

(No Model.)

5 Sheets—Sheet 1.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 528,657.

Patented Nov. 6, 1894.

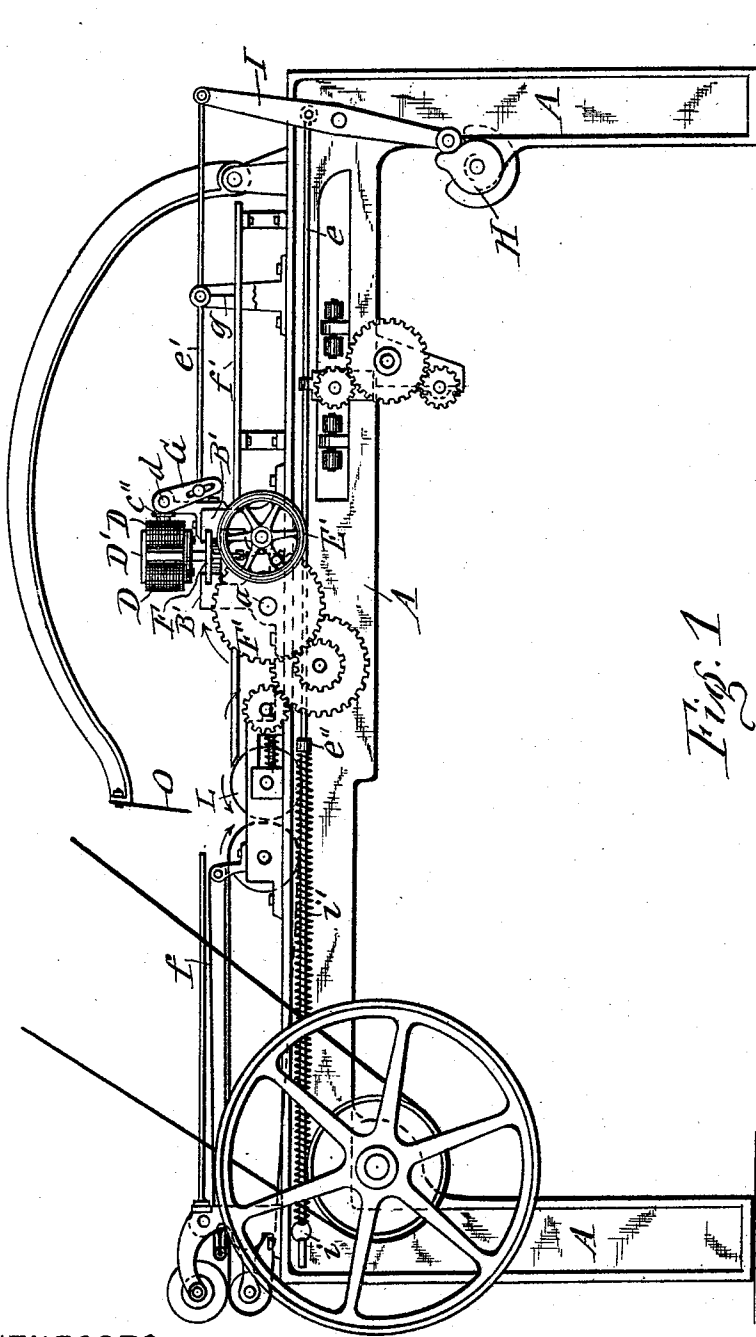


Fig. 1

