No. 648,161. Patented Apr. 24, 1900.

T. C. DEXTER.

PAPER REGISTERING INSTRUMENT.

(Application filed Feb. 24, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1

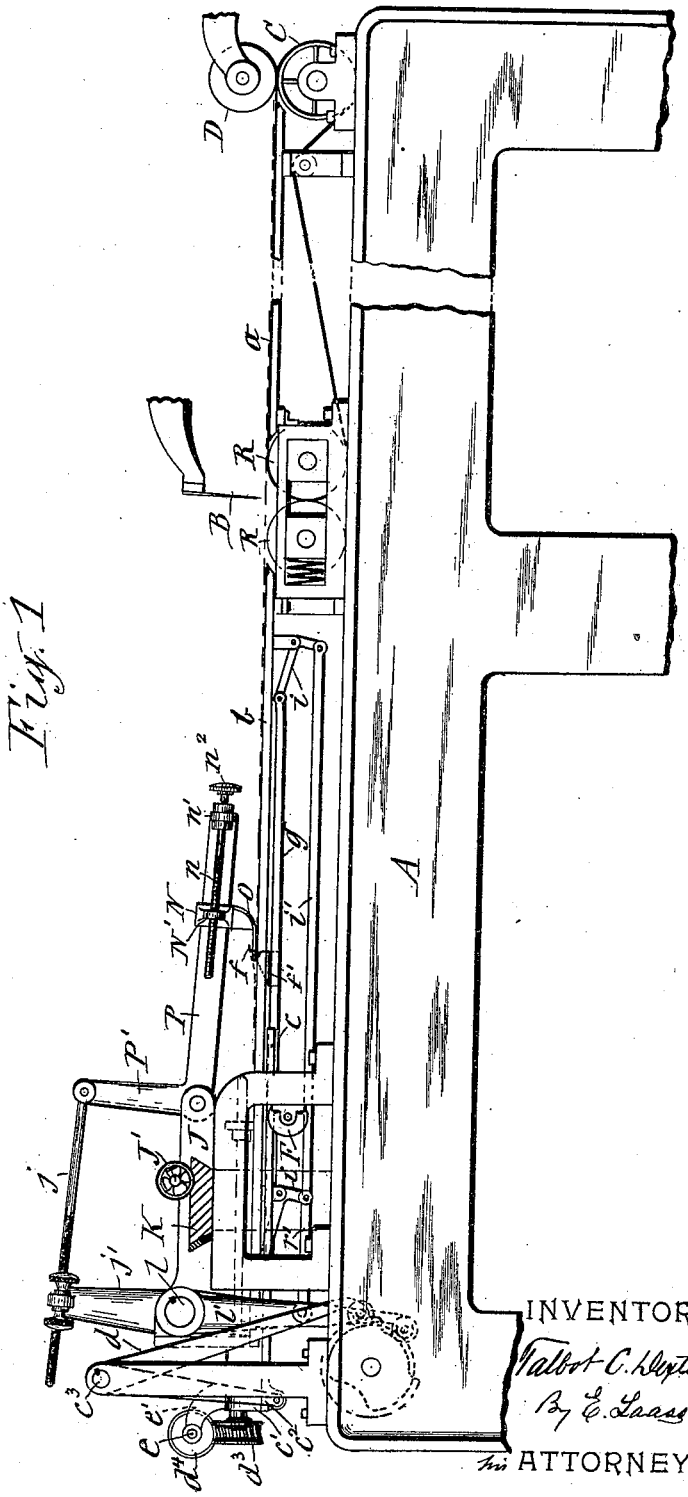

