

W. F. C. TICHBORNE.
SHEET ADJUSTER AND GUIDE FOR PRINTING PRESSES.
APPLICATION FILED MAR. 27, 1909.

1,014,269.

Patented Jan. 9, 1912.
3 SHEETS—SHEET 1.

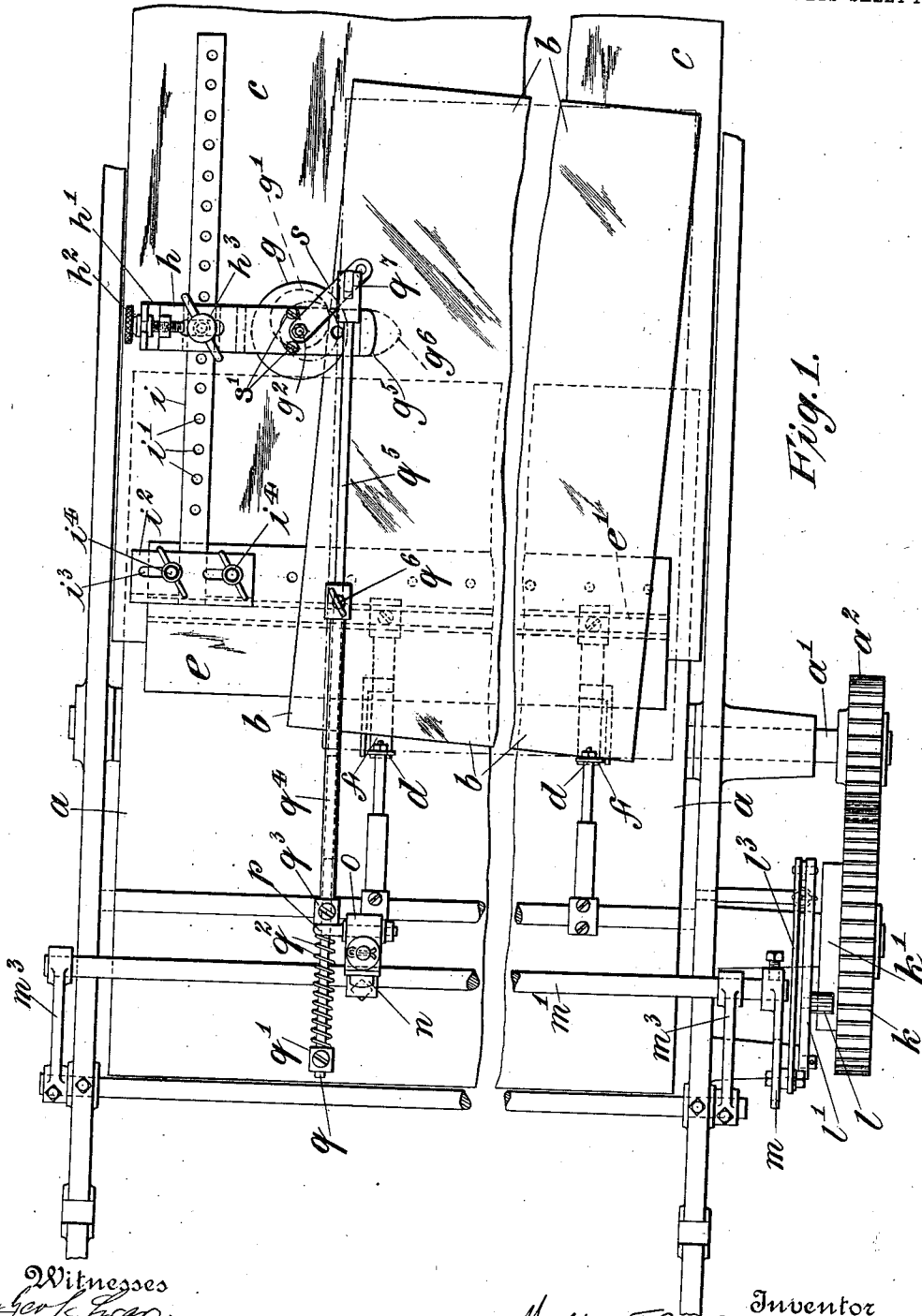


Fig. 1.

