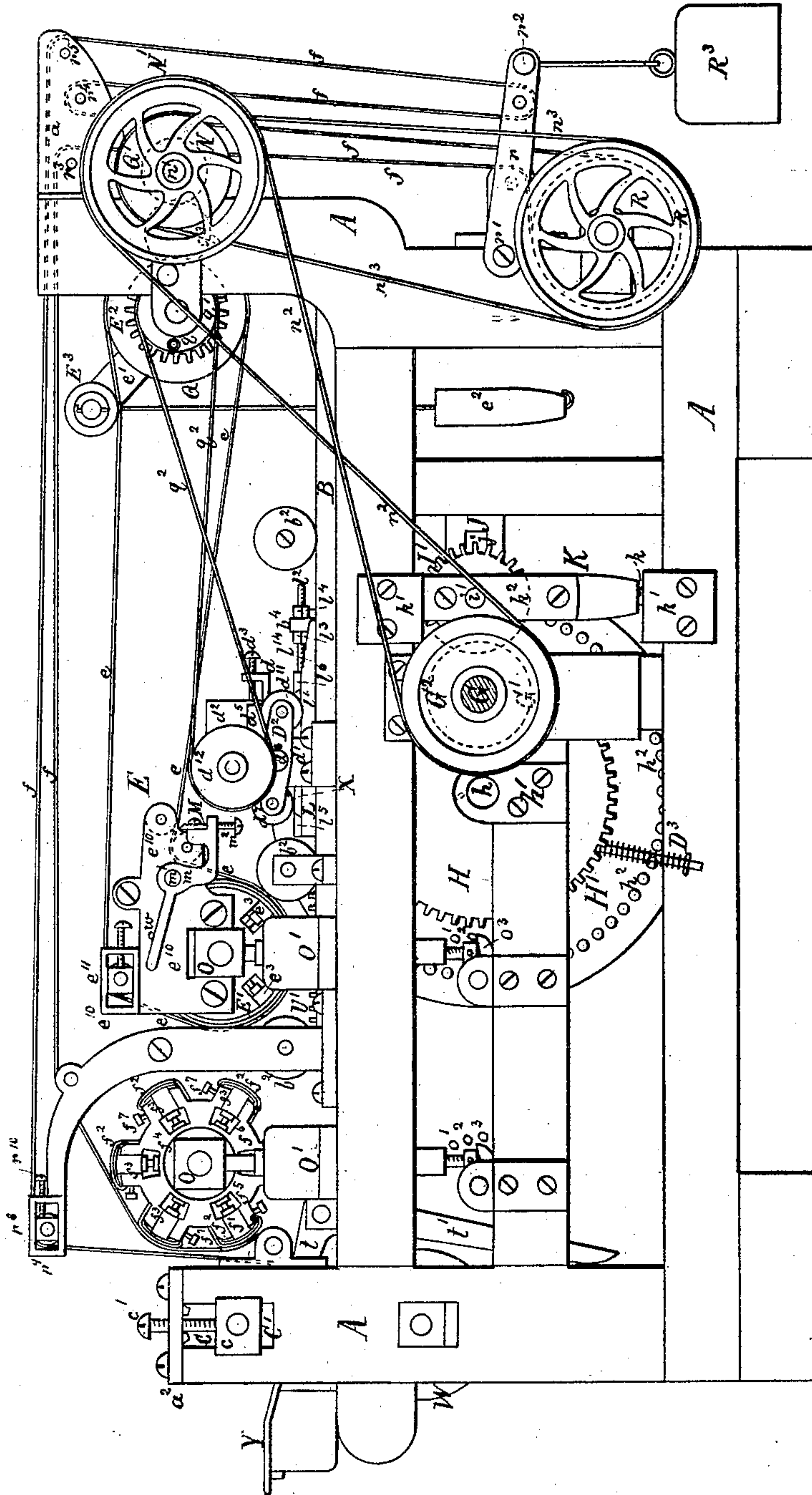


R. NEALE.

PLATE PRINTING PRESS.

No. 245,970.

Patented Aug. 23, 1881.



Witnesses:

Russell Carr
J. P. Th. Lacey

Inventor.

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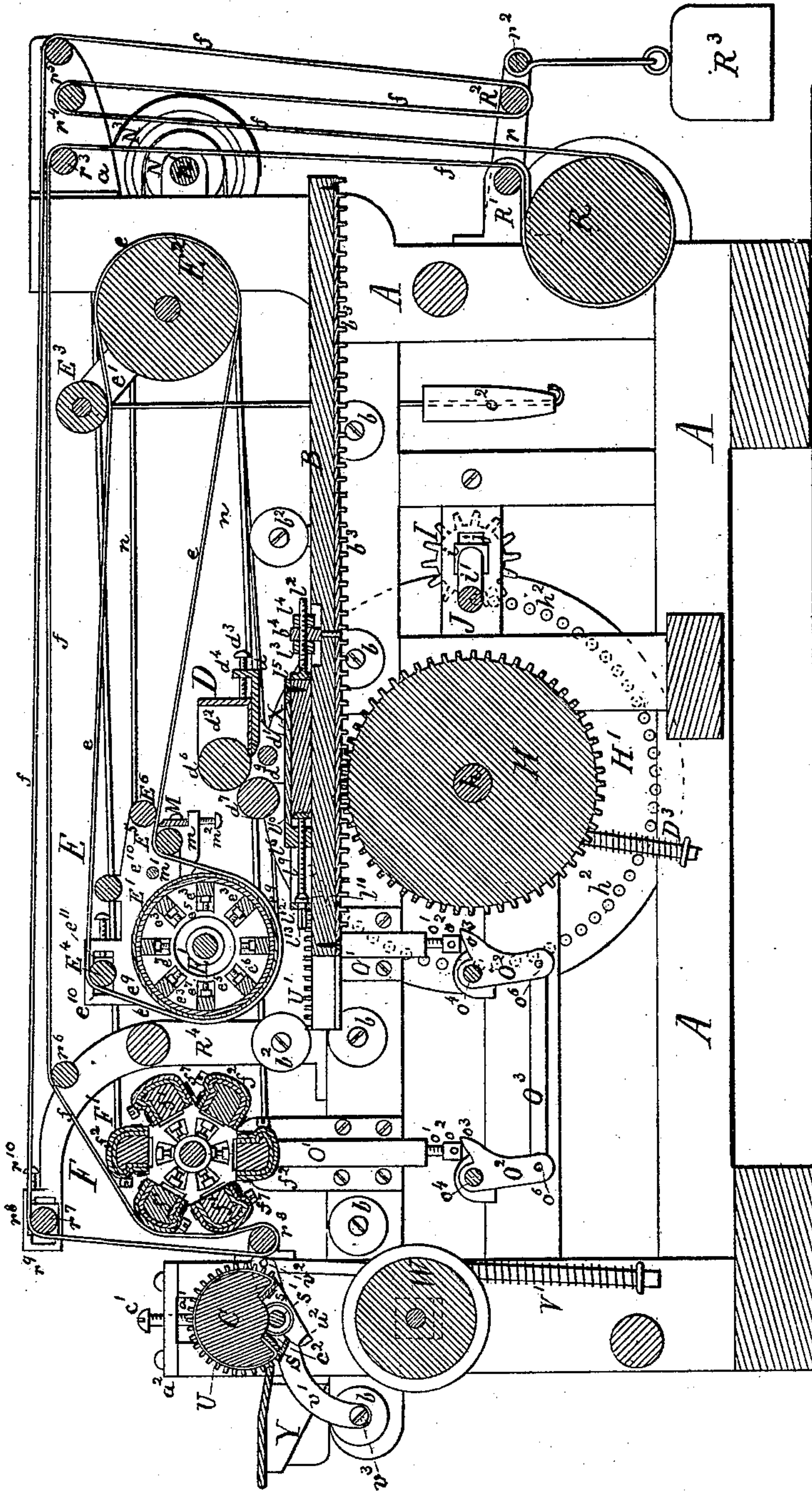
R. NEALE.

PLATE PRINTING PRESS.

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Patented Aug. 23, 1881.

Fig 2.



