L. L. ROGERS & A. C. ROBBINS.

SHEET GAGE FOR PRINTING PRESSES.

APPLICATION FILED AUG. 1, 1912.

1,095,126.

Patented Apr. 28, 1914.

2 SHEETS—SHEET 1.

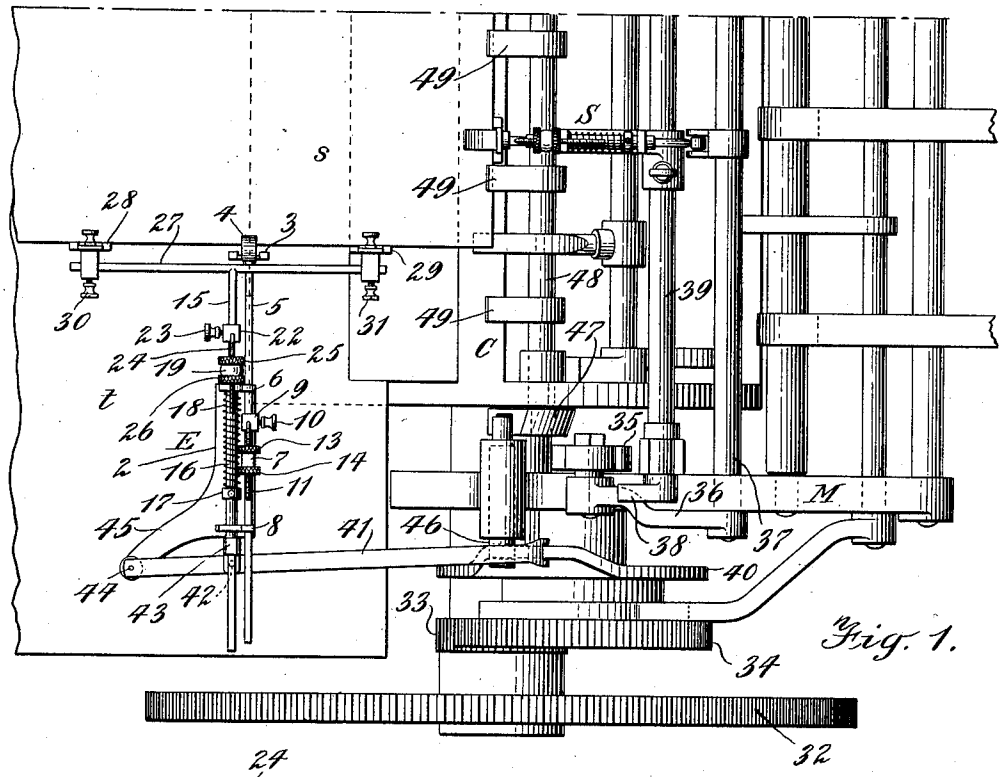


Fig. 1.

