

A. J. LEWIS.

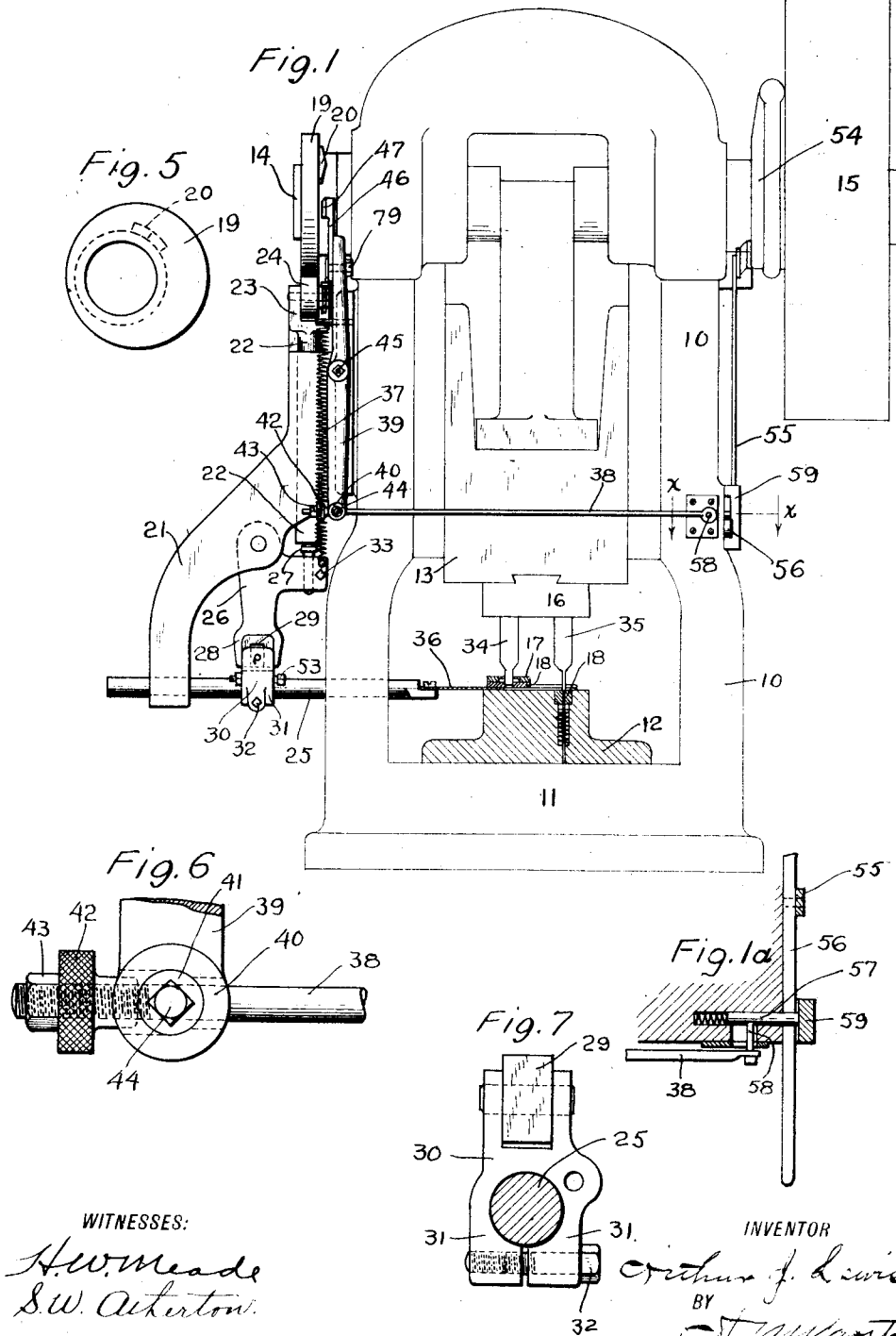
TRANSFER ATTACHMENT AND STOP MOTION FOR PRESSES.

APPLICATION FILED SEPT. 11, 1911.

1,031,351.

