

(No Model.)

5 Sheets—Sheet 1.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 554,913.

Patented Feb. 18, 1896.

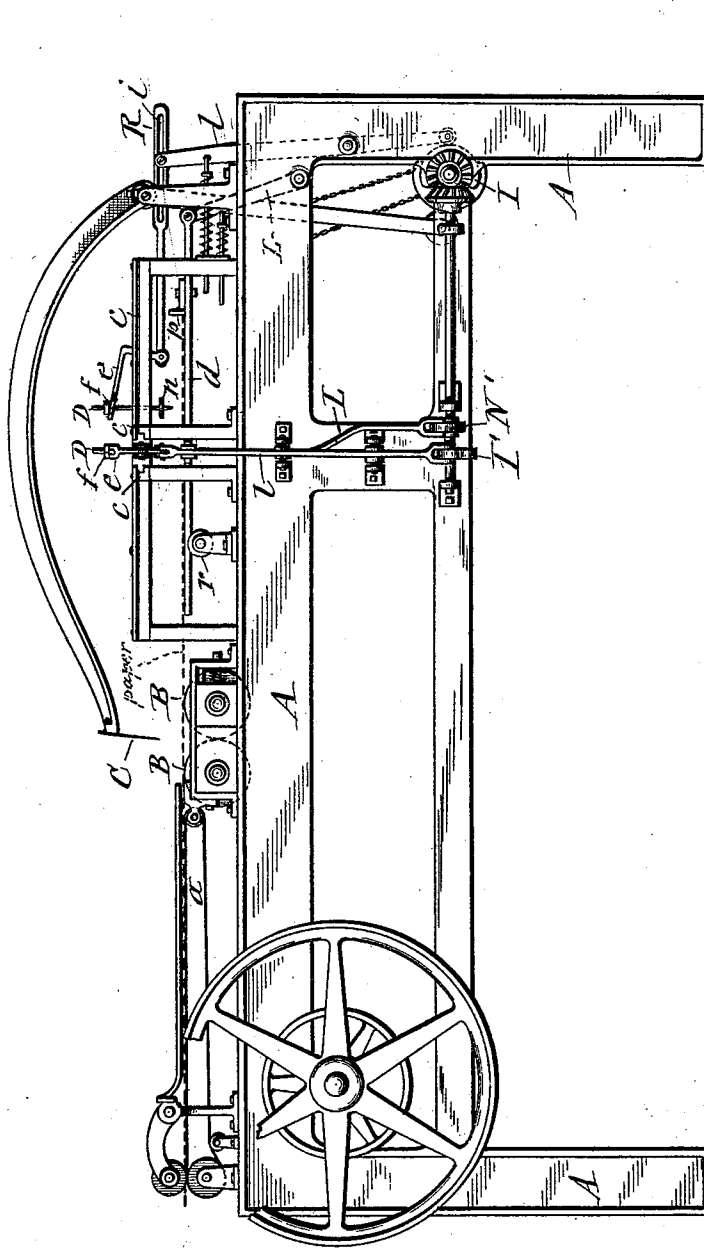


Fig. 1

WITNESSES:

C. E. Hamiltonson.
C. L. Rud Dixon

INVENTOR:

