No. 705,352. Patented July 22, 1902.

D. E. HUNTER.

ROLLER COPYING PRESS.

(Application filed Oct. 8, 1901.)

(No Model.) 5 Sheets—Sheet 1.

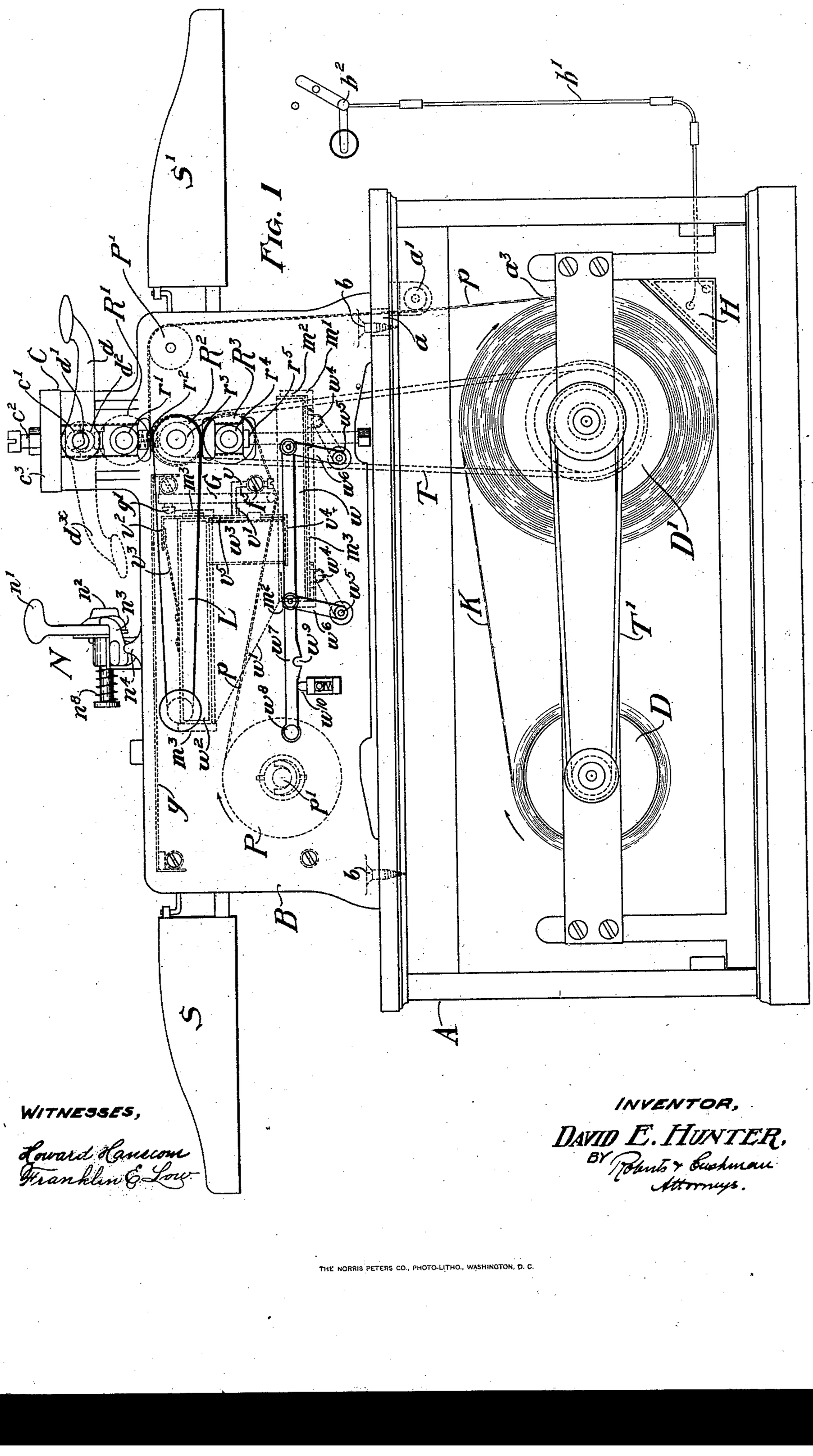

FIG. 1

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(No Model.) 5 Sheets—Sheet 2.

