

**No. 635,616.**

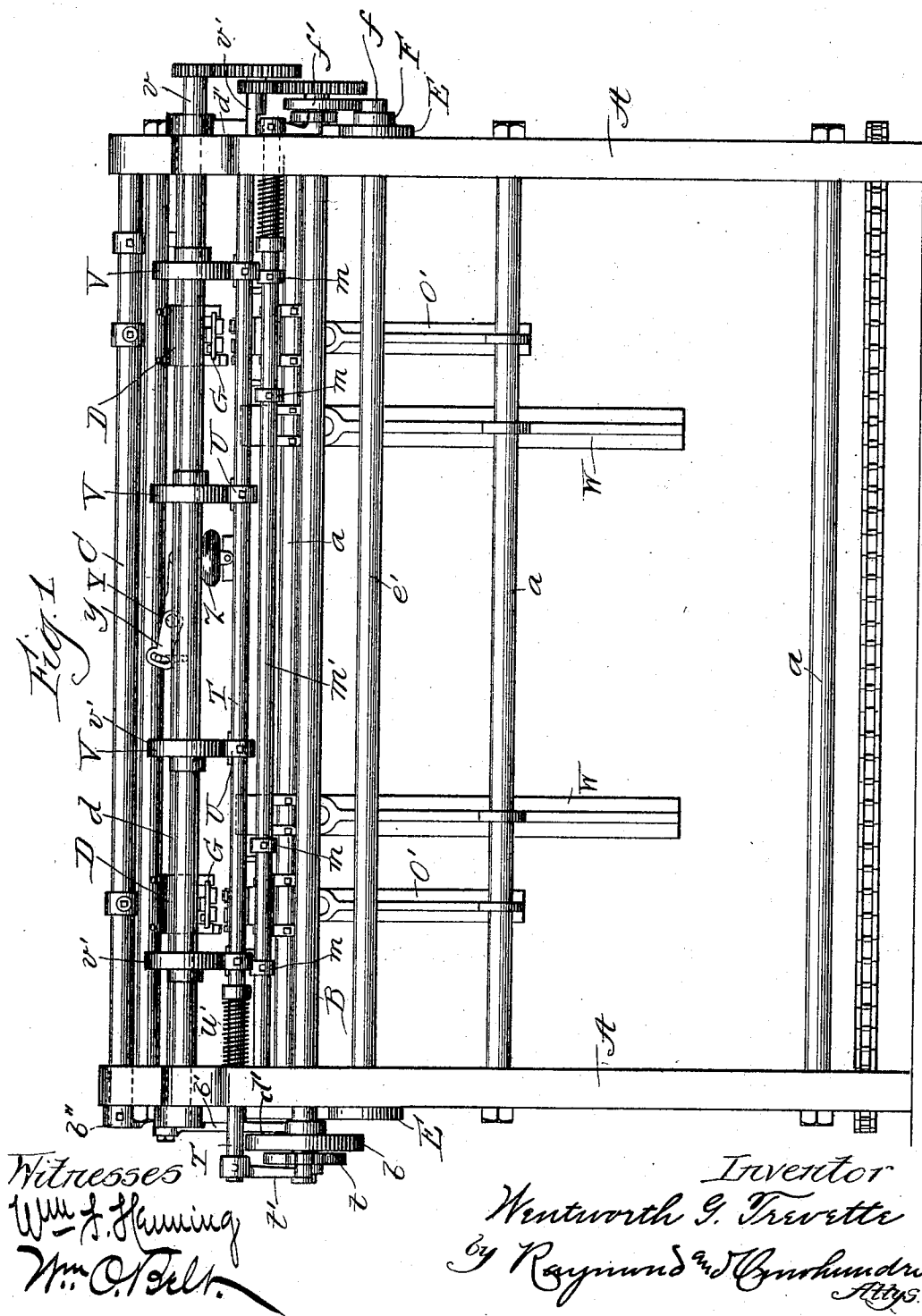
**Patented Oct. 24, 1899.**

**W. G. TREVETTE.**  
**PAPER FEEDING MACHINE.**

(Application filed Dec. 18, 1895.)

(No Model.)

6 Sheets—Sheet 1.



**No. 635,616.**

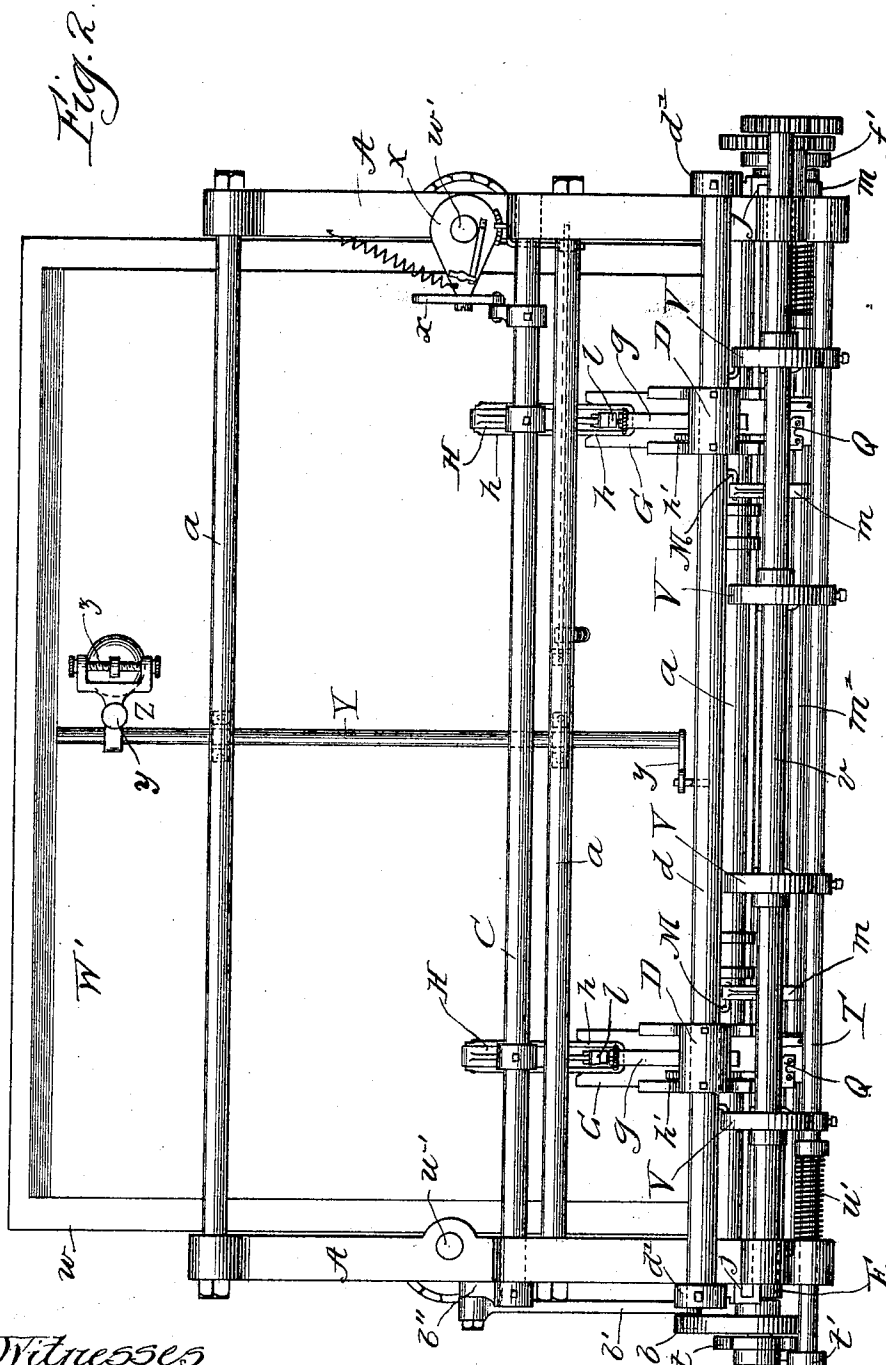
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(Application filed Dec. 18, 1895.)

