

O. BRIEDE.
MANUFACTURE OF BOLTS, RIVETS, &c.
APPLICATION FILED JAN. 8, 1909.

987,282.

Patented Mar. 21, 1911.

3 SHEETS—SHEET 1.

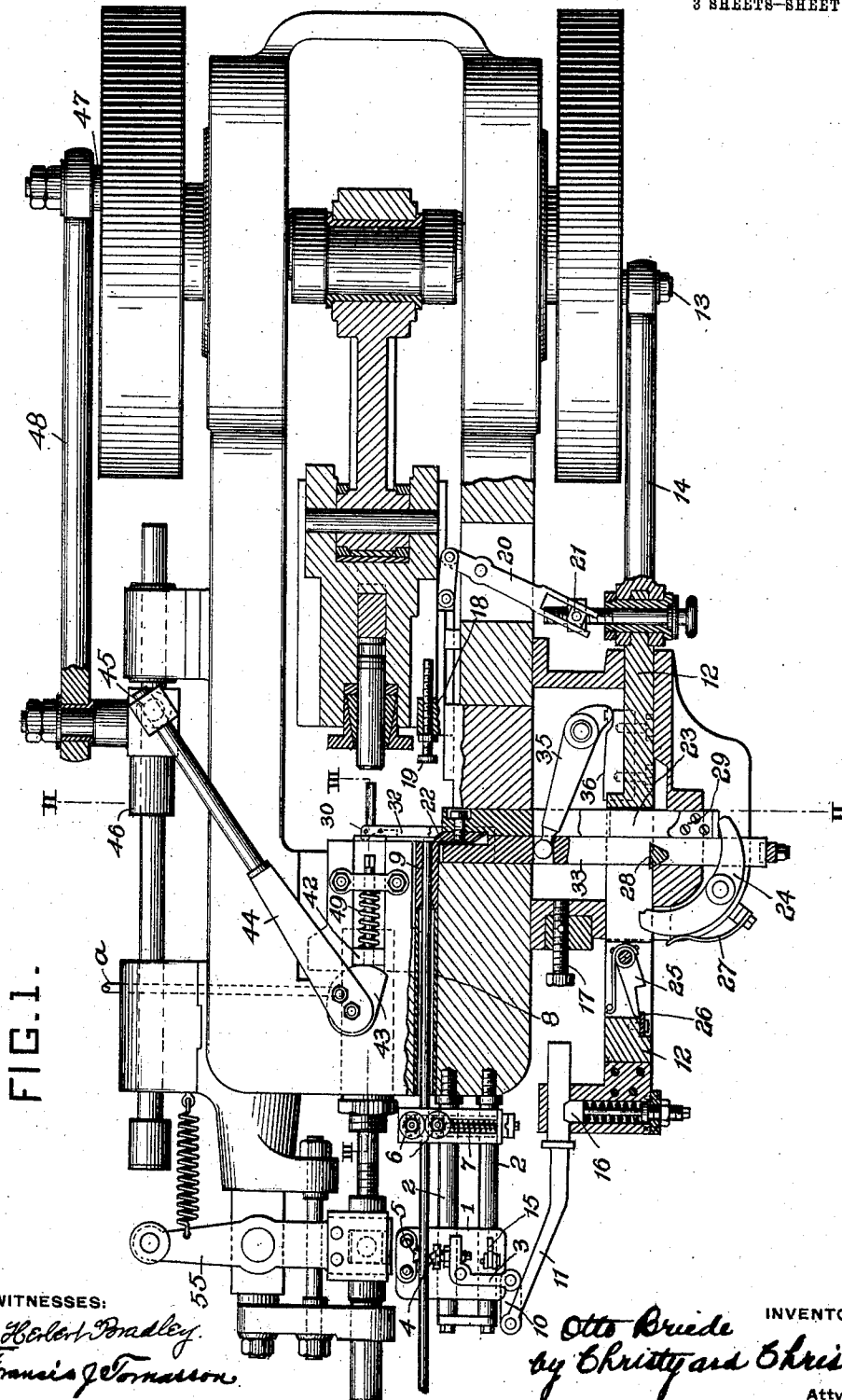


FIG. 1.

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by Christy and Christy,
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3 SHEETS—SHEET 2.

FIG. 2.

