

H. A. W. WOOD.

MACHINE FOR MAKING STEREOTYPE PRINTING PLATES.

APPLICATION FILED MAR. 12, 1900.

Patented Nov. 21, 1911.

26 SHEETS—SHEET 1.

1,009,206.

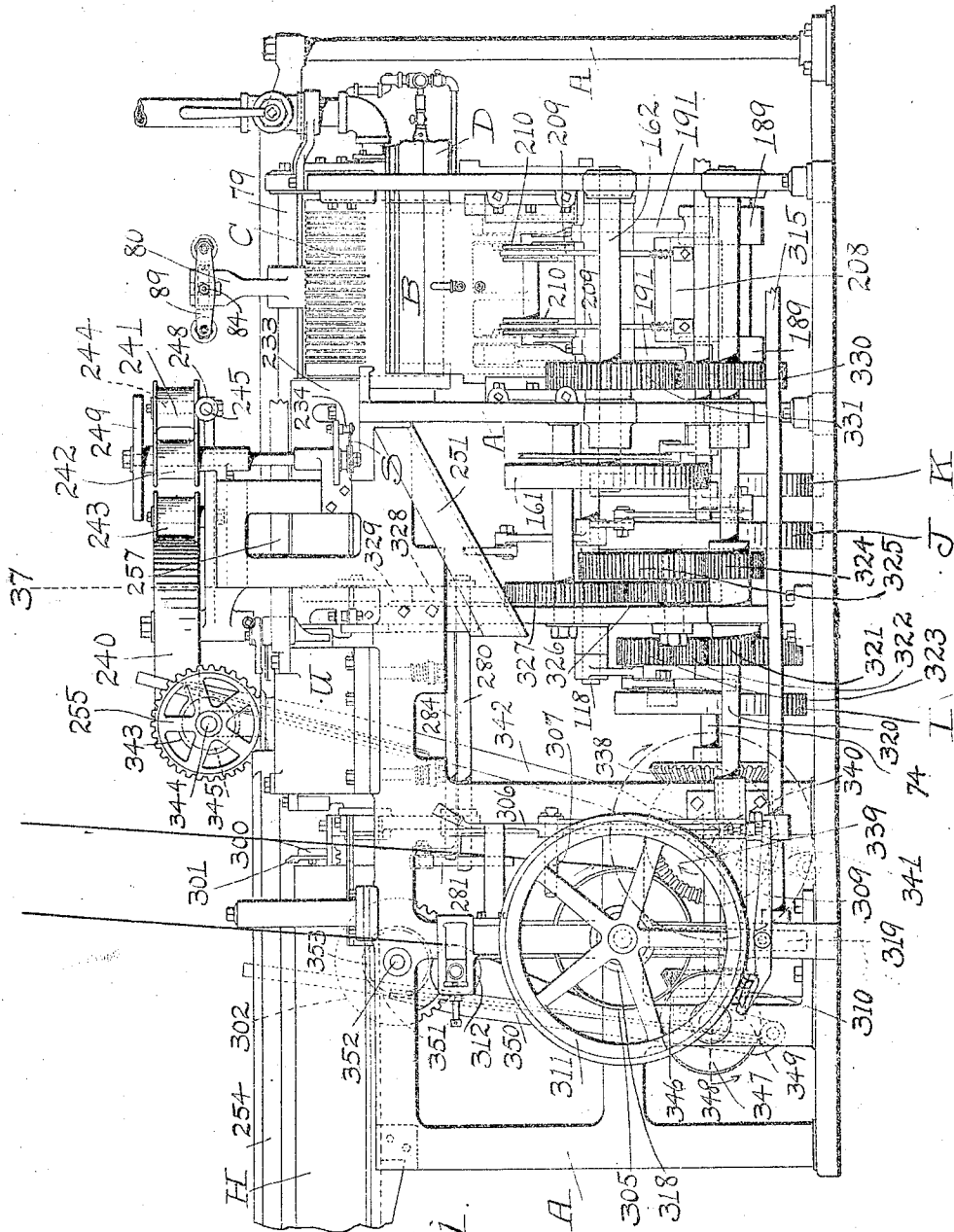


Fig. 1.

Witnesses:

G. F. Wilson.

M. C. Rogers.

Inventor:

H. A. Wise Wood.

Southgate & Southgate

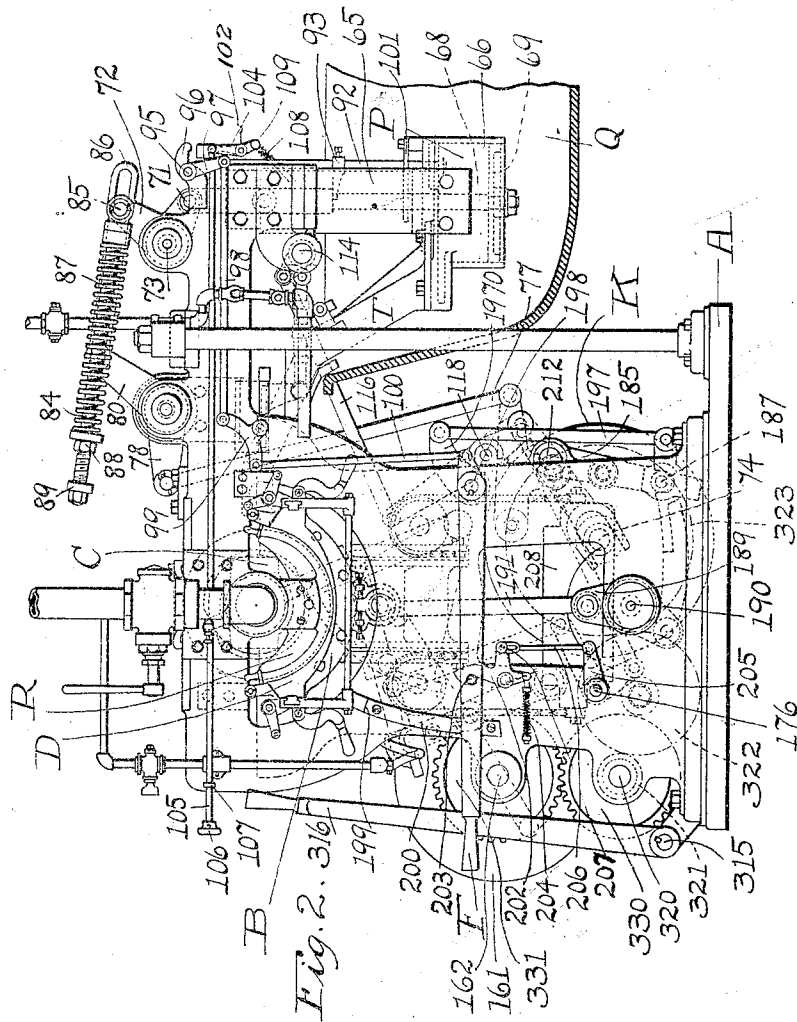
Attorneys

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26 SHEETS—SHEET 2.

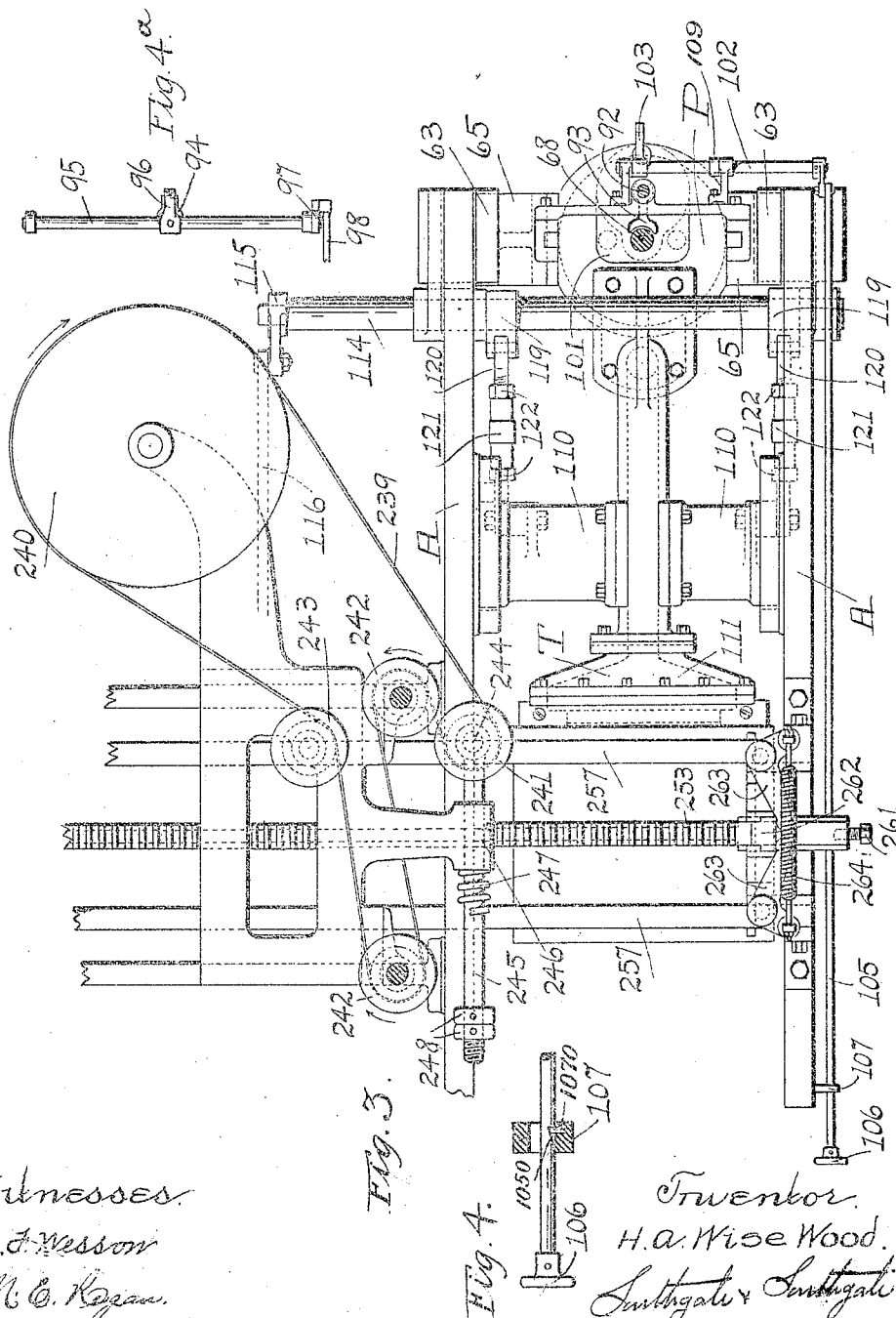


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Patented Nov. 21, 1911.

