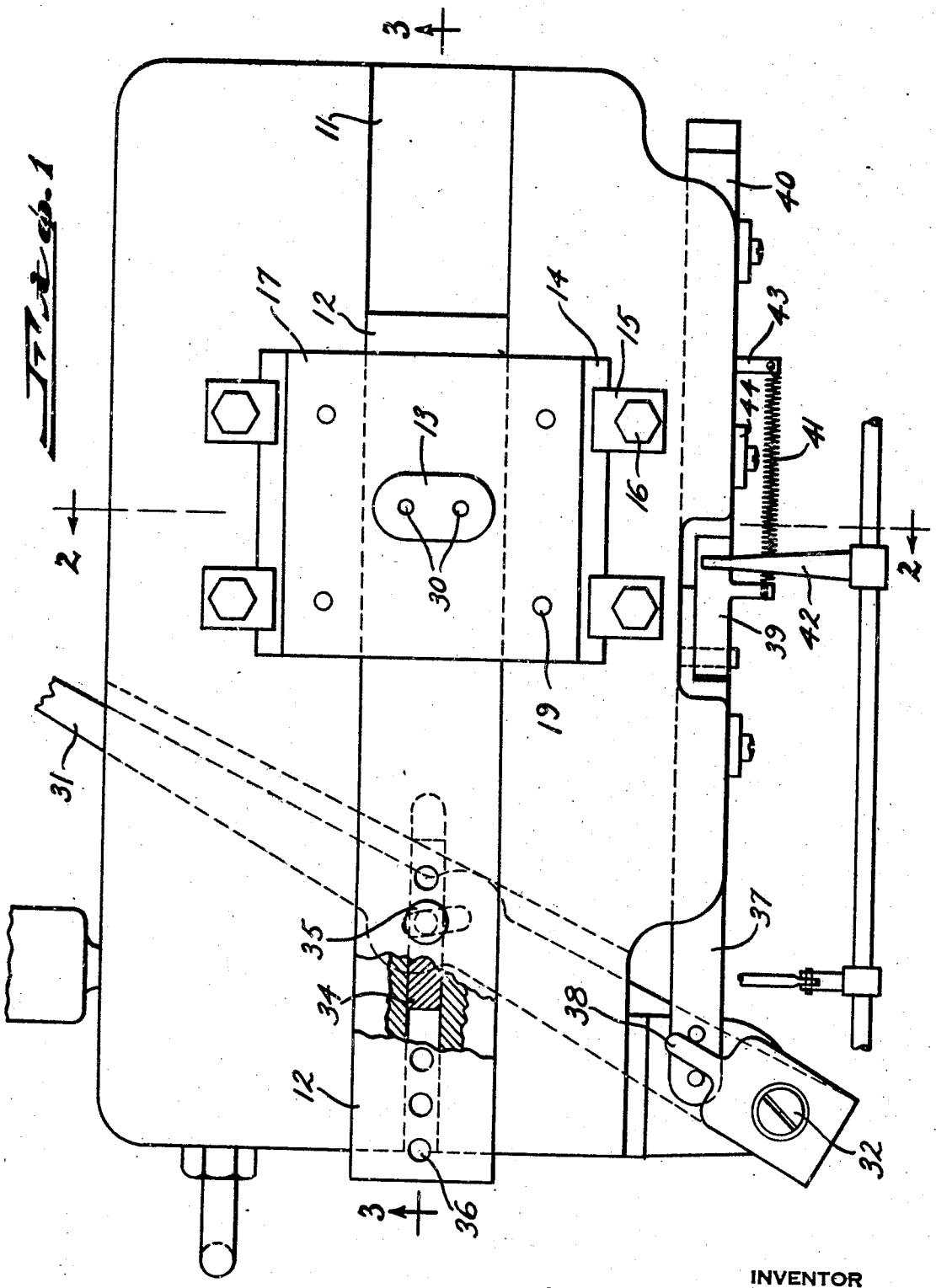
Jan. 29, 1935. S. A. GRUCHACZ 1,989,412

TEMPORARY BLANKING MECHANISM

Filed June 28, 1934 3 Sheets-Sheet 1

Fig. 1



INVENTOR

Stanley A. Gruchacz

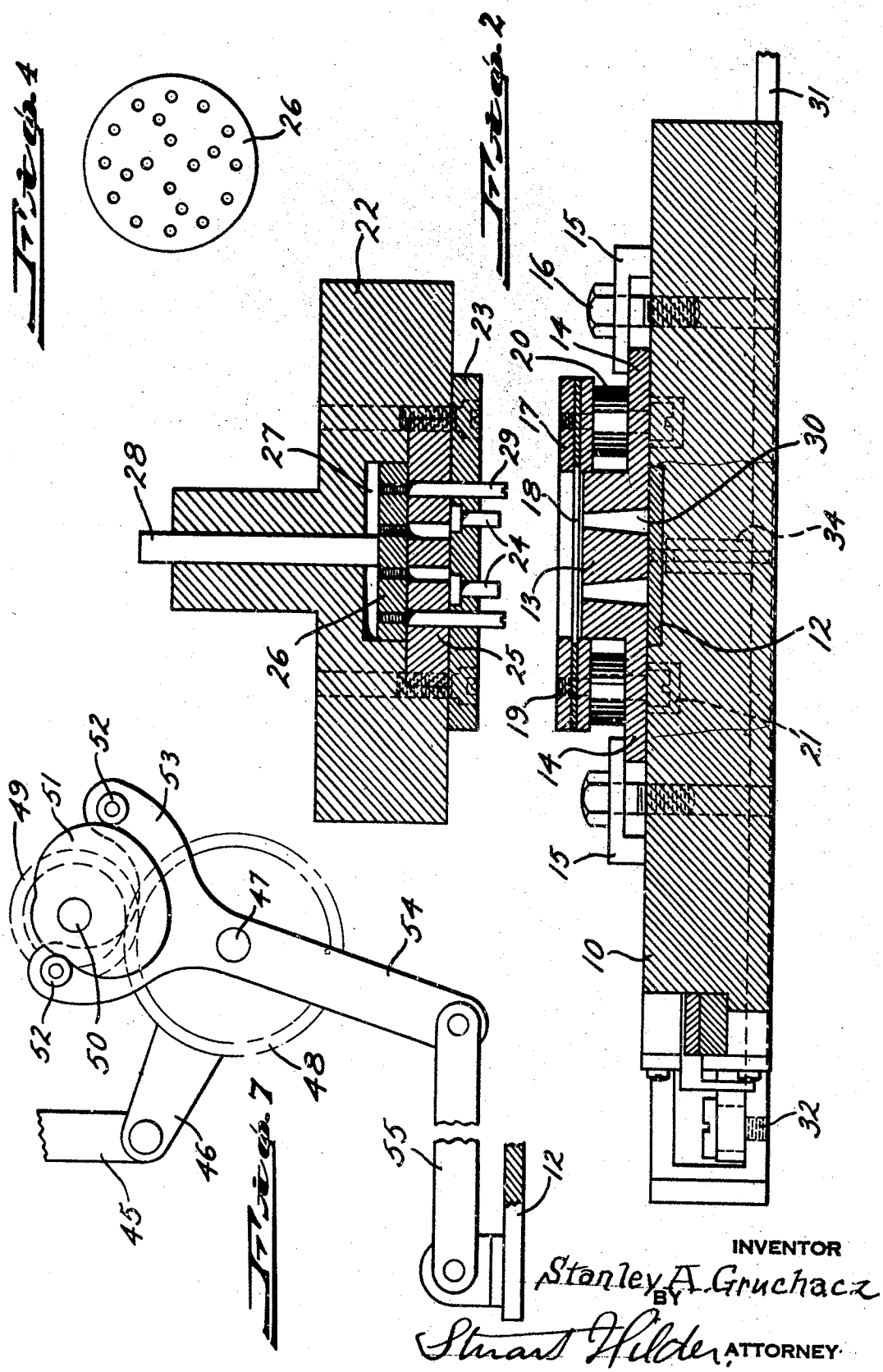
BY

Stuart Wilder ATTORNEY

Jan. 29, 1935. S. A. GRUCHACZ 1,989,412

TEMPORARY BLANKING MECHANISM

Filed June 28, 1934 3 Sheets-Sheet 2



INVENTOR