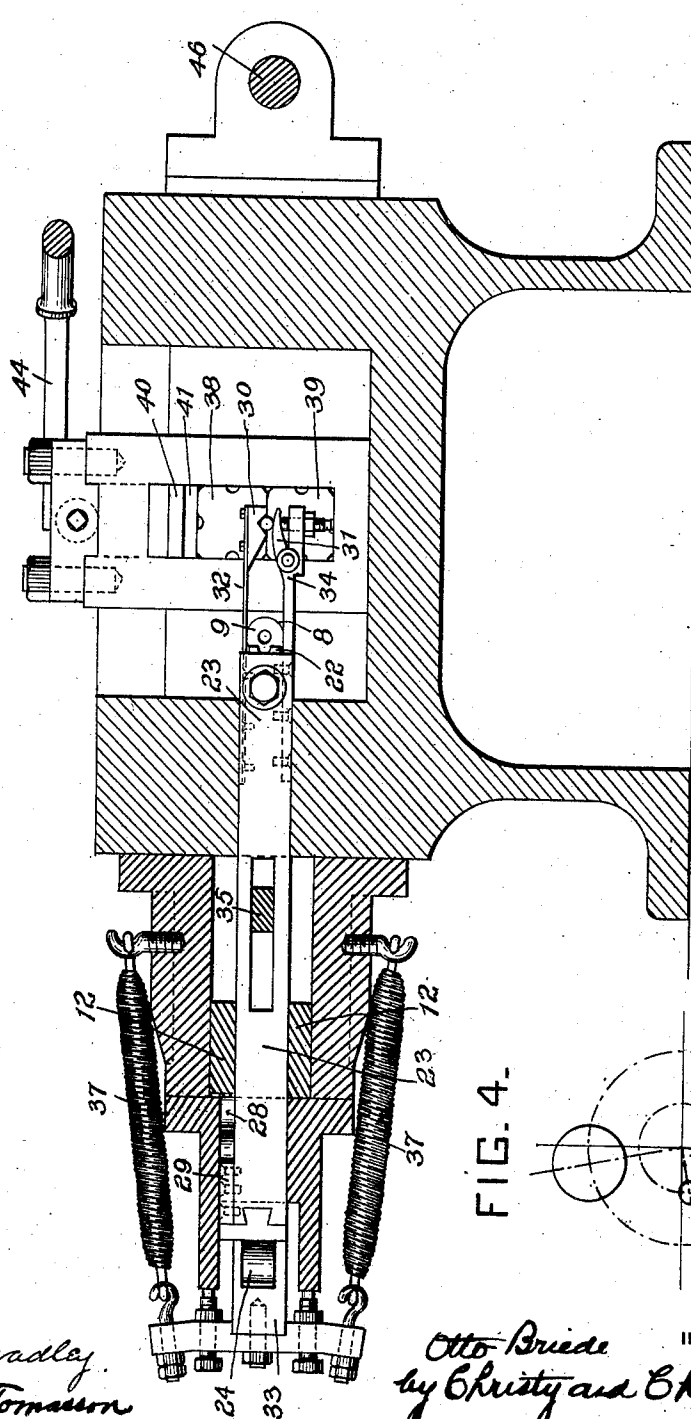
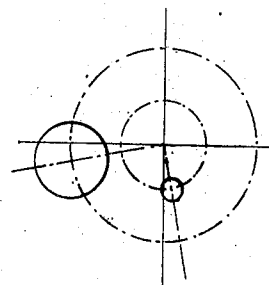


FIG. 4.



