

(No Model.)

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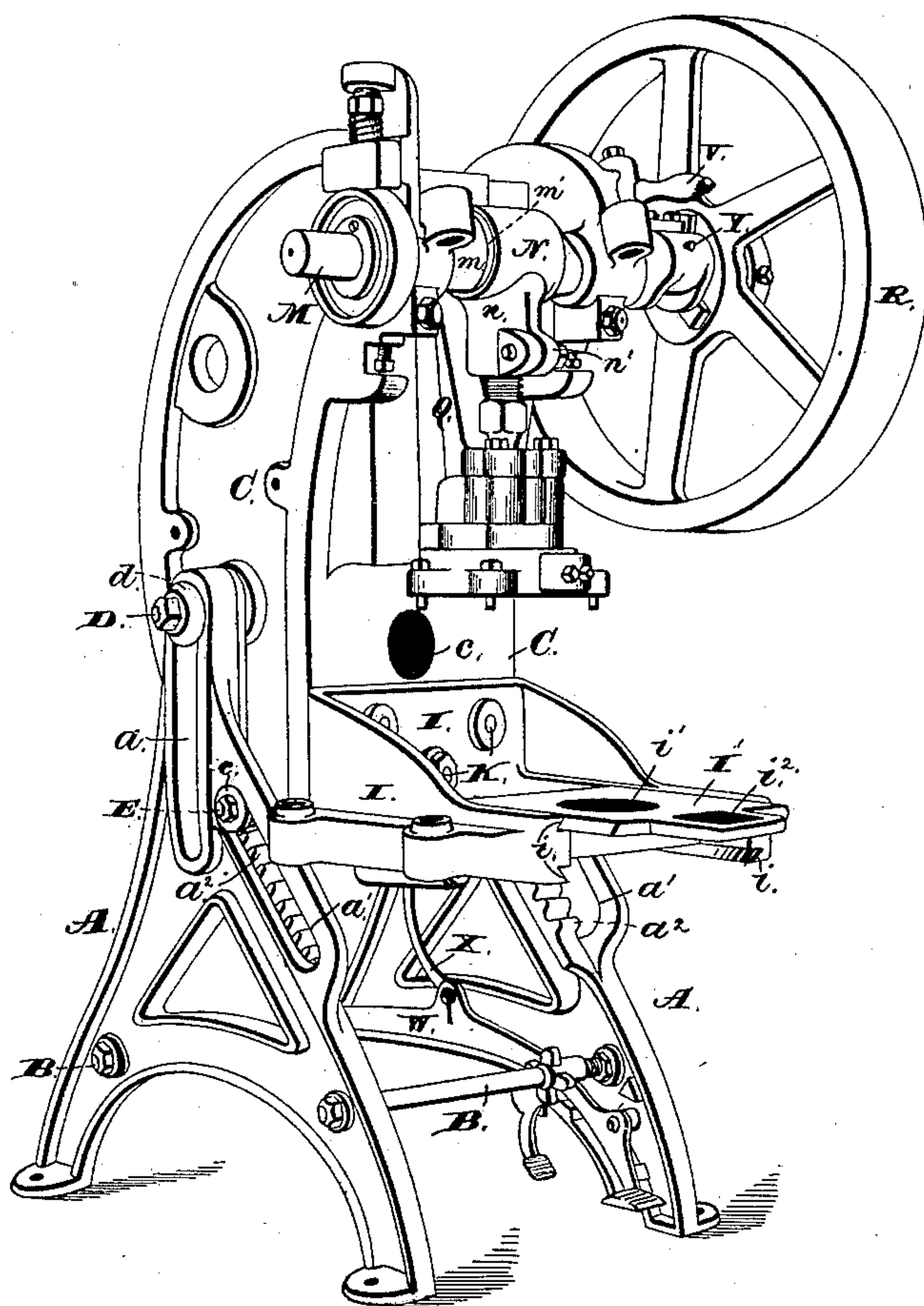
O. SMITH.

PRESS FOR CUTTING AND DRAWING SHEET METAL.

No. 341,353.

Patented May 4, 1886.

Fig. 1.



Witnesses:

Jas. C. Hutchinson.

Henry C. Hazard

Inventor.

Charles Smith, by

Chindle^{2nd} Russell, his Attiya

(No Model.)

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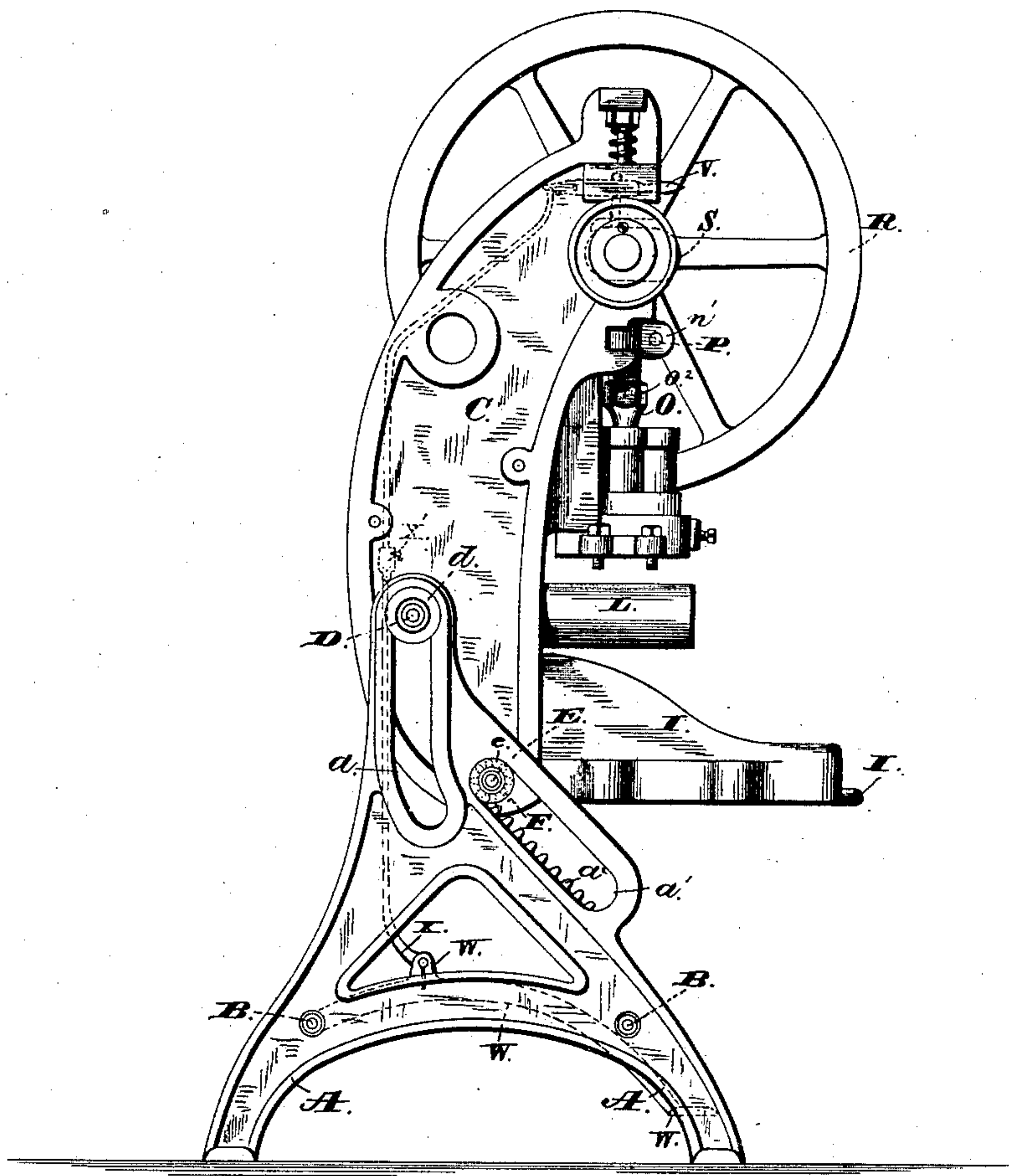
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Fig. 2.



Witnesses:

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(No Model.)

5 Sheets—Sheet 3.

O. SMITH.

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Fig. 3.

