July 4, 1933. G. H. LELAND 1,916,378

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

Filed Nov. 9, 1931 6 Sheets-Sheet 1

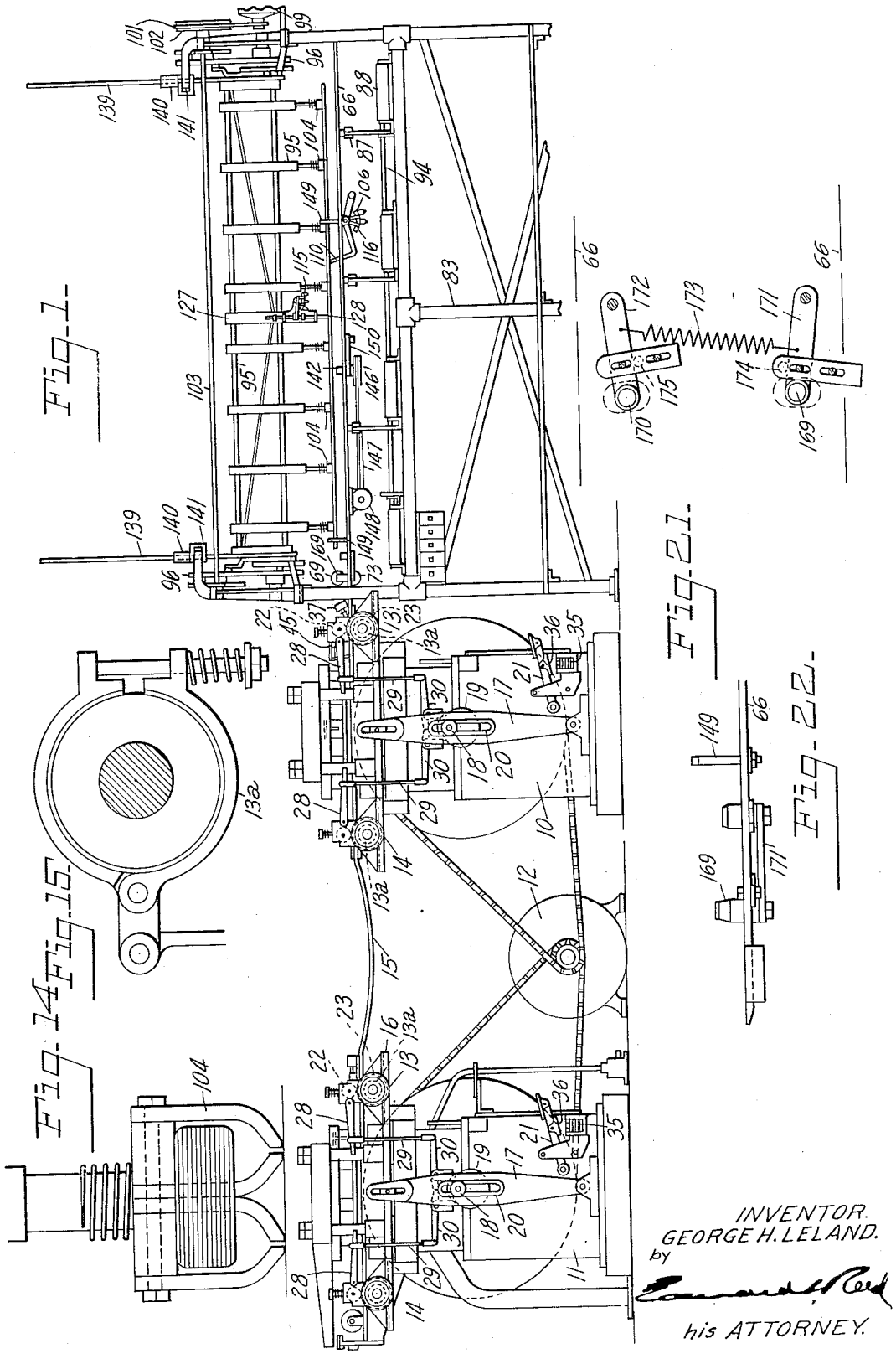


Fig. 1.

Fig. 2.1.

Fig. 2.2.

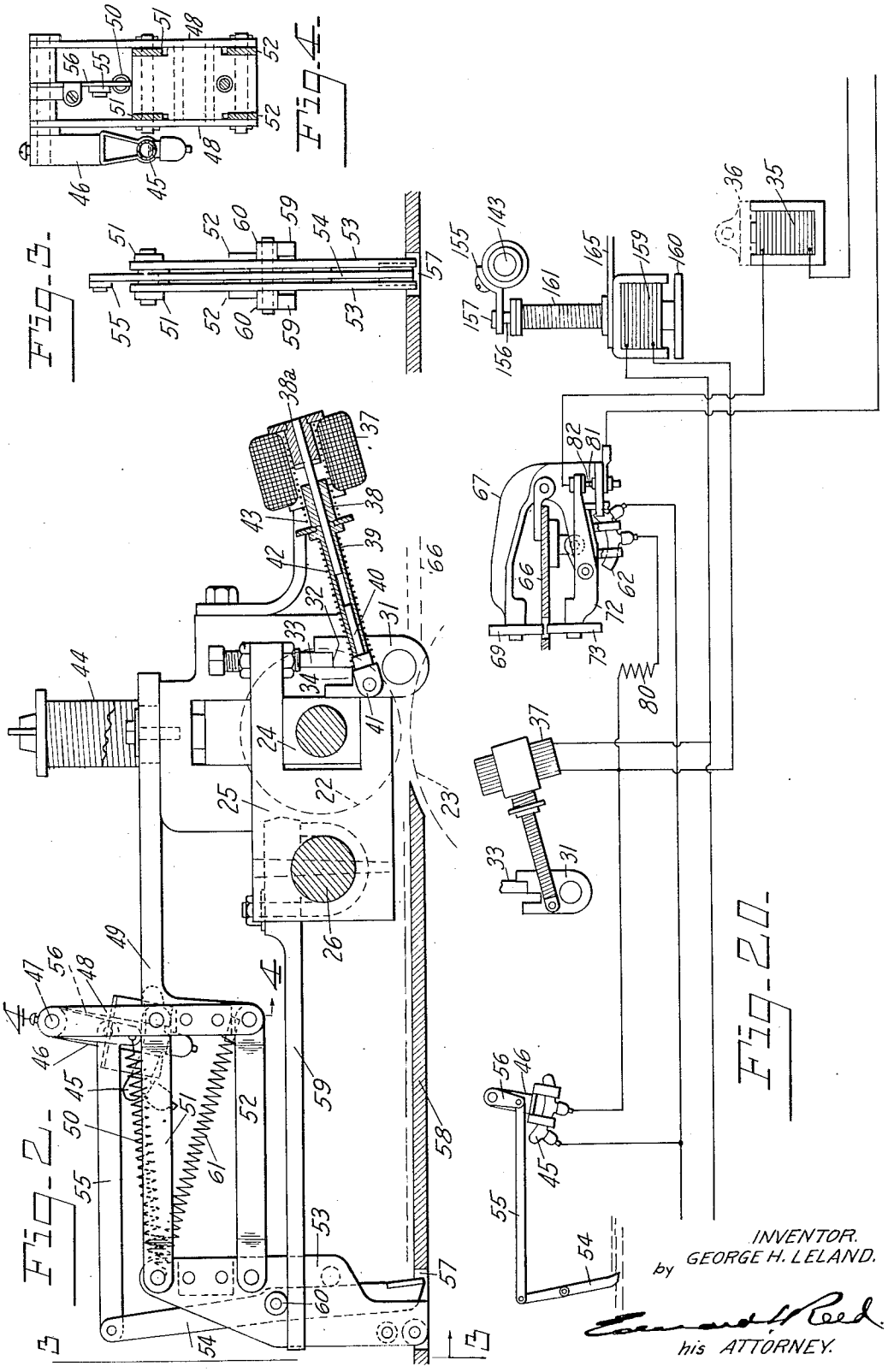
Fig. 14 Fig. 15.

INVENTOR.
GEORGE H. LELAND.
by
his ATTORNEY.

July 4, 1933. G. H. LELAND 1,916,378

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

Filed Nov. 9, 1931 6 Sheets-Sheet 2



INVENTOR.
by GEORGE H. LELAND.
his ATTORNEY.

July 4, 1933. G. H. LELAND 1,916,378

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

Filed Nov. 9, 1931 6 Sheets-Sheet 3

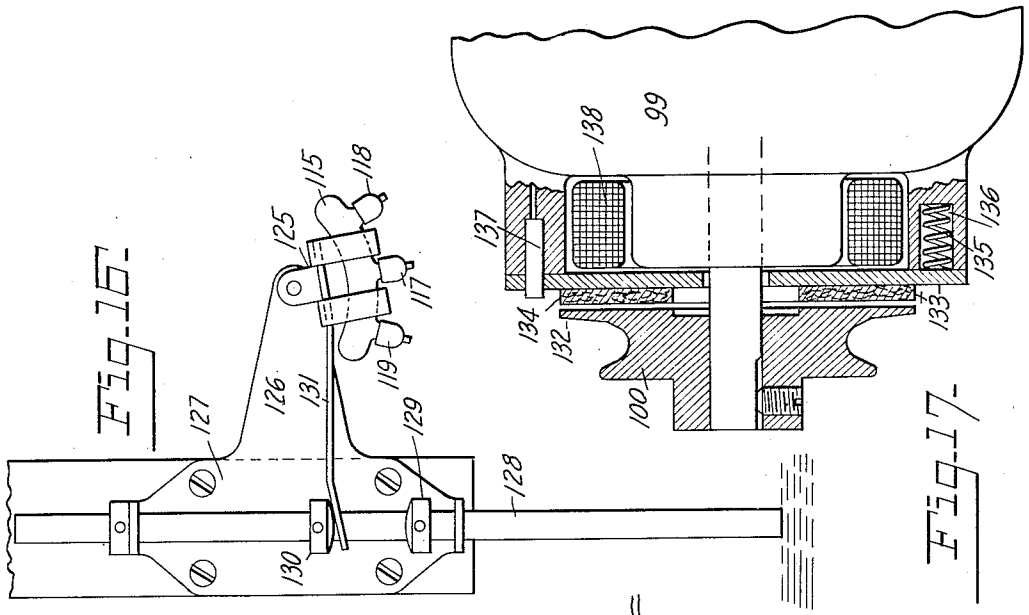


Fig. 16.

Fig. 17.