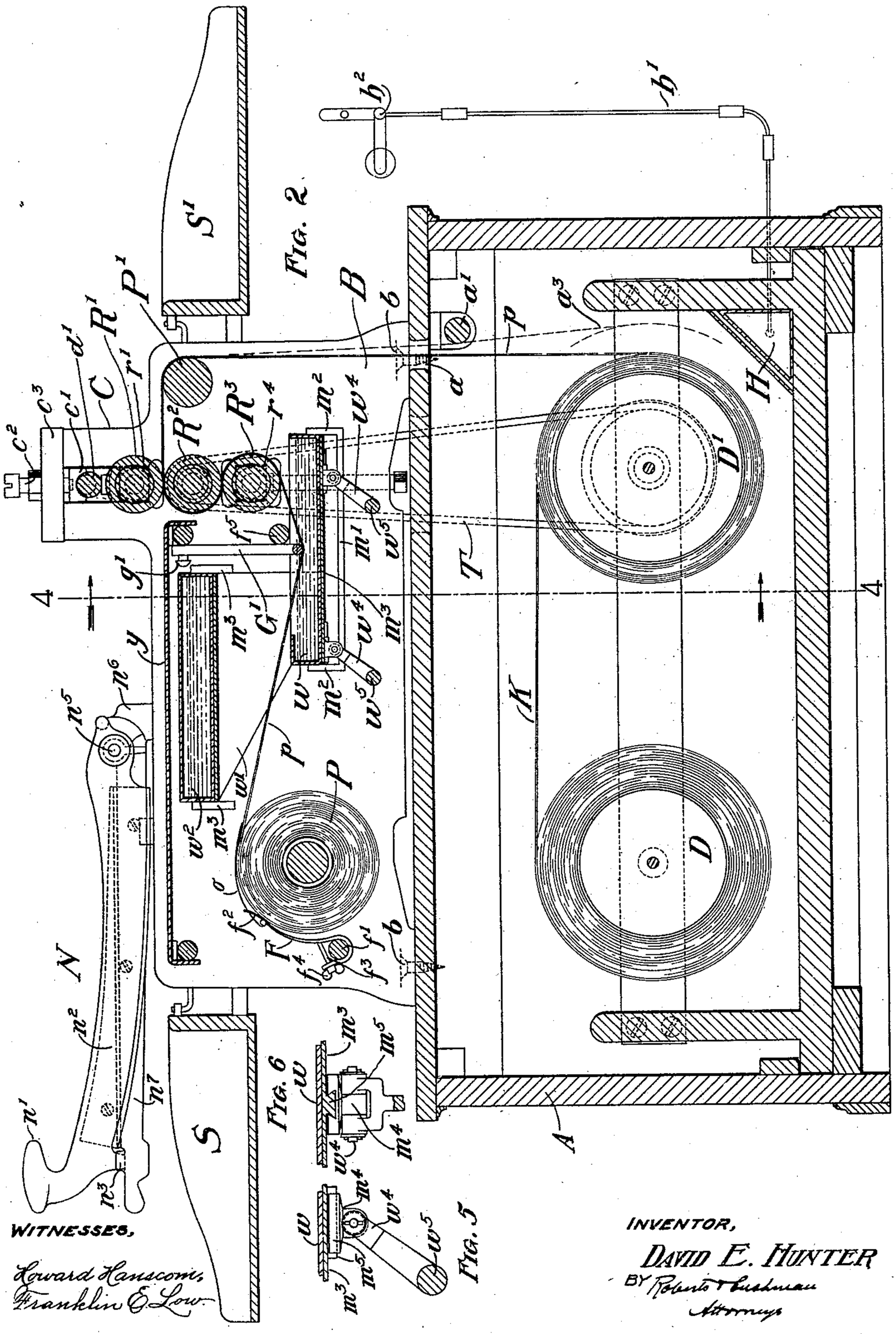

FIG. 2.

FIG. 6

FIG. 5

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(No Model.) 5 Sheets—Sheet 3.

