

No. 721,120.

PATENTED FEB. 17, 1903.

H. A. W. WOOD.

STEREOTYPE PRINTING PLATE CASTING AND FINISHING APPARATUS.

APPLICATION FILED MAR. 4, 1898.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

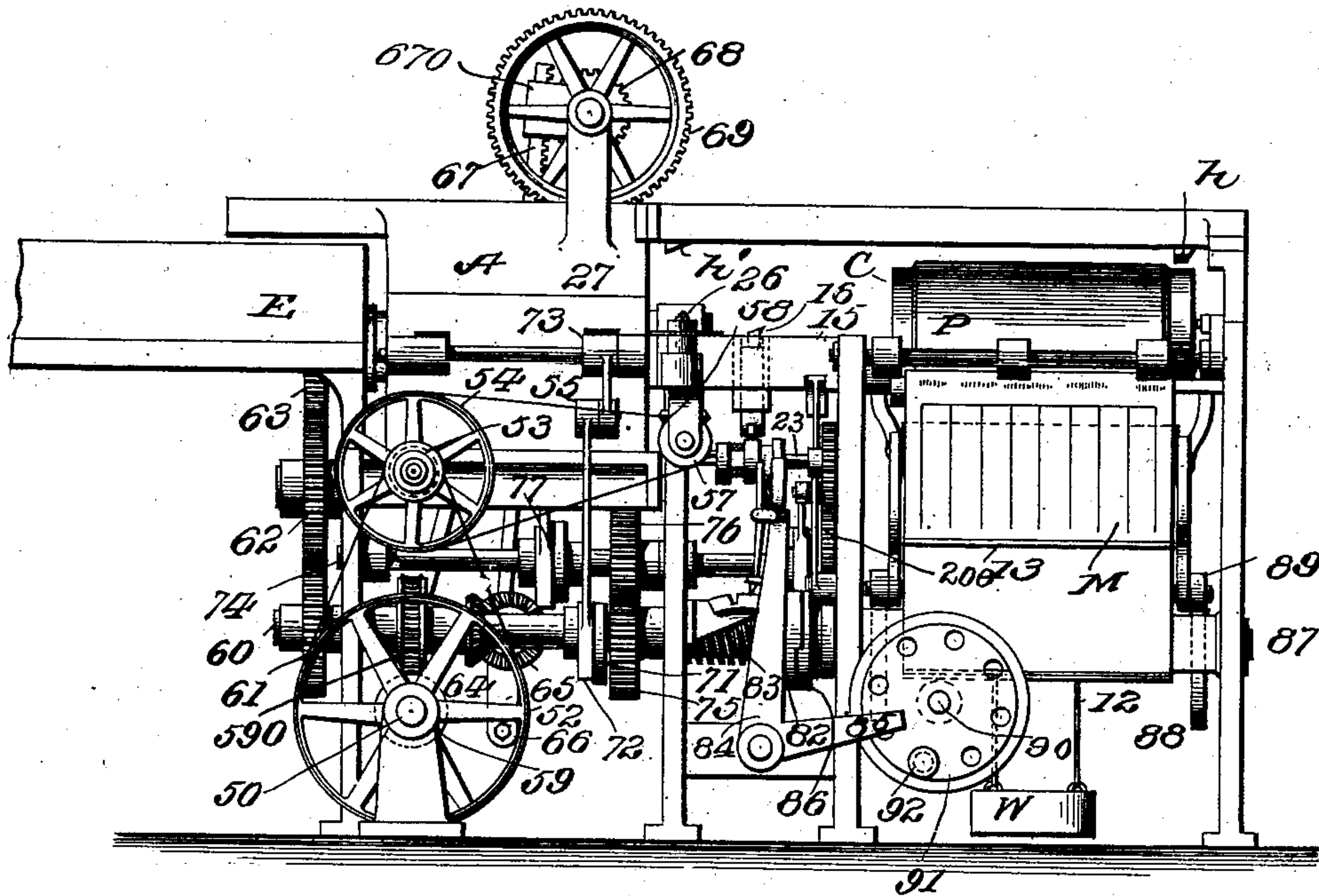
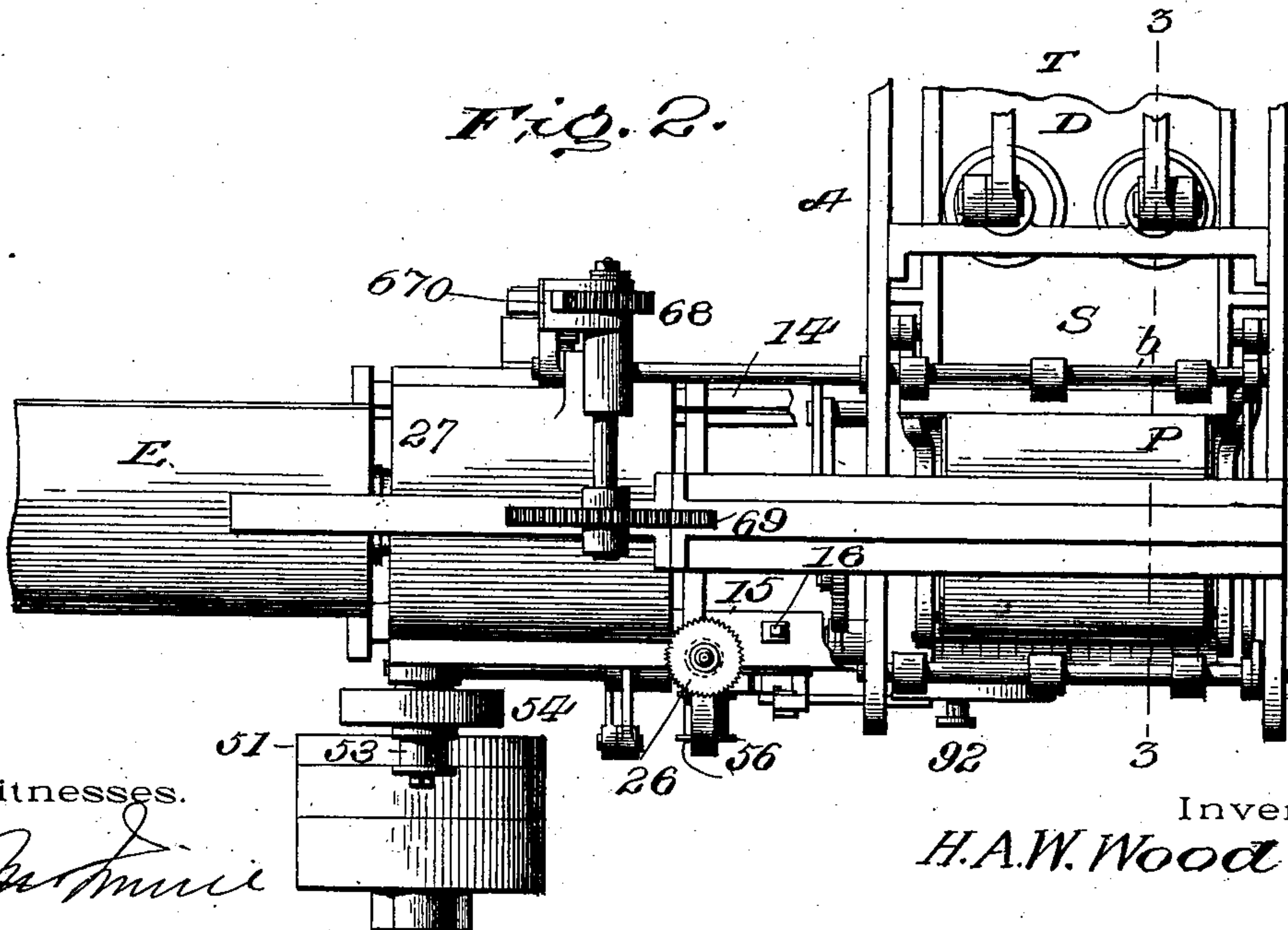


