W. H. NEEDHAM.

PRESS FEEDING MECHANISM.

APPLICATION FILED APR. 13, 1918.

1,422,605.

Patented July 11, 1922.

3 SHEETS—SHEET 1.

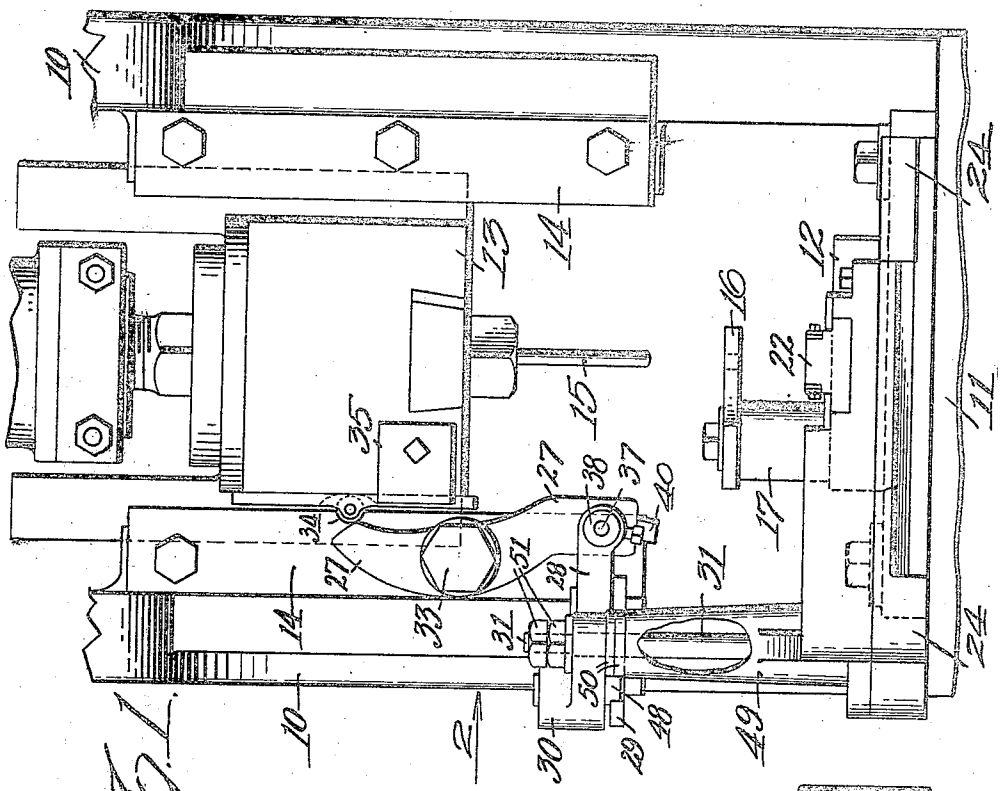


Fig. 1.

