

M. Hardaway,
Making Bolts and Rivets,
N^o 44,623. *Patented Oct. 11, 1864.*

Fig. 2.

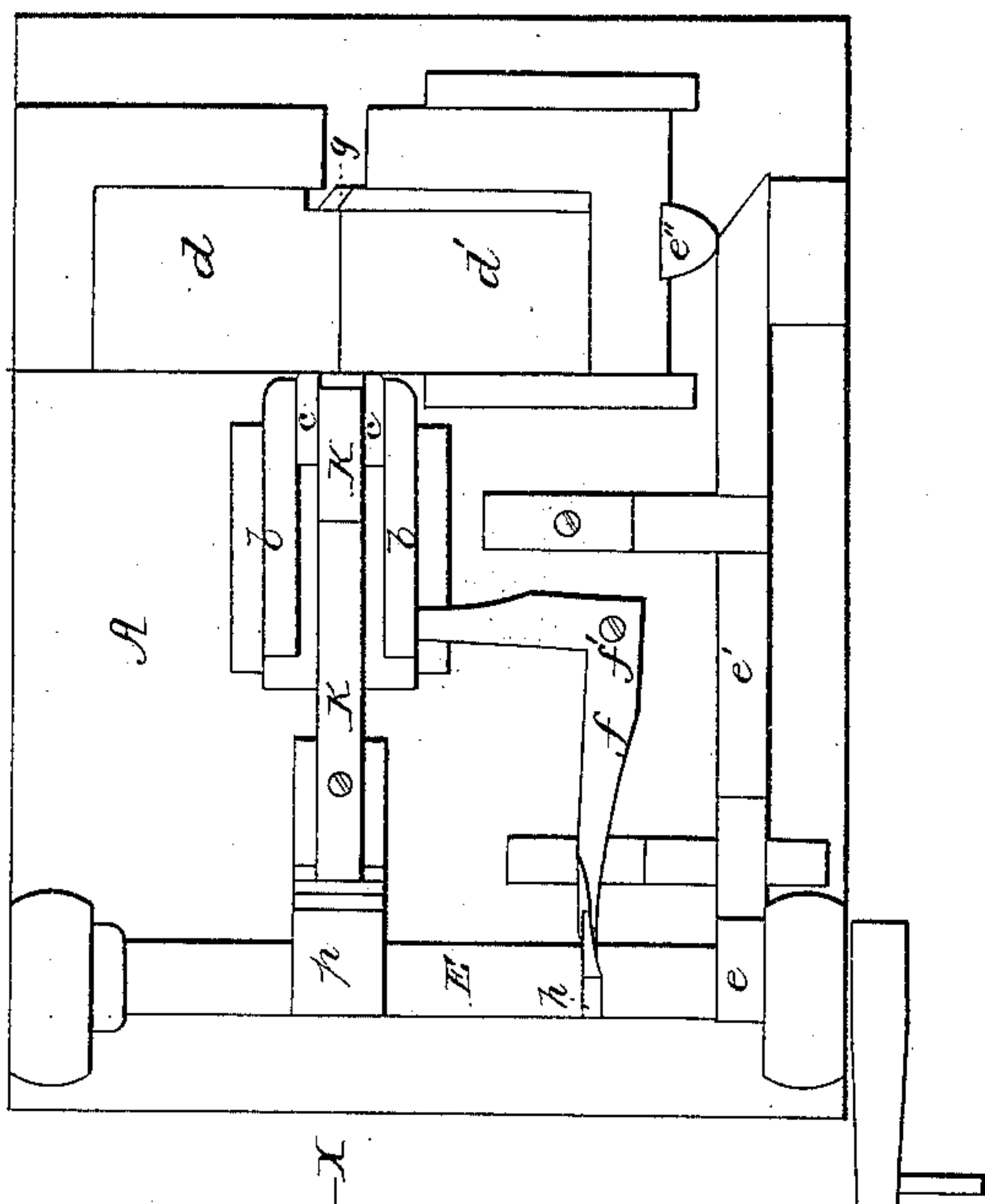


Fig. 1.

