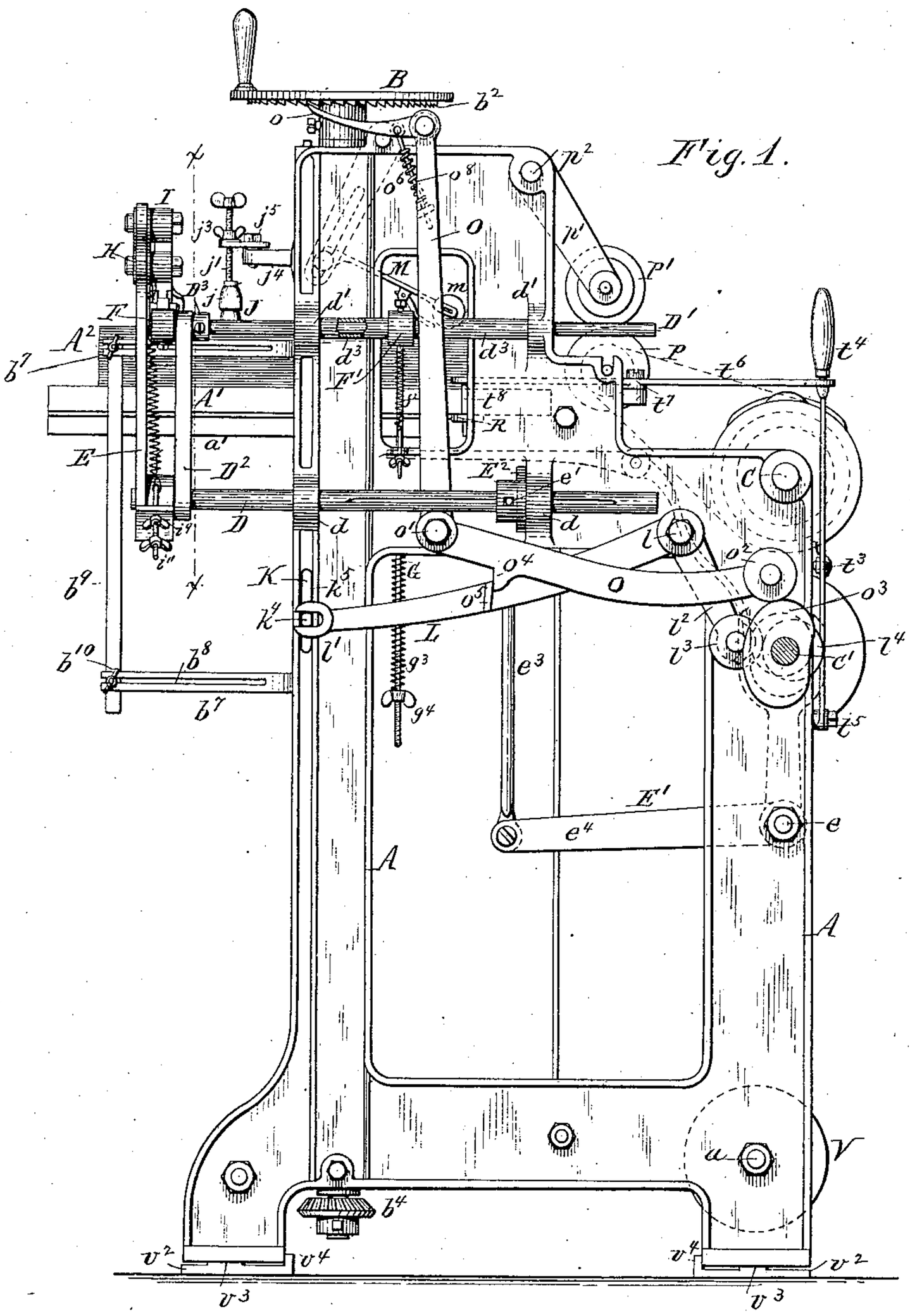
(No Model.) 5 Sheets—Sheet 1.

A. SEDGWICK & J. NAYLOR, Jr.

PAPER FEEDING MACHINE.

No. 336,070. Patented Feb. 9, 1886.

Fig. 1.



Witnesses:
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Attorneys.

(No Model.)

5 Sheets—Sheet 2.

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PAPER FEEDING MACHINE.

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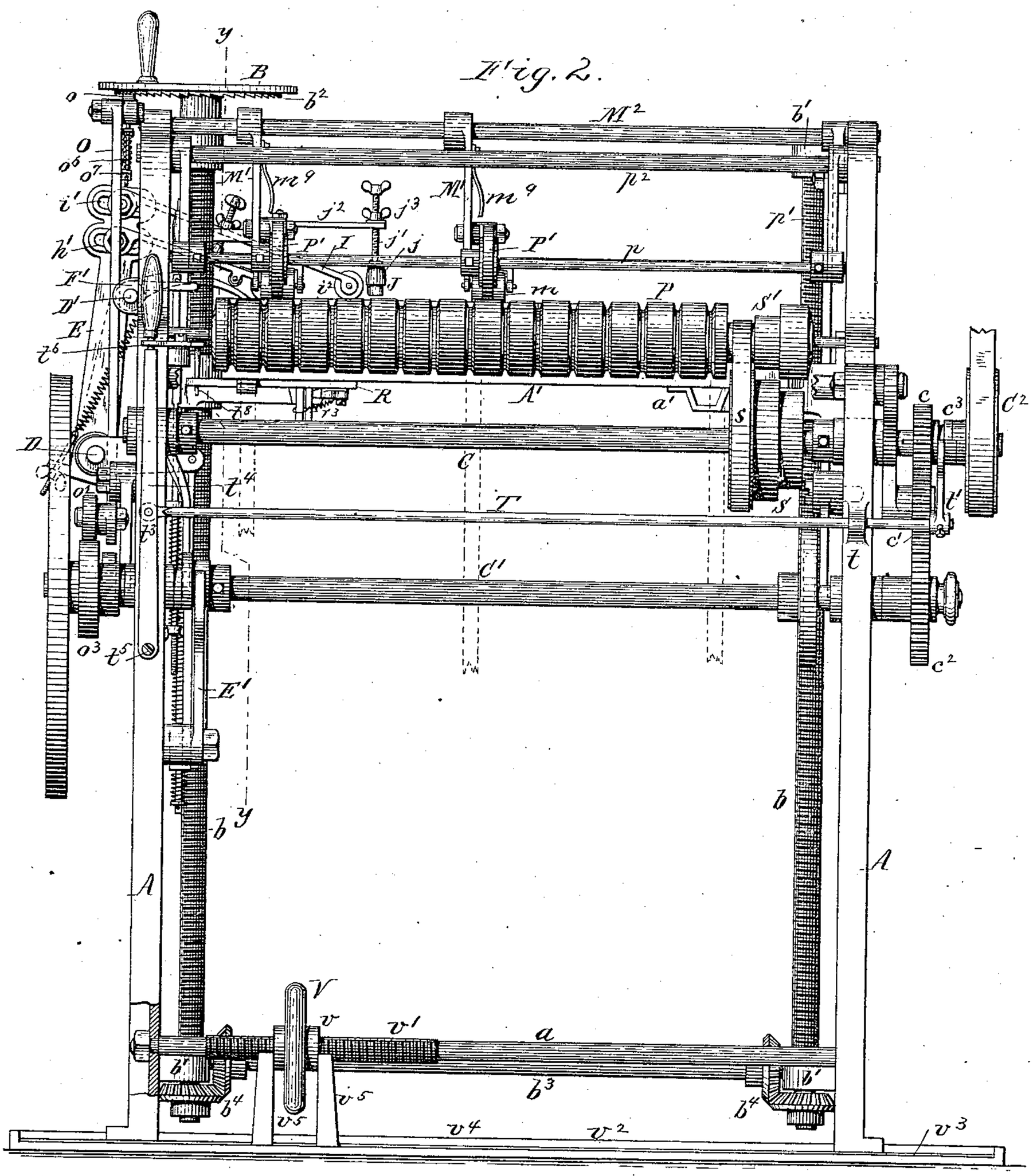
Fig. 2.



