

Feb. 4, 1930.

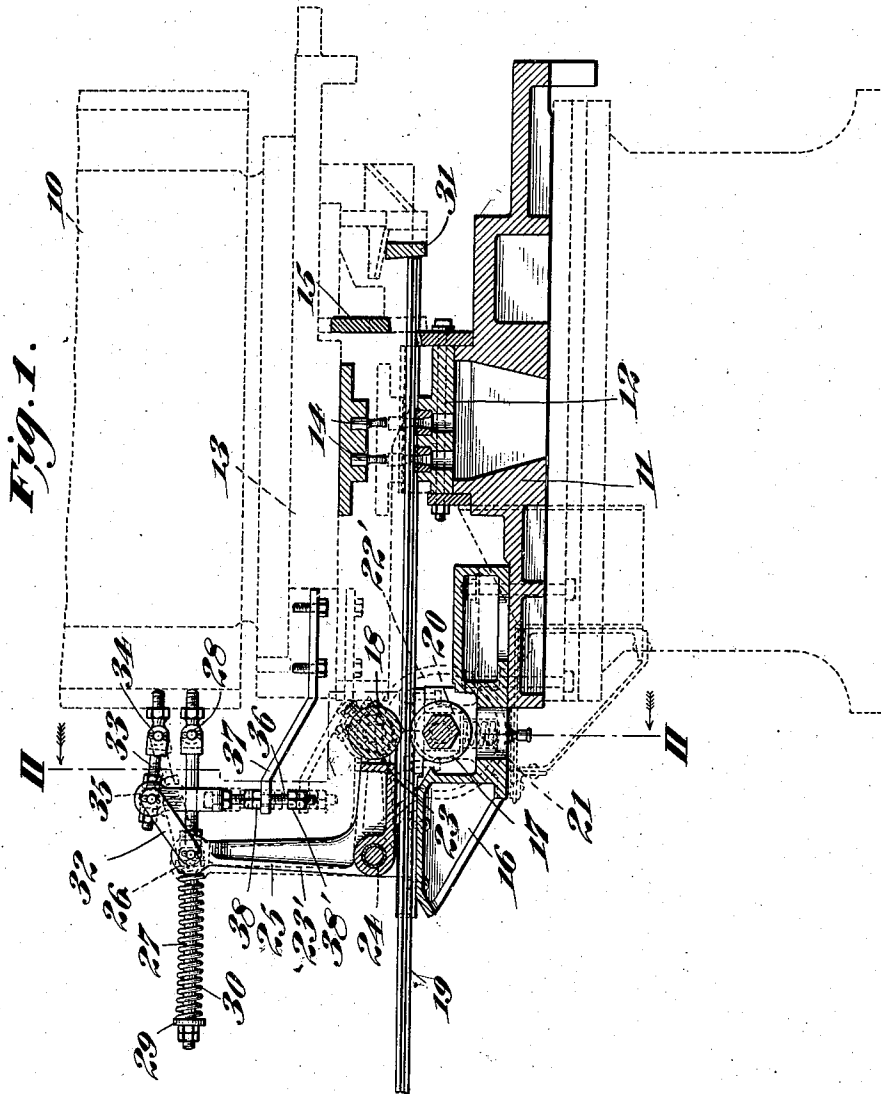
H. M. ELY

1,746,032

TIE PLATE MACHINE

Filed Oct. 1, 1926

2 Sheets-Sheet 1



INVENTOR

Harold M. Ely

BY

R. S. C. Dougherty
ATTORNEY

Feb. 4, 1930.

