Jan. 28, 1930. A. S. LISS 1,744,776

WORK FEEDING DEVICE

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Fig. 1

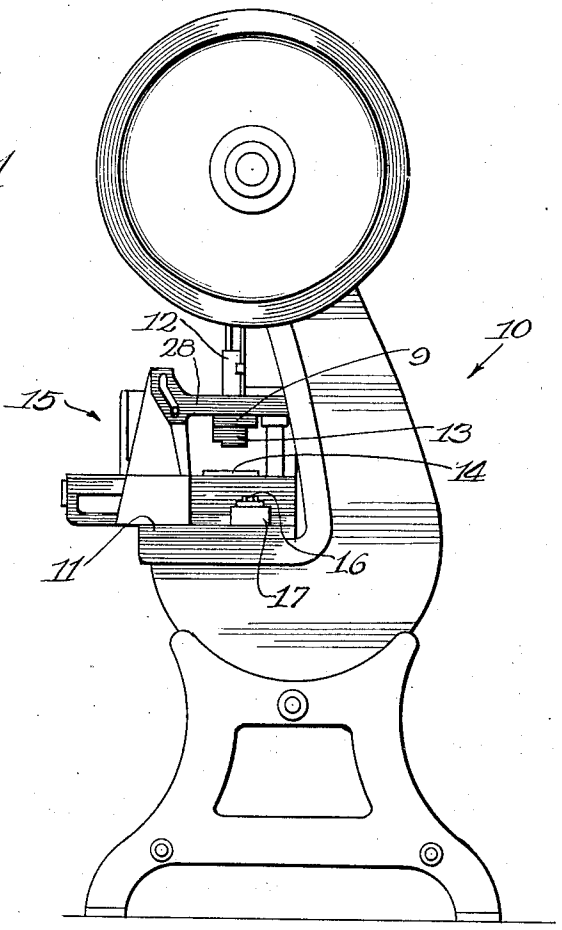


Fig. 5

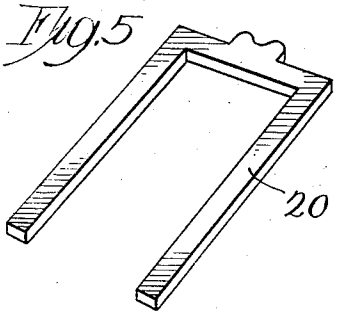
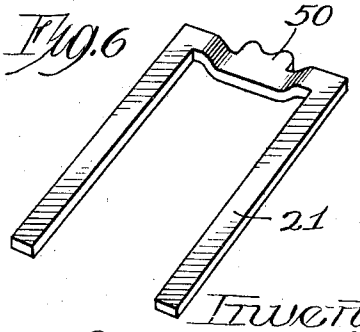