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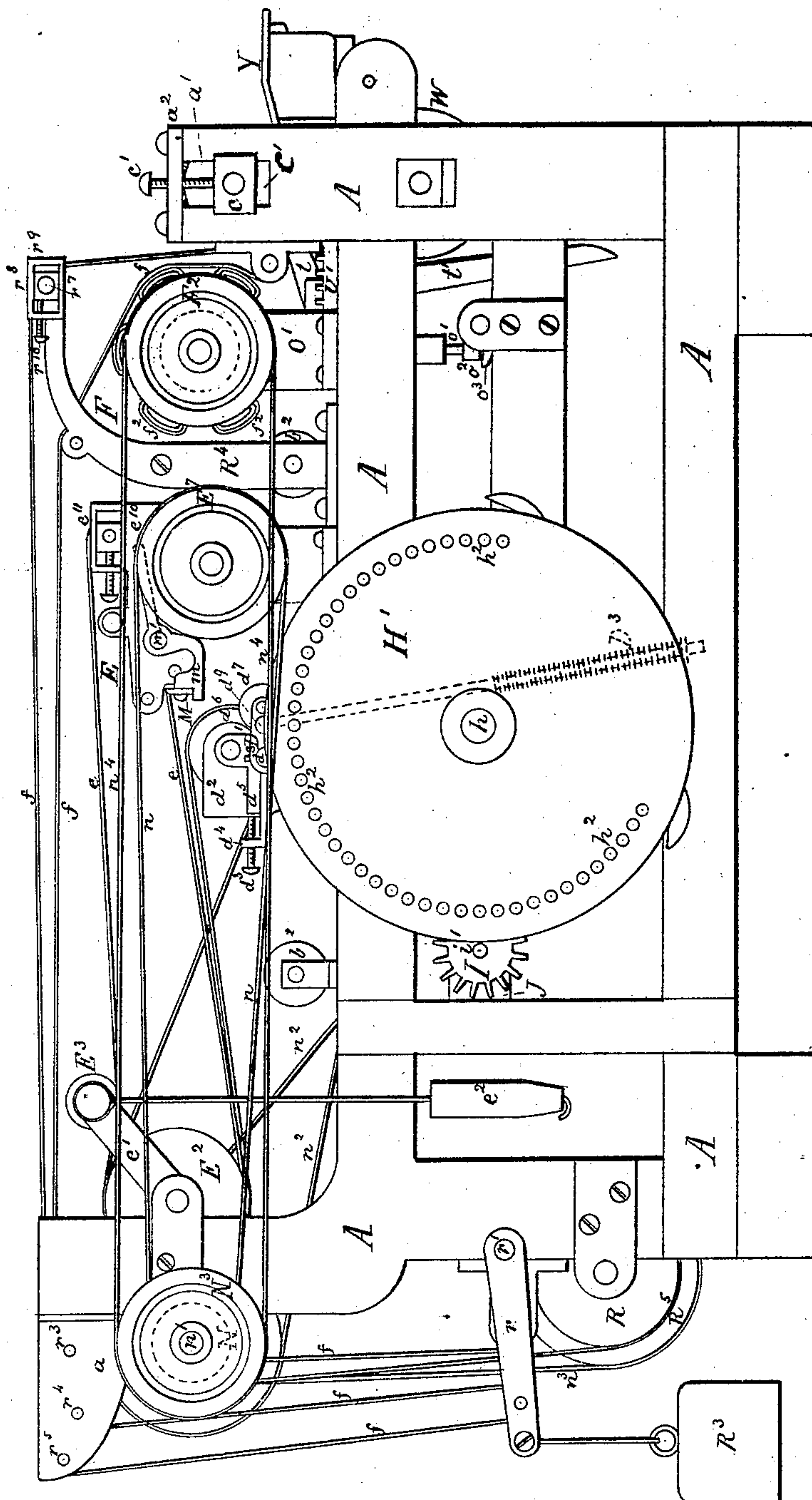
R. NEALE.

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Patented Aug. 23, 1881.

Fig 3.



Witnesses:

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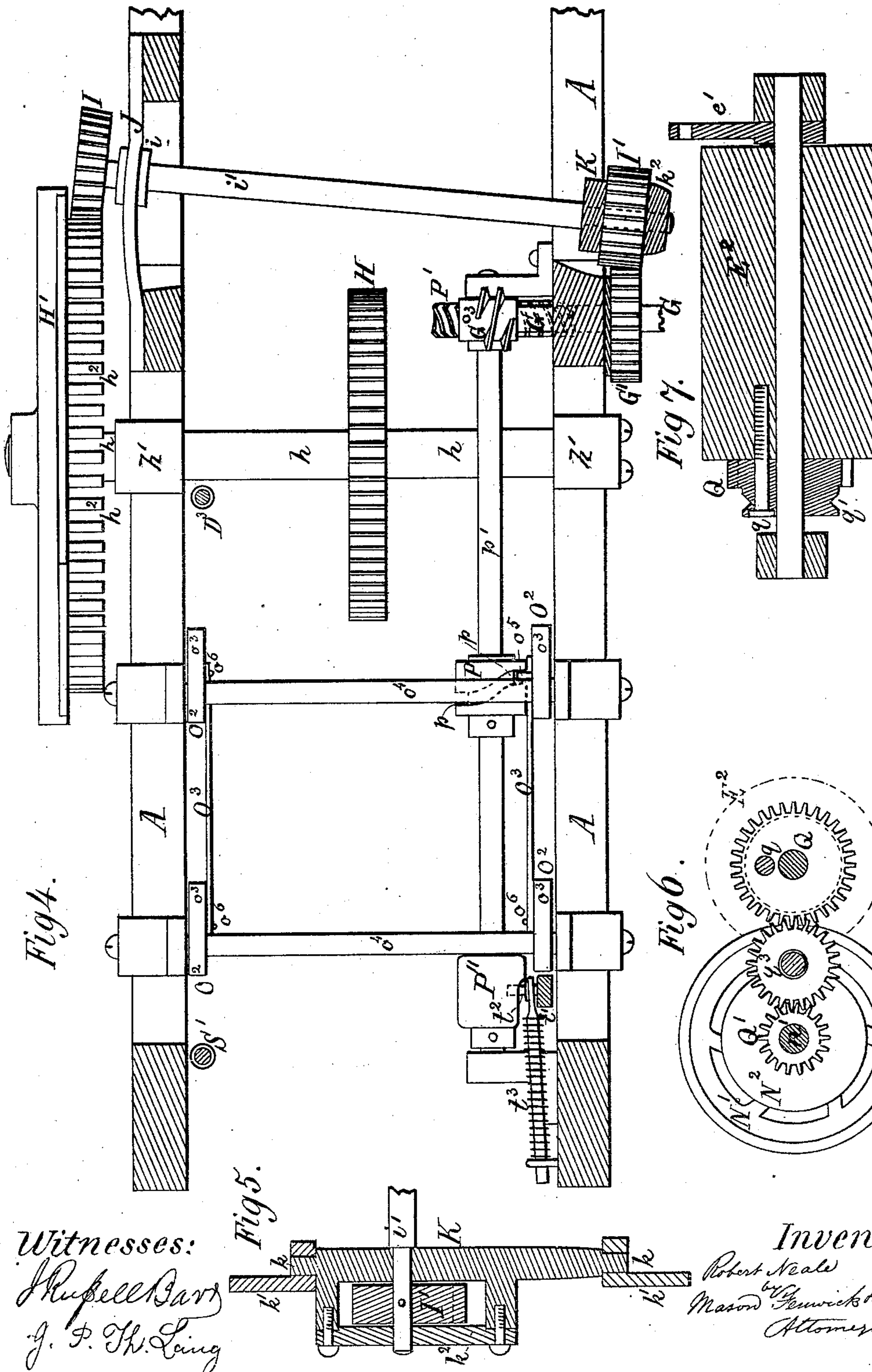
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Fig 10.