Fig. 2.



Witnesses.

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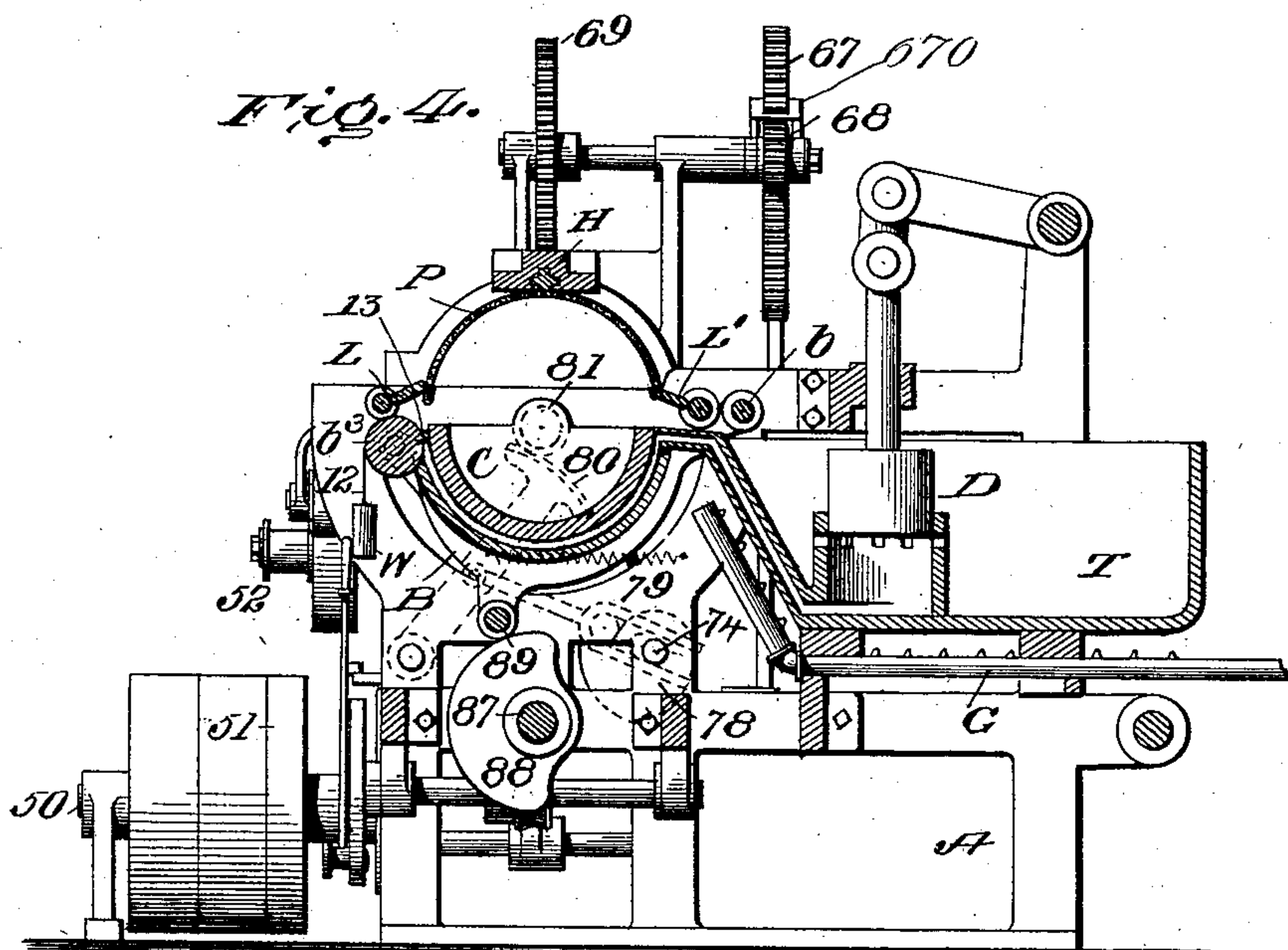
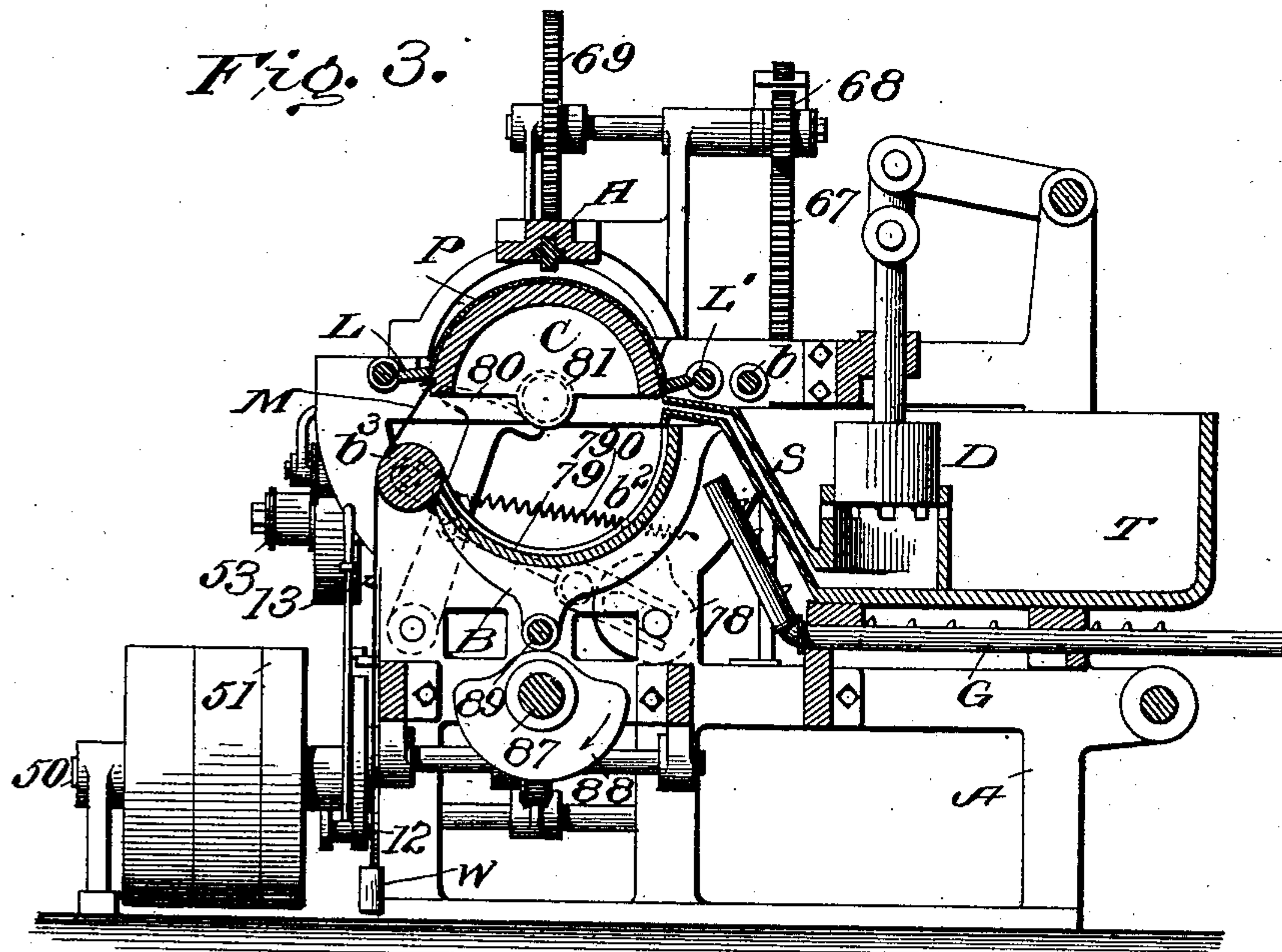
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APPLICATION FILED MAR. 4, 1898.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses.

