

(No Model.)

9 Sheets—Sheet 1.

C. B. STILWELL.
PAPER BAG MACHINE.

No. 511,171.

Patented Dec. 19, 1893.

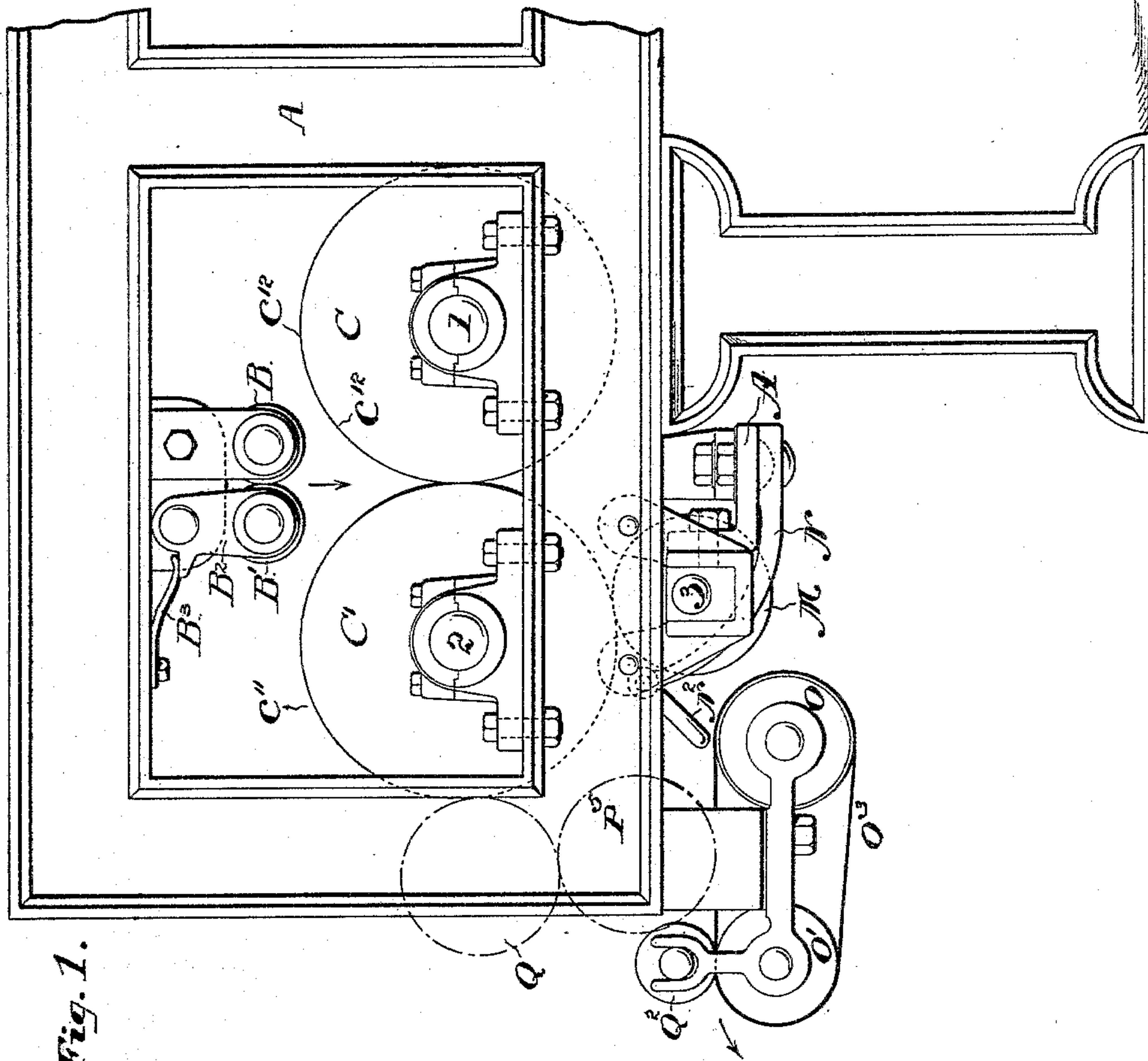


Fig. 1.

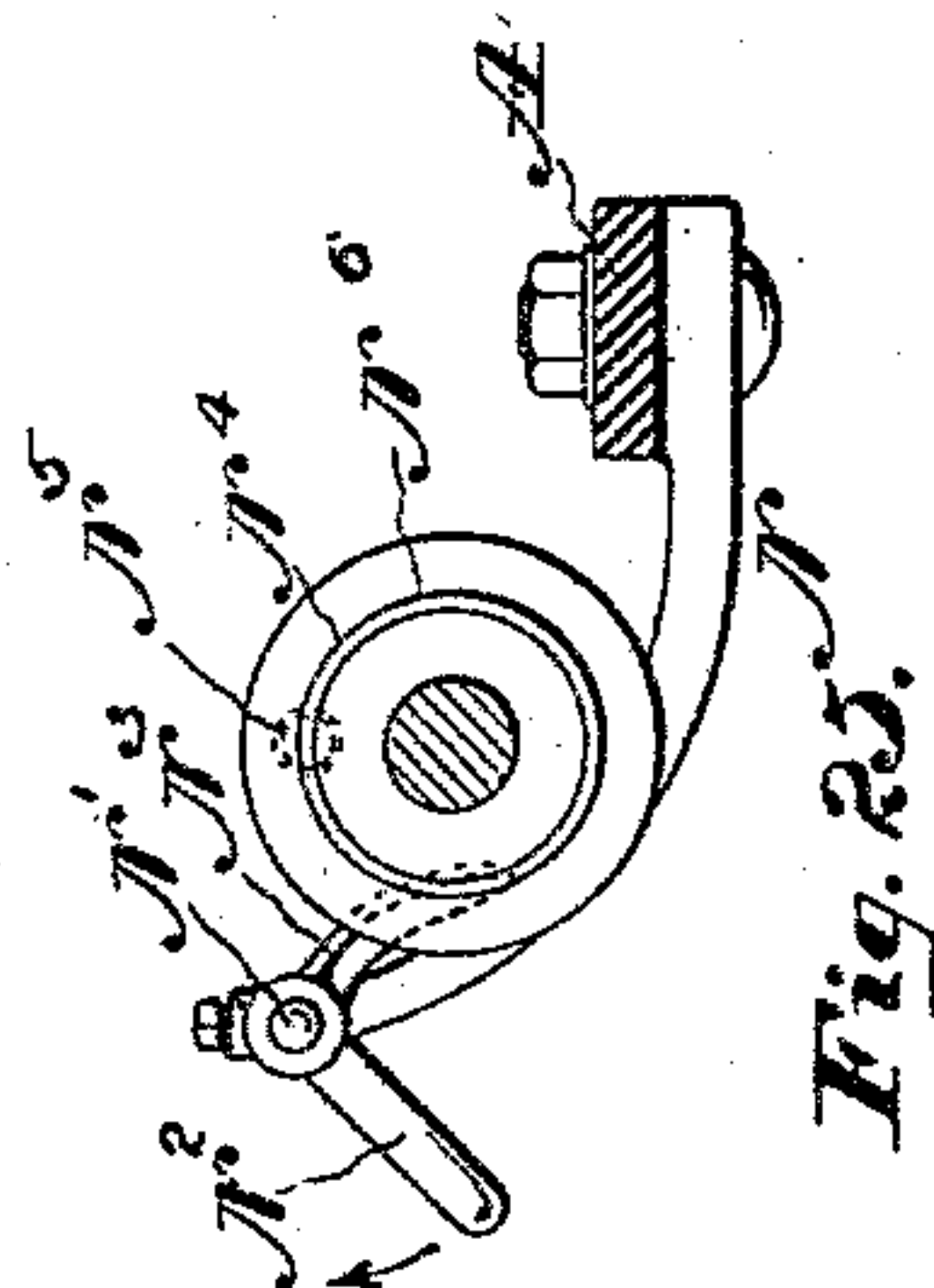


Fig. 25.

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INVENTOR:

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Charles B. Stilwell

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THE NATIONAL LITHOGRAPHING COMPANY,
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9 Sheets—Sheet 2.

No. 511,171.

