

(No Model.)

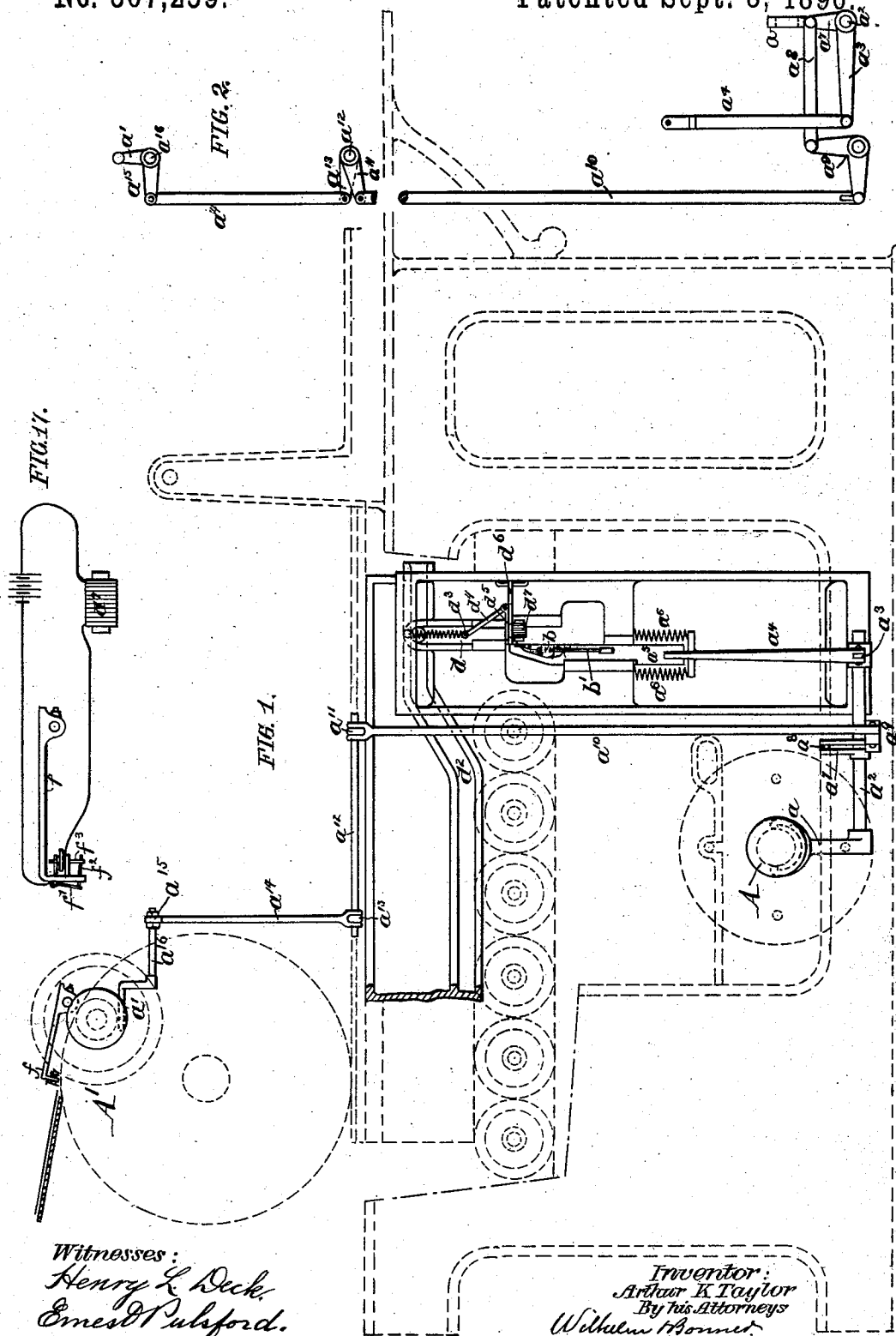
4 Sheets—Sheet 1.

A. K. TAYLOR.

AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES.

No. 567,259.

Patented Sept. 8, 1896



Witnesses:
Henry L. Deck.
Ernest Pulsford.

Inventor:
Arthur K. Taylor
By his Attorneys
Wilhelm Hornet.

(No Model.)