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NO MODEL.

3 SHEETS—SHEET 3.

Fig. 5.

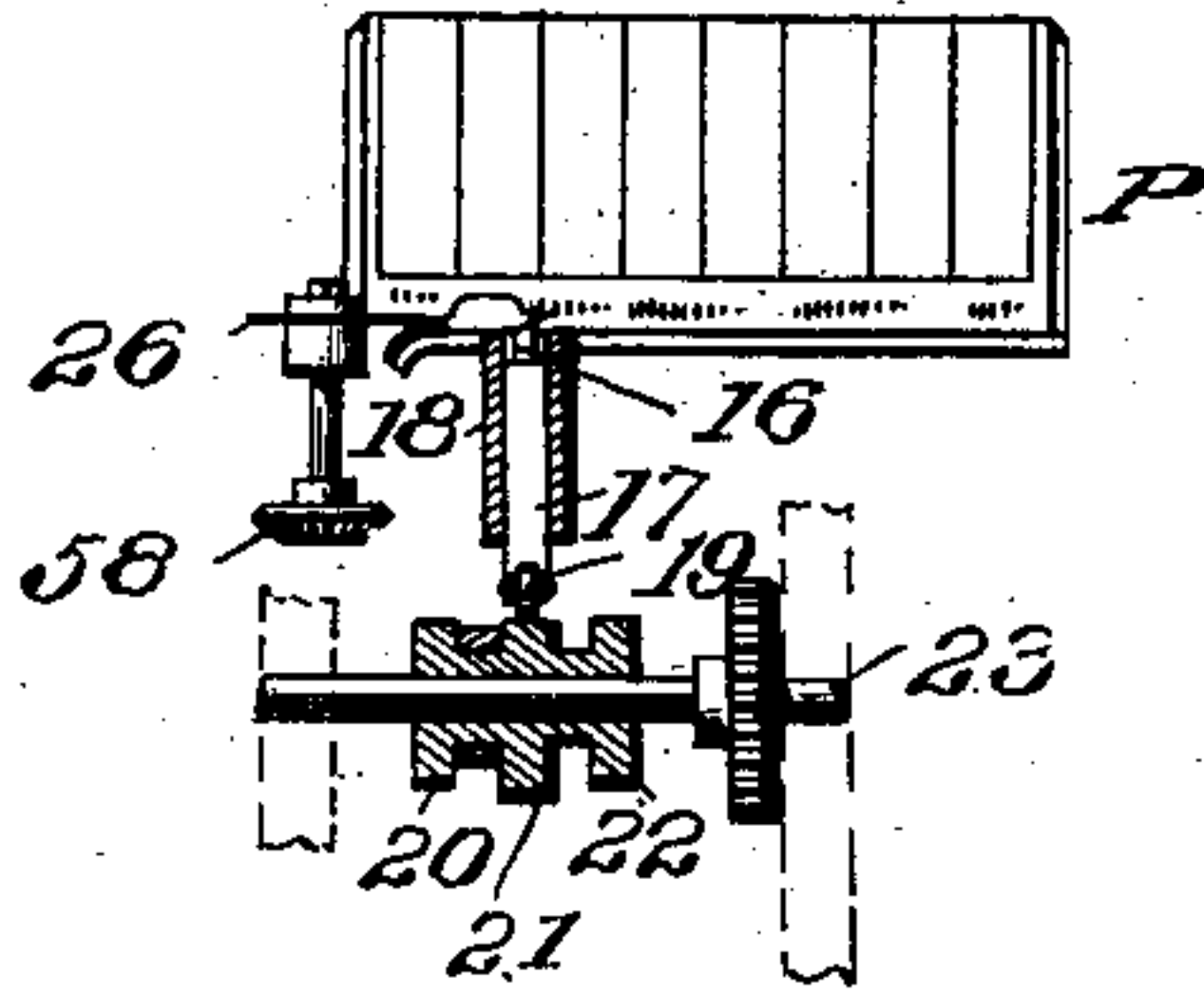


Fig. 6.

