

No. 632,450.

Patented Sept. 5, 1899.

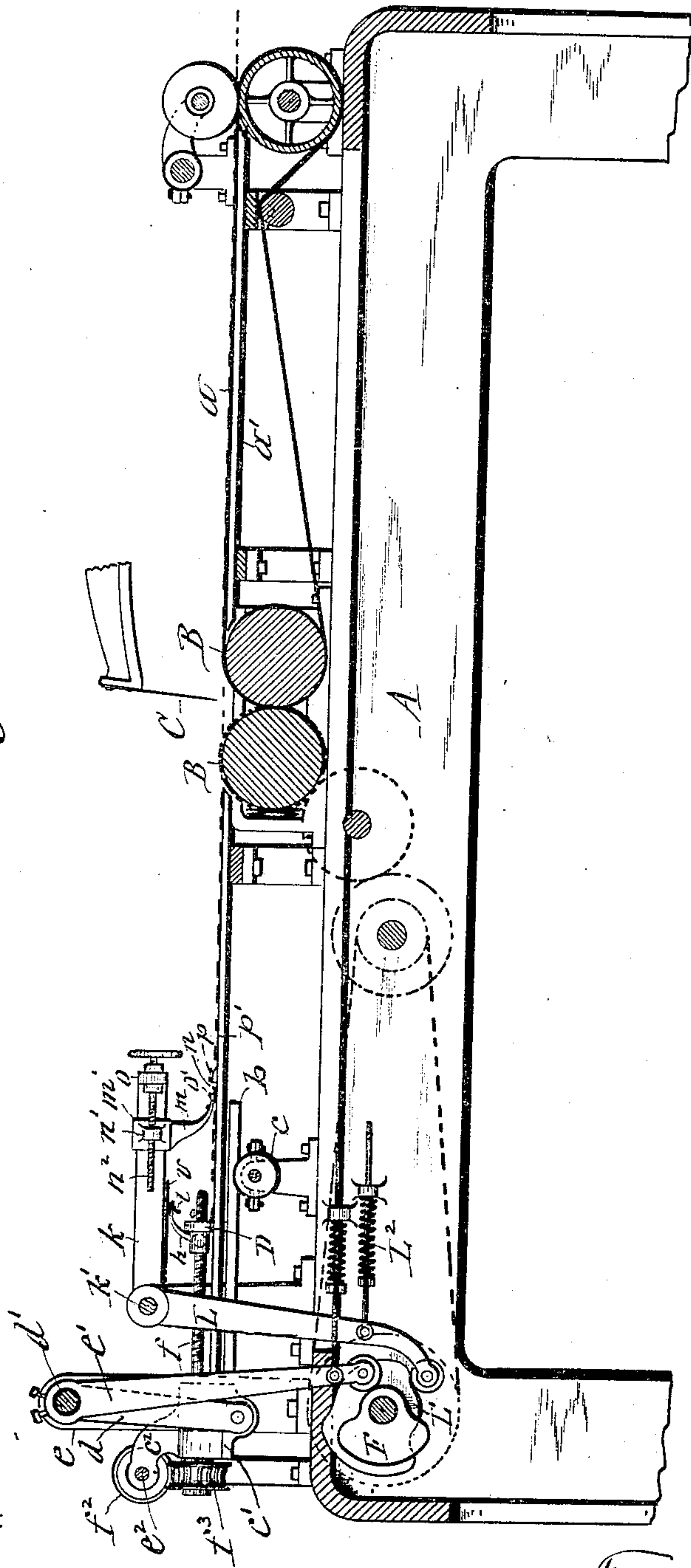
T. C. DEXTER.  
PAPER REGISTERING INSTRUMENT.

(No Model.)

(Application filed Jan. 7, 1899.)

5 Sheets—Sheet 1.

*Fig. 1*



WITNESSES:

*W. B. Smith*  
*J. J. Laess*

INVENTOR

*Talbot C. Dexter*  
*By E. Laess*  
his ATTORNEY

No. 632,450.

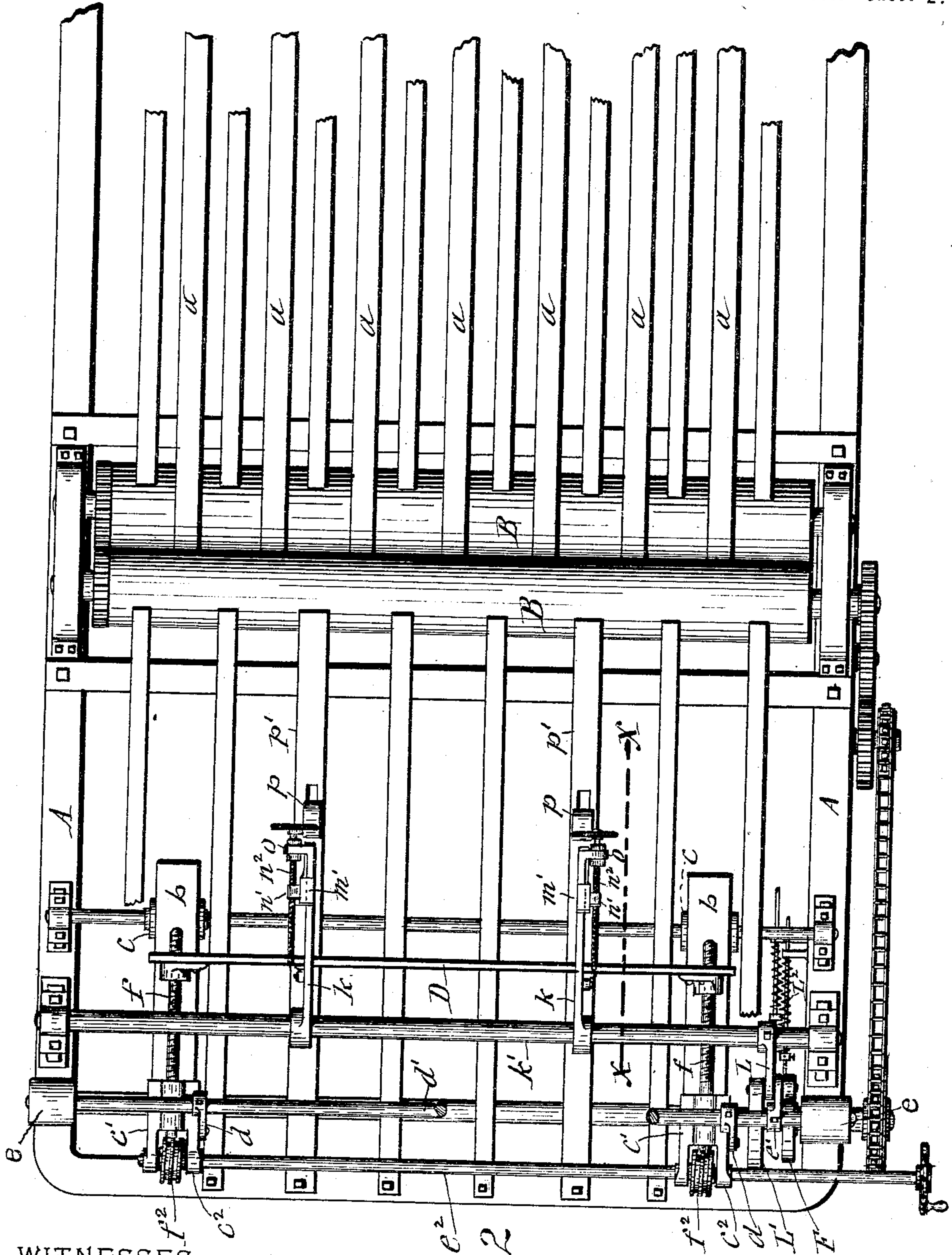
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WITNESSES:  
H. B. Smith.  
J. J. Laane.

