

(No Model.)

4 Sheets—Sheet 1.

W. DUNCAN.

BLANKET CONTROLLER FOR CALICO PRINTING MACHINES.

No. 497,953.

Patented May 23, 1893.

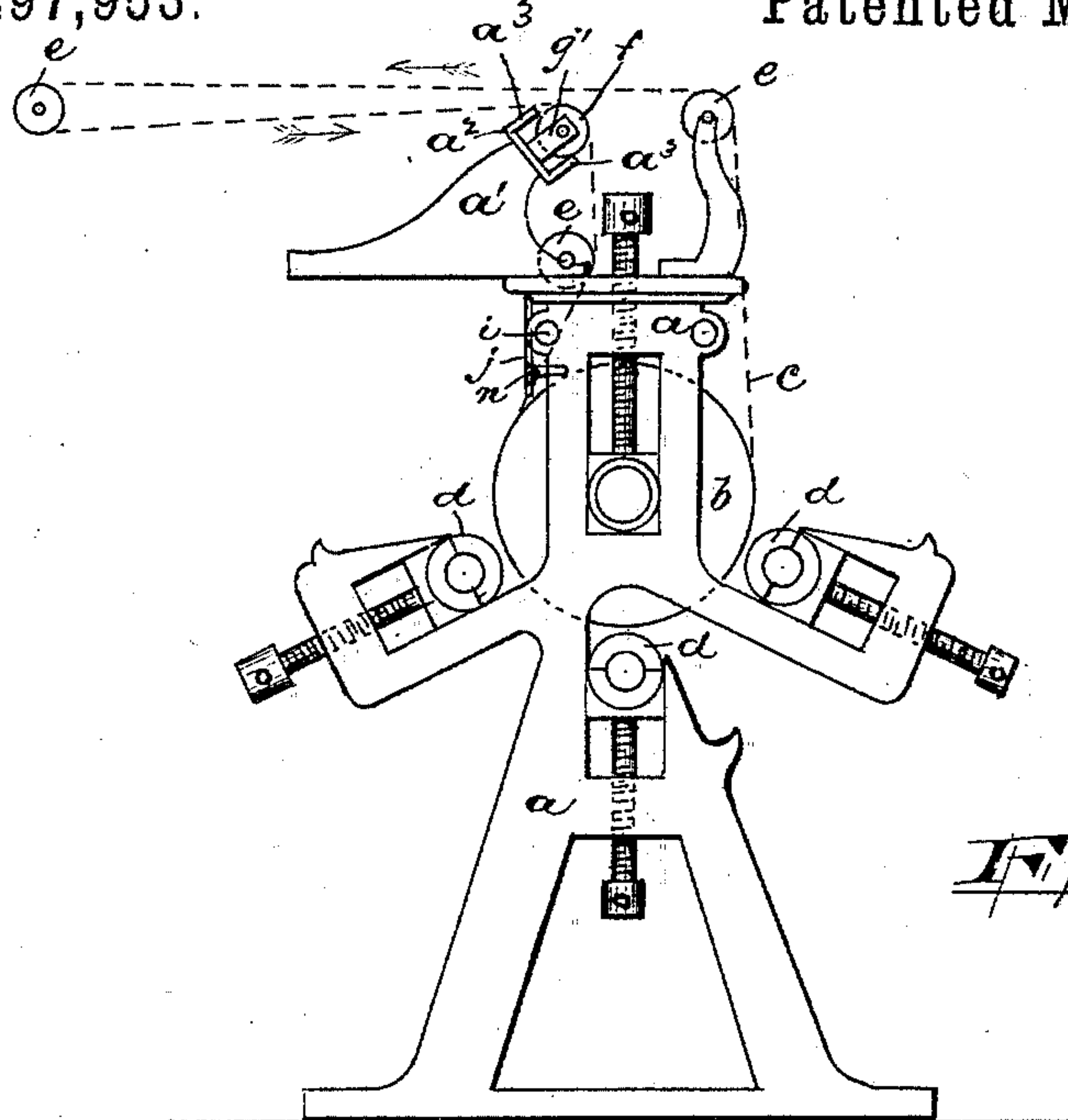


Fig. 1.

