J. KAASE.

MECHANISM FOR FEEDING BLANKS TO METAL WORKING MACHINES.

APPLICATION FILED NOV. 6, 1919.

1,387,055.

Patented Aug. 9, 1921.

3 SHEETS—SHEET 1.

Fig. 7.

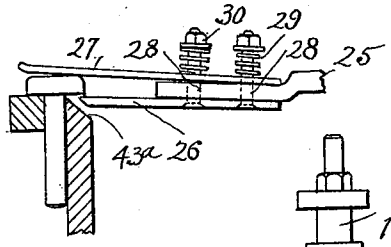


Fig. 1.

Inventor
John Kaase
By Thurston Rivas & Hudson
attys

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3 SHEETS—SHEET 2.

Fig. 2.

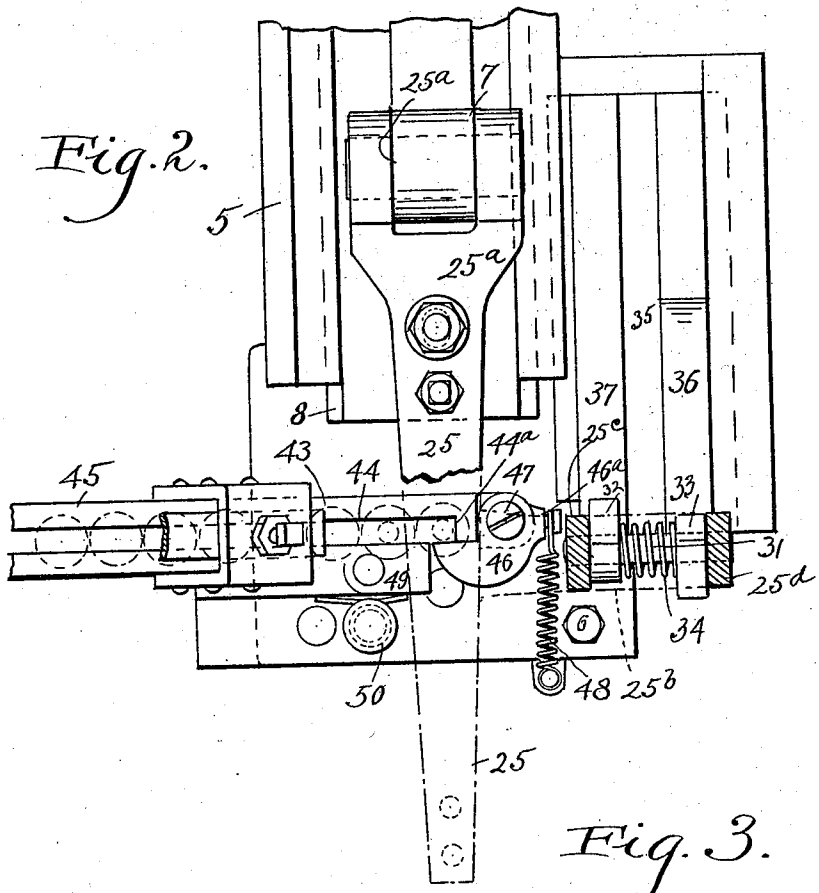
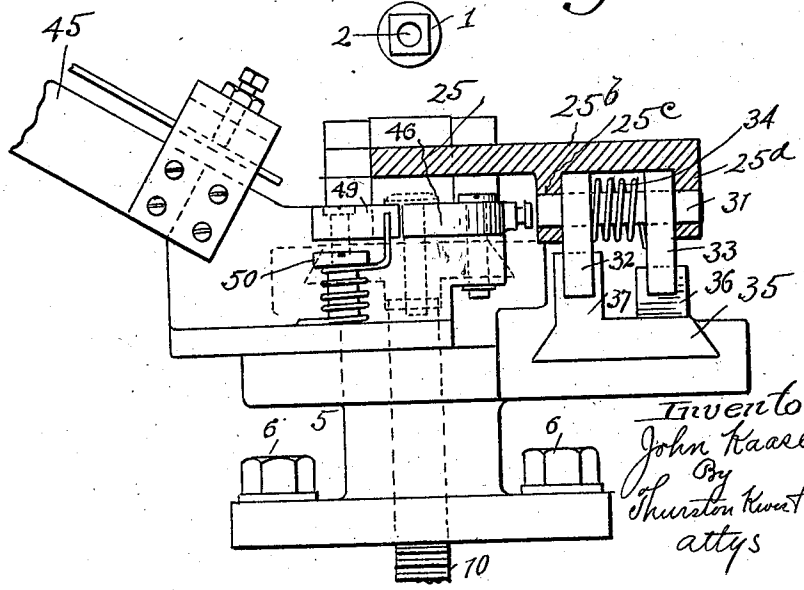


Fig. 3.