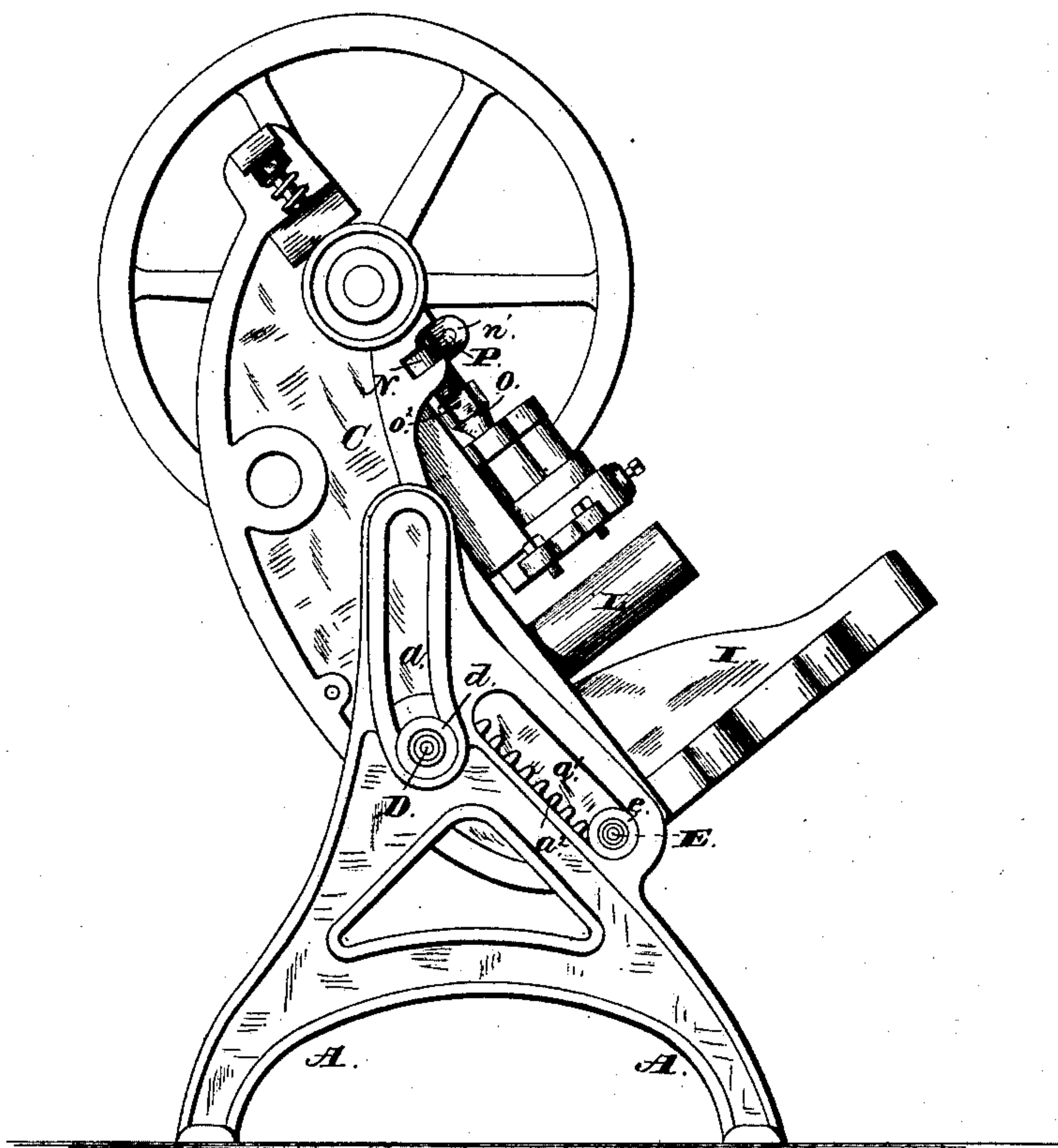
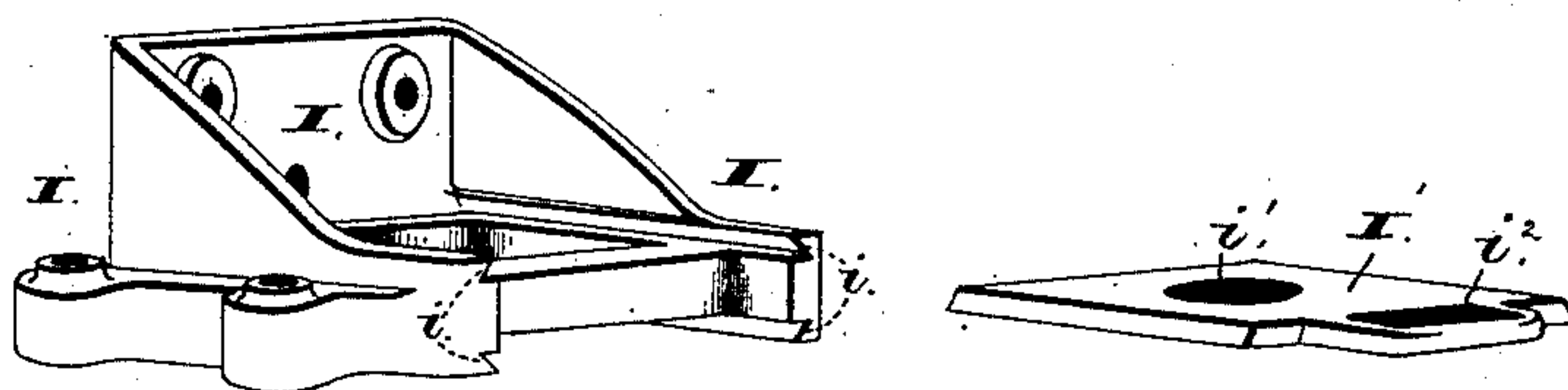


Fig. 4.



Witnesses:

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Prindle & Russell, his Attys

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Fig. 5.

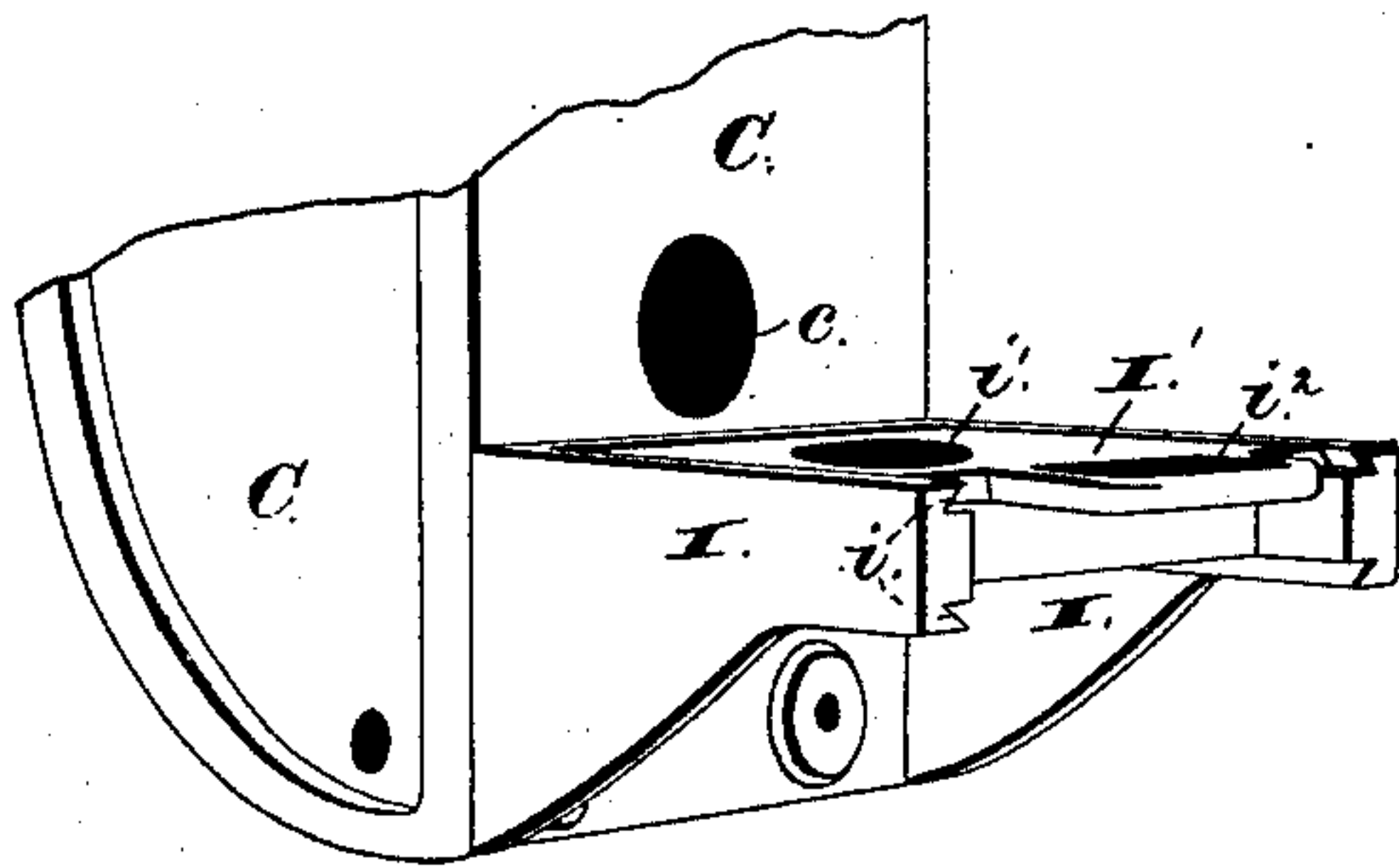


Fig. 6.