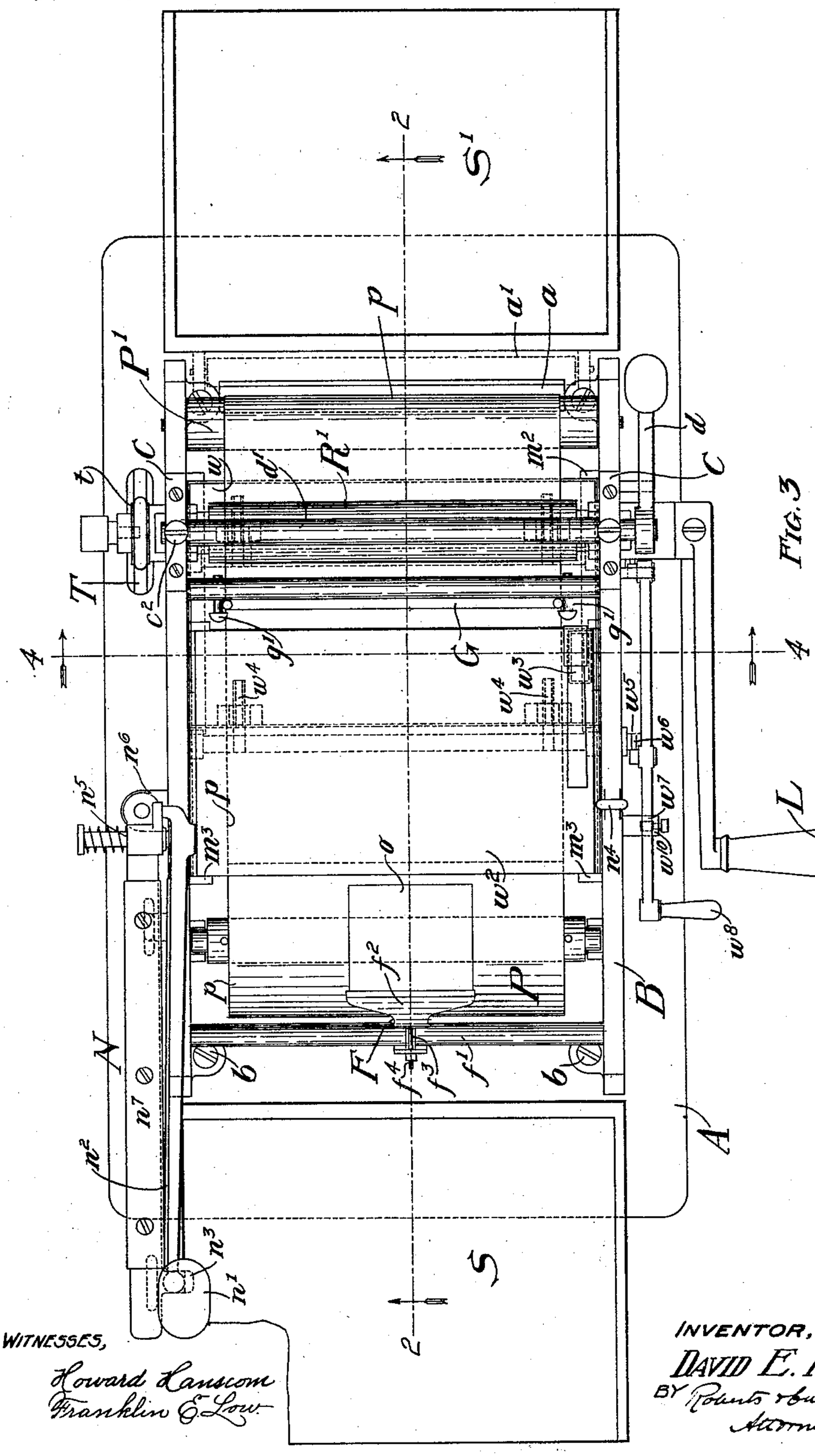

FIG. 3

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(Application filed Oct. 8, 1901.)