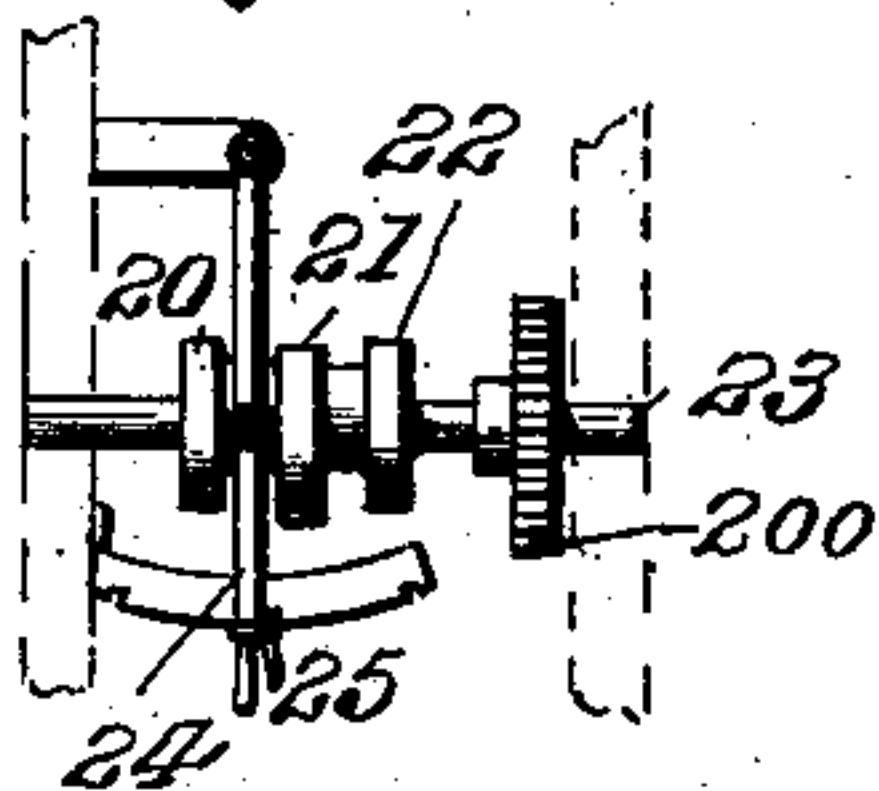


Fig. 7.

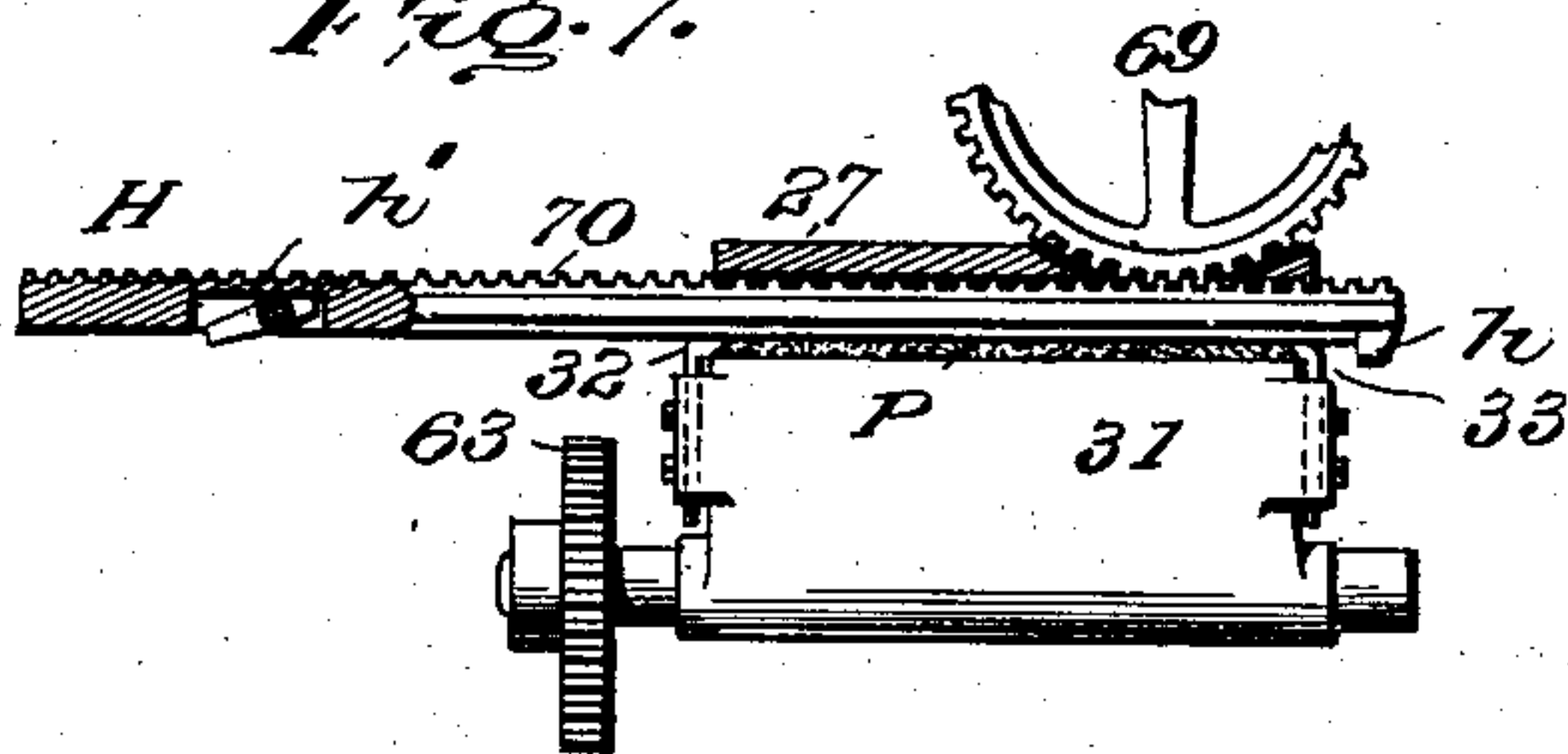


Fig. 8.