Fig. 6



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WORK FEEDING DEVICE

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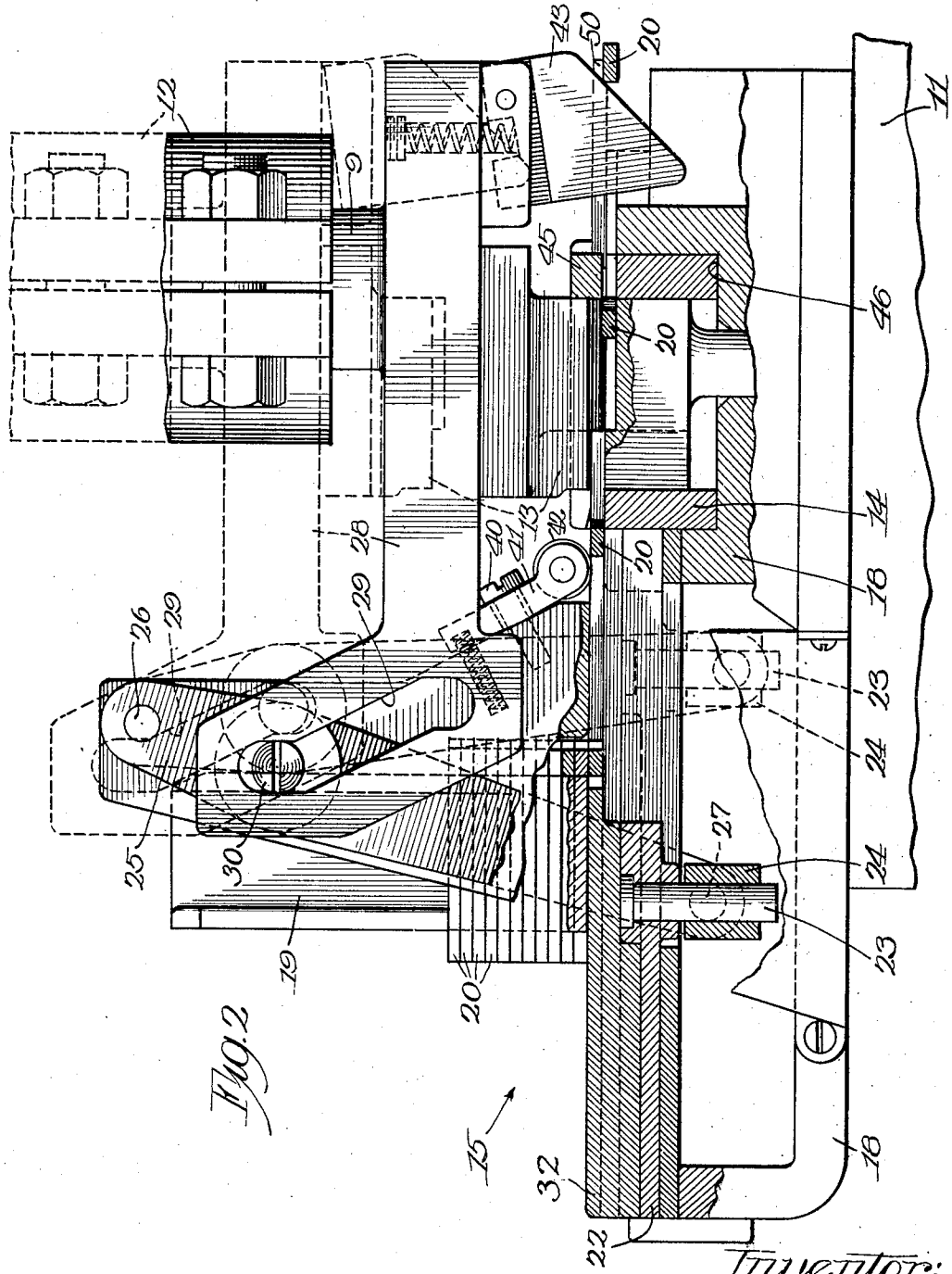