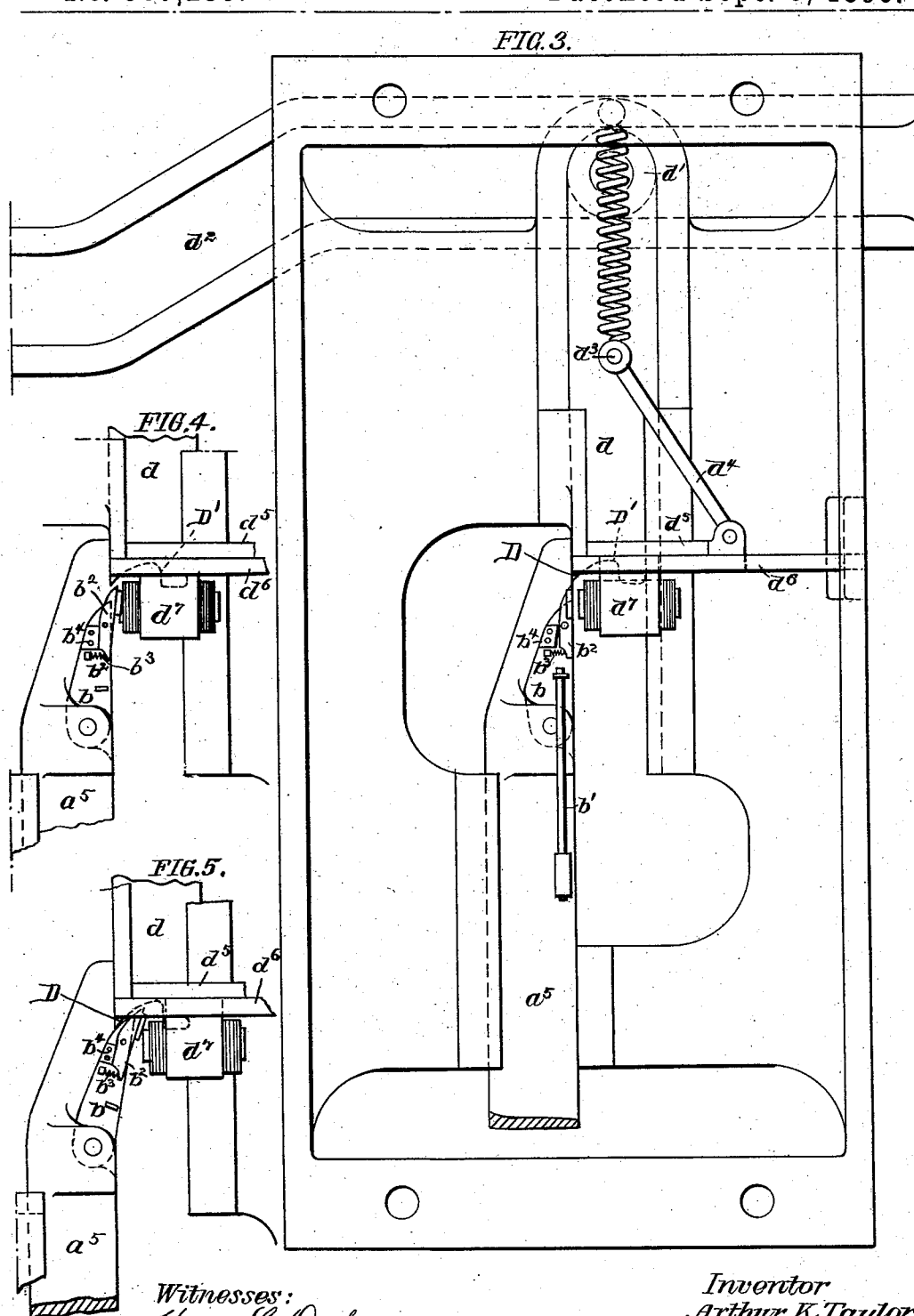
4 Sheets—Sheet 2.

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AUTOMATIC TRIP MECHANISM FOR PRINTING PRESSES.

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Patented Sept. 8, 1896.



