(No Model.)

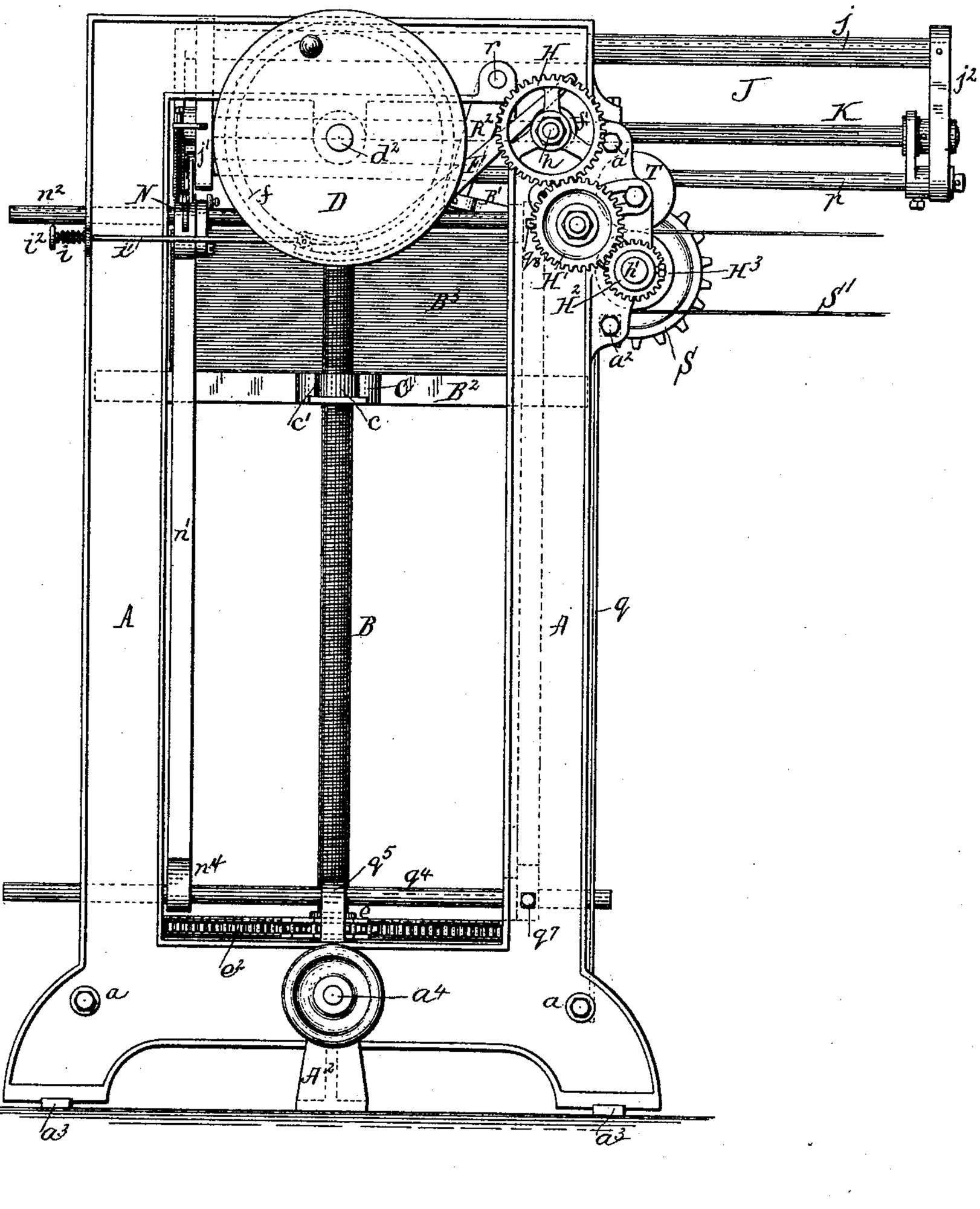
5 Sheets—Sheet 1.

J. NAYLOR, Jr.

PAPER FEEDER.

No. 434,643. Patented Aug. 19, 1890.

Fig. 1.



Witnesses.
Chas. J. Buchheit.
Geo. J. Buchheit Jr.

James Naylor Jr. Inventor.
By Wilhelm & Bonner.
Attorneys.

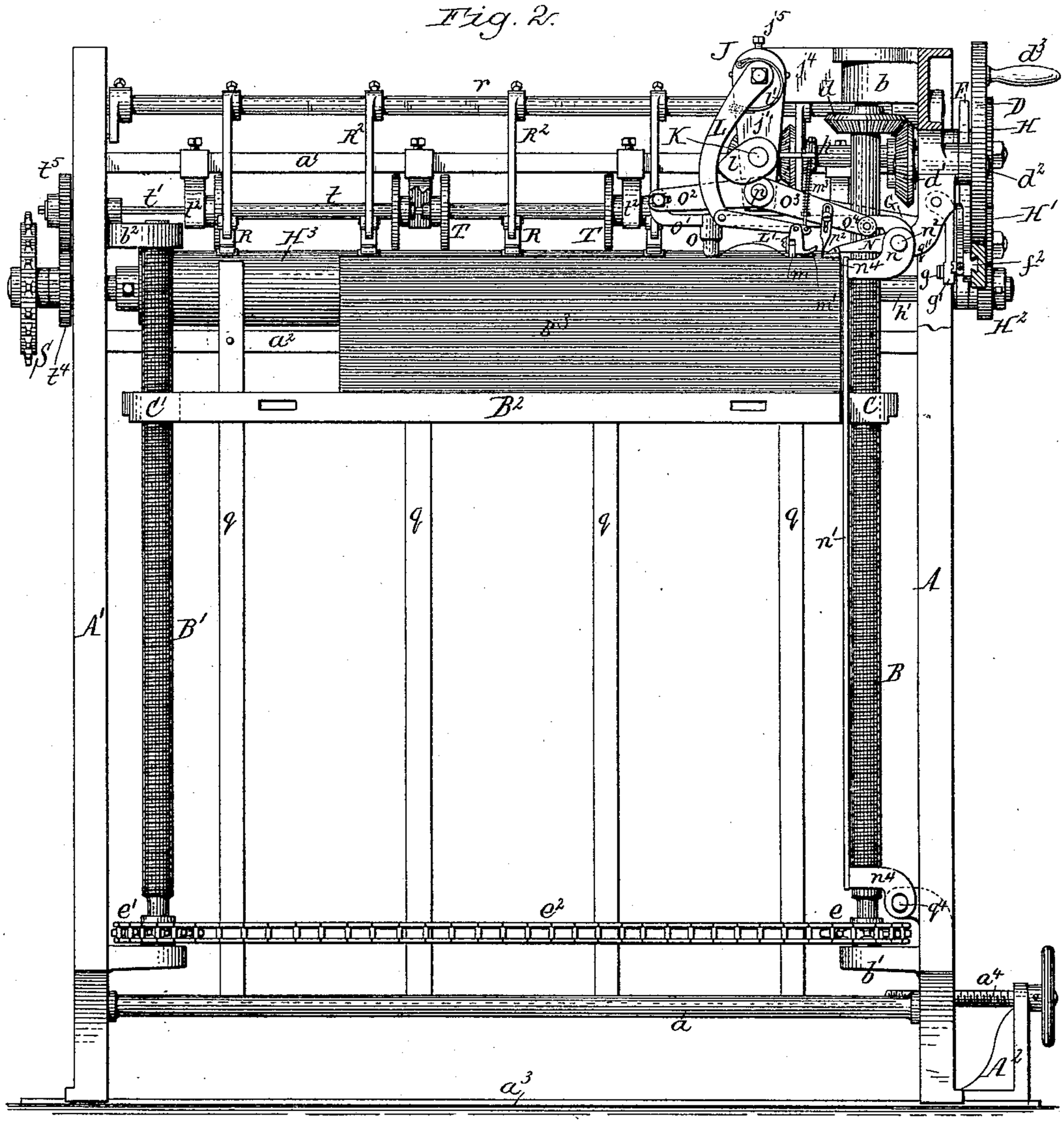
(No Model.) 5 Sheets—Sheet 2.