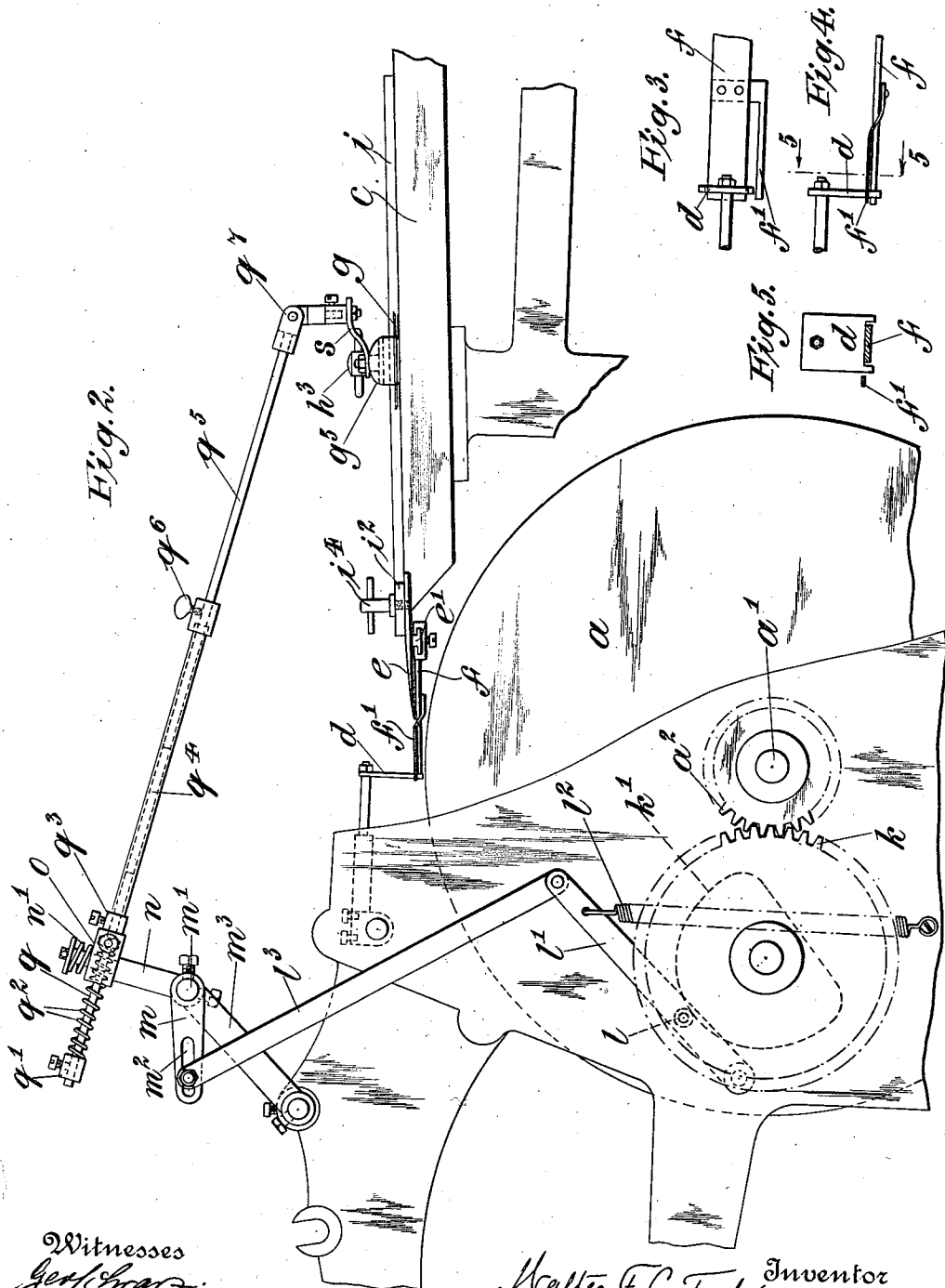
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Witnesses
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