

No. 673,114.

Patented Apr. 30, 1901.

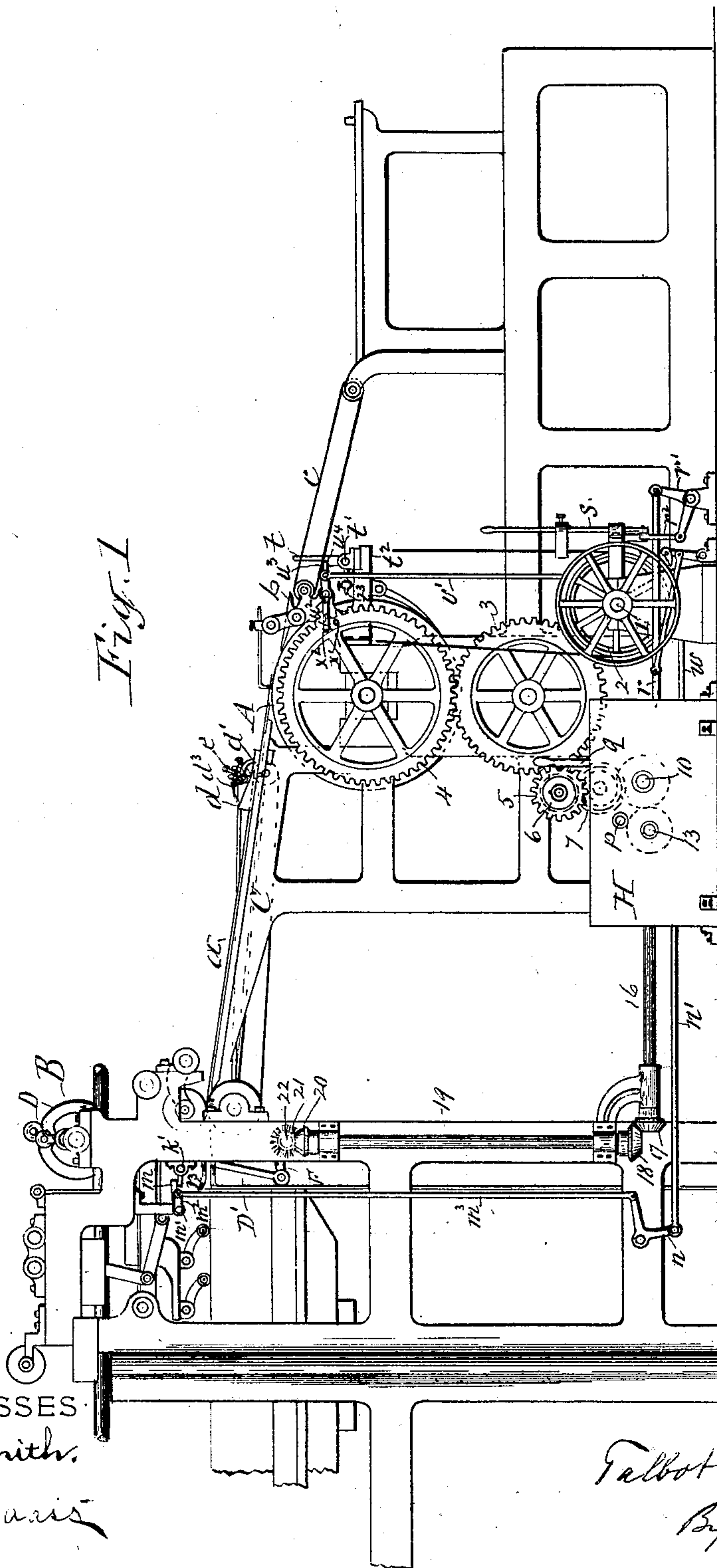
T. C. DEXTER.

PROTECTIVE MECHANISM FOR PRINTING PRESSES, &c.

(Application filed July 27, 1900.)

(No Model.)

7 Sheets—Sheet 1.



WITNESSES

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J. J. Lavis

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By E. Laess

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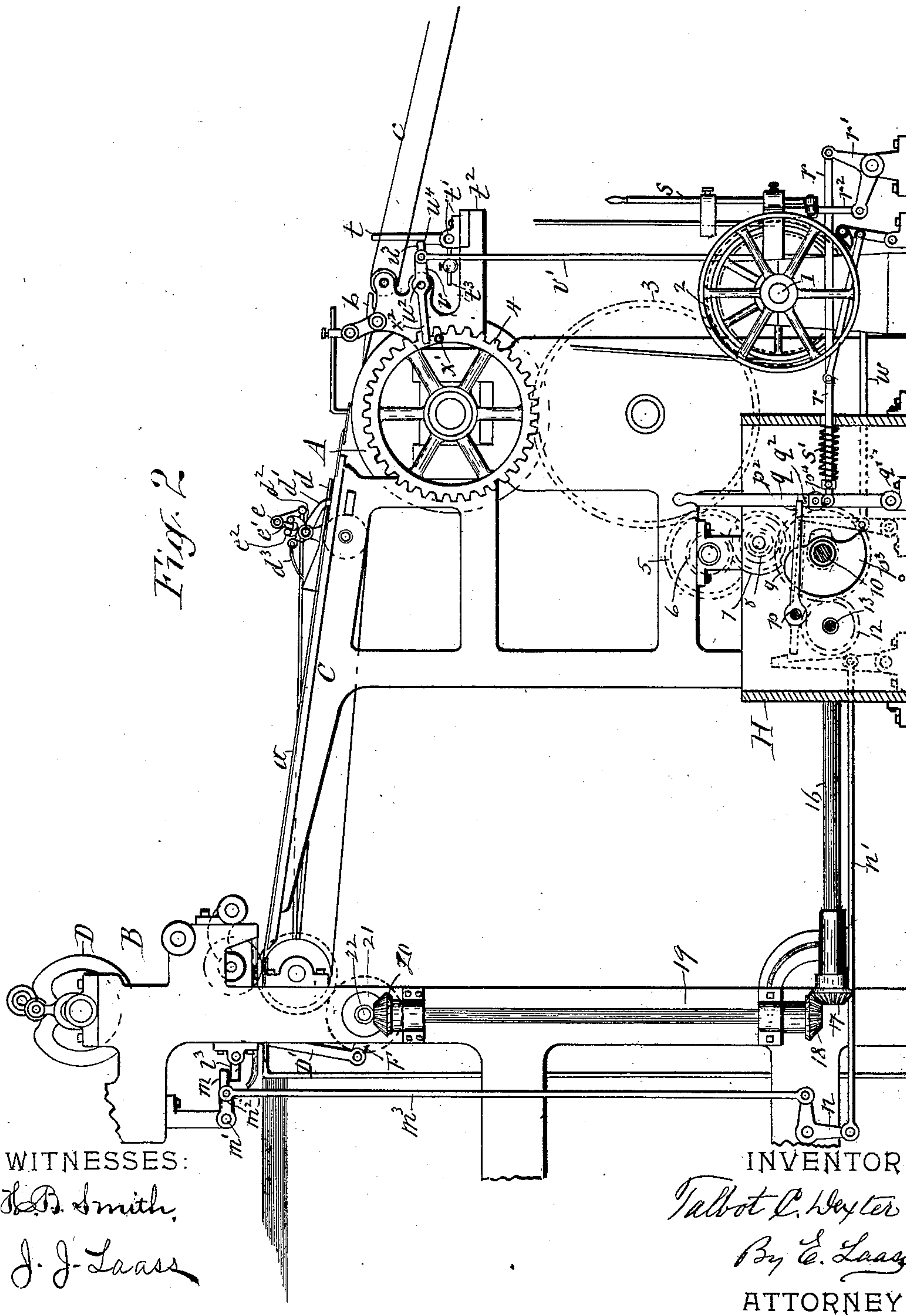
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7 Sheets—Sheet 2.