Patented July 2, 1912.

4 SHEETS-SHEET 1.



WITNESSES:

H. W. Meade
S. W. Arthurton.

INVENTOR

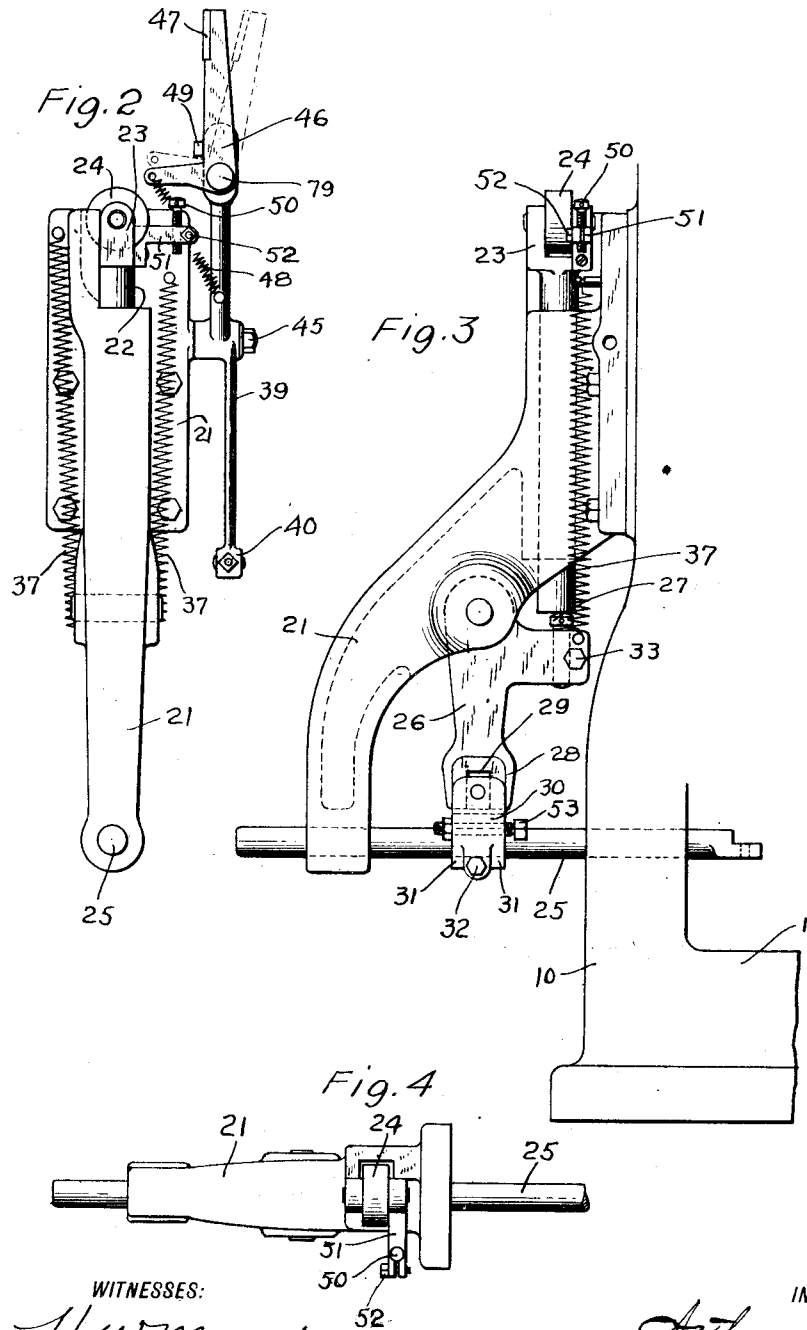
Arthur J. Lewis
BY
C. M. Webster
ATTORNEY