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(No Model.) 5 Sheets—Sheet 3.

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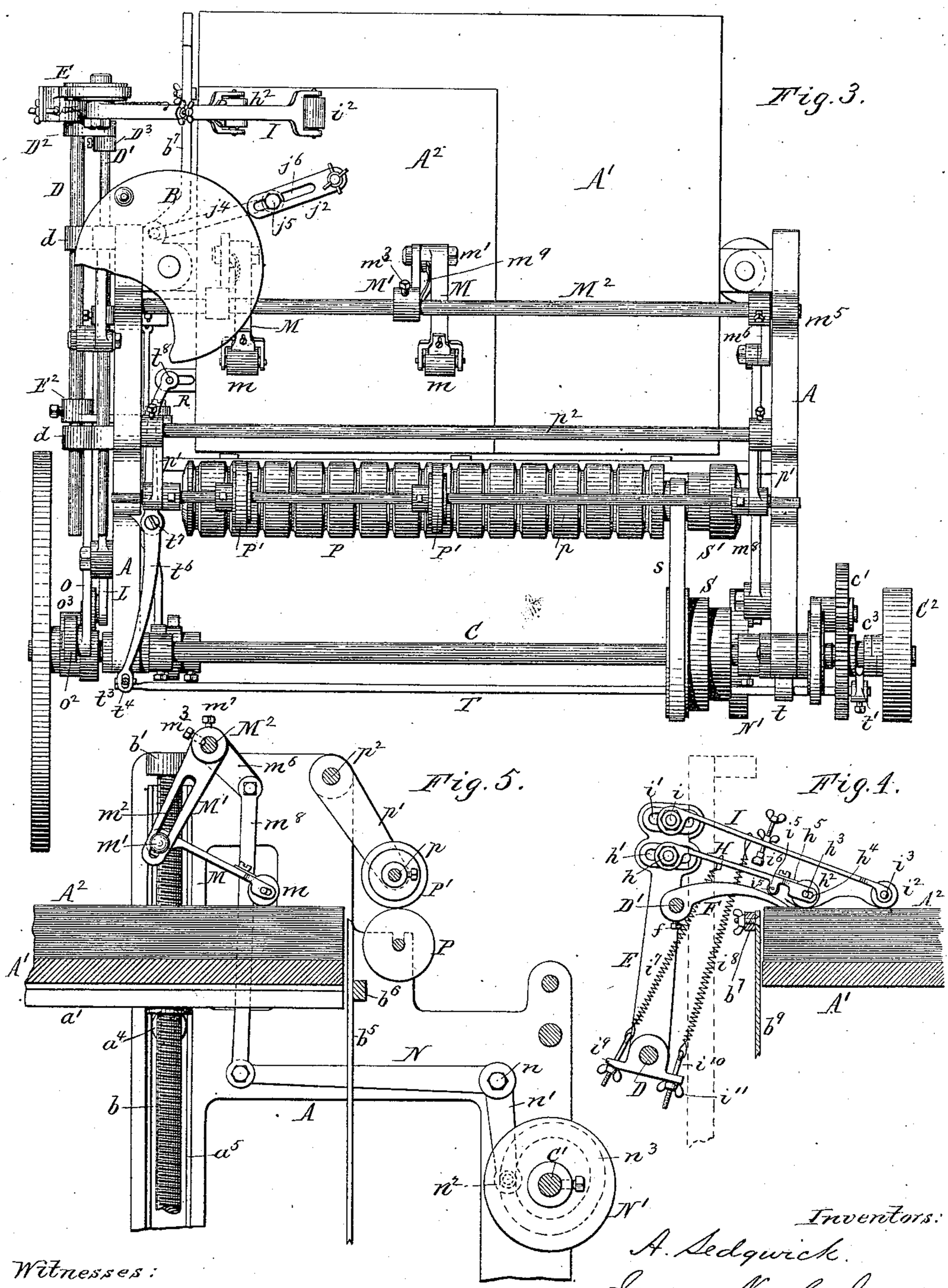

Fig. 3.

Fig. 5.

Fig. 4.

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5 Sheets—Sheet 4.

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PAPER FEEDING MACHINE.

No. 336,070. Patented Feb. 9, 1886.

Fig. 6.

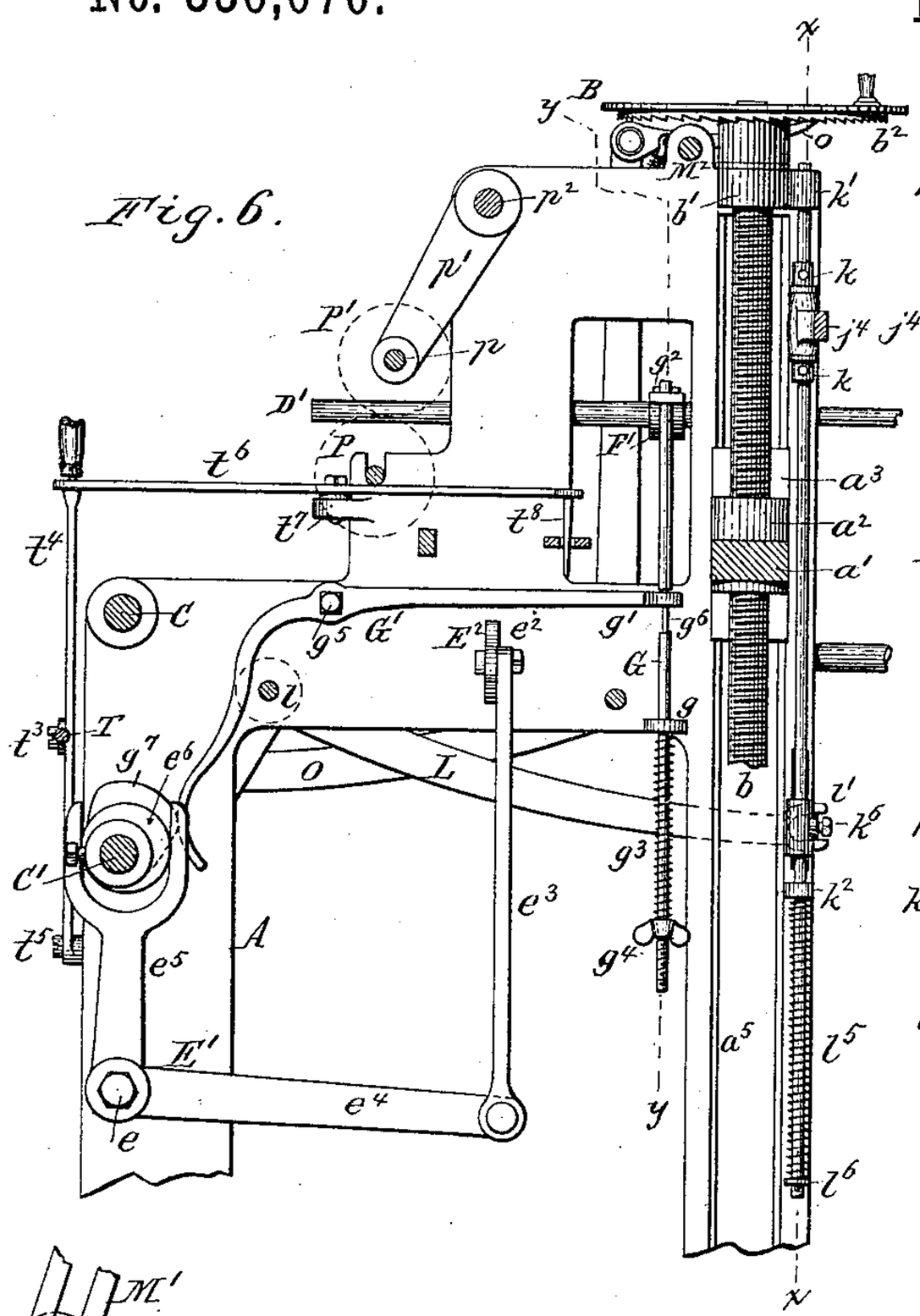


Fig. 7.

