Sheet 1, 2 Sheets.

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Making Bolts and Rivets.

No. 49,902. Patented Sept. 12, 1865.

Fig. 2.

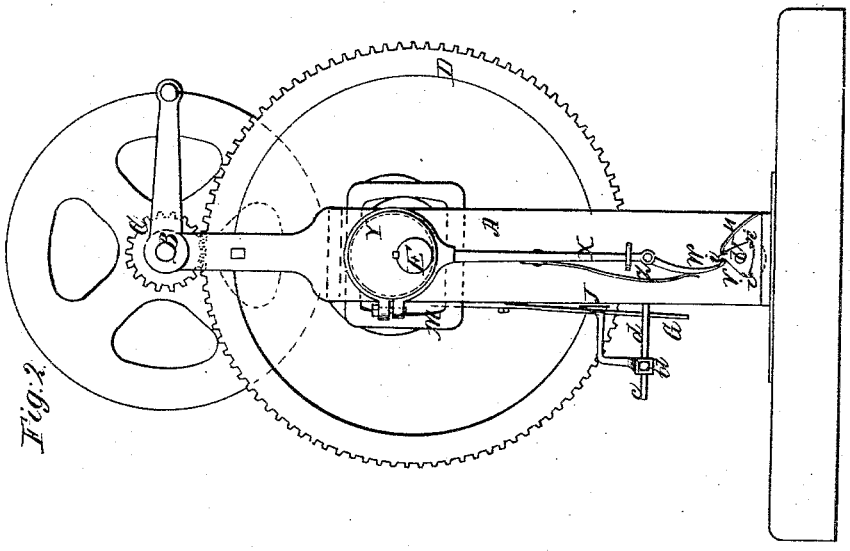

Fig. 1.

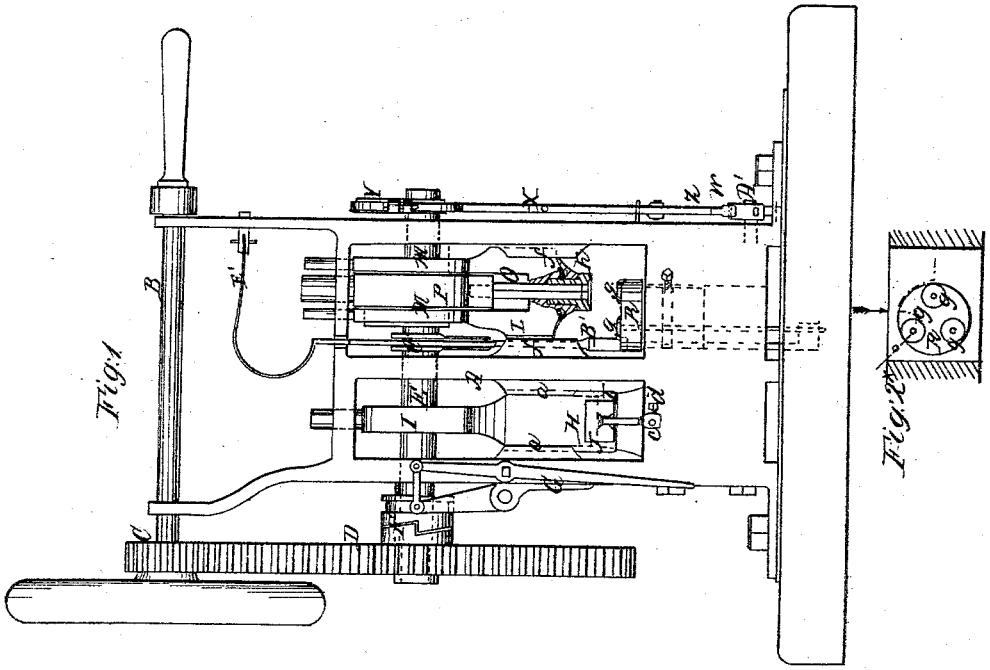

Fig. 3.

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Sheet 2, 2 Sheets.

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Fig. 6.

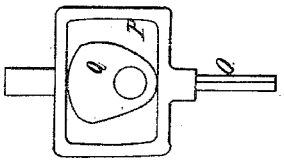


Fig. 4.

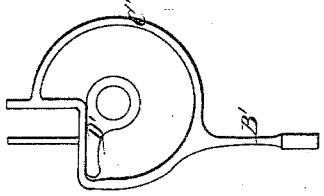


Fig. 5.

