

(No Model.)

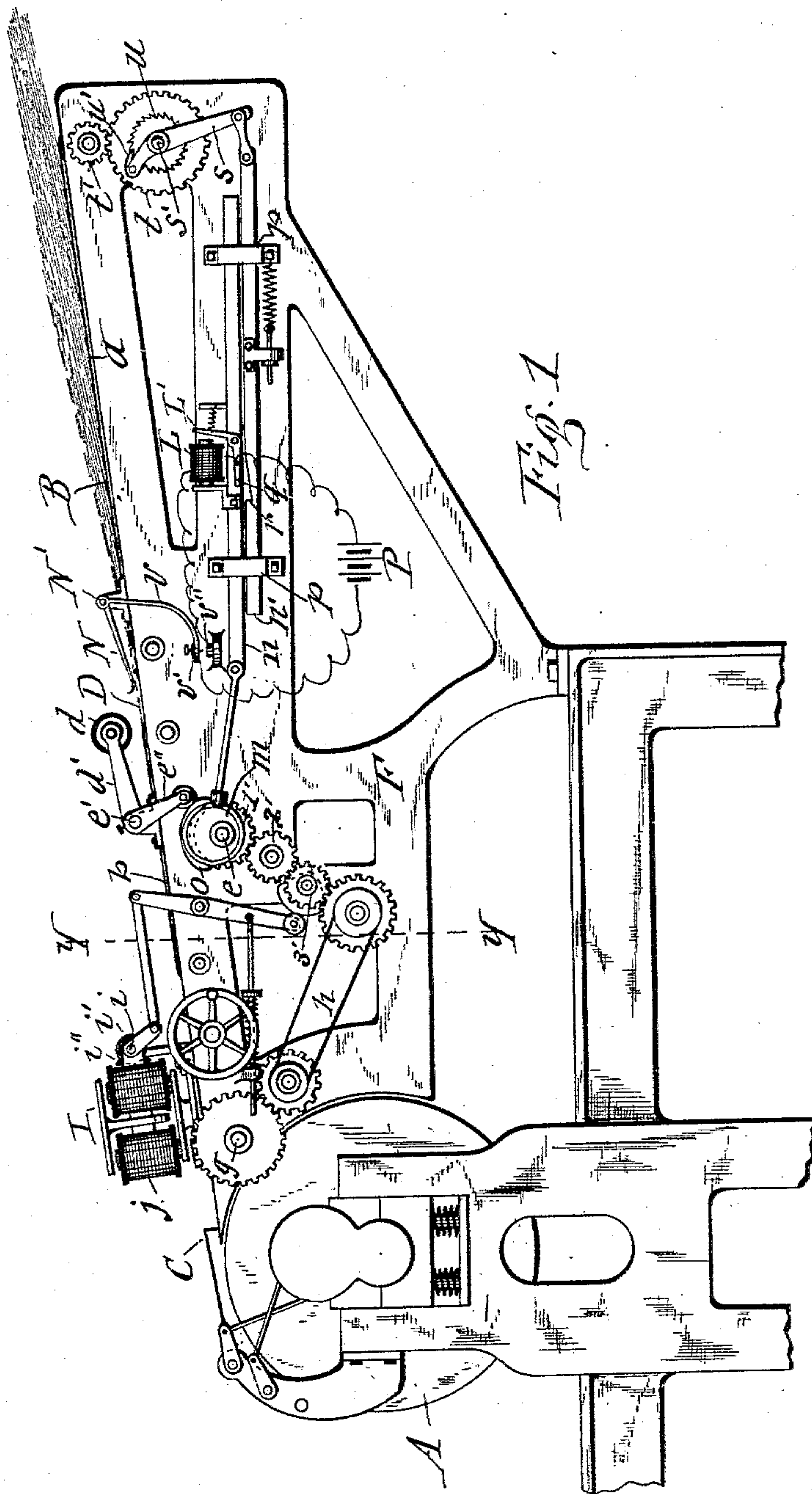
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T. C. DEXTER.

FEEDER'S HELPER FOR PAPER FEEDING MACHINES.

No. 561,773.

Patented June 9, 1896.



WITNESSES:

C. Robinson

J. J. Laas

INVENTOR:

Talbot C. Dexter

By E. Laas

his ATTORNEY

(No Model.)

