

April 14, 1959

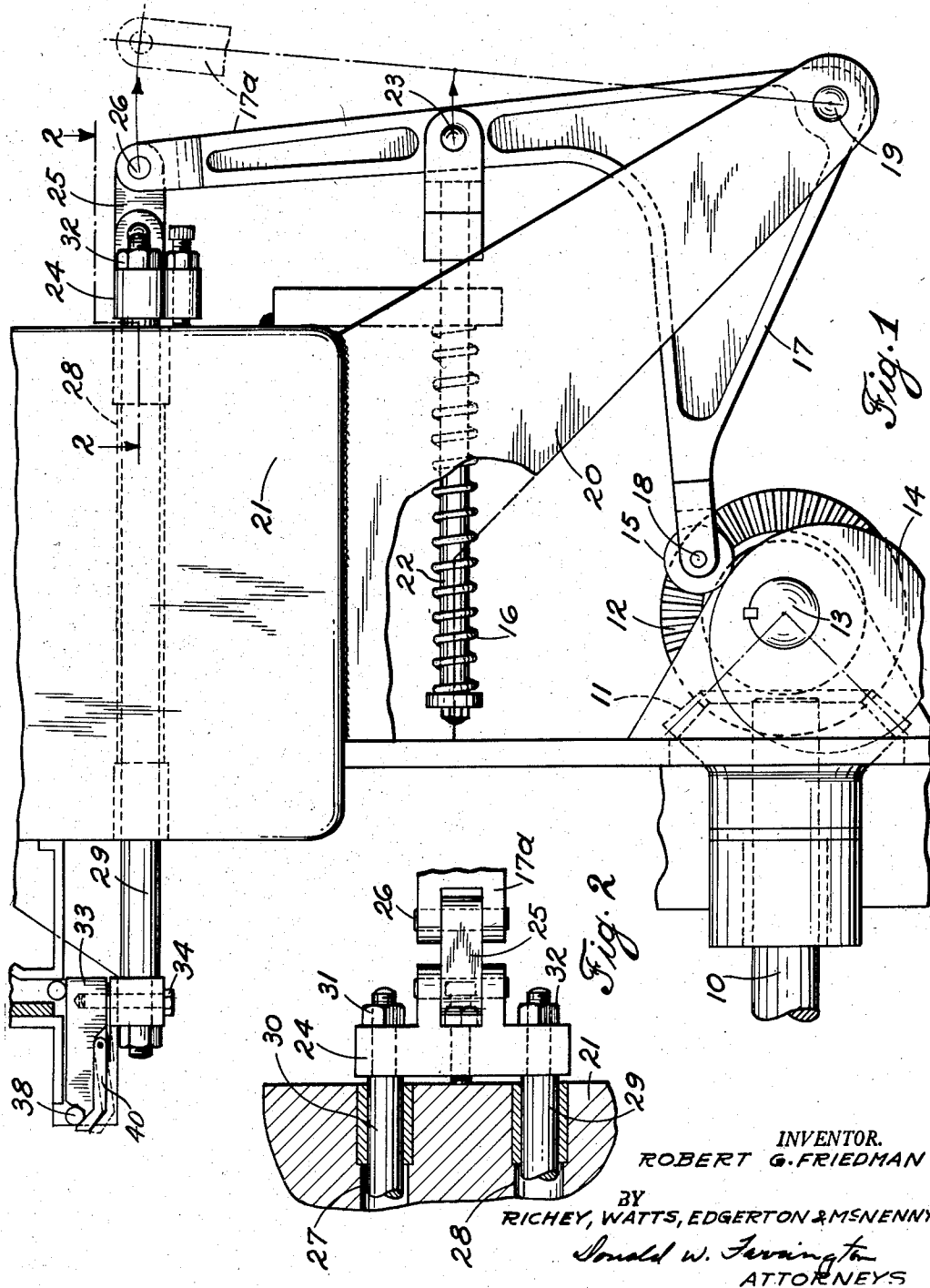
R. G. FRIEDMAN

2,881,950

CUT BLANK FEED

Filed June 6, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

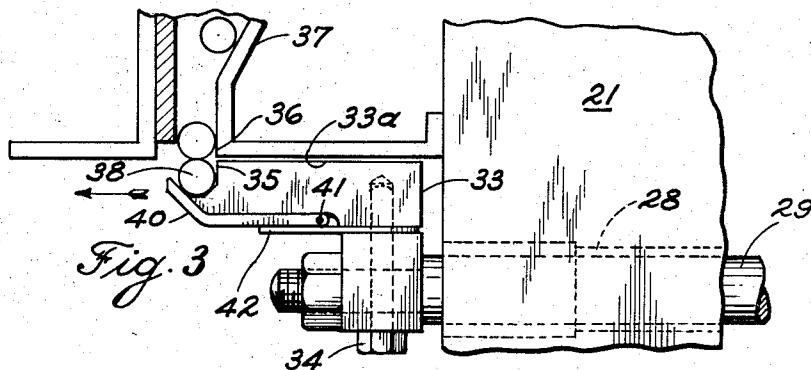


Fig. 3

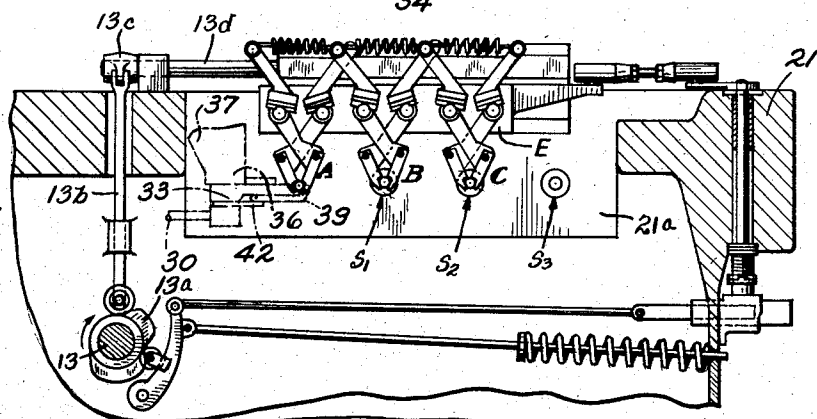


Fig. 4

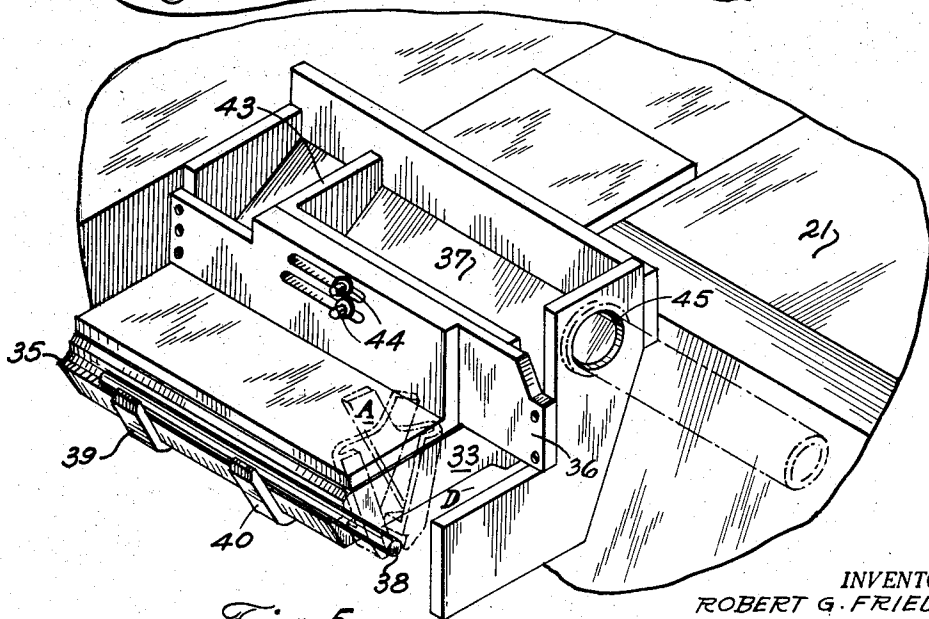


Fig. 5

INVENTOR.
ROBERT G. FRIEDMAN.

BY
RICHEY, WATTS, EDGERTON & MENENNY

Donald W. Fawcett
ATTORNEYS

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CUT BLANK FEED

Robert G. Friedman, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio, a corporation of Ohio

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2 Claims. (Cl. 221—225)

This invention relates to machines for making bolts and similar articles and particularly to a feed device for cut blanks for such machines.

