

No. 648,162.

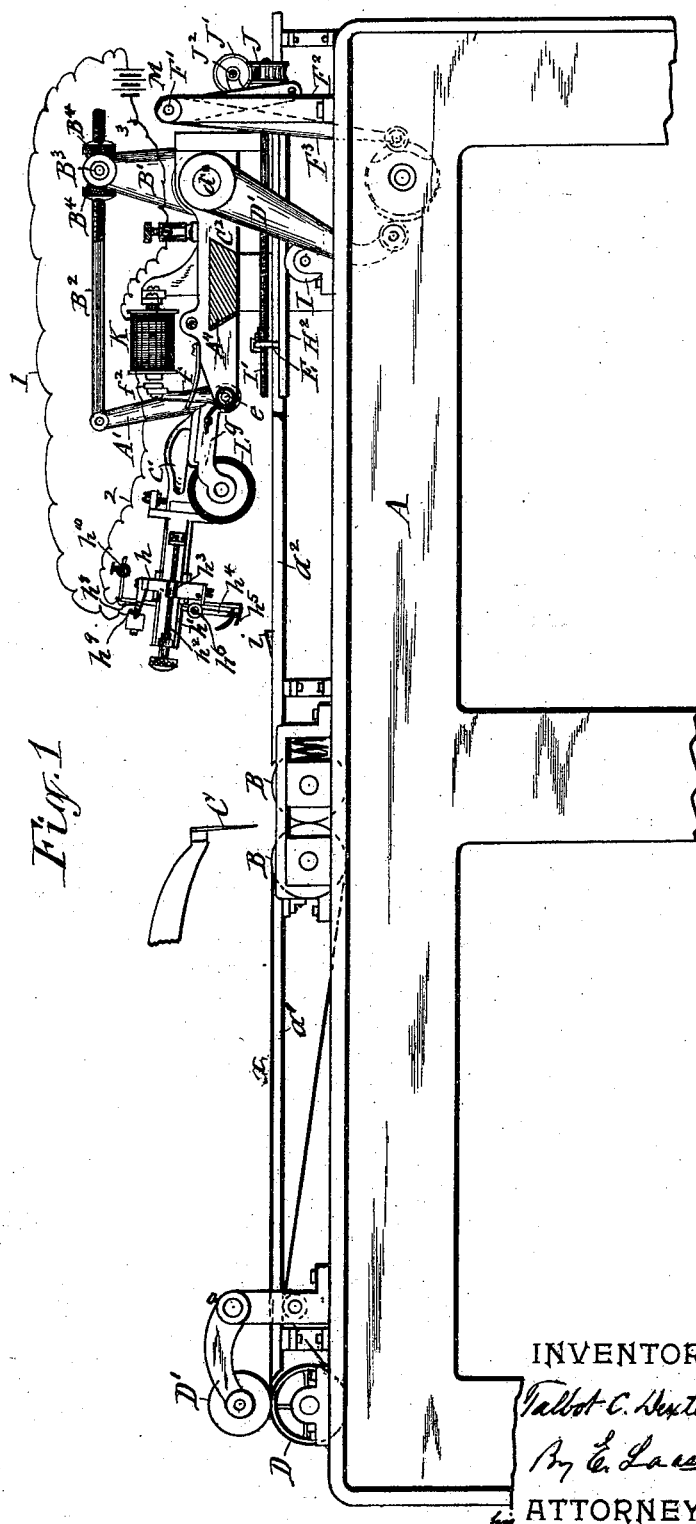
Patented Apr. 24, 1900.