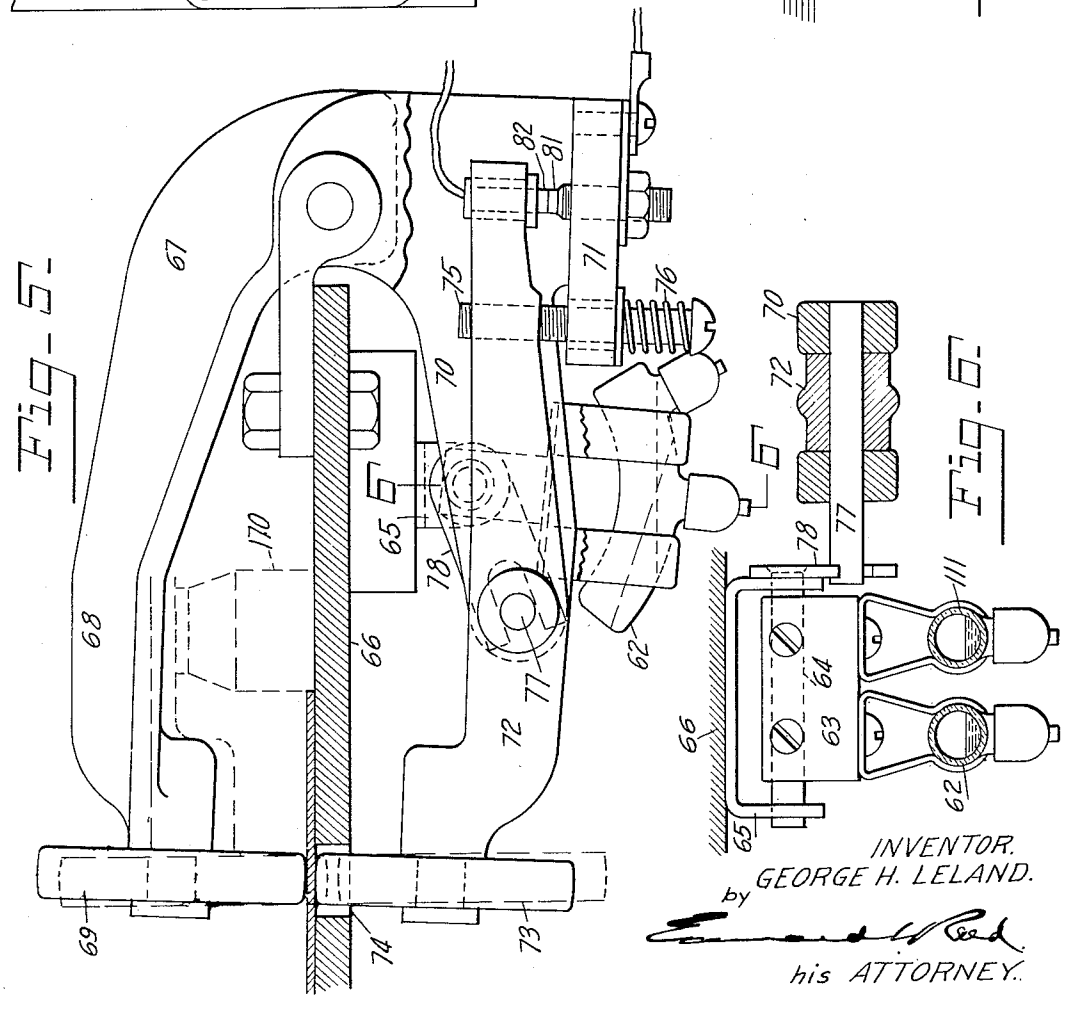


Fig. 5.

Fig. 6.

INVENTOR.
GEORGE H. LELAND.
by
his ATTORNEY.

July 4, 1933. G. H. LELAND 1,916,378

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

Filed Nov. 9, 1931 6 Sheets-Sheet 4

Fig. 7.

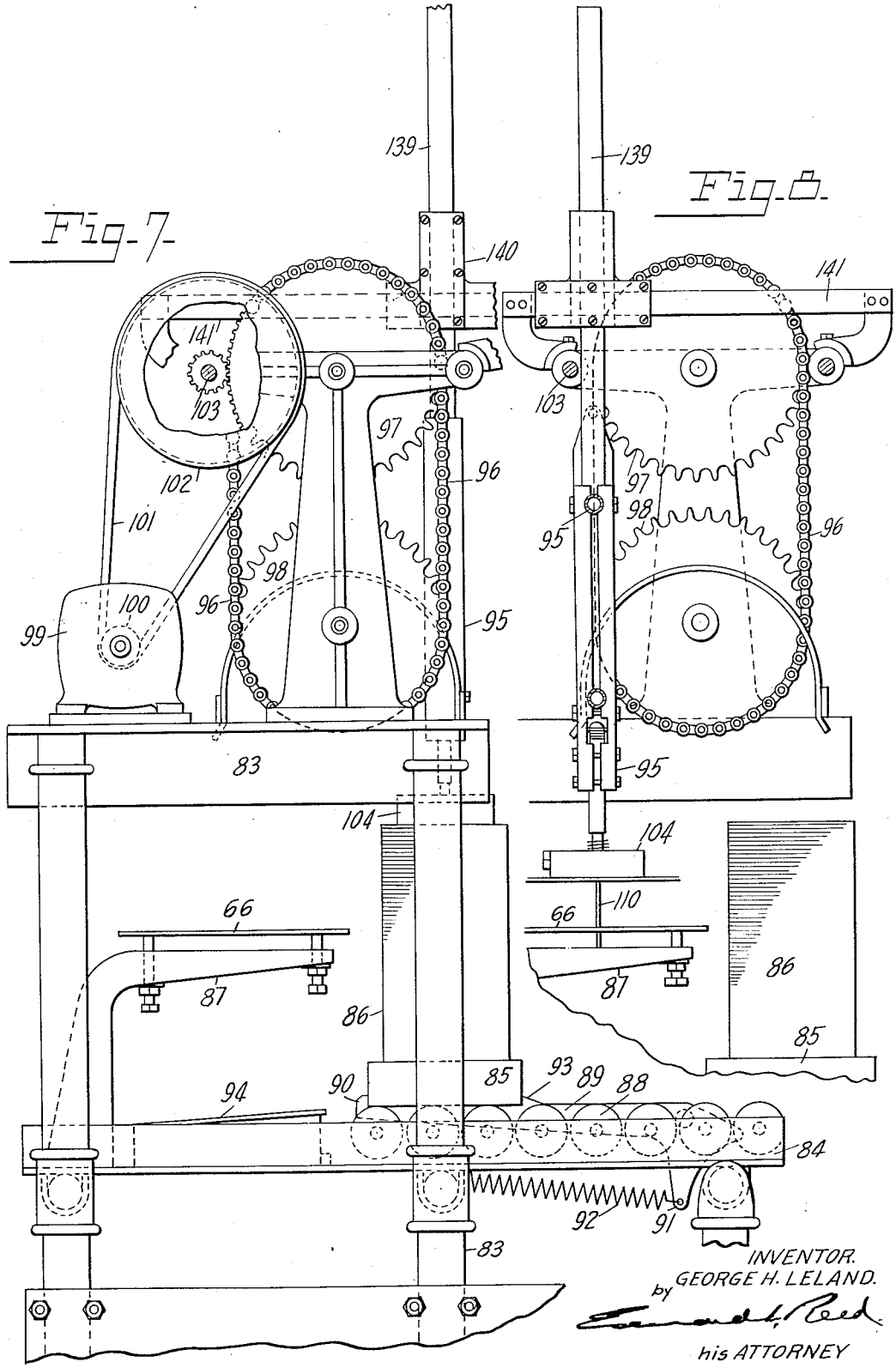


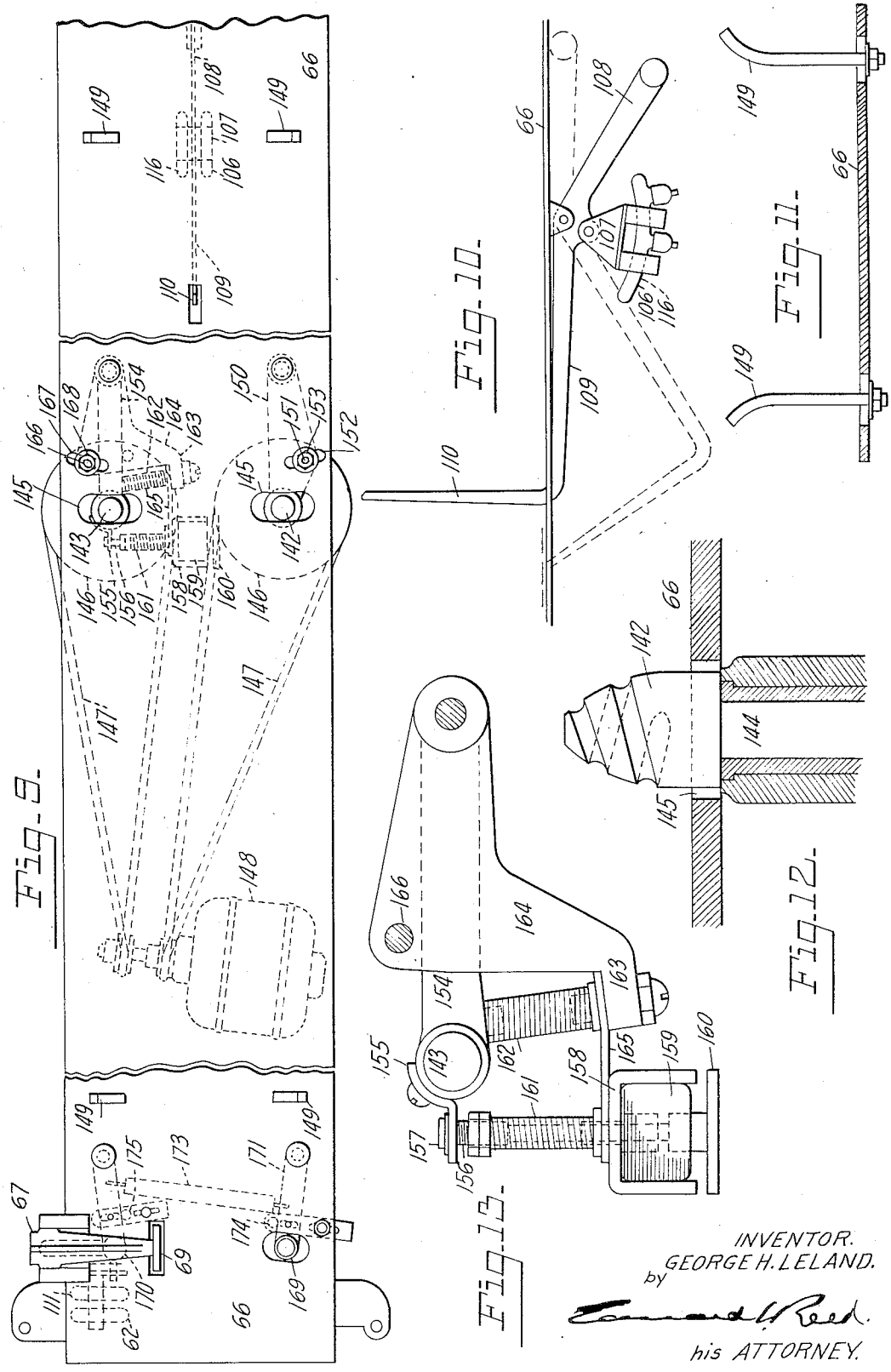
Fig. 8.

