No. 701,447. Patented June 3, 1902.

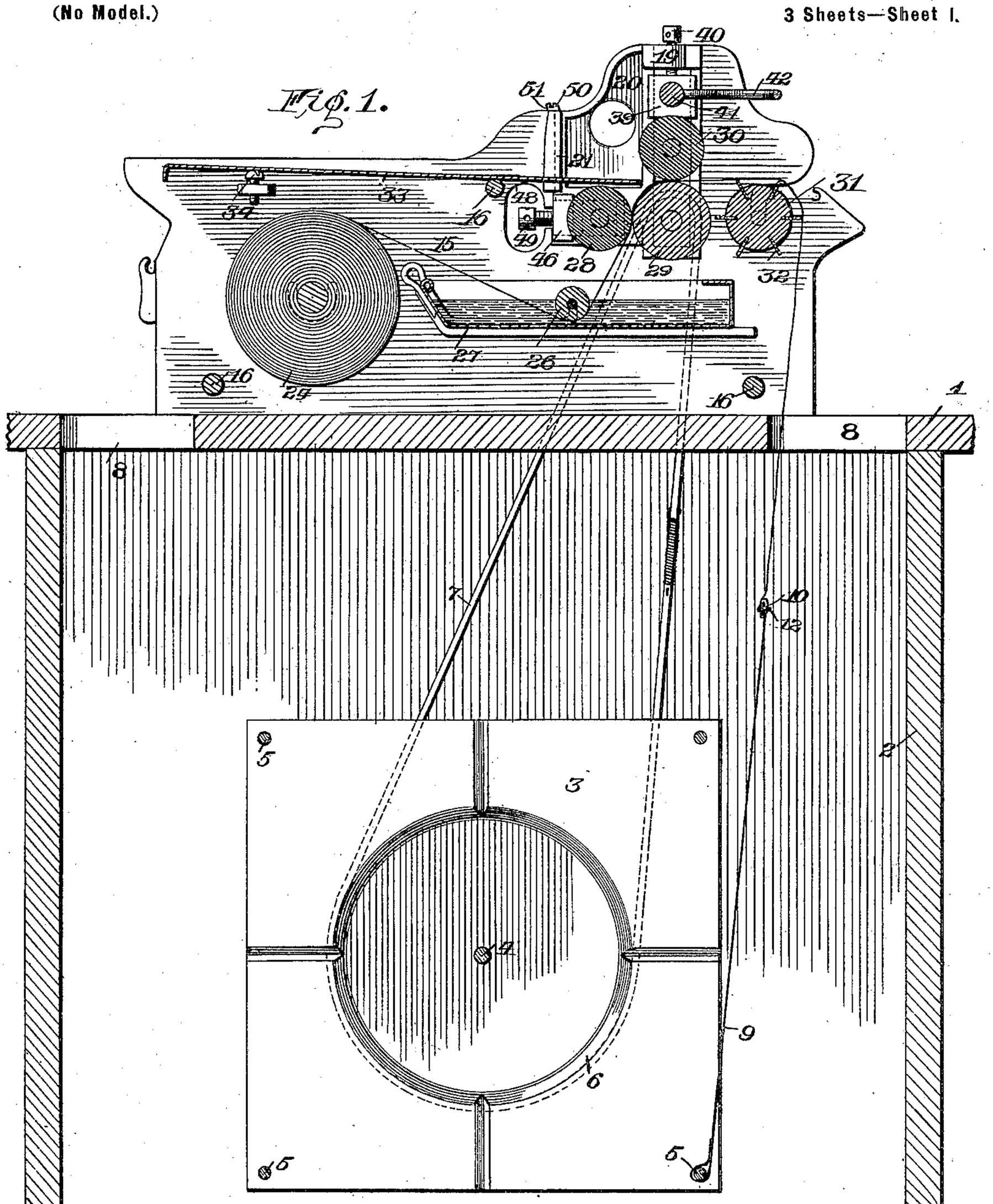
P. H. YAWMAN.

ROLLER COPYING PRESS.

(Application filed Jan. 14, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses.

G. Willard Rich.

Walter B. Payne

Inventor.

Philip H. Yawman

by Frederick S. Church

his Attorney.

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Fig. 2.

