

June 20, 1933.

M. LAPHAM

1,914,514

HEADER

Filed Sept. 5, 1929

5 Sheets-Sheet 1

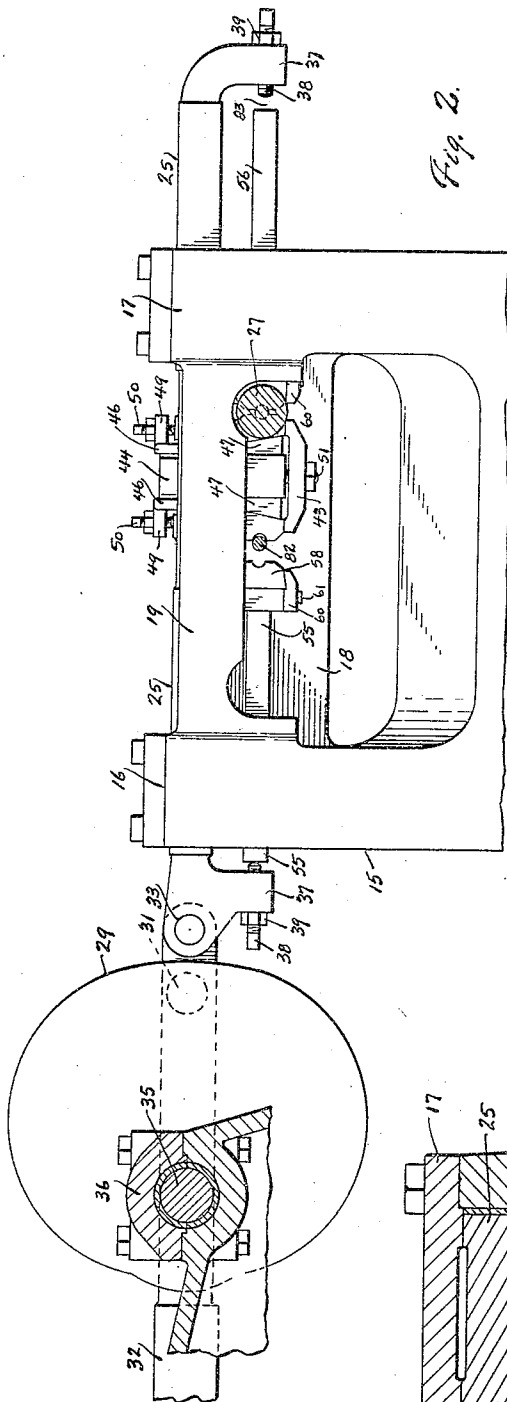


Fig. 2.

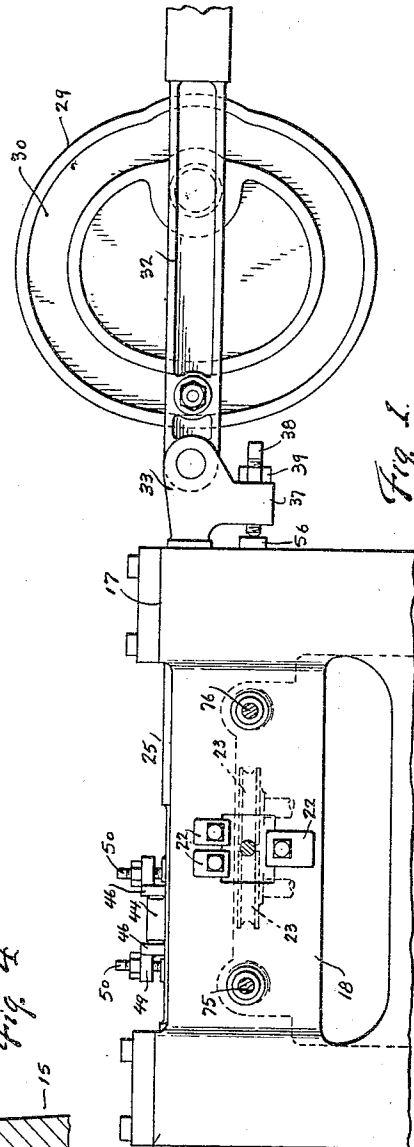


Fig. 1.

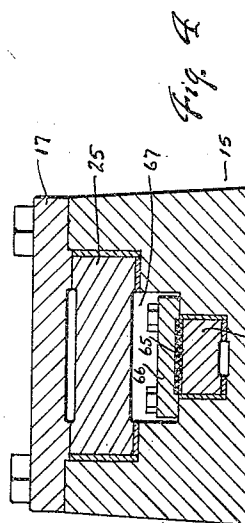


Fig. 4.