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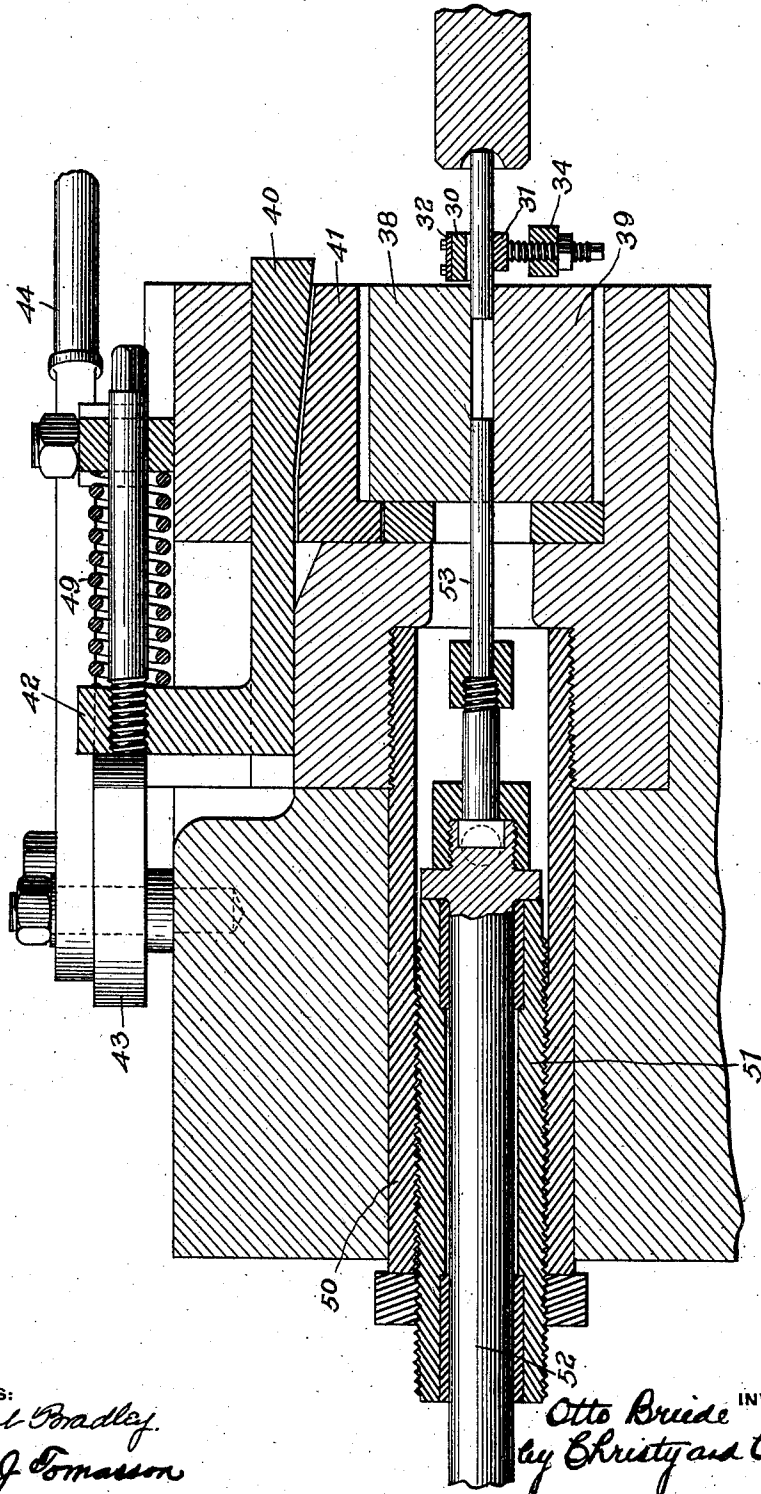
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3 SHEETS—SHEET 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF BOLTS, RIVETS, &c.

987,282.

Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed January 8, 1909. Serial No. 471,284.

To all whom it may concern:

Be it known that I, OTTO BRIEDE, a citizen of the German Empire, residing at Benrath, near Dusseldorf, Germany, have
5 invented or discovered certain new and useful Improvements in the Manufacture of Bolts, Rivets, &c., of which improvements the following is a specification.

The invention described herein relates to
10 certain further improvements in the class or type of bolt or rivet machines described and claimed in an application filed by me April 27th, 1908, Ser. No. 429,430.

The present invention is hereinafter more
15 fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a sectional plan view of my improved machine, Fig. 2 is a transverse section on a plane indicated by the line II—II Fig. 1; Fig. 3 is a sectional view showing the die box and header, the plane of section being indicated by the line III—III Fig. 1, and Fig. 4 is a view
20 showing the relative movements of the header and the slide controlling the feed transfer and cutting mechanism.

In the practice of my invention the bar or rod from which the blanks are cut, is passed through a step by step feed mechanism, a
30 holding or retaining device and a tubular guide to the point where the shearing is effected.

The feed mechanism consists of a slide 1 mounted on guide bars 2 secured to the
35 frame of the machine. A bell crank lever 3 is so mounted on the slide that when the lever is shifted as hereinafter stated a bit 4 adjustably secured to one of the arms, will bear against the rod and force it against a
40 stationary bit 5 carried by the slide, and thereby firmly grip the rod. By the feed movement of the slide, the bar is forced through between two rollers 6 one of which is pressed toward the other by a spring 7
45 to firmly hold the rod from movement during the backward movement of the slide. From the rollers the rod passes through a tubular guide 8, the portion 9 thereof being formed of hardened steel and constructed to
50 form one of the shear blades. The movement of the feeding slide is effected through the bell crank lever, which is connected by a link 10 to an arm 11 carried by the slide 12, which as shown is operated by the crank
55 pin 13 through the pitman 14. It will be observed that the feed-slide will not be shift-

ed until the movement of the bell crank is arrested either by the bit 4 bearing on the rod or by the pivoted latch 15, when turned to engage an arm of the bell crank in case
60 it is desired to stop any feeding of the rod or stock, without arresting the operation of the machine. The arm 11 is so connected to the slide 12, that the latter can move independent of the arm during the latter
65 part of the movement of the slide to the right in Fig. 1, or after a feed of the stock or rod has been effected and also during a portion of the slide to the left. A convenient means for detachably connecting the
70 arm to the slide consists of a spring operated pin 16 mounted in the slide and engaging a notch in the arm, the engaging faces of the pin and notch being inclined. The
75 length of rod or stock to be fed on each forward movement of the slide is controlled by an adjustable stop 17 against which the end of the arm will strike.