WITNESSES:

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7 Sheets—Sheet 3.

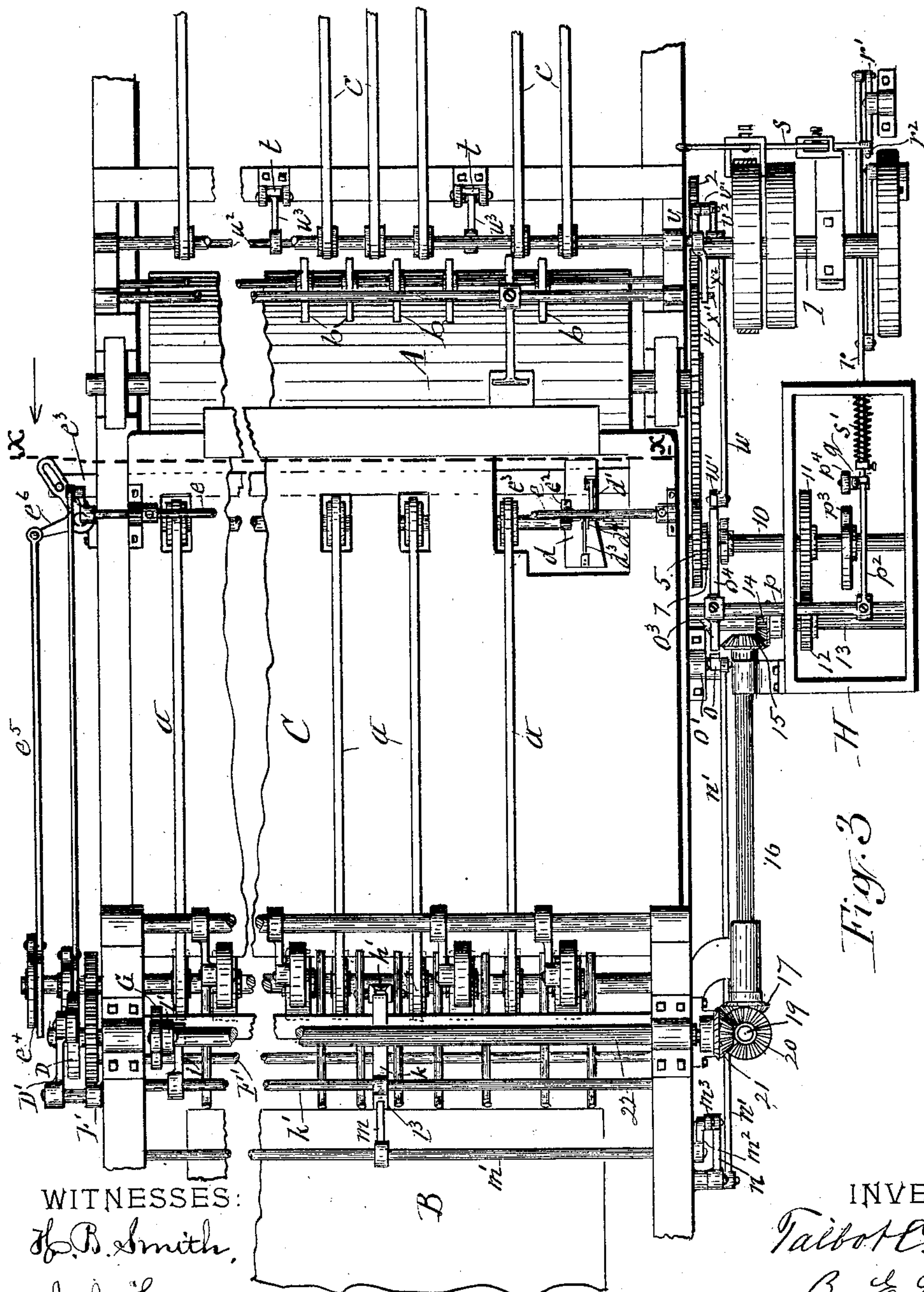


Fig. 3

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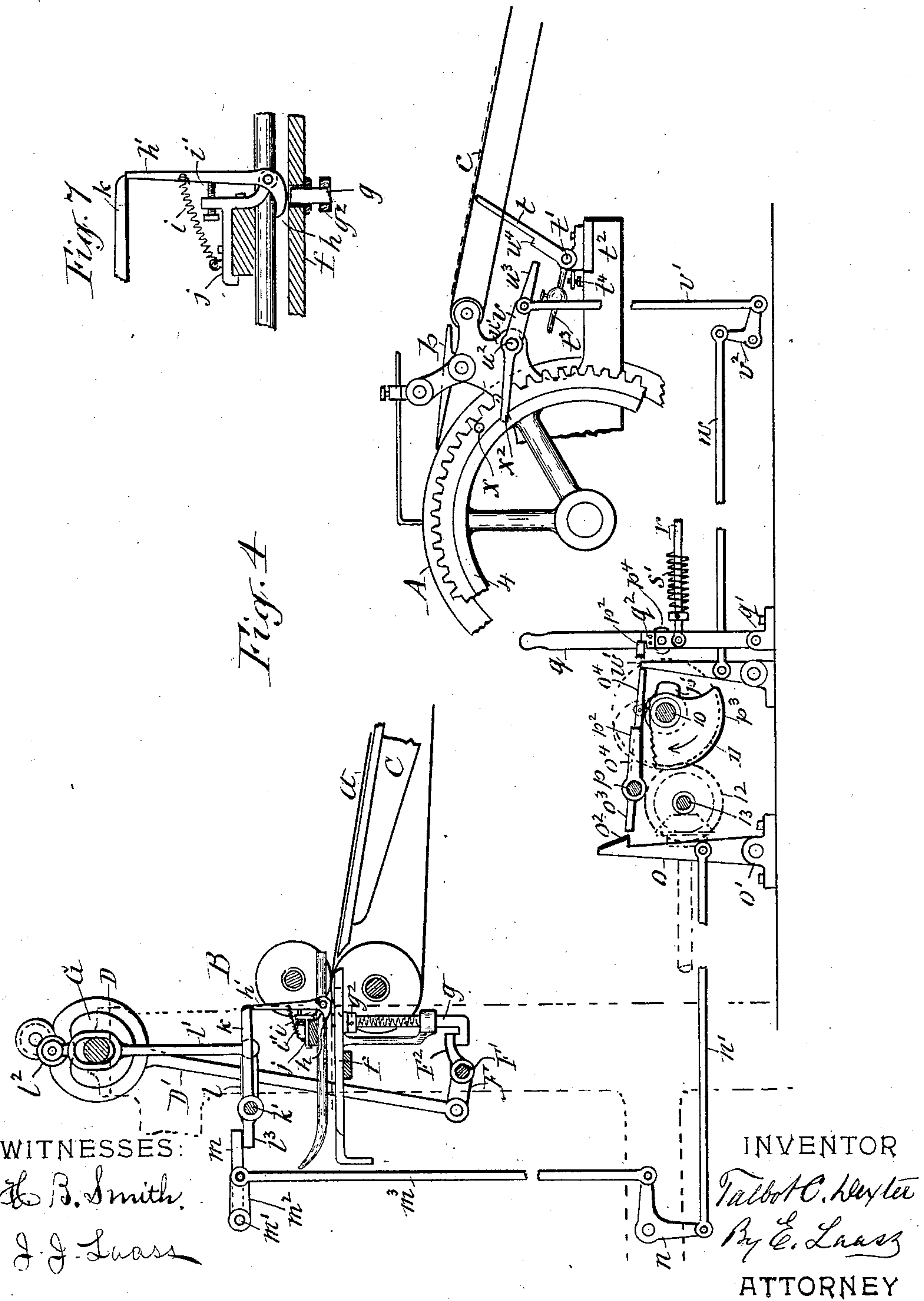