Talbot C. Dexter
By E. Laess
his ATTORNEY

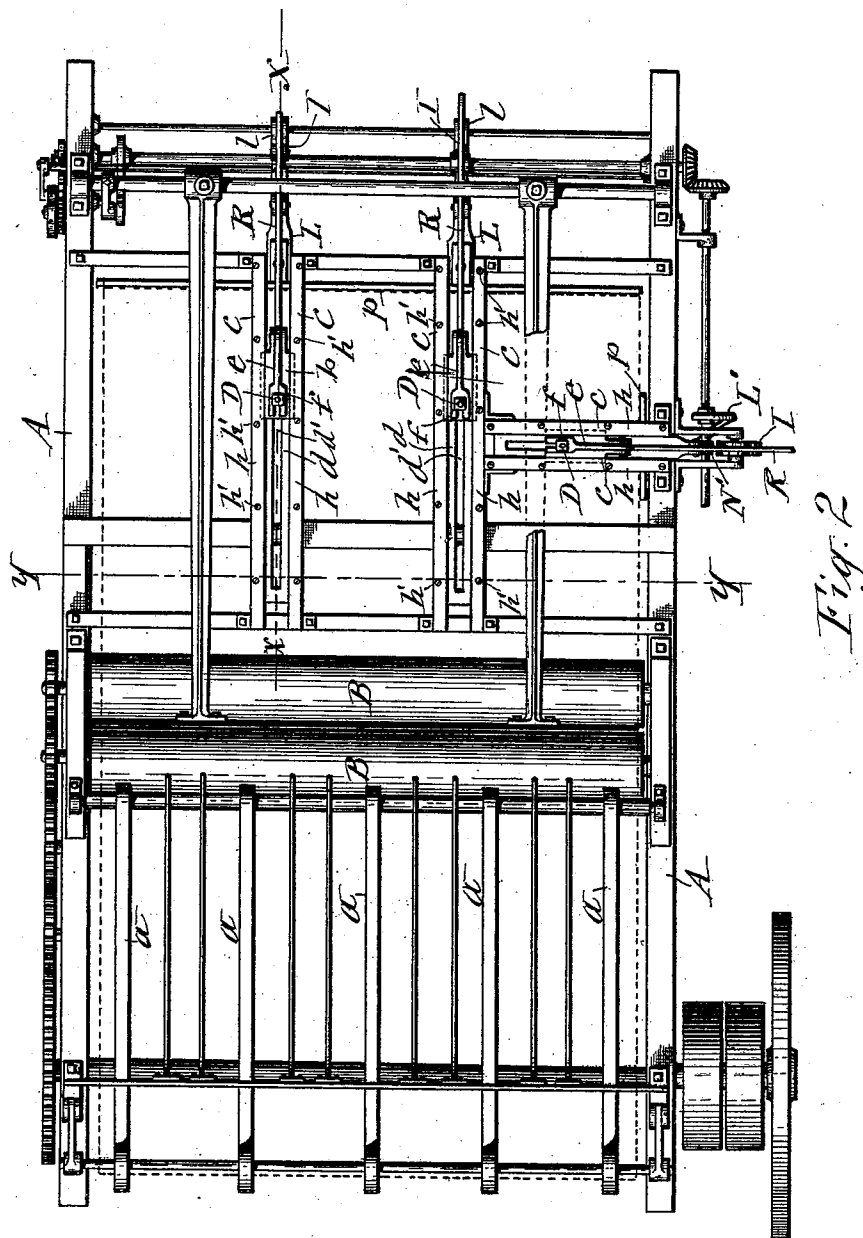
(No Model.)

5 Sheets—Sheet 2.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 554,913.

Patented Feb. 18, 1896.



WITNESSES:

C. E. Robinson
C. L. Burdison

INVENTOR:

Talbot C. Dexter
By *E. Laess*
his ATTORNEY

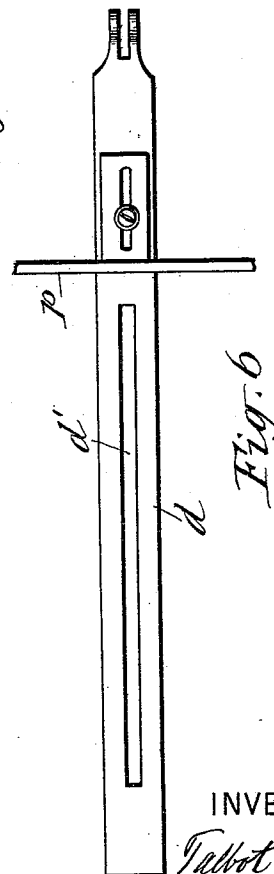
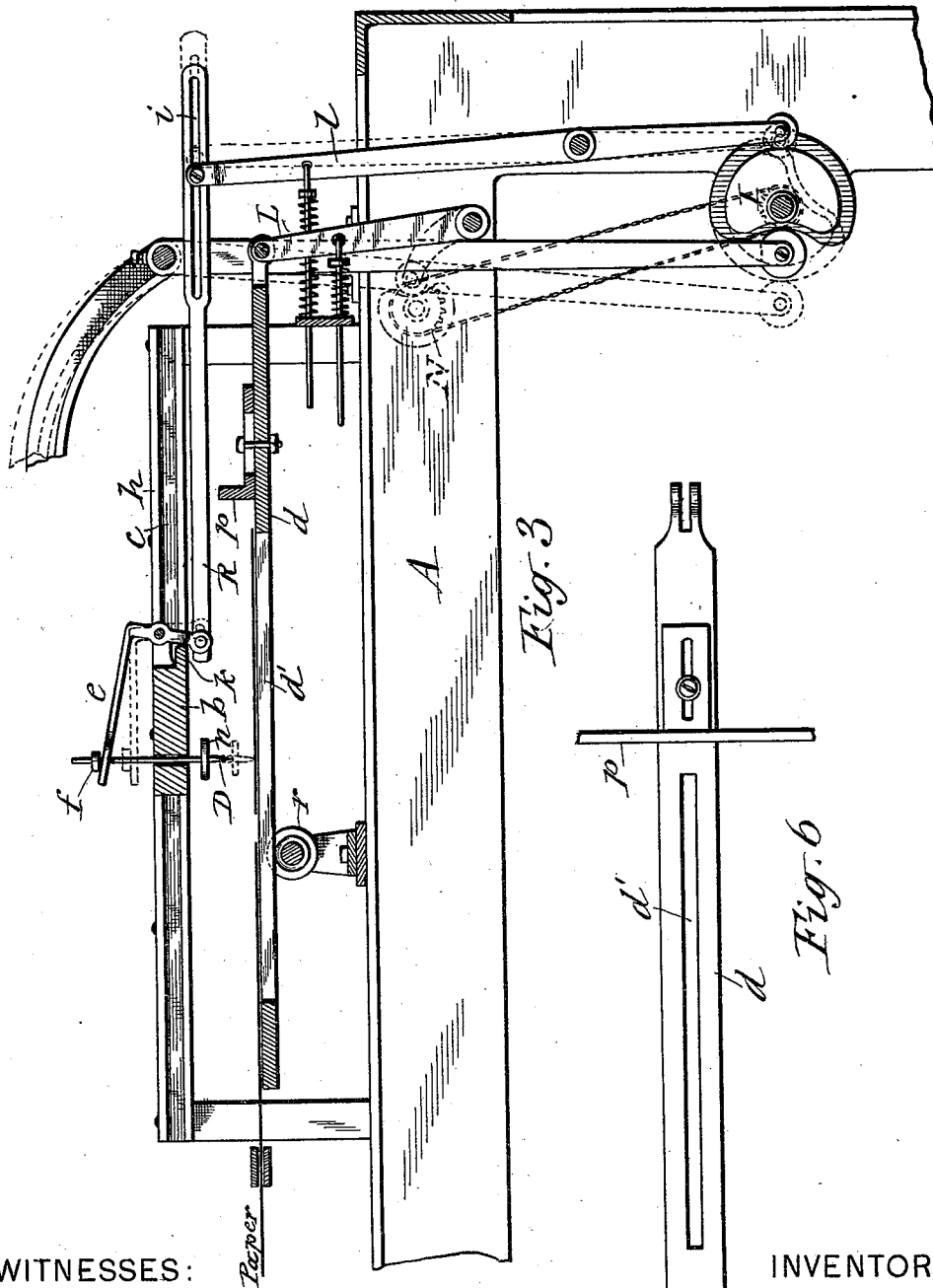
(No Model.)

5 Sheets—Sheet 3.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 554,913.

Patented Feb. 18, 1896.



WITNESSES:

W. E. Comlinson
C. L. Bendixon

INVENTOR:

Talbot C. Dexter
By E. Laas
his ATTORNEY

(No Model.)

5 Sheets—Sheet 4.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 554,913.

Patented Feb. 18, 1896.

