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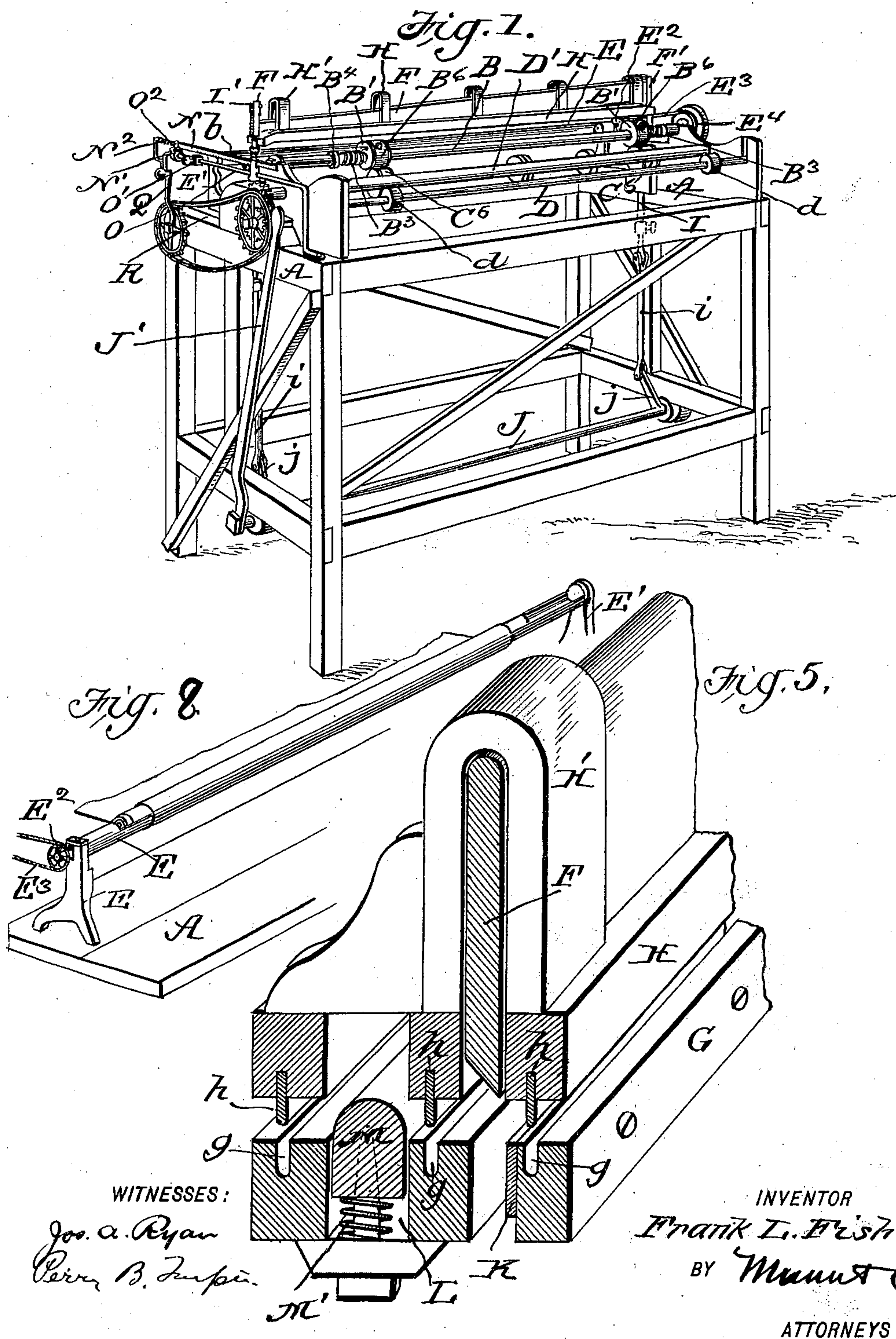
Patented Nov. 19, 1901.