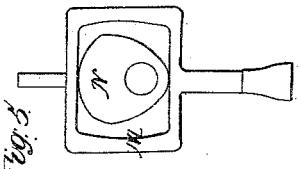
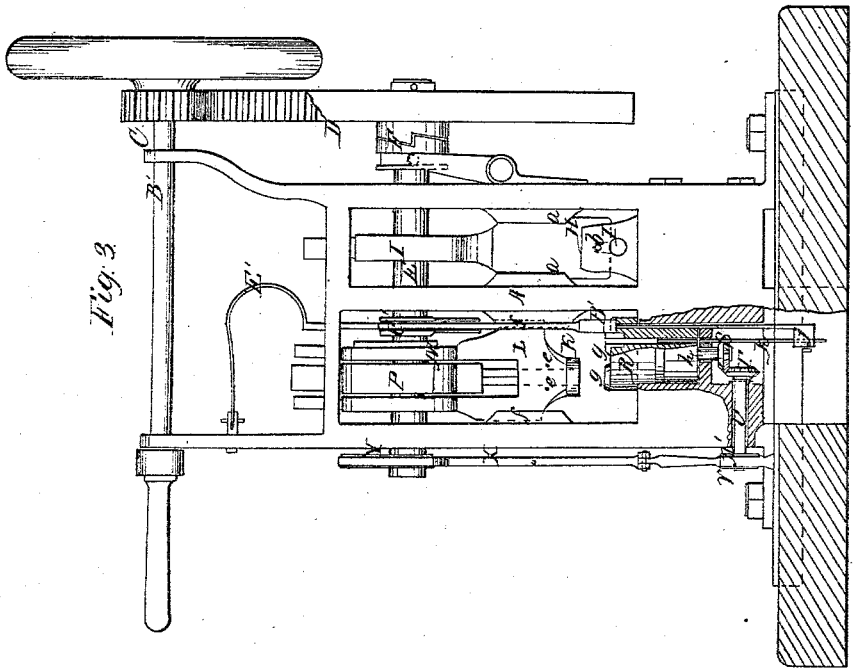


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES LUSTED, OF NEW YORK, N. Y.

MACHINE FOR MAKING BOLTS.

Specification forming part of Letters Patent No. **49,902**, dated September 12, 1865.

To all whom it may concern:

Be it known that I, CHARLES LUSTED, of the city, county, and State of New York, have invented a new and Improved Machine for Making Bolts and Rivets; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet No. 1, is a front elevation of my invention, partly in section; Fig. 2, a side elevation of the same; Fig. 2×, a detached plan or top view of the rotary die. Fig. 3, Sheet No. 2, is a rear elevation of the same, partly in section; Figs. 4, 5, and 6, detached side views of cams and yokes pertaining to the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new and improved machine for making bolts and rivets; and it consists in certain novel means employed for severing the blanks and discharging the finished bolts or rivets, as hereinafter fully shown and described, whereby the desired work may be done in an expeditious and perfect manner, the rod being cut into pieces of the required length and the heads formed on the pieces by mechanism operated from one and the same driving-shaft.

A represents an upright rectangular framing, in the upper part of which a horizontal shaft, B, is fitted, provided with a pinion, C, which gears into a toothed wheel, D, on a shaft, E. The wheel D is fitted loosely on the shaft E, and is connected with it by means of a clutch, F, the latter being operated by means of a lever, G. (See Fig. 1.)

H represents a vertical cutter, which is fitted and works between guides *a a* in the framing A. The upper part of the cutter-plate is provided with a yoke, I, in which an eccentric on the shaft E works and gives, as the shaft E is rotated, a reciprocating movement to the cutter H. The cutter H works over a stationary upright plate, I, the latter having a hole, *b*, made in it for the rod from which the bolts or rivets are cut to pass through and form a bearing for the rod while being acted upon by the cutter.

J is an adjustable gage, fitted on a horizontal rod, *c*, and secured at the desired point thereon by a set-screw, *d*. This gage is directly in line with the hole *b* in plate I, and it insures the rod being cut into pieces of uniform length.

K is a female die, which is secured by pins *e* to the lower end of a sliding frame, L, the latter being fitted between guides *f f* in the framing A. The upper part of this sliding frame L is provided with two yokes, M M, in which eccentrics N on the shaft E work. One of these yokes, with its eccentric, is shown in Fig. 5. A vertical reciprocating motion is given the die K by means of the yokes and eccentrics above mentioned.