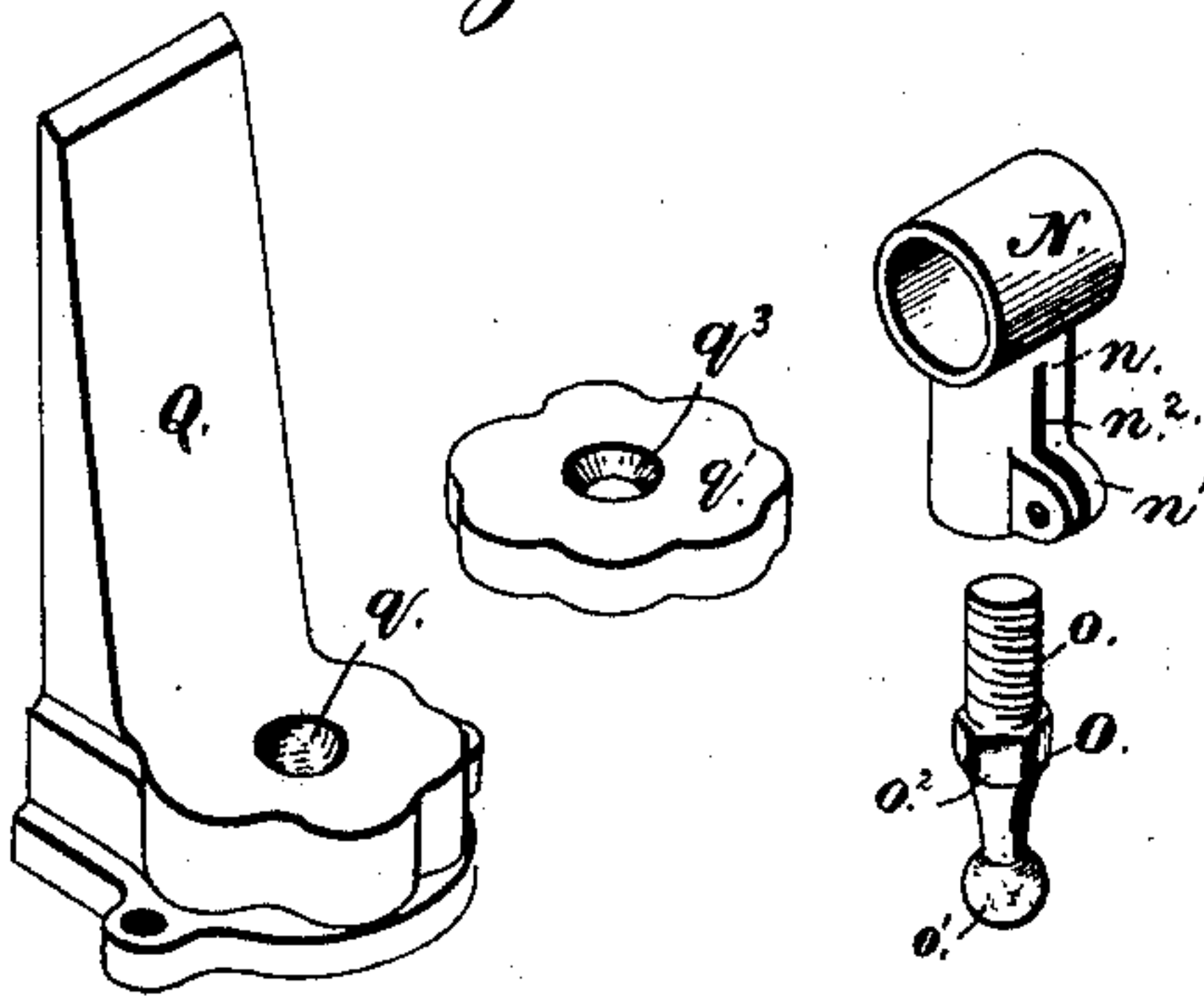


Fig. 7.

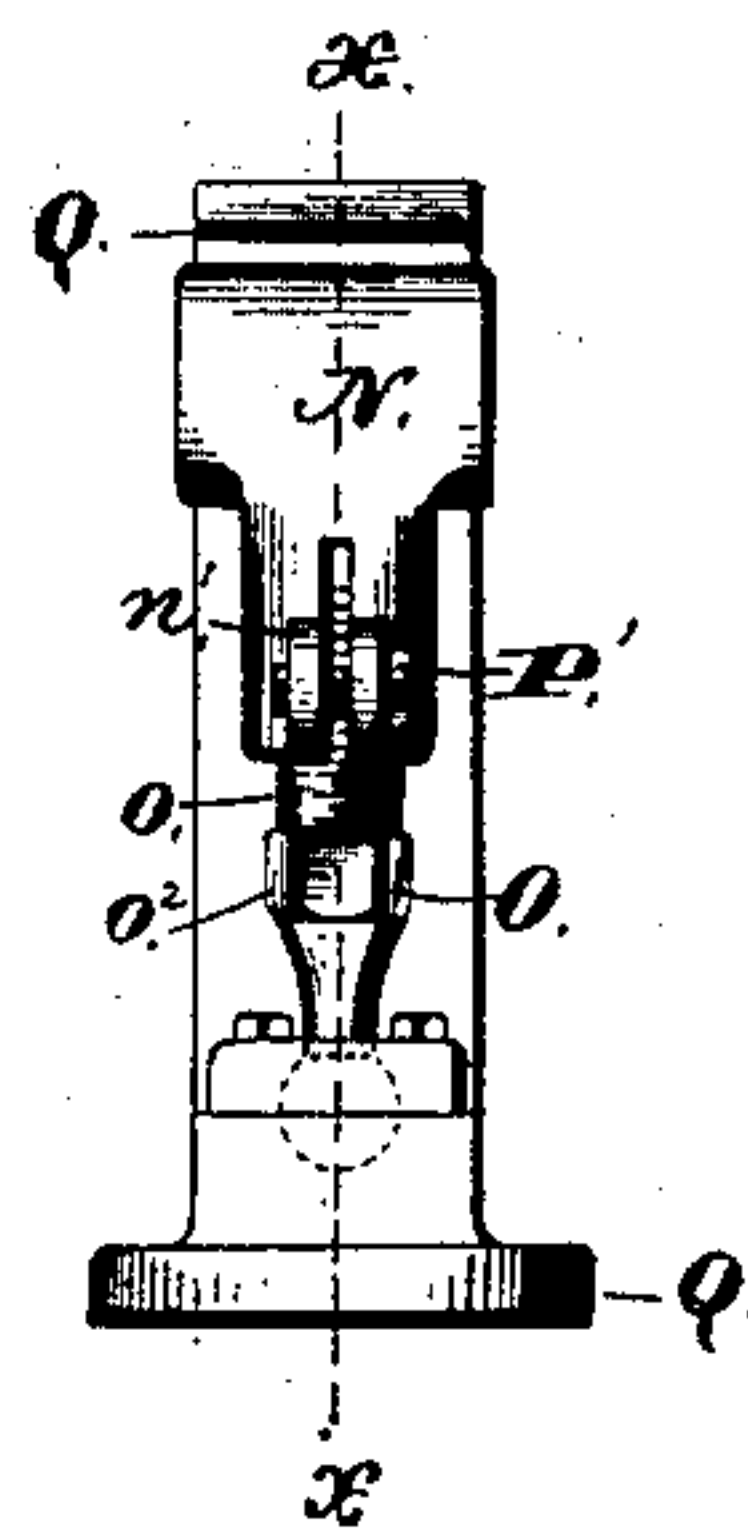


Fig. 9.

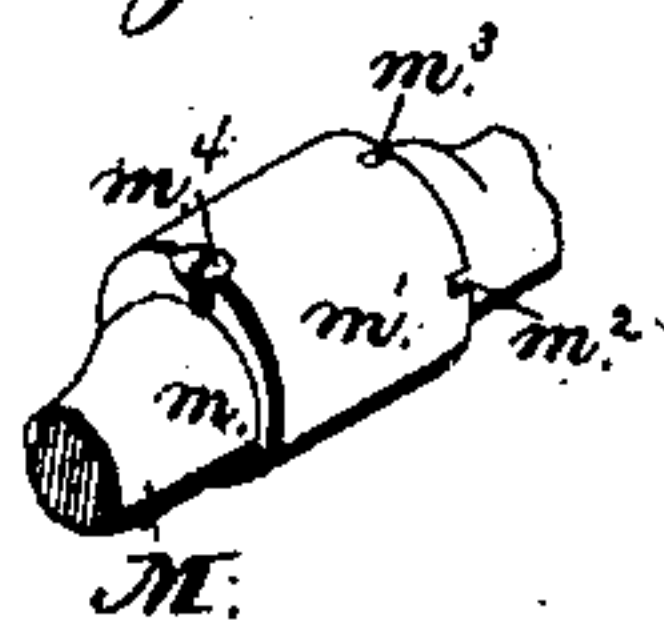


Fig. 10.

