

No. 632,448.

Patented Sept. 5, 1899.

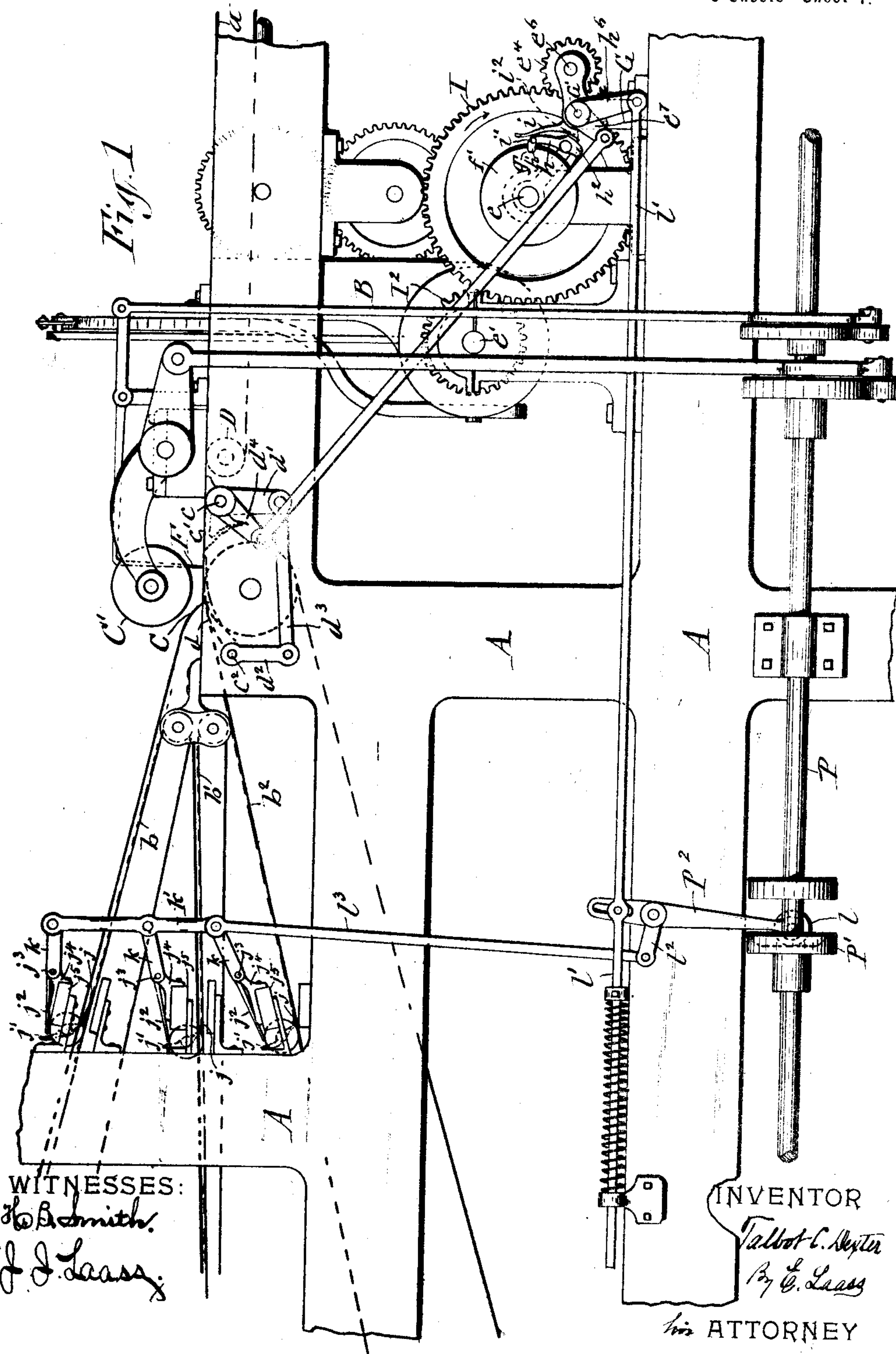
T. C. DEXTER.

PAPER ASSEMBLING AND STAPLING MACHINE.

(No Model.)

(Application filed Nov. 3, 1898.)

5 Sheets—Sheet 1.



WITNESSES:

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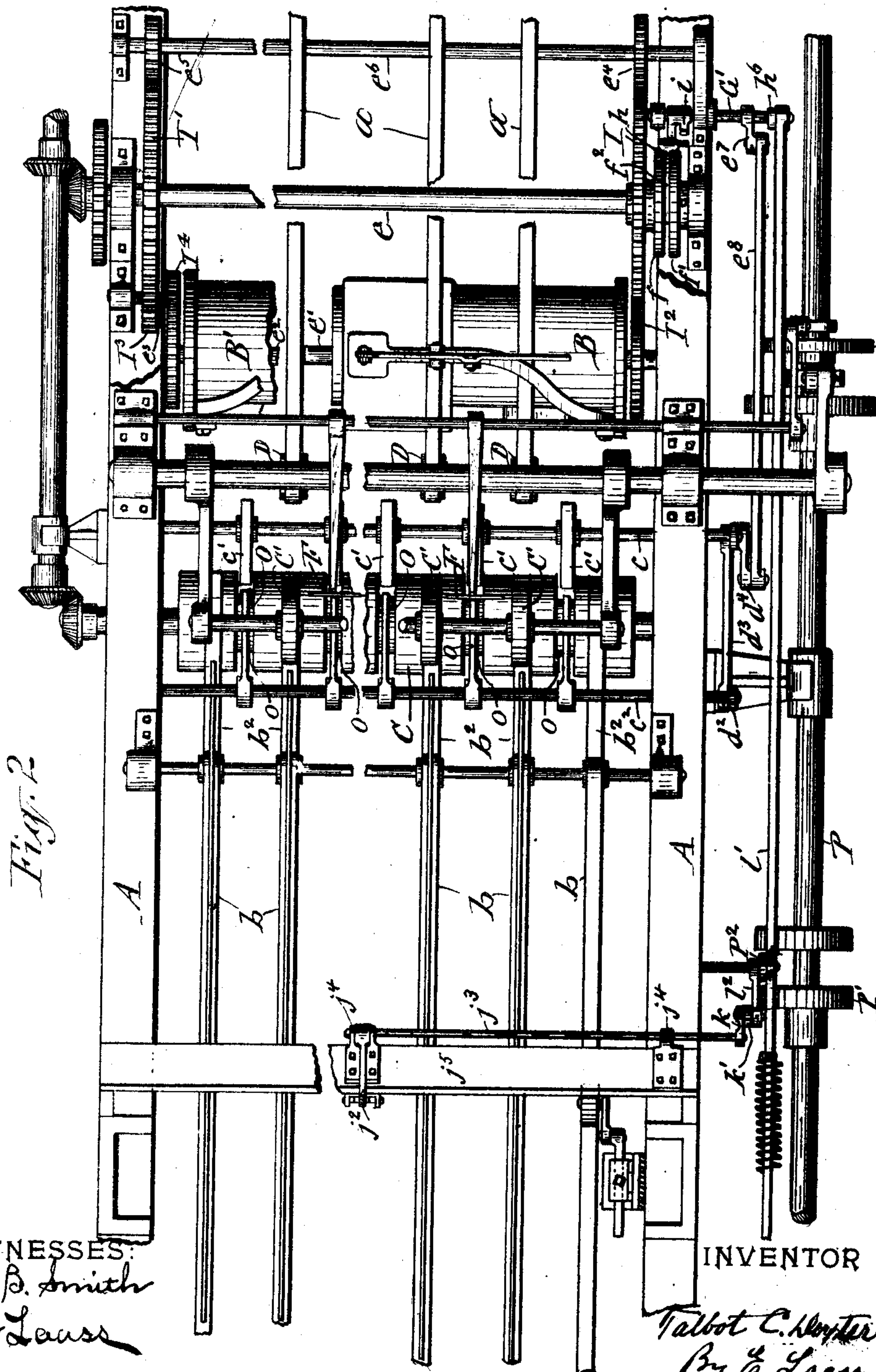
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