26 SHEETS—SHEET 3.



38 witnesses.
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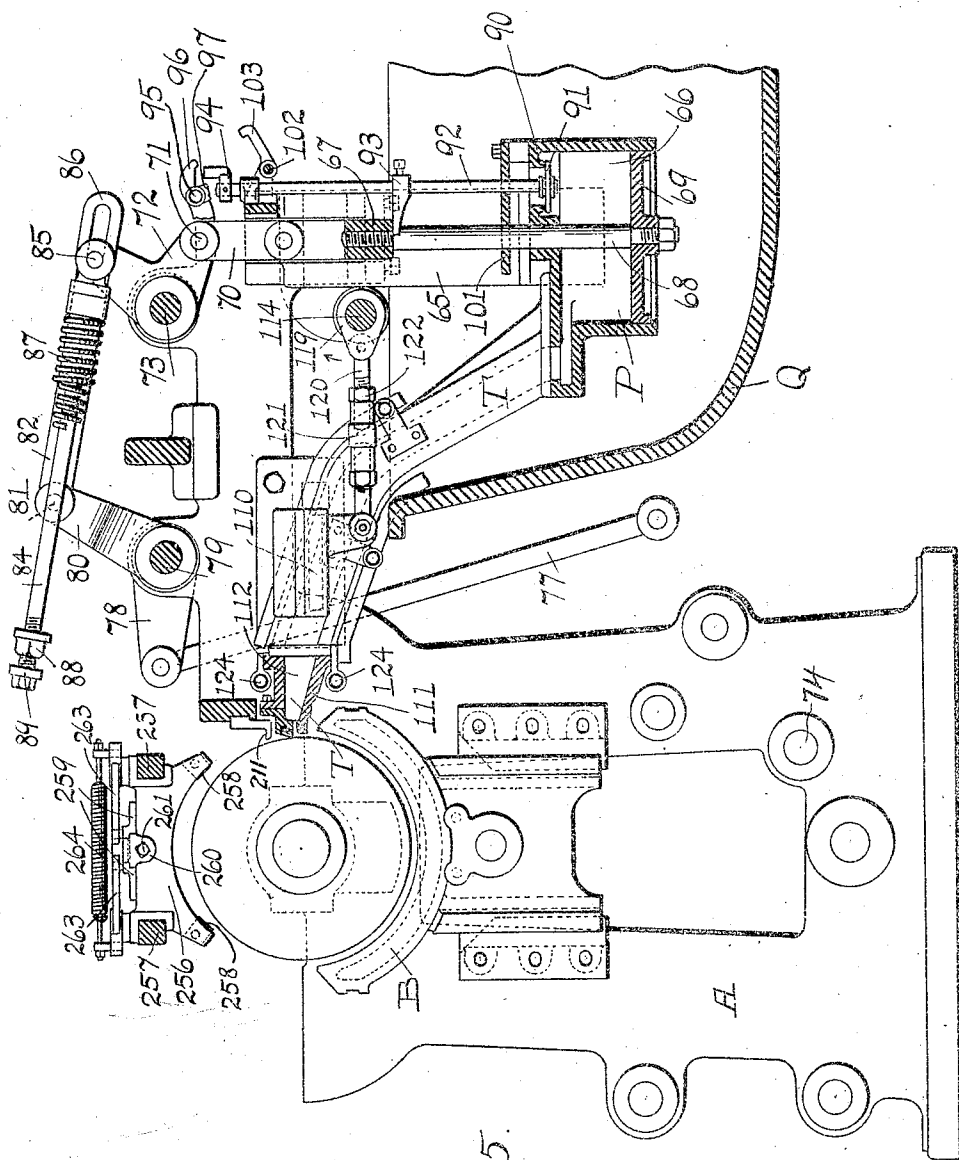


Fig. 5.

Witnesses:
C. F. Nelson.
M. C. Regan.

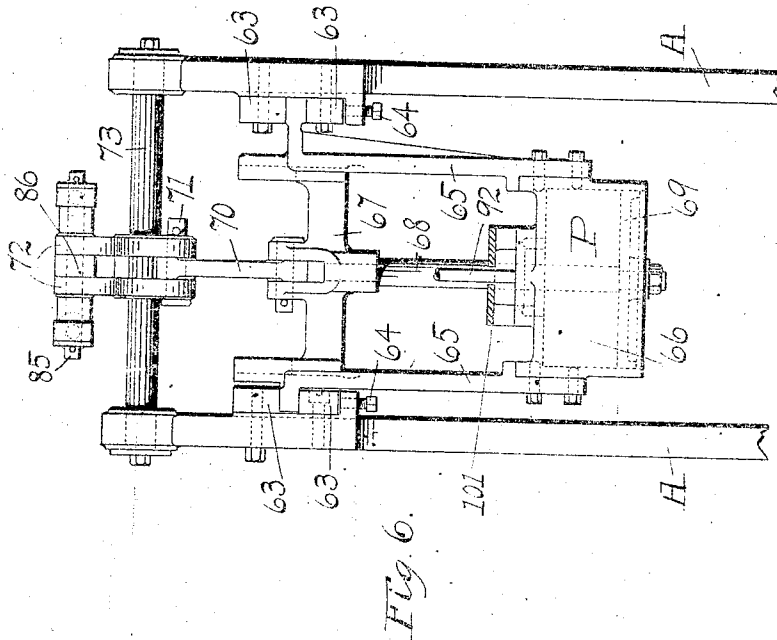
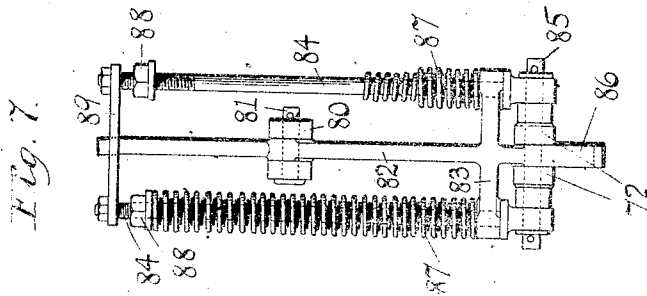
Inventor:
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26 SHEETS—SHEET 5.



Witnesses:

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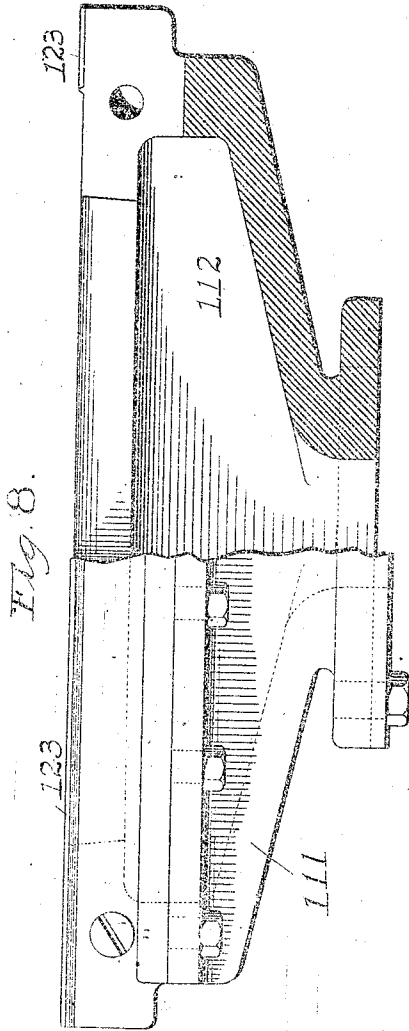


Fig. 8.

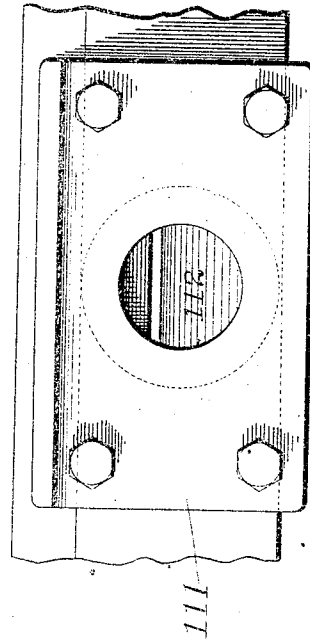


Fig. 10.

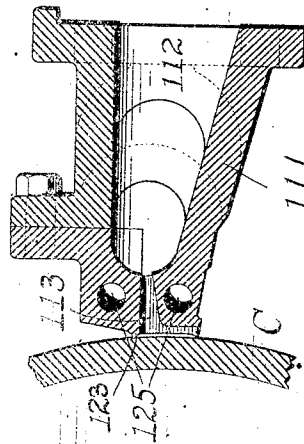


Fig. 9.

Witnesses
G. F. Nelson
M. C. Rogers

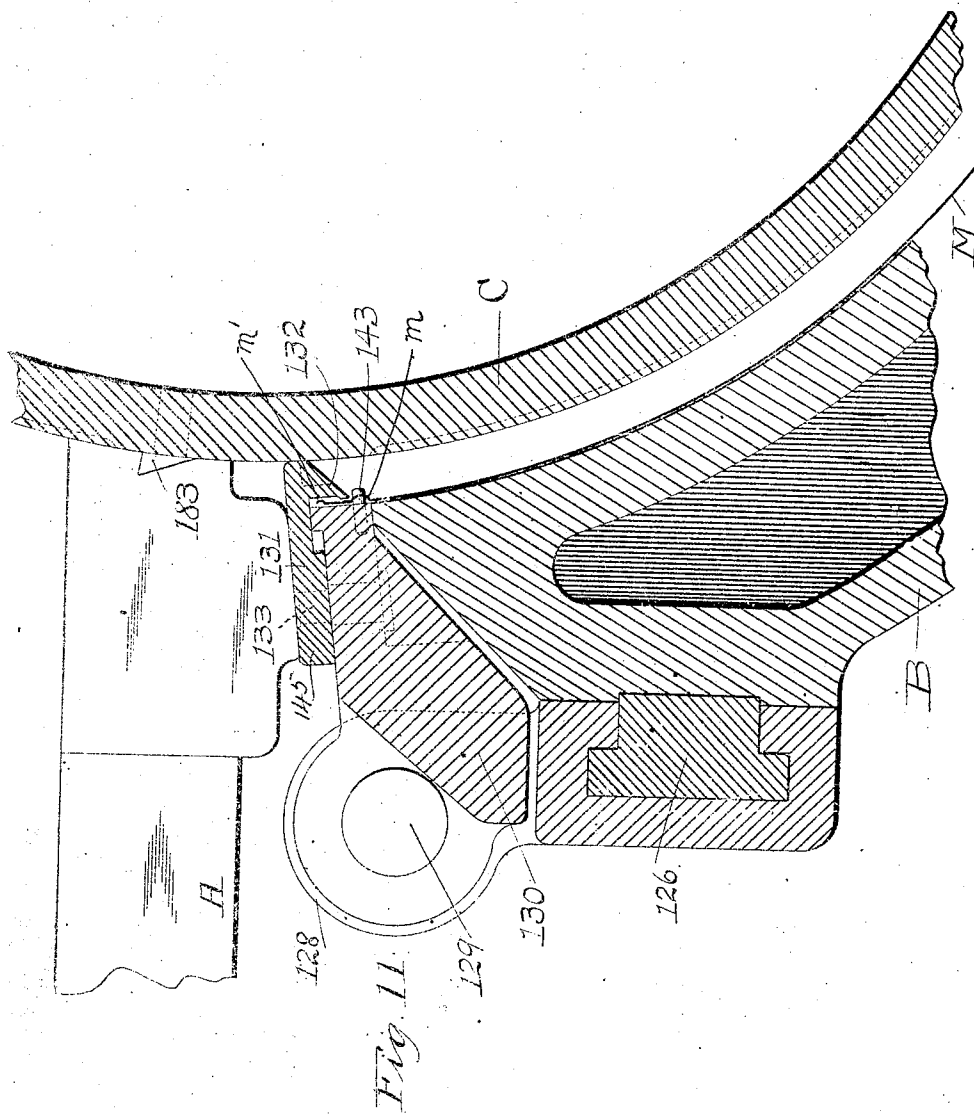
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26 SHEETS—SHEET 7.



