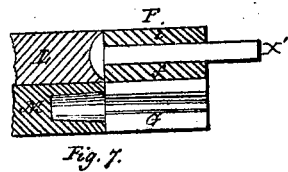
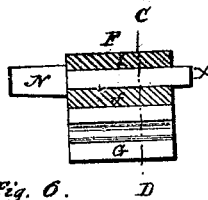
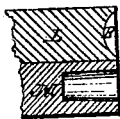
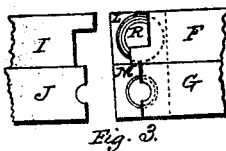
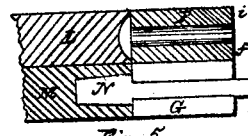
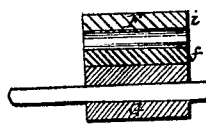
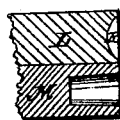
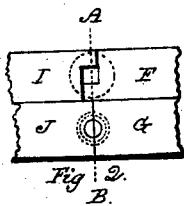
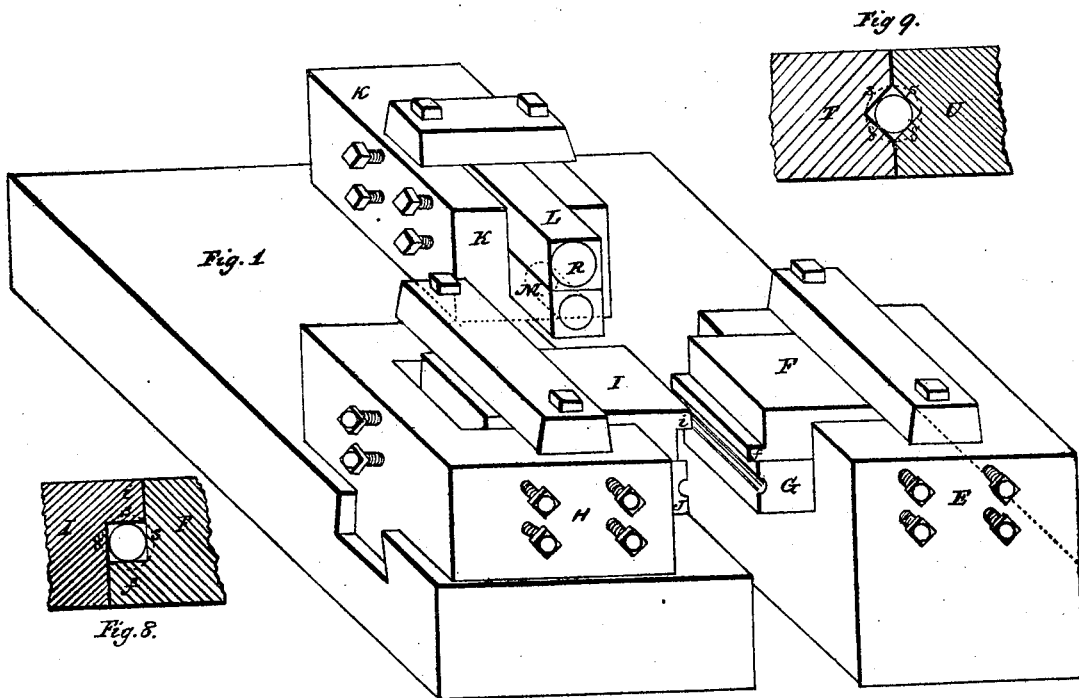


Patented Apr 10. 1866.



Witnesses. *H. P. Gunglberg,*
L. Dan. alar

Inventors. Charles Kane
James Kane

UNITED STATES PATENT OFFICE.

CHARLES KANE AND JAMES KANE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN BOLT-MACHINES.

Specification forming part of Letters Patent No. 53,832, dated April 10, 1866.

To all whom it may concern:

Be it known that we, CHARLES KANE and JAMES KANE, both of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Machine for Making Bolts; and we do hereby declare that the following is a full and exact description thereof, which will enable others skilled in the art to make and use our invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a general view in isometrical perspective, showing the relative position of the dies. Fig. 2 is a front view of the dies, showing their position when closed. Fig. 3 is the same view, showing the dies open. Fig. 4 is a sectional view of the dies through the line A B, with heated iron put in. Fig. 5 is the same view, showing the effect of the first stroke of the staving-die. Fig. 6 is also the same view with the heated iron transferred from the lower to the upper set of dies. Fig. 7 is again the same view, showing the effect of the second movement of the staving-dies and the formation of the head of the bolt. Fig. 8 is a section of the upper dies, I F, through the line C D, showing the heated piece of iron as it is in Fig. 6, but looking at it from the point X; and Fig. 9 is a similar view of dies of another shape, which can be used instead of the ones represented in Fig. 8, and will answer the same purpose. These two last figures are on a larger scale for the purpose of better explaining certain things peculiar to their working.