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By C. Laass
his ATTORNEY

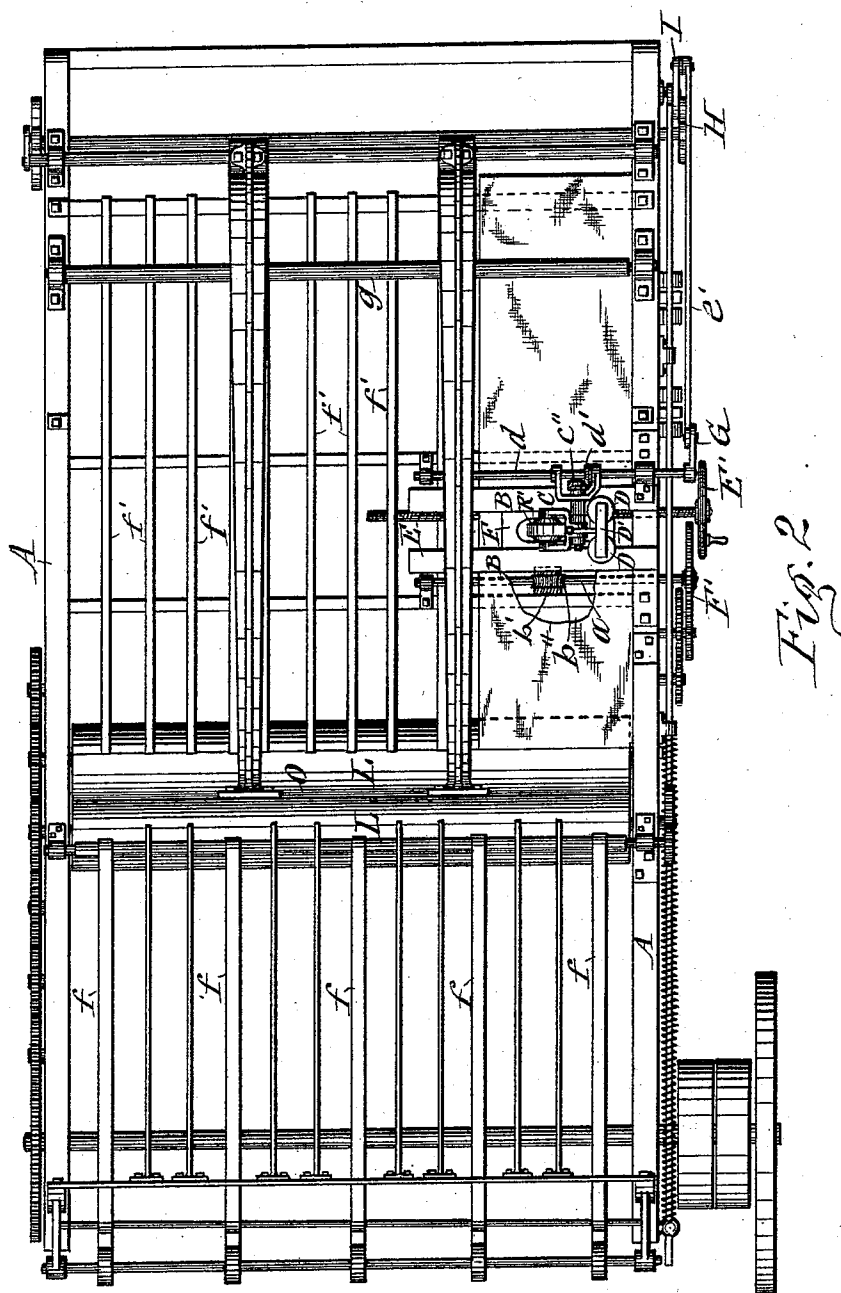
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