T. C. DEXTER.
PAPER REGISTERING MECHANISM.

(Application filed Mar. 28, 1899.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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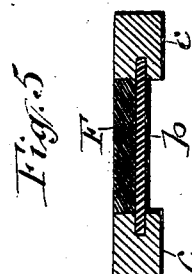
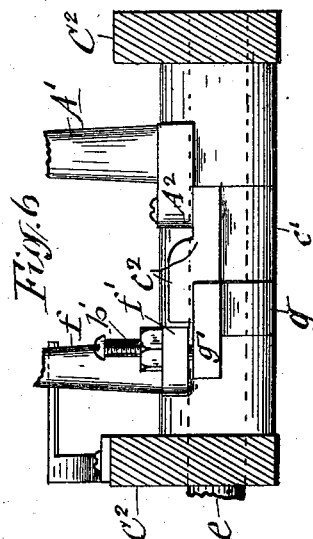
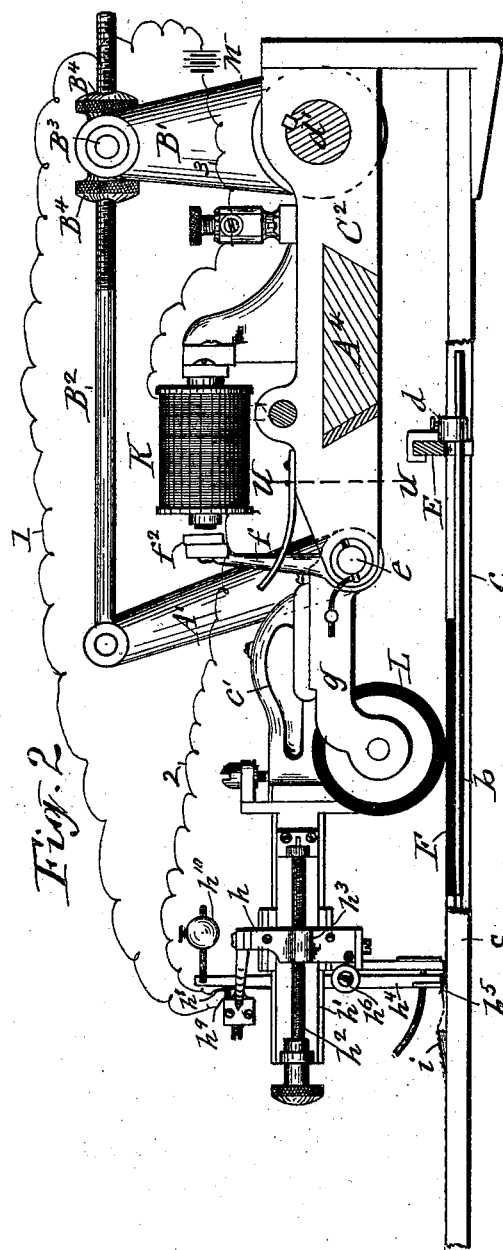
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PAPER REGISTERING MECHANISM.

(Application filed Mar. 28, 1899.)

(No Model.)