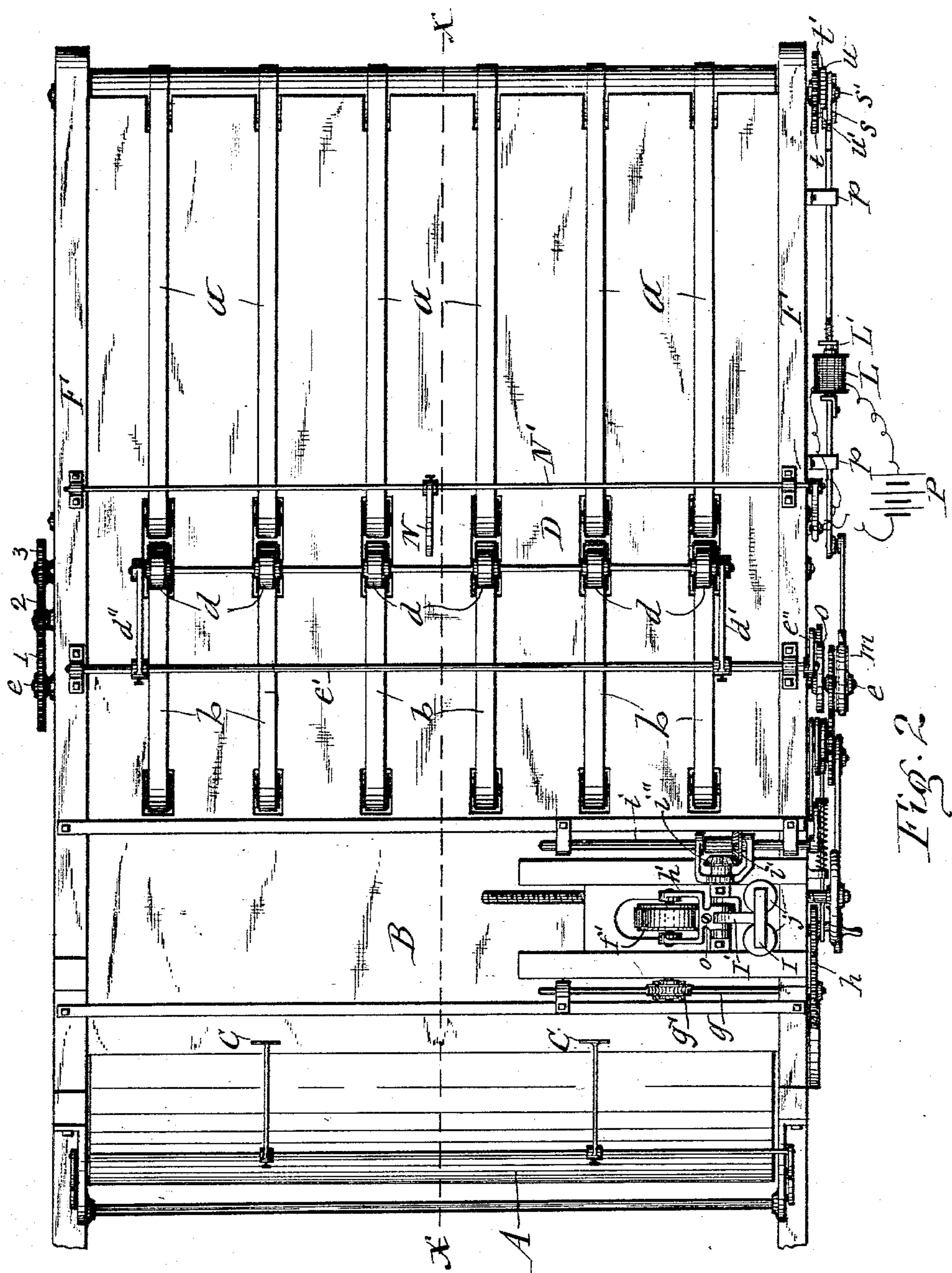
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Patented June 9, 1896.



WITNESSES:

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(No Model.)

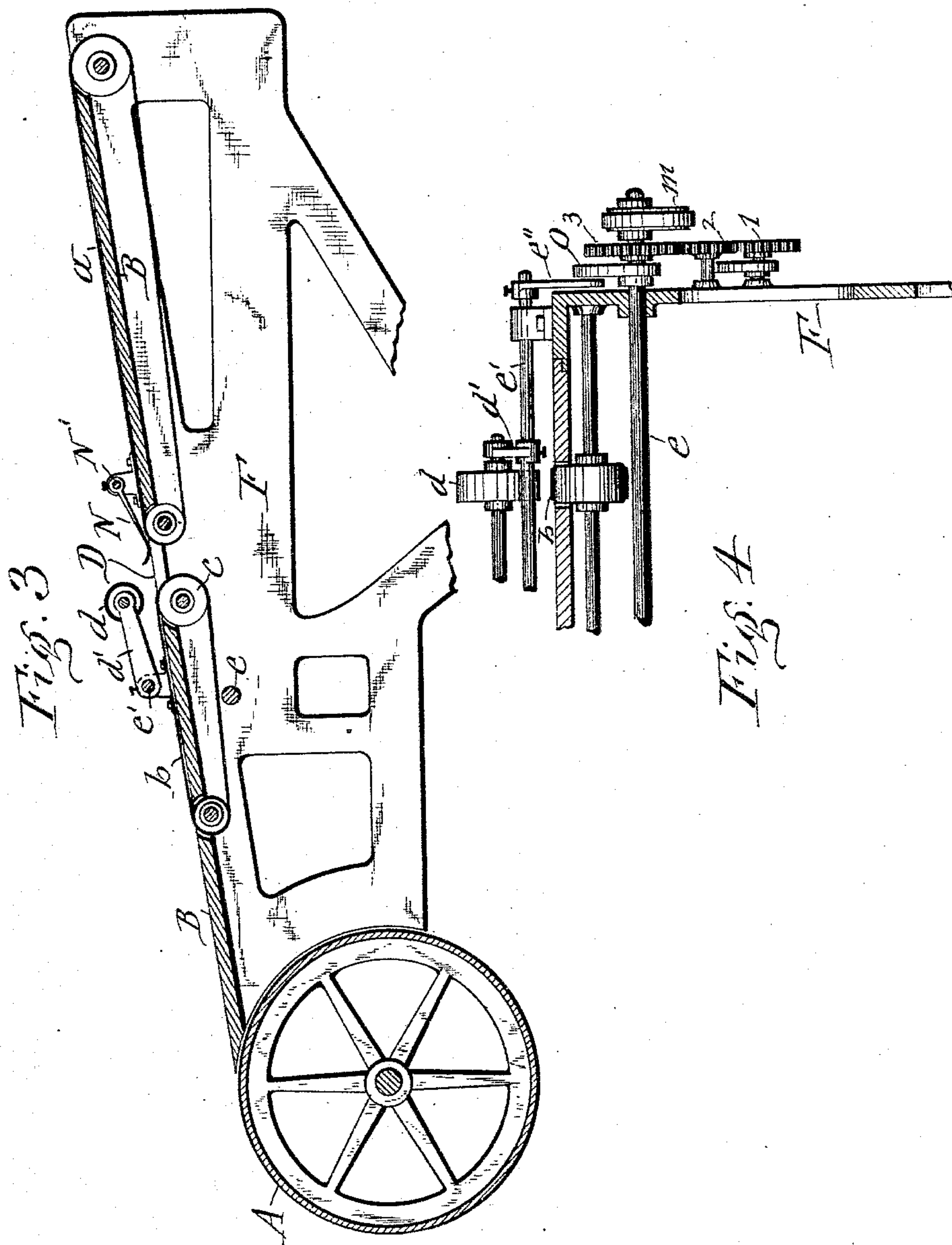
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No. 561,773.