Stanley A. Gruchacz

BY

Stuart Hilder ATTORNEY

Jan. 29, 1935. S. A. GRUCHACZ 1,989,412

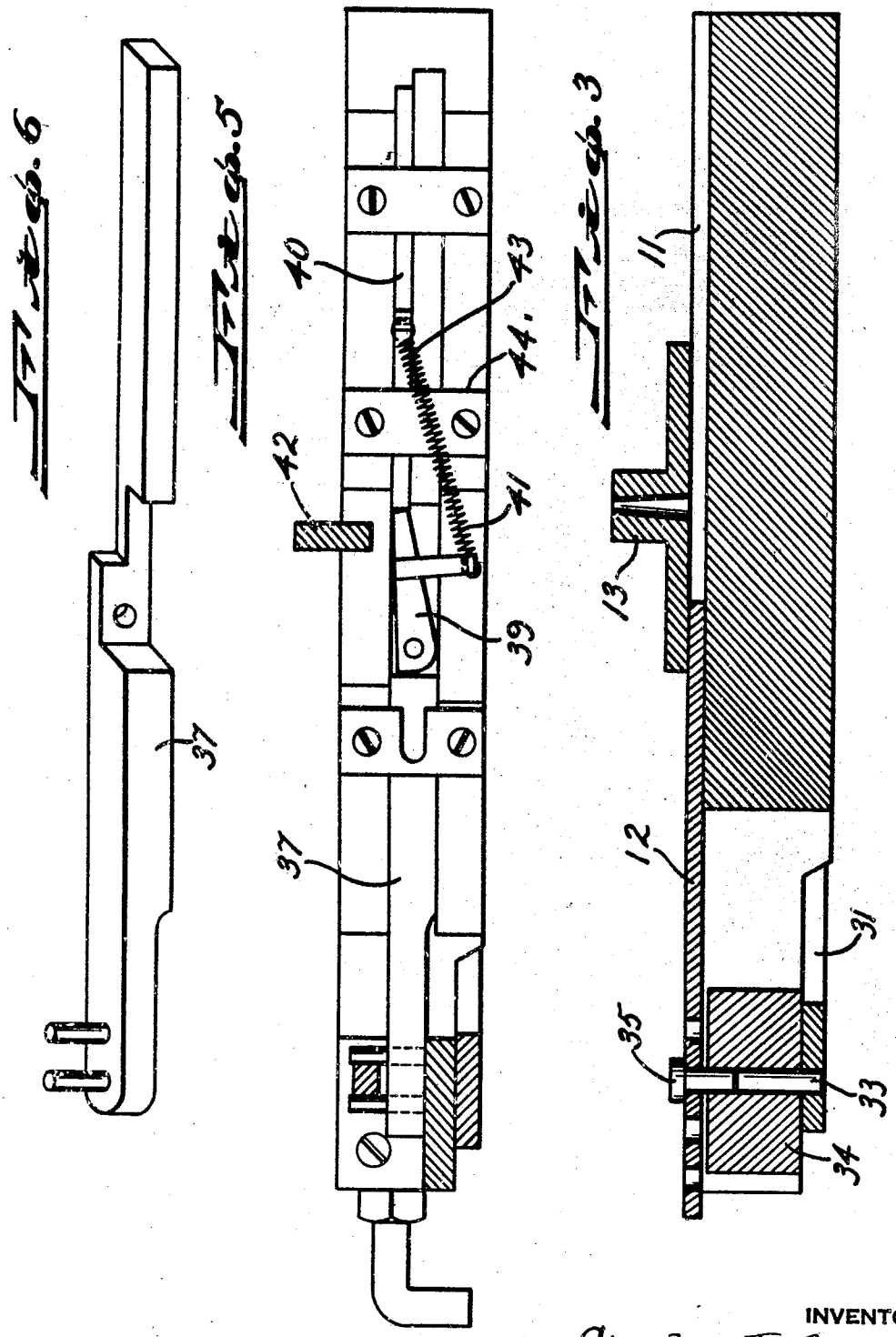
TEMPORARY BLANKING MECHANISM

Filed June 28, 1934 3 Sheets-Sheet 3

Fig. 6

Fig. 5

Fig. 3



INVENTOR
Stanley A. Gruchacz
BY
Stuart Hilde
ATTORNEY

Patented Jan. 29, 1935

1,989,412

UNITED STATES PATENT OFFICE

1,989,412

TEMPORARY BLANKING MECHANISM

Stanley A. Gruchacz, Bloomfield, N. J., assignor to Monroe Calculating Machine Company, Orange, N. J., a corporation of Delaware

Application June 28, 1934, Serial No. 732,862

4 Claims. (Cl. 164—86)

The invention relates to an interchangeable die couple for use with punch presses and is designed to provide means for rapid operation and automatic discharge of the blanks and slugs.