Machines for performing a plurality of operations upon blanks are illustrated in the patents to Frost, Nos. 2,020,658 and 2,020,659, and in Friedman Patent No. 2,020,660. Transfer fingers for such machines may be as shown in Clouse Patent No. 2,026,823 for taking the blank from one station to a die or die stations for working by the header tools mounted on a reciprocating header slide, as described in the above patents.

As is customary and well known in the art, the header slide is reciprocated by a main, or crankshaft journaled in the bed frame all as shown in Fig. 1 of the aforesaid patent to Clouse (and in Frost 2,020,658) and described, for example, on page 2 of Clouse, column 1, lines 71-75.

Also, as is well known in the art, suitable ejectors or knock outs for the blanks are provided. Illustration of these details is not necessary for an understanding of the invention, a suitable mechanism being shown in the aforesaid patent to Frost, 2,020,658, and described in detail on page 3, column 2, lines 50-66. The arrangement therein described may be incorporated in a machine embodying this invention, wherein suitable ejectors are arranged to eject the blanks from the dies in the usual manner in such a way that as the punches recede the blanks are pressed out of the dies to follow the punches. In this way the shanks of the blanks project outwardly from the dies to permit the pairs of fingers carried on the transfer slide to snap over the same as the header slide recedes from the dies. The ejectors may be operated in any suitable way. As shown in Fig. 2 of the Frost patent, for example, they are pressed by levers carried on a shaft which is oscillated by an arm driven by a link. The link is pivoted at its opposite end to an oscillating frame which receives a cam on the crankshaft. The heading pressure is received by an adjustable backstop engaging the levers in alignment with the ejectors.

I have found it advantageous to provide a blank feeder means whereby ready cut blanks may be carried from a hopper by means of a chute to a blank receiving position whereupon a blank carrier in the feeder carries a blank to a blank discharge position or point where the blanks can be picked up by and transferred by transfer fingers to the first die station of the machine. Such cut blanks may be heated in a suitable induction furnace prior to their admission to the hopper, so that upsetting of the blanks may be facilitated.

Heating of the cut blank at the portion to be upset is advantageous, in that it requires less force for upsetting at the heated portion, consequently smaller machines can be utilized for the upsetting. Additionally, metals that heretofore could not be economically upset in the cold state can be upset when heated. By the use of induction heating, scaling problems usually associated with heated blanks, can be avoided if the heated blank is worked soon after the heating has been accomplished.

In the present embodiment, I disclose a hopper and

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cooperating feed mechanism for moving the blanks from the hopper to a point where they can be picked up by the transfer fingers for transfer to the die stations on the die-breast of the machine.

5 An object of my invention is to provide a cut blank feed mechanism operating in timed relation to the machine.

10 A further object of my invention is to provide a convenient pick-up station for blanks that are carried from the hopper, and transferred laterally to a die station.

These and other objects will appear in the following detailed description.

In the drawings:

15 Fig. 1 discloses the actuating means for the cut blank feed device;

Fig. 2 is a section taken at 2-2 of Fig. 1;

Fig. 3 is a sectional view of the feed device receiving a blank from the hopper;

20 Fig. 4 discloses the transfer fingers in relation to the cut blank feed device; and

Fig. 5 is an isometric view of the hopper and feed device disclosing the blank ready for transfer.

In machines such as those disclosed in patents Nos. 2,020,658 and 2,020,659, the metal stock is fed to the machine and a blank is sheared off and is transferred to the first die station. In the present embodiment of my invention, provision is made for the feeding of cut blanks from a hopper and chute unit to the first die station. In this regard, a hopper and chute unit is shown provided with a discharge outlet and a reciprocating blank carrier means is disclosed slidably mounted beneath the chute for carrying the cut blank from the hopper and chute discharge to a location where the transfer fingers of the machine can grasp the blank to transfer it to a first die station.

For assistance in the upsetting operation at the die station, the blanks may be heated at the portion to be upset. Such a heated blank requires less force for upsetting and thus a smaller machine can be utilized for blanks of a size that would require a larger machine if upset cold. The means for heating the blanks forms no essential part of my invention, as I am concerned with the reception of the blanks in a hopper and chute unit and their transfer from the chute to a position where the blanks can be grasped by the transfer fingers of the machine. Such transfer fingers are adequately described in Clouse Patent No. 2,026,823, although, as will be seen as this description proceeds, as compared to the Clouse machine, the transfer mechanism of the machine embodying this invention has one set of transfer fingers for each die station.