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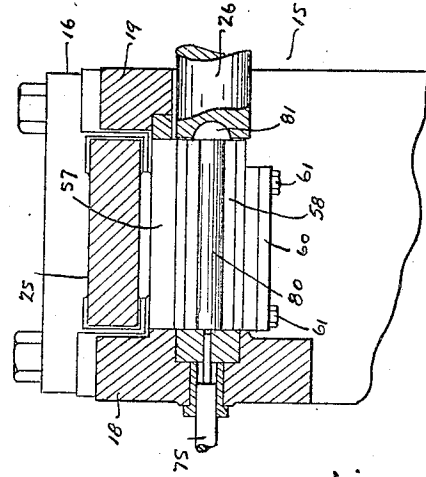
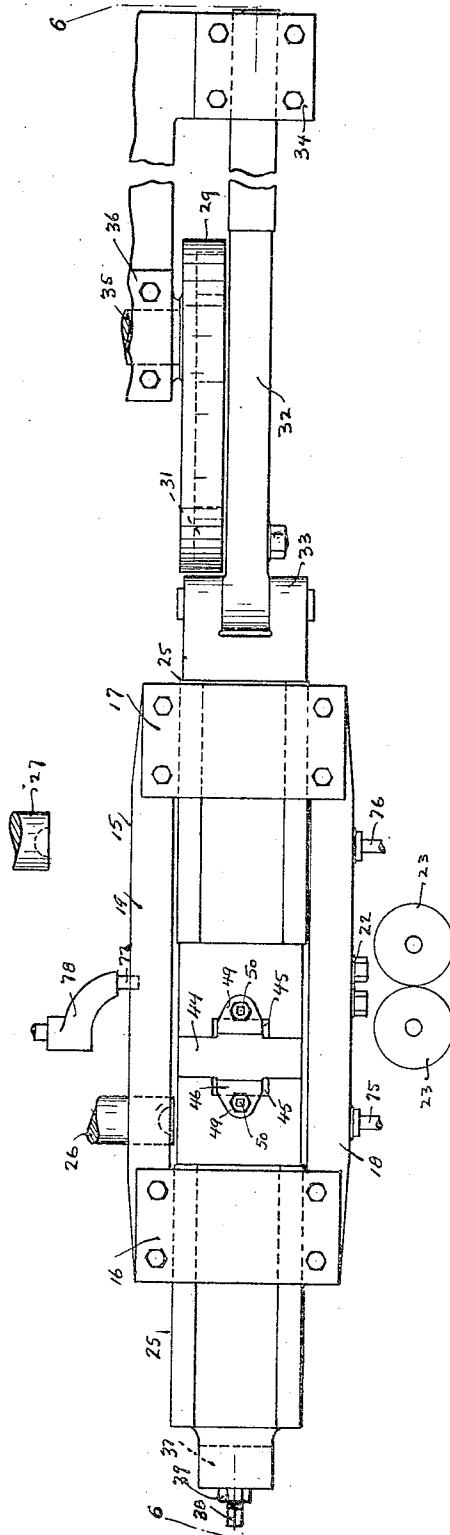


Fig. 5.

Fig. 3.

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5 Sheets-Sheet 3

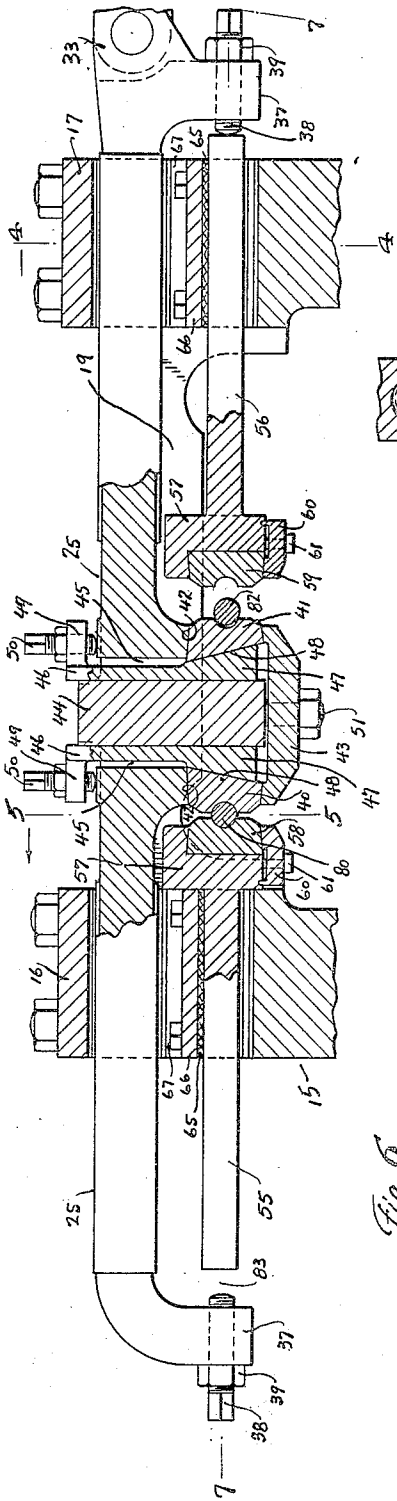


Fig. 6.