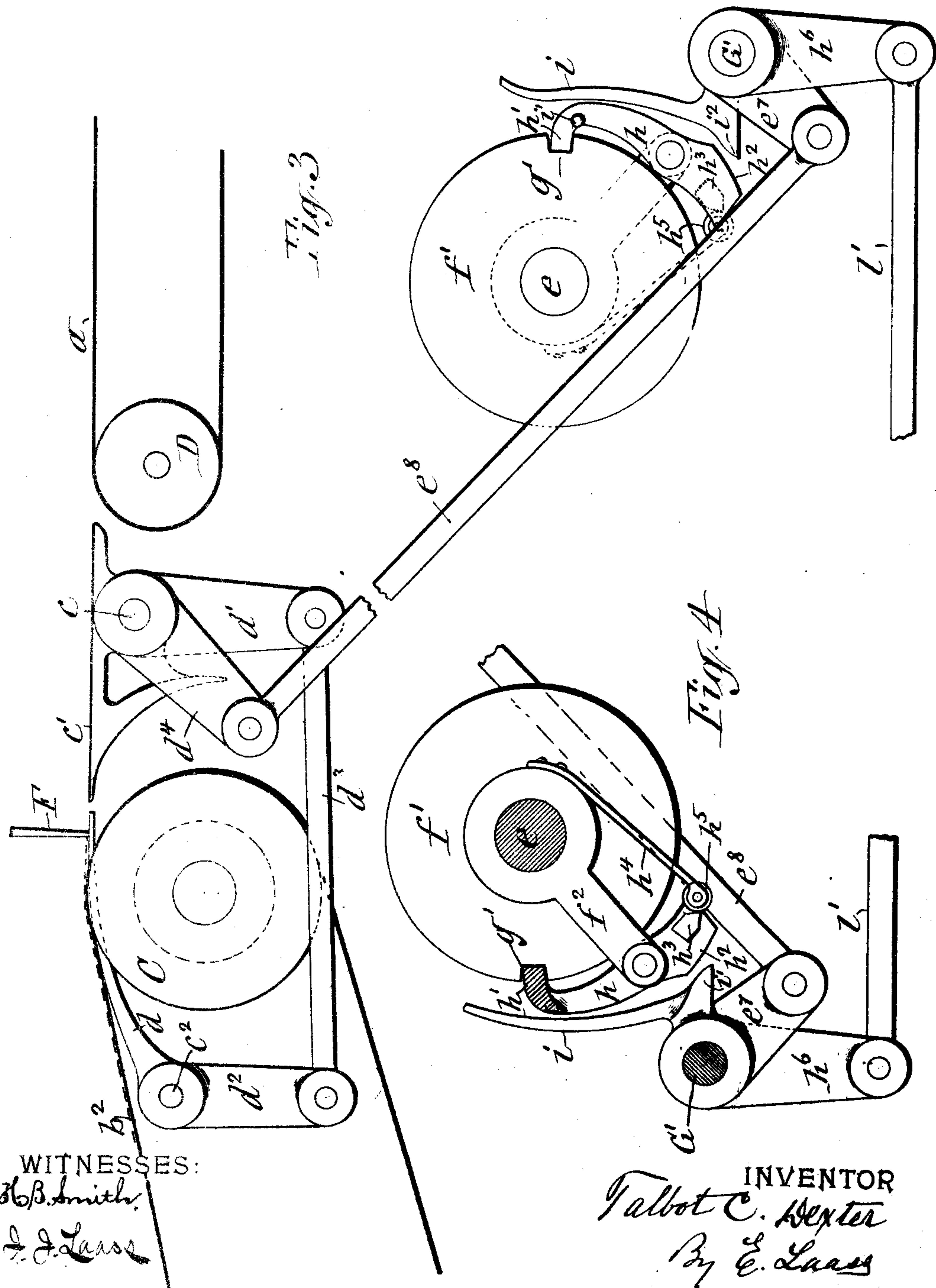
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