F. L. FISHER.
WINDOW SHADE MACHINE.

(Application filed July 17, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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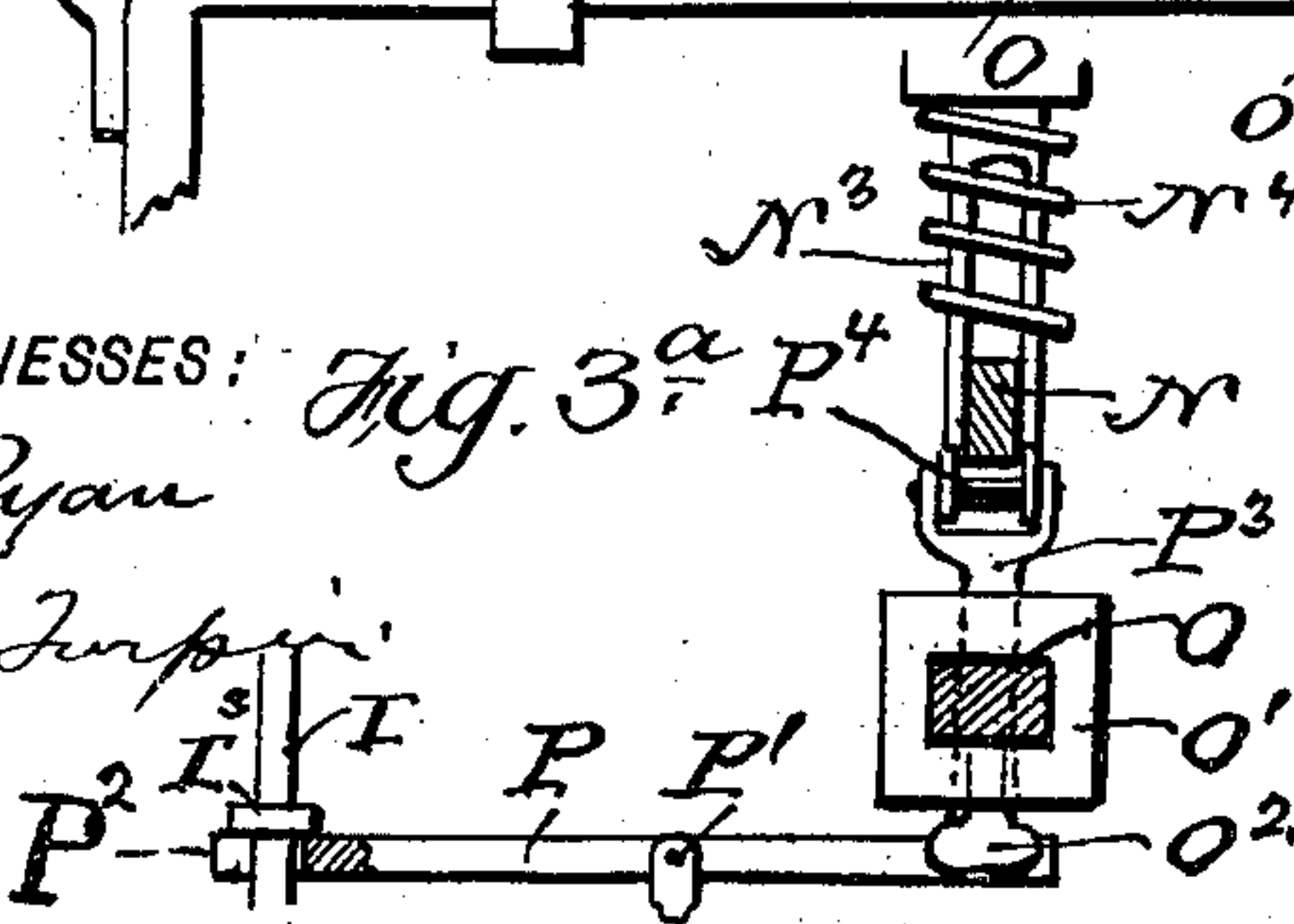
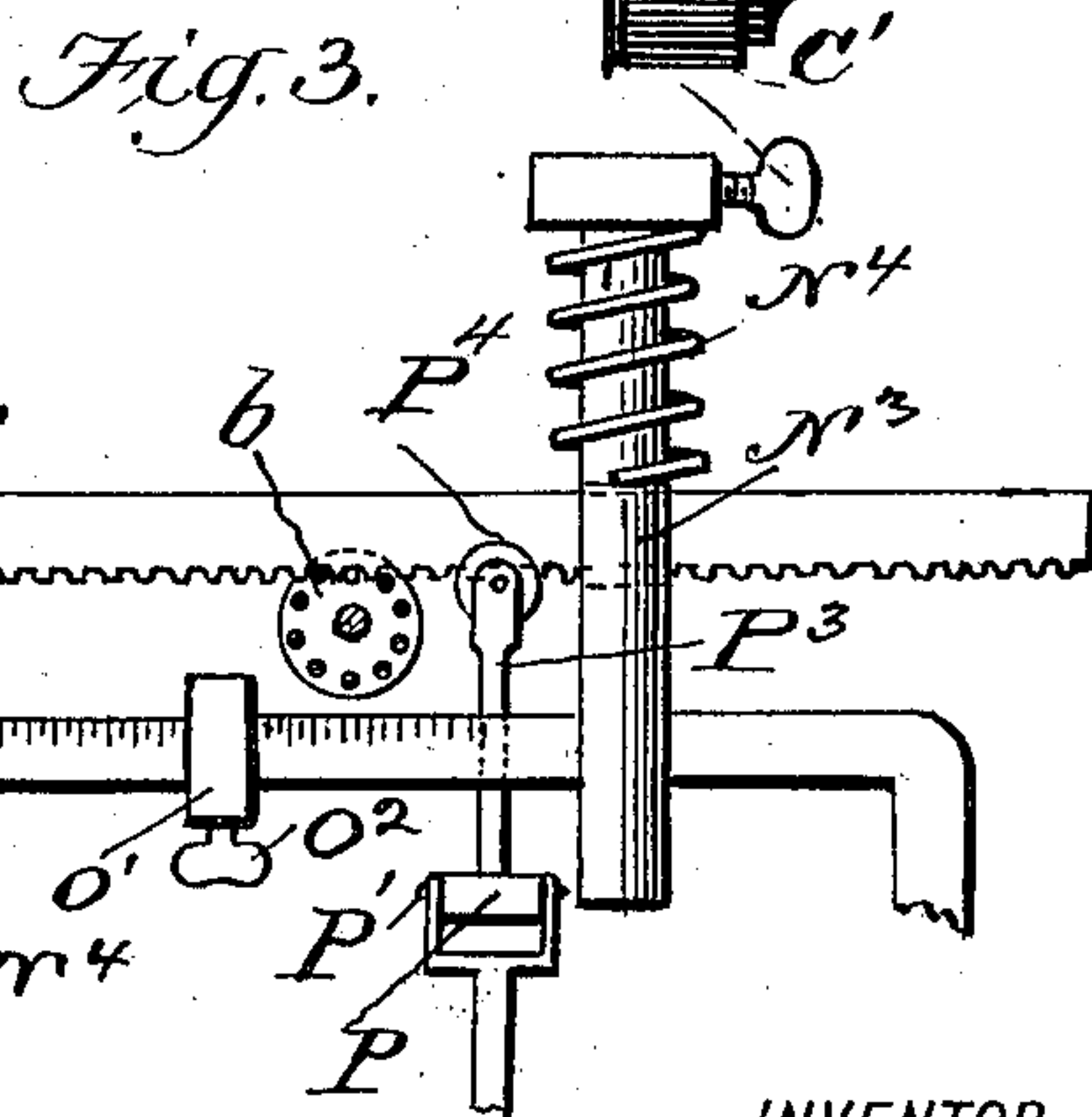
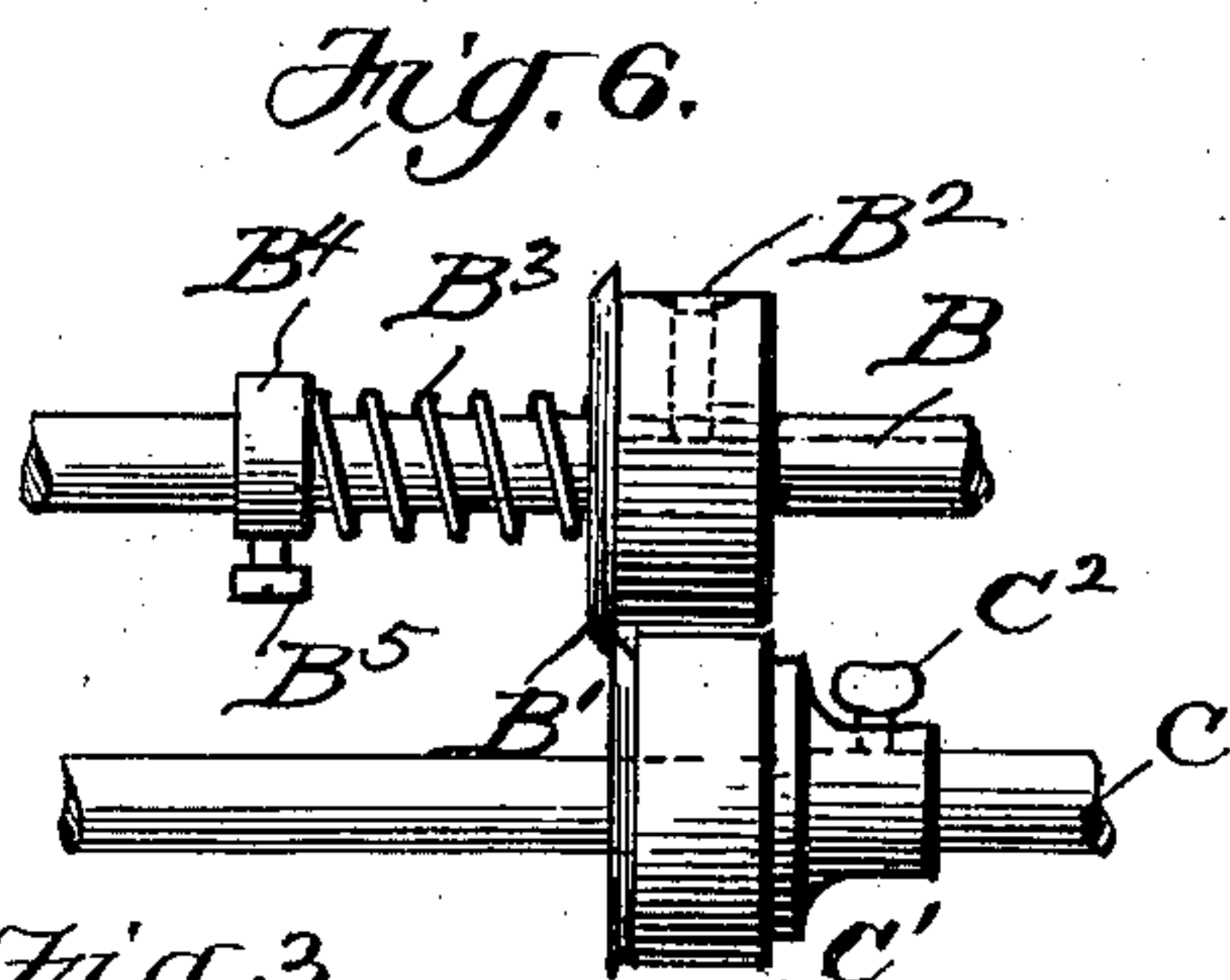