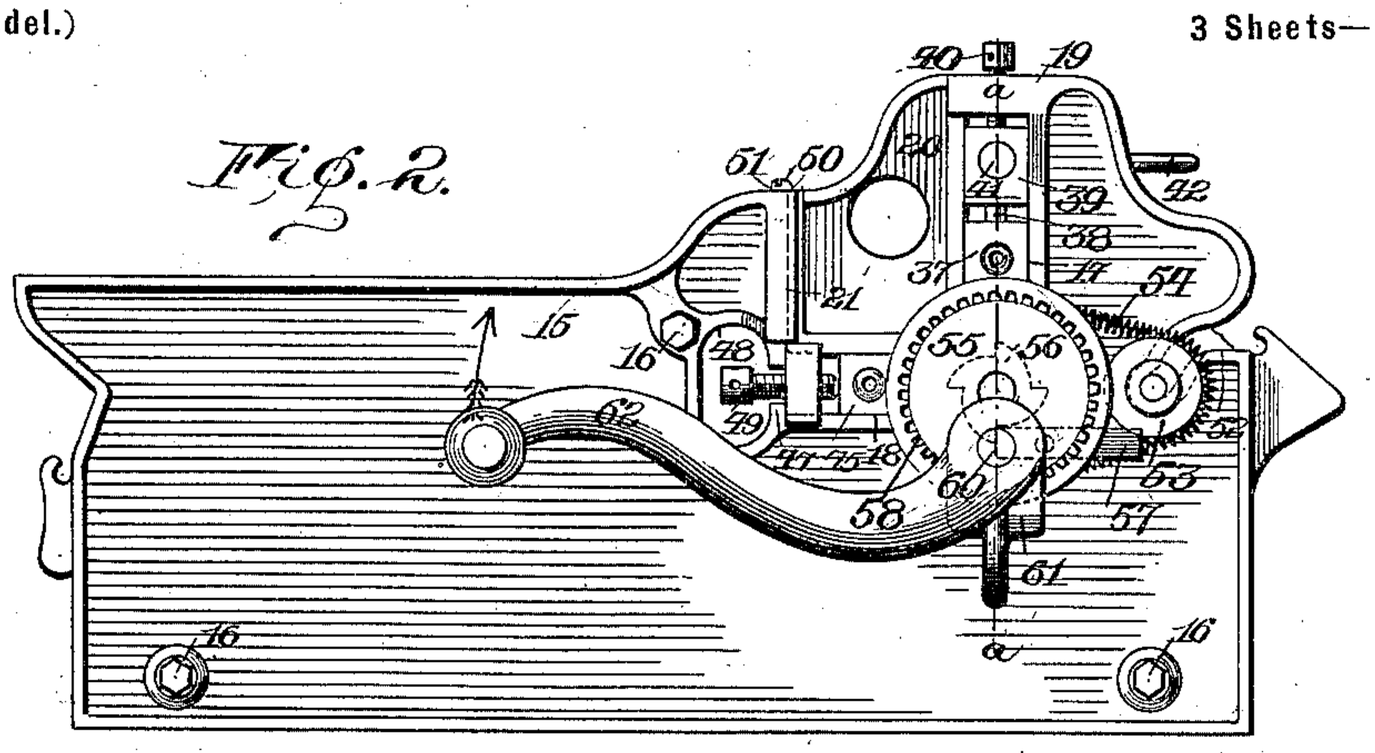

Fig. 3.