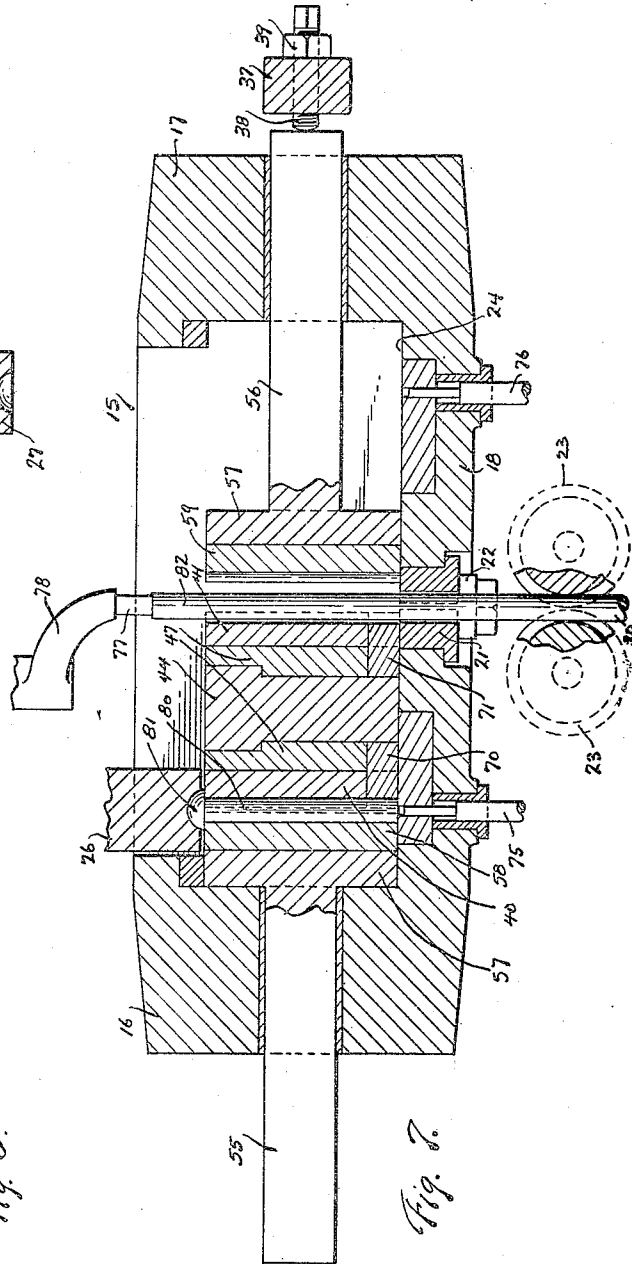
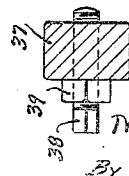


Fig. 7.



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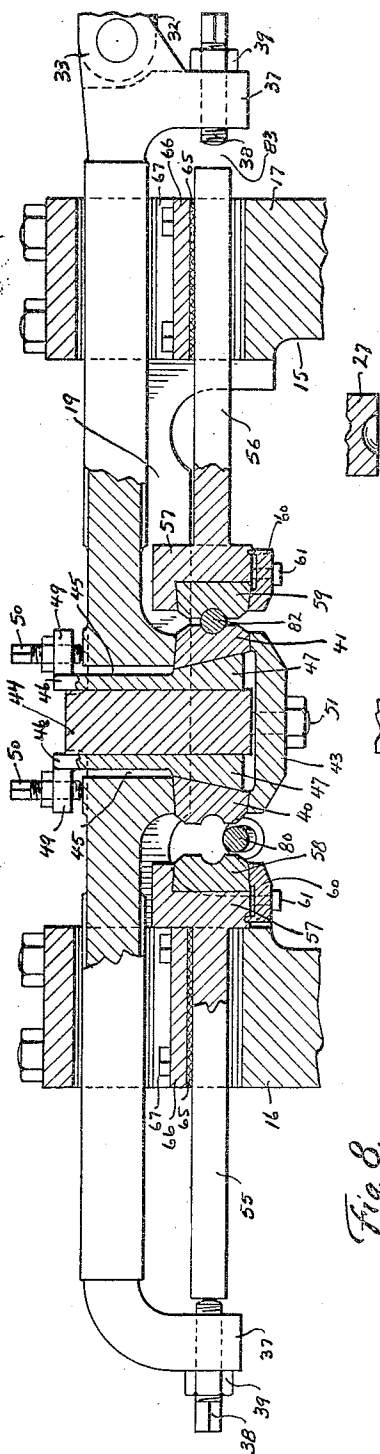


Fig. 8.