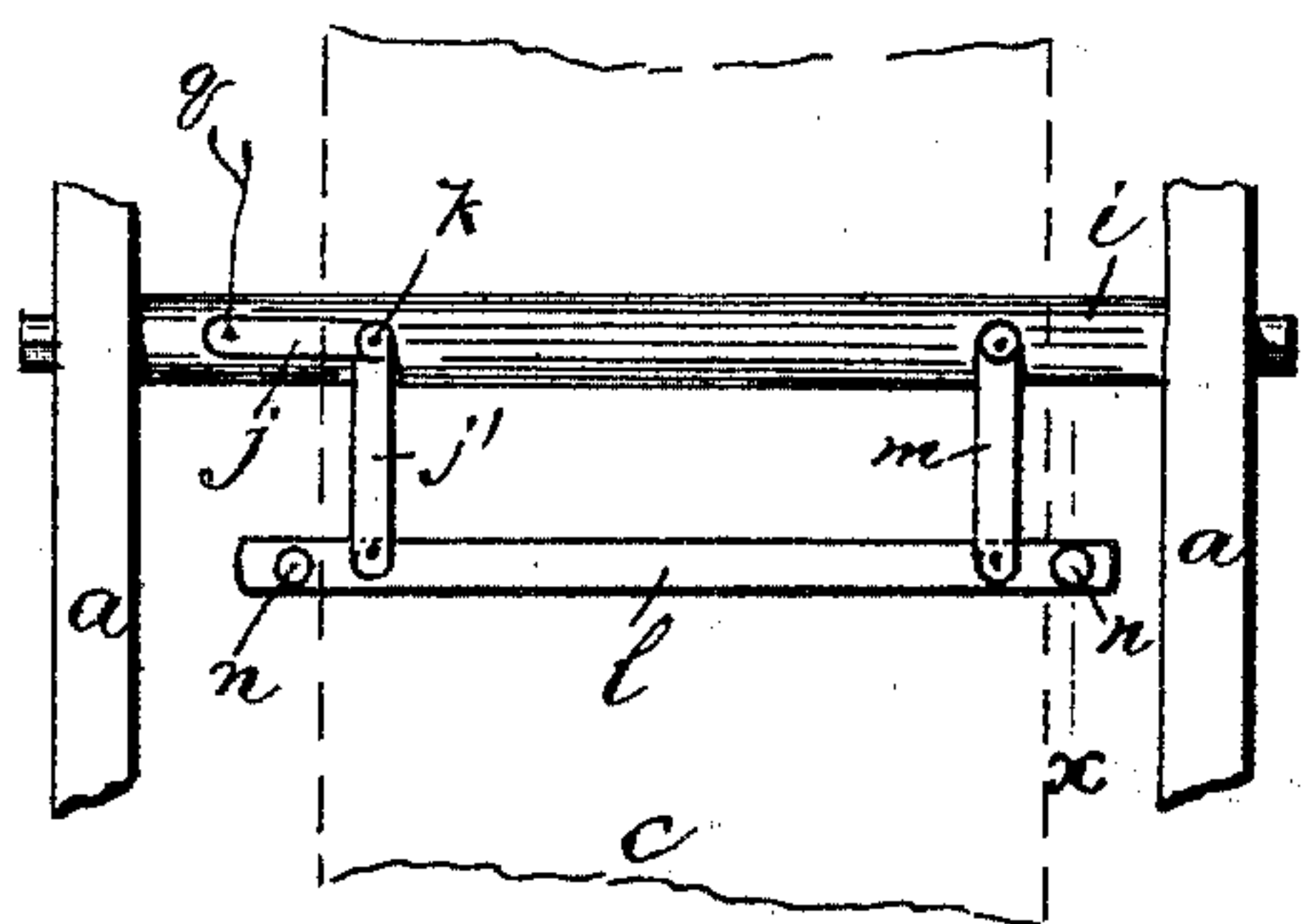


Fig. 2.

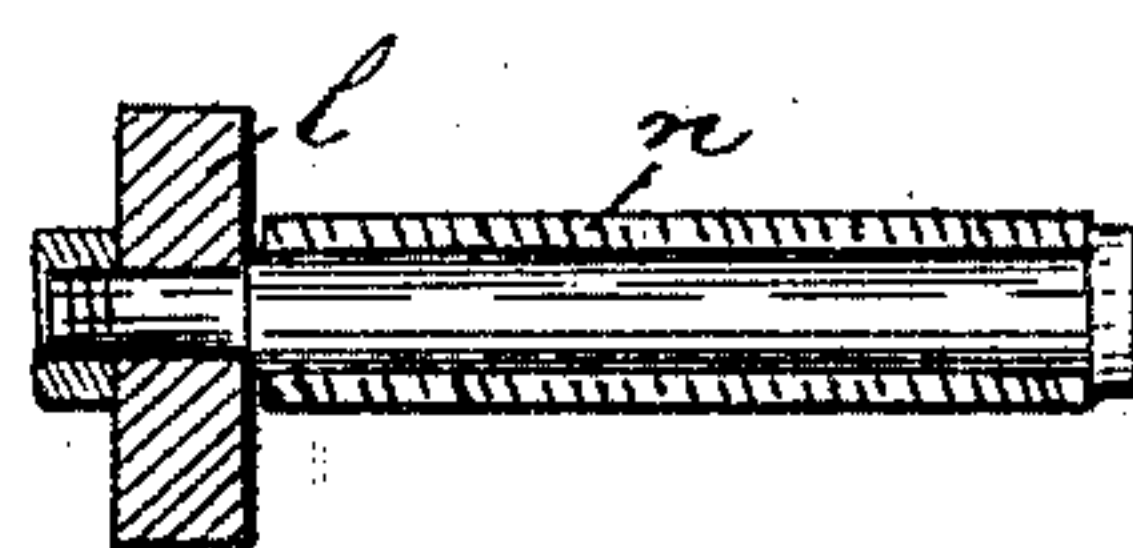


Fig. 3.

Witnesses

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(No Model.)