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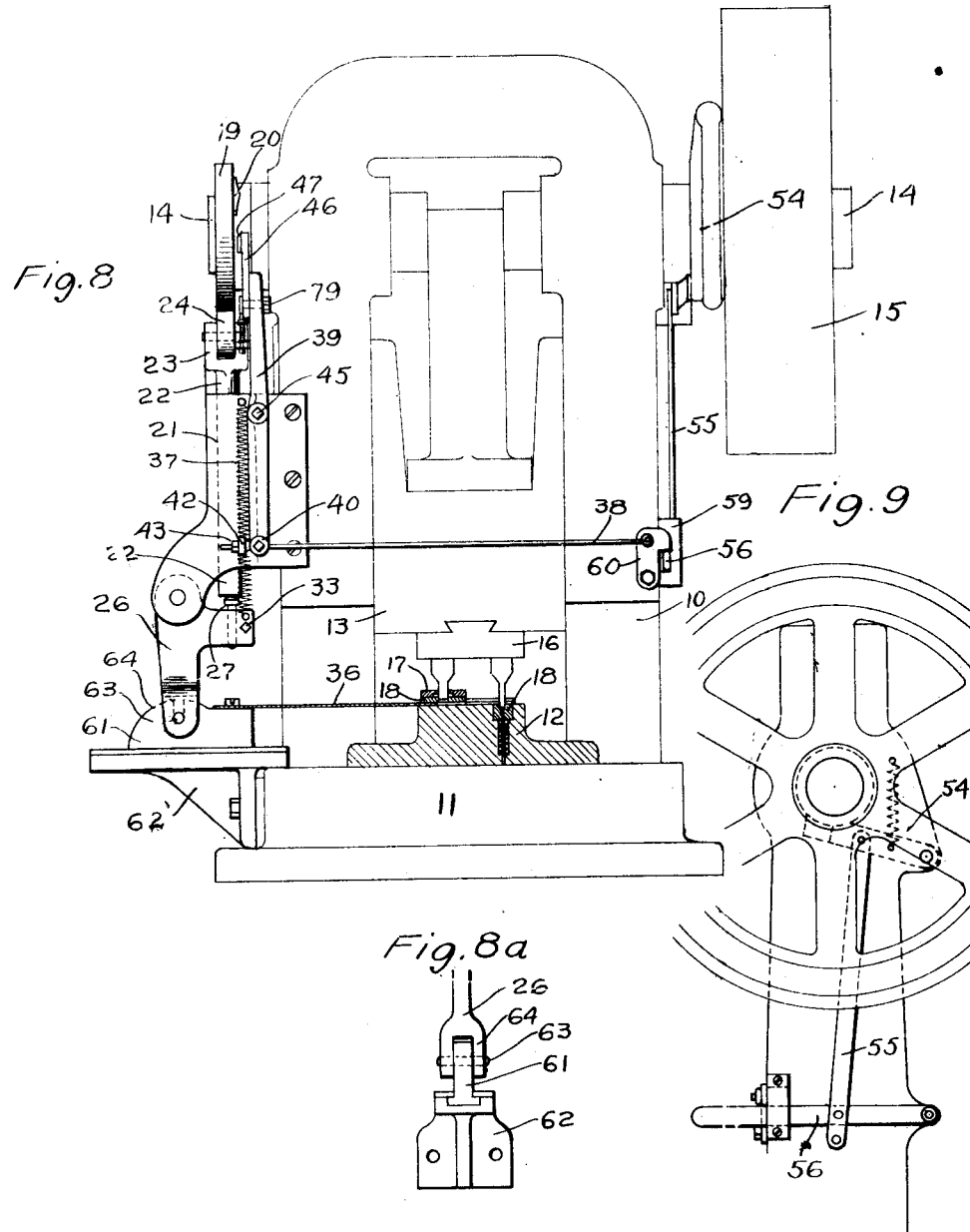
INVENTOR
Arthur J. Lewis
BY *A. Ambroster*
ATTORNEY

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4 SHEETS-SHEET 3.



WITNESSES:

H. W. Meade
S. W. Atkinson

INVENTOR

Arthur J. Lewis
BY
A. McBooster
ATTORNEY

4 SHEETS--SHEET 4.

Arthur J. Lewis
BY
A. Ambroster
ATTORNEY

UNITED STATES PATENT OFFICE.