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Fig. 4

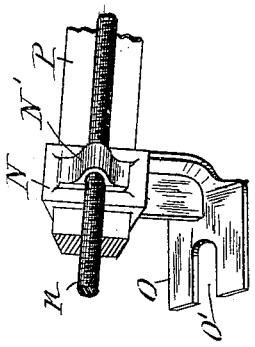

Fig. 2

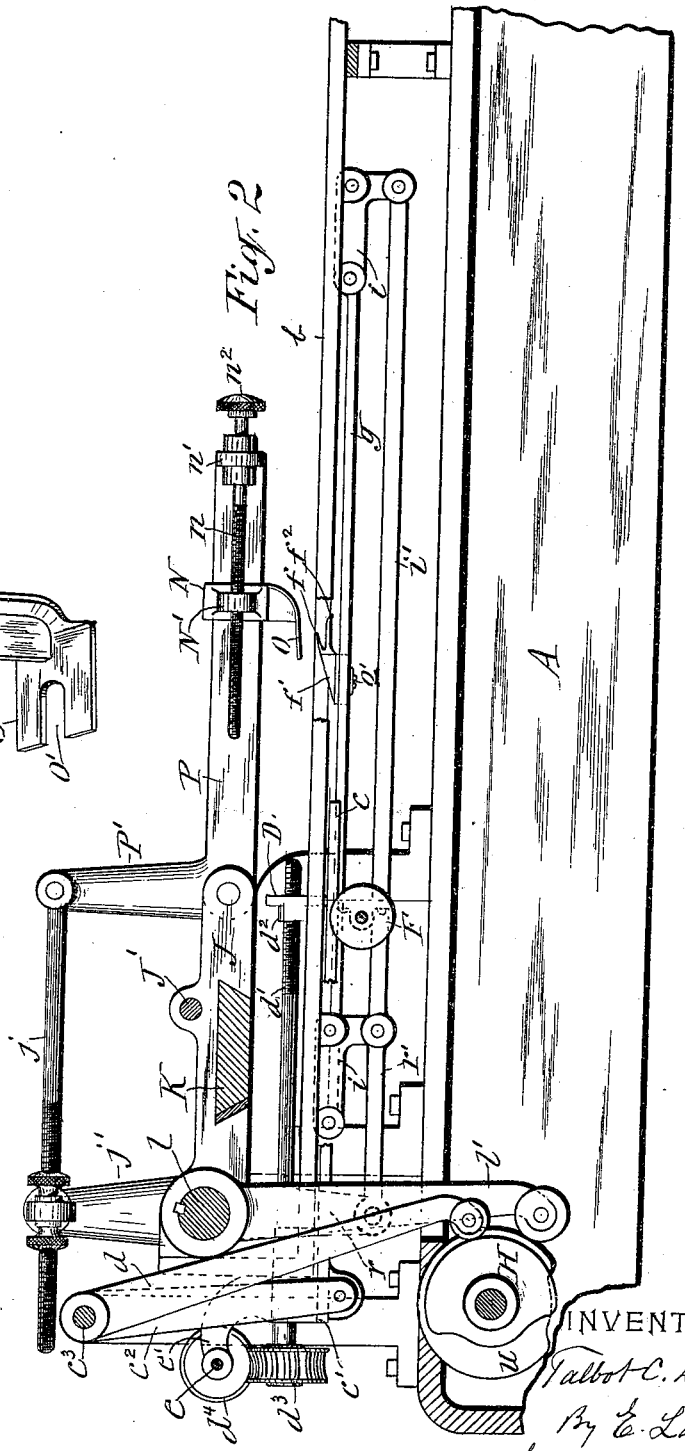

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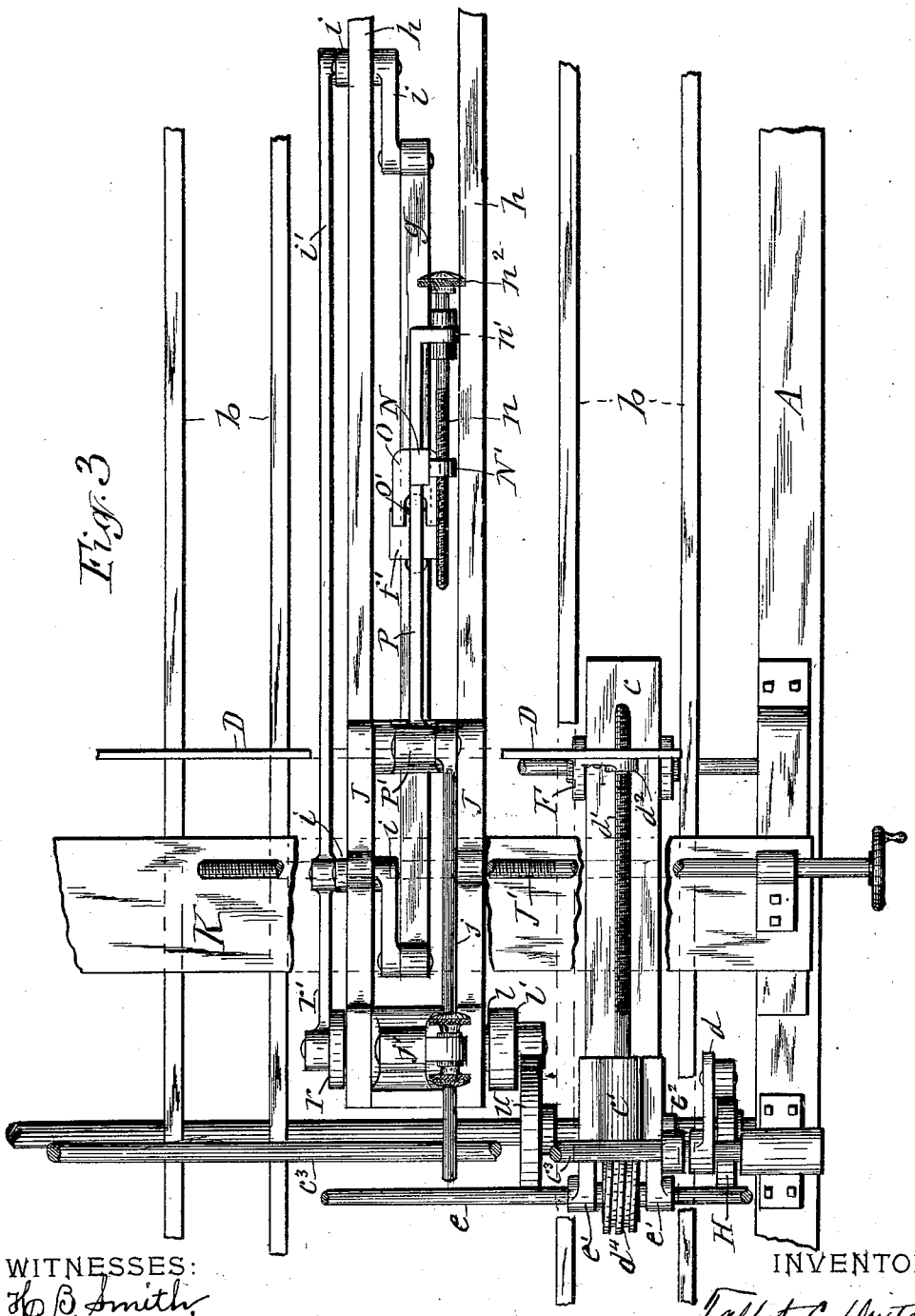
Fig. 3



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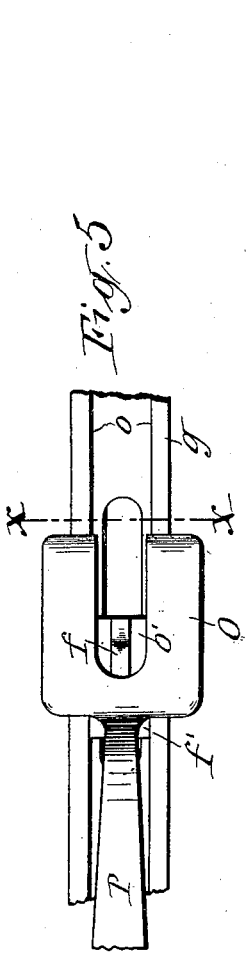

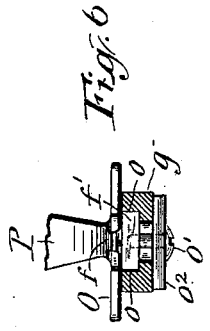

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UNITED STATES PATENT OFFICE.