4 Sheets—Sheet 2.



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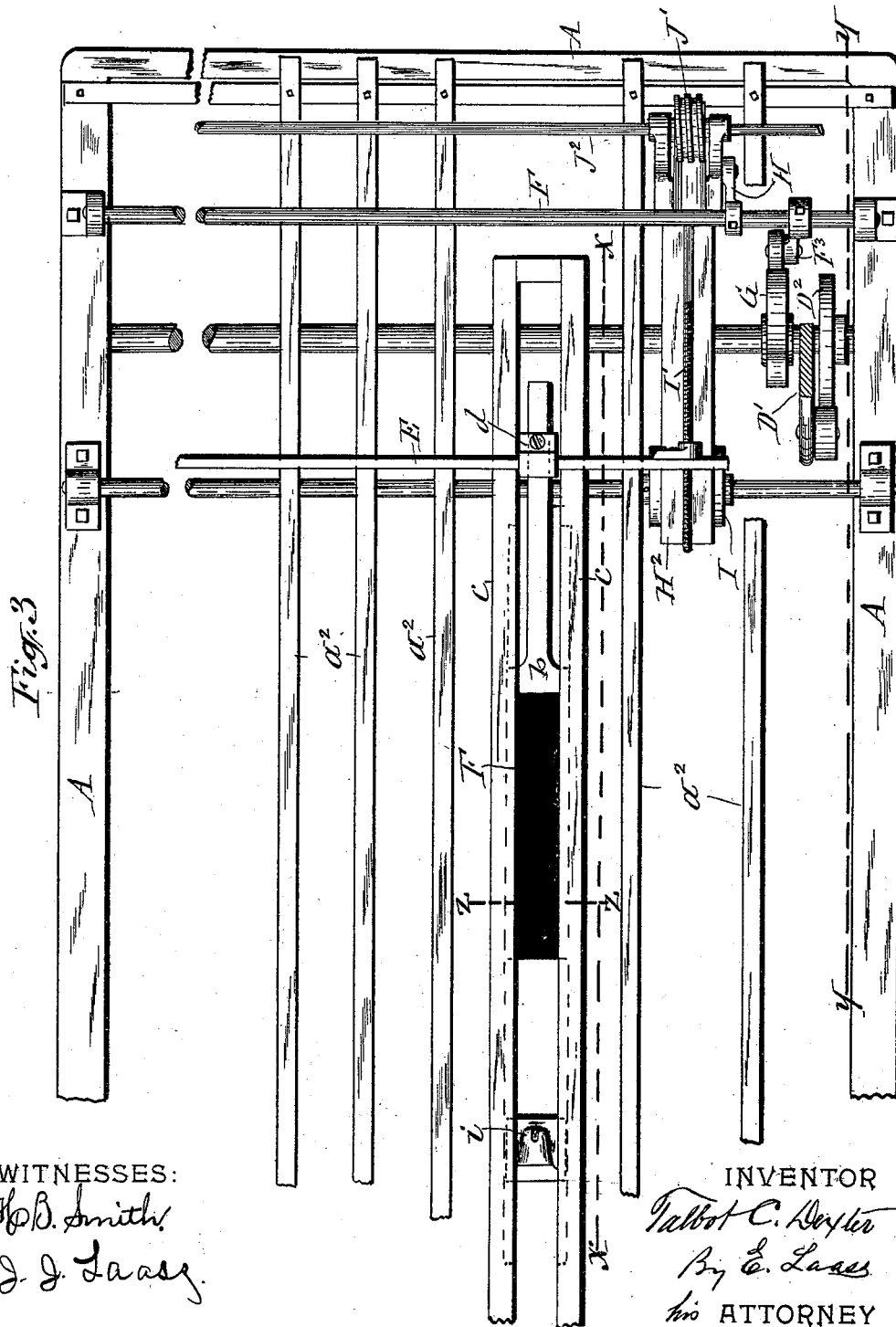
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4 Sheets—Sheet 3.