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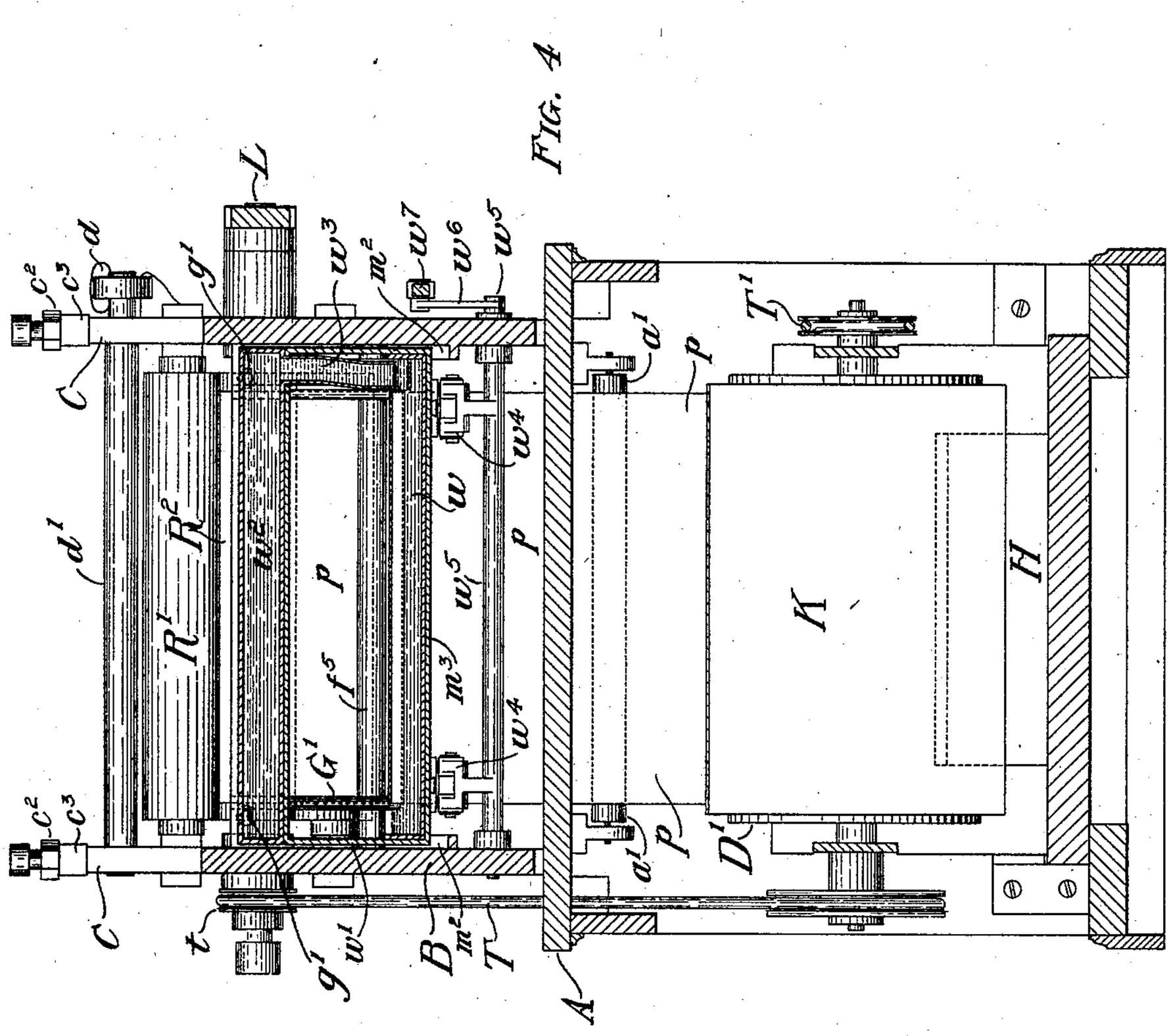
FIG. 4



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(No Model.) 5 Sheets—Sheet 5.