J. NAYLOR, Jr.

PAPER FEEDER.

No. 434,643. Patented Aug. 19, 1890.

Fig. 2.



Chas. J. Buchheit.
Geo. J. Buchheit Jr. } Witnesses.

James Naylor Jr. Inventor.
By Wilhelm & Bonner.
Attorneys.

(No Model.) 5 Sheets—Sheet 3.

J. NAYLOR, Jr.

PAPER FEEDER.

No. 434,643. Patented Aug. 19, 1890.

Fig. 3.

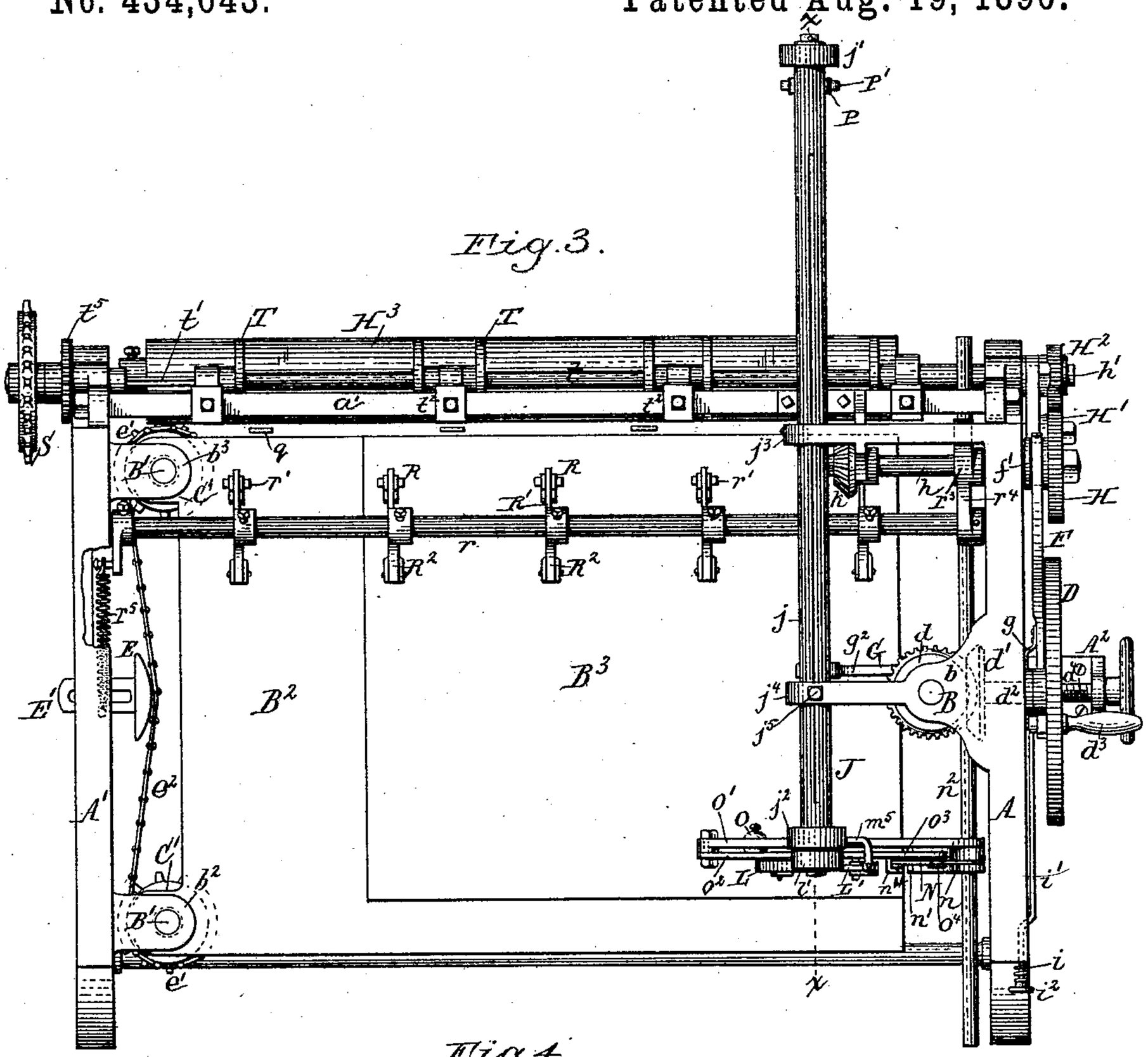


Fig. 4.

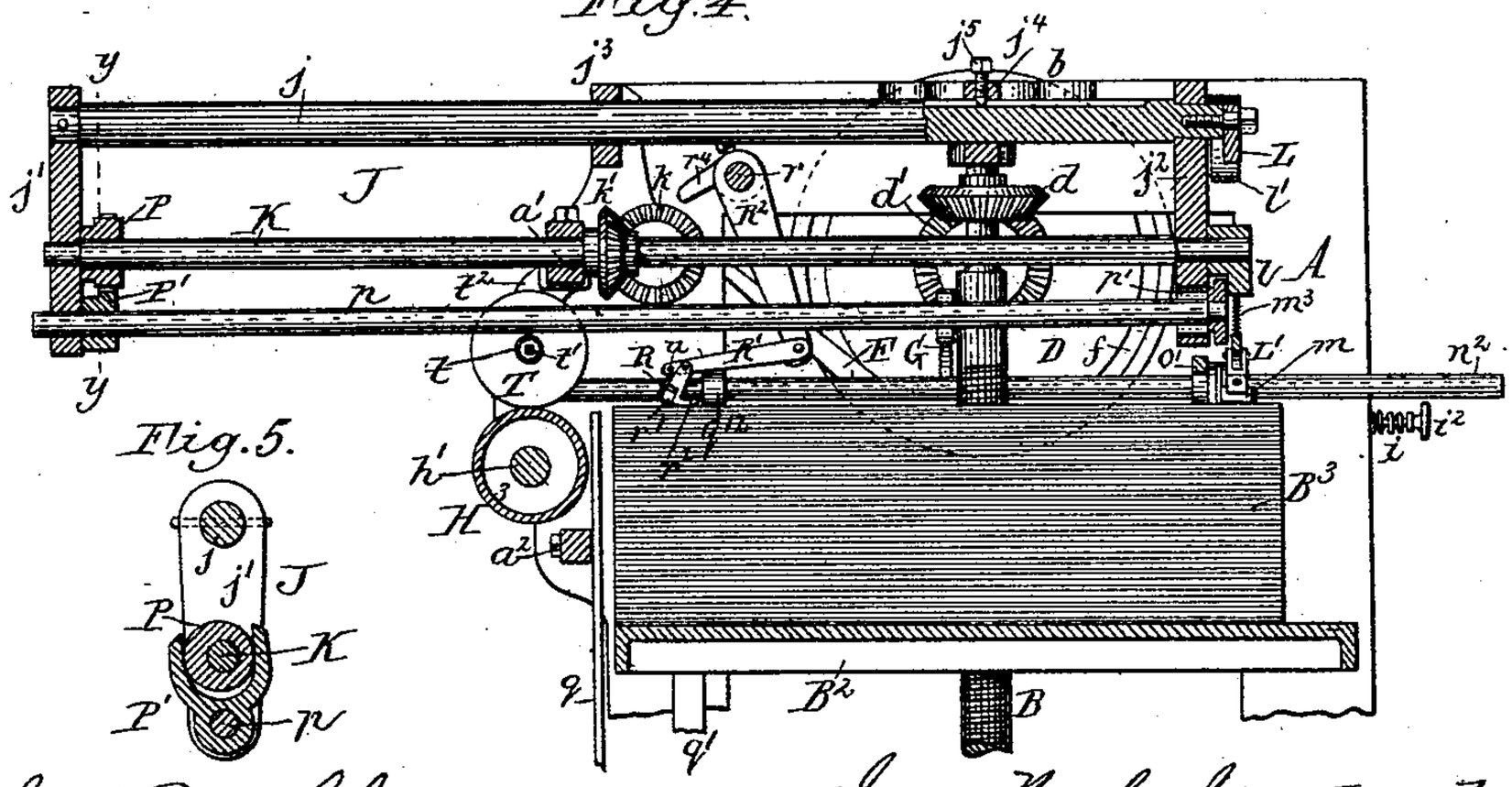


Fig. 5.