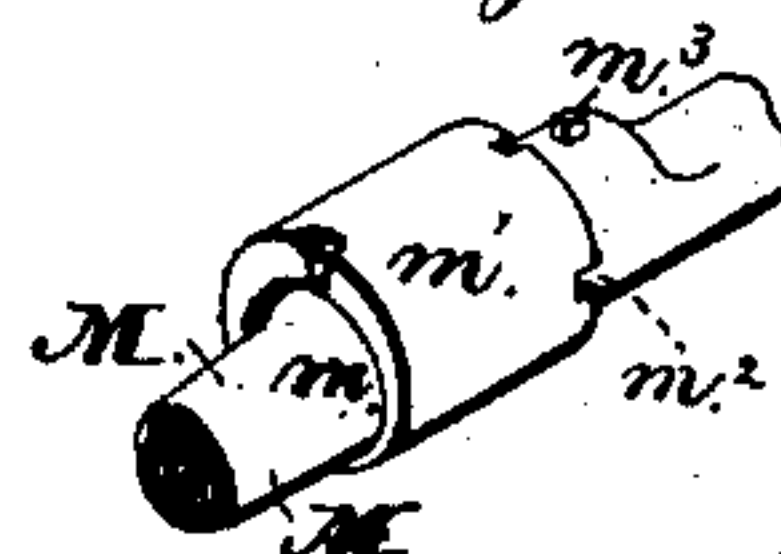


Fig. 8.

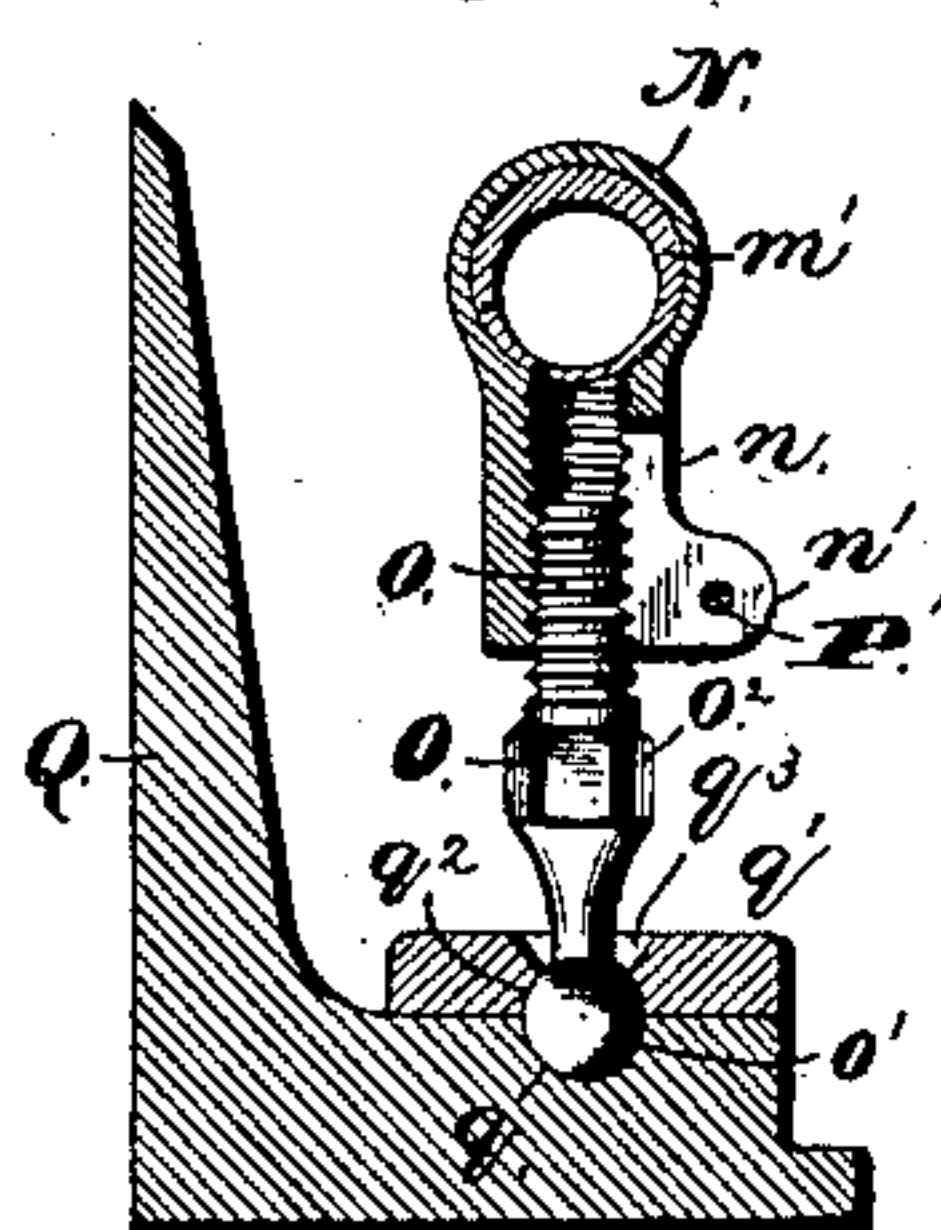


Fig. 11.



Fig. 12.



Fig. 13.



Witnesses:

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Fig. 14.

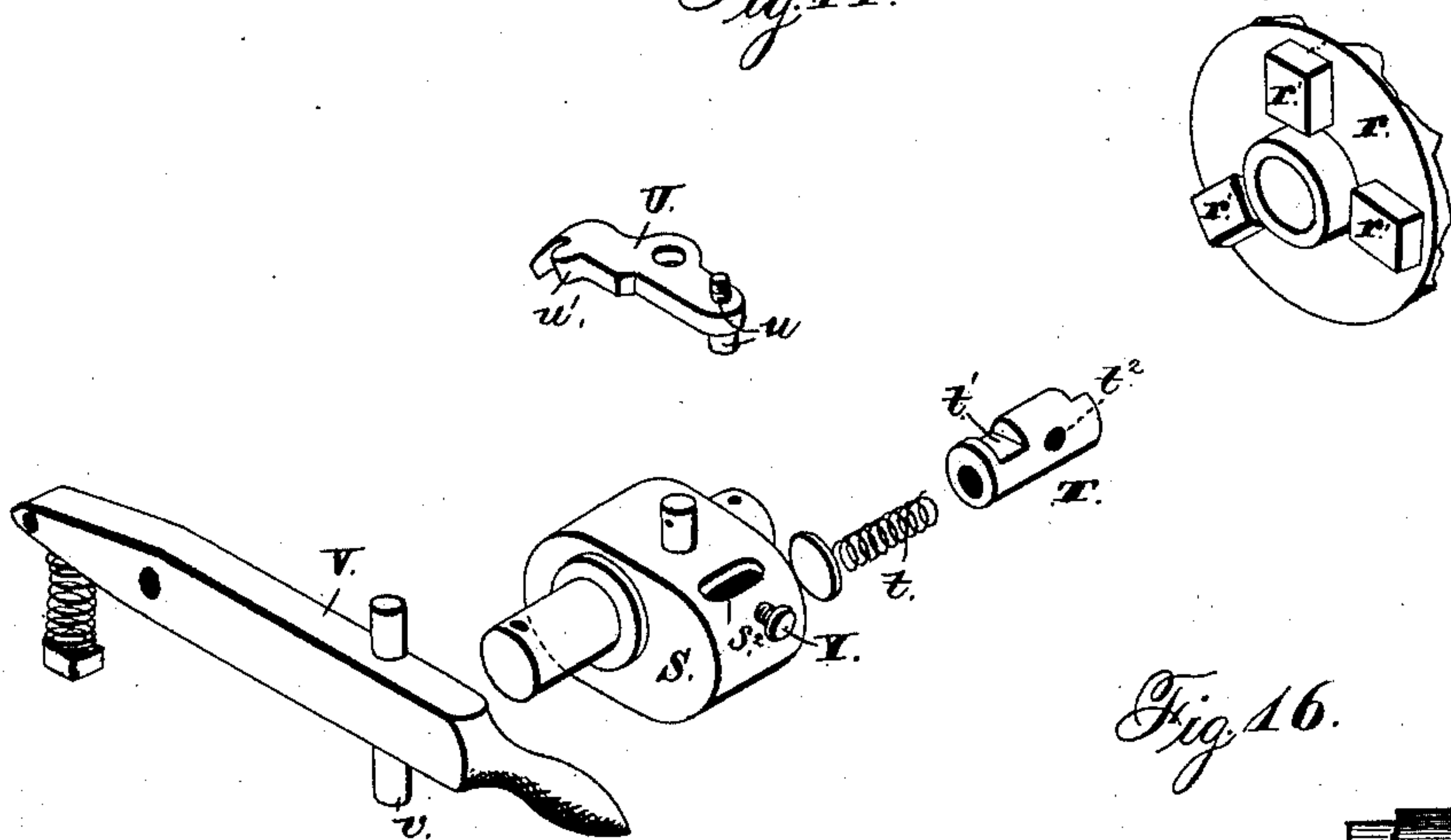


Fig. 16.