Witnesses:
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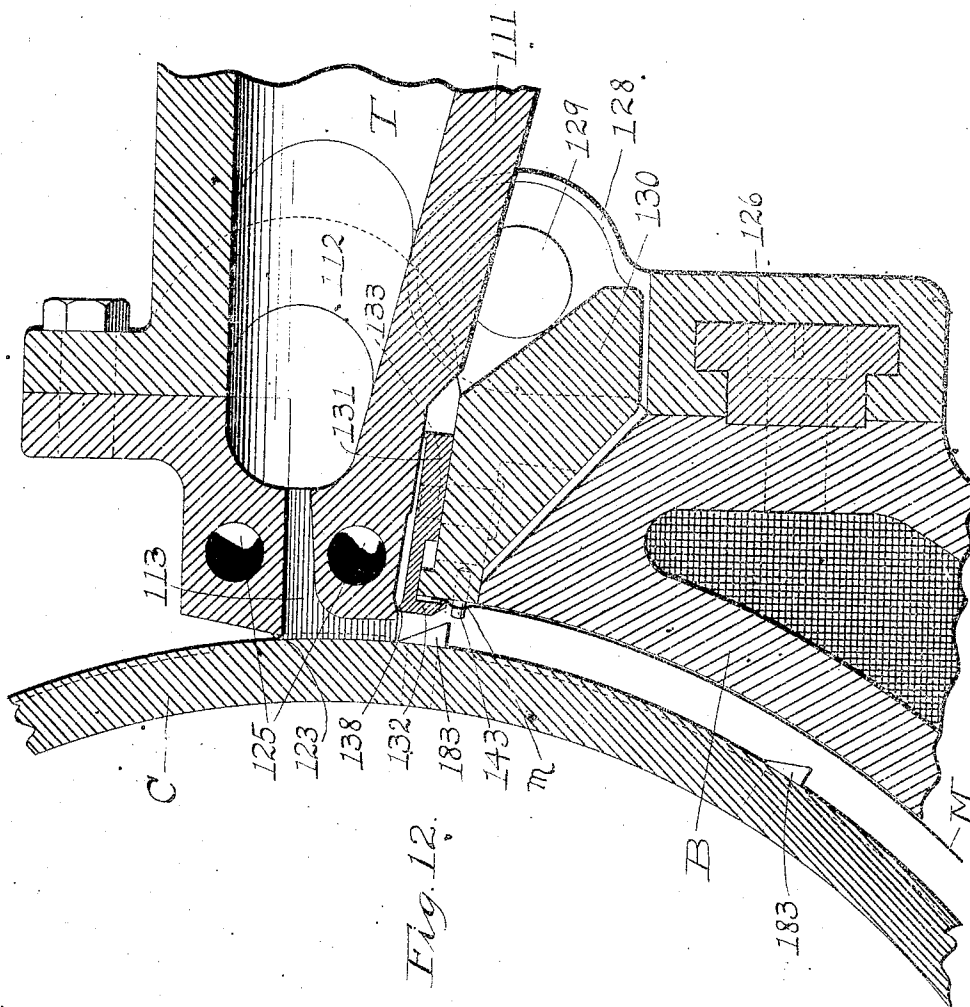


Fig. 12.

Witnesses:
C. F. Wesson.
M. C. Regan.

Inventor:
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26 SHEETS—SHEET 9.

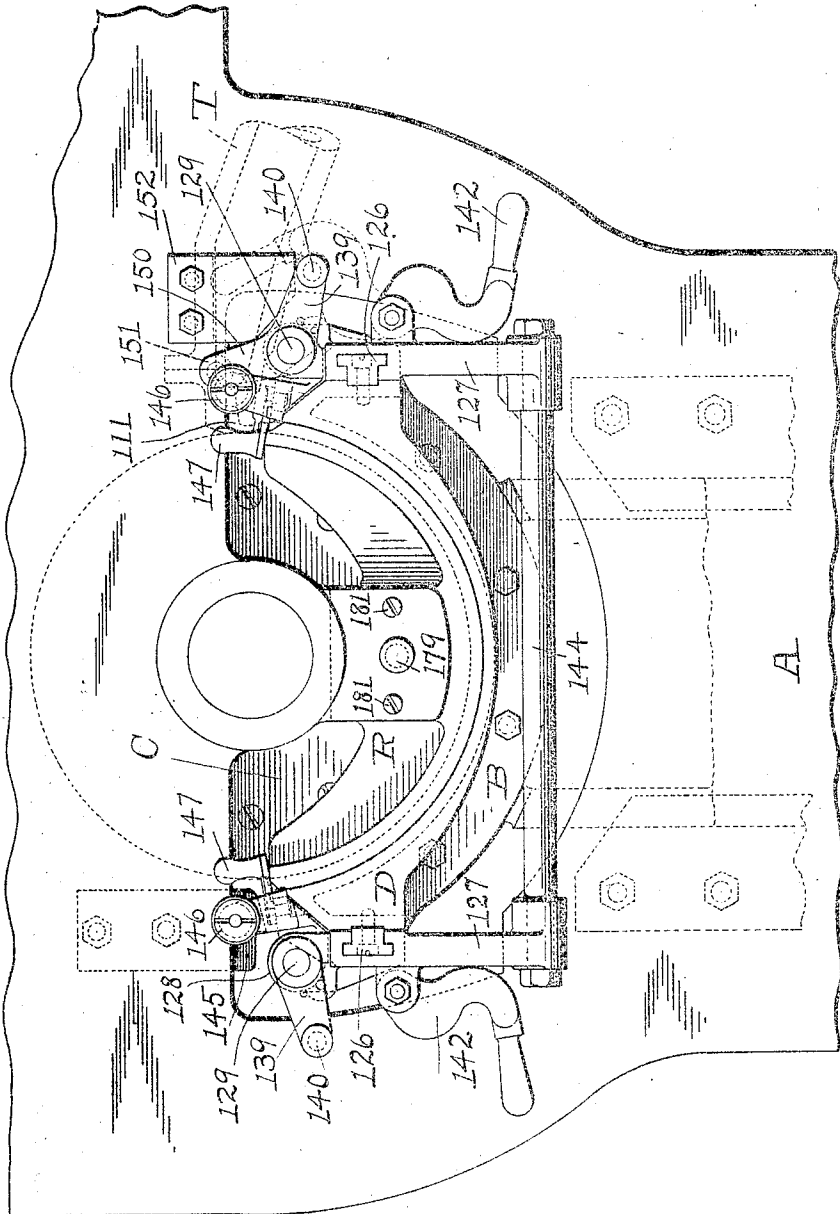


Fig. 13.

Witnesses.
C. F. Nesson.
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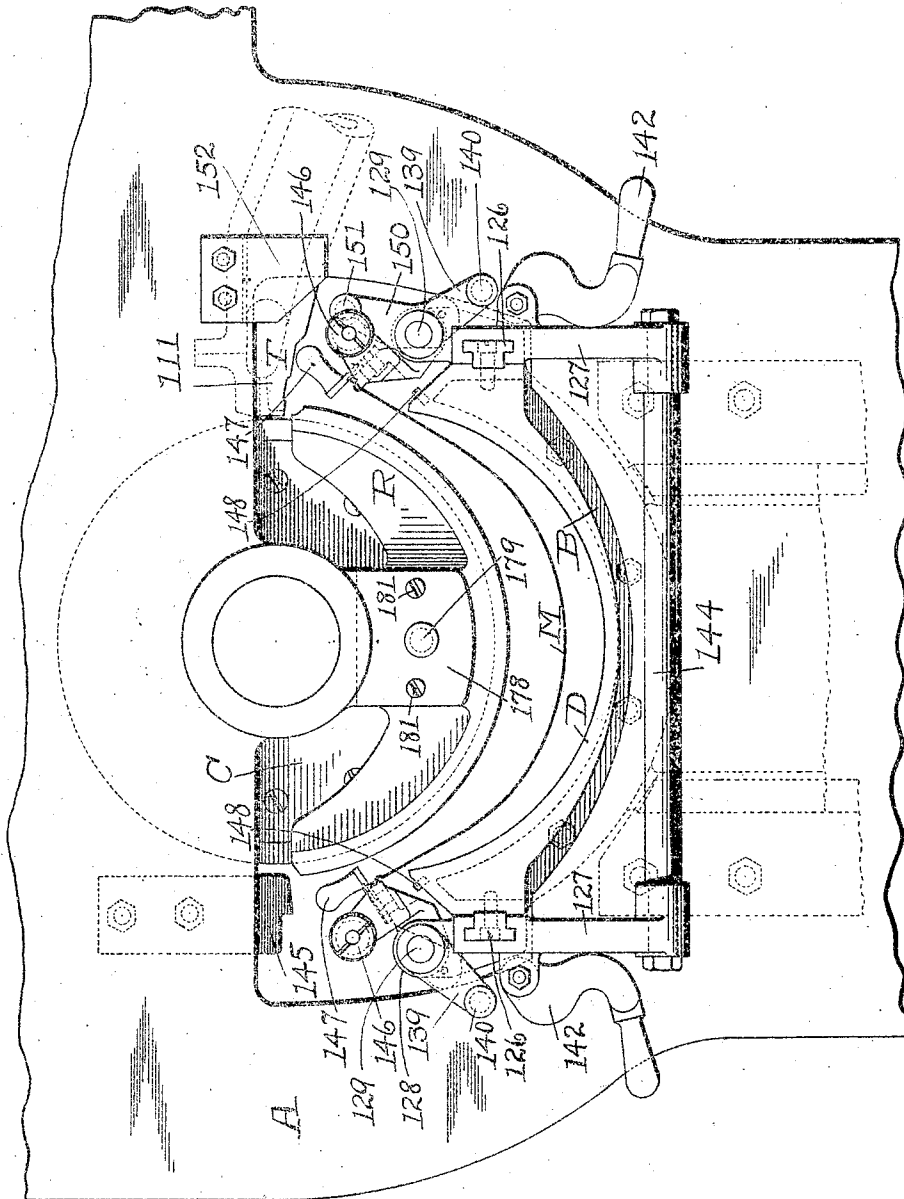


Fig. 14.

Witnesses:
C. F. Nesson.
M. C. Regan

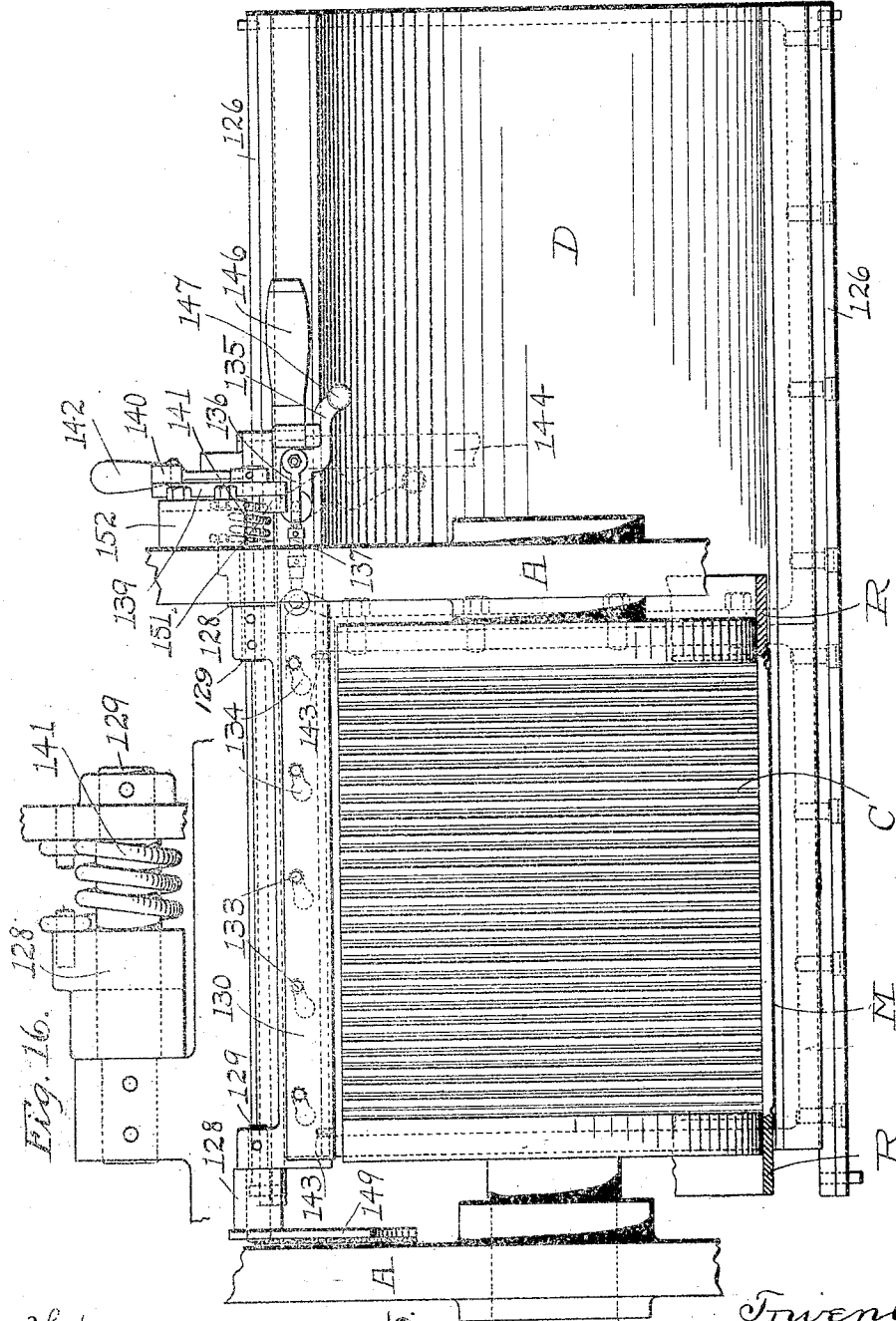
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26 SHEETS—SHEET 11.