ARTHUR J. LEWIS, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE BAIRD MACHINE COMPANY, OF OAKVILLE, CONNECTICUT, A CORPORATION OF CONNECTICUT.

TRANSFER ATTACHMENT AND STOP-MOTION FOR PRESSES.

1,031,351.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed September 11, 1911. Serial No. 648,794.

To all whom it may concern:

Be it known that I, ARTHUR J. LEWIS, a citizen of the United States, residing at Waterbury, county of New Haven, State of Connecticut, have invented an Improvement in Transfer Attachments and Stop-Motions for Presses, of which the following is a specification.

This invention is applicable to the various types of automatic presses in general use and has for its object to provide a simple, inexpensive and accurately working attachment permitting adjustment for wear, which will act to transfer blanks as they are cut from a strip of metal into position to be acted upon by a forming punch and die and which will stop the press if for any reason the blank should not be properly placed.

With these ends in view I have devised the novel transfer attachment and stop motion which I will now describe referring to the accompanying drawings forming a part of this specification and using reference characters to indicate the several parts.

Figure 1 is a front elevation of a well known type of press with my novel attachment applied thereto; Fig. 1^a a section on an enlarged scale on the line *x-x* in Fig. 1, looking in the direction of the arrows; Fig. 2 an elevation on an enlarged scale as seen from the left in Figs. 1 and 3, of the attachment removed; Fig. 3 a front elevation of the attachment on an enlarged scale with the stopping mechanism removed; Fig. 4 a plan view of the attachment as seen in Fig. 3; Fig. 5 an elevation of the operating cam removed; Fig. 6 a detail elevation showing the connection of the stop rod to the stop lever; Fig. 7 a detail elevation illustrating the connection of the slide rod to the bell crank lever; Fig. 8 an elevation corresponding with Fig. 1, illustrating modifications in the details of construction to adapt the invention to a different type of press; Fig. 8^a a detail elevation of the bracket as seen from the left in Fig. 8; Fig. 9 an elevation as seen from the right in Fig. 8 and substantially as seen from the right in Figs. 1 and 10; and Fig. 10 is an elevation corresponding with Fig. 1, illustrating another modification of the invention.

10 denotes the framework of the press, 11 the bed, 12 the bolster, 13 the gate, 14 the shaft, 15 the balance wheel which is loose, 16 the punch block, 17 the stripping plate

and 18 the dies, all of which parts may be of any ordinary or preferred construction.

The attachment is operated by means of a cam 19, secured to the shaft, outside the framework on the side opposite to the balance wheel and provided on its inner face with a boss 20.

21 denotes a bracket bolted to the framework and 22 a plunger which is socketed in the bracket and reciprocates therein. At the upper end of the plunger is a yoke 23 in which is journaled a roller 24 which bears upon the periphery of the cam. In the form illustrated in Fig. 1, the lower end of the bracket extends outward from the framework and supports the outer end of a slide rod 25, the inner end of which passes through the framework.

26 denotes a bell crank lever pivoted to the bracket, one arm of which carries an adjusting screw 27 against which the lower end of the plunger bears, the other arm comprising a yoke 28 which straddles an oscillatory block 29 pivoted in a recess in a clamping block 30. The lower end of block 30 is split transversely, the parts 31 inclosing the slide rod and being tightened about it by a bolt 32. The arm which carries adjusting screw 27 is split vertically and the parts are clamped about the screw by a bolt 33 which locks said screw against the reasonable possibility of movement. The transferring of the blank over the bolster from one punch to another, as from a blanking punch 34 to a forming punch 35, is performed by a carrier 36 attached to the slide bar.

37 denotes springs the ends of which are connected respectively to the bracket and to the bell crank lever, the action of which is to hold adjusting screw 27 in contact with the lower end of the plunger and to retain the plunger in close engagement with the cam.