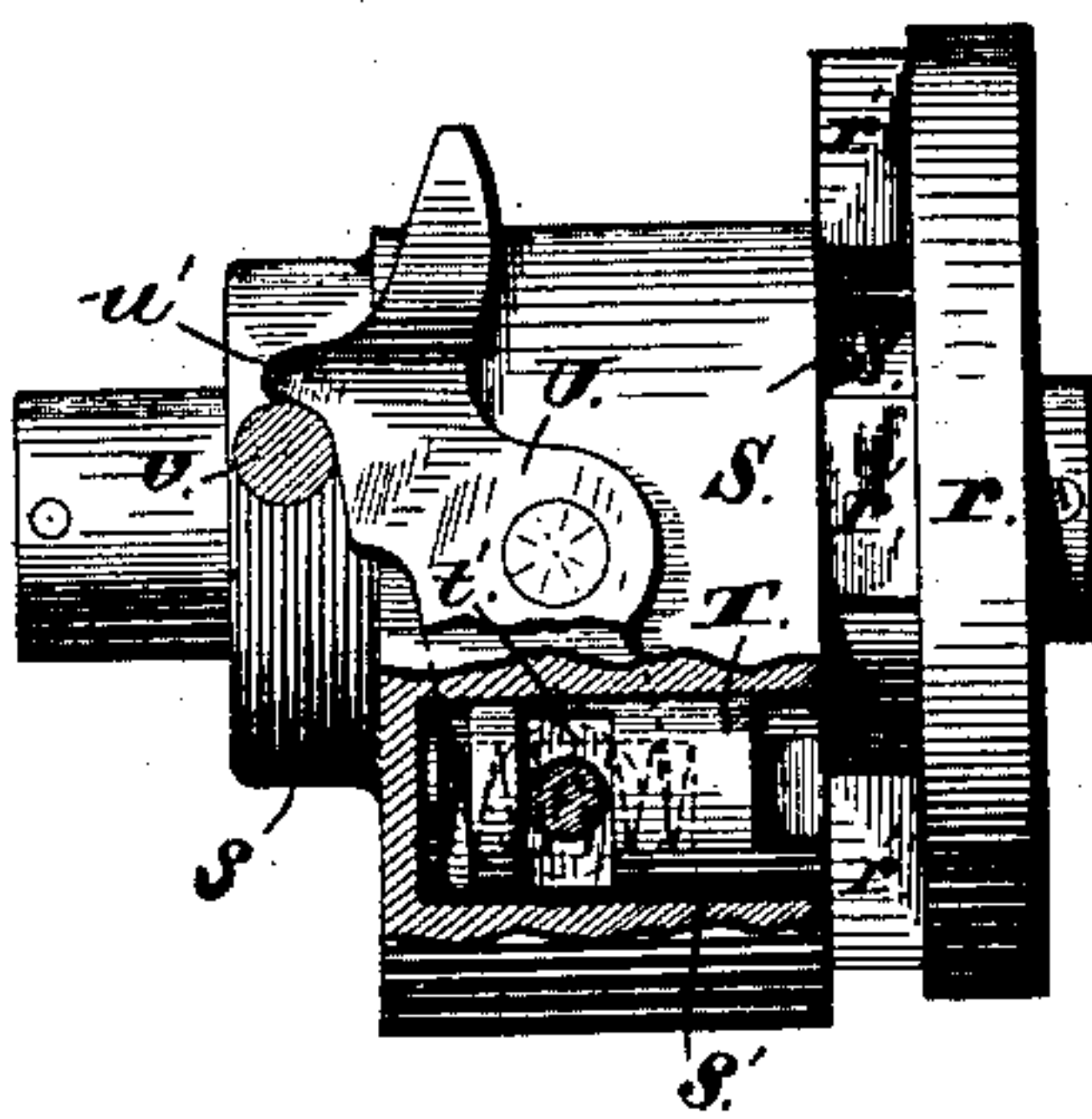


Fig. 15.

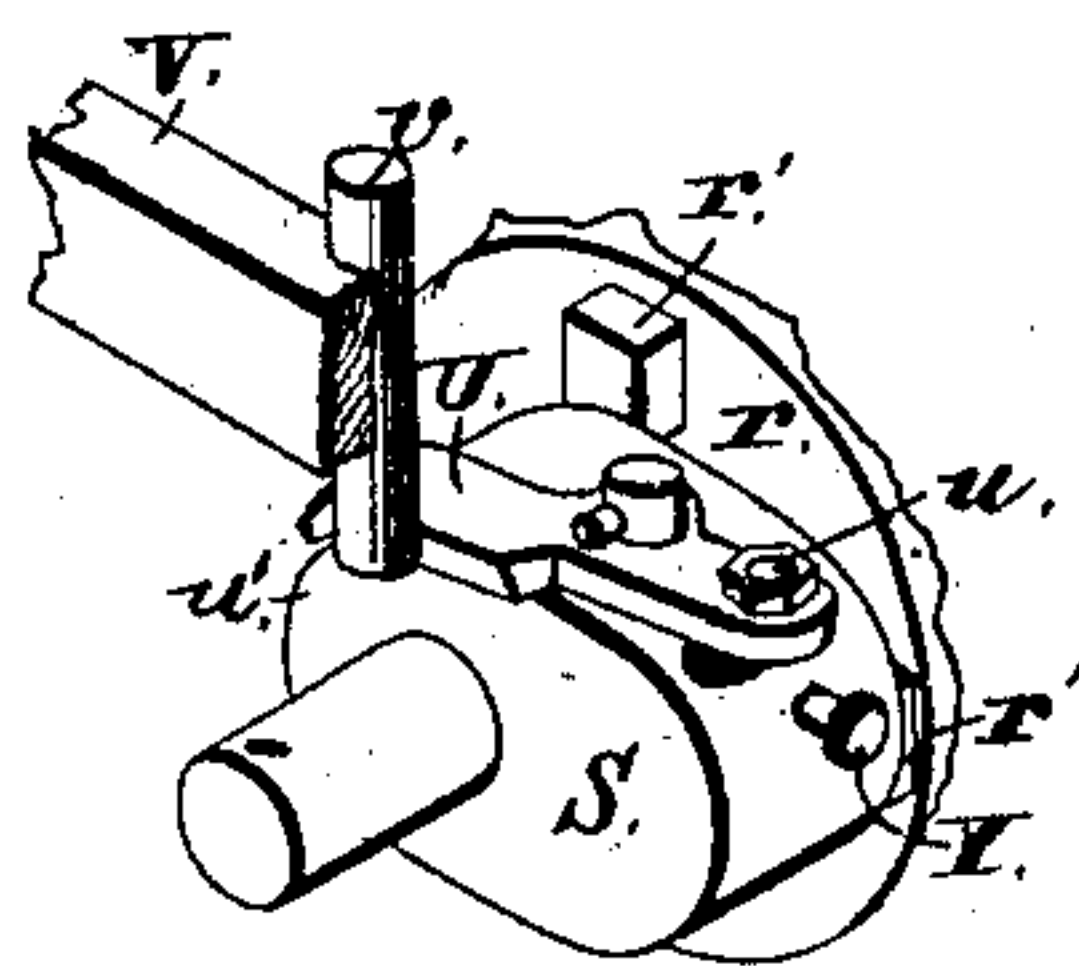


Fig. 17.