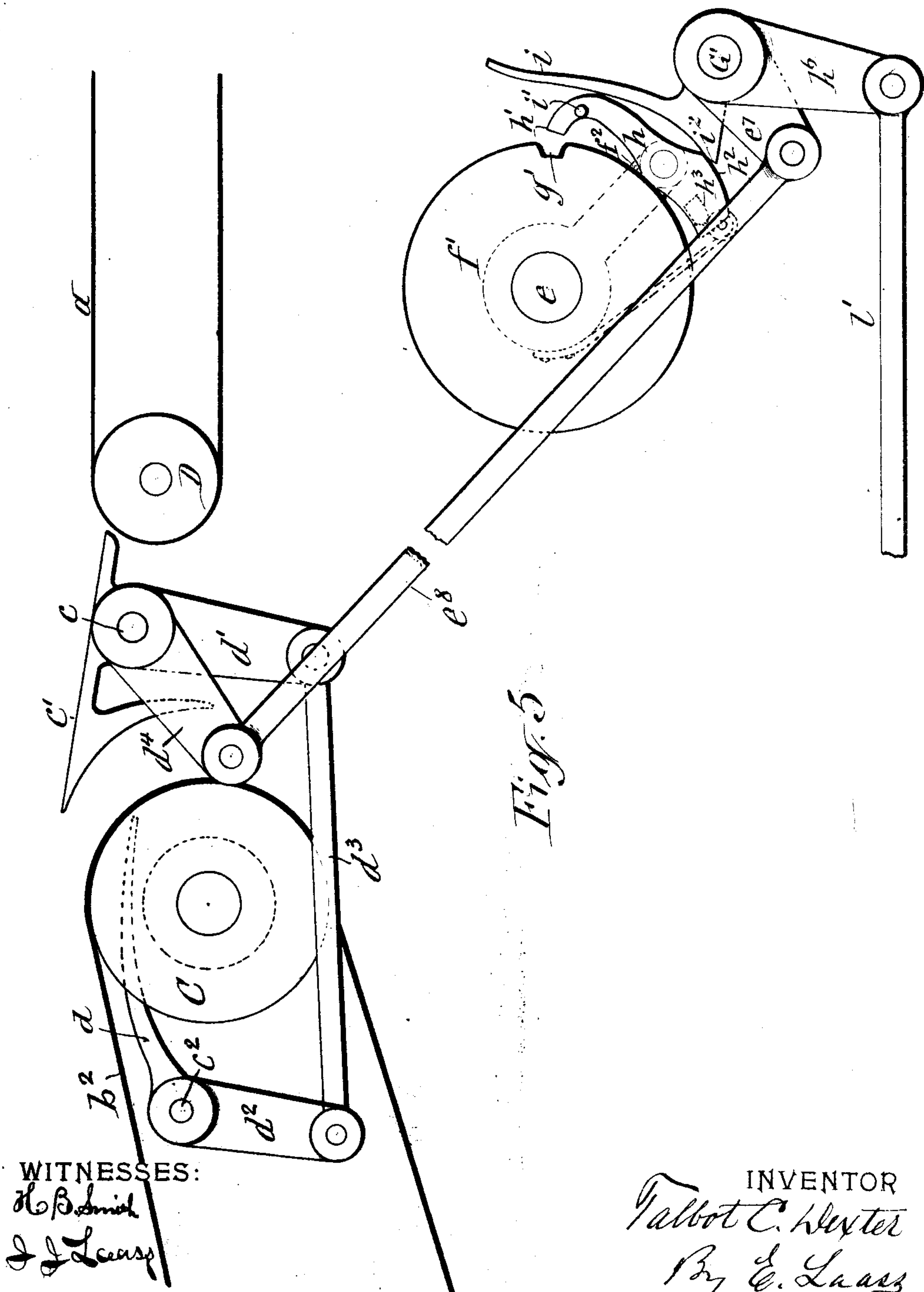
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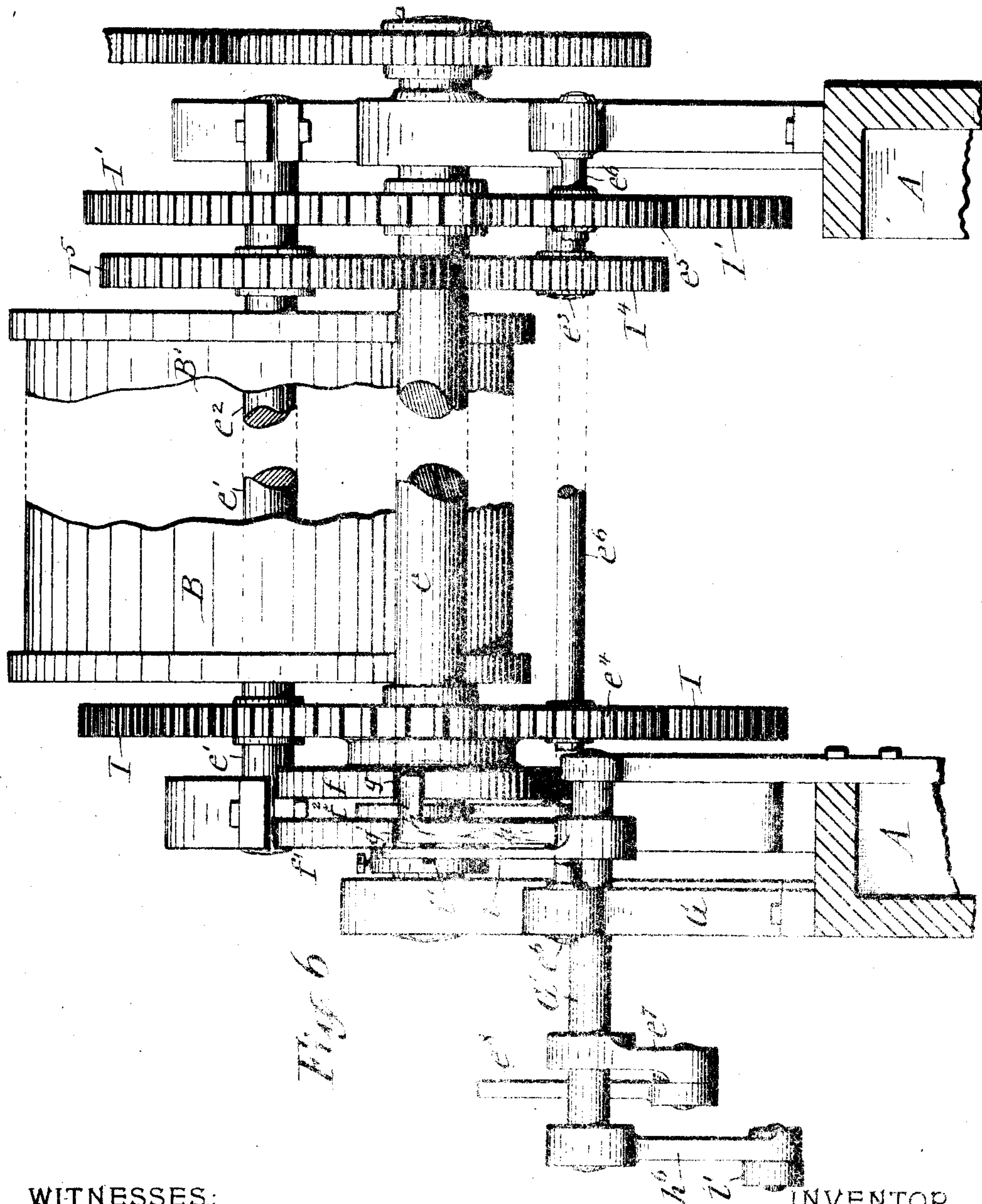
T. C. DEXTER.