(No Model.)

**6 Sheets—Sheet 2.**



Witnesses  
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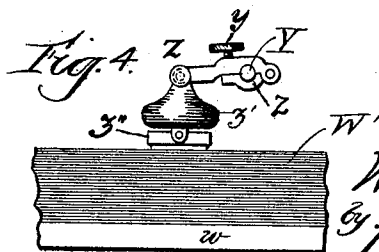
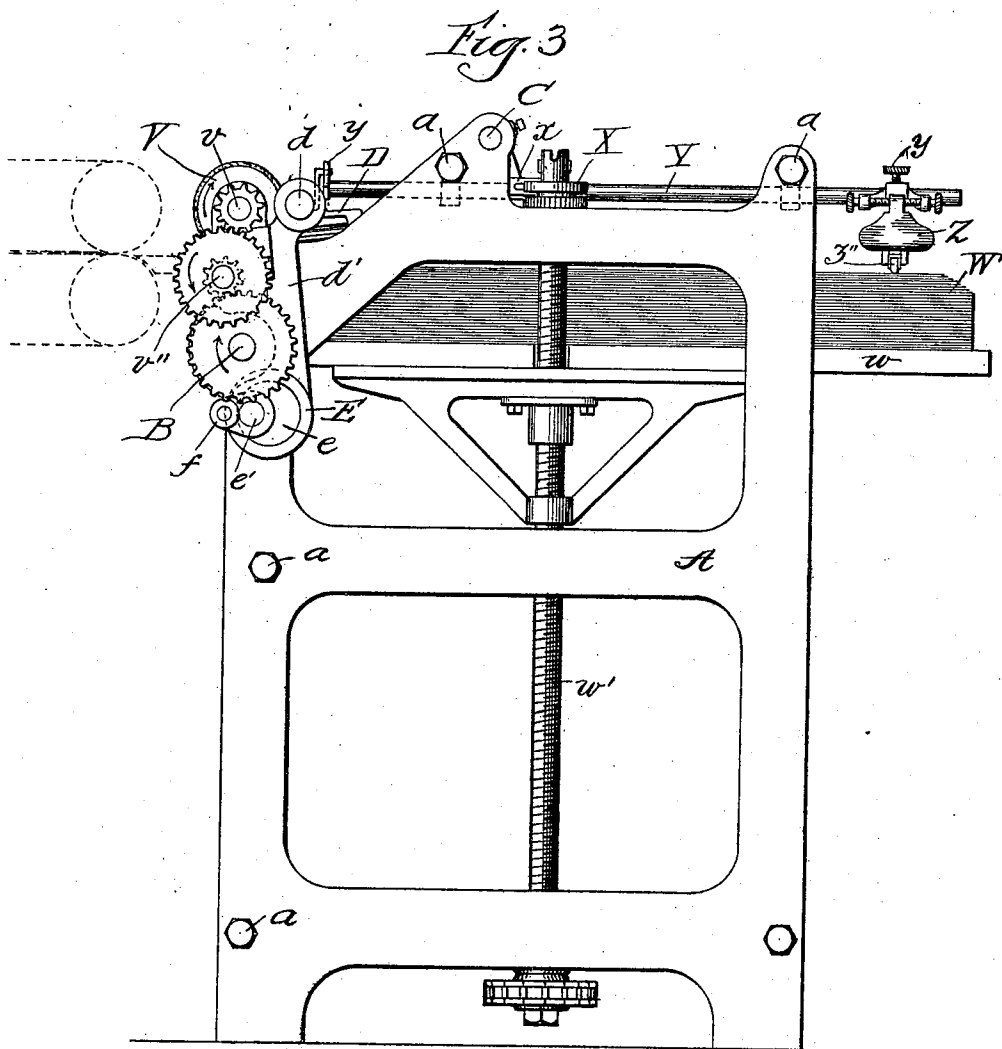
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W. G. TREVETTE.  
PAPER FEEDING MACHINE.

(Application filed Dec. 18, 1895.)

(No Model.)

6 Sheets—Sheet 3.



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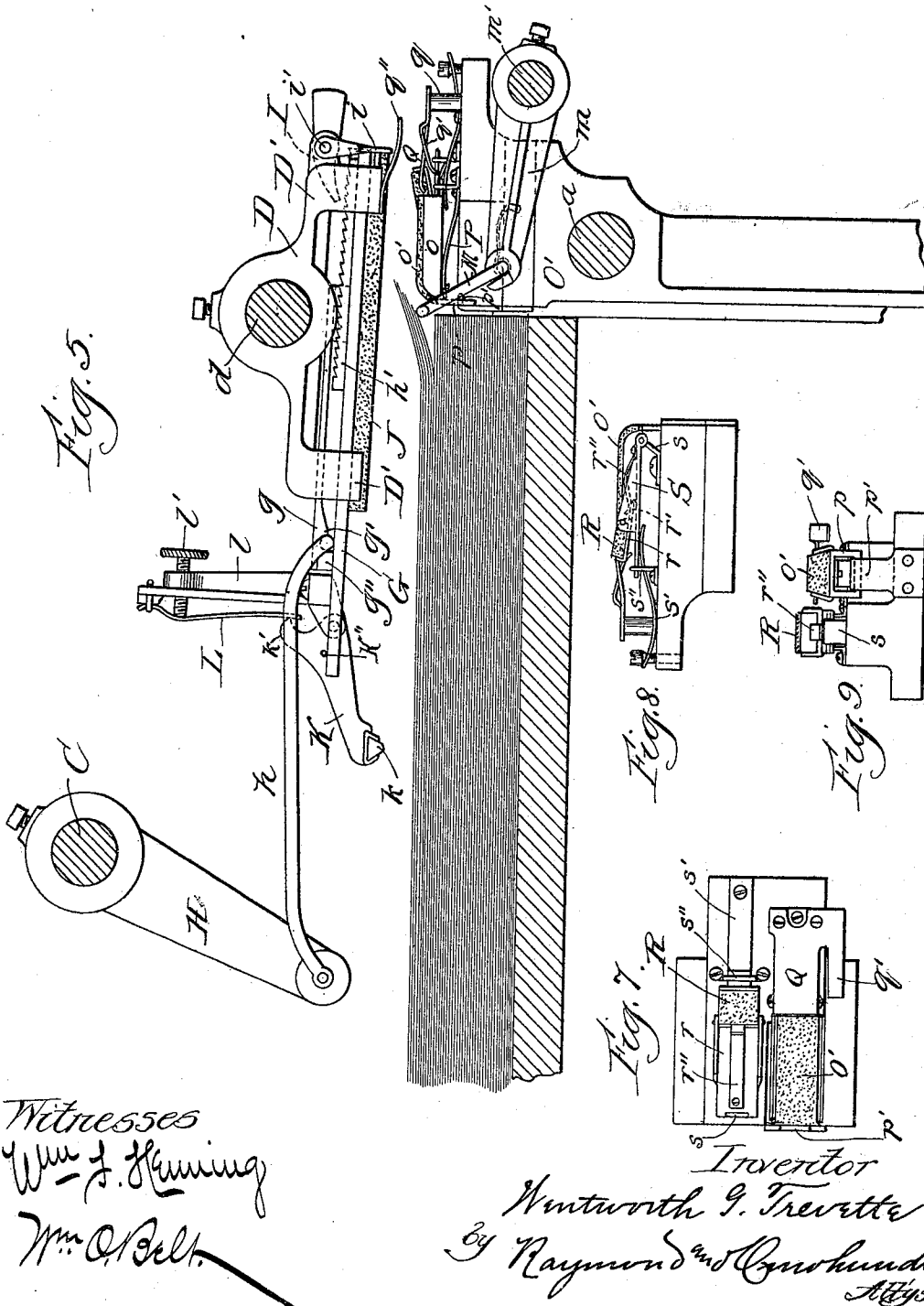
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6 Sheets—Sheet 4.