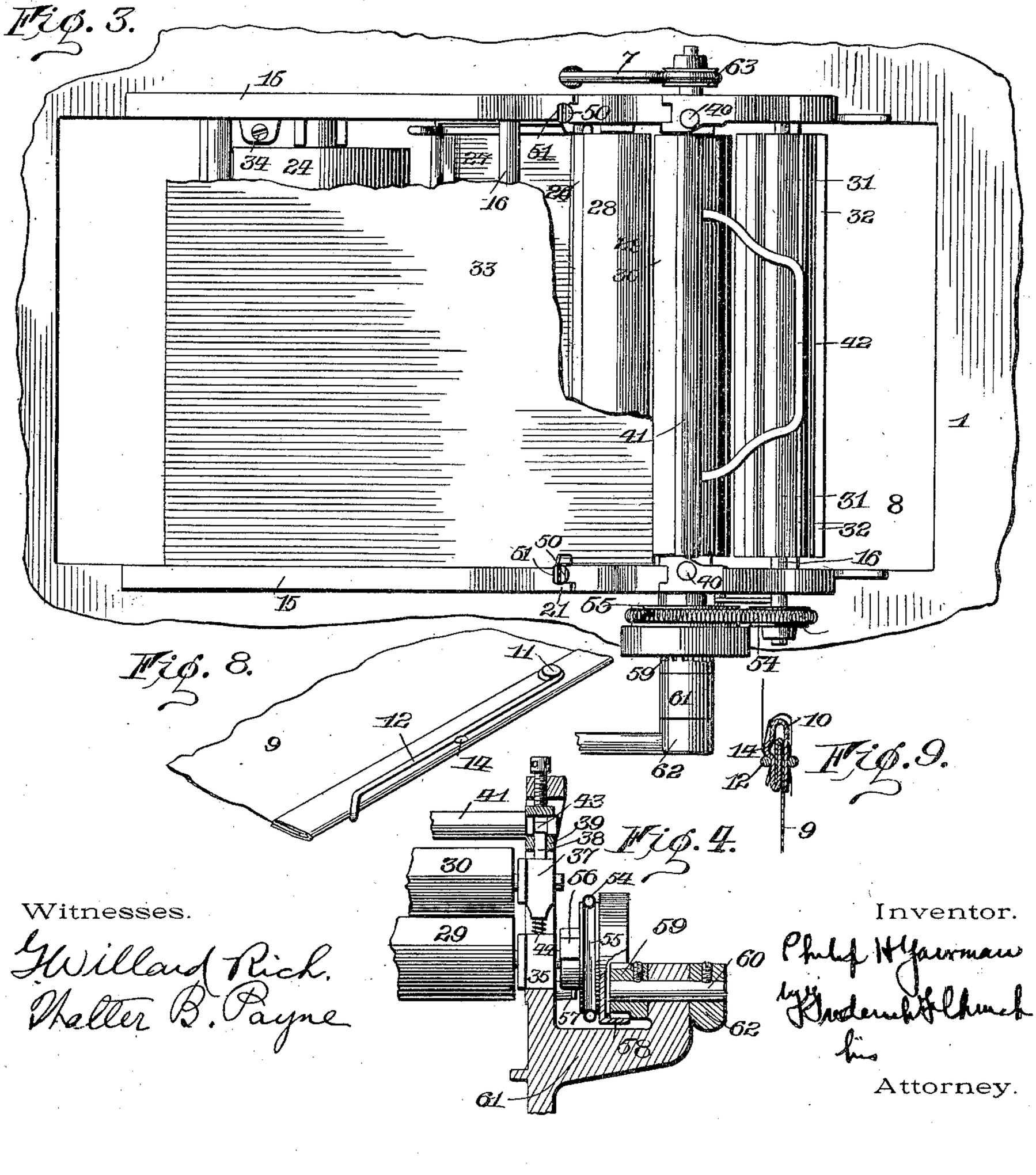

Fig. 8.

Fig. 9.

Fig. 4.

Witnesses.

G. Willard Rich.

Walter B. Payne

Inventor.

Philip H. Yawman

by Frederick P. Fish

his

Attorney.

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Fig. 5.