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(Application filed Nov. 3, 1898.)

(No Model.)

5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

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

PAPER ASSEMBLING AND STAPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 632,448, dated September 5, 1899.

Application filed November 3, 1898. Serial No. 695,344. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States of America, and a resident of Pearl River, in the county of Rockland, in the State of New York, have invented new and useful Improvements in Paper Assembling and Stapling Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates chiefly to the paper assembling and stapling machine shown in my Letters Patent No. 602,816, dated April 19, 1898.

The objects of my present invention are, first, to provide simpler and less expensive means for automatically throwing the stitching or stapling machine in and out of gear; secondly, to provide more efficient and reliable paper-switching devices for diverting from the stitching or stapling machines an incomplete set of sheets delivered to the assembling-gage, and, thirdly, to provide more positively-acting mechanisms for operating the paper-switching devices in unison with the means for throwing the stitching or stapling machine in and out of gear; and to that end the invention consists in the improved construction and combination of mechanisms herein-after described.

In the annexed drawings, Figure 1 is a side elevation of that part of a paper assembling and stapling machine to which my improvements are applied. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged side view of my invention in its normal position. Fig. 4 is a reversed side view of the clutch mechanism. Fig. 5 is a side view illustrating my invention in position to arrest the motion of the stitching or stapling machine and switch the incomplete set of sheets out of the path leading to the said stitching or stapling machine, and Fig. 6 is an enlarged vertical transverse sectional view showing the driving mechanism of the stapling-machines.

A represents the main frame of the paper assembling and stapling machine.

B B represent the two stitching or stapling machines designed to bind in pamphlet form a plurality of duplicate signatures and covers. Said machines are arranged axially in line

with each other, as shown in Fig. 2 of the drawings, in which part of one of said machines is broken away. *a a* designate the main tapes, which carry the assembled plurality of sheets to the said stitching or stapling machines and thence to a cutter which separates the duplicates and to folding-machines, as shown in my prior Letters Patent hereinbefore mentioned.

b, b', and *b²* are the tributary tapes, designed to deliver to the main tapes *a* the plurality of sheets to be stapled. The roller C, upon which the lower set of tapes *b²* run, is placed a proper distance back from the tape-roller D, at the receiving end of the main tapes *a*, to accommodate between said rollers the switch which is designed to divert from the main tapes any incomplete sets of sheets delivered by the tributary tapes. All of said tributary tapes converge toward the top of the roller C, over which are the drop-rollers C'. The plurality of sheets are thus delivered upon the roller C, where they are assembled by the gage F, which is located in front of and in proximity to the shaft of the drop-roller C'. The word "front" designates the side facing in the direction of the travel of the tapes.

The aforesaid paper-diverting switch consists of a rock-shaft *c* disposed between and parallel with the shafts of the tape-rollers C and D and mounted in suitable bearings on the sides of the frame A and actuated automatically, as hereinafter described. To said rock-shaft are fastened the paper-switching fingers *c' c'*, which normally bridges the space between the aforesaid tape-rollers to guide the assembled sheets onto the main tapes *a a*, as more clearly shown in Fig. 3 of the drawings. By giving the rock-shaft *c* a slight turn the switch-fingers *c' c'* are thrown into inclined positions, as shown in Fig. 5 of the drawings, said position holding the rear ends of said fingers elevated from the path of paper leading from the roller C to the roller D of the main tapes *a*. The switch-fingers *c' c'* are thus caused to guide the paper from the roller C down to the base and lower part of the machine, where a suitable receptacle may be provided for the collection of said switched paper. Said switching of the paper

is effected automatically, as hereinafter described.

The assembling-gage F moves intermittently to and from the passage of the paper in the usual manner and is timed to descend to said passage while the drop-rollers C' are raised to allow the plurality of sheets to pass from the tributary tapes $b\ b'\ b^2$ to the assembling-gage.

The lower set of tapes b^2 , which carry the cover-sheet, pass around the roller C, and in order to prevent said sheet from following the downwardly-moving top portion of said roller and becoming jammed against the assembling-gage F, I form the roller C with circumferential grooves $o\ o$ and place at the rear of and parallel with said roller a rock-shaft c^2 , journaled in bearings in the sides of the frame A and having projecting from it fingers $d\ d$, which extend into the grooves $o\ o$ and under the assembling-gage F to support the front portion of the cover-sheet delivered by the tapes b^2 , as clearly shown in Fig. 3 of the drawings. The assembled sheets are subsequently released and moved forward to the stapling-machines by the assembling-gage F rising from the fingers $d\ d$ and the drop-rollers C' descending and pressing the paper down onto the roller C, which advances the paper to the stapling-machine B, by means of which the sheets are bound together. To prevent the fingers $d\ d$ from interfering with the switching of the accidental incomplete sets of sheets, as hereinbefore described, I attach to corresponding ends of the two rock-shafts c and c^2 , respectively, arms d' and d'^2 , which I couple together by a strap or bar d^3 , pivotally connected to the free ends of said arms. Said coupling causes the two rock-arms to operate in unison, and when the switch-fingers c' are tilted to divert the paper from the path of the main tapes a the paper-guiding fingers $d\ d$ are thrown into inclined position to carry the free ends of said fingers inside of the periphery of the roller C, as illustrated in Fig. 5 of the drawings. Said position of the fingers $d\ d$ obviates obstructing the downward passage of the switched paper.