Inventor:
John Kaase
By
Thurston Kent Hudson
attys

J. KAASE.

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3 SHEETS—SHEET 3.

Fig. 6.

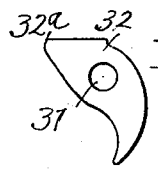
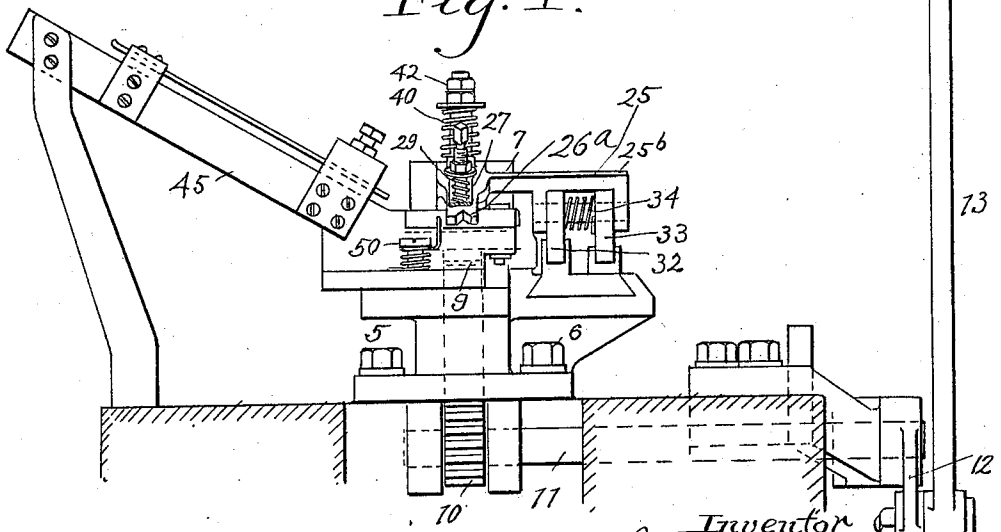


Fig. 5.

Fig. 4.



Inventor
John Kaase
By Thurston Kerr & Hudson
attys

UNITED STATES PATENT OFFICE.

JOHN KAASE, OF CLEVELAND, OHIO, ASSIGNOR TO THE UPSON NUT COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

MECHANISM FOR FEEDING BLANKS TO METAL-WORKING MACHINES.

1,387,055. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed November 6, 1919. Serial No. 336,086.

To all whom it may concern:

Be it known that I, JOHN KAASE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Mechanism for Feeding Blanks to Metal-Working Machines, of which the following is a full, clear, and exact description.

The present invention relates to a device intended to be used in association with a metal working machine, the function of the device being to feed blanks and properly position the blanks so that they may be operated upon by the metal working machine.

One of the objects of the invention is to provide a device in which the blanks are successively positioned to be operated upon by the metal working machine, thus eliminating the necessity for hand feeding and placement of the blanks to be operated upon and thereby resulting in eliminating the danger incident to hand placement and feeding, and at the same time materially speeding up the production operation of the metal working machine.

The embodiment of the invention which is shown and described in the present case, is particularly designed and adapted to feed and properly place bolt blanks in a bolt head trimming machine. However, it will be apparent as the description of the invention proceeds, that the device may find other use and application than in the present connection.

Generally speaking, the invention may be said to comprise the elements and the combinations thereof set forth in the accompanying claims.