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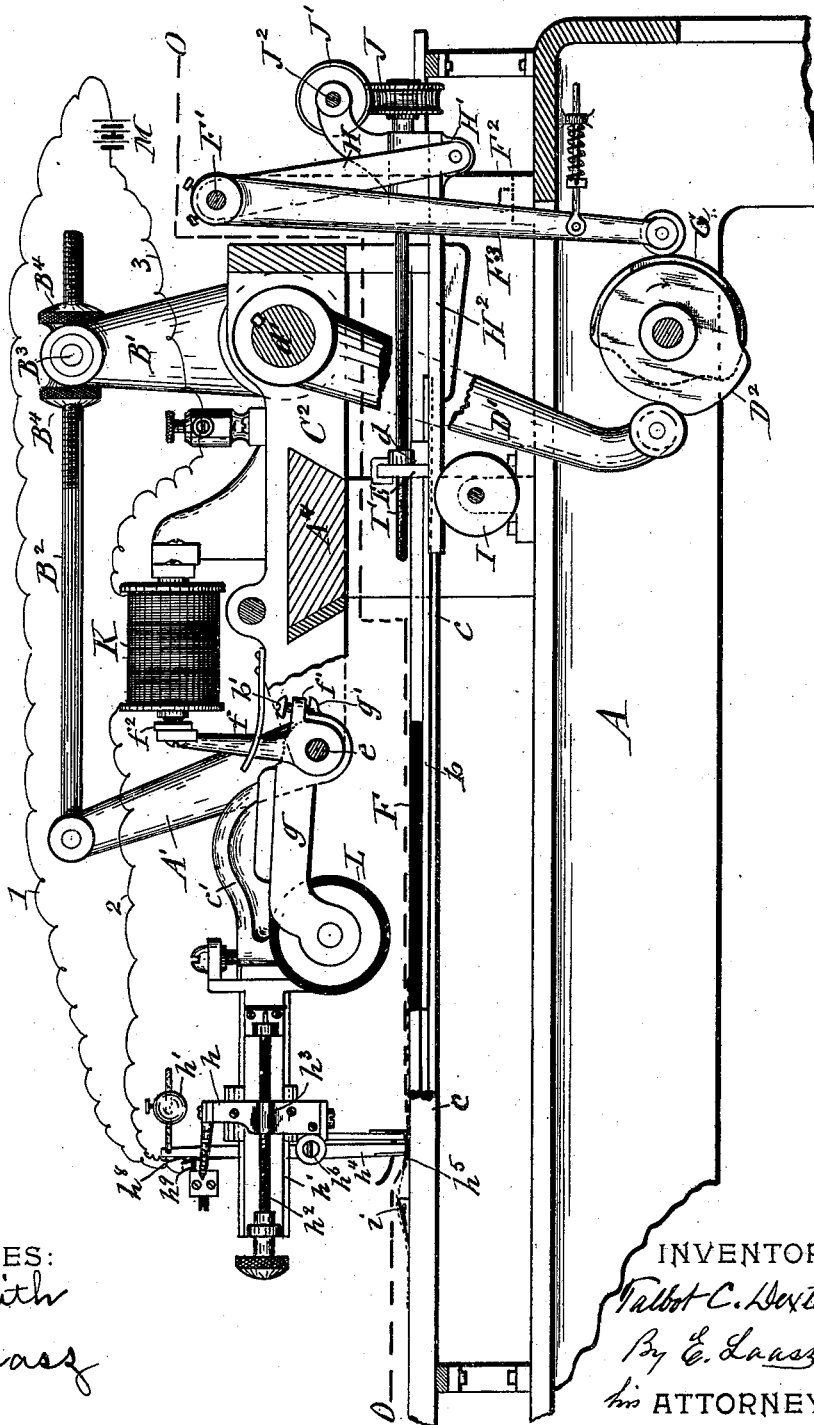
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(No Model.)

4 Sheets—Sheet 4.

Fig. 4



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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK, ASSIGNOR TO THE
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PAPER-REGISTERING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 648,162, dated April 24, 1900.

Application filed March 28, 1899. Serial No. 710,781. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, and a resident of Pearl River, in the county of Rockland, in the State of New York, have invented new and useful Improvements in Paper-Registering Mechanism, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to an improvement in registering mechanism employed in connection with paper-folding machines and analogous machines of that character for the purpose of moving the sheet of paper to a predetermined position to be folded or otherwise operated on; and the invention relates to the mechanism shown and described in my Letters Patent No. 575,150, dated January 12, 1897, and more particularly to my application for patent, Serial No. 682,316, filed June 2, 1898, in which application the registering mechanism is employed in connection with a paper-folding machine and comprises, essentially, an electromagnetically-controlled drop-roller for pressing the sheet of paper in contact with a friction-roller located directly below the drop-roller for the purpose of imparting a secondary advance movement to the sheet after it has been arrested by the usual front stop or gage, whereby a pin or attenuated tongue with which the registering instrument proper is equipped engages a slit provided in the paper, and thus the sheet is arrested in its latter movement, with its predetermined line of folding directly over the bite of the folding-rollers.

In practice it has been found that owing to the peculiar construction of the folding-machines in some cases it is not convenient to employ the friction-roller hereinbefore referred to nor the gearing which is required to impart the motion thereto. It has also been found that in operating on certain qualities of paper, especially calendered paper, sufficient frictional hold on the paper is not obtained by the use of the frictional roller.