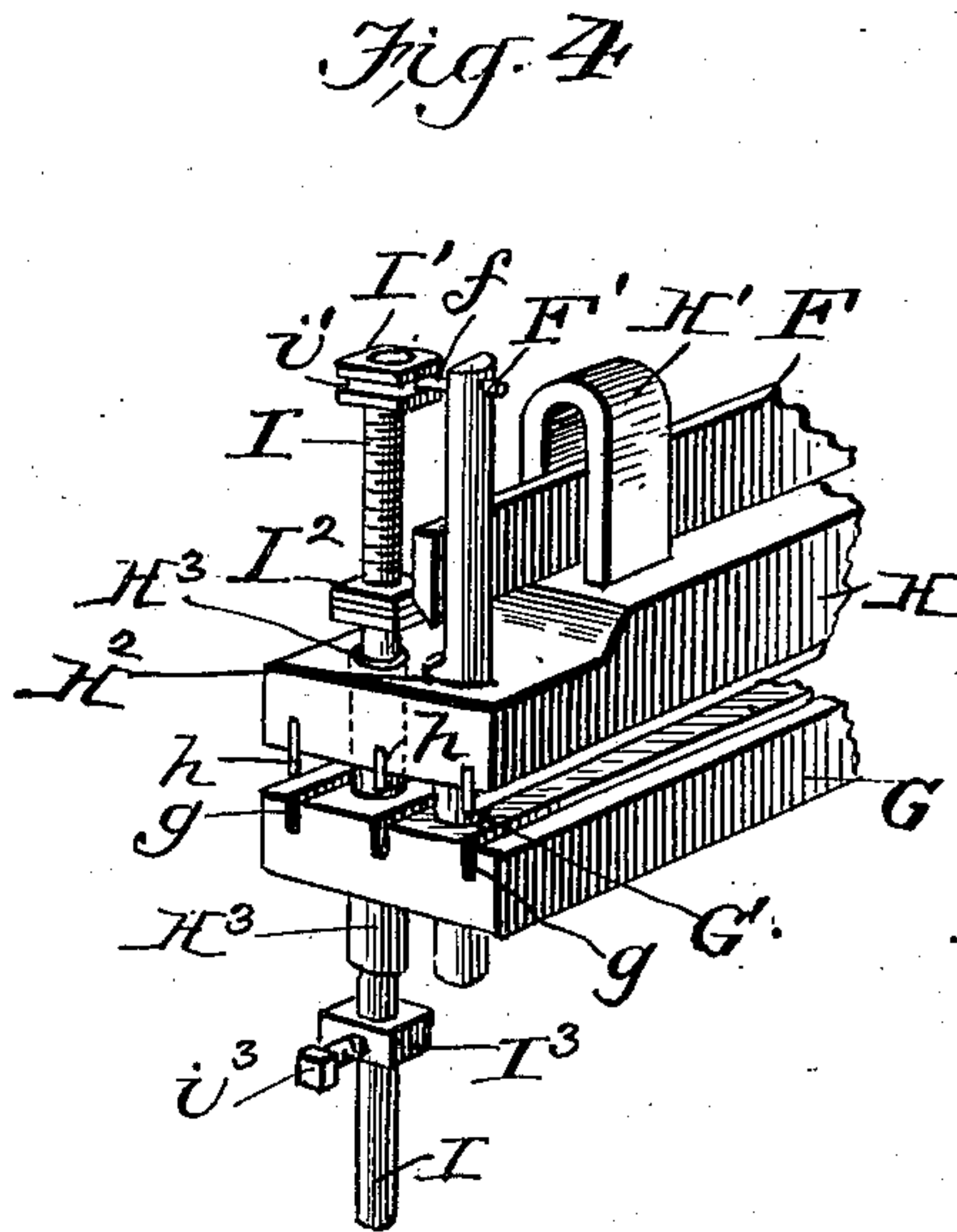
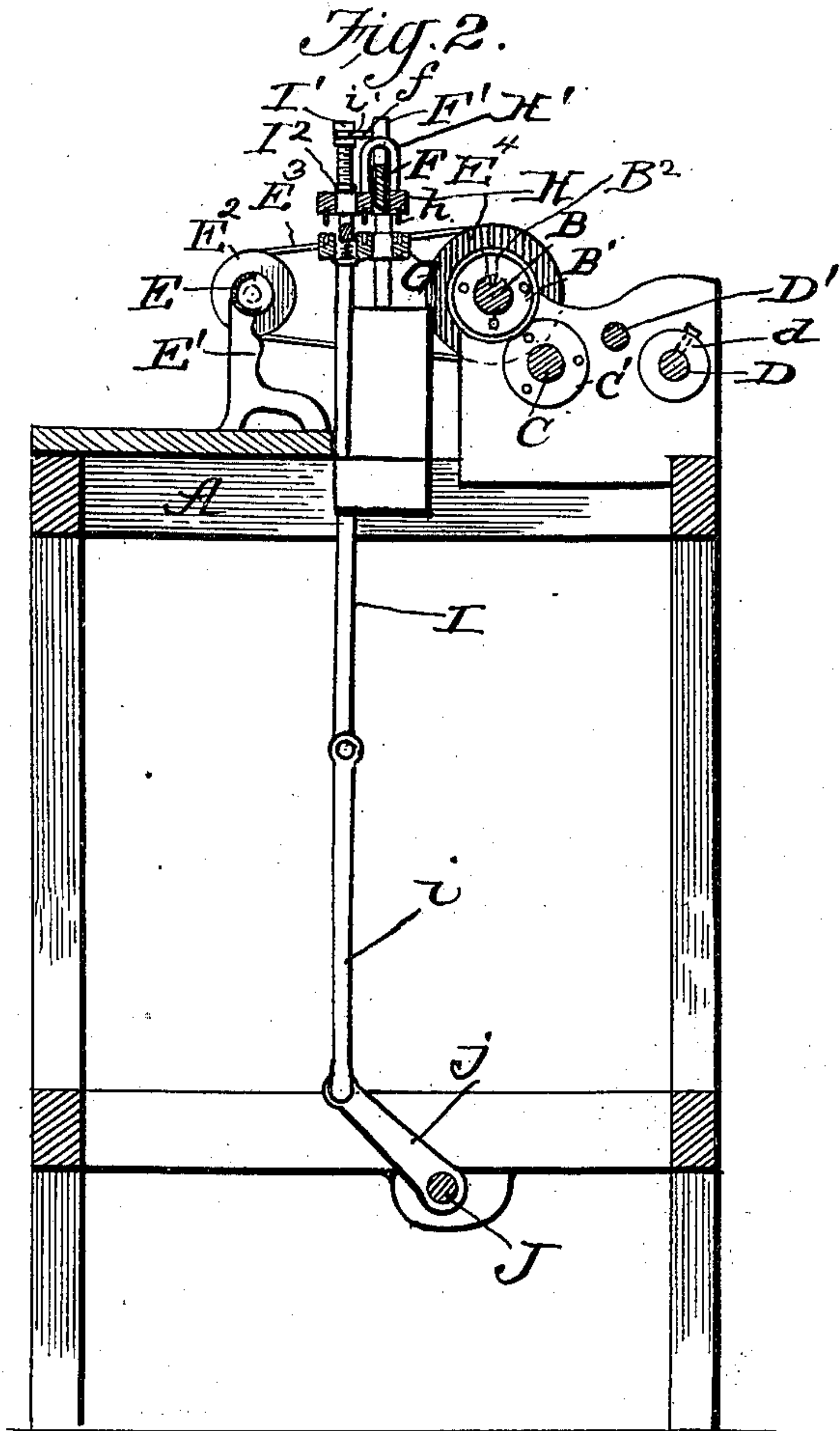
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2 Sheets—Sheet 2.