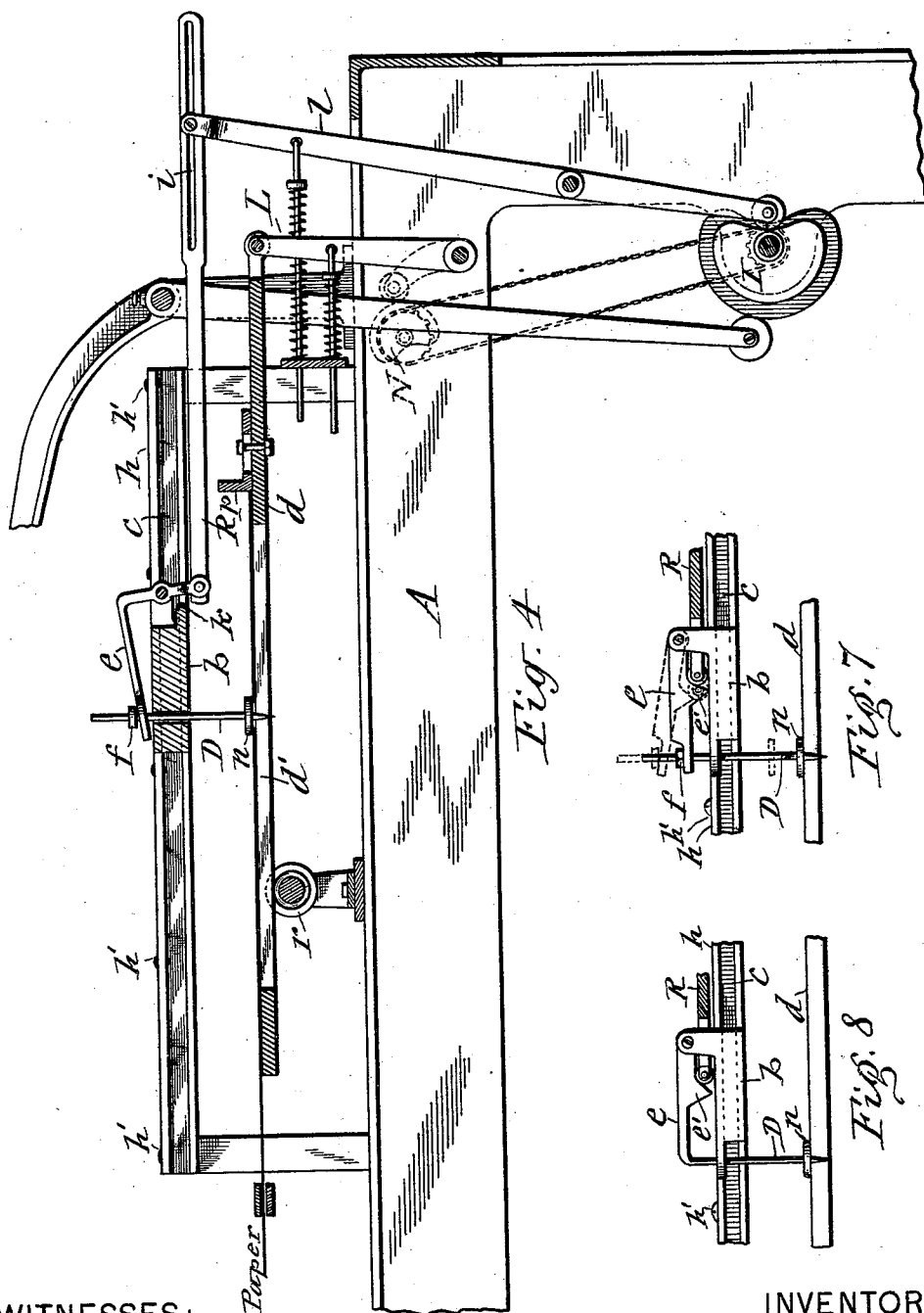


Fig. 4

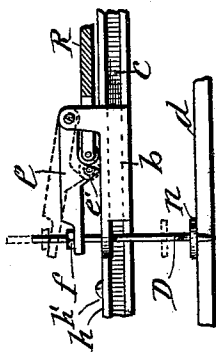


Fig. 7

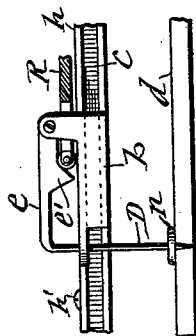


Fig. 8

WITNESSES:

C. C. Tomlinson
C. L. Burdison

INVENTOR:

Talbot C. Dexter
By E. Laass
his ATTORNEY

(No Model.)

5 Sheets—Sheet 5.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 554,913.

Patented Feb. 18, 1896.