The object of my present invention is to overcome the aforesaid difficulties by simple, inexpensive, and efficient means; and to that end my invention consists, mainly, in a paper-folding machine or analogous machine

designed to operate on sheets of paper, the combination, with a receding front gage arresting the sheet fed into the machine, of a paper-registering mechanism comprising a longitudinally-reciprocating bed operated by said gage and receiving upon it the sheet to be registered, an electromagnetically-controlled drop-roller pressing the sheet periodically into frictional contact with said bed to impart a secondary advance movement to the sheet to carry the sheet to its registered position, and a registering instrument provided with a pin or point entering a slit provided in the sheet to arrest the sheet in said position, as hereinafter more fully described; and the invention also consists in certain novel details of construction, as hereinafter fully described, and set forth in the claims.

In the annexed drawings, Figure 1 is a side elevation of a paper-folding machine equipped with my improved paper-registering mechanism shown in position for receiving the paper. Fig. 2 is an enlarged vertical longitudinal section on line X X in Fig. 3, showing the registering instrument in operative position. Fig. 3 is a plan view taken in a plane beneath the line o o in Fig. 4. Fig. 4 is a vertical longitudinal section on line y y in Fig. 3 and showing the registering instrument in its position when the paper is registered. Fig. 5 is an enlarged transverse section on line z z in Fig. 3, and Fig. 6 is an enlarged transverse section on line U U in Fig. 2.

Similar letters and figures of reference indicate corresponding parts.

A represents the main supporting-frame of a paper-folding machine. B B designate the paper-folding rollers, C is the blade which introduces the paper between the folding-rollers in the usual and well-known manner, and a a are the tapes which convey the paper into the machine. a' a' are the bars which are arranged between the tapes to assist the tapes in conveying the paper. D is a rotary roller which by the aid of the usual drop-rollers D' feeds the paper to the top of the aforesaid tapes. a² a² are the usual bars which support the portion of the paper beyond the folding-rollers, and E represents the alternately advancing and receding stop or gage, which ar-

rests the movement of the sheet carried into the machine by the tapes *a a*. All of the said parts are of the usual construction, and any suitable and well-known mechanisms may be employed for operating the aforesaid rollers and folding-blade, and therefore need no special description in the present case.

My improved registering mechanism is employed for the purpose of automatically and accurately registering the sheet of paper or, in other words, to properly adjust the sheet to bring the predetermined line of folding thereof directly over and parallel with the bite of the folding-rollers before the sheet is introduced between the said rollers by the folding-blade hereinbefore referred to. Said registering mechanism is constructed as follows:

F F denote two longitudinally-reciprocating beds, which are disposed at opposite sides and parallel with the longitudinal central line of the machine. Said beds are preferably formed of flat pieces or pads of soft rubber or other suitable material capable of obtaining a sufficient frictional hold on the sheet of paper pressed into contact therewith to move the sheet with the travel of the beds, as hereinafter explained. The beds are secured to plates *b b*, which slide in longitudinal grooves in stationary horizontal bars *c c* and are secured to the gage *E*, preferably by means of blocks *d d*, attached to the gage and provided with openings through which the front end portions of the plates pass and in which they are retained by set-screws passing through said blocks and engaging said plates, whereby the beds are caused to move with the alternately advancing and receding gage *E*. The described connection of the plates *b b* to the gage permits said plates to be adjusted to carry the beds *F F* a greater or less distance from the gage, and thus maintain said beds in proper position in relation to the drop-rollers *L L*, while the gage is adjusted for sheets of different widths, as hereinafter described. Said gage is operated by preferably the same mechanism as shown in the patent and application hereinbefore referred to, which mechanism comprises a rock-shaft *F'*, extending across the machine and supported in suitable bearings on posts *F²*, mounted on the main frame *A*. An arm *F³*, secured to said shaft, has pivoted to its free end a roller, by which it bears on a rotary cam *G*, which imparts oscillatory motion to said arm. Two other arms *H H* are fastened in suspended positions to the shaft *F'* and are connected at their lower ends to blocks *H' H'*, attached to the outer ends of bars *H² H²*, which ride with their inner ends on supporting-rollers *I I*. Upon said bars is adjustably supported the gage *E*, which is provided with screw-threaded eyes, through which pass the screw-threaded portions of the longitudinal rods *I' I'*, journaled in the blocks *H' H'*. To the outer ends of the screw-rods *I' I'* are fastened worm-gears *J J*, which engage corresponding