Reference should be had to the accompanying drawings forming a part of this specification, in which Figure 1 is an elevation of the device forming the subject matter of the invention; Fig. 2 is a top plan view of the same; Fig. 3 is a front elevation with portions omitted; Fig. 4 is a front elevation; Fig. 5 is a side elevation of a portion of the device with parts omitted; Fig. 6 is an elevation showing a detail of construction; Fig. 7 is a sectional elevation also showing a feature of construction.

The device of the invention may be briefly described as comprising a pivoted arm which is adapted to be bodily reciprocated. Blanks to be operated upon are fed through a suitable guideway to be in such position that at any one position of the pivoted arm, suitable fingers carried by the arm will pick up one of the blanks and bodily move it into proper position with respect to one of the dies which are to operate upon the blank for the purpose of trimming the head of the bolt blank.

In the present instance no attempt will be made to describe or show in detail the construction of the bolt head trimming machine in connection with which the present invention is used, only those parts of the machine being shown and described which may seem necessary to properly describe the function of the device forming the subject matter of the invention.

Referring to Fig. 1, the lower die of the bolt head trimming machine is indicated at 1. This is usually a stationary die and is provided with a central opening indicated at 2, which is adapted to receive the shank of the bolt blank, preparatory to the trimming operation. Above the die 1 is a plunger 3 which is reciprocated by suitable mechanism and on its downward stroke and in cooperation with the die 1 trims the head of the bolt.

The plunger 3 has a central opening indicated at 3^a and in the present instance the bolt when trimmed is ejected from the die 1 through the opening 3^a through which opening it is discharged from the machine. The particular matters which have just been described form no part of the present invention, but form parts of bolt head trimming machines which are well known in the art.

Secured to the bed 4 of the bolt head trimming machine, or to any other suitable part thereof, is a base such as indicated at 5. This base member 5 is secured by any suitable means, such as bolts indicated at 6. Upon the base there is mounted a reciprocating carriage 7. This carriage has beveled side portions as indicated at 8 in Fig. 2, which coöperate with suitable undercut portions formed in the base 5. Upon the underside of the carriage 7, a suitable rack having teeth thereon is secured, and these rack teeth are adapted to be engaged by a segmental gear 10, which is mounted upon a suitable shaft 11, which finds bearing in suitable journals carried by the base 5. Secured to the shaft 11 is an arm 12, and pivotally

secured to the end of the arm 12 is a rod 13. Upon the rod 13 there is threaded an adjustable abutment 14 which engages with a spring 15. Above the spring there is a sliding block 16, and above the block there is a retaining nut 17 which is threaded on the rod 13. Pivotally secured to the block 16 is an arm 18. This arm at its opposite end is pivoted as indicated at 19, upon a suitable portion of the bolt head trimming machine. Intermediate its ends, the lever 18 is pivotally connected with an eccentric strap 20, which coöperates with an eccentric 21 carried upon the shaft 22, which shaft 22 is a shaft forming a part of the bolt head trimming machine, which is positively driven.

It will be obvious from the construction described, that the eccentric 21 imparts movement to the lever 18, which in turn imparts a reciprocating movement to the rod 13, which in turn through the arm 12 causes the segmental gear 10 to oscillate upon the shaft 11 and thereby reciprocate the carriage 7. Attention is called to the fact that the driving movement between the lever 18 and the rod 13 in the direction which moves the carriage 7 forward, is through the spring 15, which spring is of such stiffness as to ordinarily not yield during such driving action, except, however, the spring will yield when the carriage 7 reaches its most forward position and in such position abuts against a stop, as will be later described.

The carriage 7 at the rear end thereof has a depending arm 5^a. This arm has an opening through which extends a set screw 23. The set screw is adapted to engage with a lug or stop 24 which is carried by the base 5. The set screw 23 is adjusted so that it will engage with the stop 24 when the carriage 7 is in its most forward position and in proper position so that the pivoted arm carried thereby, which is about to be described, is in position to properly deliver a bolt blank to the die 1. It will be apparent that when the set screw 23 has engaged the stop 24, the forward movement of the carriage 7 is arrested and further movement of the lever 18 under action of the eccentric 21 will be taken up by the spring 15.

