Dec. 19, 1922. 1,439,532.

H. L. SMITH.

FEED MECHANISM FOR HEADING MACHINES.

FILED JULY 16, 1921. 6 SHEETS—SHEET 1.

Fig. 1

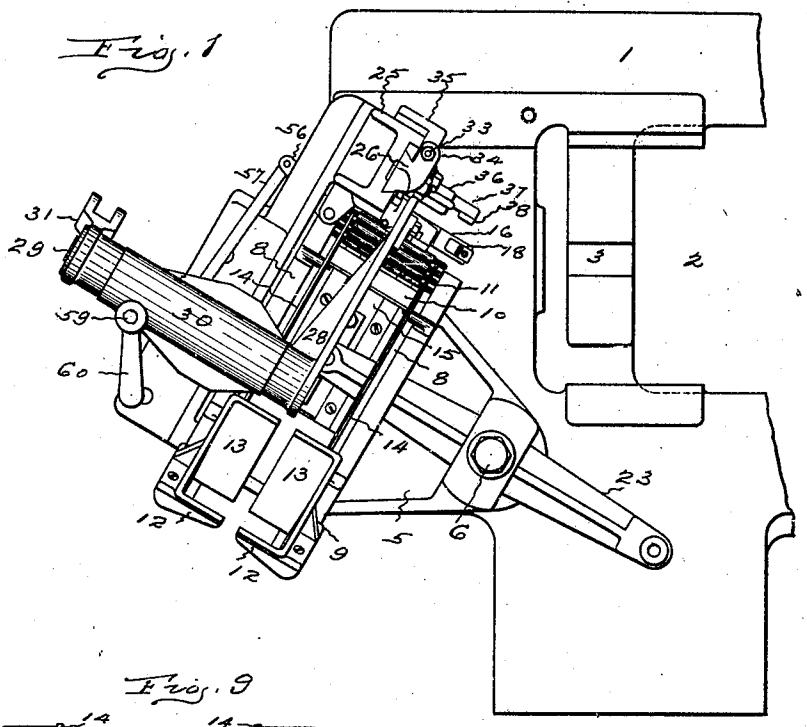
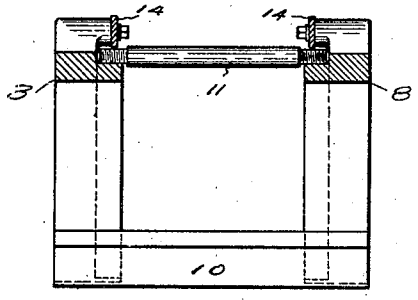