Fig. 2

INVENTOR  
Talbot C. Dexter  
By E. Laane  
his ATTORNEY

No. 632,450.

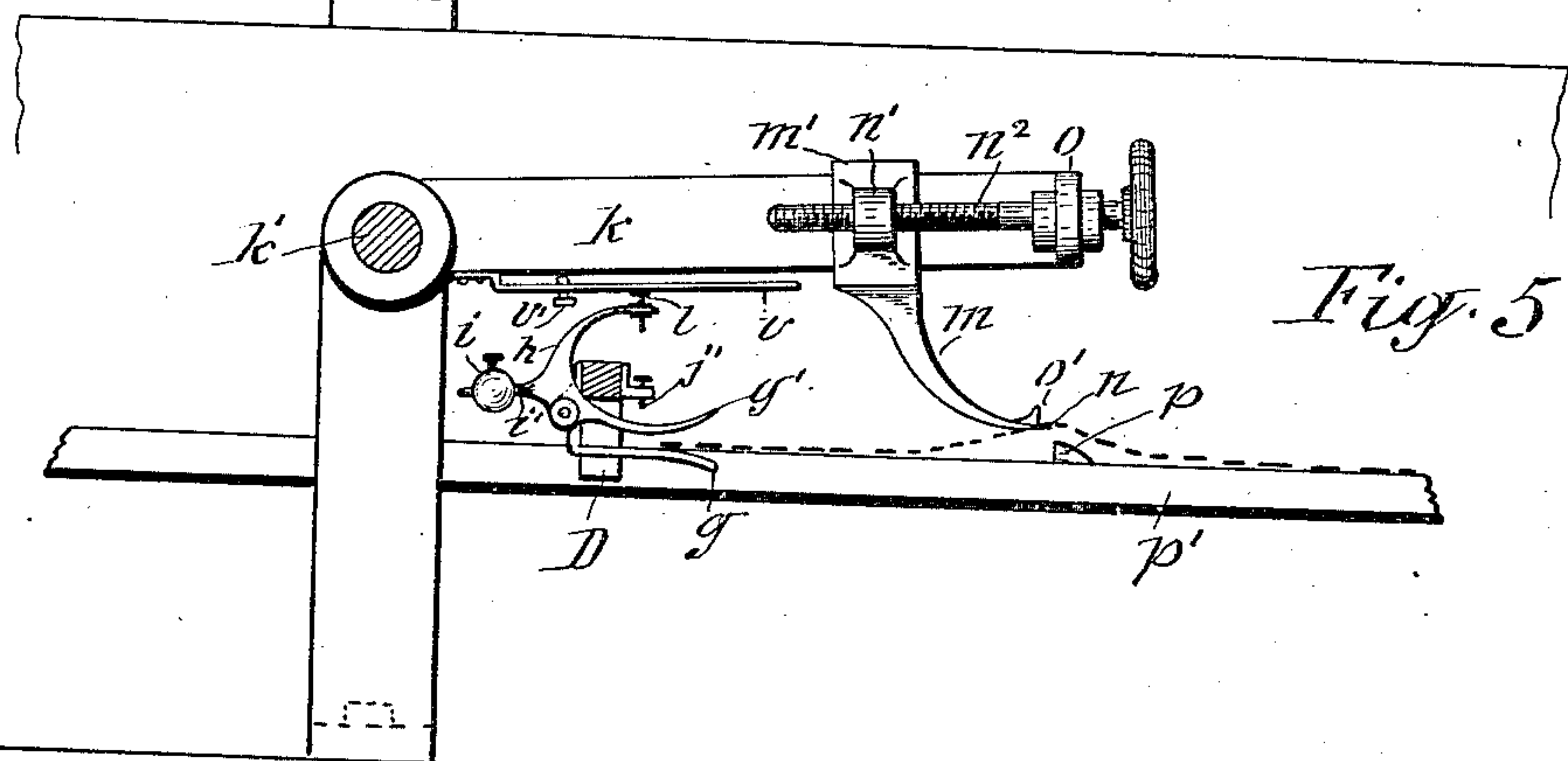
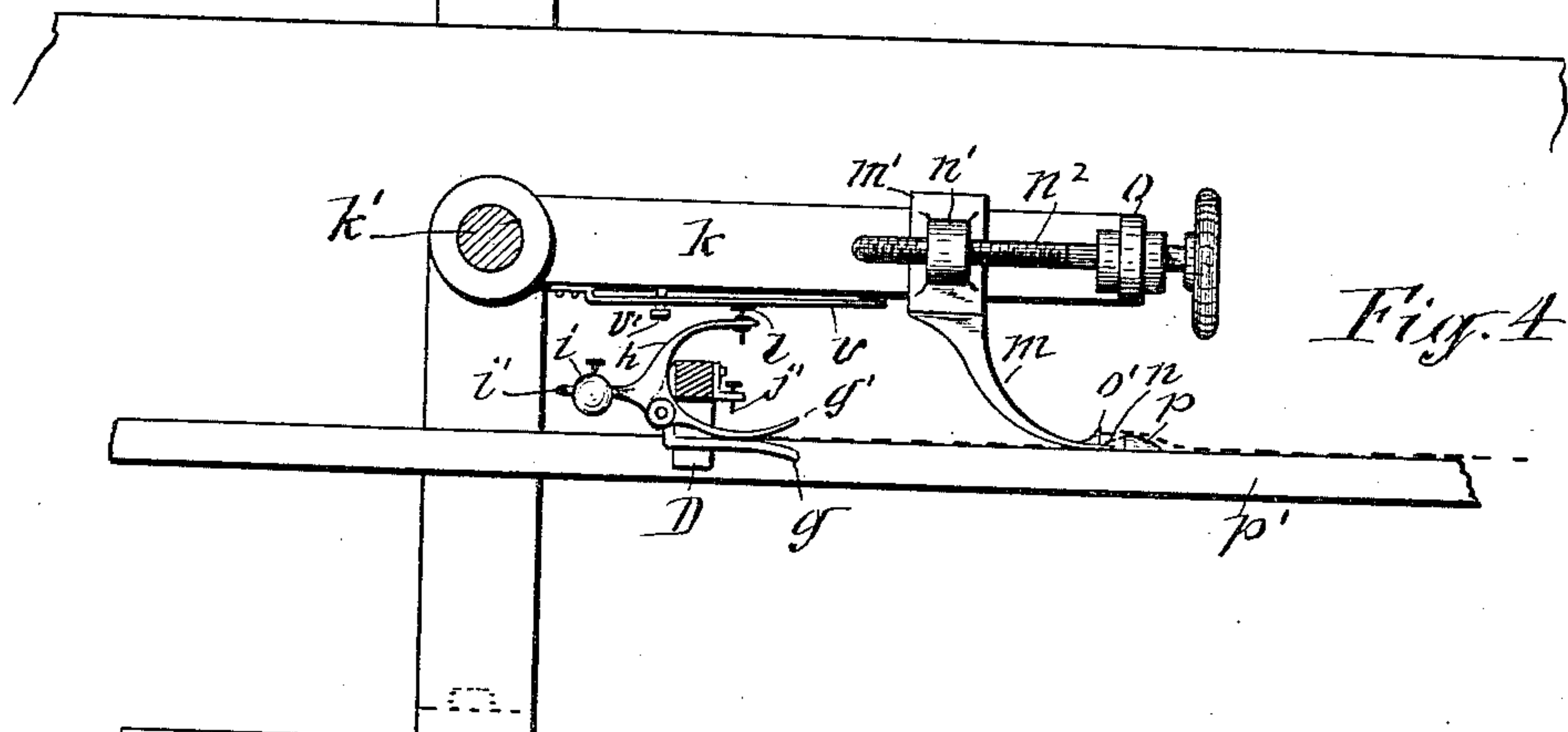
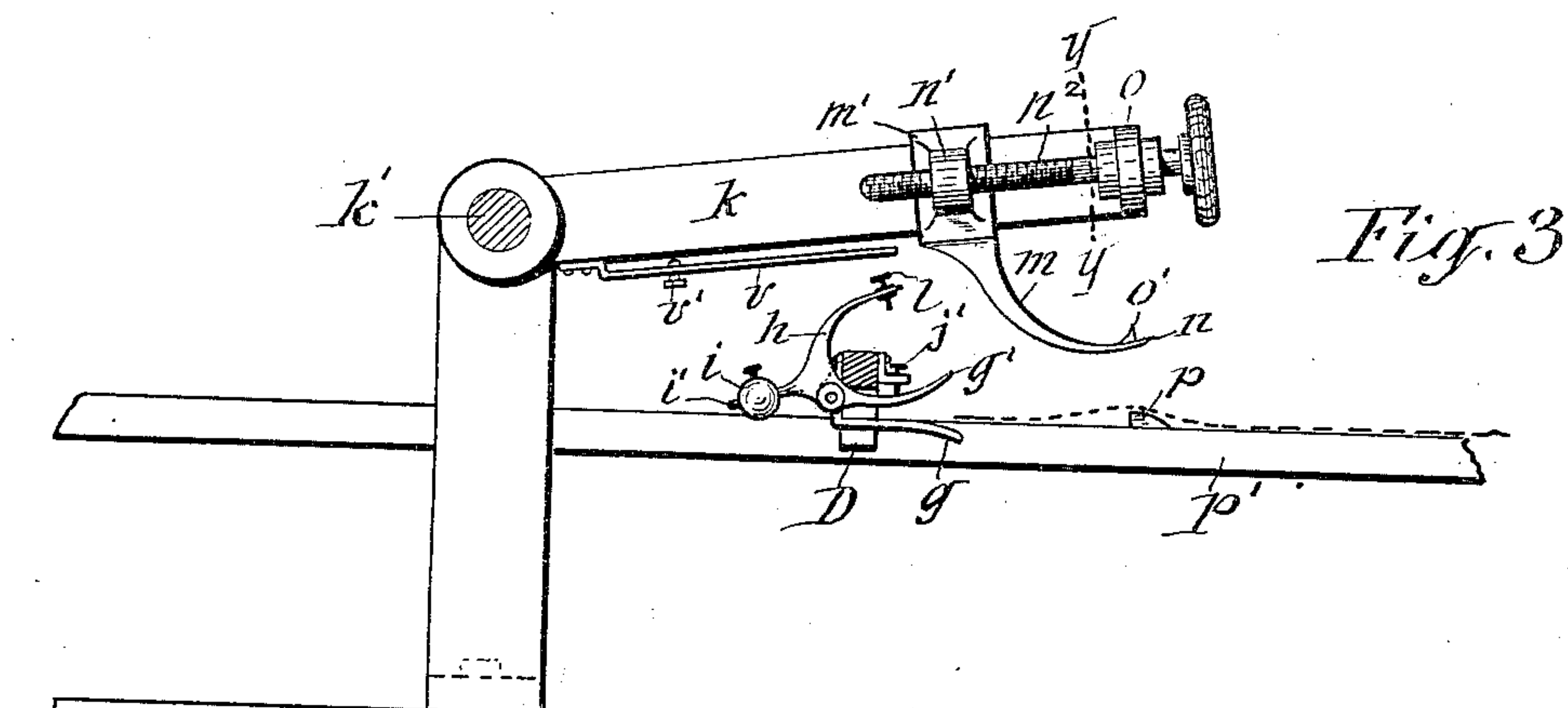
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5 Sheets—Sheet 3.