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FRANK L. FISHER, OF CUMBERLAND, MARYLAND.

WINDOW-SHADE MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,145, dated November 19, 1901.

Application filed July 17, 1901. Serial No. 68,619. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. FISHER, a citizen of the United States, residing at Cumberland, in the county of Allegany and State of Maryland, have invented certain new and useful Improvements in Window-Shade Machines, of which the following is a specification.

My invention is an improvement in machines for use in making window shades or curtains, and has for an object to provide a novel construction by which the shade may be trimmed off on its side edges to any desired width and can be cut off at any desired length and in which the ends will be creased in such manner as to form a guide for folding over the strip to bar at the free end of the curtain, so the hem can be produced regularly and uniformly, as desired; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of a machine embodying my invention. Fig. 2 is a cross-sectional view thereof. Fig. 3 is a detail side elevation of a portion of the upper part of the machine on an enlarged scale; and Fig. 3^a is a detail view, partly in section, illustrating some of the constructions shown in Fig. 3. Fig. 4 is a detail perspective view of the gage stop mechanism; and Fig. 5 is a detail sectional perspective of the cutting apparatus, &c.; and Fig. 6 is a detail side view of the rotating cutters. Fig. 7 shows a somewhat different form of cutter, and Fig. 8 is a detail view of the hollow winding-rod with a curtain-roller therein.

In carrying out my invention I provide cutters for trimming the side edges of the curtain, a knife for cutting the curtain off at its ends, creasers for forming the guides for the insertion of the stick and the production of the end, and a gage stop mechanism which can be adjusted to regulate the length of the curtain.

The machine as shown includes a frame for supporting the several parts, having the end top bars A, on which are supported parts of the operating devices, as presently described.

For trimming the side edges of the curtain I provide the machine with shafts B and C,

journaled at their ends in the framing and provided with the circular cutters B' and C', which are slidable on their shafts and can be adjusted to trim the shades different widths. The lower cutters C' are held in any desired adjustment by set-screws C². The top cutters B' are keyed on and movable along the shaft B by means of a screw B² and springs B³, operated to press the cutters B' firmly against the cutters C', such springs bearing between their respective cutters and a collar B⁴, which is secured on the shaft B by means of a set-screw B⁵, so the said collar may be adjusted to and held in any position desired. Each shaft B and C is provided, preferably immediately next to its cutters, with feed-rollers B⁶ and C⁶, between which the shade passes and by which the shade is fed forward from a reel-shaft D over a guide-roller D'. By the described construction the shade is fed to the rollers B⁶ and C⁶ and will be fed forward by such rollers, whose shafts operate the cutters to trim off the side edges of the shades.