55 Additionally, use of a heated blank makes possible greater upsetting with fewer blows from a header, and also permits the successful working of materials in the heated state that until now, have been unworkable in the cold state.

60 However, it is obvious that my invention need not be limited to use with heated blanks, for the following description describes apparatus equally suited to handling cold blanks.

Referring to Fig. 1, I disclose a counter shaft 10, rotated by and at the same speed as the main or crank shaft (not shown) by appropriate means, as described in the aforesaid patent to Clouse 2,026,823, page 2, column 2, lines 1-3. The rotation of counter shaft 10 rotates bevel gears 11 and 12, bevel gear 12 being keyed to a longitudinal shaft 13 to which a cam 14 is affixed. Thus the rotation of cam 14 is in timed relation with the main shaft of such machines as are described in Patent Nos. 2,020,658, 2,020,659 and 2,026,823.

70 As described in detail in the aforesaid patent to Clouse, page 4, column 1, lines 1-38, and as partially seen in

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Fig. 4, opening and closing of the transfer fingers are controlled by a cam 13a mounted on longitudinal shaft 13 (Fig. 1) which cam 13a operates a vertical rod 13b pinned to a crank 13c on a rock shaft 13d, details of the transfer finger opening and closing mechanism not being critical to the invention except their operation is properly timed relative to the header slide and blank ejectors as is well known in the art and described in detail in the Clouse patent.

As cam 14 rotates, a cam roller 15 is positioned along the periphery of the cam, being held in contact with cam 14 by the action of spring 16 acting through rod 22 on pin 23.

Cam roller 15 is mounted on bell crank 17 as at 18, with said bell crank being pivotally mounted as at 19 to a member 20 affixed to the frame 21 of the machine.

As bell crank 17 is positioned by the action of cam roller 15 on cam 14, it positions bracket 24 connected by shackle 25 to the bell crank arm 17a as at 26. Fig. 2 discloses the details of connection of the bracket to the bell crank arm 17a.

Bores 27 and 28 provided in frame 21 allow passage of rods 29 and 30, said rods being secured to bracket 24 by nuts 31 and 32. To the other end of rods 29 and 30 is affixed blank carrier member 33 as by bolt 34.

The rotation of cam 14 causes bell crank 17 to reciprocate blank carrier member 33 through rods 29 and 30. As viewed in Fig. 1, the carrier member 33 is at one extreme of reciprocation away from frame 21. This position of Fig. 1 may be referred to as the blank discharge position.

Fig. 3 discloses carrier member 33 at its other extreme of reciprocation in relation to frame 21. This may be referred to as a blank receiving position. In this blank receiving position a shoulder recess 35 is aligned with outlet chute 36 of hopper 37 to receive a cut blank 38. Cooperating with carrier 33 at recess 35 are spring pressed fingers 39 and 40 pivoted as at 41. The fingers are normally urged in the position shown in Fig. 3 by a resilient member 42. These fingers may be moved downwardly as shown in dotted lines in Fig. 1, as the blank 38 is carried away laterally by transfer fingers A.

Fig. 4 discloses transfer fingers A, B, and C mounted on a transfer carriage E. The carriage E reciprocates to progressively advance a blank to each station (die) S₁, S₂, and S₃ disposed in a die breast 21a on frame 21 as disclosed in Clouse Patent No. 2,026,823. For the purposes of my invention, the axis of the blank 38 is disposed transverse to the direction of movement of the carrier 33 as shown in Fig. 5, so that transfer fingers A can grasp blank 38 when in their blank pick-up position shown in Fig. 4 and move it laterally to their blank-presenting position at the first die station S₁. As the blank is moved laterally by transfer fingers A, the springs 42 are overcome by the action of blank 38 on fingers 39 and 40, thus eliminating any need of a lifting action by the transfer fingers during such movement. Of course, the other transfer fingers B and C also move with the carriage between blank pick-up and blank-presenting positions.

As carrier 33 is moved under hopper discharge chute 36, only one blank is allowed to drop into recess 35, and as the carrier 33 reciprocates outwardly of the frame, the top surface 33a closes off the hopper discharge to prevent any blanks that may be collected therein from falling downwardly.