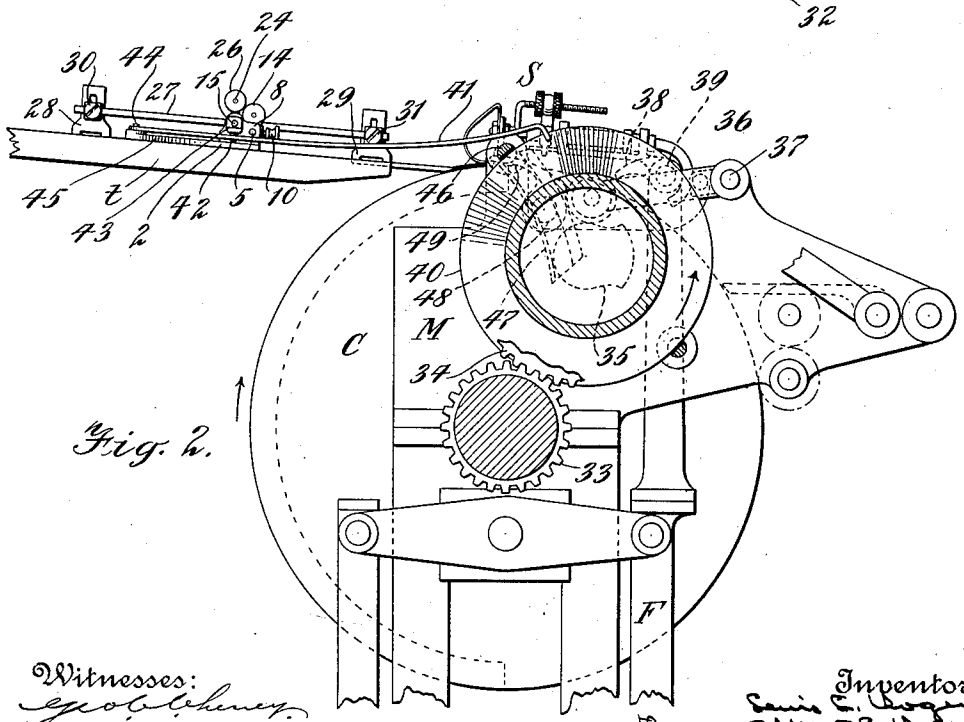


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

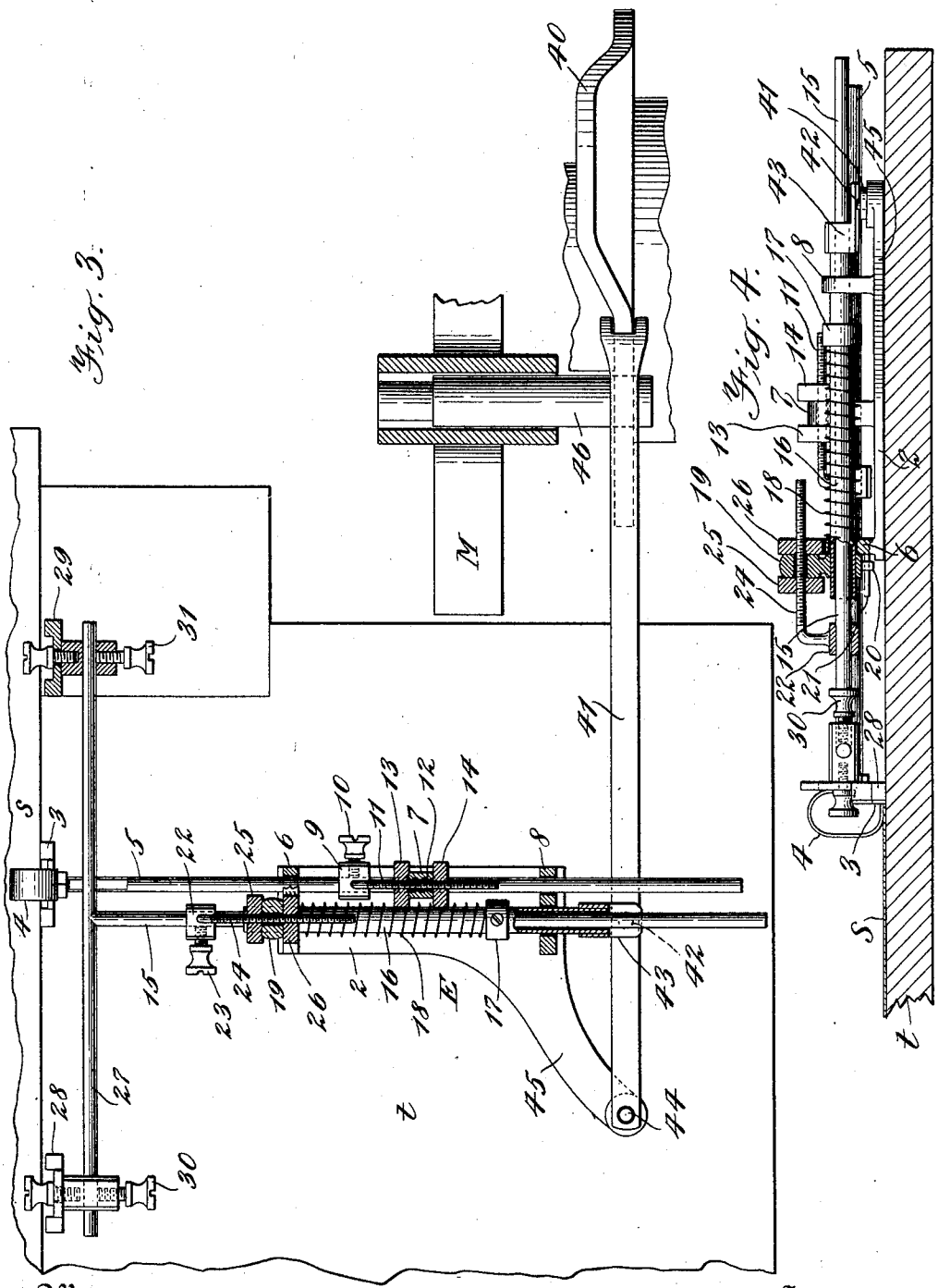


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SHEET-GAGE FOR PRINTING-PRESSES.

1,095,126. Specification of Letters Patent. Patented Apr. 28, 1914.

Application filed August 1, 1912. Serial No. 712,621.

To all whom it may concern:

Be it known that we, LEWIS L. ROGERS and ALBERT C. ROBBINS, citizens of the United States, and residents of Orange, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Sheet-Gages for Printing-Presses, of which the following is a specification.

This invention relates to a sheet-gage for a printing press, and particularly to an end-gage for a one-cylinder, two-revolution press in which the cylinder is movable up and down relatively to a horizontally reciprocating form and bed. In printing presses of this type individual sheets to be printed are usually fed by hand on to a feed-table against a stationary end-gage by which the far end of the sheet is located on said feed-table, suitable stationary side-gages being also ordinarily employed for correspondingly locating the edge of the sheet about to enter the press. In presses of this type the sheets in color printing frequently go through the press three or four times and at each impression perfect registration is of course essential. In feeding these sheets on to the feed-table, however, the edge of the sheet which comes in contact with the end-gage usually strikes sharply against the gage-face, the tendency being to indent the edge of the paper. When the sheet is fed up against the gage several times and is indented one or more times at the same point by the gage face the sheet does not go through the press properly and imperfect registration, particularly in passing sheets through a press many times, results in the spoiling in the long run of a large number of sheets.

One of the principal objects of this invention is to provide a sheet-gage, and particularly an end-gage, by means of which this loss due to improper registration may be avoided.

In order to accomplish the desired result the gage constituting the subject matter of this invention has both stationary and movable gages proper, or gage-faces, the stationary gage serving in the usual manner as a stop against which the successive sheets may be placed when they are fed on to the feed-table, while the movable gage is preferably shiftable by automatic means into and out of a working position slightly in advance of that of the gage-face of the stationary gage, in order that after the end of a sheet fed up to the stationary gage-face has been preliminarily located it may be automatically pushed back—that is, in a direction opposite to that in which it is fed on by hand—to its final or properly gaged position. By combining stationary and automatically movable gages in this manner each sheet on each run of the press will be properly located in its correct or gaged position for registration with the impressions made by the plate or plates previously used, no matter how many times the sheet may be fed up to the stationary end-gage and indented thereby at each impact. The extent to which the edge at a given point may be indented by the stationary end-gage on the successive presentations of the same sheet to said gage is a matter of no importance when a proper automatically movable end-gage, such as will be hereinafter described, is employed in connection with said stationary gage.