Witnesses.
Chas. J. Buchheit.
Geo. J. Buchheit Jr.

James Naylor Jr. Inventor.
By Wilhelm Bonner.
Attorneys.

(No Model.) 5 Sheets—Sheet 4.

J. NAYLOR, Jr.

PAPER FEEDER.

No. 434,643. Patented Aug. 19, 1890.

Fig. 6.

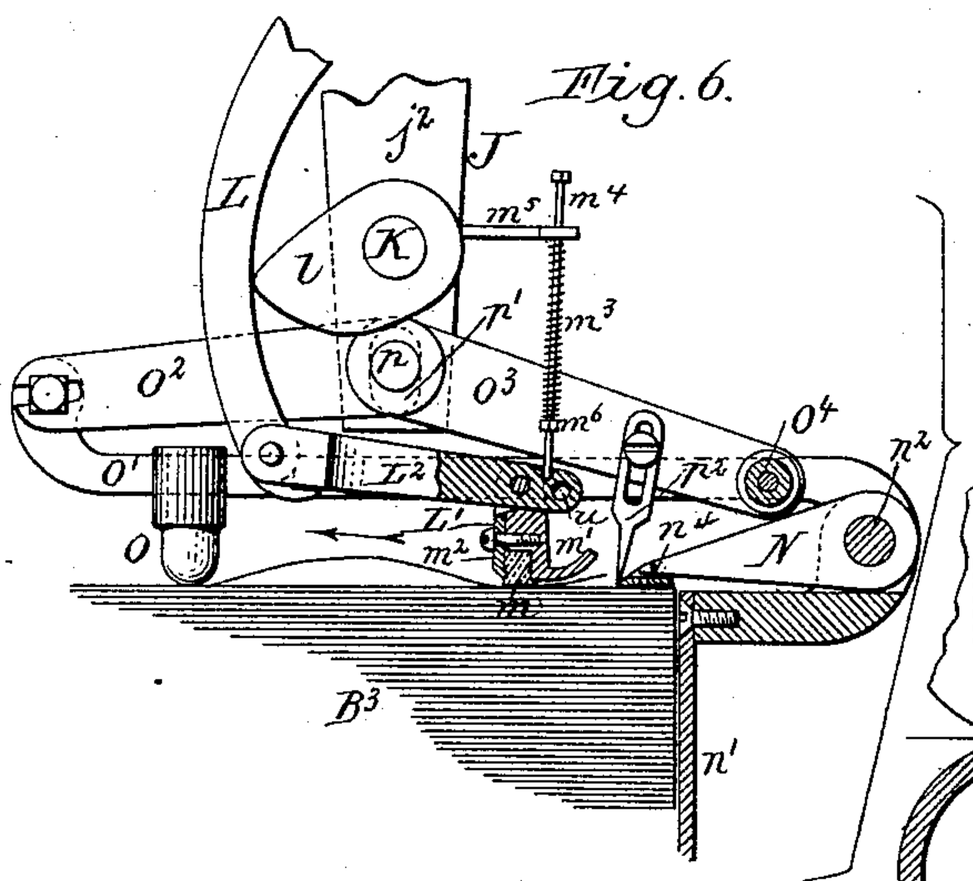


Fig. 7.

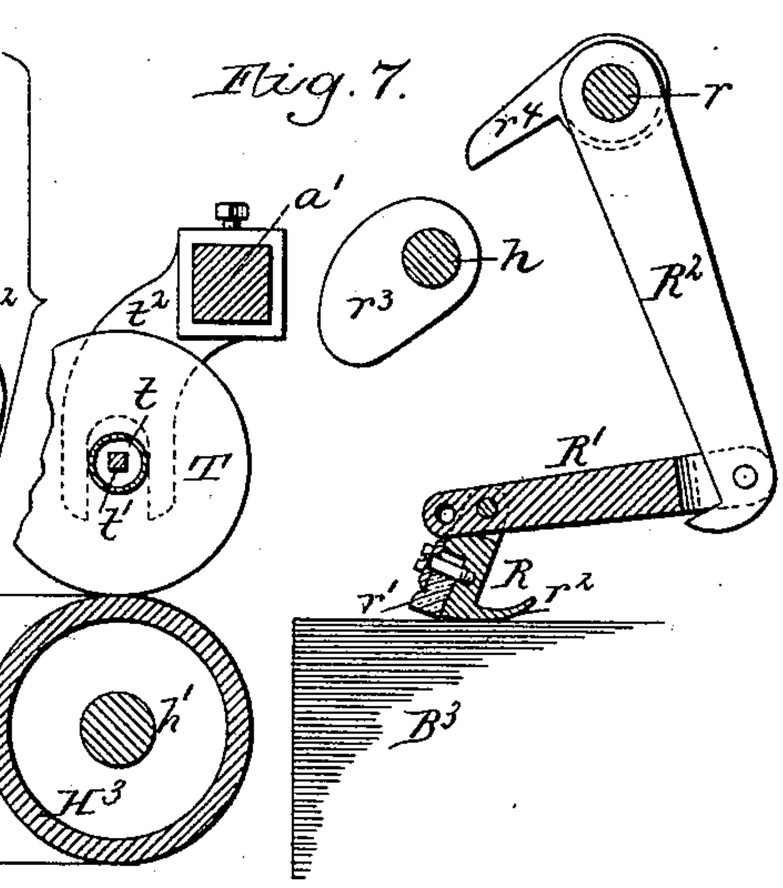


Fig. 8.

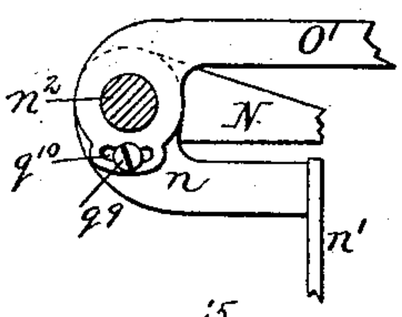


Fig. 10.

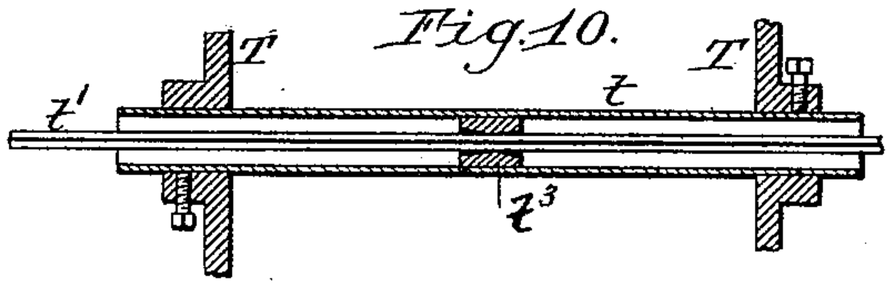


Fig. 9.