Blank 38 projects outwardly from carrier 33 as shown in Fig. 5 in the open space or pocket designated generally as D. It is in this open portion D that transfer fingers A operate to grip the end of the blank 38. Then with the transfer fingers A operating in timed relation to the machine, the blank is moved laterally to die station S₁.

In regard to the chute 36 and hopper 37 construction, wall 43 is adjustable as by loosening nuts 44 so that the hopper may be adjusted to accommodate blanks of various lengths. The blanks are fed to hopper 37 substantially in

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timed relation to the machine through opening 45 through a tube or other suitable means.

Thus it can be seen that I have disclosed a cut blank feed device that enables the blanks to be fed laterally from the hopper, in timed relation to the operation of the machine to a first die station.

While I have described one embodiment of my invention in considerable detail, various modifications may be made without departing from the mode of operation and the essence of my invention. Accordingly, the appended claims are determinative of the scope of my invention.

I claim:

1. In a blank heading machine of the type having a frame and a die breast, a plurality of die stations in said die breast, said die stations being spaced from one another for successively receiving blanks to be worked upon by tools, a reciprocating transfer carriage, a plurality of blank transfer devices on said transfer carriage, said transfer devices being spaced from one another by a distance equal to the spacing between said die stations, there being one transfer device for each die station, means to reciprocate said transfer carriage to move said transfer devices simultaneously and uni-directionally between a blank presenting position wherein each transfer device is aligned with a die station, and a blank pick-up position wherein one transfer device is laterally offset from a first die station with which it was previously aligned by a distance equal to the spacing between said die stations, and with the remaining of said plurality of transfer devices each aligning with a die station next to that with which it was previously aligned, and a feeding device for feeding blanks to said one transfer device, said blank feeding device comprising a blank receiving chute for supplying cut blanks and a blank carrier for receiving said cut blanks from said chute, said chute being mounted on the machine at said die breast and being laterally spaced from said pick-up position of said one transfer device, said blank carrier being shiftable relative to said chute from a blank receiving position at said chute to a blank-discharge position corresponding to said blank pick-up position of said one transfer device, means for shifting said blank carrier with a blank between its blank receiving and blank discharge positions, said transfer carriage reciprocating means moving said transfer carriage to place said one transfer device at its blank pick-up position when said blank carrier has carried a cut blank to the blank-discharge position so that when said one transfer device reaches its blank pick-up position it can at once pick up a cut blank from the carrier at its blank discharge position.

2. In a blank heading machine of the type having a frame and a die breast, a plurality of laterally spaced die stations in said die breast disposed in a line extending across said die breast, said die stations being spaced from one another for successively receiving blanks to be worked upon by tools, a reciprocating transfer carriage, a plurality of blank transfer devices on said transfer carriage, said transfer devices being spaced from one another by a distance equal to the spacing between said die stations, there being one transfer device for each die station, means to reciprocate said transfer carriage to move said transfer devices simultaneously and uni-directionally between a blank presenting position wherein each transfer device is aligned with a die station, and a blank pick-up position wherein one transfer device is laterally offset from a first die station with which it was previously aligned by a distance equal to the spacing between said die stations, and with the remaining of said plurality of transfer devices each aligning with a die station next to that with which it was previously aligned, and a feeding device for feeding blanks to said one transfer device, said blank feeding device comprising a blank receiving chute for supplying cut blanks and a blank carrier for receiving said cut blanks from said chute, said chute being mounted on the machine at said die breast and being laterally spaced from said pick-up position of said one transfer

device, said blank carrier being shiftable relative to said chute along the line of said die stations from a blank-receiving position at said chute to a blank-discharge position corresponding to said blank pick-up position of said one transfer device, means for shifting said blank carrier with a blank between its blank receiving and blank discharge positions, said transfer carriage reciprocating means moving said transfer carriage to place said one transfer device at its blank pick-up position when said blank carrier has carried a cut blank to the blank-discharge position so that when said one transfer device reaches its blank pick-up position it can at once pick up

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a cut blank from the carrier at its blank discharge position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,294,993	Wilcox	Feb. 18, 1919
1,309,998	Buchek	July 15, 1919
1,975,445	Brunner	Oct. 2, 1934
2,026,823	Clouse	Jan. 7, 1936
2,068,075	Rosenberg	Jan. 19, 1937
2,584,465	Kaserman	Feb. 5, 1952
2,728,318	Burton	Dec. 27, 1955