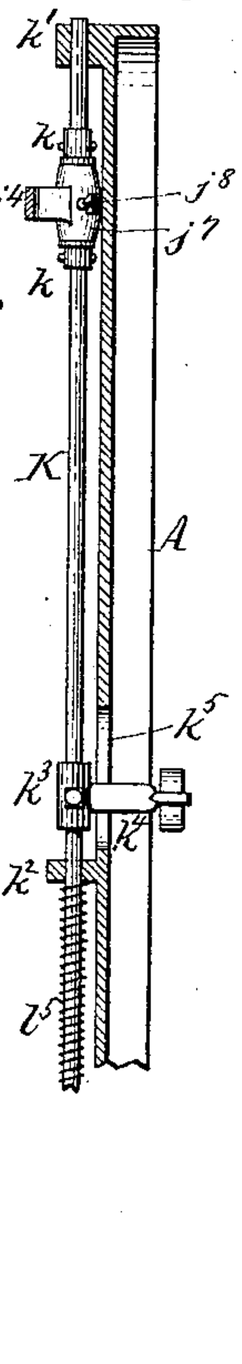


Fig. 8.

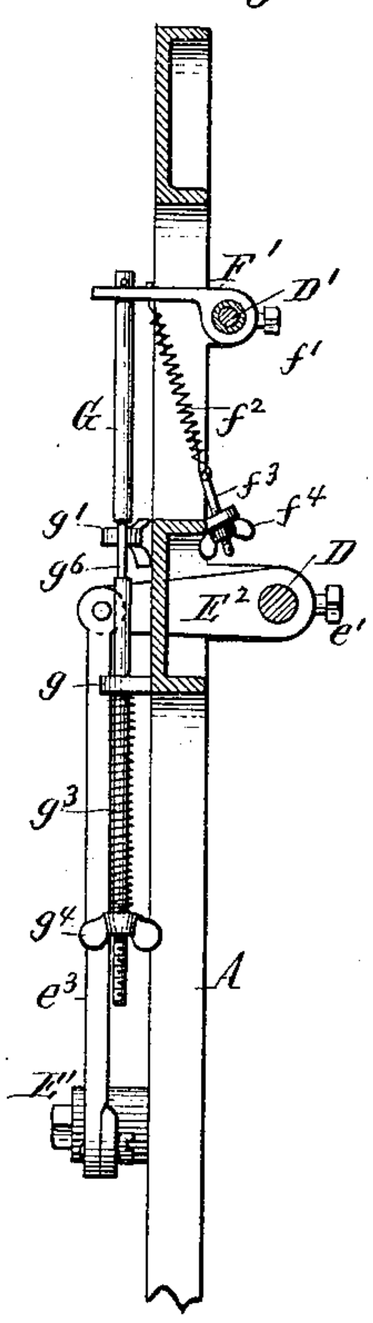


Fig. 9.

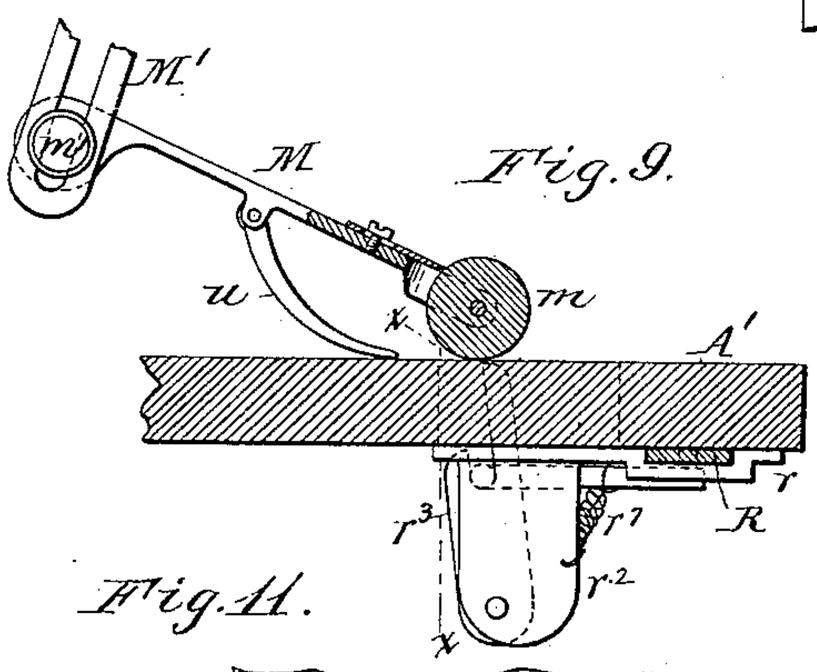


Fig. 10.

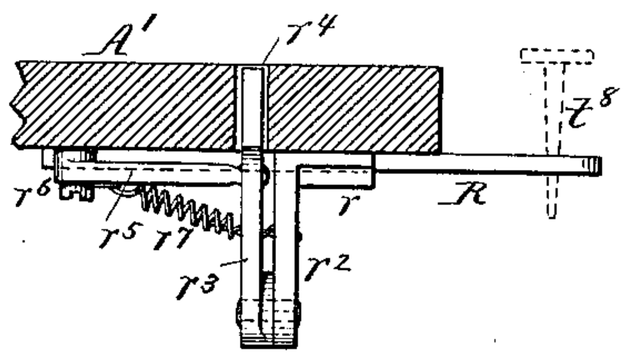
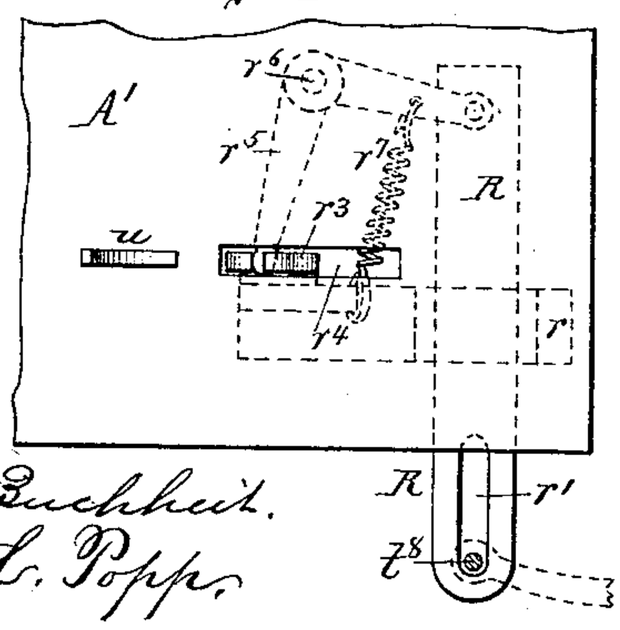


Fig. 11.



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(No Model.) 5 Sheets—Sheet 5.

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PAPER FEEDING MACHINE.

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Fig. 12.