H. M. ELY

1,746,032

TIE PLATE MACHINE

Filed Oct. 1, 1926

2 Sheets-Sheet 2

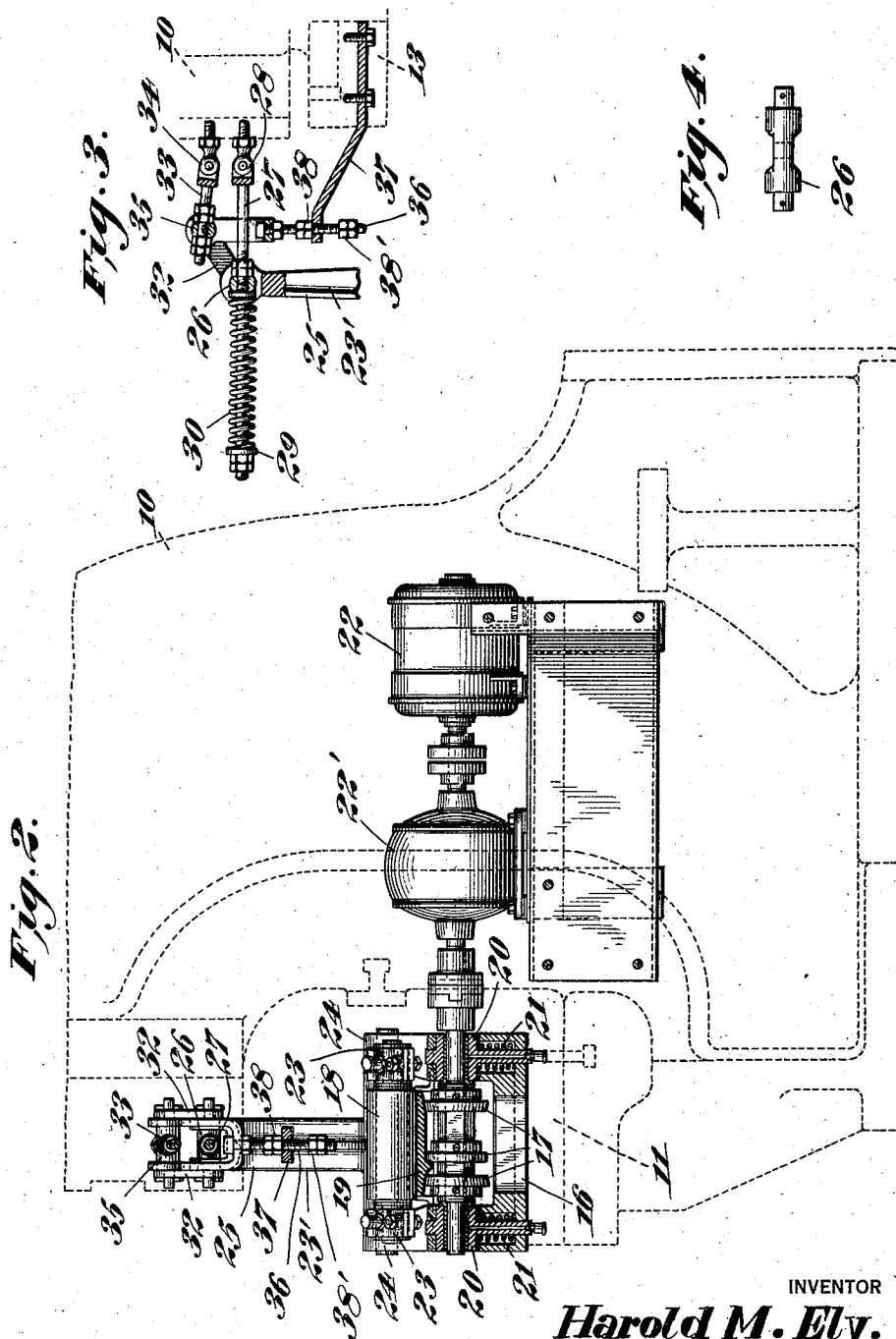


Fig. 4.



INVENTOR

Harold M. Ely.

BY

R. S. C. Dougherty.

ATTORNEY

UNITED STATES PATENT OFFICE

HAROLD M. ELY, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO BETHLEHEM STEEL COMPANY

TIE-PLATE MACHINE

Application filed October 1, 1926. Serial No. 139,009.

My invention relates to improvements in punching and shearing machines and particularly to an automatic mechanism for feeding the material to be acted upon. The object of my invention is the provision of a feed mechanism which is simple in construction and controls the feeding operation in sequence with the working step.

The novel features will be more fully understood from the following description and claims taken with the accompanying drawings, in which:

Fig. 1 is a partial front elevation of a tie plate machine embodying one form of my invention;

Fig. 2 is a side elevation of the mechanism shown in Fig. 1;

Fig. 3 is a sectional view showing the pinch roll operating mechanism; and

Fig. 4 is a detail view of the trunnion block.

Referring to the drawings: 10 indicates generally a tie plate machine of a well known type comprising a table 11 carrying the die block 12 and a reciprocating head 13 carrying the punches 14 and the shear blade 15. The drawings do not show the tie plate machine in its complete form, as it is not considered to be part of my invention, but only as much thereof has been shown as will suffice to show the construction of my invention therewith. It should be understood that the head 13 may be reciprocated by means well known to the art.

Fixed at the side of the table 11 is a bracket 16 which serves to support the mechanism provided for the purpose of feeding the work to the punching and shearing operation.

A pair of pinch rolls 17 and 18 are provided for feeding the bar 19 to position beneath the punches 14 and shear blade 15. The bottom roll 17 is rotatably mounted in bearing blocks 20 which are slidably mounted in suitable guideways formed in the bracket 16 and are held yieldingly in elevated position by the springs 21. The bottom roll 17 is positively and continuously driven in a feeding direction by a motor 22 through a speed transformer 22' which is operatively connected to said motor by a flexible coupling. The upper pinch roll 18 is mounted

in suitable bearings formed at the end of the horizontally disposed spaced arms 23 of the bell crank lever 23'. The latter is pivotally mounted to the bracket 16, as at 24. The vertically extending arm 25 of the lever 23' is bifurcated at its upper end and rotatably receives the trunnion block 26. The latter is apertured to receive the rod 27 which extends laterally from the side of a stationary portion of the machine to which it is pivoted, as at 28. The rod 27 extends beyond the trunnion block and is threaded at its ends to receive an adjustable collar 29.