38 denotes the stop rod and 39 the stop lever. At the lower end of the stop lever is a boss 40 in which an oscillating hub 41 is socketed. The stop rod passes through this hub and through enlarged recesses in the boss, indicated by dotted lines in Fig. 6, and the threaded end of the rod is engaged by an adjusting nut 42 having a reduced inner end which bears against the hub and is locked in position after adjustment by a set nut 43. After adjustment the stop rod is

locked in the oscillating hub by a set screw 44, the recesses in the boss being large enough to permit ample swinging movement of the stop rod and the adjusting nut in the vertical plane. The stop lever is fulcrumed on the bracket as at 45.

46 denotes a bell crank lever which is pivoted to the upper end of the stop lever, as at 79, and is adapted to oscillate in a plane at right angles to the plane of oscillation of the stop lever. One arm of bell crank lever 46 is adapted to be engaged by boss 20 on cam 19 for a purpose presently to be explained, the lever being shown as provided with a wearing plate 47 for engagement with the boss. A spring 48, the ends of which are connected respectively to the bell crank lever and to the stop lever, acts to normally hold the engaging arm of the bell crank lever in engagement with a stop 49 on the stop lever.

50 denotes a contact screw, carried by a bracket 51 secured to a yoke 23, which engages bell crank lever 46, as will presently be fully explained. Bracket 51 is split vertically and the parts are clamped about the contact screw by means of a bolt 52 which locks the contact screw against the reasonable possibility of movement.

The movement of the slide rod and carrier in transferring a blank from one punch to another is limited by the engagement of an adjusting screw 53 in clamping block 30 with the framework of the press. This adjusting screw is locked in place by a set nut and in practice the adjustment of the parts is so fine that should a blank not be placed in proper position to be acted upon by the forming punch, the press will be stopped instantly and injury to the punches and dies and the spoiling of blanks will be prevented.

The stop lever and stop rod act in cooperation with the ordinary stopping mechanism of the press, which of course varies greatly in different presses. In presses as ordinarily constructed, a loose balance wheel is connected to the shaft by means of a suitable clutch, indicated by 54, from which a clutch rod 55 extends to a clutch lever 56. The clutch may be operated in any suitable manner to stop the press as by means of a spring controlled wedge plate (see Fig. 9) to which the clutch rod is connected, the clutch lever being locked against the power of the spring, while the press is running, in any suitable manner and the stopping of the press being effected by release of the clutch lever. In the form of press illustrated in Figs. 1 to 7 inclusive, I have shown the clutch lever as lying within a guard 59 and as locked in the operative position by means of a spring controlled bolt 57 which is recessed in the framework and is connected to the stop rod by a pin 58 which slides transversely in a slot in the framework.

The bolt normally crosses the opening in the guard over the lever and retains it in the operative position as clearly shown in Fig. 1.

The operation of the attachment as a whole is briefly as follows: The parts are so timed that the plunger will rise with the gate and springs 37 will cause bell crank lever 26 to move the slide rod and carrier 36 forward. It will of course be understood that the carrier is adapted to the special blanks to be operated upon and as the gate rises it will push the blank along on the top of the bolster, *i. e.* transfer it from the position in which it was left by a blanking or drawing die into position to be operated upon by the forming die. It will be noted that the feeding movement of the slide rod and carrier is a spring controlled movement. The return movement of the slide rod and carrier, which takes place an instant later, is positive and is produced by the engagement of the plunger with adjusting screw 27 in bell crank lever 26 and against the power of springs 37. In Fig. 2, the plunger is shown at the extreme of its downward movement. When the plunger rises, contact screw 50 will engage the short arm of bell crank lever 46 and will tilt said lever on its pivot, as indicated by dotted lines in Fig. 2, just out of the path of movement of boss 20 on the cam, so that the reciprocation of the plunger will have no effect whatever upon the stop lever, stop rod and the clutch locking mechanism. Adjusting screw 27, contact screw 50 and adjusting screw 53 are adapted to receive very fine adjustment and are all rigidly locked against movement after adjustment. These adjustments in practice are so fine that should bell crank lever 26 fail by a minute fraction of an inch to make a full movement, *i. e.* fail to move the slide rod and carrier far enough to place the blank in practically the exact position to be operated upon by the forming die, the plunger will not be lifted to its normal height by the engagement therewith of adjusting screw 27 on bell crank lever 26, and consequently bell crank lever 46 will not be oscillated far enough to clear the path of movement of boss 20 on cam 19. When the boss engages bell crank lever 46, said lever will be moved in a plane at right angles to its plane of oscillation and will swing stop lever 39 on its fulcrum, the lower arm of said lever moving toward the left as seen in Fig. 1, which will draw stop rod 38 toward the left and will cause the locking mechanism to release the clutch lever and cause the balance wheel to be disconnected from the shaft, thus stopping the press instantly. In Figs. 1 and 1^a, the clutch lever is shown as locked in the operative position by a spring-controlled bolt, in Fig. 8 by means of a pivoted hook and in Fig. 130