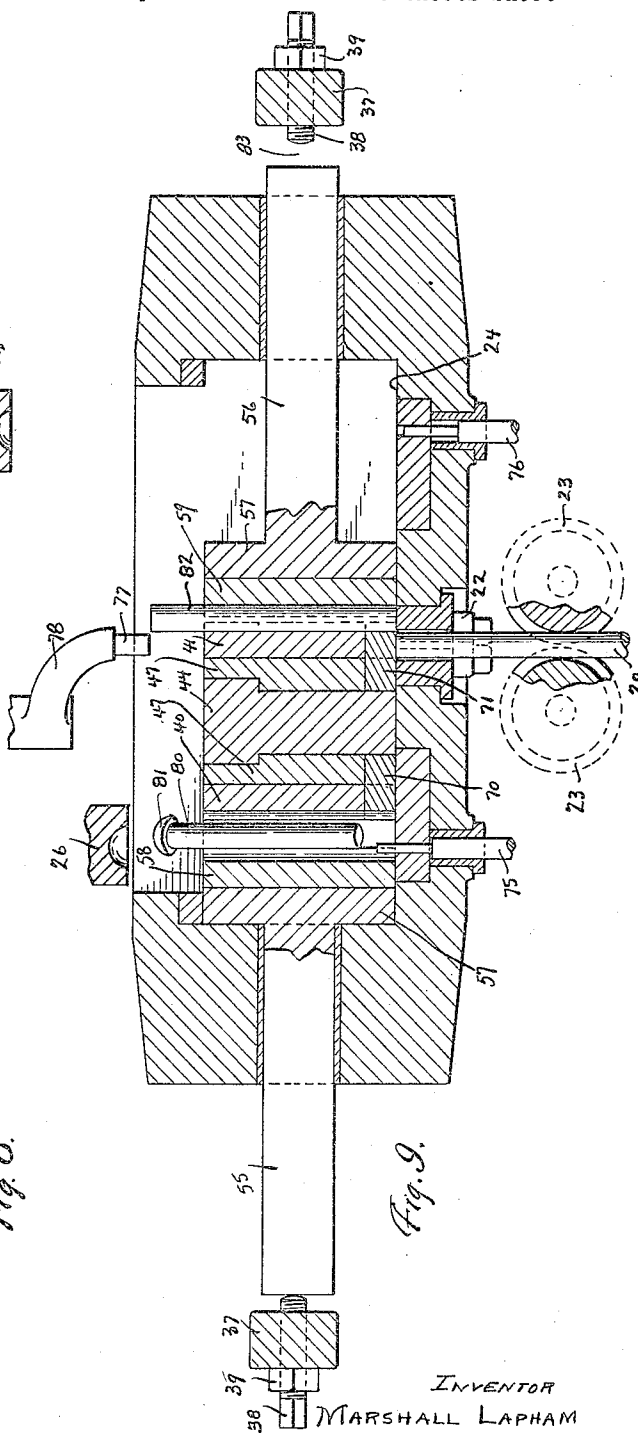


Fig. 9.

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5 Sheets-Sheet 5

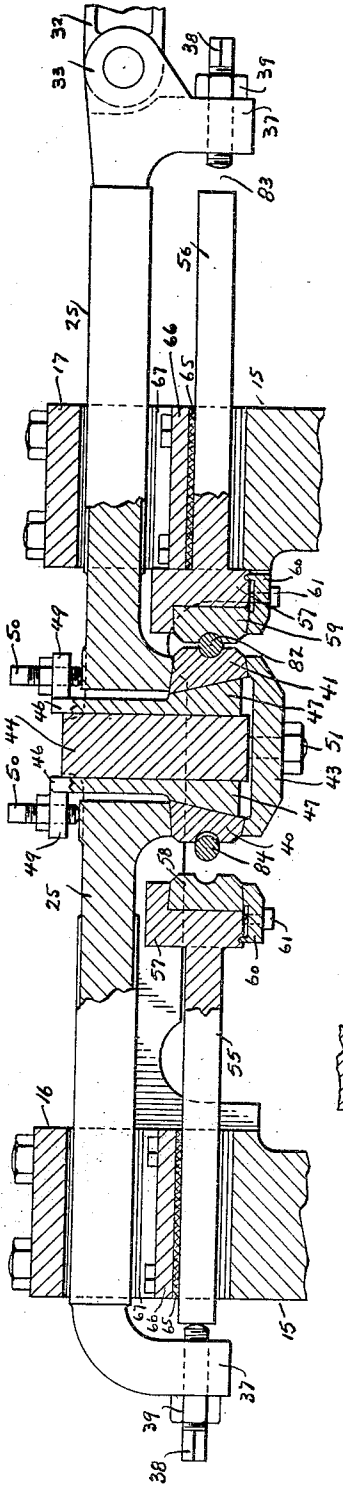


Fig. 10.