Patented June 9, 1896.



WITNESSES:

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(No Model.)

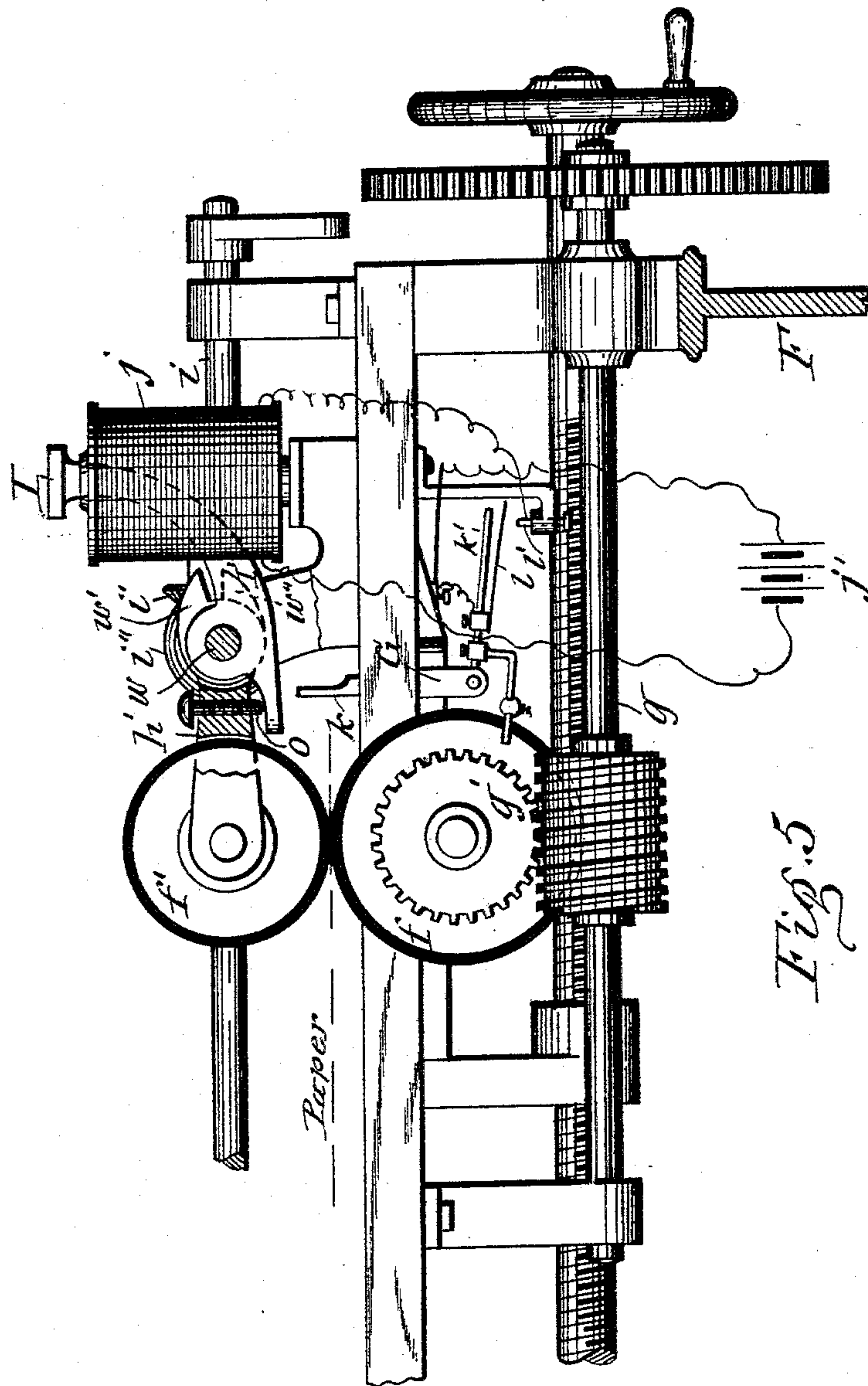
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Patented June 9, 1896.