INVENTOR.
GEORGE H. LELAND.
by Edmund J. Reed
his ATTORNEY

July 4, 1933. G. H. LELAND 1,916,378

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

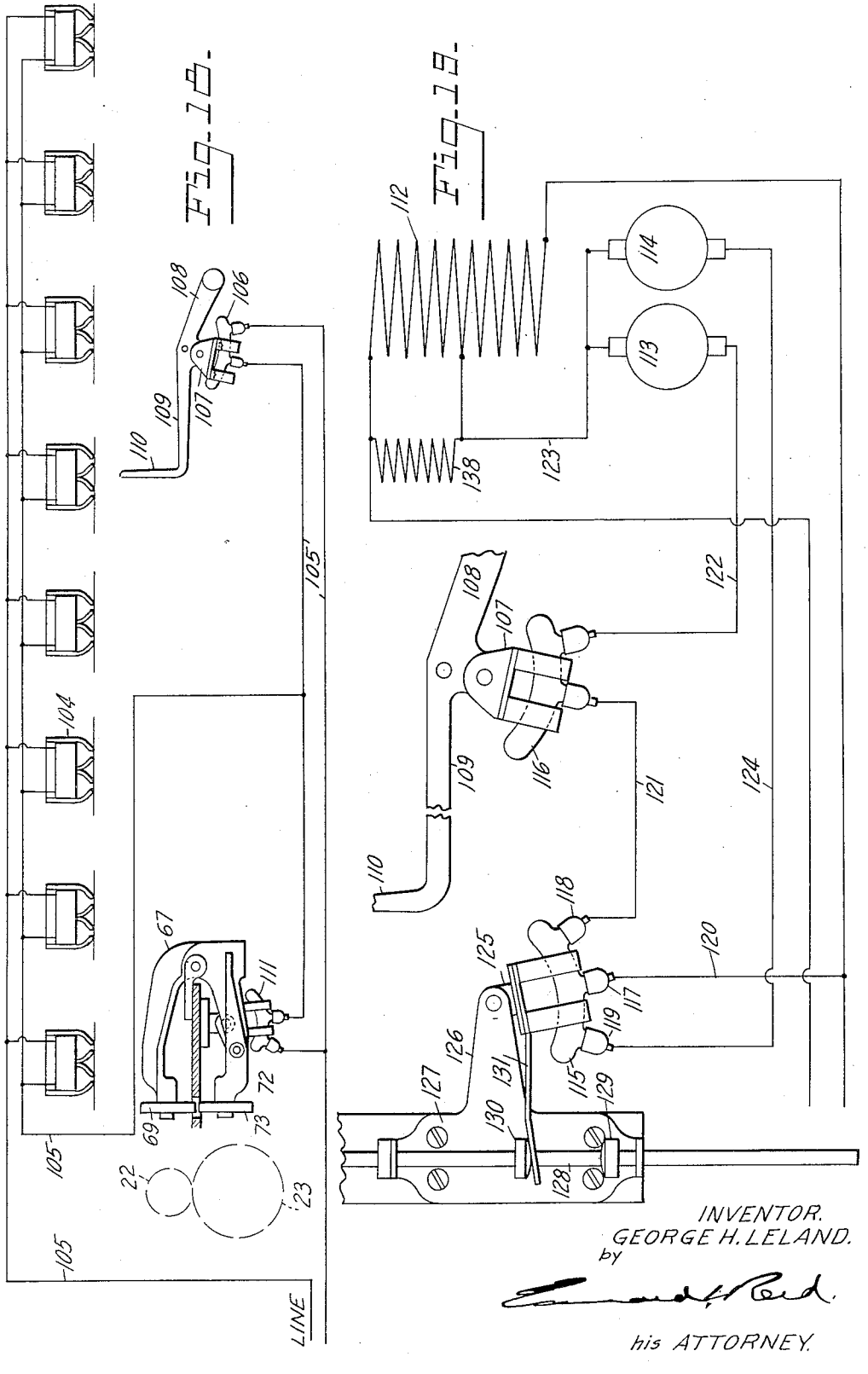
Filed Nov. 9, 1931 6 Sheets-Sheet 5



July 4, 1933. G. H. LELAND 1,916,378

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

Filed Nov. 9, 1931 6 Sheets-Sheet 6



INVENTOR.
GEORGE H. LELAND.
by
his ATTORNEY.

Patented July 4, 1933 1,916,378

UNITED STATES PATENT OFFICE

GEORGE H. LELAND, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF TO THE LELAND ELECTRIC COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO

STRIP DELIVERY MECHANISM FOR PUNCH PRESSES AND THE LIKE

Application filed November 9, 1931. Serial No. 573,785.

This invention relates to punch presses and more particularly to mechanism for delivering strips of material to the press and for controlling the operation of that mechanism and of the feeding devices on the press.

One object of the invention is to provide an automatically controlled mechanism for feeding strips of material successively from a pile of such strips to the press.

A further object of the invention is to provide means for so controlling such a feeding mechanism that the strips will be delivered to the press in proper relation one to the other and to the press mechanism.

A further object of the invention is to provide a feeding mechanism with devices to lift the uppermost strip from a pile of strips and deposit the same on a feeding table and having means for automatically controlling the operation of the lifting device.

A further object of the invention is to provide a reversible motor for moving the lifting device from one position to another with automatic means for reversing the motor at the end of each movement.

A further object of the invention is to provide such a mechanism with means for preventing the release of a strip by the lifting devices, or the reversal of the motor, when a preceding strip is located on the feeding table beneath the lifting devices.

A further object of the invention is to provide feeding devices for moving the strips over the table and for automatically controlling the action of said feeding devices.

A further object of the invention is to provide in connection with the strip delivering mechanism means for so controlling the feeding devices which form part of the press as to provide a complete automatic control of the strip.

Other objects of the invention will appear as the apparatus is described in detail.

In the accompanying drawings Fig. 1 is a side elevation of a mechanism comprising synchronously operating presses with the feeding mechanism associated therewith; Fig. 2 is a detail view of the device for controlling the operation of the feeding-in rollers on the press; Fig. 3 is a section on the line 3—3 of Fig. 2, showing the switch actuating mechanism in elevation; Fig. 4 is a section taken on the line 4—4 of Fig. 2; Fig. 5 is a detail view of the circuit controlling device, the operation of which is controlled by the strips; Fig. 6 is a section taken on the line 6—6 of Fig. 5; Fig. 7 is an end elevation of the feeding mechanism; Fig. 8 is a sectional view of the carriage and its operating devices; Fig. 9 is a plan view of the feeding table, partly broken away; Fig. 10 is a detail view of the operating devices for the switch which controls the lifting devices; Fig. 11 is a transverse section of the feeding table showing the guides for the strip; Fig. 12 is a detail view of one of the strip feeding devices; Fig. 13 is a detail view of the device for controlling the pressure exerted by the feeding devices on the strip; Fig. 14 is a detail view of one of the lifting magnets; Fig. 15 is a detail view of the frictional retarding device for the feeding-in rollers of the press; Fig. 16 is a detail view of the actuating device for the motor reversing switch; Fig. 17 is a sectional detail view of the brake for the motor; Fig. 18 is a diagram of the lifting magnet circuit; Fig. 19 is a diagram of the motor circuit; Fig. 20 is a diagram of the circuits controlling the feeding devices, both of the presses, and the automatic strip inserting mechanism; Fig. 21 is a plan view of the device for centering the strip with relation to the dies; and Fig. 22 is a side elevation of the centering device.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a pair of synchronously operating presses, the individual presses being of a well known type, but it will be understood that this particular installation has been chosen for the purpose of illustration only and that the mechanism may take various forms and may be used with presses of various kinds, either singly or in multiple, or with other machines.

In the installation here illustrated the two presses 10 and 11 are arranged in tandem and are driven from a common motor 12. Each press is provided with a feeding-in device 13 and a feeding-out device 14, these feeding

devices preferably comprising superimposed rollers. A guideway or chute 15 leads from the feeding out rollers of the first press 10 to the feeding-in rollers of the second press 11 and the presses are so arranged and controlled that they will operate synchronously to perform successive operations on the same portions of the strips fed through the same. This mechanism is fully shown and described in my co-pending application for patent filed November 19, 1931, Serial No. 576,025, and need not be here shown or described in detail. The lower roller of each feeding device on each press is actuated by a reciprocatory toothed bar 16, the respective end portions of which mesh with pinions connected with the rollers by overrunning clutches, so that the rollers will be moved in one direction only. The pinions and overrunning clutches are well known and are not here shown. A frictional retarding device 13*a* acts on the lower roller to check its movement and prevent overthrow. Reciprocatory movement is imparted to the bar 16 by a rock arm 17 which is actuated by a stud 18 mounted eccentrically on a cam 19 and extending through a slot 20 in the rock arm. This cam is connected with the driving mechanism by the usual spring retracted clutch which is operated against the action of the spring to set the clutch by means of a foot lever 21. In presses equipped with progressive dies, as here shown, the second stage die is provided with alining devices, such as pilot pins, adapted to extend through openings formed in the strip by the first stage die, to properly aline that strip with the second stage die. In order that the strip may be free for movement by the alining devices it is released from the feeding devices by moving the upper feed rollers out of engagement with the lower feed rollers. In Fig. 2 the upper and lower feed rollers are shown at 22 and 23 and the upper roller is mounted in bearings 24 carried by roller supporting structures 25, which are pivotally mounted. In the present instance, these structures are rigidly secured to a transverse shaft 26 with which is connected an inwardly extending arm 28, shown in Fig. 1. The arms 28 for the two feeding devices of each press are connected by links 29 with levers 30 which are pivotally mounted between their ends and have their inner end portions arranged for actuation by the cam 19, the arrangement being such that during the downward movement of the ram, which carries the movable dies or punches, the levers 30 will be actuated to draw the arms 28 downwardly and thus lift the upper feeding rollers and release the strip. When a second strip is to be fed into the press it is desirable that the feeding in rollers should be maintained in their separated positions until the strip has been inserted and properly located and for this purpose a latch 31 is mounted on the side of the press and provided with a shoulder 32 to engage a part of the roller supporting structure, such as an adjustable screw 33, and support that structure in its elevated position. The latch also has a recess 34 arranged to receive the end of the screw when the latch is withdrawn and permit the roller to move to its operative position. The structure of the individual presses so far described is well known and forms no part of the present invention, except in so far as it enters into combination with the novel features to be hereinafter described.

In presses of the kind here shown the clutch actuating foot lever 21 is usually retained in its lower position by a manually operated latch. In the present machine, I have substituted for that latch a magnet 35, see Fig. 1, the armature 36 of which is carried by the lever and when the magnet is energized will retain the lever in its lower or operative position. This enables the operation of the press to be automatically interrupted through mechanism which will be later described.

In Fig. 2 of the drawings I have shown a novel mechanism for automatically controlling the operation of the roller supporting latch 31. This operating mechanism comprises a magnet 37 which is preferably in the form of a solenoid, the core 38 of which is slidably mounted on a rod 38*a* extending through the coil. Rigidly connected with the core 38 and, in the present instance, forming a part thereof, is a tubular rod 39, the outer end of which is slidably mounted on a reduced end portion 40 of a member 41 pivotally mounted on the latch. A spring 42 is coiled about the tubular rod 39 and is connected at one end with that rod adjacent to the core 38 and is connected at its other end with the pivoted member 41 beyond the end of the tubular rod 39. A second spring 43 is coiled about the core 38 within the coil of the solenoid and tends to move that core outwardly when the solenoid is deenergized. The energization of the coil will retract the core 38 and place the spring 42 under such tension that it will withdraw the latch 31 from its operative position with relation to the roller supporting structure, thus permitting that structure and roller to be moved downwardly. When the solenoid is deenergized the spring 43 will press the core 38 outwardly and cause the end of the tubular rod 39 to engage the pivoted member 41 and move the latch toward its operative position. In the operation of the press it is desirable that the upper feed roller should be retained in its inoperative position until the strip has been inserted and moved to such a position with relation to the dies that the normal operation of the feed rollers will correctly position the end portion thereof with relation to the dies as the strip is fed forward. I have therefore provided means arranged to be actuated by the strip,

when it has been properly positioned, to energize the magnet 37 and withdraw the latch when the roller is next lifted by its cam. This means comprises a switch, here shown as a mercury tube switch 45, which is connected in circuit with the magnet 37, (see Fig. 20). This switch is carried by a bracket 46 secured to a shaft 47 which is journaled in upright bars or standards 48 rigidly secured to a part 49 of the press frame, thus permitting the switch to be tilted from its open to its closed position. A spring 50 acts on the switch supporting bracket to hold the switch normally in its open position. Links 51 and 52 are pivotally connected with the standards 48 and extend forwardly some distance beyond the same. Pivotally mounted on the ends of these links is a vertically arranged member 53 on which is pivotally supported a lever 54, the upper end of which is connected by a link 55 with a rock arm 56 secured to the shaft 47. The lower end of the supporting member 53 is arranged above an opening 57 in the strip supporting table 58 of the press and when there is no strip in position on that table the lower end of the supporting member will extend into the opening 57 and the lower end of the lever 54 will be arranged in the path of a strip which is inserted into the press. When this strip engages the lever the latter will be actuated thereby to move the switch 45 to its closed position, thus energizing the magnet 37 and actuating the latch 31 to release the feed roller and its supporting structure and permit the same to be moved downward. As the roller moves downwardly a two part arm 59 which is rigidly connected with the supporting structure for the roller will engage studs 60 on the lever supporting member 53 and lift that member and the lever out of the path of the strip, this operation taking place very quickly so there is no appreciable interruption of the strip and no interference is offered to the movement of the strip by the feed rollers when the upper roller assumes its operative position with relation thereto. A spring 61 acts on the upper link 51 to press the studs 60 against the arms 59 and support the lower end of the lever supporting member 53 above the upper surface of the strip when the arms are in their elevated positions. Thus the lever and its supporting member rise and fall with the arms 59, their downward movement being limited by contact of the supporting member with the strip, and when the rear end of the strip has passed the supporting member the latter will move to its lowermost position and thereby position the lever in the path of a succeeding strip.