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PAPER-REGISTERING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 648,161, dated April 24, 1900.

Application filed February 24, 1899. Serial No. 706,704. (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 Instruments, 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 registering instruments which are equipped with a point or tongue entering or engaging a slit or perforation previously made in the paper for that purpose, said engagement arresting the motion of and thereby registering the sheet while carried to a position to be folded or otherwise operated upon. Such registering instruments are chiefly employed on paper-folding machines and have hitherto been placed over the path of the paper and usually coöperated with a bridge disposed under the path of the paper to open the slit therein, so as to facilitate the entry or engagement of the registering-point. Said arrangement of the registering instrument in relation to the path of the paper necessitated the placing of the slit-opening bridge with its abrupt and high end facing from the paper-folding rolls, and in order to prevent said end of the bridge from catching on the edge of the slit and thereby tearing the sheet in the operation of introducing said sheet between the folding-rollers it was necessary to employ a cam formed with two successive steps or other suitable mechanism to impart to the registering instrument two successive lifts, one of which caused the entered registering-tongue to lift the slitted portion of the paper over the bridge, and the second lift raised the registering instrument still farther to permit the front end of the next incoming sheet to freely pass under the aforesaid registering-tongue. The most serious defect of such operation of the registering instrument is the liability of disturbing the sheet from its registered position by the lifting of the sheet after the registering thereof has been perfected.

The object of this invention is to simplify the construction of the registering instrument and to obviate the aforesaid liability of disturbing the sheet from its registered position; and to that end the invention consists, essentially, in the combination, with paper-conveyers, of a registering instrument disposed beneath the path of the paper and provided with a point for engaging a slit in the paper and periodically-operated means for forcing said point into engagement with the slit in the paper in transit; and the invention also consists in novel construction and combinations of auxiliary devices connected therewith, as hereinafter fully described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a paper-folding machine equipped with my improved registering instrument. Fig. 2 is an enlarged side elevation of said registering instrument. Fig. 3 is a plan view of the same. Fig. 4 is a further enlarged perspective view of the sheet-depressing foot. Fig. 5 is a plan view of said foot and subjacent registering instrument. Fig. 6 is a transverse section on line x x in Fig. 5. Fig. 7 is a side elevation of a modification of my invention.

Referring to Fig. 1 of the drawings, A represents the main supporting-frame of a paper-folding machine.

R R are the paper-folding rollers; B, the blade which introduces the paper between said rolls; C, the feed-roller; a, the paper-conveying tapes which carry the paper from the said feed-roller to the folding-rollers.

One of the drop-rollers is placed over the feeding-roller.

b designates the stationary longitudinal bars which support the paper beyond the folding-rolls.

D denotes the front stop which arrests the paper carried into the machine by the aforesaid tapes. This front stop is in the present case arranged to alternately advance to and recede from its sheet-arresting position and is actuated by mechanisms similar to those shown in my Letters Patent No. 561,937, dated June 9, 1896, in which said front stop is termed the "first-fold gage." Said front stop or gage rides on a longitudinal bar c, which is supported at one end on a roller F and is attached at the opposite end to a bracket c', pivotally connected to the end of an arm c^2, which is fastened to a rock-shaft c^3, extend-

ing across the machine and mounted on suitable supports on the frame A. Said rock-shaft receives motion from a rotary cam H by means of a lever d, attached to the rock-shaft and bearing with its free end on the aforesaid cam. The front stop D is adjustably supported on the bar c by means of a screw-threaded rod d', passing through a nut d^2, attached to the front stop. To the opposite end of said rod is attached a worm-wheel or pinion d^3, engaged with a similar wheel d^4, attached to a transverse shaft e, which is journaled in an arm e' on the bracket c' and is provided on its end with a hand-wheel or other suitable means (not shown) for turning it by hand. Said adjustment of the front stop is necessary to accommodate it to different-sized sheets of paper fed to the machine.