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(No Model.)

5 Sheets—Sheet 5.

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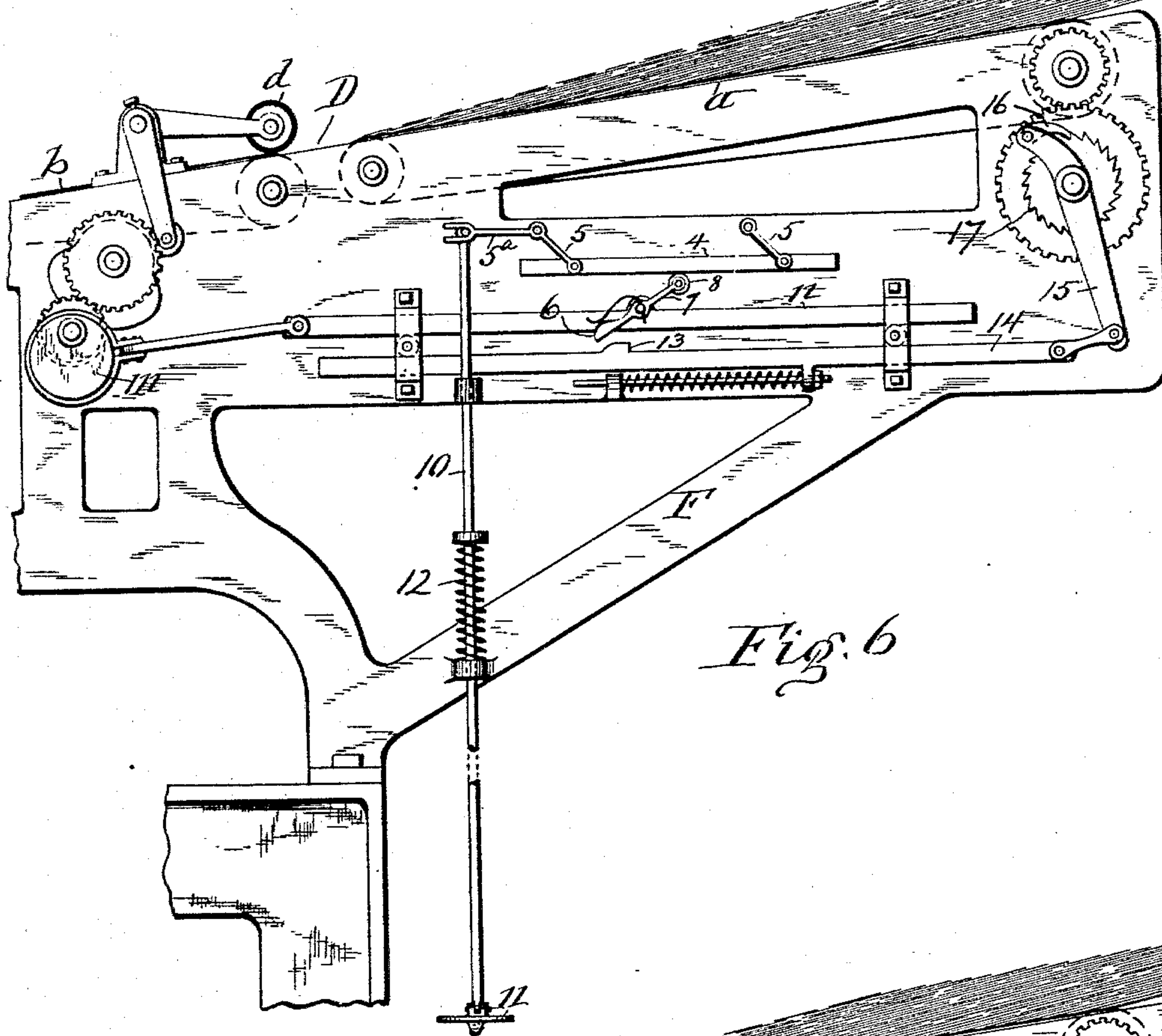