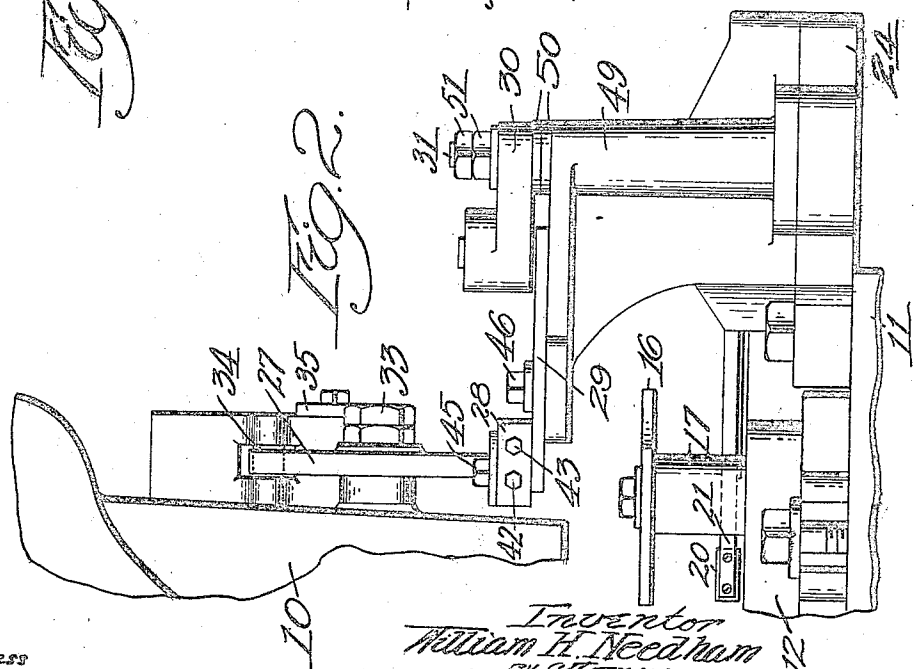


Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3.

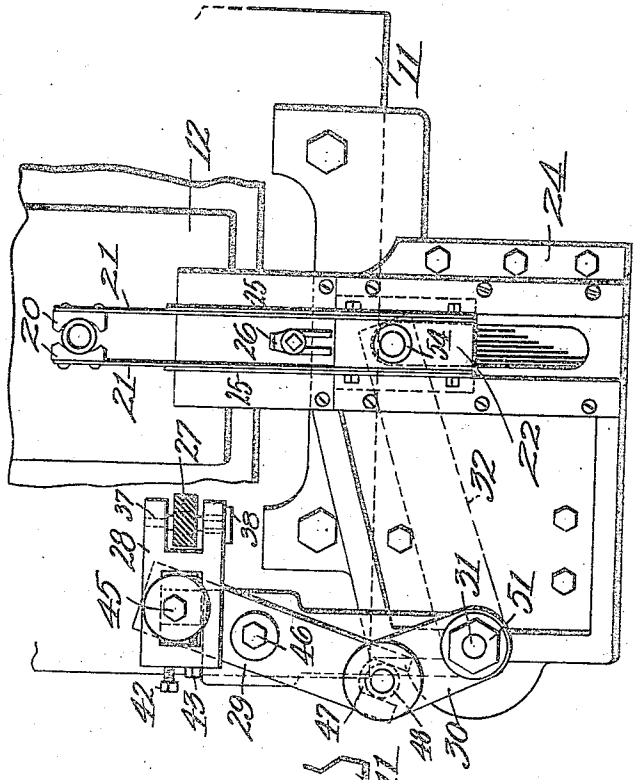
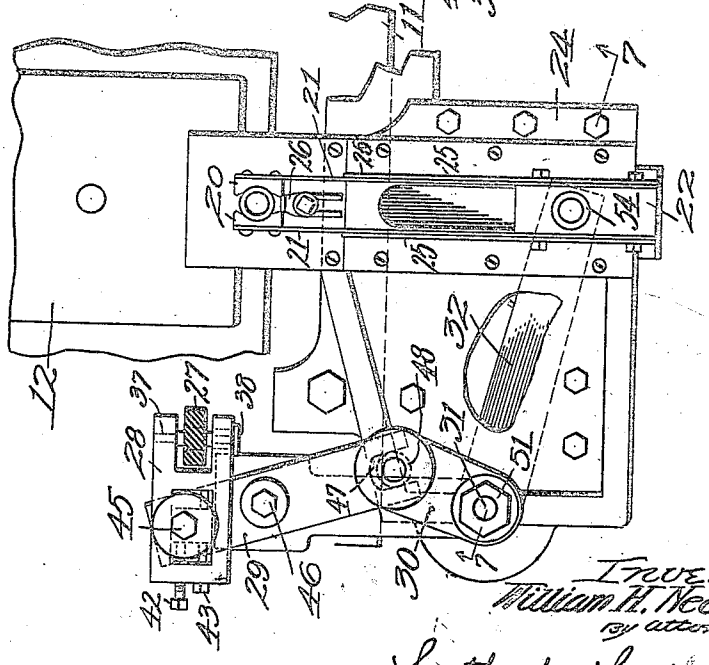


Fig. 4.