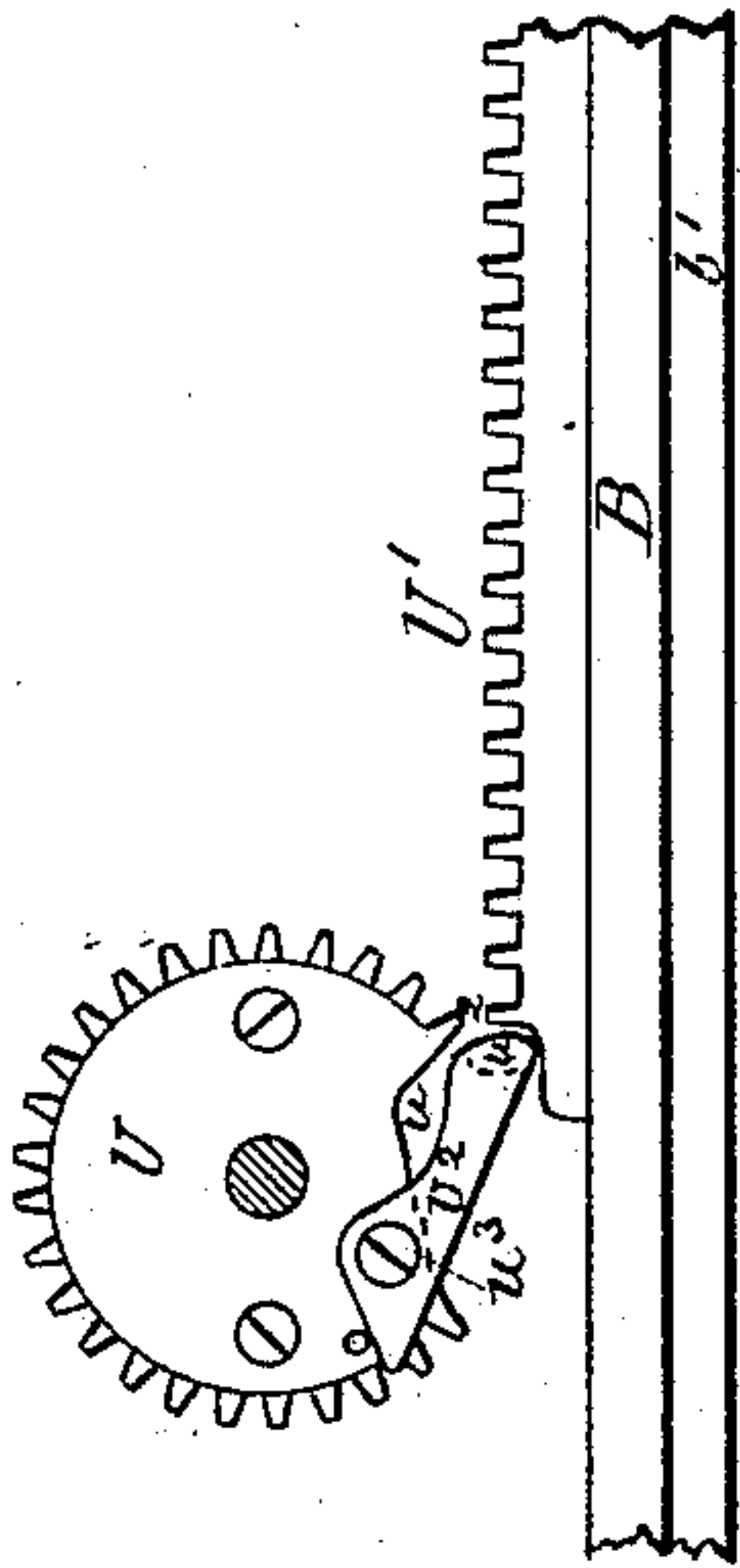


Fig 11.

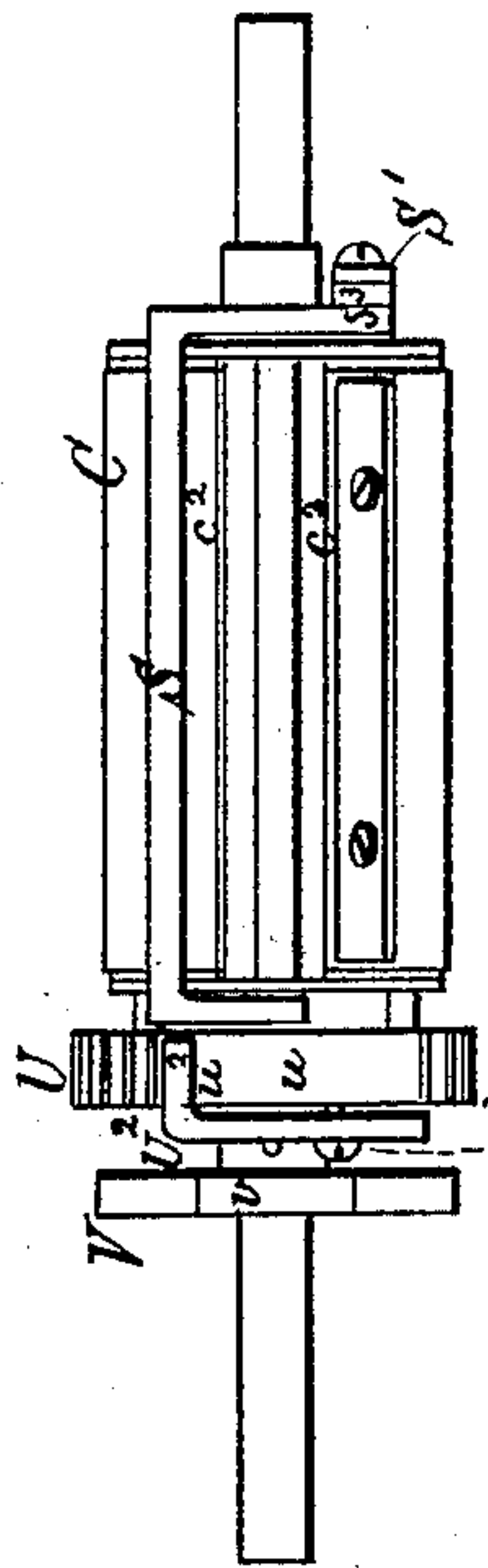


Fig 13.