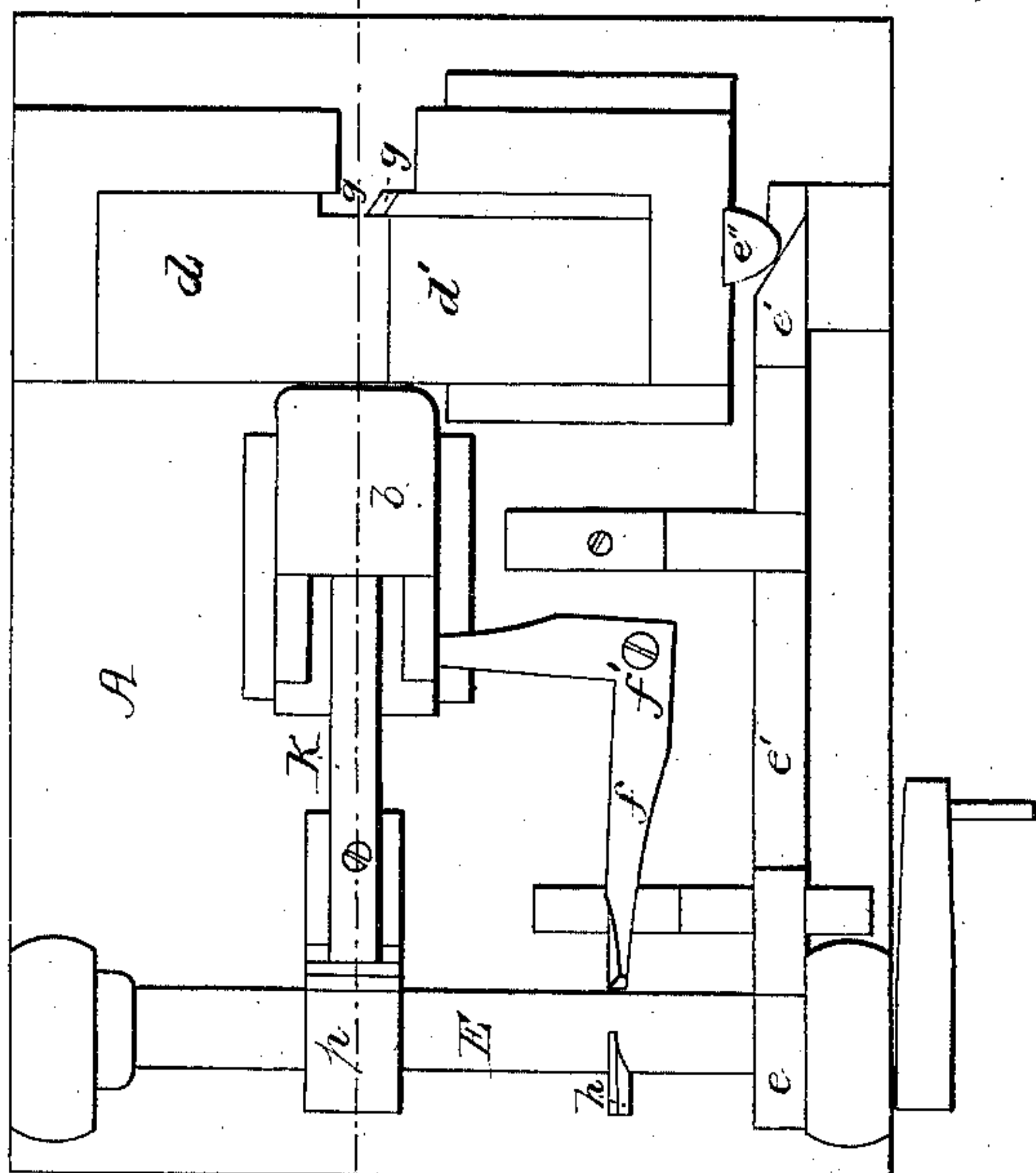