As soon as the switch actuating lever 54 is moved out of engagement with the end of the strip which has actuated the same the spring 50 will return the switch 45 to its open position, thus breaking the circuit through the magnet. In order to maintain the latch 31 in its inoperative position during the feeding of the strip through the press, and thus permit the movement of the roller to be controlled wholly by its actuating cam 19, I have connected a second switch 62 in circuit with the magnet 37 and in parallel with the switch 45 and this second switch is so controlled that it will prevent the complete deenergizing of the magnet 37 until the rear end of the strip has passed or is close to the feeding-in rollers. The second switch is then moved to its inoperative position and the magnet completely deenergized, thus causing the latch to be returned to its operative position and the feeding-in roller 22 held in its inoperative position. The continued movement of the strip is then effected wholly by the feeding-out rollers. This second switch 62, which is also in the form of a mercury tube, is supported by a bracket 63 secured to a shaft 64 journaled in bearings 65 which, in the present instance, are secured to the underside of a feed table 66 forming part of an automatic feeding mechanism to be hereinafter described. Pivotally secured to the feed table 66, at one side thereof, is a bracket 67 comprising an arm 68 which extends above the table and has mounted on its outer end a roller 69, which normally extends through an opening 74 in the table. The bracket also comprises a second part 70 which extends beneath the table and which carries a plate 71, preferably of insulating material. The part 70 of the bracket is bifurcated and an arm 72 is pivotally mounted between its ends upon this bifurcated portion of the bracket. A roller 73 is mounted on the outer end of the arm 72 directly beneath the upper roller 69. The inner end of the arm 72 is yieldably connected with the plate 71 which is also carried by the bracket. As here shown, a screw 75 is mounted in the arm 72 and extends loosely through an opening in the plate 71, and a spring 76, confined between the head of the screw and the plate, resists the movement of the arm 72 away from the plate, thus causing the arm and the bracket to normally move together about the axis of the bracket, and so positioning the arm and the bracket with relation one to the other that the rollers will be spaced apart a distance sufficient to permit the passage of a strip of normal thickness. The arm 72 is connected with the part 70 of the bracket by a pivot pin 77 which extends beyond one side of the part 70 and is embraced by the slotted end of a crank arm 78 secured to the shaft 64 which carries the switch supporting bracket, the arrangement being such that when the parts are in their normal position, below that shown in the drawings, the switch will be open. The bracket 67 and arm 72 tend to move downwardly by gravity and this movement is limited by a stop so ar-

ranged that the roller 69 will extend into the opening 74 in the table 66. In the present instance, I have utilized as the stop a part 170 of a strip centering device to be hereinafter described. These rollers are arranged adjacent to and slightly in advance of the feeding-in rollers 22 and 23 so that a strip must pass between the rollers 69 and 73 before it is inserted between the feeding-in rollers. The rollers 69 and 73 are spaced apart a distance approximately equal to the thickness of the strip to be operated on and when such a strip is inserted between these rollers the structure as a whole will be moved upwardly about the axis of the bracket, thus tilting the switch 62 to its closed position. Inasmuch as the magnet should not operate the latch until the forward end of the strip has been moved some distance beyond the feeding-in rollers I have inserted in the circuit of the switch 62 a resistance 80 which will so reduce the strength of the current that the magnet will not be sufficiently energized to move its armature against the action of the springs 42 and 43. Consequently the magnet will not be fully energized until the forward end of the strip is advanced beyond the feeding-in rollers and has engaged the lever 54 and actuated the switch 45. This full energization of the magnet, which causes the latch to be retracted, is of short duration, as the switch 45 returns at once to its open position. However, the energization of the magnet through the switch 62 and resistance 80 is sufficient to retain the armature in its retracted position against the action of the springs after it has been once retracted, and therefore the latch will not be returned to its operative position until the rear end of the strip has passed the controlling rollers 69 and 73 and the switch 62 has been again restored to its open position.

It will be apparent that in the operation of the press the feeding roller 22 will be held in its inoperative position by the latch 31 so long as there is no strip between the controlling rollers 69 and 73. When the strip is inserted between the controlling rollers the magnet 37 is only partially energized and does not withdraw the latch and the upper feeding roller remains inoperative until the strip engages the lever 54 and causes the switch 45 to be closed, thus fully energizing the magnet and releasing the feeding roller. As the feeding roller moves to its operative position the lever supporting member 53 is lifted by the arms 59 and moved out of the path of the strip. The strip is then advanced intermittently by the feeding rollers as above described, the upper roller being moved to its inoperative position during each downward movement of the ram. The arms 59 move with the upper feeding roller and cause the lever supporting member 53 to rise and fall as that roller moves downwardly and upwardly. When the rear end of the strip has passed the controlling rollers 69 and 73 the magnet 37 will be deenergized and the latch will move to its operative position and lock the upper feeding roller in its inoperative position. The feeding of the strip is then completed by the feeding-out rollers and when the rear end of the strip has passed the lever supporting member that member will move the lever into the path of the succeeding strip and the cycle of operations will be repeated. The mechanism here shown for controlling the feed roller 22 and its associated parts is useful in various organizations other than here illustrated and forms the basis of my co-pending application for patent filed November 16, 1931, Serial No. 575,324.

The controlling rollers 69 and 73 also control a second switch which in turn controls the operation of the press as a whole. This second switch comprises a fixed contact member 81, carried by the plate 71, and a movable contact member 82 carried by the adjacent end of the pivoted arm 72. These contact members are connected in the circuit of the magnet 35 which retains the clutch operating lever 21 in its operative position. So long as the rollers are in their normal positions the contacts 81 and 82 will be in engagement and the circuit and the switch controlling magnet will be closed. Inasmuch as the plate 71 is carried by the bracket 67 and moves with the arm 72 in the normal operation of the device the switch will not be opened by the passage of a single normal strip but if a strip of excessive thickness or two superimposed strips be presented to the rollers 69 and 73 the rollers will be forced apart and the arm 72 moved with relation to the plate 71, thus separating the contacts 81 and 82 and deenergizing magnet 35 and permitting the lever 21 to be moved to its inoperative position by the action of the clutch springs.

The strips may be fed to the press in any suitable manner but the press mechanism as described has been designed particularly for cooperation with an automatic strip feeding mechanism and I have here shown a mechanism automatically operating to remove strips one at a time from a pile of said strips and deliver the same to the press. This mechanism is here shown as comprising a main frame 83 on which the feeding table 66 is supported in alinement with the strip supporting table of the press. Means are provided for supporting a pile of strips adjacent to and preferably alongside the feeding table 66 and preferably the pile of strips is supported on the frame 83. As here shown, that frame is provided with horizontal supporting members 84 extending laterally beyond the table 66. The strips may, if desired, be piled directly upon the supporting members 84 but I prefer that the pile of strips should be carried by a suitable carrier, such as a

plank 85, see Figs. 7 and 8, on which the strips may be piled, as shown at 86, and the carrier with the pile of strips thereon then placed on the supporting members. When the supply of strips on one carrier has been exhausted a second carrier is placed on the supporting member and pushed into proper position thereon and this movement of the second carrier will force the empty carrier laterally beneath the feeding table 66, which is here shown as supported by L-shaped arms 87. This empty carrier can then be removed lengthwise from the frame and reloaded with another pile of strips. To facilitate the movement of the carriers I have provided the supporting members 87 with rollers 88. The loaded carrier is properly positioned with relation to the feeding mechanism by means of suitable positioning devices which are here shown as arms 89 having their outer ends pivotally mounted on the supporting members 84 and having at their inner ends lugs 90 constituting stops which will be engaged by the carrier and will properly position the same. As here shown, each arm 89 has a depending portion 91 which is acted upon by a spring 92 to hold the stop 90 normally in operative postion. Each arm 89 also has an inclined lug 93 extending upwardly therefrom just beyond the outer side of the pile carrier when the latter is in its proper position. Consequently when a loaded carrier is placed upon the supporting members and pushed inwardly it will engage the inclined lugs 93 and press the arms 89 downwardly to move the stops 90 to their inoperative positions thus permitting the empty carrier to be pushed beyond the arms 89 and onto a suitable support 94. As soon as the loaded carrier is moved past the lugs 93 the springs 92 will move the stops 90 into the path of that carrier.

A carriage is mounted on the frame 83 for movement from a position above the pile of strips to a position above the feeding table, and vice versa, and this carriage is provided with suitable lifting devices which will engage the topmost strip on the pile and carry the same to a position above the feeding table and then release the strip. As here shown, the carriage comprises an elongated frame 95 extending parallel to the feeding table and supported by sprocket chains 96 arranged at the respective ends of the frame and passing about upper sprocket wheels 97 and lower sprocket wheels 98. Preferably the carriage is pivotally mounted on the sprocket chains so that it will be suspended therefrom in a substantially vertical position at all times during the movement of the sprocket chains. If desired, means may be provided for positively retaining the carriage in a vertical position at all times during its travel. For this purpose I have rigidly connected to the carriage, near each end thereof, and in vertical alinement therewith, an upwardly extending rod 139 which slides in a vertical guideway in a guide member 140 which is movable transversely to the carriage. As here shown, the guide members 140 are slidably mounted on horizontal bars 141 rigidly secured to the respective end members of the main frame and extending beyond the opposite sides of the upper sprocket wheel, thus the carriage may have vertical movement with relation to the guide members and horizontal movement therewith and will be held against movement about its pivotal connection to the sprocket chains. The chains and carriage may be driven by any suitable means and, in the present instance, an electric motor 99 is utilized and a pulley 100 on the armature shaft thereof is connected by a belt 101 to a pulley 102 secured to a shaft 103 which carries the upper sprocket wheels 97. Means are provided as hereinafter described for automatically reversing the direction of movement of the sprocket chains so that the carriage will be moved from the position above the pile of strips to a position above the feeding table and then returned to a position above the pile of strips.

