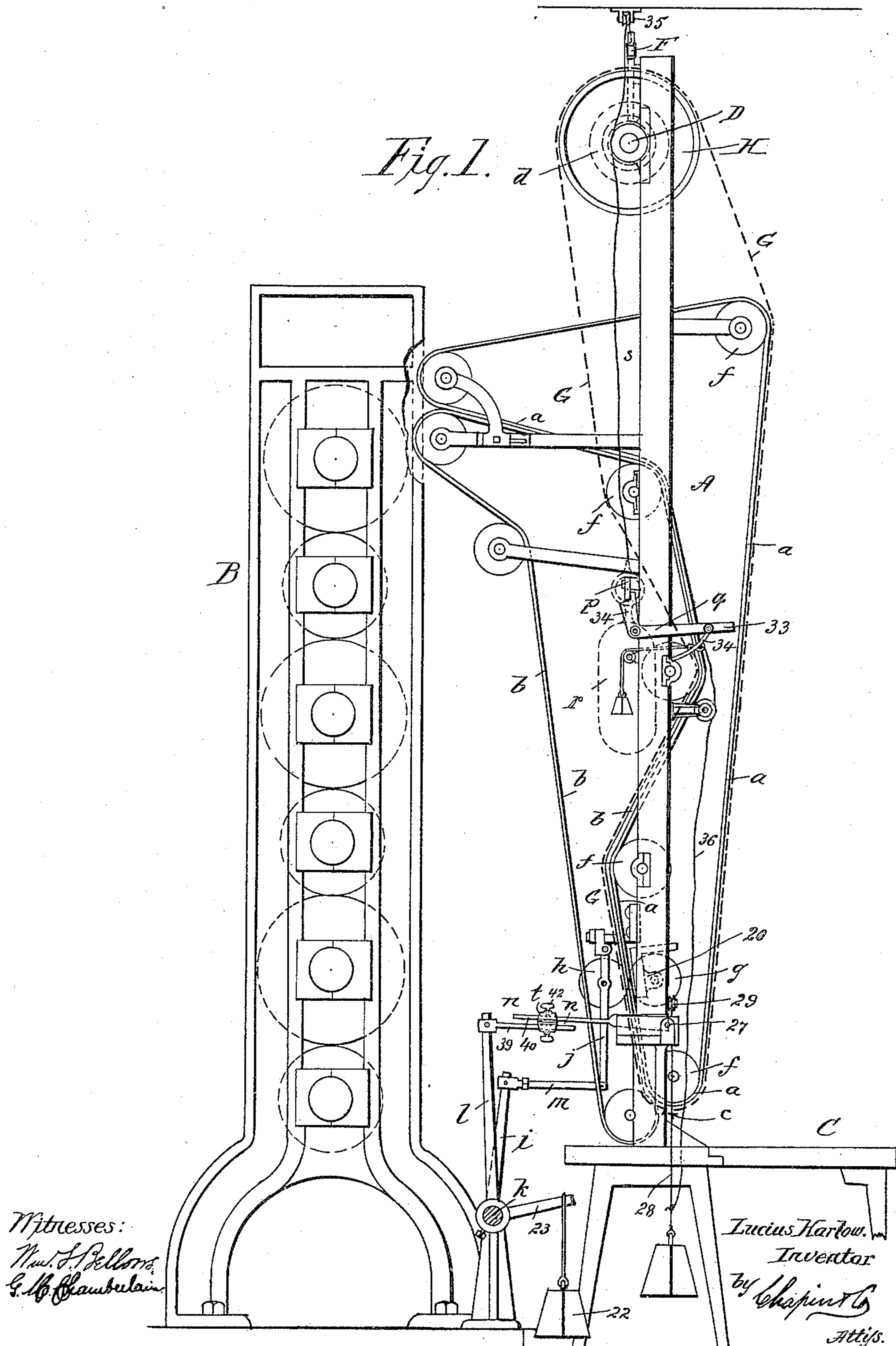


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AUTOMATIC STOP MECHANISM FOR PAPER FEEDING MACHINES.

No. 446,678.

Patented Feb. 17, 1891.