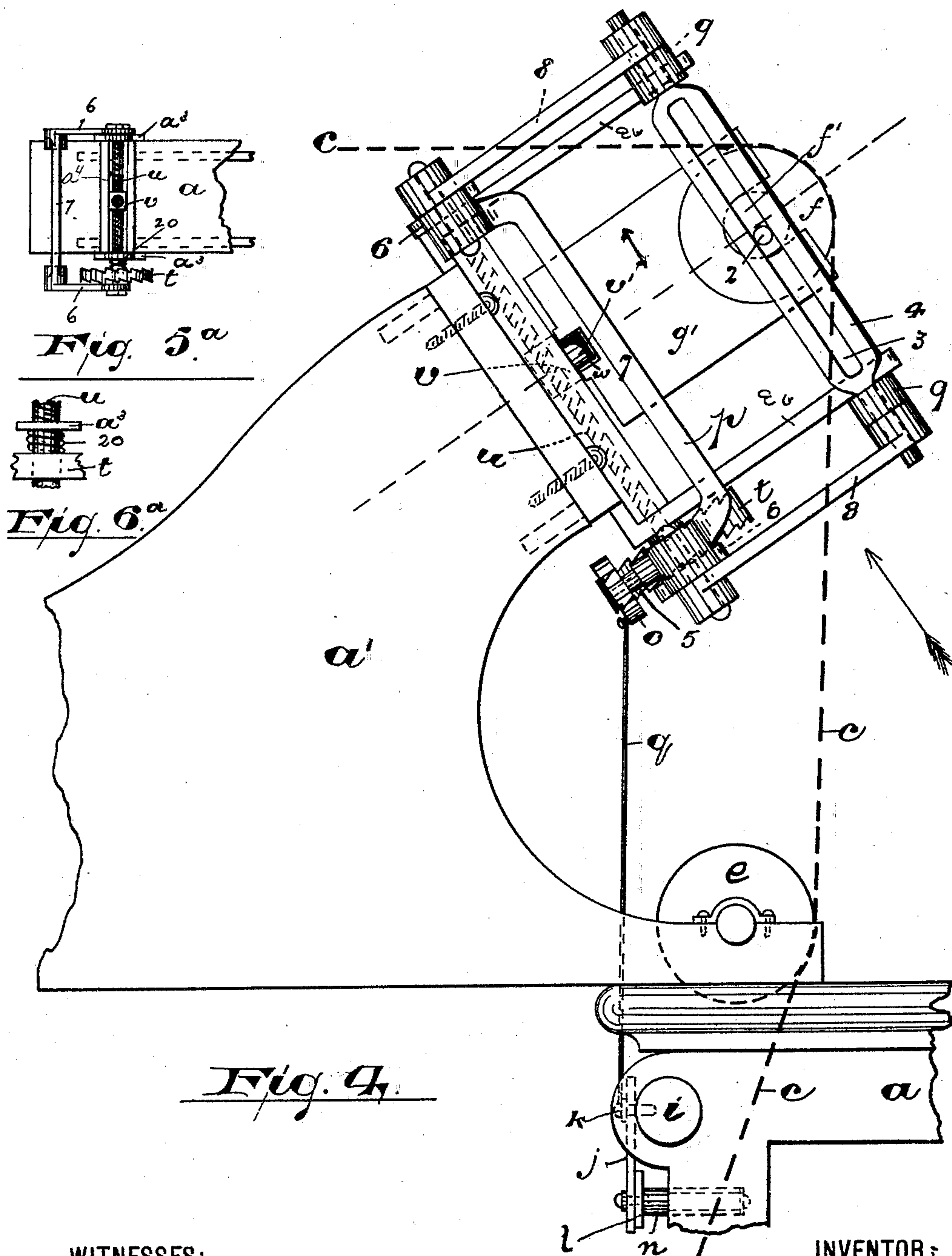
4 Sheets—Sheet 2.

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WITNESSES:

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William Duncan,

BY *Wm. D. Duncan* ATTY'S.

(No Model.)

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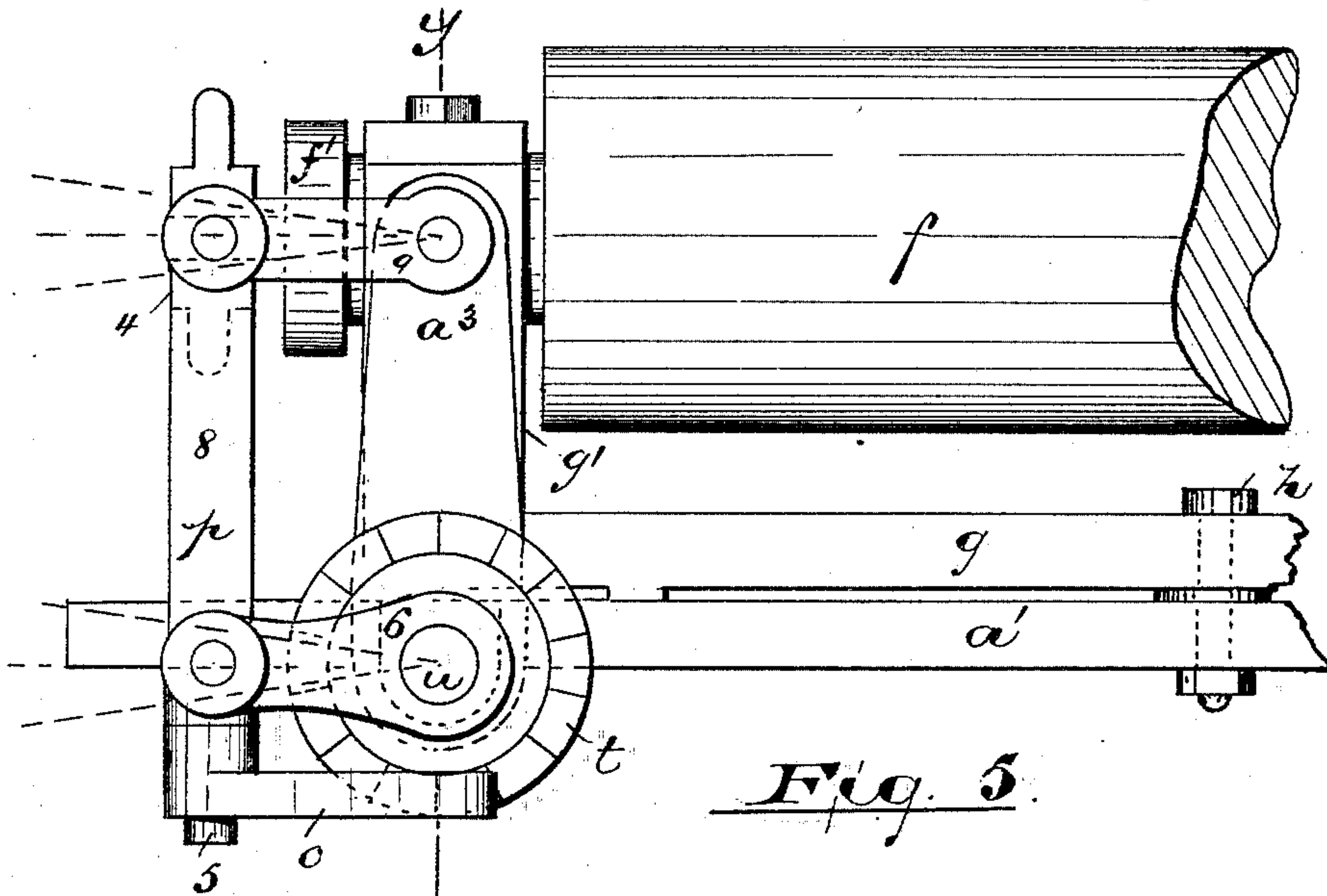