Witnesses
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Fig. 15.

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26 SHEETS—SHEET 12.

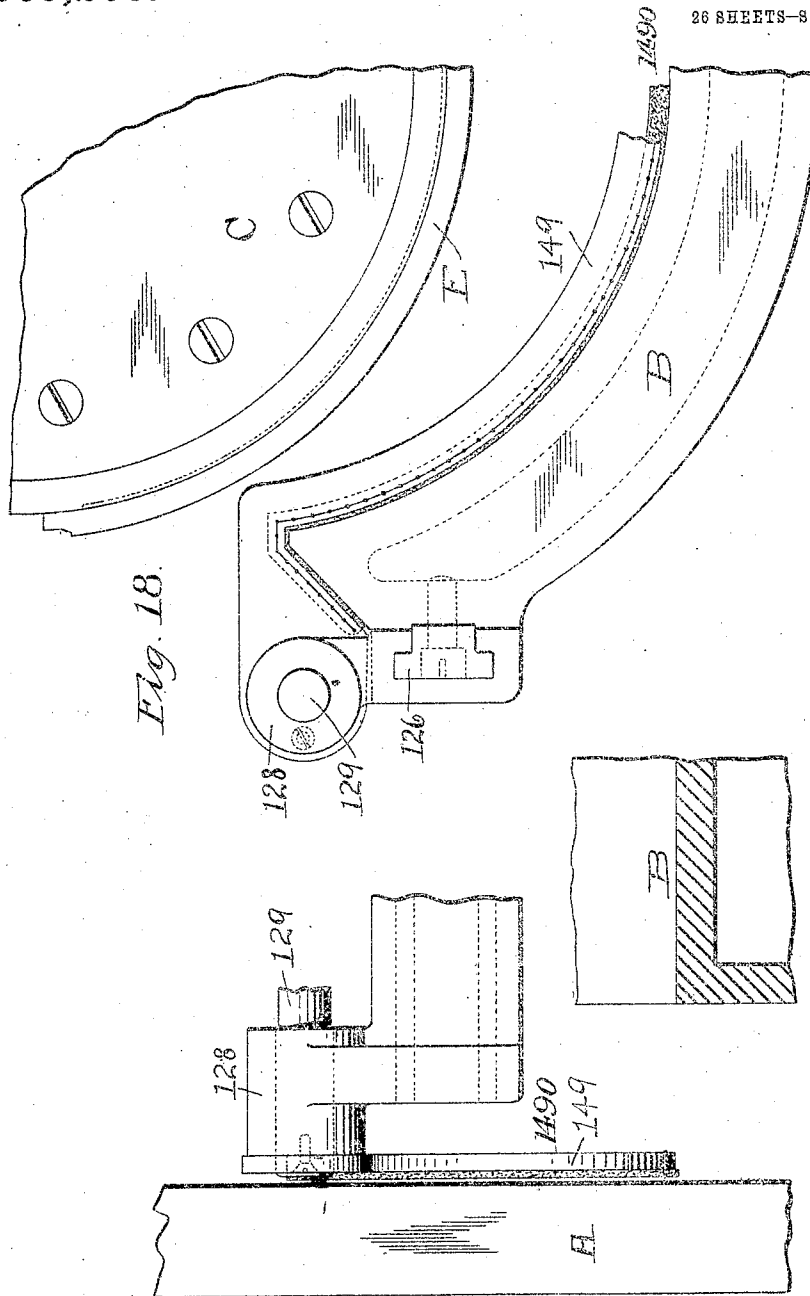


Fig. 18.

Fig. 17.

Witnesses.
G. F. Nelson.
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26 SHEETS—SHEET 13.

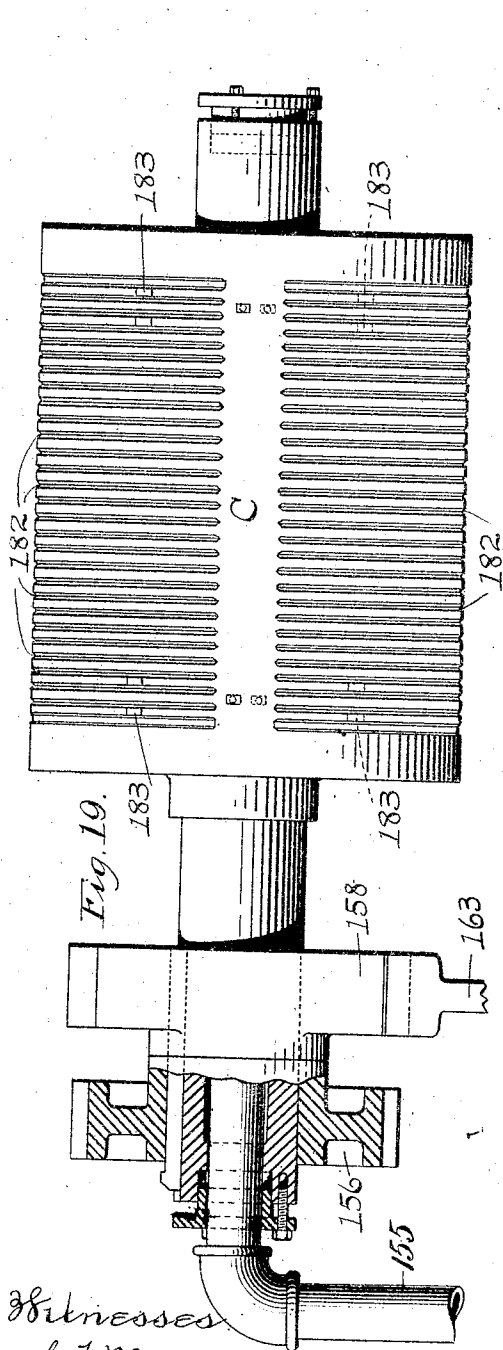


Fig. 19.

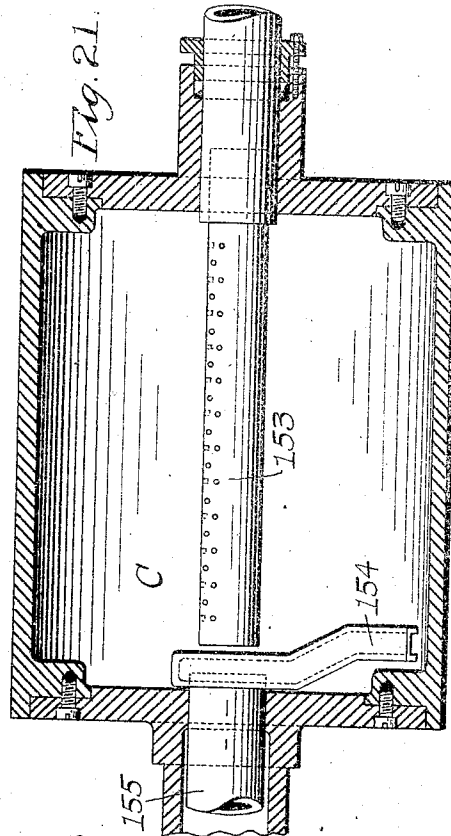


Fig. 21.

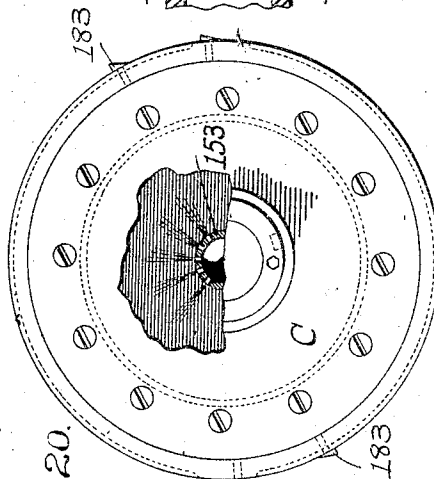


Fig. 20.

Witnesses
C. F. Nelson.
M. C. Regan.

Inventor.
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Smithgate Smithgate
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1,009,206.

26 SHEETS—SHEET 14.

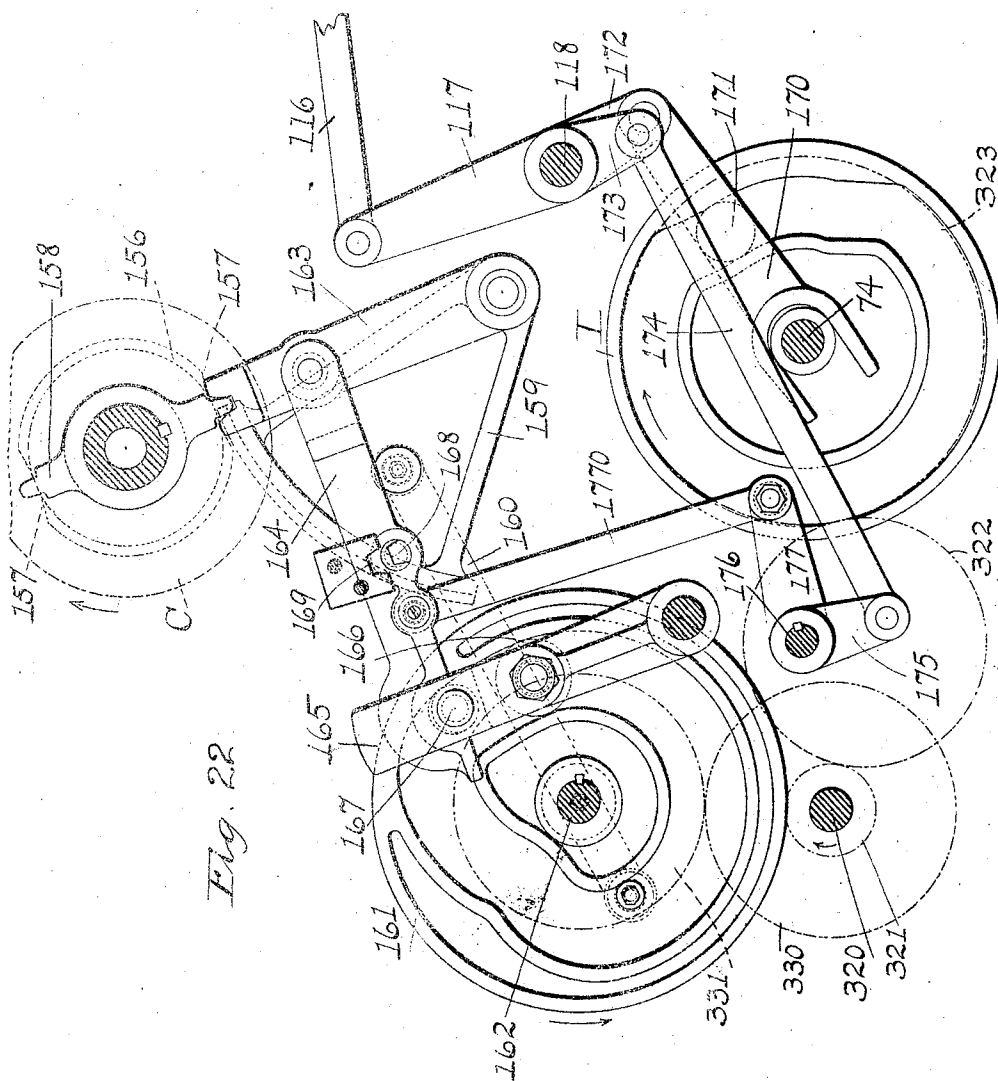


Fig. 22

Witnesses:
C. F. Pearson.
M. C. Regan.