gears *J' J'*, secured to a transverse shaft *J²*, which is journaled to arms projecting from the blocks *H'*. The end of the shaft *J²* is provided with a hand-wheel for turning said shaft, and thereby imparting motion to the screw-rods *I'*. In this manner the gage *E* is adjusted in its position to conform to different-sized sheets fed into the machine.

Upon the sides of the main frame *A* of the machine is supported a stationary cross-bar *A⁴*, upon which is mounted at right angles the supporting-bracket *C²* of the registering instrument. To the inner end of the bracket *C²* is fastened a transverse shaft *e*, upon which is loosely mounted a lever *f*, which extends upward therefrom and has fastened to its upper end the armature *f*, which faces the magnet *k*, mounted on the bracket *c²*. On the same shaft *e* and adjacent to the lever *f* is also loosely mounted an arm *g*, to the free end of which is pivoted the drop-roller *L*, said arm having a lug *g'* projecting from its hub. A similar lug *f'* projects from the hub of the lever *f* and bears upon the top of the lug *g'*, preferably by means of a set-screw *b'*, passing vertically through the lug *f'*, whereby the lever *f* can be adjusted to carry the armature *f²* at a proper distance from the magnet *K*. Adjacent to the drop-roller arm *g* is a longitudinal arm *c'*, also loosely mounted on the shaft *e* and provided on its hub with a lug *c²*, by which it bears on the lug *g'*. At the side of the arm *c'* is a rock-arm *A'*, mounted loosely on the shaft *e* and provided with a lug *A²*, which is fastened to the lug *c²* by a screw *A³*, and thus causes the arm *c'* to move synchronously with the rock-arm *A'*. Said rock-arm derives its motion from another rock-arm *B'*, with which it is adjustably connected by a screw-rod *B²*, which is pivoted at one end to the arm *A'* and passes with its screw-threaded opposite end through a collar *B³*, pivoted to the arm *B'*. By means of nuts *B⁴ B⁴* on said screw-threaded portion of the rod at opposite sides of the collar *B³* the distance between the free ends of the two rock-arms can be increased or diminished as may be required to cause the free end of the longitudinal arm *c'* to be moved the proper distance toward and from the plane of the paper-supporting bars *a² a²*.

The rock-arm *B'* is fastened to a transverse shaft *d'*, journaled in the bracket *C²* and extending to the side of the main frame *A*, where it has attached to it a lever *D'*, the free end of which has pivoted to it a roller, by which it bears on a rotary cam *D²*. Said cam is shaped with two steps to impart to the rock-arms *B'* and *A'* two successive increased thrusts, and thereby causes the longitudinal arm *c'* to receive two successive increased lifts for the purpose hereinafter explained. On said longitudinal arm is mounted the registering instrument proper, consisting of a vertical bracket *h*, riding on a guide *h'*, extending from the end of the arm *c'* and adjusted longitudinally therein by a screw *h²*,

journalled in suitable bearings on the arm and passing through a nut h^3 on the bracket h . To the said bracket beneath the guide h' is pivoted a vertical lever h^4 , the foot of which is provided with the point or attenuated tongue h^5 for engaging the slit made in the paper for that purpose. Said lever is insulated from the bracket h by the pivot-screw h^6 bearing on a rubber hub h^7 , secured to the lever. On the upper end of this lever is the terminal h^8 , facing the terminal h^9 , attached to the bracket h and held normally out of contact therewith by a counterbalance h^{10} , connected to said lever. From the terminal h^8 to the battery M extends a wire 1, and from the other terminal h^9 to the magnet K extends a wire 2, which magnet is connected to the battery by a wire 3. Said wire connection may be made in any suitable manner, and therefore it is unnecessary to show or explain the same in detail in my present case.