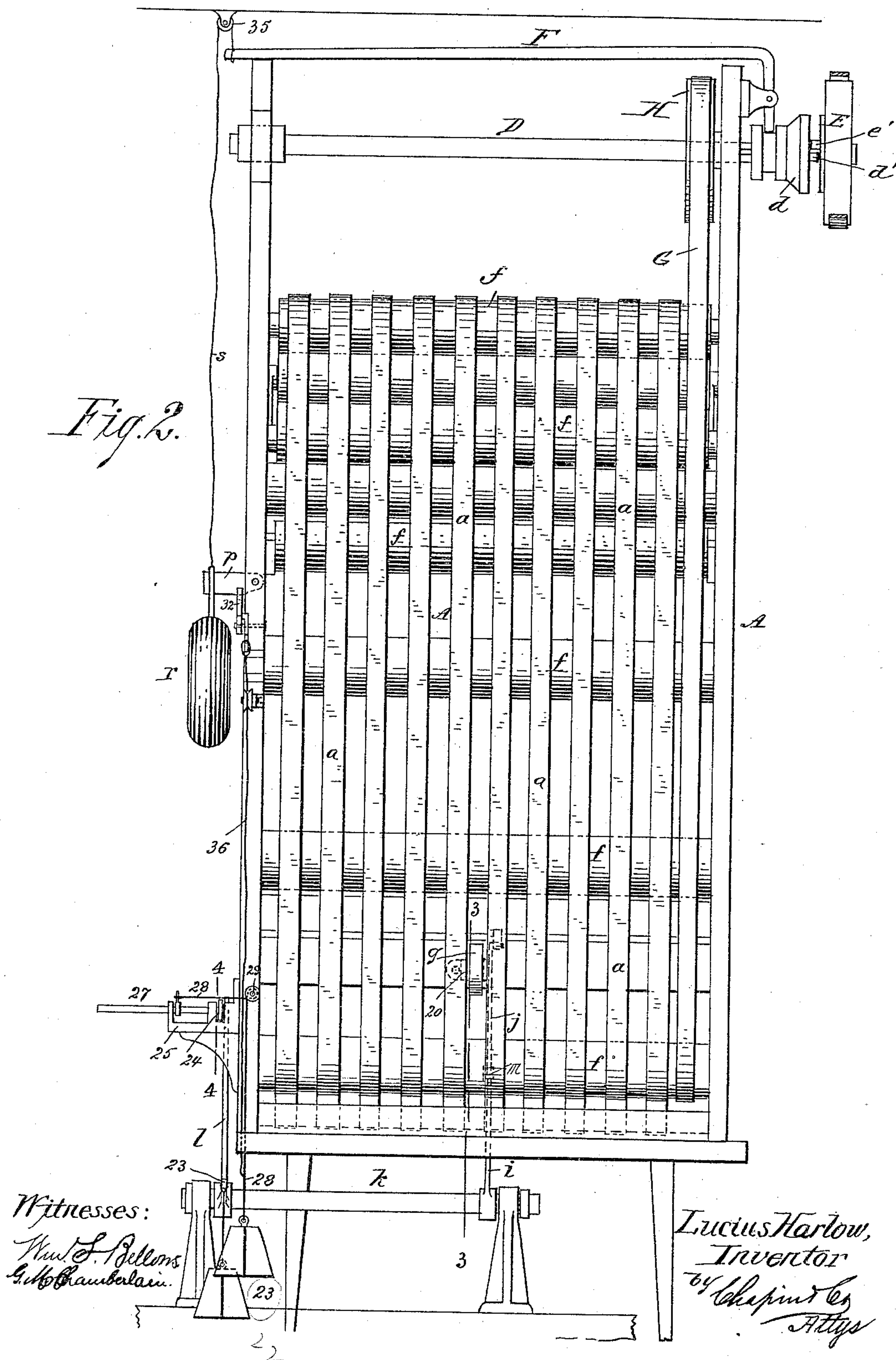
(No Model.)