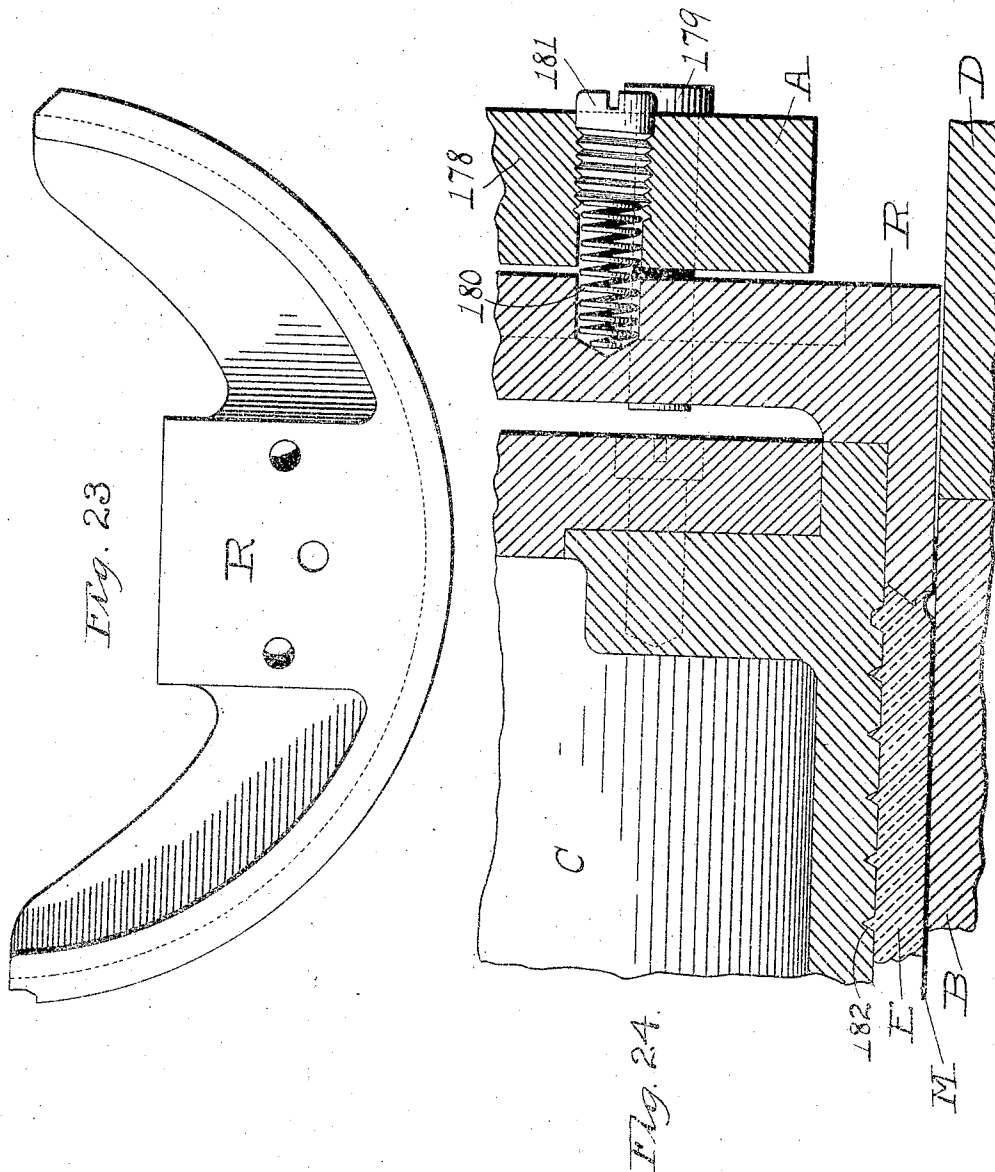
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26 SHEETS-SHEET 15.



Witnesses:
C. F. Kesson.
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26 SHEETS-SHEET 16.

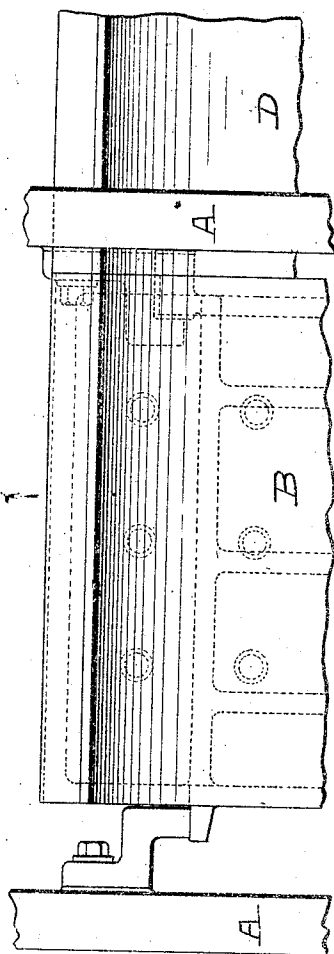


Fig. 25.

Fig. 27.

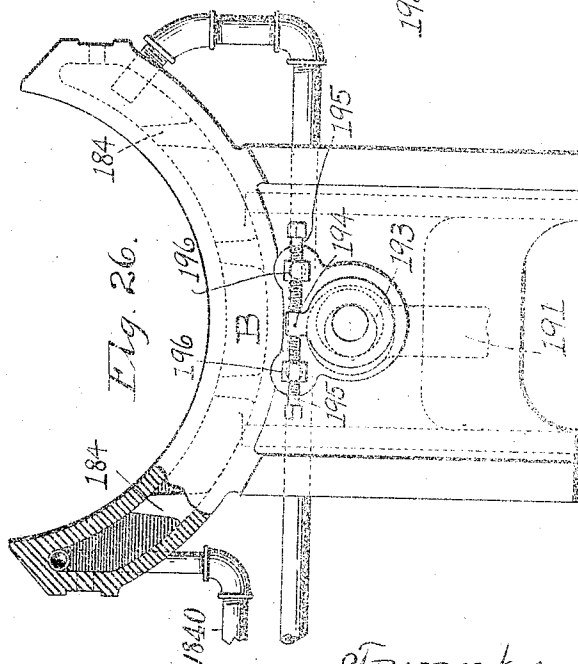
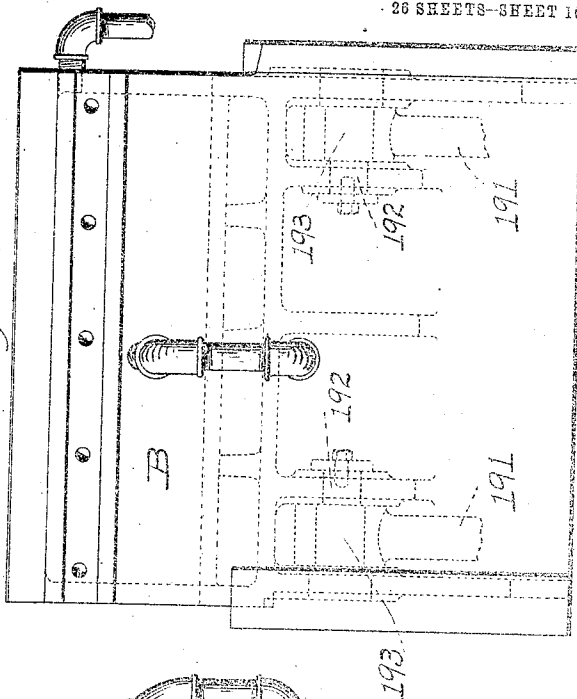


Fig. 26.

Witnesses:
C. F. Nesson.
McE. Egan.

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26 SHEETS—SHEET 17.

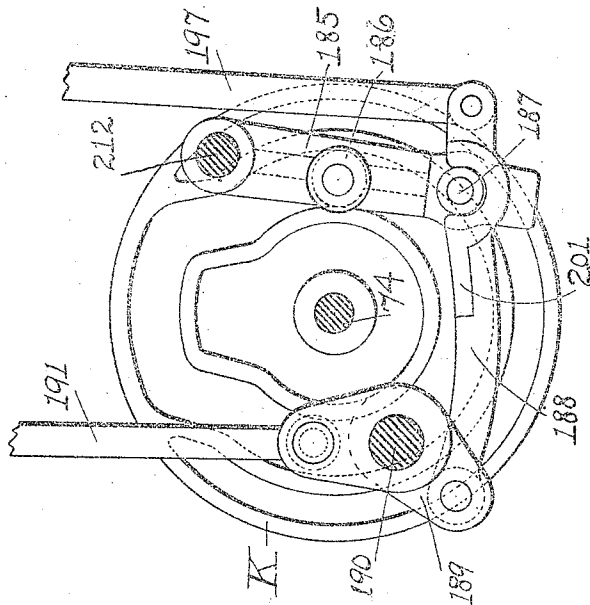


Fig. 29.

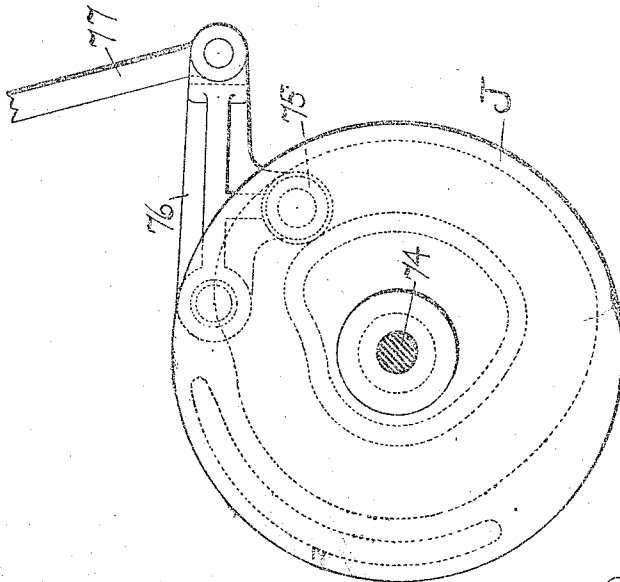


Fig. 28.

Witnesses
C. F. Mason.
M. C. Ryan.

