

No. 611,282.

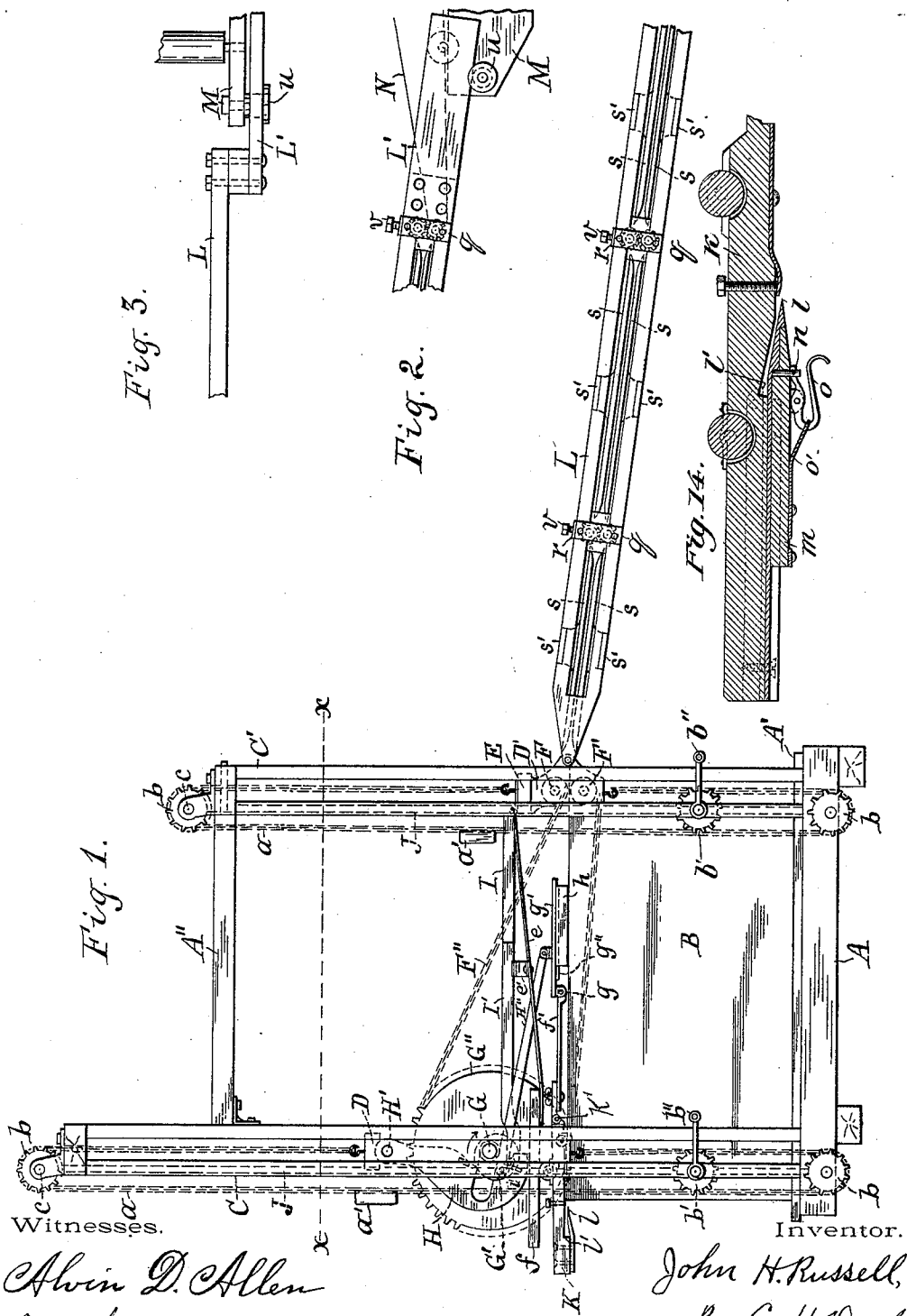
Patented Sept. 27, 1898.

J. H. RUSSELL.
PAPER FEEDING MACHINE.

(Application filed Sept. 27, 1897.)

(No Model.)