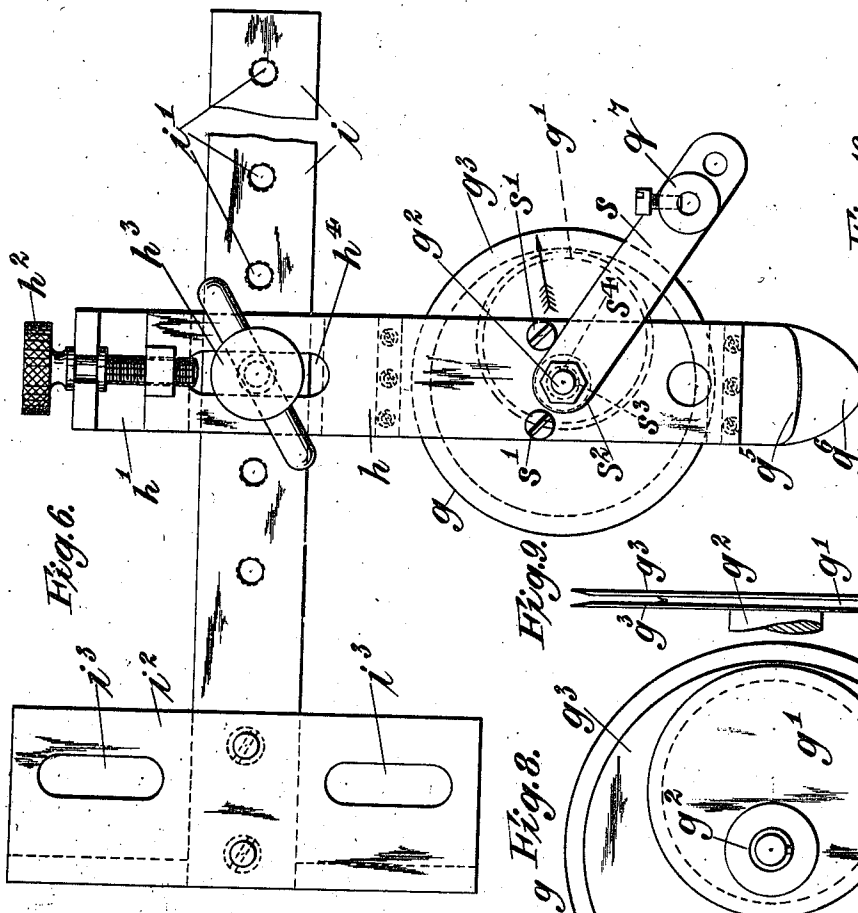
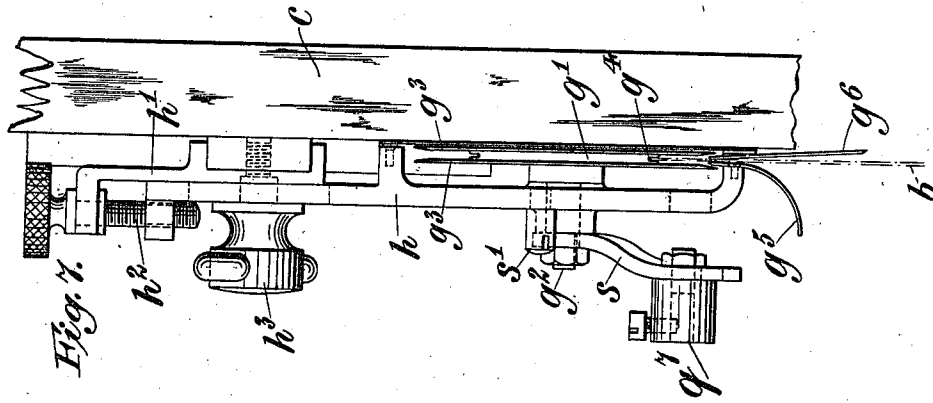
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UNITED STATES PATENT OFFICE.