3 Sheets—Sheet 2.

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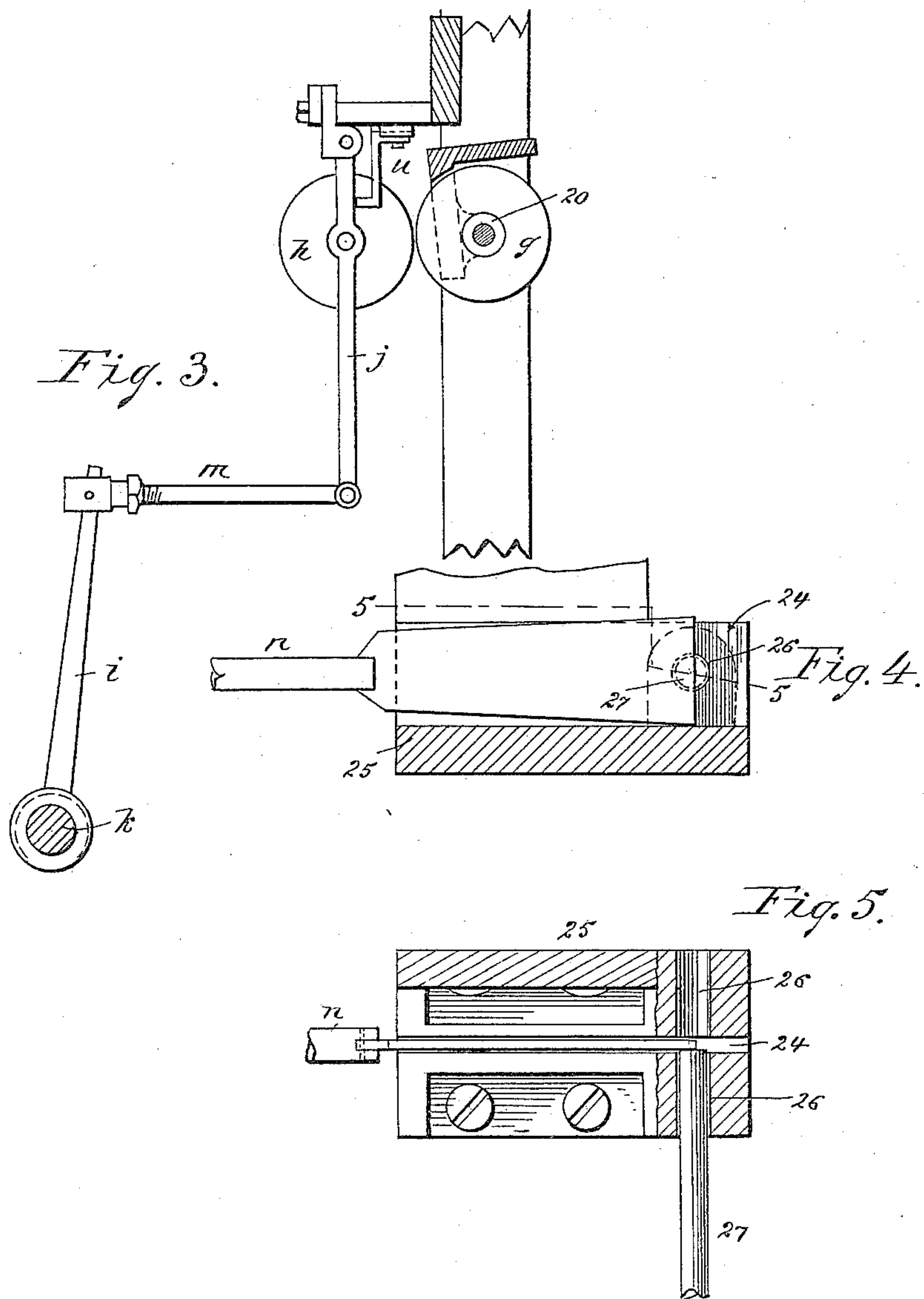
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# UNITED STATES PATENT OFFICE.

LUCIUS HARLOW, OF HOLYOKE, MASSACHUSETTS.

AUTOMATIC STOP MECHANISM FOR PAPER-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 446,678, dated February 17, 1891.

Application filed February 19, 1890. Serial No. 340,983. (No model.)

*To all whom it may concern:*

Be it known that I, LUCIUS HARLOW, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Automatic Stop Mechanism for Paper-Feeding Machines, of which the following is a specification.

This invention relates to improved contrivances for application in relation to paper-feeding mechanism, the same having for its object the stoppage of the said feeding mechanism on the feed to or into the same of more than a single sheet of paper at once, or a wrinkled sheet of paper, also that before said double sheets or wrinkled sheets may be delivered the same may be withdrawn from the feeding mechanism; and the invention consists in the construction and combination of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In the accompanying sheets of drawings illustrations are given of mechanism constituting the stopping appliances for the paper-feeding device.