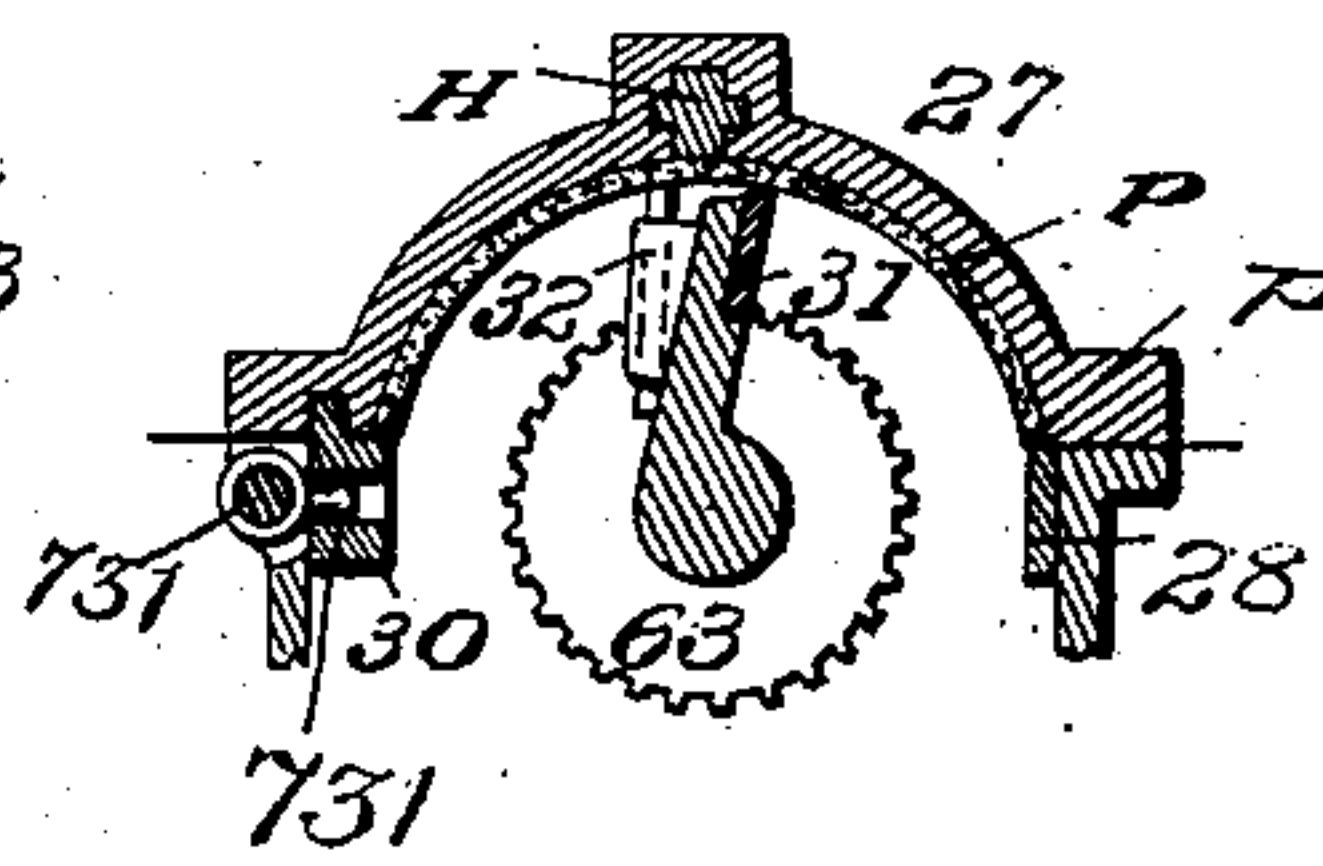


Fig. 9.