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SHEET ADJUSTER AND GUIDE FOR PRINTING-PRESSES.

1,014,269.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER F. C. TICHBORNE, a citizen of the United States, residing at Pelham, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Sheet Adjusters and Guides for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

In certain classes of printing, particularly in color work, it is necessary that each sheet to be printed shall be placed with great exactness in relation to the plate or type, so that all the sheets shall be printed in perfect register and the waste of sheets through imperfect register be avoided. To place each sheet in exact position by hand would require so much time and effort on the part of the feeder as to result in a considerable increase in the cost of the work. Any feeder, however, can very rapidly and without special effort place sheets in approximately exact position and it is the object of this invention to provide a device which shall supplement the hand work of the feeder and adjust or correct the position of each sheet so that all sheets shall register perfectly.

The adjuster comprises a device which coacts with one of the lateral edges of each sheet, swinging it upon one or the other of the front stops, against which the forward edge of the sheet rests, until it bears against both of such stops, its proper lateral adjustment being assured at the same time. Obviously the adjuster might be applied to presses of different kinds and might be actuated by various means, but in the accompanying drawings in which for purposes of explanation, it is illustrated, it is shown as applied to an ordinary cylinder press and as actuated from a convenient moving part of the press mechanism.

In the drawings—Figure 1 is a top view showing a portion of a cylinder press with its feed board and the improved adjuster applied thereto, the drawing being broken out to save space. Fig. 2 is a view in side elevation of the parts shown in Fig. 1. Fig. 3 is a detail top view showing one of the tongues which support the forward edge of the sheet while it projects beyond the feed

board extension and rests against the front stops, the latter being also shown. Fig. 4 is a view in side elevation of the parts shown in Fig. 3. Fig. 5 is a view in section on the plane indicated by the line 5—5 of Fig. 4, looking in the direction of the arrows. Fig. 6 is an enlarged top view of the adjuster and its supporting devices. Fig. 7 is an edge view of the parts shown in Fig. 6 with a portion of the feed board. Fig. 8 is a detail view on a still larger scale, and partly broken away, of the adjuster with one of its plates removed. Fig. 9 is an edge view of the adjuster. Fig. 10 is a detail view of the actuating arm.

The invention is illustrated as applied to an ordinary cylinder press which has the usual impression cylinder *a* and grippers (not shown) for taking hold of the sheet *b* as it rests upon the feed board *c* and transferring it to the impression cylinder when the usual front stops *d* have been lifted out of the way. The feed board *c* is shown as provided, as usual, with the extension plate *e* which is brought down to a thin edge, as usual, and on a T-headed rail *e'*, on the underside of the extension plate *e*, are adjustably mounted the tongues *f* which extend forward of the extension *e* and support the comparatively narrow portion of the sheet *b* which projects beyond the extension plate *e* while such sheet rests against the front stops *d*, preparatory to being seized by the grippers. In order that the adjuster may operate properly, it is desirable that the forward edge of the sheet, when it rests against one of the front stops *d*, as shown in Fig. 1, shall not bend down over the side of the tongue *f* so as to be caught under the edge of the front stop or to have its freedom of movement interfered with by dragging under the edge of the front stop. There is, therefore, secured to the tongue *f* a light spring tongue *f'*, shown particularly in Figs. 3, 4, and 5, which, being secured to the underside of the tongue *f*, is bent upward slightly above the plane of the tongue *f* and is carried forward to one side of the stop *d*, such spring tongue yielding readily to pressure, but serving to lift slightly the sheet at the corresponding point and prevent it from being entangled under or dragging against the edge of the stop *d*.

The sheet adjuster is located at one side

of the feed board and is adapted to engage only one lateral edge of each sheet when released by the feeder, the adjuster having a swinging or oscillating or generally diagonal forward movement in a plane substantially parallel with the feed board, that is, in the plane of the sheet, and operating to push the sheet at the same time forwardly and transversely into a predetermined position. The sheet adjuster or shifter engages the sheet practically at one point only so that the sheet is permitted to swing about the point of contact with the shifter. At this time the sheet rests against one or the other of the stops d or against both of the stops. If the sheet rests against both of the stops, then the adjuster pushes the sheet transversely, but if the sheet rests against only one of the stops then the adjuster pushes the sheet transversely and forwardly at the same time, so that the sheet swings upon that stop as a fulcrum until its forward edge rests against the other stop. After this action the adjuster recedes so that in the forward movement of the sheet, with the grippers, the edge of the sheet will not rub against the adjuster, even if the sheet is not cut exactly square. The adjuster may be variously located according to convenience and the degree of inclination of the feed board, but usually at a point slightly to the rear of the middle of the side edge of the sheet. The adjuster is suitably timed with reference to the operation of the press so that it shall have placed the sheet properly before the sheet is grasped by the grippers or otherwise transferred to the printing surface, the feeder placing the sheet in approximate position before the action of the adjuster takes place. The adjuster may have any suitable form and may be supported and actuated by any suitable means according to the requirements of the work to be performed. In the embodiment of the invention illustrated in the drawings, the adjuster g is shown as an eccentric g' mounted upon a shaft g^2 between two thin concentric disks or plates g^3 , the edge of the cam or eccentric g' being preferably grooved circumferentially, as at g^4 , to prevent the possibility of the sheet catching between the cam or eccentric and the guide disks or plates g^3 . Other stationary guides g^5 and g^6 direct the sheet between the disks or plates g^3 . The end s^2 of the actuating arm s is preferably provided with two key-ways s^3 and s^4 , shown in dotted lines in Fig. 6 and in full lines in Fig. 10, either of which may be engaged with the single key of the shaft g^2 , so that the adjuster may be placed at either side of the feed board as may be convenient, the key being engaged with one or the other of the key-ways according to whether the adjuster is placed on one side of the feed board