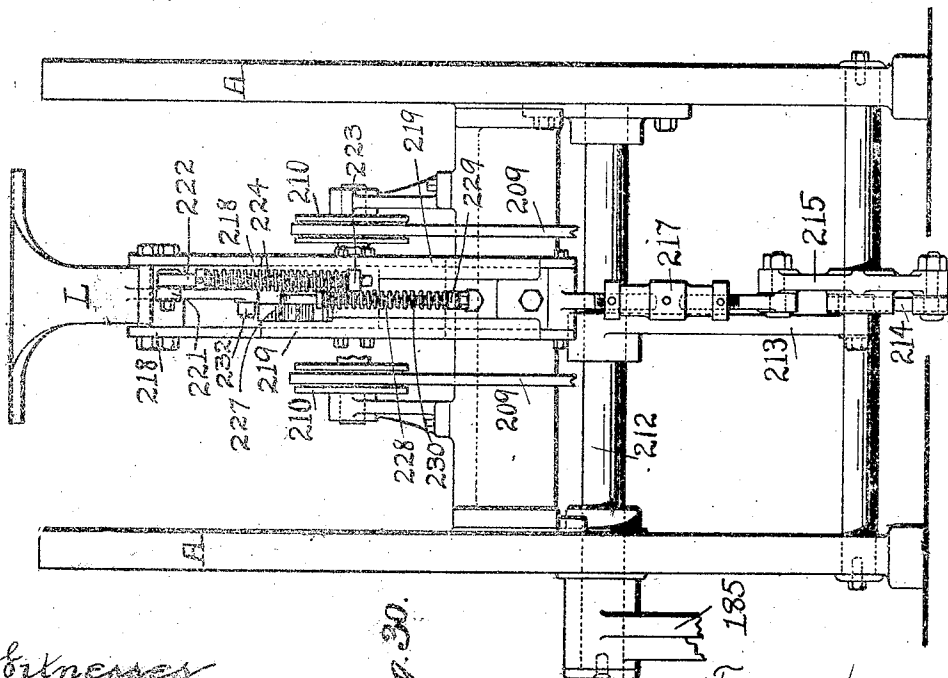
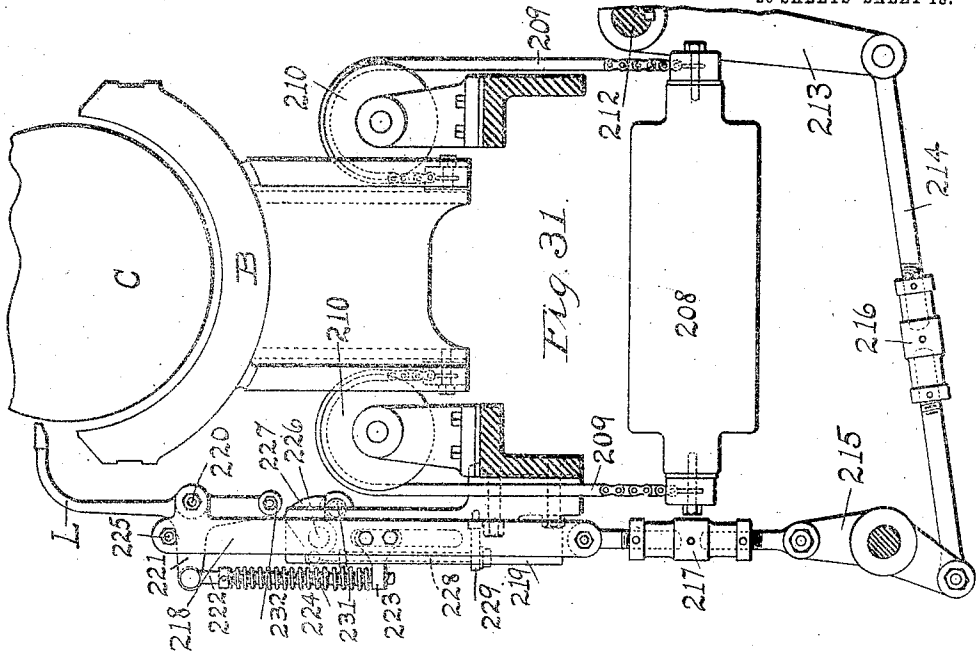
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E. A. W. WOOD.
MACHINE FOR MAKING STEREOTYPE PRINTING PLATES.
APPLICATION FILED MAR. 12, 1900.

1,009,206.

Patented Nov. 21, 1911.

26 SHEETS—SHEET 18.



Witnesses.

E. F. Nelson.

M. C. Rogers.

Fig. 30.

Inventor

H. A. Wise Wood.

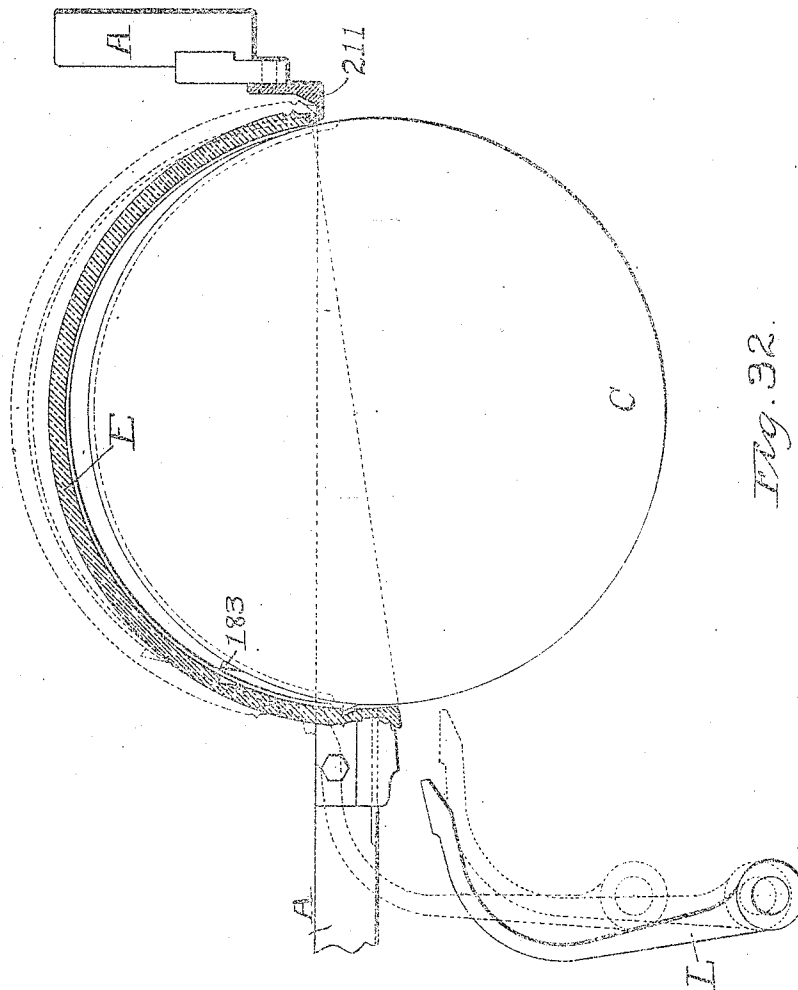
Smithgate Smithgate
Attorneys

H. A. W. WOOD.
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APPLICATION FILED MAR. 12, 1906.

1,009,206.

Patented Nov. 21, 1911

26 SHEETS—SHEET 19.

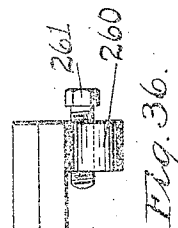
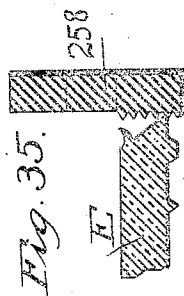
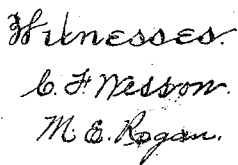


Witnesses
L. F. Nesson.
M. C. Rogers.

Inventor
H. A. Wise Wood.
Smithgals & Smithgals
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1,009,206.

26 SHEETS--SHEET 20.



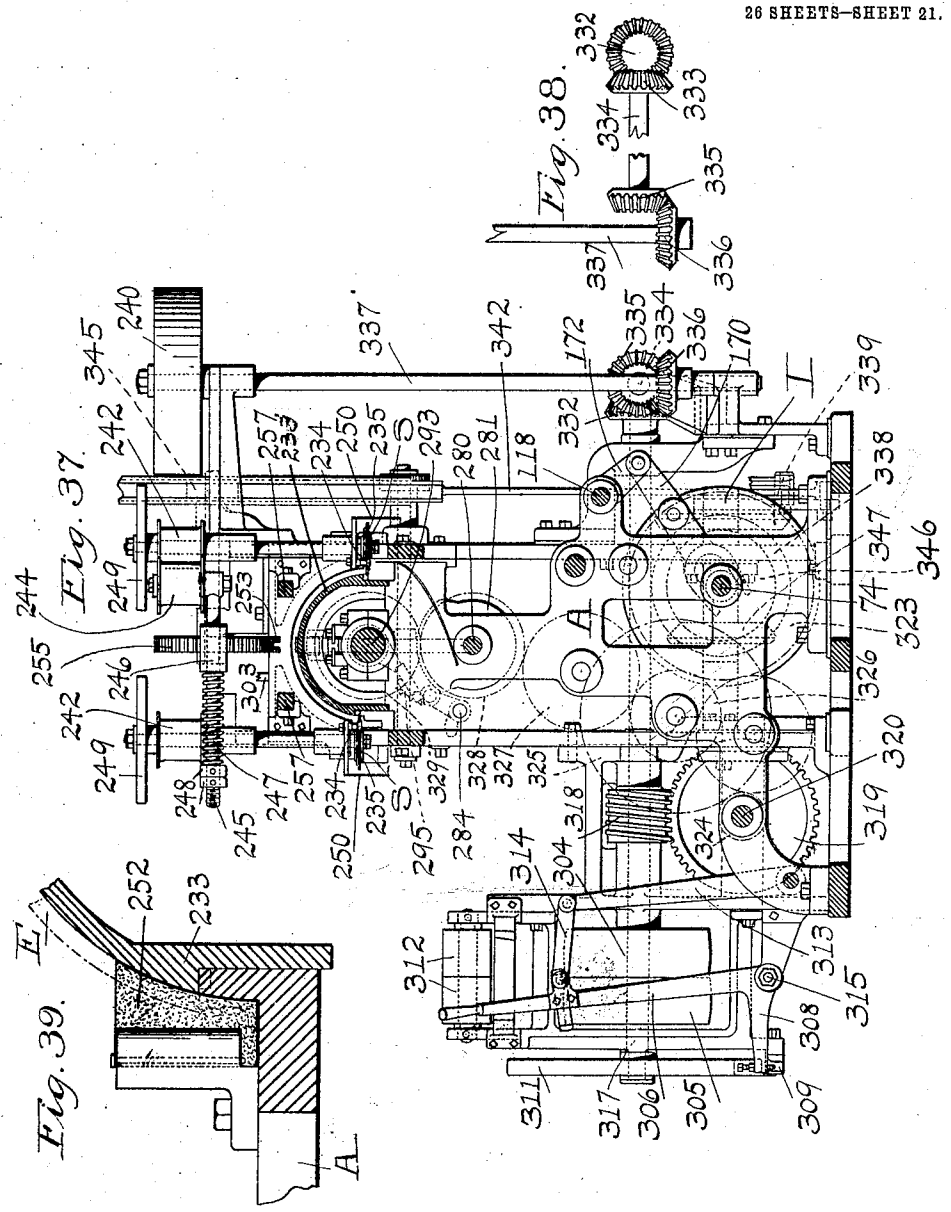
Twenty
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APPLICATION FILED MAR. 12, 1900.

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Patented Nov. 21, 1911.

26 SHEETS—SHEET 21.



Witnesses.
E. F. Messon.
M. C. Regan.