In front of the registering instrument is the bridge i , which serves to open the slit provided in the paper to insure the entrance of the point h^5 during the process of registering the sheet.

In the operation of the described registering mechanism the arms g and c' are lifted to their greatest elevation to allow the incoming sheet to be moved freely to the gage E, to which it is carried by the tapes $a a$. Said gage at that time is in its nearest position to the folding-rollers and arrests said movement of the sheet. The aforesaid lifting of the two arms is effected by the rock-arm A' pressing with its lug A^2 upon the lug c^2 of the arms c' and causing the lug c^2 to press upon the lug g' of the drop roller-arm g . As soon as the sheet has been arrested by the gage E the latter recedes and the rock-arm A' is actuated to allow both arms g and c' to descend. This causes the drop-roller J to press the sheet into frictional contact with the bed F and at the same time the bottom of the point h^5 is caused to press upon the sheet in front of the bridge i . The aforesaid frictional hold of the bed F on the sheet imparts a secondary advance movement to the sheet, whereby the slitted portion of the sheet is drawn off the bridge i , which serves to open the slit, so as to allow the registering-point h^5 to readily enter the slit. The edge of the slit coming in contact with the lower end of the lever h^4 tilts said lever, and thereby brings the terminal h^8 in contact with the terminal h^9 . Thus the circuit is closed, and the magnet K is caused to attract the armature f^2 and move the lever f sufficiently to lift the drop-roller arm g by the pressure of the lug f' upon the lug g' . The friction-bed is thereby deprived of its hold upon the sheet and leaves the sheet in its reg-

istered position. The rock-arm A' is then actuated sufficiently by the cam D^2 to lift the arm c' , so as to cause the point h^5 to lift the portion of the sheet hanging on said point. This allows the folding-rollers B B to draw the sheet into the bite of said rollers without danger of tearing the sheet during the travel of the slitted portion of the sheet across the bridge i . After the sheet has passed through the bite of the folding-rollers the rock-arm A' receives its second impulse from the cam D^2 , and thereby lifts jointly the two arms c' and g still farther to insure free passage of the next incoming sheet under the registering-point h^5 and drop-roller L.

What I claim as my invention is—

1. In a paper-folding machine or analogous machine designed to operate on sheets of paper, the combination with a receding front gage arresting the sheet fed into the machine, of a paper-registering mechanism comprising a longitudinally-reciprocating bed operated by said gage and receiving upon it the sheet to be registered, an electromagnetically-controlled drop-roller pressing the sheet periodically into frictional contact with said bed to impart a secondary advance movement to the sheet to carry the sheet to its registered position, and a registering instrument provided with a pin or point entering a slit provided in the sheet to arrest the sheet in said position as set forth.

2. In combination with the sheet-delivering tapes and a movable gage temporarily arresting the movement of the sheet, a frictional horizontal sheet-shifting bed disposed to receive upon it the delivered sheet and connected to the gage to move therewith, a stationary bracket, an intermittently-operating sheet-depressor, and a registering instrument both supported on said bracket, and a point on said instrument entering into a slit in the sheet as set forth and shown.

3. The combination with the adjustable receding gage arresting the advance movement of the sheet, a longitudinally-reciprocating bed secured longitudinally adjustable to said gage and receiving upon it the paper to be registered, an electromagnetically-controlled drop-roller pressing the sheet periodically into frictional contact with said bed to carry the sheet to its registered position, and a paper-registering instrument equipped with a pin or point engaging a slit provided in the sheet to arrest the sheet in its registered position as set forth.

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Witnesses:

H. B. SMITH,
J. J. LAASS.