

June 3, 1930.

F. T. WOOD

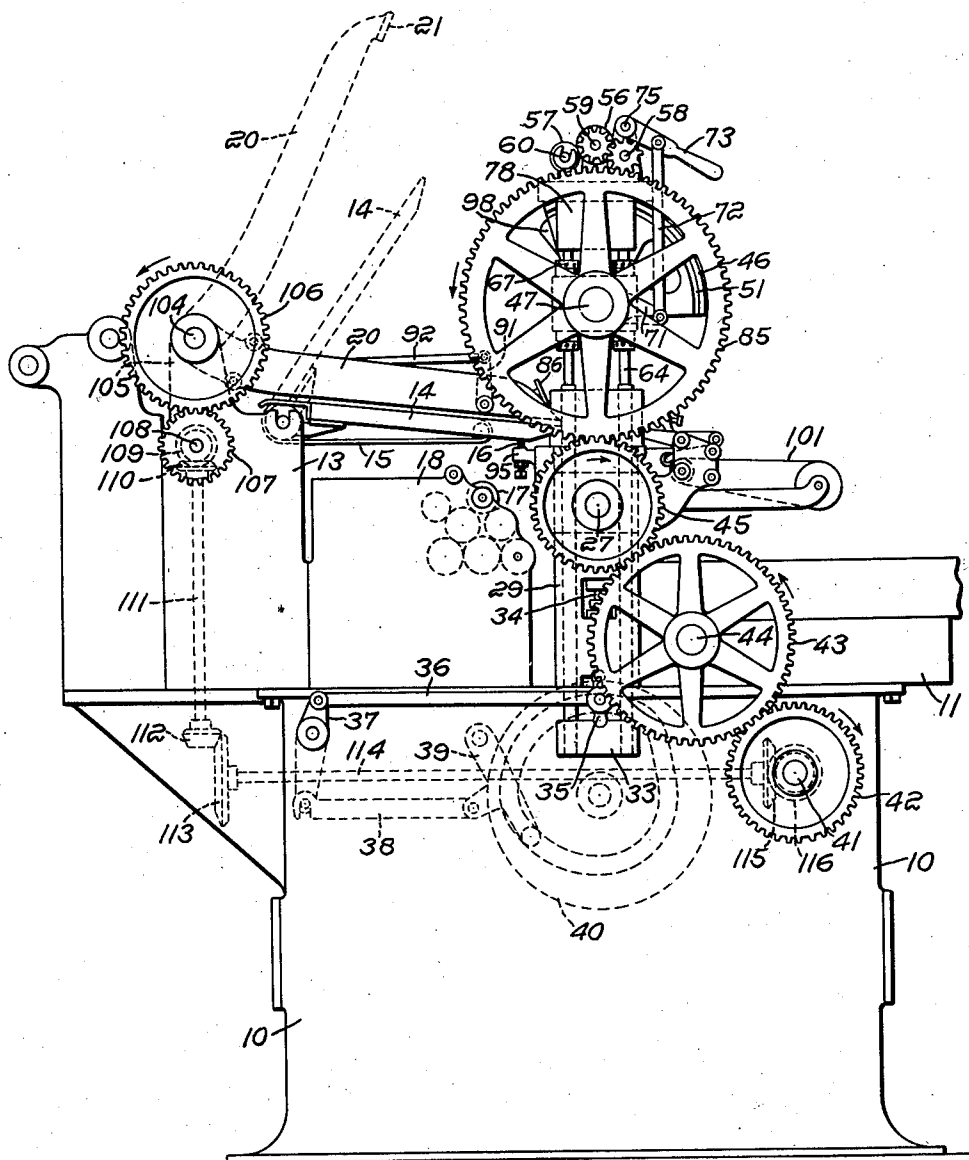
1,761,607

PRINTING PRESS

Filed June 22, 1929

5 Sheets-Sheet 1

Fig. 1.



Inventor:
Frank T. Wood,
by Emory, Smith, Varney & Townsend
Attys.

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F. T. WOOD

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5 Sheets-Sheet 2

Fig. 2.

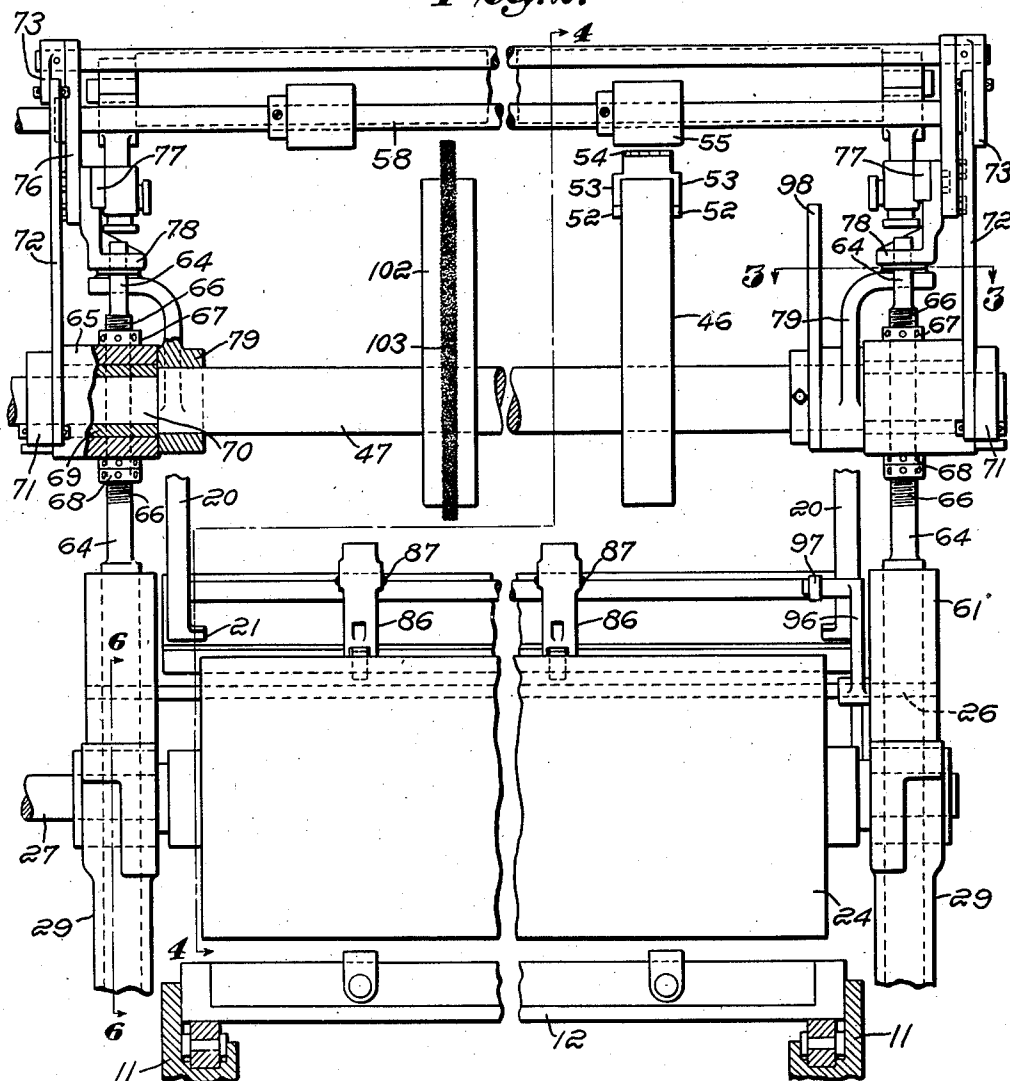
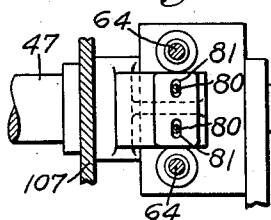