Other features of the invention not hereinbefore referred to will be hereinafter described and claimed and are illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a portion of one type of printing press—to wit, a one-cylinder, two-revolution press—embodying a combined stationary and automatically movable end-gage constructed in accordance with this invention; Fig. 2 is a sectional elevation of the rear side of the same; Fig. 3 is an enlarged sectional plan of a portion of the same illustrating the details of construction of a combined stationary and automatically movable end-gage and operating mechanism therefor, and Fig. 4 is a sectional front elevation of the same, drawn to the same scale and also in operative relation with the feed-table and a sheet thereon.

Similar characters designate like parts in all the figures of the drawings.

As before stated, the principal feature of the invention is a combined stationary and movable gage, the movable element of which is automatically shiftable relatively to the stationary element for the purpose of locating the oncoming end of a sheet on the feed-table in its final or correctly gaged position. The end-gage employed comprises therefore stationary and movable gages. Each may be of any well-known or suitable type and construction and each of those shown is similar in many respects to sheet-gages heretofore used in printing presses, though specifically each gage differs more

or less from the gages heretofore used. The end-gage as a whole is designated generally by E and comprises in this case a main frame or base-plate, a pair of gages one stationary and the other movable, a spring tongue or guard carried by the stationary gage for engaging the oncoming edge of a sheet delivered on to the feed-table and suitable means for supporting each gage and the tongue or guard on the base-plate and for adjusting them for proper coöperation with the feed-table and the sheets delivered on to it. A suitable base-plate is illustrated at 2, it being supported, as is usual, directly on the feed-table, indicated at *t*.

The stationary gage proper may be substantially of the usual type employed in printing presses as end-gages for gaging the oncoming edges of sheets fed by hand to the machine, it being indicated herein at 3. Cooperating therewith is also the usual spring tongue or guard, 4, for assuring the proper delivery of a sheet with its edge flat. Both the stationary gage proper and the tongue or guard are in this case carried by and removably secured to a gage-rod, 5, adjustable back and forth with respect to the main frame or base-plate 2 of the gage, said rod being supported directly in registering openings in uprights, 6, 7 and 8, rising from the base-plate 2. The gage-rod 5 is intended to have sufficient movement back and forth to permit it to be properly located with respect to the edge of the sheet to be gaged. Any suitable means may be employed for obtaining such a movement or adjustment of this stationary gage 3. In the construction shown a collar, 9, is secured to the gage-rod 5 by a clamp-screw, 10, in such a manner as to permit a quick and rough adjustment of said gage-rod and the gage carried thereby, while the final adjustment is obtained by means of a threaded rod, 11, extending from said collar toward the rear of the machine and passing through an opening, 12, in the upper part of the upright 7, suitable adjusting and check-nuts, such as 13 and 14, being mounted on the threaded rod 11 and coöperating with the adjacent cheeks of the upright 7.

The movable gage proper is similar in many respects to the stationary gage just described, but it also embodies features of construction and operation not embodied in the stationary gage. As here shown, the movable gage also has a gage-rod, indicated at 15, but this gage-rod is not mounted directly in the uprights 6, 7 and 8 but instead is supported in a tubular member, 16, mounted to slide in alined openings in the uprights 6 and 8, which openings are parallel with those in which the gage-rod 5 is mounted. Here the tubular member 16 and the gage-rod 15 and the parts carried by these two members are intended to slide in one direction or the other in openings or bearings in the uprights 6 and 8 according as the movable gage is shifted toward or from its working or gaging position. Suitable means are employed for limiting this movement, and a stop is also shown at 17 on the tubular member 16 between which stop and the rear face of the upright 6 a coiled spring 18, is placed. A stop or check on a cross-head, 19, secured to the tubular member 16 serves by contact with the corresponding forward face of the upright 6 to limit the movement of the gage-rod, etc., to their retracted positions, and at the same time controls the amount of extension of the spring 18. The movement of the gage-rod 15, etc., to the gaging position is in this case controlled by suitable means for automatically shifting the movable gage. The cross-head 19 just referred to is also shown as having a depending lug, 20, with an opening in it to permit the cross-head to slide back and forth on a guide-rod, 21, projecting from the forward side of the upright 6, this construction serving to hold said cross-head positively against turning movement on the tubular member 16 while at the same time permitting it to slide freely therewith.