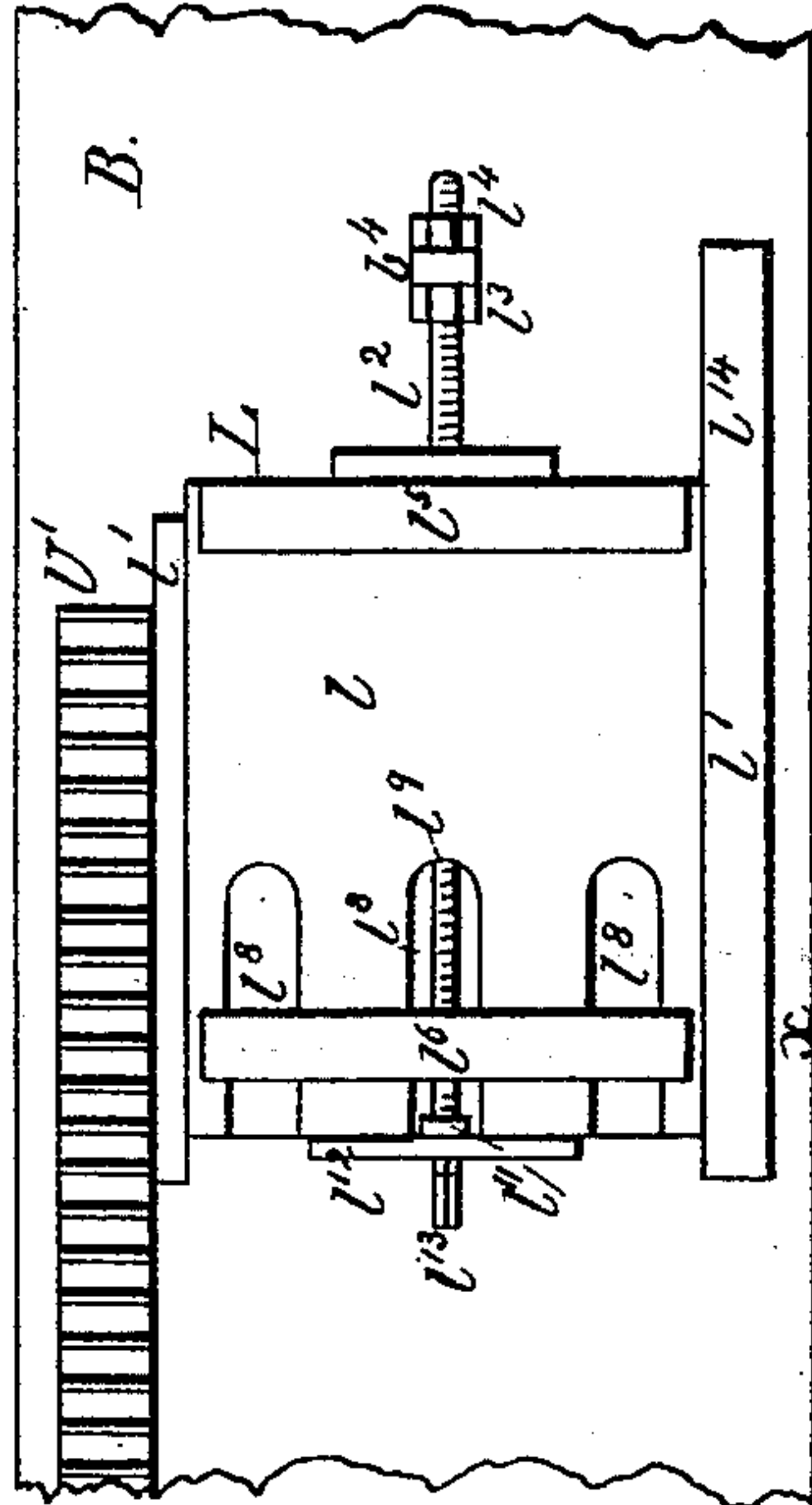


Fig 9.

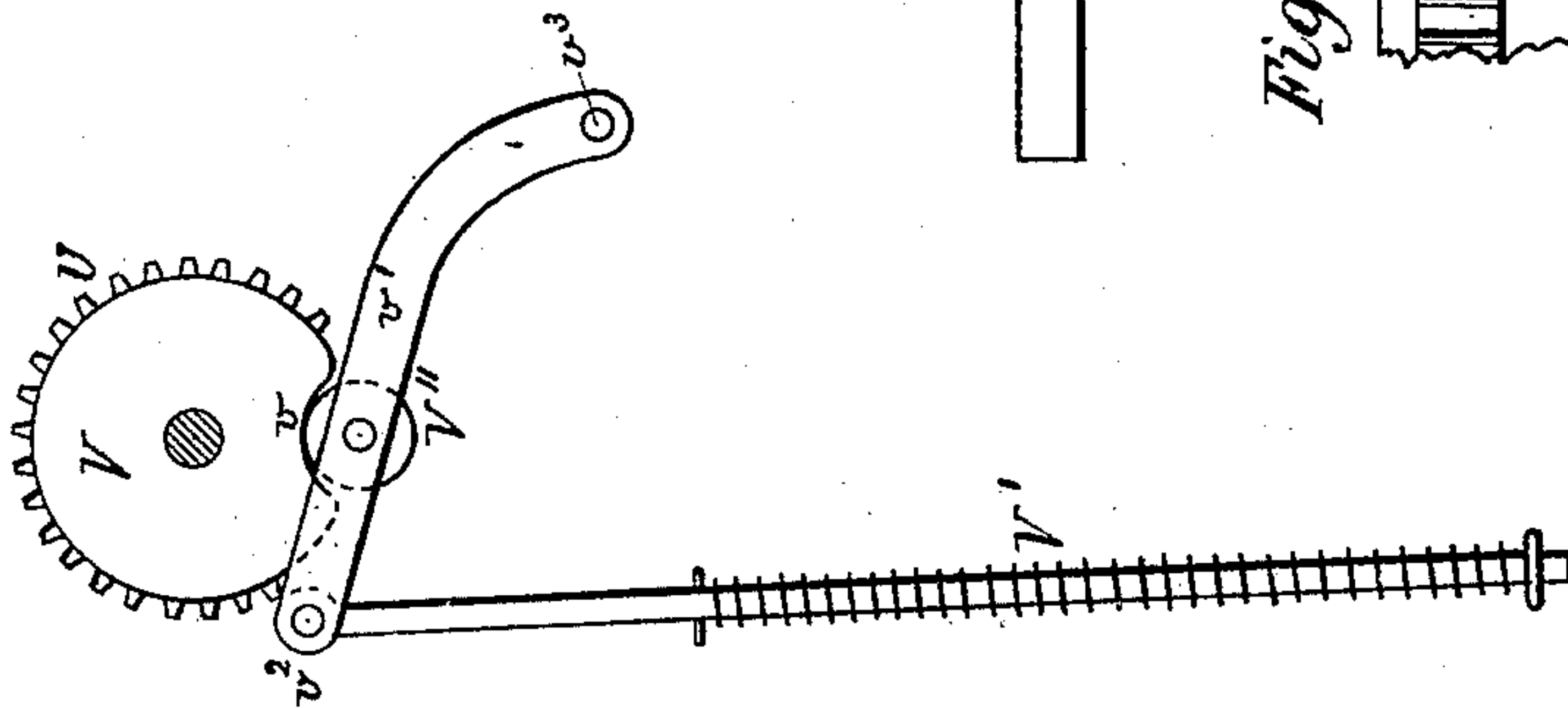


Fig 8.

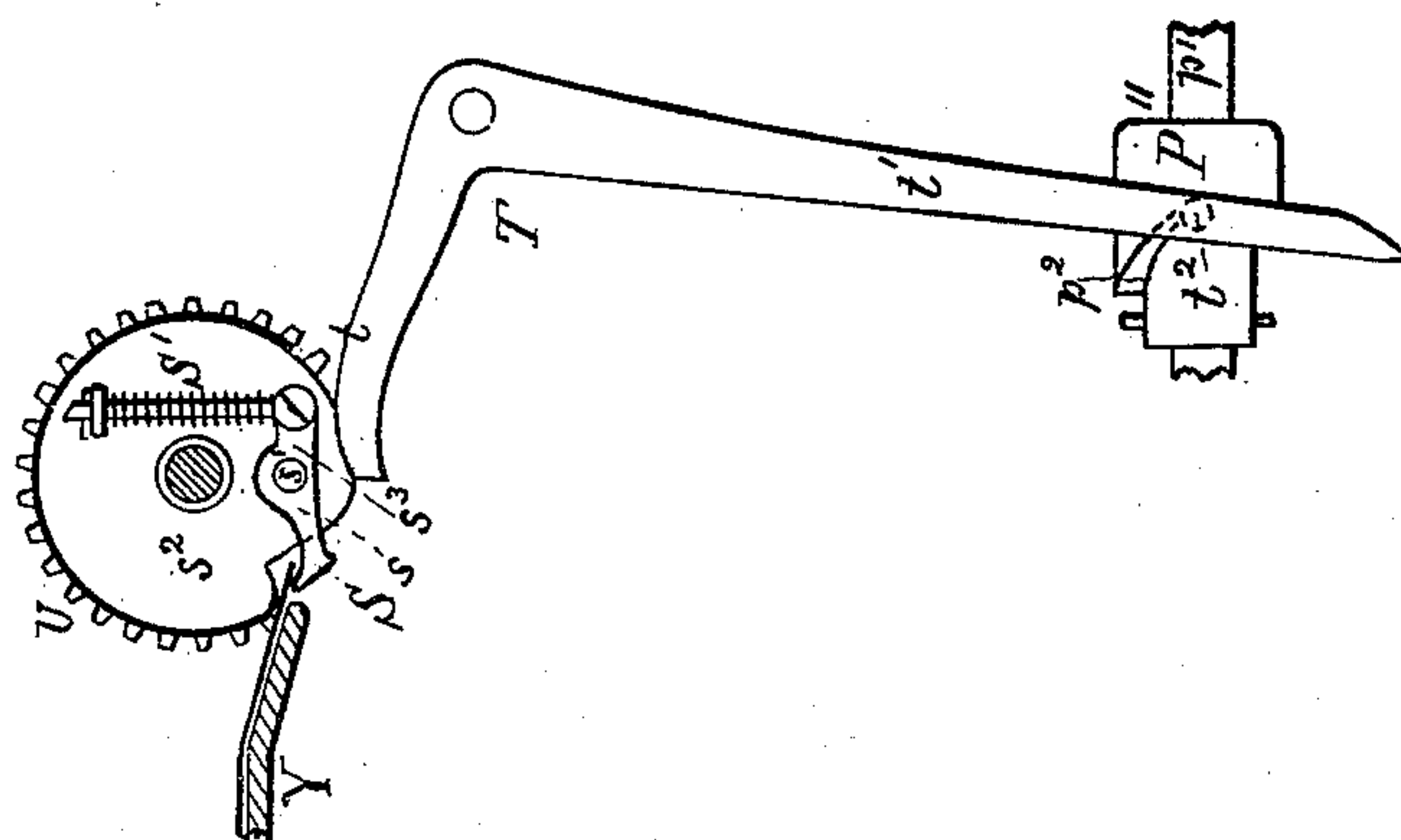
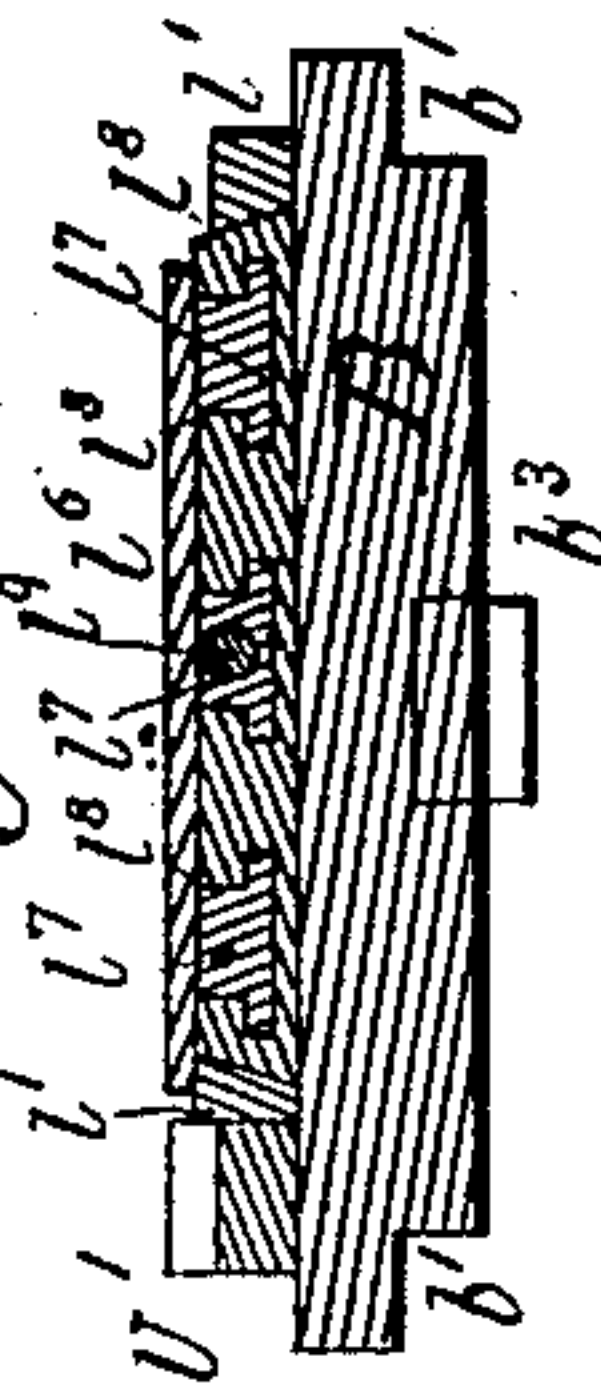