In the Letters Patent hereinbefore referred to and in other prior Letters Patent the paper-registering instrument is arranged above the stationary paper-supporting bars b and cooperates with a stationary slit-opening bridge which necessarily was placed with its high and abrupt end facing toward the front stop D. Said disposition of the bridge is liable to cause it to catch on the edge of the slitted portion of the paper and tear the paper when drawn toward the folding-rolls R R by the folding-blade B tucking the paper into the bite of said rolls. To guard against such accident, it was necessary to employ means for imparting two successive lifts to the registering instrument after the registering of the paper had been perfected, and for this purpose a rotary cam formed with two steps of different radii was employed to impart two successive lifts to the arm which carries the registering instrument. The first of said lifts was necessary to lift the slitted portion of the paper by the entered tongue sufficiently to carry the said portion of the paper over the bridge, and the second lift was required to afford clear passage of the next incoming sheet under the registering instrument. In the operation of said registering instrument it has been found that the lifting of the paper over the bridge after the registering of the paper has been perfected is liable to disturb the paper from its registered position. These defects are overcome by my present invention in placing the registering instrument under the path of the paper and employing in connection therewith suitable periodically-operated means for forcing said instrument into engagement with the slit in the paper in transit, in connection with which registering instrument I preferably employ auxiliary devices, as hereinafter described. f denotes said registering instrument, consisting of a point or tongue formed on a block f', which is mounted adjustably on a suitable vertically-movable support, for which I prefer to employ a longitudinal bar g, arranged between two stationary longitudinal paper-supporting bars h and pivotally connected at each end to one of the arms of one of the bell-cranks i, pivoted to one of the stationary bars h. The other arms of said bell-cranks are connected by a rod i' and receive a properly-timed oscillatory motion, as hereinafter described, to periodically lift the registering instrument to a position to register the paper in transit. Said registering instrument projects from the block f' slightly upward and toward the folding-rolls, and under the registering-point f is a tongue f^2, projecting likewise from the block f', said tongue serving to support the slitted portion of the paper while the registering-point f enters into the slit in the paper. The tops of the block f' and registering-point f are sloped or inclined from the folding-rolls or toward the front stop D, so as to allow the paper to freely slide over them and the paper to be withdrawn from the registering instrument by introduction of the paper into the bite of the folding-rolls. There are two of such registering instruments located at opposite sides of the longitudinal center of the path of the paper, and directly over each of said instruments is a sheet-depressing foot O, depending from and rigidly attached to a bracket N, mounted on a longitudinal rock-arm P and adjustably secured in its position by means of a screw n, journaled on said arm, as shown at n', and passing through a nut n', affixed to the bracket n. A suitable knob or thumb-piece n^2 is attached to the end of said screw for turning the same.

The corresponding adjustability of the registering instrument is illustrated in Fig. 6 of the drawings, and consists of the block f', sliding in longitudinal ways o o in the bar g and clamped in its required position by means of a screw o', inserted into the block from underneath, and a spring-plate o^2, interposed between the head of said screw and under side of the bar g.

The sheet-depressing foot O is provided with a slot O', as shown in Figs. 4 and 5 of the drawings, for the protrusion of the registering instrument when lifted to its operative position. Said shoe is thus caused to depress the sheet at opposite sides of the registering instrument.

The foot O is depressed simultaneously with the lifting of the registering instrument by means of mechanisms which I will now describe.

The arm P is pivoted to a bracket J, which is mounted on a stationary cross-bar K and adjustably secured in its position by means of a horizontal screw J', passing through a screw-threaded ear on the bracket and provided with suitable means for turning it by hand and thereby shifting the bracket lengthwise on the cross-bar. The pivoted end of the arm P is formed with an upward extension P', the upper end of which is connected by a rod j to an arm j', attached to a shaft l, which is mounted on a bracket J and receives intermittent rocking motion from a lever l', attached to said shaft and bearing with its free end on a single stepped cam U, attached to

to the shaft of the cam H. To the shaft *l* is also attached an arm *r*, the free end of which is connected by a pitman *r'* to one of the bell-crank arms *i*, to which the rod *i'* is connected, as hereinbefore described.

The modification of my invention shown in Fig. 7 of the drawings consists in the form of the sheet-depressing foot O, which in this case is integral with the arm P and extends toward the folding-rolls R.