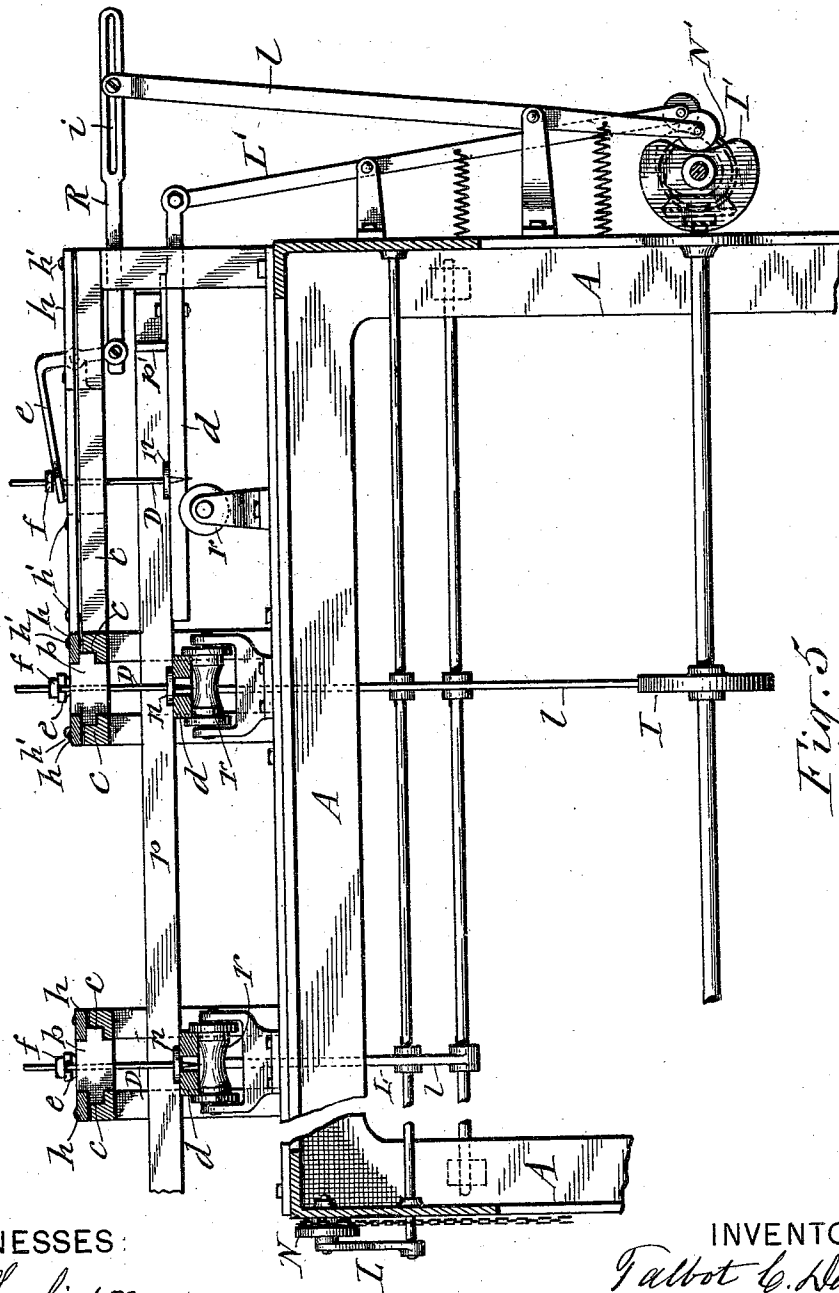


Fig. 5

WITNESSES:

C. C. Comlinson,
C. L. Bendixon

INVENTOR:

Talbot C. Dexter
By C. Laess
his ATTORNEY

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF FULTON, ASSIGNOR TO THE DEXTER FOLDER COMPANY, OF NEW YORK, N. Y.

PAPER-REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 554,913, dated February 18, 1896.

Application filed May 14, 1894. Serial No. 511,132. (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 mechanisms employed for registering printed sheets of paper preparatory to folding the same into book form.

In practice it has been found that frequently the blank margins of the printed sheet vary
15 in width, especially when the sheet has been printed on what is known as a "web" or "rotary" printing-press that takes the sheet from the roll. In severing the sheets the cutting may be perfectly parallel to the printing; but
20 it often occurs that the cutting at one end or side of the sheet is nearer to the printing than the opposite end or side, and consequently the two margins differ in width, and at other times the cutting may be slightly oblique to the
25 printing, and in that case the margins are wider at one end than at the opposite end. In consequence of these variations of the margins it is impossible to accurately register the sheet by bringing the edge of the sheet
30 in contact with gages or guides. To obviate this difficulty the so-called "point-feed" has been resorted to, in which the sheet is perforated at predetermined locations during the passage of the sheet through the printing-
35 press and is then placed by hand upon the folding-machine and adjusted thereon in such a position as to cause the upwardly-projecting points on said machine to enter the perforations of the sheet. The perforations being
40 always in the same positions in the successive sheets, and the aforesaid points being permanently located on the folding-machine, causes the sheets to be perfectly registered. Said method of registering the sheet is, however,
45 very slow and tedious, and therefore the process of folding the sheets is very much delayed.