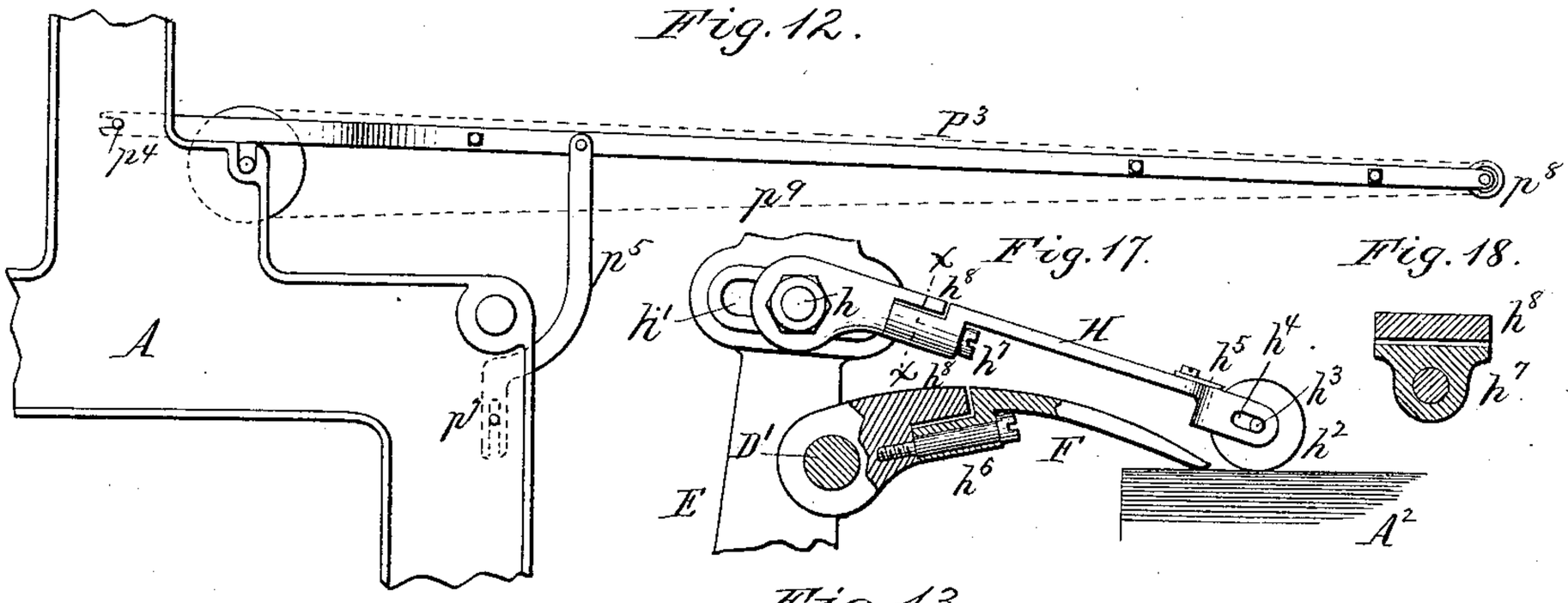

Fig. 17.

Fig. 18.

Fig. 13.

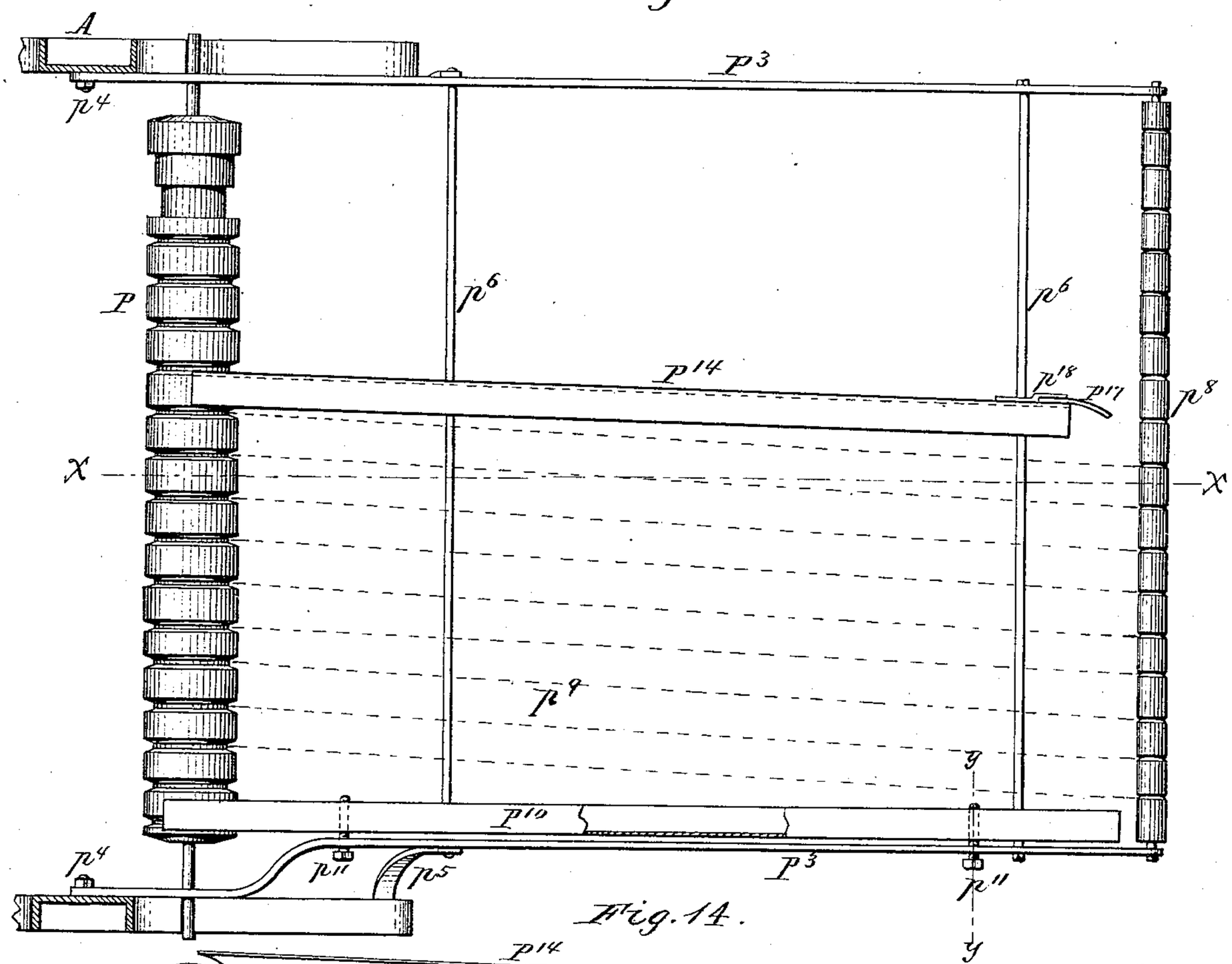

Fig. 14.

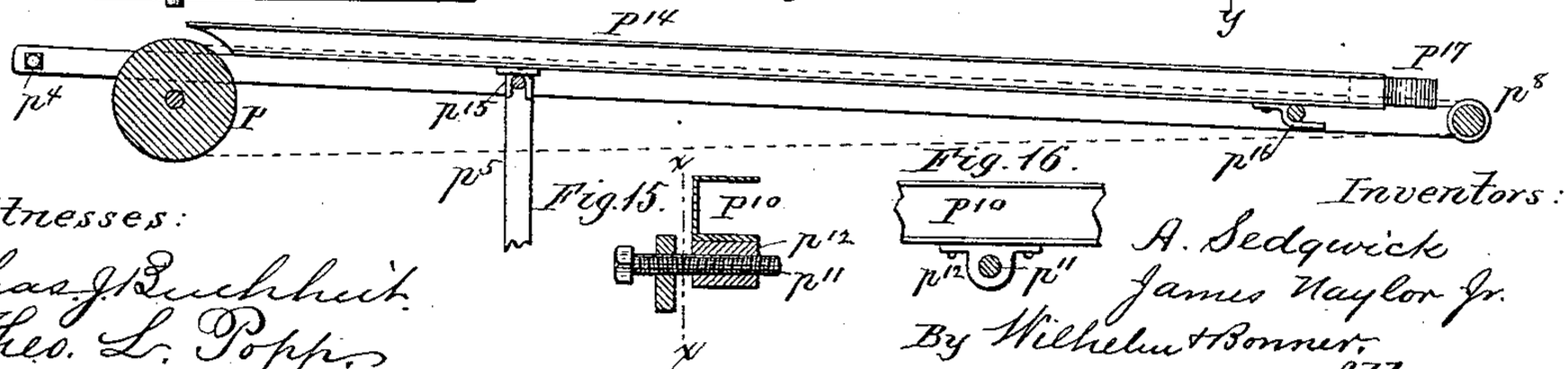

Fig. 15.

Fig. 16.

Witnesses:
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UNITED STATES PATENT OFFICE.

ALONZO SEDGWICK AND JAMES NAYLOR, JR., OF POUGHKEEPSIE, ASSIGNORS, BY MESNE ASSIGNMENTS, TO DAVID H. BURRELL, OF LITTLE FALLS, NEW YORK.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 336,070, dated February 9, 1886.

Application field October 15, 1884. Serial No. 145,606. (No model.)