Figure 1 is a side elevation of a sheet-feeding device for a paper-calendering machine, substantially such as is fully shown and described in the Letters Patent of the United States granted to me October 12, 1886, No. 350,741, said feeding device being shown in proximity to a paper-calendering machine which it is intended to feed, and a stop mechanism embodying the essentials of my present invention is shown as combined with said paper-feeding device. Fig. 2 is a front elevation of the paper-feeding device and of the stop mechanism shown in Fig. 1. Fig. 3 is an enlarged sectional elevation taken about on the plane indicated by the line 3 3 on Fig. 2. Fig. 4 is a sectional elevation of parts in detail, enlarged, as seen on the section plane indicated by line 4 4 on Fig. 2. Fig. 5 is a plan and partial horizontal section of the parts shown in Fig. 4. The parts of said figure, which are shown in section, are taken on the planes indicated by the lines 5 5, Fig. 4.

Proceeding to describe the stop mechanism embodied in Figs. 1 and 2 and other detail views next following, A represents the paper-feeding device above mentioned as constitut-

ing the subject-matter of my aforesaid Letters Patent; and B represents a calendering-machine, the sheets of paper to be operated upon by said calender being fed into the action of the carrying-tapes *a b* at *c* in advance of the work-table C.

D represents the driving-shaft for the paper-feeder, there being supported loosely thereon the belt-driven pulley E; and *d* represents a splined clutch-collar adapted to slide upon said shaft D, being, however, constrained against rotation thereon, and a projection *d'* of said collar is adapted, when the collar is properly slid, to have an engagement with a projection *e'*, fixed on the hub of the pulley E.

F represents a shipper-lever pivoted on the frame of the paper-feeder or other suitable support, the short arm of which engages the annular groove in the clutch-collar *d*, and, as usual in the operation of this common form of power-shipping devices, swinging the lever in one direction insures the interlocking of the driving-pulley with the driving-shaft D of the paper-feeder, while swinging said lever in the reverse direction unclutches, insuring a cessation of the rotation of the shaft D. The belt G passing around the fast pulley H, and also around or in engagement with one or more of the supporting-rolls *f* for the carrier-tapes of the paper-feeder, imparts the proper rotary motion to said tape-rollers, whereby the forward travel thereof for feed of paper thereby is insured. In Fig. 2 this driving-belt G is shown in face view in full lines at one side of the paper-feeder, but in Fig. 1 this belt G is indicated by the heavy broken line, it being deemed expedient to thus indicate the course of said driving-belt in an effective manner.

Adjacent to the plane of travel of the sheet of paper in the feeding mechanism I provide two rolls, one *g* of which is mounted for rotation in fixed bearings 20, while the other roll *h* is supported upon a bearing which is movable toward and away from the first-named roll *g*. A movable bearing for roll *h*, as shown in the drawings, consists of a lever *j*, which by a suitable portion thereof is pivotally hung on a part or extension of the supporting-frame.

*k* represents a rocker-shaft, having a radi-



ally-extended arm *i*, to the extremity of which one end of the connecting-rod *m* is secured, the other end of said rod being pivotally connected to the roll-carrying lever *j*. The rocker-shaft *k* has a normal tendency to rock, so as to swing its radial arm *i* forwardly or toward the front of the feeder, whereby the carrying-lever *j* is correspondingly swung and the forward periphery of the roller *h* maintained against the periphery of its fellow-roll *g*, which contact is coincident with the plane of the contacting inner faces of the carrier-tapes *a b*, (it being understood that said rollers *g h* are located in one of the spaces between the edges of two sets of the carrier-tapes *a b*.) The tendency toward forward rocking movement of said shaft *k* is imparted by applying a weight 22 to a radial arm 23, affixed to said rocker-shaft. It will be understood that the roller *h*, movably supported, substantially as described, in relation to its fellow-roller and located with its contacting peripheral portion in the plane of the paper-feed, will, on the passage of a single sheet of paper between said two rollers, be outwardly moved a slight distance, moving its carrying-support therewith a relatively corresponding distance, and on the passage between said two rollers of two or more sheets of paper at once, or of a sheet of paper which, due to a defective condition—as, for instance, occasioned by wrinkles, creases, or kinks therein—the said movable roller and its carrying-support will be moved a correspondingly greater distance; and it will be clearly understood that whatever of movement is imparted to the carrying lever or support for roller *h* will be imparted in a proportionately increased degree to the radial arm *i*, and in a proportionately corresponding degree to the rocker-shaft *k*; and it will be further understood that having thus imparted a rocking motion to said shaft such motion may be in a variety of ways communicated to the power-shipping device.