Fig. 6

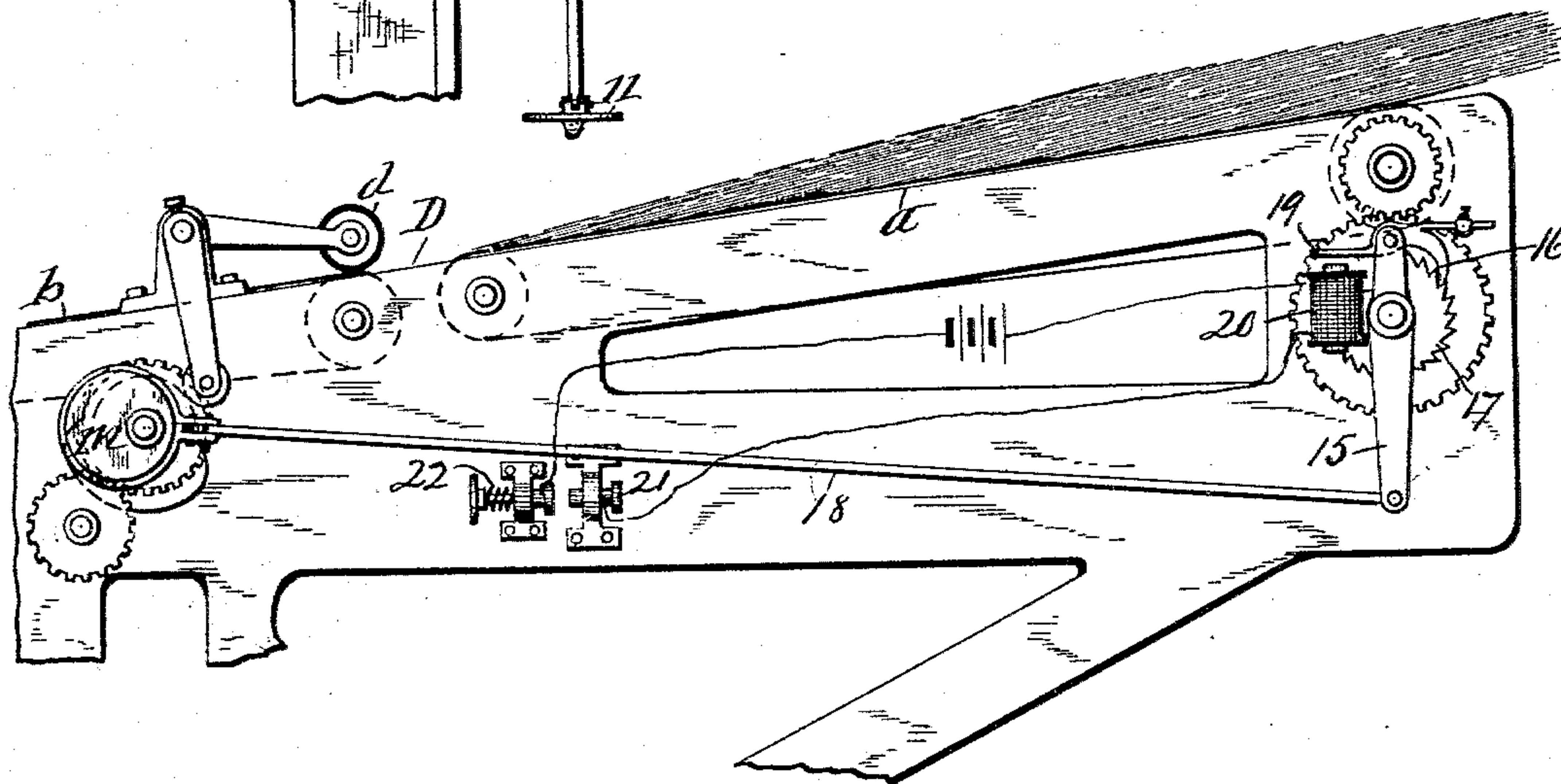


Fig. 7

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK.

FEEDER'S HELPER FOR PAPER-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 561,773, dated June 9, 1896.

Application filed November 7, 1895. Serial No. 568,203. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, of Pearl River, in the county of Rockland, in the State of New York, have invented new and useful Improvements in Feeders' Helpers for Paper-Feeding Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to the feeding of paper to printing-presses and other machines designed to receive a single sheet at a time and in proper alinement in relation to said press or machine.

15 The object of the invention is to provide the feed-board with automatically-operating devices for facilitating the manipulation of the paper by the person feeding the same to the printing-press or other machine, as aforesaid; and to that end the invention consists, essentially, in the combination, with a paper-feed board, of paper-supplying tapes extending from the receiving end of said board to the feeder's stand, situated intermediate the 25 length of the feed-board, and feeding-tapes running from said stand toward the discharge end of the board, said supplying-tapes carrying the pile of paper arranged so as to cause each sheet to project with its advance edge 30 beyond that of the next underlying sheet, and the actuating mechanism of said supplying-tapes being timed to cause the successive top sheets of the pile to lie in proper proximity to the feeding-tapes to allow the person in charge of the machine to readily pass 35 the sheets to said feeding-tapes.

The invention also consists in the combination, with the aforesaid two sets of paper-conveying tapes arranged one back of the 40 other with a space or feeder's stand between them, of drop-rollers over the tape-roller of the second set adjacent to the feeder's stand to insure a more positive forward motion of the paper placed on the feeding-tapes by the attendant of the machine.