Fig. 5.

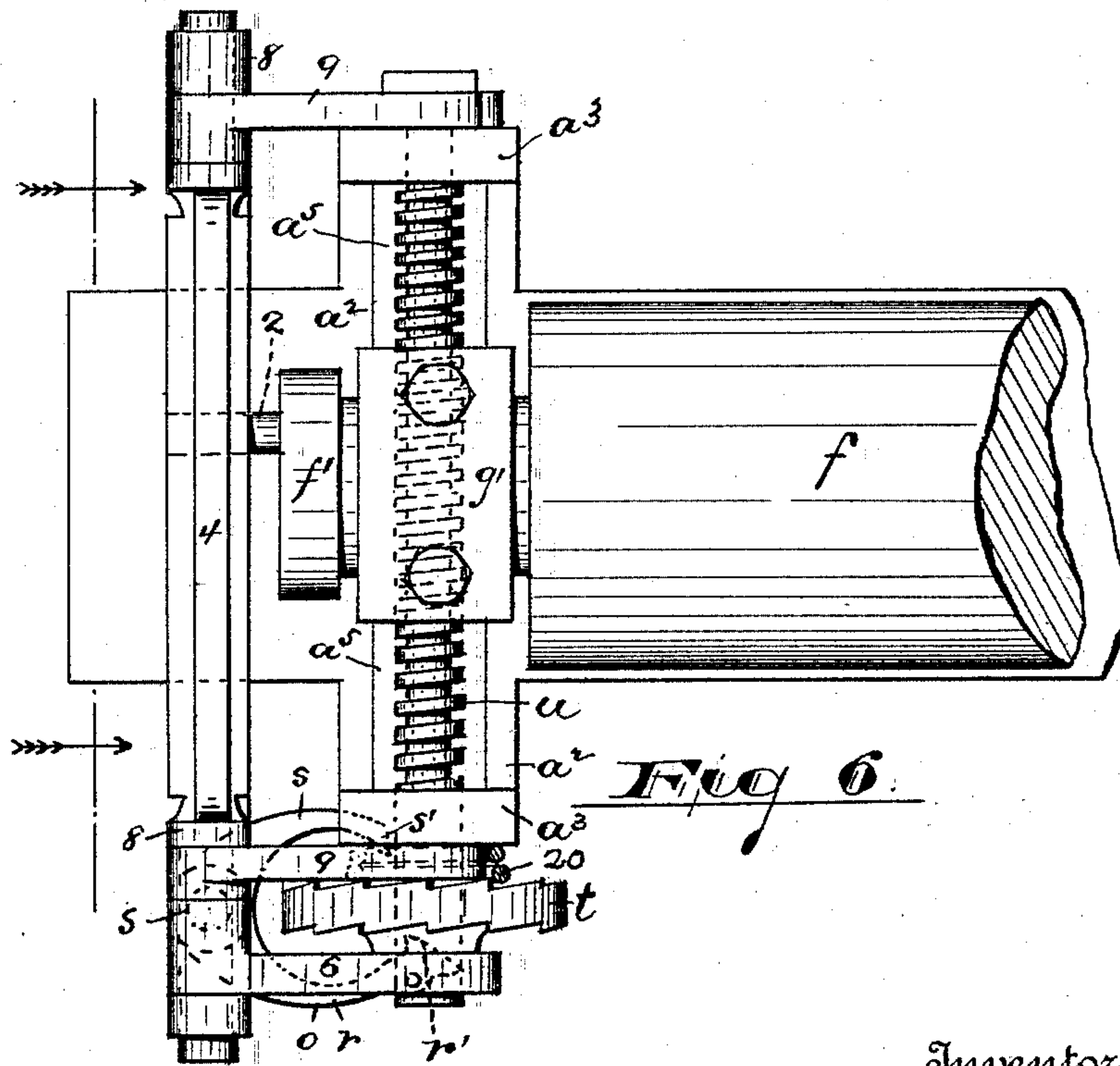


Fig. 6.