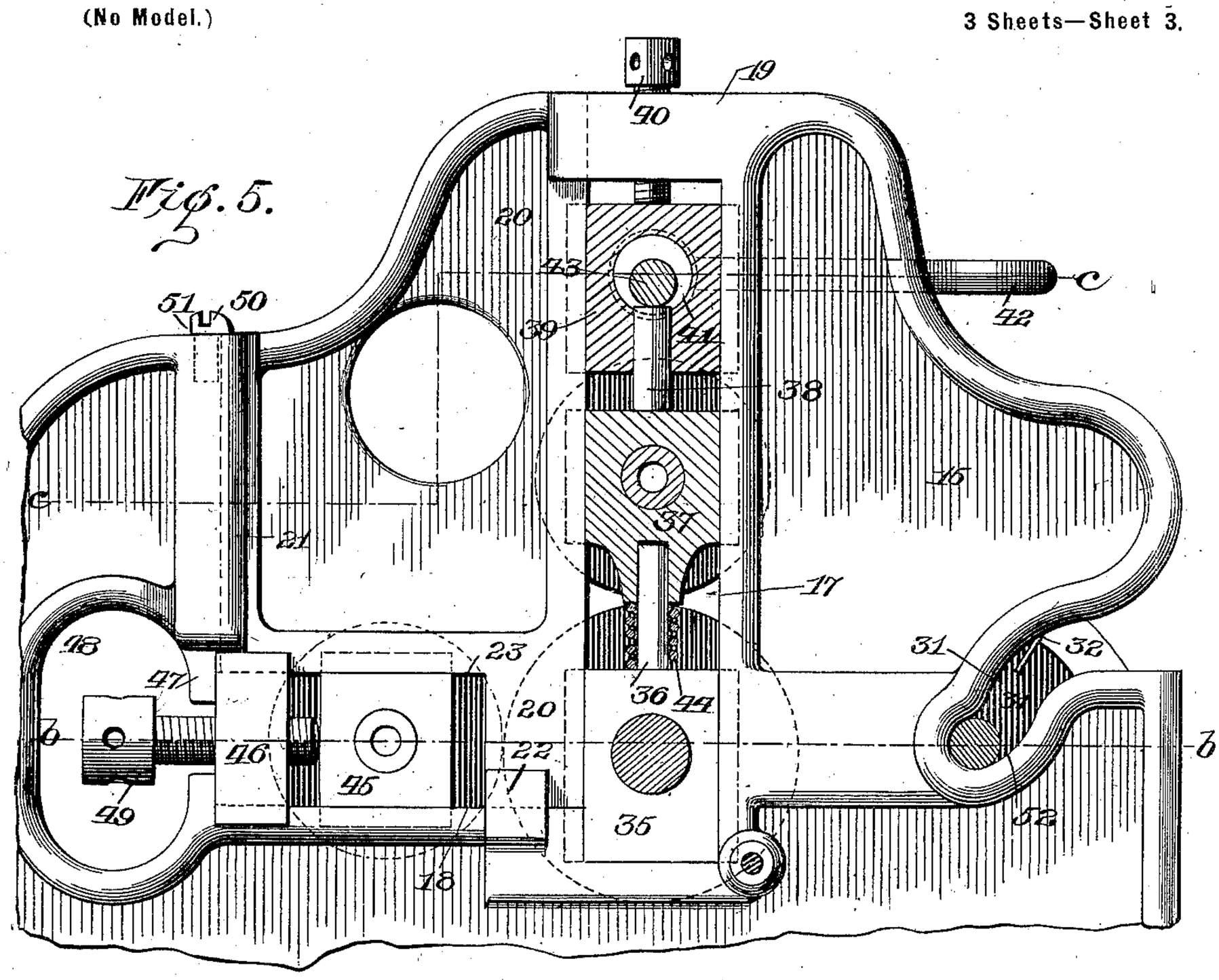


Fig. 6.