Fig. 2



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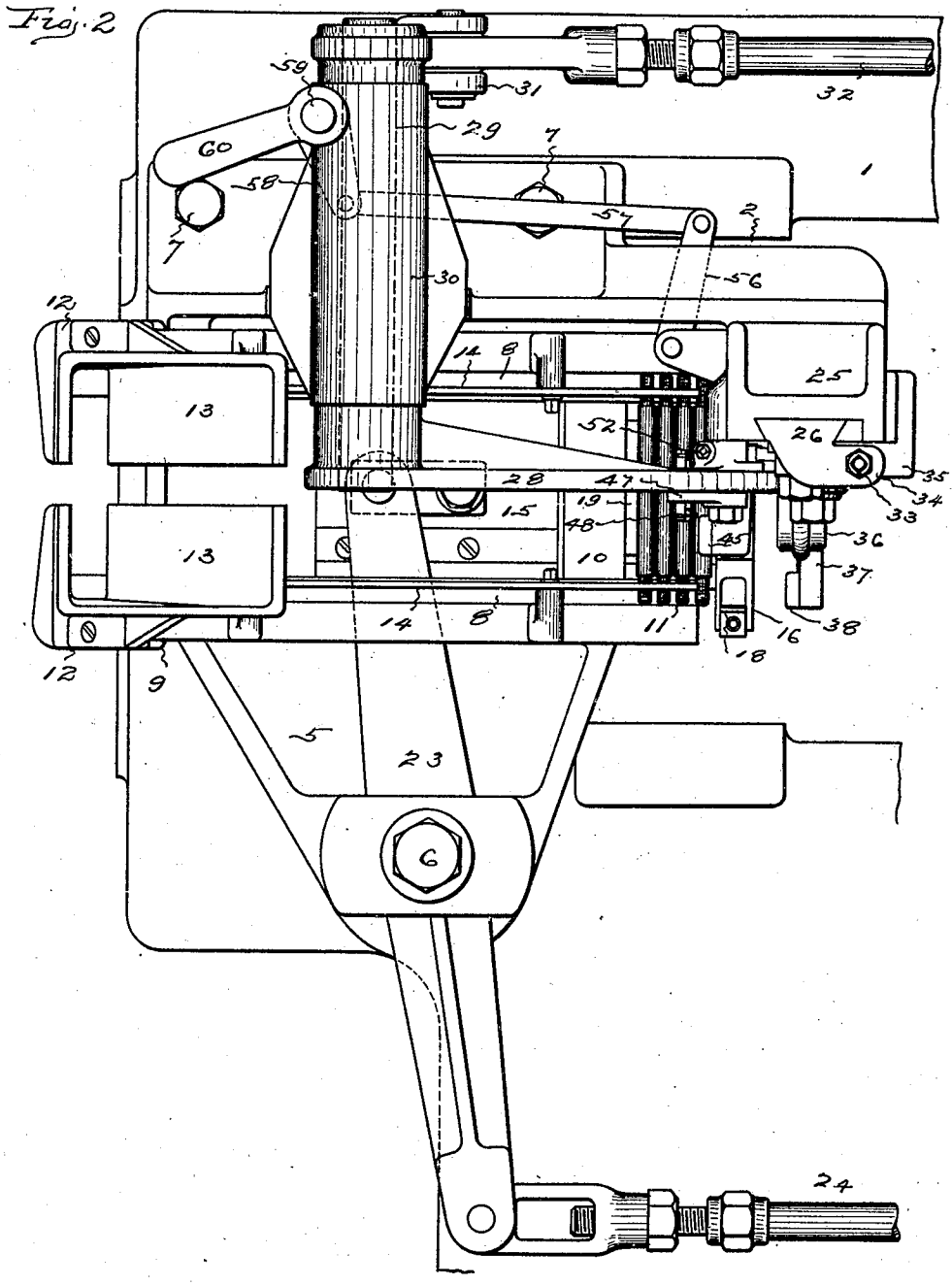
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Fig. 2