Fig. 3.



Inventor:
Frank T. Wood,
by Emory, Smith, Varney & Townsend
Att'ys.

June 3, 1930.

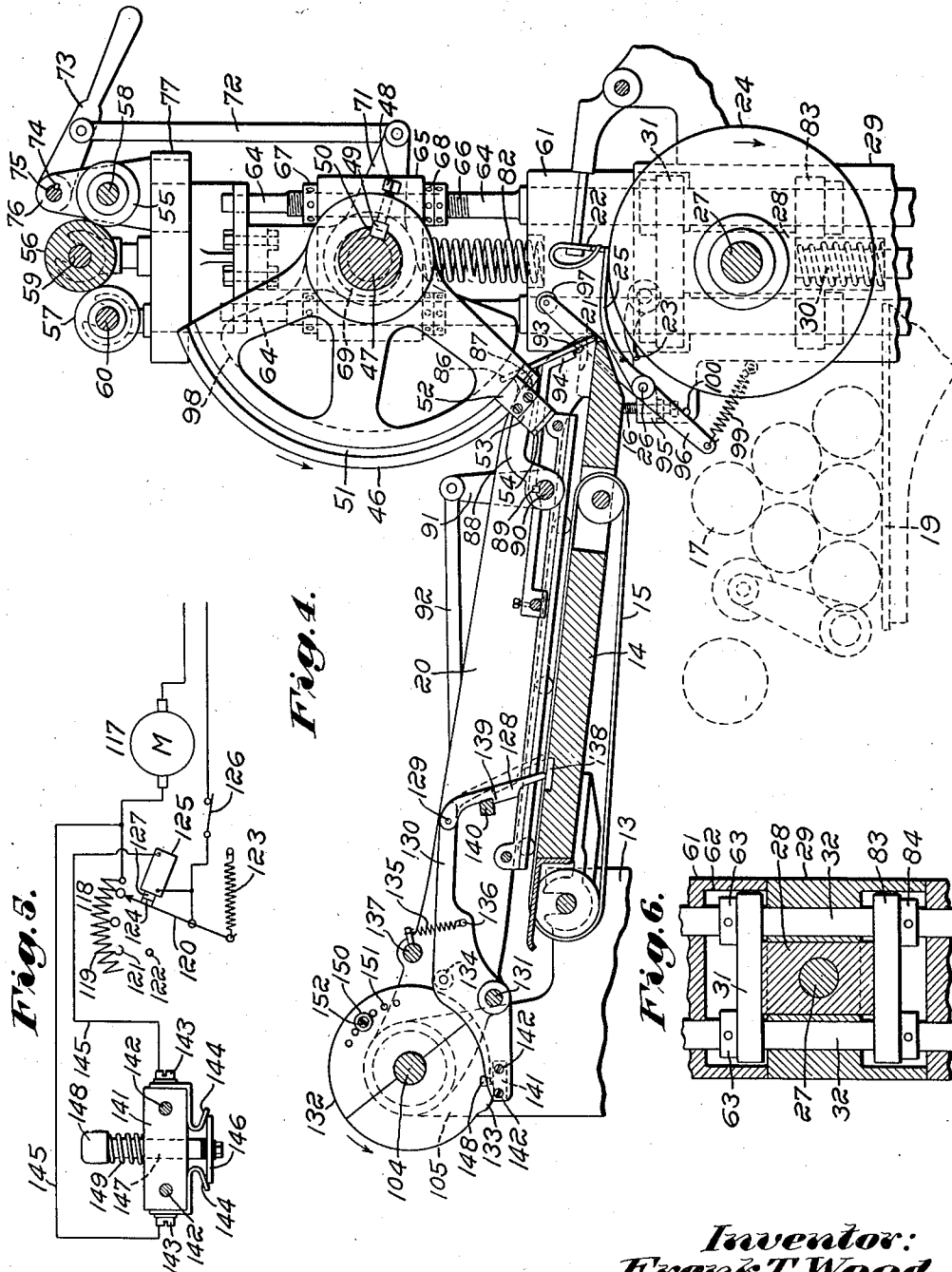
F. T. WOOD

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5 Sheets-Sheet 3



Inventor:
Frank T. Wood,
 by Emery, Borth, Varney & Townsend
 Attys.

June 3, 1930.