The operation of my invention is as follows: The registering instrument *f* is lowered beneath the path of the paper, and the paper-depressing foot O is raised while the paper is carried into the machine by the tapes *a*. The front stop D is at the same time in its nearest position to the folding-rolls R R to arrest the advance movement of the sheet. The sheet is then registered laterally by any suitable and well-known means, (not shown,) and as soon as this is effected the two feet O descend to gently bear on the sheet, and at the same time the registering instruments *f* rise and the front stop D recedes from its sheet-arresting position and allows the sheet to be advanced by the tapes *a*. During this movement of the sheet the registering-points *f* project slightly above the plane of the paper-supporting bars *b* and bars *h* to allow said points to enter into the slits in the sheet. The edges of the slitted portions coming subsequently in contact with the shoes *f'*, between the points *f* and tongues f^2, arrests the paper in its registered position. As soon as this is accomplished the sheet-depressing feet O rise to the position shown in Fig 2 of the drawings, and then the folding-blade B descends and tucks the paper into the bite of the folding-rolls. In the resultant draft of the sheet to the folding-rolls the slitted portions of the sheet slip freely out from between the registering-points *f* and subjacent tongues f^2, while the sloping tops of the registering instruments permit the sheet to freely slide over them without danger of tearing or injuring the sheet or disturbing it from its registered position.

It will be observed that the herein-described sloping block *f'*, with the correspondingly-sloping registering-point *f*, projecting from the high end of said block and disposed beneath the path of the paper, constitutes a combined slit-opener and registering instrument formed in one piece.

What I claim as my invention is—

1. In combination with paper-conveyers, a registering instrument disposed beneath the path of the paper and provided with a point for engaging a slit in the paper, and periodically-operated means for forcing said point into engagement with the slit in the paper in transit.

2. In combination with paper-conveyers, a registering instrument disposed beneath the path of the paper and provided with a point for engaging a slit in the paper, bars supporting the paper at opposite sides of said point, and periodically-operated means for forcing said point into engagement with the slit in the paper in transit.

3. In combination with paper-conveyers, a registering instrument disposed beneath and out of the path of the paper and provided with a point for entering a slit or perforation in the paper in transit and means periodically lifting said instrument to a position to automatically enter said slot or perforation and thereby arrest and register the paper.

4. In combination with paper-conveyers, a registering instrument disposed normally beneath and out of the path of the paper and provided with a point for entering a slit in the paper and with a projecting tongue under said point to support the entered portion of the paper, and means periodically lifting said instrument to its registering position.

5. In combination with paper-conveyers, a registering instrument disposed normally beneath and out of the path of the paper and provided with a point for entering a slit in the paper in transit, means periodically lifting said instrument to the path of the slitted portion of the paper and thereby register the paper and means depressing the paper to facilitate the entry of the aforesaid registering-point as set forth.

6. In combination with paper-conveyers, a registering instrument disposed normally beneath and out of the path of the paper and provided with a registering-point for entering a slit in the paper, means periodically lifting said instrument to its registering position, and means having two bearings depressing the paper at opposite sides of the registering-point.

7. In combination with paper-conveyers, a registering instrument disposed beneath and normally out of the path of the paper and provided with a registering-point for entering a slit in the paper in transit, means periodically lifting said instrument to its registering position and a vertically-movable paper-depressing foot disposed over said registering instrument and provided with a slot for the protrusion of the aforesaid registering-point as set forth and shown.

8. In combination with paper-conveyers, a registering instrument disposed beneath and normally out of the path of the paper and provided with a point for entering a slit in the paper in transit, means periodically lifting said instrument to its registering position, a vertically-movable paper-depressing foot over said registering instrument and mechanism actuating said foot to descend simultaneously with the rising of the registering instrument as set forth.

9. In combination with the paper-folding rolls and tapes conveying the paper over said rolls, vertically-movable registering instruments disposed beyond said rolls and normally beneath the path of the paper and provided with registering-points projecting toward the folding-rolls and with tops inclined

in the opposite direction, and means periodically lifting said instruments to engage the paper in transit and thereby arrest the same as set forth.