A hollow winding-rod E is arranged in rear of the cutters B' and C' of the end knife and creasers presently described and has at one end a spindle which passes through the closed bracket E' and carries a small pulley E², which is driven by a belt E³ from a large pulley E⁴ on the end of the upper shaft B. The other end of the winding-rod is fitted in an open bracket, so it can be readily removed in order to slip the shade off as desired. The upper shaft B is provided at its end opposite the pulley E⁴ with a toothed pinion b, which operates the rack of the gage stop mechanism hereinafter described.

For driving the feed-rollers B and C power is suitably applied preferably to the lower roller C by hand, if desired, or by gearing it up with a suitable source of power.

For cutting off the ends of the shades I employ a cutter-plate F, which extends from side to side of the machine and is suitably guided in its vertical movements by the rods F', to which it is secured at or near its ends and which rods operate in suitable guides G' in the bed-plate G, which extends from side to side of the machine in rear of the feed-shafts B and C, as will be understood from Figs. 1 and 2. The plate F is further guided by the

straps H' on the creasing-head H, such straps being secured to the head H and reaching over the cutter-plate F, as shown. This creasing-head H is also provided at H² with
 5 openings through which the knife-rods F' pass to the bed-plate G, so the bed-plate, creaser-head, and knife F are held in the desired relation at all times. Tubes H³ are secured at their upper ends preferably by
 10 threading to the creaser-head and extend thence downwardly through openings in the bed-plate G to a point below said bed-plate, so the lower ends of the tubes H³ can be operated upon by the projection on the vertical
 15 operating-rods presently described. It will be noticed that the creaser-head is provided on its under side with depending longitudinally-extending creasing-plates h, which enter corresponding grooves g in the bed-plate and
 20 crease the shade material when the creasing-head is lowered into contact with the bed-plate in the operation of the device, as presently described.

The operating-rods I extend through the
 25 tubes H³ and project upwardly to a point adjacent to the upper end of the knife-rods F and downwardly so they can connect by pitman i or other suitable means with crank-arms j on the knife-operating shaft J, which
 30 shaft is provided with a hand-lever J', so it can be operated to raise and lower the operating-rods I whenever it is desired to operate the end-cutter F and the creasing-head before described. The rod I is suitably
 35 threaded to receive nuts I', I², and I³, so such parts may be adjusted as desired. Set-screws may be provided, as shown at i³, to secure the nuts in any desired adjustment and manifestly where desired the nuts may be simply
 40 fitted on the shafts I without threads and be held in any suitable adjustment by the set-screws i³; but I prefer the construction shown and before described.

The nut I' is preferably provided with a
 45 groove at i' to receive a pin f on the knife-rod F'. The nut I² is arranged to overlies the creasing-head, so it will engage with such head and depress it subsequent to the initial downward movement of the cutter F. The nut I³
 50 is arranged below the lower end of the tube H², so it will engage such tube to lift the creasing-head on the upward movement of the rod I.

In the operation of the end-cutter F and
 55 creasing devices it will be noticed that if a downward movement be imparted to the rods I the knife will be carried downward until its cutting edge cuts against a bed-cutter, as shown at K, operating with a shearing action
 60 to cut the end of the shade off clean, as desired. As the blade F approaches its cutting position the nut I² will engage upon the creasing-head and carry the same downward to crease the curtain on opposite sides of the
 65 cutter.

In rear of the knife F and between the middle creasing-rib h and the rear one of such

ribs I form the bed-plate with a longitudinal recess L, in which is fitted a bar M, supported
 on springs M', bearing between its under side 70 and the base of the recess M and acting normally to press the bar M upward to a point above the upper surface of the bed-plate. In the operation of the device when the creasing-ribs h rest upon the goods before they
 75 press such goods down in the grooves g this bar stands upward and elevates the goods between the said ribs. As the creasing-ribs are forced downward into their grooves with the goods the bar M is pressed downward, allowing the goods to be creased without tearing.
 80 This bar therefore forms between the two creasing devices a yielding guide, which is projected by springs prior to the creasing operation and may be depressed as the creasing
 85 operation proceeds in order to avoid the tearing of the goods by the taking up of the material by the creasing operation, as will be readily understood from the drawings. This guide-bar M also operates when the creasing
 90 head is elevated after the creasing operation to lift the goods out of the creasing-head.

The toothed pinion b on the upper end of the feed-shaft B operates the rack-bar of the
 gage stop mechanism by which to control the 95 feed of the material through the rollers B and C and so control the length of shade to be cut off. This gage mechanism is shown in detail in Fig. 3 and includes a rack-bar N, which is
 100 meshed with the roller b and is provided with a slide N', which is moved along the gage-bar O, which may be graduated or otherwise marked, as desired, and is provided with an
 105 adjustable stop O' in the form of a block secured upon the said bar O in any desired adjustment by means of a clamping-screw O². It will be noticed that the operation of the
 110 upper feed-shaft B will move the rack-bar N in the direction of the arrow in Fig. 3 as the material is fed between the rollers B and C, and the said rack-bar N is actuated in the opposite
 115 direction by a spring N², (see Fig. 3,) which returns the rack-bar to its normal position after the end knife F has been operated by means of the mechanism presently
 120 described. It will be noticed that one end of the rack-bar is connected with the slide N', while its other end is movable vertically, so it can be adjusted into and out of meshing with the pinion b. Such free end of
 125 the rack-bar is held in the slotted guide N³, and the spring N⁴ bears upon the rack-bar to press into mesh with the pinion b and yet permit it to be forced out of such mesh when the knife F has been lowered to cutting position.
 130 To this end I provide a rocking lever P, which is pivoted at P' in a suitable support, and has its inner end at P² arranged for engagement by the nut I³ or other suitable projection on the adjacent slide-rod I, and the outer end
 of the lever P supports a standard or upright bar P³, carrying at its upper end a roller P⁴, which bears beneath the rack-bar, all of which is shown in Figs. 3 and 3^a. From these Figs.