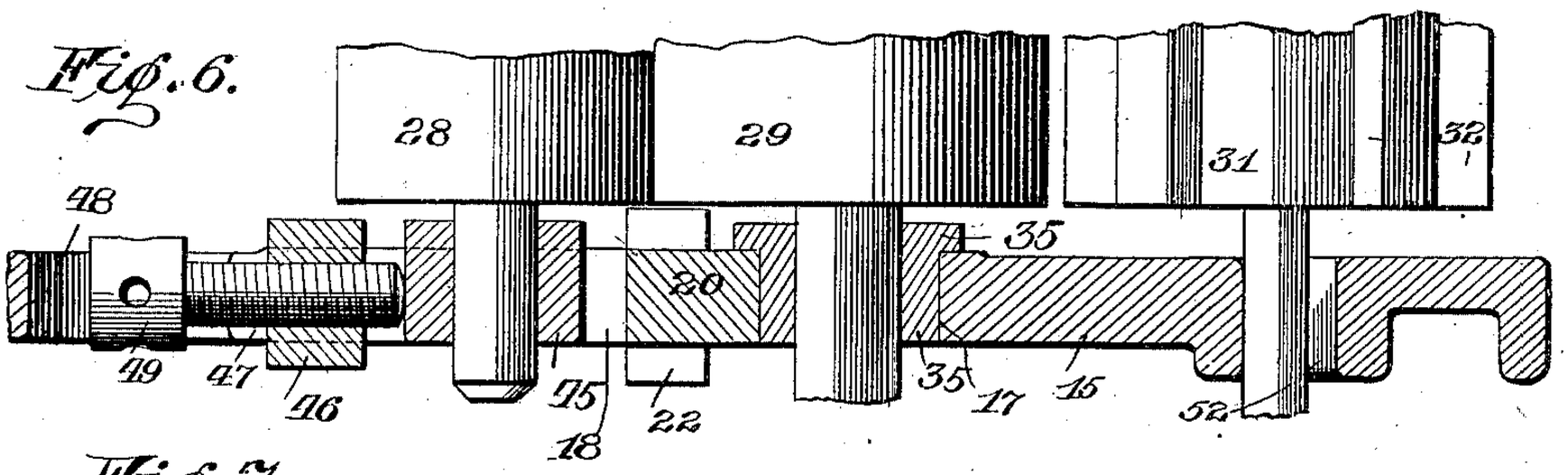
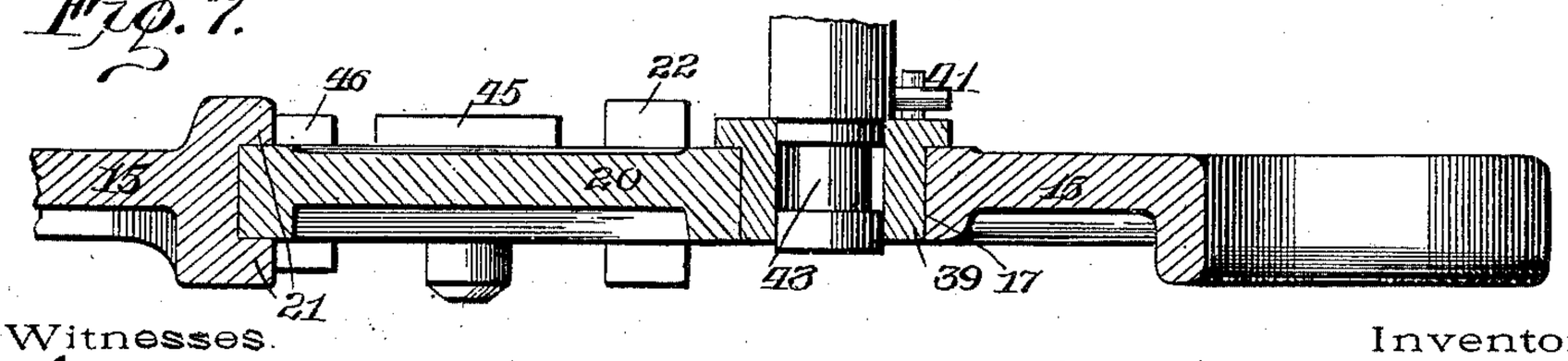


Fig. 7.



Witnesses.
G. Willard Rich
Walter B. Payne.

Inventor.
Philip H. Yawman
by Frederick P. Fish
his Attorney.

UNITED STATES PATENT OFFICE.

PHILIP H. YAWMAN, OF ROCHESTER, NEW YORK, ASSIGNOR TO THE YAWMAN & ERBE MANUFACTURING COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

ROLLER COPYING-PRESS.

SPECIFICATION forming part of Letters Patent No. 701,447, dated June 3, 1902.

Application filed January 14, 1901. Serial No. 43,164 (No model.)

To all whom it may concern:

Be it known that I, PHILIP H. YAWMAN, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Roller Copying-Presses; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to roller-copiers or devices for press-copying letters or other documents upon a continuous web or sheet of paper, and has for its object to improve the construction and operation of said devices whereby they may be readily constructed and assembled and the various adjustments provided for.

The invention further consists in improved connecting devices between the web-reel and the paper-web and in certain improved constructions and combinations of parts, all as will be hereinafter fully described and the novel features pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a roller-copier embodying my improvements; Fig. 2, a side elevation of the upper portion thereof; Fig. 3, a plan view with a part of the letter-support broken away; Fig. 4, a vertical sectional view on the line *a a* of Fig. 2; Fig. 5, a view, partly in section, of the roller-adjusting devices; Fig. 6, a horizontal sectional view on the line *b b* of Fig. 5; Fig. 7, a sectional view on the line *c c* of Fig. 5; Fig. 8, a detail view of the clip or holding device for attaching the paper-web to the roll, and Fig. 9 a cross-sectional view of the same.

Similar reference-numerals in the several figures indicate similar parts.