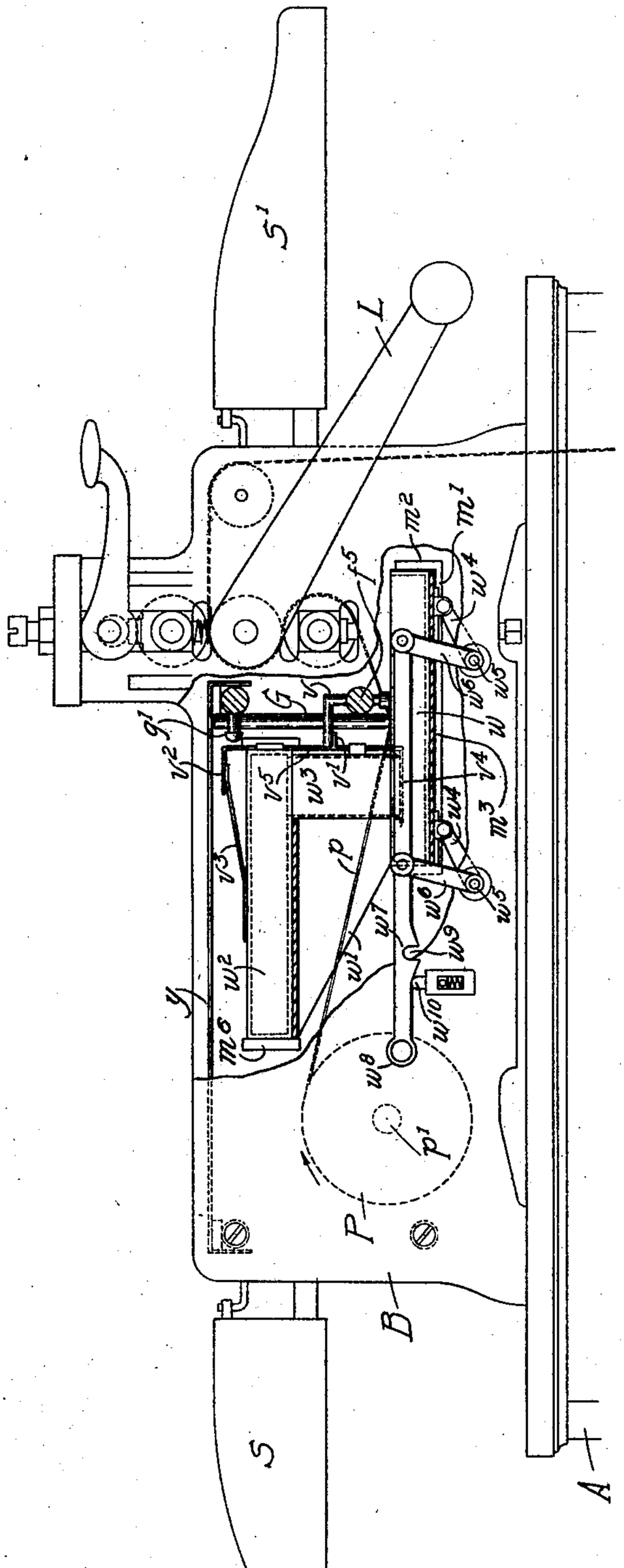

FIG. 7

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UNITED STATES PATENT OFFICE.

DAVID E. HUNTER, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO LIBRARY BUREAU, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ROLLER COPYING-PRESS.

SPECIFICATION forming part of Letters Patent No. 705,352, dated July 22, 1902.

Application filed October 8, 1901. Serial No. 77,953. (No model.)

To all whom it may concern:

Be it known that I, DAVID E. HUNTER, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Roller Copying-Presses, of which the following is a specification.

My invention relates to roller copying-presses; and it consists of sundry improvements whereby a roller copying-press is rendered more efficient and convenient than heretofore.

In the drawings hereto annexed, which illustrate an embodiment of my invention and improvements, Figure 1 is a side elevation of a roller copying-press from which the side of the stand or cabinet is removed to afford a view of the interior and in which the parts inside the frame are shown in dotted lines. Fig. 2 is a vertical longitudinal section of a copying-press taken along the line 2 2 of Fig. 3. Fig. 3 is a plan view of a copying-press. Fig. 4, a vertical cross-section taken along the line 4 4 of Fig 3, and Figs. 5 and 6 are details of the water-pan-shifting mechanism. Fig. 7 is a side elevation of the upper part of the press, partly broken away to disclose the interior.

A is the cabinet which forms the base of my improved press, and B is the frame of the press, mounted upon the cabinet A.