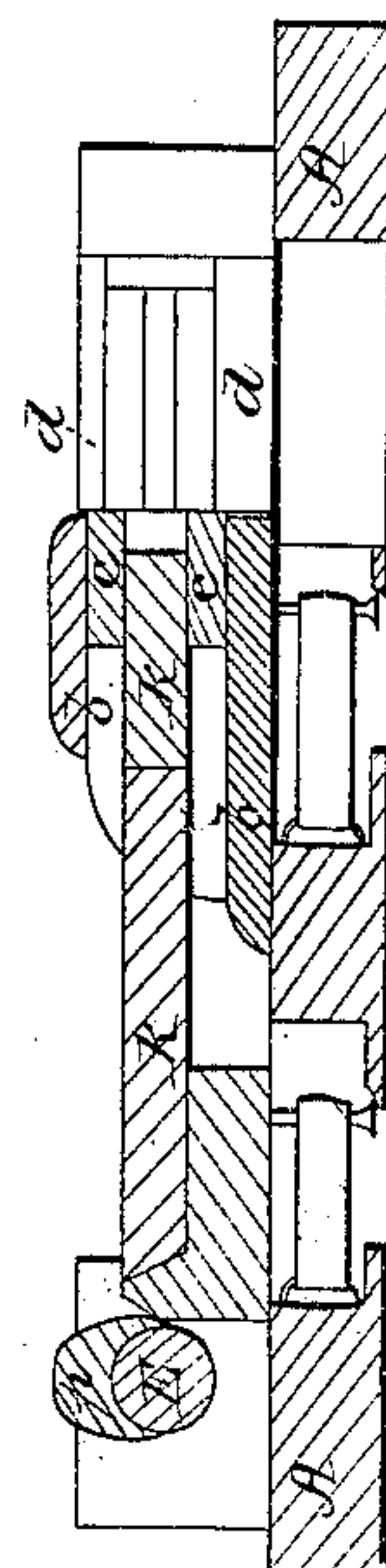