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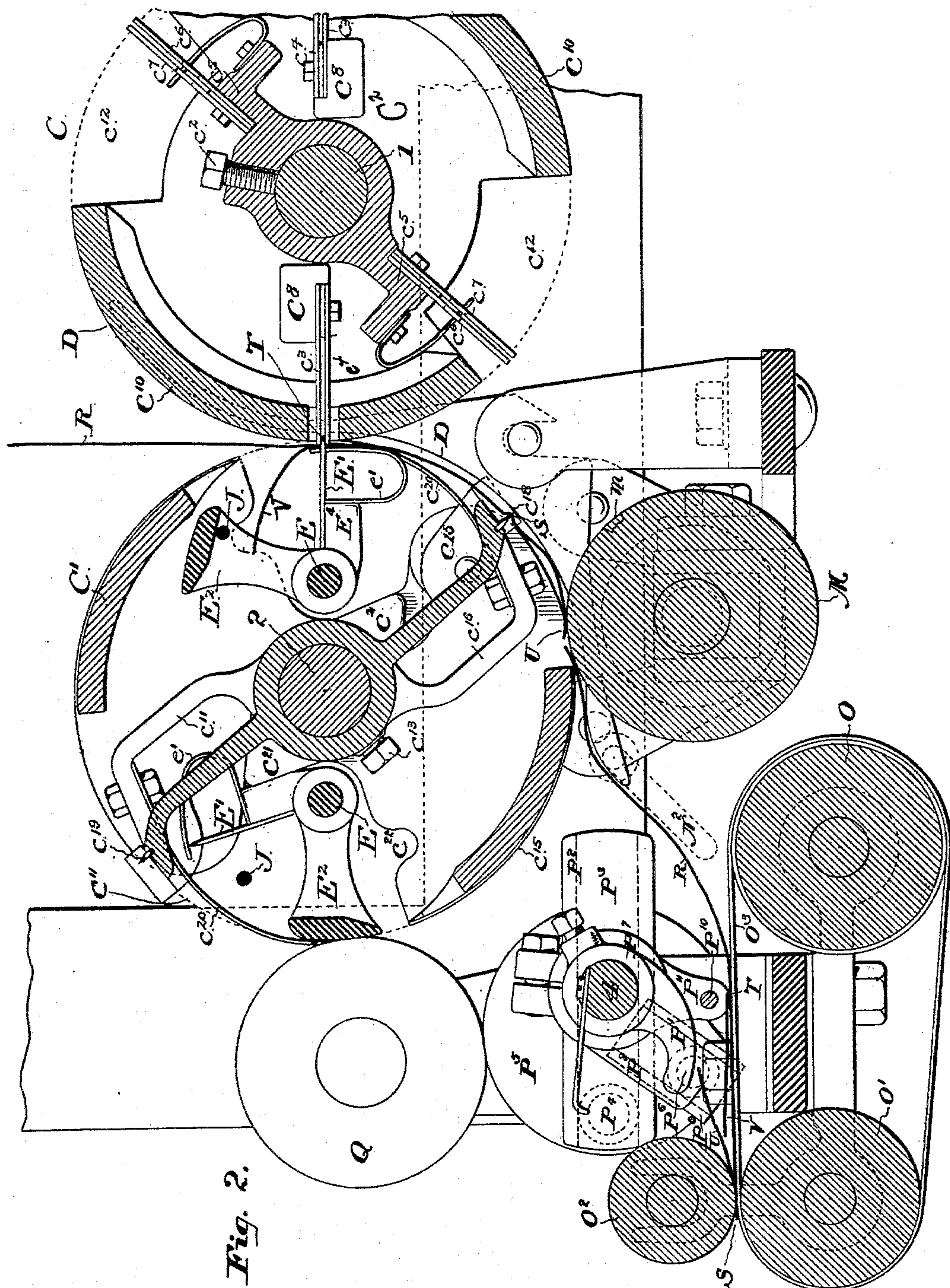


Fig. 2.

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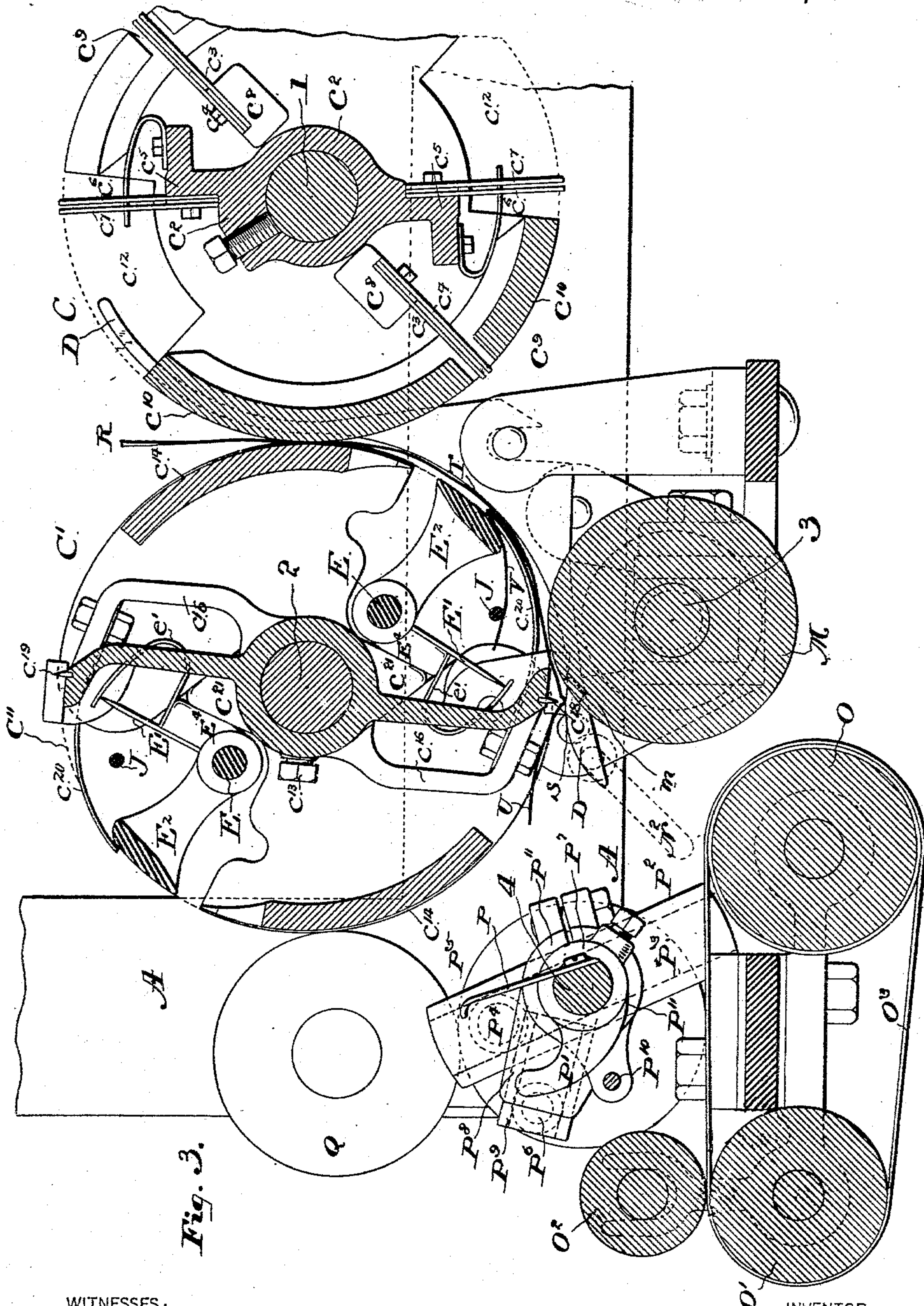


Fig. 3.