Our invention consists in a machine so constructed as to have two sets of dies, for the purpose of making at one heat and with only two strokes of the cams, levers, or eccentric a bolt which will have its square neck or collar cut by being forced through a square hole instead of it being pressed or swaged laterally, as is now the way in all the machines in use.

E is a stationary head or die box to receive and hold fast the stationary dies F and G. H is a sliding head or box containing the dies I and J, which are to match the dies F and G. These two heads H and E, with their dies F, G, I, and J, constitute the gripping-tool of the machine.

K is another sliding head, movable in a direction at right angle with the center of mo-

tion of the box H. This box or head K receives the two dies L and M, which are the dies that stave and head the bolt.

M is the staving-die, which we call our "socket-die," because it has a socket at its forward end in which the heated bar of iron is staved to the proper shape. This socket is formed of any desired shape and depth best adapted to the shape desired to be obtained, either cylindrical or conical, rectangular or polygonal, in section, pyramidal, or composed of these different shapes combined.

L is the heading-die, having a cavity of the proper shape for forming the head of the bolt in the usual way.

The two heads K and H are acted upon by cams, eccentrics, or levers in the ordinary way. They are mounted on the machine, have their slides, &c., also in the usual way, and they have set-screws for securing and regulating the position of the dies.

The dies I and F or T and V are so shaped that when brought together they leave between them a rectangular aperture or hole of the shape it is desired to obtain the neck or collar of the bolt. In our drawing we have represented them as square, as the machine is to make square-necked bolts, but they can be shaped so as to form any shape neck required. The ones represented in Figs. 1, 2, 3, and 8 have the advantage of offering a shelf or ledge, f, on the stationary die, which is very convenient as a guide or rest for the heated bar of iron to be worked.

The dies J and G have their extremity provided with semi-cylindrical grooves, so that when they are brought in contact they will fit exactly all their length the heated round bar-iron to be worked and hold it firm while the process of staving is going on.

Operation: The gripping-dies I J being opened, as in Fig. 3, the staving-dies being shoved back, as in Fig. 4, the heated round iron P is placed in the groove of the lower dies and they are brought together by the machinery, holding the heated iron firmly in the position shown in Fig. 4. The head K then moves forward, and the socket-die M, by acting on the heated point P of the bar of iron, will stave it as it appears in Fig. 5 by the letter N. The socket-die M moves backward, the gripping-dies open, and the iron is at once transferred

from the lower dies, J G, to the upper dies, I F, (or T V, Fig. 9,) having care to let only the round iron not staved pinched between the dies, and leaving the staved part N project at the back of the dies, as shown in Fig. 6. The griping-dies now close, but as the square groove or opening left between the dies is a shade larger than the round bar of iron used for making the bolt, the iron is held perfectly in place, but not bound tightly, and it can slide lengthwise. The head K now moves again forward, and as the die L comes in contact with the part N of the heated iron it pushes it forward, and forces it partly through the opening left between the dies I and F or T and V, thereby cutting the square neck of the bolt. The square of the hole left between the dies T V or I F is of a size that could be inscribed in the diameter of the staved part N, (see Figs. 8 and 9,) so that the segments S S S S represent the part of the metal which cannot be forced through the square hole and is left out. This excess of metal accumulates and helps materially in making an excellent head to the bolt.

In Fig. 7, which represents the position of the dies when the operation is terminated, it will be observed that the point X of the bolt has been forced forward to X". This indicates that part of the staved piece N has been forced through the opening and there cut into the proper shape for the neck or collar of the bolt, thus making that collar or neck of the bolt by cutting it instead of pressing it side-wise into that shape, as is invariably done by all the machines now used.

We are aware that bolts have been made by machinery, and that bolt-machines are in general use, and therefore we do not claim, broadly, the idea of making bolts by machinery nor the use of a machine for making bolts, but in all the machines in use the iron is staved by one machine and headed by another machine. Our machine will do the two operations. In the machines now in use the staving is done in a cavity left in the griping-dies. We make our staving in a socket left in the staving-die. In the machines now in use the square neck or collar is made by pressing several times the staved portion of the heated iron between the griping-dies, shaped in the form of Fig. 9, and turning the iron several times to obtain, after all, an imperfect square neck.

In our machine the griping-dies are closed on the part of the iron not staved, and the staved part is forced lengthwise into the square hole, thereby cutting the neck or collar instead of pressing it.

We claim and desire to secure by Letters Patent of the United States—

A bolt-machine having a double set of dies, one above the other, in the one of which to stave and in the other to cut the square neck of the bolt and head the same, arranged and operating substantially as described.

CHARLES KANE. [L. S.]
JAMES KANE. [L. S.]

Witnesses:

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J. DONALDSON.