The invention consists in the novel construction and combination of parts as set forth in the appended claims.

In the accompanying drawings illustrating the invention:

Fig. 1 is a plan view of that portion of the mechanism attached to the bed of a press.

Fig. 2 is a central vertical section through the mechanism, taken on the line 2—2 of Fig. 1.

Fig. 3 is a central vertical section of the parts shown in Fig. 2, taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail plan view of the knockout plate.

Fig. 5 is a detail side view of the disabling means for the tripping mechanism.

Fig. 6 is a detail perspective view of a part shown in Fig. 5.

Fig. 7 is a detail face view of means for automatically operating the slug ejector slide.

In these drawings the numeral 10 indicates a bolster designed to be secured upon the bed of a punch press, said bolster being rebated as shown at 11 for the reception of a slide 12, said slide being flush with the upper face of the bolster and normally underlying and supporting a blanking punch 13.

The blanking punch is provided with flanges 14 engaged by clamps 15 secured to the bolster by screws 16. The punch is provided with tapered perforations 30 serving as dies for the piercing punches to be later described.

17 represents a die, provided with a slot 18 through which the stock is fed, said die being slidably mounted upon the flanges 14 by means of screws 19 having cylindrical shanks engaging perforations of the flanges. Resilient means are provided for holding the die 17 in raised position relative to the punch, such a means being shown as rubber washers 20 surrounding the shanks of screws 19 and located between the die and the punch. The heads of the screws 19 are received in recesses 21 of the bolster, these recesses being of sufficient depth to allow for the proper operation of the die relative to the punch 13.

The ram 22 of the press has a plate 23 secured to the lower face thereof, said plate carrying the piercing punches 24, these punches being in the form of pins, backed up by a plate 25 held in a recess of the ram 22 by the plate 23.

A knockout plate 26 is slidable within an inner recess 27 of the ram, and is provided with a shank 28 projecting through the top of the ram and intended to cooperate with a knockout bar of the press in the usual manner. Knockout pins 29 are screwed into the plate 26, and project through perforations of the plates 23 and 25, a number of such perforations and a number of screw seats in the plate 26 being provided, so that knockout pins may be located in any positions desired. For instance, Fig. 4 is a bottom plan view of the plate 26 and illustrates one possible arrangement of the screw seats for pins 29.

In the operation of the press, the above-described parts function as follows:

When the press is tripped ram 22 descends, pins 29 first striking the stock inserted in slot 18, so that knockout plate 26 moves upward in its seat 27. Plate 23 now comes in contact with the top of die 17, forcing the die down so that the stock strikes the blanking punch 13 and the blank is pushed into the die. Further downward movement of the ram 22 brings the piercing punches 24 against the blank, and forces the slugs down into the tapered perforations 30, the slugs dropping onto the top of slide 12.

On the return stroke of the ram the blank adheres to the piercing punches 24, which pull the blank out of the die. At the top of the stroke shank 28 strikes the knockout bar which, through plate 26 pushes pins 29 against the blank, freeing said blank from the piercing punches, so that it may be blown aside by a compressed air discharging device of well known character.

Slide 12 is then withdrawn, by the means to be described, the piercing slugs dropping to the bottom of the rebated portion 11 of the bolster, the return of slide 12 to normal position pushing the slugs out from under the punch. Meantime the resilient washers 20 have returned the die into its upper position, and the stock may be fed through for the punching of the next blank.

Slide 12 may be reciprocated manually or automatically. In the former case, a lever 31 is provided, as shown in Figs. 1, 2 and 3, said lever being fulcrumed at 32 and having pin connection 33 with a sliding block 34 mounted in a slot of the bolster, the slide 12 being connected with block 34 by means of a pin 35, engaging any one of a series of perforations 36 of the slide.