45 The invention also consists in certain auxiliary devices employed in connection with said two sets of paper-conveying tapes for registering the paper preparatory to passing 50 the same to the printing-press or other machine; and the invention furthermore consists in the combination, with the two sets of

paper-conveying tapes arranged as aforesaid, of electrically-operated means for automatically controlling the motion of the paper-supplying tapes, all as hereinafter more fully described, and set forth in the claims. 55

In the accompanying drawings, Figure 1 is a side elevation of a printing-press feed-board embodying my invention. Fig. 2 is a plan 60 view of the same. Fig. 3 is a longitudinal section on line X X in Fig. 2. Fig. 4 is an enlarged sectional view on line Y Y in Fig. 1. Fig. 5 is an enlarged side elevation of the registering mechanism, and Figs. 6 and 7 are 65 side elevations of manually-controlled mechanism for imparting motion to the tapes which convey the paper to the feeder's stand of the machine.

Similar letters and figures of reference indicate corresponding parts. 70

A represents the impression-cylinder of a printing-press.

B denotes the feed-board, and C the usual gages employed on drum-cylinder or two-revolution presses. 75

a and *b* designate two sets of paper-conveying tapes arranged one set back of the other with a space D between them and all running in the same direction toward the impression-cylinder A. Said two sets of tapes I designate, respectively, "paper-supplying" 80 tapes and "paper-feeding" tapes.

The tapes *a* extend from the receiving end of the feed-board part way the length thereof 85 and carry the pile of paper bodily toward the space D, which for brevity of description I designate the "feeder's stand," it being the part of the feed-board on which the attendant of the machine manipulates the paper in transferring it from the supplying-tapes *a* to the feeding-tapes *b*. The paper is piled upon said supplying-tapes in such a manner as to cause each sheet to project with its advance edge beyond that of the next underlying sheet 95 and thus present the top sheet in a convenient position for the attendant of the machine for manipulating said sheet in transferring the same to the feeding-tapes *b*, which extend from the feeder's stand toward the impression-cylinder A. The said feeding-tapes receive constant motion by means of a train of gears 1' 2' 3', transmitting motion 100 from a rotary shaft extending across the ma-

chine to the shaft of the tape-rollers *c c*, adjacent to the feeder's stand D. Over these rollers are drop-rollers *d*, pivoted to arms *d'*, which are fastened to a transverse shaft *e'*, mounted on suitable brackets secured to the sides of the frame F, which supports the feed-board B. Said shaft receives a rocking motion by means of an arm *e''*, fastened to the end of the shaft and having pivoted to its free end a roller, by which it bears on a cam O, secured to the shaft *e*, which receives positive rotary motion from the driving-gears of the printing-press by any suitable gearing. (Not necessary to be shown.)

Between the gages C and adjacent tape-rollers of the feeding-tapes I place suitable automatically-operating lateral paper-registering mechanisms, preferably of the type shown in my United States Letters Patent No. 528,657, dated November 6, 1894, or analogous electrically-controlled paper-shifting mechanism. Although I have shown only one of said registering mechanisms, I nevertheless deem it necessary to employ two such mechanisms, disposed, respectively, at opposite sides of the line of travel of the paper in order to permit the paper to be registered toward either side of the feed-board. This is required for registering paper fed twice to the press to print the same on both sides, said paper being turned over when fed the second time and thus reversed from the position in which it was fed the first time. Said paper-registering mechanism consists of the roller *f*, which is arranged with the top of its periphery flush with or slightly above the top of the feed-board and rotates constantly with its upper portion toward the adjacent side of the feed-board, which motion is imparted to said roller by means of the shaft *g*, which is at right angles to the axle of the roller and has affixed to it a worm which engages a worm-gear *g'*, attached to the axle of the roller *f*, as shown in Figs. 2 and 5 of the drawings and more fully illustrated in my Patent No. 528,657, hereinbefore referred to. The shaft *g* receives rotary motion from the shaft *e* by a suitable train of gears or sprocket-wheels and chain, as indicated at *h* in Fig. 1 of the drawings hereto annexed. Over the registering roller *f* and parallel therewith is a drop-roller *f'*, pivoted to a vertically-movable rock-arm *h'*, which is intermittently lifted to allow the paper to enter between the two rollers. Said lifting is effected by means of a rock-shaft *i*, which has attached to it a miter-pinion *i'*, meshing with a similar pinion *i''* on a short shaft *w*, to which is attached a cam *w'*, engaging a lug *w''* on the heel or pivoted end of the arm *h'*, as more clearly illustrated in my patent aforesaid. The motion of the rock-arm is so timed as to allow the drop-roller *f'* to drop onto the paper entered between the two rollers, and by pressing said paper onto the revolving lower roller *f* the frictional hold of the latter draws the paper toward the side of the feed-board. This movement is limited

electrically by means of magnets *j* in an electric circuit, the generator or battery of which is represented at *j'*. The armature I of said magnet is attached to a lever I', which by engagement with a set-screw *o* on the rock-arm *h'* lifts said arm, and thus raises the drop-roller *f'* from the paper when the magnet is energized. The action of said magnet is controlled by a circuit maker and breaker actuated by the laterally-shifting paper. It consists of a finger *k*, which is pivoted to the supporting-bracket G of the aforesaid registering device beneath the feed-board and projects with its free end through an opening in said board, so as to come into the path of the laterally-shifting paper and cause it to be tilted by contact with the edge of said paper. From the pivoted end of said finger extends another finger, *k'*, to which is attached one of the terminals *l* of the electric circuit maker and breaker. The other terminal, *l'*, is attached to a suitable bracket attached to the aforesaid supporting-bracket G, all of which is more clearly illustrated in Fig. 5 of the drawings.