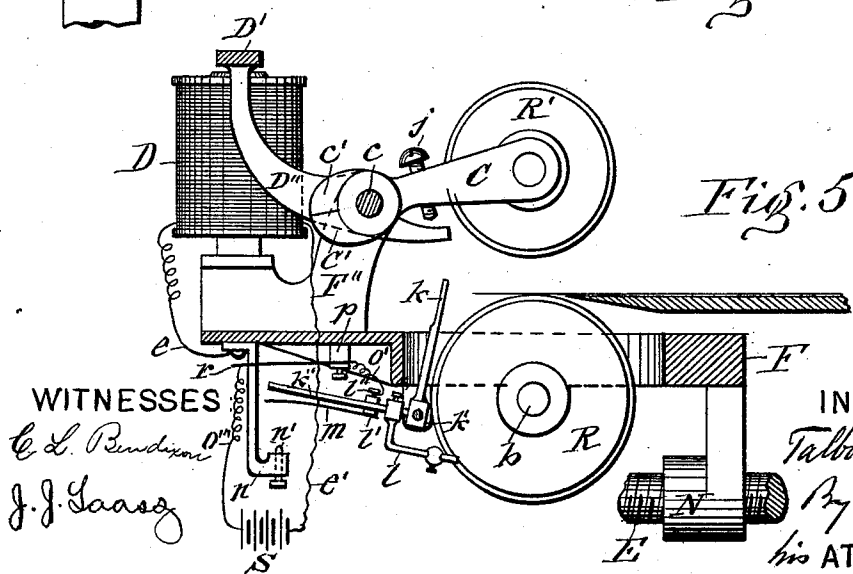
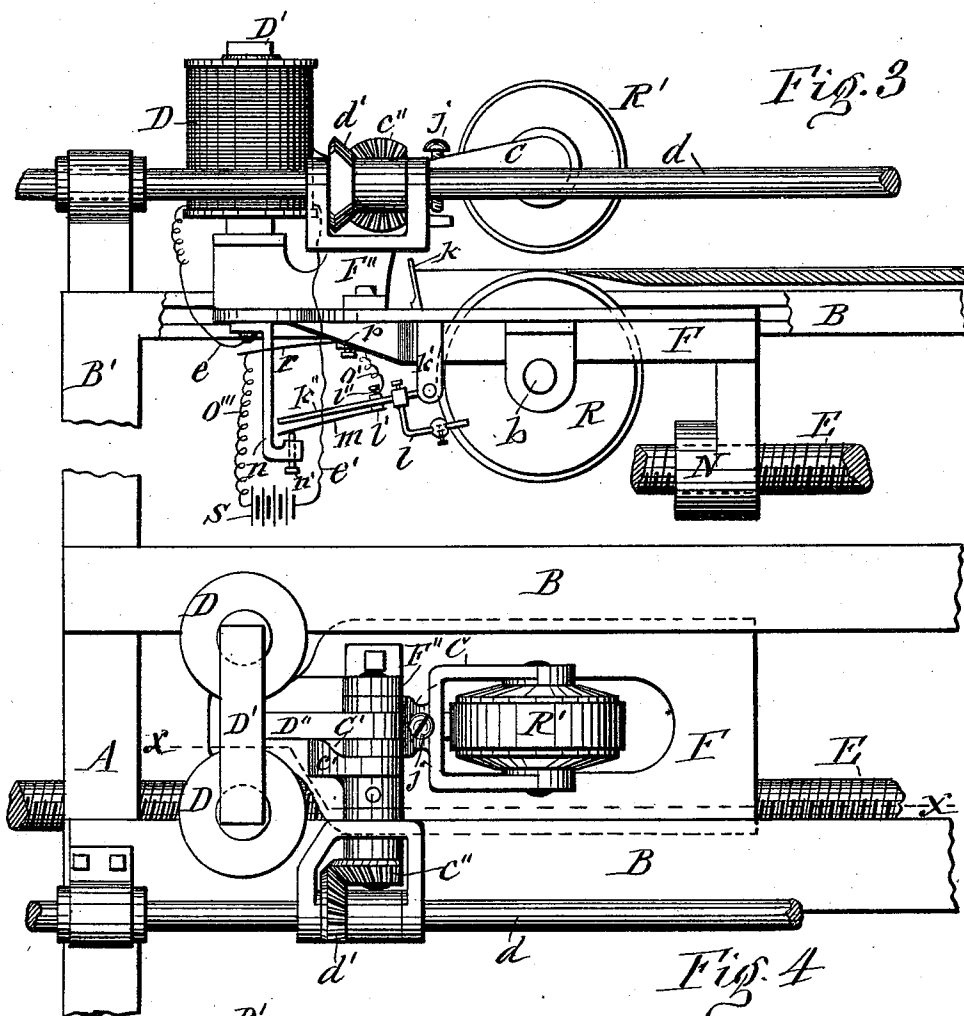
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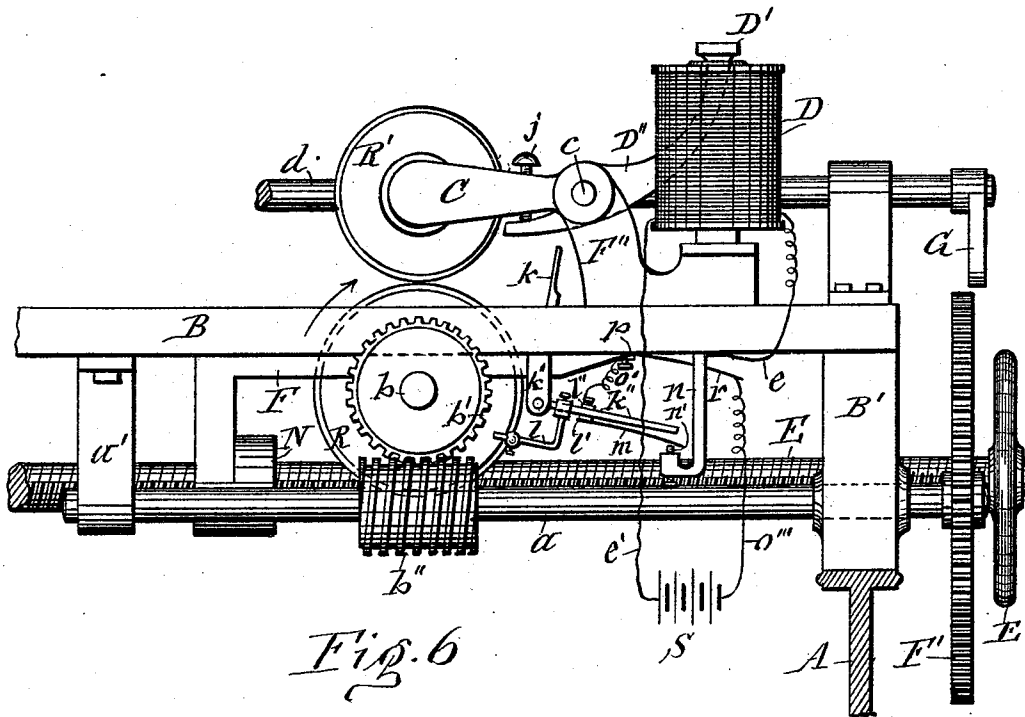