To all whom it may concern:

Be it known that we, ALONZO SEDGWICK and JAMES NAYLOR, Jr., both of the city of Poughkeepsie, in the county of Dutchess and State of New York, have invented new and useful Improvements in Paper Feeding Machines, of which the following is a specification.

This invention relates to an improvement in that class of machines which are employed for feeding sheet-paper to ruling, folding, and calendering machines, printing-presses, and other kinds of machines in which sheet-paper is used.

Our invention relates more particularly to a machine in which the feed-table on which the pile of paper is placed is automatically raised as the sheets of paper are successively fed from the top of the pile to within reach of the carrying rollers or tapes which move the sheets onward one after the other. A machine of this description is described, shown, and claimed in the pending application of Robert J. Stuart, Serial No. 119,082, filed January 29, 1884; and our invention consists of improvements on this machine, and has the object to simplify the construction of the machine and to render the same more efficient and reliable in its operation.

Our invention consists, to these ends, in the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of five sheets, Figure 1 is a side elevation of our improved machine. Fig. 2 is an end elevation thereof. Fig. 3 is a top plan view of the machine. Fig. 4 is a sectional elevation of the holding-finger and buckling device, resting on the pile of paper in line *x x*, Fig. 1. Fig. 5 is a vertical sectional elevation of the mechanism for actuating the feed-fingers, whereby the top sheet is moved to the carrying-rollers. Fig. 6 is a sectional elevation on line *y y*, Fig. 2. Figs. 7 and 8 are vertical sections in lines *x x* and *y y*, Fig. 6, respectively. Fig. 9 is a sectional elevation of the automatic clutch-shifting device, whereby the movement of the machine is stopped when the last sheet of paper has been fed from the table. Fig. 10 is a cross-section of the same in line *x x*, Fig. 9. Fig. 11 is a top plan view of a portion of the feed-table, underneath which the stop mechanism is arranged. Fig. 12 is a fragmentary side elevation of the machine with the tape or paper-carrying frame attached thereto. Fig. 13 is a top plan view of the same. Fig. 14 is a longitudinal sectional elevation in line *x x*, Fig. 13. Fig. 15 is a cross-section, on an enlarged scale, in line *y y*, Fig. 14. Fig. 16 is a sectional elevation at right angles to Fig. 15, taken in line *x x* of the same. Fig. 17 is a side elevation, partly in section, of the holding-down finger and buckling-finger on an enlarged scale. Fig. 18 is a cross-section in line *x x*, Fig. 17.

Like letters of reference indicate corresponding parts in the several figures.

A A represent the side frames of the machine connected by cross-stays *a a*.

A′ represents the feed-table, upon which the pile of paper A^2 is placed. The feed-table A′ is secured to supports *a*′, which are provided near their outer ends with screw-nuts a^2 and upright extensions a^3, having rollers a^4, which run in vertical grooves a^5, formed on the inner sides of the side frames, A, whereby the feed-table is guided in its vertical movement.

b represents vertical screws, which work in the screw-nuts a^2, secured to the feed-table, and which are held against lengthwise movement in bearings *b*′, secured to the side frames, A.

B represents a hand-wheel secured to the upper end of one of the feed-screws, and provided on its under side with an annular ratchet-rim, b^2. The lower ends of the feed-screws *b b* are connected by a horizontal shaft, b^3, and bevel-wheels, b^4, so that both feed-screws are actuated simultaneously.

b^5 represents stationary vertical guides, arranged upon cross-bars b^6, secured to the side frames, A. The guides b^5 are arranged closely against the front end of the table A′, so as to support the front of the pile of paper on the table and prevent the same from tipping or tilting forwardly. Similar guides may also be arranged adjacent to the table and the outer side of the pile of paper on the same.

b^7 represents outwardly-projecting arms or brackets, secured at their inner ends to the

side frames, A, and provided with longitudinal slots b^8.

b^9 is an adjustable vertical guide, secured at its ends to the brackets b^7 by means of thumb-screws b^{10} passing through the slots b^8 of the brackets. By this means the guide b^9 can be adjusted backwardly and forwardly for different-sized piles of sheets placed upon the table. The upper bracket b^7 also serves to support the buckling mechanism when the table A′ is lowered to receive a fresh supply of paper.

C represents the horizontal driving-shaft, arranged transversely in the machine and supported in bearings in the side frames, A.

C′ represents a counter-shaft arranged below the driving-shaft C and parallel with the same. Motion is transmitted from the driving-shaft C by a train of gear-wheels, c c' c^2, in such manner that the speed of the counter-shaft C′ can be increased or reduced by changing the size of the gear-wheel c^2 and adjusting the size of the gear-wheel c' accordingly.

c^3 represents a clutch-coupling whereby the driving-pulley C^2 can be thrown in and out of gear, as desired.

D represents a horizontal rock-shaft, arranged at right angles to the shafts C C′, and supported in bearings d d, formed on one of the side frames, A; and D′ represents a similar rock-shaft arranged parallel with the shaft D, and above the same, and supported in bearings d' d', formed on the side frame, A.

D^2 is a strap or link connecting the shafts D D′ near their outer ends, so as to prevent the same from springing or bending when they are extended, as shown in Fig. 1. The strap D^2 is held from lateral displacement by the finger F and a collar, D^3, which are secured to the shaft D′ on opposite sides of the strap D^2.

E represents an upwardly-extending arm, secured to the shaft D, and to the upper end of which the buckling device is attached.

E′ represents an elbow-lever, which is pivoted to the inner side of one of the side frames, A, by means of a pivot-bolt, e.

E^2 represents a lever secured to the rock-shaft D by means of a set-screw, e'. The lever E^2 extends inwardly through an elongated opening or slot, e^2, formed in one of the side frames, A, whereby the lever and the shaft D are held from lateral displacement. The set-screw e' of the lever E^2 engages in a longitudinal slot or groove formed in the shaft D, so that by loosening the screw e' the shaft D may be moved laterally in its bearings, to adjust the arm E and buckling device attached thereto to the different sizes of sheets of paper.

e^3 is a vertical rod connecting the inner end of the lever E^2 with the horizontal arm e^4 of the elbow-lever E′. e^5 is the vertical arm of elbow-lever E′, which is bifurcated to engage over a cam, e^6, secured to the counter-shaft C′, whereby motion is imparted to the lever E′, rod e^3, lever E^2, and rock-shaft D.

F represents a finger which is secured to the end of the shaft D′ by a set-screw, f, and which rests with its free end upon the corner of the pile of paper adjacent to the buckling device. The finger F is held down upon the pile of paper by means of an arm, F′, which is secured to the shaft D′ by a set-screw, f', and a spiral spring, f^2, which is secured at its upper end to the arm F′, and at its lower end to the frame A by a screw, f^3, and thumb-nut f^4. The shaft D′ is held from lateral movement by means of two sleeves, d^3, which surround the shaft and are arranged between the bearings d' and the arm F′. The outer ends of the sleeves abut against the inner sides of the bearings d', and their opposite ends against the arm F′. By loosening the set-screw f' of the arm F′ the shaft D′ can be adjusted in its bearings, and the finger F, which is secured to the outer end of the shaft, is thereby adjusted, so as to rest upon the corner of the pile of paper. By tightening the arm F′ upon the shaft D′, the further lateral movement of the shaft is prevented by the sleeves or collars d^3.

G represents an auxiliary vertical tension-rod, which is guided at its upper end in the arm F′, and near its lower end in a lug, g, formed on the frame A.

g^2 is a pin or split key inserted through an opening in the rod G, above the arm F′, and g^3 is a spiral spring which surrounds the rod G between the lug g, and a thumb-nut, g^4, engaging over the lower threaded end of the rod G. The tension of the spring g^3 holds the rod G with its pin g^2 against the arm F′, thereby increasing the pressure of the finger F upon the pile of paper.