The operation of the described registering mechanisms is as follows: During the passage of the paper to the gages C the drop-roller *f'* is lifted out of the path of the paper by the rock-arm *h'*. By the time the longitudinal movement of the paper is arrested by its contact with the aforesaid gages the rock-arm *h'* descends to cause the drop-roller *f'* to press the paper down onto the revolving roller *f*, which by frictional hold on the paper draws the same laterally. In this movement of the paper the edge thereof is brought in contact with the finger *k*, and thereby tilts said finger, so as to throw the terminal *l* in contact with the terminal *l'*. The resultant closing of the electric circuit causes the magnet *j* to attract its armature, and thereby causes the lever I' to tilt the rock-arm *h'*, so as to lift the drop-roller *f'* from the paper. The lower roller *f* thereby loses its hold on the paper and leaves the same at rest and in registered position. At this moment the gages C are lifted to allow the paper to pass to the impression-cylinder A of the printing-press.

It will be observed that my invention does not entirely dispense with the services of a person attending to the feeding of the paper to the printing-press; but by the described combination of the paper-supplying tapes *a a*, paper-feeding tapes *b*, with the paper-manipulating space between the two sets of tapes and the registering mechanism between the delivery end of the feed-tapes and paper-arresting gages C, the person in charge of the machine receives the pile of paper automatically delivered to him and in a most convenient position to pass the successive top sheets from the pile to the feeding-tapes *b*, and inasmuch as the paper is properly alined or registered in its passage from said feeding-tapes to the impression-cylinder A the person in charge of the machine is relieved to a great

extent of the time and care required to accurately feed the paper to the printing-press.

In order to automatically control the motion of the paper-supplying tapes *a a* so as to insure a prompt delivery of the paper to the person required to transfer the paper to the feeding-tapes *b b*, I employ a suitable motion-transmitting mechanism adapted to be thrown in and out of operative connection by a suitable gripping or clutching device controlled by the armature of an electromagnet in a circuit and a circuit maker and breaker operated by a feeler over the feed-board at the feeder's stand or delivery end of the paper-supplying tapes *a*, so as to actuate said feeler by the paper passing under it. Said automatically-controlled motion-transmitting mechanism is represented in the annexed drawings to consist of the following construction and combination of parts: To the shaft *e* is rigidly secured an eccentric *m*, to the rod of which is connected a pitman *n*, sustained in guides *p p*, attached to the outer side of the supporting-frame of the feed-board. On this pitman is mounted the electromagnet *L*, the armature *L'* of which is pivoted to said pitman and is formed with a dog *q*, which is adapted to engage and release a notch or shoulder *r* on a longitudinally-movable bar *n'*, which is parallel with the aforesaid pitman and is connected to the end of a lever *s*, fulcrumed on the end of a shaft *s'*, which is pivoted to the feed-board-supporting frame and parallel with the axis of the tape-roller at the paper-receiving end of the feed-board. To the shaft *s'* are fastened a ratchet-wheel *u* and a gear-wheel *t*, which latter meshes with a pinion *t'*, attached to the shaft of the aforesaid tape-roller. To the short arm of the lever *s* is connected a pawl *u'*, which engages the ratchet-wheel *u*, as shown in Fig. 1 of the drawings.

N denotes the mechanical feeler, which is connected to the central portion of a shaft *N'*, extending across the feed-board some distance above the same, and is mounted at opposite ends on suitable posts secured to the feed-board or its supporting-frame. To one end of said shaft is fastened a finger *v*, to the free end of which is attached one of the terminals, *v'*, of a maker and breaker of an electric circuit derived from the battery *P*. The other terminal, *v''*, of said circuit maker and breaker is attached to the side of the feed-board-supporting frame and in such a position as to break contact with the terminal *v'* when the feeler *N* is lifted by the paper passing under it. Said feeler rests normally on the top of the feed-board, and when in this condition the aforesaid circuit is closed. This causes the magnet *L* to attract its armature and thereby throw the dog *q* into a position to engage the notch *r* in the bar *n'* during the reciprocating motion of the pitman *n*, which is thereby caused to impart longitudinal movement to the bar *n'*, which swings the lever *s* on its fulcrum, and by means of the

pawl *u'* engaging the ratchet-wheel *u* the gear-wheel *t* receives a partial rotation, which is transmitted to the adjacent tape-roller by the pinion *t'*. The paper-supplying tapes *a* are thus moved longitudinally to carry the pile of paper toward the feeder's stand *D*. As soon as the advance edge of the top sheet of the pile passes under the feeler *N* the latter is lifted sufficiently to throw the electric terminals *v* and *v''* out of contact. This breaking of the circuit causes the magnet *L* to release its armature and thereby allows the usual spring to draw the armature into a position which carries the dog *q* out of the path of the notch *r*, and thus the pitman is free to move without disturbing the bar *N'*. This leaves the aforesaid tape-roller at rest.