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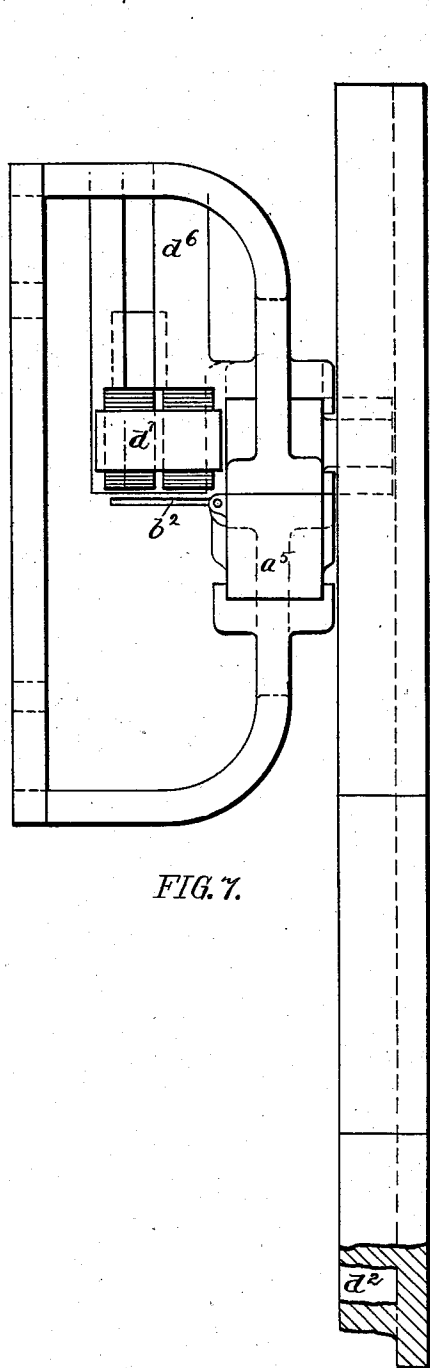


FIG. 7.

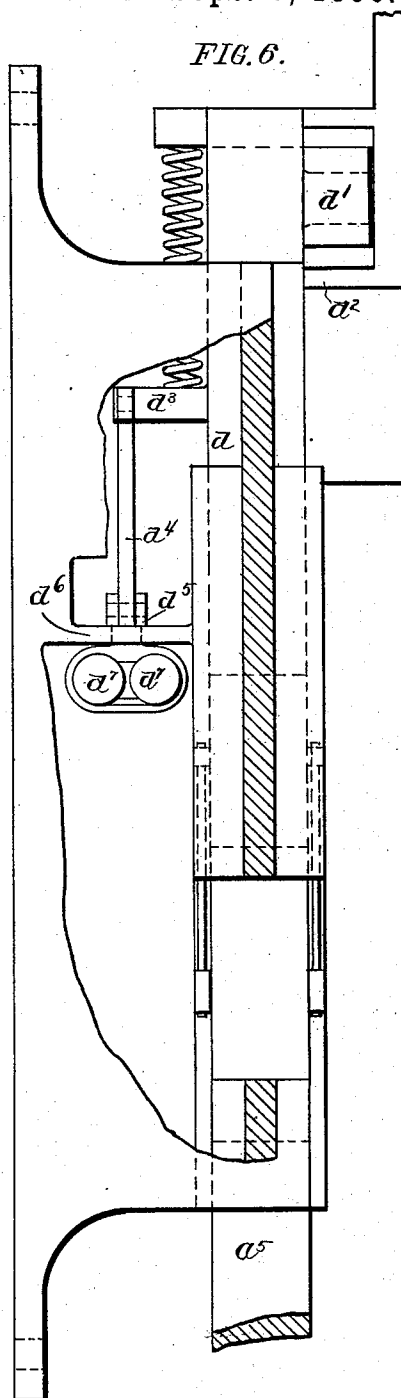


FIG. 6.

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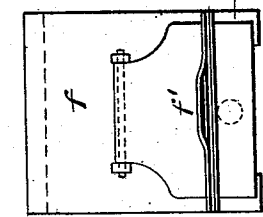


FIG. 10.