On account of the difficulty of obtaining an accurate feed of the stock or rod, it is
80 preferred to so adjust the feed mechanism, that each feed-movement of the slide 1 will feed past the shear blades a greater length of stock than is required to form a given
85 size of bolt or rivet, and then push the stock or rod back until the length required will project beyond the blades. This backward movement of the stock or rod is effected during the latter part of the movement of
90 the slide 12 to the right in Fig. 1 or immediately after the feed-in has been effected. In the construction shown, a sliding block 18 provided with an adjustable portion 19 is connected to a lever 20 having a forked end
95 engaging an adjustable block 21 carried by the slide 12. By the adjustment of the portion 19 the stock or rod will be shifted with reference to the shears so that the length of stock projecting beyond the shears at
100 the time of their operation will always be the same, regardless of the stroke of the feed-slide, provided that such stroke is greater than the desired length of blank.

As before stated the end portion 9 forms one of the shearing members, the other member being formed by a blade 22 secured to the movable bar 23. This bar is moved inwardly to effect the cutting of the rod by
105 lever 24 one end of which engages the outer end of the bar 23 while the opposite projects into the path of movement of a spring actuated dog 25 pivotally mounted on the
110

slide 12. As the slide moves to the right in Fig. 1, the dog moves over the end of the lever 24, but when the slide moves to the left a shoulder on the dog engages a shoulder on the lever, which is shifted thereby moving the bar 23 in to effect the shearing of the blank. As the dog is carried along by the slide it will slip out of engagement with the lever and drop onto a stop 26. The lever is held in proper position to be engaged by the dog by a spring 27. The return or outward movement of the bar is effected by a projection 28 on the slide engaging a cam plate 29 on the bar. The projection is so located on the slide that it will engage the cam plate immediately after shearing.

It will be observed that the guide passage 8 is substantially parallel and at one side of the blank-holding dies, and hence means are provided whereby the blank may be transferred from a position in alinement with the guiding passage to position in front of the holding dies. To this end jaws 30 and 31, the former being connected by a spring to the bar 32, and the latter being constructed in the form of a tongue pivotally connected to an arm 34 secured to the bar 33. The tongue is so adjusted with reference to the jaw 30 that a blank on the end of a bar will pass in between these jaws and be yieldingly held thereby. As shown in Fig. 2 the spring 32 and arm 34 are on opposite sides of the tubular guide 8 so that when these jaws are drawn backward by the bar the end of a rod projecting out through the tubular guide, will pass in between the jaws and be held thereby. After the shearing has occurred, the bar 33 will be shifted to bring the blank carried between these jaws, into alinement with the opening in the holding dies. The outward movement of the bar 33 to cause the jaws to engage the end of the rod projecting from the tubular guide is effected by a lever 35 extending through a slot in the bar 23 and engaging the bar 33 as clearly shown in Fig. 1. The lever is shifted on the reciprocation of the slide 12 by a cam 36 carried by such slide. The outward movement of the bar 33 is against the tension of springs 37 connected to the outer end of such bar as shown in Fig. 2, so that the bar will be snapped forward to place a blank in position in front of the holding dies as soon as the short end of the lever 35 passes off the high portion of the cam 36.

While closed dies may be used in the heading operation, it is preferred to employ a divided die which in the construction shown is formed by blocks 38 and 39 having grooves in their faces. These blocks are arranged in a suitable recess in the frame of the machine and are held in close contact with each other so as to practically form a