WITNESSES:

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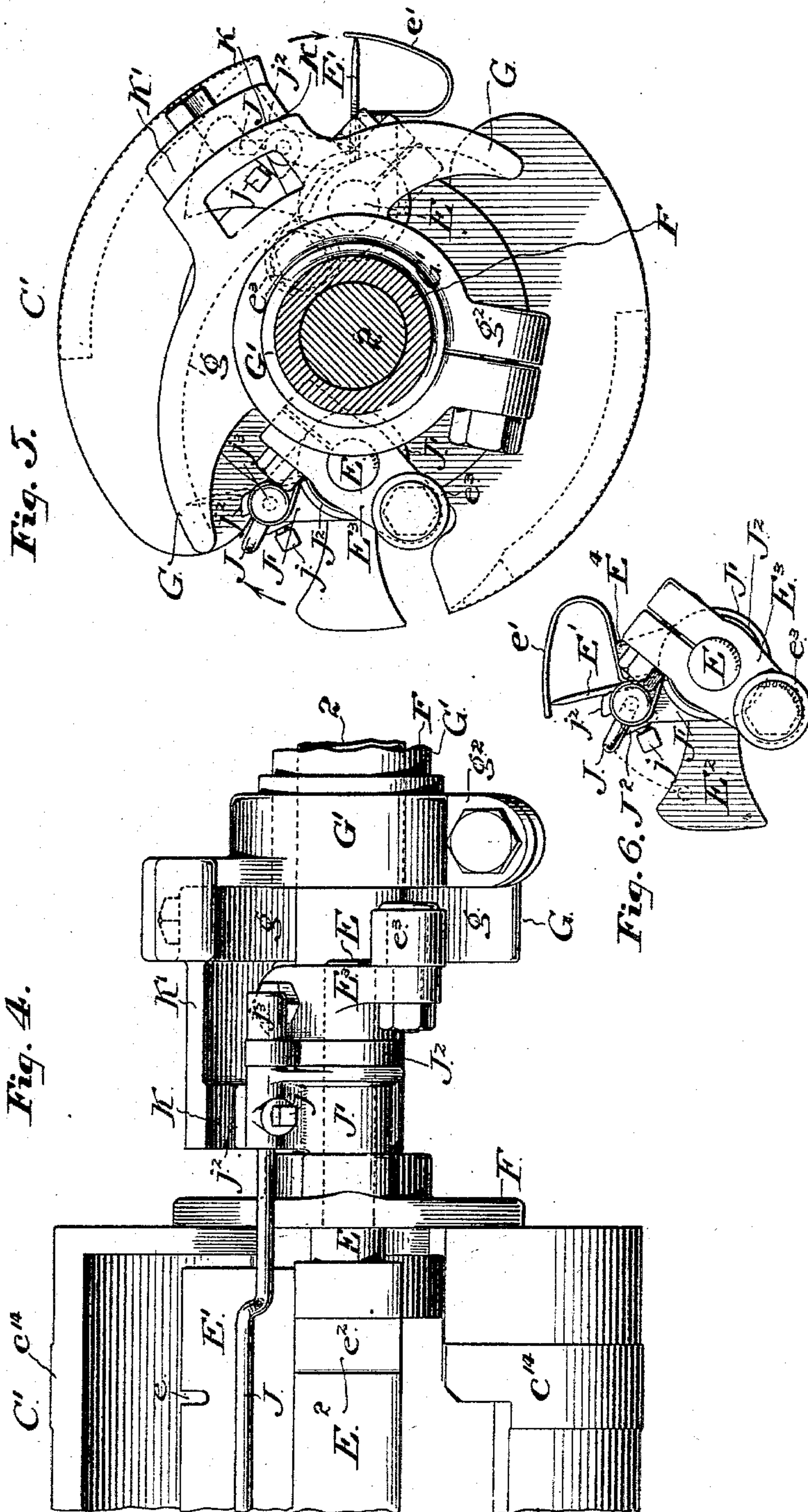
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9 Sheets—Sheet 4.

C. B. STILWELL.
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No. 511,171.

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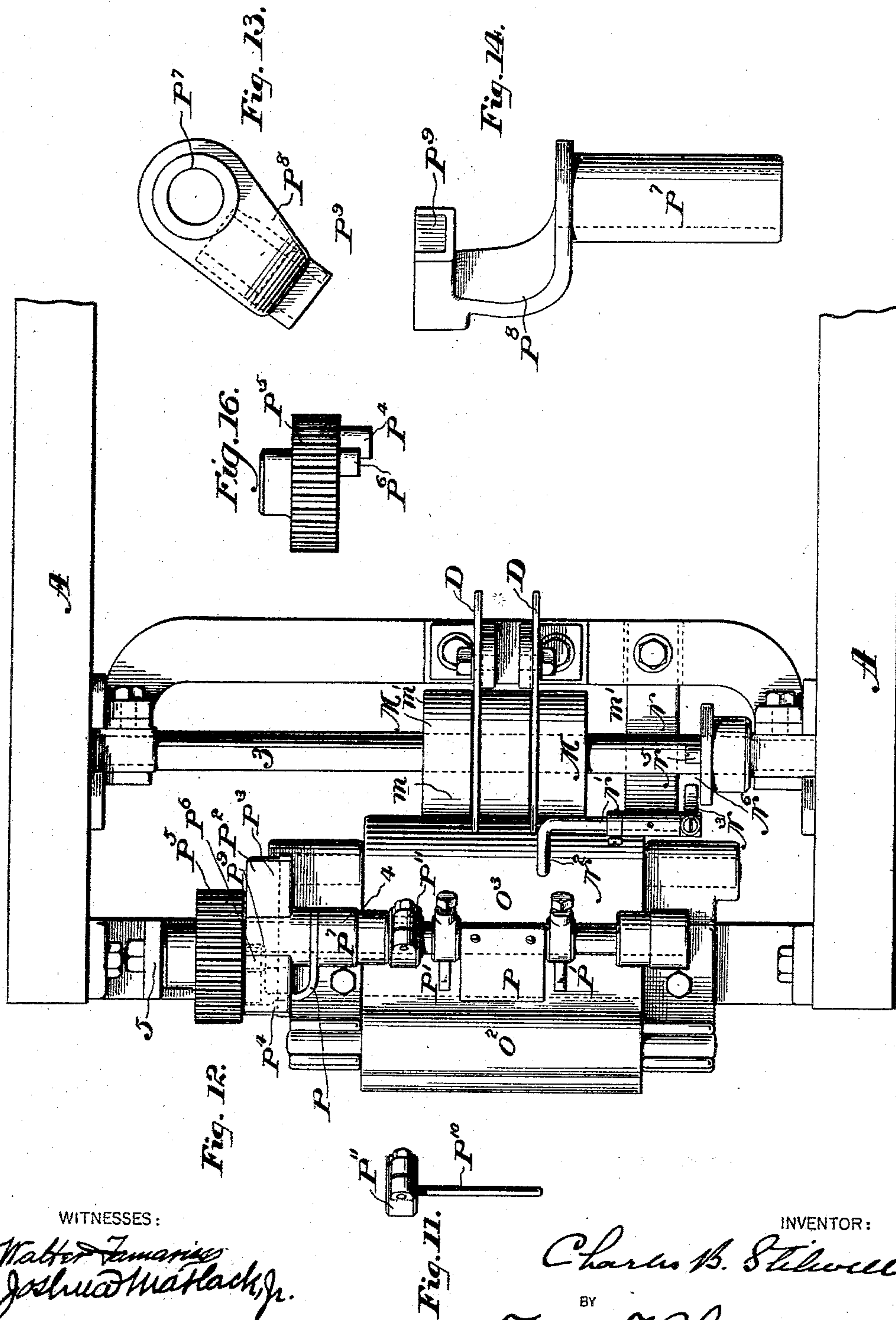
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9 Sheets—Sheet 6.

C. B. STILWELL.
PAPER BAG MACHINE.

No. 511,171.