Fig 12.



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UNITED STATES PATENT OFFICE.

ROBERT NEALE, OF BROOKLYN, E. D., NEW YORK.

PLATE-PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 245,970, dated August 23, 1881.

Application filed November 28, 1879.

To all whom it may concern:

Be it known that I, ROBERT NEALE, a citizen of the United States, residing at Brooklyn, E. D., in the county of Kings and State of New York, have invented certain new and useful Improvements in Power Plate-Printing Presses, of which the following is a specification.

Figure 1 is a side elevation of the press, viewed from the side where the power for driving it is applied. Fig. 2 is a central vertical longitudinal section of the same, viewed from the same direction as Fig. 1. Fig. 3 is a side elevation of the press, viewed from an opposite direction to Fig. 1. Fig. 4 is a horizontal section of a portion of the frame of the press, showing a top view of a portion of the gearing below the reciprocating plate-carrying bed, and also of the lifting devices of the wiping and polishing cylinders, and the devices which operate the printing-cylinder and its grippers. Fig. 5 is a detail section of the oscillating bearing of the shaft carrying the pinions for reciprocating the plate-carrying bed. Fig. 6 is a detail section through the shafts carrying the toothed wheels for operating the wiper-belt and its cylinder, the view being from the same direction as Fig. 3. Fig. 7 is a longitudinal section of the driving-drum of the wiper-belt and its cylinder, with an attachment to it whereby the drum may at pleasure be coupled with a loose driving-pinion of mechanism for driving the cylinder of the wiper-belt. Fig. 8 is a detail view of the printing-cylinder and its gripping device. Fig. 9 is a detail view of the stopping device of the printing-cylinder. Fig. 10 is a detail view of the starting device of the printing-cylinder. Fig. 11 is a detail view of the printing-cylinder and its attached parts. Fig. 12 is a transverse section in the line $x x$ of Fig. 13, and Fig. 13 is a top view of a portion of the reciprocating engraved-plate-carrying bed and an adjustable clamping device of the same.

The object of my invention is to so improve power plate-printing presses that bank-bills especially, and pictures of all kinds generally, may be produced from engraved plates very expeditiously and with a high degree of finish, and this without the use of whiting as polishing material.

The nature of my invention will fully appear

from the subjoined description, when considered with reference to the accompanying drawings, forming a part of this specification.

The letter A in the accompanying drawings represents a suitable frame of a plate-printing press; B, a horizontally-reciprocating printing-bed; C, a printing-cylinder; D, an inking apparatus; E, a wiping apparatus; F, a polishing apparatus, and G a driving-shaft.

The printing-bed B moves upon rollers b , suitably fastened to the sides of the frame A, and is guided or kept in line by a rabbet, b' , on both sides of the bed, bearing upon the upper and the inner side surfaces of the rollers b . It is prevented from lifting by a number of rollers, b^2 , suitably fastened to the frame and bearing upon the upper surfaces of the bed at either side. The bed at its bottom is provided with a rack, b^3 , into which a gear-wheel, H, meshes, and thus gives motion to the bed. The wheel H is mounted on a shaft, h , which has its bearings h' fastened to the frame, and which at one end is provided with a mangle-wheel, H' , of ordinary construction, having upon its face a number of pegs or pins, h^2 , arranged in an interrupted circle. Into these pins h^2 a pinion, I, gears, and by means of the interruption aforesaid and a movable bearing, i , of its shaft i' is caused to shift itself in turns in or outside the said circle of pins h^2 by swinging around either of the last pins of the said interrupted circle, and thus alternately revolve the wheels H H' to the right or left, and at the same time move the bed B backward and forward. The shaft i' of the pinion I is hung near the pinion in the bearing i , which slides in a slot, j , of a suitable support, J, on the frame A, and at the opposite side of the frame in a horizontally-swinging swivel-bearing, K, which, by means of vertical journals k and suitable bearings, k' , on the side of the frame A, is held in a vertical position. An oblong hole or mortise, k^2 , is provided in the swivel-bearing K around the shaft i' , in which hole or mortise a pinion, I' , is fastened to said shaft in such manner that the center of the pinion passes through the axis of the swivel-bearing K. Into the pinion I' a pinion, G' , of the driving-shaft G gears, and thus moves the reciprocating printing-bed B.

Upon the upper surface of the printing-bed the engraved printing-plate X is secured by

means of an adjustable clamp, L. This clamp consists of a slide, l , fitted between two dove-tailed guide-bars, l' , and the surface of the bed, and provided with a screw, l^2 , which passes
 5 through a stationary head, b^4 , on the bed B, and is clamped to it by means of check-nuts l^3 l^4 . Two suitable jaws, l^5 l^6 , are provided for holding the engraved printing-plate X firmly to the slide l , the one l^5 being fastened to the
 10 slide, and l^6 sliding upon it. This jaw l^6 is provided with a number of T-shaped sliding blocks, l^7 , which are fitted into and slide in similarly-shaped longitudinal slots l^8 of the slide l , and serve as means for producing a
 15 parallel motion of the jaw l^6 . The middle one of the sliding blocks l^7 is provided with an adjusting set-screw, l^9 , which bears with its forward end against a hard plate, l^{10} , in the slide l , and by means of a collar, l^{11} , against
 20 an abutment-plate, l^{12} , of the slide, and is thus prevented from moving longitudinally. A square head, l^{13} , of the screw l^9 facilitates its operation by a key or wrench.