Witnesses

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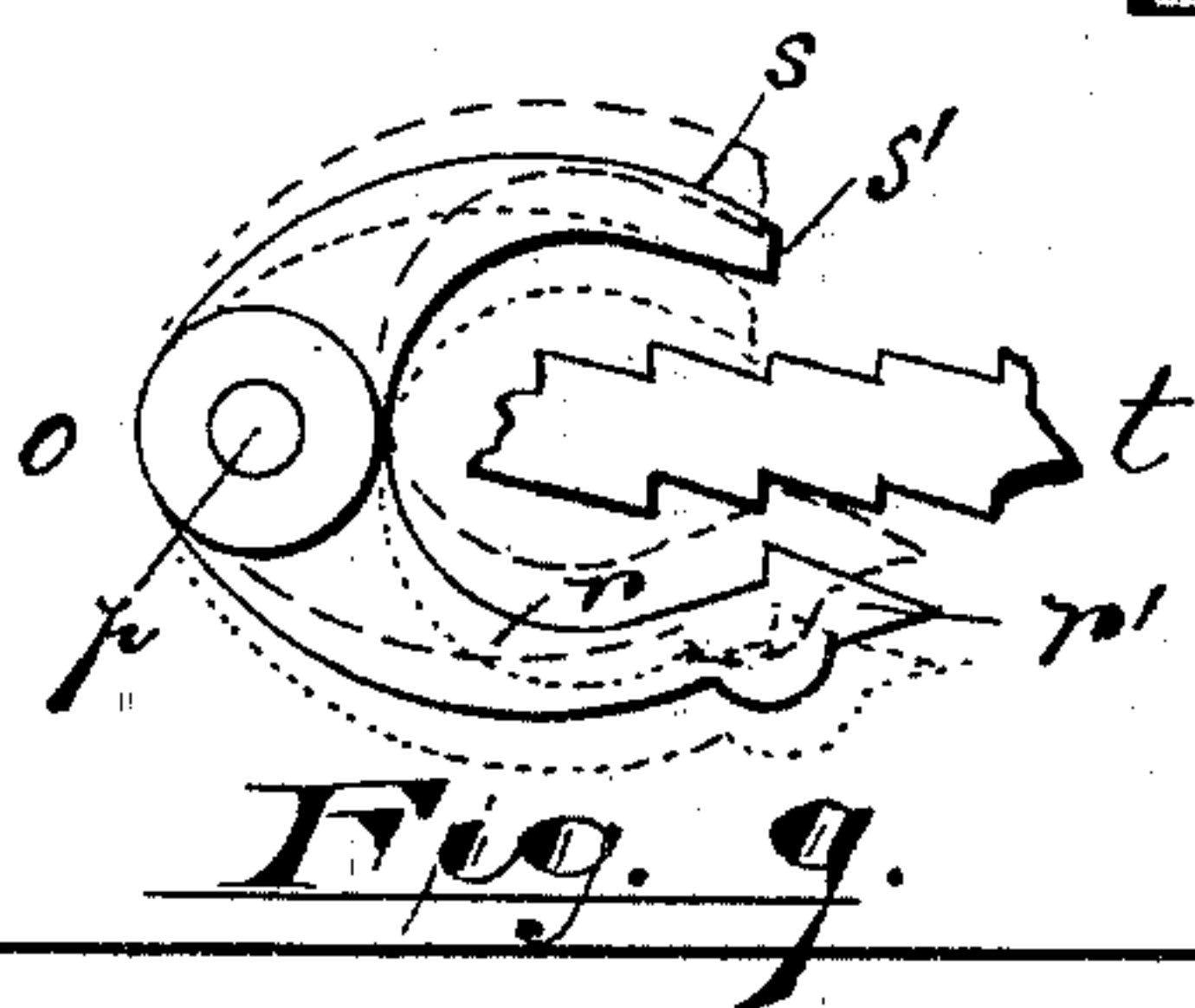