It is this defect which is effectually obviated by my present invention, which consists essentially of a registering apparatus provided
50 with a gravitating pin or other suitable catch

carried back and forth over the plane of the paper conveyed into the machine automatically, and in the movement of said pin or catch in one direction it engages the perfora-
55 tion in the paper, and thereby moves the said paper to its registering position; and the invention also consists in the combination, with said gravitating pin or catch, of a bearing connected thereto and riding on the sheet to assist the movement thereof and guard against
60 the tearing of the sheet by the engagement of the pin or catch; and the invention furthermore consists in other auxiliary devices employed in connection with the aforesaid pin
65 or catch, as hereinafter more fully 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 improved registering apparatus. Fig. 2 is a plan view of the same.
70 Figs. 3 and 4 are enlarged vertical longitudinal sections respectively on line X X in Fig. 2 and showing the registering apparatus in different operative positions. Fig. 5 is an enlarged
75 vertical transverse section on line Y Y in Fig. 2. Fig. 6 is an enlarged detached plan view of the gage-supporting bar, and Figs. 7 and 8 are enlarged side views and partly vertical longitudinal sectional views of modifi-
80 cations of the paper-engaging catch or pin and its carrier.

Similar letters of reference indicate corresponding parts.

A denotes the main supporting-frame of
85 the paper-folding machine. B B designate the folding-rollers, C the folding-blade, and a a the tapes which convey the paper from the feed-board rectilinearly to the folding-machine. All of said parts are arranged to
90 operate in the usual and well-known manner.

The paper to be folded is perforated or provided with short slits at predetermined points during its passage through the printing-press, as hereinbefore stated.
95

The purpose of my invention is to register the irregularly-margined paper automatically, accurately, and rapidly after it has been delivered to the folding-machine by the aforesaid tapes, and thus save time and labor in
100 the operation of folding the paper. This I accomplish by means of a gravitating pin or

analogous suitable catch D, which is supported on a carrier *b* riding on horizontal guides *c c* over the paper-supporting bars or plates *d d*. I preferably employ for said catch a vertical pin suspended from the free end of a lever *e* pivoted to said carrier. Said pin may be formed separate from the lever and provided with a collar *f* above the lever to permit the said lever to lift the pin, as hereinafter described. The lower end of said pin passes through a vertical guide either in or on the carrier, and is thus sustained in a vertical position while operating on the sheet to be registered, or said pin may be formed integral with the lever, as represented in Fig. 8 of the drawings.

The carrier is moved back and forth by a reciprocating rod R, which is connected to the carrier, with a lost motion between them to allow said rod to lift the lever *e* in the forward movement of the rod and drop said lever in the reverse movement of the rod. This lost motion of the rod and its action on the lever may be obtained in various ways, two of which I have illustrated in the annexed drawings. In one case the lever *e* is of the shape of an elbow or bell crank, one arm of which is under the collar *f* of the pin D and the other arm has connected to it the reciprocating rod R and is limited in its movement by a stop *k* on the carrier. In the forward movement of the rod it first lifts the lever *e* and then moves the carrier. In the other case the lever *e* is pivoted to an upwardly-projecting ear on the carrier *b* and is provided with a beveled or inclined downward projection *e'*. The end of the rod R is bifurcated or slotted longitudinally, as shown by the longitudinal sectional views of said rod in Figs. 7 and 8 of the drawings. Through the slot of said rod projects the ear to which the lever *e* is pivoted. In the end of this same slot is a roller pivoted to the rod R and riding on the carrier *b* in front of the ear of the carrier. The aforesaid slot is of sufficient length to allow the rod R to slide a short distance longitudinally without causing either the closed end of the slot or the roller in the opposite end of the slot to push or draw the carrier *b* along with the rod. In the forward movement of said rod the roller in the end thereof passes under the beveled downward projection *e'* of the lever *e*, and thereby pries up said lever and causes the same to lift the pin D. In the retrograde movement of the rod R it draws its roller from under the projection *e'*, and thereby causes the pin D to drop onto the paper, and then the said roller comes in contact with the upwardly-projecting ear of the carrier *b* and draws said carrier back with the rod R.

In order to insure the lifting of the lever *e* as aforesaid, I mount on the guides *c c* friction-plates *h h* secured adjustably thereto by means of screws *h' h'* and bearing on the carrier *b* so as to resist the movement thereof

sufficiently to allow the rod R to move forward and lift the lever.

The rod may be reciprocated by any suitable mechanism actuated by the gearing of the folding-machine. It is represented of the form of a lever *l*, fulcrumed on the frame A, and having its upper end connected to the rod R and its lower end bearing on a rotary cam I.