4 Sheets—Sheet 1.



No. 611,282.

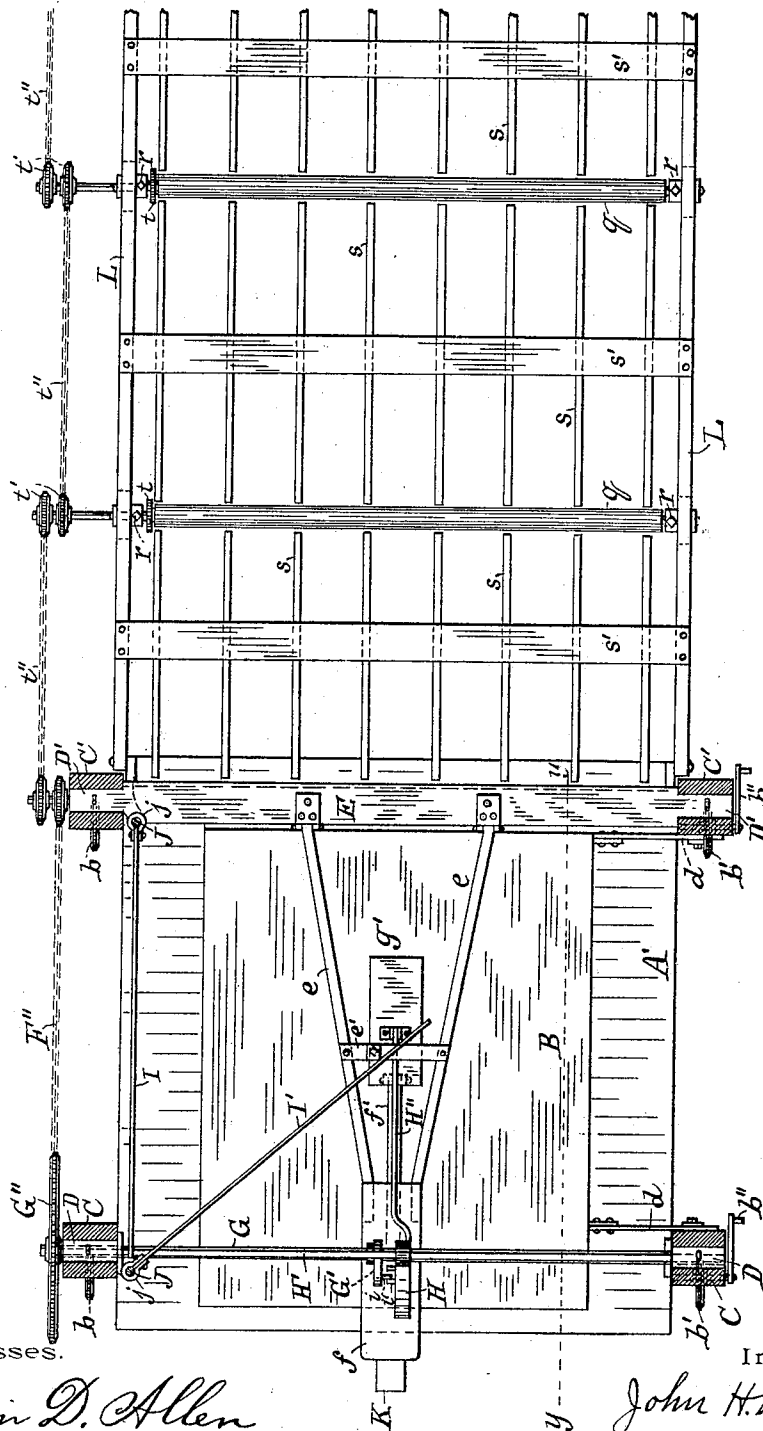
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4 Sheets—Sheet 2.



Witnesses.

Alvin D. Allen
Mark W. Dewey

Inventor.

John H. Russell
By C. H. Duell
his Attorney.