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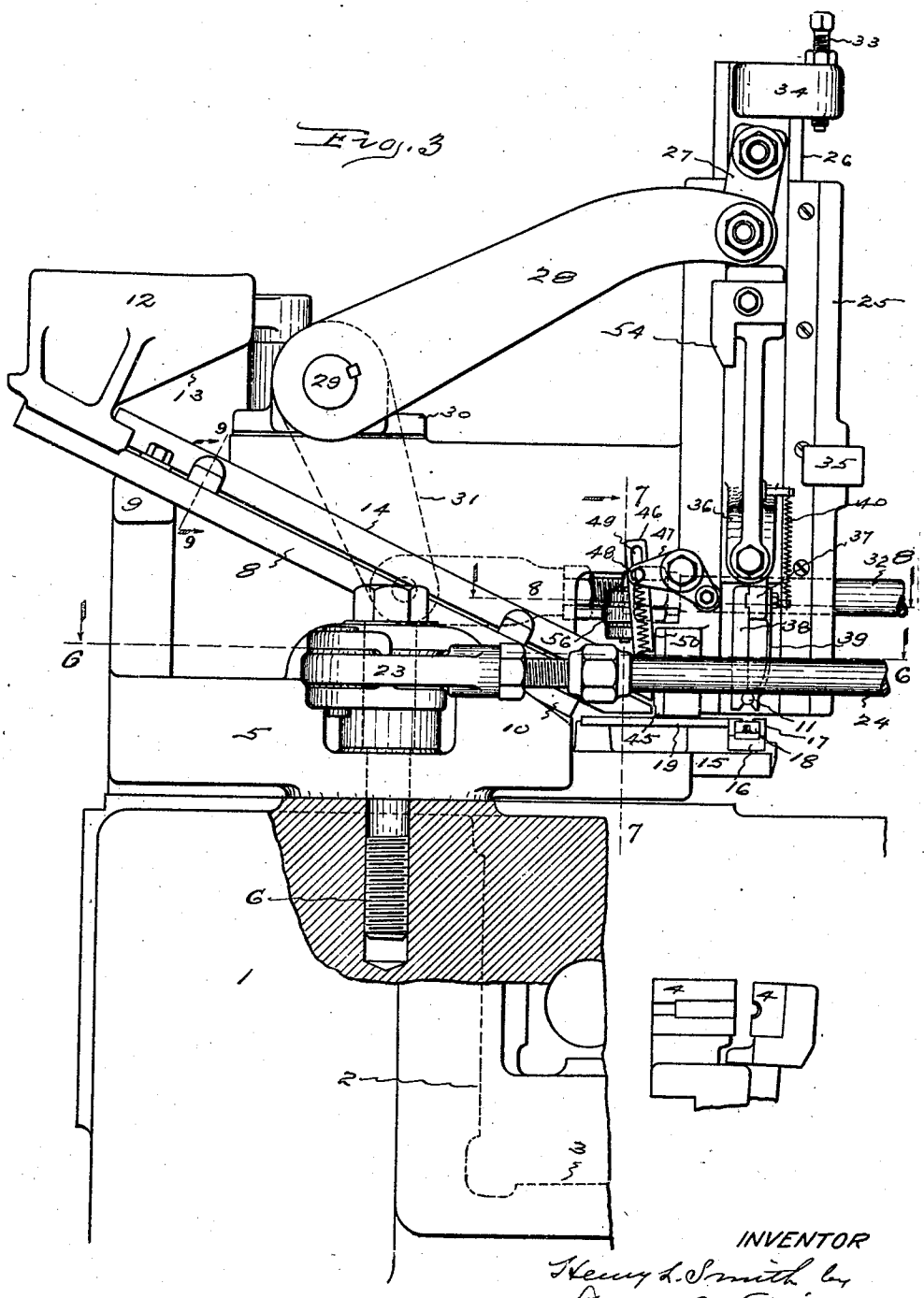
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FILED JULY 16, 1921. 6 SHEETS—SHEET 3.