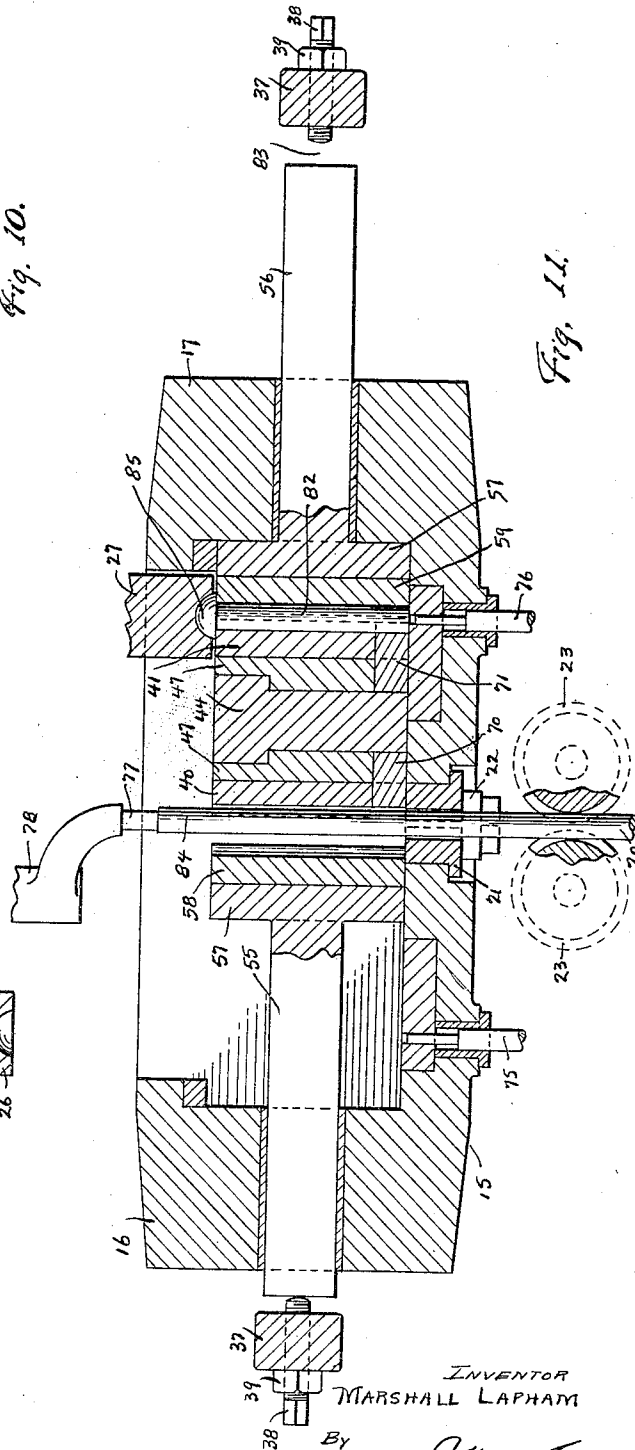


Fig. 11.

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UNITED STATES PATENT OFFICE

MARSHALL LAPHAM, OF NEW YORK, N. Y., ASSIGNOR TO SPIRAL-ROLLED PRODUCTS COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

HEADER

Application filed September 5, 1929. Serial No. 390,590.

My invention relates in general to headers and more particularly to a duplex header for bolts, rivets, spikes, and the like, in which one blank is being headed and ejected while a new work-piece is being fed into the machine and cut off.

The principal object of my invention has been to increase the output of headers, which results in a reduced cost of making bolts, rivets, and the like.

Moreover, my device has been so designed that one part of the gripper die is held frictionally, while the blank is being severed and initially gripped by the die.

Furthermore, my device provides for easy adjustment of the various parts.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 shows a fragmentary, front elevation of my device.

Fig. 2 is a rear elevation thereof.

Fig. 3 is a plan view of the device.

Fig. 4 is an enlarged, fragmentary, sectional view, taken on line 4—4 of Fig. 6.

Fig. 5 is an enlarged, fragmentary, sectional view, taken on line 5—5 of Fig. 6.

Fig. 6 is an enlarged, fragmentary, vertical, sectional view, taken on line 6—6 of Fig. 3.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 6.

Figs. 8 and 9, and 10 and 11, respectively, are views similar to Figs. 6 and 7, showing various steps in the process of heading.

In the accompanying drawings and in the following description, I have shown and described my invention as applied to the heading of round bolts, but it is obvious that the device is applicable to the heading of bolts of various cross-sections, as well as rivets, railroad spikes, or the like.