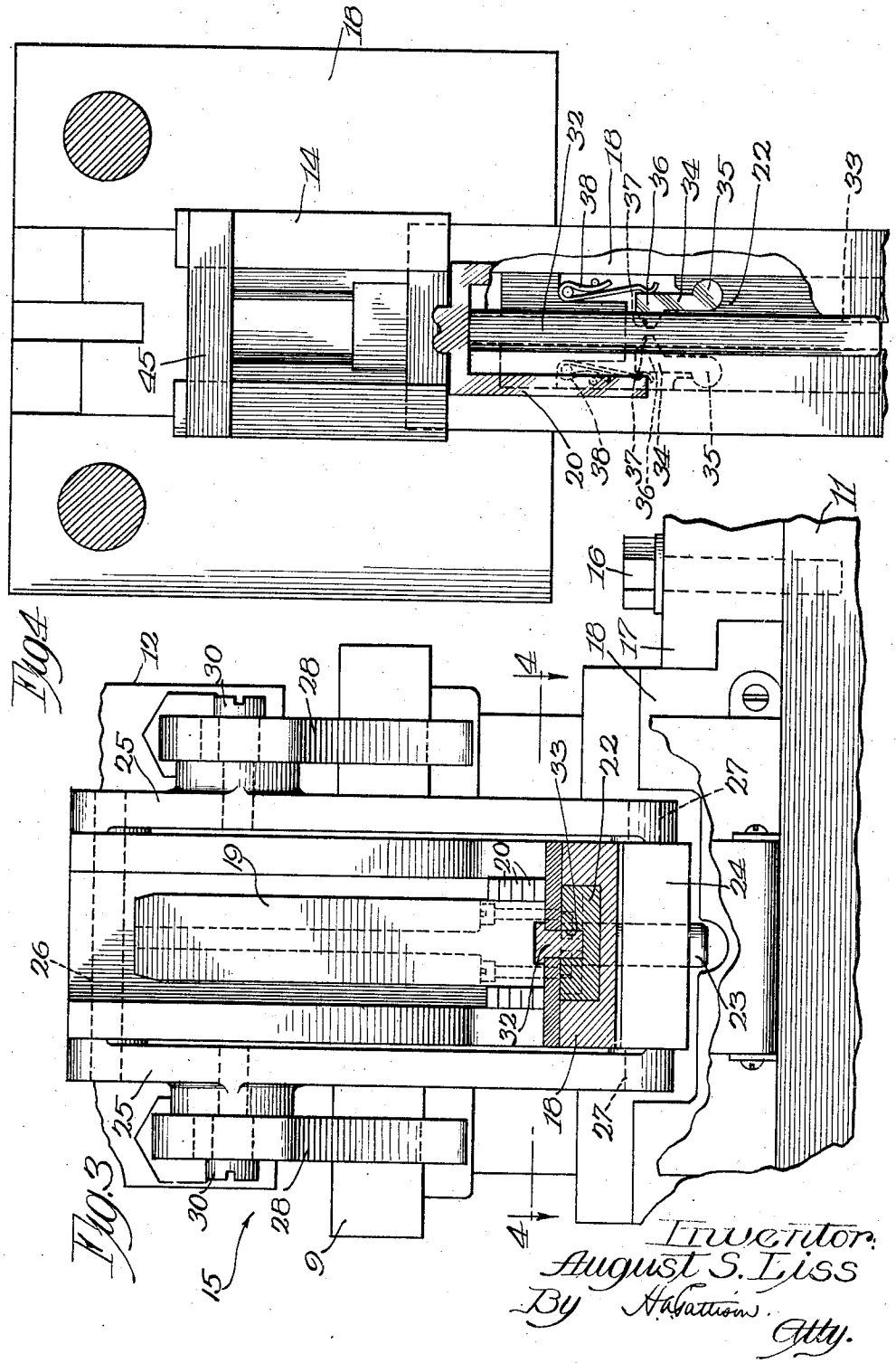
Fig. 2

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WORK FEEDING DEVICE

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Patented Jan. 28, 1930 1,744,776

UNITED STATES PATENT OFFICE

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WORK-FEEDING DEVICE

Application filed September 4, 1925. Serial No. 54,436.

This invention relates to work feeding devices, and more particularly to work feeding devices for use with forming presses.

The object of the invention is to provide a self contained work feeding device which is attachable to and removable from a forming press as a unitary structure without necessitating any changes in, or additions to, the press itself.

In accordance with one embodiment of the present invention a self contained forming tool, die and work feeding device removably attachable to the bed of a forming press, with the forming member fitting within a reciprocating tool holder of the press, operates contemporaneously with the reciprocation of the tool holder to feed blanks from a magazine to the die, whereupon work is performed upon the blanks, after which they are ejected therefrom.