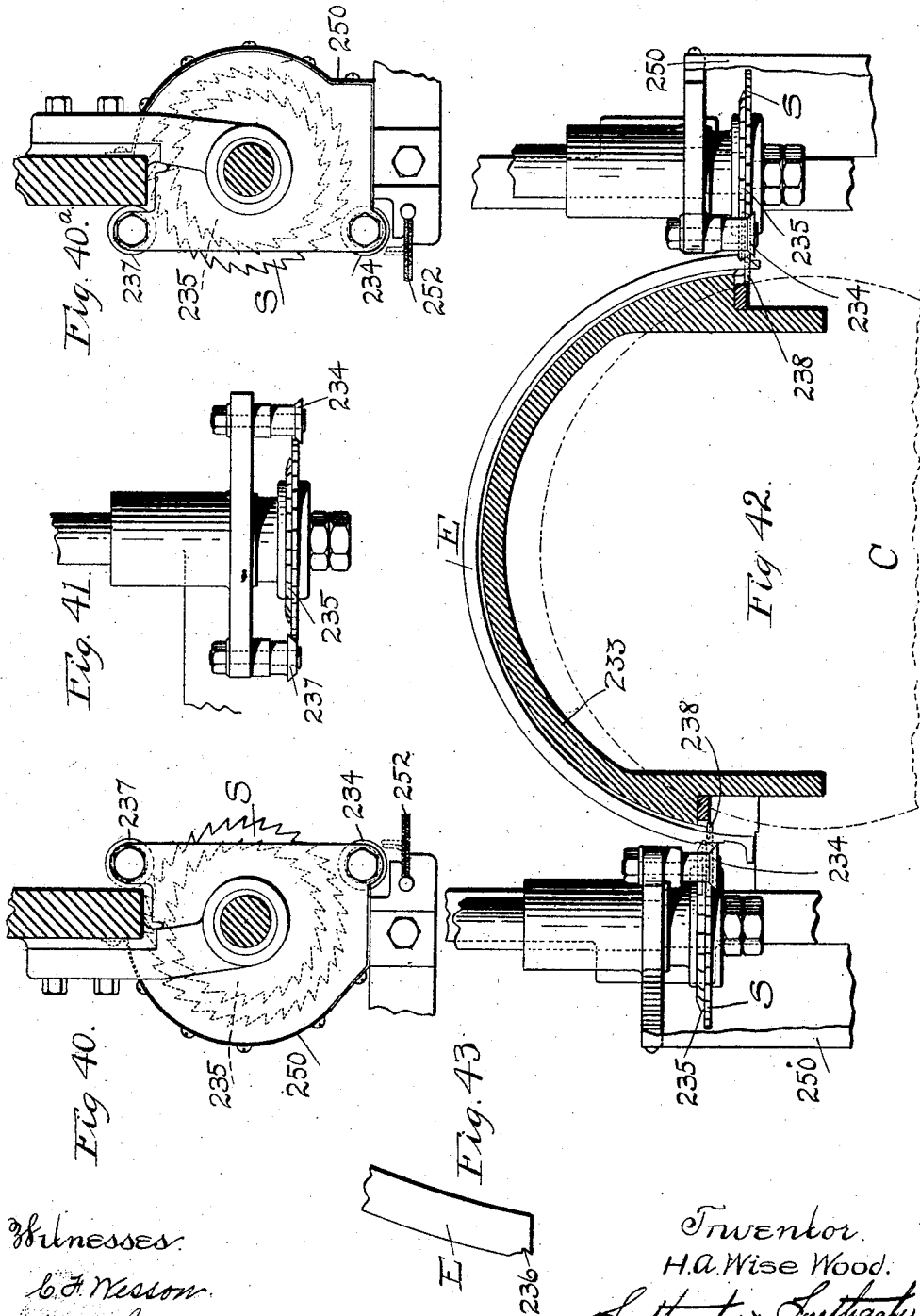
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26 SHEETS—SHEET 22.



Witnesses:
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26 SHEETS—SHEET 23.

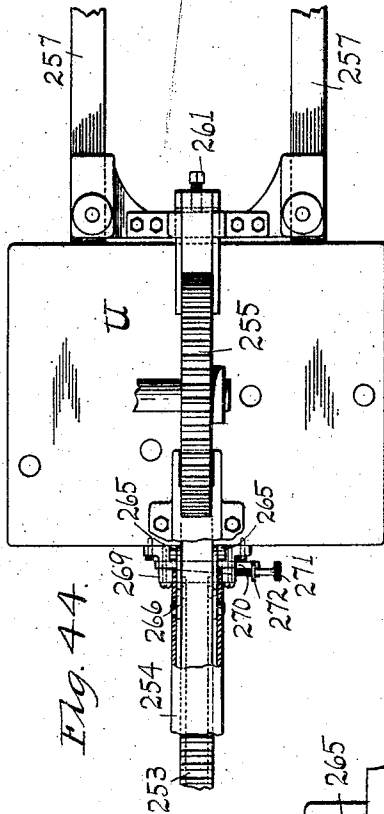


Fig. 44.

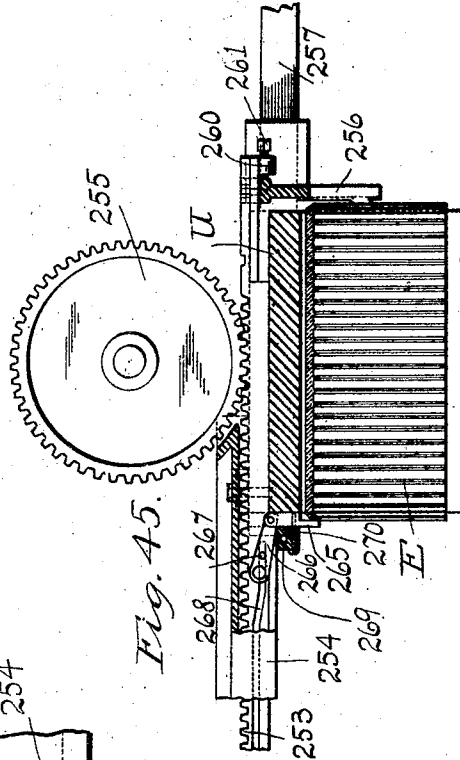


Fig. 45.

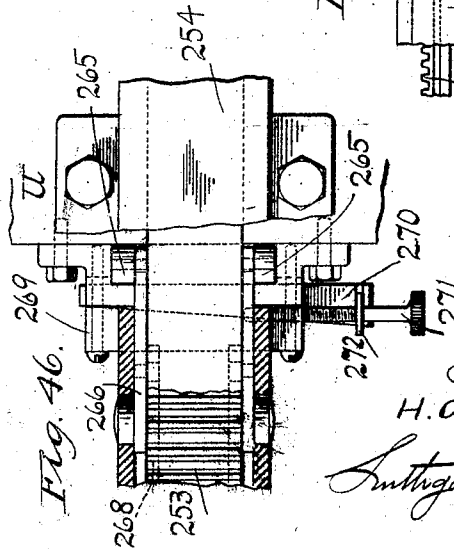


Fig. 46.

Witnesses:
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APPLICATION FILED MAR. 12, 1900.

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Patented Nov. 21, 1911.

26 SHEETS—SHEET 24.

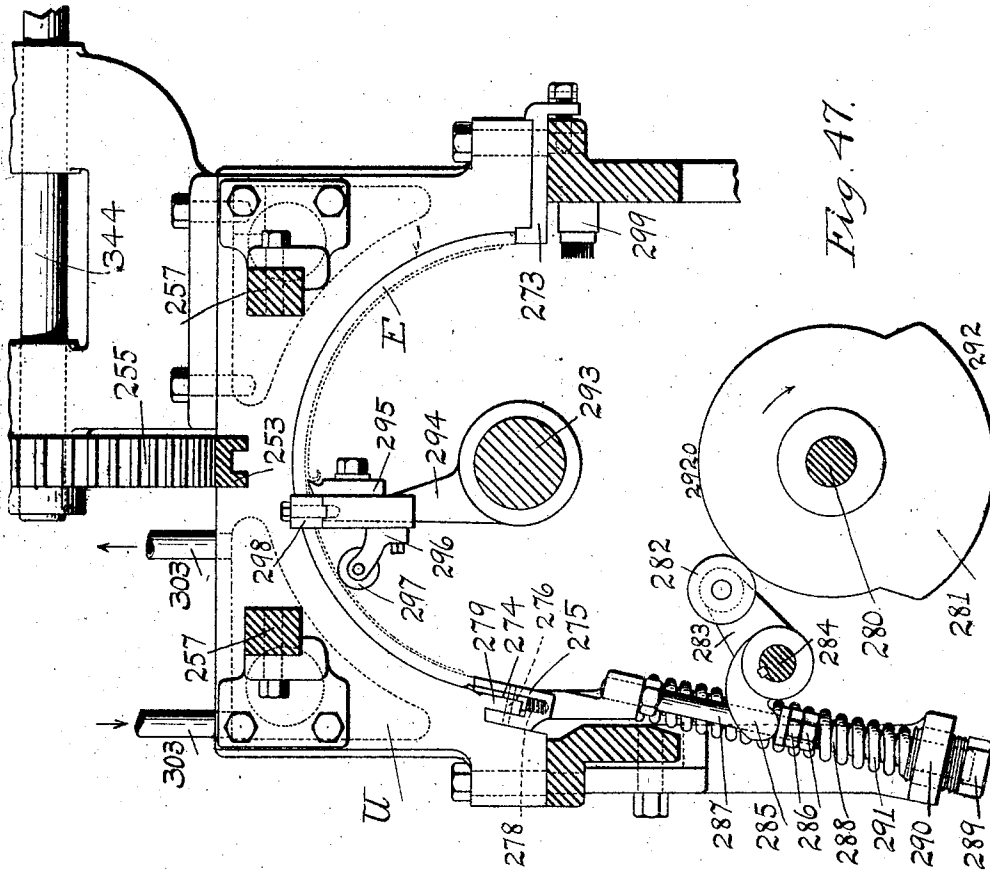


Fig. 47.

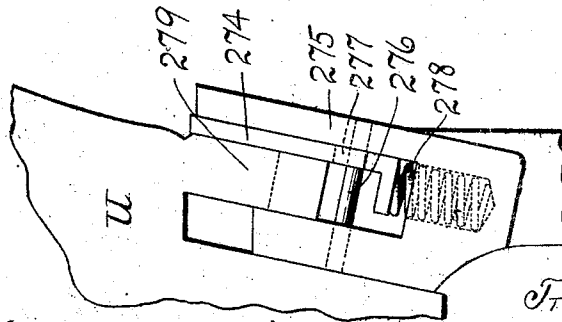


Fig. 48.

Witnesses.
C. F. Nesson.
M. C. Regan.

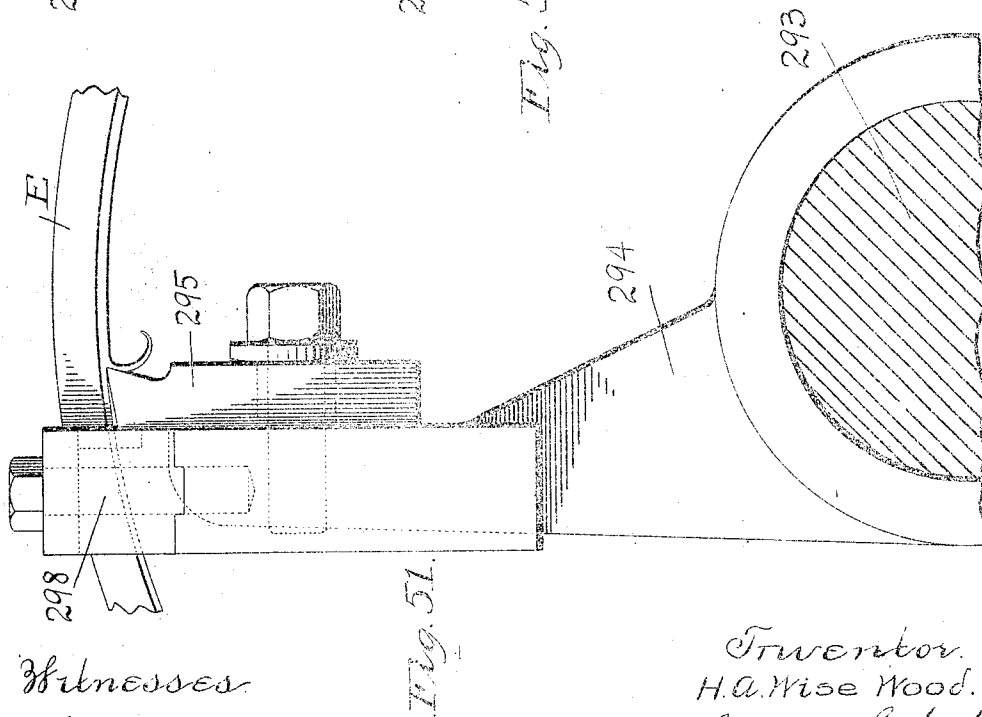
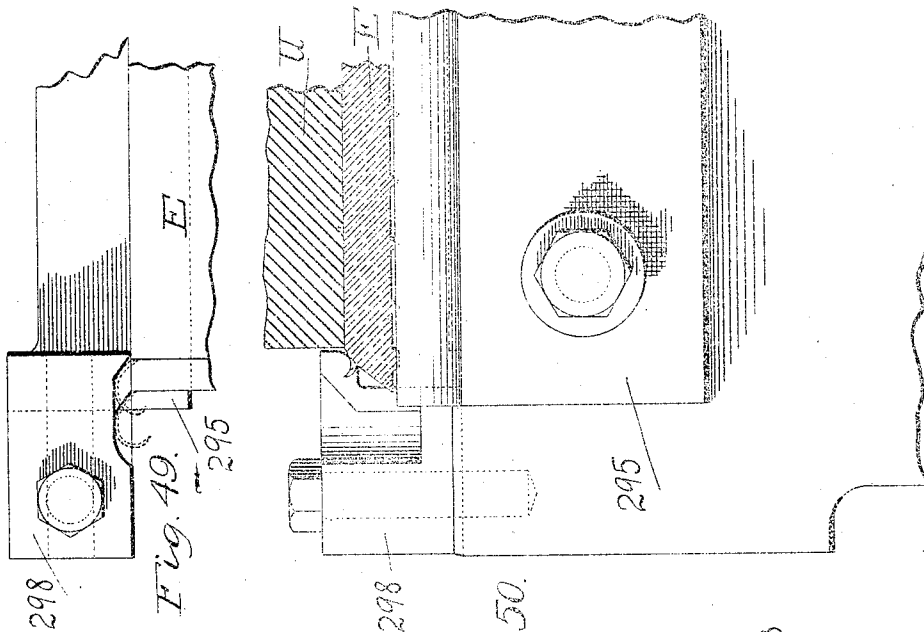
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APPLICATION FILED MAR. 12, 1900.