or the other. The shaft g^2 is mounted in an arm h which is movable longitudinally upon the supporting block h' by means of an adjusting screw h^2 , being held in adjusted position by a thumb screw h^3 which passes through an elongated slot h^4 in the bar or arm h and through the block h' into a supporting arm or bar i which is provided with a series of threaded holes i' for the thumb screw h^3 . This arm or bar i is preferably arranged substantially parallel with the edge of the feed board and is adjustably mounted upon the feed board, having a crosshead i^2 provided with elongated slots i^3 to receive thumb screws i^4 which are tapped into the feed board or a plate set into it. The slots i^3 in the crosshead i^2 permit a relative coarse adjustment, laterally, of the adjuster g , while the adjusting screw h^2 effects close or fine lateral adjustment thereof. The longitudinal adjustment of the position of the adjuster is effected by engagement of the thumb screw h^3 in one or another of the holes i' in the arm or bar i .

In the illustrated embodiment of the invention, the sheet-shifter g is shown as actuated from a moving part of the press. As thus shown, the shaft a' of the impression cylinder carries a pinion a^2 which meshes with a gear k . The latter carries a cam k' which coöperates with a stud l on a lever l' suitably pivoted on the frame of the press and having connected thereto a spring l^2 which holds the stud l against the cam. A link l^3 connects the lever l' with an arm m on a shaft m' , the arm m being slotted longitudinally, as at m^2 , for connection with the link l^3 , so as to permit of adjustment of the throw of the arm m . The shaft m' is carried by adjustable arms m^3 and has longitudinally adjustable upon itself an arm n in engagement with which a block o is held by a spring n' , so as to be readily detachable whenever the adjuster is to be disconnected. An eye bolt p , swiveled in the block o , receives a rod q and between the eye bolt p and an adjustable collar q' on the rod q is a spring q^2 . A collar q^3 is applied to the rod q on the other side of the eye bolt p to limit the movement of the rod. Secured to the rod q beyond or to the right of the eye bolt p , as by means of the collar q^3 , is a sleeve or tube q^4 in which telescopes a rod q^5 , held in adjusted position by a thumb screw q^6 . The rod q^5 is connected through a swivel and adjustable connection q^7 with an arm s which is secured to the adjuster shaft g^2 . A stop or stops s' is or are mounted on the arm or bar h to limit the throw of the arm s and therefore of the adjuster.

Through the connections just described, the adjuster may be actuated from a moving part of the press and at the same time the position of the adjuster may be shifted to meet the requirements of the work to be per-

formed. The purpose of the spring q^2 on the rod q , between the eye bolt p and the collar q' , is to permit the connections to yield after the arm s has been moved against the stop s' , so that the adjuster may be moved to an exact predetermined position at each operation without requiring exact adjustment of the actuating connections and without exposing such connections to danger of breakage.

The operation of the sheet adjuster has already been explained and no further description thereof is necessary.