WITNESSES:

H. B. Smith.

J. J. Laass.

INVENTOR

Talbot C. Dexter

By E. Laass

his ATTORNEY



No. 632,450.

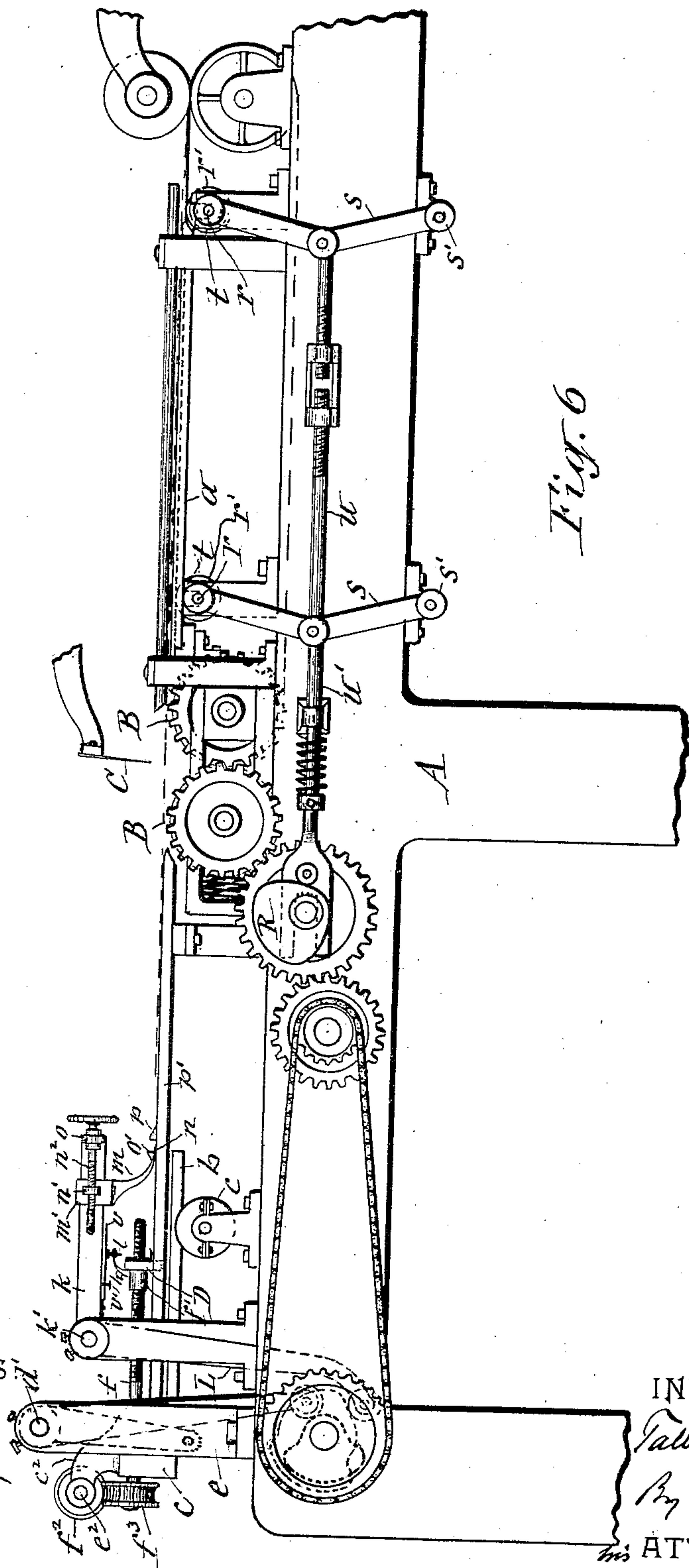
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(No Model.)