Fig. 3



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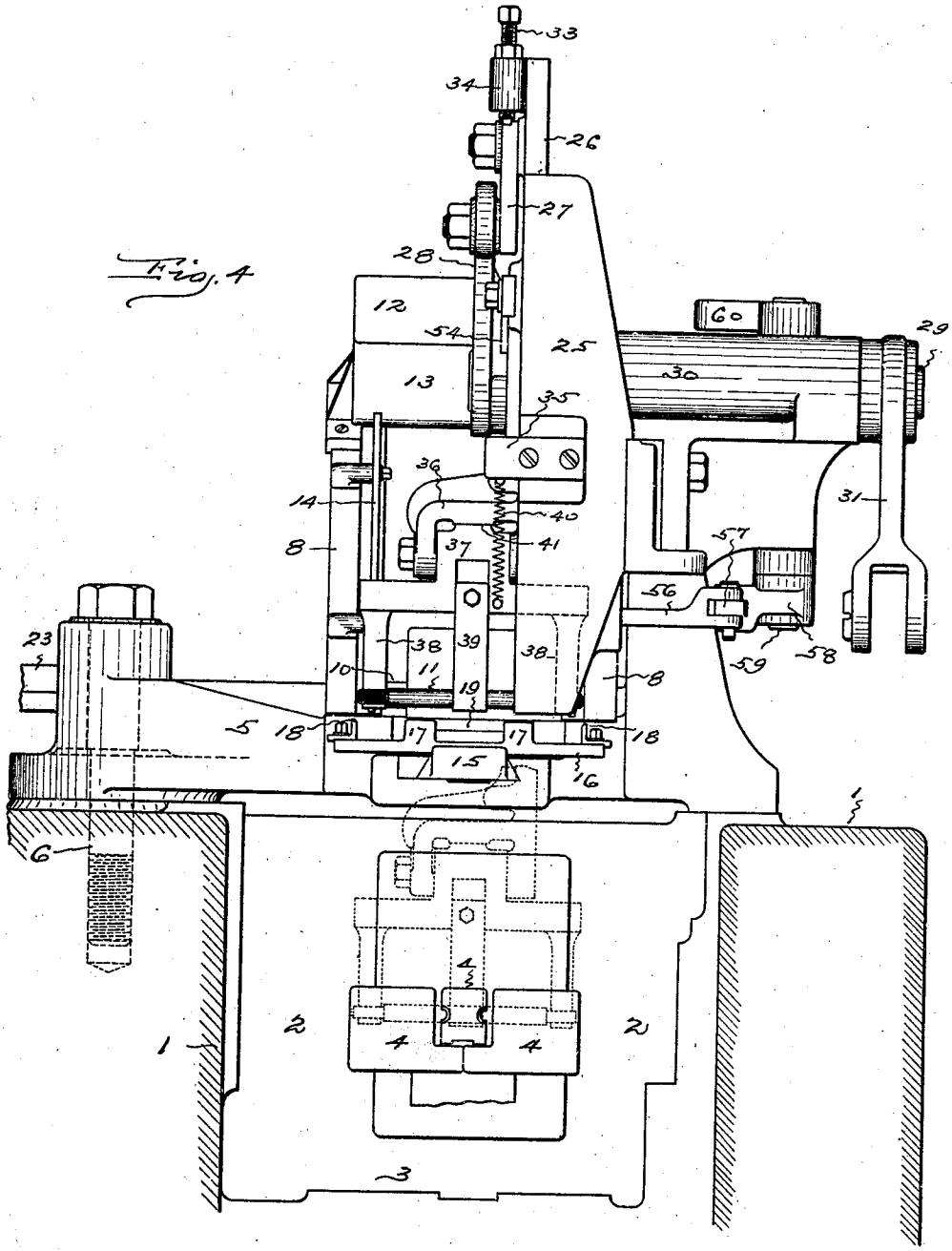
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FILED JULY 16, 1921.

6 SHEETS—SHEET 4.