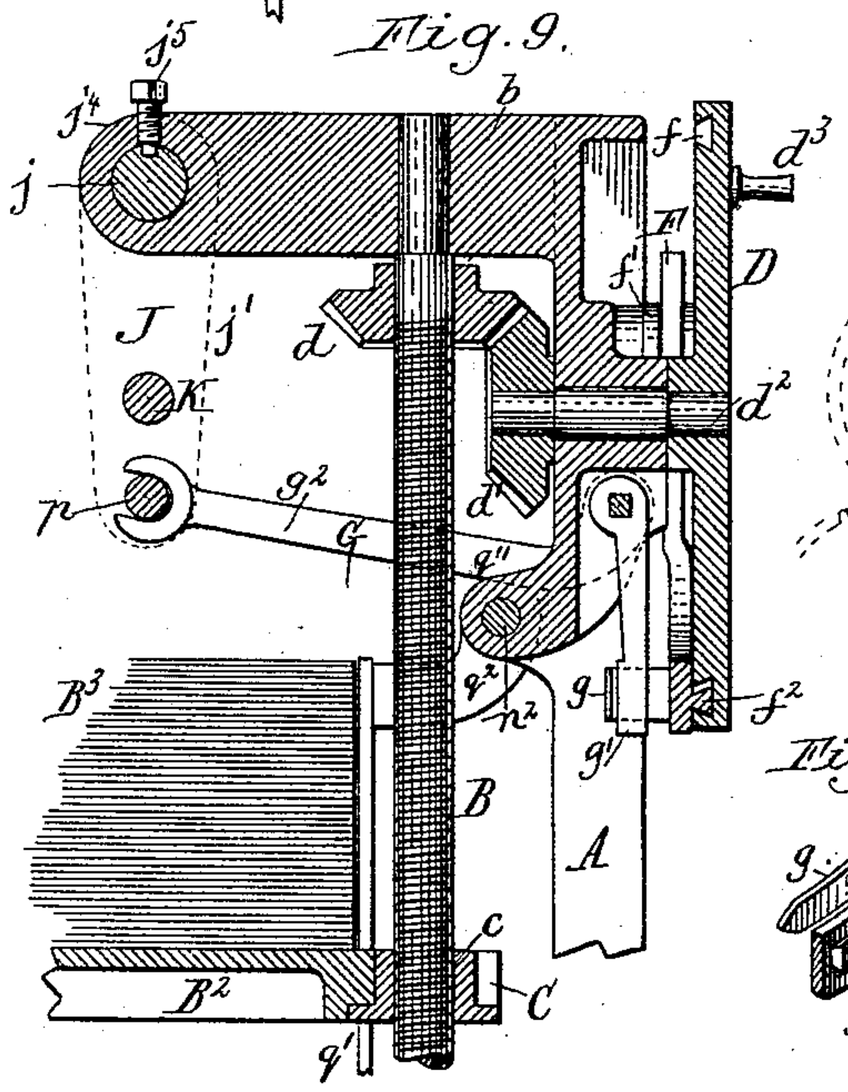


Fig. 11.

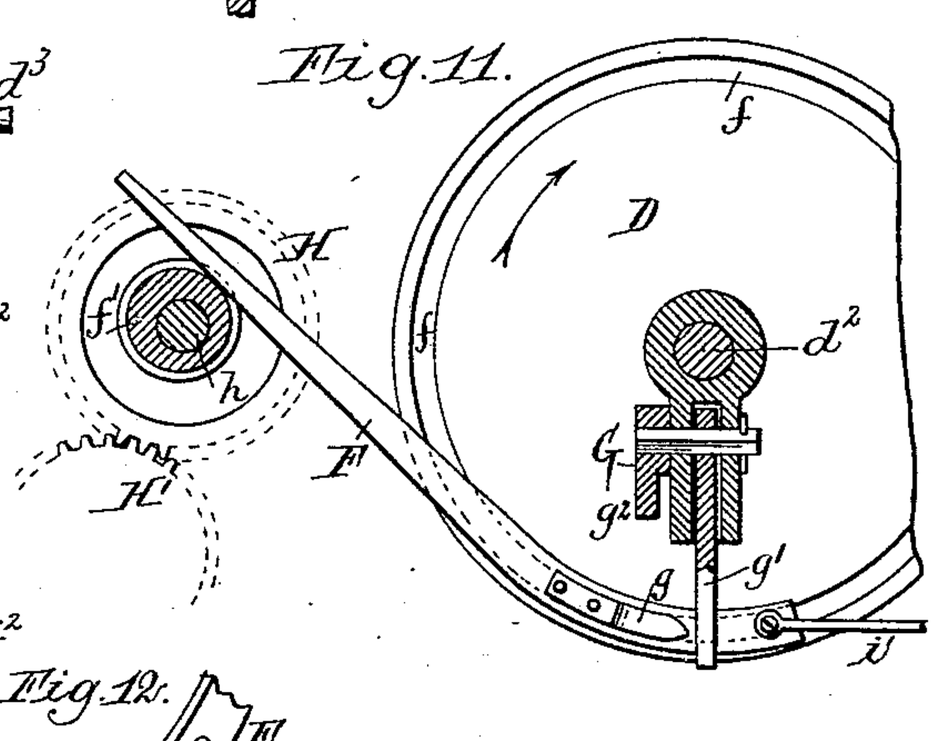


Fig. 12.

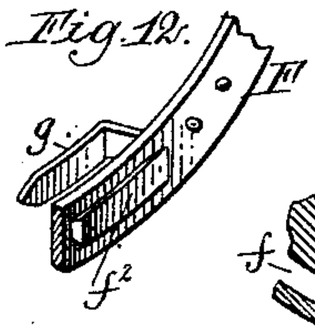
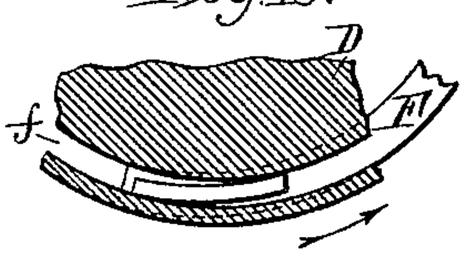


Fig. 13.



Witnesses.
Chas. J. Buchheit.
Geo. J. Buchheit Jr.

James Naylor Jr. Inventor.
By Wilhelm & Bonner
Attorneys.

(No Model.) 5 Sheets—Sheet 5.

J. NAYLOR, Jr.

PAPER FEEDER.

No. 434,643. Patented Aug. 19, 1890.

Fig. 14.

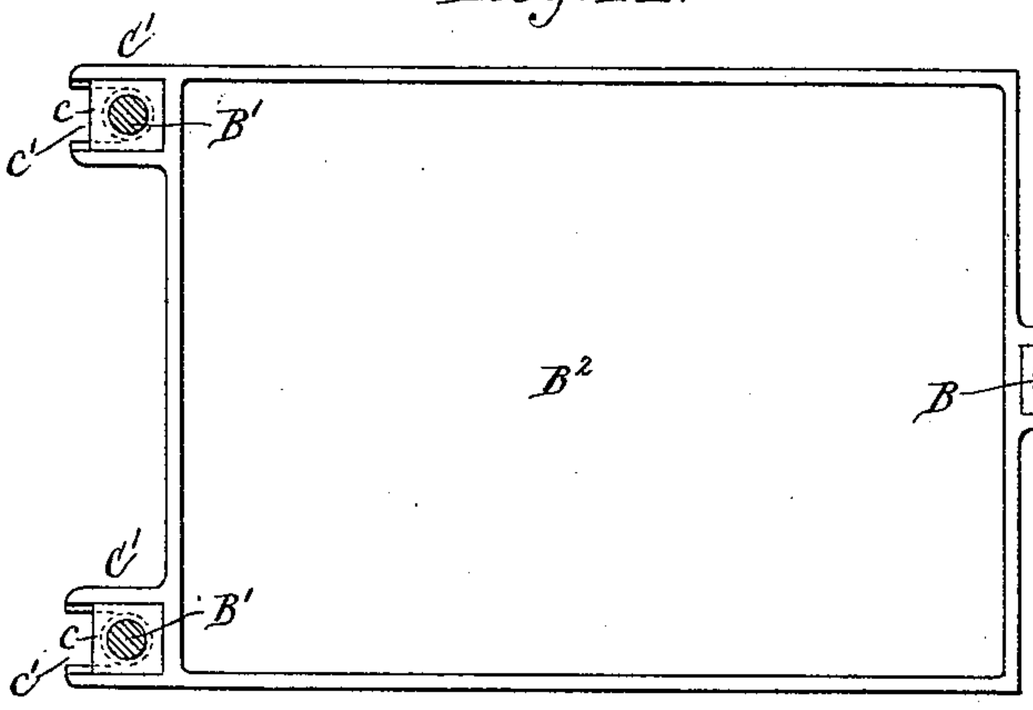


Fig. 15.