10 by means of a spring controlled angle latch.

In the form of press illustrated in Figs. 8, 8^a and 9, instead of using a spring controlled bolt the clutch lever is locked in the operative position by means of a pivoted hook 60 to which the stop rod is connected. The slide rod and clamping block are dispensed with and the carrier is attached to a slide 61 which reciprocates on a bracket 62 attached to the framework. The bell crank lever is connected to the slide by means of a cross pin 63 in a yoke 64 which straddles the slide, the pin lying in a slot in the slide. In the form illustrated in Fig. 10, precisely the same result is accomplished by another modification of the mechanism, the plunger being dispensed with. At the outer end of the shaft is a face cam 65 which is engaged by a roller 66 at the upper end of a lever 67 which has its fulcrum in a bracket 68 secured to the framework. A slide rod 25 is supported by a bracket and the framework and is locked in a clamping block 30 by a bolt 32 as in the first form. The bell crank lever 26, however, is dispensed with and the clamping block is pivoted to lever 67 as at 69. A spring 70, the ends of which are connected respectively to the framework and to lever 67, retains the roller in engagement with the cam and produces the forward movement of the slide rod. The clamping block carries a set screw 53 locked in place by a set nut as before, but instead of engaging the framework said set screw engages a lever 71 fulcrumed in a bracket 72 on the framework. The upper end of lever 71 is pivoted to a slide rod 38 as at 80. The opposite end of the slide rod is connected to the gate by means of a pin 73 which passes through a slot 74 in the slide rod and engages the gate. A spring 75 connected to the slide rod and to the pin acts to draw the slide rod forward and to retain lever 71 constantly in engagement with the end of set screw 53. Clutch lever 56 is locked in the operative position by means of an angle latch 76 itself retained in the operative position by a spring 77 the ends of which are connected respectively to the framework and to the latch, a stop 78 being provided to limit the movement of the latch in swinging to the operative position. The cam and lever 67 produce the return movement of the slide rod, the forward movement being produced by spring 70. The rising movement of the gate and the inward movement of the slide rod take place simultaneously. When clamping block 30 and the slide rod move forward, adjusting screw 53 in the clamping block engages the long arm of lever 71, the effect of which is to draw the stop rod toward the left, as seen in Fig. 10, far enough so that the engaging end of said rod will just clear angle latch

76 as the gate rises, the stop rod in this form swinging on its pivotal connection to lever 71 as the gate moves upward and downward, the stop rod clearing the angle latch in both its upward and downward movement and consequently having no effect whatever on the clutch locking mechanism. Should lever 67, however, fail by a minute fraction of an inch to move the slide rod far enough to place the blank in practically the exact position to be operated upon by the forming die, the stop rod will not be drawn far enough toward the left to clear the angle latch, consequently the angle latch will be tripped thereby and will release the clutch lever and cause the balance wheel to be disconnected from the shaft, thus stopping the press instantly.

Having thus described my invention I claim:

1. The combination with the shaft of a press, a cam secured thereto, a balance wheel loose on the shaft and clutch mechanism for connecting it thereto, of means for locking the clutch mechanism in the operative position, a stop rod adapted to release the clutch locking mechanism, a carrier for transferring blanks to position to be operated upon, spring-controlled means coöperating with the cam for actuating the carrier, and connections intermediate the carrier and the stop rod for causing the latter to release the clutch locking mechanism should the carrier fail to move a blank into position to be operated upon.