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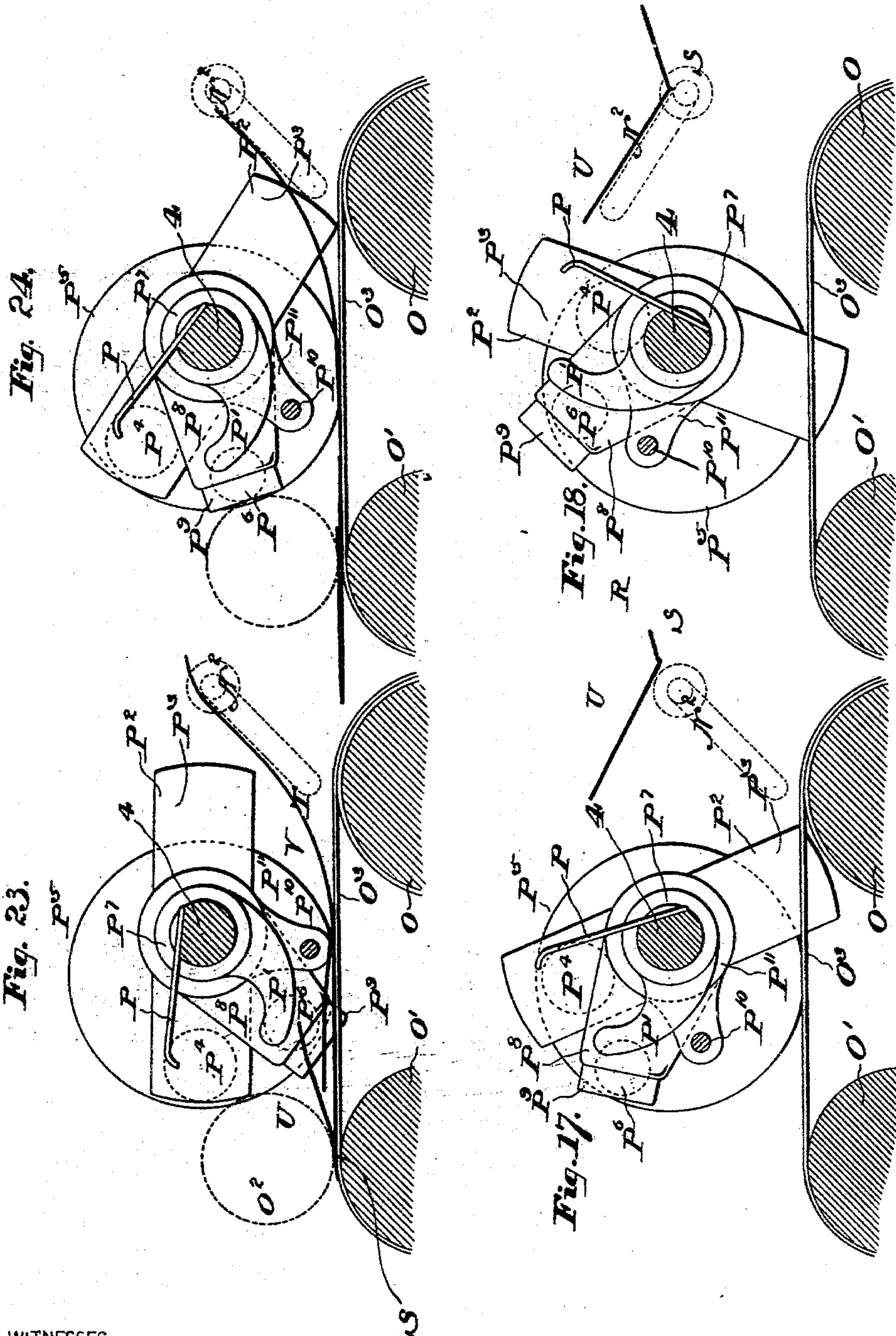
(No Model.)

9 Sheets—Sheet 7.

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No. 511,171.

Patented Dec. 19, 1893.