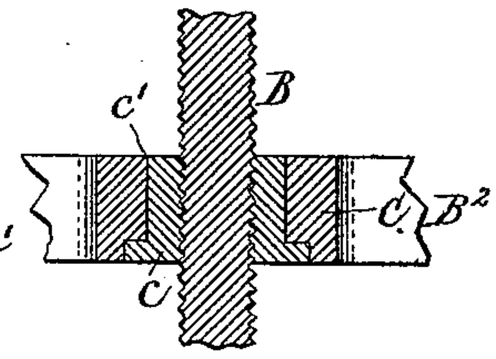


Fig. 16.

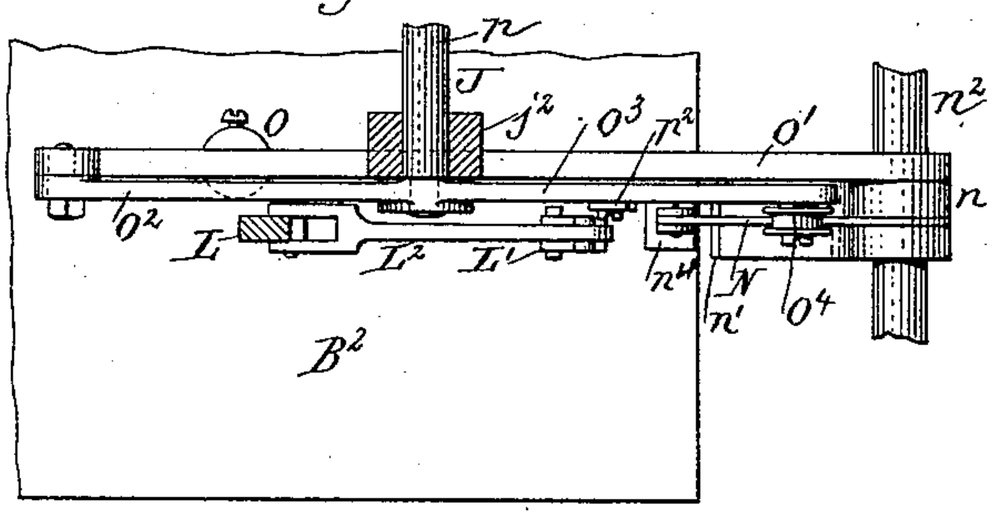


Fig. 17.

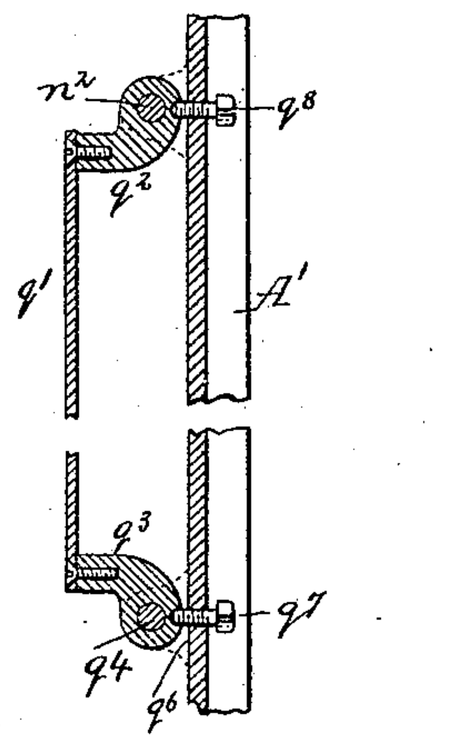


Fig. 18.

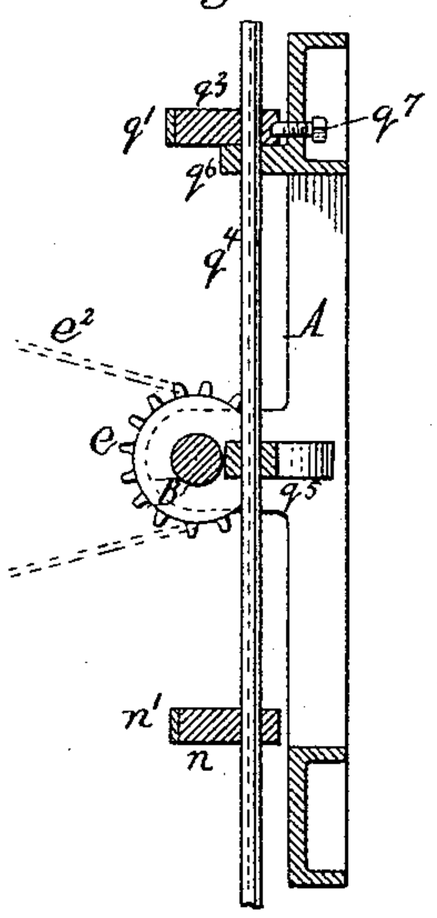


Fig. 19.

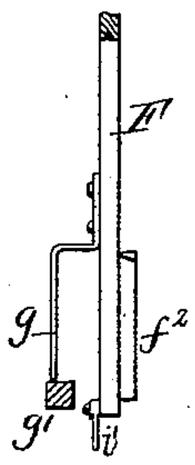


Fig. 20.

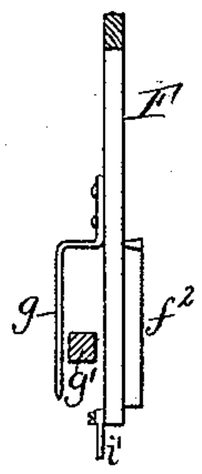
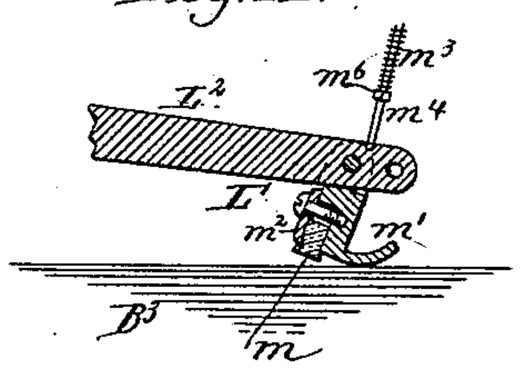


Fig. 21.



Witnesses.
Chas. J. Buchheit.
Geo. J. Buchheit Jr.

James Naylor Jr. Inventor.
By Wilhelm & Bonner.
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES NAYLOR, JR., OF POUGHKEEPSIE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO D. H. BURRELL & CO., OF LITTLE FALLS, NEW YORK.

PAPER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 434,643, dated August 19, 1890.

Application filed October 15, 1886. Serial No. 216,353. (No model.)

To all whom it may concern:

Be it known that I, JAMES NAYLOR, Jr., of Poughkeepsie, in the county of Dutchess and State of New York, have invented new and useful Improvements in Paper-Feeders, of which the following is a specification.

This invention relates to that class of paper-feeders which feed sheets of paper successively from the top of a pile to a ruling, folding, or calendering machine, printing-press, or other machine in which sheet-paper is used. These machines consist, essentially, of a pile-supporting bed or table, which is automatically raised as the paper is fed off, devices whereby the top sheet is buckled or loosened, and devices whereby the loosened top sheet is fed off.

The object of my invention is to produce a simple and reliable machine of this kind, which will operate with certainty and which can be easily adjusted to feed paper of different sizes.