2. The combination with a press having clutch mechanism, of means for locking the clutch mechanism in operative position, a stop rod adapted to release the clutch locking mechanism, a carrier for transferring blanks, for the purpose set forth, spring-controlled means operated by the press for actuating the carrier, and connections intermediate the carrier and the stop rod for causing the latter to release the clutch locking mechanism should the carrier not make a full movement.

3. The combination with a press having a loose balance wheel and a clutch for connecting the balance wheel to operate the press, of means for locking the clutch mechanism in operative position, a stop rod for releasing said locking means to stop the press, a carrier for transferring blanks, for the purpose set forth, means operated by the press for actuating the carrier, and connections intermediate the carrier and the stop rod for causing the latter to stop the press should the carrier not make a full movement.

4. The combination with a press having clutch mechanism, of means for locking the clutch mechanism in operative position, a stop rod adapted to release said locking means, a carrier for transferring blanks, a

slide rod by which it is carried, mechanism operated by the press for actuating the slide rod, and mechanism controlled by the slide rod for causing the stop rod to stop the press; should the slide rod not make a full movement.

5. The combination with the shaft of a press, a cam secured thereto, a balance wheel loose on the shaft and clutch mechanism for connecting it thereto, of means for locking the clutch mechanism in operative position, a stop rod adapted to release said locking means, a carrier for transferring blanks, mechanism operated by the cam for actuating the carrier, and mechanism intermediate the carrier and the stop rod for causing the latter to stop the press should the carrier not make a full movement.

6. The combination with the shaft of a press, a cam secured thereto and clutch mechanism for stopping and starting the press, of means for locking the clutch mechanism in operative position, a stop rod adapted to release said locking means, a slide rod and carrier for transferring blanks, mechanism operated by the cam for actuating the slide rod, and mechanism controlled by the slide rod for causing the stop rod to stop the press should the carrier not make a full movement.

7. An attachment for presses of the character described, comprising a stop rod for stopping the press, a carrier for transferring blanks, a slide rod to which the carrier is attached, a bell-crank lever to which the carrier is loosely connected, a plunger operated by the press and engaging the bell-crank lever, a spring connected to the bell-crank lever for producing the forward movement of the slide rod, a stop lever to which the stop rod is connected, a bell-crank lever adapted to be engaged by the press and which is pivoted to the stop lever and oscillates in a plane at right angles to the plane of oscillation of the stop lever, and a spring for retaining said bell-crank lever in operative position.

8. The combination with the shaft of a press, a cam secured thereto and having on its face a boss, clutch mechanism for stopping and starting the press and means for locking the clutch mechanism in operative position, of a stop rod adapted to release said locking means, a slide rod and carrier for transferring blanks, a spring-controlled bell-crank lever loosely pivoted to the slide rod, a plunger actuated by the cam and engaging the bell-crank lever, a stop lever to which the stop rod is connected, and a spring controlled bell-crank lever which is pivoted to the stop lever and is adapted to be engaged by the boss on the cam and oscillated in a plane at right angles to the plane of oscillation of the stop lever, for the purpose set forth.

9. In an attachment for presses of the character described, the combination with a slide rod and a stop rod, of spring controlled means operated by the press for actuating the slide rod, and spring-controlled means operated by the press for actuating the stop rod when the slide rod fails to make a full movement.

10. In an attachment for presses of the character described, the combination with a slide rod and a stop rod, of a bell crank lever and connections to the slide rod, a spring acting on the bell-crank lever to move the slide rod forward, a plunger actuated by the press and acting on the bell-crank lever to retract the slide rod, and spring-controlled means operated by the press for actuating the stop rod when the slide rod fails to make a movement.

11. In an attachment for presses of the character described, the combination with a slide rod, of a bell-crank lever and connections to the slide rod, a spring acting on the bell-crank lever to move the slide rod forward, and a plunger actuated by the press and acting on the bell-crank lever to retract the slide rod.

12. In an attachment for presses of the character described, the combination with a slide rod, of a bell crank lever and connections to the slide rod, a spring acting on the bell-crank lever to move the slide rod forward, a plunger actuated by the press, and an adjusting screw in the bell-crank lever which is engaged by the plunger and determines the retraction of the slide rod.