As shown in the drawings, the copier is fastened upon a suitable table or support 1, forming a part of or connected to a cabinet 2, inclosing the reel upon which the paper containing the copied letters is wound, said reel being composed of side plates 3, mounted upon a journal or arbor 4, said plates being connected by rods 5 to form an open reel permitting the dampened web to dry readily. Upon one end of the arbor 4 is arranged a pulley 6, (indicated by dotted lines in Fig. 1,) around which extends a belt 7, connected with the copying or pressing rollers, as hereinafter described. The table or support 1 is provided with two apertures 8, through either of which the paper-web may extend to and from the reel, as usual in devices of this description. Connected to one of the cross bars or rods 5 of the reel is a strip of flexible material, as cloth, (indicated by 9,) having at its upper end a detachable clamping device, to which the paper-web is attached after having passed from the copier, the said clip or connecting device consisting of a strip of metal 10, doubled over with and upon the end of the strip 9 and having pivoted to the stud 11 thereon a clip or fastening device in the form of a wire 12, having the two parallel spring arms or portions adapted to extend upon opposite sides of the sheet-metal strip 10 and prevented from accidental movement by the engagement of one of the arms with a slight projection 14 on the side of the plate 10, said clip being adapted to detachably secure the free end of the paper-web when the latter is folded over the strip 10, as shown in Figs. 8 and 9.

The body or main frame of the copier consists of two side plates 15, connected by the cross-rods or braces 16 and each provided with suitable slots or recesses finished or smoothed on the forward and lower sides or edges 17 and 18, respectively, forming ways for suitable bearing-blocks on which the various rollers are mounted. Extending rearwardly over the ways or surfaces 17 are overhanging arms 19, preferably forked or recessed at the ends, as shown, for the reception of the forward edges of the filling pieces or plates 20, the rear edges of said plates 20 being movable in and held from lateral movement by ways formed by flanges or lugs 21 on the rear sides of the openings in the side plates. The lower ends of the filling pieces or plates 20, when the latter are in place, are guided and held from lateral movement by suitable lugs

or projections 22, formed at the lower portions of the apertures in the sides 15. The forward edges of the filling-pieces 20 are finished and extend substantially parallel with the finished edges or surfaces 17 and form ways for the bearing-blocks carrying the rollers, as will be described, and the lower portions of said filling-pieces are finished and smoothed, as at 23, to form ways for other bearing-blocks located between said surfaces and the lower finished surfaces 18. As usual in devices of this description the paper upon which the copies are to be made is contained in a roll 24, arranged upon a shaft loosely journaled in the sides of the casing, and from this the paper extends beneath an immersing-roller 26, located in the water-pan 27, and then extends upward between the wringing-roller 28 and the lower pressing or copying roller 29, passing partially around the latter and between it and the upper pressing or copying roller 30, thence over the roller 31, having the flexible rubber strips 32 projecting radially therefrom, and then down into the casing or cabinet, where it is attached to the reel, as described.

33 indicates a removable letter support or plate resting loosely upon suitable adjustable supports, such as screws 34. (See Fig. 1.) The lower pressing-roller 29 is provided with journals at its ends rotating loosely in journal-boxes 35, arranged between the surfaces 17 and the forward edge or surface of the filling-blocks 20 and is preferably composed of unyielding material, such as hard rubber. Resting upon the upper sides of the bearing-blocks 35 are pins 36, held loosely in suitable recesses formed in the bearing-blocks 37, in which latter the journals of the upper pressing-roller 30 are loosely mounted, said bearing-blocks 37 operating in the vertical ways and being provided at their upper sides with pins 38, entering vertical apertures formed in bearing-blocks 39, the latter being also vertically movable and operated downwardly by set-screws 40, passing through the overhanging arms 19 and contacting with their upper surfaces. Journaled loosely in the bearing-blocks 39 are the ends of a transversely-extending spindle or arbor 41, having an operating bail or handle 42 and provided near the ends with radially-extending slots or grooves cut away eccentrically to form the cams or eccentric portions 43, as shown in Figs. 5 and 7, and in the cut-away portions thus formed project the upper ends of the pins 38 on the journal-blocks 37 of the upper pressing or copying roller.

44 indicates springs encircling pins 36, arranged between the bearing-blocks 35 and 37, as shown in Fig. 5, so as to raise the roller 30 out of contact with the roller 29 when the copier is not in use. The pins 38, projecting into the slots formed in the shaft or spindle 41, prevent endwise movement of the latter in its bearing-blocks and form a cheap and suitable adjusting device for the upper pressing-roller. The inner sides of the bearing-blocks 35, 37, and 39 are flanged, as usual, as indicated in Fig. 7, to prevent their outward movement, their inward movement being prevented by the rollers themselves. The wringing-roller 28 is provided at its ends with studs or spindles loosely operating in journal or bearing blocks 45, resting upon the ways or surfaces 18 of the frame and movable between the latter and the surface 23 of the filling-blocks 20.