My invention consists of 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 my improved paper-feeder. Fig. 2 is a rear elevation thereof. Fig. 3 is a top plan view thereof. Fig. 4 is a sectional elevation in line $x\ x$, Fig. 3, looking outward. Fig. 5 is a cross-section in line $y\ y$, Fig. 4. Fig. 6 is a sectional rear elevation of the buckling and holding-down mechanism. Fig. 7 is a longitudinal sectional elevation of the feeding-fingers and feed-rollers. Fig. 8 is a sectional elevation showing the connection of the rear side guide with the supporting-bar of the holding-down finger. Fig. 9 is a vertical cross-section of the mechanism whereby the feed-screws are actuated. Fig. 10 is a longitudinal section of the upper feed-rollers. Fig. 11 is a sectional elevation of the mechanism by which the feed-screws are actuated, the section being taken at right angles to Fig. 9 and looking outward. Fig. 12 is a perspective view of the lower end of the pawl-lever. Fig. 13 is a sectional view showing the pawl in engagement. Fig. 14 is a bottom plan view of the feed-table. Fig. 15 is a sectional elevation of one of the lugs of the feed-table on an enlarged scale. Fig. 16 is a top plan view of the buckling and holding-down fingers. Fig. 17 is a sectional elevation of the forward side guide. Fig. 18 is a horizontal section through the lower part of the side frame to which the side guides are attached. Fig. 19 is a top plan view of the pawl-lever, showing the same arrested by the automatic stop. Fig. 20 is a similar view showing the pawl-lever released. Fig. 21 is a sectional view of the buckling-finger on its return-stroke.

Like letters of reference refer to like parts in the several figures.

A A′ represent the upright side frames of the machine, connected at the bottom by cross-stays $a\ a$ and at the top by cross-stays $a'\ a^2$. The side frames A A′ rest upon transverse rails a^3, which are secured to the floor and which enter grooves in the feet of the side frames, as represented in Figs. 1 and 2, so that the machine can be readily moved laterally to adjust its position with reference to the ruling or other machine in connection with which it is used.

A^2 represents a standard secured to the floor on one side of the machine between the rails a^3, and a^4 is a horizontal adjusting-screw, which is journaled in the standard A^2 and works in a threaded opening in the adjacent side frame, so that the machine can be nicely adjusted on the rails by turning the screw a^4.

B B′ B′ represent the vertical feed-screws by which the bed or table B^2 is raised and lowered. The screw B is arranged on the inner side of the frame A at or near the middle thereof, and the screws B′ B′ are arranged on the inner side of the side frame A′ near the front and rear ends thereof, as clearly shown in Figs. 1, 2, and 3. The screw B is journaled at its upper and lower ends, respectively, in bearings $b\ b'$, secured to the inner side of the frame A, and the screws B′ B′ are journaled in bearings $b^2\ b^3$, secured to the frame A′. The bed or table B^2 is supported by the feed-screws B B′ at three points, whereby the table can be freely raised and lowered without binding on the feed-screws, although the paper is piled on the table out of center or at one side of the machine near the side frame A, as shown at B^3. The feed-table rests loosely upon screw-nuts c, which are applied to the feed-screws

B B′ and which enter recesses or sockets *c′* in the under side of lugs C C′, formed on the feed-table, as shown in Figs. 1, 14, and 15. The screw-nuts are made square or otherwise so shaped that they are prevented from turning when seated in the correspondingly-shaped recesses *c′* of the feed-table. Upon raising the feed-table so as to disengage its recess *c′* from the screw-nut *c* on which it rests the screw-nut can be turned on the feed-screw, thereby affording means for raising or lowering each side of the feed-table independently, as may be necessary for the purpose of leveling or adjusting the table.

d represents a bevel-wheel secured to the feed-screw B near the upper end thereof and meshing with a bevel-wheel *d′*, which is secured to the inner end of a horizontal shaft d^2, journaled in the upper portion of the frame A.

D is a wheel secured to the outer end of the shaft d^2 and provided with a handle d^3, so that it can be turned by hand.

e e′ e′ represent sprocket-wheels secured, respectively, to the lower portions of the feed-screws B B′ B′, and e^2 is an endless chain running around the sprocket-wheels *e e′ e′*, whereby the motion of the feed-screw B is transmitted to the screws B′ B′.

E represents a tightening-block adjustably attached to the lower portion of the side frame A′ by a slotted arm E′, as represented in Fig. 3, and bearing against the outer side of the chain e^2 between the wheels *e′ e′*, so as to maintain the proper tension of the chain. Upon turning the shaft d^2 in one or the other direction the three feed-screws are turned simultaneously, so as to raise or lower the table B^2. This arrangement of the screws and their driving mechanism simplifies the construction of the machine materially. It dispenses with the vertical guides and anti-friction rollers usually employed for guiding the table in its vertical movement on the main frame and imparts greater steadiness to the table. It permits all of the screws to be made right-handed and admits of comparatively coarse threads on the feed-screws.

The wheel D, by which the feed-screw B is actuated, is provided on its rear side with an annular groove *f*, arranged concentric with the axis of said wheel.

F represents a pawl-lever whereby the wheel D is actuated, and which rests with its upper and free end upon an eccentric or cam *f′*, while its lower end is provided on its front side with a curved rib or pawl f^2, which enters the groove *f* of the wheel D. The pawl f^2 fits loosely in the groove *f*, so that it can be moved back and forth in the same without moving the wheel D, except when the lever is inclined, so as to cause the pawl to bind against opposite sides of the groove, as represented in Fig. 13, when the wheel is moved by the pawl in the direction of the arrow. This movement of the wheel causes the feed-screws to raise the feed-table. The groove *f* and the pawl f^2 are made of dovetail form in cross-section, as represented in Fig. 9, whereby the pawl is caused to hug the disk of the wheel during its movements, thus preventing the pawl from escaping from the groove, although the latter is so large as to permit the pawl to be inserted and removed.

g is a finger, which is secured to the rear side of the actuating-lever F near the lower end thereof, and which is adapted to engage against the lower arm *g′* of a bell-crank lever G. The latter is pivoted to the side frame A underneath the shaft d^2 of the wheel D, and swings in a plane at right angles to the movement of the actuating-lever F. The upper arm g^2 of the lever G projects over the pile of paper, and its position is controlled by the height of the pile in such manner that the upper arm g^2 descends and the lower arm *g′* moves outward as the height of the pile decreases. When the lever G is in its normal position, which is the case when the feed-table presents the top sheet of the pile properly to the mechanism by which the sheets are removed, the lower arm *g′* stands in the way of the finger *g*, as represented in Fig. 19, and prevents the arm F from descending to the lowest point of the groove *f*. In this position of the arm F the rocking movement, which is imparted to it by the cam *f′*, has no effect upon the wheel D and the feed-table is not moved. When the height of the pile is so much reduced that the feed-table is required to be raised, the upper arm g^2 descends so far as to cause the lower arm *g′* to swing outward far enough to clear the finger *g*, as represented in Fig. 20. In this position of the lever G the lever F descends at every stroke to its lowest position, as represented in Fig. 11, and during its upward stroke, which is effected by the eccentric *f′*, the pawl f^2 binds against opposite sides of the groove *f* and turns the wheel. The latter is turned in this manner by a succession of movements of the lever F until the feed-table has been raised to its normal position, whereby the upper arm g^2 of the lever G is raised accordingly, and the lower arm *g′* is moved inwardly to a position in which it arrests the downward movement of the lever F by coming in contact with the finger *g*. The eccentric *f′* is secured to a horizontal shaft *h* on the inner side of a gear-wheel H, which is driven by an idler H′ from a gear-wheel H^2, secured to the shaft *h′* of the lower tape-roller H^3.

The downward movement of the lever F may be effected solely by gravity; but I prefer to accelerate its downward movement by means of a spring *i*, which is applied to a rod *i′*, and which bears against the rear side of the frame A, as represented in Fig. 1. The opposite end of the rod *i′* is connected with the lower end of the lever F, as represented in Fig. 11. The outer end of the rod *i′* is provided with a screw-nut i^2, by which the pressure of the spring may be regulated.

J represents the movable frame to which

the fingers are attached, by which the outer rear corner of the pile is held down and by which the top sheet is loosened preparatory to feeding it off from the pile. The frame J is made movable lengthwise of the machine in the direction in which the paper is fed off, in order to permit the devices which are attached to this frame to be quickly adjusted to paper of different sizes. The frame J consists of a horizontal rod j, arranged at right angles to the tape-rollers, and two arms j' j^2, depending from the ends thereof and rigidly secured thereto, as clearly represented in Figs. 3 and 4. The rod j is guided in lugs j^3 j^4, projecting inwardly from the top portion of the side frame A, and the lug j^4 is provided with a set-screw j^5, by which the frame J can be secured in position after it has been adjusted.