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7 Sheets—Sheet 4.



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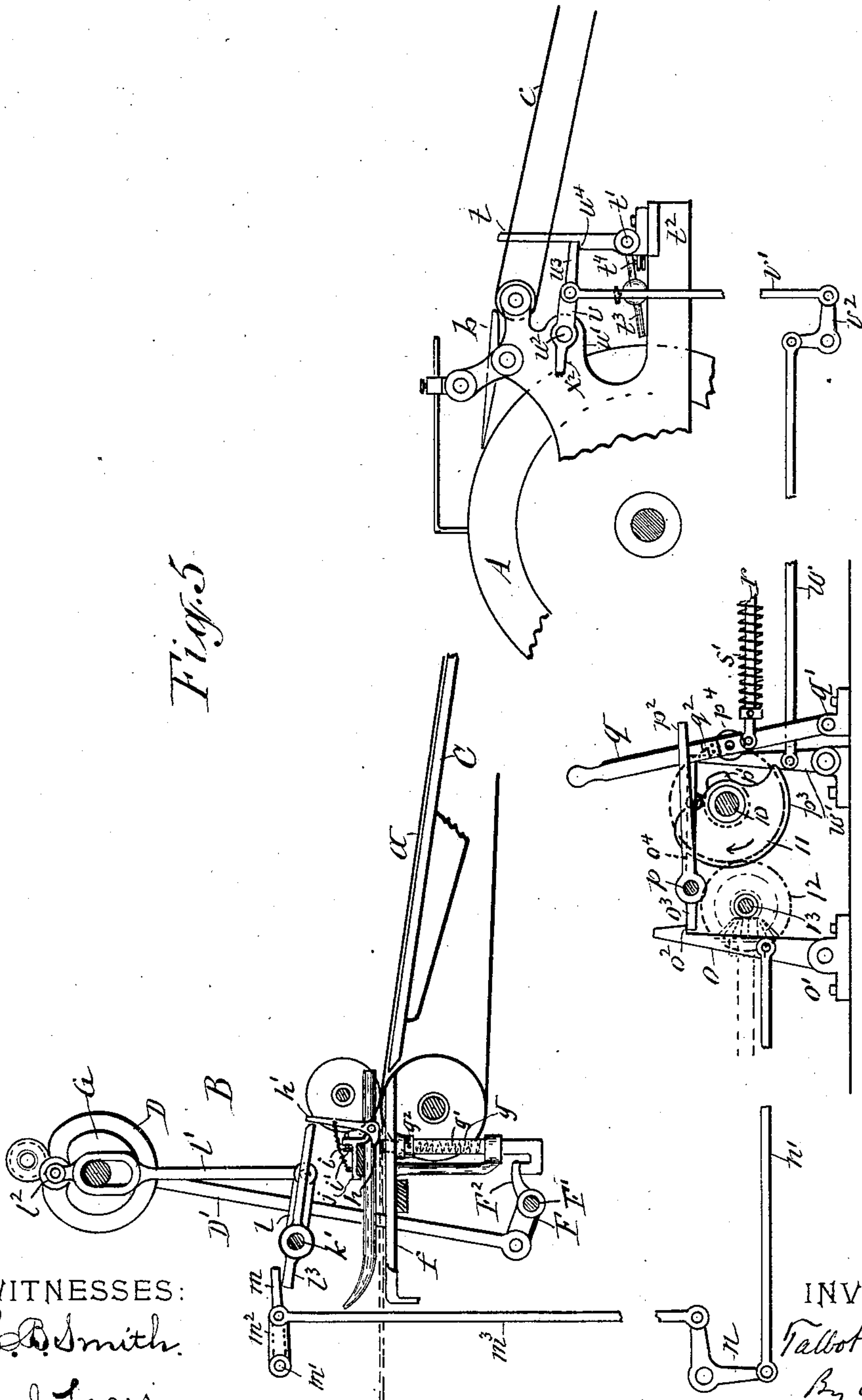
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(No Model.)