An arm 25 is pivotally mounted upon the carriage 7 as indicated at 25^a. This arm extends forward beyond the carriage 7 and at its forward end carries a finger 26. This finger is bifurcated, as indicated at 26^a in Fig. 4, so that the shank of the bolt which is being engaged by the finger 26, may be engaged in the bifurcation in the manner later described. The forward end of the lever 25 also carries a spring plate member 27, which extends above the finger 26, the member 27 being adapted to engage with the top of a bolt head, while the finger 26 engages with the shank of the bolt, thus preventing any slippage or movement of the bolt blank during the time that it is being engaged and moved by the lever 25. The finger 26 and the plate 27 are secured to the end of the lever 25 by a resilient connection, so that there is permitted a slight movement between the finger 26 and the plate 27 to accommodate variation in the thickness of the head of the bolt blanks which may be operated thereon. This resilient connection comprises bolts such as indicated at 28, which extend through suitable openings in the finger 26, the end of the lever 25 and the member 27. Each of the bolts have a spring such as indicated at 29 which surrounds the shank of the bolt and bears upon the member 27. Nuts 30 which engage the bolts 28 regulate the tension of the springs 29.

The lever 25 at one portion thereof has a side extending arm indicated at 25^b and from this arm there are depending flanges 25^c and 25^d. The flanges are spaced apart and secured to the flanges and extending between the same is a pin 31, upon which there are mounted two dogs indicated at 32 and 33. One of these dogs is so shown in Fig. 6 and as will be noted, has a flat surface 32^a at the upper end thereof. This surface 32^a lies adjacent the underside of the arm 25^b and when the dog tends to move in a clockwise direction about the pin 31, the surface 32^a engaging with the arm 25^b prevents such rotation, so that the dog 32 is held in substantially a vertical position. However, when the dog 32 moves in a counter clockwise direction about the pivot 31, the movement of the surface 32^a is away from the arm 25 and the pivoted movement of the dog is permitted. The dog 33 is of the same general construction as the dog 32 but it is motioned upon the pin 31 in a manner opposite to the motioning of the dog 32, so that when the dog 32 moves in a counter clockwise direction and yields, the dog 33 does not yield, and vice versa.

Surrounding the pin 31 is a spring 34. This spring at its opposite ends is connected with the dogs 32 and 33. The action of the spring is to normally hold the dogs 32 and 33 in relative position, and the spring returns the dogs to their normal position when in the operation of the machine they have been caused to move about the pin 31.

Upon the bed 5 there is suitably mounted a cam member 35. This cam member 35 is mounted directly below the arm 25^b. The cam member 35 has formed thereon two wedges or cam projections which are indicated at 36 and 37. The projections 36 and 37 have their slanting surfaces extending in opposite directions and are positioned so as to engage with the dogs 32 and 33.

It will be obvious that as the carriage 7 is reciprocated, carrying with it the pivoted

arm 25, this arm will be elevated upon the forward excursion of the carriage 7 by the engagement of the dog 32 with the wedge 37, but that during this time the dog 33 is inoperative, being free to move about the pin 31. However, upon the rearward excursion of the carriage 7, the dog 33 is engaging with the wedge 36 and the dog 32 is inoperative.

As will be apparent, from the drawing, the forward excursion of the carriage 7 moves the finger 26 toward and above the die 1 of the bolt head trimming machine and inasmuch as the bolt blank has a long shank, it is necessary to elevate the bolt blank so that the end of the bolt blank will at the end of the forward excursion of the carriage 7 be in position to engage with the opening 2 in the die 1. During the forward movement of the lever 25, the lever is elevated and when the lever 25 is in such position that the shank of the bolt blank is above the opening 2 in the die 1, the lever 25 drops in a vertical direction, thereby permitting and causing the shank of the bolt blank to enter the opening 2 of the die 1.

The foregoing is accomplished by positioning the cam member 35 so that on the forward excursion of the carriage 7 the dog 32 drops over the end of the wedge 37 when the bolt blank is in proper position above the die 1. As will be recalled, the extent of the forward movement of the carriage 7 is controlled through the engagement of the set screw 23 with the stop 24, while the raising and lowering of the arm 25 on the forward excursion of the carriage 7 is controlled by the positioning of the cam member 35.

When the arm 25 has descended at the end of its forward excursion, the shank of the bolt blank occupies the opening 2 in the die 1 and when the lever 25 begins its rearward excursion, the bolt blank is retained in the die 1. During the rearward excursion, the dog 33 engages with the wedge 36, thereby elevating the arm 25 during its rearward excursion, until at the end thereof when the dog 33 drops over the end of wedge 36 the lever 25 is again lowered.