Fig. 6

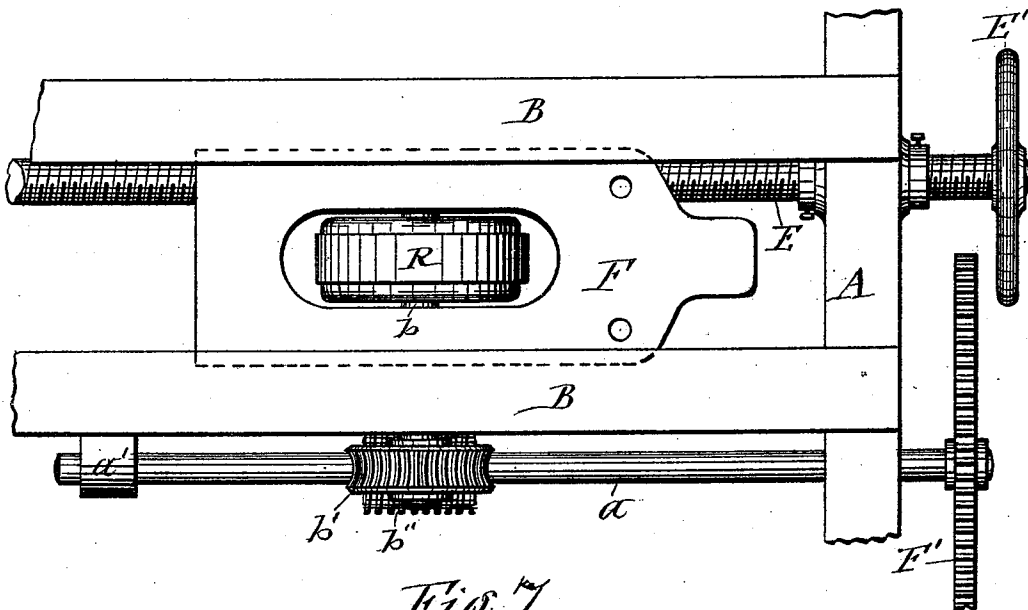


Fig. 7

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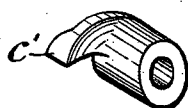
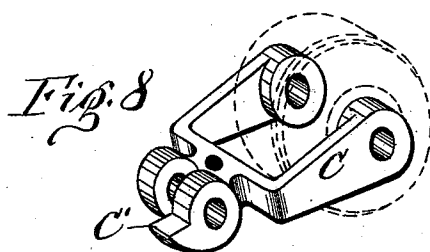