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(Application filed Dec. 18, 1895.)

(No Model.)

6 Sheets—Sheet 5.

Fig. 14.

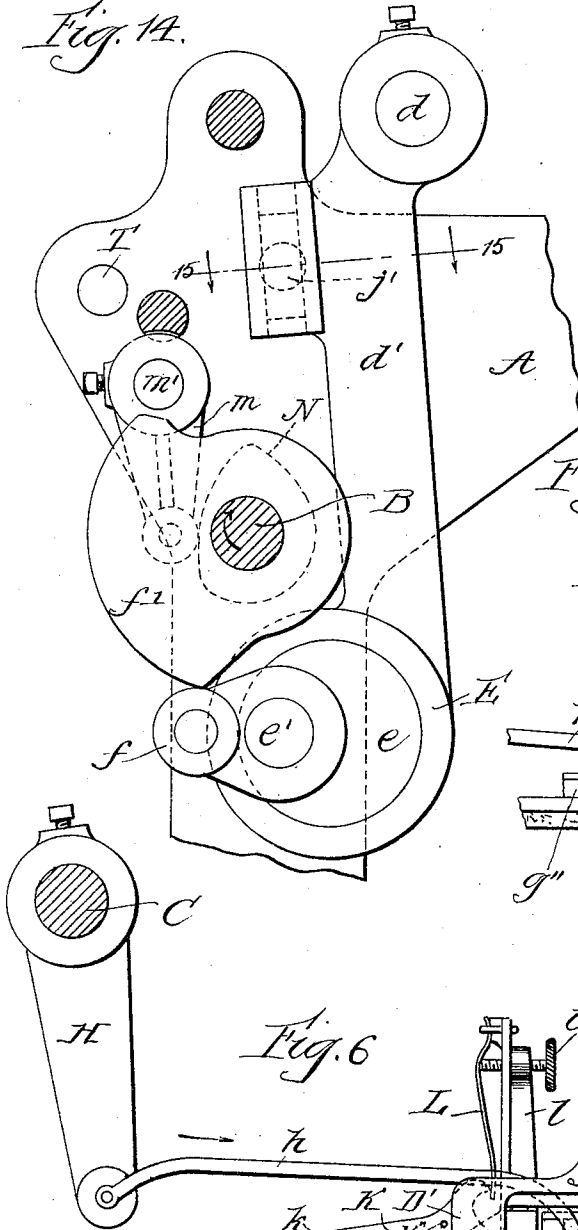


Fig. 15.

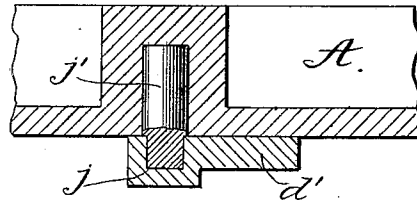


Fig. 10.

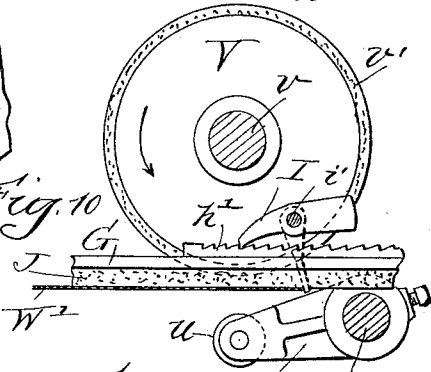


Fig. 11.

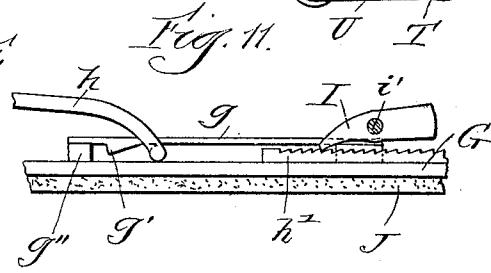
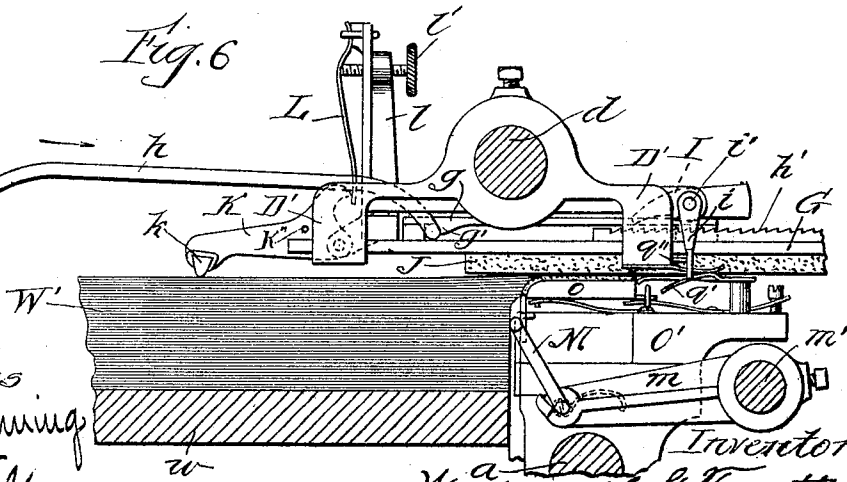


Fig. 6.