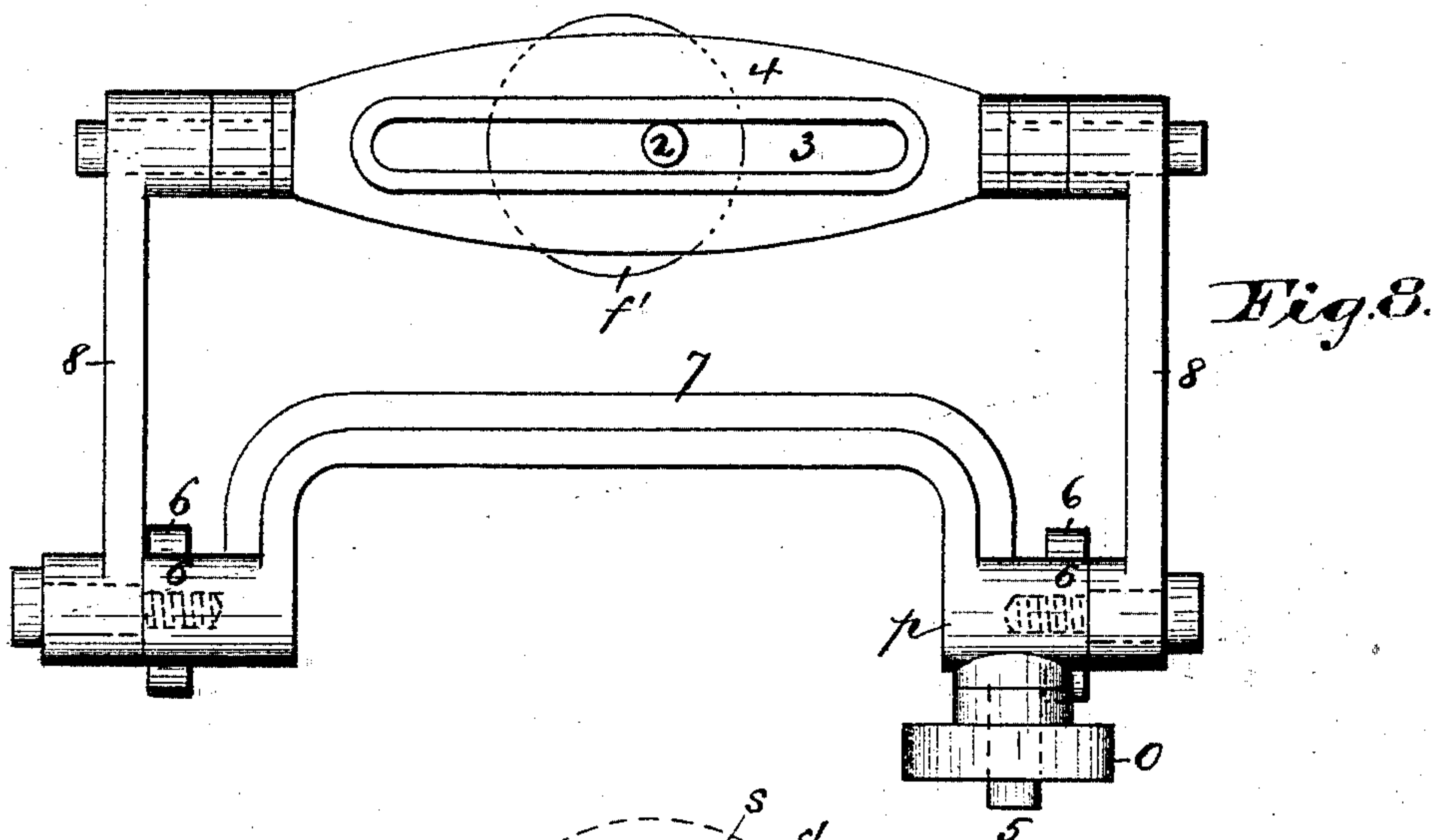
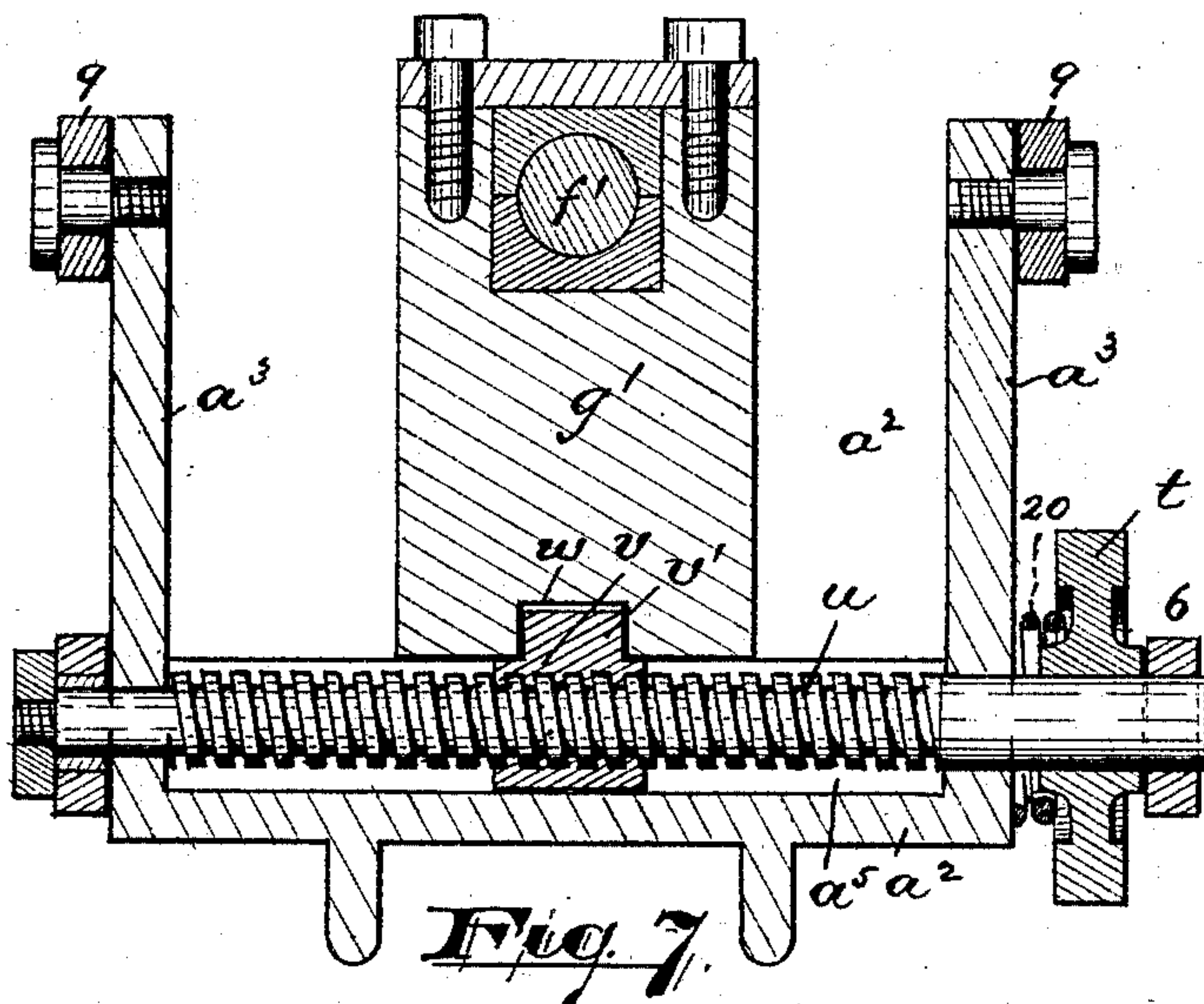
4 Sheets—Sheet 4.