Fig. 9

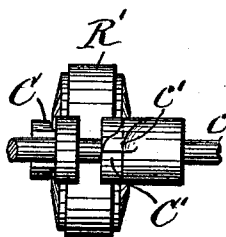


Fig. 10

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF FULTON, NEW YORK, ASSIGNOR TO, THE DEXTER FOLDER COMPANY, OF SAME PLACE.

PAPER-REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,657, dated November 6, 1894.

Application filed June 5, 1893. Serial No. 476,580. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, of Fulton, in the county of Oswego, in the State of New York, have invented new and useful
5 Improvements in Paper-Registering Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of devices which are employed for automatically registering or adjusting to proper alignment sheets of paper in process of being fed to a paper-folding machine or other machine designed to operate on a single sheet at a time.
15 It has hitherto been found very difficult to provide a registering device of sufficient sensitiveness in its action to operate with the necessary accuracy on sheets of paper of different grades or qualities, and fed irregularly
20 or which may be carried out of proper alignment in their transit in the machine.

The object of this invention is to overcome the aforesaid difficulty by automatic and reliably operating means, and to that end the invention consists in the novel construction and combination of parts hereinafter described and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a side elevation of a paper folding machine equipped with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is an enlarged side view of the registering mechanism. Fig. 4 is a top plan view of the same. Fig. 5 is a vertical longitudinal section on line *x, x*, in Fig. 4. Fig. 6
30 is a view of the opposite side of said registering mechanism. Fig. 7 is a plan view of the carriage of said mechanism with the lower parts of the mechanism connected thereto. Fig. 8 is a perspective view of the arm which
35 carries the presser roller of the registering devices. Fig. 9 is a perspective view of the cam which actuates said arm, and Fig. 10 is an outer end view of the arm in connection with said cam.

45 Similar letters of reference indicate corresponding parts.

f-f and *f'-f'* are the tapes or conveyers which carry the paper across the top of the folding rollers —*L-L*— and to the stop
50 or end-gage —*g*— which arrests the movement of the paper so as to cause it to lie with

the center of its length under the folding blade —*O*—. The paper usually requires registering and adjusting in its position after it has been carried to the end-gage —*g*— in
55 order to bring the desired folding line of the paper in line with the folding blade, and for this purpose I employ my improved registering mechanism, which is constructed as follows:

Transversely over the conveyers —*f-f'*— I support horizontal guides —*B-B*— which are rigidly secured to a pedestal —*B'*— mounted upon the side of the frame —*A*—. Upon the said guides is mounted a longitudinally movable carriage —*F*— which is adjustably confined in its position by means of the horizontal screw —*E*— which is parallel with the guides —*B-B*— and journaled in the pedestal —*B'*—, and is provided at its outer
60 end with a hand-wheel —*E'*—, and has its inner end passing through the nut —*N*— affixed to or integral with the carriage —*F*—. In bearings on the under side of said carriage is journaled a shaft —*b*— disposed at right
65 angles to the guides or parallel with the conveyers —*f-f'*—, and to this shaft is fastened the roller —*R*— which has the top of its periphery protruding through an opening in the top of the carriage so as to be in proximity to the passage of the paper, and is revolved toward the side of the machine or laterally from the line of travel of the paper. The roller —*R*— receives its rotary motion from the actuating mechanism of the paper
70 conveyers —*f-f'*— by means of a spiral gear —*b'*— fastened to the shaft —*b*— and meshing with a spirally toothed pinion —*b''*— attached to a shaft —*a*—, which is at right angles to the paper conveyers or parallel with the carriage —*F*— and journaled at its inner end in a hanger —*a'*— fastened to one of the guides —*B*—, and at its outer end in the pedestal —*B'*—, and has attached to it a gear —*F'*— which meshes with one of the gears of
75 the usual train employed on the folding machine. Over the roller —*R*— and parallel therewith is another roller —*R'*— pivoted to a suitable vertically movable support which allows it to be raised sufficiently for the paper
80 in transit to pass freely between the two rollers, and subsequently fall upon the said pa-