K represents a horizontal shaft journaled in the arms j' j^2 of the frame J below the rod j and rotated by bevel-wheels k k'. The wheel k is secured to the inner end of the shaft h, by which the actuating-lever F is operated, and the wheel k' is mounted on the shaft K by means of a groove and feather, so that the shaft K can move through the wheel k' in adjusting the frame J on the machine. The wheel k' is held against longitudinal displacement between the inner end of the shaft h and the upper cross-stay a'.

l represents a cam secured to the rear end of the shaft K, and L is an arm pivoted with its upper end to the rear arm j^2 of the frame J, so as to be moved in one direction by the cam l and in an opposite direction by a spring l', as represented in Fig. 2.

L′ represents the buckling-finger, by which the top sheet of the pile is loosened, and which is connected with the lower end of the arm L by a link or rod L^2. The finger L′ consists of a rough or adhesive portion m, which bears against the paper and moves the same during the operative or forward movement of the finger, and a smooth portion m', which slides over the paper during the return movement of the finger and does not move the same. The rough portion m of the finger is preferably formed by a block of rubber, which is secured by a removable cap m^2, while the smooth portion m' is preferably constructed of metal. The finger L′ is pivoted at its upper end to the rod L^2, and rests with its lower curved surface upon the pile near the outer rear corner thereof. When the arm L is swung backwardly by the cam l, the finger is rocked on its base by the rod L^2, so as to bring the rough front portion m of the finger in forcible contact with the paper, as represented in Fig. 6, whereby the top sheet is buckled or loosened. Upon the reversal of the movement of the arm L the finger L′ is rocked in an opposite direction, so as to bring the smooth portion m' in contact with the paper, as represented in Fig. 21, whereby the finger is enabled to effect its return-stroke without moving the top sheet. The downward pressure of the finger L′ against the paper may be increased by a spring m^3, which is applied to an upright rod m^4 and abuts against a bracket m^5, secured to the rear arm j^2 of the adjustable frame J. The lower end of the rod m^4 is attached to the rod L^2, while its upper end passes loosely through the bracket m^5. The tension of the spring is regulated by a screw-nut m^6 on the rod m^4. The rod m^4 is vertical when the finger L′ is in the middle of its stroke, whereby the spring is compressed to the greatest extent and exerts the greatest pressure upon the finger at this point of its movement, while the pressure grows less as the finger moves out of this position in either direction.

N represents the outer holding-down finger, whereby the corner of the pile is held down near the edge thereof. This finger is pivoted at its outer end in a lug n, secured to the upper end of the rear side guide n'. The lug n is provided in its upper side with a recess, in which the finger N is pivoted by a horizontal rod n^2. The upper edge of the finger N is made inclined, so as to rise outward, as represented in Fig. 6, and the inner end of the finger is provided with a pivoted bearing-piece n^4, which rests upon the paper.

O represents the inner holding-down finger, which rests upon the pile near the outer rear corner thereof at a short distance inwardly from the outer finger N. The finger O is attached to a rod O′, which is pivoted at its outer end to the rod n^2, upon which the outer finger N is pivoted. The inner end of the rod O′ is connected by an arm O^2 with the rear end of a shaft p, to which the arm O^2 is rigidly secured and from which it projects inwardly.

O^3 is an arm, which is also secured to the rear end of the shaft p and which projects outwardly therefrom, its outer end being located over the outer finger N. The outer end of the arm O^3 carries a grooved roller or stud O^4, which is adapted to bear upon the inclined back of the finger N. The shaft p is arranged in the adjustable frame J below the shaft K, and is journaled with its front end in the arm j', while its rear end is capable of a limited vertical movement in a slot p' in the arm j^2, as represented in Fig. 4.

P represents a cam or eccentric secured to the front end of the shaft K, and P′ is a bifurcated arm secured to the front end of the shaft p below the eccentric P and engaging therewith, as represented in Fig 5, whereby a rocking motion is imparted to the shaft p. The arms O^2 O^3 take part in this rocking motion of the shaft p, one arm rising when the other descends. The cams l and P are so arranged upon the shaft K that the cam l causes the buckling-finger L′ to move toward the inner holding-finger O in the direction of the arrow in Fig. 6, when the cam P tends to depress the arm O^2 and raise the arm O^3. As the inner holding-finger O rests upon the pile, the arm O^2 cannot be depressed, and the rock-

ing motion imparted to the shaft p by the cam P and arm P′ causes the shaft p to be raised on the inner end of the arm O^2 as a fulcrum. This ascending motion of the shaft p is greatest at its rear end and is provided for by the slot p', while it is insignificant at the front end of the shaft, at which the shaft is loosely journaled. The ascending movement of the shaft p raises the outer end O^4 of the arm O^3 from the outer holding-finger N, thereby relieving the latter from pressure and enabling the buckling-finger L′ to move the corner of the top sheet from under the outer finger N in buckling it against the inner finger O. When the movement of the shaft p is reversed, the arm O^3 descends until it rests with the roller O^4 upon the outer finger N. The continued rocking motion of the shaft p in the same direction causes the shaft to be raised on the outer end of the arm O^3 as a fulcrum, thereby raising the inner holding-finger O from the pile and releasing the top sheet. In this manner one of the holding-down fingers is always held down upon the pile, as neither finger can be raised, except after the other finger has secured a firm bearing upon the pile.

p^2 represents a pointed guard, which is hung loosely on the arm O^3 on the inner side of the finger N, and which rests upon the pile and prevents the loosened top sheet from passing under the outer finger N during the return-stroke of the buckling-finger. The inner holding-finger O is adjustably secured to the bar O′ by a set-screw or other suitable means. The position of the rock-shaft p is controlled by the fingers N and O, which rest upon the pile. When the top of the pile sinks below the normal position, the shaft p sinks also, and this movement of the shaft is transmitted to the lever G by the upper arm g^2 of the latter, which straddles the shaft p, as shown in Fig. 9, while an ascending movement of the pile causes the shaft p to rise and moves the lever G in an opposite direction. In this manner the position of the shaft p is regulated by the height of the pile, and the actuating-lever F is automatically released or arrested by the lever G, as the maintenance of the normal height of the pile may render necessary.

q represents the upright front guides against which the paper is piled, and which are rigidly secured to the upper cross-piece a^2 and the lower cross-piece a, as represented in Fig. 2.

q' represents the front side guide secured to the inner side of the frame A near the front end thereof, and provided at its upper and lower ends, respectively, with perforated lugs q^2 q^3.

q^4 represents a horizontal rod by which the lower ends of the side guides q' and n' are supported. The rod q^4 passes loosely through lugs q^5 q^6, formed on the inner side of the lower portion of the frame A, as represented in Fig. 18, and is clamped in these lugs by a set-screw q^7, which passes through the frame A and bears against the lower lug q^3 of the forward side guide q', so as to spring the rod q^4 and bind it in the lugs q^5 q^6. Upon releasing this set-screw the rod q^4 can be adjusted forwardly and backwardly to correspond with a similar adjustment of the frame J. The upper end of the forward side guide q' is similarly secured by a set-screw q^8, bearing against the upper lug q^2. The upper lug n of the rear side guide n' is attached to the rod O′ by a screw q^9, which passes through a segmental slot q^{10} in the rod and enters the lug, as shown in Fig. 8. By this means the rear guide n' is caused to take part in the adjustment of the frame J, and is therefore always in the proper position to support the outer rear corner of the pile. The lower end of the guide n' is provided with a perforated lug n^4, which slides upon the lower rod q^4. The upper horizontal rod n^2 is loosely supported in lugs q^{11} q^{12}, formed on the upper portion of the side frame A, in which lugs the rod is clamped by the set-screw q^8. The rods n^2 and q^4 are easily adjusted backwardly or forwardly to correspond with the position of the adjustable frame J.

r represents the transverse horizontal rock-shaft by which the fingers R are actuated, which move the loosened top sheet from the pile. Each finger R is connected by a rod or link R′ to an arm R^2, which depends from the rock-shaft r. Each finger R is pivoted to the front end of its rod R′, and is provided with a rough pushing surface r' and a smooth retreating surface r^2, corresponding, respectively, with the rough and smooth surfaces m m' of the buckling-finger L′. The fingers R bear upon the paper with their rough surfaces r' during their forward movement and push the top sheet out, while they slide over the paper on their smooth surfaces r^2 during their return movement. The rock-shaft r is actuated in one direction by a cam r^3, mounted upon the inner end of the shaft h and engaging against an arm r^4, and is returned by a spring r^5 when released by said cam. (See Figs. 3 and 7.) The lower feed-roller H^3, mounted upon the shaft h', is driven by a sprocket-wheel S, secured to said shaft and connected by an endless chain with the ruling or other machine to which the paper is fed, thereby maintaining positively the proper relative movement of both machines.