3 and 3^a and the other figures it will be noticed that when the cutter F is lowered to cutting position the projection I³ will engage the inner end P² of the lever P and will
 5 cause an upward movement of the roller P⁴ to lift the rack-bar N out of mesh with the opening b, so the spring N² can return the said rack-bar to its starting-point, the roller P⁴ operating as a guide for the rack-bar in its
 10 return movement.

In the operation of the gage mechanism it will be noticed from Fig. 3 that when the parts are in normal position the guide N' will be at the unit-point, and the stop O' will be
 15 adjusted along the bar O, according to the length of shade desired. If now motion be imparted to the machine by turning the hand-crank Q, which is suitably geared with the lower roller C, it will be noticed that the pin-
 20 ion b will operate upon the rack-bar N to move the guide N' along the bar O until such guide N' is stopped against the stop O'. Then the end lever J may be operated to set the knife F to cut off the end of the shade, and
 25 such operation will by means of the lever P and other described devices free the rack-bar from mesh with the pinion b, and the spring N² will readjust the gage stop mechanism to the starting-point.

30 It will be noticed that the rocking lever P forms a trigger for operation by the cutter mechanism to free the gage stop mechanism from its connection with the devices for cutting the shade, so the operation of the cutter
 35 will readjust the gage stop mechanism to its starting-point. It will be understood from the preceding description that when the rod I is raised by the operation of the end lever J' the projection I³ will engage the tube H², and thereby raise the creasing-head to its up-
 40 permost position at the same time the knife F is raised by the connection thereof with the rod O. As the rod I is lowered, the tube H², with the head H, moves downward until the
 45 creasing-ribs h rest upon the shade material, when a further downward movement will cause the creasing-head and knife F to descend farther, creasing the material and cutting it off at the end as desired.

50 In proceeding to make shades by the described machine the roll of goods is placed on the reel-shaft D, which may have suitable adjustable guides d and be removably secured in the framing, and the goods pass from this
 55 reel-shaft D over the guide-roller D' to the feed-rollers on the shafts D and C, thence below the knife F, between the bed-plate G and the creasing-head H, to the table R, where the end of the shade material is fastened to the roller, and the roller is placed in the hol-
 60 low winding-rod E, before described. The machine is then put in motion by turning the crank Q, which will be operated until the gage stop mechanism stops the machine, at
 65 which time the length of the shade is measured or determined. The lever J' is then pulled forward, bringing the creasing-head

down on the goods and holding it into position to be cut, which is accomplished by a still further downward movement of the op-
 70 erating-rods I. When the knife F has passed through the goods, the stop I² will engage with the creasing-head, and the ribs on the latter will force the shade material into the grooves g. The lever J' may then be thrown
 75 back, elevating the cutter F and the creasing-head, and the bar M will rebound and throw the material out of the grooves g. The shade may then be removed by raising the end of the winding-rod from the open bracket, slip-
 80 ping the roller off, when the shade is ready for sewing.

By my machine I secure a great saving of time, enable the shades to be kept much cleaner than when trimmed by hand, secure
 85 truer cleaner cut edges, and a more regular hem. At the same time the machine will take up less room than a trimming-table, does not require any expense to operate it, and can be used to cut shades of any desired length and
 90 width.

In Fig. 7 I show a somewhat different form of cutter which may be used when desired in place of the cutter F shown in the other fig-
 95 ures and before described:

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine substantially as described, the combination of the end feed-rollers, the
 100 cutters for cutting off the side edges of the shades, a bed-plate over which the shade is passed, said bed-plate being provided with creasing-grooves and with a longitudinal re-
 105 cess and with a bearing against which the end-cutter blade may operate, a guide-bar fitting in the recess of the bed-plate, springs supporting said guide-bar and normally ele-
 110 vating the same above the surface of the bed-plate, the creasing-head provided with de-
 115 pending ribs to operate in the grooves of the bed-plate, the knife or cutter movable toward and from the bed-plate, and means for operating the said knife and creasing-head, sub-
 120 stantially as set forth.

2. In a machine substantially as described, the combination of a bed-plate, a creasing-head operating toward and from the same, a knife for cutting off the end of the shade and means for supporting and operating such
 125 knife and creasing-head, substantially as set forth.

3. In a machine substantially as described, the combination of the bed-plate, the creasing-head movable toward and from the same
 130 and provided with the curved guide-straps, the blade for cutting off the ends of the shades and operating in the curved guide-straps and means for operating the creasing-head and end-cutter, substantially as described.

4. In a machine substantially as described, the combination of the bed-plate, the creasing-head having front and rear portions and curved straps connecting the same, the end-

cutter blade operating within the curved guide-straps, and means for operating the end-cutter and the creasing-head, substantially as set forth.