10. In combination with the paper-folding rolls and tapes conveying the paper over said rolls, registering instruments disposed beyond said rolls and normally beneath the path of the paper and provided with registering-points projecting toward the folding-rolls and with tops inclined in the opposite direction, means periodically lifting said instruments to registering positions and means simultaneously depressing the paper to facilitate the entry of the registering-points into the slits in the paper in transit.

11. In combination with paper-conveyers, an alternately advancing and receding front stop, vertically-movable bars disposed horizontally beneath the path of the paper, registering instruments mounted on said bars and carried thereby normally out of the path of the paper, and mechanisms periodically lifting said bars to carry the registering instruments into position to engage the paper and thereby arrest the same.

12. In combination with the paper-folding rolls, tapes conveying the paper over said rolls, and stationary longitudinal bars supporting the paper beyond said rolls, vertically-movable longitudinal bars between said stationary bars and normally below the plane thereof, registering instruments mounted on said movable bars and provided with registering-points projecting toward the aforesaid folding-rolls and with paper-supporting tongues under said points, the tops of said registering instruments being inclined from the folding-rolls to allow the paper to be freely drawn over said instruments in the process of folding the paper, and mechanisms periodically lifting the aforesaid movable bars to carry the registering-points into position to enter into slits in the paper in transit and thereby arrest said movement as set forth.

13. In combination with the paper-folding rolls and tapes conveying the paper over said rolls, an alternately advancing and receding front stop, vertically-movable bars beneath the path of the paper, registering instruments mounted on said bars and provided with points for entering into slits in the paper in transit, vertically-movable sheet-depressing devices over said registering instruments, mechanisms periodically lifting the aforesaid bars to carry the registering-points into the path of the slitted portions of the paper and mechanisms simultaneously actuating said sheet-depressing devices to facilitate the entries of the points into the slits as set forth.

14. In combination with the paper-folding rolls, tapes conveying the paper over said rolls, stationary paper-supporting bars beyond said rolls, and an alternately advancing and receding front stop, vertically-movable bars between the said stationary bars, registering instruments mounted on said movable bars and provided with registering-points projecting toward the folding-rolls and having the tops of said instruments sloping in the opposite direction, paper-supporting tongues projecting from the registering instruments under the registering-points, mechanisms periodically lifting the aforesaid movable bars to carry the registering-points into the path of the slitted portions of the paper, and sheet-depressing devices facilitating the entries of the points into the slits as set forth.

15. In combination with the paper-folding rolls, tapes conveying the paper over said rolls, stationary longitudinal bars supporting the paper beyond the said rolls, bell-cranks pivoted to the said stationary bars, a longitudinal bar pivoted to one of the arms of each bell-crank, a rod connecting the other arms of said bell-cranks, a pitman actuating the bell-cranks to periodically lift the longitudinal bar, and the registering instrument mounted on said movable bar and provided with a point for entering into a slit in the paper in transit as set forth.

16. In combination with the paper-folding rolls, tapes conveying the paper over said rolls, and stationary longitudinal bars supporting the paper beyond the folding-rolls, an alternately advancing and receding front stop, bell-cranks pivoted to said stationary bars, a longitudinal bar pivoted to one of the arms of each of said bell-cranks, a rod connecting the other arms of the bell-cranks, a registering instrument mounted on said movable bar and provided with a registering-point and with a paper-supporting tongue under said point and both projecting toward the folding-rolls, the top of said instrument sloping in the opposite direction, a pitman actuating the bell-cranks to periodically lift the longitudinal bar, a vertically-movable sheet-depressor over the registering instrument and mechanism actuating said depressor simultaneously with the lifting of the longitudinal bar as set forth.

17. In a machine designed to operate on paper fed thereto automatically and provided with slits by which to register said paper, a combined slit-opener and registering instrument disposed beneath the path of the paper and movable to and from said path, said instrument being provided with an inclined top surface and with a similarly-inclined registering-point projecting from the high end of said instrument in combination with means for periodically lifting said instrument to enter the aforesaid point into the slit in the paper in transit as set forth.

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