is operated or moved back and forth to change the "tappets" and consequently the force of blow, is made to move the spring, which controls the operation of the hammer when driven very fast and also when operated slowly, to any necessary position to suit the force of blow desired.

The same letters of reference in each of the several figures indicate corresponding parts.

The nature of our invention consists in elevating the hammer to any height desired by means of a series of "tappets" or double acting lifters arranged on the driving shaft, the said "tappets" being of a peculiar shape and of different sizes and are all cast together. These tappets are made movable on the driving shaft so that a large tappet may be substituted for a small one when it is desired to give a heavy blow to the hammer, or vice versa. There is a lever arranged in the back of the machine which serves to move these tappets back and forth,

the said lever fitting in the clutch of the "tappets" in the manner hereinafter described. The hammer which is employed in connection with these tappets has a peculiarly formed slot cut through it for the tappets to work through after lifting the hammer to the desired height. This rectangular notched slot is so formed that the smallest of the tappets is made to lift the hammer and the largest allowed to revolve and escape freely through the longest portion of the slot, and also if the largest tappet is in operation the smaller ones will likewise escape free of the hammer, only not through the longest but the shortest portion of the said slot. It is by means of this rectangular notched slot that the hammer can be lifted by the tappets, the employment of which is very desirable, as the said tappets do away with a great deal of friction and also the complexity of the ordinary vertical trip hammers, and by the use of these tappets, in connection with a spring arranged over the hammer, two blows for every revolution of the driving shaft may be obtained.

Our invention also consists in so arranging the spring which controls the operation of the hammer, that when the tappets, either large or small, are moved from one position to the other by the lever, the said spring will also be operated by the same lever and moved to positions to suit the different sized tappets or different force of blows required. To enable others skilled in the art to make and use our invention we will now proceed to describe its construction and operation more minutely.

A, A', represent the frame of the hammer which may be of the construction herein represented or of any other more suitable.

B is the hammer helve which has a rectangular notched or peculiarly formed slot C, cut through it, as shown in Figs. 1, 2, and 3, the said slot allowing of the hammer being elevated by means of the double acting lifters or tappets D, D', and also of their escape through the said slot after lifting the hammer and passing from under the same. These tappets will be clearly seen in Fig. 2 of the drawings. They are secured loosely on the driving shaft E, and are made to slide over a feather *a*, on the said shaft when it is desired to give a light or heavy blow—or when it is desired to change the tappet D for that D'.



F, is the clutch cast with the tappets. In this clutch the lever G, fits, the said clutch serving to keep the lever in place while the tappets are being moved along on the shaft E by the said lever. The lever G, is secured near its lower end to a cross bar of the frame A and turns loosely on the pin b, which secures it. It is also connected with the clutch F, and the spring H, by means of hook shaped shifter I. The said shifter I, having an oblong slot c cut in it for the top end of the said lever to work in. There is also another open slot d cut in this shifter in which the collar that surrounds the top portion of the spring rod e, works freely as the lever draws the said shifter out or forces it inward. This shifter I turns on a pin f, which secures it permanently to the top of the frame A'. The object of this shifter is to draw the spring out to its proper position when the large tappet is used and to throw it back to its proper position when the small tappet is used. It should be remembered that the lever G, in operating the tappets must of necessity operate the spring and consequently when the tappet is changed the position of the spring is changed to suit the position and size of the tappet. This we consider an important arrangement, as there is no danger of a mistake being made when they both move together.

The collar J, which is placed around the spring H, and in which the rod e works up and down has two flanges g, g, on each of its two sides, the said flanges fitting against the top and bottom of the top piece of frame A', and the neck of this sliding piece J fits and slides back and forth in the slot h cut in the top of the frame A'. The arrangement of the spring and its attachments will be clearly seen in the different figures, and especially in Figs. 2 and 4.

K, is a projection cast on the back of the hammer. This projection is designed

for the spring to strike against when the largest tappet is used, and the top of the hammer answers the same purpose as this projection when the small tappet is used. By having this projection placed or cast on the hammer a uniform and perfect action of the spring is obtained. It is for this purpose that the lever G, is made to operate upon the tappets and spring at the same time, for when the large tappet is changed for the small one the spring H, is moved out in a line with the projection K, against which it presses as the hammer rises and falls.

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

1. The employment of the peculiar shaped movable tappets D, D', of different sizes, the said tappets being arranged loosely on the driving shaft F, and moved back and forth or one substituted for the other by means of the lever G; in combination with the hammer B, having a rectangular notched or peculiarly formed slot C, cut in it; the whole being constructed arranged and operated in the manner and for the purpose herein described.

2. We likewise claim so arranging the lever G, that when the large or small "tappets" are moved from one position to the other or the small tappet made to occupy the place of the large one, the controlling spring will also be operated upon and made to assume a proper position to suit the size of the "tappet," the arrangement for effecting this object consisting of a hook shaped shifter I, and movable collar J, which are constructed arranged and operated in the manner substantially as herein set forth.

JAMES C. FORREST.  
GEORGE BAKER.

Witnesses:

JOHN WEEKES,  
ROBERT TAIRNIE.