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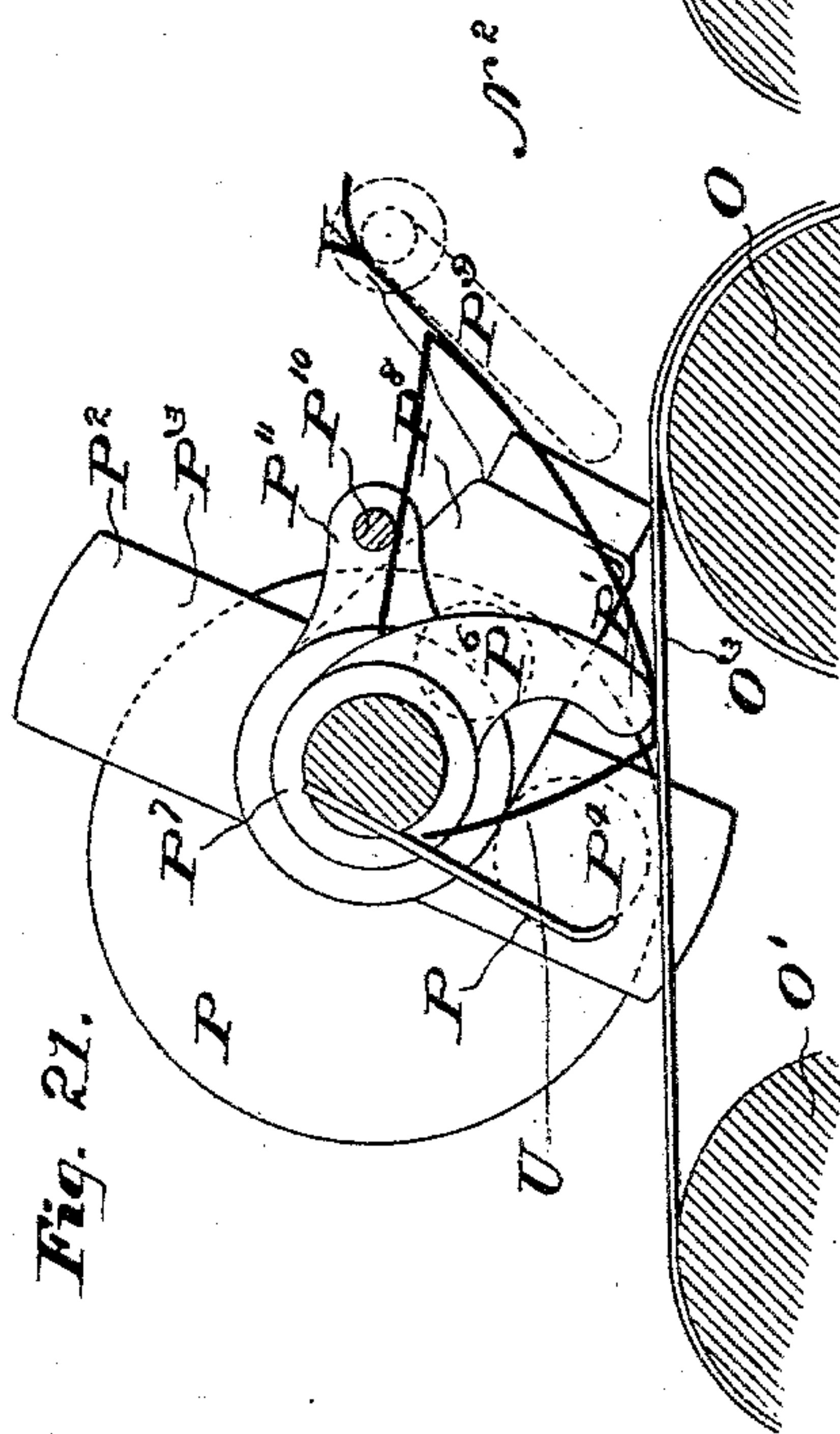
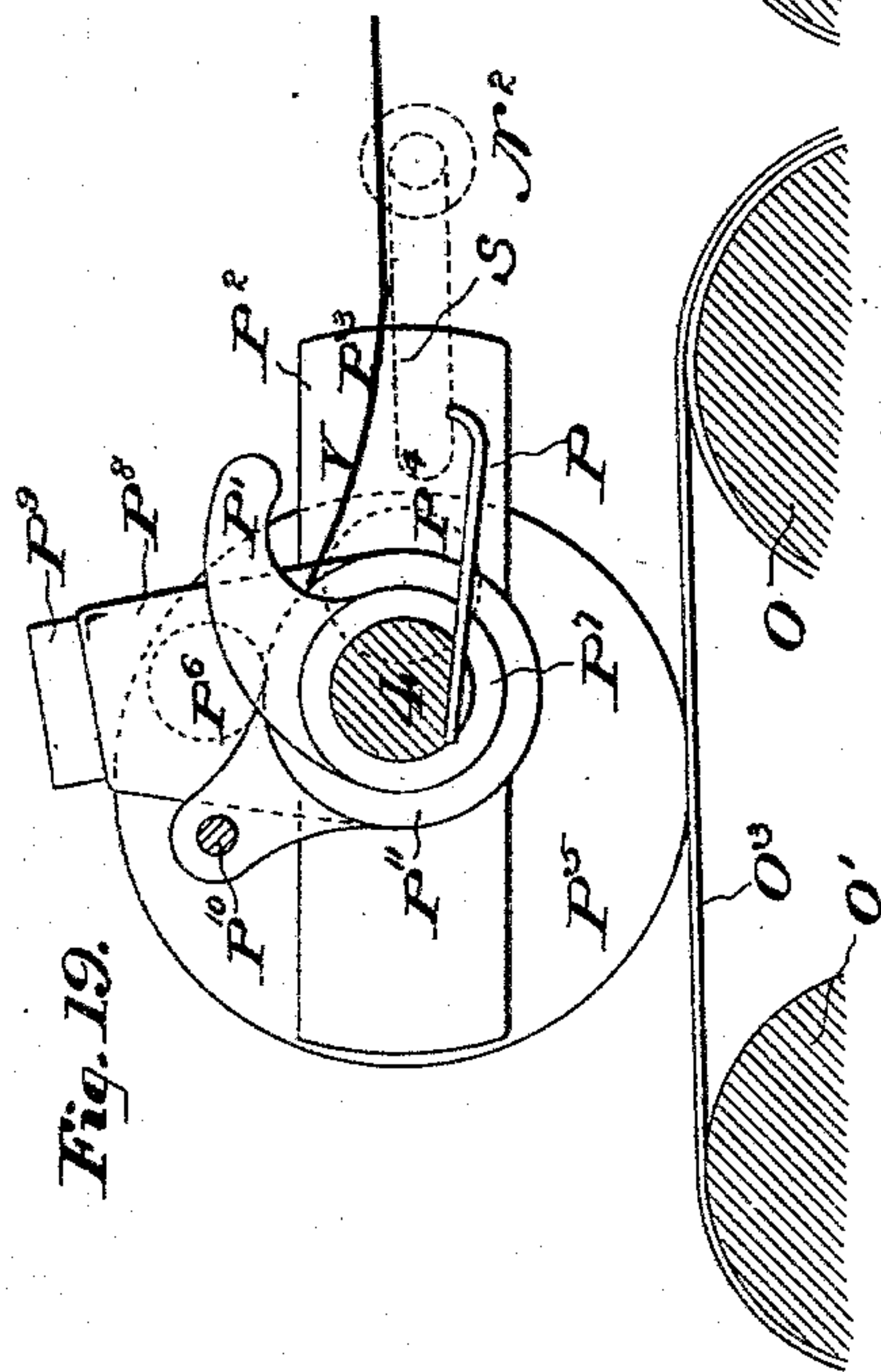
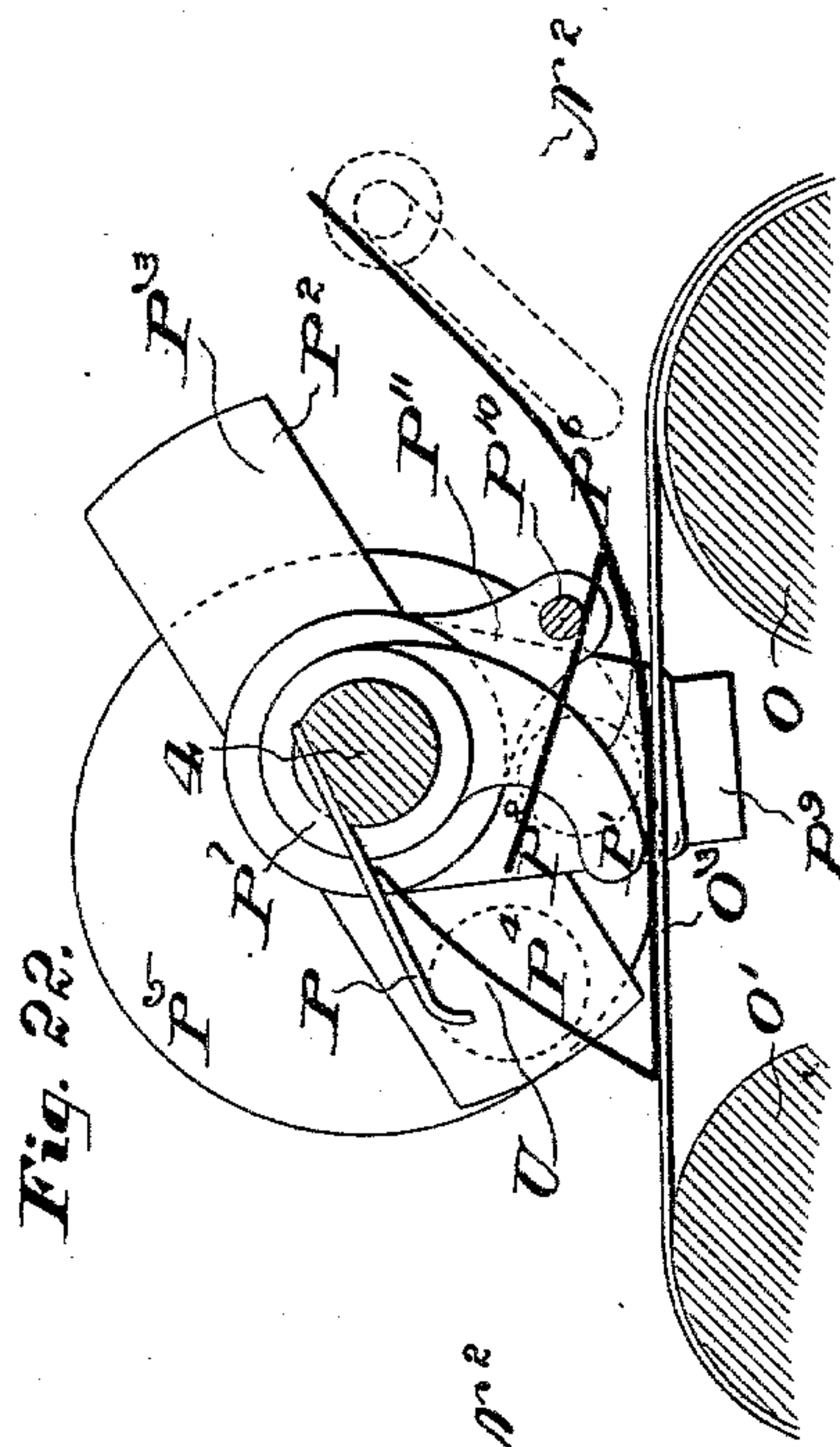
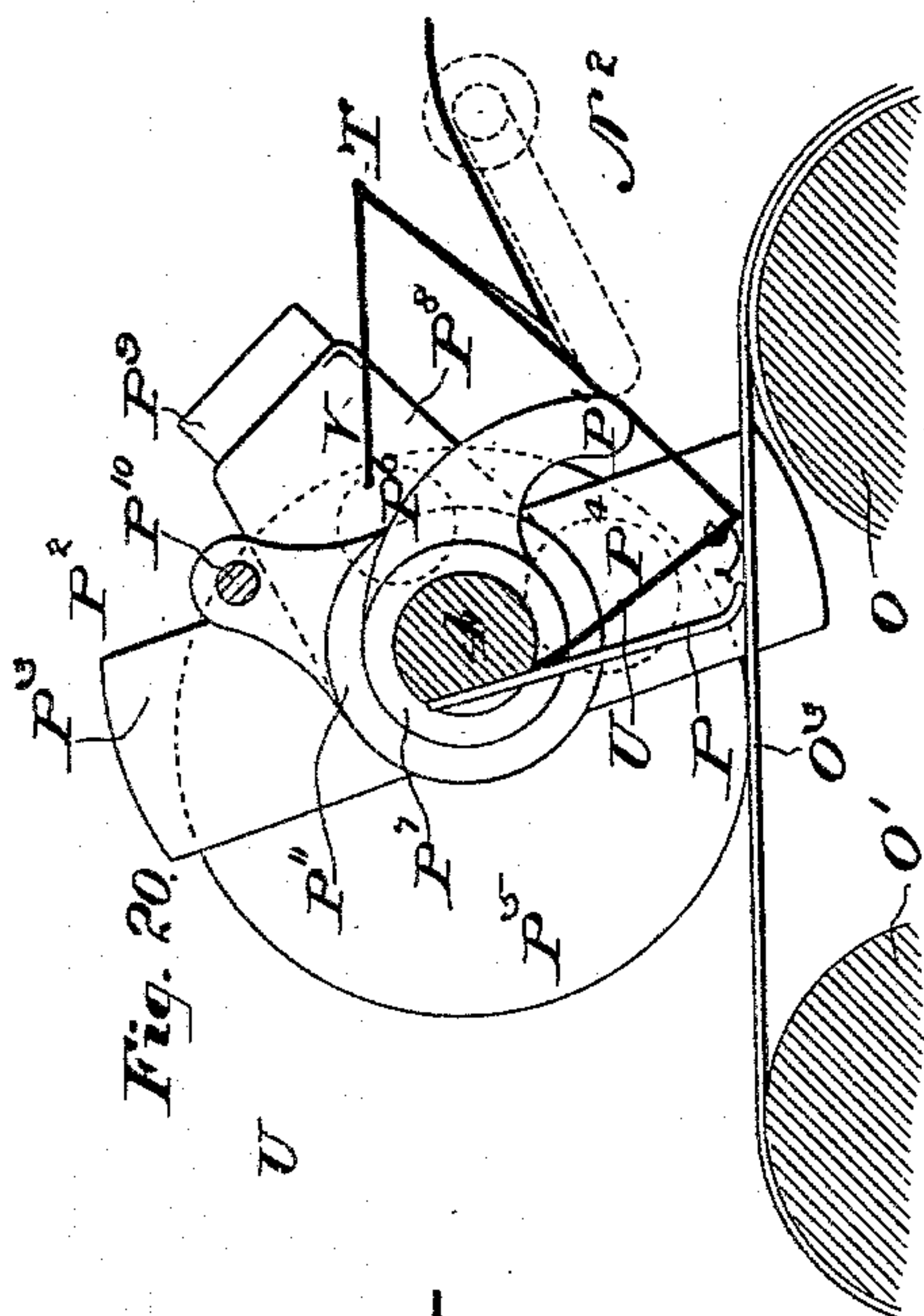
(No Model.)