(Application filed Jan. 7, 1899.)

5 Sheets—Sheet 4.



WITNESSES  
H. B. Smith,  
J. J. Laass

INVENTOR  
T. C. Dexter.  
By E. Laass  
ATTORNEY

No. 632,450.

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T. C. DEXTER.  
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(No Model.)

5 Sheets—Sheet 5.

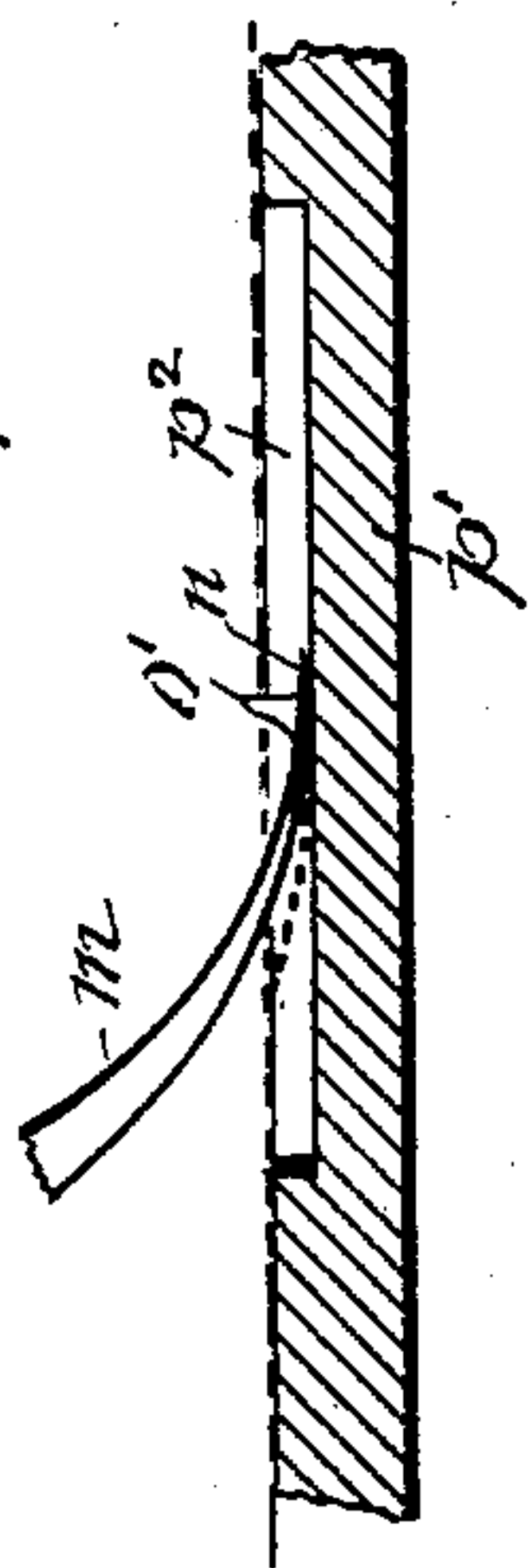
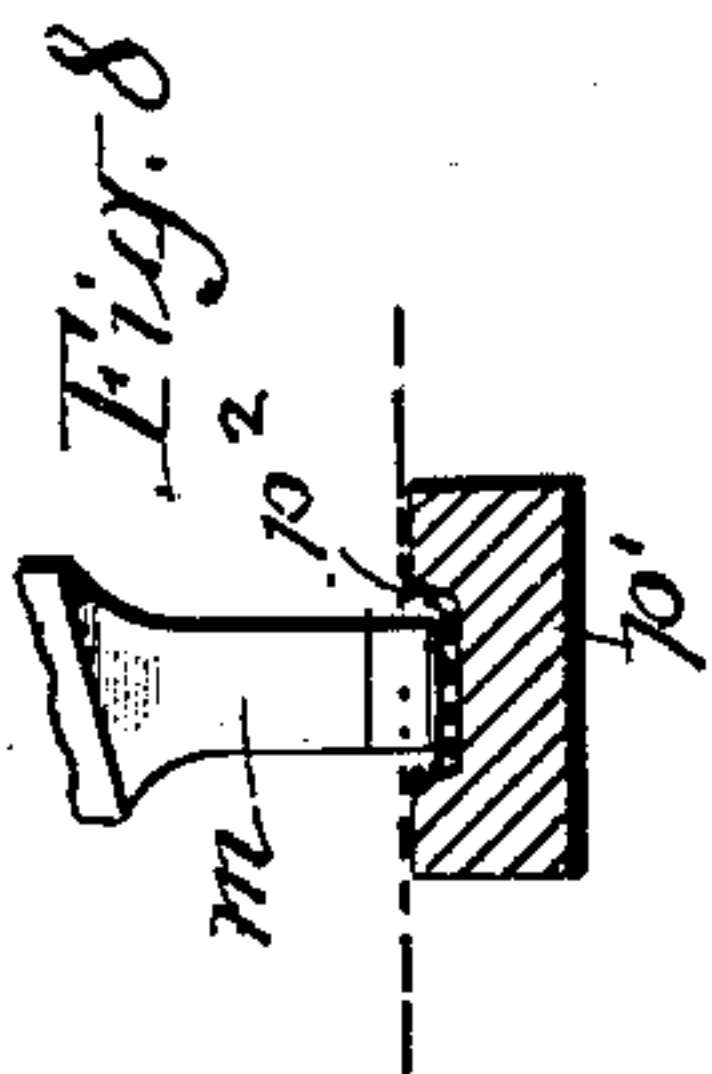
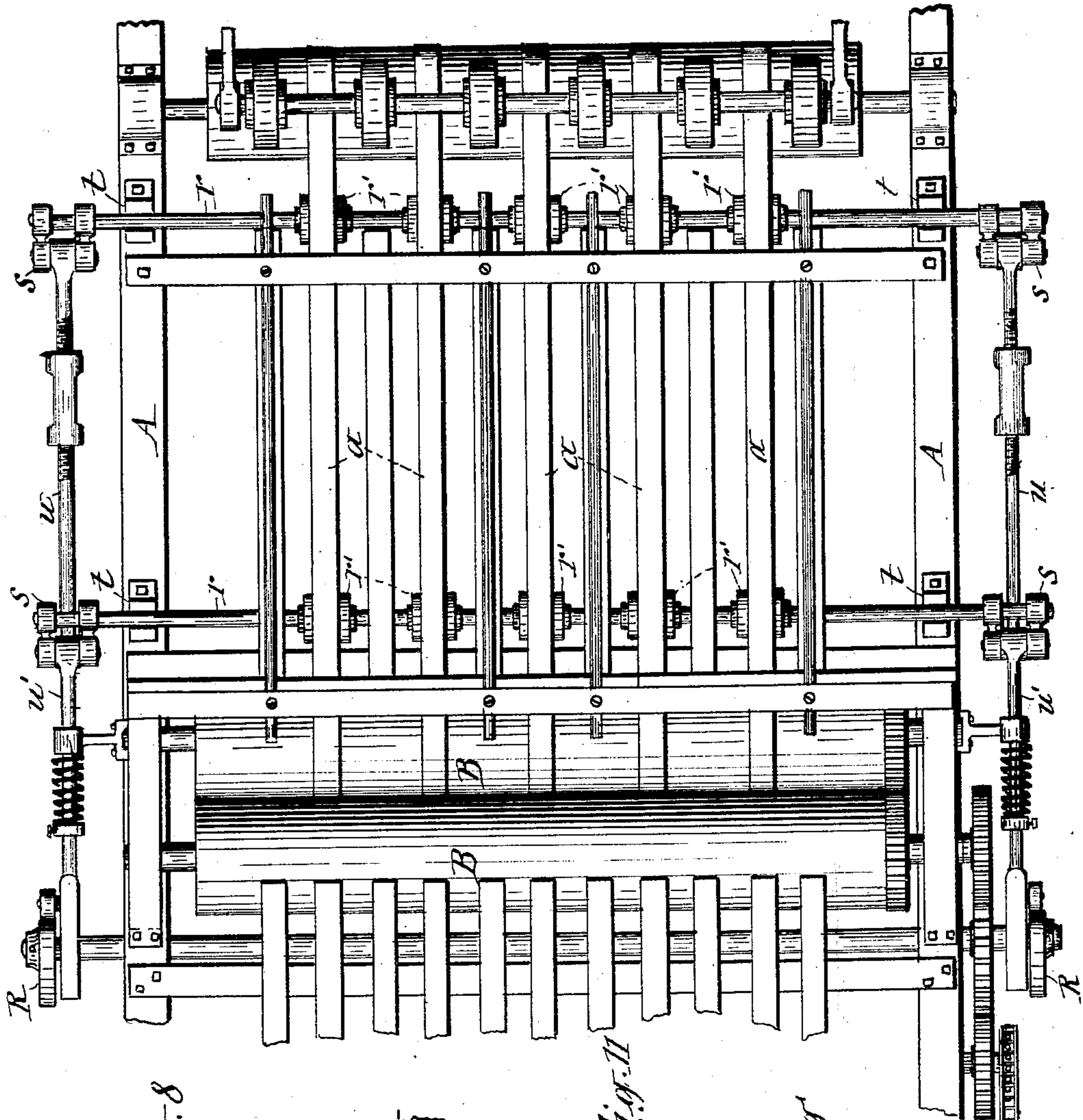


