

No. 680,967.

Patented Aug. 20, 1901.

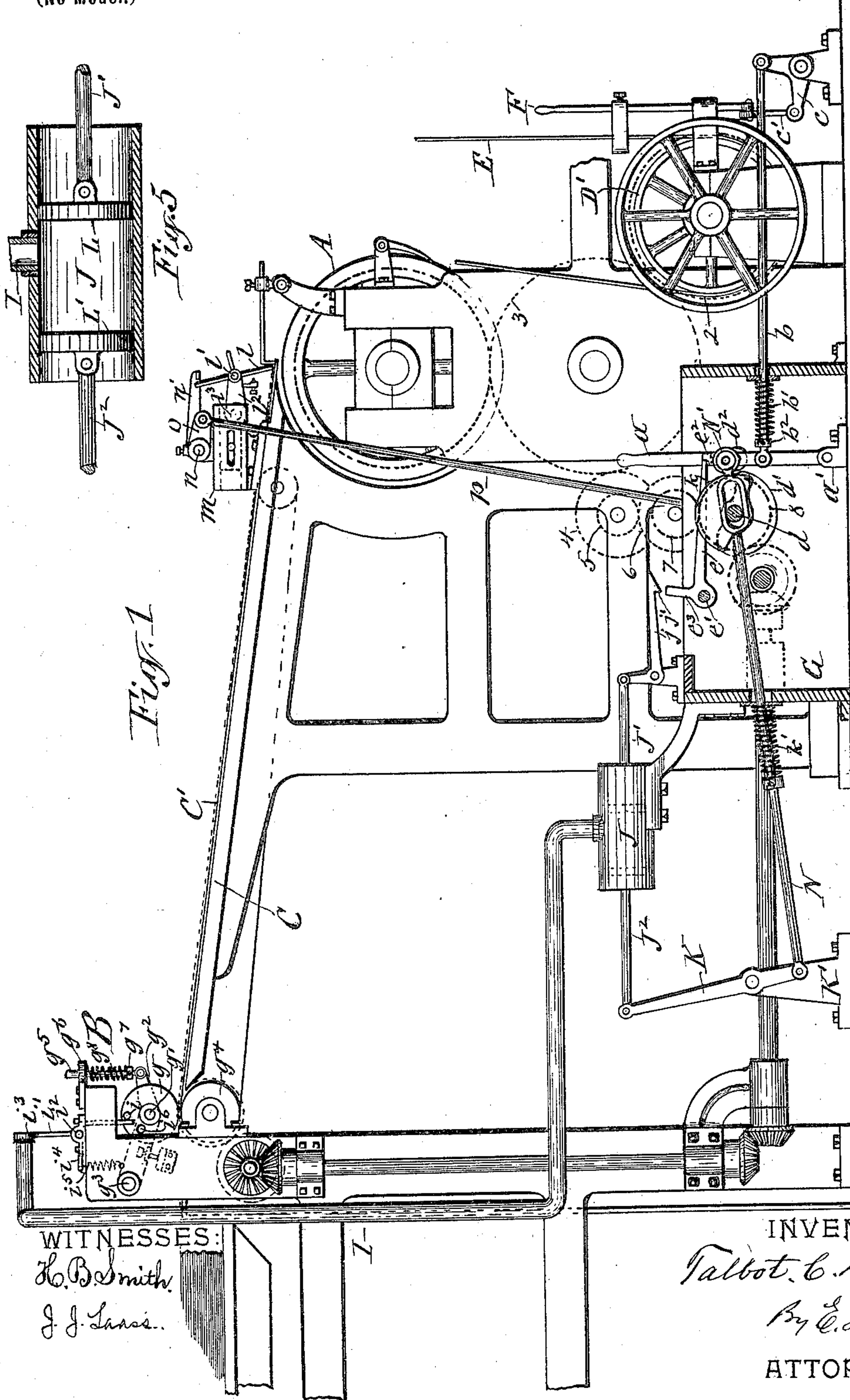
T. C. DEXTER.

AUTOMATIC PROTECTOR FOR PRINTING PRESSES.

(Application filed Sept. 11, 1900.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

H. B. Smith.

J. J. Laas.

INVENTOR

Talbot C. Dexter

By E. Laas

ATTORNEY

No. 680,967.

Patented Aug. 20, 1901.