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C. B. STILWELL.
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No. 511,171.

Patented Dec. 19, 1893.



WITNESSES:

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Fig. 27.

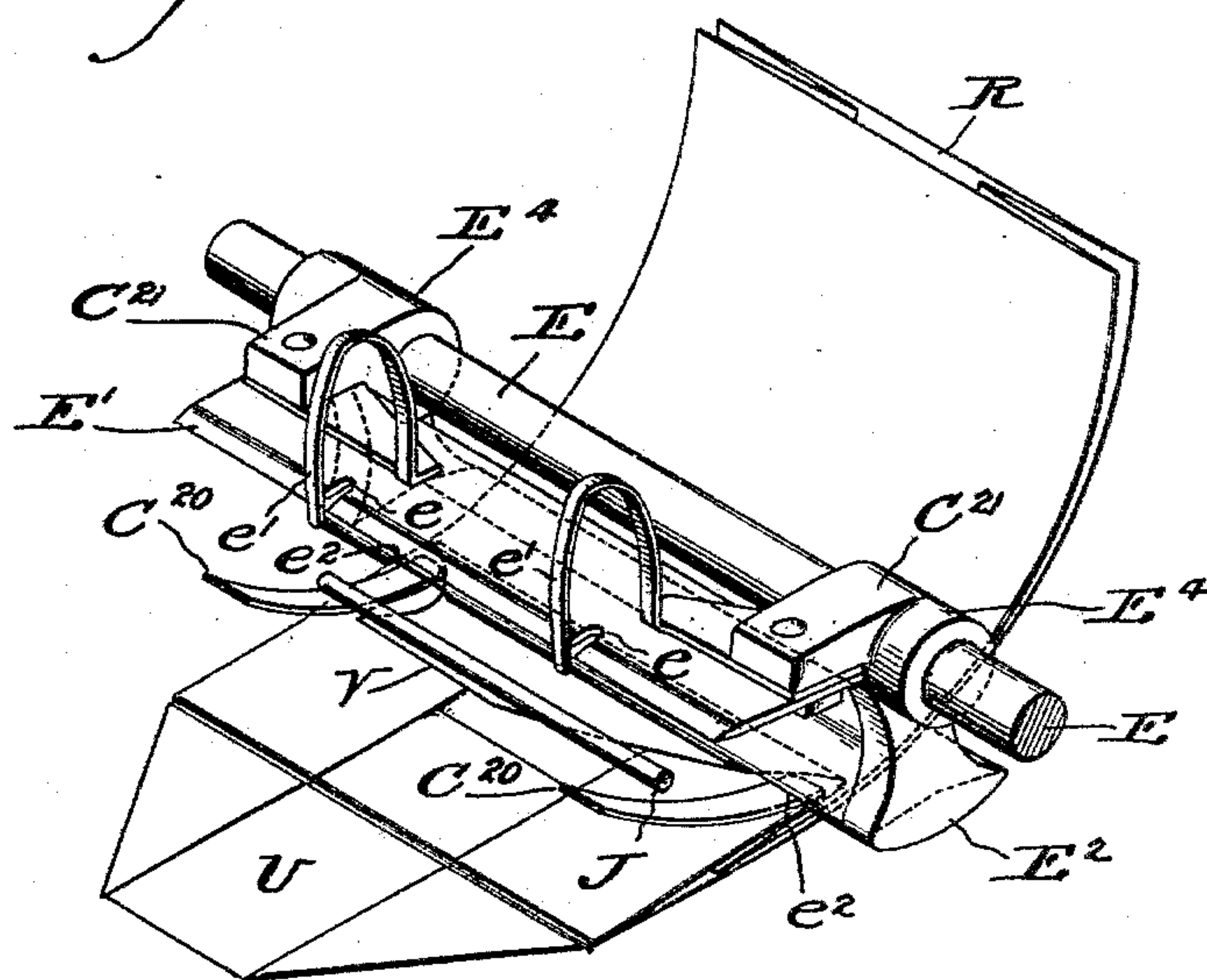
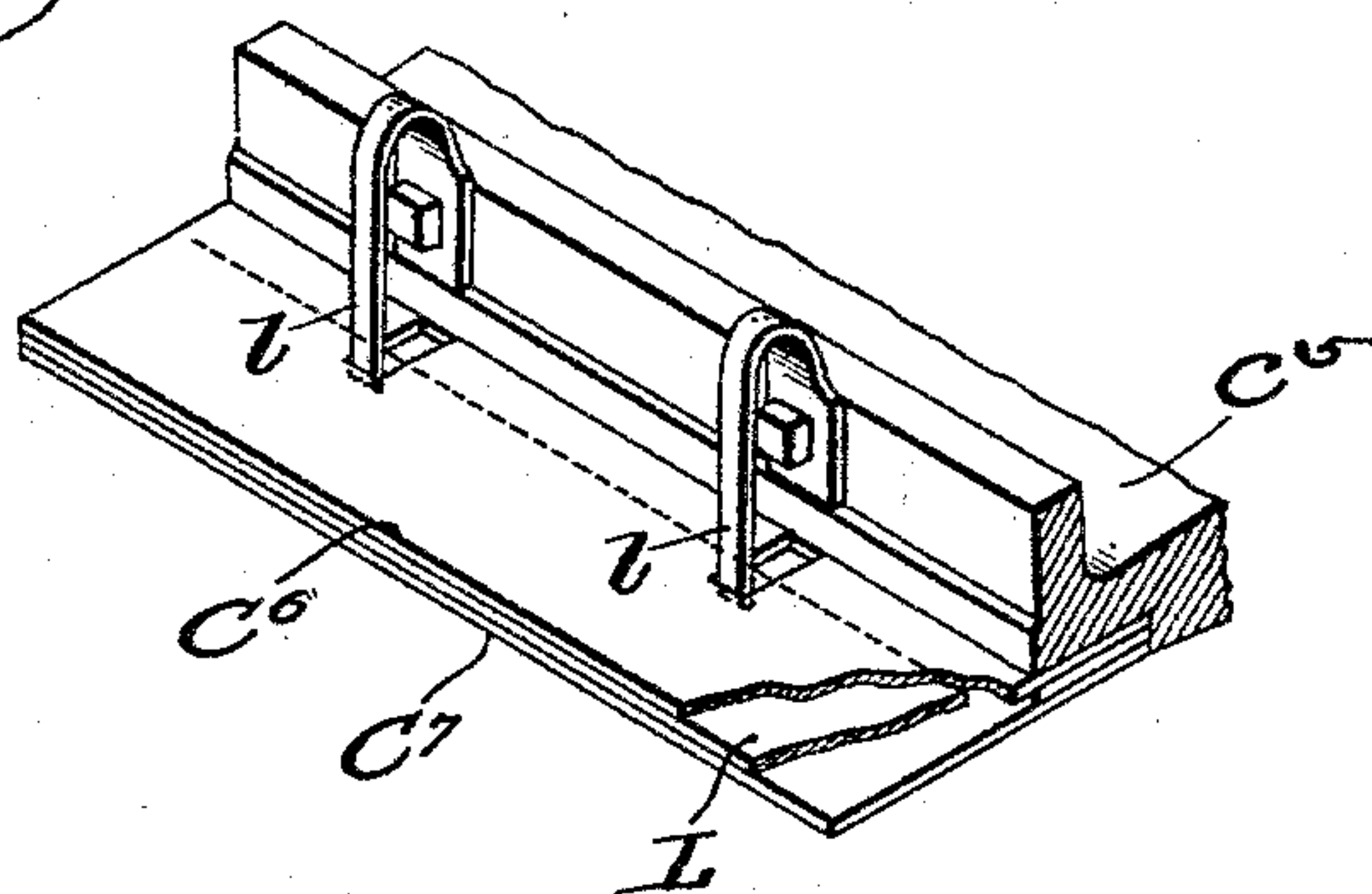