G′ represents an elbow-lever, which is pivoted at g^5 to the inner side of one of the side frames, A. The rod G is provided with a reduced portion, g^6, over which engages the bifurcated end g' of the elbow-lever G′, so as to hold the rod G in an elevated position and relieve the arm F′ from the tension of the spring g^3. The elbow-lever G′ is actuated by a cam, g^7, on the counter-shaft C′ in such manner that while the top sheet of paper is being withdrawn from under the finger F the latter is relieved from the additional pressure of the spring g^3 and rod G, the finger F at this movement being held down upon the pile by the spring f^2 alone. When the top sheet has been removed from under the finger F, the rod G is released by the elbow-lever G′ and cam g^7, and the pressure of the spring g^3 forces the rod G downward, and bearing upon the arm F′ increases the pressure of the finger F upon the pile, whereby the pile is more securely held in place upon the feed-table.

H represents the buckling-finger, which is pivoted to the upper end of the rock-arm E by a bolt, h, passing through a slot, h', in the rock-arm, so that the finger can be adjusted backward or forward, as may be desired. The free end of the finger H is bifurcated, and is provided with a roller, h^2, of rubber or other suitable material, which is provided with journals h^3. The journals h^3 of the rollers are seated in elongated openings h^4, formed in the jaws of the bifurcated portion of the finger H

in such manner that the journals move backwardly in the openings h^4 when the roller moves forwardly over the paper during the buckling operation, and so that the journals rest against the front ends of the openings h^4 when the roller moves backwardly over the paper toward the finger F.

h^5 is a blade secured to the upper side of the finger H, and having its sharp front edge arranged at a short distance in rear of the roller h^2, so that the latter can turn freely when the journals rest in the front portions of the openings h^4, but will impinge against the blade and prevent the roller from rotating when the roller-journals are moved backwardly in the openings h^4. When the finger H is moved forwardly over the paper, the pressure of the roller upon the paper causes the roller-journals to move backwardly in the openings h^4 until the blade h^5 impinges against the roller. The roller is thereby prevented from turning, and moves over the paper like a fixed bearing-piece. During the backward movement of the roller the journals of the latter move forwardly in the openings h^4 until they rest against the front ends of the openings h^4, in which position the roller is free to turn, and consequently rolls over the paper during the backward movement of the finger.

I represents a finger, which is pivoted to the rock-arm E above the finger H by a bolt, i, passing through a slot, i', in the rock-arm, so that the finger may be adjusted backward or forward, as may be necessary. The free end of the finger I is bifurcated, and is provided with a roller, i^2, preferably of metal, which is provided with journals i^3. The journals of the roller i^2 are seated in openings in the bifurcated portion of the finger I in the usual manner, so that the roller i^2 may turn freely when the finger I is moved forward or backward. The finger I is made somewhat longer than the finger H, so that its roller will move over the top sheet of the paper a suitable distance in front of the buckling-roller h^2, to permit the latter to buckle the top sheet against the roller i^2.

i^5 is a roller or stud attached to the under side of the finger H, and adapted to ride upon the upper side of the finger F during the last portion of the backward movement of the finger H.

i^6 is an adjustable foot, secured to the finger I, and which is adapted to rest upon the top of the finger H when the latter, in its backward movement, rides upon the finger F, so that both fingers are elevated a short distance above the pile and away from the top sheet, and their pressure added to the finger F, whereby the pile is more securely held in place on the feed table.

i^7 i^8 are spiral or other suitable springs, secured, respectively at their upper ends to the fingers H and I and at their lower ends to projections i^9 of the lever E, by means of screw-stems i^{10} and thumb-nuts i^{11}. The springs i^7 i^8 serve to hold the fingers down upon the paper during their forward movement, and also serve to increase the pressure on the finger F when the fingers H and I rest upon the same.

We prefer to construct each of the fingers F, H, and I in two parts, connected together by swivel-joints h^6 h^7, whereby the rollers or other portions of the fingers which bear upon the top sheet are enabled to assume an inclined position and adjust themselves to the inequalities of the upper surface of the pile. The swiveling movement of the end portion of each finger is limited by the overlapping portions h^8 of each finger.

J represents a gage or foot, which rests upon the top sheet, and which serves the double function of regulating the upward feed-motion of the table A′ and of holding the pile of paper in place. The foot J is arranged in such close proximity to the buckling-finger H that it may be used in connection with the buckling-finger H as a buckling device. The foot J is preferably made of a block of rubber or other elastic material, and seated in a socket, j, which latter is provided with an upwardly-projecting screw-stem, j', which works in a threaded opening formed in a horizontal arm, j^2, and is secured in position, after being adjusted, by a jam-nut, j^3. The arm j^2 is attached to an inwardly-projecting arm, j^4, by a vertical bolt, j^5, passing through a longitudinal slot, j^6, in the arm j^2, whereby the foot J can be adjusted as may be required. The arm j^4 is provided with a vertical socket, j^7, which is secured to a vertical bar, K, by means of a set-screw, j^8. The socket j^7 of the arm j^4 is arranged upon the bar K, between two sleeves or collars, k k, in such manner as to permit the arm j^4 to swing on the rod K between the collars k k when it is desired to change the position of the foot to adapt it to different-sized sheets of paper. The rod K is guided at its upper and lower ends in lugs k' k^2, formed on the adjacent side of the frame A.

k^3 is a socket or stem secured to the rod K above the lug k^2, and which is provided with an outwardly-projecting stud or arm, k^4, guided in an elongated opening or slot, k^5, formed in the frame A. The socket k^3 is adjustably secured to the vertical rod K by means of a set-screw, k^6.

L is an elbow-lever pivoted to the side frame, A, at l, and having its long arm bifurcated at l', and engaging over the projecting end of the stud k^4. The short arm l^2 of the elbow-lever L is provided with a roller, l^3, which is operated upon by a cam, l^4, secured to the countershaft C′, and formed in such manner that it will cause the foot J to be lifted from the top sheet when the latter is ready to be withdrawn from under the foot J by the feeding device. The foot J is held down on the top sheet by a spring, l^5, surrounding the lower end of the bar K, and which is interposed between the lug k^2 of the frame A and a pin or washer, l^6, on the bar K.

M M represent the feeding-fingers, whereby the top sheet is fed from the pile to the carry-

ing-rollers. The fingers M M are bifurcated at their lower ends and provided with rollers *m m*, and a stop device like that of the buckling-finger H, so that the rollers *m m* operate like a rigid bearing-piece in moving forwardly, and carry the sheets of paper in their forward movement, and roll over the underlying pile of paper in moving backwardly. The fingers M M are pivoted at their upper ends to rock-levers M′ M′ by bolts *m′ m′* passing through slots m^2, formed in the rock-levers M′ M′, so that the fingers M M may be set at any desired angle. The rock-levers M′ M′ are adjustably secured at their upper ends to a horizontal rock-shaft, M^2, by set-screws m^3. The set-screws m^3 engage in a longitudinal slot formed on one side of the rock-shaft M^2, whereby both rock-levers are held in parallel lines, thereby facilitating the adjustment of the fingers M M when it becomes necessary to adjust the fingers to different sizes of sheets. The rock-shaft M^2 is supported in bearings m^5, formed on the frames A A.

m^6 is an arm arranged at an angle to the rock-levers M′ M′, and secured to the rock-shaft M^2 by a screw-nut, m^7.

m^8 is a vertical rod connecting the arm m^6 with the end of the long arm of an elbow-lever, N. The lever N is pivoted at *n* to the inner side of one of the side frames, A, and the short arm *n′* of the lever N is provided with a roller, n^2, which engages in a cam-groove, n^3, formed in the disk N′, secured to the counter-shaft C′, by means of which an intermittent reciprocating movement is imparted to the fingers M M. The rock-levers M′ are provided with flat springs m^9, arranged on the sides adjacent to the fingers M, so as to bear against the same when they are placed in an elevated position above the pile, and hold the fingers up away from the work when required.

o represents a pawl, which engages with the ratchet-rim b^2 of the hand-wheel B. The pawl *o* is pivoted to the upper end of an elbow-lever, O, which is pivoted to the outer side of the side frame, A, at *o′*. The lower arm of the lever O is provided with a roller, o^2, which is operated upon by a cam, o^3, secured to the counter-shaft C′. The cam o^3 is so formed that it will impart a rocking motion to the lever O, thereby moving the pawl *o* back and forth over the ratchet-rim b^2.

o^4 is a projection or nose formed on the lower arm of the lever O, and which engages against a shoulder, o^5, on the outer side of the lever L, whereby the stroke of the lever O and the motion which the pawl *o* produces in the ratchet-wheel b^2 are regulated. In the same measure as the foot J descends by the removal of the sheets from the top of the pile the lever L and the stop o^5 descend also, whereby the oscillation of the lever O and the stroke of the pawl *o* are increased, so that the rotation of the wheel B and the feed-screws *b b* is proportionate to and controlled by the amount of paper which is removed from the top of the pile. The pawl *o* is held in engagement with the ratchet-rim b^2 by a spring, o^6, which is seated upon a lug, o^7, on the lever O, and surrounds a sliding rod, o^8, attached at its upper end to the pawl *o*. The spring o^6 bears with its upper end against a pin or collar on the rod o^8, thereby pressing the pawl upward against the ratchet-rim b^2 and keeping the same in engagement therewith.