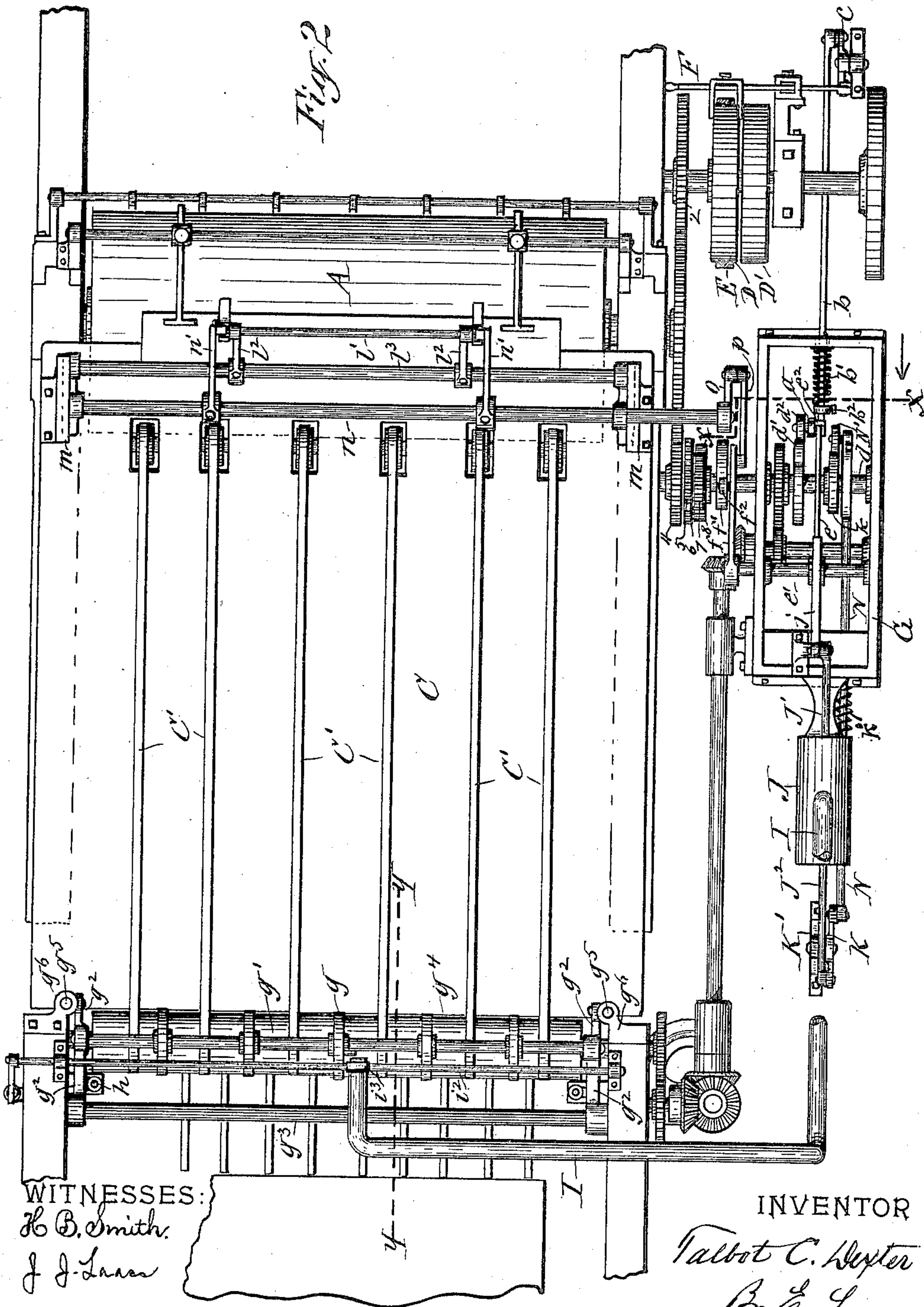
T. C. DEXTER.

AUTOMATIC PROTECTOR FOR PRINTING PRESSES.

(Application filed Sept. 11, 1900.)

(No Model.)

4 Sheets—Sheet 2.



WITNESSES:
H. B. Smith.
J. J. Lasee

INVENTOR
Talbot C. Dexter
By E. Lasee
ATTORNEY

No. 680,967.

Patented Aug. 20, 1901.

T. C. DEXTER.
AUTOMATIC PROTECTOR FOR PRINTING PRESSES.

(Application filed Sept. 11, 1900.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 3