7 Sheets—Sheet 5.



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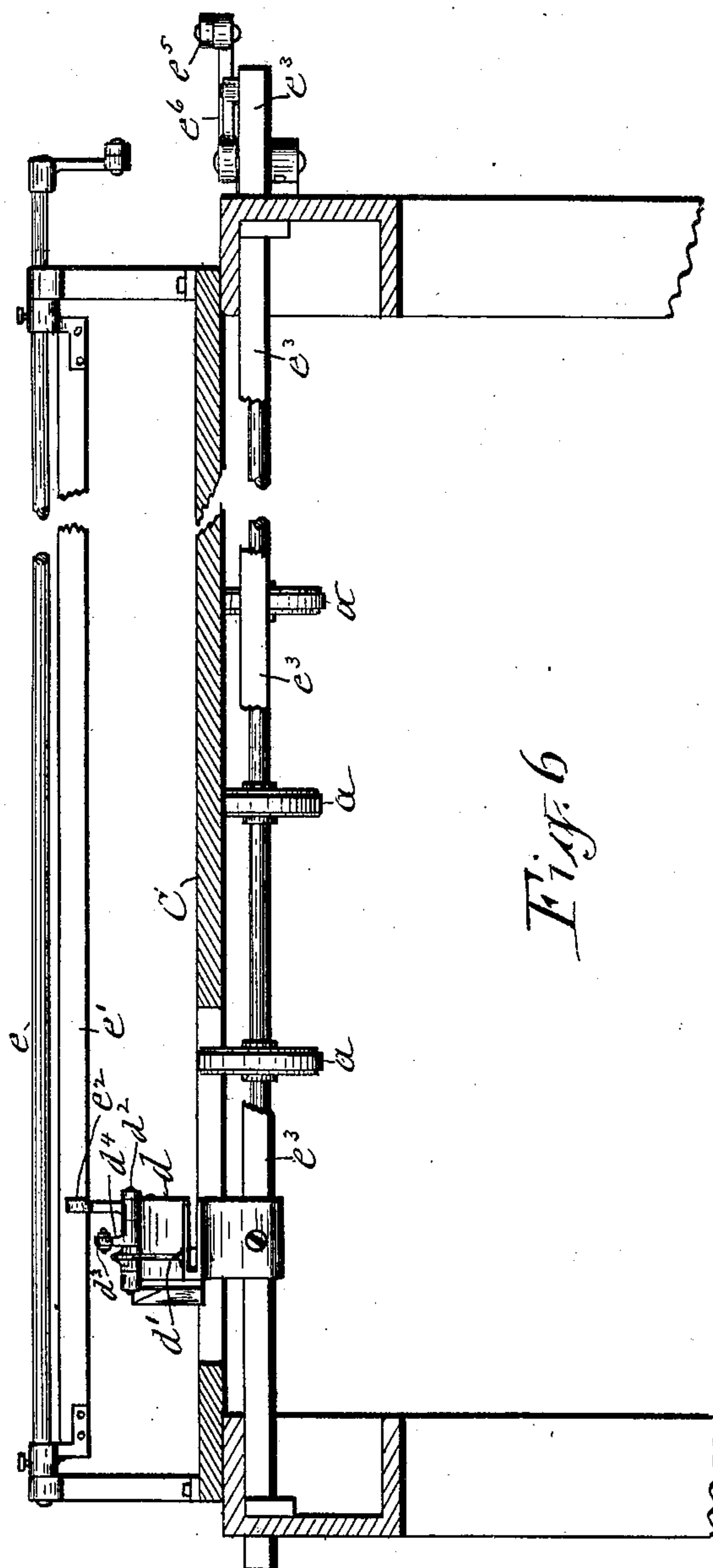
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(Application filed July 27, 1900.)

(No Model.)

7 Sheets—Sheet 6.



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(No Model.)

7 Sheets—Sheet 7.

Fig. 8

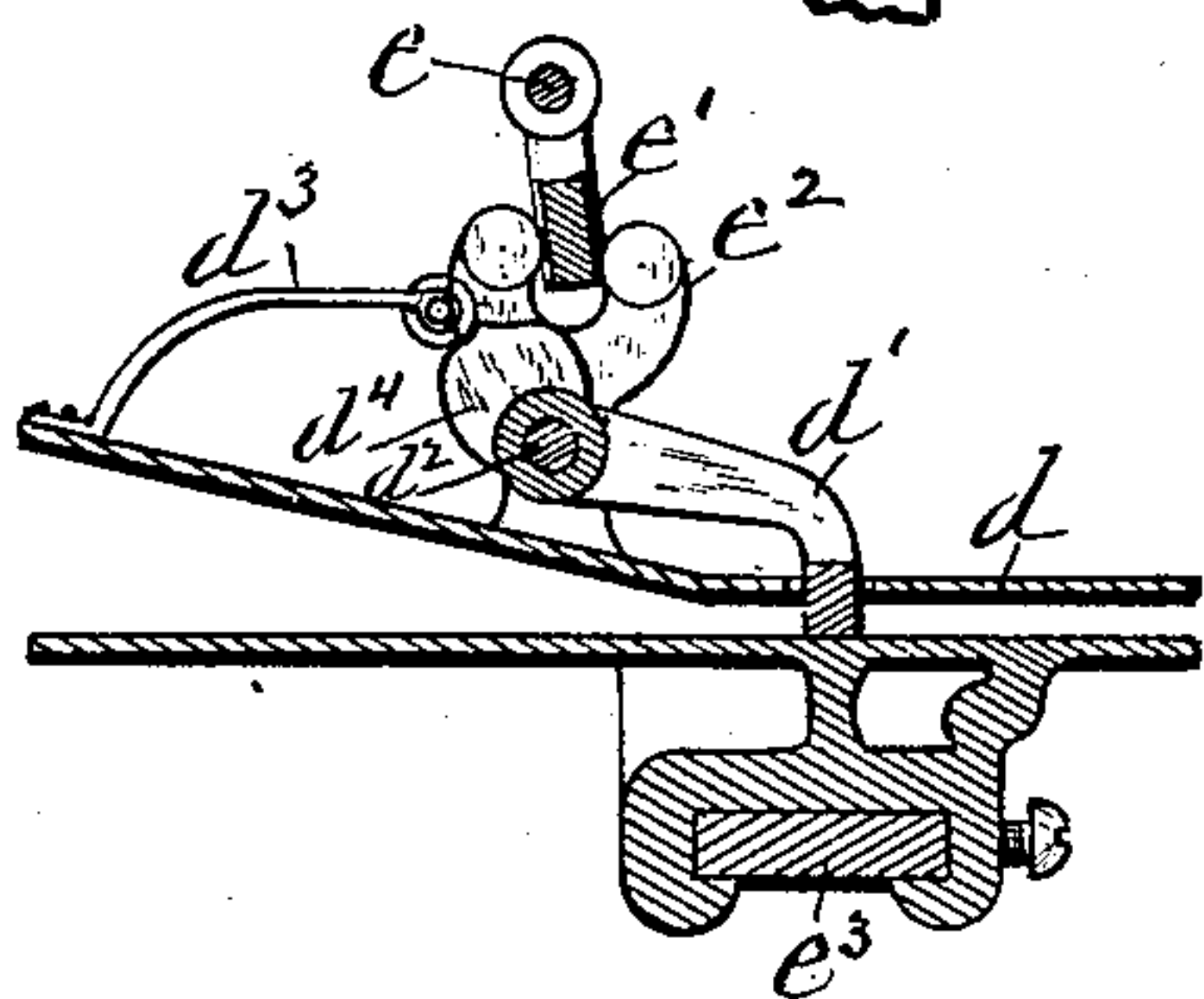
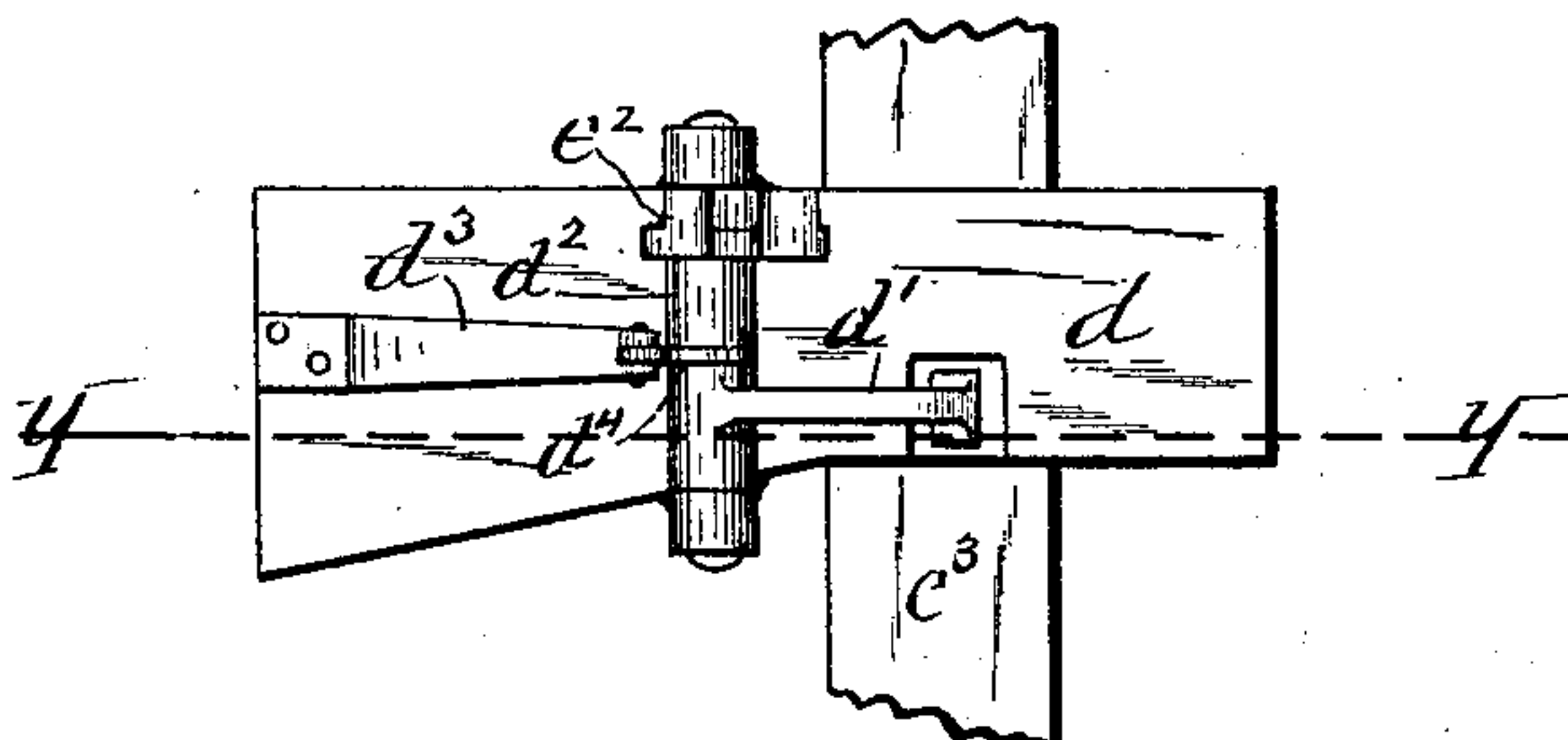