In the operation of the machine it is essential to stop the motion of the stapling-machines when deprived of paper to be stapled. For this purpose I have invented my present improved stop mechanism, which is much simpler, less expensive, and more efficient in its operation than the mechanism shown in my prior Letters Patent hereinbefore referred to.

My present improvements consist of the following construction and combination of parts, to wit:

Parallel with the axes of the two stapling-machines B B' is a continuously-revolving driving-shaft e , mounted in suitable bearings on the sides of the frame A. On said shaft are loosely mounted gear-wheels I and I'. The wheel I meshes directly with the pinion I², attached to the shaft e' of one of the sta-

pling-machines. The other wheel I' transmits motion to the reversely-disposed stapling-machine through intermediate pinions I³ and I⁴, fastened to a short shaft e^3 , journaled in a bearing on the frame A. The intermediate pinion I³ meshes with the gear-wheel I', and the other pinion I⁴ meshes with the gear I⁵, attached to the shaft e^2 of said stapling-machine. The two loosely-mounted gear-wheels I and I' are caused to rotate in unison by means of pinions e^4 and e^5 , fastened to a counter-shaft e^6 and meshing with said gear-wheels.

The gear-wheel I has attached to it a clutch-disk f , which is also loose on the shaft and is provided with a notch g in its periphery. At the side of said disk is a companion clutch-disk f' , fastened to the shaft e and provided with a notch g' similar to the notch g . From this fastened disk motion is transmitted to the two stapling-machines by the following mechanisms: To the hub of this fastened disk f' is rigidly secured a radially-extending arm f^2 , to the free end of which is pivoted the clutch-dog h , which extends in opposite directions from its pivot and is formed at one end with a tooth h' , adapted to enter into the notches g and g' . The opposite end of said dog is formed with an outwardly-projecting back h^2 and has projecting from its side a V-shaped double wedge h^3 . A leaf-spring h^4 is attached at one end to the hub of the fastened disk f' and has pivoted to its free end a roller h^5 , which bears on the double wedge h^3 to impart spring action to the dog, as hereinafter described.

In a bracket G, mounted on the frame A, is journaled a short shaft G', to one end of which is fastened the tripping-lever i in a position to be traversed by the dog h during the rotation of the disk f' . By means of a rock-arm h^6 , attached to the shaft G' and actuated as hereinafter described, the tripping-lever i receives a rocking motion toward and from the dog h . In rocking toward the dog it strikes a pin i' , projecting from the side of the dog, and said contact tilts the dog sufficiently to cause the roller h^5 of the leaf-spring h^4 to pass over the center of the double wedge h^3 , and thereby retain the dog h in position to bear on the peripheries of the disks $f\ f'$ and snap the tooth h' into the notches g and g' when registering with each other. The said tripping-lever is formed at its pivoted end with a cam i^2 , and by rocking said lever from the dog said cam is placed in position to come in contact with the back h^2 of the dog, and thereby force said dog out of engagement with the notches of the disks, which movement is accelerated by the spring action imparted to the dog by the spring-pressed roller h^5 passing over the center of the double wedge h^3 . When said dog is in engagement with the notches of the two disks $f\ f'$, the gear-wheel I is forced to rotate with the driving-shaft e and imparts a corresponding motion to the gear-wheel I' by the pinions e^4 and e^5 on the

counter-shaft e^6 . The two gear-wheels I and I' actuate the two stapling-machines B B' in the manner hereinbefore described.

It will be observed that when the dog h is out of engagement with the two clutch-disks $f f'$ both stapling-machines are stopped. To effect this simultaneously with the switching of the paper out of the path leading to the main tapes a , I attach to the shaft G' an arm e^7 and connect the free end of said arm to the free end of an arm d^4 of the switch-shaft c by a rod e^8 .

To control the operations of the stapling-machines and paper-diverting switch automatically by the paper in transit to the stapling-machines, I preferably employ the mechanisms shown in my prior Letters Patent hereinbefore referred to—i. e., in the plane of each of the tributary tapes b, b' , and b^2 is a feeler j , disposed to be actuated by the sheets in transit on said tapes. Each of said feelers is formed with an upward-projecting prop j^1 on the pivoted end of the feeler, and over the said props are the free ends of the fingers j^2 , which are attached to rock-shafts j^3 , journaled in brackets j^4 , mounted on cross-bars j^5 . To the ends of said rock-shafts are fastened arms k , which are coupled together by a strap k' .

To a rotary shaft P, extending along the side of the frame A, is fastened a cam P', and to the frame A is pivoted a lever P², the lower end of which has pivoted to it a roller l , which is forced toward the cam by means of a spring-actuated rod l' , connected to the upper end of said lever. An arm l^2 projects from the side of the lever, at the pivot thereof, and is connected to the strap k' by a rod l^3 , as shown in Fig. 1 of the drawings. An extension of the spring-actuated rod l' is connected to the arm h^6 , which is attached to the shaft G' of the clutch-tripping lever i .