per and press the same upon the lower roller —R— which by its frictional contact therewith draws the paper into proper alignment with the folding rollers and blade. For this purpose I provide the lower roller —R— with a facing of rubber or other suitable material adapted to obtain the necessary frictional hold on the paper. The upper roller is revolved simply by its frictional bearing on the paper moved by the lower roller. The aforesaid vertically movable support I preferably form of an arm —C— pivoted at one end to a rock-shaft —c— journaled in a bracket —F''— secured to the top of the carriage —F. The presser-roller —R'— is pivoted to the free end of the arm —C. The rock-shaft —c— receives its motion by a miter pinion —c''— fixed thereto and meshing with a similar pinion —d'— attached to a rock-shaft —d— which is disposed at right angles to the line of paper conveyers —f'—f'— and has an arm —G— attached to its outer end. This arm is connected by a rod —e'— to the upper end of another rock-arm —I— which is pivoted intermediate its length to the frame —A— and has pivoted to its lower end a roller by which it bears on a rotary cam —H. The arm —I— is held in its bearing on said cam by a rod —e— connected to the arm above its pivot or fulcrum and passing freely through a rigid stud —e''— attached to the frame —A— and having affixed to it a collar —i— between which and the stud —e''— is a spiral spring *i'* surrounding the rod and bearing on said collar and stud and thereby forcing the rod toward the rock-arm —I—, as shown in Fig. 1 of the drawings.

The heel or pivoted end of the roller-carrying arm —C— has projecting from its side a cam-shoulder —C'— upon which bears a cam —c'— fastened to the rock-shaft —c—, the motion of which latter thus alternately lifts and drops the arm —C— and causes the roller —R'— to rise and allow the paper to pass between it and the lower roller —R— and subsequently drop upon the paper and press the same onto the lower revolving roller which shifts the paper laterally to the side-gage as aforesaid. To arrest the said lateral movement of the paper immediately after it has been registered by the side-gage I employ an electrically operated stop-motion, which obviously is susceptible of many variations in the details of its construction. Hence I do not wish to be limited specifically to the construction hereinafter described.

The construction shown in the annexed drawings for an exemplification of such stop-motion is as follows: On the bracket —F''— are mounted electro-magnets —D—D— connected to an electric circuit in which —S— denotes the battery. The armature —D'— is affixed to a lever —D''— which is fulcrumed or loosely mounted on the rock-shaft —c— and is thus pivoted axially in line with the pivot of the roller-carrying arm —C. The inner end of the lever —D''— is extended

under the arm —C— so as to engage the same from beneath and lift the same as hereinafter described. I preferably provide said arm with an adjustable set-screw —j— by which it bears on the lever —D''— as shown in Figs. 3 and 5 of the drawings. To cause the lever —D''— to alternately lift and drop the arm —C— I employ a circuit-making and breaking lever consisting of a movable side-gage —k— in the path of the paper shifted by the rollers —R—R'. This lever is pivoted to a hanger —k'— on the carriage —F— and is held normally in its circuit-breaking position by a weighted arm —l— connected thereto in a suitable manner, as shown in Fig. 5 of the drawings, in which it is connected to another arm —k''— extending laterally from the pivoted end of the lever. On this arm is mounted an insulated block —l'— provided with a binding-post —l''— and having extending from it the metallic spring-finger —m— which constitutes one of the electric terminals. A hanger —n— is attached to the carriage —F— and insulated therefrom, and to the foot of this hanger is connected an adjustable vertical set-screw —n'— which serves as the other electric terminal. Said set-screw is under the free end of the finger —m— so as to come in contact therewith when the lever —k— is tilted outward as shown in Fig. 3 of the drawings. The hanger —n— is electrically connected with one of the magnets —D— by wire —e. The other magnet is connected directly with the battery —S— by wire —e'. The finger —m— is electrically connected with the battery by wire —o'— attached at one end to the binding-post —l''— and at the opposite end to a metallic bracket —p— fastened to and insulated from the carriage, F, and having extending from it a metallic finger —r— from which extends a wire —o'''— to the battery —S.