My device comprises a housing 15 having a bearing 16 at one end thereof, and a bearing 17 at the opposite end. The bearings are

connected at the front of the machine by a wall 18 and at the rear thereof by a wall 19.

As is customary in headers, my machine is arranged in front of the usual furnace (not shown), and the bar of stock 20, which is to be cut off at suitable lengths and headed, is fed into the front of the machine through a guide bushing 21 arranged in the front wall 18 of the housing. The inner face of this bushing is flush with the inner face 24 of the housing, and it acts as a stationary shear for the stock. This guide bushing is held in place in the usual manner by means of the clips 22. Arranged immediately in front of the guide bushing 21 is a pair of rolls 23. These rolls are for the purpose of feeding the bar through the guide bushing and into my device. Where pre-formed stock is to be headed, the rolls 23 simply act as feed rolls, but where the cross-sectional shape of the material is to be altered before passage into my device, as for instance, changing an oval bar to a round, or putting a groove into a round bar, the feed rolls are provided with forming faces, and also answer the purpose of forming rolls. These feed rolls are, of course, operated intermittently, and, since they are well known and do not form a part of my invention, they are not further shown or described, and, obviously, are operated in timed relation with the other parts of my device.

Slidably arranged in the bearings 16 and 17 is the distributor 25 of my device. This distributor is reciprocated back and forth so as to bring the blanks held by it in alternate registration with the reciprocating header dies 26 and 27. Each of these dies is substantially like the dies used on a single header, and each is operated from a shaft and suitable crank means, not shown or described since these parts are well known and do not form parts of my invention. It is obvious that the dies 26 and 27 are alternately operated so as to head the stock carried to the

proper position by means of the distributor.

The distributor may be operated either by a crank (not shown) or by a cam 29 (see Fig. 1). The cam, I find, is preferable since it provides the necessary dwell at the two extremes of the stroke of the distributor. This cam is preferably of the type having a groove 30 with which a roller 31 engages. The roller is carried by a reciprocating arm 32 which has one end connected to the end 33 of the distributor and its other end slidably mounted in a suitable bearing 34. The cam is carried by a shaft 35 suitably mounted in a bearing 36. Each end of the distributor is provided with a downwardly extending arm 37 having a set-screw 38 passing therethrough, for purposes to be hereinafter described. Each set-screw has a locknut 39.

Carried by the distributor are two moving gripper dies 40 and 41, one arranged at each side of the center. The top and bottom faces of each of the gripper dies are preferably inclined outwardly, and the top face of each engages with a similarly inclined surface 42 formed on the distributor. These dies are held in place by a yoke 43, which has an inclined surface at each end for engagement with the bottom surface of the dies 40 and 41. The yoke is held in place by means of a bolt 51 passing into the central portion 44 of the distributor. The distributor is formed on each side of the central portion 44 with a vertical recess 45, in each of which is disposed an adjusting key 46. Each key has a wedge-shaped portion 47 which engages with the tapered rear face 48 of the moving gripper die with which it co-acts. A lug 49 is carried by each of the adjusting wedges through which an adjusting screw 50 passes, by which the wedge may be raised or lowered to adjust the lateral position of the moving gripper die. The working face of each of the gripper dies is grooved to conform with substantially one-half of the cross-sectional shape of the stock being headed.

Carried by the bearing 16 is a floating gripper arm 55, and carried by the bearing 17 is a floating gripper arm 56. These gripper arms are arranged below the distributor and are provided for longitudinal movement in substantially the same vertical plan as the distributor. Each of the floating gripper arms is provided with a gripper head 57 by which a floating gripper die 58 is secured to the arm 55 and a floating gripper die 59 to the arm 56. The top and bottom faces of these dies are inclined, and the top inclined face thereof engages a correspondingly inclined face of the gripper head 57. The bottom inclined face of each of these dies 58 and 59 is engaged by a clip 60, carried by the head 57 and secured in place by means of bolts 61. The working face of each of the floating gripper dies 58 and 59 is formed with

a groove or recess of substantially one-half of the cross-sectional shape of the stock being handled, and these grooves or recesses correspond to the grooves and recesses of the moving gripper dies 40 and 41, with which recesses they register. The bearings for the floating gripper arms 55 and 56 are provided with suitable friction material 65 arranged under the bearing cap 66, whereby the arms will remain in the position to which they are moved, and can only be moved against the resistance offered by such frictional lining. Each of the bearing caps 66 for the bearings of the floating gripper arms 55 and 56 is disposed in a recess 67 formed in each of the bearings 16 and 17. The outer end of each of the floating gripper arms 55 and 56 is engaged by one of the gripper arm adjusting screws 38 carried by each of the arms 37 of the distributor. The relative lengths of the arms 55 and 56 and the space between the operative ends of the adjusting screws 38 is such that the distributor will have considerable movement in either return direction before the floating gripper arms are operated, as more fully described hereinafter in connection with the operation of the device.