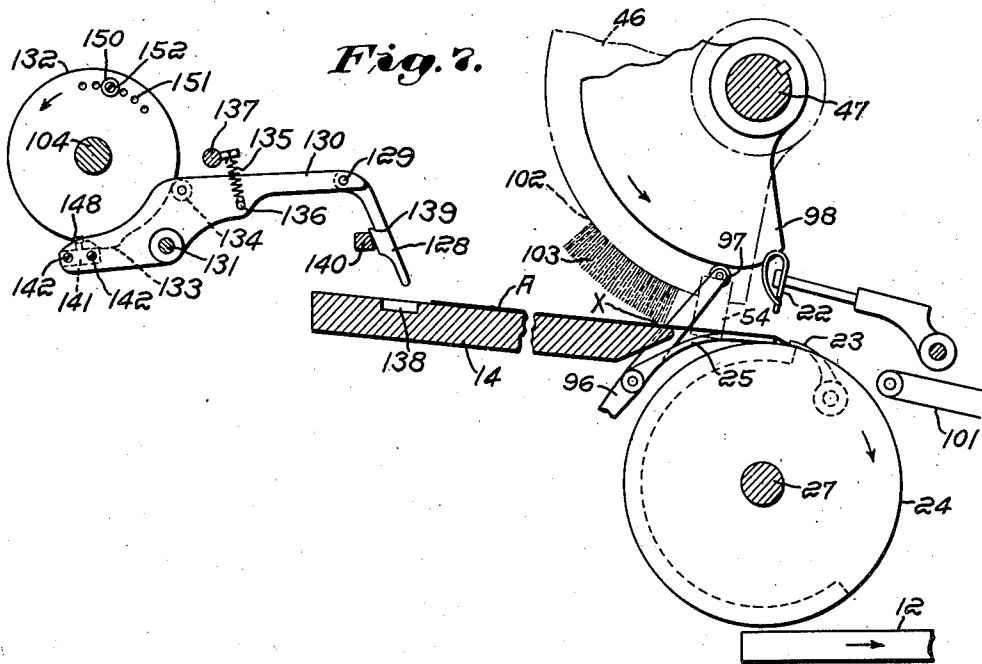
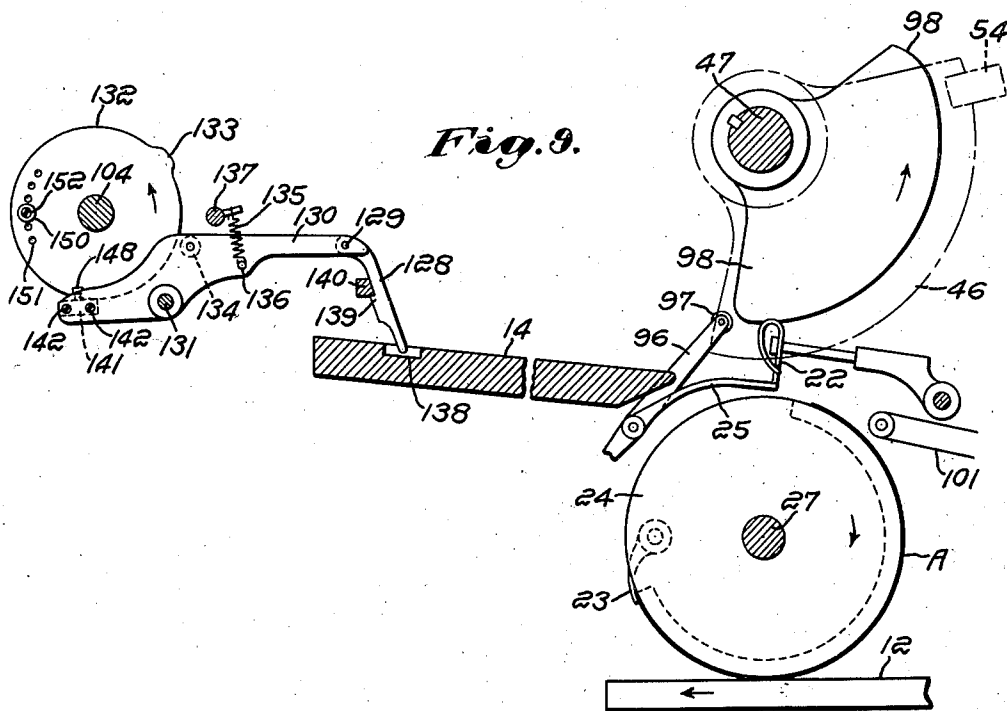
F. T. WOOD

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5 Sheets-Sheet 4



Inventor:
Frank T. Wood,
by *Emory, Brath, Parry & Townsend*
Attys.

June 3, 1930.