Fig. 9

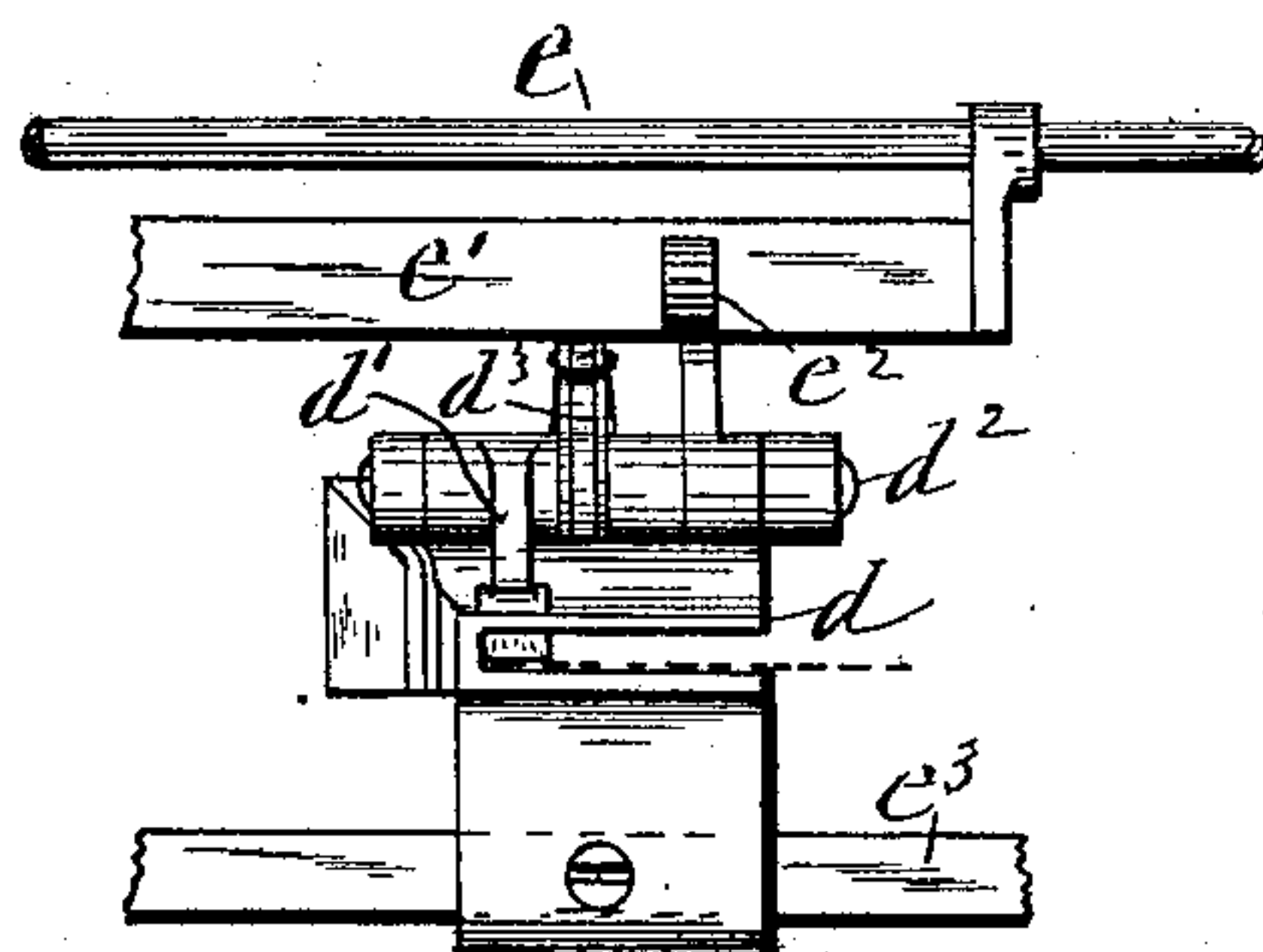


Fig. 10

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UNITED STATES PATENT OFFICE.