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3 SHEETS—SHEET 3.

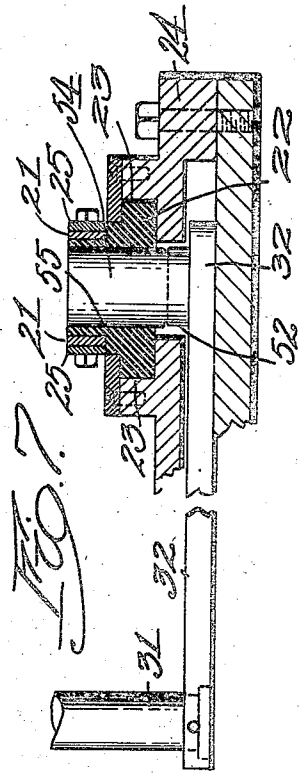


Fig. 7.

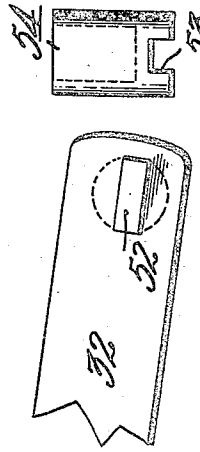


Fig. 8.

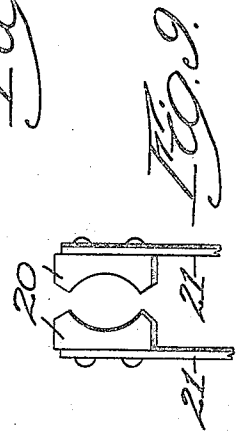


Fig. 9.

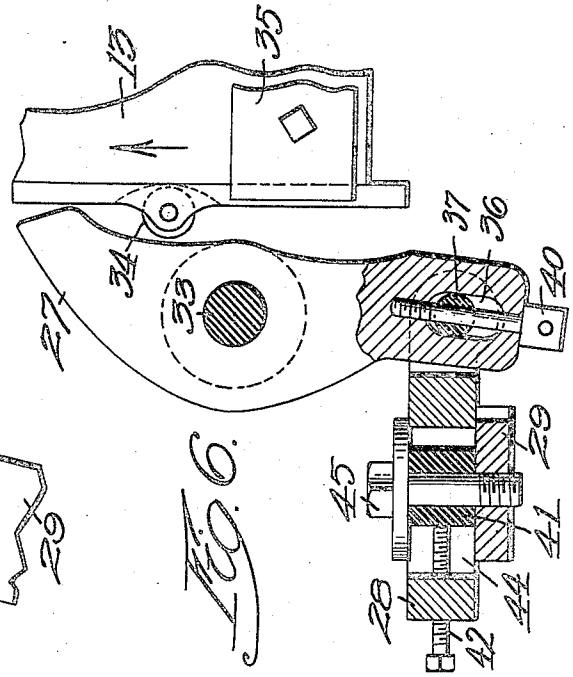


Fig. 6.

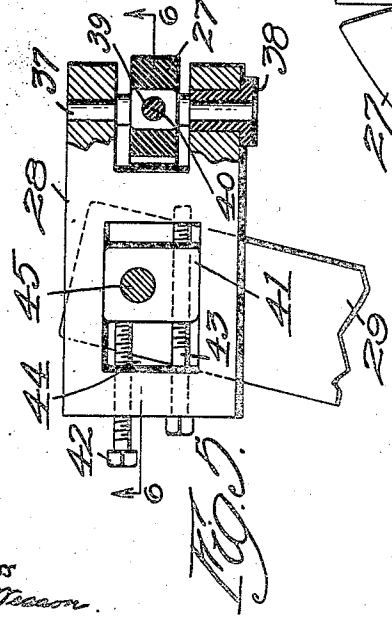


Fig. 5.

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UNITED STATES PATENT OFFICE.

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PRESS-FEEDING MECHANISM.