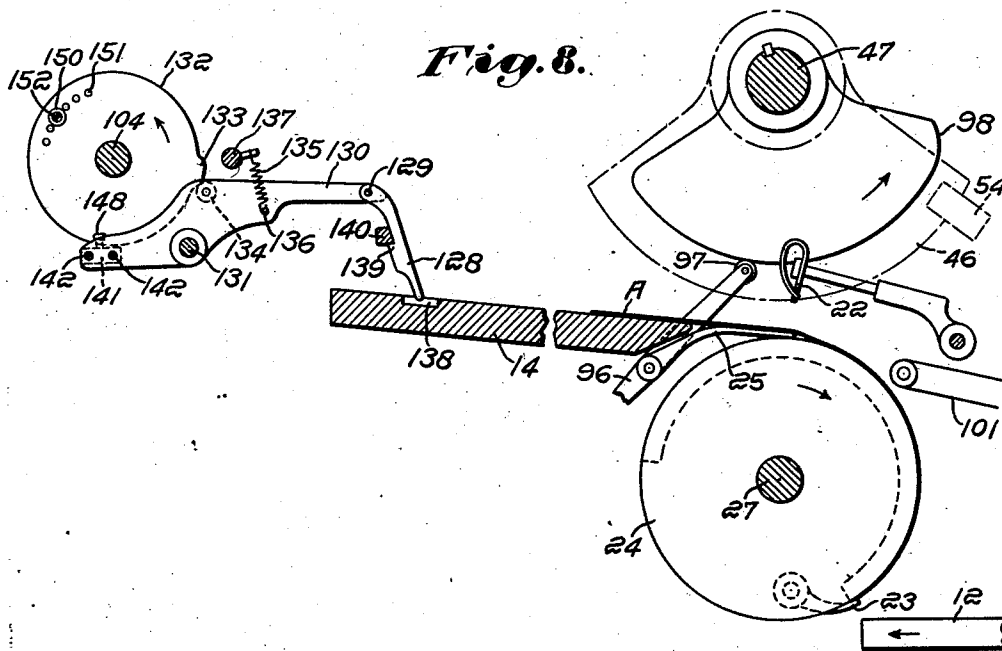
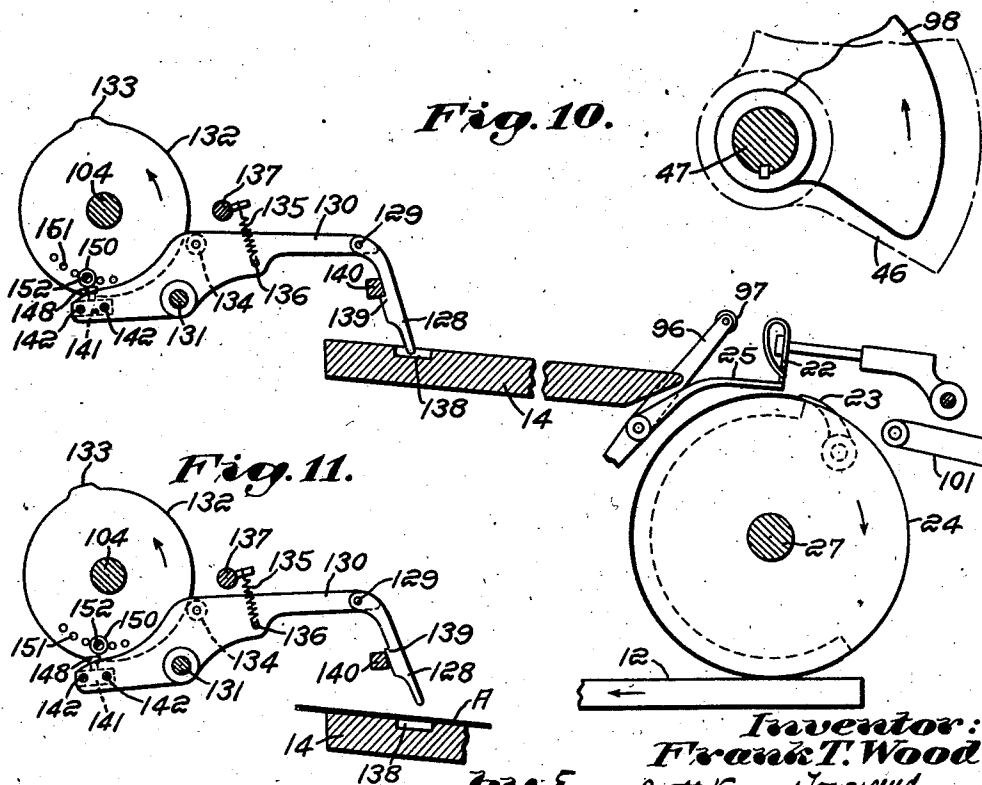
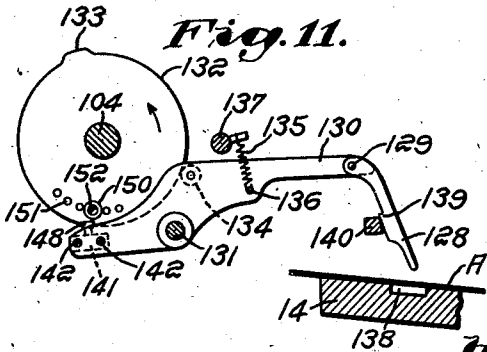
F. T. WOOD

1,761,607

PRINTING PRESS

Filed June 22, 1929

5 Sheets-Sheet 5



Inventor:
Frank T. Wood,
by Emory, Orth, Varney & Townsend
Attys.

UNITED STATES PATENT OFFICE

FRANK T. WOOD, OF LARCHMONT, NEW YORK, ASSIGNOR TO AMERICAN BANK NOTE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

PRINTING PRESS

Application filed June 22, 1929. Serial No. 373,014.

This invention relates to two-revolution cylinder and bed presses, and aims to provide means for the conversion of a standard one-color press of this class to a two-color press. This invention is in the nature of an improvement on the subject matter of my Patent No. 1,750,557 dated March 11, 1930. The particular type of press selected for illustration is the well-known and widely used Kelly press, which is the subject matter of several patents, including patents to William M. Kelly, 1,096,036, dated May 12, 1914; 1,336,841, dated April 13, 1920; 1,339,654, dated May 11, 1920; and 1,227,450, dated May 22, 1917, to which reference may be had for such details as are not shown herein.

The invention will be best understood by reference to the following description, when taken in connection with the accompanying drawings of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation of a portion of a Kelly press, in connection with which one embodiment of my invention is shown;

Fig. 2 is an end elevation of the same on an enlarged scale, and partly in vertical section, as viewed from the right-hand side of Fig. 1;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view on the irregular line 4—4 of Fig. 2;

Fig. 5 is a diagrammatic view illustrating the electrical system which cooperates with the stop mechanism to stop the press;

Fig. 6 is a sectional view on line 6—6 of Fig. 2; and

Figs. 7 to 11, inclusive, are diagrammatic views illustrating the cycle of operations.

Referring to the drawings, and to the embodiment of the invention which is illustrated therein, there is shown a press having a frame (see Fig. 1), comprising a base 10 and ways 11 for a reciprocating type-bed 12, (see Fig. 2). Secured to the base on opposite sides thereof (see Fig. 1) are upwardly projecting brackets 13, which support a pivoted feed board or table 14, having associated

therewith feed tapes 15. The front end of the feed board is normally supported by stop screws 16, but it may be raised to some such position as that shown in dotted lines in Fig. 1, to afford access to inking mechanism therebeneath, including a group of inking rollers 17, supported on brackets 18 on opposite sides of the base, and cooperating with an ink plate 19 (see Fig. 4) secured to the reciprocating type-bed.

The brackets 13 also afford pivotal support for arms 20 (see Fig. 1), which are normally arranged immediately above the side portions of the feed board 14, but may be elevated to some such position as that shown in dotted lines in Fig. 1, when the feed board is to be elevated for access to the inking mechanism. These arms are rigidly connected together to swing as one, and each is provided with a foot 21 (see Fig. 4), normally resting upon the feed board 14. These arms carry several devices, including detector mechanism which will be described hereinafter.

As each sheet is fed forward on the feed board, its front edge engages pivoted front register stops 22, which are lifted as the sheet is seized by grippers 23 carried by an impression cylinder 24, which makes two revolutions for each reciprocation of the bed. The gripper operating mechanism is the subject matter of the aforesaid Patents 1,227,450 and 1,339,654, and is not shown herein, because its construction and mode of operation are well known, and not necessary to a proper understanding of the present invention. The gap between the feed board and the impression cylinder is bridged by fingers 25, which, in accordance with my invention, are mounted on a rockshaft 26, by which they are raised and lowered as hereinafter described.

The impression cylinder is secured to a shaft 27, the latter being mounted in bearing blocks 28 (see Fig. 4), which are mounted to slide vertically in ways presented by brackets 29. The impression cylinder must be raised at the proper time, so that the type on the bed shall not engage the cylinder during the reverse movement of the bed. The mechanism for raising and lowering the cylinder

is disclosed in the aforesaid Patent No. 1,096,036, but will now be described, as a knowledge of it is necessary to a proper understanding of the present invention, particularly as the mechanism has been somewhat modified in accordance with my invention, as will presently appear.