I do not, however, limit myself to the aforesaid automatically-operating devices for controlling the motion of the paper-supplying tapes *a a*, inasmuch as said motion may be controlled by suitable manually-operated tripping mechanism, two exemplifications of which are illustrated in Figs. 6 and 7 of the drawings. Fig. 6 shows said tripping mechanism operated by purely mechanical devices, which consist of the bar 4, pivoted to hangers 5 5, which are pivoted to the side of the frame *A* and are of equal lengths and equidistant from the pitman *n* to maintain said bar in parallelism with said pitman. The dog 6, which is pivoted to the pitman, is formed with a lever 7, the free end of which has pivoted to it a roller 8, by which it bears on the under side of the bar 4. One of the hangers 5 is formed with an arm 5^a, the free end of which is connected to the vertically-movable rod 10 of the treadle 11. A spring 12 lifts said rod and thereby causes the bar 4 to be depressed and hold the dog 6 out of the path of the shoulder 13 on the longitudinally-movable bar 14, which is connected to the lever 15 of the pawl 16, engaging the ratchet 17 in the same manner as shown in Fig. 1 of the drawings. Hence the tapes *a a* are normally at rest. When the attendant of the feed-board requires the pile of paper to be moved forward, he depresses the treadle 11 and thereby lifts the bar 4, so as to allow the dog 6 to engage the shoulder 13 during the movement of the pitman, and thus motion is imparted to the bar 14, which, by means of the lever 15, pawl 16, and ratchet-wheel 17, transmits motion to the tapes *a a*.

Fig. 7 shows the employment of electrically-operated devices for controlling the movement of the aforesaid tapes. In this case the eccentric rod or pitman 18 is connected directly to the lever 15 of the pawl 16, which engages the ratchet-wheel 17 in the same manner as hereinbefore described. In this case the heel of the pawl 16 is formed with an extension 19, to which is attached the armature of a magnet 20, secured to the lever 15. Near the feeder's stand *D* are the two electric terminals 21 and 22 of the circuit, in which is inclosed the magnet 20. The terminal 22 is of

the form of a push-button, which is normally out of contact with the terminal 21, and thus breaks the circuit. This allows the pawl 16 to engage the ratchet-wheel 17 and causes the tapes *a* to be moved to carry the pile of paper toward the feeder's stand D. In case said paper is moved forward faster than desired by the attendant of the feed-board he pushes the push-button 22 into contact with the terminal 21, and thereby closes the circuit, which causes the magnet 20 to throw the pawl 16 out of engagement with the ratchet-wheel 17, and consequently the motion of the tapes ceases.

What I claim as my invention is—

1. The combination of a feed-board provided with a sheet-manipulating space intermediate its length, a set of tapes carrying the bank of paper toward said space, mechanism controlling the motion of said tapes and thereby regulating the supply of paper to the manipulating-space, and a set of tapes carrying the separate sheets from the manipulating-space to the discharge end of the feed-board as set forth.
2. The combination with a paper-feed board, of paper-supplying tapes extending from the receiving end of said board to the feeder's stand situated intermediate the length of the board, paper-feeding tapes extending from said stand toward the discharge end of the board, a mechanical feeler over said board at the feeder's stand, mechanism imparting motion to the paper-supplying tape-rollers, an electric circuit, an electromagnet in said circuit controlling said tape-roller-actuating mechanism, and a circuit maker and breaker actuated by the aforesaid feeler as set forth.
3. The combination, with a paper-feed

board, of paper-supplying tapes extending from the receiving end of the board to the feeder's stand situated intermediate the length of the board, paper-feeding tapes extending from said stand toward the discharge end of the board, drop-rollers over the feed-tape roller adjacent to the feeder's stand, a paper-arresting gage at the discharge end of the board, lateral paper-registering mechanism between said gage and delivery ends of the feeding-tapes, a feeler over the feed-board at the feeder's stand, mechanism imparting motion to the supplying-tape rollers, an electric circuit, a magnet in said circuit controlling said tape-roller-actuating mechanism, and a circuit maker and breaker actuated by the aforesaid feeler, all combined to operate in the manner herein described to facilitate the manipulation of the paper by the person feeding the same to the printing-press as set forth.

4. The combination, with a feed-board, of paper-supplying tapes extending from the paper-receiving end of the board part way the length thereof, a paper-manipulating space upon said board at the forward ends of said tapes, paper-registering mechanism between said space and discharge end of the feed-board, and mechanism controlling the motion of the aforesaid tapes and thereby insure the supply of paper to the aforesaid manipulating-space as set forth.

In testimony whereof I have hereunto signed my name this 10th day of October, 1895.

TALBOT C. DEXTER. [L. S.]

Witnesses:

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J. J. LAASS.