Fig. 7

Fig. 11

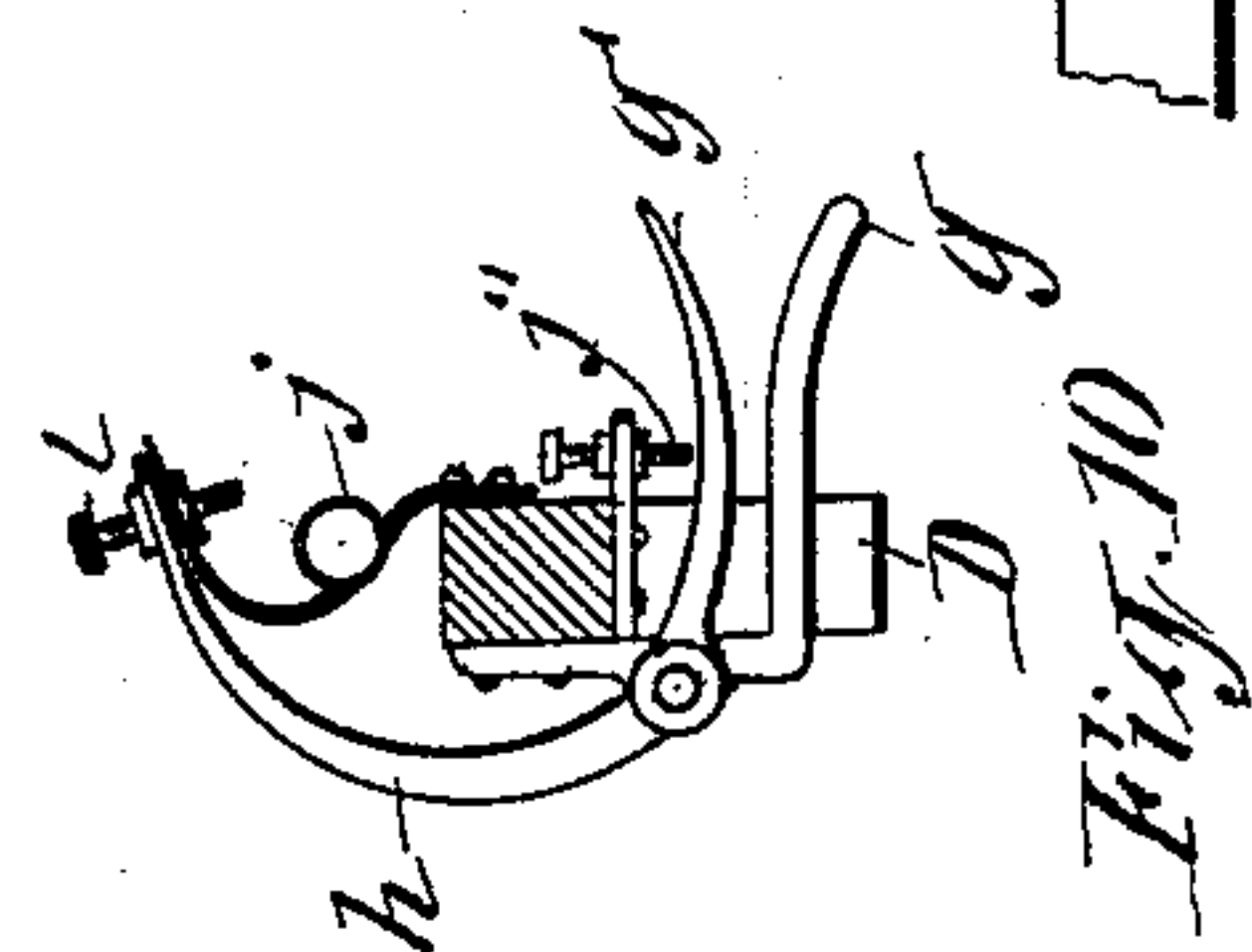


Fig. 10

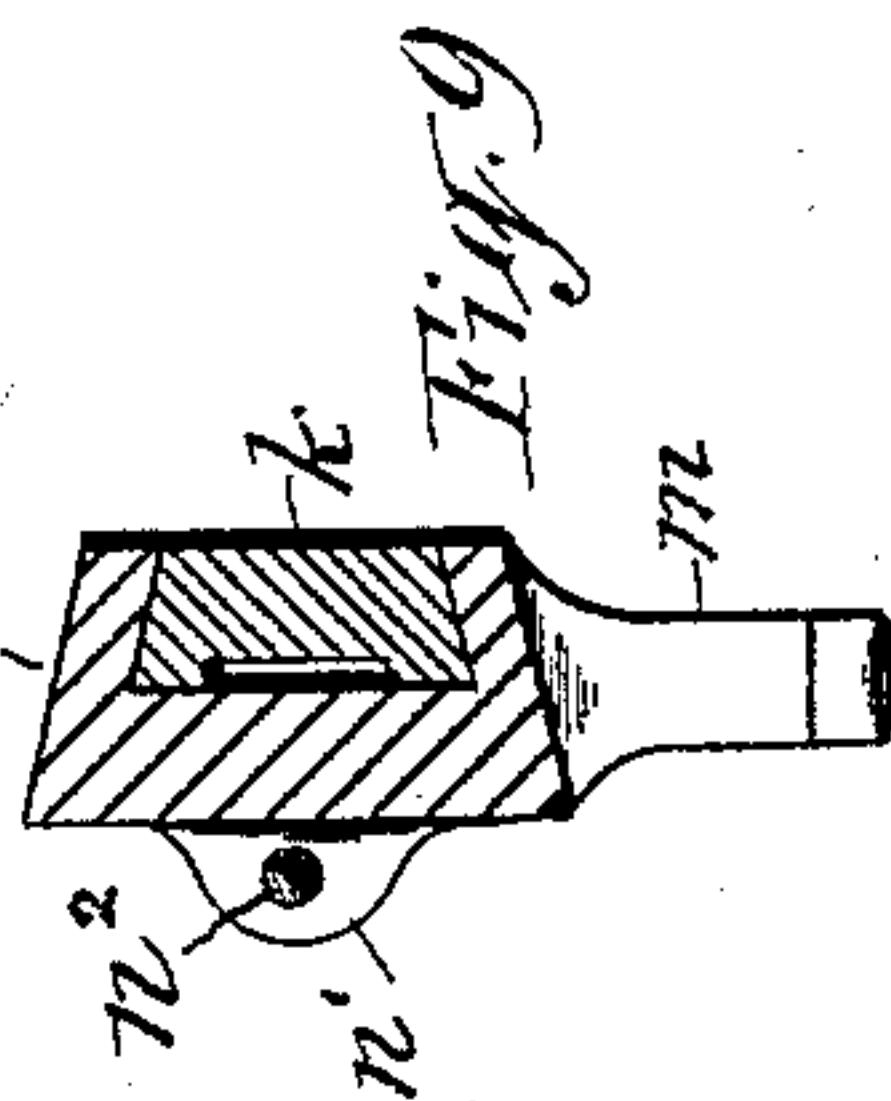


Fig. 9

WITNESSES:  
H. B. Smith.  
J. J. Laess

INVENTOR  
Talbot C. Dexter  
By E. Laess  
his ATTORNEY



# UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK, ASSIGNOR TO THE  
DEXTER FOLDER COMPANY, OF NEW YORK, N. Y.

## PAPER-REGISTERING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 632,450, dated September 5, 1899

Application filed January 7, 1899. Serial No. 701,454. (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 Paper-Registering Instruments, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to mechanisms employed for alining or registering paper to its requisite position for being folded or otherwise operated upon; and the invention has more particular reference to the class of paper-registering devices in which a pin or point is made to enter into a slit or other perforation made in the paper for that purpose; and the invention consists in a novel organization of mechanisms which effect the registering of the paper in an accurate and reliable manner, as hereinafter fully explained.

In the accompanying drawings, Figure 1 is a side elevation of that part of a paper-folding machine to which my invention is applied. Fig. 2 is a plan view of the front portion of said machine. Figs. 3, 4, and 5 are enlarged vertical longitudinal sections on the line X X in Fig. 2, showing the paper-registering instrument in its different operative positions. Fig. 6 is a side view of a paper-folding machine provided with means for relieving the paper from the propelling force of the conveying-tapes while the registering instruments perform their function. Figs. 7 and 8 are respectively longitudinal and transverse sections of my preferred form of the paper-supporting bars over which the registering-points are placed to open the slits in the paper and to enter into said slits. Fig. 9 is a transverse section on line Y Y in Fig. 3. Fig. 10 illustrates a modification of the means for holding the gripper normally in its open position, and Fig. 11 is a plan view of the end portion of the machine which is provided with the vertically-movable paper-conveying tapes.

Similar letters of reference indicate corresponding parts.

A represents the main supporting-frame of a paper-folding machine, which frame may be of any suitable shape.

B B denotes the paper-folding rollers,

which are geared together to cause them to rotate with their top portions toward each other in the usual and well-known manner. C represents the blade, which tucks the sheet into the bite of said rollers.

a a are traveling endless tapes which carry the paper into the machine and deliver it over the folding-rollers, and D represents the front stop or gage, which arrests the movement of the incoming sheet. This front stop alternately advances to and recedes from its sheet-arresting position for the purpose hereinafter explained. For imparting said movement to the front stop various mechanisms may be employed. I have preferred to show said mechanisms of the form illustrated in my Letters Patent No. 561,937, dated June 9, 1896; and it consists, essentially, of longitudinal bars b, supported at their inner or rear ends on rollers c and having fastened to their outer or front ends