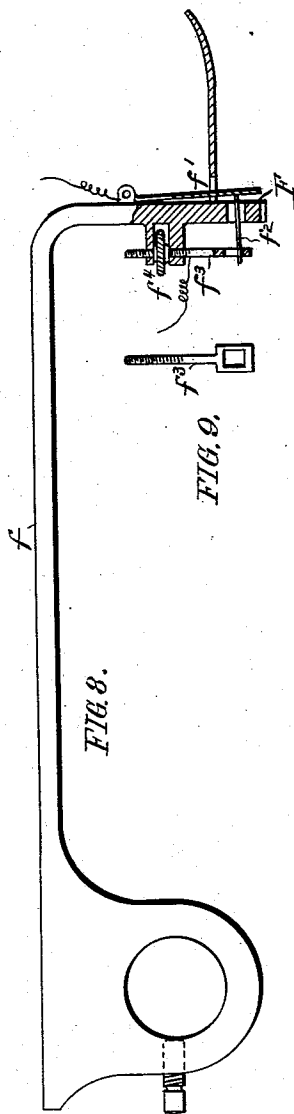


FIG. 8.

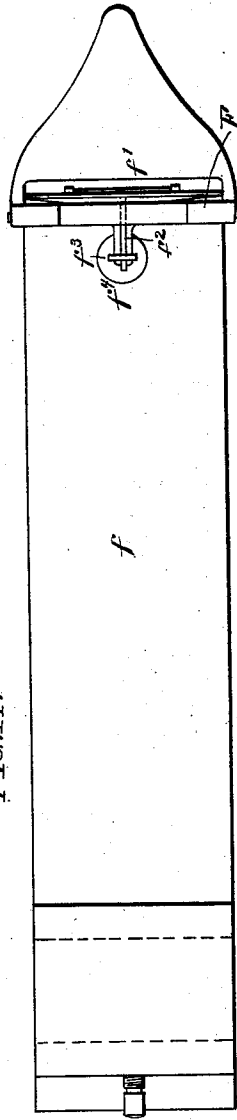


FIG. 11.

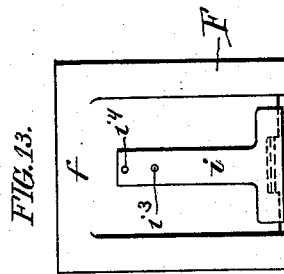


FIG. 13.

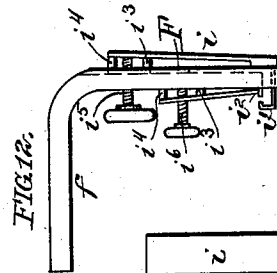


FIG. 12.

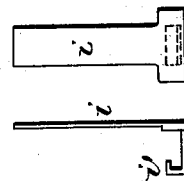


FIG. 15.

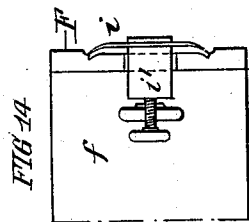


FIG. 14.

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UNITED STATES PATENT OFFICE.

ARTHUR K. TAYLOR, OF WILMINGTON, DELAWARE, ASSIGNOR TO THE
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AUTOMATIC TRIP MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 567,259, dated September 8, 1896.

Application filed February 10, 1896. Serial No. 578,677. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR K. TAYLOR, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware, have invented new and useful Improvements in Automatic Trip Mechanisms for Printing-Presses, of which the following is a specification.

The object of my invention is to construct a sensitive and reliable trip mechanism for rendering inoperative a printing-press or other machine to which sheets of paper are fed, except when a sheet of paper is properly presented to the feeding or gripping devices.

In the accompanying drawings, consisting of four sheets, Figure 1 is a fragmentary side elevation, partly in section, of a printing-press provided with my improved trip mechanism. Fig. 2 is a transverse view of a portion of the mechanism illustrated in Fig. 1. Fig. 3 is a side elevation, on an enlarged scale, of the trip mechanism, showing the position of the parts during the normal operation of the press. Figs. 4 and 5 are similar views showing two positions of the trip mechanism preparatory to stopping the press. Fig. 6 is a fragmentary transverse section, on an enlarged scale, of the trip mechanism. Fig. 7 is a bottom plan view of the same. Fig. 8 is a sectional side view, on an enlarged scale, of the guide or detector lever and connecting parts. Fig. 9 is a detached view of the adjustable contact-bolt. Fig. 10 is a front view of the detector-lever. Fig. 11 is a bottom plan view of the same. Fig. 12 is a fragmentary sectional elevation of the detector-lever, showing a modification of the contact devices. Fig. 13 is a front elevation of the same. Fig. 14 is a bottom plan view of the same. Fig. 15 is a detached side elevation of one of the contacts. Fig. 16 is a front view of the same. Fig. 17 is a diagram illustrating the electric circuit.