To allow the described registering apparatus to be adjusted for operating on sheets of different sizes, I connect the lever *l* to the rod R, adjustable longitudinally, which may be accomplished by means of the coupling-pin of said parts passing through a longitudinal slot *i* in the rod.

In order to guard against the tearing of the paper in the operation of the pin or catch D engaging the perforation in the sheet and drawing the sheet to its registering position, I attach to the lower end of the pin a disk *n*, of rubber or other suitable material, to form a proper bearing by which the pin rides on the paper during the retrograde movement of the carrier *b*.

Directly under the plane of the sheet to be registered is a sheet-supporting bar *d*, which is supported at one end upon a roller *r* and connected at the opposite end to a lever L pivoted to the frame and actuated by a rotary cam N, which imparts an intermittent oscillatory motion to the lever and a corresponding reciprocating motion to the said supporting-bar. This bar is provided with a longitudinal slot *d'* for the passage of the lower end of the pin D. Upon this bar is adjustably mounted the front guide, *p*, against which the sheet is drawn by the movement of the pin D when engaged with the perforation of the sheet. The movement of the lever L is so timed as to cause the front guide, *p*, to recede and prevent the buckling of the sheet between the gage and pin. The adjustability of the front guide, *p*, upon the bar *d* is desirable to allow said front guide to be shifted in its position to correspond to the width of the sheet to be registered.

To completely register a sheet requires three of the aforesaid sheet-shifting mechanisms, two of which are arranged at the end of the folding-machine to register the sheet endwise, and one at the side of the machine, as shown in Fig. 2 of the drawings, to register the sheet laterally. All of said mechanisms are substantially alike with a slight modification of the forms of the levers which move the paper-supporting bars *d*. In the end-registering mechanism the lever L is pivoted to the frame beneath the cam N, as shown in Fig. 4 of the drawings, while the lever L', which moves the bar *d*, with its side guide, *p'*, is pivoted to the frame above its actuating-cam N'. The cam I' (shown in Fig. 5) operates the lever *l* in the same manner as the cam I in Figs. 1 and 4.

The operation of the described registering

apparatus is as follows: The paper is delivered to the folding-machine by the traveling tapes in the usual manner and arrested in said movement by the advance edge of the paper coming in contact with the front guide, *p*. The pins *D D* of the registering mechanisms at the end of the machine are in the meantime sustained in elevated positions. As soon as the paper has come to a stop the registering mechanism at the side of the machine is actuated to carry its pin *D* in an elevated position in a lateral direction over the paper. In the subsequent retrograde movement of the carrier *b* the pin *D* is allowed to drop onto the paper, and in traversing the same it enters the side registering slit in the paper and by the resultant engagement of the pin with the paper the paper is drawn laterally to the side guide, *p'*, by the movement of the carrier. The end guide, *p*, recedes at about the same time the aforesaid pin *D* enters the slit to allow the paper to be shifted, as aforesaid, more freely and without liability of buckling the paper between said pin and end guide. The two registering mechanisms at the end of the machine are then set in motion to be operated in the same manner as the side registering mechanism. In the operation of the two end registering mechanisms the registering of the paper is completed, irrespective of any irregularities in the margins of the sheet, inasmuch as the two carriers are located at opposite sides of the central lines of the paper-conveying tapes and travel parallel therewith, and the pins *D D* mounted on said carriers enter two slits which are at right angles to the line of movement of the pins and made accurately in the sheet, as hereinbefore stated, and in case the sheet is out of alignment, so as to present the slits different distances from the end guide, *p*, the pin which engages the farthest slit draws one side of the sheet forward until the two slits are equidistant from the aforesaid guide, and the sheet is drawn along rectilinearly by the two pins entered into the two slits. Fig. 3 of the drawings shows one of the end registering mechanisms in position to allow the sheet to be carried to the end guide, *p*, by the traveling tapes in the usual manner, and Fig. 4 shows the end guide receded and the sheet drawn longitudinally to its register by the pin *D*. In the latter part of the longitudinal movement of the sheet it is carried beyond and out of contact with the usual tape-roller and drop-roller at the feed end of the machine.

It will be readily understood that in view of the fact that the slits or perforations are made in the paper during the process of printing the same and by cutters maintained uniformly in their position in relation to the printed portions of the sheet, and the registering of the machine is controlled by the slits or perforations, the variations in the width of the margins of the printed sheets have no effect on the registering of the sheets. Hence by my present invention the registering of

the sheets is accomplished automatically in a most accurate and expeditious manner.