brackets c', which are pivotally connected to the lower ends of arms d, suspended from and fastened to a rock-shaft d', which extends across the machine and is mounted in bearings on posts e, erected on the sides of the main frame A, said rock-shaft receiving motion from a lever e', attached to one end of said shaft and bearing with its free end on a rotary cam F, which imparts oscillatory motion to said lever and intermittent reciprocating motion to the bars b b. The front stop or gage D rides on the said bars and is connected thereto, so as to cause it to move with the same by means of screws f, passing through nuts f', affixed to the said front stop and journaled in the brackets c', hereinbefore mentioned. These brackets are formed with posts c<sup>2</sup>, in which is journaled a horizontal shaft e<sup>2</sup>, extending across the machine and having fastened to it worm-gears f<sup>2</sup>, which mesh with similar gears f<sup>3</sup>, attached to the screws f. By turning said shaft e<sup>2</sup> the two screws f f are caused to turn and move the front stop D backward or forward, as may be required, for operating on sheets of different lengths. The aforesaid connection of the front stop D to the longitudinally-movable bars b b causes said front stop to alternately advance to and recede from its sheet-arresting position. To this front stop I attach two grippers disposed at opposite



sides of and equidistant from the longitudinal central line of the machine. The purpose of these grippers is to engage the arrested sheet and impart to it a secondary advance movement simultaneously with the receding movement of the front stop. Each of these grippers I prefer to form of a gripper-shoe *g*, fastened to the base of the front stop *D* and projecting rearward therefrom to receive upon it the front portion of the arrested sheet, as more clearly shown in Figs. 3, 4, and 5 of the drawings. Over each of said gripper-shoes is a gripper-finger *g'*, pivoted to the front stop and having affixed to its pivoted end an arm *h*, which extends upward and rearward over the gripper-finger for the purpose hereinafter explained. Said gripper-finger is to be held normally in its raised or open position either by a weight *i*, adjustably connected to an arm *i'*, extending forward from the pivoted end of the gripper-finger, as shown in Figs. 3, 4, and 5 of the drawings, or by means of a suitable spring *j*, attached at one end to the front stop *D* and having its free end pressing the arm *h* of the gripper-finger forward, as illustrated in Fig. 10 of the drawings. A set-screw *j'* may be connected to the front stop directly over the gripper-finger *g'* to limit the upward movement of said finger. Directly over each of said grippers is a vertically-movable arm *k*, which in its downward movement bears on the free end of the arm *h*, and thereby depresses the gripper-finger *g'* and imparts the required gripping force upon the subjacent gripper-shoe *g*. To permit this gripping force to be regulated so as to allow the gripped paper to be withdrawn therefrom without opening the gripper, as hereinafter described, a suitable adjustable tappet *l* is interposed between the two arms *k* and *h*, which tappet may consist of a set-screw connected to the arm *h* of the gripper-finger, as shown.