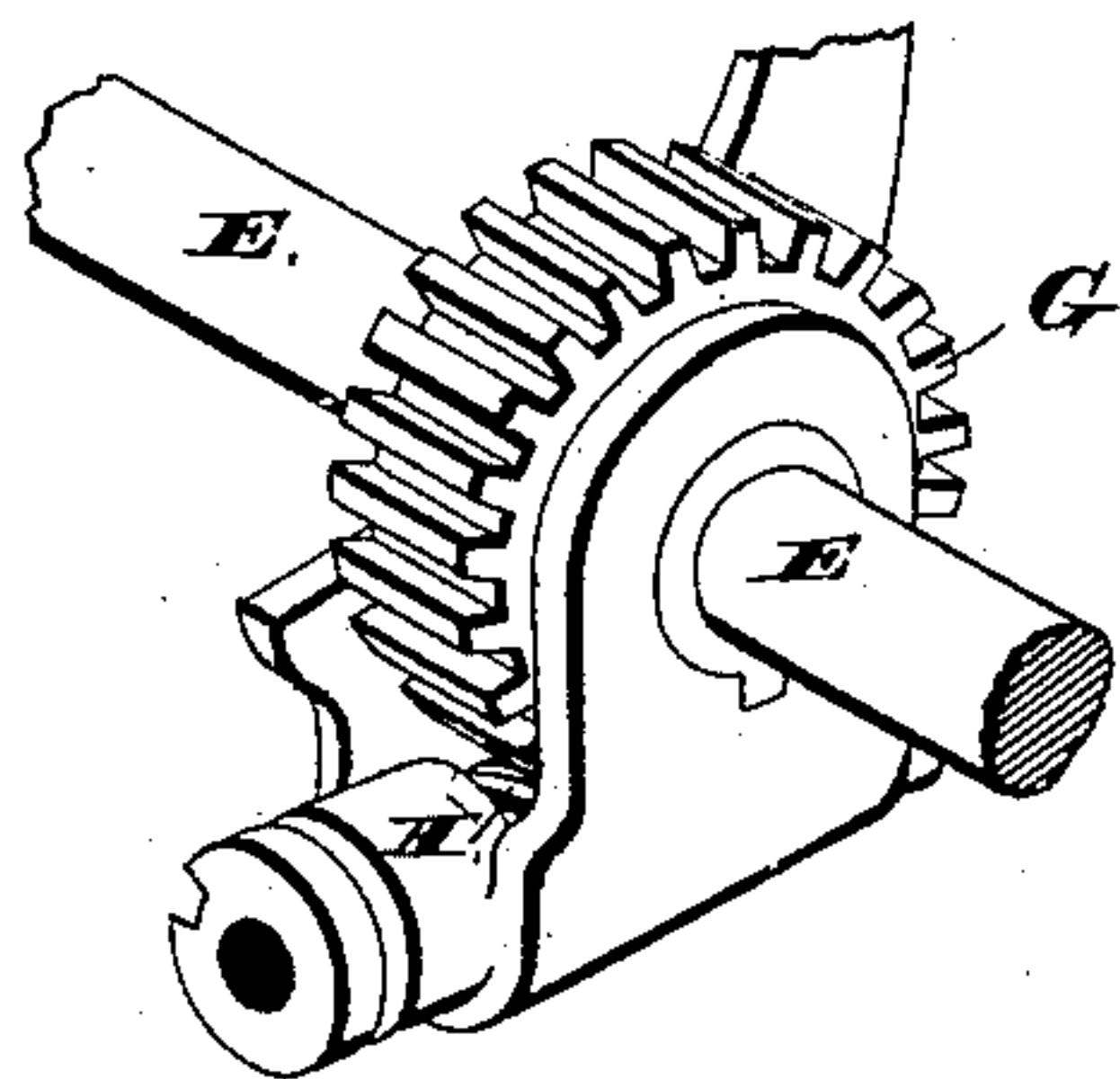


Fig. 18.

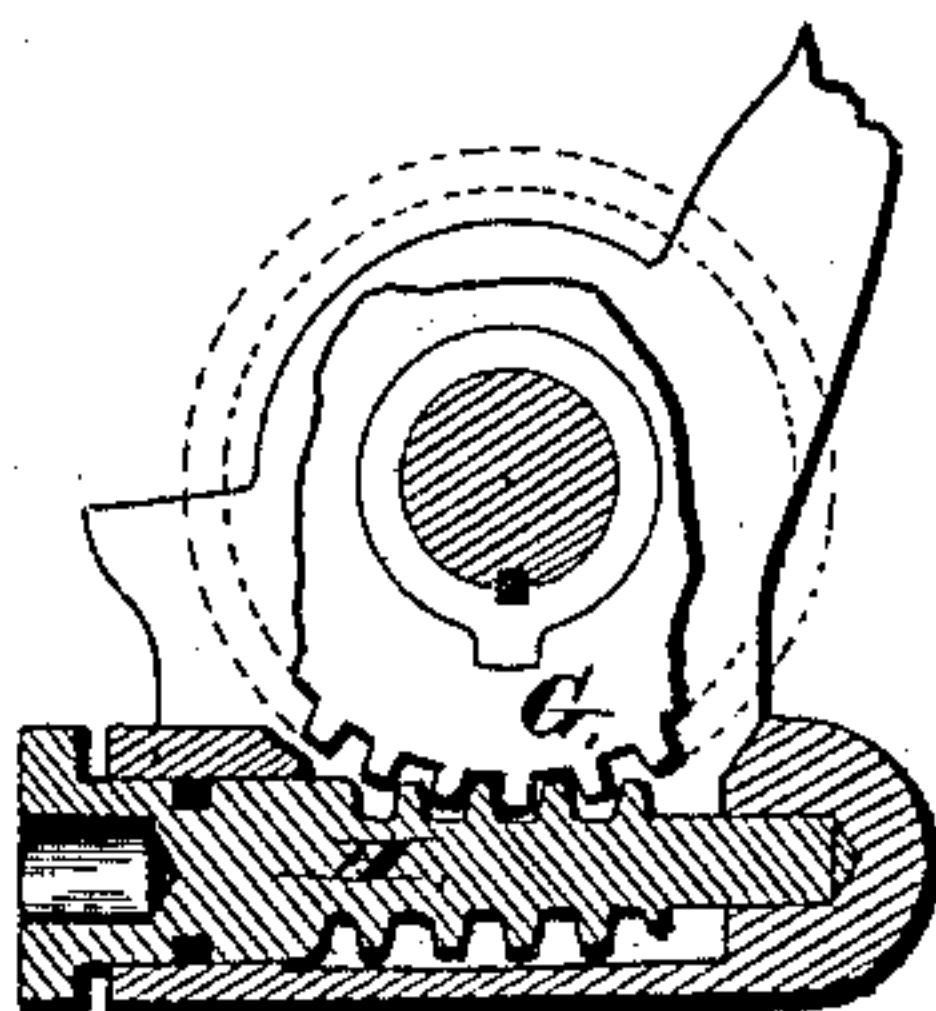
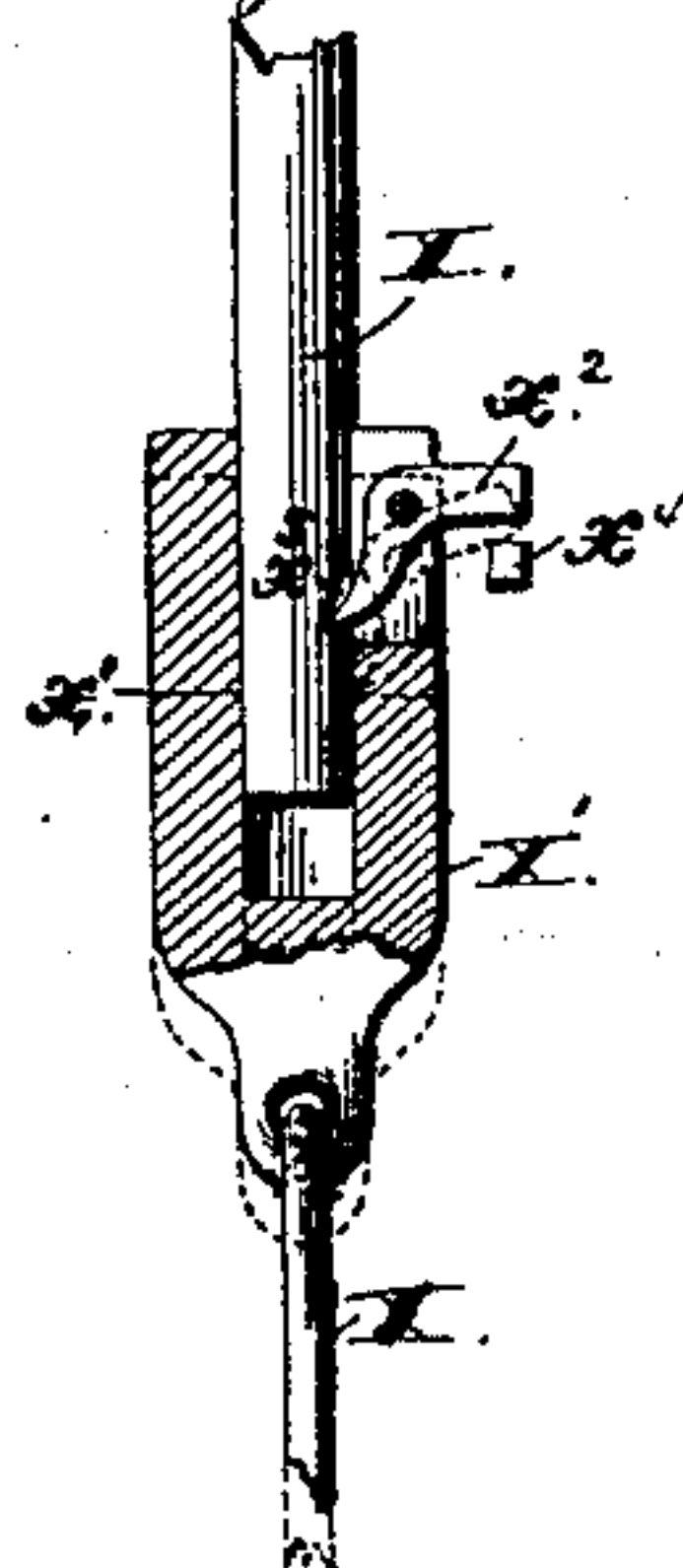


Fig. 19.