Other features and advantages of the invention will appear from the following detailed description, in which

Fig. 1 is a side elevation of a forming or punch press showing a device embodying the features of the invention attached to the bed of the press;

Fig. 2 is an enlarged fragmentary side elevation, partially in section, of the device embodying the features of the invention;

Fig. 3 is an enlarged end view of the device, partially in section;

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 3 looking in the direction indicated by the arrows, a part being broken away to illustrate certain details more clearly, and

Figs. 5 and 6 are perspective views of a blank and a finished article, respectively.

Referring to the drawings in which like reference numerals indicate like parts throughout the several views, the numeral 10 denotes in general a forming or punch press (Fig. 1), of which 11 indicates the bed of the press and 12 the slide of the press terminating in a forming member holder. The press is operated by any suitable source of power (not shown) in a manner common to punch presses. The numeral 15 indicates in general a self-contained forming member, die and feeding device.

A forming member holder 9 which carries a forming member 13 is designed to slide within and be operatively engaged by the forming member holder of the press as shown in Fig. 2. The die 14 is supported by a shouldered portion 46 of a frame 18 of the device 15. The frame 18 is removably attached to the bed 11 of the press 10 by clamps 17 which are secured to the bed of the press by studs 16 as shown in Fig. 3. Mounted on the frame is a suitable magazine 19 particularly adaptable for stacking blanks 20 shown in Fig. 5.

A slide member 22 is reciprocably mounted in the frame 18 as shown in Figs. 2 and 3 and mounted at one end of said slide member is a shouldered pin 23 which engages a bar 24. A pair of cam levers 25 are pivoted at their upper ends by pins 26 to the upper part of the frame 18, their lower ends being pivoted to doweled ends 27 of the bar 24 and thereby supporting it.

A pair of arms 28 suitably fastened to the opposite sides of the forming member holder 9 have cam slots 29 in their end portions for receiving and engaging a pair of cam rollers 30 suitably secured to the pivoted levers 25 as shown in Figs. 2 and 3.

A feeder bar 32 is reciprocally mounted in a groove 33 of the slide member 22. Each of a pair of pawls 34 is pivotally secured at one of its ends 35 to the slide member 22 as shown in Fig. 4. The opposite ends of the pawls 34 are provided with toothed portions 36 adapted to engage notches 37 in the feeder bar 32 and normally maintained therein by springs 38 suitably mounted on the slide member 22. Secured to the frame 18 by a screw 40 as shown in Fig. 2, is a member 41 having a roller 42 mounted in one end thereof which aids in guiding the blanks 20. A spring pressed ejector member 43 is suitably carried by the punch member 9. A portion 45 formed in the die 14 as shown in Fig. 2 serves as a stop for the blanks 20.

As the slide 12 of the press descends carrying the punch member 9 the movement of the arms 28 relative to the levers 25 will cause

the cam rollers 30 to follow the surface of the cam slots 29 thereby moving the levers 25 around the pins 26 through their association with the arms 28. The downward movement of the punch member 9 rotates the lower ends of the levers 25 moving the bar 24 towards the magazine and the slide 22 reciprocates therewith. When the forward end of the feeder bar 32 has moved under the magazine 19 the lowest blank 20 will drop in front of the feeder bar and be engaged thereby. As the slide 12 of the press 10 ascends raising the punch member 9 and the arms 28 therewith the cam rollers 30 will again follow the cam slots 29 thereby rotating the levers 25 in a direction reverse to that just described, and the blank 20 will be moved towards the die by the feeder bar 32 to an intermediate position where it is securely held by the roller 42 as shown in Fig. 2.

As the levers 25 continue to rotate and cause the bar 24 to reciprocate the feeder bar 32 will reciprocate therewith through association with the slide member 22 as hereinbefore described. Should the movement of the blank be arrested for any reason such as due to its being slightly oversize the continued movement of the slide member 22 will flex the springs 38 permitting the ends 36 of the pawls 34 to leave the notches 37 so that the slide member 22 will continue to reciprocate while the feeder bar and the blank engaged thereby remain idle.