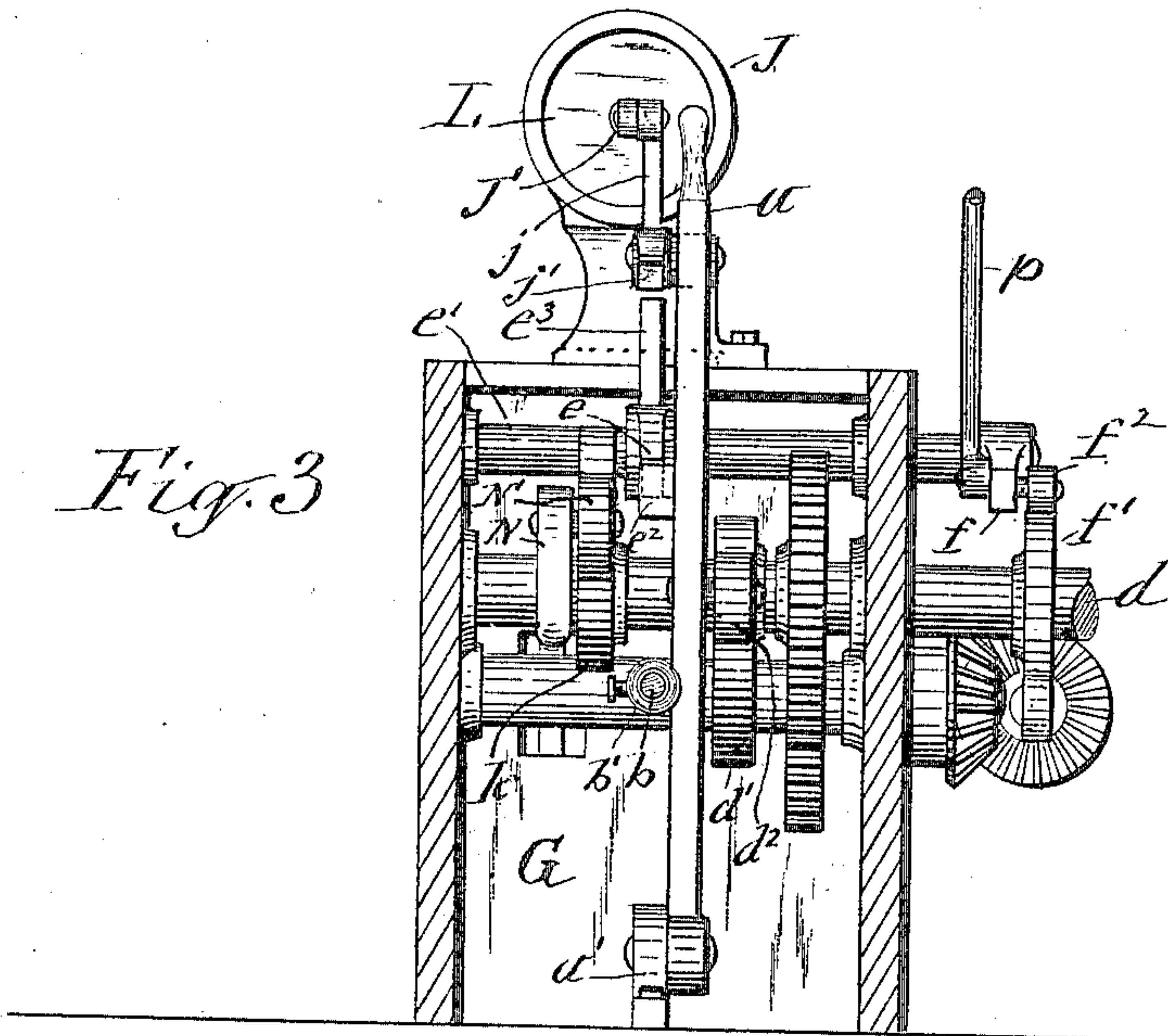
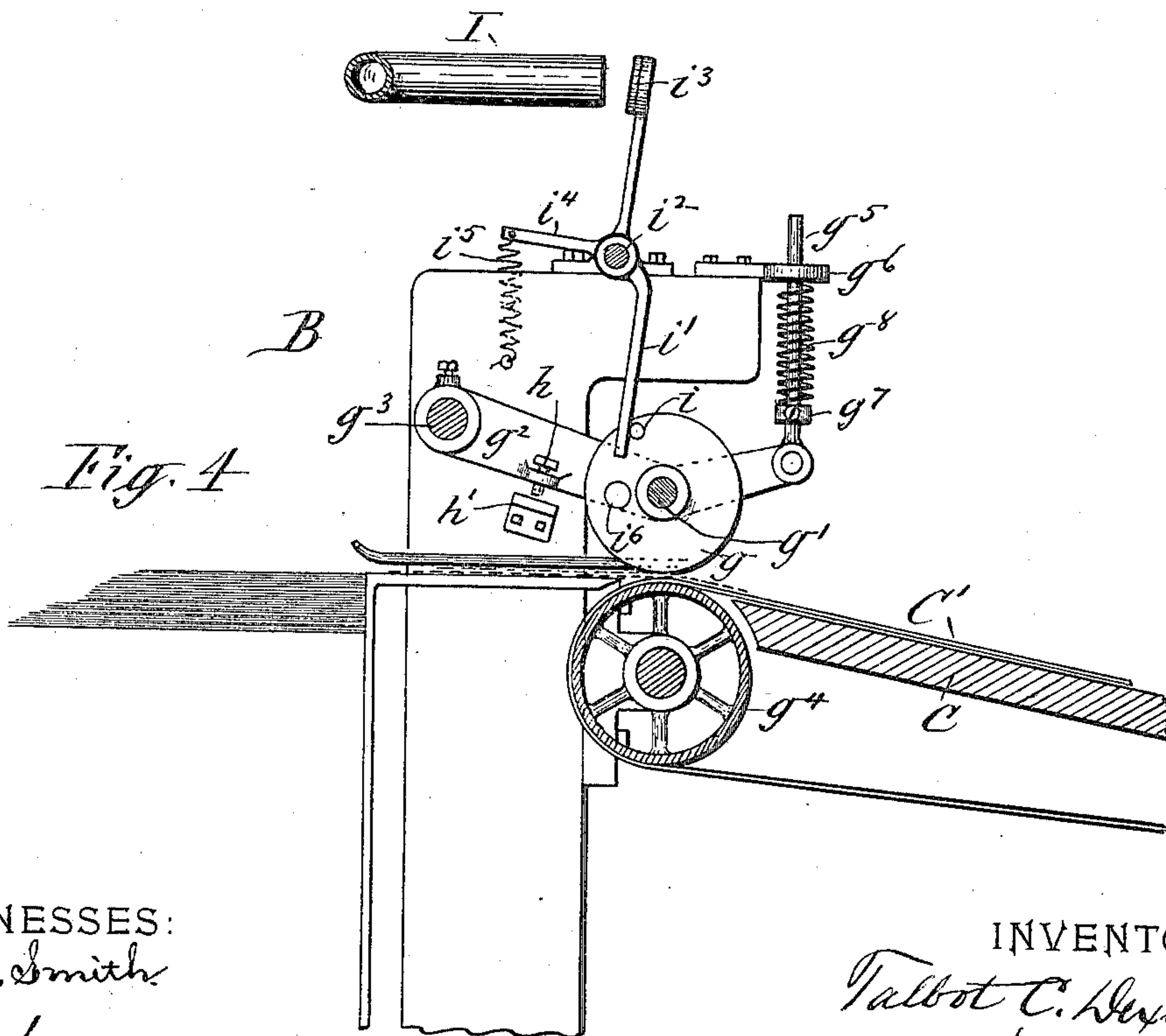