At a suitable point above the bed the ink-
 25 ing apparatus D is secured to the frame A. It consists of a stationary table, d , resting by means of brackets d' on the frame A, and a sliding trough, d^2 , adjusted by means of set-screws d^3 in a lug, d^4 , of the table d , and mov-
 30 ing between suitable guides, d^5 , upon the table, and of the rollers d^6 d^7 . The roller d^6 forms one of the sides of the trough d^2 , and serves as an ink-distributing roller. The roller d^7 is the inking-roller, and has its bearings in the
 35 ends of two levers, D' D^2 , fastened to and swinging with a fulcrum-rod, d^8 , hung in the brackets d' . The lever D' is connected at d^9 with a spring pushing-rod, D^3 , suitably hung to the frame A, whereby the inking-roller d^7
 40 is kept up at a proper distance from the engraved plate X and in contact with the distributing-roller d^6 . The lever D^2 extends forward from its fulcrum, and is at d^{10} provided with a pressure-roller, d^{11} , which is by the ac-
 45 tion of the rod D^3 pushed downward, and thus at every reciprocation of the bed B is caused to travel over the guide-bar l' , which it ascends by means of the incline l^{14} . The horizontal
 50 part of the guide-bar l' is of such height that it elevates the roller d^{11} sufficiently to cause it to depress the inking-roller d^7 upon the engraved plate, which travels under the inking-roller at this moment. The ink-distributing
 55 roller d^6 is provided with a driving-pulley, d^{12} , operated by means hereinafter described.

In front of the inking apparatus D a gravitating wiping apparatus, E, is placed. This consists of a continuous wiper-belt, e , of fibrous absorbent material, such as leather or woven
 60 woolen fabric, and a gravitating wiper-cylinder, E' , of a diameter as great as or greater than the cylinder E^2 . The belt e passes around the cylinders E' and E^2 , and is sustained in a stretched condition by these cylinders, said
 65 belt being stretched by means of a roller, E^3 , on a swinging arm, e' , which arm is fitted on the shaft of the roller E^2 , and is provided with

a pendent vessel, e^2 , for the reception of weights, in order to adjust the strain of the tightening-roller E^3 .

The cylinder E' consists of a number of
 70 presser-bars, e^3 , having a radial adjustment by means of set-screws in annular flanges e^5 of the two head-plates e^6 . These head-plates are pro-
 75 vided with radial slots e^7 , in which the reduced ends of the presser-bars e^3 are inserted, and wherein they slide when adjusted. The presser-
 80 bars are first covered with felt or other suitable elastic material, and over this a stretched leather cover, e^9 , is fastened to the head-plates
 85 e^6 . One or both of these head-plates may be movable endwise of the shaft, in order to tighten the coverings of the cylinder E' endwise by suitable means.

To prevent the dragging of the wiper-belt e
 85 on the plate X, by reason of the tenacity of the ink thereon and a too close proximity of the unengaged portion of the belt to said plate, the wiper-belt is passed over guide-rollers E^4 E^5 ,
 90 from which it reaches the cylinder E' in a nearly-vertical direction. The guide-rollers E^4 E^5 are hung in a suitable frame, e^{10} , which is fastened to the bearings of the cylinder E' . The guide-
 95 roller E^4 is provided with ordinary adjustable sliding bearings, e^{11} , for taking up the actual stretch or elongation of the wiper-belt e . A
 100 presser-roller, E^6 , is also provided in the frame e^{10} , above and back of the guide-roller E^5 , against which presser-roller the wiper-belt e bears upwardly, and is thus steadied for the
 105 purpose of being scraped by a transverse scraper, M. This scraper is fastened to two levers, m , of fulcrum-rod m' , hung in the frame e^{10} , and both ends of it are made adjustable
 110 upon its lever m by means of a slot and set-screw fastening and an adjusting-screw, m^2 , so that the edge of the scraper can at all times be kept parallel with the presser-roller above it. The free arms of the levers m are made to
 115 serve as handles, by which, with the aid of a pin, w , the scraper can be held in position when put into operation.

The cylinder E' is made with a large pe-
 115 riphery and heavy, in order that it shall move steadily and relatively slow, and thus wipe the engraved plate with such an action as will not cause the ink to be suddenly lifted or sucked
 120 out of the engraved portions of the plate by reason of a too great velocity of its periphery. This cylinder may be, if desired, revolved by means of a pulley, E^7 , on its shaft and a driv-
 125 ing-belt, n , from a driving-pulley, N, the shaft n' of which is suitably hung to the frame A, and is at the other end provided with a pulley, N' . A belt, n^2 , gives motion to the pulley N'
 130 from a pulley, G^2 , on the main shaft G of the machine.

The journal-bearings O of the cylinder E' are provided with vertical guide-rods, which are fitted into suitable vertical bearings, O' , on
 130 the frame A, and the lower ends of which are provided with vertical adjusting-screws o' , the heads o^2 of which rest upon the cams o^3 of two cam-levers, O^2 , fastened to a fulcrum-rod, o^4 ,

suitably hung to the frame A. One of the cam-levers O^2 has a pin, o^5 , at its lower end, which pin moves in a cam guide-groove, p , of a revolving pulley, P, whereby an up-and-down motion of the cylinder E' is effected at regular intervals. The cam-pulley P is fastened to a horizontal longitudinal shaft, p' , suitably hung to the frame A, and having a worm-wheel, P' , at one end, into which a worm or screw, G^3 , on the end of the main driving-shaft G gears, and thus causes the cylinder E' and the wiper-cloth e to be lifted away from the engraved plate X when this plate is on its way to the inking-roller, but allows the same to be sufficiently lowered to press, by its own weight, with proper force on said plate to effect the perfect wiping thereof when the plate X is on its return-stroke from the inking-roller. The friction between the cylinder E' and its wiper-belt e is increased by the large diameter of this cylinder, and thus a greater tangential surface with respect to the engraved plate, and a more perfect and uniform motion of the cylinder E' and its wiper-belt, are insured. The cylinder E' is of such weight that it, in conjunction and co-operation with the elastic covering of the cylinder, suffices for the operation of wiping very large plates, while this weight can be regulated for lighter work by the adjusting-screws o' .

It is found more advantageous for most classes of plate-printing to drive the cylinder E' by the wiper-belt. For this purpose the cylinder E' is disconnected from its operating-pulley N by throwing off the belt n from this pulley and the pulley E^7 , and the cylinder E^2 is then made the driving-cylinder of the wiper-belt e by suitable means. Such means consists of a toothed wheel, Q, fitted loosely to the shaft of the cylinder E^2 , and fastened by a removable screw, q , to the end of the cylinder, whereby the cylinder is moved around through the said wheel. This wheel Q is provided with a pulley, q' , and a belt, q^2 , which drives the pulley d^{12} of the distributing-roller before mentioned, and it receives its motion by means of a wheel, Q' , on the shaft n' and an intermediate wheel, q^3 , (see Fig. 6,) suitably hung to the frame A. Thus the wiper-belt e may be driven by the cylinder E^2 and caused to drive the cylinder E' in the same direction as when revolved by the cylinder E' —to wit, in a direction opposite to that of the engraved plate on its forward stroke.

I prefer to drive the wiper-belt e by the cylinder E^2 ; but if it is driven by the cylinder E' , the screw q is removed from the cylinder E^2 and wheel Q, and in this case the wheel Q is moved independently on the shaft of the cylinder E^2 , and the distributing-roller is driven by the gearing, the same as before, either one of which plans of operating the wiping apparatus may be adopted in a power plate-printing press; but my invention does not have reference to either of said modes of operating the wiper, as both of said modes of revolving an

endless wiper and its drum are old, and cannot be claimed here.

The material of the wiper-belt, as already stated, may be either leather or woven woolen fabric, but must be absorbent, in order to constitute an effective wiper without requiring such pressure as to be detrimental to the surface of the engraved plate; and, according to the degrees of absorption found in different materials, I use different kinds of fine soft leather or woven woolen fabric for the wiper-belts for different classes of plate-printing.