13. In an attachment for presses of the character described, the combination with a slide rod, of a bell-crank lever having a yoke, a clamping block engaging the slide rod, a block pivoted in the clamping block and engaged by the yoke, a spring acting on the bell-crank lever to move the slide rod forward, an adjusting screw in the clamping block for determining the forward movement of the slide rod, and a plunger actuated by the press and acting on the bell-crank lever to retract the slide rod.

14. In an attachment for presses of the character described, the combination with a slide rod and a stop rod, of spring-controlled means operated by the press for actuating the slide rod, a stop lever to which the stop rod is connected, and a spring-controlled bell-crank lever adapted to be engaged by the press and which is pivoted to the stop lever and oscillates in a plane at right angles to the plane of oscillation of the stop lever.

15. In an attachment for presses of the character described, the combination with a slide rod and a stop rod, of spring controlled means operated by the press for actuating the slide rod, a stop lever to which the stop rod is connected, a spring-controlled

bell-crank lever adapted to be engaged by the press and which is pivoted to the stop lever and oscillates in a plane at right angles to the plane of oscillation of the stop lever, and means for moving said lever out of engagement with the press when the slide rod makes a full movement, said lever being engaged by the press and actuating the stop rod when the slide rod fails to make a full movement.

16. In an attachment for presses of the character described, the combination with a slide rod and a stop rod, of a spring-controlled bell-crank lever and connections to the slide rod, a plunger operated by the press and engaging the bell crank lever, a contact screw carried by the plunger, a stop lever to which the stop rod is connected, and a spring-controlled bell-crank lever pivoted to the stop lever which is engaged by the contact screw on the plunger.

17. In an attachment for presses of the character described, the combination with a slide rod and a stop rod, of spring-controlled means operated by the press for actuating the slide rod, a stop lever, an oscillating hub socketed therein in which the stop rod is adjustably secured, and a spring-controlled bell-crank lever pivoted to the stop lever in a plane at right angles to the plane of oscillation of the stop lever, substantially as described, for the purpose specified.

18. In an attachment for presses of the character described, the combination with a stop lever, a stop rod connected thereto, and a spring-controlled bell-crank lever pivoted thereto at right angles to its plane of oscillation, of a slide rod, a spring-controlled bell-crank lever and connections to the slide rod, a plunger engaging the bell-crank lever, and a contact screw carried by the plunger and engaging the first-mentioned bell-crank lever.

19. In an attachment for presses of the character described, the combination with a

stop lever, a stop rod connected thereto, and a spring-controlled bell-crank lever pivoted thereto at right angles to its plane of oscillation, of a slide rod, a spring-controlled bell-crank lever and connections to the slide rod, an adjusting screw in said bell-crank lever, and a plunger which engages both bell-crank levers, for the purposes set forth.

20. In an attachment for presses of the character described, the combination with a stop lever, a stop rod connected thereto and a spring-controlled bell-crank lever pivoted thereto at right angles to its plane of oscillation, of a slide rod, a spring-controlled bell-crank lever, a clamping block engaging the slide rod and carrying a pivoted block which is engaged by said bell-crank lever, a plunger engaging both bell-crank levers, and an adjusting screw carried by the clamping block and adapted to engage the press to determine the forward movement of the slide rod.

21. In an attachment for presses of the character described, the combination with a stop lever, a stop rod connected thereto, and a bell-crank lever pivoted thereto at right angles to its plane of oscillation, of a slide rod, a clamping block engaging said rod, a bell-crank lever engaging the clamping block, a plunger engaging both bell-crank levers, and springs for producing return movement of said bell-crank levers.

22. In an attachment for presses of the character described, the combination with a stop lever, a stop rod connected thereto, and a bell-crank lever pivoted thereto at right angles to its plane of oscillation, of a slide rod and spring-controlled operating connections therefor, substantially as described, for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR J. LEWIS.

Witnesses:

R. G. STEWART,
CHAS. L. WARNER.