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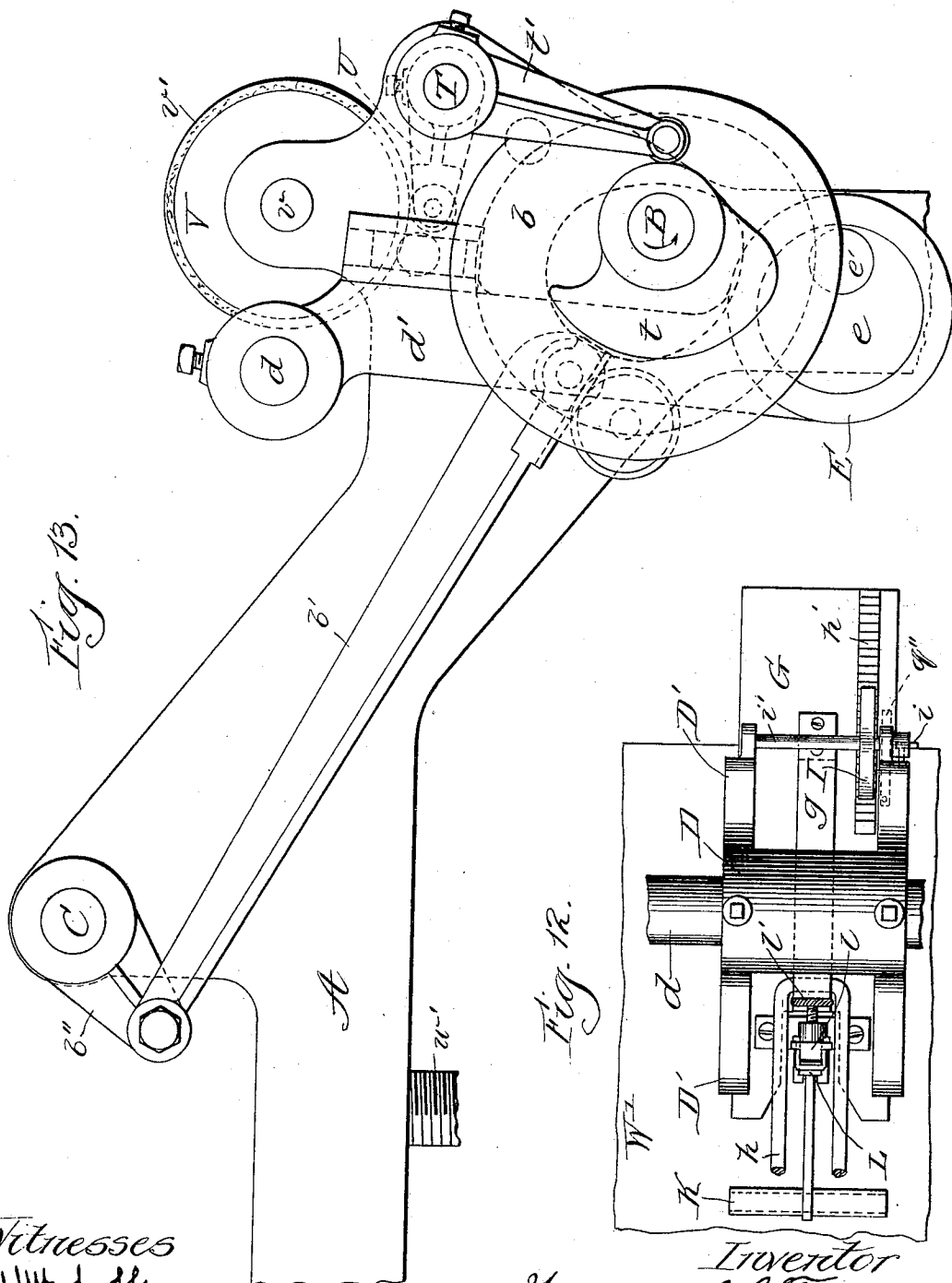
Patented Oct. 24, 1899.

W. G. TREVETTE.  
PAPER FEEDING MACHINE.

(Application filed Dec. 18, 1895.)

(No Model.)

6 Sheets—Sheet 6.



Witnesses  
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Attys.

# UNITED STATES PATENT OFFICE.

WENTWORTH G. TREVETTE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO LUCIUS W. WINCHESTER, OF SAME PLACE.

## PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,616, dated October 24, 1899.

Application filed December 18, 1895. Serial No. 572,581. (No model.)

*To all whom it may concern:*

Be it known that I, WENTWORTH G. TREVETTE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention relates to certain new and useful improvements in paper-feeding machines which are primarily adapted for use in connection with printing-presses.

A primary object of my invention is to provide a simple and compact machine which is designed and adapted to separate in regular succession single sheets from a pile of paper suitably arranged with relation to the mechanism.

Another object of my invention is to provide means for insuring the advancement of but a single sheet of paper during each cycle of the operation of the mechanism.

A further object of the invention is to provide means adapted to be operated by the advancing sheet for automatically limiting the forward movement of the advancing means.

A further object of the invention is to raise the forward ends of the upper sheets on the pile of paper to facilitate the operation of the advancing mechanism and the removal of the top sheet; and a further object of the invention is to provide gripping devices which are normally out of contact with the paper and which are automatically operated to contact with and remove the paper at a certain period in the cycle of operation of the mechanism.

Further objects of my invention which are of equal importance with those before mentioned are to provide devices for removing the top sheet of paper which correspond to and are adapted to operate in a manner substantially similar to the action produced by rubbing together two pieces of paper between the forefinger and thumb, to hold the other sheets of paper from movement while the top sheet is being advanced and removed, to automatically govern the upward feed of the pile of paper, and to accomplish all the aforementioned results in a positive, efficient, and

simple manner in a continuous cycle of operation.

With these and other important ends in view my invention consists of the combination and arrangement of parts, the construction of devices, and the location of mechanism, all of which will be fully described hereinafter and claimed.

In the accompanying drawings, Figure 1 is a front elevation of my improved machine. Fig. 2 is a top plan view. Fig. 3 is a side elevation. Fig. 4 is a detail view of the holding devices. Fig. 5 is a detail sectional view showing the location of the advancing means at or about the beginning of its downward and forward movement. Fig. 6 is a similar view of the same mechanism, showing its position at that point where the top sheet has been advanced and the advancing means is about to be tripped. Figs. 7, 8, and 9 are detail views of the separator and supplemental separator. Figs. 10 and 11 are detail views of the advancing slide-plate. Fig. 12 is a top plan view of a portion of the advancing devices. Figs. 13 and 14 are enlarged views showing the gearing mechanism, and Fig. 15 is a transverse sectional view on the line 15 of Fig. 14.

Referring to the drawings, in which like letters of reference denote corresponding parts in all of the figures, A designates the frame upon which the mechanism hereinafter described is supported, and it is held together by means of tie-rods *a*. The main shaft B is journaled in suitable bearings in the frame, and it is provided with a grooved cam *b*, which is adapted to actuate the arm *b'*, pivotally connected to the arm *b''*, rigidly secured on the rock-shaft C, and by means of which connections said rock-shaft is rocked when the machine is operated. This rock-shaft is adapted to actuate the advancing devices, one or more of which may be used in accordance with the size and capacity of the machine; but in the drawings I have shown a machine comprising two complete advancing means which are constructed substantially alike in every particular and only one of which I will hereinafter describe.

The advancing devices are supported in a bracket D, which is carried on a vertically-

movable supporting-rod *d*. This rod is secured in the eccentric-arms *d'*, which are arranged on each side of the machine and are provided with rings *E*, arranged on eccentrics *e*, which are carried by the eccentric rock-shaft *e'*. An arm *F* is rigidly secured on this eccentric-shaft, and it is provided with a roller *f*, which operates in contact with a cam *f'* on the main shaft *B*. As the main shaft *B* is operated, the cam *f'* actuates the eccentric-shaft *e'* through the medium of the roller and arm and causes the eccentrics to raise and lower the arms *d'* and the supporting-rod.