Like letters of reference refer to like parts in the several figures.

In Fig. 1 is represented in dotted lines a portion of an ordinary form of reciprocating bed and cylinder-press, the operation of the impression-cylinder being controlled by a clutch A, adapted to be actuated by a clutch-fork a , while the operation of the feeding de-

vices is controlled by another clutch A', which operates the pins of the tumbler-box in the usual manner and which is adapted to be actuated by an arm a' . The clutch-fork a is carried by a rock-shaft a^2 , having an arm a^3 , connected by a rod a^4 to a vertically-reciprocating slide a^5 , which latter is guided on the main frame and acted upon by springs a^6 , tending to raise it. The rock-shaft a^2 has another arm a^7 , which is connected by a rod a^8 to a bell-crank lever a^9 , the latter being connected by a rod a^{10} to an arm a^{11} on a horizontal rock-shaft a^{12} . The rock-shaft a^{12} has another arm a^{13} , connected by a rod a^{14} to an arm a^{15} on a rock-shaft a^{16} , which latter carries the arm a' . Both clutches are thus adapted to be operated in unison, and the parts are so arranged that when the slide a^5 is raised by its spring the clutches are engaged and the impression-cylinder and feeding devices are in operation, but when said slide a^5 is depressed the clutches will be disengaged and the impression-cylinder and feeding devices are rendered inoperative.

In order that the operation or tripping of the press may be rendered dependent upon the presence or absence of a sheet of paper in proper position to be caught by the feeding devices of the press, I employ mechanism which I will now proceed to describe.

On the slide a^5 is a pivoted catch or trigger b , which is normally held in the retracted position shown in Fig. 3 by means of a spring b' , and to this trigger b is pivoted a supplementary trigger or toe b^2 , the upper end of which is normally held in a retracted position by means of a spring b^3 , the toe b^2 , however, being capable of a limited independent movement on the trigger b to an extent limited by the contact of said toe with the stop b^4 on said trigger b .

To suitable guides on the same frame which carries the slide a^5 is adapted another slide d , to which, during the operation of the press, a constant vertical reciprocation is imparted by reason of the engagement of an anti-friction-roller d' at the upper end of the slide d with a cam-groove d^2 on the horizontally-reciprocating bed of the press. The lower end of the upper slide d is provided with an inclined or beveled face D, which is adapted

to engage with the toe or trigger of the lower slide for coupling the two slides together.

A pin d^3 on the slide d is connected by a rod d^4 to a horizontally-movable slide d^5 , suitably guided in a plate d^6 of the fixed frame, said slide d^5 carrying an electromagnet d^7 . Hence as the slide d reciprocates in a vertical plane the slide d^5 will be reciprocated in a horizontal plane and the magnet d^7 will be caused to approach and recede from the toe d^2 , which latter serves as an armature for the magnet.

The upper slide is preferably connected with the main frame by a spring D^2 , which constantly tends to raise the upper slide and normally holds the slide in its highest position, so that the roller d' upon leaving the cam-groove d^2 during the forward movement of the bed will be in the proper position to again engage with said groove during the subsequent backward movement thereof.

Suitably pivoted adjacent to the impression-cylinder is a detector or guide lever f , (see Figs. 8 to 11,) this detector-lever consisting of an arm provided at its front end with a downwardly-projecting front guide F .

f' is a plate which is pivoted with its upper end to the front side of the front guide, and which is provided with a finger f^2 , projecting rearwardly through an opening in the guide F and normally resting in contact with an eye on the lower end of a bolt f^3 . The upper end of this bolt is threaded and engages with a nut f^4 , mounted between two lugs on the back of the front guides F , so that by operating said nut the bolt f^3 can be adjusted vertically as desired.

The electromagnet d^7 is contained in a circuit, of which the bolt f^3 constitutes one terminal and the plate f' the other terminal, as shown in Fig. 17. Hence whenever the finger f^2 of the plate f' is in contact with the eye of the bolt f^3 the circuit will be completed and the magnet will be rendered active, but whenever the plate f' is pressed inward toward the depending portion of the arm f the finger f^2 will be lifted from contact with the eye of the bolt f^3 and the circuit will be broken and the magnet thus rendered inactive.