Fig. 4



WITNESSES:

H. B. Smith

J. J. Lacey

INVENTOR

Talbot C. Dexter

By E. Lacey

ATTORNEY

No. 680,967.

Patented Aug. 20, 1901.

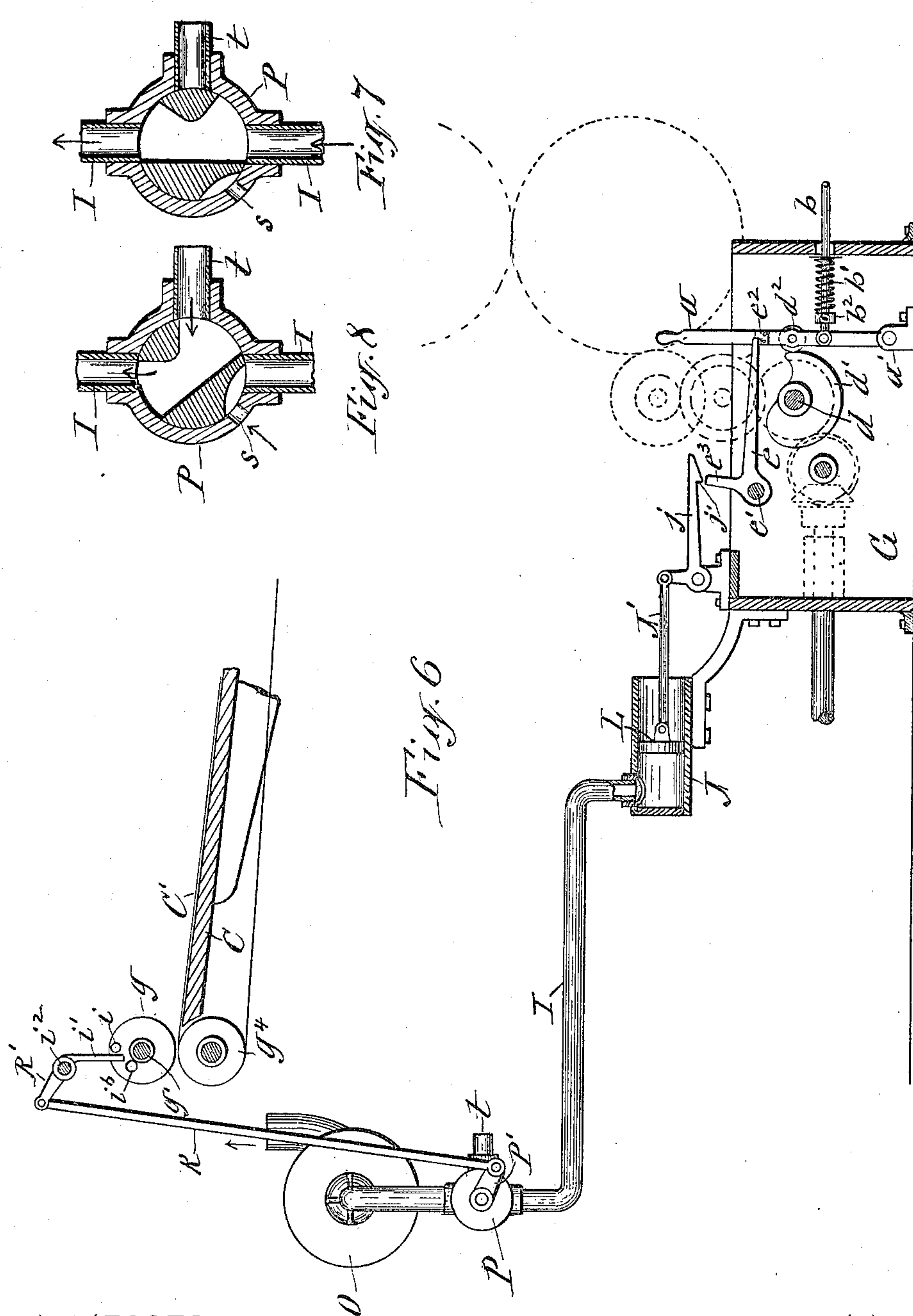
T. C. DEXTER.