It will be understood that the adjuster may be varied in form and may be actuated by any suitable means, or as may be required by convenience in manufacture or the character of the press with which it is employed or the nature of the work to be done without substantially modifying the function of the adjuster in shifting the sheet at the same time both forwardly and laterally or in shifting it laterally only, as may be required by the position in which the sheet is left by the feeder and the invention, therefore, is not limited to the particular construction and arrangement of parts shown and described herein. Thus, although the adjuster itself or shifter is described herein as oscillating, it is obvious that such oscillation is with respect to the edge of the sheet, that is, that its operative surface approaches the edge of the sheet with a forward and lateral or generally diagonal forward movement and then retires, and that the shaft which carries the adjuster might therefore have a continuous rotary movement as well as a forward and back movement.

I claim as my invention:

1. A sheet adjuster for printing presses comprising a shifter having a generally diagonal forward movement in the plane of the sheet and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the same transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, a fixed front stop to cooperate with the forward edge of the sheet and means to actuate said shifter.

2. A sheet adjuster for printing presses comprising a cam or eccentric mounted to oscillate in a plane parallel with the feed board and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the same transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the cam or eccentric and means to actuate said cam or eccentric.

3. A sheet adjuster for printing presses, comprising a cam or eccentric mounted to oscillate in a plane parallel with the feed board and having a circumferentially grooved edge to engage one side edge of the

sheet and to shift the same transversely and forwardly at the same time and means to actuate said cam or eccentric.

4. A sheet adjuster for printing presses, comprising a cam or eccentric mounted to oscillate in a plane parallel with the feed board and adapted to engage one side edge of the sheet and to shift the same transversely and forwardly at the same time, plates mounted on opposite sides of said cam or eccentric to guide the sheet thereto and means to actuate said cam or eccentric.

5. The combination with a supporting arm adapted to be secured to the feed board of a press longitudinally with respect thereto and a transverse arm mounted adjustably thereon, of an oscillating shifter supported by the last named arm and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the sheet transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, and means to oscillate said oscillating shifter.

6. The combination with a supporting arm adapted to be secured to the feed board of a press longitudinally with respect thereto and a transverse arm mounted adjustably thereon, of an oscillating shifter supported by the last named arm and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the sheet transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, a fixed front stop to cooperate with the forward edge of the sheet, and means to oscillate said oscillating shifter.

7. The combination with a printing press and its feed board, of a shifter mounted to oscillate in a plane parallel with the feed board and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the sheet transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, and means operated by a moving part of the press to actuate said shifter.

8. In a printing press, the combination with an impression cylinder and a feed board, of a shifter mounted to oscillate in a plane parallel with the feed board and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the same transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, and means operated through the rotation of the cylinder to actuate said shifter.

9. In a printing press, the combination with the feed board and front stops, of a shifter mounted to oscillate in a plane parallel with the feed board and adapted to engage the sheet at one point only on one

side edge of the sheet and to shift the same transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, and means to actuate said shifter.

10. In a printing press, the combination with a cam or eccentric mounted to oscillate in a plane parallel with the plane of the feed board and adapted to engage one side edge of the sheet and to shift the same transversely and forwardly at the same time, a stop to limit the movement of the shifter, and means operated by a moving part of the press to actuate said shifter, said means including a yielding connection whereby the moving part of the press may continue its movement after the shifter has come to rest.

11. In a printing press, the combination with a cam or eccentric mounted to oscillate in a plane parallel with the plane of the feed board and adapted to engage one side edge of the sheet and to shift the same transversely and forwardly at the same time, a stop to limit the movement of the shifter, and means operated by a moving part of the press to actuate said shifter, said means comprising an oscillating arm carrying an

eye, a rod passed freely through said eye and a spring interposed between said eye and an abutment on the rod whereby the moving part of the press may continue its movement after the shifter has come to rest.

12. In a printing press, the combination of a feed board, a shifter mounted to oscillate in a plane parallel with the feed board and adapted to engage the sheet at one point only on one side edge of the sheet and to shift the sheet transversely and forwardly at the same time while permitting the sheet to swing about the point of contact with the shifter, means to actuate said shifter, a front stop, a sheet supporting tongue extended forwardly from the feed board to support the sheet adjacent to the stop and a supplemental guard tongue extending forward alongside the supporting tongue and at the side of the stop.

This specification signed and witnessed this 22d day of March, A. D. 1909.

WALTER F. C. TICHBORNE.

Signed in the presence of—

W. B. GREELEY,
ELLA J. KRUGER.