The carriage is provided at its lower edge with a series of lifting devices 104 which are preferably in the form of electro-magnets, as shown in detail in Fig. 14, and are arranged lengthwise of the frame so as to engage the uppermost strip of the pile at intervals throughout its length. These lifting magnets are automatically controlled to cause the same to be energized when they are brought into operative relation to the uppermost strip on the pile and to be deenergized to release the strip and permit it to drop on the feeding table. The circuit 105 for the lifting magnets has connected therein a switch, here shown as a mercury tube switch 106, which is carried by a pivotally supported bracket 107 which, in the present instance, is supported beneath the feeding table. This switch is held normally in its closed position and for this purpose I have connected with the bracket 107 a counterweight 108. Also connected with the bracket 107 is a switch actuating arm 109 arranged beneath the table and having its end upturned, as shown at 110, and extending through an opening in the table, so that when the switch is in its closed position the upper end of this arm will extend some distance above the table. In the normal operation of the mechanism this switch will therefore be closed and the magnets energized when they are brought into operative relation with the pile of strips and the topmost strip will be lifted, moved to a position above the feeding table and then lowered toward that table. As the carriage and strip move downwardly the strip will engage the end 110 of the switch

actuating arm and depress the same, thus moving the switch 106 to its open position and breaking the circuit at that point. If no other controlling means is employed in connection with the magnet circuit this breaking of the circuit at the switch 106 will deenergize the magnets and permit the strip to drop onto the table. However, it is desirable to provide means for preventing a second strip being dropped onto the table while a preceding strip is already on the table and it may sometimes happen that the preceding strip will not be entirely withdrawn from the table before a second strip is positioned above the same. I have therefore connected a second switch 111 with the magnet circuit 105 in parallel with the switch 106, so that both switches must be opened before the magnets are deenergized. This second switch 111 is controlled by the strip which rests upon the feeding table and will be held in its closed position until that strip has been entirely withdrawn from the table or has been moved from a position beneath the strip which is suspended above the table. Various means may be employed for so controlling the switch 111 but I prefer to employ for that purpose the same device which controls the switch 62 in the circuit of the latch operating magnet 37. It will be remembered that this device, which is shown in detail in Fig. 5, holds the switch 62 in its closed position until the strip which is being fed into the press has been moved beyond the rollers 69 and 73. As here shown, the witch 111 is a mercury tube switch and is mounted on the bracket 63 alongside of the switch 62 so that it will be maintained in its closed position until the strip has moved beyond the rollers 69 and 73 and will then be automatically opened. Consequently if there is a strip on the table at the time the succeeding strip is lowered toward the table and opens the switch 106 the magnet circuit lifting magnets will remain energized until the preceding strip has been withdrawn and then, both switches being opened, the magnets will be deenergized and the strip dropped upon the table. The switch 111 will remain open until the succeeding strip has been fed between the rollers 69 and 73 and the switch 106 will remain open until the rear end of that succeeding strip has been moved beyond the switch actuating arm 109. One or both of these switches will usually be closed before the carriage has returned the lifting magnets to their operative positions above the pile of strips and therefore the magnets will be energized and ready to engage the uppermost strip by the time they are ready to return with the next strip.

Any suitable means may be employed for reversing the direction of movement of the carriage but I prefer to utilize a reversible electric motor and, as shown in Fig. 19, I have employed a motor having a compoundly wound field 112 and having two armature windings 113 and 114 which are alternately operable and which act to rotate in opposite directions. The armature winding 113 serves to drive the carriage from a position above the pile of strips to a position above the feeding table and the armature winding 114 serves to return the carriage to a position above the pile of strips. These armature windings are automatically controlled by two switches 115 and 116. The switch 115 is a two-way switch and is here shown as a mercury tube switch having three contacts, 117, 118 and 119. The contact 117 is connected by a conductor 120 with one side of the power line and the contact 118 is connected by conductor 121, switch 116 and conductor 122 with one side of the armature 113 and the other side of this armature is connected by a conductor 123 with the other side of the power line. The contact 119 of the switch 115 is connected by a conductor 124 with one side of the armature 114 and the other side of this armature is also connected by the conductor 123 with the other side of the power line. It will be apparent therefore that when the switch 115 is in the position shown in Fig. 19 the circuit will be closed through the armature 114 and when that switch is tilted to its other position the circuit will be closed through the armature 113, subject to the additional control of that circuit by the switch 116. The switch 115, which is thus the reversing switch, is preferably mounted on the carriage 95 for movement therewith and is controlled by the position of the lifting magnets with relation to the strip which is to be delivered to the feeding table. As here shown, the switch is carried by a bracket 125 which is pivotally mounted on an arm 126 carried by a supporting member 127 which is secured to the frame 95. Slidably mounted in the supporting member 127 is a rod 128, the lower end of which, when unrestrained, extends below the level of the lifting magnets. Secured to this rod 128 are two stops such as collars 129 and 130, which are spaced apart and between which extends an arm 131 secured to the switch supporting bracket 125, the arrangement being such that when the rod 128 moves to its lowermost position, as shown in Fig. 19, the stop 130 will engage the arm 131 and move the switch to a position to close the circuit through the armature 114. When the lifting magnets are lowered into operative relation to the pile of strips the rod 128 will engage the uppermost strip and the carriage will move downwardly with relation thereto, thus causing the stop 129 to engage the arm 131 and move the switch 115 to a position to close the circuit between the contacts 117 and 118 in the circuit of the armature 113 and, if the switch 116 is in its closed position, closing the circuit through

that armature, thereby reversing the direction of movement of the carriage. The switch 116 is so controlled that it will be normally closed and, as here shown, that switch is supported by the bracket 107 which carries the switch 106 for the lifting magnet circuit and is so arranged that it will be closed when the actuating arm 109 is in its elevated position. Therefore, in the normal operation of the machine this switch will be closed when the lifting magnets approach the pile of strips and the actuation of the switch 115 by the rod 128 will reverse the direction of travel of the carriage. As the carriage is lowered above the feeding table and the strip engages the upturned end of the actuating arm 109 the switch 116 will be moved to its open position, thus breaking the circuit through the armature 113 and stopping the motor. If the breaking of the lifting magnet circuit at the switch 106 serves to deenergize the lifting magnets and release the strip the rod 128 will drop and the switch 115 will be actuated to again reverse the direction of travel of the carriage. However, if the preceding strip is still on the feeding table and the lifting magnet circuit is closed at the switch 111 the switch 115 will be retained in position to hold open the circuit through the armature 114 and the opening of the switch 116 will merely stop the motor and the strip will be held suspended above the table until the preceding strip has been withdrawn and the magnet circuit broken at the switch 111.

Means are provided for instantly stopping the movement of the carriage when the circuit is broken through either motor armature winding and I prefer to provide an automatic brake on the armature shaft. As here shown, the pulley 100 on the armature shaft has on its inner side a part 132 provided with a friction surface, and slidably mounted on the motor frame for movement lengthwise of the armature shaft is a brake member or disk 133 which has a facing of friction material 134 adapted to engage the friction face of the part 132. A series of springs 135 arranged about the peripheral portion of the disk 133, and preferably mounted in recesses 136 in the motor frame, act on the disk 133 to set the brake. Dowel pins 137 hold the brake member 33 against rotation without interfering with its sliding movement. A magnet coil 138 is arranged on the inner side of the brake member or disk 133 and when energized acts on that member to withdraw the same against the action of the springs 135 and thus release the brake. The magnet is connected in the common circuit to both armature windings, as shown in Fig. 19, and will therefore be energized when the circuit is closed through either winding and will be deenergized whenever both circuits are broken.

After the strip has been released by the lifting magnets and has dropped onto the feeding table it is automatically advanced and delivered to the press. As has been explained the upper feeding roller 22 of the press is retained in an inoperative position when there is no strip between the same and the lower feeding roller 23. This permits of the strip being inserted directly into the press and into engagement with the switch actuating lever 54 which controls the operation of the latch which supports the feeding roller in its inoperative position. In the construction here illustrated the means for so inserting the strip comprises two feeding members 142 and 143 which are carried by shafts 144 journaled in vertical bearings arranged beneath the feeding table and the feeding members project through slots 145 in the feeding table to points some distance above the table. Secured to the lower ends of the shafts 144 are pulleys 146 which are connected by belts 147 with a motor 148, the arrangement being such that the feeding members will be rotated in opposite directions. A pair of upright guides 149 are arranged near each end of the feeding table and have their upper ends flared outwardly. When the strip is released from the magnets it drops between the guides 149 and between the feeding members 142 and 143 and these several members serve to correctly position the strip lengthwise of the table. The feeding members are preferably tapered upwardly, or cone-shaped, and may be provided with spiral grooves to positively move the strip downwardly between the feeding members. The feeding members are adjustable transversely to the table to vary the space between the same and, as here shown, the bearing for the feeding member 142 is carried by an arm 150 which is pivotally mounted beneath the table and carries a stud 151 which extends through a slot 152 in the table and is secured in adjusted positions in that slot by a nut 153. One of the feeding members is preferably spring pressed toward the other to cause the strip to be firmly gripped between the same and thereby provide an efficient feeding contact between the edges of the strip and the feeding members, but it is desirable that this pressure should be relieved after the strip has been engaged by the feeding rollers of the press. In the construction here illustrated the bearing for the feeding member 143 is carried by an arm 154 pivotally mounted beneath the table. This bearing has secured thereto a lip 155 provided with an opening through which extends a rod 156, the rod having a head 157 to engage the outer side of the lip. The other end of the rod extends through a bracket 158 and through a coil 159 of a magnet which is supported by that bracket, and has secured thereto, beyond the magnet, a plate or disk 160 which constitutes an armature for the magnet. A spring 161 is coiled about the

rod 156 and has one end rigidly secured to that rod adjacent to the lip 155 and has its other end secured to the bracket 158. When the magnet is deenergized the tension of the spring 161 will be exerted on the rod and the head 157 of the latter will engage the lip 155 and thus press the feeding member 143 firmly in engagement with the edge of the strip. When the magnet is energized the armature 160 will be drawn toward the same and the rod moved lengthwise to carry the head 157 thereof either out of engagement with the lip 155 or to a position which will relieve that lip of all or a part of the spring pressure. The magnet 159 is connected with the circuits for the latch controlling magnet 37, the connection being such that the magnet will be energized when either the switch 45 or the switch 62 is closed. The smaller current which is delivered to the magnet through the switch 62 is not sufficient to overcome the action of the spring 161 but is sufficient to hold the armature seated after it has been actuated by the larger current delivered thereto through the switch 45. Consequently the feeding pressure will be maintained on the edges of the strip until the latter has been fully inserted between the feed rollers and the switch 45 actuated. While it is desirable to reduce the feeding pressure exerted on the edges of the strip after the latter has been engaged by the feeding rollers of the press it is preferable that a light pressure shall be maintained on the edges of the strip to properly position the same. I have therefore connected with the arm 154 a second tension spring 162 of less strength than the spring 161 and which acts constantly on the arm. As here shown, this spring is connected at one end with the arm 154 and at the other end with a lug 163 forming part of a bracket 164 on which the bracket 158 is supported by means of a bar 165. The bracket 164 is adjustably mounted, preferably on the axis about which the arm 164 is adjustable and carries a stud 166 which extends through a slot 167 in the plate and is held in adjusted positions therein by a nut 168.

The strips which are to be delivered to the press are not always straight but are sometimes slightly curved edgewise. In order that such a strip may be moved through the press in such a manner that complete blanks will be struck from each successive portion thereof I have provided means for positioning the forward end of the strip in a slightly off center position with relation to the die but in a position which will permit a complete blank to be struck therefrom, and to then so guide the strip through the press that the successive blanks will be struck therefrom in a straight line. This will cause the intermediate blanks to be struck from portions of the strip slightly off center toward that side of the strip opposite the side from which the first blank was struck and the final blank will be struck from the portion of the strip off center toward the same side of the strip from which the first blank was struck. The striking of the blanks from the off center portions of the strip is possible because of the waste material that ordinarily remains on the respective sides of the openings from which the blanks were struck. As shown in Figs. 9, 21 and 22, I have mounted on the feed table 66 slightly in advance of the feeding-in rollers, a pair of guide studs 169 and 170 which are preferably in the form of rollers and are carried by arms 171 and 172 pivotally mounted on the underside of the table, the studs extending upwardly through suitable openings in the table. A tension spring 173 is connected with the respective ends of the respective arms 171 and 172 and serve to hold these arms in contact with normally fixed but adjustable stops 174 and 175. The spring 173 is connected with the arms 171 and 172 at different distances from the axes of those arms so that, because of the difference in leverage, the pull exerted by the spring on one arm will be greater than the pull exerted on the other arm. In the present arrangement the spring is connected with the arm 171 at a distance from its axis sufficiently greater than the distance between the point of connection of the spring with the arm 172 and the axis of that arm to cause the pull on the arm 171 to be approximately twice the pull on the arm 172. When a curved strip is presented to the guide rollers 169 and 170 the forward end of that strip will be slightly off center with the line of movement of the strip and the roller 170 will be displaced by the strip, because of the smaller resistance offered to its movement by the spring 173, and will press the opposite edge of the strip against the roller 169 which is held firmly against its stop by the spring. This results in so positioning the end of the strip that the forward portion thereof will be presented to the dies in a slightly off center position but in line therewith so that a complete blank may be struck from the first portion thereof. The dies being essentially straight line piloting dies will guide the strip in a straight line after it enters the same, the rollers 169 and 170 yielding according to the curvature of the strip.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of

strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table and lowering the same toward said table, a lifting device mounted on said carriage, and means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is lowered to a position adjacent to said table.

2. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table, a lifting device mounted on said carriage, and means controlled by the position of said carriage and by the position of a preceding strip on said table to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is positioned above said table.

3. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table, a lifting device mounted on said carriage, means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is positioned above said table, and means controlled by a preceding strip to prevent the release of said strip by said lifting device while said preceding strip is on said table beneath the strip which is supported by said lifting device.

4. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table, a lifting device mounted on said carriage, means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is positioned above said table, and means controlled by a preceding strip to prevent the release of said strip by said lifting device and to interrupt the movement of said carriage when a preceding strip is on said table beneath the strip which is supported by said lifting device.

5 In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table, a lifting device mounted on said carriage, means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is positioned above said table, and means controlled by the position of a preceding strip on said table to interrupt the movement of said carriage.

6. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table and to then lower the same toward said table, a lifting device mounted on said carriage, means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is lowered to a position adjacent to said table, and means to move said strip over said table to said press.

7. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means to a position above said table, a lifting device mounted on said carriage, means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is positioned above said table, and rotatable feeding devices arranged above said table to engage the edges of said strip and feed the same to said press.

8. In a mechanism for delivering strips of material to a punch press or the like, a feeding table over which the strips may be moved to the press, means to support a supply of strips adjacent to said table, a carriage, means for moving said carriage from a position above said strip supporting means

to a position above said table, a lifting device mounted on said carriage, means controlled by the position of said carriage to cause said lifting device to operatively engage a strip on said supporting means when said carriage is positioned above said supporting means and to release said strip when said carriage is positioned above said table, rotatable feeding devices arranged above said table to engage the edges of said strip and feed the same to said press, and means controlled by the position of the strip with relation to the press to relieve the pressure of said feeding devices on the edges of said strip.

9. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting device mounted on said carriage, means for actuating said carriage to move said lifting device to position to engage a strip on said supporting means, to then elevate said lifting device and move the same above said feeding device, and to then lower the same to a position adjacent to said feeding device, and means controlled in accordance with the movements of said carriage to cause said lifting device to operatively engage said strip when it is in the first mentioned position and release said strip when it is in the last mentioned position.

10. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting device mounted on said carriage, means for actuating said carriage to move said lifting device to position to engage a strip on said supporting means and then to a position to deliver said strip to said feeding device, and means controlled by the movements of said carriage to cause said lifting device to operatively engage said strip when it is in the first mentioned position and release said strip when it is in the last mentioned position, and to reverse the direction of movement of said carriage after said lifting device has engaged said strip and after it has released said strip.

11. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage mounted for both vertical movement and transverse movement, a lifting magnet mounted on said carriage, means for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means and then to a position to deliver said strip to said feeding means, and means controlled in accordance with the movements of said carriage to energize and deenergize said lifting magnet.

12. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting magnet mounted on said carriage, means for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means, then to a position above said feeding device and to then lower the same to a position to deliver said strip to said feeding device, a switch to control the energization of said lifting magnet, and means controlled in accordance with the position of said carriage to open said switch when said lifting magnet is lowered to a position to deliver the strip to said feeding means.

13. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting magnet mounted on said carriage, means for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means and then to a position to deliver said strip to said feeding means, a switch to control the energization of said lifting magnet, and means actuated by the strip which is supported by said lifting magnet to open said switch when said lifting magnet is in a position to deliver said strip to said feeding means.

14. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting magnet mounted on said carriage, means for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means and then to a position to deliver said strip to said feeding means, a tiltable switch in circuit with said lifting magnet, means to hold said switch normally in its closed position, and an actuating member connected with said switch and arranged to be engaged by the strip which is supported by said lifting magnet and to move said switch to its open position when said lifting magnet is in a position to deliver said strip to said feeding means.

15. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting magnet mounted on said carriage, means for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means and then to a position to deliver said strip to said feed-

ing means, a tiltable switch in circuit with said lifting magnet, means to hold said switch normally in its closed position, an actuating member connected with said switch and arranged to be engaged by the strip which is supported by said lifting magnet and to move said switch to its open position when said lifting magnet is in a position to deliver said strip to said feeding means, a second switch to maintain the energization of said lifting magnet when the first mentioned switch is opened, and means controlled by a strip previously delivered to said feeding means to control said second switch.

16. In a mechanism for delivering strips of material to a punch press or the like, a table, feeding means to move a strip over said table toward said press, means to support a supply of strips adjacent to said table, a carriage, means to move said carriage from a position above said strip supporting means to a position above said table, a lifting magnet mounted on said carriage, two switches connected in parallel in the circuit for said lifting magnet, means controlled in accordance with the movement of said carriage to actuate one of said switches, and means controlled by a strip on said table to actuate the other of said switches.

17. In a mechanism for delivering strips of material to a punch press or the like, a table, feeding means to move a strip over said table toward said press, means to support a supply of strips adjacent to said table, a carriage, means to move said carriage from a position above said strip supporting means to a position above said table, a lifting magnet mounted on said carriage, two switches connected in parallel in the circuit for said lifting magnet, means controlled in accordance with the movement of said carriage to actuate one of said switches, and a yieldable strip engaging member operatively connected with the second switch, extending normally above the upper surface of said table near that end thereof which is adjacent to said press and arranged to be depressed by a strip which is passing from said table to said press.

18. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting magnet mounted on said carriage, reversible means for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means, then to a position to deliver said strip to said feeding means and then again to a position to engage another strip on said supporting means, and means controlled in accordance with the movement of said carriage to energize said lifting magnet and to reverse the direction of movement of said carriage actuating means when said lifting magnet is in a position to engage a strip on said supporting means and to deenergize said magnet and again reverse said carriage actuating means when said lifting magnet is in a position to deliver said strip to said feeding means.

19. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage movable from a position above said supporting means to a position adjacent to said feeding means, a reversible motor for actuating said carriage, a lifting magnet mounted on said carriage for movement therewith, a switch in circuit with said lifting magnet, a reversing switch in circuit with said motor, and means controlled in accordance with the movements of said carriage to control said switches.

20. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage movable from a position above said supporting means to a position adjacent to said feeding means, a reversible motor for actuating said carriage, a lifting magnet mounted on said carriage for movement therewith, a normally closed switch in circuit with said lifting magnet, a reversing switch in circuit with said motor, and means controlled in accordance with the movements of said carriage to actuate said reversing switch when said lifting magnet is in operative relation to a strip on said supporting means and to again actuate said reversing switch and to open said normally closed switch when said lifting magnet is in a position to deliver the strip to said feeding means.

21. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage movable from a position above said supporting means to a position adjacent to said feeding means, a reversible motor for actuating said carriage, a lifting magnet mounted on said carriage for movement therewith, a normally closed switch in circuit with said lifting magnet, means controlled in accordance with the movements of said carriage to open said normally closed switch when said lifting magnet is moved to a position to deliver the strip to said feeding means, a reversing switch in circuit with said motor, and strip controlled means mounted on said carriage to actuate said reversing switch.

22. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press,

means for supporting a supply of strips adjacent to said feeding device, a carriage movable from a position above said supporting means to a position adjacent to said feeding device, a reversible motor for actuating said carriage, a lifting magnet mounted on said carriage for movement therewith, a normally closed switch in circuit with said lifting magnet, means controlled in accordance with the movements of said carriage to open said normally closed switch when said lifting magnet is moved to a position to deliver the strip to said feeding means, a reversing switch mounted on said carriage and connected in circuit with said motor, and an actuating device for said reversing switch mounted on said carriage and so arranged that it will move said reversing switch in one direction when a strip is engaged by said lifting magnet and will move said reversing switch in the other direction when said strip is released from said lifting magnet.

23. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage movable from a position above said supporting means to a position adjacent to said feeding device, a reversible motor for actuating said carriage, a lifting magnet mounted on said carriage for movement therewith, a normally closed switch in circuit with said lifting magnet, means controlled in accordance with the movements of said carriage to open said normally closed switch when said lifting magnet is moved to a position to deliver the strip to said feeding means, a reversing switch mounted on said carriage and connected in circuit with said motor, an actuating device operatively connected with said reversing switch and so arranged that when said lifting magnet is moved into engagement with a strip on said supporting means said actuating device will engage said strip and will be operated thereby to move said reversing switch in one direction and will be held in the position to which it has been moved by said strip when the latter is lifted by said magnet and will be operated to move the reversing switch in the other direction when said strip is released by said magnet.

24. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means for supporting a supply of strips adjacent to said feeding device, a carriage, a lifting magnet mounted on said carriage, a reversible motor for actuating said carriage to move said lifting magnet to a position to engage a strip on said supporting means, then to a position to deliver said strip to said feeding device and then again to a position to engage a strip on said supporting means, a switch in circuit with said lifting magnet, a reversing switch in circuit with said motor, means to actuate the switch in said magnet circuit and to break the circuit through said motor when said lifting magnet is in a position to deliver the strip to said feeding device, and means to actuate said reversing switch after the switch in said magnet circuit has been operated.

25. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means to support a supply of strips adjacent to said feeding device, a carriage movable from a position adjacent to said supporting means to a position adjacent to said feeding device, electrically controlled means for driving said carriage, a switch in circuit with said electrically controlled driving means to reverse the direction of operation thereof, means controlled in accordance with the movements of said carriage to operate said switch, an electrically controlled lifting device mounted on said carriage, a switch in circuit with said electrically controlled lifting device, and means controlled in accordance with the movements of said carriage to cause the last mentioned switch to be closed when said carriage is in a position adjacent to said supporting means and to be opened when said carriage is in a position adjacent to said feeding means.

26. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means to support a supply of strips adjacent to said feeding device, a carriage movable from a position adjacent to said supporting means to a position adjacent to said feeding device, electrically controlled means for driving said carriage, a switch in circuit with said electrically controlled driving means to reverse the direction of operation thereof, means controlled in accordance with the movements of said carriage to operate said switch, an electrically controlled lifting device mounted on said carriage, a switch in circuit with said electrically controlled lifting device, a device connected with the last mentioned switch, and arranged to be engaged by a strip supported by said lifting device and to open said switch when said carriage is in a position adjacent to said feeding device and to close said switch when said strip is moved out of engagement therewith.

27. In a mechanism for delivering strips of material to a punch press or the like, a feeding device to move a strip toward the press, means to support a supply of strips adjacent to said feeding device, a carriage movable from a position adjacent to said supporting means to a position adjacent to said feeding device, electrically controlled means for driving said carriage, a switch in circuit with said electrically controlled driving means to reverse the direction of operation

thereof, means controlled in accordance with the movements of said carriage to operate said switch, an electrically controlled lifting device mounted on said carriage, a switch in circuit with said electrically controlled lifting device, means controlled in accordance with the movements of said carriage to cause the last mentioned switch to be closed when said carriage is in a position adjacent to said supporting means and to be opened when said carriage is in a position adjacent to said feeding means, a second switch connected in circuit with said electrically controlled lifting device in parallel with said last mentioned switch, and a device connected with said second switch and arranged to be actuated by a strip which has been advanced by said feeding device to close said second switch and to maintain the same closed or until said strip has been moved past the last mentioned device.

28. In a mechanism for delivering strips of material to a punch press or the like, a feeding table, a feeding device to move a strip from said table toward said press, means to support a supply of strips adjacent to said table, a carriage movable from a position adjacent to said supporting means to a position adjacent to said table, a lifting device mounted on said carriage, means controlled in accordance with the movements of said carriage to cause said lifting device to operatively engage a strip on said supporting means and to release said strip when said carriage is in a position above said table, electrically controlled means to drive said carriage, a reversing switch and a stop switch in circuit with said electrically controlled driving means and in series one with the other, means controlled by the strip which is supported by said lifting device to open said stop switch when said carriage is in a position above said table, and means controlled by the strip which is supported by said lifting device to actuate said reversing switch when said strip has been released by said lifting device.