The movable gage proper, as before stated, also preferably has a suitable adjustment for controlling the working position of its gage-face or faces, the means employed for adjustment in the construction illustrated being substantially identical with those shown in connection with the stationary gage 3 and its gage-rod 5. Thus the gage-rod 15 has thereon a collar, 22, similar to that shown at 9 and a clamp-screw, 23, for securing said collar in place on the gage-rod 15; while a threaded rod, such as 24, similar to that shown at 11, is also provided in fixed relation with said collar 22, said threaded rod extending through an opening in the upper part of the cross-head 19 and its adjustment being determined by a pair of adjusting and check-nuts, 25 and 26, cooperating with it and with the cross-head 19 substantially in the manner previously described in connection with the adjusting devices for the stationary gage. By suitably adjusting the nuts 25 and 26 the gage-rod 15 and the gage or gages carried thereby may be positioned to push the oncoming edge of a sheet on the feed-table back to any desired final gaged position after it has been preliminarily located by the stationary gage proper 3. It will be obvious that in the construction illustrated this final gaging position of the movable gage is, or may be, controlled in part by the clamp-screw 23, which permits a rough adjustment of the movable gage, in part by the automatic actuating means for the movable gage, which means serves to advance said gage to the limit of its working stroke, and in part by

the adjusting means just described by which a final adjustment of the movable gage is obtained. The gage-rod 15 of this adjustable and automatically-operated movable gage may carry any suitable gaging means for coacting directly with the edge of a sheet to be pushed to its final gaged position by the automatic actuating mechanism. In the construction illustrated the movable gage embodies a plurality of gages proper located preferably at opposite sides of the stationary gage 3 and disposed at a considerable distance apart, for the double purpose of engaging the edge of a sheet at a different point from that at which it is engaged by the stationary element 3 and of coming in contact with it at two widely separated points and thus obtaining a final gaging at two different points relatively far apart. Here the gage-rod 15 has a transverse rod, 27, secured thereto and forming with it a T-shaped carrier for the gages proper. This rod is of considerable length and permits the adjustment to different positions along it of a plurality of gages proper, the positions of these gages lengthwise of said rod 27 depending somewhat upon the length of the edge to be gaged. The gages themselves may be of any suitable type and are designated generally by 28 and 29. They are preferably held in place on the cross-rod 27 by clamp-screws, such as 30 and 31, by means of which the gages may be clamped in any desired positions on the rod. In other respects these movable gages and their gage-faces may be of any desired construction suitable for the purpose.

The movement of the gage just described to its working position may be effected by any suitable actuating means. In the present construction this movement is automatically brought about at the proper time by a suitable part of the printing press. When the gage is used on a hand-fed printing press of the one-cylinder, two-revolution type specifically illustrated in the drawings, in which a cylinder, such as C, reciprocates up and down to permit the passage of a form and a reciprocating bed under it, this forward movement of the movable end-gage to the final gaging position will preferably be controlled from the same cam by means of which the grippers of the press are brought into action to engage a sheet and hold it as it passes to the impression point. The cylinder C is supported, as usual, in a movable frame, M, which works up and down in the fixed frame F of the press in a manner well understood. Said press is also shown as having the usual train of gearing, 32, 33, and 34, for driving the cylinder C and for also rotating a cam, 35, in proper timing with the revolutions of said cylinder C. This cam 35, however, does not control the operation of the movable element of the end-gage E but governs a suitable side-gage or side-gages, designated generally by S, said cam 35 operating upon a lever, 36, pivoted on a rock-shaft, 37, and serving to raise the free end of a rock-arm, 38, secured to a transverse rock-shaft, 39, carrying said gage or gages S. Said side-gage or gages and its or their operating mechanism constitute however, no part of the invention specifically described and claimed herein, and are described and illustrated more in detail in a companion application, Serial No. 712,620 filed August 1, 1912.