The operation of the described registering mechanism and its electric stop-motion is as follows: As the paper is passed to the end-gage —g— by the conveyers —f—f'— said paper becomes aligned by its encounter with said gage. The arm —C— with the roller —R'— is then lifted by the cam —c'— of the rock-shaft —c— pressing down the shoulder —C'— of the aforesaid arm. The lifting of said roller allows the paper to pass between it and the lower roller —R. The motion of the rock-shaft —c— is so timed with the motion of the conveyers —f—, that the cam —c'— relieves the shoulder —C'— from the downward pressure and allows the arm —C— to drop and cause the roller —R'— to press the paper upon the lower roller —R— which is in constant motion, and, by its frictional hold on the paper, draws the same laterally into alignment with the folding roller. In this movement the edge of the paper comes in contact with the free end of the circuit making and breaking lever, and pushes said lever into its circuit-making position, as represented in Fig. 3 of the drawings. The mag-

net becoming thus energized causes the armature to be attracted, and in this motion the armature lever —D''— lifts the arm —C— sufficiently to relieve the paper from the pressure of the roller —R'. The lower roller —R— thereby loses its frictional hold on the paper and consequently the motion of the paper is arrested.

It will be observed that inasmuch as the circuit-making and breaking lever —k— is nearly balanced by the weighted arm —l— it requires only a very slight pressure of the paper upon said lever to tilt it into its circuit making position. Hence the described electric stop-motion is very sensitive and reliable in its action.

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

1. In combination with the paper-conveyers and end-gage, a roller revolving with its top toward the side of the machine and engaging the under side of the paper arrested by the end-gage, and a presser-roller over the paper and parallel with the lower roller and movable vertically to and from the same, as set forth.

2. In combination with the paper-conveyers and end-gage, a vertically revolving roller at right angles to said conveyers and in contact with the under side of the paper arrested by the end-gage and moving with its engaging face toward the side of the machine, a vertically oscillatory arm over said roller, and a presser-roller pivoted to said arm directly over the lower roller and intermittently pressing the paper upon the same, as set forth.

3. A paper-registering apparatus comprising conveyers feeding the paper to the machine, a gage arresting the advance movement of the paper and aligning the same, paper-shifters moving the arrested and aligned paper laterally, an electrically operated stop-motion arresting the movement of said shifters and a movable side-gage operated by the laterally shifting paper and controlling said stop-motion.

4. In combination with the paper conveyers and end-gage, paper-shifting mechanism drawing the paper laterally, an electric circuit, electro magnets in said circuit, the armature adapted to arrest the action of the aforesaid shifting mechanism upon the paper, and a circuit maker and breaker actuated by the shifting paper, as set forth.

5. In combination with the paper-conveyers and end-gage, a revolving shaft under the passage of the paper and parallel with the conveyers, a roller fixed to said shaft and having its periphery engaging the under side of the paper in transit, a roller over said paper parallel with the lower roller and mounted on a vertically movable support, an electric circuit, magnets in said circuit, the armature adapted to lift the aforesaid support, and a circuit maker and breaker actuated by the

paper moved by the aforesaid rollers, as set forth.

6. In combination with the paper conveyers and end-gage, a revolving shaft under the passage of the paper and parallel with the conveyers, a roller fixed to said shaft and having its periphery in proximity to the under side of the paper in transit, a vertically movable arm extending with its free end over the passage of the paper, a roller pivoted to said end of the arm, and disposed parallel with and vertically over the lower roller, an electric circuit, magnets in said circuit, the armature adapted to lift the aforesaid arm, and a circuit maker and breaker actuated by the paper moved by the aforesaid rollers, as set forth.