In order to insure the operation of lever 31, to discharge the slugs, after each operation of the press, means are provided whereby the tripping means which connects the ram 22 with the source of power cannot be operated a second time until lever 31 has been reciprocated. This means, as shown in Figs. 1, 5 and 6, comprises

a slide bar 37, operated by a finger 38 of lever 31 in unison with slide 12, this slide bar being provided with a pawl 39 normally abutting against the end of and holding a blocking plate 40 in ineffective position. A spring 41 holds the blocking plate against the end of pawl 39. An arm 42 is connected with the treadle device which operates the tripping mechanism of the punch, the end of said arm normally lying above pawl 39. Upon the operation of the treadle arm 42 will strike pawl 39 and disengage the same from the blocking plate 40, whereupon spring 41 will move the blocking plate into position above the pawl, and against the side of arm 42. Upon release of the treadle, arm 42 will rise and blocking plate 40 will move under said arm, coming to rest with projection 43 of the plate in engagement with a fixed member 44, so that the treadle cannot be operated until the blocking plate is reengaged by the pawl. Upon reciprocation of lever 31 slide bar 37 is also reciprocated, pawl 39 first being carried free of blocking plate 40, and rising into position in line therewith, and thereafter acting to push plate 40 back to its original position.

As stated, it may be desired to operate the slide 12 automatically, so that it will be reciprocated between each two punching operations. One means for this purpose is illustrated in Fig. 7, wherein a link 45 is provided connecting the ram 22 with an arm 46 pivoted upon a shaft 47. A gear 48 is fast with arm 46 and meshes with a pinion 49 mounted upon a shaft 50 and having a cam 51 fast therewith. Cam 51 acts upon follower rolls 52 carried on a yoke 53, which yoke is pivoted on the shaft 47, and has a lever extension 54, connected by a link 55 with the slide 12. Reciprocation of ram 22 thus gives a quarter rotation of gear 48, which, through pinion 49 imparts a half rotation to cam 51. The first part of this movement throws the slide 12 into its position under punch 13, in supporting relation thereto, the slide 12 remaining stationary during the latter part of the movement owing to a dwell of cam 51. This dwell will hold the slide stationary during the first part of the return movement of the ram, and thereafter, the slide will be retracted, allowing the slugs to drop into the rebated portion 11 of the bolster. Upon the next operation of the press, before plate 23 strikes die 17, the slugs will be ejected and the slide 12 returned to supporting position.

The above description relates to compound blanking mechanism, and it is to be noted that in such mechanism the element 13 is in reality a die as well as a punch. That is to say the margins of the perforations 30 act as dies for the piercing punches 24. In simple blanking mechanism the corresponding element is a die only, this die cooperating with a blanking punch carried by the ram. It will be obvious that the slide 12 of the present invention would be useful in a simple blanking mechanism of this character, serving to support the die and to eject the finished blanks in the manner above-described.

I claim:

1. In an interchangeable die couple, a rebated bolster, a slide mounted in the rebated portion of and lying flush with the top of said bolster, a blanking punch having perforations therethrough normally bottomed by said slide, a die yieldably connected with the blanking punch, a ram provided with piercing punches registering with the perforations of the blanking punch, and means for intermittently reciprocating said slide from and immediately thereafter to normal bottoming position to eject the slugs forced into the perforations by the piercing punches.

2. In an interchangeable die couple, a rebated bolster, a slide mounted in the rebated portion of and lying flush with the top of said bolster, a blanking punch having perforations therethrough normally bottomed by said slide, a die, a ram provided with piercing punches registering with the perforations of the blanking punch, and means for intermittently reciprocating said slide from and immediately thereafter to normal bottoming position to eject the slugs forced into the perforations by the piercing punches.

3. In an interchangeable die couple, the combination with a power press having a reciprocating ram and a tripping mechanism governing the operation of said ram, of a rebated bolster, a slide mounted in the rebated portion of and lying flush with the top of said bolster, a blanking punch having perforations therethrough normally bottomed by said slide, a die, piercing punches mounted in said ram and registering with the perforations of the blanking punch, a spring urged blocking plate adapted to move into the path of the tripping mechanism, and a pawl connected with the slide, normally holding said blocking plate in ineffective position, movable by the tripping mechanism to release the blocking plate and reciprocable with said slide to reengage the blocking plate and release the tripping mechanism.

4. In an interchangeable die couple, a rebated bolster, a slide mounted in the rebated portion of and lying flush with the top of said bolster, a die having a perforation therethrough normally bottomed by said slide, a ram, a punch carried by said ram and operable thereby to force material into the perforation of said die, and means for intermittently reciprocating said slide from and immediately thereafter to normal bottoming position to eject the material forced into the perforation by said punch.

STANLEY A. GRUCHACZ.