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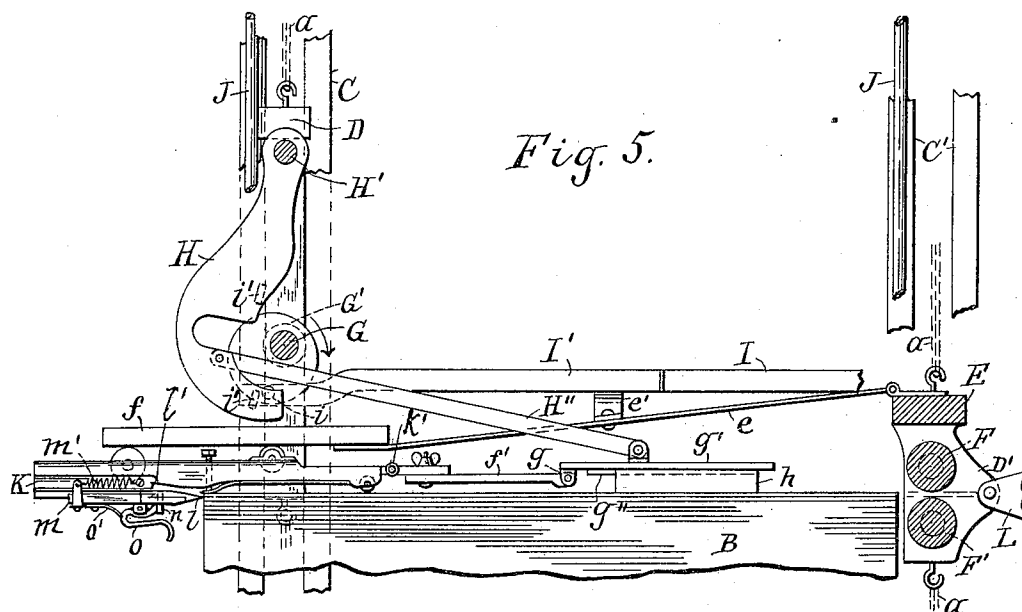
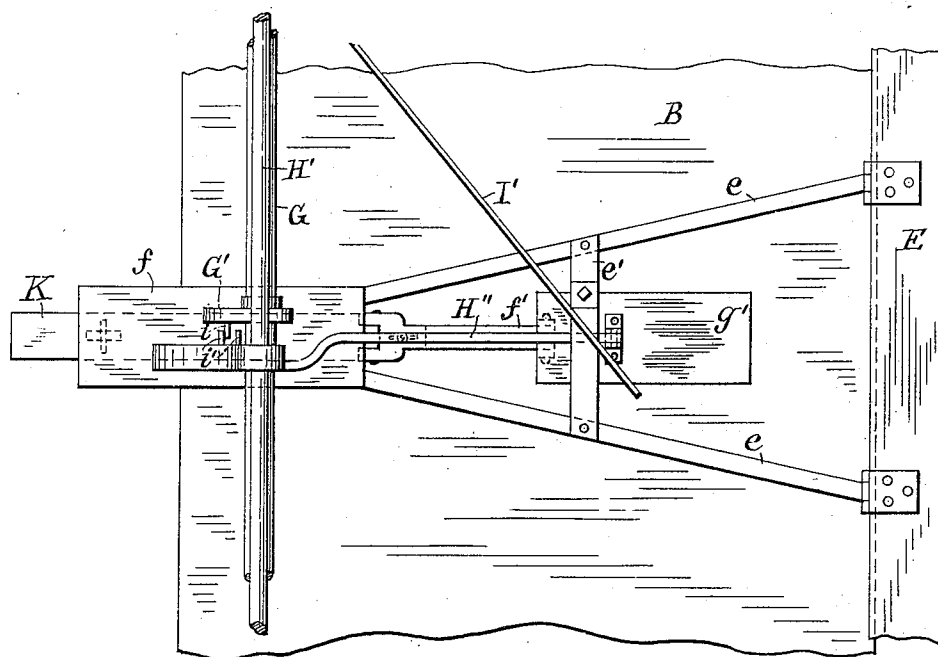
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4 Sheets—Sheet 3.



Witnesses.

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Fig. 6.

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No. 611,282.