29. In a mechanism for delivering strips of material to a punch press or the like, a feeding table, a feeding device to move a strip from said table toward said press, means to support a supply of strips adjacent to said table, a carriage movable from a position adjacent to said supporting means to a position adjacent to said table, a lifting device mounted on said carriage, means controlled in accordance with the movements of said carriage to cause said lifting device to operatively engage a strip on said supporting means and to release said strip when said carriage is in a position above said table, electrically controlled means to drive said carriage, a reversing switch and a stop switch in circuit with said electrically controlled driving means and in series one with the other, means controlled by the strip which is supported by said lifting device to open said stop switch when said carriage is in a position above said table, means controlled by the strip which is supported by said lifting device to actuate said reversing switch when said strip has been released by said lifting device, and means controlled by a preceding strip on said table to prevent the release of the first mentioned strip by said lifting device while said preceding strip is on the table beneath said first mentioned strip.

30. In a mechanism for delivering strips of material to a punch press or the like, a feeding table, a feeding device to move a strip over said table toward said press, means to support a supply of strips adjacent to said table, a carriage movable from a position adjacent to said supporting means to a position adjacent to said table, an electrically controlled lifting device mounted on said carriage, a switch in circuit with said electrically controlled lifting device, electrically controlled driving mechanism for said carriage, a stop switch in circuit with said electrically controlled driving mechanism, means controlled by a strip supported by said lifting device to open both of said switches when said carriage is in a position above said table, a reversing switch in circuit with said electrically controlled driving mechanism and in series with said stop switch, a device mounted on said carriage and controlled by the strip which is supported by said lifting device to actuate said reversing switch when said strip is released, a second switch connected in circuit with said electrically controlled lifting device and in parallel with the first mentioned switch, and a device controlled by a preceding strip on said table to maintain said second switch closed until said preceding switch has passed from beneath the strip supported by said lifting device and to then open said second switch.

31. In a mechanism for delivering strips of material to a punch press or the like, a feeding table, feeding members projecting above said feeding table, rotatable about vertical axes and spaced apart, means for delivering a strip to said table between said feeding members, means for rotating said feeding members, means for pressing one of said feeding members toward the other to cause said strip to be gripped between them, and means for relieving the pressure on said feeding member when said strip has been advanced to a predetermined point.

32. In a mechanism for delivering strips of material to a punch press or the like, a feeding table, a pair of conical feeding members projecting above said table, said members being rotatable about vertical axes and being spaced apart and each member having a spiral groove, means for delivering a strip of material to said table between said feeding members, means for rotating said feeding

members, one of said feeding members being movable toward and from the other, a spring acting on said movable feeding member to press it toward the other member, and means controlled by the strip which is being advanced by said feeding members to automatically relieve the pressure of said spring on said feeding members.

33. In a mechanism for delivering a strip of material to a punch press or the like, a feeding table, a pair of feeding members projecting above said table, said feeding members being rotatable about vertical axes and being spaced one from the other, means for delivering a strip of material to said table between said feeding members, means for rotating said feeding members, one of said members being mounted for movement toward and from the other member, an apertured lip connected with said movable feeding member, a rod extending through said apertured lip and having a head to engage the same, means for slidably supporting said rod at a point spaced from said lip, a spring coiled about said rod and connected at one end with said rod and connected at its other end with said supporting means, and means controlled by a strip which is being advanced by said feeding members to move said rod against the action of said spring and thereby relieve the pressure of said spring on said movable member.

34. The combination with a punch press having a pair of feeding rollers one of which is movable toward and from the other, means for supporting said movable roller in its inoperative position, and means controlled by a strip inserted between said rollers to release said movable roller for movement into engagement with said strip, of a strip feeding mechanism comprising a table, feeding members projecting above said table and rotatable about vertical axes, means for delivering a strip to said table between said feeding members, means for rotating said feeding members, one of said feeding members being movable toward and from the other, a spring acting on said movable feeding member to press the same toward said other feeding member, and means controlled by the releasing means for the movable roller of said press to relieve the pressure of said spring on said movable feeding member.

35. The combination with a punch press having feeding rollers one of which is movable toward and from the other, means for supporting said movable roller in an inoperative position, and electrically operated means controlled by a strip inserted between said rollers to release said movable roller for movement into engagement with said strip, of a feeding mechanism comprising a table, feeding members projecting above said table and rotatable about vertical axes, means for delivering a strip of material to said table between said feeding members, means for rotating said feeding members, one of said feeding members being movable toward and from the other, a spring acting on said movable roller to press the same toward said other roller, and an electrically operated device to relieve the pressure of said spring on said feeding member, said electrically operated device being connected in circuit with the electrically operated releasing means for said movable roller.

36. The combination with a punch press having feeding rollers one of which is movable toward and from the other, means for supporting said movable roller in an inoperative position, and electrically operated means controlled by a strip inserted between said rollers to release said movable roller for movement into engagement with said strip, of a feeding mechanism comprising a table, feeding members projecting above said table and rotatable about vertical axes, means for delivering a strip of material to said table between said feeding members, means for rotating said feeding members, one of said feeding members being movable toward and from the other, an apertured lip connected with said movable feeding member, a rod extending through the aperture in said lip and having a head to engage the lip, and supporting member spaced from said lip and in which said rod is slidably mounted, a spring coiled about said rod and connected at one end therewith and connected at its other end with said supporting means, a magnet carried by said supporting means and connected in circuit with the electrically operated means for releasing said movable roller, and an armature for said magnet connected with said rod and so arranged that when said magnet is energized said rod will be moved against the tension of said spring.

37. In a mechanism for delivering a strip of material to a punch press or the like, a feeding table, a pair of feeding members projecting above said table, said feeding members being rotatable about vertical axes and being spaced one from the other, means for delivering a strip of material to said table between said feeding members, means for rotating said feeding members, one of said members being mounted for movement toward and from the other member, an apertured lip connected with said movable feeding members, a rod extending through said apertured lip and having a head to engage the same, means for slidably supporting said rod at a point spaced from said lip, a spring coiled about said rod and connected at one end with said rod and connected at its other end with said supporting means, means controlled by a strip which is being advanced by said feeding members to move said rod against the action of said spring and thereby relieve the pressure of said spring on said

movable member, and a lighter spring acting constantly on said movable feeding member to press the same toward said other feeding member.

38. In a mechanism for delivering a strip of material to a punch press or the like, a feeding table, a pair of feeding members projecting above said table, said feeding members being rotatable about vertical axes and being spaced one from the other, means for delivering a strip of material to said table between said feeding members, means for rotating said feeding members, one of said members being mounted for movement toward and from the other member, an apertured lip connected with said movable feeding member, a rod extending through said apertured lip and having a head to engage the same, means for slidably supporting said rod at a point spaced from said lip, a spring coiled about said rod and connected at one end with said rod and connected at its other end with said supporting means, means controlled by a strip which is being advanced by said feeding members to move said rod against the action of said spring and thereby relieve the pressure of said spring on said movable member, a supporting member adjustably mounted on said table and having supporting connection with the rod supporting bracket, and means for securing said supporting member in adjusted positions with relation to said table.

39. In a mechanism for delivering strips of material to a punch press or the like, a frame, means for supporting a supply of strips adjacent to one side of said frame, a feeding table arranged adjacent to the other side of said frame, a pair of sprocket wheels mounted adjacent to each end of said frame, the sprocket wheels of each pair being arranged one above the other, sprocket chains extending about the wheels of the respective pairs, a carriage supported by said sprocket chains for movement therewith transversely to its length between the two pairs of sprocket wheels, a lifting device mounted on said carriage, whereby the movement of said carriage with said sprocket chains will cause said lifting member to move from a position above said strip supporting means to a position above said table, and means for causing said lifting device to operatively engage a strip on said supporting means and to release said strip when said carriage is supported above said table.

40. In a mechanism for delivering strips of material to a punch press or the like, a frame, means for supporting a supply of strips adjacent to one side of said frame, a feeding table arranged adjacent to the other side of said frame, a pair of sprocket wheels mounted adjacent to each end of said frame, the sprocket wheels of each pair being arranged one above the other, sprocket chains extending about the wheels of the respective pairs, a carriage supported by said sprocket chains for movement therewith from a position above said strip supporting means to a position above said feeding table, means mounted on said frame and connected with said carriage to maintain the latter in a vertical position at all points in its travel, a lifting device mounted on said carriage, and means to control the operation of said lifting device and the movement of said carriage.

41. In a mechanism for delivering strips of material to a punch press or the like, a frame, means for supporting a supply of strips adjacent to one side of said frame, a feeding table arranged adjacent to the other side of said frame, a pair of sprocket wheels mounted adjacent to each end of said frame, the sprocket wheels of each pair being arranged one above the other, sprocket chains extending about the wheels of the respective pairs, a carriage supported by said sprocket chains for movement therewith from a position above said strip supporting means to a position above said feeding table, a guide member mounted on said frame for movement transversely thereto, a part rigidly connected with said carriage and mounted in said guide member for vertical movement with relation thereto and transverse movement therewith, a lifting device mounted on said carriage, and means to control the operation of said lifting device and the movements of said carriage.

42. In a mechanism for delivering strips of material to a punch press or the like, a frame, means for supporting a supply of strips adjacent to one side of said frame, a feeding table arranged adjacent to the other side of said frame, a pair of sprocket wheels mounted adjacent to each end of said frame, the sprocket wheels of each pair being arranged one above the other, sprocket chains extending about the wheels of the respective pairs, a carriage supported by said sprocket chains for movement therewith from a position above said strip supporting means to a position above said feeding table, bars mounted near the respective ends of said frame and extending from one side thereof to the other side, guide members slidably mounted on said bars and having vertical guideways, parts rigidly connected with said carriage and slidably mounted in the respective guideways, a lifting device supported by said carriage, and means to control the operation of said lifting device and the movement of said carriage.

43. In a mechanism for delivering strips of material to a punch press or the like, a frame, a pair of sprocket wheels mounted adjacent to each end of said frame, the sprocket wheels of each pair being arranged one above the other, sprocket chains extending about the wheels of the respective pairs, a carriage

supported by said sprocket chains for movement therewith transversely to its length between the two pairs of sprocket wheels, a lifting device mounted on said carriage, means for supporting a supply of strips adjacent to one side of said frame, a feeding table arranged adjacent to the other side of said frame, whereby the movement of said carriage with said sprocket chains will cause said lifting member to move from a position above said strip supporting means to a position above said table, means for causing said lifting device to operatively engage a strip on said supporting means and to release said strip when said carriage is supported above said table, a guide member mounted for movement transverse to the axes of said sprocket wheels, and a part rigidly connected with said carriage and mounted for vertical movement in said guide member and for transverse movement therewith.

44. In a mechanism for delivering strips of material to a punch press or the like, a frame having at one side thereof a part forming a support for the pile of strips, a table arranged near the other side thereof and at a higher level than said strip support, a support for said table arranged wholly at the outer side thereof, a strip carrier adapted to be supported by said supporting part of said frame and movable therefrom into the space beneath said feeding table, a carriage mounted on said frame for movement from a position above said strip supporting part of said frame to a position above said table, a lifting device carried by said carriage, and means controlled in accordance with the movement of said carriage to cause said lifting device to operatively engage a strip on said supporting means and to release said strip when said carriage is in a position above said table.