closed die during the heading operation by means of wedges 40 and 41, the latter being stationary and resting on the upper die 38. The wedge 40 is provided with a lug 42 extending upwardly into the path of movement of the cam 43 on the lever 44. This lever has its end loosely mounted in a block 45 pivotally mounted on a slide 46, adapted to be shifted back and forth by a crank pin 47 to which it is connected by a pitman 48. The upper projection 42 on the wedge is held in contact with the cam by means of a spring 49 interposed between the projection and an abutment on the bed of the machine. In the rear of the die block is arranged a cylinder 50 having an adjustable lining 51, which is threaded into the cylinder. A piston rod 52 is adapted to reciprocate back and forth in the inner cylinder or lining and to its front end is connected a plunger 53 fitting into the matrix of the die. The movement of the piston is effected by means of a lever 55 connected therewith and adapted to be hit by the slide 46 as it approaches the rear end of its movement. By the movement imparted to the piston and plunger by the slide, a finished blank is ejected from the dies. It will be observed that the plunger will not be shifted by the slide until after the lever controlling the closing of the dies has also been shifted to permit of the opening or separation of the dies. The portion of the cylinder in front of the piston is connected with a water supply by a pipe and passage *a*, so that when the plunger is moved to eject a blank, water will also be forced forward through the matrix of the die cleaning and cooling the same. The lining within the cylinder, which as stated is adjustable, forms a stop to regulate the projection of the plunger into the die matrix, the position of the plunger being dependent upon the length of the shanks on the bolts to be formed.

It is characteristic of my improved machine that the wedge 40 is shifted so as to press the die sections together, and lock them in such position prior to the insertion of the blank into the matrix by the heading die, the movement of the wedge to press the dies together being effected by a spring which becomes operative the instant the cam 43 is shifted away from the lug 42. It is also characteristic of my machine that the cam acts to relieve the pressure of the die blocks before the ejecting plunger is moved in to force out the completed bolt or rivet. By reason of the fact that the die sections are closed together prior to the insertion of the blank practically no finning will be produced in the heading operation, such finning being usually the result of the pinching out of metal by dies closing around the blank. As the blank during the heading operation is largely held as against

movement by a movable plunger, the matrix need not close so tightly on the blank.

By reason of the detachable connection between the rod grippers, whereby the rod is fed into the machine, and the slide operating the grippers, a variation in the amount of feed can be easily effected, merely by shifting the adjustable stop 17 which can be effected without stopping the machine. And further, as the mechanism employed for shifting the stock back until the desired length projects beyond the guide 8 is adjustably connected to the slide whereby such mechanism is operated, the length of stock to be cut off can be changed without stopping the machine. As both the feed of the stock and the length of blank to be cut can be so easily changed, it is clear that my improved machine can be adapted for very close work and also for the quick change from one length of bolt or rivet to another.

I claim herein as my invention:

1. In a machine for heading bolts, rivets, etc., the combination of a longitudinally divided die, means for inserting a blank into the die and means operative prior to the operation of blank-inserting means, for locking the die sections together.

2. In a machine for heading bolts, rivets, etc., the combination of a longitudinally divided die, means for locking the die sections in closed position, means for ejecting the bolt or rivet from the die, and means operative prior to the operation of ejecting means for unlocking the die sections.

3. In a machine for heading bolts, rivets, etc., the combination of a die having a matrix therethrough, a plunger forming a blank-supporting abutment in the die matrix, a cylinder in line with the matrix, a piston for operating the plunger means for shifting the piston and means for introducing a cooling fluid to the cylinder at a point intermediate of the piston and the die.

4. In a machine for heading bolts, rivets, etc., the combination of a die having a matrix therethrough, a plunger forming a blank-supporting abutment in the die ma-

trix, a cylinder in line with the matrix, a piston for operating the plunger and an adjustable abutment for limiting the movement of the piston and plunger.

5. In a machine for heading bolts, rivets, etc., the combination of a die, a movable header, a rod guide at one side of the die, a movable bar carrying a shear blade, a second movable bar, arms carrying blank-gripping jaws, said arms having a length greater than the distance between the guide and die, and means for reciprocating the bars.

6. In a machine for heading bolts, rivets, etc., the combination of rod gripping means, a slide, an arm connected to the rod grippers, means for detachably connecting the arm to the slide and adjustable means for disconnecting the arm from the slide.

7. In a machine for heading bolts, rivets, etc., the combination of rod gripping means, a slide, a detachable connection from the gripping means to the slide, means for breaking such connection on a predetermined movement of the gripping means, and means operated by the slide for shifting the stock in opposition to the feed movement.

8. In a machine for heading bolts, rivets, etc., the combination of rod gripping means, a slide, a detachable connection from the gripping means to the slide, means operative on a predetermined movement of the gripping means for breaking such connection, and means having an adjustable connection to the slide for shifting the stock in opposition to the feed movement.

9. In a machine for heading bolts, rivets, etc., the combination of a die consisting of blocks normally in contact, means for feeding the blank into the die and means for locking said blocks in such position prior to the insertion of the blank.

In testimony whereof I have hereunto set my hand.

OTTO BRIEDE.

Witnesses:

OTTO RAABEN,
LOUIS VANDORN.