The movement of the electromagnet toward and from the armature of the trigger is so timed that it stands in working proximity to the trigger when a sheet is supposed to be present at the front guide and the circuit is expected to be broken by the engagement of the front edge of the sheet against the pivoted plate f' , but the magnet is removed from the vicinity of the trigger at all other times. When, therefore, a sheet of paper is properly fed to the impression-cylinder, the front edge of the sheet of paper will engage with the lower portion of the plate f' and move the same forward, thereby breaking the circuit and preventing the magnet, which at this time stands close to the trigger, from attracting the latter. In this manner the recipro-

cating magnet will always be deenergized as it approaches the trigger during the normal operation of the press, and the toe and trigger will both remain retracted out of the path of the reciprocating upper slide, so that the lower slide remains at rest in its elevated position and holds the clutches of the impression-cylinder and feeding device in their coupled position.

If no sheet has been presented to the front guide, or if a sheet has not been placed properly against the front guide so as to break the circuit, the magnet remains energized as it approaches the trigger and attracts the armature of the same, thereby carrying the upper end of the trigger underneath the inclined or beveled lower face D of the upper slide d , as shown in Fig. 4. The outward movement of the toe b^2 , which is begun by the action of the magnet d^7 , is continued by the action of the beveled lower end of the slide d , and such movement is communicated to the trigger b , as shown in Fig. 5, owing to the fact that when the toe b^2 is moved to the position shown in Fig. 4 it has a rigid bearing upon the shoulder b^4 of the trigger b , and hence becomes in effect a rigid projection of said trigger and imparts to the latter any outward movement which it may receive.

After the trigger has been directed by the magnet underneath the inclined or beveled face of the upper slide the latter during its descent moves the trigger laterally without effecting the lower slide until the trigger engages with a shoulder or stop D' at the base of the incline, after which the movement of the upper slide is transmitted to the lower slide and from the latter by the intermediate mechanism to the clutches for tripping the impression-cylinder and feeding devices and rendering the same inoperative. The arm a' , which connects with the gripper-clutch A , acts upon the pins which enter the tumbler-box on the end of the gripper-shaft in a well-known manner. The fork a connects with the clutch A of the bed and thereby operates the ordinary trip mechanism which is commonly used on two-revolution presses and which sets in motion mechanism which lifts the cylinder, so that the type will not touch the paper. When the mechanism is organized as hereinafter described, the press continues to run, but refuses to print or to take the sheet from the feed-table until it is so fed that the sheet touches the guides and breaks the circuit.

As the upper end of the trigger b is moved outward by the action of the beveled lower end of the slide d the magnet d^7 is withdrawn by the retraction of the slide d^5 , said magnet resuming its normal position as the slide d rises. The magnet d^7 might be strong enough to pull the trigger b directly into engagement with the lower end of the slide d , but by the use of the lighter toe b^2 the work of the magnet is materially lessened and the apparatus is rendered operative with the use of a much

weaker current than would otherwise be required.

In Figs. 12 to 16 I have illustrated a modified form of circuit-breaking device in which a spring-plate i is mounted upon the front side of the front guide and carries at its lower end an inwardly-projecting hooked contact-finger i' , which is adapted to contact with a terminal plate i^2 on the back of said depending portion of the arm. Each of the plates i and i^2 is preferably made of spring metal and secured at its upper end to the front guide by pins i^3 i^4 , arranged vertically in line. The lower end of the front plate is adjusted toward and from the lower end of the rear plate by an adjusting-screw i^5 , arranged in a screw-threaded opening in the front guide and engaging with the spring-plate i between its supporting-pins, so that by turning the adjusting-screw in the proper direction the portion of the plate between the pins will be deflected more or less and the lower end of the plate i shifted accordingly. The lower end of the rear spring-plate i^2 is in like manner adjusted by an adjusting-screw i^6 , engaging with a screw-threaded opening formed in the rear spring-plate between its supporting-pins and engaging with its end against the front guide. When the lower end of the plate i is carried forwardly by the action of the paper, the contact-plates i' i^2 will be separated and the circuit broken, but when the lower end of the plate i is permitted to remain projected the plates i' i^2 will remain in contact and the circuit will be complete.