45. In a mechanism for delivering strips of material to a punch press or the like, a frame having at one side thereof a part forming a support for the pile of strips, a table arranged near the other side thereof and at a higher level than said strip support, a support for said table arranged wholly at the outer side thereof, a strip carrier adapted to be supported by said supporting part of said frame and movable therefrom into the space beneath said feeding table, arms pivotally mounted on said supporting part of said frame and having parts forming stops to limit the movement of said strip carrier, springs acting on said arms to hold said stops normally in the path of said strip carrier, said arms also having inclined projections arranged in the path of a succeeding strip carrier to move said arms against the action of said springs and thus move said stops out of the path of the first mentioned strip carrier, a carriage mounted on said frame for movement from a position above said strip supporting part of said frame to a position above said table, a lifting device mounted in said carriage, and means controlled in accordance with the movements of said carriage for causing said lifting device to operatively engage a strip on said supporting part of said frame and to release said strip when said carriage is positioned above said table.

46. The combination with a machine comprising a part to operate on a strip of material, cooperating members to feed said strip to said operating part, one of said members being movable to an inoperative position, and a device to retain said movable member in its inoperative position, of means to insert a strip between said feeding members while said movable member is in its inoperative position, a lifting device to lift a strip from a supply of strips and deliver the same to said inserting means, and means controlled by the strip which is being inserted between said feeding members to cause said retaining device to release said movable member when the forward end of said strip is in a predetermined position with relation to said operating part of said machine.

47. The combination with a machine comprising a part to operate on a strip of material, cooperating members to feed said strip to said operating part, one of said members being movable to an inoperative position, and a device to retain said movable member in its inoperative position, of means to insert a strip between said feeding members while said movable member is in its inoperative position, a lifting device to lift a strip from a supply of strips and deliver the same to said inserting means, an electrically controlled device to actuate said retaining device and release said movable member for movement to its operative position, a switch in circuit with said electrical controlled device, and a switch actuating device arranged to be operated by said strip when the forward end of said strip is in a predetermined position with relation to said operating part of said machine.

48. The combination with a machine having a part to operate on a strip of material, cooperating members to feed a strip to said operating parts, one of said members being movable to an inoperative position, and means to retain said movable member in its inoperative position, of means to insert a strip between said feeding members while said movable member is in its inoperative position, power operated means to deliver a strip to said inserting means, and strip controlled means for controlling the delivery of a strip by said delivery means and for actuating said retaining device to cause said movable feeding member to move to its operative position when said strips is in a predetermined position with relation to said operating part of said machine.

49. The combination with a machine hav-

ing a part to operate on a strip of material, cooperating members to feed a strip to said operating part, one of said members being movable to an inoperative position, and means to retain said movable member in its inoperative position, of means to insert a strip between said feeding members while said movable member is in its inoperative position, power operated mechanism to lift a strip from a supply of strips and deliver the same to said inserting means, means controlled by the strip which is supported by said lifting mechanism to control the delivery of said strip, and means operated by said strip when it has been inserted between said feeding members a predetermined distance to cause said retaining device to release said movable feeding member.

50. The combination with a machine having a part to operate on a strip of material, cooperating members to feed a strip to said operating part, one of said members being movable to an inoperative position, and means to retain said movable member in its inoperative position, of means to insert a strip between said feeding members while said movable member is in its inoperative position, power operated mechanism to lift a strip from a supply of strips and deliver the same to said inserting means, means controlled by the strip which is supported by said lifting mechanism to control the delivery of said strip, means operated by said strip when it has been inserted between said feeding members a predetermined distance to cause said retaining device to release said movable feeding member, and means controlled by a strip which has been delivered to said inserting means to prevent the delivery of a succeeding strip until the first mentioned strip has been moved from a position beneath the succeeding strip.

51. The combination with a machine having a part to operate on a strip of material, mechanism to feed said strip to said operating part, means to render said feeding mechanism inoperative, and other means to complete the movement of said strip past said operating part, of means to insert a strip in said feeding mechanism while the latter is inoperative, power operated mechanism to deliver a strip to said inserting means, and means controlled by a strip in said machine to prevent the delivery mechanism from delivering a succeeding strip to said inserting means until said feeding mechanism has been rendered inoperative.

52. The combination with a machine having a part to operate on a strip of material, mechanism to feed said strip to said operating part, means to render said feeding mechanism inoperative, and other means to complete the movement of said strip past said operating part, of means to insert a strip in said feeding mechanism while the latter is inoperative, power operated mechanism to deliver a strip to said inserting means, means controlled by a strip in said machine to prevent the delivery mechanism from delivering a succeeding strip to said inserting means until said feeding mechanism has been rendered inoperative, and means actuated by said succeeding strip after it has been inserted in said feeding mechanism to cause said feeding mechanism to be rendered operative.

53. The combinaton with a machine having a part to operate on a strip of material, rollers to feed a strip of material to said operating part, means to move one of said rollers to an inoperative position, a device to retain said movable roller in its inoperative position, and other means to complete the movement of said strip past said operating part, of a table arranged in advance of said feeding rollers, power operated mechanism to deliver a strip to said table, means to feed said strip over said table and between said feed rollers when said movable roller is in its operative position, means actuated by said strip after it has been moved between said feed rollers to cause said retaining device to release said movable roller, means controlled by said strip as it is advanced by said feed rollers to cause said retaining device to again retain said movable roller in its inoperative position, and means controlled by said strip as it is advanced by said feed rollers to prevent said delivery mechanism from delivering a succeeding strip to said table until the last mentioned means has been actuated.

54. In a machine of the character described, mechanism for feeding strips of material to said machine and comprising a member which is movable to an inoperative position, a device to retain said member in its inoperative position, a table leading to said feeding mechanism, means for supporting a supply of strips adjacent to said table, a strip lifting device movable from a position adjacent to said supply of strips to a position above said table, means controlled by the position of said lifting device to cause a strip supported thereby to be deposited on said table, means for moving the forward end of said strip past said feeding mechanism, and means arranged beyond said feeding mechanism and controlled by said strip to cause said retaining device to release said movable member for movement to its operative position.

55. In a machine of the character described, having a pair of feed rollers one of which is movable toward and from the other, a retaining device to hold the movable roller in spaced relation to the other roller, driving mechanism for said rollers, and a device to control the operative connection between said

driving mechanism and said rollers, a magnet to hold said controlling device normally in an operative position, a switch in circuit with said magnet, mechanism including a lifting magnet for delivering a strip of material to said feeding rollers while the latter are in their separated positions, a switch in circuit with said lifting magnet, means including a magnet for moving said roller retaining device to its inoperative position, means controlled by a strip which has been inserted between said feeding rollers for initially energizing the last mentioned magnet, a switch in circuit with said last mentioned magnet to maintain the same energized independently of the first mentioned energizing means, a bracket pivotally supported in advance of said feeding rollers, an arm pivotally mounted on said bracket, yieldable means for holding said arm normally against movement with relation to said bracket, rollers carried by said bracket and said arm, spaced apart a distance sufficient to permit a strip of normal thickness to pass between the same and so arranged that said strip will elevate said rollers and cause said bracket and said arm to move in unison and that a strip of abnormal thickness will further separate said rollers to cause said arm to move with relation to said bracket, means for so connecting said bracket and said arm with the switch for said lifting magnet and the switch for the magnet which operates said retaining device that said switches will be closed when said bracket and said arm are elevated in unison. said arm being so connected with the switch for the magnet which controls the connection of said rollers with the operating mechanism that said switch will be opened when said arm is moved relatively to said bracket.

56. In combination with a machine having feed rollers one of which is movable toward and from the other, and a device to retain said movable roller in spaced relation to the other roller, a feeding table leading to said feed rollers, means for delivering a strip of material to said table, a feeding device to move said strip between said feed rollers while the latter are in their separated positions, means controlled by said strip to retract said retaining device and cause said movable roller to operatively engage said strip when the forward end of said strip has been moved to a predetermined position with relation to said machine, means controlled by said strip to hold said roller retaining device in its inoperative position until the rear end of said strip has been moved to a position adjacent to said feeding rollers and to then cause the same to be moved to its opertive position, and means controlled by said strip to prevent the delivery of a second strip to said table until the first strip has been withdrawn therefrom.

57. In combination with a machine having feed rollers one of which is movable toward and from the other, and a device to retain said movable roller in spaced relation to the other roller, a feeding table leading to said feed rollers, means for delivering a strip of material to said table, a feeding device to move said strip between said feed rollers while the latter are in their separated positions, means controlled by said strip to retract said retaining device and cause said movable roller to operatively engage said strip when the forward end of said strip has been moved to a predtermined position with relation to said machine, electrically controlled means to hold said roller retaining device in its inoperative position until the rear end of said strip has been moved to a position adjacent to said feed rollers and to then release said retaining device, electrically controlled means to prevent the delivery of a second strip to said table until the first strip has been withdrawn therefrom, switches in circuit with the respective electrically controlled means, and a single strip controlled device to actuate both switches.

58. In a mechanism for delivering strips of material to a punch press or the like, a feeding device, means to support a supply of strips adjacent to said feeding device, a carriage movable from a position adjacent to said supporting means to a position adjacent to said feeding device, a lifting device mounted on said carriage, means controlled in accordance with the movements of said carriage to control the operation of said lifting device, a motor to drive said carriage, a switch in circuit with said motor, means controlled in accordance with the movement of said carriage to open said switch and stop said motor, and an electrically controlled brake for said motor connected in circuit with said switch.

59. In a mechanism for delivering strips of material to a punch press or the like, a feeding device, means to support a supply of strips adjacent to said feeding device, a carriage movable from a position adjacent to said supporting means to a position adjacent to said feeding device, a lifting device mounted on said carriage, means controlled in accordance with the movements of said carriage to control the operation of said lifting device, a motor to drive said carriage, a switch in circuit with said motor, means controlled in accordance with the movement of said carriage to open said switch, and stop said motor, a brake member carried by the shaft of said motor, a second brake member, springs to move said second brake member into engagement with the first mentioned brake member, and a magnet to move said second brake member against the action of said springs to an inoperative position, said magnet being connected in circuit with said switch.

60. In a mechanism for delivering strips of material to a punch press or the like, a feeding device, means to support a supply of strips adjacent to said feeding device, a carriage movable from a position adjacent to said supporting means to a position adjacent to said feeding device, a lifting device mounted on said carriage, means controlled in accordance with the movements of said carriage to control the operation of said lifting device, a motor to drive said carriage, said motor having two armatures rotatable in opposite directions and a single armature shaft, separate circuits for said armatures, switches to control said circuits, a brake member secured to said armature shaft, a second brake member mounted about said shaft and held against rotation, springs to move said second brake member into engagement with the first mentioned brake member, and a magnet to withdraw said second brake member against the action of said springs, said magnet being connected in circuit with both armatures.

61. The combination with a machine having a part to operate on successive portions of a strip of material, mechanism to feed a strip to said operating part, and to cause said strip to travel in a substantially straight line, a table arranged in advance of said feeding mechanism, and means to move a strip over said table and deliver the same to said feeding mechanism, of guide members yieldably mounted on said table to engage the respective edges of a curved strip and position the forward end of said strip slightly off center with relation to said operating part.

62. The combination with a machine having a part to operate on successive portions of a strip of material, mechanism to feed a strip to said operating part, a table arranged in advance of said feeding mechanism, and means to move a strip over said table and deliver the same to said feeding mechanism, of guide members mounted on said table in advance of said feeding mechanism for movement transversely to said table and adapted to engage the edges of a strip of material delivered to said feeding mechanism, stops to limit the inward movement of said guide members, and yieldable means acting on said guide members to hold the same normally in engagement with the respective stops, said yieldable means being arranged to exert a greater pressure on one guide member than on the other guide member.

63. The combination with a machine having a part to operate on successive portions of a strip of material, mechanism to feed a strip to said operating part, a table arranged in advance of said feeding mechanism, and means to move a strip over said table and deliver the same to said feeding mechanism, of arms pivotally mounted on said table and extending lengthwise thereof, guide members carried by said arms and extending above said table, stops to limit the inward movement of said arms, and a coiled spring connected at its respective ends with said arms at different distances from the axes of the respective arms.

In testimony whereof, I affix my signature hereto.

GEORGE H. LELAND.