Next to the wiping apparatus E the polishing apparatus F is placed, and consists of a polishing-cylinder, F' , and an endless wiper-belt, f , for cleaning this cylinder, the belt and the cylinder running against each other in opposite directions. The polishing-cylinder F' consists of a number of bars, f' , provided in a suitable manner with elastic and absorbent polishing-cushions f^2 , the ends of said bars being held in radial slots f^3 of the heads f^4 of the cylinder by means of adjusting-screws f^5 , suitably connected with the said heads by nuts f^6 , and permanently fastened to the bars. These bars f' are prevented from becoming loose in the slots f^3 by lateral set-screws f^7 . The cylinder F' is hung in vertically-moving bearings O, with vertical guide-rods and adjusting-screws o' , which rest with their heads o^2 on cams o^3 of two cam-levers, O^2 , fastened to a fulcrum-rod, o^4 , the same as are provided for the wiper-cylinder. These cam levers O^2 are connected with the cam-levers O^2 of the wiper-cylinder by two connecting-rods, O^3 , pivoted to them at o^6 , and thus the vertical motions of the two cylinders E' and F' are the same. The cylinder F' is provided with a pulley, F^2 , which is driven by means of a belt, n^4 , from a pulley, N^3 , on the shaft n' .

The endless wiper belt f is driven from a cylinder, R, suitably hung to the rear part of the frame A, and is caused to pass almost entirely around said cylinder by means of a deflecting-cylinder, R' , suitably hung to the frame A, by which means a great amount of frictional surface is secured, and undue stretching of the apron in order to operate it is avoided.

Opposite the cylinder R' an adjustable stretching-roller, R^2 , is hung between two parallel swinging arms, r , pivoted at r' to the frame A, and united at their swinging ends by a bar, r^2 , and by this adjustable roller R^2 the belt f is provided with the necessary tension, said roller being made adjustable by means of a weight or weights, R^3 , suitably suspended from the bar r^2 .

Above the cylinder R' , three deflecting-rollers, r^3 r^4 r^5 , are suitably hung to an extension, a , of the frame A, over which the belt f is guided to and from the cylinder R' and roller R^2 , and whereby its own surfaces are prevented from chafing against each other. Two other deflecting-rollers, r^6 r^7 , suitably hung between two stands, R^4 , on the frame A, and a stretching-roller, r^8 , hung in the frame A, as shown,

serve to deflect the belt f downward and in front of the polishing-cylinder F in such manner that its inner portion bears upon the surfaces of the polishing-pads of the polishing-cylinder, and thus rubs their polishing-surfaces, thereby removing all ink and other impurities from said pads. It will be understood that the construction of the gearing for driving the polishing apparatus is such that the polishing-cylinder F' thereof is driven much more rapidly than the wiper-cylinder, and in a direction opposite that of the engraved plate on its forward stroke, and in the same direction as the wiper-cylinder.

In order to prevent the heating and undue wear of the engraved plate by the polisher, the set-screws o' are so adjusted as to allow only a slight pressure of the polishing-pads upon the plate.

The belt f has a less rapid motion than the polishing-cylinder F' , and passes over the polishing-pads thereof in a direction opposite to the rotation of said cylinder.

The roller r^7 is made adjustable by means of movable bearings r^8 , sliding in slotted heads r^9 of the stands R^4 , and bearing, by reason of the tension of the belt f , against set-screws r^{10} in said slotted heads.

The cylinder R is provided with a pulley, R^5 , which, by means of a belt, n^3 , receives its motion from a pulley on the shaft n' .

The arrangement of the wiper-belt e and the cleaning-belt f is such that while a sufficient length of the wiper-belt e is secured within the frame of the machine, and without adding to the otherwise necessary height or length of said frame, the belt f is passed above the wiper-belt e , and otherwise arranged as shown, in order that a compact and well-proportioned press may be secured.

In front of the polishing apparatus the printing-cylinder C is suitably hung to the frame A in vertical slots a' , wherein the movable bearings c of the cylinder are fitted, and wherein they are supported by elastic cushions C' and adjusted by presser-screws c' in the top plates, a^2 , of the slots. The cylindrical surface of the printing-cylinder C is covered with a suitable elastic fabric, and is interrupted by a transverse depression, c^2 , in which a griper for the purpose of gripping the paper sheets is located. This griper consists of a gripping-bar, S , fastened to the ends of two levers, s , which are united by a fulcrum-rod, s' , suitably hung in the heads s^2 of the printing-cylinder. One of the levers s has an extension, s^3 , beyond its fulcrum, to which extension a spring-bolt, S' , is connected, whereby the gripping-bar S is pressed upon the surface of the depression c^2 of the printing-cylinder C , so that when the cylinder revolves the bar S is kept out of the way of the plate X . The extension s^3 in its normal position stands opposite the upper arm, t , of a bell-crank lever, T , the lower arm, t' , of which is provided with a pin, t^2 , and a spring-bolt, t^3 , the former of which travels upon the cam-surface p^2 of a pulley, P'' , on

the shaft p' , and the latter of which presses the pin t^2 upon said cam-surface. By this device the arm t is swung up, and remains in that position until the plate X begins its return-stroke toward the inking-roller, and in consequence the extension s^3 is moved up by the arm t , and the griper-bar moved from its seat on the printing-roller, in order to allow the operator to introduce the edge of a paper sheet into the griper previous to printing, when the arm t leaves the extension s^3 and the griper closes upon the paper sheet with a tight hold during the printing operation.

In order to insure a perfect motion of the printing-cylinder C , it is provided with a toothed wheel, U , which is revolved by a rack, U' , upon the bed B , and as the cylinder C is not intended to move during the forward stroke of the bed B , the portion u of the wheel U standing opposite the depression c^2 is not provided with teeth, and is cut down sufficient to clear the rack U' below, and to allow a transverse toe, u^2 , of a lever, U^2 , pivoted at u^3 to said wheel, to have free play between the rack and wheel. The toe u^2 glides over the teeth of the rack U' on its forward stroke, but at the back-stroke it is pushed back by the rack, and thus causes the wheel U to be sufficiently turned over to have its teeth engaged with those of the rack for the purpose of carrying the paper sheet over the plate X and printing it.

During the time in which the act of printing is suspended the cylinder C is kept in place by means of a disk, V , on its shaft, which disk is provided with an indentation, v , into which a roller, V'' , on a lever, v' , is forced by means of a spring-bolt, V' , pivoted at v^2 to the lever v' , the lever having its fulcrum at v^3 at the other side of the roller. Below the printing-cylinder C another cylinder, W , is suitably hung in the frame A , over which cylinder the bed B passes, and by which it is supported during the printing operation. A feed-table, Y , is provided in front of the printing-roller C , upon which the paper sheets are fed to the machine, and upon which they are received when printed.

Operation: The machine being set in motion, the printer places a paper sheet upon the table Y and inserts its forward edge into the open griper of the printing-cylinder. At the same time the plate X is moved under the inking apparatus and returns with the forward stroke of the bed B toward the wiping-cylinder, which, together with the polishing-cylinder, has at the same time been lowered, and now wipes the ink from the smooth surface of the plate X by means of the belt e , which belt is from time to time freed from adhering ink by adjusting the scraper M in the manner described. Leaving the wiper apparatus, the plate X passes under the polishing-cylinder, which removes all moisture and blurring matter from its surface, whereupon the plate, now clean and bright, passes under the printing-cylinder C to its forward position, which allows the pivoted toe u^2 to engage with the rack U'

upon the bed B, and the back or rearward movement of the bed sets the printing-cylinder in motion, and the griper being caused simultaneously to take a firm hold upon the paper sheet, it is carried around with the cylinder C, and receives the impression from the engraved plate. After the impression has been made the bed continues its return or rearward movement, and the griper releases its hold upon the printed paper, and the cylinders F' E' are elevated to afford a free passage-way for the return of the plate X to the inking apparatus.

From the foregoing specification it will be seen that the essential feature of this press consists of an endless revolving fibrous wiper-belt working over a revolving gravitating cylinder having an elastic-surface, said cylinder and belt being applied above a reciprocating bed carrying an engraved plate, and the cylinder of the wiping apparatus being applied loosely in guideways of the frame of the press and the belt upon rollers in such a manner that the whole wiping apparatus is allowed unrestrainedly to bear with its weight upon the engraved plate, the usual springs, caps, and set-screws being dispensed with. This mode of applying the wiping apparatus secures a steady, uniform pressure upon the engraved plate without the aid of pressure-screws, the weight of the wiping apparatus, in addition to the elastic pressure of the elastic surface of the cylinder, being made available, which weight and pressure can be regulated as required by screws beneath the journals of the roller or wiper-cylinder. Besides this, the engraved plates can be used with their face surface upward, which is much more convenient, and allows full view of all the operations, and enables the pressman to make a more perfect adjustment of all the parts, and all the mechanism for raising the wiping apparatus can be applied in the lower part of the frame of the press, where proper supports can be provided without having to enlarge or heighten the press to an inconvenient extent.