My improved press is constructed and adapted to use a long roll or band of press copy-paper p, which is rolled upon the paper-roll P in the manner usual with roller copying-presses. The copy-paper band p is drawn from the roll P to and through a water-pan w, and thence through the rolls R^3 R^2, of which R^2 is the copying-roll, and thence over an idler-roll P′ to a receiving-roll D′, which is mounted in the cabinet. A slot a in the top of the cabinet affords passage for the copy-paper band, and a roller a', placed adjacent to the slot a, serves to guide the paper band when the receiving-roll D′ is full of paper, as indicated in solid lines at a^3 in Fig. 1 and in dotted lines in Fig. 2. In order to keep the paper band moderately taut, I provide a frictional drag upon the paper-roll, which in the instance here shown consists of a spring-plate F, adjustably secured to the cross-rod f' of the press-frame by means of the screw and thumb-nut f^3 f^4 and an apron o, of cloth or felt or equivalent flexible material, secured to the spring near its free end f^2. The drag of the apron o or the spring end f^2, or both, resists movement of the paper-roll sufficiently to keep it from sagging.

The mechanism of my roller copying-press comprises, in addition to the paper-roll, drawing and copying devices, a new arrangement of water-pan and its attendant parts, a new arrangement of a paper-trimming knife, and improvements in copy-paper-receiving devices.

The paper-moistening mechanism consists of the water-pan w, (see Figs. 1, 2, and 4,) which carries a supply-tank w^2, the latter being mounted upon side supports w' and provided with a water-passage w^3, which leads from the supply-tank w^2 to the water-pan w. (See Figs. 2, 4, and 7.) The water-pan w is supported upon rocker-arms w^4, which in turn are mounted on rock-shafts w^5, journaled in suitable boxes in the sides of the frame B. On the outside of the frame B cranks w^6 w^6 are secured to the rock-shafts w^5, and an operating-rod w is articulately joined to the cranks w^6. The rod w^7 is provided with a convenient handle w^8 and a retaining-notch w^9, which when the rod is drawn to the left, Fig. 1, slips over the spring-pin w^{10} and holds the water-pan-sustaining mechanism in position as long as desired. The cranks w^6 and rocker-arms w^5 are parallel to each other, respectively, so that the water-pan w is maintained in a horizontal position at all times. When the water-pan w is in its lower position, as indicated in dotted lines in Fig. 1, it rests upon brackets m', secured to or integral with the sides of the frame B, and in its vertical movements the water-pan w is guided by the guides m^2, likewise secured to or integral with the sides of the frame B. The tank w^2 is likewise guided by guides m^6, secured to or integral with the sides of the frame B. In order to accommodate the lifting mechanism to the rectilinear vertical movement of the water-pan w, the rocker-arms w^4 (see Figs. 5

and 6) are dovetailed at m^5 to the platform m^3, upon which the water-pan w is supported. Thus as the water-pan-shifting mechanism is operated the slippers m^4 slide along the bottom of the platform m^3. The supply-tank w^2 is normally closed, being provided with a valved opening, whereby it may be filled and automatically replenishes water in the pan w. Whenever by evaporation or absorption on the paper-roll the supply in the pan w becomes depleted and the lower end of the water-passage w^3 is opened to the air, the water in the supply-tank w^2 automatically supplies the deficiency until by the rise of the water-surface in the pan the passage n^3 again becomes sealed. I have provided also an arrangement whereby the supply-tank w^2 is controlled by an automatic valve, which performs its office of closing the water-passage w^3 whenever the water-pan is lowered out of working position or is removed from the press for any purpose. A flat valve v^4, adapted to close the mouth of the water-passage w^3, is secured to or integral with the sliding stem v^5, which at its upper end is provided with the arm v^2 and at a suitable point with the stub v'. (See Fig. 7.) A spring v^3, acting on the arm v^2, constantly tends to close the valve v^4. Upon a cross-rod or other stationary part of the press-frame there is adjustably secured the stop v, which coacts with the stub v'. When the water-pan w and the parts supported thereby are lowered to inactive position, as above described, the spring v^3 asserts itself and closes the valve v^4, thus preventing the escape of water from the tank w^2. When the pan w is raised, the stub v' strikes against the stop v, and thereby opens the valve v^4. If it be desired to remove the tank w^2 from the press, the stop v is turned out of the way, the spring v^3 closes the valve v^4, and the tank w^2 may be lifted without fear of spilling water. To fill the tank w^2, invert it, raise the valve v^4, and pour water into the passage w^3.