1,422,605. Specification of Letters Patent. Patented July 11, 1922.

Application filed April 13, 1918. Serial No. 228,441.

To all whom it may concern:

Be it known that I, WILLIAM H. NEEDHAM, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Press-Feeding Mechanism, of which the following is a specification.

This invention relates to mechanism for feeding small articles such as bushings or ferrules to a press having a reciprocating plunger.

It is the common but dangerous practice to feed articles to such presses by hand, placing each article separately in position in the path of the plunger. Many and serious accidents have resulted from this practice, the loss of one or more fingers by the operator often resulting.

It is the general object of my invention to provide a mechanical feeding device for such machines, so designed that the article may be placed in position in the feeding device at a point removed from the path of the plunger, said article being thereafter advanced to delivery position automatically and without risk to the operator.

With this general object in view, one feature of my invention relates to the provision of a pair of holding jaws mounted on a slide and movable alternately from receiving to delivery position. Provision is made for opening said jaws to receive an article while in receiving position, and the jaws are preferably yieldingly separable to permit removal of the supported article when in delivery position.

Other features of my invention relate to improved devices for actuating the feeding mechanism; to the provision of friction devices for preventing overthrow of the feeding mechanism; and to the provision of adjustable connections whereby the locus of movement of the jaw-supporting slide may be changed.

Other features of my invention relate to arrangements and combinations of parts hereinafter described and more particularly pointed out in the appended claims.

A preferred form of my invention is shown in the drawings, in which—

Fig. 1 is a front elevation of a portion of a press having my improved feeding mechanism mounted thereon;

Fig. 2 is a left-hand side elevation of the parts shown in Fig. 1;

Fig. 3 is a plan view of the feeding mechanism with the holding jaws in delivery position;

Fig. 4 is a view similar to Fig. 3, but showing the parts in receiving position;

Fig. 5 is an enlarged detail plan view of the adjustable connections to the operating cam lever;

Fig. 6 is a front elevation partly in section, taken along the line 6—6 in Fig. 5;

Fig. 7 is a detail sectional elevation taken substantially along the line 7—7 in Fig. 4;

Fig. 8 is an enlarged detail view of the connections between the slide and its operating arm, and

Fig. 9 is an enlarged plan view of the holding jaws.

Referring to the drawings, I have shown portions of a press frame 10 having a bed 11 upon which a die plate 12 is secured. A plunger or slide 13 is mounted in guide ways 14 on the frame 10 and is reciprocated therein in the usual manner. A punch or die 15 of any desired form is secured in the plunger 13 and passes through a stripper plate 16 mounted on a fixed support 17. All of the parts thus far described may be of any usual or desired type.

My improved feeding mechanism comprises a pair of holding jaws 20 (Figs. 3 and 4) supported by resilient bars 21 which in turn are secured to a slide 22 movable in guide ways 23 (Fig. 7) formed in a plate 24 fixed to the press bed 11. The resilient bars 21 may be reenforced by additional resilient strips 25 as shown in Fig. 3 if found desirable.

The outline of the holding jaws 20 is clearly shown in Fig. 9 and permits easy removal of the supported article therefrom either by forcing the jaws apart as the article is moved downward, or by pulling the jaws away from the article after the punch has entered therein. As the jaws approach the receiving position shown in Fig. 4, they are engaged by a stop 26 adjustably secured to the plate 24 and adapted to separate the jaws when in receiving position, thus permitting easy insertion of an article therein.

The slide 22 is reciprocated by the plunger 13 through a series of connections which include a cam lever 27, an adjustable connecting link 28, a lever 29, an arm 30, a rock shaft 31, and a lower arm 32 connected to the slide 22. The cam lever 27 is mounted

on a stud 33 fixed in the frame 10, and is actuated by a cam roll 34 carried by a bracket 35 secured to the plunger 13.