In order to lower the feed-table, the pawl *o* is disconnected from the ratchet-rim b^2, when the feed-table can be lowered by hand for supplying a fresh charge of paper to the machine.

P represents the grooved tape-roller, arranged in front of the feed-table A′, with its upper surface in line with the top sheet, so as to receive on its upper surface the top sheet as the latter is removed from the pile by the fingers M.

P′ are rollers mounted upon a horizontal shaft, *p*, and faced with india-rubber or other suitable material, so as to bite against the paper when brought in contact therewith. The shaft *p* is journaled in arms *p′ p′*, suspended from a transverse rock-shaft, p^2, which is journaled in the side frames, A. The shaft *p* is supported by the arms *p′*, so that the rollers P′ will rest by their weight upon the tape-roller P.

P^3 represents an adjustable carrying-frame, attached to the frame A, as shown in Figs. 12 and 13, by pivot-bolts p^4 and supporting-arms p^5. The upper ends of the arms p^5 are pivoted to the frame P^3 by one of the stay-bolts p^6 of the frame P^3. The lower ends of the arms p^5 are bifurcated or slotted, and are secured to the frame A by bolts p^7, which engage in the slotted ends of the arms p^5, so that the inclination of the carrying-frame may be varied as required.

p^8 is a grooved tape-roller, journaled in bearings in the outer end of the frame P^3, and p^9 are the endless tapes, which are arranged over the rollers P and p^8, and which deliver the sheets of paper to the machine in which they are to be operated upon.

P^{10} is a channel-guide secured to one of the sides of the frame P^3 by screw-bolts p^{11}. The latter are preferably provided with right and left hand screw-threads, and are arranged in screw-threaded openings in the frame P^3. The inner ends of the bolts p^{11} engage in threaded openings formed in lugs or bearing-pieces p^{12}, secured to the under side of the guide P^{10}, whereby the guide can be adjusted to a true line.

P^{14} is a similar guide, arranged upon the frame P^3 obliquely to the sides of the frame, and adapted to guide the sheets toward the guide P^3. The guide P^{14} rests upon the stay-bolts p^6, and is held thereon, near its inner end, by a U-shaped clip, p^{15}, which fits over the bolt p^6, and near its outer end by a clip or clasp, p^{16}, which bears against the under side of the stay-bolt p^6. The guide P^{14} can be adjusted to different sizes of paper by simply sliding it over the rods p^6.

P[17] is a spring-finger, which is preferably formed by curling a piece of card-board or similar material, and which is secured in a vertical clasp, p^{18}, attached to the guide P[14], and which also serves to force the paper against the guide P[10]. The tapes p^9 are preferably arranged obliquely in the frame P[3], so as to cause the sheets of paper to be carried toward the guide P[10]. The sheets move with their outer edges in the guide P[10], which latter serves to deliver the sheets at the proper place to the machine or apparatus in which they are further operated upon.

S represents a cone-pulley mounted on the shaft C, and S′ is a similar cone-pulley, formed with or secured to the roller P. Motion is imparted to the pulley S′ from the cone-pulley S by means of an endless belt, *s*, or in any other suitable manner.

T represents the shipper bar or lever whereby the clutch c^3 is thrown in and out of gear, and the motion of the machine arrested when desired. The bar T is supported at one end in a bearing, *t*, formed on the frame A, and is provided with a finger or bar, *t′*, which engages in the annular grooves of the clutch c^3. The opposite end of the bar T is pivoted at t^3 to a vertical hand-lever, t^4, which is pivoted at its lower end to the frame A by a pivot-bolt, t^5. By moving the hand-lever t^4 backward the shipper-bar T is shifted, and the motion of the machine arrested.

t^6 represents a horizontal rock-lever pivoted at t^7 to the frame A, and connected at its outer end to the upper end of the hand-lever t^4, and provided at its inner end with a downwardly-projecting finger, t^8.

R represents a horizontal shifting plate, which is arranged on the under side of the feed-table A′, and supported and guided by a horizontal channel-plate, *r*, secured to the under side of the feed-table. The plate R is provided at its outer end with an elongated slot or opening, *r′*, and is so arranged that when the table is raised to nearly the limit of its upward movement the opening *r′* will engage over the finger or pin t^8 of the rock-lever t^6.

r^2 is a downwardly-projecting arm or lug formed on or secured to the plate *r*, and r^3 represents a vertical bifurcated pawl or lever pivoted at its lower end to the arm r^2, and having its upper end extending through a slot, r^4, formed in the table A′.

r^5 represents a bell-crank or elbow lever, pivoted at r^6 to the under side of the table A′. One arm of the lever r^5 is pivoted to the shifting plate R, and the opposite arm of the lever r^5 engages in the bifurcated portion of the pawl or dog r^3.

r^7 represents a spiral spring, secured at one end to the elbow-lever r^5 and at its opposite end to the arm r^2, whereby the shifting lever R is held with its outer slotted end in a forward position, in which position the slot *r′* of the lever R will engage over the finger t^8 of the lever t^6 when the table has reached the proper height.

The slot r^4, which is formed in the table A′, is arranged in line with one of the feeding-fingers M, so that the feed-roller in feeding the paper from the pile will roll in a line directly over the slot. The upper end of the pawl or lever r^3 projects through the slot r^4, so that its upper end will be nearly in line with the top of the table, but will not extend above the same.

u represents a pawl or finger pivoted to one of the feeding-fingers M, so as to rest with its free end upon the pile of paper. When the last sheet of paper has been fed from the table A′ by the feeding-fingers M, the pawl or finger *u* drops into the slot r^4, so that its free end engages against the upper end of the pawl or lever r^3, and moves the same forwardly in the slot r^4. During this movement of the pawl r^3 the shifting plate R is moved inwardly by the bell-crank lever r^5 engaging with the pawl r^3, and the finger t^8 of the rock-lever t^6 being now engaged in the slot *r′* of the shifting-lever R, will cause the rock-lever t^6 to swing on its pivot and shift the hand-lever t^4, whereby the further movement of the machine is automatically stopped. By disengaging the finger *u* from the pawl r^3, the shifting-lever and the pawl r^3 are again brought back to their former position by the action of the spring r^7. The slot *r′* of the lever R is made sufficiently long to permit of this movement without disturbing the shipper-bar T. The table can now be lowered for a fresh supply of paper by turning the hand-wheel B. To again start the machine it is only necessary to give the hand-lever t^4 a sufficient forward movement to cause the clutch c^3 to engage with the driving-wheel, when the finger or pin t^8 and slot *r′* are again in a vertical line, ready to engage when the table has reached the proper height.

V represents a hand-wheel, provided in its hub *v* with an internal screw thread which engages with an external screw-thread, *v*, formed on one of the stay-rods *a*, which connect the side frames, A A, of the machine.

v^2 v^2 represent two parallel plates secured to the floor and adapted to support the machine. The feet of the side frames, A A, rest upon tracks v^3, formed on the plates v^2, and are guided by upwardly-projecting flanges, v^4, formed along the inner edges of the plates.

v^5 v^5 are upwardly-projecting studs or lugs, formed on one of the plates v^2, and arranged on opposite sides of the hub of the wheel V, whereby the wheel is confined between the studs and prevented from moving longitudinally over the screw-thread *v′*. By turning the wheel V in one or the other direction the threaded hub *v*, engaging with the screw-thread *v′*, causes the machine to be moved longitudinally on the plates v^2, whereby the position of the machine can be adjusted with reference to a ruling or other machine which receives the paper from the feeding-machine.