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

PROTECTIVE MECHANISM FOR PRINTING-PRESSES, &c.

SPECIFICATION forming part of Letters Patent No. 673,114, dated April 30, 1901.

Application filed July 27, 1900. Serial No. 24,965. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, and a resident of Pearl River, in the county of Rockland, in the State of New York, have invented new and useful Improvements in Protective Mechanism for Printing-Presses, &c., of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to paper-feeding machines and conveyers delivering the paper from said machines to printing-presses or other machines designed to operate on one sheet at a time and requiring the sheet to be properly registered or alined preparatory to being operated on.

Prior to my present invention I have devised various means for automatically stopping the feeding-machine in case of a failure of its properly feeding from it one sheet at a time. However, in applying such stopping devices to feeding-machines which deliver the sheet to conveyers carrying said sheet to a printing-press I have experienced some difficulty arising from the fact that the sheet in transit has to be side-registered or alined before it is taken by the grippers of the impression-cylinder, and inasmuch as the registering instrument is located adjacent to the impression-cylinder there are always two sheets in transit between the feeding-machine and the registering instrument. This instrument deriving motion from the actuating mechanism of the feeding-machine causes said instrument to be stopped simultaneously with the feeding-machine, while the conveying-tapes continued to operate and carried to the impression-cylinder the sheets which have been left unregistered back of the dormant registering instrument. These sheets being seized by the grippers of the impression-cylinder and carried through the press causes said sheets to be printed far out of register owing to the failure of the necessary preliminary registering of the sheet. It is these defects which my present invention is designed to obviate; and to that end the invention consists in the improved combination of mechanisms which coöperate to produce the desired result, as hereinafter described.

In the accompanying drawings, Figure 1 is

a side elevation of a printing-press with a feeding-machine connected thereto and equipped with my present invention. Fig. 2 is an enlarged side view of said press and delivery end of said feeder and showing the automatic stop mechanisms. Fig. 3 is a plan view of same. Figs. 4 and 5 are enlarged detail views showing my invention in different operative positions. Fig. 6 is an enlarged vertical transverse section on line X X in Fig. 3. Fig. 7 is an enlarged side view of the calipering devices. Fig. 8 is an enlarged detached plan view of the registering-gripper. Fig. 9 is a vertical longitudinal section on line Y Y in Fig. 8, and Fig. 10 is an end view of said gripper.

Similar characters of reference indicate corresponding parts.

A represents the impression-cylinder of a printing-press, which may be of any well-known style. B designates a paper-feeding machine, which may also be of any suitable construction.

C is the prolonged feed-board, extending from the feeding-machine to the impression-cylinder.

aa represent endless tapes running lengthwise of the feed-board to carry the paper from the feeding-machine to the impression-cylinder, which is provided with the usual grippers for drawing the paper from the delivery end of the feed-board onto said impression-cylinder.

bb are the usual fingers, which pick the printed sheet from the impression-cylinder and conduct said sheet either onto tapes *cc* or onto a "fly." (Not shown in this case.)

d denotes a laterally-movable gripper which is located in the path of the paper, near the delivery end of the feed-board, for the purpose of seizing the side margin of the paper and drawing the paper sidewise to its requisite register preparatory to passing to the impression-cylinder A. This gripper or registering instrument may be of any suitable construction, preferably of the style shown in my Letters Patent No. 599,319, dated February 22, 1898. It consists, essentially, of the shoe *d*, disposed to receive the side margin of the paper through it. The top plate of said shoe is provided with an aperture through which plays the gripper-finger *d'*, fastened to a rock-

shaft d^2 , mounted in bearings on top of the shoe d , as shown more clearly in Figs. 8, 9, and 10 of the drawings. A spring d^3 , bearing on a lug d^4 , projecting from the shaft d^2 , imparts a snap action to the gripper-finger. This finger receives vertical movement from a rock-shaft e , to which is attached a plate e' , playing between two arms of a tumbler e^2 , fastened to the shaft d^2 . The shoe d is mounted on a transverse bar e^3 , which receives intermittent reciprocating motion from a cam e^4 , imparting longitudinal movement to a rod e^5 , which is connected to one arm of a bell-crank e^6 , whose other arm is connected to the bar e^3 , which carries the gripper inward to a position to allow the paper to pass through the shoe d and the gripper-finger to seize the paper, the bar e^3 then moving outward and causing the gripper-finger to draw the paper to registering position.

The feeding-machine B, the tapes a , the impression-cylinder A, and registering-gripper d are all operated in common by mechanisms transmitting motion from the main driving-shaft, said mechanisms consisting, preferably, of a gear 2 on the main driving-shaft 1 engaging a gear 3 on the printing-press, which latter gear meshes with a gear 4 on the shaft of the impression-cylinder A. A train of gears 5 6 7 8 transmits motion from the gear 3 to a gear 9, mounted on a horizontal shaft 10. Another gear 11 on this shaft meshes with a gear 12, fastened to a counter-shaft 13, to which also is secured a miter-gear 14, engaging a similar gear 15, fastened to the end of a shaft 16, which extends to the feeding-machine B, where it has secured to it another miter-gear 17, meshing with a corresponding gear 18, which is fastened to the lower end of a vertical shaft 19, supported in suitable bearings on the frame of the feeding-machine. To the upper end of the shaft 19 is attached a miter-gear 20, engaging a similar gear 21, attached to a horizontal shaft 22 on the feeding-machine. By means of suitable gears (not shown) the main tape-rollers y and various mechanisms of the feeding-machine derive motion from the shaft 22, and inasmuch as the registering-gripper d is actuated by mechanism connected to the feeding-machine it is obvious that said gripper also derives its motion from the before-described actuating mechanism. To control this mechanism automatically, so as to arrest the motion thereof in case of failure of proper delivery of paper from the feeding-machine, I employ on said feeding-machine suitable automatic paper-calipering devices actuated by excessive thickness of paper starting from the feeding-machine, which excessive thickness is produced by accident of two or more sheets starting simultaneously from the feeding-machine. Said calipering devices I preferably form of a plate f , which is firmly sustained in a horizontal position and with its upper surface even with the plane of the feeding-path of the paper. Through the plate

f passes the upper end of the calipering-bolt g , which is forced upward, so as to cause it to protrude at the top of the plate, by means of a spring g' , said upward movement being limited by a collar g^2 , attached to the bolt and coming in contact with the under side of the plate f , as shown in Figs. 4 and 5 of the drawings.