7. In combination with the paper-conveyers and end-gage, a roller disposed axially parallel with the conveyer and with its periphery in proximity to the under side of the paper in transit and revolving with its upper portion toward the side of the machine, a presser roller directly over the aforesaid roller and parallel therewith and mounted on a vertically movable support, an electric circuit, magnets in said circuit, the armature adapted to lift the roller-support, and a circuit making and breaking lever in the path of the paper moved by the aforesaid rollers and held normally in its circuit breaking position, as set forth.

8. In combination with the paper-conveyers, end-gage, and mechanism actuating said conveyers, a shaft under the passage of the paper parallel with the conveyers and geared with the aforesaid actuating mechanism to receive continuous rotary motion, a roller fixed to said shaft and having the top of its periphery in proximity to the passage of the paper, an arm pivoted axially parallel with the aforesaid shaft and having its free end over the aforesaid roller, a presser roller pivoted to said end of the arm and in the same vertical plane with the lower roller and pressing the paper upon said roller, an electric circuit, magnets in said circuit, the armature fixed to a lever fulcrumed intermediate of its length and engaging at its free end the aforesaid roller-supporting arm to lift the same by the attraction of the armature to the magnets, and a circuit making and breaking lever in the path of the paper and sustained normally in its breaking position, as set forth.

9. In combination with the paper-conveyers, end-gage and mechanism actuating said conveyers, the shaft —a— at right angles to the conveyers and receiving rotary motion from the aforesaid mechanism, the shaft —b— at right angles to the shaft —a— and geared to partake rotary motion therefrom, the roller —R— fixed to the shaft —b— and having the top of its periphery in proximity to the underside of the paper in transit, the arm —C— pivoted to swing with its free end vertically over the roller —R—, the roller —R'— piv-

oted to the free end of said arm and pressing the paper upon said lower roller, an electric circuit and magnets —D— in said circuit, the armature —D'—, the lever —D''— fixed to
 5 said armature and pivoted intermediate of its length axially in line with the pivot of the roller-carrying arm and engaging at its free end said arm from beneath the same, and a circuit-making and breaking lever in the path
 10 of the paper moved by the rollers, as set forth.

10. In combination with the paper-conveyers, mechanism for operating the same, paper end-gage and the roller —R— under the passage of the paper and revolving with its top
 15 in contact with the paper and laterally from the travel of the paper, the rock-shaft —c—, cam —c'— fastened to said shaft, the arm —C— mounted loosely on the same shaft and having affixed to it the shoulder —C'— bearing
 20 on the under side of the cam —c'— and the roller —R'— pivoted to said arm, as set forth and shown.

11. In combination with the main-frame, paper-conveyers, mechanism for operating the same, paper end-gage, and the roller —R—
 25 under the passage of the paper and revolving with its top in contact with the paper and laterally from the travel of the paper, the rock-shaft —d— at right angles to the aforesaid conveyers, miter pinion —d'— attached
 30 to said shaft, the shaft —c— at right angles to the shaft —d—, the pinion —c''— on the

shaft —c— meshing with the pinion —d'—, the arm —C— mounted loosely on shaft —c— and provided with the shoulder —C'—, the
 35 roller —R'— pivoted to said arm, the cam —c'— fixed to the shaft —c— and bearing upon the shoulder —C'—, the arm —G— secured to the shaft —d—, the cam —H— rotated by the actuating mechanism of the
 40 paper conveyers, the lever —I— pivoted to the main frame, the spring-rod —e— holding said lever in contact with the cam, and the rod —e'— connecting said lever to the arm
 45 —G—, substantially as described and shown.

12. In combination with the main frame, paper-conveyers and end-gage arresting the movement of the paper, lateral guides mounted on the frame, a carriage mounted
 50 on said guides, and sustained adjustably lengthwise thereof, lateral paper-shifting mechanism supported on said carriage, an electric circuit, electro magnets on the aforesaid carriage, the armature adapted to arrest
 55 the action of the aforesaid paper-shifting mechanism, and a circuit maker and breaker actuated by the shifting paper as set forth.

In testimony whereof I have hereunto signed my name this 28th day of April, 1893.

TALBOT C. DEXTER. [L. s.]

Witnesses:

MARK W. DEWEY,
 H. M. SEAMANS.