5 5. In an apparatus substantially as described, the combination with creasing devices spaced apart, of a yielding guide between said creasing devices and arranged to be normally projected and to be depressed by
10 the stress of the goods during the creasing operation, substantially as set forth.

6. In a machine substantially as described, the combination of the bed-plate having creasing-grooves and a longitudinal recess between the same, and the spring-pressed guide-
15 bar normally projecting above the bed-plate between the creasing-grooves, the creasing-head having depending ribs operating in the grooves of the bed-plate, the end-cutter, and
20 means for operating the end-cutter and the creasing-head, substantially as set forth.

7. The combination in a machine substantially as described, of the bed-plate having openings for the guide-rods of the end-cutter
25 and for the operating-rods and the tubes of the creasing-head, the creasing-head having openings for the operating-rods, and the guide-rods, of the end-cutter the tubes connected with the creasing-head and extending
30 below the bed-plate, the end-cutter having its guide-rods extending within the openings therefor in the creasing-head, the operating-rods provided with means for operating the
35 cutter and the creasing-head, and means for operating such operating-rods, substantially as set forth.

8. The combination in a machine substantially as described of the vertically-movable knife for cutting off the ends of the shades,
40 the vertically-movable creasing-head provided with means for creasing the shades, the vertically-movable operating-rods provided with means for operating the creasing-head, and the end-cutter, and means for operating
45 such rods, substantially as set forth.

9. In a machine substantially as described, the combination of the end-cutter, the bed-plate having creasing-grooves and guide-openings for the guide-rods of the cutter and for
50 the creasing-head tubes, and the operating-rods, the guide-rods for the cutter, the creasing-head having curved guide-straps for the cutter and provided with the tubes depending below the bed-plate, the operating-rods
55 movable within said tubes, and provided with projections to engage the lower ends of the tubes, means whereby the operating-rods may be actuated, and means for operating the said rods, substantially as set forth.

60 10. In a machine substantially as described, the combination with a cutter for cutting off the ends of the shades, the creasing devices operating adjacent to said end-cutter, the lever, and means whereby the lever may operate
65 both the end-cutter and the creasing devices, substantially as set forth.

11. In a machine substantially as described,

the combination of the bed-plate, the creasing-head movable toward and from the said bed-plate and provided with creasing devices
70 spaced apart, and a yielding guide device arranged between the creasing devices, substantially as set forth.

12. In a machine substantially as described, the combination of the infeed-rollers arranged
75 adjacent to the front of the machine, the table at the rear of the machine, cutters for cutting off the side edges of the shades, the end-cutter, the creasing devices, a hand-crank adjacent to the rear table, means whereby said
80 hand-crank may operate the infeed-rollers, gage stop mechanism arranged for automatic operation by the infeed-rollers, means for operating the end-cutter, and devices whereby
85 to release the gage stop mechanism when the end-knife is adjusted to cutting position, substantially as set forth.

13. In an apparatus substantially as described, the combination with the cutter for cutting off the end of the shade and means
90 for feeding the shade material, and a gage stop mechanism for operation by the feed mechanism, of mechanism whereby the operation of the end-cutter may free the gage stop mechanism from its connection with the feed
95 mechanism to permit the readjustment of the gage stop mechanism to its initial position after the end-cutter has been operated, substantially as set forth.

14. In a machine substantially as described,
100 the combination of the shaft having a pinion for operating the gage stop mechanism and a gage stop mechanism having a rack-bar normally meshed with the feed-roller pinion and arranged to be freed from such mesh, a spring
105 for readjusting the rack-bar, and a stop for limiting the movement of the rack-bar by the operation of the feed-roller pinion, substantially as set forth.

15. In a machine substantially as described,
110 the combination of the infeed mechanism having a pinion, the gage stop mechanism having a rack-bar arranged to mesh with said pinion, a spring for pressing the said rack-bar into mesh with the pinion a stop to limit the
115 movement of the rack-bar by the said pinion, means for separating the rack and pinion and means for readjusting the rack-bar when released from the pinion, substantially as set forth.
120

16. The combination of the infeed mechanism, a gage stop mechanism arranged for operation by the infeed mechanism, the knife for cutting the ends of the shade, and means
125 in connection with the knife whereby the operation of the latter will effect the release of the stop mechanism from the infeed mechanism, substantially as set forth.

17. In a machine substantially as described, the combination with the infeed devices and
130 the knife for cutting off the end of the shade, of a gage stop mechanism having a bar geared with the infeed mechanism and provided with a slide, a guide-bar along which said slide op-

erates a stop on the bar for engagement by such slide, a pivoted lever provided at one end with means by which to adjust the bar of the stop mechanism out of gear with the feed mechanism, and the rod for operating the end-cutter provided with means for engagement with the inner end of said lever by which the movement of the knife may free the stop mechanism from its engagement with the in-
10 feed mechanism, substantially as set forth.

18. A machine for trimming shades having infeed devices for the shade material, a cutter for cutting off the ends of the shades, a

stop gage mechanism by which to stop the infeed mechanism when the desired length of shade has been fed into the machine, means for operating the stop gage mechanism by the infeed mechanism, and devices whereby the operation of the end-cutter may free the stop gage mechanism from operative engagement with the infeed mechanism, substantially as set forth. 15 20

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Witnesses:

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