In order to limit the lowermost position of the lever 25, a set screw 39 is mounted upon the lever 25 and engages with a portion of the reciprocating carriage 7. The lever 25 will descend after being raised by gravity but in order to assure a quick and positive lowering of the lever and in general to prevent any unnecessary movement of the lever 25, the lever is engaged by a spring 40, which surrounds a pin 41, the pin being mounted on the carriage 7 and extending through a suitable opening in the lever 25. The tension of the spring 40 is controlled by a nut carried by the pin 41 as indicated at 42.

In order to feed and position the bolt blanks so that they may be engaged and moved in succession by the reciprocating lever 25, there is mounted upon the base 5 a member 43. This member is provided with a groove 44 which is of a proper width to accommodate the shanks of the bolt blanks which are fed to it. In operation the shanks of the bolt blanks extend through the slot 44 while the heads of the blanks ride upon opposite sides of the slot 44. The member 43 coöperates with a chute 45 which is a diagonally extending chute and the bolt blanks are adapted to be fed into the end of the chute 45, which may be of any desired length, and by gravity fed down the chute 45 into the slot 44. As before stated, the bolt blanks feed down the chute 45 by gravity and the pressure of the bolt blanks in the chute is sufficient to move the bolt blanks through the slot 44 and into position to be engaged by the lever 25. The slot 44 has an end wall indicated at 44^a against which the shank of the foremost bolt blank engages, and where it is in proper position to be engaged by the fingers 26 that are carried at the forward end of the lever 25. The slot 44 is open upon one side at this point and in order to retain the bolt blank from accidentally dropping out of the slot ahead of the engagement of the blank by the fingers 26, a pivoted gate is provided, which comprises the gate member 46 which is pivoted, as indicated at 47, upon the member 43. This gate member 46 has an arm 46^a which is engaged by a spring 48, the spring normally holding the gate member in the position indicated in Fig. 2. However, it will be seen that when the fingers 26 engage with the bolt blank and move it forward, the gate 46 will yield and permit the bolt blank to move. The spring pressure upon the gate 46 is sufficient to retain the blank in place until the fingers 26 are properly engaging the bolt after which the gate 46 yields.

In order to avoid any jamming of the bolt blanks in the groove 44, in the event that they would not be properly positioned or in the event that the fingers 26 should in part engage with the bolt blank which is next to the one at the end of the slot 44, a portion of one wall of the slot is provided by having a pivoted wall member 49. This wall member is acted upon by the coiled spring 50 in a manner to normally hold the wall member 49 in the position indicated in Fig. 2, however, it will be seen that the member 49 will yield under sufficient pressure so that there is absolutely no opportunity for any jamming action of the bolt blanks in the slot 44.

The portion of the member 43 which is just beyond the position occupied by the foremost bolt blank is beveled, as indicated at 43^a in Fig. 7. This beveled portion guides the fingers 26 up against the underside of

the head of the bolt blank in the forward movement of the lever 25 and continued forward movement of the lever pushes upon the gate 46 which immediately upon the passage of the particular bolt blank in question returns to its initial position and closes the exit end of the slot 44.

From the foregoing description, it will be seen that the general operation of the lever 25 is upon its forward excursion to pick up a blank from the feeding slot 44, raise the same so that the end of the shank is above the opening in the die 1 and drop the shank into the opening in die 1 and upon the rearward reciprocation of the lever 25 the lever is lifted over the member which carries the feeding slot 44 and is dropped beyond this member so as to be in position to pick up the next succeeding blank.

Having described my invention I claim:

1. The combination with a hollow die member adapted to receive a blank to be operated upon, of a reciprocating lever, means for reciprocating the lever, means for moving the lever in a vertical direction during its reciprocation and means for feeding blanks into the path of movement of said lever and intermediate the limits of the path of reciprocation of said lever, whereby the lever engages the blank and moves it to said die.