As particularly shown in the mechanism illustrated by the drawings, said mechanism comprises a radial arm *l*, affixed on said rocker-shaft *k*, and which is preferably even longer than the radial arm *i*, to the upper end of which a pawl-rod *n* is attached, said pawl-rod by its forward end playing in a vertical slot 24, formed in a horizontal block 25, affixed to the frame of the machine. The extremity of said pawl is supported on the solid part of said block, which forms the base of said slot 24. 26 represents a horizontal hole formed through said block 25, angularly intersecting the slot 24; and 27 represents a slide-rod, which is adapted to play through said hole 26, and a normal tendency is imparted to said rod 27 to move inwardly by means of the weighted cord 28, which is suitably guided as by passage over pulley 29, and which has its end secured to said slide-rod 27, or a proper angular extension thereof, as seen in Fig. 2. Said slide-rod

is, however, prevented under normal conditions from sliding inwardly through said hole 26 further than to said slot 24, as from the position of the pawl *n*, the extremity of which lies either in whole or in part across and covering the area of said hole, such inward slide is prevented and this relation of the extremity of said pawl with the slideway or hole for said rod 27 is illustrated in the enlarged views, Figs. 4 and 5.

*p* represents an arm, by one end pivoted on the supporting-frame of the feeder and adapted to be swung horizontally and laterally to said frame. Below said arm *p* an angular arm *q* by its elbow is pivoted, the vertical arm 32 of said angular lever serving as a movable support for said swinging arm *p*, while to the other arm 33 is pivoted a movable supporting-brace 34, the object of which is to maintain the angular lever *q* in the position seen in Fig. 1, which is its position for supporting the arm *p* horizontally, which latter arm supports the weight *r*, and a cord or other flexible connection *s* is by its lower end connected to said weight *r*, its upper portion passing upwardly over a sheave 35, which is mounted on an overhead support, and the extremity of said cord thence extending downwardly is connected with the long arm of the power-shipping lever *F*. A cord 36 is connected to the said pivoted brace-support of the angular lever *q*, and it thence passes downwardly to a connection with the weighted cord 28, one end of which cord 28, as has been hereinabove explained, is connected to the slide-rod 27, all so that when said slide-rod is held back or in its outermost disposition by the engagement therewith of the sliding pawl *n*, as illustrated in the drawings, on account of the drawing up of the pending portion of said cord, the cord 36, attached, as stated and shown, to said weighted cord 28 is slack and exerts no draft upon the supporting-brace 34, and therefore as long as said pawl *n* remains in a position to prevent the inward slide of the rod 27 no change in position of brace 34 or lever *q* will be effected and the support for the weight *r* (constituted by the horizontal maintenance of arm *p*) will remain intact; but assuming that two or more sheets of paper pass through the feed-tapes and to and between the rolls *g* and *h*, the latter roll is forced rearwardly away from the roll *g*, its carrying-lever also correspondingly swinging and causing a rock of the shaft *k*, and through the arm *l* pawl *n* is drawn sufficiently rearward as to carry its end back away from the end of slide-rod 27, leaving the hole 26 through said block entirely unobstructed, and under the action of the weight the cord 28 draws said rod 27 laterally inward, and the weighted end of the cord moving downwardly draws the cord 36 taut, and exerting a draft thereon draws the supporting-brace 34 by its free end out from its supporting engagement upon the side of the frame,



5 permitting the angular lever *q* to swing, positive swinging motion being imparted thereto either from the gravity of the arm 33 or by the draft exerted by the tautened cord 36 through the brace 34. The arm *p*, swinging downwardly, permits the weight *r* to slide off and to exert its force through cord *s* to swing the shipper-lever. The travel of the carrying-tapes of the paper-feeder having been stopped,
 10 the duplicated sheets are removed from between the carrying-tapes, which may readily be done by causing a reverse travel of said carrying-tapes by moving the belt *G* in a reverse direction by hand. After the double
 15 sheets have been removed from the feeding mechanism, the parts are replaced in their positions, as respectively shown in Figs. 1 and 2, when the parts will run without cessation until again caused to stop by the automatic
 20 stop mechanism.