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BLANKET CONTROLLER FOR CALICO PRINTING MACHINES.

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Witnesses

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Inventor.

William Duncan,

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UNITED STATES PATENT OFFICE.

WILLIAM DUNCAN, OF HARRISON, NEW JERSEY.

BLANKET-CONTROLLER FOR CALICO-PRINTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 497,953, dated May 23, 1893.

Application filed January 29, 1889. Serial No. 297,913. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DUNCAN, a citizen of the United States, residing at Harrison, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Blanket-Controllers for Calico-Printing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

The objects of this invention are to reduce the amount of labor and attention that has heretofore been required in keeping the "blanket" of calico printing machines from working to one side or the other of the printing cylinder and guide roll, owing to the irregularity of pressure of the printing rolls on said blanket, or other causes; to enable a narrower blanket to be employed, and to reduce the amount of damage to said blanket because of its working laterally on said cylinder and roll and thus wearing against the frame of the machine.

The invention consists in the improved calico printing machine and in the arrangements and combinations of parts substantially as will be hereinafter set forth and finally embodied in the clauses of the claim.

Referring to the accompanying drawings embraced in four sheets in which like letters and figures indicate corresponding parts in each of the several views, Figure 1 is a side elevation of the improved machine, showing the relations of the cylinder, rolls and blanket of the machine to one another but devoid of certain parts of my improvements which are shown in detail in other figures. Fig. 2 is a detail elevation of a system of mechanisms adapted to be engaged by the blanket and to operate other mechanisms for changing the inclination of the guide roll so that the blanket will tend to work in an opposite direction thereon as will be hereinafter fully explained. Fig. 3 is a detail section on line *x*, Fig. 2. Fig. 4 is a detail side elevation, enlarged, of a guide roll and adjacent parts and mechanisms for automatically changing the inclination of said guide roll so that, when the blanket works to one side of the said guide roll a limited dis-

tance, the inclination of said guide roll will be changed and the blanket will at once commence to travel in the opposite direction toward the opposite end of the roll, as will be understood. Fig. 5 is a detail view taken in the direction indicated by the arrow in Fig. 4. Figs. 5^a and 6^a are detail views hereinafter referred to. Fig. 6 is a downward view taken in a direction at right angles to that of the said arrow. Fig. 7 is a sectional view taken on line *y*, Fig. 5. Fig. 8 is a detail view taken in the direction of the arrows in Fig. 6. Fig. 9 is a detail showing the operation of a certain pawl and ratchet wheel.

In said drawings, *a* indicates a suitable framework or bed frame of any suitable construction adapted to the uses and purposes of a calico printing machine.

b indicates the usual cylinder arranged therein, and over which the blanket *c* travels.

d, d, d, are the printing rolls, *e* the blanket rolls and *f*, the guide roll which operates to keep the blanket in proper relation to the cylinder and printing rolls. Said guide roll is arranged on a frame *g, g'*, pivoted as at *h* to the bed frame *a'*, at a central point between the ends of the guide roll. Heretofore this pivotal frame was generally operated by hand so that, as the blanket, in its lateral movement, approached the end of the guide roll in one or the other direction, the attendant would, by the use of an adjusting screw, change the position of the roller in its relation to the blanket, turning the said roll on its frame and thus cause the blanket to travel in the opposite direction and thus avoid entering into contact with the bed frame. This movement continued until the opposite limit was reached when the attendant would again adjust the guide roll. It will be seen that the guide roll thus required constant attention, which it is the principal object of this invention to avoid.

To secure an automatic adjustment of the guide roll, I have secured upon any suitable part of the frame *a*, as for example the bar *i* Figs. 1, 2, 4, a bell crank or lever *j*, which is fulcrumed on said bar *i*, as at *k*, and carries or helps to carry a bar *l*. I prefer to have a link *m* in addition to the bell crank for carrying said bar *l*. Said link lies parallel with the portion *j'*, Fig. 2, and moves therewith, being pivoted to the bar *i* and bar *l* at equal

distances from said portion j' as will be understood. Projecting from said bar l , at the opposite ends thereof, are studs n , shown in Figs. 2, 3 and 4 which engage the opposite edges of the blanket, the said blanket working therebetween as will be understood. Said studs are preferably provided with anti-friction rollers to prevent wear on said blanket. When the blanket engages one or the other of said studs, it causes it and the parts movable therewith to move laterally; this operates the bell crank and causes the movement of a pawl o on the pawl carrier p adjacent to the guide roll. The bell crank and pawl are connected by the rod q . The pawl o is provided with both a pulling and pushing arm, marked r and s respectively in Figs. 6 and 9, which engage the opposite sides of a ratchet wheel t secured on the end of a screw shaft u shown in Fig. 7 and in outline in Fig. 4. To enable the pawl, o , to either pull upon the ratchet wheel when operated upon by the bell crank rod or to push the said wheel or lie stationary and cause said wheel to turn when operated upon by mechanisms hereinafter described, I provide the pulling arm with a hook r' adapted to draw on the ratchet-wheel to operate it in one direction, and the pushing arm with an abutment s to push on the said ratchet wheel or resist its oscillatory movement and cause it to move pivotally in the opposite direction as will be apparent upon inspection of Fig. 9. The said screw shaft u upon which the ratchet wheel is arranged, is secured in bearings on the top frame a' , the upper part of the top frame being provided with a guide roll frame a^2 having arms a^3, a^3 , which provide the bearings for the said screw shaft.