Fig. 4



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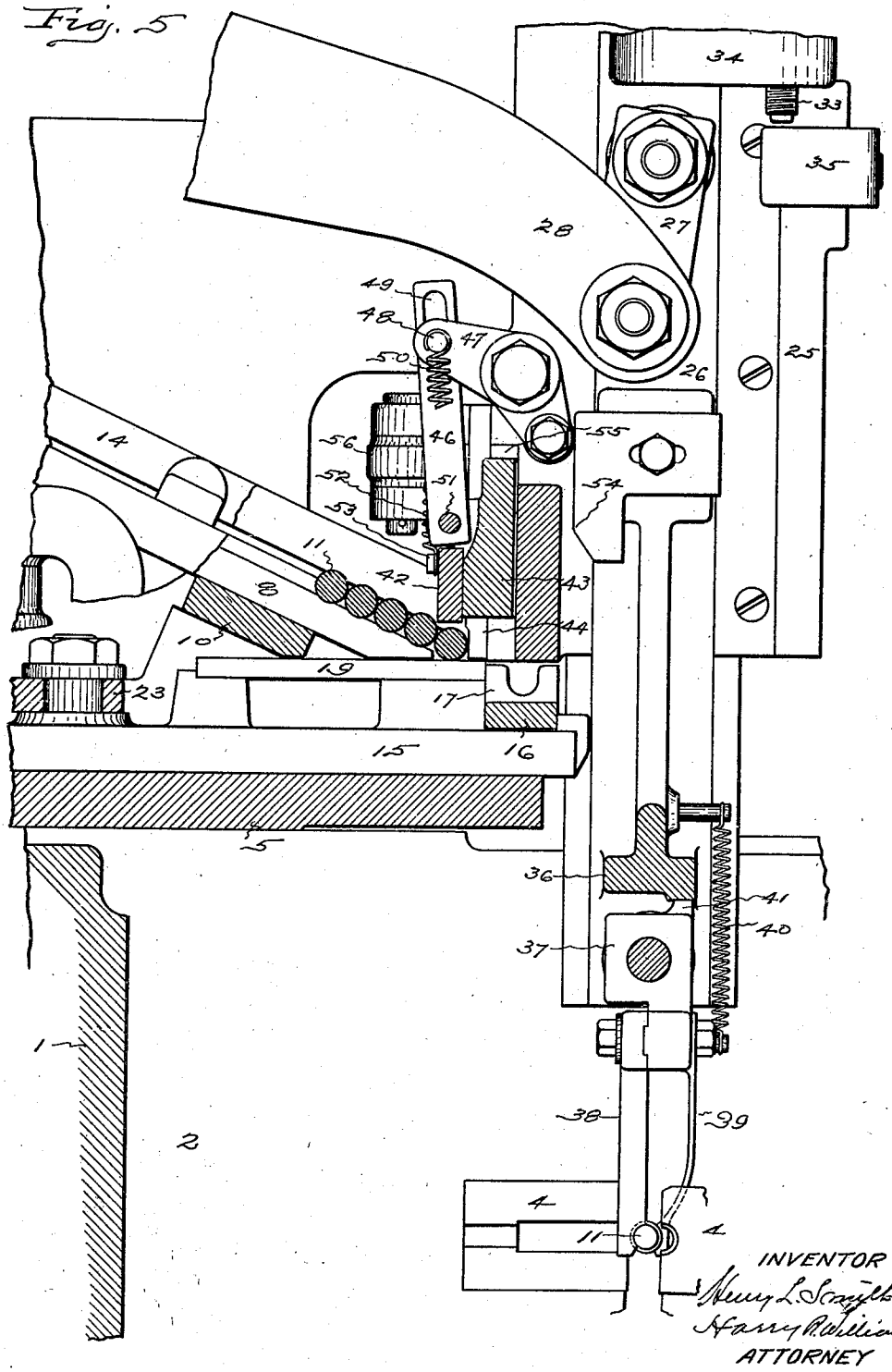
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FILED JULY 16, 1921. 6 SHEETS—SHEET 5.