Springs 30, disposed beneath the bearing block 28, tend to move the latter, and consequently the impression cylinder, upwardly. Downward movement of the bearing blocks in opposition to the springs is accomplished by cross-bars 31 (best shown in Fig. 6), which are connected by rods 32 with lower cross-bars 33 (see Fig. 1). The upward pressure exerted by the springs can be adjusted by screws 34, fully shown and described in Patent No. 1,096,036. Usual toggles 35, also disclosed in said patent, are interposed between the adjustment screws and the lower cross-bars, and are operated by links 36, a lever 37, link 38, cam lever 39, and cam 40, all of which are fully shown and described in Pat. No. 1,096,036. When these toggles are straightened to the position shown in Fig. 1, the impression cylinder is drawn down, while on the other hand, when the toggles are "open" or "broken", the springs 30 are allowed to raise the impression cylinder to a position where it will not be engaged by the type on the bed.

Rotation of the impression cylinder is accomplished by driving mechanism fully disclosed in the aforesaid Patent No. 1,096,036. So much of this driving mechanism as is necessary to a proper understanding of the present invention is shown herein (see Fig. 1), the same comprising a countershaft 41, to which is secured a gear 42, meshing with and driving an idler 43 mounted on a stud 44, said idler gear meshing with a gear 45 secured to the shaft 27 of the impression cylinder. The gear 45 is also utilized for the driving of the auxiliary printing mechanism presently to be described. The type-bed reciprocating mechanism is neither shown nor described herein, as it is fully disclosed in Patent No. 1,336,841, and need not be repeated here, as its functions and mode of operation are well known. It is sufficient to say that the bed makes one complete reciprocation to two revolutions of the impression cylinder, that the impression is made during one stroke of the bed, and that the impression cylinder is elevated so that it will not contact with the type during the reverse stroke of the bed.

The auxiliary mechanism will now be described, reference being had at first to Fig. 4. An auxiliary type carrier, herein a sector 46 of a cylinder, is secured to a shaft 47, as by a set-screw 48 and a key or feather 49, the latter in the present example being slidably received in a keyway 50 in the shaft, thereby to permit of adjustment of the sector axially within certain limits determined by

the detector mechanism, the front register mechanism, the sheet supporting fingers and other factors. The type carrier has suitable provision for the attachment of type thereto, as by the provision of grooves 51 in its sides to receive tongues 52 presented by a clamp 53. The type may occupy the whole or any part of the sector, the circumferential length of which is preferably the same as that of the impression surface. Herein the type is a numbering machine 54 of common form, though it should be understood that the type may be of any suitable character or dimensions. The inking of the type may be accomplished by appropriate inking instrumentalities, herein a set of inking and ink-distributing rolls 55, 56 and 57, mounted on shafts 58, 59 and 60, respectively.

In this embodiment, the auxiliary type carrier, with its inking mechanism, is directly above the impression cylinder, and is mounted to move vertically with the latter. This is conveniently accomplished by mounting these mechanisms in a frame-work which will now be described, reference being had at first to Fig. 6. The brackets 29, which afford guideways for the bearing blocks 28, are surmounted by deep caps 61, which are substituted for the relatively low, shallow caps disclosed in Patent No. 1,096,036. These caps are chambered, as at 62, to provide a working clearance for the upper cross-bars 31, as is the case with the caps of the patent, but the rods 32, instead of terminating in heads just above the cross-bars, are provided with collars 63, and are prolonged upwardly beyond said collars, and, as shown in Fig. 4, are provided with reduced portions 64, which extend through split bearing boxes 65, herein conveniently secured to the rods as by providing the latter with screw-threads 66 to receive nuts 67 and 68 above and below the boxes.

Referring now to Fig. 2, the boxes contain bearing bushings 69, which receive reduced portions 70 of the shaft 47. Herein, these bushings are eccentric (see Fig. 4), so that by turning them in their boxes, the shaft may be raised to prevent contact of the type 54 on the carrier 46 with the impression cylinder 24. Turning of the bushings is conveniently accomplished by providing them with arms 71 (best shown in Fig. 4), connected by links 72 with hand levers 73, suitably secured as by keys 74 to a shaft 75 mounted in bearing brackets 76, which also provide bearings for the ink-roll shaft 58. These brackets are secured to horizontal bars 77, which afford bearings for the ink roll shafts 59 and 60. Referring now to Fig. 2, the bars 77 are conveniently supported on the shaft 47, and partake of its vertical movement under the influence of the eccentric bushings, but do not partake of its horizontal movement. Herein, there is secured to

each bar 77 a slide 78 guided vertically by the rods 64, and connected to a collar 79 on the shaft, by a suitable articulated connection, such as studs 80 (see Fig. 3), extending through horizontally elongated holes 81 in an upward and lateral prolongation of the collar.

Referring again to Fig. 4, it will be remembered that the weight of the impression cylinder 24 is sustained by the springs 30, which yield and allow the cylinder to descend under the influence of the toggles 35 (Fig. 1). It will also be remembered that the auxiliary printing mechanism is mounted on the rods 32; hence it follows that the additional load of the auxiliary printing mechanism is thrown onto the rods. Since the springs 30 are designed to carry only the load of the impression cylinder, its bearing blocks and the rods, it is evident that unless the strength of the springs is to be increased, they should be aided by other springs. To this end, I have provided auxiliary springs 82, interposed between the caps 61 and the bearing blocks 65, to carry the additional load.

When the impression between the impression cylinder and the auxiliary type carrier takes place, there is a tendency for the former to be displaced downwardly with relation to the latter. One convenient means for preventing this downward displacement of the impression cylinder is illustrated in Fig. 6, and comprises stops, herein bars 83 resting on collars 84 secured to the rods 32, said bars extending beneath and in engagement with the bearing blocks 28, which carry the impression cylinder shaft. These bars, therefore, constitute stops which maintain the spacing of the impression cylinder and the auxiliary type carrier.

Referring now to Fig. 1, rotation of the auxiliary type carrier is conveniently accomplished by securing to the shaft 47 a gear 85, which meshes with and is driven by the gear 45. The ratio of the gear 85 to the gear 45 is two to one, and the pitch circles of the gears correspond with the respective diameters of the auxiliary type surface and the impression cylinder.