Fig. 26.



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UNITED STATES PATENT OFFICE.

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PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 511,171, dated December 19, 1893.

Application filed June 4, 1891. Serial No. 395,114. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. STILWELL, of Wayne, county of Delaware, State of Pennsylvania, have invented a certain new and useful Paper-Bag Machine, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to mechanism for folding over the ends of what is called the diamond in satchel-bottom and square satchel-bottom bags.

As shown in the drawings the mechanism is especially designed and adapted for use in connection with the mechanism for forming the diamond on the end of a bellows-folded tube which is shown and described in the Letters Patent granted to me December 17, 1889, No. 417,346.

The particular objects which I have in view are the rapid and perfect formation of the final folds of the bag, the provision of readily adjustable mechanism adapted for different sizes of bags, and the organization of the mechanism into compact form.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated and in which—

Figure 1 is an elevation showing the general organization and arrangement of the mechanism to which my invention relates. Fig. 2 is a central vertical section through such mechanism; Fig. 3 a similar mechanism showing the parts in a different relation with each other; Fig. 4 a view of a portion of the mechanism connected with the shaft 2; Fig. 5 an end view of the mechanism shown in Fig. 4 viewed from the right; Fig. 6 an elevation of a part of the mechanism connected with shaft 2. Fig. 7 is an elevation of the cylinder C'; Fig. 8 an end view of said cylinder. Fig. 9 is an elevation showing the shaft E and parts attached to it; Fig. 10 an end elevation of shaft E and parts shown as attached to it in Fig. 9; Fig. 11 a view illustrating a detail of construction; Fig. 12 a plan view of that part of the mechanism which completes the folding down of the two ends of the diamonds; Figs. 13 and 14 end and side elevations showing a device used in connection with the shaft

4. Fig. 15 is a cross-sectional view on the line *xx* of Fig. 7; Fig. 16 a detail view illustrating parts of the mechanism not clearly shown in the other figures. Figs. 17 to 24 inclusive all represent in elevation the same parts of the mechanism illustrating different positions occupied by said parts in completing the folds of the bag. Fig. 25 is a detailed elevation illustrating another part of the mechanism not clearly shown in the other views, and Figs. 26 and 27 are perspective views of detached details of the machine.

A indicates the frame-work supporting the operating mechanism; B and B' feed rolls which deliver the blank from the mechanism described in my former patent to the mechanism forming the final folds of the diamond. The roller B' is secured to pivoted arms B² and is held against the roller B by a spring B³.

C and C' are two segmental cylinders journaled respectively on the shafts 1 and 2; each cylinder is provided with a gear wheel as indicated at C¹¹ Fig. 7 and by the lines C¹¹ and C¹² in the other figures; these gears are of similar diameter and are engaged so that the rotation of the one cylinder always effects a similar movement in the other cylinder.

C² is a spider fastened to the shaft 1 and supporting the two plates C⁶ and C⁷ placed side by side so as to leave a space or groove between them. In this groove is situated a plate L the edge of which is held flush or nearly so with the mouth of the groove by means of springs I. (See Fig. 26.) The groove between the plates C⁶ and C⁷ constitutes a part of a creasing device the creasing of a piece of paper taking place by the action of a plate pushing the paper before it into the groove; and the spring-supported plate, or plunger as I shall call it, L, is used for the purpose of pushing the paper out of the groove after the creasing plate is withdrawn, the said plunger yielding to the pressure of the plate but resuming its former position when the plate is removed.

Before going further with the description I will here note the fact that the creasing devices are shown throughout in duplicate; that is to say, two sets of creasing devices are shown as connected with the shafts 1 and 2. It will, however, be understood as my inven-

tion has no particular reference to the use of two separate creases and that mechanism in which only a single set is attached to the shaft or in which more than two sets are used as equally within the scope of my invention.

The spider C^2 is secured to the shaft 1 inside of the segmental cylinder C and the creasing plates connected with it extend out through spaces in which the periphery or pressing surfaces of the cylinder is cut away.

C^3 and C^4 are parallel creasing blades secured to the cylinder C in the same way that the plates C^6 and C^7 are secured to the spider. The shaft 1 is geared to the shaft 2 so as to rotate with exactly the same speed and in an opposite direction and the segmental cylinder C is loosely journaled on the shaft 1.

Upon the shaft 2 is secured by means of screws C^{13} a spider C^{16} carrying creasing blades C^{18} and C^{19} which enter the slots between the plates C^6 and C^7 on the spider C^2 . The spider C^{16} is inside of the cylinder C' which is journaled on the shaft 2 and the pressing surfaces or periphery of which is intermediate as shown where the creasing blades C^{18} and C^{19} extend through it. Connected with the cylinder C' are creasing blades E' arranged to enter between the creasing blades C^3 and C^4 connected with the cylinder C. As the two cylinders are geared together it will be seen that their respective creasing devices will always come to proper position irrespective of the position of the cylinders with respect to the spiders; and the adjustment for different sizes of bags is made by turning the cylinder C' to a position with respect to the spider which will bring the creasing blades E' to a proper distance from the creasing blades C^{18} and C^{19} . This effects a similar arrangement of the creasing blades attached to the spider C^2 and cylinder C and the adjustment having been made the cylinder C' is secured to the shaft 2 so as to rotate with it. In the drawings this is accomplished by means of a bolt C^{15} (shown in Figs. 2 and 3) screwing into the spider C^{16} and through a slot C^{22} in the side of cylinder C' (as shown in Fig. 8) the slot being sufficiently long to enable any desired adjustment to be made.

E are shafts extending through the cylinder C' and journaled at the sides thereof so as to turn with the cylinder. At the end of the shaft E is secured a lever or crank arm E^3 (see Figs. 4, 5 and 6) having a cam roller e^3 extending out from its end; this cam roller is acted upon by a cam G of which g is the acting face, said cam being secured by a clamp G' to the stationary journal box F on shaft 2; this cam acting through the cam roller e^3 gives an oscillating movement to the shaft E as it rotates with the casing C' ; a spring I (see Figs. 7 and 7^a) coming in opposition to the cam and tending to hold the shaft E in the normal position indicated at the left of Fig. 2 in which it will be seen that a stop E^4 attached to shaft E rests against a stop or projection C^{21} on cylinder C' . Attached to the

shaft E is a creasing blade E' and folder E^2 and the action of the cam is first to bring the blade E' into proper position to enter between the plates C^3 and C^4 as shown in Fig. 2 and then to permit the folder E^2 to move rapidly forward to the position shown at the right hand of Fig. 3, the blade E' moving in at the same time. Attached to the stop E^4 is a spring e' the ends of which extend through slots formed in the blade E' ; when the blade is operating, the springs are forced inward as shown in Fig. 2 and the action of the spring is to force the paper away from the blade after the crease has been formed.