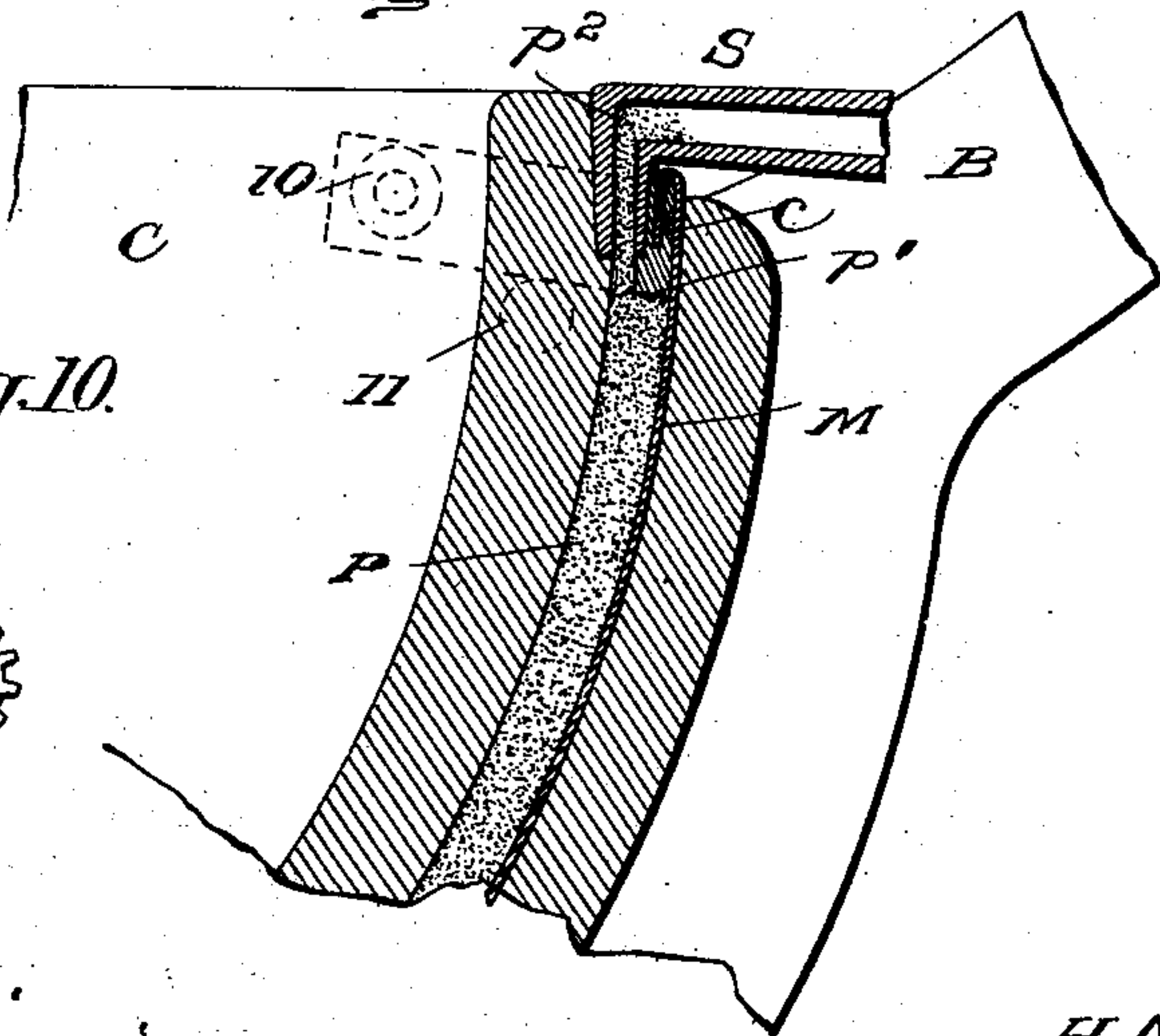
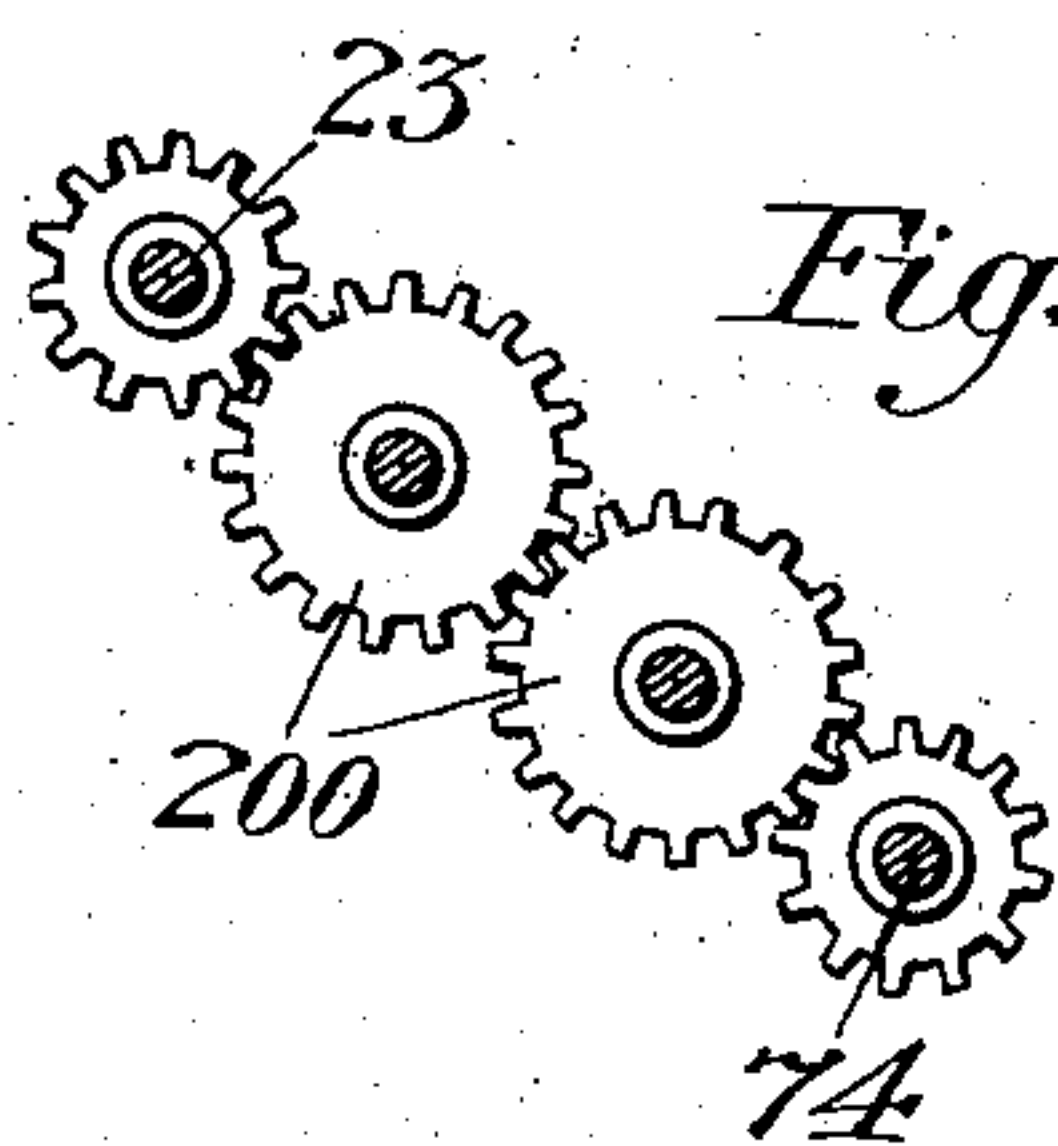


Fig. 10.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

STEREOTYPE-PRINTING-PLATE CASTING AND FINISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 721,120, dated February 17, 1903.

Application filed March 4, 1898. Serial No. 672,552. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Stereotype-Printing-Plate Casting and Finishing Apparatus, of which the following is a specification.

The aim of this invention is to provide an apparatus which will cast curved stereotype printing-plates from a flexible matrix.

I also combine with the casting apparatus a finishing mechanism, as hereinafter described.

The device described and claimed in this application for patent is a modification of the apparatus described in my application for patent filed March 4, 1898, Serial No. 672,549, patented of even date herewith.

The improved casting apparatus shown, described, and claimed in this case comprises a core, means for moving the same, and means for controlling the matrix, so that as the core moves the matrix will be unwound or stripped from the cast plate. The parts which make up this casting-chamber comprise a hinged flanged back and a pivoted core, which can be oscillated. The matrix is attached at one side to the core, the other side passing over a suitable guide or turner on the side of the back to a take-up device, as a weight. A suitable device, as a cam mechanism, is provided to allow the back to drop from the core, so that as the core is oscillated the matrix will turn down over the roll, and thus unwind from the plate. The oscillation of the core will also remove the plate from the casting-chamber. Combined with this casting mechanism is a finishing device, which is arranged to trim the side type edge of the plate to correspond to the heading that is used—that is, I provide a tool which as the plate is moved will trim the type-heading of the plate. This is obtained by providing means to actuate the tool to follow the contour of the heading. I also preferably arrange with this type-edge-trimming tool a set of cams, any one of which may be thrown into operation, so that the same tool and ma-

chine may be used to trim the type-headings of plates with various headings.

Also combined with the casting mechanism before described is a finishing device, which will trim the ends of the plate close up to the type. The specific details of these finishing-tools are claimed in an application for patent filed by me December 23, 1902, Serial No. 136,352, in pursuance to a Patent Office requirement, and only the broad combinations between these various mechanisms are claimed in this case.

Referring now to the drawings, I will describe the specific machine which I have chosen to illustrate the application of my improvements and in detail.

Figure 1 is a front side elevation thereof. Fig. 2 is a plan. Fig. 3 is a cross-sectional view through the casting mechanism, taken on line 3 3 of Fig. 2. Fig. 4 is a view similar to Fig. 3, with the parts in a different position. Fig. 5 is a detail view of the side type-edge-trimming mechanism. Fig. 6 is a plan of the cam mechanism that I use in connection therewith. Fig. 7 is a detail of the end-trimming mechanism. Fig. 8 is a cross-sectional view thereof. Fig. 9 is a detail view, on an enlarged scale, of the means that I preferably use to secure the end of the flexible matrix to the oscillating core; and Fig. 10 is a detail of the gearing.