The operation of the machine is as follows: The three sets of tributary tapes b, b' , and b^2 receive the sheets of paper or signatures and cover-sheet from three paper-feeding machines, as shown in my aforesaid prior application for Letters Patent, and when said machines are in proper working order and feed the sheets successively and at the required times to the tapes the feelers j are lifted from the planes of the tributary tapes by the sheets passing under said feelers. This throws the props j^1 back sufficiently to allow the fingers j^2 to oscillate. This release of the fingers allows the lever P² to be oscillated by the cam P' and impart intermittent reciprocating motion to the rod l' , which by its connection with the arm h^6 rocks the shaft G', and thereby actuates the tripping-lever i and the paper-switching fingers c' . The motion of the lever P² is timed to cause the tripping-lever i to strike the dog h momentarily once in each revolution of the clutch-disk f' , and thereby throw the said dog into a position to allow the spring h^4 to snap it into engagement with the notches in the clutch-disks, and thus cause motion to be transmitted to the stapling-machines. At the

same time the paper-shifting switch is held in its normal position to form a bridge in the space between the tape-rollers C and D. The sheets are delivered by the tributary tapes b, b' , and b^2 upon the roller C while the drop-rollers C' are in their elevated position and the gage F is in its lowered position to arrest the forward movement of said sheets and assemble the same in proper order preparatory to passing to the stapling-machines B. As soon as the sheets are thus assembled the gage rises and the drop-rollers C' descend and cause the roller B to move the sheets forward across the aforesaid bridge and onto the main tapes a , which carry said sheets to the stapling-machines. In case either of the aforesaid tributary tapes fails to deliver paper the feeler j in the plane of said tapes holds its prop j^1 in position to prevent the finger c' from rocking, and thus the lever P² is held stationary and in a position to cause the tripping-lever i to throw the dog h out of engagement with the clutch-disks and at the same time hold the paper-shifting switch in a position to divert the paper from the path leading to the main tapes a .

What I claim as my invention is—

1. The combination with a driving-shaft, a clutch-disk fastened to said shaft, a companion disk mounted loosely on said shaft and a dog carried on the fastened disk and pivoted to engage and release the loose disk, of a wedge fixed to the dog, a spring-arm attached to the hub of the fastened disk and having its free end traversed by and pressing on said wedge in throwing the dog into and out of engagement, a tripping-lever traversed by said dog and pivoted to actuate the dog to force the aforesaid spring-arm over the center of the wedge, and means for rocking said arm as set forth.

2. In combination with a machine designed to operate on paper and tapes conveying the paper to said machine, a clutch-disk fastened to the driving-shaft of said machine, a companion disk mounted loosely on said shaft, a dog carried on the fastened disk and pivoted to engage and release the loose disk, a V-shaped double wedge affixed to said dog, a spring-arm attached to the hub of the fastened disk and having its free end traversed by and bearing on said wedge in throwing the dog into and out of engagement, a tripping-lever traversed by the dog and pivoted to actuate the dog to force the spring-arm over the center of the double wedge, a rock-arm actuating said tripping-lever, mechanisms actuated by the sheet in transit to the aforesaid machine and means transmitting motion from said mechanisms to the aforesaid rock-arm as set forth.

3. In combination with a machine designed to operate on paper and tapes conveying the paper to said machine, a clutch-disk fastened to the driving-shaft of said machine, a companion disk mounted loosely on said shaft, a dog rotating with the fastened disk and pivoted to engage and release the loose disk, a V-shaped double wedge affixed to said dog, a spring-arm attached to the hub of the fastened

disk and having its free end traversed by said wedge to impart spring action to the dog, a tripping-lever traversed by the dog and actuating same to force the spring-arm over the center of the double wedge, a rock-arm actuating said tripping-lever, a rod transmitting motion to said rock-arm, a lever actuating said rod, and mechanisms actuated by the sheet in transit to the aforesaid machine and controlling the action of said lever as set forth.

4. The combination with two stitching or stapling machines arranged axially in line with each other, and pinions attached to the shafts of said machines, a continuously-rotating driving-shaft parallel with the shafts of the aforesaid machines, gear-wheels mounted loosely on said shaft and meshing with the aforesaid pinions, a counter-shaft parallel with said driving-shaft, pinions fastened to said counter-shaft, and meshing with the aforesaid gear-wheels, a clutch-disk fastened to one of said gear-wheels, a companion disk mounted rigidly on the aforesaid driving-shaft, a dog rotating with said fastened disk and pivoted to engage and release the loose disk, a V-shaped double wedge affixed to said dog, a spring-arm attached to the hub of the fastened disk and having its free end traversed by said wedge to impart spring action to the dog, a tripping-lever traversed by the dog and actuating the same to force the spring-arm over the center of the double wedge, a rock-arm actuating said tripping-lever, tapes conveying the paper to the aforesaid machine, mechanisms actuated by the sheets in transit on said tapes and means transmitting motion from said mechanism to the aforesaid rock-arm as set forth.