In order to guide the copy-paper band p through the water-pan w, I provide the guide G, which consists of a U-shaped resilient wire, whereof the bottom of the U is a straight rod, which extends nearly across the width of the water-pan. The vertical arms of the U-shaped guide G are sprung between supports g' in such manner that the spring-pressure exerted by the arms of the guide G sustains the guide in any desired position. A rod f^5, secured to the sides of the frame B and extending across the interior of the same, serves as a back-stop for the guide G and holds it in position against frictional drag of the paper-roll P.

The rolls R^3 R^2 are rubber rollers of ordinary construction, mounted in boxes at r^3 r^4, placed in vertical guides, which extend to the top of the standards C, and the pressure-roll R′ is mounted in sliding boxes at r', supported by springs r^2, so as to respond to the action of the pressure-regulator. The pressure-regulator consists of the handle d, Fig. 1, which is secured to and operates the eccentric roller d'. This is mounted in the box C′, which is adjustably secured in standards C by set-screws c^2, which pass through the cover-plate c^3. When it is desired to depress the pressure-roll R′, the handle d is moved to its solid-line position, as shown in Fig. 1, and when it is desired to remove the pressure from the roll R′ the handle d is shifted to its dotted-line position $d^\times$.

In preparing my roller copying-press for operation the water-pan w and its supply-tank w^2 are filled with water, the letter-plate y is removed, and the water-pan placed upon its platform m^3, the water-pan-shifting mechanism being thrown forward to the position shown in Fig. 1. The tank w^2 is placed in position upon the upright wings w', the stop v moved into position, as shown in Fig. 1. The paper-band p is then drawn off from the roller P, passed under the guide G, which is sprung into the desired position, thence through the rolls R^3 R^2, under the pressure-roll R′, over the idler-roll P′, and thence to the receiving-roll D′. Then the operating-handle w^8 of the water-pan-lifting mechanism is pulled to the left as viewed in Fig. 1, and the water-pan is lifted to the position shown in Fig. 2, raising the surface of the water above the point to which the guide G depresses the paper band p. The plate y being replaced, letters to be copied are taken from the shelf S and in the usual manner passed through the machine, from which they emerge and fall upon the shelf S′. The copy-paper roll then passes to the receiving-roll D′, where it is stored. In order to prevent offsetting of copy from one portion of the paper-roll to another as it is wound upon the receiving-roll, I provide two devices, which may be used separately or together. These are a band of blotting material, such as soft cloth, of substantially the same width as the paper-roll, which is wound upon the blotter-roll D and drawn from the roll D to the roll D′ as the press is operated. When the end of the paper band p is drawn through the slot a to the roll D′ the blotter band K is brought forward and laid on the roll D′ under the paper band p and there secured, so that as the paper is wound on the receiving-roll there is always an absorbent layer between two successive layers of the paper. The other contrivance for the prevention of offsetting consists in the heater H, which is preferably a small electric heater of any suitable construction, having electrical connections b', controlled by the switch b^2. This is placed in proximity to the receiving-roll D′, and as the paper passes onto the roll the heater dries it sufficiently to prevent the ink from offsetting. The two rolls D D′ are driven by belts, of which the tension is so adjusted that they slip, and thus compensate for changing differentials due to the accumulation and diminution of paper or cloth on any one of the respective rolls. The belt T is driven from the pulley t, which is on the shaft of the copy-roll R^2.

This roll is the driving-roll of the machine and is provided with an operating-crank L, Figs. 3 and 4. The belt T′ drives the roll D from the roll D′.