The parts of the mechanism are mounted in a suitable framework A.

Referring first to the details of the casting mechanism, B represents the back of the casting-chamber. This back is pivoted or hinged to the main frame by means of suitable pivots *b* at a point or line so that when outside of the same the same is dropped it will easily swing clear of the oscillating core. This back B has suitable flanges, which fit over the ends of the core to close the casting-chamber. The back also carries a suitable roll *b*³, over which the matrix is led. C represents the core, which preferably consists of a segment mounted on bearings which are journaled in the framing A. This core carries a clip *c*, into which the edge of the matrix may be inserted and secured, as shown in Fig. 9. This clip *c*

has arms which extend beyond the ends of the core and which are pivoted to the core by suitable studs, as 10, and coacting with these arms are stops 11, so that the clip can turn only about its pivots in one direction. The matrix M is made long enough or has suitable flexible strings or devices 12 attached thereto so that the same will extend over the roll b^3 to connect to a weight W. Secured on the edge of the matrix or to the extension thereof is a stopping-piece 13, which when the casting-chamber is closed will stop off the side thereof opposite to the spout.

D represents a suitable pumping device, which is mounted in a melting-tank T, under which may be arranged a suitable heater G. The pumps connect by a spout S to the casting-chamber. These devices are so arranged that the cast plate P will have one of its edges p , which comes against the stopping-piece 13, cast comparatively smooth. The other edge of the plate, which comes next to the spout, will have a shoulder p' formed thereon by means of the clip c and an extending lip p^2 , which lip is formed by the edge of the clip and the extension of the spout. The edge p and the shoulder p' form working shoulders which are cast comparatively accurately and which may be used as guiding-surfaces in the further manipulation of this plate, the rough or broken edge of the plate being on the lip p^2 , which is not used. The operation of these parts is as follows: Starting with the matrix in place and with the casting-chamber closed, the pumping mechanism will be actuated to force the requisite amount of molten metal into the casting-chamber. This will force the matrix tightly against the back, so that an accurate plate will be cast. Then when the plate has been sufficiently cooled the back B will drop slightly away from the matrix. The core will then be oscillated. This core preferably has grooves formed thereon, so that the cast plate will adhere thereto. As the core is rotated the plate will be turned up and delivered from the casting mechanism. As the core rotates the matrix will unwind or strip from the same and run down over the roll v^3 , the weight W forming a device for controlling this action. Other means besides a weight—as, for example, springs—can be used to put the matrix under tension. As the core turns it will be seen that the clip c will be free to turn about its pivot, so that the same will hang down in line with the matrix when the matrix is in the position shown in Fig. 3, but that the stops 11 will bring the same back to the position shown in Fig. 9 when the box is closed. This will give access to the working edge p' of the plate. When the core has been turned about one hundred and eighty degrees, suitable lifters, as L and L', will act on the edge p and the shoulder p' of the plate and will lift the same clear of the core. The core will then be oscillated back to its original position and the casting-chamber closed, so that another plate may be cast.

A suitable conveyer or traveler H is mounted in the frame, as shown, and is so arranged that a lip h thereof will strike the rear edge of the plate and will slide the same from the position shown in Figs. 1 and 4 out over ways 14 and 15. The way 14 is preferably grooved or formed so that the plates will be accurately guided along the same. As the plate passes along these guides the type edge thereof which is to constitute the heading of the plate will be acted upon by a tool, as 16, which is set in position to just engage the type edge and preferably not to trim the entire side of the plate, as shown in Fig. 5. This tool is arranged in a suitable holder 17, which holder is mounted in a casting 18, secured to the frame A. The holder 17 has a roller 19 on the bottom thereof, which bears on one of the cams 20 21 22. These cams are preferably secured together to form one piece and are keyed to a shaft 23. A lever 24, with a suitable catch 25, is arranged to engage these cams, so that any one of the same may be slid into position to control the action of the tool 16. The operative cam will act to raise and lower the tool 16, so that as the plate P is moved past said tool the tool will follow the contour of the heading. By the term "contour of the heading" I mean the contour of the type of the plate that is to form the heading, which generally consists of the number of the page and the name of the paper and sometimes the volume and number of the issue. It is desirable in finishing plates to trim the top surface of the plate close to this matter and to trim down the surface between the page-number and the heading, so that the plate will accurately and nicely make the proper impression. These cams are arranged to trim plates with various headings. Thus, for example, in the ordinary newspaper there are three headings—the outside heading, which contains generally the name of the paper in large type and matter at each side thereof, the second page, which contains the number of the page and the heading in small type, and the third page, which contains the heading and the number of the page, but in different relative positions to that of page 2. The remaining pages are generally, so far as the lining of the headings is concerned, duplications of pages 2 and 3. Thus with three cams I can generally fulfil the requirements of the ordinary newspaper, although in some instances I provide a larger number of cams to suit the varying exigencies for headings intended for that particular paper. As the plate is moved beyond this type-edge-trimming mechanism the edge or the shoulder p^2 thereof is cut off by a saw 26. The plate is then carried by the conveyer into an arch 27, which has a back guide 28 and a front clamping-guide 30. When the conveyer has brought the plate accurately into position in this arch, the clamping-guide 30 is raised to tightly and rigidly clamp the plate in its exact position. A cutter 31 is then rotated to trim or shave

off the inside of the curved plate, so that the same will accurately fit on the printing-cylinder of the press to which the same is to be applied. Also turning with this cutter 31 are edge-trimming tools, as 32 and 33. These tools are so set as to just touch the type ends of the plate, as shown in Fig. 7, and to accurately finish or clean off any blurs or imperfections. These tools 16, 32, and 33 will thus automatically do the operations that are generally performed by hand of truing the plate up to its type edges, and thus by this mechanism I may dispense with all or practically all manual finishings of the plate. After the plate has been finished in this manner the clamp 30 is released and the plate is slid out of the arch by the next left-hand movement of the conveyer onto a suitable horse or delivery-table E by means of a gravity-pawl *h'*, arranged in the conveyer, as shown. Many suitable forms of gearing for actuating these parts may be devised. The one that I have shown is arranged to act as follows:

50 designates a shaft to which power may be applied by means of the usual tight and loose pulleys. Mounted on this shaft is a pulley 51, which connects by belt 52 to a small pulley 53, which turns a large pulley 54, which by means of belt 55 drives a small pulley 56, which communicates power by means of bevel-gears 57 and 58 to the saw 26. A worm 59 is arranged on the shaft 50 and drives a worm-wheel 590, secured to the main shaft 60 of the machine. This shaft 60, by means of gears 61, 62, and 63, drives the trimming mechanism within the arch. The shaft 60, by means of bevel-gears 64 and 65, turns a crank 66, to which is connected a sliding rack 67, which passes through a yoke 670, hung on the shaft of the pinion 68, and which engages said pinion 68. Mounted on the cam-shaft of the pinion 68 is a gear 69, which meshes with a rack 70, mounted on the back of the conveyer H, and by this mechanism the conveyer H will be reciprocated back and forth to manipulate the plate, as before described. Also arranged on the shaft 60 is a cam 71, which operates a yoke 72, which is connected to a lever 73, mounted on shaft 730, which connects by short arms or fingers 731 to control the clamping mechanism inside of the arch. A shaft 74 is driven from the shaft 60 by means of gears 75 and 76, and the said shaft carries a cam 77, which by means of suitable connections will actuate the lifters L and L' at the proper time. This gearing is substantially the same as that shown in my other application referred to and is more clearly and fully illustrated and described in said application. Arranged on the end of this shaft 74 is a cam 78, (see dotted lines, Figs. 3 and 4,) which controls and actuates a yoke 79, which connects to a pivoted segment 80, which meshes with a gear 81, secured on the core, a spring 790 being secured

to the pivoted segment 80 and to a stationary point, and by this mechanism the core will be oscillated at the proper time. This shaft 74 is geared to drive the shaft 23, which actuates the type-trimming tool by means of suitable gearing 200, as shown in Fig. 10. One member 82 of a clutch is arranged on the end of the shaft 60, and the other member 86 thereof is arranged on the end of a shaft 87, which shaft 87 is journaled in line with the shaft 60. The member 82 is keyed to the end of the shaft 60 and can slide thereon. A suitable spring 83 is placed behind the same to keep the clutch normally in engagement. The sliding member 82 of the clutch is controlled by a lever 84, which has an arm 85, which arm 85 is set in position to engage a pin 92, which may be set in different positions in a disk 91, mounted on a shaft 90, which is driven by means of a suitable worm and worm-wheel from the shaft 87. This device constitutes a suitable stopping mechanism by which the operation of the casting device will be stopped after the desired number of plates have been cast from the particular matrix then in place, the number being determined by setting the pin in the proper hole in the disk, as is fully described in said other application. The shaft 87 carries suitable cams 88, which bear on rollers 89, secured to the back B, and by this means the back is raised and lowered at the proper time. The connections for actuating the pumping device are also preferably driven from the shaft 87, as described in said other application, whereby when the clutch is disconnected automatically or otherwise the operation of the casting and pumping mechanism is stopped. This gearing is substantially that shown and described in my previous application before referred to, and I do not deem further description thereof necessary in this application.

Although I have shown my improvements applied to a machine which is entirely automatic in action, I contemplate applying them to devices which are not automatic in action, as these improvements I believe to be valuable features in any plate casting or finishing device.

Many other arrangements can be devised for carrying out the broad features of my invention, and I do not wish to be limited to the specific construction which I have shown and described.

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

1. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for opening and closing the casting-chamber, and connections to the flexible matrix for separating the same from the cast plate after the chamber is opened.

2. The combination in a stereotype-printing-plate-casting apparatus of a core, means

for moving the same, and connections for moving the matrix in harmony with the core to unwind the matrix from the cast plate.

3. The combination in a stereotype-printing-plate-casting apparatus of a core, means for moving the same, means for attaching a matrix to the core, and connections for moving the matrix with the core to unwind the matrix from the cast plate.
4. The combination in a stereotype-printing-plate-casting apparatus of a casting-chamber comprising a back and core, means for attaching a matrix to the core, means for opening the casting-chamber, means for moving the core, and connections for moving the matrix with the core to unwind the matrix from the surface of the cast plate.
5. The combination in a stereotype-printing-plate-casting apparatus of a casting-chamber comprising an oscillating core, and a hinged or pivoted back, means for attaching a matrix to the core, means for moving the back to open the casting-chamber, means for oscillating the core, and connections for moving the matrix with the core to unwind the matrix from the cast plate.
6. The combination in a stereotype-printing-plate-casting apparatus of a flanged hinged back and an oscillating core, means for oscillating the core, means for attaching one edge of a matrix to the core, a guide at one side of the box around which the matrix is led, and a take-up connected to the other edge of the matrix, whereby when the core is turned the matrix will unwind from the surface of the cast plate.
7. The combination in a stereotype-printing-plate-casting apparatus of a flanged hinged back and an oscillating core, means for oscillating said core, means for attaching one edge of a matrix to the core, a roll arranged on the end of the hinged back around which the matrix is led, and a weight attached to the matrix whereby when the core is turned, the plate will be delivered from the casting-chamber, and the matrix unwound from the surface of the cast plate.
8. The combination in a stereotype-printing-plate-casting apparatus of a back and an oscillating core, means for oscillating the core, means for securing one edge of a matrix to the core, comprising a clip pivoted to the

core, constructed and arranged to clear the plate when the matrix is unwound therefrom, and connections to the matrix for stripping the same from the cast plate as the core moves.

9. The combination of a casting-chamber, comprising a back and an oscillating core, means for oscillating the core, means for attaching a matrix to the core, connections to the matrix for unwinding the same as the core moves, and means for lifting the plate off of the oscillating core.

10. The combination in a stereotype-printing-plate-casting apparatus, means for sliding the plates therefrom, a tool set to trim the type edge of the heading of the plates as the same are delivered, and means for automatically actuating the tool.

11. The combination in a stereotype-printing-plate-casting apparatus, means for sliding the plates therefrom, a tool set to trim the type edge of the headings of the plates as the same are delivered, and adjustable means for automatically actuating the tool so that the same can be used with different headings.

12. The combination in a stereotype-printing-plate-casting apparatus, means for delivering the plates therefrom, and an automatic finishing mechanism comprising means for finishing the inner concave surface of the plate and the ends thereof.

13. The combination in a stereotype-printing-plate-casting apparatus, means for delivering the plates therefrom, automatic means for finishing the front side of the plate, and means for finishing the inner concave surface of the plate and the ends thereof.

14. The combination in a stereotype-printing-plate-casting apparatus, means for delivering the plates therefrom, automatic means for finishing the front side of the plate, means for trimming the type edge of the heading of the plate, and means for finishing the inner concave surface of the plate and the ends thereof.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

H. A. WISE WOOD.

Witnesses:

HENRY W. COZZENS, Jr.,
LOUIS W. SOUTHGATE.