AUTOMATIC PROTECTOR FOR PRINTING PRESSES.

(Application filed Sept. 11, 1900.)

(No Model.)

4 Sheets—Sheet 4.



WITNESSES:
H. P. Smith.
J. J. Laase

INVENTOR
Talbot C. Hexter
By *E. Laess*
ATTORNEY

UNITED STATES PATENT OFFICE.

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

AUTOMATIC PROTECTOR FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 680,967, dated August 20, 1901.

Application filed September 11, 1900. Serial No. 29,632. (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 Automatic Protectors for Printing-Presses, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to devices employed for automatically preventing injury to the impression-cylinder and to the form on the press-bed of printing-presses equipped with automatic paper-feeders.

The purpose of the invention is to provide simple and efficient means for quickly and positively stopping the operation of the printing-press and feeder in case said feeder either fails to supply the paper to the press or accidentally starts two or more sheets simultaneously from the pile of paper deposited in the feeder; and to that end the invention consists, chiefly, in the combination, with the printing-press, its paper-supplying feeder, and mechanisms actuating said press and feeder, of a stop mechanism controlling said actuating mechanism, a pneumatic tripper controlling said stop mechanism, a valve controlling said tripper, and an instrument disposed to be actuated by the paper passing from the feeder and governing said valve, all as hereinafter more fully described.

In the annexed drawings, Figure 1 is a side elevation of a printing-press equipped with an automatic paper-supplying feeder and with my improved means for controlling and protecting said press. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged vertical transverse section on line xx in Fig. 2. Fig. 4 is an enlarged detached side view of the paper-calipering devices, with the means for governing the valve of the pneumatic controller of the press and feeder. Fig. 5 is an enlarged detached longitudinal section of the air-cylinder of the pneumatic controller. Fig. 6 is a side elevation of a modification of my invention, and Figs. 7 and 8 are enlarged transverse sections of the valve employed in connection with said modification and shown in its different operative positions.

Similar characters of reference indicate corresponding parts.

A represents the impression-cylinder of a two-revolution printing-press or other well-known style of press.

B denotes the feeder, which automatically supplies the paper to the press and which may be of any suitable construction and is therefore only partly shown.

C denotes the feed-board, and C' are the endless tapes which convey the paper from the feeder to the impression-cylinder.

D and D' represent the fast or driving pulley and loose pulley, respectively.

E is the driving-belt, and F the hand-lever by means of which the belt is shifted for starting and stopping the press and feeder.

To shift the belt from the driving-pulley onto the loose pulley automatically, a suitable mechanism is employed, preferably of the following construction, to wit: An automatic belt-shifting lever a is pivoted at its lower end to a stationary block a' and is connected by a rod b to one of the arms of a bell-crank c , whose other arm is connected by a rod c' to a horizontal extension of the ordinary belt-shifting lever F. The lever a is arranged in a stationary case G, which incloses the principal stop mechanism. A spiral spring b' surrounds the portion of the rod b adjacent to the lever a and abuts with one end against the inner side of the case G and with the opposite end against a collar b^2 , adjustably secured to said rod. By the expansive force of said spring the lever a is thrown in a direction which causes the belt E to be shifted from the driving-pulley D onto the loose pulley D' . Horizontally across the case G extends a shaft d , to which is fastened a cam d' , arranged to engage a roller d^2 , pivoted to the lever a . The shaft d receives rotary motion from a gear 2, attached to the shaft of the driving-pulley D. Said motion may be transmitted by any suitable means, preferably by a train of gears, as indicated by dotted lines 3, 4, 5, 6, 7, and 8 in Fig. 1 of the drawings. The rotation of the shaft d causes the cam d' to periodically push the lever a in opposition to the spring b' and to a position which causes the belt E to be shifted onto the driving-pulley

D. To retain said lever in its cam-forced position while the cam is turned away from the lever, a detaining-arm e is fastened to a rock-shaft e' , which carries said arm at a proper time to a position to engage a shoulder e^2 on the lever a . The rock-shaft e' is actuated by another arm f , fastened to said shaft and having pivoted to its free end a roller f^2 , which is directly over a cam f' , attached to the rotary shaft d , which cam lifts the arm f intermittently and during the period of the engagement of the cam d' with the lever a and allows the arm f to drop in time to cause the synchronously-moving arm e to engage the shoulder e^2 on the lever a when the cam d' turns from the said lever. It is therefore obvious that by retaining said arms in their lifted positions the lever a is free to be actuated by the spring b' , which causes said lever to shift the belt from the driving-pulley onto the loose pulley, and thus stop the motion of the press and feeder. To effect the retention of the said arms f and e automatically in their lifted positions in case of the hereinbefore-mentioned defects of the operations of the feeder B, I employ two instruments, one of which is located at the feeder and effects the aforesaid retention by the accidental starting of two or more sheets simultaneously from the feeder, and the other instrument is placed near the delivery end of the feed-board and normally in the path of the paper and by its normal position causes said retention.