The operation of the machine is as follows: The pile of paper being placed upon the feed-table A′, the finger F, buckling-fingers H I, foot J, and the feeding-fingers M M all rest upon the top sheet. The forward movement of the buckling-finger H draws the corner of the top sheet from under the finger F, and buckles the corner of the sheet against the roller i^2 of the finger I, thereby separating the top sheet from the pile. The fingers H and I on their return movement are raised from the separated sheet by the finger F, and ride upon the latter. The tension-rod G is released at the same time by the action of the cam g^7 on the lever G′, and these parts add their combined pressure to that of the finger F, thereby holding the latter tightly upon the pile of paper. The foot J is now lifted from the top sheet by its actuating mechanism, and the fingers M begin their forward movement and cause the top sheet to move toward the rollers P and P′ until the latter grip the front edge of the top sheet. The sheet is then fed forward by the rollers P P′ upon the carrying-tapes. After the fingers M M have completed their forward movement, they are brought back by the action of the grooved cam N′ and connecting parts, and when they have reached the limit of their backward movement they remain at rest upon the top sheet until the buckling device has again moved forward and buckled the top sheet. When the buckling fingers have returned and rest upon the top of the finger F, the feeding-fingers M again begin their forward movement and carry the top sheet between the rollers P P′, and so the movements of the parts continue until the last sheet has been fed from the table A′, when the pawl u drops into the slot r^4 in the table and engages against the lever r^3, and thereby shifts the clutch mechanism and stops the movement of the machine.

We claim as our invention—

1. In a machine for feeding sheet-paper from a pile, the combination, with the pile-supporting table, of a buckling-finger whereby the top sheet is loosened, an arm carrying a feed-roller, which is provided with a stop whereby the feed-roller is held rigidly during its feeding movements and permitted to rotate during its return movement, and mechanism, substantially as described, whereby a rectilinear reciprocating motion is imparted to the feed-roller, substantially as set forth.

2. In a machine for feeding sheet-paper, the combination, with a vertically-movable table supporting the pile, of a buckling-finger whereby the top sheet is loosened, a horizontal shaft arranged above the pile, a feeding-finger connected with said shaft and provided with a feed-roller having a stop, whereby the roller is held rigidly during its feeding movement and permitted to rotate during its return movement, and mechanism, substantially as described, whereby a rocking motion is imparted to said horizontal shaft and a rectilinear reciprocating motion to the feed-roller, substantially as set forth.

3. In a machine for feeding paper, the combination, with the stationary frame A and a vertically-movable table working in said frame, of a horizontal rock-shaft, M^2, supported in bearings in said frame above the table, rock-levers M′ M′, made lengthwise adjustable on said shaft, feeding-fingers M M, pivoted to said levers, and mechanism, substantially as described, whereby a reciprocating movement is imparted to said fingers, substantially as set forth.

4. In a machine for feeding paper, the combination, with the rock-shaft M^2, levers M′ M′, and feeding-fingers M M, of a lever, m^6, connecting-rod m^8, elbow-lever N, roller n^2, and cam-disk N′, substantially as set forth.

5. In a machine for feeding sheet-paper from a pile, the combination, with the rock-shaft M^2 and feeding-fingers M M, of the supporting-levers M′ M′, provided with springs m^9, whereby said fingers can be held in an elevated position, substantially as set forth.

6. The combination, with the adjustable feed table and gage J, of a socket, j, in which said gage is seated, screw-stem j', slotted arm j^2, radially-adjustable arm j^4, vertical rod K, lever L, and cam l^4, substantially as set forth.

7. The combination, with the adjustable feed-table, of a gage, J, resting on the pile, a support, j^2, in which the gage is made vertically adjustable, a radially-adjustable arm, j^4, and a gage-rod, K, to which the arm j^4 is adjustably attached, substantially as set forth.

8. The combination, with the feed-table, of the holding-finger F, resting upon the edge of the pile, a tension-rod, G, which increases the pressure of the finger F upon the pile after the top sheet has been withdrawn from under the finger, and mechanism, substantially as described, whereby the tension-rod G is alternately raised or lowered, substantially as set forth.

9. The combination, with the feed-table A′, of the holding-finger F, secured to a horizontal shaft, D′, and bearing upon the edge of the pile, an auxiliary tension-rod, G, whereby the pressure of the finger F upon the pile is increased after the top sheet has been withdrawn from under the finger F, elbow-lever G′, and cam g^7, whereby the pressure of the rod G is removed from the finger F during the operation of buckling the top sheet from under the finger F, substantially as set forth.

10. The combination, with the feed-table, of the holding-finger F, horizontal rock-shaft D′, arm F′, spring f^2, rod G, spring g^3, elbow-lever G′, and cam g^7, substantially as set forth.

11. The combination, with the stationary frame and feed-table, of a rock-shaft, D′, arranged in bearings d' d', secured to the frame and provided with a holding-finger, F, an arm, F′, secured to the shaft D′, and sleeves d^3 d^3, arranged on said shaft between the bearings d' d' and arm F′, whereby the shaft and arm F′ are held from lateral movement, substantially as set forth.

12. The combination, with the holding-finger

F, of the buckling-finger H, provided with a roller, i^5, above the finger F, and the finger I, provided with an adjustable foot, i^6, above the finger H, substantially as set forth.

13. In a paper-feeding machine, the combination, with a movable feed-table, of a shipper device, a reciprocating feeding-finger, a pawl attached to the feeding-finger, and mechanism, substantially as described, whereby the pawl of the feeding-finger actuates the shipper device automatically and arrests the movement of the machine when the last sheet of paper has been delivered, substantially as set forth.

14. In a paper-feeding machine, the combination, with a movable feed-table, of a shipper device, a shifting plate arranged underneath said table, a feed-finger arranged above the feed-table, a pawl attached to said feed-finger and actuating the shifting plate when all the paper has been delivered, and mechanism, substantially as described, whereby the shifting plate is connected with said shipper device, substantially as set forth.

15. The combination, with a vertically-movable feed-table, of a shifting plate, R, a vertical rock-lever, r^3, operating in a slot in said table, an elbow-lever, r^5, pivoted to said table and connected at one end to the lever r^3, and at its opposite end to the shifting plate R, a pawl, u, arranged above said table and engaging against the lever r^3 when the last sheet of paper has been fed from the table, and a shipper connected with the plate R, substantially as set forth.

16. The combination, with a vertically-movable feed-table, of a shifting plate, R, arranged underneath said table, a pawl-lever, r^3, extending through a slot, r^4, in the table, an elbow-lever, r^5, connecting the lever r^3 with the plate R, a lever, t^6, connected with the hand-lever t^4 and engaging with the plate R, shipper-bar T, and clutch c^3, substantially as set forth.

17. The combination, with the side frames, A A, and screw-threaded rod v, of a screw-threaded hand-wheel, V, working on the rod a, and supporting-plates, one of which is provided with lugs or shoulders bearing against the wheel V, substantially as set forth.

18. In a paper-feeding machine, the combination, with the stationary frame, movable table, and buckling mechanism, of the slotted arms b^7, secured to the stationary frame underneath the buckling mechanism, and the guide-bar b^9, adjustably secured to said arms, substantially as set forth.

19. In a paper-feeding machine, the combination, with the pile-supporting table, of an arm or finger bearing upon the pile and composed of two parts connected by a swivel-joint, whereby said arm or finger is enabled to adjust itself to inequalities of the surface of the pile, substantially as set forth.

20. The combination, with a paper-feeding machine, of a sheet carrying frame, P^3, provided with carrying-tapes, said frame being pivoted to the main frame of the machine, and provided with an arm which is adjustably secured to the main frame, whereby the carrying-frame can be raised and lowered and secured in the desired position, substantially as set forth.

Witness our hands this 22d day of September, 1884.

A. SEDGWICK.
JAMES NAYLOR, JR.

Witnesses:
J. S. VANCLEEF,
EDWIN RISLEY.