What I claim as my invention is—

1. In a machine designed to operate on paper perforated at predetermined points for registering said paper, the combination of rectilinearly-moving paper-conveyers, an end guide arresting the movement of the paper, a carrier reciprocating parallel over the conveyers, a pin supported vertically on the carrier and movable by gravity to the paper-conveyers, and mechanism transmitting motion from the machine to the carrier and lifting the pin during the movement of the carrier in one direction, as set forth.

2. In a machine designed to operate on paper perforated at predetermined points for registering said paper, the combination of rectilinearly-moving paper-conveyers, an end guide arresting the movement of said paper, two carriers arranged over the conveyers at opposite sides of the central line thereof and movable parallel therewith, vertically-movable pins mounted on said carriers and riding by gravity on the paper, and mechanism transmitting motion to said carriers and lifting the pins during the movement of the carriers in one direction, said pins dropping into the perforations in the paper and drawing the sheet into alignment substantially as set forth.

3. In a machine designed to operate on paper perforated at predetermined points for registering said paper, the combination of rectilinearly-moving paper-conveyers, an end guide arresting the movement of the paper, two carriers over the conveyers and at opposite sides of the central line thereof and movable parallel therewith, a carrier over the conveyor and movable at right angles thereto, vertically-movable pins mounted on said carriers and riding by gravity on the paper, and mechanisms transmitting motion alternately to the carriers moving in different directions in relation to the paper-conveyers and lifting the pins during the movements of the carriers in one direction as set forth.

4. In a machine receiving paper perforated for registering, the combination of horizontal guides over the paper-supports, a carrier riding on said guides and provided with a vertical guide, a pin sliding in the latter guide, a collar on the pin above the carrier, an elbow-lever pivoted to the carrier and having one arm under the aforesaid collar, and a reciprocating rod connected to the other arm of said lever to impart reciprocating motion to the carrier and lift the pin in the forward movement of said carrier.

5. In a machine receiving the paper perforated for registering, the combination of horizontal guides over the paper-supports, a carrier riding on said guides, a gravitating catch supported on said carrier to enter the perforations of the paper, a reciprocating rod moving the carrier and lifting the pin during the forward movement of said carrier, an intermittent reciprocating bar under the paper and

a registering guide mounted on said bar as set forth.

6. In a machine receiving the paper perforated for registering, the combination of horizontal guides over the paper-supports, a carrier riding on said guides, a gravitating catch supported over said carrier to enter the perforations of the paper, a disk attached to the catch to ride on the paper when engaged by the catch, a reciprocating rod moving the carrier and lifting the catch in the forward movement of said carrier, an intermittent reciprocating bar immediately under the paper and slotted longitudinally, and a registering guide mounted on said bar substantially as and for the purpose set forth.

7. In a machine receiving the paper perforated for registering, the combination of horizontal guides over the paper-supports, a carrier riding on said guides, a lever pivoted to said carrier, a gravitating catch carried on said lever and entering the perforations of the paper, a reciprocating rod connected to the carrier with a lost motion between them, and thereby cause the reciprocating rod to lift the catch-carrying lever during the forward movement of said rod as set forth.

8. In a machine receiving the paper perforated for registering the combination of horizontal guides over the paper-supports, a carrier riding on said guides, a lever pivoted to

said carrier, a gravitating paper-engaging pin carried on said lever, a disk attached to the lower end of the pin to ride on the paper when the pin is dropped into engagement, a reciprocating rod connected to the carrier with a lost motion between them and frictional bearings retarding the movement of the carrier and thereby causing the aforesaid rod to actuate the lever to lift the aforesaid pin as set forth.

9. In a machine receiving the paper perforated for registering, the combination of horizontal guides over the paper-supports, a carrier riding on said guides, a gravitating pin supported on said carrier, a disk on the lower end of said pin, a collar on the upper end of the pin, a lever pivoted to the carrier and having one arm under the collar of the pin, a reciprocating rod connected to the carrier with a lost motion between them and lifting the lever in the forward movement of the rod, an intermittent reciprocating bar immediately under the paper and slotted longitudinally, and a registering guide mounted on said bar as set forth.

In testimony whereof I have hereunto signed my name this 14th day of April, 1894.

TALBOT C. DEXTER. [L. s.]

Witnesses:

JOHN J. LAASS,
C. L. BENDIXON.