Referring to Fig. 4, it will be remembered that the feed board 14 and the arms 20 must be raised to afford access to the inking mechanism therebeneath. The auxiliary type carrier is made in the form of a sector, and must be turned to the correct position to permit the feed board and arms to be raised. In the aforesaid pending application, a part of the detector mechanism projects a considerable distance beyond the front edge of the feed board, and in accordance with said application, is specially constructed and arranged to permit it to be retracted. However, according to the present invention, this retraction is not necessary, as the detector mechanism herein does not project beyond the front edge

of the feed board, but is moved back so that the feeler fingers hereinafter described are substantially in line with the front edge of the feed board. It is found that this position is just as satisfactory as the former arrangement of the feeler fingers beyond the front edge of the feed board. The present arrangement is much more satisfactory, because no preliminary rearrangement of the detector mechanism is necessary before raising the feed board.

Each sheet as it passes from the feed board to the impression cylinder strikes and lifts feelers 86, which are mounted on pivots 87 on arms 88, the latter being secured, as by keys 89 to a rockshaft 90, which has bearings in the arms 20. There is also secured to this rockshaft an arm 91, to which is pivoted a link 92, which forms a part of the usual stop or throw-off mechanism of the Kelly press, the link having a horizontal reciprocatory motion and controlling a trip mechanism (not shown herein, but shown in Patent No. 1,336,841), by which, if the link is prevented from reciprocating, the press is stopped, or the impression is thrown off.

If for any reason no sheet engages the feelers 86 during any given cycle, they are locked against upward movement by reason of the fact that each feeler is provided on its rear face with a tooth 93, which engages beneath an abutment 94, against the front face of which the feeler rests, except when it is thrust forwardly and upwardly by a sheet passing therebeneath. When the feeler is thus locked, the link 92 cannot reciprocate, and the tripping mechanism is operated to stop the press or to throw off the impression.

In this application, as in the aforesaid application, the fingers 25, which bridge the gap between the front edge of the feed board 14 and the impression cylinder 24, are secured to the rockshaft 26 by which they may be raised and lowered. This rockshaft is mounted in lugs 95 on the brackets 29. Rocking movement of the shaft is conveniently accomplished by securing thereto a lever 96, carrying a cam roller 97 adapted to be engaged periodically by a cam 98 secured to the shaft 47. When the cam roller is not engaged by the cam, the lever 96 is held by a spring 99 against a stop 100.

The operation of the fingers 25 is illustrated in Figs. 7 to 10, inclusive. Fig. 10 shows the front register stops 22 lowered, and the fingers 25 elevated to clear a previously fed sheet, which is being printed by the type on the bed 12, and is about to be carried by the now depressed cylinder 24 onto delivery tapes 101. After the rear edge of the sheet has passed the fingers 25, the impression cylinder rises (see Fig. 7), and the fingers guide the front edge of the sheet A to the grippers 23, by which it is seized, and at the same instant, the stops 22 are lifted. At this

point, it should be noted that the cam 98 is caused to engage the cam-roller 97, by reason of the fact that the cam is lowered by the shaft 47 to which it is secured. In fact, the cam 98 might be simply a complete disk, concentric with the shaft 47, were it not for the fact that it would be in the way of the feed board 14, when the latter is being lifted.

In Fig. 7, as previously stated, the impression cylinder is up, and the type-bed is travelling on its idle movement forward (toward the right), the impression by the type on the auxiliary type carrier is about to commence, and this will happen as soon as the surface of the type 54 reaches a plane containing the axis of the shafts 27 and 47, but here it should be noted that the fingers 25 are holding the sheet elevated somewhat above the surface of the impression cylinder, and furthermore that the path of the type face commences to intersect the plane of the paper at a point *a*, a considerable distance rearwardly of this plane. The sheet should, therefore, be depressed below the path of the type just as soon as the paper leaves the front edge of the feed board. Otherwise, premature contact of the type with the paper will produce a blurred impression, or smutch. One convenient sheet-depressing means is a rotating presser 102 (see Fig. 2), carried by the shaft 47, and herein provided with a resilient surface for contact with the paper. Such surface, in the present example, is presented by radially-disposed bristles 103, on the presser. The radius of this surface should be slightly greater than the radius of the type face.

Fig. 8 shows the impression cylinder, as well as the auxiliary type carrier, lowered, and the type bed travelling rearwardly about to commence an impression of the type on the bed with the sheet on the cylinder. Fig. 8 also shows the fingers 25 lowered. This is important, as otherwise the sheet would be hanging from the fingers, and the making of a clean, clear impression by the type on this part of the auxiliary type carrier would be impossible. Fig. 9 shows the impression cylinder lowered, and the lower impression continuing, but the rear edge of the sheet has now passed the fingers 25, and the latter and the stops 22 are now in readiness to receive another sheet.

Except for the change in the location of the detector feeler fingers 86, the machine, as thus far described, is the same as that disclosed in the aforesaid pending application, but a full disclosure of the machine as heretofore constructed is essential to a proper understanding of the present invention, the remainder of which will now be described.

In the Kelly press, as regularly constructed, there is mechanism not described in the foregoing application, a knowledge of which is essential to an understanding of the present invention. This mechanism will now be de-

scribed, reference being had at first to Fig. 1. A shaft 104, journaled in bearings 105 presented by the brackets 13, is driven by mechanism comprising a spur gear 106 secured to said shaft, and meshing with a pinion 107, which is secured to a shaft 108. To this shaft there is secured a mitre gear 109, meshing with a mitre gear 110, which is secured to one end of a shaft 111, to the other end of which there is secured a bevel pinion 112, meshing with a bevel gear 113, which is secured to one end of a shaft 114. There is secured to the other end of this shaft a bevel gear 115, meshing with a bevel pinion 116, which is secured to the countershaft 41. This mechanism drives the shaft 104 continuously during the operation of the press. The shaft 104 carries certain cams, which are not shown herein because they are not necessary to an understanding of the present invention. One of these cams is the actuator for the link 92.