The advancing devices comprise a pusher or advancing-plate *G*, which is adapted to slide in the hangers *D'* on the bracket and has an orbital bodily travel. A spring-bar *g* is secured to the upper side of this plate at a suitable point and is provided with a projection *g'*. An arm *H* is rigidly secured on the rock-shaft, and a pusher-rod *h*, which is preferably in the form of a yoke, is pivotally secured to the lower end of this arm. The forward end of the pusher-rod is arranged beneath the spring *g*, and it is adapted to normally engage the projection *g'* and advance the pusher *G* as the shaft *C* is rocked. A rack *h'* is arranged on the upper side of the pusher or advancing-plate, and it is adapted to be engaged by the pawl *I* when the tripper *i* is operated, in a manner hereinafter fully described, by means of the advancing sheet of paper.

On the lower face of the pusher *G* is a sheet or plate of hard rubber *J* or some other more or less adhesive material, which is adapted to contact directly with the top sheet and carry it forward as the advancing means move. The tripper *i* is rigidly secured, together with the pawl *I*, on the shaft *i'*, supported on bracket *D*, and it projects slightly below the face of the rubber sheet *J*, so that the sheet of paper moving forward will engage the end of the tripper, thereby rocking the shaft *i'* and causing the pawl *I* to engage the rack *h'*. This limits the forward movement of the advancing means; but the pusher-rod *H* still continues its forward movement for a more or less distance and in doing so raises the spring-arm *g*, so that the pusher-rod may force its way beneath the projection *g'*. At or about this time the eccentric-arms are being elevated and the advancing means raised above the paper. The eccentric-arms are provided with slots *j*, which operate upon guide-posts *j'* on the frame.

On the rear end of the pusher *G* a pusher-finger *K* is pivotally secured, and it carries on its lower end a rubber contact-point *k*, which is adapted to engage the top sheet of paper and move it forward during the orbital bodily travel of the pusher. The pusher-finger is provided with an upwardly-extending hooked arm *k'*, and a spring *L* is arranged to engage the hooked arm *k'* and normally hold the contact *k* down and in close contact

with the paper when the advancing means are in operation. The spring *L* is supported upon an arm *l*, and its tension is maintained by means of an adjusting-screw *l'*. The pin *k''* engages the pusher *G* and holds the pusher-finger in an elevated position when the pusher is raised, so that the contact-point *k* will not contact with the paper, as shown in Fig. 5.

It will be found in practice that while the top sheet is the only one advanced any material distance and actually removed from the pile several of the other sheets immediately beneath the top sheet are actually advanced a more or less distance. Owing to the friction of the paper it is practically impossible to prevent a more or less movement of the sheets immediately beneath the top sheet; but in order to avoid jamming the mechanism or the possibility of two sheets being removed at the same time I provide a kicker *M*, which is pivotally supported on the forward end of an arm *m*, which arm is rigidly secured on the kicker rock-shaft *m'*. This kicker-shaft is operated by means of a cam *N* on the main shaft *B*, which operates an arm *n*, secured on the kicker-shaft. As the shaft *m'* rocks, the kicker *M* rises beneath the forward ends of those sheets of paper which have been more or less advanced and elevates them in the manner illustrated in Fig. 5. This causes the upper sheets to be loosened slightly from contact with the other sheets, and as the advancing means drop down into contact with the top sheet the kicker also drops down and allows the forward ends of said sheets to resume substantially their former position. The kicker also serves to prevent the forward sheets from becoming jammed or crumpled against the main separator by raising the forward ends thereof, so that when they do resume their normal position the edges of said forward ends will rest easily and lightly upon the rounded edge of the main separator.

The main separator comprises a block *O*, having a rounded edge *o* and provided with a rubber covering *o'*. This block is mounted upon a flat spring *P*, which is secured beneath the rear end of said block and also secured to the separator-support *O'*, as clearly shown in Figs. 5 and 6. The tendency of the spring is to hold the main separator in a normally-elevated and substantially level position. The rear end of the main separator is held from rising too high by means of a link *p*, which is attached to the rear end of said main separator and to a hook *p'* on the separator-support. In advance of the main separator a flat plate *Q* is attached to the separator-support, and it is provided with a smooth upper face adapted to receive the sheet of paper after it passes over the main separator, and thereby promote its advancing movement through the mechanism. This plate *Q* is secured at its forward end on a post *q*, whereby said plate constitutes, in effect, a spring-plate, so that the paper may always be maintained in a substantially level



position as it passes through the machine, for the said plate Q will be depressed to the same extent as the main separator O and by the same means if the main separator is depressed at all. At one side of the plate Q is a bent arm  $q'$ , which forms, in conjunction with the arm  $q''$ , carried by the bracket D, a narrow throat to receive the advancing sheet. These arms  $q' q''$  guide the sheet, so that it will be sure to engage the tripper in its forward movement.

The main separator accomplishes for all ordinary purposes the separation of the top sheet from those immediately below it; but in order to provide absolutely against the possibility of two sheets passing through the machine at one and the same time I arrange a supplemental separator at one side of the forward end of the main separator O. The supplemental separator (shown more particularly in Figs. 7 and 8) comprises a rubber block R, which is mounted on a plate  $r$ , provided with a rearward extension  $r'$ . This plate  $r$  is pivotally supported on a frame S, which frame is pivoted on an arm  $s$  on the separator-support O' substantially opposite the rear end of the main separator. The forward end of the frame S is normally held in an elevated position by means of a flat spring  $s'$ , and its upward movement is regulated and controlled by a link  $s''$ , in which the free end of the frame S operates. A spring  $r''$  is carried by the frame S and bears upon the rearward extension  $r'$  on the plate  $r$  to hold the forward end of the supplemental separator in an elevated position. It will thus be observed that as the paper passes over the main separator it will strike the slightly-inclined supplemental separator, which offers additional resistance to the advancing movement of the paper on the underneath side thereof, and this will effectually prevent more than a single sheet of paper passing to the gripping means at one time.

The gripper rock-shaft T is supported in the forward part of the frame, and it is rocked by means of a cam  $t$  on the main shaft B, which actuates an arm  $t'$ , rigidly secured to said gripper rock-shaft. Another arm U is rigidly secured to the gripper rock-shaft, and it extends rearward thereof and is provided with a roller  $u$ , which is adapted to be brought into contact with the underneath side of the sheet of paper when the gripper rock-shaft is operated. The roller  $u$  on the arm U acts to press or grip the sheet of paper against the delivery-roll V, which is carried upon the delivery-roll shaft  $v$  and is provided with a rubber covering  $v'$ . When the roll  $u$  presses the paper against the roll V, the sheet is immediately carried from the machine. The delivery-roll shaft  $v$  is driven from the main shaft B by means of gear-wheels mounted on the ends of said shafts and intermediate gears supported on a stud  $v''$ . Spring  $u'$  is provided on the delivery rock-shaft T to automatically bring said shaft to the position in which the roller  $u$  is in contact with the sheet of paper,

and the cam  $t$  at the proper time causes the shaft to rock and lower the roll  $u$  from contact with the delivery-roll. The movements are of course timed with such precision that the sheet of paper will have been removed from the machine before the roller  $u$  is withdrawn from its position adjacent to the roller V. I also provide guides W, which project upward in front of the pile of paper to constitute, in effect, a front or abutment for said pile to maintain it in its proper position. These guides W are stationary and secured upon a tie-rod  $a$ . The pile of paper W' is supported on a table  $w$ , which is automatically raised by means of the screws  $w'$ . On the upper end of one or both of these screws is an arm X, which is operated by means of a slotted arm  $x$ , connected to the rock-shaft C in substantially the manner described and illustrated in Letters Patent No. 562,867, granted to me and Lucius W. Winchester on June 30, 1896.