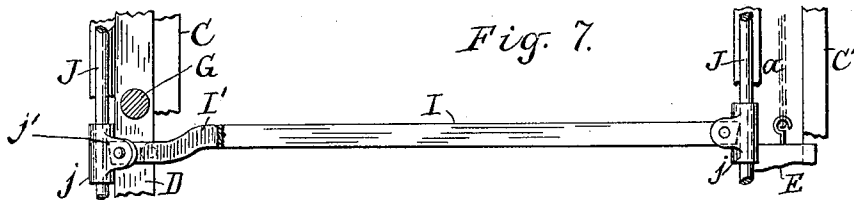
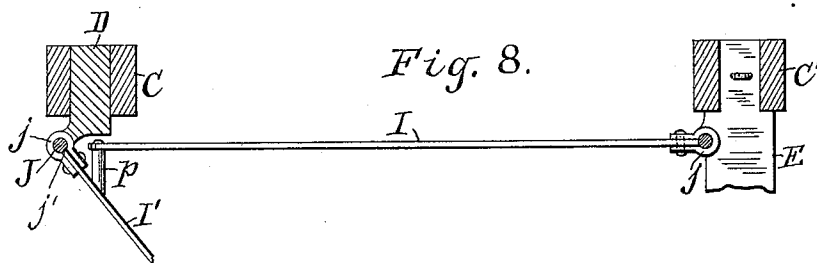
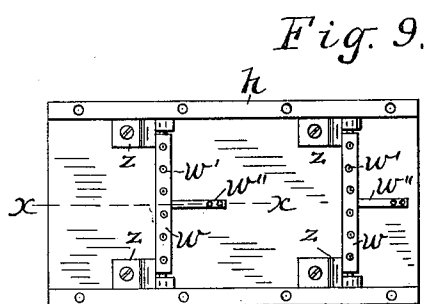
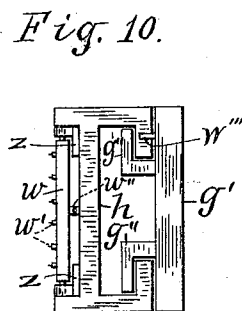
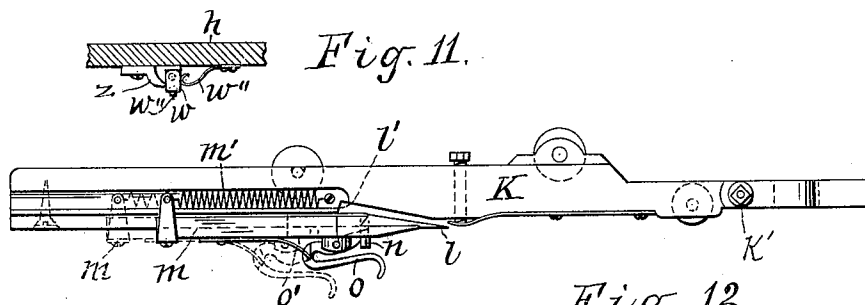
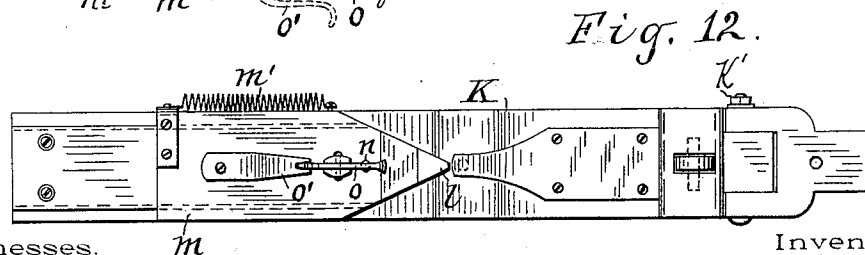
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(No Model.)

4 Sheets—Sheet 4.



Witnesses.

Alvin D. Allen
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Fig. 13.

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John H. Russell
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UNITED STATES PATENT OFFICE.

JOHN H. RUSSELL, OF AMSTERDAM, NEW YORK, ASSIGNOR OF ONE-HALF
TO JOHN H. GILES, OF SAME PLACE.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 611,282, dated September 27, 1898.