Fig. 5



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Fig. 6

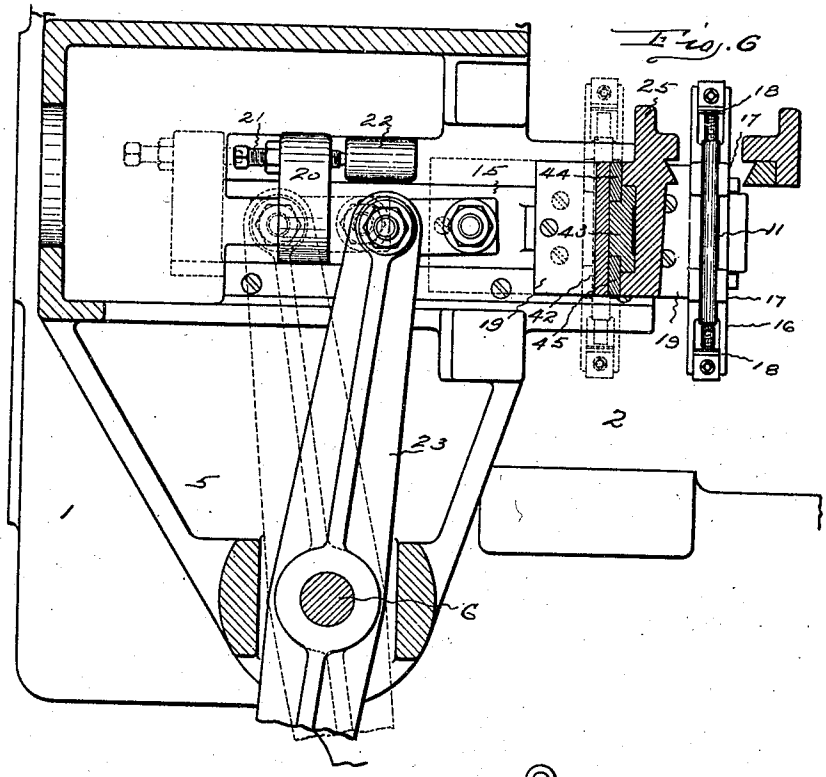


Fig. 8

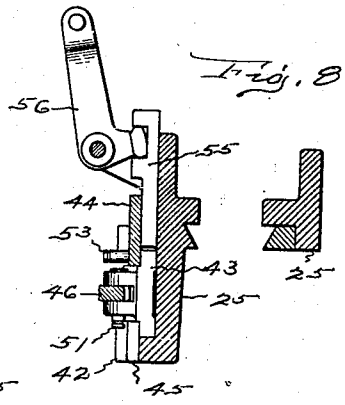
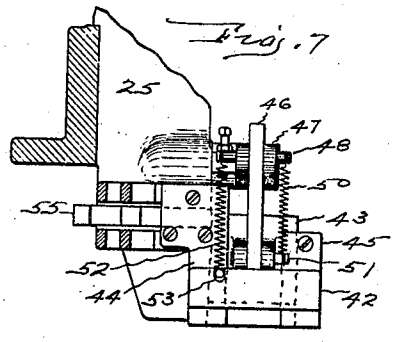


Fig. 7



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Patented Dec. 19, 1922. 1,439,532

UNITED STATES PATENT OFFICE.

HENRY L. SMITH, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE E. J. MANVILLE MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

FEED MECHANISM FOR HEADING MACHINES.

Application filed July 16, 1921. Serial No. 485,369.

To all whom it may concern:

Be it known that I, HENRY L. SMITH, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Feed Mechanism for Heading Machines, of which the following is a specification.

This invention relates to those mechanisms which are provided for feeding blanks to metal heading machines of the class shown in United States patent to Campbell No. 926,170, June 29, 1909. In these machines the blanks are fed into dies located in a die pocket formed in the forward end of the frame and are acted upon by a punch or punches which swage or bend the blanks held by the dies to the desired shape. In such machines particularly in those of large size, the dies and die holders are heavy; they require accurate adjustment; and they of course must be changed for different sizes and forms of work, consequently it is advantageous to have the dies and their holders readily accessible and easily placed in or removed from the pockets.

The object of the present invention is to construct and arrange a blank feeding mechanism for machines of this character which will feed the blanks surely and accurately and which can be quickly manipulated into feeding position or from feeding position so as to expose the die pocket and permit free insertion, adjustment and removal of the dies and die holders.

The invention is represented as embodied in a form which is particularly designed for feeding down from above to the dies arranged in the die pocket, individual rod shaped blanks that are to be first bent and then swaged by the punches, as set forth in my application for United States Patent No. 465,824 filed April 30th, 1921, although the invention is not limited to a mechanism which will only feed this special form of blank.

In the accompanying drawings, Figure 1 is a plan view of a feed mechanism constructed and arranged according to the invention, swung from over the die pocket in the frame of a heading machine. Fig. 2, on larger scale, shows a plan with the mechanism swung into operative position over the die pocket of the heading machine. Fig. 3 is a side elevation of the feed mechanism in operative position. Fig. 4 is a front elevation of the mechanism in operative position. Fig. 5 is a side elevation on still larger scale with portions cut in vertical section. Fig. 6 is a horizontal section on the plane indicated by the dotted line 6—6 on Fig. 3. Fig. 7 is a vertical section on the plane indicated by the dotted line 7—7 on Fig. 3. Fig. 8 is a horizontal section on the plane indicated by the dotted line 8—8 on Fig. 3. Fig. 9 is a vertical section through the blank feed track on the plane indicated by the dotted line 9—9 on Fig. 3.

The frame 1 of these machines is usually a large, heavy and firm casting with a die pocket 2 at the forward end of the frame. In these machines the dies may be arranged on the die bed 3 at the bottom of the pocket or may be supported so as to be carried over the die bed as are the dies 4. The particular form of die pocket and the special shape of the dies is not material to this invention which is concerned only with the arrangement of the mechanism for feeding the blanks to the dies in the pocket.

The blank feeding mechanism is mounted on a carriage 5 that is pivotally held on the top of the forward end of the machine frame by a screw stud 6 which is passed through the carriage from above and is threaded into the frame in front of and at one side of the die pocket. This allows the carriage with the feeding mechanism to be swung clear of the die pocket, as shown in Fig. 1, or to be swung over the die pocket, as shown in Fig. 2 in which latter position it is fastened to the top of the frame by screw bolts 7.