The connections between the cam lever 27 and the link 28 are best shown in Figs. 5 and 6, in which it will be seen that the lower end of the cam lever is provided with a slot 36 through which extends a cross shaft 37 having a bearing at one end in the link 28, and at the opposite end in a bushing 38 inserted in said link. The shaft 37 is provided with a hole 39 extending transversely through its center portion. A stud 40 is screwed into the end of the lever 27, extending longitudinally of the slot 36 and also extending through the hole 39. These connections permit the link 28 to move in a horizontal plane, while at the same time driving connection is maintained between the swinging lever 27 and the link 28 by means of the stud 40 and its sliding connection with the cross shaft 37.

The link 28 is adjustably connected with the lever 29 by means of a bearing block 41 adjusted by means of screws 42 and 43 within a recess 44 formed in the link. A stud 45 (Fig. 6) is fixed in the end of the lever 29 and has a bearing in the block 41. The lever 29 is mounted on a pivot 46 fixed in a framework connected to or integral with the plate 24. The opposite end of the lever 29 is slotted at 47 to receive a roll 48 mounted on the underside of the arm 30, which arm is keyed or otherwise non-rotatably secured to the upper end of the rock shaft 31 which has a fixed bearing in a vertical post 49 secured to the plate 24. The lower arm 32 (Fig. 7) is rigidly secured to the lower end of the shaft 31.

Fiber friction washers 50 (Fig. 2) are interposed between the arm 30 and post 49, and the friction may be adjusted by means of check nuts 51 on the upper end of the rock shaft 31. At its outer end the arm 32 (Figs. 7 and 8) is provided with a lug or projection 52 having parallel sides and extending into a recess 53 in the lower end of a plug or sleeve 54 rotatable is a vertical opening or socket 55 in the slide 22. This connection permits continuous action between the slide 22 moving in a straight line, and the end of the arm 32 which moves in the arc of a circle.

Having thus described my invention, I will briefly indicate the operation thereof. As the press plunger moves upward the roll 34 engages the upper end of the cam lever 27, moving the lever to the position shown in Fig. 1 and advancing the slide 22 and holding jaws 20 to the delivery position shown in Fig. 3. The exact locus of this delivery position may be adjusted by means of the adjusting screws 42 and 43 acting on the bearing block 41. As the plunger descends the punch or die 15 enters the article held by the jaws and at the same time the roll 34 engages the lower cam surface on the lever 27, moving the lever to the position shown in Fig. 6, and withdrawing the slide to the receiving position shown in Fig. 4. In this position the jaws 20 are spread apart by the stop 26, and the operator can easily place another article therein. As the plunger again moves upward, the first mentioned article is removed from the punch by the stripper plate 16, and the new article is advanced to delivery position by the feeding mechanism. The friction discs 50 will be adjusted to prevent overthrow of the mechanism in either direction.

Having thus described my invention, it will be evident that changes and modifications can be made therein by those skilled in the art without departing from the spirit and scope thereof as set forth in the claims, and I do not wish to be otherwise limited to the details herein disclosed, but what I claim is:—

1. Press feeding mechanism having, in combination, separable holding jaws, a slide for said jaws, means to move said slide and jaws alternately to receiving and delivery positions, an adjustable stop effective to spread said jaws as they approach receiving position, and means to change the locus of the movement of said slide.

2. Press feeding mechanism having, in combination, separable holding jaws, a slide for said jaws, and means to move said slide and jaws alternately to receiving and delivery positions, said means comprising a lever mounted on a fixed pivot and having separated cam surfaces, a cam engaging device associated with the plunger of the press effective to positively engage said cam surfaces at different points in the travel of said plunger and to thereby rock said lever alternately in opposite directions, and operating connections between said lever and said slide.

3. Press feeding mechanism having, in combination, separable holding jaws, a slide for said jaws, and means to move said slide and jaws alternately to receiving and delivery positions, said means including an arm, means to swing said arm alternately in opposite directions, a parallel-sided lug on said arm, and a plug rotatable in a socket in said slide and having a slot closely fitting said lug.

In testimony whereof I have hereunto affixed my signature.

WILLIAM H. NEEDHAM.