A rotary cam D imparts an intermittent reciprocating motion to a rod D', which is connected to a lever F, fastened to a shaft F', to which is also attached an arm F², engaging the calipering-bolt g and depressing the same during proper periods to allow the successive top sheets of the pile of paper in the feeding-machine to freely pass over the top of said calipering-bolt in the operation of starting the said sheets from the feeding-machine in the manner described in my Letters Patent No. 623,770, dated April 25, 1899.

Directly over the top of the calipering-bolt g is the calipering-nose h , which is pivoted to a suitable stationary support and is formed with an upwardly-extending prop h' . A suitable spring i draws the prop h' to an adjustable stop or set-screw i' , connected to a bracket j , as more clearly shown in Fig. 7 of the drawings. This serves to sustain the prop, with its calipering-nose h , in its normal position. The set-screw i' permits the calipering nose h to be accurately adjusted to allow a single sheet of paper to pass freely between said nose and subjacent calipering-bolt g without disturbing the prop h' from its normal position and yet hold the nose h in such proximity to the bolt g as to cause the prop h' to be thrown out of its normal position in case two sheets of paper pass simultaneously over the bolt g , the vertical movement of which bolt is timed to cause it to rise from the plane of the plate f as soon as the advance margin of the sheet has arrived over the top of the bolt. If, then, two sheets are accidentally over said bolt, the excessive thickness of the paper will cause the nose h to be lifted and the prop h' to be thrown out of its normal position.

Over the upper end of the prop h' is the free end of an arm k , attached to a shaft k' , which extends across the feeding-machine and supported in suitable bearings on the side frames of said machine. The shaft k' receives a properly-timed intermittent rocking motion by means of an arm l , attached to the end of said shaft and connected to a rod l' , suspended from and actuated by a rotary cam G, upon which rides a roller l^2 , pivoted to the rod l' . The arm l is formed with a rearwardly-projecting heel l^3 , directly over which is a lever m , fastened to a shaft m' , which is parallel with the shaft 1 and mounted in bearings on the side frames of the feeding-machine.

To one end of the shaft m' is fastened an arm m^2 , the free end of which is connected by a rod m^3 to one of the arms of a bell-crank n , pivoted to the lower portion of the frame of the feeding-machine. The other arm of the bell-crank n is connected by a rod n' to a latch

6, which is pivoted at its lower end to a firm support o' and is provided on its upper end with a hook o^2 , facing the free end of a rearward extension o^3 of a lever o^4 , fastened to a shaft p , which is supported in bearings in the sides of the stationary case H.

To the shaft 10, hereinbefore referred to, is secured a cam p' , which during the rotation of said shaft intermittently lifts the free end of the lever o^4 . Another lever p^2 , which I term the "detaining-lever," is fastened to the shaft p and has its free end extended toward the trip-lever q , which is pivoted at its lower end to a stationary block q' and has projecting from its side a shoulder q^2 in position to allow it to engage the free end of the detaining-lever p^2 when said lever is in its lowered position and the trip-lever q is pushed toward the free end of the detaining-lever, as represented in Fig. 4 of the drawings. This trip-lever q is connected by a rod r to one of the limbs of a bell-crank r' , the other limb of which is connected by a rod r^2 to a horizontal extension of the belt-shifting lever s .

A spring s' , interposed between the end wall of the case H and tripping-lever q , forces said lever toward the supporting-shaft p of the detaining-lever p^2 , and thereby actuates the belt-shifting lever s to throw the belt from the driving-pulley onto the loose pulley of the printing-press.

The operation of the described mechanisms is as follows: When the feeding-machine is in proper working condition and delivering regularly a single sheet from the pile of paper in said machine, the successive sheets pass freely between the calipering-nose h and the calipering-bolt g and thence to the tapes a , which carry the sheets to the impression-cylinder A of the press, where each sheet is momentarily arrested by the usual feed-gages a' , and while thus at rest the laterally-movable gripper d seizes the side margin of the sheet and draws the sheet toward one side and to register it for receiving the subsequent impression from the form in the press. The feed-gages a' then immediately rise and the grippers of the impression-cylinder seize the sheet and draw it onto said cylinder in the usual and well-known manner. During said operation of the feeding-machine the prop h' of the calipering instrument stands erect and in a position to cause the end of the arm k to rest upon the top of said prop, as shown in Fig. 4 of the drawings, and thus prevent the descent of said arm, which had previously been lifted by the movement of the rock-shaft k' , imparted to it by the cam G by means of the rod l' , connected to the arm l on the said rock-shaft, as hereinbefore described. The raised position of the arm k , resting upon the prop h' , causes the heel l^3 of the arm l to be held in a depressed position, and thus allows the overlying free end of the lever m to assume a correspondingly-depressed position. The arm m^2 being attached to the same shaft m' to which the lever m is fastened causes the connecting-

rod m^3 , bell-crank n , and rod n' to conjointly hold the latch o in a position to prevent the hook o^2 of said latch from engaging the lever extension o^3 , and thus allows the lever o^4 to be oscillated by the cam p' on the rotary shaft 10. Another cam p^3 is attached to the same shaft and shaped to intermittently bear on a roller p^4 , pivoted to the trip-lever q . The engagement of the cam with said roller forces the trip-lever in opposition to the force of the spring s' and to a position to cause the belt-shifting lever s to hold the belt on the driving-pulley of the printing-press. The cam p' is so disposed in relation to the cam p^3 as to allow the lever o^4 to descend after the cam p^3 has forced the trip-lever q to its aforesaid position. The detaining-lever p^2 moving with the lever o^4 is thereby carried to a position to engage the shoulder q^2 , and thereby retain the trip-lever in its aforesaid forced position, and thus the belt is maintained on the driving-pulley.

In case the feeding-machine accidentally starts two sheets simultaneously from the pile, the excessive thickness of paper entering between the calipering-bolt g and the calipering-nose h , the upward thrust of said bolt lifts the nose h , and thereby tilts the prop h' from under the end of the rock-arm k , as represented in Fig. 5 of the drawings. Said arm is thus allowed to descend, and by the resultant upward movement of the heel l^3 of the arm l the lever m is lifted and caused to actuate the arm m^2 , rod m^3 , bell-crank n , and rod n' , so as to push the latch o to a position to engage by its hook o^2 the lever extension o^3 . This prevents the lever o^4 and detaining-lever p^2 from descending, and thus the trip-lever is allowed to be actuated by force of the spring s' as soon as said lever is released from the cam p^3 . The spring s' throws the trip-lever in a direction which causes the belt-shifting lever s to throw the belt onto the loose pulley, and consequently the entire actuating mechanism is stopped, and the main object of my invention is accomplished in that it prevents the grippers of the impression-cylinder from drawing into the press the sheets which are left unregistered upon the conveying-tapes a back of the registering-gripper d . The attendant of the machine can then remove the unregistered sheets and the sheets held in the calipering devices and then throw the trip-lever q into a position to again set the actuating mechanism in motion.