Various means may be employed to impart the vertical movement to the arm *k*, and I therefore do not wish to be limited in this respect. The means illustrated in the annexed drawings are of the form shown in my Letters Patent No. 561,937, hereinbefore mentioned, in which the arm *k* is fastened at one end to a rock-shaft *k'*, receiving motion from a lever *L*, attached to the end of said shaft and bearing on a rotary cam *L'*, which, in connection with a spring *L<sup>2</sup>*, imparts an oscillatory motion to said lever.

At the rear end of each of the described grippers is a registering-finger *m*, carried on the arm *k* and extending rearward and downward therefrom and formed at its free end with a registering-point *n*, adapted to enter into a slit made in the paper for that purpose. The registering-finger is supported longitudinally adjustable on the arm *k* by means of a shoe *m'*, formed on said finger and fitted by a dovetail joint to the said arm, as shown in Fig. 9 of the drawings. A nut *n'*, projecting from the side of said shoe, embraces a screw *n<sup>2</sup>*, which is journaled in an ear *o*, projecting

from the arm. Immediately in front of the registering-point *n* is a shoulder or abutment *o'*, projecting upward from the finger *m*.

In connection with the described registering-finger I employ under said finger a paper-supporting bar *p'*, which has a portion of its top deviated from the plane of the main portion of the bar and in a position to receive over it the slitted portion of the paper. Said deviation may consist either of a bridge *p*, rising from the bar *p'*, similar to that shown in my aforesaid Letters Patent, or of a longitudinal groove *p<sup>2</sup>* in the top of said bar, as represented in Figs. 7 and 8 of the drawings.

In the operation of the machine the registering of the paper is effected in the following manner, to wit: The paper is carried into the machine by the tapes *a-a* in the usual manner. During the delivery of the paper the arms *k* are in their elevated position to allow the paper to pass under the registering-points *n* and the front stop *D* is in its rearmost position to arrest the movement of the paper. Said positions of the arms and front stop cause the grippers to be in their normal position. Then the free ends of the arms *k* descend and cause the registering-points *n* to depress the portions of the paper at the aforesaid deviations of the planes of the paper-supporting bars *p'*, and thereby strain said portions of the paper sufficiently to open the slits in the paper. Simultaneously with said opening of the slits the arms *k* depress the gripper-arms *h*, and thereby close the gripper-fingers *g'* upon the paper lying upon the gripper-shoes *g*. The front stop *D* then moves forward, and by means of the grippers it draws along with it the paper. In this secondary forward movement of the paper the registering-points *n* are caused to enter into the slits in the paper, and the rear edges of the slits are brought in contact with the abutments *o'* on the registering-fingers. These abutments constitute a secondary sheet-arresting gage which prevents further advance movement of the paper and causes the paper to be withdrawn from the closed grippers during the further movement of the front stops. This withdrawal of the paper from the closed grippers without tearing the slitted portions of the sheet requires very accurate adjustment of the gripping force of the grippers, and for this purpose I employ the hereinbefore-described adjustable tappet or set-screw *l*, preferably in connection with an adjustable spring-plate *v*, which is placed lengthwise on the under side of the arm *K* and is fastened at one end thereto. An adjusting-screw *v'* is connected to the free portion of said spring-plate and is brought to bear on the arm *K* by the pressure of the tappet *l* when said arm is depressed, as shown in Figs. 1 and 4 of the drawings. By means of said adjusting-screw *v'* the tension of the spring-plate *v* can be adjusted to apply the desired pressure to the gripper. The aforesaid abutment of the reg-



istering-fingers during the secondary advance movement of the paper causes the paper to be arrested in its registered position. The arms  $k k$  then rise sufficiently to lift the paper from the bridges  $p$  or relieve the paper from depression into the grooves  $p^2$  in the paper-supporting bars  $p'$ , and thus obviate tearing or injuring the paper during the operation of introducing it between the folding-rollers B B.

10 In order to guard against buckling the paper by its contact with the front stop D and also obviate disturbing the paper from its registered position, I employ suitable means for relieving the paper from the frictional hold of the traveling tapes  $a a$  as soon as the paper has come in contact with the aforesaid front stop. For this purpose I prefer to place directly under the tapes  $a a$  rollers  $r' r'$ , mounted on shafts  $r r$ , which extend across the machine and pass with their ends through vertical guides  $t t$  and are connected to the upper ends of toggle-levers, which are pivoted at their lower ends to bearings  $s' s'$  on the frame A, as shown in Fig. 6 of the drawings. There is a set of such toggles on each side of the machine to support the ends of the shafts  $r r$ . Each of said sets is connected by a rod  $u$  and is actuated by a pitman  $u'$ , which receives intermittent reciprocating motion from a rotary cam R. The action of the toggles is timed to lower the roller-shafts  $r r$ , so as to cause the paper to ride on the usual stationary bars  $a'$ , arranged between the tapes, and thus relieve the paper from contact with the tapes as soon as the paper has been carried into contact with the front stop and while the blade C introduces the paper between the folding-rollers B B.

I do not limit my invention to the use of a registering pin or point entering into the slit in the paper, as this is not absolutely necessary in every instance. The essential feature of said pin or point is its abutting against the edge of the slit, and thereby arresting the movement of the paper in its registered position. The functions of the points  $n$  are chiefly to depress the paper, and thereby open the slit in the paper, and subsequently lift the paper to allow it to freely pass into the bite of the folding-rollers.

What I claim as my invention is—

1. In a paper-folding machine equipped with conveyers for delivering the paper over the folding-rollers, a primary paper-arresting gage, means imparting a secondary movement to the arrested paper, a secondary paper-arresting gage, and mechanism actuating said second gage and timed in its movement to carry said gage to its operative position during the aforesaid secondary movement of the paper.

2. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, means for imparting a secondary advance movement to the paper during the receding motion of said

front stop and a registering-point disposed to come in contact with the edge of the slitted portion of the paper during said secondary movement of the paper and operating in advance and independently of the folding-blade as set forth.

3. In combination with the folding-blade conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, grippers carried on said front stop and actuated to move the paper simultaneously with the receding movement of the front stop, and registering-points disposed to come in contact with the edges of the slitted portions of the paper during the latter movement of said paper and operating separately and independently of the folding-blade as set forth.

4. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, grippers carried on said front stop to engage and release the paper, means for opening and closing said grippers and means for adjusting the gripping force of said grippers to allow the paper to withdraw therefrom when arrested in its registered position.

5. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, intermittently-reciprocating longitudinal bars and a front stop mounted adjustably on said bars and moving with the same, grippers carried on the front stop to engage and release the paper.

6. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, means imparting a secondary advance movement to the paper during the receding movement of said front stop, registering-points disposed to enter into the slits in the paper during said secondary movement thereof and operating separately and independently of the folding-blade, and abutment on said points receiving the rear edges of the slits as set forth.

7. In combination with the folding-rollers, folding-blade and conveyers automatically delivering the paper over said rollers, an alternately advancing and receding front stop, grippers carried on said front stop to engage and release the paper and draw said paper forward with the receding movement of the front stop, registering-points disposed to enter into the slits in the paper during said forward draft of the paper and operating separately and independently of the folding-blade, and abutments on said registering-points receiving the rear edges of the slits as set forth.

8. In combination with the folding-rollers, folding-blade and conveyers automatically delivering the paper over said rollers, an alternately advancing and receding front stop, grippers carried on said front stop to engage and release the paper, registering-points disposed to enter into the slits in the paper dur-



ing the forward draft thereof by the grippers, abutments on said registering-points receiving the rear edges of the slits, and means for adjusting the gripping force of the grippers to allow the paper to withdraw therefrom when engaged by the abutments of the registering-points as set forth.

9. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, intermittently-reciprocating longitudinal bars, a front stop mounted adjustably on said bars and moving with the same, grippers carried on said front stop to engage the paper and registering-points disposed to enter into the slits in the paper while moved by the grippers and provided with abutments receiving the rear edges of the slits as set forth.

10. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, intermittently-reciprocating longitudinal bars, a front stop mounted adjustably on said bars and moving with the same, grippers carried on said front stop to engage the paper, registering-points disposed to enter into the slits in the paper while moved by the grippers, abutments arresting said movement of the paper and means for adjusting the gripping force of the grippers to allow the arrested paper to withdraw from said grippers as set forth.

11. In combination with folding-rollers, folding-blade, conveyers delivering the paper over said rollers and the front stop arresting the movement of the paper, longitudinally-movable grippers imparting a secondary advance movement to the arrested paper, vertically-movable arms disposed to close said grippers upon the paper by the downward movements of said arms, and registering-points carried by said arms into position to enter into the slits in the paper during the aforesaid secondary movement of the paper.

12. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, grippers traveling with said front stop to impart a secondary movement to the arrested paper, vertically-movable arms disposed to close said grippers upon the paper by the downward movement of the arms, registering-points carried by said arms into positions to enter into the slits in the paper during the aforesaid secondary movement thereof, and abutments on said registering-points receiving the rear edges of the slits as set forth.

13. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, grippers connected to and traveling with said front stop to impart a secondary advance movement to the arrested paper, vertically-movable arms over said grippers to close the same upon the paper by the downward movement of the arms, fingers attached to said arms adjust-

able longitudinally thereon, and registering-points on the free ends of said fingers to enter into the slits in the paper during the secondary movement thereof as set forth.

14. In combination with the folding-rollers, folding-blade and conveyers delivering the paper over said rollers, an alternately advancing and receding front stop, grippers connected to said front stop to impart a secondary advance movement to the arrested paper, vertically-movable arms over said grippers, means for closing the grippers by the downward movement of said arms and adjustable to vary the gripping force of said grippers, registering-points carried by said arms to positions to enter into the slits in the paper, and abutments on said points receiving the rear edges of the slits as set forth.

15. In combination with the paper-folding rollers, folding-blade, paper-conveyers and front stop, paper-supporting bars provided with deviations of their planes disposed to receive over them the slitted portions of the paper, vertically-movable registering-points disposed to depress the paper in front of said deviations and thereby open the slits in the paper and longitudinally-movable grippers imparting a secondary advance movement to the arrested paper and thereby causing the registering-points to enter into the aforesaid slits.

16. In combination with the paper-folding rollers, folding-blade and paper-conveyers an alternately advancing and receding front stop, paper-supporting bars provided with deviations of their planes disposed to receive over them the slitted portions of the paper, vertically-movable registering-points disposed to depress the paper in front of the aforesaid deviations and thereby open the slits in the paper, grippers connected to and moving with the aforesaid gage to impart a secondary advance movement to the arrested paper, and means for closing the grippers simultaneously with the downward movements of the registering-points and adjustable to vary the gripping force of the grippers as set forth.

17. In combination with the paper-folding rollers, folding-blade and paper-conveyers, an alternately advancing and receding front stop, paper-supporting bars provided with deviations of their planes disposed to receive over them the slitted portions of the paper, vertically-movable arms over said bars, fingers carried on said arms and provided with registering-points on their free ends bearing on the paper in front of the aforesaid deviations and thereby opening the slits, abutments on the fingers back of the registering-points thereof, grippers carried on the aforesaid front stop to impart a secondary advance movement to the arrested paper and thereby causing the registering-points to enter into the slits in the paper, and means for closing the grippers by the downward movements of the aforesaid arms and adjustable to regulate the gripping force of the grippers to allow the paper to be



withdrawn therefrom by the engagement of the rear edges of the slits with the abutments on the aforesaid fingers as set forth.

18. In combination with the paper-conveyers and an alternately advancing and receding front stop, a gripper-shoe projecting rearward from said front stop to receive upon it the front portion of the paper; a gripper-finger disposed over said shoe and normally lifted therefrom, a vertically-movable arm over said gripper-finger, a vertically-adjustable tappet interposed between said arm and gripper-finger to depress said finger by the depression of said arm and cause the gripped paper to move with the receding gage as set forth.

19. In combination with the paper-conveyers and an alternately advancing and receding front stop, gripper-shoes projecting rearward from said front stop to receive upon them the front portion of the paper, gripper-fingers pivoted to the front stop, arms fastened to the pivoted portions of the said fingers and extending over the free ends thereof, vertical set-screws adjustably attached to the free ends of said arms, means for sustaining the gripper-fingers normally lifted from the gripper-shoes, vertically-movable arms pressing on the aforesaid set-screws and thereby depressing said gripper-fingers as set forth.

20. In combination with the alternately ad-

vancing and receding front stop, grippers connected to and moving with said front stop to impart a secondary advance movement to the arrested paper, registering-points disposed to enter into the slits in the paper during the aforesaid secondary movement thereof, paper-conveying tapes carrying the paper to the front stop and rising and falling to and from their conveying position and paper-supporting bars between said tapes as set forth.

21. In combination with the alternately advancing and receding front stop, grippers connected to and moving with said front stop to impart a secondary advance movement to the arrested paper, vertically-movable arms disposed over said grippers to close the same upon the paper by the downward movement of said arms, registering-points carried on said arms to enter into the slits in the paper during the aforesaid secondary movement thereof, tape-rollers mounted in vertically-movable supports, paper-conveying tapes carried on said rollers, mechanisms raising and lowering said tape-rollers, and paper-supporting bars between said tapes as and for the purpose set forth.

TALBOT C. DEXTER. [L. S.]

Witnesses:

G. V. B. LEITCH,

M. E. MORRISON.