Application filed September 27, 1897. Serial No. 653,141. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. RUSSELL, of Amsterdam, in the county of Montgomery, in the State of New York, have invented new and useful Improvements in Paper-Feeding Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to paper-feeding machines, particularly those wherein thick paper, as sheets of strawboard, are fed successively from a pile; and the object is to feed the board from the top of a pile automatically to another machine—as, for instance, a lining-machine.

To this end my invention consists in the combination, with the frame, of blocks or followers movable vertically in the parts of the frame, feed-rollers between two of the blocks, a rod extending between the other pair of blocks, supporting a swinging arm, means connected to the said arm for engaging the upper sheet of the pile and pushing it between the feed-rollers, a shaft below the said rod between the blocks, a cam on the shaft to operate the swinging arm, and gearing between the said shaft and one of the feed-rollers; and my invention consists in certain other combinations of parts hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a side elevation of my improved paper-feeding machine. Figs. 2 and 3 are side and plan views, respectively, of the end of one of the side bars of the conveyer connected with the end of the lining-machine. Fig. 4 is a horizontal sectional view of the feeding apparatus, taken on line *xx* of Fig. 1. Fig. 5 is an enlarged vertical sectional view of the apparatus, taken on line *yy* of Fig. 4. Fig. 6 is an enlarged plan view of the central portion of the feeding devices, taken below the frame. Figs. 7 and 8 are side and plan views, respectively, of the gripping means for the blocks or followers in the posts. Figs. 9, 10, and 11 are lower side, end, and sectional views, respectively, of the paper-feeding block nearest the feed-rolls, Fig. 11 being a sectional view taken on line *xx* of Fig. 9. Figs. 12 and 13 are side and lower side views of the

pushing device which engages the edge of the board, and Fig. 14 is a longitudinal vertical section of the device shown in Fig. 13.

Referring specifically to the drawings, A is the base of the framework supporting the table A', on which the pile of paper or boards B lies.

C and C' are the corner-posts, C extending higher than C', and A'' are the beams connecting the posts together at the top. Each of the corner-posts is divided transversely throughout its length to provide guideways for followers or sliding blocks D D'. The followers D' are connected together by a bar E and a pair of paper-feed rollers F and F', arranged one below the other, between which the upper sheet of the pile of boards passes when pushed to the right by the pushing device. The followers D are connected together by a shaft G, carrying at its center an eccentric or cam G', which operates or swings a hanging bar H and a rod H' above and parallel with said shaft, from which the bar H is suspended. Each of the followers is connected at its upper and lower end with the opposite ends of chain *a*, which passes around sprocket-wheels *b b* at the upper and lower ends of the post. Weights *a' a'* are shown on the chains *a a* to partially counterbalance the parts mounted on the blocks D and D'.

b' is a sprocket-wheel on one of each pair of posts, provided with a crank *b''* for operating the chain and raising the followers. The sprocket-wheels *b b* on the top of the frame are secured on the same shaft *c*. Consequently the followers on opposite sides work together. The followers in the posts C' are caused to move with the followers in posts C by means of a gripping-bar I, which extends between the followers on one side of the machine and is pivoted at one end to the follower D' and at the other end to the bar I' near the follower D.

Each of the corner-posts on the side of the machine having the bar I has a vertical rod J, extending the full length of the post on the inside thereof. The said rods J are stationary and pass through projections *j* on the followers. The end of the bar I, pivoted in the projection *j* of the follower D', is provided with a heel or corner which impinges upon the rod

J and prevents the falling of the follower D' when the follower D is at rest. The means for lowering the followers D is substantially the same as those described for lowering the followers D', and will be hereinafter referred to.

$d d$ are adjustable guides on the posts C and C' on one side of the machine, against which the pile of boards B is placed.

10 Hinged to the cross-bar E is a pair of converging bars $e e$, which slightly incline toward the opposite side of the pile and are joined together at their ends by a rectangular piece f , which rests upon one or more rollers on the pushing and separating device K below. The said pushing device K is provided with a hinge K' on its inner end, which is coupled to an arm f' , that is in turn pivoted to a lug or projection g on the lower side of a board g' , having ribs g'' , on which the pushing-block h for the paper slides. The block h is moved in the rearward direction by a small pin w''' , projecting from the lower side of the board g' , striking the end of the block h during the rearward movement of the said board. Said pin w''' is shown in Fig. 10 of the drawings. While engaging and pushing forward a blank, the pivoted ribs w are held in a vertical position by the small projections or blocks z , secured to the lower side of the block h .