When my invention is applied to a front-delivery printing-press, I prefer to employ in addition to the hereinbefore-described tripping mechanism means for automatically arresting the actuating mechanism of the press and feeder in case the paper becomes clogged in its transit from the impression-cylinder in a manner similar to that shown in my prior application for Letters Patent, Serial No. 22,957, filed July 9, 1900. For this purpose I employ a detecting-finger t , fastened at one

end to a shaft t' , which extends across the front of the printing-press and mounted in suitable bearings on arms t^2 , extending from the frame of the press. By means of a weighted lever t^3 , extending from the shaft t' , the detecting-finger t is held in position to project, with its free end, above the plane of the tapes c , which convey the printed paper from the impression-cylinder, or above the free end of a fly-wheel when in position to receive the paper from the press. Said position of the finger t is determined by a suitable stop t^4 , which arrests the movement of the finger t in swinging to its erect position, as shown in Fig. 5 of the drawings.

To brackets u' on the press-frame are pivoted the ends of a transverse shaft u^2 , from one end of which projects an arm u^3 , which is adapted to rest upon a shoulder u^4 on the detecting-finger t when said finger is in its aforesaid erect position. To the end of the shaft u^2 is fastened an arm v , the free end of which is connected by a rod v' to one of the limbs of a bell-crank v^2 , pivoted to a suitable support at the base of the press-frame. The other limb of said bell-crank is connected by a rod w to a prop w' , pivoted to a stationary block w^2 and of the proper length and in a position to engage with its upper end the underside of the hereinbefore-described lever o^4 when lifted by the cam p' , said prop being movable to and from the aforesaid engaging position. The arm u^3 drops automatically when deprived of its bearing u^4 on the detecting-finger t , tilted by paper in transit on the tapes c , as represented in Fig. 4 of the drawings, said dropping of the arm u^3 causing the arm v , rod v' , bell-crank v^2 , and rod w to draw the prop w' from under the lever o^4 , and thus allows said lever free movement, which causes the trip-lever q to be held in position to maintain the driving-belt on the driving-pulley, as hereinbefore described.

In the operation of front-delivery presses it sometimes happens that the advance edge of the printed paper becomes caught on the ends of the usual fingers b which are arranged to strip the paper from the impression-cylinder. Such accident to the paper in transit from the impression-cylinder causes serious clogging of the press, and this is obviated by the hindrance of the paper from being carried away by the tapes c , allowing the detecting-finger t to stand erect and project above the plane of the tapes, as shown in Fig. 5 of the drawings, the arm u^3 being at regular intervals lifted to allow the detecting-finger to assume its aforesaid erect position and retain the arm u^3 in its lifted position by its engagement with the shoulder u^4 . When the arm u^3 is thus retained, the arm v , rod v' , bell-crank v^2 , and rod w hold the prop w' in position to cause the upper end thereof to pass under the lifted lever o^4 and prevent the same from descending. The trip-lever q is thus liberated from the detaining-lever p^2 and allowed to be actuated by the spring s' to throw the belt from

the driving-pulley to the loose pulley. The arm u^3 receives its properly-timed lifts by means of a lug x' on the gear 4 engaging a rearwardly-extending arm x^2 , which may be integral with the arm v .

What I claim as my invention is—

1. The combination, with a printing-press, a paper-feeder automatically supplying the paper to the press, and means for actuating said press and feeder in common, of paper-calipering devices actuated by excessive thickness of paper starting from the feeder, and mechanism movable to and from a position to arrest the aforesaid actuating means, and controlled by the action of the calipering devices as set forth.

2. The combination with a printing-press, a paper-feeding machine, paper-conveyers leading from the feeder to the press, and a paper-registering instrument between said feeder and press, of mechanisms actuating said press, feeder, and conveyers in common, and means actuated by excessive thickness of the paper starting from the feeder and controlling the aforesaid actuating mechanisms as set forth.

3. The combination with a paper-feeder, paper-conveyers leading from said feeder, and a registering instrument disposed to operate on the paper carried on said conveyers, of mechanisms actuating said feeder, conveyers, and registering instrument in common, and means actuated by the paper in starting from the feeder and controlling the aforesaid actuating mechanisms as set forth.

4. The combination with a paper-feeder, conveyers leading from said feeder and prolonged to carry a plurality of sheets distributed lengthwise of said conveyers, and an instrument disposed in proximity to the delivery end of the conveyers and actuated to register the sheet sidewise, of mechanism actuating the feeder, conveyers, and registering instrument in common, stop mechanism movable to and from a position to arrest the actuating mechanism, and means actuated by the paper in starting from the feeder and controlling the stop mechanism as set forth.

5. The combination with a printing-press, a paper-feeder, paper-conveyers leading from the feeder to the press, and an instrument disposed to register the paper adjacent to the press, of mechanisms actuating said press, feeder, conveyers, and registering instrument in common, paper-calipering devices actuated by excessive thickness of paper started from the feeder, stop mechanism movable to and from a position to arrest the aforesaid actuating mechanism, and a rock-arm actuating said stop mechanism and controlled by the calipering devices as set forth.

6. The combination with a printing-press, a paper-feeder, paper-conveyers leading from the feeder to the press, and an instrument disposed to register the paper adjacent to the press, of mechanisms actuating said press, feeder, conveyers, and registering instrument

in common, a trip-lever sustained normally
in position to arrest said actuating mechanism, a cam forcing said lever from its said
normal position, a detaining-lever movable to
5 and from a position to confine the trip-lever
in its forced position, mechanism actuating
said detaining-lever, a latch adapted to hold
the detaining-lever out of operative position,
paper-calipering devices actuated by excessive
10 thickness of paper starting from the
feeder, and mechanism actuating the latch
and controlled by the calipering devices, as
set forth.

7. The combination, with a printing-press,
15 a paper-feeder, paper-conveyers leading from
the feeder to the press, and an instrument disposed
to side-register the paper adjacent to
the press, of mechanisms actuating said press,
feeder, conveyers, and registering instrument

in common, a trip-lever for throwing the ac- 20
tuating mechanism in and out of action, a
spring forcing said lever in a direction to arrest
the said actuating mechanism, a cam
forcing said lever in the opposite direction,
a detaining-lever movable to and from a po- 25
sition to engage the trip-lever in its cam-
forced position, a cam intermittently throwing
said detaining-lever out of engaging position,
a latch adapted to hold the detaining-
30 lever in the last-mentioned position, paper-
calipering devices actuated by excessive
thickness of paper starting from the feeder,
and mechanism actuating the latch and controlled
by the calipering devices as set forth.

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Witnesses:

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EUGENE KETCHUM.