O is a vertical reciprocating rod, which works through the center of the female die K, and is operated by a yoke, P, at its upper end, in which an eccentric, Q, on the shaft E works, (see Fig. 6,) the yoke P and eccentric Q being between the yokes M M and eccentrics N N of the sliding frame L. The eccentrics N N and Q are of such a form and placed on their shaft E in such relative position as to cause the sliding frame L and rod O to operate at different times, and also to cause each to have a period of rest at the termination of each movement. For instance, when the sliding frame L reaches the termination of its downward movement it remains stationary, while the rod O is forced down through it, and when the rod O reaches the termination of its downward movement it remains stationary and the sliding frame L commences to rise, and when the latter reaches the termination of its upward movement it remains stationary until the rod O is raised, when the latter, in turn, remains stationary until the sliding frame is again forced down.

R represents a rotating bed or die fitted vertically in the lower part of the framing A, and having three protuberances, *g*, on its upper surface, corresponding in form to the lower interior part of the female die K. (See Fig. 1.) This bed or die R has such a position relatively with the female die K that as the bed or die R is rotated the protuberances *g* will come in line with the die K, as will be understood by referring to Figs. 1 and 3. The bed or die R is perforated vertically and centrally through each protuberance *g*, and these perforations receive the pieces of rods on which heads are to be formed by the female die K, the interior of the latter above the lower part which receives the protuberances *g* being of the form

designed to be given the heads of the bolts or rivets. The bed or die R has a small rod, *h*, extending down centrally from its lower end, and this rod *h* has a bevel-wheel, S, upon it, which gears into a corresponding wheel, T, on a horizontal shaft, U, the latter extending through the side of the framing and having a trilateral head or ratchet, V, upon it, as shown clearly in Fig. 2, each angle of said head or ratchet having a hook, *i*, for a pawl, W, to engage with. The pawl W is at the lower end of a rod, X, which is operated by a cam, Y, at the end of the shaft E, the pawl W having a spring, *z*, bearing against it, which spring has a tendency to keep the pawl engaged with the head or ratchet, as shown clearly in Fig. 2. The head or ratchet V has a retaining-pawl, A′, bearing against it to prevent it from casually turning, recesses being made in V, near each angle, to receive said pawl.

B′ is a vertical rod fitted in the framing A, and having a yoke, C′, at its upper end, in which a tappet, D′, on the shaft E works. This rod C′ extends down below the bed or die R, and has an arm, *j*, projecting horizontally from its lower end, to which a vertical rod, *k*, is attached, said rod *k* being in line with the perforations in the bed or die R. (See Fig. 3.) On the upper end of the rod B′ a spring, E′, bears. (Shown in Figs. 1 and 3.)

The operation is as follows: The rods from which the bolts or rivets are made is cut into pieces of a proper length by means of the cutter H, and these pieces are inserted in the perforations of the bed or die R, said pieces projecting above the upper surfaces of the protuberances *g* to leave a sufficient amount of metal to form the heads. These pieces, when inserted in the bed or die R, are heated to a proper degree, and, if they are shorter than the perforations in said bed or die, rods are fitted within the latter in order to have the pieces project a suitable distance above the protuberances. The bed or die R is turned intermittingly by means of the pawl W engaging with the head or ratchet V, and, as said head or ratchet is of trilateral form, a protuberance, *g*, is brought underneath the female die K at each upward movement of the rod X. At the termination of each movement of the bed or die R the female die K descends and covers the top of the piece projecting above the protuberance *g* within it, and when the die K reaches the termination of its downward movement the rod O is forced down and acts upon the top of the piece of rod and forms the head of the bolt or rivet, causing the upper end of the piece to conform to the interior of the female die. The rod O then remaining stationary, the female die K rises, so as to leave the bolt or rivet in the bed or die R, and the latter is rotated by the pawl W and head or ratchet V to bring a succeeding protuberance and piece of rod underneath the female die K, while the bolt or rivet previously formed is brought over the rod *k*, which is forced upward by the tappet D′ working in the yoke C and ejects the bolt or rivet from the bed or die R, the rod *k* being forced down out of the bed or die R by the spring E′, which performs its work as soon as the tappet D′ leaves the prominent portion a^{x} of the yoke C′. (See Fig. 4.)

Thus by this simple and compact machine bolts or rivets may be made very expeditiously and in a perfect manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The reciprocating cutter H, in connection with the stationary perforated plate I, when said parts are constructed as herein described and used in combination with the intermittingly-rotating bed or die R and reciprocating female die K, for the purpose specified.

2. The rod B, operated through the medium of the yoke C′, tappet D′, and spring E′, and provided with the rod *k*, all the said parts being constructed as herein described, and arranged in relation with the perforations of the bed or die R as shown, for the purpose of discharging the bolts or rivets from the bed or die R, as set forth.

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