The separating and pushing device K, the board g' , and the connecting-arm are moved together and reciprocated to carry forward or push the upper sheet of paper or board from the pile between the feed-rollers F and F', and these carry the sheet still farther to the conveyer L, which is provided with a series of pairs of feed-rolls and guides between them to keep the sheet flat during its transit to the lining or other machine, on which one end of the conveyer rests. As soon as one sheet is pushed between the rolls F and F' the pushing devices are moved backward preparatory to pushing forward another sheet. Immediately after one sheet has passed the feed-rolls another sheet is pushed between them, the operation being repeated until the pile is exhausted.

50 The pushing devices are connected by a bar H'' with the lower end of the hanging bar H, and this bar is oscillated by a projection on one side of the cam striking a pair of projections alternately on one side of the bar H. 55 The cam is rotated by the shaft in the direction of the arrow, (shown in the figures,) and when its projection i strikes the lower projection on the swinging bar H the latter is moved back preparatory to separating the edge of the upper sheet from the pile and pushing it forward. Having accomplished this, the projection i leaves the said projection i' on the bar and is turned by the shaft G to engage the rear side of the upper projection i' , which causes the wedge or point l on the pushing device K to enter between the upper sheet and the sheet below, thus separating them,

and when the stop l' strikes the edge of the upper sheet it is pushed forward and the opposite edge enters between the feed-rollers F and F'.

In Fig. 1 a simple form of pushing device K is shown; but in Figs. 5, 11, 13, and 14 the device is shown provided with a sliding piece m , which is connected to the device by dove-tailed guide and a coiled spring m' . The sliding piece is provided with a vertical bolt n , which enters the plate having the point l . This bolt is operated by a pivoted trigger o , which is engaged by a small spring o' , that forces the bolt inward and locks the sliding part m to the upper part having the point l . When the entire pushing device has been moved forward sufficiently to cause the point l to enter between the top sheet and the lower sheets, together with the beveled end of the part m , the trigger o strikes against the side of the pile of sheets of paper, drawing downward the bolt n from the said upper part and unlocking the part m . When, however, the cam G' has turned sufficiently to disengage the upper projection i on the swinging bar H, the spring m' causes the upper part to move backward quickly toward its outward position. When the projection on the cam G' engages the lower projection i' on the swinging bar H, the movement of the part K is completed. The spring m' may be dispensed with, the part K being moved back by the cam engaging the lower projection i . By means of this modification much friction is overcome that attends the operation of the device shown in Fig. 1 due to moving the device on the rough paper. With the part m it enters with the point l but a short distance and is arrested in its movement by the trigger o striking the pile and remains in this position while the upper part slides smoothly upon it while feeding the sheet.

The feeding devices are lowered with the pile of paper by means of a gripping-arm I', pivoted to the projection j on the follower D and having the upper corner j' of its end impinging against the vertical rod J. The said arm I' extends inward over the center of the pile of paper and rests on an arched cross-bar e' , extending between the bars $e e$.

The operation is very simple. When a sheet is withdrawn from the pile by the feed-rollers, the bars $e e$ and e' fall the distance corresponding to the thickness of one sheet. This allows the end of the bar I' to fall correspondingly, removing the corner j' slightly from the rod J, allowing the feeding devices to drop slightly; but as soon as the followers D have dropped the same distance that the end of the bar I' fell the grip is again applied to the bar J and the followers held from falling farther until another sheet is drawn from the pile. The other gripping-bar I being pivoted to the bar I', as shown at p in Fig. 8 of the drawings, the followers D' fall at the same time or immediately after the followers D.