It will be seen in Fig. 1 that the pawl *n* comprises two sections 39 and 40, one of which is longitudinally extensible or adjustable on the other by means of the clamping-block *t*
 25 and the set-screws 42. By this provision the described mechanism may be rendered operative under any given movement of the roller *h* away from the one *g*. Therefore if after the parts have been adjusted for the feeding
 30 of thin paper and it is desired to next feed very much thicker paper the section 40 of the pawl is adjusted so that the pawl extremity lies further across the end of the slide rod 27, whereby whatever movement may be im-
 35 parted by the mechanism described to the pawl will not be sufficient to carry it free from the end of the slide rod, and yet the adjustment is to be such that two of the sheets or a wrinkled sheet passing between
 40 rolls *g h* will, through the intervening connections, move the pawl entirely out of engagement with the slide rod. By providing a suitable abutment for the movable carrying-support for the roll *h*—such, for instance,
 45 as is shown in Fig. 3—the roll *h* may be normally held so as to present its periphery at a distance from the periphery of the roll *g*, exactly corresponding to the thickness of the sheets of paper intended to be fed. Of course
 50 it will be understood that under the provision of this stop device for the roll-carrying support the pawl *n* will have no movement with relation to the end of the slide rod 27, except when it is given such a movement as to en-
 55 tirely free it from engagement with the slide rod, while in the arrangement of the parts first described, wherein the rolls are normally in peripheral contact, on each passage between them of a sheet of paper of the proper
 60 thickness the pawl *n* will be moved, but only sufficiently to carry its extremity partially across the end of rod 27, said pawl only moving far enough to be entirely free from en-
 65 gagement with said rod when paper of unusual or undue thickness is carried between the rolls *g* and *h*. The abutment above men-

tioned, as shown in Fig. 3, and which is indicated in said figure by the letter *u*, may be adjustable, as shown, whereby the distance
 70 between the peripheries of the rolls *g* and *h* may be made to correspond to the thickness of any paper which it is desired to feed. The employment of this abutment is by no means essential; but its use may be elected, as preferable in some instances.
 75

It is of course not necessary that this stop mechanism for paper-feeding devices be understood as limited to a paper-feeder essentially comprising carrier-tapes, for to one conversant with paper-feeders at large it will be
 80 apparent that the invention is readily applicable to other classes of paper-feeders.

What I claim is—

1. The combination, with the power-shipping device of a paper-feeder, of a pair of
 85 paper-bearing rolls, one thereof having provided therefor a movable bearing-support, a slide-pawl and connections between same and said movable roll-support, whereby from the vibration of said movable roll-support a move-
 90 ment may be imparted to said pawl, a slide-rod, and mechanism intervening between same and said power-shipping device, said pawl constituting a temporary obstruction to the movement of said rod, and all whereby
 95 on the freedom of and movement of said rod through the mechanism connected thereto and intervening between same and said power-shipping device the latter will be operated, for the purpose set forth.
 100

2. The combination, with a power-shipping device of a paper-feeding machine, of a pair of rolls arranged in the plane of the feed of the paper, and a lever suitably pivotally hung
 105 constituting the support for one of said rolls, whereby it is movable toward and from its fellow, a rock-shaft provided with a radial arm which is connected to said lever, a suitable part, as the block 25, provided with a guiding-hole 26, a slide-rod 27, movable in
 110 and through said hole, another radial arm on said rock-shaft having connected thereto a sliding pawl which is guided to move across and away from said guide-hole and to serve as a stop against the free passage of said
 115 slide-rod, a weight-carrying cord attached to said power-shipping device, and a movable device for maintaining said weight in a suitably elevated position, a connection by one
 120 portion thereof engaged to said movable weight-supporting device and by another portion connected to said slide-rod, all whereby through the primary action of an undue paper thickness on said movable roll, on the resultant movement of said slide-pawl to per-
 125 mit the passage thereby of said slide-rod, the latter will through its connection with the supports for the weight insure a movement thereof to free said weight to its normal action upon the shipping device.
 130

3. In a stop mechanism for paper-feeding machines, the combination, with the rock-



shaft, of the pair of paper-bearing rolls, one thereof having provided therefor a movable bearing-support, a slide-pawl receiving its movement from the vibration of said movable  
5 roll-support and formed extensible or longitudinally adjustable, and a slide-rod having a connection through intervening devices with the power-shipping device of the feeding-ma-

chine, said pawl constituting a temporary obstruction to the movement of said rod, as and 10 for the purpose set forth.

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