Carried by the face of the distributor which engages with the face 24 of the housing are two movable shear blocks 70 and 71. The shear block 70 is arranged on the left hand side of the central portion 44 of the distributor, as viewed in Fig. 7, and the block 71 is arranged at the right hand side of the central portion. These movable shear blocks co-operate with the stationary shear block formed by the guide bushing 21 as the distributor is moved back and forth in the housing.

The distributor is designed to move to the right and to the left and carry with it the floating gripper arm which is carrying the blank work-piece until the head 57 of such gripper arm is forced in contact with and comes to rest against either end wall of the housing, which wall is formed by either of the bearings 16 or 17.

An ejector 75 is provided in the front wall 18 of the housing for the blank which is headed up by the header die 26 and an ejector 76 is likewise provided in the front wall of the housing for the stock which is headed up by the header die 27. These ejectors are of the usual type, well known to those skilled in the art, and are operated by any suitable means in timed relation with the operation of the other parts of the device, to be hereinafter described. A stop 77 is provided for the device, and this stop is carried by a suitable arm 78 of the usual and well known form. Since the mechanism for operating the ejectors does not form a part of my invention, it is not shown or more fully described.

When my device is to be put into opera-

tion, the heated stock 20 is fed into my machine through the guide bushing 21 by means of the feed rolls 23 and against the stop 77 which has been previously adjusted so as to allow sufficient material for the formation of the head on the bolt, rivet, or other object being headed. If the feed rolls 23 are also forming rolls, the bar is formed by passage between them before it is passed into the machine. In Figs. 6 and 7, a finished bolt 80 is shown with its head 81 completely formed and ready to be ejected from the machine. The feeding of the stock 20 through the guide bushing 21 and between the open gripper dies 41 and 59 occurs just before the distributor is moved to the right in these figures, or at a time immediately before the head 81 of the bolt 80 has been completed. When the stock has now been fed into the machine, and the previously formed head finished, the distributor is caused to move to the right by the cam 29. The result of the first part of this movement will be two-fold. Since the header die 26 has been drawn away from the work-piece, it will release the bolt 80 and allow it to fall out from between the gripper dies 40 and 58, as clearly shown in Figs. 8 and 9. The other result of this movement will be that a new piece of stock 82 will be severed from the bar 20 by means of the movable shear block 71. During this initial movement, the ejector 75 will operate to eject the bolt. As this portion of stock is being severed, it will be held between the gripper dies 41 and 59 and fed along between these dies until the head 57 of the floating gripper arm 56 reaches the end wall surface formed by the bearing 17. Obviously, the friction material 65 serves to offer sufficient resistance to the movement of the floating gripper arm, whereby the piece of stock will be securely held between the grippers until it reaches the position where it is operated upon by the header 27. The gripper adjusting screw 38 carried by the arm 37 at the left of the distributor, as shown in Fig. 6, is adjusted so that there is a space 83 between it and the end of the floating gripper arm 55 when the gripper dies 40 and 58 are holding a piece of stock, as shown in Figs. 6 and 7. This space permits the distributor, carrying the moving gripper die 40, to move sufficiently so as to release the finished bolt 80, as shown in Figs. 8 and 9, before the screw 38 engages with the end of the floating gripper arm 55. After such engagement, however, this floating gripper arm will be carried along with the distributor with the gripper dies 40 and 58 maintained in spaced relation, or in their open position, as shown in Figs. 8 and 9, until these dies are moved to a position where the space between them is opposite the guide bushing 21, at which time another piece of stock 84 is fed

into the device and against the stop 77, as clearly shown in Fig. 11.

Figs. 8 and 9 also show the piece of stock 82 severed or sheared from the bar 20 and held between the gripper dies 41 and 59. Figs. 10 and 11 show this piece of material in the position which it occupies when being headed and shows a head 85 having been formed thereon by the header die 27. When the distributor 25 is now moved in the opposite direction, the screw 38 carried by the arm 37 at the right hand side of the distributor will pass through the space 83 and permit the moving gripper die 41 to move away from the floating gripper die 39 before the floating gripper arm 56 is actuated. As hereinbefore described, during such interval, the finished bolt formed from the piece of stock 82 is ejected by the ejector 76 and allowed to fall out from between the open dies 41 and 59. The left hand movement of the distributor shears off the piece of stock 84 by means of the movable shearing block 70, whereupon it is gripped by the gripper dies 40 and 58 and moved to the position of the bolt 80 shown in Figs. 6 and 7.