35 The instrument located at the feeder consists of a suitable paper-calipering member g , sustained normally in position to allow a single sheet of paper to pass freely under said member and yielding to the pressure of excessive thickness of paper entering under said calipering member. I preferably form said member of a roller pivotally supported on a transverse shaft g' , which is mounted at its end in arms g^2 , secured to a shaft g^3 , extending across the feeding-machine and mounted in bearings on the side frames of said machine. The roller g is sustained normally in a position to allow a single sheet of paper to freely pass between said roller and the sub-

50 jacent tape-roller g^4 and to be turned by frictional contact with the excessive thickness of two or more sheets advanced simultaneously from the pile of paper and entering between the rollers g and g^4 . The roller g is adjusted to its said normal position by means of set-screws h , adjustably connected to correspondingly-screw-threaded ears on the arms g^2 and resting on lugs h' , projecting from the sides of the feeder-frame, as more clearly

60 shown in Fig. 4 of the drawings, which shows the roller g lifted from its aforesaid normal position by two sheets of paper passing simultaneously under said roller. To insure sufficient frictional contact of the roller with the top of the two sheets of paper to cause the roller to be turned by the movement of the paper, each of the arms g^2 is formed

with a forward extension, to which is connected an upwardly-extending rod g^5 , passing through a guide-plate g^6 , attached to the feeder-frame. Beneath this guide-plate is a collar g^7 , adjustably secured to the rod, and between said plate and collar is interposed a spiral spring g^8 , which exerts a downward pressure on the arm g^2 . From the side of the roller g projects a pin or lug i , which is arranged to press on the front of the lower end of a lever i' , fastened to a shaft i^2 , which extends across the feeder and is mounted in bearings on the sides of the feeder-frame. This lever i' I employ for governing the valve of a pneumatic tripper which controls the aforesaid stop mechanism. For this purpose I preferably form the lever i' with an upward extension, to the free end of which is attached a valve i^3 , facing the mouth of an air-pipe I, as shown in Figs. 1, 3, and 4 of the drawings. To the end of the shaft i^2 is fastened a rearwardly-projecting arm i^4 , to the free end of which is connected a spring i^5 , the opposite end of which is secured to the feeder-frame. This spring causes the valve i^3 to be pressed tightly onto the mouth of the pipe I when the roller g is in its normal position, in which position said roller is permitted to be turned back by the pressure of the lever i' against the lug i . A boss i^6 on the side of the roller g is arranged to come in contact with the lever i' during the reverse movement of the roller g , and thus limit said movement. The pipe I is extended to and communicates with a cylinder J, at or near the center of the length thereof, as shown in Figs. 1 and 5 of the drawings. This cylinder is open at its ends, and in opposite ends are pistons L and L', one of which is connected by a rod J' to an arm extending from a latch or tripper j , pivoted to a suitable support on the stationary case G, which tripper is provided with a hook j' or other suitable catch, adapted to engage an arm e^3 , extending upward from the pivoted end of the detaining-arm e hereinbefore described. The piston L' in the opposite end of the cylinder is connected by a rod J² to the upper end of a lever K, pivoted intermediate its ends to a suitable stationary support K'. To the lower end of the lever K is connected a rod N, which is extended into the case G, and is formed at its inner end with a longitudinal slot straddling the shaft d , so as to be supported thereon. To this end of the rod N is pivoted a roller N', which bears on a cam k , rigidly mounted on the shaft d . The rotation of this cam, in conjunction with a spring k' , pushing the rod to maintain the roller N' on said cam, imparts reciprocating motion to said rod, and this motion is transmitted to the piston-rod J' by the lever K. The resultant reciprocating motion of the piston L' causes the air to be exhausted from the cylinder during the movement of said piston from the other piston L, and in case the pipe I is closed by the valve i^3 the aforesaid

exhaust causes the piston L to follow the piston L', and by this movement the latch or tripper *j* is lifted to prevent it from engaging the arm *e*³ of the detaining-arm *e*, which is thus allowed to drop to a position to engage the shoulder *e*² on the automatic belt-shifting lever *a*, and thereby retain said lever in position to maintain the belt on the driving-pulley D. It will be observed that this release of the detaining-arm *e* is effected when the calipering member or calipering-roller *g* is in its normal position, which allows the valve *v*³ to be forced to its closed position on the pipe I by the spring *v*⁵. Hence the press and feeder continue in action when the paper is properly advanced one sheet at a time from the feeder. The closing of the valve *v*³, as aforesaid, cuts off the air from the cylinder J, and thus causes the piston L to follow the piston L' in its reciprocating movement, which movement is timed with relation to the cam *d'* to allow the tripper *j* to drop only at the time when said cam forces the lever *a* to a position to maintain the driving-belt on the tight pulley. If, however, said feeder happens to advance two or more sheets of paper simultaneously, the frictional contact of the roller *g* with the top of the excessive thickness of paper causes said roller to turn and move the valve *v*³ from the mouth of the pipe I by the engagement of the lug or pin *i* with the lever *v'*, carrying said valve. This allows the air to pass through said pipe and to the cylinder J, and consequently prevents the piston L' from producing the necessary vacuum in the cylinder to move the piston L, which is thereby allowed to be drawn to its normal position by gravity of the tripper *j*, which drops into engagement with the arm *e*³ of the detaining-arm *e*, while lifted by the cam *f'*, as hereinbefore described. This retention of the arm *e* in its elevated position while the cam *d'* is turned from the lever *a* allows said lever to be actuated by the spring *b'* and thrown thereby into a position which causes the belt E to be shifted onto the loose pulley D', and thus stop the motion of the press and feeder.