The conveyer L consists of a frame com-

prising side bars, each having a central slot extending lengthwise the bar, pairs of feed-rollers q equal distances apart between the side bars and adapted to turn in bearings r , secured on the inside of the bars, and a series of parallel guides s , arranged side by side between the pairs of rollers to keep the sheets flat while passing between the rollers. The guides are formed of strips of wood secured equal distances apart at their centers to cross-bars s' , extending between both the upper and lower sides of the side bars. The upper and lower guides s s' are parallel with each other are separated sufficiently to allow the sheet to pass freely between them, and have their ends beveled properly to receive the sheet easily as it comes from the rollers. Each pair of feed-rollers is geared together by small cog-wheels t at one end of the rolls. The lower shafts of the feed-rolls are extended through the side bar on one side of the conveyer and are provided each with a pair of small sprocket-wheels t' , and these wheels are connected together by chains t'' , (indicated by broken lines in Fig. 4,) so that they are driven together synchronously with the feed-roller F' . The feed-roller F' is provided with a sprocket-wheel and chain F''' , which drives a large sprocket-wheel G' on the shaft G .

The driving belt or chain N is connected to a sprocket on the last lower feed-roll shaft of the conveyer and receives motion from a sprocket (not shown) on the lining-machine M , the end of which is shown in Fig. 2 of the drawings. The rear ends of the side bars of the conveyer are hinged to the followers D' , so that they will rise and fall with them. The opposite end of the conveyer is broadened by means of offsets L' in the side bars to receive the end of the lining-machine M between them. The offsets rest on rollers u , mounted on the sides of the frame of the lining-machine, so that said conveyer can move longitudinally while the conveyer is raised or lowered. The upper roller of each pair of feed-rollers is made yielding and adjustable to a limited extent by any suitable and well-known means, v being the screws for adjusting them. At the commencement of the movement of the device K to the right the part h remains stationary; but after the point l enters the pile below the upper sheet and when the edge of this sheet strikes the stop l' then the lug g on the lower side of the board g' engages the plate h , and the latter is moved, with the device K , the balance of the movement to the right.

The lower side of the block h is provided with pivoted ribs w containing teeth w' , which engage the sheet to carry it forward. During the backward movement of the block h these ribs turn in their bearings and incline so that the sheet is not hindered in its forward movement. As soon as the lug g strikes the end of the block h to carry it forward the ribs assume their vertical position, and this

is aided by the small springs w'' , engaging the central parts of the sides of the ribs, as indicated in Fig. 11.

I do not desire to be limited to the precise form of construction of the parts shown and described, as they may be modified without departing from my invention.

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

1. In a paper-feeding machine, the combination with the frame, of followers adapted to slide vertically in the posts of the frame, feed-rollers between two of the followers, a connection between the other pair of followers, a swinging arm suspended from said connection, means connected to the said arm for engaging the upper sheet on a pile of paper and pushing it between the feed-rollers, a shaft to turn in the last-mentioned followers, a cam on the shaft for operating the swinging arm, and gearing between the said shaft and one of the feed-rollers, as set forth.

2. In a paper-feeding machine, the combination with the frame, of followers adapted to slide vertically in the posts of the frame, horizontal feed-rollers between one pair of the followers, a connection between the other pair of followers, a swinging arm suspended from the connection, means connected to the said arm for engaging the upper sheet at one edge, and pushing it between the said feed-rollers, a shaft below the said connection and turning in the followers, a cam on the shaft for operating the swinging arm, and gearing between the said shaft and one of the feed-rollers, as set forth.

3. In a paper-feeding machine, the combination with the frame having corner-posts with vertical guideways therein, of followers adapted to slide in the guideways, chains passing around sprocket-wheels on shafts at the top and bottom of the frame having their ends connected to the upper and lower ends of the followers, horizontal feed-rollers between one pair of the followers, a connection between the other pair of followers, a swinging arm suspended from the connection, means connected to the said arm for engaging the upper sheet at one edge, and pushing it between the said feed-rollers, a shaft below the said connection and turning in the followers, a cam on the shaft for operating the swinging arm, and gearing between the said shaft and one of the feed-rollers, as set forth.