Witnesses:
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UNITED STATES PATENT OFFICE.

OBERLIN SMITH, OF BRIDGETON, NEW JERSEY.

PRESS FOR CUTTING AND DRAWING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 341,353, dated May 4, 1886.

Application filed July 22, 1884. Serial No. 138,467. (No model.)

To all whom it may concern:

Be it known that I, OBERLIN SMITH, of Bridgeton, in the county of Cumberland and State of New Jersey, have invented certain new and useful Improvements in Power-Presses; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

10 Figure 1 is a perspective view of my press with its frame upright and its bed horizontal. Fig. 2 is a side elevation of the same when thus arranged. Fig. 3 is an elevation of the same side of said press, with its frame tilted rear-ward and downward and its bed inclined. 15 Fig. 4 is a perspective view of the parts of the reversible bed separated from each other and from the frame of the press. Fig. 5 is a like view of the same combined with each other and with said press-frame, and arranged in the reverse position from that shown in Fig. 1. Fig. 6 is a perspective view of the parts of the pitman separated from each other. Fig. 7 is a front elevation of the same as combined. 25 Fig. 8 is a section of said parts upon line *x x*, Fig. 7. Fig. 9 is a perspective view of the main and adjustable eccentrics locked together in position for use. Fig. 10 is a like view of the same when disconnected for adjustment of throw. Figs. 11, 12, and 13 are cross-sections 30 of the same, and show, respectively, the relative positions of said parts in the different adjustments provided. Fig. 14 is an enlarged perspective view of the parts of the automatic clutch used for connecting the main shaft with the driving-wheel, said parts being separated from each other. Fig. 15 is a like view of the same combined. Fig. 16 is a plan view of the side of said clutch which is uppermost when 40 disconnected from the driving-wheel, a portion of the housing being removed to show the arrangement of the spring-pawl and the safety-screw for locking the same. Fig. 17 is a perspective view of the mechanism employed for tilting the frame of the machine and locking the same in position. Fig. 18 is a vertical section of said mechanism upon a line passing through the axis of the worm; and Fig. 19 is a side elevation, partly in section, of the treadle-trip, the full lines showing the relative positions of parts when the sections of the rod 50 are engaged and the dotted lines their positions when disconnected.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to increase the efficiency and to render more easy of operation presses employed for drawing and cutting sheet metal by means of dies, to which end said invention consists, principally, in the construction of the frame and legs whereby the former may be readily changed from a vertical to an inclined position, substantially as and for the purpose hereinafter specified. 55

It consists, further, in the means employed for connecting the frame and legs, substantially as and for the purpose hereinafter shown. 65

It consists, further, in the means employed for moving the frame to position and locking the same therein, substantially as and for the purpose hereinafter set forth. 70

It consists, further, in the construction of the bed and its combination with the frame of the press, substantially as and for the purpose hereinafter shown and described. 75

It consists, further, in the construction of the pitman and its combination with the slide-bar and head, substantially as and for the purpose hereinafter specified.

It consists, further, in the means employed for varying the stroke of the slide-bar, substantially as and for the purpose hereinafter shown. 80

It consists, further, in the means employed for connecting the main shaft with the driving-wheel, substantially as and for the purpose hereinafter set forth. 85

It consists, further, in the means employed for connecting the treadle with and disconnecting the same from the clutch mechanism, substantially as and for the purpose hereinafter shown and described. 90

It consists, finally, in the means employed for locking the clutch mechanism out of engagement with the driving-wheel, substantially as and for the purpose hereinafter specified. 95

In the annexed drawings, A and A represent the legs which support the frame of my press, which legs have a general A shape in side elevation, and are secured in relative vertical position by means of two cross-bars, B and B, that extend horizontally between their lower portions. Within the upper portion of each of said legs A is formed a slot, *a*, which is vertical nearly to its lower end, and from 100 105

thence downward has a slight curve toward the front of the frame, while within the front upper edge of said leg is formed a second slot, a' , that corresponds in length to the length of said slot a and has an angle of about forty-five degrees with relation thereto. Said slot a' is straight throughout its entire length, and upon its lower side is provided with teeth a^2 .

The frame C of the press has the form in side elevation shown in Fig. 2, and is suspended between the legs A by means of four trunnions, two of which, D and E, project from each side into and through the slots a and a' , respectively, and are provided upon their outer ends with a washer and nut, d and d' or e and e' . The trunnions E are formed upon and constitute part of a shaft which passes through and is journaled within the frame C, and upon each, within each slot a' , each trunnion has secured thereon a pinion, F, that meshes with the toothed rack a^2 at the lower side of said slot a' , by which means and in consequence of the relative arrangement of said trunnions and slots the rotation of said shaft in one direction will cause the upper end of said frame to be tilted rearward and downward and its lower end to be lowered, as shown in Fig. 3, while by reversing the motion of said shaft said frame will be turned to its former position, as seen in Figs. 1 and 2.

Motion is imparted to the shaft E by means of a worm-wheel, G, which is secured upon its central portion, and a worm or screw, H, that is journaled within suitable bearings beneath and is adapted to mesh with the same. The front end of said worm is adapted to receive a handle, by which the latter may be turned until the frame C is adjusted to place, after which the friction between said screw and its gear is sufficient to cause said frame to maintain its position.

If desired, the pinions F may be omitted and the trunnions E adapted to fit into either of the spaces between the teeth a^2 , in which event said frame would require to be lifted bodily to the desired position and said trunnions then caused to engage with the contiguous spaces.

In place of a bed attached to and forming part of the frame, as usually employed, I employ a detachable bed composed, principally, of an angle-plate, I, that is adapted to have one end secured to or upon the front side near the lower end of said frame, by means of bolts K, that pass through the former and into or through the latter. The body of said plate extends outward at a right angle to the said connecting rear end and has a portion of its central part made open, while within the upper and lower sides of such body are provided dovetail grooves i , that are adapted to receive and contain a correspondingly-shaped plate or slide, I' , which plate may be placed within either of said grooves, and when in position completes the working-surface of the bed and renders the same practicable for use. The central portion of said slide I' is preferably

provided with the usual opening, i' , while at its front end is a hand-hole, i^2 , which affords a firm hold for the hand in withdrawing said slide from its containing-groove.

As the vertical portion of the bed is wholly at one side of its body, it will be seen that by reversing said part upon the frame C the vertical positions of said body and the slide I' will be changed a distance nearly equal to the width of said vertical portion, and a high or low bed secured as needed.

The detachable bed described enables a horn, L, to be employed, for which purpose an opening, c , is provided within the frame C, at a point immediately above that occupied by said bed, said press being thus adapted for uses which have heretofore required several separate presses. Journaled within the upper end at the front side of the frame C is a shaft, M, upon which, between its bearings, is an eccentric, m , and upon the same is fitted an eccentrically-bored sleeve, m' , which is capable of rotation thereon and of being moved longitudinally within certain limits. Within one end of said eccentric-sleeve are formed a number of radial notches, m^2 , either of which, when placed in proper position circumferentially, may be caused to engage with a stud, m^3 , that projects radially from said eccentric m , so as thereby to lock said parts in relative circumferential positions and cause said sleeve to rotate with said eccentric and to practically constitute a part of the same. Said sleeve is held in longitudinal position when in engagement with said stud by means of a screw, m^4 , which is placed radially within said eccentric m at a point longitudinally opposite to said stud, and bears against the end of said sleeve.

The number of notches m^2 in the end of the eccentric-sleeve m' corresponds to the number of different strokes desired for the movable die, and by the rotation of said sleeve upon the eccentric m the movement of said die may be varied from the result of the combined eccentricities of said parts to anything less than absolute rest.

Journaled upon the eccentric-sleeve m' is a head, N, which closely embraces the same, and upon its lower side is provided with a threaded sleeve, n , that receives the upper threaded end, o , of a pitman, O. The front side of said sleeve is provided with two forwardly-projecting lugs, n' , through which passes a horizontal bolt, P, and between the same has a longitudinal slot, n^2 , which enables said sleeve to be slightly compressed by the action of said bolt in drawing said lugs toward each other, by which means the inclosed end of said pitman, when adjusted to position, may be so closely confined as to render independent movement impracticable.