The trimming-knife and its mounting are shown at N in the several figures. The knife n^2 is a blade, preferably curved, mounted upon a handle n' and pivoted for vertical motion at n^5 upon a knife-frame n^7, which is pivoted for horizontal motion upon the vertical pivot n^6 at the side of the frame B. (See Fig. 3.) A stop n^3 upon the frame n^7 serves to retain the knife in proper position with relation to the frame when not in use, and the spring n^8 is coiled upon the shaft n^5 in such manner as to hold the edge of the knife n^2 in close shearing contact with the frame n^7. When the trimming-knife is to be used, it is swung across the letter-plate y from the position shown in Fig. 2 to that shown in Fig. 1, where it is conveniently located for its work. A stop n^4, located on the side of the frame B opposite to the knife-pivot n^6, engages the knife-frame n^7 and holds it and the knife in proper position for trimming letter-sheets as they are placed on the press. When the knife is not in use, it is swung to the position shown in Fig. 2 and is entirely out of the way.

What I claim, and desire to secure by Letters Patent, is—

1. In a copying-press, the combination with a paper-roll and copying-rolls, of a water-pan, a closed tank supported over the pan, and a water-supply pipe depending from the tank into the pan.

2. In a copying-press, the combination with a paper-roll and copying-rolls, of a water-pan, a movable support therefor, whereby the pan may be vertically shifted, a closed tank, supported on and over the pan and movable therewith, and a water-supply pipe depending from the tank into the pan.

3. In a copying-press, the combination with a paper-roll and copying-rolls, of a water-pan, a supporting-frame therefor, consisting of rocker-arms whereon the tank rests, rock-shafts for the said arms, parallel cranks and an operating-rod, whereby the pan may be vertically shifted.

4. In a copying-press, the combination with a paper-roll and copying-rolls, of a water-pan, a supporting-frame therefor consisting of rocker-arms, slide connections between the rocker-arms and the pan, a bracket whereon the pan rests when lowered, vertical guides for the pan, and connections whereby the rocker-arms may be actuated to raise or lower the pan in its guides.

5. In a copying-press, the combination with a paper-roll and copying-rolls, of a water-pan, and an immersing-guide consisting of a rod provided with resilient arms, and supports for the said arms whereby the guide is held by the spring-pressure of the said arms.

6. In a copying-press, the combination of a paper-roll and copying-rolls, of a water-pan and an immersing-guide consisting of a U-shaped resilient wire with a straight lower portion, and supports for the arms of the U whereby the guide is held by the spring-pressure of the said arms.

7. In a copying-press, the combination with a paper-roll and copying-rolls, of a water-pan, an immersing-guide consisting of a rod provided with resilient arms and supports for the said arms whereby the guide is held by the spring-pressure of the said arms, and a back-stop for the guide.

8. The combination in a copying-press, of a water-pan, supports thereon for a supply-tank, the supply-tank, a water-passage, open at the bottom extending downward from the supply-tank to a point within the water-pan.

9. The combination in a copying-press, of a water-pan, supports thereon for a supply-tank, the supply-tank, a water-passage, open at the bottom, extending downward from the supply-tank to a point within the water-pan and a valve, secured to the supply-tank, normally spring-pressed to a position of closure against the water-passage opening, substantially as described.

10. The combination in a copying-press, of a water-pan, a supply-tank supported thereby, a water-passage from the tank to the pan, a vertically-movable support for the pan, means for moving said support vertically, a valve for the water-passage, normally spring-pressed to a position of closure, and means whereby the said valve is opened against its spring-pressure upon lifting the water-pan.

11. The combination in a copying-press, of a paper-roll, copying-rolls, a water-pan, an immersing-guide for the paper suspended over the water-pan, and means for vertically changing the relative positions of the water-pan and immersing-guide whereby the pan and paper may be made to coact, or not, at will.

12. The combination in a copying-press, of a paper-roll, copying-rolls, a water-pan, a supply-tank carried thereby, a water-passage from the tank to the pan, a valve, controlling the water-passage, and normally spring-pressed toward a position of closure, an immersing-guide, means for vertically changing the relative positions of the water-pan and immersing-guide, and means, associated with the said relative vertical movement, whereby the water-passage valve is opened as the pan and immersing-guide approach each other, substantially as described.

Signed by me at Boston, Massachusetts, this 5th day of October, 1901.

DAVID E. HUNTER.

Witnesses:

ROBERT CUSHMAN,

FRANK S. HARTNETT.