4. The combination with a lining or other machine, of a pushing device to push the sheets from the pile successively and descend with the pile, a pair of feed-rollers for the sheets adapted to descend with the pile, and a conveyer extending between the lining-machine and the movable bearings of the feed-rollers, said conveyer being provided with pairs of feed-rollers geared together and guides between the rollers, and rollers on the frame of the lining-machine to support one

end of the conveyer, its opposite end being pivoted to the said movable bearings, substantially as described and shown.

5 5. In a paper-feeding machine, the combination with the frame, blocks sliding vertically in the sides of the frame, a rod extending between the blocks, an arm suspended from the rod, projections on the arm, a horizontal shaft extending between and turning
10 in said blocks, a cam on the shaft provided with a projection to engage the projections on the said arm, a pushing-block, *h*, to bear upon the pile of paper, a bar connecting the pushing-block, *h*, with the said arm, a pushing-
15 block carrying a plate provided with a point to enter between the sheets and also a stop to engage the edge of the paper, and a connection between the pushing-block, *h*, and the other pushing-block, substantially as described and shown.

20 6. In a paper-feeding machine, the combination with the frame, blocks sliding vertically in the sides of the frame, a rod extending between the blocks, an arm suspended
25 from the rod, projections on the arm, a horizontal shaft extending between and turning in said blocks, a cam on the shaft provided with a projection to engage the projections on the said arm, a pushing-block, *h*, to bear
30 upon the pile of paper, a bar connecting the pushing-block, *h*, with the said arm, a pushing-block carrying a plate provided with a point to enter between the sheets and also a stop to engage the edge of the paper, a plate
35 below and sliding upon the plate provided with the point, a spring to pull the sliding plate in one direction, a locking device provided with a lever to engage the pile, and a connection between the pushing-block *h*, and
40 the other pushing-block, substantially as described and shown.

45 7. In a paper-feeding machine, the combination with the frame, blocks sliding vertically in the sides of the frame, a rod extending between the blocks, an arm suspended from the rod, projections on the arm, a horizontal shaft extending between and turning
50 in said blocks, a cam on the shaft provided with a projection to engage the projections on the said arm, a pushing-block, *h*, to bear upon the pile of paper, a bar connecting the pushing-block, *h*, with the said arm, a pushing-
55 block carrying a plate provided with a point to enter between the sheets and also a stop to engage the edge of the paper, a plate below

and sliding upon the plate provided with the point, a spring to pull the sliding plate toward the pile, when the pushing-block is moving to cause the point to enter between the sheets, a bolt to lock the sliding plate, a lever pivoted to the sliding plate and adapted to engage the pile, a spring engaging the lever, and a connection between the pushing-block, *h*, and the other pushing-block, substantially as described and shown.

65 8. In a paper-feeding machine, the combination with the frame having posts with vertical guideways therein and a stationary vertical rod at a post, of blocks movable in the guideways and connected with the feeding
70 devices resting on the pile, a frame supported by the feeding devices, a bar pivoted at one end in a projection on one of the blocks and adapted to grip the vertical rod, the opposite end of the pivoted bar resting on the
75 frame supported by the feeding devices, and the feeding devices for feeding the sheets successively from the top of the pile, as set forth.

80 9. In a paper-feeding machine, the combination with the frame having corner-posts with vertical guideways therein, and stationary vertical rods at two of the posts, of blocks movable in the guideways, and connected to the feeding devices resting on the pile, a
85 frame supported by the feeding devices, projections on two of the blocks through which the vertical rods extend, bars pivoted at one end in the projections and adapted to grip the vertical rods, the opposite end of one bar *I'*
90 resting upon the frame supported by the feeding devices and the corresponding end of the other bar connected to the bar *I'* near the projection to which said bar is pivoted, and the feeding devices for feeding the sheets
95 successively from the top of the pile, as set forth.

100 10. In combination with the feeding devices *K* and *l*, of a sliding block *h* to reciprocate upon the top of the pile of paper, pivoted ribs on the lower side of the block provided with points to engage the paper, and springs on the block to bear upon the ribs to turn them back when the block moves forward, substantially as described and shown.

In testimony whereof I have hereunto signed my name.

JOHN H. RUSSELL. [L. S.]

Witnesses:

JAMES W. FERGUSON,
AMBROSE P. FITZ JAMES.