The immediate actuating mechanism for the movable element of the end-gage E is here illustrated as comprising a cam, 40, by means of which the grippers are ordinarily thrown into action in a machine of this type, and a lever-arm, 41, controlled thereby and suitably pivoted, as shown at 42, to the rear end of the movable element of the end-gage. The part to which said lever-arm is pivoted is shown as an extension, 43, of the tubular member 16. This lever 41 is illustrated as fulcrumed at 44 to an extended arm or bracket, 45, of the base-plate 2 of the end-gage. At its working end it may have any suitable means for coöperation with the cam 40, it being illustrated as divided to straddle said cam and be positively held in contact with the opposite faces of the cam-wheel at all points in its movement. This lever 41 at the proper time in the rotation of the cam 40 is rocked first one way and then the other to shift the gages 28 and 29 first to the gaging position and then away from it, this movement being assisted in the present construction by the spring 18. The working stroke of the movable element of the end-gage takes place just in advance of the operation of the grippers, as will be clear by referring particularly to Fig. 2, from which and Figs. 1 and 3 it will be seen that the usual sliding pin, 46, by which the gripping means is controlled, is actuated by said cam-wheel 40 after the lever 41 has imparted the working stroke to the movable element of the end-gage. This sliding pin 46 carried at the upper end of the movable frame M of the press coöperates as usual with a cam, 47, on a rock-shaft, 48, carrying grippers, 49, which rotate with the cylinder C and serve in a well-known manner to hold each sheet in its proper gaged position in its travel through the press.

In operation, a sheet, *s*, is fed, usually by hand, on to the feed-table and is engaged by the stationary element 3 of the end-gage and is also brought at its forward side into position to be engaged by the side gage or gages S. It being understood that the cylinder C is rising after having finished its printing revolution the press-rod 37 movable therewith will, at the proper point in the rise of the cylinder, automatically shift the side-

gages to their advanced or working position and gage the side of the sheet. At substantially the same time, and in advance of the operation of the grippers, the gages 28 and 29 of the end-gage E are shifted automatically forward to push the rear end of the sheet into place and gage it, said sheet being pushed back slightly from the position in which it was preliminarily located by the stationary element 3 of said end-gage. On the final gaging of the end of the sheet the cam 40 operates in the usual manner to actuate the grippers 49 to engage the forward end of the sheet on the feed-table and at substantially the same time the cam, 35, operating through the swinging arm 36 and the rock-arm 38, oscillates the side-gage or gages to raise the same to clear the gaged sheet. The movable end-gages 28 and 29 remain in their gaging position only so long as the lever 41 remains on the dwell of the cam 40, they being returned almost at once to the normal retracted position shown in Fig. 3.

What we claim is:

1. In a sheet-gage for a printing press, the combination with a stationary gage and a pair of movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions with respect to the edge of a sheet to be gaged, of automatic means for shifting the movable gages to a working position in advance of that of the stationary gage.

2. In a sheet-gage for a printing press, the combination with a stationary gage and a pair of movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions with respect to the edge of a sheet to be gaged, of automatic means governed by a movable element of said press for shifting the movable gages to a working position in advance of that of the stationary gage.

3. In a sheet-gage for a printing press, the combination with a stationary gage and a pair of movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions with respect to the edge of a sheet to be gaged, of a spring for holding the movable gage in its normal position, and automatic means for shifting the movable gages to its gaging position in advance of that of the stationary gage.

4. In a sheet-gage for a printing press, the combination with an adjustable stationary gage and movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press, of automatic means for shifting the movable gages relatively to the stationary gage to a gaging position which position is variable in accordance with the adjustment.