I do not limit myself specifically to the hereinbefore-described detail construction of the pneumatic tripper and its controlling-valve, as the same admits of several modifications. The essential feature of my invention resides in the combination, with a printing-press, a paper-feeder supplying paper to said press, mechanisms operating said press and feeder, and a stop mechanism controlling said actuating mechanisms, of a pneumatic tripper controlling the stop mechanism, a valve controlling the tripper, and an instrument disposed to be actuated by the paper passing from the feeder and controlling the valve.

An exemplification of one of the aforesaid modifications is illustrated in Figs. 6, 7, and 8 of the drawings, in which the cylinder J is provided with a single piston L and is closed

at one end and has extending from said end an exhaust-pipe I, which is connected either to an exhaust-fan O or to a suitable exhaust-chamber. A two-way cock P, clearly shown in Figs. 7 and 8 of the drawings, is connected to the pipe I, and a lever P', attached to said cock, is connected by a rod R to an arm R', attached to the end of the shaft *v*² to which is attached the lever *v'*, which is actuated by the calipering-roller *g*, as hereinbefore described. Said cock thus performs the same function as the valve *v*³ (shown in Figs. 1 and 4 of the drawings) and is controlled by substantially the same means. In case the calipering-roller *g* is turned by contact with excessive thickness of paper advanced from the pile in the feeder, the lever *v'* is actuated by said roller and caused to turn the two-way cock P into the position shown in Fig. 8 of the drawings, in which position the air is drawn through the side inlet *t* and the suction is cut off from the pipe I. At the same time air is admitted through a port *s* in the valve-case and through a passage in the valve, and thence through the pipe to the cylinder J. The piston L is thus relieved from suction and allowed to be drawn to its normal position by gravity of the tripper *j*, which drops into engagement with the upper end of the arm *e*³ of the detaining-arm *e*, which is thereby prevented from dropping into position to engage the shoulder *e*² of the lever *a*. This release of said lever allows it to be actuated by the spring *b'*, which causes the belt to be shifted onto the loose pulley and stop the action of the press and feeder.

In addition to the paper-calipering devices for arresting the actuating mechanism of the feeder by the excessive thickness of two or more sheets of paper accidentally advanced simultaneously from the feeder, it is also desirable to provide means for automatically arresting the actuating mechanism in case the feeder fails entirely to advance the paper from the pile in said feeder. For this purpose I employ the feelers *l*, which are pivoted to a transverse shaft *l'*, supported in arms *l*², fastened to a shaft *l*³, adjustably secured to brackets *m*, mounted on the feed-board adjacent to the impression-cylinder A. A rock-shaft *n* is mounted at its ends on posts rising from the brackets *m*, and to said shaft are fastened arms *n'*, the free ends of which are adapted to come in contact with the tops of upward extensions of the feelers *l* when in their normal position, in which they rest with their lower ends upon the feed-board. To one end of the rock-shaft *n* is attached an arm *o*, which is connected at its free end by a rod *p* to the rock-arm *f*, which is actuated by the cam *f'* and controls the detaining-arm *e*, as hereinbefore described. The paper passing under the feelers *l* to the impression-cylinder tilts said feelers from their normal position, as represented in Fig. 1 of the drawings. This action of the feelers allows the rock-shaft *n*, with its arms *n'*, to be oscillated by

the cam f' , which also rocks the detaining-arm e and allows said arm to fall at the proper time into engagement with the automatic belt-shifting lever a , so as to maintain the belt on the driving-pulley. In case the feeder B fails to supply the paper to the impression-cylinder the feelers l remain in their normal position and cause the arms n' to come in contact with the tops of the upward extensions of the feelers. This arrests the motion of the rock-shaft and causes the detaining-arm e to be confined in its raised position and prevented from engaging the lever a , which is thus allowed to throw the belt from the driving-pulley onto the loose pulley, and consequently stops the action of the press and feeder.

What I claim is—

1. The combination with a paper-feeder and its actuating mechanism, of a stop mechanism controlling said actuating mechanism, a pneumatic tripper controlling the stop mechanism, a valve controlling said tripper, and an instrument disposed to be actuated by the paper passing from the feeder and governing the said valve.

2. The combination with a printing-press, an automatic paper-feeder, actuating mechanisms operating said press and feeder, and a stop mechanism controlling said actuating mechanism, of a lever controlling the stop mechanism, a tripper controlling said lever, a cylinder, a piston in said cylinder operating the tripper and actuated by vacuum in the cylinder, a valve controlling said vacuum, and an instrument disposed to be actuated by the paper passing from the feeder and governing said valve as set forth.