The wiper-cylinder E', of large diameter and formed of segments or radially-adjustable bars, I have found, after many costly experiments, to overcome the heretofore experienced difficulty of keeping that portion of the endless wiper-belt which is caused to come in contact with the engraved plate in the form of a true segment of a circle while working, and although the elastic covering is secured to the wood at or near the end of the cylinder, as heretofore, its center will not retain a true cylindrical form, for after working for two or three days it becomes stretched, and presents a bulging or irregular form, and such change of form of the cylinder would cause the endless wiper-belt e to assume a similar form, and consequently accurate work could not be performed, and frequent renewals of the roller were necessary, causing expense and loss of time, all of which difficulties are overcome by setting the elastic surface of the cylinder in a true circle by means of the segments and set-screws.

The large wiping-surface of the cylinder E', without the endless wiper-belt e, works uniformly and satisfactorily at a moderate speed; but when working at a high speed with a bed traveling at the rate of one hundred and eleven feet per minute, and the surface of the cylinder three times as fast, printing at the rate of ten to twelve impressions per minute, it becomes overheated and dries the oil and ink of the cover, and makes it too stiff for the finest class of work; and to overcome this difficulty I combined the endless belt to work over the wiper-cylinder, together with a large roller at the rear of the press, and the belt e thus arranged, being exposed on both sides to the air, is kept cool and can be used continuously for a much greater time.

In the progress of the art of printing with power-presses from engraved plates various plans of presses have been devised. Among the first, and constituting the most radical departure from the old hand-presses for printing from engraved plates, was the press patented by me in England January 18, 1853, and in the United States January 9, 1855. In this press the beds for supporting the engraved plates were carried by an endless chain below the impression-cylinder and there inked, wiped, and polished, and from thence carried around to said cylinder, the wiper-belt being passed around a drum smaller than the one by which it was driven, and located below instead of above the engraved plate, and which drum and belt were caused to act upward instead of downwardly upon the plate. In brief, all the parts for inking, wiping, and polishing the engraved plates were below the endless chain which carried the plate. The next important step in this direction was the press patented by me in England March 14, 1855. In this press the bed carrying the engraved plate was reciprocated, and the wipers consisted of horizontally-revolving devices, and these were arranged above the bed carrying the engraved plate; and another step in this direction was the press patented by Gritzner April 14, 1857, wherein was employed a portion of my patent of 1855, above referred to, in combination with a wiping-roller covered with oil-silk—a material not absorbent in its nature, and therefore not, according to my experience, adapted for the work which my press is intended to perform. The next step was the patent granted to Lewis and Stuart May 12, 1868, wherein the modification plan of press shown in my aforesaid English patent of 1853 is adopted, the wiper-belt of said English patent being placed around a drum or wiper-cylinder which is revolved positively. This press prints from a cylindrical plate.

Upon several of the above-named presses various improvements have been made by me at different times, as appears in United States Letters Patent granted me, dated respectively April 27, 1875, April 10, 1877, and British Letters Patent dated May 3, 1877.

My present invention as herein described consists, in the main, of novel combinations of the leading features of the presses above mentioned.

I claim—

1. In a plate-printing press, the combination, with a reciprocating bed carrying an engraved plate on its upper side, of an angularly-arranged endless revolving absorbent fibrous wiper-belt, an elastically-surfaced drum or cylinder, around which the belt is passed, a roller, E^5 , in close relation to the rear surface of the drum or cylinder, and forward of and over which the wiper-belt is passed, and a rear roller, around which the belt revolves, the combination being such that the wiper-belt is kept in close relation to a large portion of the elastically-surfaced cylinder forward of the roller E^5 , and in rear of this roller is supported above the bed of the press, substantially as and for the purpose described.

2. The combination, with the upper and under intermediate rollers, E^5 E^6 , and the scraper or cleaner, of the elastically-surfaced cylinder or drum and the endless traveling absorbent fibrous belt, which is passed around the said drum or cylinder, and in contact with an engraved plate on top of a reciprocating bed, then between the rollers, past the scraper, and then around a rear supporting-roller, substantially as and for the purpose described.

3. The combination of an endless revolving absorbent fibrous wiper-belt, an elastically-surfaced drum or cylinder, around which the belt is passed, and by the pressure and weight of which downwardly the belt is held close against the surface of an engraved plate, and a reciprocating bed having means on its upper side for holding or confining an engraved plate, the combination being such that the endless wiper-belt and the elastically-surfaced drum or cylinder are applied above the reciprocating bed, and the engraved plate carried by the bed is reciprocated beneath the said belt and elastically-surfaced drum, and the belt caused to be revolved over the surface of the said plate, and while revolving is caused to wipe the surplus ink from its surface by means of an elastic downward and longitudinal action, substantially as described.

4. The combination of a reciprocating bed for carrying the engraved plate and a wiper composed, substantially as herein set forth, of an endless absorbent fibrous wiper-belt and a revolving elastically-surfaced gravitating drum or cylinder, around which the belt is passed and caused to come in contact with the engraved plate, said bed, belt, and drum or cylinder being operated substantially as described.

5. The combination, in a press for printing from engraved plates, of an inking apparatus, gravitating wiping apparatus consisting of an elastically-surfaced cylinder of large diameter and a wiper-belt of fibrous material passed around said cylinder, a gravitating polisher consisting of an elastically-surfaced cylinder and a wiper-belt bearing against this cylinder, a reciprocating bed carrying the engraved plate, a printing apparatus, and suitable devices for cleaning the wiper-belt, substantially as described.

6. The combination of an endless fibrous wiper-belt, E , an elastically-surfaced drum, E' , around which the belt is passed, a weighted tension-roller, E^3 , and a reciprocating bed, B , having means on its upper side for holding or confining an engraved plate, the combination being such that the said wiper-belt, drum, and tension device are applied above the reciprocating bed, substantially as and for the purpose described.

7. The combination of an endless fibrous wiper-belt, E , an elastically-surfaced drum or cylinder, E' , around which the belt is passed, rollers E^5 E^6 , stretching device E^4 , tension device E^3 , and a reciprocating bed having means on its upper side for holding or confining an engraved plate, the combination being such that the said belt, drum, rollers, stretching and tension devices are applied above the reciprocating bed of the press, substantially as and for the purpose described.

8. The combination of an endless fibrous belt and an elastically-surfaced drum or cylinder formed of segmental sections provided with radial adjusting-screws, the combination being such that the endless belt is passed around the drum and caused to revolve, substantially as and for the purpose described.

9. The combination of a revolving endless absorbent fibrous wiper-belt, an elastically-surfaced gravitating drum, around which the belt is passed, a reciprocating bed carrying an engraved plate, and mechanism, substantially as described, having vibrating toes or lifters for elevating the elastically-surfaced drum or cylinder and the endless belt out of contact with the engraved plate as the bed moves from the printing-cylinder, substantially as and for the purpose described.

10. A power plate-printing press which comprises in its construction the reciprocating bed having means on its upper side for holding an engraved plate, the inking apparatus above the bed, the wiping apparatus consisting of an endless woven fibrous belt having means for stretching it and regulating its tension, and an elastically-surfaced drum or cylinder, around which the belt is passed and caused to revolve, said belt and drum being applied above the reciprocating bed, the endless polishing-belt having a means by which its tension and pressure are regulated, the polishing-cylinder, against the upper portion of which the polishing-belt impinges, the printing-cylinder, and the means by which the wiping and polishing devices are elevated while the bed and engraved plate are passing to the inking apparatus, and are allowed to descend when the bed and plate are passing toward the printing-cylinder, the whole combined and arranged substantially as and for the purpose described.

Signed in presence of two subscribing witnesses.

ROBERT NEALE. [L. S.]

Witnesses:

CHAS. S. GAUBERT,
ALONZO GAUBERT.