46 indicates blocks or plates guided upon ways 18 and 23 and prevented from rearward movement by lugs 47, arranged between the ends of said ways and the recess or aperture 48.

49 indicates a set-screw having an operating-head in the recess 48 and extending through the block 46 and operating against the bearing-blocks 45 to operate the squeezing or wringing roller against the roller 29 with greater or less pressure, as may be desirable or necessary.

The filling blocks or pieces 20 are guided to move vertically in the side frame, but are held normally in the position shown in Fig. 5 by heads of screws 50, operating in said side frame, one side of the heads of said screws being cut away, as at 51, to permit the removel of said filling-blocks when said cut-away portion is turned into line with the rear edges of the filling plates or blocks.

The roller 31 is provided at its ends with journals operating in the lower ends of open bearing-slots 52 and is also provided at one end with a pulley 53, around which extends a belt 54, preferable formed of a spiral spring, said belt also passing around the grooved pulley 55, secured to the end of the shaft of the roller 29. On the inner side of this pulley 55 is a ratchet-wheel 56, with which cooperates a gravitating pawl 57, pivoted on the side of the casing and preventing backward rotation, and on the outer side thereof are provided internal gear-teeth 58, with which meshes a pinion 59, formed upon or secured to a short shaft or stud 60, journaled in the bracket 61 on one of the side frames and having an operating-handle 62. The object of embodying the internal gear and the pinion is to provide a comparatively slow motion for the rollers and yet permit the crank to rotate in the same direction. The rear end of the shaft of the roller 29 is provided with a pulley 63, around which extends the belt 7, connected to the paper-reel.

The operation of the device as a whole is not essentially different from that of the device shown in the patent to Jewel, No. 416,628. The letter to be copied being placed in the pan 27, the handle is operated in the direction indicated by the arrow in Fig. 2, the surplus water being wrung or squeezed from the web of copying-paper and the manuscript fed from the support 33 and upon the damp web, between the pressing-rollers 29 and 30, and thence the copying-web extends to the reel,

which is slowly rotated by the means described.

The amount of pressure exerted between the pressing or copying rollers may be varied by the adjustment of the eccentric spindle or shaft 41, the forward movement of the bail or handle to the position shown in Fig. 5 forcing the upper pressing-roll downward against its spring and the movement of the handle or bail 42 to the rear will release the pressure, allowing the rolls to be separated by the spring. By the operation of the adjusting-screws 40 the parts are adjusted, so that when the bail 42 is swung forward the maximum pressure desired will be given, and when it is swung to the rear the pressing-rollers will be spread far enough by the springs 44, so as to prevent their becoming flattened when not in use.

By the employment of the bearing-surface on the side frames as described and the filling-piece 20 I am enabled not only to manufacture the copiers more readily, as the surfaces to be finished are readily accessible; but by the removal of these pieces 20 each of the journal boxes or blocks is accessible and may be removed for repair or adjustment without the necessity of taking the whole machine apart.

The location of the cam-shaft 41 in the bearing or journal boxes and providing the pins in the boxes with which the cam-grooves engage also simplifies the construction and enhances the appearance of the device.

I claim as my invention—

1. The combination with the side frames having the recesses and the ways at the sides thereof extending at an angle relatively, of the removable filling-pieces secured in the recesses and having corresponding ways thereon, the journal blocks or boxes operating in the ways and the coöperating rollers arranged in the boxes.

2. The combination with the side frames having the recesses and the ways at the sides thereof extending at an angle relatively, of the removable filling-pieces secured in the recesses and having corresponding ways thereon, the stationary bearing-blocks held between the frames and filling-pieces, the roller in said blocks and the movable bearing-blocks arranged between the filling-pieces and frames adjustable toward and from the roller, and rollers journaled in said last-mentioned bearing-blocks and coöperating with the first-mentioned roller.

3. The combination with the side frames having the recesses and the ways at the sides thereof extending at an angle relatively, of the filling pieces or blocks located in the recesses having the ways opposing those on the frames, a pressing-roller arranged near the intersection of the ways on the frames, bearing-blocks adjustable on both of the ways on the frames toward and from the first-mentioned roller, and rollers journaled in said bearing-blocks coöperating with said roller.