On the screw-shaft u , is arranged a nut or block v which slides in a slot a^5 in the frame a^2 under the influence of the screw shaft, the said nut moving either backward or forward in accordance with the movement of said shaft under the influence of the ratchet and pawl as will be understood. The said nut or block v carries a lug or projecting pin v' which enters a transverse slot w on the under side of the pivoted frame g . The movement of the lugged-nut causes said frame to move pivotally in one direction or the other and thus change the relation of the roller f to the blanket, and cause the latter to travel in an opposite direction.

The pulling or pushing on the pawl by the wire q , tends to either move the pawl to or from engagement with the ratchet; to secure an additional movement whereby the pawl throws the ratchet wheel in one or the other direction, I have given the pawl-carrier p a vibratory movement on its bearings. To this end, I have provided on the end of the guide roll journal f' Figs. 4 and 8 an eccentric pin, 2, which works in a slot, 3, in the bar 4 of the pawl carrier so that as the said eccentric pin, 2, moves with the journal of the guide roll the said bar, 4, is given a reciprocating move-

ment which is transmitted to the pawl and is effective in giving the desired push or pull by which the ratchet-wheel is turned.

I prefer to construct the pawl-carrier as indicated in Figs. 4, 5 and 8. The said pawl is arranged on a stud or pin 5 arranged on a frame 6, 6, 7, which latter is pivoted on the ends of the screw-shaft u at the base of the arms a^3 .

The slotted bar 4 is connected to the free end of the pivoted frame 6, 6, 7, by links or connections 8, so that the reciprocal movement of said rod is transmitted to the frame 6, 6, 7, and the pawl o . The slotted bar, 4, and links, 8, are tied to the upper ends of the arms a^3 , and thus held in proper relative position, by links 9.

The slot, 3, is of suitable length to allow for a considerable pivotal movement of the guide roll, frame g , and pin 2 as will be apparent.

In practice, I find it desirable to produce a resistance to the action of the screw-shaft and ratchet wheel to prevent the pawl from turning it too freely and thus being affected by the back action or drag of the pawl. To this end I employ a small spring 20 shown in Figs. 5^a, 6, and 6^a which is placed between the ratchet wheel and adjacent parts of the frame a^2 .

While I have thus described an effective device for automatically regulating the guide roll, I am aware that various changes, modifications and equivalents may be employed and therefore I do not wish to be understood as limiting myself to the exact device positively described.

Having thus described the invention, what I claim as new is—

1. In a calico printing machine, the combination with the guide roll and blanket, a pivotal frame, nut, v , engaging said frame, a screw shaft, u , ratchet wheel, t , and pawl carrier pivoted on said shaft, and a pawl engaging said ratchet wheel and operated by means engaged by the blanket, substantially as set forth.

2. In combination, a guide roll arranged on a pivotal frame, a nut, v , engaging said frame, a screw-shaft operating said nut, a frame 6, 6, 7, pivoted on the ends of said screw shaft, a ratchet wheel also arranged on said shaft, a slotted bar, 4, linked or connected with the frame 6, 6, 7 and movable therewith, an eccentric, 2, movable with the guide roll, a pawl arranged on said frame and engaging the ratchet wheel and a rod, q , connecting with means controlled by the blanket, all said parts being arranged and operating substantially as set forth.

3. In a calico printing machine, the combination with a cylinder, and a blanket, a guide roll arranged on a pivoted frame and studs adapted to engage the edges of the blanket and train of mechanism connecting said studs with said pivotal frame, whereby the said pivoted frame is turned by the engagement of said blanket with said studs, substantially as set forth.

4. In a calico-printing machine, the combination with the cylinder, and guide roll arranged on a pivoted frame, a screw shaft, lugged nut, ratchet wheel *t*, pawl *o*, rod *q*, bell crank *j* and means for engaging the blanket substantially as set forth.

5. In a calico printing machine, the combination with the cylinder, guide roll and blanket, of studs for engaging the opposite edges of the blanket, means for communicating the motion given to said studs to a pawl, a ratchet wheel and connections adapted to change the relation of said guide roll to said blanket, substantially as set forth.

6. In a printing machine, the combination with the guide roll and blanket, cylinder and other means to support the blanket a ratchet wheel connected with said guide roll and adapted to change the relation of the same to

the blanket and a pawl arranged on a vibrating frame, substantially as and for the purposes set forth.

7. In combination with the guide roll and bearings and blanket, a slotted pawl carrier, pawl and ratchet wheel for changing the inclination of the guide roll and bearings and an eccentric working with said guide roll to give a reciprocating movement to the pawl carrier and pawl, and means connecting the ratchet wheel and guide roll, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of January, 1889.

WILLIAM DUNCAN.

Witnesses:

ALFRED GARTNER,
CHARLES H. PELL.