3. The combination with a printing-press, a paper-feeder supplying paper to said press, mechanisms operating said press and feeder, and a stop mechanism controlling said actuating mechanisms, of a pneumatic tripper controlling the stop mechanism, a valve controlling said tripper, and an instrument disposed to be actuated by the paper passing from the feeder and governing the valve as set forth.

4. The combination with a printing-press, its actuating mechanism and automatic paper-feeder delivering the paper to said press, of a paper-calipering member sustained movably in the direction of the travel of the paper from the feeder and in position to partake motion by frictional contact with excessive thickness of the paper in transit, stop mechanism controlling the actuating mechanism of the press, and a pneumatic tripper controlling the stop mechanism and governed by the aforesaid movement of the calipering member as set forth.

5. The combination with a printing-press, an automatic paper-feeder and mechanisms actuating said press and feeder in common, of a paper-calipering member pivotally supported in position to be turned by frictional contact with paper of excessive thickness advancing from the feeder, stop mechanism con-

trolling the movement of both the press and feeder, and a pneumatic tripper controlling the stop mechanism and governed by the turning of the calipering member as set forth.

6. The combination with a printing-press, an automatic paper-feeder, and mechanisms actuating said press and feeder, of a stop mechanism controlling said actuating mechanism, a tripper controlling the stop mechanism, a cylinder, a piston in said cylinder connected to the tripper, an air-conducting pipe extending from the cylinder, a valve for governing the air-passage through said pipe, a paper-calipering member pivotally supported in position to be turned by frictional contact with paper of excessive thickness advancing from the feeder, and a lever actuated by the turning member and governing the aforesaid valve.

7. The combination with a printing-press, an automatic paper-feeder and mechanisms actuating said press and feeder, of a stop mechanism controlling said actuating mechanism, a tripper controlling the stop mechanism, a cylinder, a piston in said cylinder connected to the tripper, means for exhausting the air from one end of the cylinder, a valve for controlling the exhaust, a paper-calipering member pivotally supported in position to be turned by frictional contact with paper of excessive thickness advancing from the feeder, and a lever actuated by the turning member and governing the aforesaid valve as set forth.

8. The combination with a printing-press, an automatic paper-feeder and mechanisms actuating said press and feeder, of a stop mechanism controlling said actuating mechanisms, a lever controlling said stop mechanism, an arm extending vertically from the pivoted end of said lever, a bell-crank having one of its arms provided with means for engaging and releasing the arm of the aforesaid controlling-lever, a cylinder, a piston in said cylinder connected to the other arm of the aforesaid bell-crank and normally in one end of the cylinder, means for exhausting the air from the cylinder at the rear of the piston and thereby draw said piston from its normal position, a valve for controlling the exhaust, a paper-calipering roller supported in position to be turned by frictional contact with paper of excessive thickness advancing from the feeder, and a lever actuated by the turning roller and governing the aforesaid valve as set forth.

9. The combination with a printing-press, an automatic paper-feeder and mechanisms actuating said press and feeder, of a stop mechanism controlling said actuating mechanism, a tripper controlling the stop mechanism, a cylinder, a piston in one end of said cylinder connected to the tripper, a piston in the opposite end of the cylinder, a lever connected to the last-named piston, a reciprocating rod connected to said lever, means for actuating said rod, a pipe extending from the

cylinder at a point between the pistons, a paper-calipering member pivotally supported in position to be turned by frictional contact with paper of excessive thickness advancing from the feeder, a lever actuated by the turning member, and a valve carried by said lever to and from the mouth of the aforesaid pipe as set forth.

10. The combination with a printing-press, automatic paper-feeder, mechanisms actuating said press and feeder in common, and the belt-shifting lever for starting and stopping said mechanisms, of an automatic belt-shifting lever, a horizontal shaft receiving motion from the aforesaid actuating mechanism, a spring forcing the automatic lever in a direction to stop the actuating mechanism, a cam on the aforesaid horizontal shaft forcing said automatic lever in opposition to the spring, a rock-arm movable to and from a position to retain the automatic lever in the cam-forced position, a tripper adapted to lock the rock-arm out of its retaining position, a cylinder, a piston in said cylinder connected to the tripper, means for exhausting air from the cylinder and thereby move the piston, a valve for controlling the exhaust, and a paper-calipering member disposed to be actuated by excessive thickness of paper advancing from the feeder and governing the aforesaid valve as set forth.

ated by excessive thickness of paper advancing from the feeder and governing the aforesaid valve as set forth.

11. The combination with a printing-press, automatic paper-feeder, mechanisms actuating said press and feeder in common, a lever controlling said mechanisms, a spring forcing said lever in one direction, a rotary cam forcing said lever in the opposite direction, a rock-arm movable to a position to retain the said lever in its cam-forced position, a cam throwing said rock-arm from its retaining position, a tripper adapted to lock the rock-arm out of its retaining position, a cylinder, a piston in said cylinder connected to the tripper, means for producing a vacuum in the cylinder back of the piston and thereby move said piston, a paper-calipering member pivotally supported in position to be turned by frictional contact with paper of excessive thickness advancing from the feeder, and a lever actuated by the turning member and governing the aforesaid valve as set forth.

TALBOT C. DEXTER. [L. S.]

Witnesses:

V. E. MARSH,
EUGENE KETCHUM.