Interposed between the collar 29 and the trunnion block 26 is a coil spring 30 which surrounds the rod 27 and serves to urge the arm 25 toward the right, thereby constraining the upper pinch roll toward its lower position. In this position the rolls are adapted to pinch the bar and feed it forward against the stop 31. In order to discontinue the feeding of the bar during the punching and shearing operations, without discontinuing the operation of the motor 22, I provide a device which cooperates with the head 13 to elevate the upper pinch roll sufficiently to relieve the traction pressure of the rolls ordinarily required to move the bar. This device comprises a pair of link members 32 and 33 constituting a toggle which is pivoted at one end, as at 34, to a stationary portion of the machine and, at its other end is rotatably mounted on the extending ends of the trunnion block 26. The contiguous ends of the links 32 and 33 are pivotally connected to each other by means of the king pin 35. Pivoted to the latter and depending therefrom is a rod 36 which extends slidably through an aperture formed at the extremity of an arm 37 projecting laterally at the side of the head 13. The rod 36 is threaded along its length and is provided with a pair of spaced adjustable collars 38 and 38'.

It will be noted that when the head 13 is at the top of its stroke, as shown in Fig. 1, the pinch rolls grip the bar 19 and the latter is fed into position beneath the operating tools. The bottom pinch roll 17 is elevated sufficiently so that the bar does not drag across the upper face of the die block 12 and

during the punching operation the springs 21 yield, allowing the bar to be depressed by the advancing tools, and thus a solid support is provided for the bar on the die block. The head 13 reciprocates, and at a predetermined position of the head during its downward movement, the arm 37 engages the lower adjustable collar 38' and the continued downward movement of the head 13 draws down the rod 36. The downward movement of the latter causes the links 32 and 33 to straighten, thereby rocking the arm 25 of the lever 23' towards the left against the pressure of the coil spring 30. The movement of the arm 25 toward the left raises the upper pinch roll 18 and relieves the tractive pressure of the pinch rolls on the bar and thus renders the rolls ineffective to move the bar.

It will be seen that by adjusting the collar 38 the movement of the arm 25 may be easily coordinated with the stroke of the head 13, so that feeding of the bar is discontinued while the punches and shear are operating upon the work.

The upper adjustable collar 38 is provided to assure the return of the toggle to its original position. When the head 13 moves upwardly the arm 37 engages with said collar and moves the rod upwardly thus contracting the links upwardly beyond their dead center. The upward movement of the links causes the arm to rock toward the right and allows the coil spring 30 to yieldingly force the upper roll to its lower position.

In operation the bar, having the configuration in cross section the particular shape desired in the finished tie plate, is fed between the pinch rolls. The head 13 is reciprocated and at a predetermined position in its travel the arm 37 engages the collar 38' and draws down the rod 36 which in turn causes the toggle to rock arm 25 toward the left. The movement of the lever elevates the upper pinch roll and thus renders the pinch rolls ineffective during the continued downward stroke of the head, at which time the finished tie plate is sheared from the end of the bar and the set of holes is punched in the portion of the bar which, upon another advance movement of the bar during the upward movement of the head, constitutes another finished plate.

It will be clear from the foregoing description that I have devised a simple and novel mechanically controlled feeding mechanism which automatically controlled the feed of the work to a punching and shearing machine.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as

are imposed by the prior art or as are specifically set forth in the appended claims.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. In a device for feeding work to a machine, the combination with a reciprocating member, of a driving roll, an idle roll, a lever supporting the latter, means to constrain the idle roll towards the driving roll, a stationary member, means constituting a toggle pivoted at one end to said stationary member and at its other end to said lever, a rod depending from said toggle, and means on said reciprocating member adapted to co-act with said rod whereby said toggle operates to rock said lever.

2. In a punching machine, the combination with a stationary bed, a reciprocating head, a pair of rolls, a lever pivoted to said bed and supporting one of said rolls, means constraining said rolls towards each other, a toggle connected at one end to said stationary bed and at its other end to said lever, a rod having an abutment and depending from said toggle, and means on said reciprocating member adapted to engage said abutment.

3. In a punching machine, the combination of a stationary bed, a reciprocating head, a pair of pinch rolls, means to drive one of said rolls, a lever pivoted to said stationary bed, bearing members on said lever for supporting one of said pinch rolls, a yieldable support for the other roll, means constraining said rolls towards each other, a pair of links, a king pin pivotally connecting said links, a pivot connecting one of said links to said lever, a pivot connecting the other of said links to said stationary bed, a rod pivoted to said king pin, an abutment member mounted on said rod, and a member attached to said head adapted to engage said abutment member.

In testimony whereof I hereunto affix my signature.

HAROLD M. ELY.