S′ represents the feed-tapes, which run around the lower roller H^3.

T represents the upper feed wheels or rollers, which are arranged above the lower roller H^3 and run in contact with the upper surface of the paper. The rollers T are secured to a tubular shaft t, which is driven by means of a flexible shaft or rod t', passing through the tubular shaft t, as represented in Figs. 7 and 10. The tubular shaft t is held in slotted bearings t^2, which are secured to the cross-stay a' and permit a limited vertical movement of the shaft t, thereby enabling the rollers to adapt themselves to any inequality in

the surface of the paper or lower feed-roller. The inner driving-shaft t' is made so thin that it springs or bends as the feed-wheels rise or fall, thus providing a positive driving mechanism for the upper feed-wheels within the limits required for their vertical motion. The driving-shaft t' is preferably made square and passes through a socket t^3, secured centrally in the tubular shaft t, and having a square opening, which is slightly enlarged toward both ends to permit the shaft t' to spring or bend. When the sheets of paper are very wide, two or more tubular shafts t, provided with feed-wheels, may be arranged upon the shaft t'. The latter is driven from the shaft h' of the lower roller by a gear-wheel t^4, mounted on the shaft h', and a gear-wheel t^5, having a hub with a square opening, in which the shaft t' is seated. By thus driving the upper feed-wheels the slipping of the wheels on the paper is prevented, which will take place when frictional contact is relied upon for driving the upper wheels from the lower roller through the intervening sheet of paper, and the excessive pressure formerly applied to the upper wheels is avoided.

The link of the buckling-finger L′ and the links of the feeding-fingers R are each provided with an opening u, in which can be secured a lifting-string. These strings run over suitable rollers arranged overhead and terminate in convenient reach of the operator, where they are attached to a suitable ring or handle, by which all of the fingers can be raised simultaneously from the paper for stopping the feeding of paper without stopping the moving parts. The upper rod n^2, to which the inner holding-finger O and the outer finger N are both pivotally connected, is arranged somewhat higher than the top of the pile and the bearing-surfaces of the fingers. These fingers therefore tend to draw the paper toward the side guides, and cause the pile to rest closely against the side guides at all times and counteract the tendency of the buckling-finger L′ to move the pile away from the side guides.

My improved paper-feeder is especially desirable for use in small establishments in which a feeder is required for job work and where the feeder must be frequently adjusted to operate upon small quantities of paper of different sizes.

I claim as my invention—

1. In a paper-feeder, the combination, with the feed-screw, of a screw-nut mounted on said feed-screw, and a feed-table resting loosely on said screw-nut and provided with a socket in which the screw-nut is held against turning, substantially as set forth.

2. The combination, with the feed-screw, of an actuating-wheel provided with an annular groove, an actuating-lever having a rib which engages in said groove, and an automatic stop which limits the movement of the actuating-lever or releases the same, according to the position of the top of the pile, substantially as set forth.

3. The combination, with the feed-screw, of an actuating-wheel provided with an annular groove, an actuating-lever having a rib which engages in said groove, an automatic stop which limits the movement of the actuating-lever or releases the same, a spring whereby the actuating-lever is moved downward, and an eccentric whereby the actuating-lever is moved upward, substantially as set forth.

4. The combination, with the feed-screw, of an actuating-wheel D, provided with an annular groove f, an actuating-lever F, provided with a rib f^2, engaging in said groove, a finger g, secured to the lever F, and a stop-lever G, whereby the movement of the lever F is automatically regulated, substantially as set forth.

5. The combination, with the stationary main frame, the pile-supporting table, and the feed-fingers, of a movable frame arranged above said table and made adjustable lengthwise of the machine, a buckling-finger attached to said movable frame, and an actuating-shaft journaled in the frame, whereby the finger and its actuating-shaft are simultaneously adjusted lengthwise of the machine, substantially as set forth.

6. The combination, with the stationary main frame, the pile-supporting table, and the feed-fingers, of a movable frame arranged above said table and made adjustable lengthwise of the machine, a buckling-finger attached to said movable frame, an actuating-shaft journaled on said movable frame and moving therewith, an inner holding-down finger against which the sheet is buckled, and an outer holding-down finger bearing on the corner of the pile, both attached to said movable frame, whereby by the single adjustment of said frame the entire buckling mechanism is adjusted lengthwise of the machine, substantially as set forth.

7. The combination, with the stationary main frame, the pile-supporting table, and the feed-fingers, of a frame J, made lengthwise adjustable on the main frame, an arm L, attached to said movable frame, a buckling-finger L′, attached to said arm, and a rotating shaft K, actuating the buckling-finger and journaled in said movable frame and moving therewith, substantially as set forth.

8. The combination, with the pile-supporting bed, of an inner and an outer holding-down finger, and lifting mechanism connected with the inner holding-down finger and resting on the outer holding-down finger, substantially as set forth.

9. The combination, with the pile-supporting bed, of an outer holding-down finger N, an inner holding-down finger O, a rock-shaft p, a rod O′, and arm O^2, whereby the inner finger O is connected with said shaft, and a pressure-arm O^3, secured to said shaft and adapted to bear upon the outer finger N, substantially as set forth.

10. The combination, with the outer holding-down finger N, of the rock-shaft *p*, and the pressure-arm O^3, secured thereto and carrying a grooved roller O^4, adapted to bear upon the finger N, substantially as set forth.

11. The combination, with the main frame, the pile-supporting bed, and the feed-fingers, of a frame made lengthwise adjustable on the main frame, a buckling-finger and holding-down fingers attached to said adjustable frame, and a side guide connected with said frame and taking part in its adjustment, substantially as set forth.

12. The combination, with the main frame, of the adjustable frame J, the buckling-finger L′, holding-down fingers O and N, and the side guide *n′*, to which the finger N is pivoted, substantially as set forth.

13. In a paper-feeder, a finger provided with a rough surface by which the paper is moved, and a smooth surface upon which the finger slides over the paper without moving it, substantially as set forth.

14. In a paper-feeder, the combination, with a finger having a rough surface by which the paper is moved, and a smooth surface upon which the finger slides over the paper, of an actuating-rod whereby the finger is shifted and whereby one or the other surface of the finger is brought in contact with the paper, substantially as set forth.

15. In a paper-feeder, a finger provided with a smooth metallic surface *m′* and a rubber block *m*, substantially as set forth.

16. The combination, with the lower feed-roller, of the upper feed-wheels, a driving-shaft passing through said feed-wheels, and a flaring socket by which the feed-wheels are connected with the shaft and permitted to adapt themselves to the inequalities of the paper, substantially as set forth.

17. The combination, with the feed-wheels T, of a tubular shaft *t*, to which said wheels are secured and which is provided with an angular socket t^3, and a flexible angular shaft *t′*, passing through the tubular shaft *t* and seated in said socket, substantially as set forth.

Witness my hand this 14th day of September, 1886.

JAMES NAYLOR, JR.

Witnesses:
OSCAR SCHAUB,
EDWARD WILHELM.