Within suitable ways upon the front side of the frame C is a slide bar, Q, of usual construction, the lower end of which extends forward beneath the shaft M, and is adapted to receive and carry any desired form of upper

die. Within the upper side of the projecting lower portion of said slide-bar is formed a semi-spherical socket, q , and over the same is placed a removable cap, q' , which is provided within its lower face with a semi-spherical socket, q^2 , that coincides with and corresponds to said socket q , and at the axis of said socket q^2 has a round opening, q^3 , that is made flaring from below upward.

The lower end of the pitman O is provided with a ball, o' , which corresponds to and fits within the sockets q q^2 , and connects the slide bar Q through said pitman and head N with the operating-shaft M , and enables said slide-bar to be moved vertically by the rotation of said shaft. In order that the vertical position of said slide-bar, with relation to the axis of said shaft, may be raised so as to adjust the upper die to the lower fixed die, it is only necessary that the sleeve n be loosened and said pitman turned, so as to screw its upper end into or out from said sleeve until the desired adjustment is effected. To enable such operation to be readily performed the central portion, o^2 , of said pitman is squared, or provided with parallel faces, upon which a wrench may be placed for the purpose of turning the same.

The operative mechanism is driven through a band-wheel, R , which is loosely journaled upon the projecting end of the shaft M , and is connected therewith, when desired, by the following described means, viz: Upon the inner end of the hub r of the wheel R are provided a number of radial lugs, r' , and between said hub and the outer end of the adjacent journal-bearing of the shaft M is an eccentrically-shaped housing, S , that is attached to and revolves with said shaft. The inner end of said housing is either provided with a cylindrical collar, s , or said journal-box has a like part formed upon its outer end, against which said housing bears, for reasons hereinafter given. Fitted loosely within a corresponding recess, s' , that is provided within the projecting portion of the housing S , parallel with the shaft M , and extending from the outer end of said housing nearly to its inner end, is a pawl, T , which is adapted to be moved longitudinally outward into engagement with either of the lugs r' or inward until wholly contained within said recess. A spring, t , placed in rear of said pawl holds the same with a yielding pressure at the outer limit of its motion, while a lever, U , having the form in plan view shown in Fig. 16, pivoted centrally upon the side of said housing, and having its front end connected with said pawl by means of a stud, u , which projects through a slot, s^2 , in said housing into a recess, t' , in said pawl, furnishes means whereby the latter may be retraced from engagement with said lugs.

The operation of the press requires that the driving-shaft should after each complete revolution be disconnected from the driving-wheel, for which purpose a lever, V , is pivoted upon the side of the frame C , above and in rear of

the shaft M , and extending horizontally forward is provided with a vertical pin, v , that is adapted to rest upon the collar s , without interference with the rotation of the housing S . The normal position of the lever U is with its free rear end in contact, or nearly so, with the side of said frame C , in which position the revolution of the shaft M will bring the inner edge of the rear portion of said lever into contact with said pin v and force the same outward and its front end inward until the pawl T is withdrawn from engagement with the lugs r' , when the motion of said shaft ceases. For the purpose of insuring the stoppage of the latter each time at the precise point desired a shoulder, u' , is formed upon said lever U in position to engage with said pin v immediately after said pawl has been released from engagement.

The clutch-pawl T is released and permitted to engage with the driving-wheel lugs r' by raising the lever V and removing the pin v from engagement with the lever U , which operation may be effected by the operator grasping the front end of said lever V with his hand; but a more convenient means is afforded by a foot-lever, W , which is pivoted at its rear end upon the rear cross-bar, B , has its front end within convenient reach of the foot of the operator, and is connected with the rear end of said lever V by means of a rod, X , that extends between the latter and said lever W at a point in front of its pivotal bearing. As thus arranged, by depressing the front end of said foot-lever the rear end of said lever V will be depressed and its front end raised so as to remove said pin v from engagement with said lever U , as before stated. Said levers V and W are held in normal position by means of a spring placed at some suitable point beneath the rear end of the former.

In order that the driving-shaft may be prevented from making more than one complete revolution, should the operator accidentally continue to press downward upon the foot-lever, the rod X is made in two sections, the upper of which is straight and has its lower end contained within a sleeve, X' , that is pivoted to the upper end of the lower section. The opening x' in said sleeve has such diameter and shape as to permit said upper section to slide longitudinally therein, while within one side of said sleeve is pivoted a pawl, x^2 , that has its engaging end project inward and downward into said opening in position to engage with a notch, x^3 , which is formed in the contiguous side of said upper section, by which arrangement said upper and lower sections are combined as against a downward pull upon the latter.

When the foot-lever or treadle has been depressed until the clutch-pawl is released, and the press set in motion, the outer end or tail of the pawl x^2 comes into contact with stationary lug x^4 , and by the farther downward movement of said treadle said pawl is thrown out of engagement with upper rod-section,

and the latter, with the lever V, permitted to resume its normal position. Before said treadle can be again connected with and in condition to actuate the clutch-pawl T it must be raised until said pawl x^2 engages with said notch x^3 , for which purpose a spring is arranged to throw said treadle upward to position as soon as released by the operator. The lug x^4 is made vertically adjustable for the purpose of permitting the point at which the treadle is disconnected to be raised at will.

While setting or adjusting dies upon the press it is necessary that the operative parts should be removed from all possible connection with the driving-wheel, for which purpose a screw, Y, is placed radially within the housing S, and is adapted, when turned inward, to have its inner end engage with a correspondingly-shaped recess, t^2 , in the pawl T, said recess being located within the latter so as to coincide with said screw end when said pawl is retracted within said housing, and is entirely out of engagement with said driving-wheel. It will be seen that when said set-screw is in engagement with said recess all liability of the starting of the shaft M is avoided, and the operator is enabled to work with safety about the press.

I am aware that it is not new to place an eccentric-bearing upon a crank for the purpose of neutralizing the throw of such crank, when desired.

I am also aware that it is not new to lock a pawl in engagement with a ratchet-wheel, so as to compel such pawl, when thus locked, to move said wheel in either direction.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the legs A and A, provided with the vertical slots a and inclined slots a' , the latter having toothed lower sides, the frame C, provided upon each side with trunnions D, which are contained within said slots a , and trunnions E, which are contained within said slots a' , and are adapted to engage with the toothed lower sides of the same, substantially as and for the purpose specified.

2. In combination with the legs A and A, each provided with the vertical slot a and inclined toothed slot a' , the frame C, having the stationary trunnions D and D and revolvable trunnions E and E, each of which latter has secured thereto a pinion, F, that is adapted to mesh with the toothed lower side of said slot a' , together with means, substantially as described, whereby said trunnions E may be turned upon their axes and may be locked in circumferential position, substantially as and for the purpose shown.

3. In combination with the legs A and A, each provided with the vertical slot a and inclined toothed slot a' , the frame C, having the stationary trunnions D and D, revolvable trunnions E and E, pinions F and F, worm-

wheel G, and worm or screw H, substantially as and for the purpose set forth.

4. In combination with the frame C, having a plane front side, the reversible bed composed of the angle-plate I, provided with the dovetail grooves i , and the slide I', adapted to be placed within said grooves, substantially as and for the purpose shown and described.

5. In combination with the head N, journaled upon the shaft M, and having the split threaded sleeve n , lugs n' , and bolt P, and with the slide-bar Q, provided with the spherical socket q q^2 , covered by the cap q' , the pitman O, having at its upper end a screw-thread, o , and at its lower end a ball, o' , substantially as and for the purpose specified.

6. In combination with the eccentric m of the driving-shaft M, the eccentric-sleeve m' , journaled upon said eccentric and adapted to be turned circumferentially to and secured in different relative positions upon the same for the purpose of varying the movement of the pitman, substantially as shown.

7. In combination with the eccentric m , provided with the stud m^3 , the eccentric-sleeve m' , having the radial notches m^2 , and the screw m^4 , placed within said eccentric and engaging with the end of said sleeve, substantially as and for the purpose set forth.

8. In combination with the shaft M and with the wheel R, journaled thereon and provided upon its hub r with the radial lugs r' , the housing S, secured to said shaft, the spring-actuated pawl o' , fitted within the recess s' and adapted to engage with said lugs, the lever U, pivoted upon said housing and at one end connected with said pawl, and the pin v , adapted to be placed in or removed from engagement with said lever, substantially as and for the purpose shown and described.

9. In combination with the clutch-pawl T, the lever U, and the releasing-pin v , the lever V, pivoted upon the frame C and carrying said pin v , the treadle W, and the connecting-rod X, substantially as and for the purpose specified.

10. In combination with the clutch-releasing mechanism described and with the treadle W, the rod X, constructed in two sections, which are connected and disconnected by means of the sleeve X', pawl x^2 , and lug x^4 , substantially as and for the purpose shown.

11. In combination with the clutch-pawl T, arranged within the housing S, the screw Y, pressing radially inward through said housing and adapted to engage with a recess, t , in said pawl when the latter is retracted, and to lock the same out of engagement with the driving-wheel R, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of July, A. D. 1884.

Witnesses: OBERLIN SMITH.

JAMES J. REEVES,

WALTER H. BACON.