The detecting device may be so located that its trip-plate will engage with the sheet of paper at any desired point. Thus if a single detector is used it may be located midway between the opposite edges of the sheet, or if a pair of detectors are used one may be located near each edge of the sheet and the circuit may pass through both detectors, so that both detectors' plates will have to be depressed in order to break the circuit, the result in this case being that the press will be tripped either when no sheet is presented for the action of the printing devices or when the sheet is so crooked that both ends of the same will not act simultaneously upon the circuit-breakers.

Although the mechanism which I have shown constitutes what I consider to be the preferable embodiment of my invention, it should be understood that I do not limit myself specifically thereto, since many modifications of detail may be made without departing from the main features of my invention. I therefore claim and desire to secure by Letters Patent--

1. The combination with two normally-disengaged parts of the tripping mechanism of a printing-press or other machine to which sheets of paper are fed, one of which parts is normally reciprocated by engagement with some moving part of the press while said

other part is normally at rest, of a catch or trigger carried by one of said parts and adapted to couple the same to the other part, an electromagnet for operating said catch or trigger, mechanism whereby said electromagnet is moved toward and from said catch or trigger to bring the magnet alternately within operative distance of the same and remove it therefrom, and a circuit-breaker which is acted on by the sheet, substantially as set forth.

2. The combination with two normally-disengaged parts of the tripping mechanism of a printing-press or other machine to which sheets of paper are fed, one of which parts is normally at rest, of a catch or trigger carried by one of said parts, provided with an armature and adapted to couple both parts together, an electromagnet for operating upon said armature and catch or trigger, mechanism whereby said electromagnet is moved toward and from said armature to bring said magnet alternately within operative distance of said armature and remove it therefrom, and a circuit-breaker which is acted on by the sheet, substantially as set forth.

3. The combination with two normally-disengaged parts of the tripping mechanism of a printing-press or other machine to which sheets of paper are fed, one of which parts is normally reciprocated by engagement with some moving part of the press while said other part is normally at rest, of a catch or trigger adapted to couple said parts together and mounted on the part which is normally at rest, an electromagnet for operating said catch or trigger, and a circuit-breaker which is acted on by the sheet, substantially as set forth.

4. The combination with two normally-disengaged parts of the tripping mechanism of a printing-press or other machine to which sheets of paper are fed, one of which parts is normally reciprocated by engagement with some moving part of the press while said other part is normally at rest, of a catch or trigger adapted to couple said parts together and mounted on the part which is normally at rest, an electromagnet for operating said catch or trigger, mechanism whereby said magnet is moved alternately toward and from said catch or trigger, and a circuit-breaker which is acted on by the sheet, substantially as set forth.

5. The combination with two slides, one normally at rest and connected with the trip mechanism of the press and the other reciprocated by some moving part of the press, of a catch or trigger adapted to couple said parts together and mounted on the part which is normally at rest, an electromagnet which is reciprocated toward and from said catch or trigger in a direction which does not coincide with that of said reciprocating slide and a circuit-breaker which is acted on by the sheet, substantially as set forth.

6. The combination with two slides, one

normally at rest and connected with the trip mechanism of the press and the other reciprocated by some moving part of the press, of a catch or trigger adapted to couple said parts
5 together and mounted on the part which is normally at rest, an electromagnet moving on ways arranged at right angles to these ways of the reciprocating slide, a link connecting said reciprocating slide with said
10 magnet and a circuit-breaker which is acted on by the sheets, substantially as set forth.

7. The combination with two slides, one connected to the trip mechanism of the press and the other reciprocated by engagement
15 with some moving part of the press, of a catch or trigger carried by one of said slides, a pivoted toe mounted on said catch or trigger, an electromagnet acting on said pivoted toe so as to draw it into engagement with the other
20 slide, and a circuit-breaker acted on by the

sheet of paper as it is fed into the press, substantially as set forth.

8. In a circuit-breaker, the combination with a supporting-arm, of a depending plate arranged on the front side of said arm and
25 pivoted at its upper end thereto, a finger secured to the lower portion of said plate and projecting rearwardly therefrom and beyond the rear side of said supporting-arm and a
30 bolt adjustably attached with its upper end to the rear side of said supporting-arm and supporting at its lower end said finger when said plate is projected, substantially as set forth.

Witness my hand this 3d day of February, 35
1896.

ARTHUR K. TAYLOR.

Witnesses:

WINFIELD H. SMITH,
EDWARD T. PRICE.