5. The combination, with a driving-shaft, a clutch-disk fastened to said shaft and provided with a notch in its periphery, a companion disk mounted loosely on said shaft in proximity to the fastened disk and provided with a similar notch, an arm rigidly attached to and extending radially from the hub of the fastened disk, a dog pivoted to the free end of said arm and extending in opposite directions therefrom and provided on one end with a tooth for engaging the notches of the disks and formed on the opposite end with an outwardly-projecting back and with a V-shaped double wedge on the side of said end, a lever pivoted at one end to force with its free end the toothed end of the dog toward the clutch-disks and formed at its pivoted end with a cam for striking the aforesaid back of the dog, a spring-leaf attached at one end to the hub of the fastened disk and having pivoted to its free end a roller bearing on the aforesaid wedge, and means for rocking the aforesaid lever to throw the dog into and out of engagement with the disks as set forth and shown.

6. The combination with the stapling-machine, main tapes carrying the paper to said machine, a plurality of tributary tapes designed to deliver a corresponding plurality of sheets to said main tapes, a sheet-assembling

gage at the delivery ends of the tributary tapes, feelers in the planes of the tributary tapes and actuated by the sheets in transit, a rock-shaft extending across the machine between the delivery ends of the tributary tapes and receiving end of the main tapes, paper-switching fingers attached to said shaft, an arm attached to the end of said shaft, a gear-wheel mounted loosely on the driving-shaft and transmitting motion to the stapling-machine, a clutch-disk fastened to said gear-wheel, a companion clutch-disk mounted rigidly on said driving-shaft, a dog carried on the fastened disk to engage and release the loose disk, a tripping-lever pivoted to throw the dog into and out of engagement, an arm pivoted in common with and actuated by said lever, a rod connecting said arm to the arm of the switching-finger shaft, and mechanisms actuating the tripping-lever and controlled by the action of the aforesaid feelers as set forth.

7. In combination with paper-conveyers and a switch at the delivery end of said conveyers and normally in position to carry the paper to its proper destination, a guide normally in position to direct the paper to the normally-disposed switch, and mechanism throwing said switch and guide simultaneously out of their said normal positions.

8. In combination with a roller and paper-conveying tapes running on said roller, two shafts respectively in front and rear of said roller and parallel therewith, paper guiding and switching fingers extending from said shafts normally toward each other, and mechanism rocking said shafts to simultaneously tilt the aforesaid fingers out of their said normal positions.

9. In combination with the main tapes, a roller extending across the machine back of the receiving ends of said tapes and tributary tapes leading to the top of said roller, a sheet-assembling gage over said roller, rock-shafts in front and rear of the roller, paper-switching fingers attached to the front shaft, paper-guiding fingers attached to the rear shaft, arms attached to corresponding ends of said shafts, a bar connecting said arms together, feelers in the planes of the tributary tapes and actuated by the sheets in transit and mechanisms actuating the aforesaid rock-shafts and controlled by the action of the aforesaid feelers as set forth.

10. In combination with a paper-stapling machine, main tapes conveying the paper to said machine, and a roller carrying tapes to deliver the paper to said main tapes, rock-shafts in front and rear of said roller and parallel therewith, paper-guiding fingers on the rear shaft, paper-switching fingers on the front shaft, arms on the ends of said shafts and coupled together to move in unison, stop mechanism controlling the action of the stapling-machine, and means actuating simultaneously the said stop mechanism and aforesaid rock-shafts as set forth.

11. In combination with the stapling-machine, main tapes carrying the paper to said machine, a tape-roller back of the receiving ends of said main tapes and provided with 5 circumferential grooves, a drop-roller over said roller, tributary tapes leading to the top of said tape-roller, rock-shafts in front and rear of the tape-roller, paper-guiding fingers on the rear rock-shaft and extending into the 10 grooves of the tape-roller, paper-switching fingers attached to the front rock-shaft, a sheet-assembling gage over the aforesaid paper-guiding fingers, arms attached to corresponding ends of said rock-shafts, a bar 15 coupling said arms together, a rock-arm attached to one of said rock-shafts, a gear-wheel mounted loosely on the driving-shaft and meshing with the actuating-pinion of the stapling-machine, a clutch-disk fixed to said gear-wheel, a companion clutch-disk fastened 20 to said shaft, a dog rotating with the clutch-disk for engaging and releasing the loose clutch-disk, a tripping-lever pivoted to throw the dog into and out of engagement, an arm 25 pivoted in common with and actuated by said tripping-lever, a rod connecting said arm to the arm of the aforesaid rock-shaft, feelers in the planes of the tributary tapes to be actuated by the sheets in transit and mechanisms actuating the aforesaid tripping-lever 30 and controlled by the action of the aforesaid feelers as set forth.

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Witnesses:

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