2. The combination with a hollow die of a reciprocating lever, means for reciprocating the lever toward and from said die, means for moving the lever in a vertical direction during the reciprocation, means for feeding blanks in the path of said lever and intermediate the limits of the path of reciprocation of said lever, fingers carried by the lever and adapted to pick up a blank elevate the same and position it upon said die during a forward reciprocation of said lever.

3. The combination with a die adapted to receive a blank of a reciprocating lever, fingers adjacent one end of the lever, means for imparting reciprocating a simultaneous vertical movement to the lever whereby the fingers have an arcuate movement and means for feeding blanks in the path of movement in the said lever, whereby the fingers engage a blank and move it into position upon said die during a single forward reciprocation of the lever.

4. In a device of the character described, the combination with a reciprocating lever, means for reciprocating said lever, cam means coöperating with the lever whereby the lever is moved in a vertical direction during its reciprocation, fingers carried by said lever at the end thereof and means for feeding blanks in the path of movement of said lever at a point which is intermediate the limits of reciprocation of the lever, and in position to be engaged by said fingers.

5. In a device of the character described, the combination of a reciprocating carriage, a lever pivoted at one end upon said carriage, fingers carried by the lever at the opposite end thereof, means coöperating with the lever to impart a vertical movement to the lever during the reciprocation of the carriage and means for feeding blanks in the path of movement of said lever and in position to be engaged by the fingers at one point in the reciprocation thereof.

6. In a device of the character described, the combination of a reciprocating carriage, fingers carried by the lever at the opposite end thereof, a lever pivoted at one end upon said carriage, means for reciprocating the carriage, cam means coöperating with said lever to move the lever in a vertical direction during the reciprocation of the carriage and means for feeding blanks in the path of movement of said lever and in position to be engaged by said fingers in one position of the said lever.

7. In a device of the character described, the combination of a reciprocating carriage, a lever pivoted at one of its ends upon said carriage, fingers carried by the lever at the opposite end thereof, stationary wedge members, means associated with the lever coöperating with said stationary wedge members whereby the lever is moved in a vertical direction during the reciprocation of the carriage, means for reciprocating the carriage and means for feeding blanks in the path of movement of the lever and in position to be engaged by the said fingers at one point in the movement of said lever.

8. In a device of the character described, the combination with a reciprocating carriage, means for reciprocating the carriage said means including slidable connection, an adjustable stop for limiting the forward movement of the carriage, a lever mounted upon said carriage, fingers carried by said lever, means for feeding blanks into the path of movement of said lever and in position to be engaged by the said fingers of the lever at a point during the reciprocation thereof.

9. In a device of the character described, the combination of a reciprocating carriage, means for reciprocating said carriage, an adjustable stop for limiting the forward movement of said carriage, means for driving said carriage, said driving means having a yielding portion therein, a lever carried by the carriage, fingers carried by the said lever, means for feeding blanks in the path of movement of said lever and in position to be engaged by said fingers at a position in the reciprocation of the lever.

10. In a device of the character described, the combination with a reciprocating carriage, means for reciprocating said carriage, said means having a yielding connection therein, an adjustable stop for limiting the forward movement of the carriage, a lever

pivoted at one end upon said carriage, fingers carried by said lever at the opposite end thereof, means for imparting a vertical movement of the lever during the reciprocation of the carriage, and means for feeding blanks into the path of movement of said lever and in position to be engaged by the fingers on the lever in a position of the lever.

11. In a device of the character described, the combination with a reciprocating carriage, means for reciprocating the carriage, a lever pivoted at one end upon the carriage, means for elevating the lever during the forward reciprocation of the carriage and permitting it to descend at the end of said forwarding reciprocation, means for feeding blanks into the path of movement of said lever and in a position to be engaged by the said fingers at one position of the lever.

12. In a device of the character described, the combination with a reciprocating carriage, means for reciprocating said carriage, a lever pivoted at one end upon the carriage, fingers carried by the lever at the opposite end thereof, means for raising the said lever during the forward reciprocation of the carriage and permitting the lever to descend at the end of said reciprocation, means for lifting the lever during the rearward reciprocation of the carriage and permitting it to descend at the end of said reciprocation, means for feeding blanks in the path of movement of said lever and in position to be engaged by the said fingers upon the forward reciprocation of the said carriage.