In order to maintain and hold the other sheets in a rigid position as the top sheet is being separated therefrom, I provide a holder which is carried by a rod Y, supported on the tie-rods  $a$  and connected by an arm  $y$  to the supporting-rod  $d$ , so that said rod Y will be rocked to bring the holder in contact with the other sheets of paper when the supporting-rod is elevated. The holder comprises a clamp Z, secured on the rod Y and provided with a screw  $z$ , mounted therein, and carrying a head  $z'$ , provided with a contact-block  $z''$ . The clamp Z is adjustably secured on the rod Y by means of a screw  $y'$ , so that the holder can be adjusted into any desired position for paper of different sizes, and when very fine adjustment is desired for any purpose the screw  $z$  can be operated. It will thus be seen by the foregoing description in connection with the operation of the different parts that the whole machine completes a full cycle of operation and the pusher completes its orbital bodily travel during the separation and delivery of a single sheet of paper, and the mechanisms and combinations of parts provided herein for the accomplishment of this result are marked particularly by their simplicity and precision of movement. The separation of but a single sheet of paper is practically assured by reason of the devices provided for preventing the other sheets from being advanced with the top sheet and at the same time, and it will be observed that when large sheets of paper are being distributed the advancing devices and other parts of the machine will operate even though the sheet may not be in its proper position, and when the top sheet has been properly advanced it will be squared by contact with the arms  $q' q''$ , so that the sheet will pass from the machine in proper position for delivery to a printing-press or other machine.

The arms  $q' q''$ , which act to guide the sheet being fed from the machine, also serve to disengage the said sheet from the tripper.

As the sheet strikes the tripper the latter is pushed forward, and the arms  $q'$   $q''$ , which form a narrow throat to receive the sheet, hold the latter in such a position that it will  
5 be immediately disengaged from the tripper when the advancing means are raised.

It will be found in most instances that the main separator will be sufficient without the supplemental separator for the complete separation of the top sheet from the others; but  
10 I have shown and described the others as being useful when their presence is desired.

The advancing means are returned to their initial rearward position by means of the  
15 pusher-rod  $h$ , which after completing its forward movement returns to its position behind the projection  $g'$  and engages a post  $g''$  on the pusher, so that said plate will be returned to its proper position.

20 The rubber-faced pusher  $G$  serves to advance the top sheet, and the spring  $L$  is provided to make the pusher-finger  $K$  bear somewhat harder upon the pile of paper, which thereby tends to advance some of the sheets  
25 beneath the top sheet at the same time that the top sheet is advanced by the pusher; but the underneath sheets will not be advanced as far as the top sheet for the reason that the advancing movement exerted thereon is not  
30 so great and the rounded edge  $o$  of the main separator checks the forward movement of said sheets.

By the words "orbital bodily travel" used in this specification I do not mean a forward-  
35 and-backward movement in the same plane or a simple rotary movement, but refer to a pusher which has a bodily movement in different planes.

By reason of the construction of the different parts of my improved machine and their operations, which are timed with relation to each other, the devices employed to advance the sheet of paper, comprising a pusher the construction of which may be greatly varied,  
45 travel bodily in an orbit during the cycle of operation of the machine and move in planes at angles to each other, being preferably substantially vertical and horizontal planes.

Having thus fully described my invention,  
50 what I claim, and desire to secure by Letters Patent, is—

1. In a machine for feeding sheets of paper from a pile, the combination of a kicker adapted to engage the forward ends of the upper  
55 sheets of said pile after they have been advanced beyond the other sheets and hold them temporarily in an elevated position and means for operating said kicker, substantially as described.

60 2. In a machine for feeding sheets of paper from a pile, the combination of a kicker adapted to be operated to raise and hold the forward ends of the upper sheets on said pile in an elevated position after one sheet has been  
65 fed from the machine and before another sheet has been advanced, and means for operating said kicker, substantially as described.

3. In a machine for feeding sheets of paper from a pile, the combination of a kicker-shaft, an arm rigidly secured on said shaft, a kicker  
70 carried by the arm and means for operating said kicker-shaft to cause the kicker to rise and elevate the forward ends of the upper sheets on said pile, substantially as described.

4. In a machine for feeding sheets of paper  
75 from a pile, the combination of a main shaft, a cam on said main shaft, a kicker-shaft, an arm carried by said kicker-shaft and adapted to be operated by the cam to rock the kicker-shaft, a rearwardly-extending arm on the  
80 kicker-shaft and a kicker supported by said arm and adapted to raise the forward ends of the upper sheets on said pile, substantially as described.

5. In a machine for feeding sheets of paper  
85 from a pile, the combination of mechanism for advancing the top sheet thereof comprising a pusher having an orbital bodily travel and constructed to press upon the top of the  
90 pile at the front thereof during its forward travel to advance the top sheet, and mechanism for automatically checking the forward movement of the pusher during that operation of the machine, said mechanism being  
95 engaged by the top sheet as it advances and actuated by the continued advancement of said top sheet, substantially as described.

6. In a machine for feeding sheets of paper from a pile, the combination of mechanism  
100 for advancing the top sheet thereof comprising a pusher having an orbital bodily travel, mechanism for automatically checking the forward movement of the pusher comprising a tripper arranged in the path of the top  
105 sheet and adapted to be engaged by said sheet as it advances and moved to engage and actuate the checking mechanism by the continued advancement of said sheet, substantially as described.

7. In a machine for feeding sheets of paper  
110 from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, a rack carried by the advancing means on the upper side thereof, a shaft supported in front  
115 of and above said rack, a pawl rigidly secured on the shaft and a tripper secured on the shaft and hanging in a position where it is adapted to be operated by the advancing sheet of paper to cause the pawl to engage the rack and  
120 thereby check the forward movement of the advancing means, substantially as described.

8. In a machine for feeding sheets of paper from a pile, the combination of mechanism  
125 for advancing the top sheet thereof comprising a pusher having an orbital bodily travel and constructed to press upon the pile during its forward travel, and eccentric mechanism for imparting to said pusher a positive bodily vertical movement in traversing its rectangular  
130 orbit, substantially as described.

9. In a machine for feeding sheets of paper from a pile, the combination of mechanism for advancing the top sheet thereof compris-

ing a pusher having an orbital bodily travel and constructed to press upon the pile during its forward travel, and means, comprising an eccentric mechanism, for imparting to said  
5 pusher a positive and intermittent bodily movement in planes at right angles to each other, substantially as described.

10. In a machine for feedingsheets of paper from a pile, the combination of mechanism  
10 for advancing the top sheet thereof comprising a pusher having an orbital bodily travel and constructed to press upon the pile during its forward travel, and means, comprising an eccentric mechanism, for imparting to said  
15 pusher a positive intermittent bodily movement in substantially vertical and horizontal planes, substantially as described.

11. In a machine for feedingsheets of paper from a pile, the combination of mechanism  
20 for advancing the top sheet thereof comprising a pusher having a substantially rectangular orbital bodily travel and constructed to press upon the pile during its forward travel, mechanism for checking the forward movement of the pusher and means, comprising an eccentric mechanism, for imparting to said  
25 pusher a positive bodily movement in a rectangular orbit, substantially as described.

12. In a machine for feedingsheets of paper from a pile, the combination with mechanism  
30 for advancing the top sheet thereof comprising a pusher having an orbital bodily travel and constructed to press upon the pile during its forward travel, of a tripper arranged in the path of the top sheet and adapted to be  
35 moved thereby to engage and check the forward movement of the pusher, and means for automatically raising the pusher after the forward movement thereof has been checked,  
40 substantially as described.