As the mechanism functions another blank 20 will be moved to an intermediate position under the roller 42, thereby advancing the first blank 20 to a working position in the die member 14 until its forward motion is stopped by the projecting portion 45 of the die. As the slide 12 descends the feeder bar 32 moves toward the magazine 19 for another blank 20 and the forming member 13 forms the blank 20 held in the die member 14 into the finished article 21, shown in Fig. 6. As the slide 12 ascends the oncoming blanks 20 will push the finished article 21 to a position from which it will be ejected upon the next operation by the spring pressed ejector member 43. The finished article 21 will be shaped at 50 as shown in Fig. 6 so that it will slide under the portion 45 of the die 14 after the forming member 13 has operated.

The mechanism 15 is an automatically continuously operated feeding mechanism operated by the same source of power used to raise and lower the slide of the press, the blanks 20 being fed in rapid succession from the magazine 19 through each of the four positions described and the finished article 21 ejected by the member 43. The means for driving the feeder bar 32 hereinbefore described will prevent damage to any part of the feeding mechanism should it become jammed in any way during the operation.

This device is entirely self-contained, being readily adaptable to the ordinary type of punch press without necessitating any changes in or additions thereto, this being a very desirable feature since the same press may readily be used for a variety of purposes. The device may be assembled or repaired outside of the press which is desirable since the press may be used for other purposes or a similar device substituted while the repairing or assembling is being done. Although the mechanism shown in the drawings is particularly adaptable for feeding the particular type of blank illustrated in the drawings, it is to be understood that the scope of the invention is limited only by the appended claims.

What is claimed is:

1. The combination with a forming press comprising a framework, a slide, and means to reciprocate the slide in the framework, of a unitary device removably attachable to the framework, said device comprising a frame, a die member secured thereto, a forming member supported by the frame and designed to be removably attached to the slide, and means operable by the means for moving the slide to shift a blank to a working position between the forming member and die and to cause the forming member and die to perform work thereon.

2. The combination with a forming press comprising a framework, a slide, and means to reciprocate the slide in the framework, of a unitary device removably attachable to the framework, said device comprising a frame, a die member secured thereto, a forming member supported by the frame and designed to be removably attached to the slide, a magazine for containing blanks, means operable by the means for moving the slide to transfer a blank from the magazine to a working position between the forming and the die members and to eject the worked blank from said position.

3. The combination with a forming press comprising a framework, a slide, and means to reciprocate the slide in the framework, of a unitary device removably attachable to the framework, said device comprising a frame, a die member secured thereto, a forming member supported by the frame and designed to be removably attached to the slide, a magazine for containing blanks, a feed member, and means operable by the means for moving the slide to move the feed member to transfer a blank from the magazine to the die member as the forming member moves from the die member and to return the feed member to the magazine to operatively engage another blank upon the succeeding reverse movement of the forming member.

4. The combination with a forming press comprising a framework, a slide, and means to reciprocate the slide in the framework, of a unitary device removably attachable to the framework, said device comprising a frame,

a die member secured thereto, a forming member supported by the frame and designed to be removably attached to the slide, means operable by the means for moving the slide for shifting a blank to a working position between the forming and die members, and means rendered effective when the shifting of a blank is arrested to release said blank from the shifting means.

5. The combination with a forming press comprising a framework, a tool holder, and means to reciprocate the tool holder in the framework, of a unitary device removably attachable to the framework, said device comprising a frame, a die member secured thereto, a forming member supported by the frame and designed to be removably attached to the tool holder, a slide member operable by the means for moving the tool holder and operating simultaneously therewith, a feed member for shifting a blank to a working position between the forming and die members, and resiliently controlled members operatively interconnecting said feed and slide members to cause them to move together and responding when the motion of a blank is arrested during the shifting thereof to release the feed member from the slide member.

In witness whereof, I hereunto subscribe my name this 26 day of August, A. D. 1925.

AUGUST STANLEY LISS.