13. In a device of the character described, the combination with a reciprocating carriage, means for reciprocating said carriage, a lever pivoted at one end upon the carriage, fingers carried by the lever at the opposite end thereof, pivoted dog members carried by the lever, a pair of wedge members cooperating with the said dogs, the slanting surface of said wedge members extending in opposite directions, means for feeding blanks in the path of movement of said lever and in position to be engaged by the said fingers at the beginning of the forward reciprocation of said carriage.

14. In a device of the character described, the combination with a reciprocating carriage, means for reciprocating the carriage, a lever pivoted at one end upon the carriage, fingers mounted on the lever adjacent the opposite end thereof, a pair of dogs associated with said lever, each of said dogs being pivoted and mounted to be rigid in one direction of movement and free to move in the opposite direction of movement, a pair of wedge members with which the said dogs coöperate, said wedge members having their slanting surfaces extending in opposite directions, means for feeding blanks in the path of movement of said lever and in position to be engaged by the said fingers at the beginning of the forward movement of the carriage.

15. In a device of the character described, the combination with a reciprocating lever, means for reciprocating said lever, of a guide and feed for blanks, said guide having a slot through which the blanks move, said slot being open at a portion thereof, a spring pressed gate closing said opening, fingers carried by said lever, said fingers being adapted to engage with the blank and move it to open said gate and carry the blank beyond the gate during the reciprocation of the lever.

16. In a device of the character described, the combination with a reciprocating lever, means for reciprocating said lever, of a guide and feed for blanks, said guide having a slot which extends into the path of movement of said lever, said slot having an opening at the end thereof through which a blank may move, a pivoted member forming a gate for said opening, a resilient member normally holding said gate in closed position, fingers carried by said lever, said fingers being adapted to engage with the blank and move it past the gate during the reciprocation of the lever.

17. In a device of the character described, the combination with a reciprocating lever, means for reciprocating said lever, of a member forming a guide and feed for blanks, said member having a slot through which the blanks move, the slot extending transversely with respect to the path of movement of the lever, said slot having an opening at the end thereof, a spring pressed gate forming a closure for said opening, a portion of the said wall of said slot being adjacent the opening of the slot, being movably mounted so that said portion of the wall may be displaced in the event that blanks become jammed in said slot, fingers carried by said lever, said fingers being adapted to be engaged with the blank and move it beyond said gate during the reciprocation of the said lever.

18. In a device of the character described, the combination with a reciprocating lever, means for reciprocating said lever, of a member adapted to guide and feed blanks, said guide having a slot through which the blanks move, said guide member extending transversely of the path of movement of the lever, said guide member having a slanting wall portion upon the rear thereof adapted to be engaged by the forward end of the lever at the beginning of its forward stroke, said guide having a slot through which the blanks move, a spring pressed gate forming a closure for said opening, fingers carried by the lever, said fingers being adapted to en-

gage with the blank and move it beyond said gate during the reciprocation of the lever.

19. The combination of a reciprocating lever, means for feeding blanks into the path of movement of the said reciprocating lever and transversely of said path of movement, fingers carried by the said lever and adapted to engage with a head of the blank and pick up a blank to move the same, means for imparting to said lever a reciprocating movement and simultaneous vertical movement.

20. In a device of the character described, the combination of a reciprocating lever, means for reciprocating the lever, means for feeding blanks into the path of movement of said reciprocating lever, spaced fingers carried by the said lever, a spring pressed member coöperating with the said fingers, said fingers and spring pressed members being adapted to engage with the blank to pick it up and move it.

21. In a device of the character described, the combination of a reciprocating lever, means for feeding bolt blanks into the path of movement of the said reciprocating lever and transversely of said path of movement, fingers carried by the said lever and adapted to engage beneath and above the head of the blank for the purpose of moving the blank, means for imparting to said lever a reciprocating movement and simultaneous vertical movement.

22. In a device of the character described, the combination of a reciprocating lever, means for reciprocating the lever, means for feeding bolt blanks into the path of movement of said lever, spaced fingers carried by the lever, a spring pressed member carried by the lever above the said fingers, said fingers being adapted to engage beneath the head of the bolt and the spring pressed members being adapted to engage the top of the head of the bolt for the purpose of moving the said blank.

In testimony whereof, I hereunto affix my signature.

JOHN KAASE.