13. In a machine for feedingsheets of paper from a pile, the combination with mechanism  
45 for advancing the top sheet thereof comprising a pusher having an orbital bodily travel and constructed to press upon the pile during its forward travel, of a main shaft, the eccentric arms adapted to be operated by the main shaft, a rod carried by said arms, a bracket  
50 secured to said rod, the pusher carried by said bracket, and means for operating said pusher, substantially as described.

14. In a machine for feedingsheets of paper from a pile, the combination of mechanism for  
55 advancing the top sheet thereof comprising a pusher having an orbital bodily travel and constructed to press upon the pile during its forward travel, a main shaft, eccentric arms adapted to be operated by the main shaft and projecting up above the pile of paper, a rod  
60 supported on said arms and carrying the pusher and means for controlling the eccentric arms to guide the pusher in a rectangular orbit, substantially as described.

15. In a machine for feeding sheets of paper from a pile, the combination of a main shaft, a  
65 cam on said shaft, an eccentric shaft, an arm carried by said shaft adapted to be operated

by the cam on the main shaft, the eccentric arms, cams on the eccentric shaft adapted to operate said arms, a rod mounted on said  
70 arms, and advancing means supported by said rod, substantially as described.

16. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet on said pile, and mechanism for operating the same, the guide-posts  
75  $j'$ , and eccentric arms supporting said advancing means and provided with slots adapted to operate on said guide-posts to maintain the said arms in their proper position, substantially as described. 80

17. In a machine for feeding sheets of paper from a pile, the combination of a main shaft, the eccentric arms adapted to be operated by the main shaft, means for advancing the top  
85 sheet of said pile supported by said arms, a rock-shaft adapted to be operated by the main shaft and connections intermediate of the advancing means and said rock-shaft whereby the advancing means are moved forward as  
90 the rock-shaft is operated, substantially as described.

18. In a machine for feeding sheets of paper from a pile, the combination of a main shaft, the eccentric arms adapted to be operated by  
95 the main shaft, means for advancing the top sheet of said pile supported by said arms, a rock-shaft adapted to be operated by the main shaft, a pusher-rod adapted to be operated by the rock-shaft to move the advancing means  
100 forward and continue its forward movement after the advancing means have been checked, substantially as described.

19. In a machine for feeding sheets of paper from a pile, the combination of a main shaft,  
105 eccentric arms adapted to be operated by the main shaft, means for advancing the top sheet of said pile supported by said arms, a rock-shaft adapted to be operated by the main shaft, a pusher-rod adapted to be operated by  
110 the rock-shaft to move the advancing means forward, and means for automatically checking the forward movement of the advancing means before the movement of said pusher-rod is completed adapted to be operated by  
115 the said top sheet, substantially as described.

20. In a machine for feeding sheets of paper from a pile, the combination of a main shaft, the eccentric arms adapted to be operated by the main shaft, means for advancing the top  
120 sheet of said pile supported by said arms, a rock-shaft adapted to be operated by the main shaft, a pusher-rod adapted to be operated by the rock-shaft to move the advancing means forward and a spring-arm carried by  
125 the advancing means and engaging the forward end of said pusher-rod, substantially as described.

21. In a machine for feeding sheets of paper from a pile, the combination of a rock-shaft,  
130 means for advancing the top sheet on said pile, a spring-arm carried by the advancing means and having a projection thereon, a pusher-rod adapted to be operated by the

rock-shaft and normally engaging said projection and means for operating said rock-shaft, substantially as described.

22. In a machine for feeding sheets of paper from a pile, the combination of a rock-shaft, means for advancing the top sheet on said pile, a spring-arm carried by the advancing means and having a free rear end, a projection on the under side of said free end, an arm rigidly secured to the rock-shaft, a pusher-rod secured to said arm and normally engaging the projection on said spring-arm to move the advancing means forward as the rock-shaft is operated, and means for operating said rock-shaft, substantially as described.

23. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet on said pile comprising a sliding plate, a pusher-finger pivotally secured to the plate and adapted to be brought into contact with the top sheet simultaneously with said plate, and means for advancing the plate, substantially as described.

24. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet on said pile comprising a sliding plate having a rubber sheet on its lower side, a pusher-finger pivotally secured to the plate and having a hooked arm, a spring arranged to engage said arm, and means for bringing said finger into contact with the top sheet on said pile and moving said finger forward, substantially as described.

25. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet on said pile comprising a sliding plate having a rubber sheet on its lower side and a spring-arm on its upper side, a projection on said spring-arm, a rock-shaft, an arm secured rigidly on said rock-shaft, a pusher-rod carried by said rigid arm and normally engaging the projection on the spring-arm to advance said slide, a pusher-finger pivotally secured to the slide and adapted to be brought into contact with the top sheet on said pile and means for operating the rock-shaft and said advancing means, substantially as described.

26. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet on said pile comprising a sliding plate having a rubber sheet on its lower side and a spring-arm on its upper side, a projection on said spring-arm, a rock-shaft, an arm secured rigidly on said rock-shaft, a pusher-rod carried by said rigid arm and normally engaging the projection on the spring-arm to advance said slide, a pusher-finger pivotally secured to the slide and adapted to be brought into contact with the top sheet on said pile, a rack carried by the slide, a pawl adapted to engage the rack, a tripper arranged in the path of the top sheet and adapted to be operated thereby to throw said pawl into engagement with the rack and thereby check the forward movement of the

advancing means, and means for operating the rock-shaft and said advancing means, substantially as described.

27. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet on said pile comprising a sliding plate having a rubber sheet on its lower side, a pusher-finger pivotally secured on the rear end of the slide-plate, a hooked arm on said pusher-finger, an upright arm on said slide-plate, a spring secured to said upright arm and arranged in engagement with the hooked arm on the pusher-finger, an adjusting-screw operating through said upright arm on the spring and means for operating said advancing means, substantially as described.

28. In a machine for feeding sheets of paper from a pile, the combination of an eccentric shaft, the eccentric arms operated by the eccentric shaft, a rod carried by the eccentric arms, a bracket supported on said rod, a slide-plate arranged to slide in said bracket, a spring-arm secured at one end to the slide-plate, a projection on the under side of said spring-arm, a pusher-rod normally in engagement with said projection, a pusher-finger pivotally secured to the said plate, a rack on the slide-plate, a pawl pivoted to the bracket, a tripper adapted to be operated by the top sheet to throw said pawl into engagement with the rack and thereby check the forward movement of the advancing means, and means for operating the pusher-finger and eccentric shaft, substantially as described.

29. In a machine for feedingsheets of paper from a pile, the combination with a movable flat pusher operated to travel in a rectangular orbit, of an opposing vertically-yielding separator adapted to prevent more than one sheet of paper being fed from the machine at a time, a spring arranged beneath said separator and normally pressing the same forward, and means for limiting the upward movement of said separator, substantially as described.

30. In a machine for feeding sheets of paper from a pile, the combination of a separator adapted to prevent more than one sheet of paper being fed from the machine at a time, and having a rounded edge and a rubber covering, a spring beneath said separator to hold it up in proper position, a stationary hook beneath the separator and a link connecting said hook and separator to prevent the spring from raising the separator too high, substantially as described.