Fig. 3.



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UNITED STATES PATENT OFFICE.

MOORE HARDAWAY, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN MACHINES FOR MAKING BOLTS.

Specification forming part of Letters Patent No. 44,623, dated October 11, 1864.

To all whom it may concern:

Be it known that I, MOORE HARDAWAY, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in Machines for Making Bolts and Rivets; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon and made to form a part of this specification.

It is well known that the bolts and rivets made by means of horizontal or reciprocating bolt and rivet machines now in use are in many instances very defective, and, in some cases, entirely unfit for use, owing to the strain given to the said bolts or rivets in releasing them from the dies.

The object of this invention is to overcome the aforesaid difficulty and at the same time to produce a very simple, cheap, durable, and effective machine for making bolts and rivets; and the subject-matter of my invention relates to the mode of operating the die-box, die, and plunger or header, by means of which the formed bolt may be released from the die without strain or injury of any kind, as hereinafter set forth and represented.

In reference to the accompanying drawings, Figure 1 is a top view or plan of my improved machine. Fig. 2 is also a top view of the machine with a portion of the die-box and die removed in order to show more clearly the operation of the working parts of the machine; and Fig. 3 is a vertical sectional view of the improvement, taken through the red line *x x*, Fig. 1.

A represents a platform or bed upon which the machinery is arranged to operate.

b represents the die-box, which will be constructed in a strong, substantial manner, and adjusted upon the bed *A*, so as to be movable longitudinally. This box *b* is made with a recess in its front end which is adapted to receive a die, as *c*, and the said die may be firmly and properly secured by means of screws (not shown) working through the box *b*.

d d' are clamps, one of which, *d*, may be in a fixed position, while the other, *d'*, is movable, and constructed and arranged to operate by means of suitable devices, as, for instance, the cam *e* of shaft *E*, bar *e'*, projection *e''*, and proper springs, (not shown,) in such manner

that the said clamps *d d'* may be adapted, at certain proper periods in the operation of the machine, to grasp the blank bolt and secure the same rigidly during the process of heading, after which the movable clamp *d'* will be retracted so as to release the formed bolt and allow the same to fall from the machine. The said clamps may be provided with cutters, as *g g*, by means of which the blank bolts may be severed from long rods suitable for the object desired.

The normal position of the said box *b* will be that in which the face of its contained die will bear against the said clamps, and it will be secured in or returned to this position, as the case may be, by means of a suitable spring. The said box *b*, with its contained die, may be withdrawn or retracted from its said normal position at certain suitable periods, hereinafter described, by means of a bent lever, *f*, which is pivoted to the bed *A* at *f'*. The said lever is attached to the box *b* and may be actuated by means of a cam, *h*, upon shaft *E*, in such manner as to operate the said box *b*, so as to release the formed bolt from the die at proper periods.

K represents the plunger or header, which will be adapted in form and size to fit and work within the die that may be employed, and it will be operated, with reference to its forward motion, by means of which the head of the bolt may be formed, by a suitable cam, as *p*, upon shaft *E*, and it may be retracted when released from said cam by means of a suitable spring, as *n*. (Seen in Fig. 3.) All the working parts of the aforesaid machine may be formed of suitable metal.

Having thus described the construction of my invention, I will proceed to explain the operation of the same.

The position of the working parts of the machine being the same as shown in Fig. 1, and the shaft *E* being made to rotate the rod from which the bolts or rivets are to be made, being first properly heated, may be fed to the machine. The end upon which the head is to be formed being inserted within the die *c*, the cam *e* will be made to operate the clamp *d'* through the medium of bar *e'* in such manner that the blank bolt may be grasped firmly by the said clamps *d d'*. At this period in the operation of the machine the cam *p* is made to force the header *k* forward into the die *c*

against the blank bolt, thereby upsetting the same in such manner as to form the head of the bolt to correspond with the internal configuration of the die. At this period in the operation, when the head of the bolt is completely formed, the cam *h* is made to actuate the bent lever *f* in such manner as to retract the die-box *b* with its contained die, and, the movable clamp-die *d'* being also retracted by means of a spring or other suitable device, the formed bolt is, without strain or injury, and in a perfect condition, released from the machine, the header *k* remaining stationary until the bolt is entirely free from both dies, when, being relieved from the action of the cam *p*, it is retracted by means of a suitable spring, as before described; and the said lever *f* being released from the cam *h*, the box *b* will be returned to its aforesaid normal position, ready to receive another blank.

Fig. 1 represents the working parts of the machine at that period in the operation at which the blank bolt may be fed to the die; Fig. 2, that at which the bolt is fully formed, and Fig. 3 that at which the formed bolt is discharged from the die and allowed to fall from the machine.

Headers and dies of different sizes and forms

will be employed in accordance with the nature of the result desired.

I do not claim or confine myself to the precise construction and arrangement of the devices by means of which the within-described operation of the said die-box and header and movable clamp-die may be accomplished as I am fully aware that the same result may be effected in various ways without departing from the spirit of my invention; but,

Having thus described the construction and operation of my invention sufficiently to enable persons skilled in the art to which it appertains to make and use the same, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the die-box *b*, header *k*, and clamp-dies *d d'*, in a bolt or rivet-heading machine, when operating in the manner and for the purpose herein set forth.

In testimony of which invention I have hereunto set my hand and seal this 27th day of February, 1864, in presence of witnesses.

M. HARDAWAY. [L. S.]

Witnesses:

H. E. CLIFTON,
HIRAM BANKE.