4. The combination with the side frames having the recesses provided with the vertically-extending ways, of the removable filling-pieces arranged in the recesses and having the corresponding ways or surfaces, a pressing-roller arranged at the lower portion of the ways, the vertically-movable journal-boxes in the ways, the roller carried thereby coöperating with the first-mentioned roller, and means for adjusting the said blocks vertically.

5. The combination with the frame having the ways therein, the stationary removable bearing-blocks 35 at the ends of the ways, the roller journaled therein, the bearing-blocks 37 movable on the ways and the roller journaled therein and coöperating with the first-mentioned roller, of the bearing-blocks 39 and means for adjusting them on the ways, and an arbor journaled in the blocks 39 having cams thereon for adjusting the blocks 37 in the ways.

6. The combination with the recessed side frames having the ways at one side of each of the recesses, and the arms extending over the ways, of the roller arranged at the lower end of the ways, the removable filling-pieces in the recesses, two sets of bearing-blocks arranged between the filling-pieces and the ways, a roller carried in the lower set of bearing-blocks, springs for raising them, and a rotary cam-shaft journaled in the upper blocks and operating upon the blocks of the roller.

7. The combination with the recessed side frames having the ways at one side of each of the recesses, the arms extending over the ways and the adjusting-screws, of the lower pressing-roller, the removable filling-pieces in the recesses, the two sets of bearing-blocks arranged between the filling-pieces and the ways, the upper pressing-roller carried in the lower blocks, springs for raising it and a rotary cam-shaft journaled in the upper blocks and operating upon the blocks of the roller.

8. The combination with the frame and ways therein, the stationary pressing-roller, the movable roller, the bearings therefor and the springs for separating the rollers, of the rotary cam-shaft, bearings therefor, adjustable in the ways, means for adjusting them and pins guided in the bearings and arranged between the cam-shaft and the bearings for the movable roller.

9. The combination with the frame and ways therein, the stationary pressing-roller, the movable roller, the bearings therefor and the springs for separating the rollers, of the adjustable bearings in the ways, the pins operating on the bearings of the movable roller and guided in the last-mentioned bearings, the shaft journaled in said bearings having the cam-grooves in which the pins operate.

10. The combination with the frame and ways therein, the stationary pressing-roller, the movable roller, the bearings therefor and

the springs for separating the rollers, of the rotary shaft journaled in bearings and having the cam-grooves therein, the pins entering the cam-grooves and operating upon the bearings of the movable roller.

11. The combination with the frame and ways therein, the stationary roller, the adjustable roller, the bearings for the latter and springs for separating the rollers, of bearings above the movable roller, the shaft operating therein having the cam-grooves, and the pins guided in the bearings for the shaft, entering the cam-grooves and operating upon the bearings of the movable roller.

12. The combination with the frame and ways therein, the stationary roller, the adjustable roller, the bearings for the latter and springs for separating the rollers, of the bearings above the former bearings, means for adjusting and securing them, the rotary shaft journaled in said bearings having the cam-grooves, the pins guided in the bearings, projecting into the cam-grooves and operating upon the bearings of the movable roller.

13. In a roller copying-press, the combination with the frame, the stationary pressing-roller, the movable pressing-roller coöperating therewith and web-dampening devices, of the internal toothed gear mounted on the end of the stationary roller, the bracket on the frame extending beyond the gear, the crank-shaft journaled in the outer end of the bracket beyond the gear, having the pinion on its end engaging the internal gear, and pawl-and-ratchet mechanism for preventing the backward rotation of the roller.

14. The combination with the frame, the stationary pressing-roller, the movable pressing-roller coöperating therewith, web-dampening devices, a web-take-up reel, and a ribbed roller arranged between the pressing-rollers and the reel, of the pulley on one end of the stationary roller, the belt connecting it with the reel, the internal gear and the pulley on said roller, the belt connecting the pulley with the ribbed roller, the bracket on the frame extending outwardly beyond the gear, the crank-shaft journaled in the bracket and the pinion on the end of the crank-shaft meshing with the gear.

15. The combination with the main frame having the ways, the roller therein, the bearing-blocks movable on the ways, the pressing-roller journaled therein coöperating with the first-mentioned roller, and springs for raising said blocks, of the bearing-blocks guided on the ways on the frame arranged above the last-mentioned ones, means for positively adjusting them toward the roller, and a straight arbor journaled near its ends in said blocks and extending over the roller and provided with cams operating upon the bearings of the pressing-roller, and an operating-handle.

PHILIP H. YAWMAN.

Witnesses:
G. WILLARD RICH,
WALTER B. PAYNE.