31. In a machine for feeding sheets of paper from a pile, the combination of a separator arranged in front of the upper sheet on said pile and adapted to retard the forward movement of those sheets immediately below the top sheet, and a kicker adapted to raise the said sheets out of contact with the separator after the top sheet has been fed from the machine, substantially as described.

32. In a machine for feeding sheets of paper from a pile, the combination with a movable

flat pusher operated to have an orbital bodily travel, of vertically-yielding main and supplemental separators adapted to prevent more than one sheet of paper being fed from the machine at a time, substantially as described.

33. In a machine for feeding sheets of paper from a pile, the combination with a movable flat pusher operated to have an orbital bodily travel, of an opposing vertically - yielding main separator adapted to receive the sheet being fed from the machine first and a supplemental separator arranged in advance of the initial point of contact of said sheet with the main separator, substantially as described.

34. In a machine for feeding sheets of paper from a pile, the combination with a movable flat pusher operated to have an orbital bodily travel, of an opposing vertically-yielding and substantially flat main separator, and a vertically-yielding supplemental separator arranged at one side of the main separator and in advance of the rear end thereof, substantially as described.

35. In a machine for feeding sheets of paper from a pile, the combination of a suitable support, a spring-controlled frame mounted on said support, and a plate pivoted on the frame and carrying a separator, substantially as described.

36. In a machine for feeding sheets of paper from a pile, the combination of a suitable support, a frame pivotally secured on the support, a spring beneath said frame, a plate pivoted on the frame and having a rearward extension, a separator carried by said plate and a spring operating on the said extension, substantially as described.

37. In a machine for feeding sheets of paper from a pile, the combination of a suitable support, a main separator having a rounded edge, a spring operating beneath said main separator, a frame pivoted to the support at one side of the main separator, a spring operating beneath said frame, a plate pivotally secured on said frame and having a rearward extension, a spring operating on said extension, and a supplemental separator carried by said plate, substantially as described.

38. In a machine for feeding sheets of paper from a pile, the combination of a suitable support, a bent arm secured on said support, means for advancing the top sheet of said pile, and an arm arranged above said bent arm and adapted to be brought into contact therewith when the advancing means are operating to move the top sheet of said pile forward, substantially as described.

39. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet of said pile, a rack carried by the advancing means, a pawl, a tripper adapted to be operated by the advancing sheet to throw the pawl into engagement with the rack and thereby check the forward movement of the advancing means, a suitable support, a bent arm on said support, an arm ar-

ranged above said bent arm and adapted to be brought into contact therewith when the advancing sheet has engaged the tripper to free said sheet from contact with the tripper, substantially as described.

40. In a machine for feeding sheets of paper from a pile, the combination with a movable flat pusher operated to have an orbital bodily travel, of an opposing vertically-yielding substantially flat separator, and a flat smooth plate arranged in advance of said separator, said plate having its rear end free to be depressed with the separator, substantially as and for the purpose described.

41. In a machine for feeding sheets of paper from a pile, the combination of a main separator, a flat smooth plate arranged in front of said separator, a bent arm on one side of said plate, means for advancing the top sheet of said pile and an arm adapted to be brought into contact with the bent arm when the advancing means are feeding the top sheet forward, substantially as described.

42. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet of said pile, a vertically-movable rod supporting said advancing means and means for operating the same, a rod extending to the rear end of the pile and adapted to be rocked by the vertical movement of the supporting-rod, a holder carried by said rocking rod and comprising a clamp, a screw arranged in said clamp, and a head adjustably secured on the screw and carrying a block adapted to be brought into contact with the pile of paper while the top sheet is being fed therefrom to steady the other sheets, substantially as described.

43. In a machine for feeding sheets of paper from a pile, the combination with a movable flat pusher operated to have an orbital bodily travel, of a main shaft, connections intermediate of the main shaft, and the pusher to operate the latter, a vertically-yielding and substantially flat separator opposing the pusher, a delivery-roll shaft, delivery-rolls mounted on said shaft, a gripper rock-shaft arranged below the delivery-roll shaft, a horizontal arm secured on said gripper rock-shaft and carrying a roll, a cam on the main shaft, and an arm on the gripper rock-shaft arranged in contact with said cam and adapted to be operated thereby to cause the roller on the horizontal arm to press the sheet against the delivery-roll after the sheet has been advanced by the pusher and the pusher is lifted, substantially as described.

44. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of means for arresting the advancing operation of the advancing means and a tripper adapted to be operated by the top sheet to directly engage and actuate said arresting means, substantially as described.

45. In a machine for feeding sheets of paper

- from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of means for arresting the advancing operation of the advancing means and a tripper arranged in the path of the top sheet and adapted to be operated thereby to directly engage and actuate said arresting means, substantially as described.
46. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of means for arresting the advancing operation of the advancing means and a tripper suspended in the path of the top sheet and adapted to be operated thereby to directly engage and actuate said arresting means, substantially as described.
47. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of a tripper adapted to be operated by the top sheet to engage the advancing means and arrest the advancing operation of said advancing means, substantially as described.
48. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of a tripper suspended in the path of the top sheet and adapted to be operated thereby to engage the advancing means and arrest the advancing operation of said advancing means, substantially as described.
49. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of a tripper arranged in the path of the top sheet and adapted to be operated thereby to engage the advancing means and arrest the advancing operation of said advancing means, substantially as described.
50. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of a tripper adapted to be operated by the top sheet and a rack carried by the advancing means, said tripper being adapted to engage said rack and thereby arrest the advancing operation of the advancing means, substantially as described.
51. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of a tripper arranged in the path of the top sheet and adapted to be operated thereby and a

rack carried by the advancing means, said tripper being adapted to engage said rack and thereby arrest the advancing operation of the advancing means, substantially as described.

52. In a machine for feeding sheets of paper from a pile, the combination of means for advancing the top sheet thereof and mechanism for operating said advancing means, of a tripper suspended in the path of the top sheet and adapted to be operated thereby and a rack carried by the advancing means, said tripper being adapted to engage said rack and thereby arrest the advancing operation of the advancing means, substantially as described.

53. The combination, in a paper-feeding machine, of a sheet-feeding instrument having a normally-active positive frictional engagement with top sheet of a pile on its forward stroke, means for separating the top sheet from the underlying sheets, and means, controlled by the advance edge of the sheet being fed off, for automatically and simultaneously arresting the action of the feeding instrument and separating means, substantially as set forth.

54. A paper-feeding machine comprising a sheet-separating bed at the delivery end of the machine, a main feeding and separating pad over the aforesaid bed, and an auxiliary frictional feeding instrument supported to the rear of the main pad and having an independent vertically-yielding motion with relation to the main pad to allow it to effectively engage the sheet, substantially as set forth.

55. A paper-feeding machine comprising a sheet-separating bed at the delivery end of the machine, a main frictional feeding and separating instrument operating over the aforesaid bed, an auxiliary frictional spring-pressed feeding instrument supported to the rear of the main pad and having an independent vertically-yielding motion with relation to the main pad to allow it to effectively engage the sheet, means for reciprocating the main and auxiliary instruments, and means for moving the said main and auxiliary instruments out of engagement with the sheet, substantially as set forth.

56. A paper-feeding machine, comprising a sheet-separating bed at the delivery end of the machine, a feeding-pad operating over the aforesaid bed to separate the sheets, and an auxiliary feeding-pad to the rear of said front pad and moving in unison therewith to promote the travel of the top sheet, substantially as set forth.

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Witnesses:

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