L-shaped track bars 8 are located on an incline the required distance apart on the top of the carriage, being fastened at their upper ends to the wall 9 of the carriage, and fastened at their lower ends to a bar 10 which is attached to the carriage. On the upper ends of the track bars is the hopper which is designed to receive the blanks 11. The particular form of hopper is not essential to the invention but that shown comprises two sections 12, the bottom walls 13 of which slope downward and at the back are open to permit the blanks to roll down and drop through the opening onto the inclined tracks. Guide bars 14 are secured to the track bars so as to retain the blanks as

they roll down on the track bars which not only support the blanks, but prevents endwise movement of the blanks.

Movable back and forth in ways on the carriage under the lower end of the feed track, is a transverse slide 15. On the end of the transverse slide next to the die pocket is a bar 16 with upwardly extending grooved blocks 17 for receiving the blanks as they roll down the track and carrying them over the die pocket. At the ends of the bar which extends transversely of the slide, are upwardly standing guide plates 18 that locate the blocks lengthwise in the carrier (Fig. 4). Back of the blank carrier blocks on the slide is a plate 19 that closes the lower end of the track at all times during the movements of the transfer slide except when the blank carrier blocks are under the end of the track (Fig. 5). On the top of the slide is a lug 20 provided with a screw 21 that is adapted to engage a lug 22 on the carriage for stopping the slide in exact forward position (Fig. 6). The slide is reciprocated by means of a lever 23 that is pivoted on the pivotal stud 6 of the carriage. This lever is adapted to be oscillated by a cam reciprocated rod 24 (Fig. 2) for drawing back the slide into position for the carrier to receive a blank and then carrying the slide and blank forward over the die pocket.

A bracket 25 is fastened vertically to the forward end of the carriage. Movable up and down in guide ways formed in this bracket is a slide 26. A link 27 connects the slide with the end of a rocker arm 28 secured to one end of a rock shaft 29 mounted in a bearing bracket 30 fastened to the top of the carriage (Fig. 3). On the other end of the rock shaft is a lever 31 which is designed to be oscillated by the cam reciprocated rod 32 (Fig. 2). The downward limit of the slide is determined by the screw 33 that is threaded into a lug 34 at the upper end of the slide and that is adapted to engage a lug 35 projecting from near the middle of the bracket (Fig. 3). At the lower end of the vertical slide is a yoke 36 and pivotally mounted in this yoke is a block 37. Fastened to the back face at the outer ends of this block are two downwardly extending fingers 38 and fastened to the front face at the middle of the block is a finger 39, the fingers 38 preferably being rigid and the finger 39 being yielding (Figs. 4 and 5). A spring 40 connected between the block and the slide tends to draw the lower ends of the fingers forward. A stop lug 41 at the top of the block engages the lower end of the slide and limits the amount of forward movement of the lower end of the fingers under the pull of the spring (Fig. 5). When this feed is attached to the machine with which it is to be used, the transfer slide 15 goes back and receives a blank, then comes forward and stops with the blank beneath the raised fingers carried by the vertical slide 26 (Fig. 4). The fingers then come down and grasp and pick up the blank and after the transfer slide is drawn back out of the way, the fingers move down and deposit the blank in the dies below (Fig. 5). Then the fingers are raised out of the way, the cams of the machine being timed to perform these operations in the proper time.