The Kelly press is driven by an electric motor 117 (see Fig. 5), which is controlled by a rheostat 118, having a variable resistance 119 controlled by a lever 120, which is a part of the motor circuit, and engages a series of contacts 121 in succession. This lever, in its normal or initial position, engages a stop 122, against which it is held yieldingly by a spring 123. The lever carries an armature 124, co-operating with an electro-magnet 125, which is connected in parallel with the motor circuit. In the motor circuit, there is a switch 126, which, when closed, completes the circuit and starts the motor. The motor is then brought up to speed gradually, by moving the lever 120 from its normal position until the armature 124 is brought into contact with the core 127 of the electro-magnet 125, which then holds the armature and the lever in the position shown in Fig. 5, against the yielding resistance presented by the spring 123. The lever remains in this position, and the motor continues to run until the motor circuit is broken by opening the switch 126, whereupon the magnet is deenergized, and the spring 123 restores the lever to its initial position. In the early models of the Kelly press, the rheostat lever is moved from its initial position by hand, while in the later models, it is moved automatically to cut out the starting resistance; but in Fig. 5, the earlier and simpler form is shown for convenience. In accordance with the present invention, this motor circuit is modified by the inclusion of an automatic switch presently to be described.

Referring now to Fig. 9, it will be remembered that, while the sheet is being printed by the type on the type-bed 12, the stops 22 and the fingers 25 are in readiness to receive another sheet. But assuming that for some reason the feeding mechanism should fail to feed another sheet along the feed board, if it were not for the second detector mechanism presently to be described, the type 54

would come around and make an imprint on the paper covering of the impression cylinder. Moreover, if the type 54 are a part of an automatic numbering machine, the number-shifting plunger of the machine would strike the impression cylinder and shift the wheel or wheels of the numbering machine. It would then be necessary to stop the press by hand, clean the ink from the paper covering of the impression cylinder, and shift the numbering wheel or wheels backward before restarting the press. This inconvenience and loss of time is avoided by the provision of a second detector mechanism now to be described, which, in the absence of a following sheet, breaks the motor circuit, and causes the press to stop.

Referring now to Fig. 4, the second detector mechanism comprises a feeler finger 128, which is loosely hung on a pivot 129 on a lever 130, the latter being mounted on a fulcrum, herein a rod 131 carried by the arms 20, which are pivoted to turn about the axis of the shaft 104. In the normal operation of the press, this lever is rocked by appropriate means, herein a cam 132 mounted on the shaft 104, and having a lobe 133 adapted to engage a roller 134 carried by the lever. A suitably-arranged spring 135, herein attached at one end to a pin 136 on the lever, and at the other end to a rod 137 mounted on the arms 20, tends to restore the lever to its initial position after it has been moved by the cooperative action of the cam lobe 133 and roller 134. The feed board 14 is provided with a depression 138 to receive the lower end of the feeler finger (see Fig. 9), when the latter is lowered by the lever. If a sheet is feed along the feed board, its front edge engages and lifts the feeler finger to the position shown in dotted lines in Fig. 4, but if no sheet is present, the feeler finger is locked against upward movement by reason of the fact that it is provided on its rear face with a tooth 139, which engages beneath an abutment 140 against the front face of which the feeler rests, except when it is thrust forwardly and upwardly by a sheet passing therebeneath. This abutment is conveniently in the form of a rod supported at its ends by the arms 20. When the feeler is thus locked, the lever 130 cannot rock, but is then utilized to cause the motor circuit to be broken. This is conveniently accomplished by mounting on the lever a switch, best shown in Fig. 5, which comprises an insulating mounting block 141, secured as by screws 142 to the lever 130. Secured to this block, as by screws 143, there are switch plates or contacts 144, connected by wires 145, one to the electro-magnet 125 and the other to the other side of the motor circuit. A movable switch-plate or contact 146 is mounted on, but insulated from, a plunger 147, which extends through and is slidable in the insulating block 141. This plunger is

provided with a head 148, and between this head and the insulating block there is a spring 149, which constantly tends to maintain the movable contact plate 146 in engagement with the fixed contacts 144.

In the normal operation of the press, the described switch remains closed as it is swung up and down by the rocking lever 130. When, however, the lever is locked by the feeler finger, the head 148 of the plunger 147 is engaged by a roller 150 carried by the cam 132 (see Fig. 10), and the switch is operated to break the motor circuit, and to stop the press. The point at which the cam roller 150 should be located with reference to the cycle of the press depends upon the speed at which the press is being operated, and upon the consequent momentum of the moving parts. Once this point has been determined for a given speed of the press, it requires no change, but for convenience in determining the correct point, the cam in the present example is provided with a series of holes 151 to receive a stud 152, on which the roller 150 is mounted.

The general operation of the second detector mechanism will now be described, reference being had at first to Fig. 7. As shown in Fig. 7, the gripper 23 has just gripped the sheet A. The sheet is about to be printed by the type 54. The feeler finger 128 has not yet descended to feel for the next sheet, but is just about to descend.

Referring now to Fig. 8, the sheet A has been printed by the type 54, and is about to be printed by the type on the type-bed 12. The lobe 133 of the cam 132 has engaged the roller 134, and has rocked the lever 130, thus causing the feeler finger 128 to descend, so that its shoulder 139 is beneath the abutment 140. If the sheet A is not followed immediately by another, the feeler finger will remain in this position.

Referring now to Fig. 9, the sheet A is being printed by the type on the type-bed 12, and continues to be printed as shown in Fig. 10, but owing to the absence of another sheet, the lever 130 remains locked, and the roller 150 now engages the head 148 of the plunger 147, and depresses the latter, thus breaking the circuit, whereupon the electro-magnet 125 (see Fig. 5) is de-energized, the spring 123 restores the controller arm 120 to its initial position, and the current is cut off from the motor. But the moving parts of the press, as previously stated, have a certain momentum, depending upon the speed at which the press is operated, and it follows that the parts will continue in motion from the positions shown in Fig. 10 until they reach the relative positions shown in Fig. 4. It will be observed that the momentum has not been great enough to carry the type 54 to the point where the impression is made,—that is a considerable distance rearwardly of the impression point, far enough in fact, so that after

the press is stopped, a sheet can be placed by hand on the feed board 14 in engagement with the front stops 22. The press can then be re-started.

5 If, however, the first sheet is immediately followed by a second one (see Fig. 11), the second sheet will lift the feeler finger 128 and prevent the same from being locked by the abutment 140, so that the lever 130 has been
10 rocked by the cam into position where the head 148 of the switch plunger is not engaged by the roller 150, which at this moment is passing over the plunger.

15 Having thus described one embodiment of the invention, but without limiting myself thereto, what I claim and desire by Letters Patent to secure is:

1. In a printing press, the combination of printing instrumentalities which make two
20 successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet detectors which are engaged in succession by each sheet on its way to said printing in-
25 strumentalities, means controlled by one of said detectors for preventing one impression in the absence of a sheet, and means controlled by the other detector for preventing the other impression in the absence of a sheet
30 which should succeed the first.