For clearness of illustration in Figs. 6, 8 and 10 of the drawings, I have shown the central part 44 of the distributor as being cross-hatched in a different direction than the cross-hatching of the other sectioned portions of the distributor, it being obvious that this central portion is an integral part of the distributor.

While I have shown the use of friction material for holding each floating gripper arm in place until the distributor has moved the predetermined distance on its return stroke, it may be advisable or necessary to positively hold it in place. This may be accomplished by means of a latch (not shown) carried by the housing and released at the proper time by the travel of the distributor.

These and other modifications of the details herein shown and described may be made without departing from the spirit of my invention or the scope of the appended claims, and I do not, therefore, wish to be limited to the exact embodiment herein shown and described, the form shown being merely a preferred embodiment thereof.

Having thus described my invention, what I claim is:

1. A header comprising two header dies, a housing, a distributor mounted for reciprocation in the housing, two moving gripper dies carried by the distributor, means for operating the distributor, two floating gripper arms also mounted for reciprocation in the housing, a floating gripper die carried by each of such gripper arms for co-operative engagement with the moving gripper dies, the distributor being formed with a downwardly extending arm at each end for engagement with the adjacent floating gripper

per arm, the parts being so proportioned that space is provided alternately at each end of the stroke between the movable gripper dies and the floating gripper dies, whereby the distributor will be permitted to move a definite distance before the floating gripper arms are operated.

2. A header comprising two header dies, a housing, a distributor mounted for reciprocation in the housing, two moving gripper dies carried by the distributor, means for operating the distributor, two floating gripper arms also mounted for reciprocation in the housing, a floating gripper die carried by each of such gripper arms for co-operative engagement with the moving gripper dies, the distributor being formed with a downwardly extending arm at each end for engagement with the adjacent floating gripper arm, the parts being so proportioned that space is provided alternately at each end of the stroke between the movable gripper dies and the floating gripper dies, an adjusting means carried by the distributor arms, whereby the space between the adjusting means and the floating gripper arm may be varied.

3. A header comprising two header dies, a housing, a distributor mounted for reciprocation in the housing, two moving gripper dies carried by the distributor, means for operating the distributor, two floating gripper arms also mounted for reciprocation in the housing, a floating gripper die carried by each of such gripper arms for co-operative engagement with the moving gripper dies, the distributor being formed with a downwardly extending arm at each end for engagement with the adjacent floating gripper arm, the parts being so proportioned that space is provided alternately at each end of the stroke between the movable gripper dies and the floating gripper dies, whereby the distributor will be permitted to move a definite distance before the floating gripper arms are operated, and shearing means associated with the distributor and housing.

4. A header comprising two header dies, a reciprocating distributor formed with a central portion, a moving gripper die carried at each side of the central portion of the distributor, a floating gripper arm at each side of the distributor, and a floating gripper die carried by each gripper arm and each floating die being in co-operative engagement with one of the moving gripper dies carried by the distributor, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock.

5. A header comprising two header dies, a reciprocating distributor, means carried by the distributor for shearing work-pieces, and two pairs of gripper dies actuated by the distributor, each pair comprising a

positively actuated moving element and a floating element, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock.

6. A header comprising two header dies, a reciprocating distributor, means carried by the distributor for shearing work-pieces, a floating gripper arm for each side of the distributor, and a pair of gripper dies carried at each side of the distributor, one element of each pair being carried by the distributor and the other element of each pair being carried by one of the floating gripper arms, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock.

7. A header comprising two header dies, a reciprocating distributor, means carried by the distributor for shearing work-pieces, a floating gripper arm for each side of the distributor, a pair of gripper dies carried at each side of the distributor, one element of each pair being carried by the distributor and the other element of each pair being carried by one of the floating gripper arms, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock, and means carried by the distributor for causing the operation of the floating gripper arms.

8. A header comprising a housing, two alternately reciprocating header dies, and a reciprocating distributor, each carried by the housing, movable shearing blocks carried by the distributor, a stationary shearing block carried by the housing, and two pairs of gripping dies actuated by the distributor, comprising a positively actuated moving element and a floating element, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock.

9. A header comprising a housing, two header dies, and a reciprocating distributor each carried by the housing, two movable shearing blocks carried by the distributor, a stationary shearing block carried by the housing, such shearing block comprising a bushing having an opening for the passage of the bar of stock, and two pairs of gripping dies actuated by the distributor, comprising a positively actuated moving element and a floating element, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock.

10. A header comprising two header dies, a reciprocating distributor, means carried by the distributor for shearing work-pieces, two

pairs of gripper dies actuated by the distributor, each pair comprising a positively actuated moving element and a floating element, each pair of gripper dies alternately gripping and holding a work-piece in heading position while the other pair of dies is alternately receiving blank stock, and frictional means for retarding the movement of the floating element.

In testimony whereof, I have hereunto signed my name.

MARSHALL LAPHAM.

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