To prevent more than one blank at a time from rolling from the track, a gate 42 is arranged at the lower end of the track (Fig. 5). This gate is fastened to a slide 43 designed to be moved vertically in a way in the lower end of the bracket 25, the slide being retained in position by plates 44 and 45 (Figs. 6, 7 and 8). The lower end of a link 46 is pivoted to the gate slide and the upper end of the link is loosely connected with a lever 47, a pin 48 on the lever passing through a slot 49 in the link (Fig. 5). A spring 50 connected between the pin 48 and the link pin 51 projected from the slide, normally holds the pin 48 at the lower end of the slot 49 and a spring 52 connected between the pin 48 and a pin 53 projecting from the fixed plate 44 tends to pull down the gate and turn the free end of the lever 47 into the path of a cam block 54 adjustably fastened to the finger slide 26 (Figs. 5 and 6). When the finger slide goes down and the transfer slide is forward, the cam 54 engages the lever and rocks it so that the spring 50 lifts the gate from in front of the lower end of the track. When the finger slide is raised so as to release the lever 47 and the transfer slide is drawn back, the spring 52 pulls the gate down in front of the lower end of the track and cuts off all but the lowest blank and pushes that blank into the carrier block on the transfer slide. In order to lock the gate down and prevent the feeding of any of the blanks while the machine is in operation, a bolt 55 mounted to move horizontally in the bracket 26 may be pushed over the top of the slide 43 so as to prevent it from rising under the pull of the spring 50 as the lever is swung by the cam 54 (Figs. 7 and 8). This bolt is engaged by a lever 56 which is connected by a link 57 with the rocker arm 58 on the lower end of a rock shaft 59, the upper end of which is provided with a hand lever 60 (Fig. 2).

With this mechanism the machine may be run for adjusting and testing without feeding any of the blanks by turning the hand lever 60 and locking down the gate. When the gate is raised the blanks will be fed one at a time into the transfer slide and carried into line with the fingers which will pick up the blank and then carry it down to the dies below. Whenever it is desired to remove and replace the dies and their holders or to adjust these parts, the die pocket may

be quickly exposed without lifting off the feed mechanism by simply disconnecting the link 24 from the transfer slide lever 23 and disconnecting the link 32 from the finger slide rocker arm 31, then when the bolts 7 are removed the whole feed mechanism is free to be swung on the pivot 6 from over the die pocket.

The invention claimed is:—

1. The combination with a metal heading machine of a carriage movably mounted on the machine frame adjacent to the die pocket, and an inclined track for receiving blanks, a cut off gate at the lower end of the track, means for locking said gate over the end of the track and transfer mechanism for removing blanks from the track, mounted on and movable with the carriage toward and from the die pocket.

2. The combination with a metal heading machine of a carriage pivotally mounted on the machine frame adjacent to the die pocket, and an inclined track for receiving blanks, a cut off at the lower end of the track, a horizontally movable blank carrier for removing blanks from the track and a vertically movable blank carrier for removing blanks from the horizontally movable carrier, mounted on and movable with the carriage toward and from the die pocket.

3. The combination with a metal heading machine of a carriage pivotally mounted on the machine frame adjacent to the die pocket whereby the carriage may be swung over or away from the die pocket, said carriage supporting a blank receptacle, an inclined track leading from the receptable, a horizontally movable blank carrier at the lower end of the track and a vertically movable blank carrier for removing blanks from the horizontally moving carrier.

4. The combination with a metal heading machine of a carriage located adjacent to the die pocket, said carriage supporting a receptacle for blanks, an inclined track for receiving blanks from the receptacle, a cut off gate at the lower end of said track, means for locking said gate over the end of the track, a horizontally movable slide for transferring blanks from the lower end of the track and vertically movable fingers for picking up and carrying down blanks from said slide.

5. The combination with a metal heading machine of blank feeding mechanism comprising an inclined track for receiving blanks, a cut off gate at the lower end of the track, means for locking said gate over the end of the track and transfer mechanism for removing blanks from the track, pivotally mounted on the machine frame adjacent to the die pocket.

6. The combination with a metal heading machine of blank feeding mechanism comprising an inclined track for receiving blanks, a horizontally movable blank transfer slide for receiving blanks from the track and vertically movable blank carrying fingers for picking blanks from the slide, pivotally mounted on the machine frame adjacent to the die pocket whereby the feeding mechanism may be swung over or away from the die pocket.

7. The combination with a metal heading machine of blank feeding mechanism comprising a horizontally movable blank transfer slide for receiving blanks and vertically movable blank carrying fingers for picking blanks from the slide, pivotally mounted on the machine frame adjacent to the die pocket whereby the feeding mechanism may be swung over or away from the die pocket.

8. The combination with a metal heading machine of a carriage pivotally mounted on the machine frame adjacent to the die pocket, and a horizontally movable blank carrier and vertically movable blank carrier, mounted on and movable with the carriage so as to be swung over or from over the die pocket according to the movement of the carriage.

HENRY L. SMITH.