5. In a sheet-gage for a printing press, the combination with an adjustable stationary gage and movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions with respect to the edge of a sheet to be gaged, of automatic means for shifting said adjustable movable gages to a gaging position in advance of that of the stationary gage, which gaging position is variable in accordance with the adjustment.

6. In a sheet-gage for a printing press, the combination with a base-plate associated with the feed-table of said press, of a stationary gage and movable gages disposed at opposite sides of said stationary gage, said gages being mounted on said base-plate and having their gage-faces located in different positions with respect to the edge of a sheet to be gaged, means on said base-plate for adjusting each of said gages, and automatic means for shifting said adjustable movable gages to a working position in advance of that of the stationary gage which position is variable in accordance with the adjustment.

7. In a sheet-gage for a printing press, the combination with a stationary gage and a pair of movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions lengthwise of the edge to be gaged, of automatic means for shifting the movable gages relatively to the stationary gage to a gaging position.

8. In a sheet-gage for a printing press, the combination with a stationary gage and a pair of movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions lengthwise of the edge of the sheet to be gaged, of means for adjusting said movable gages to different positions lengthwise of said edge, and automatic means for shifting the movable gage relatively to the stationary gage to a gaging position.

9. In a sheet-gage for a printing press, the combination with a stationary gage and a pair of movable gages disposed at opposite sides of said stationary gage, said gages being associated with the feed-table of said press and normally located in different positions both lengthwise and crosswise of the edge to be gaged, of automatic means for shifting the movable gages relatively to the stationary gage to a gaging position.

10. In a sheet-gage for a printing press, the combination of a stationary gage face associated with the feed-table of said press and disposed in the path of the sheet, said

gage face adapted to engage that edge of the sheet which is at right angles to the direction of feed thereof to thereby check the movement of the sheet, a pair of movable gages in line with said stationary gage and disposed in different positions lengthwise of the edge to be gaged, and automatic means for shifting the movable gage faces relative to the stationary gage face and in advance of the same.

11. In a sheet-gage for a printing press, the combination with a stationary gage-face and with a pair of movable gage-faces disposed at opposite sides of said stationary gage-face lengthwise of the edge to be gaged and all associated with the feed-table of said press, of automatic means for shifting the movable gage-faces relatively to the stationary gage-face.

12. In a sheet-gage for a printing press, the combination with a pair of gage-rods one of which is a T-shaped movable gage-rod, of a pair of movable gages adjustably carried on the head of said T-shaped gage-rod for movement lengthwise of the edge to be gaged, a stationary gage carried by the other gage-rod, and automatic means for shifting the movable gage-rod and gages relatively to the stationary gage in a direction transverse to the edge to be gaged.

13. In an end-gage for a printing press, the combination with stationary and movable gages proper associated with the feed-table of said press, of sheet-gripping means, a cam-wheel for actuating said sheet-gripping means, and automatic means actuated by said cam-wheel for shifting the movable gage relatively to the stationary gage to a working position.

14. In an end-gage for a printing press, the combination with stationary and movable gages proper associated with the feed-table of said press, of sheet-gripping means, a cam-wheel for actuating said sheet-gripping means, and automatic means actuated by said cam-wheel for shifting the movable gage relatively to the stationary gage to a working position said means including a lever connected with said movable gage.

15. In an end-gage for a printing press, the combination with stationary and movable gages proper associated with the feed-table of said press, of sheet-gripping means, a cam-wheel for actuating said sheet-gripping means, and automatic means actuated by said cam-wheel for shifting the movable gage relatively to the stationary gage to a working position before the operation of said gripping means by said cam-wheel.

Signed at Orange, in the county of Franklin, and State of Massachusetts, this 30th day of July A. D. 1912.

LEWIS L. ROGERS.
ALBERT C. ROBBINS.

Witnesses:
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ELMER G. ROBBINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."