2. In a printing press, the combination of printing instrumentalities which make two
35 successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet detectors which are engaged in succession by each sheet on its way to said printing in-
40 strumentalities, means controlled by one of said detectors for throwing off the impression in the absence of a sheet, and means controlled by the other detector for discontinuing the application of power to the press in the absence of a sheet which should succeed the first.

45 3. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two
50 sheet detectors which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by one of said detectors for throwing off the impression in the absence of a sheet, an electric mo-
55 tor for driving the press, and means controlled by the other detector for breaking the motor circuit in the absence of a sheet which should succeed the first.

60 4. In a printing press, the combination of printing instrumentalities which make an impression on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, a sheet feeler which is engaged by each sheet on its way to
65 said printing instrumentalities, means for

locking said feeler when it is not engaged by a sheet, a carrier which carries said feeler but is locked by said feeler when the latter is locked, means for imparting to said carrier a movement which carries said feeler into and out of the path of the sheets, and means actuated by said carrier, when it is locked, to prevent the impression from being made.

70 5. In a printing press, the combination of printing instrumentalities which make an impression on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, a sheet feeler which is engaged by each sheet on its way to said printing instrumentalities, means for
75 locking said feeler when it is not engaged by a sheet, a rocking carrier which carries said feeler but is locked by said feeler when the latter is locked, means for imparting to said carrier a rocking movement which carries
80 said feeler into and out of the path of the sheets, and means actuated by said carrier, when it is locked, to prevent the impression from being made.

6. In a printing press, the combination of
90 printing instrumentalities which make an impression on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, a sheet feeler which is engaged by each sheet on its way to
95 said printing instrumentalities, means for locking said feeler when it is not engaged by a sheet, a carrier which carries said feeler but is locked by said feeler when the latter is locked, a rotary body for imparting to said
100 carrier a movement which carries said feeler into and out of the path of the sheets, and means actuated by cooperation of said body and said carrier, when the latter is locked, to prevent the impression from being made.

105 7. In a printing press, the combination of printing instrumentalities which make an impression on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, a sheet feeler
110 which is engaged by each sheet on its way to said printing instrumentalities, means for locking said feeler when it is not engaged by a sheet, a carrier which carries said feeler but is locked by said feeler when the latter is
115 locked, a rotary body for imparting to said carrier a movement which carries said feeler into and out of the path of the sheets, and means including a switch carried by said carrier and actuated by said body, when said
120 carrier is locked, to prevent the impression from being made.

8. In a printing press, the combination of printing instrumentalities which make two
125 successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said print-
130 ing instrumentalities, means controlled by

the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a carrier which carries the first feeler but is locked by the first feeler when the latter is locked, means for imparting to said carrier a movement which carries the first feeler into and out of the path of the sheets, and means actuated by said carrier, when it is locked, to prevent the other impression from being made.

9. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a carrier which carries the first feeler but is locked by the first feeler when the latter is locked, means for imparting to said carrier a movement which carries the first feeler into and out of the path of the sheets, and means actuated by said carrier, when it is locked to discontinue the application of power to the press.

10. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a rocking carrier which carries the first feeler but is locked by the first feeler when the latter is locked, means for imparting to said carrier a rocking movement which carries the first feeler into and out of the path of the sheets, and means actuated by said carrier, when it is locked, to prevent the other impression from being made.

11. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a rocking carrier which carries the first feeler but

is locked by the first feeler when the latter is locked, a rotary body for imparting to said carrier a rocking movement which moves the first feeler into and out of the sheets, and means carried by said rotary body and actuated by said carrier, when it is locked, to prevent the other impression from being made.

12. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a rocking carrier which carries the first feeler but is locked by the first feeler when the latter is locked, a rotary body for imparting to said carrier a rocking movement which moves the first feeler into and out of the path of the sheets, and means including a switch carried by said rotary body and actuated by said carrier, when it is locked, to prevent the other impression from being made.

13. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a rocking carrier which carries the first feeler but is locked by the first feeler when the latter is locked, a rotary body for imparting to said carrier a rocking movement which moves the first feeler into and out of the path of the sheets, an electric motor for driving the press, and means including a switch carried by said carrier, and a part carried by said rotary body to actuate said switch, when said carrier is locked, to discontinue the supply of current to said motor.

14. In a printing press, the combination of printing instrumentalities which make two successive impressions on each sheet, sheet feeding means by which sheets are fed in succession to said printing instrumentalities, two sheet feelers which are engaged in succession by each sheet on its way to said printing instrumentalities, means controlled by the second feeler for preventing one impression in the absence of a sheet, means for locking the first feeler when it is not engaged by a sheet which should follow the first, a rocking carrier which carries the first feeler but is locked by the first feeler when the latter

is locked, a rotary body for imparting to said carrier a rocking movement which moves the first feeler into and out of the path of the sheets, an electric motor for driving the press, and means including a switch carried by said carrier, and a circumferentially adjustable part carried by said rotary body to actuate said switch, when said carrier is locked, to discontinue the supply of current to said motor.

15. In a printing press, the combination of an impression cylinder, two type carriers co-acting successively with said impression cylinder, sheet feeding means by which sheets are fed in succession to said impression cylinder, power-controlling means for controlling the application of power to the press, throw-off means for throwing off the impression, and two sheet-detectors which are engaged in succession by the sheets on their way to said impression cylinder, one of said detectors being operable in the absence of a sheet to cause said throw-off means to throw off the impression, and the other being operable in the absence of a sheet which should immediately follow the first to cause said power-controlling means to discontinue the application of power to the press.

16. In a printing press, the combination of two type carriers, an impression cylinder having means which carries each sheet and which coacts with said type carriers to cause an impression to be made first by one type carrier and then by the other, sheet-feeding means by which sheets are fed in succession to said impression cylinder, two sheet-detectors which are engaged in succession by each sheet on its way to said impression cylinder, means controlled by one of said detectors for throwing off the impression on the failure of a sheet to engage such detector, and means controlled by the other detector for discontinuing the application of power to the press on the failure of a sheet to engage such other detector.

17. In a printing press, the combination of a reciprocating type-bed, an impression cylinder cooperating with said type-bed, a type-cylinder cooperating with said impression cylinder, a feed table along which sheets are fed to said impression cylinder, and sheet detector mechanism cooperating with said impression cylinder and comprising two detectors, one adjacent said impression cylinder and the second rearwardly of the first.

In testimony whereof, I have signed my name to this specification.

FRANK T. WOOD.