The bag blank is indicated at R , the crease formed by the blade C^{18} in connection with plates C^6 and C^7 at S , the front flap of the creased diamond being indicated by U , the rear crease formed by the blade E' in conjunction with the plates C^3 C^4 is indicated at T and the rear flap of the creased diamond at V . The function of the folder E^2 is to throw or to push the rear flap of the creased diamond forward as indicated in Fig. 3 and I will here note that D D indicate guides which hold the blank close to the periphery of the roller C' ; and M is a roller between which and the folder E^2 the crease or fold T is pressed just before the blank passes away from the creasing cylinder C' .

I will here note that the operation of the folders E^2 even apart from their conjoint action with the blades E' is a novel and important feature of my invention the said device being adapted for use where the preliminary creasing of the blank is performed by other instrumentalities.

C^{20} indicate light springs secured to the spider and having their free ends projected so as to lie in the path of the folder E^2 in the face of which grooves e^2 (see Fig. 9) are formed to receive the ends of the springs. These springs serve to guide the blank, the rear flap of which is folded down between but not over the spring ends. (See Fig. 27.)

I find it desirable to provide an instrumentality which will act to throw the flap V forward in advance of the action of the folder E^2 , and for this purpose I use the rod J which is secured to an arm J' journaled on shaft E by a set-screw j and which has a projecting end j^3 to which is attached a spring J^2 connected also with the shaft E in such a way as to hold the rod J normally in the position indicated in Figs. 5 and 6. From the arm J' extends finger j^2 ; and attached to cam G by an arm K' is a cam K which engages said finger just before the corresponding blade E' is brought to operative position and pulls back the arms J' or rather holds it back until after the paper is creased; then releasing it and permitting the rod J' to fly quickly forward engaging the flap V and folding it forward in advance of the action of the folder E^2 which, moving forward more slowly, comes over the fold formed by the action of rod J .

The creased and partly folded diamond after

passing over the roller M is fed over the finger N² to the mechanism on and under shaft 4—the finger N² having an intermittent up and down motion the function of which is to present the flap U properly to the action of the following mechanism. The finger N² is formed of the end of a shaft N' journaled on an arm N extending out from the frame; and the shaft N' is provided with another arm or finger N³ which normally rests against an annular projection N⁶ of a wheel N⁴ but is struck and depressed once in each revolution of the cam by a pin N⁵ thus throwing the finger N² up to a position such for instance as is shown in Fig. 18.

O and O' are drums from which runs an apron O³; and O² is a presser roll resting on the apron immediately above the drum O'. Situated above the apron is a shaft 4 to which is attached a plate P and fingers P' P' the plate and fingers being set at an angle to each as indicated in the drawings and the fingers being adjustable on the shaft to change its angle. The shaft 4 is given a rotary movement of varying speed by means of a device known as the Witworth motion, a slotted guide plate, P², being secured to one end of the shaft in which moves a pin P⁴ attached to the rim of a wheel P⁵ the axis of which is parallel but eccentric to that of the shaft 4. Journaled on the shaft 4 is a sleeve P⁷ from which extends a bent arm P⁸ having at its end a slotted guide plate P⁹ in which moves a pin P⁶ also attached to the side of wheel P⁵ but situated at some distance from the pin P⁴ as shown in the drawings so that the differential movement imparted to the sleeve P⁷ is some times faster and some times slower than that of the shaft 4 and the parts attached to it. To the end of the sleeve P⁷ is secured the arm P¹¹ from which projects the rod or wire P¹⁰.

Referring now to the diagrams (Figs. 17 to 24) it will be noticed that Fig. 17 shows the various parts in the same position as they are shown in Fig. 3. Fig. 18 shows the next position and it will be noticed that the arm N² is thrown up so as to prevent the flap U of the bag blank from passing beneath the plate P. As soon as this danger is over the finger N² falls again permitting the flap U to enter between the plate P and the fingers P' as shown in Fig. 19. In Fig. 20 is shown the next position of the parts and it will be noticed that the flap V rests between the fingers P' and the wire rod P¹⁰. In Figs. 21 and 22 the operation of the plate P in folding back the front flap and the wire P¹⁰ in folding forward the back flap is illustrated, and in Fig. 23 this action is still further carried on showing how the folded edge S is presented to the pressing rolls O' and O².

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

1. In combination with a creasing blade, one or more springs e' the ends of which extend through slots e in the edge of the blade

and which act to push the paper away from the blade, substantially as and for the purpose specified.

2. The combination of the shaft 1, a spider C² secured to said shaft and supporting one or more pairs of creasing plates C⁶ C⁷, a segmental cylinder C journaled on said shaft and carrying one or more pairs of creasing plates C³ C⁴; a shaft 2 geared with shaft 1 as described; a spider C¹³ secured to shaft 2 and carrying one or more creasers as C¹⁸ and C¹⁹ arranged to enter the slot between plates C⁶ C⁷; a segmental cylinder C' geared with cylinder C as described and adjustably secured to shaft 2 and one or more creasing blades attached to said segmental cylinder C' arranged to enter the slot between plates C³ C⁴, all substantially as and for the purpose specified.

3. In a bag machine substantially as described the combination of the segmental cylinder C' one or more shafts E journaled in the sides of said cylinder; a crank arm E³ on said shaft; a stationary cam G arranged to operate on said crank-arm as described while the cylinder revolves; a spring I arranged to act on shaft E holding it normally against a stop C²¹; a folder E² attached to shaft E and which is actuated by cam G, and suitable creasing and holding devices substantially as and for the purpose specified.

4. In a bag machine substantially as described the combination of the segmental cylinder C' one or more shafts E journaled in the sides of said cylinder; a crank-arm E³ on said shaft; a stationary cam G arranged to operate on said crank-arm as described while the cylinder revolves; a spring I arranged to act on shaft E holding it normally against a stop C²¹; a creasing blade E' attached to shaft E and which is thrown into operative position by the cam; a folder E² also attached to shaft E and which is arranged to act after the creasing and suitable creasing and holding devices substantially as and for the purpose specified.

5. In a bag machine substantially as described, the combination of the segmental cylinder C', one or more shafts E journaled in the sides of said cylinder; a crank-arm E³ on said shaft; a stationary cam G arranged to operate on said crank arm as described while the cylinder revolves; a spring I arranged to act on shaft E holding it normally against a stop C²¹; a creasing blade E' attached to shaft E and which is thrown into operative position by the cam; a folder E² also attached to shaft E and which is arranged to act after the creasing; a supplemental folder-rod J; an arm J' supporting rod J, said arm being journaled on shaft E; a spring J² acting to hold rod J normally between blade E' and folder E² a cam K arranged to catch and hold rod J while blade E' is acting and to release it in advance of the action of folder E² and suitable creasing and holding devices.

6. The combination of an apron as O³, a shaft

- 4 journaled above said apron and rotating with varying speed; a plate P secured to said shaft; fingers P' also secured to said shaft and set at an angle with plate P as described;
- 5 a sleeve P⁷ journaled on shaft 4 and rotating at varying speed and for a time at greater speed than shaft 4; and an arm P¹⁰ secured to sleeve P⁷ and extending across the apron behind fingers P'.
- 10 7. The combination of an apron as O³, a shaft 4 journaled above said apron, a guide-bar P² secured to the end of shaft 4; a wheel P⁵ journaled eccentrically to shaft 4 and engaged in
- guide P² as by pin P⁴; a plate P and fingers P' attached to shaft 4 and set at an angle to each other; a sleeve P⁷ journaled on shaft 4 and having a guide P⁹ attached to it, said guide being engaged with wheel P⁵ at a point nearer its center than guide P² as by pin P⁶ and an arm P¹⁰ extending out from the sleeve and behind fingers P', all substantially as and for the purpose specified.
- 15 20

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Witnesses:

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