1,009,206.

Patented Nov. 21, 1911.

26 SHEETS—SHEET 25.



Witnesses.
C. F. Wesson.
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1,009,206.

Patented Nov. 21, 1911.

26 SHEETS—SHEET 26.

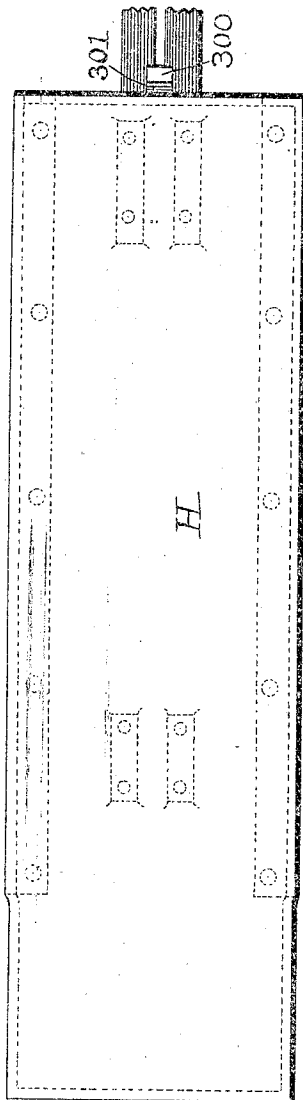


Fig. 52.

Witnesses:
C. F. Wilson.
M. C. Ryan.

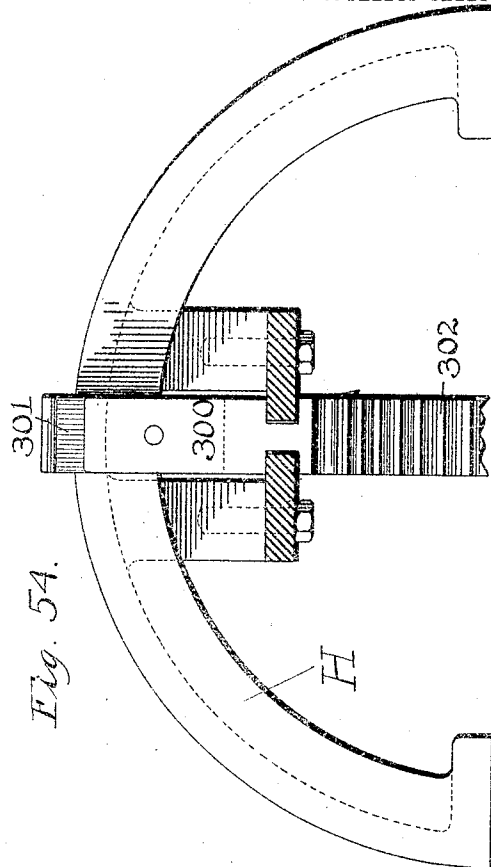


Fig. 54.

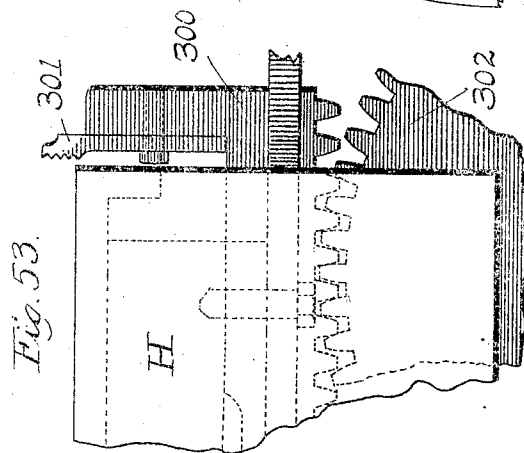


Fig. 53.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AUTOPLATE COMPANY OF AMERICA, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR MAKING STEREOTYPE PRINTING-PLATES.

1,009,206.

Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed March 12, 1900. Serial No. 8,384.

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 Machine for Making Stereotype Printing-Plates, of which the following is a specification.

The object of my present invention is to provide an improved mechanism for making stereotype printing plates.

The invention has especial reference to improving the mechanism shown, described, and claimed in an application for patent filed by me March 4, 1898, Serial No. 672,549, and to the bringing of the mechanism shown in said application up to a high state of perfection, so that the same will work at a high rate of speed in a commercial way.

A further object of the present invention is to provide safe-guards so that the operator cannot be injured by inopportune bursts of hot metal, and so that the machine cannot become clogged through momentary inattention or bungling on the part of the operator.

My present invention relates to a series of improvements in the mechanisms and structures. These can perhaps best be followed by a detailed description in connection with the accompanying twenty-seven sheets of drawings forming part of this application for patent.

Referring to said drawings, Figure 1 is a side view of the complete machine, certain details being omitted to avoid complication. Fig. 2 is an end view of the machine, the melting-pot being sectioned to allow the pump to be seen. Fig. 3 is a plan on a slightly enlarged scale from Fig. 1 of the pump and the connections therefrom to the casting chamber, and this view also shows in plan the arrangement of the belt for driving the saws. Fig. 4 is a detail view showing a locking-catch for the handle controlling the pump valve-operating connections. Fig. 4* illustrates the details of the pump-valve operating connections. Fig. 5 is a diagrammatic cross sectional view through the melting-pot showing the details of the pump and throat. Fig. 6 is a rear view of the framing in which the pump is mounted. Fig. 7 is a plan view illustrating the spring relief for

the pump. Fig. 8 is a plan view partly in section, Fig. 9 is a cross sectional view, and Fig. 10 a rear view of the nozzle at the end of the throat. Fig. 11 is a sectional view on an enlarged scale, showing the mechanism on the front of the machine for holding the matrix. Fig. 12 is a similar view of the mechanism at the rear of the machine for holding the other edge of the matrix. Fig. 13 is an end view of the mechanism for manipulating the matrix. Fig. 14 is a similar view with the parts in a different position. Fig. 15 is a plan view partly in section of the same device. Fig. 16 is a detail view illustrating the springs used in the matrix manipulating device. Figs. 17 and 18 are detail views illustrating a cleaning device used in connection with the matrix manipulating mechanisms. Fig. 19 is an elevation partly in section. Fig. 20 is an end view partly in section, and Fig. 21 a longitudinal sectional view of the core or cylinder. Fig. 22 is a detail view of the gearing or mechanism used to turn the core or cylinder. Fig. 23 is an end view, and Fig. 24 a longitudinal sectional view illustrating the way the end rims are arranged. Fig. 25 is a partial plan view, Fig. 26 an end view partly in section, and Fig. 27 a side elevation of the segmental back. Fig. 28 is a detail view of the pump-cam. Fig. 29 is a detail view of the cam used for raising and lowering the segmental back, and for operating the lifter. Fig. 30 is a front view, and Fig. 31 an end view partly in section, illustrating the construction of the lifter and the mounting of the segmental back. Fig. 32 is an enlarged sectional diagrammatic view illustrating the action of the lifter. Fig. 33 is a plan, and Fig. 34 an end view of the sliding rack-bar and head for moving the plate forward. Fig. 35 is a detail showing the engaging piece on said head. Fig. 36 is a detail showing the adjusting screw thereof. Fig. 37 is an end sectional view taken on the line 37-37 of Fig. 1 showing the arrangement of gearing and saws. Fig. 38 is a detail of the gearing. Fig. 39 is a detail view of the flexible means used to prevent the saw-dust from flying back into the casting chamber. Figs. 40 and 40* are plan views of the saws. Fig. 41 is a side view of one of the saws. Fig. 42 is a cross sectional view illustrat-

ing the position and arrangement of the saws. Fig. 43 is a detail of the plate showing the way the same is finished or trimmed by the saws. Fig. 44 is a plan, and Fig. 45 a sectional elevation illustrating the stop used to position the plate in the arch. Fig. 46 is a plan partly in section on an enlarged scale illustrating the adjusting mechanism for the stop. Fig. 47 is a cross sectional view illustrating the clamping mechanism for holding the plate in the arch. Fig. 48 is a detail of the spring clamping jaw. Fig. 49 is a plan, Fig. 50 a front elevation, and Fig. 51 a side elevation of the finishing tools. Fig. 52 is a plan, Fig. 53 a partial side elevation, and Fig. 54 a rear elevation of the delivery stand and second conveyer.

I have found in developing the machine shown and described in said application for patent that a number of improvements were necessary to bring the mechanism up to the highest state of commercial efficiency. The improvements shown, described and claimed in this application have accomplished that end.

The problem of making an automatic machine for producing stereotype printing plates is a complex and intricate one. This is due to several causes, among which may be noted the following: First; it is to be noted, that the plate which has to be cast is comparatively a large body, the size of a newspaper page, weighing perhaps forty or fifty pounds, and therefore it is very difficult to cast and tool the same in the short time that can be given for this purpose. Second; another cause which complicates the problem is the fact that the plate has to have its type surface cast from a matrix, which is a very delicate papier-mâché or similar sheet. Third; another cause which complicates the problem is the fact that the papier-mâché sheet, or matrix, has to be removed or stripped from the surface of the cast plate without injury to itself, so that a number of successive casts, sometimes up to one hundred, can be made from the same matrix, and, fourth, another cause which complicates the problem is the fact that the plate has to be finished very accurately so that the same will fit truly on the cylinders of the printing press, and so that the finishing tools will come up, to the type edges, but still will not affect the same. When it is considered that all these operations have to take place in one mechanism, and when it is considered that I have brought the mechanism up to such efficiency that it will cast, finish, and deliver complete plates ready for immediate use at the rate of four per minute, the complexity of the problem which I have solved can well be understood.

Prior to the time of my inventions, the art of making stereotype printing plates had always been practiced by hand. That is,

although tools and appliances were used for making the plates, they were essentially hand-operated devices, in which the various manipulations and setting of the parts depended upon the hand and eye of the operator. These operators were necessarily skilled men, who were paid high wages, and had to serve long apprenticeships before they were efficient. By my invention, as shown and described in my application for patent, and as developed by the improvements shown and described in the present application, this has been eliminated. I have produced what I believe to be the first automatic machine for making, as well as the first combined machine for making and finishing curved stereotype printing plates, and I have changed the art from being essentially an art practiced by hand, to an art which is practiced by machinery, thus not only eliminating the great cost of making the plates, but making the plates in a very much shorter time than was before possible. This latter point is one of essential vitality to newspaper publishers who desire to keep their forms open to the last possible minute for the insertion of the latest items of news.

The mechanism in its general features comprises a melting pot from which metal is taken by a pump and forced into a casting chamber formed by the annular space between a cylindrical core and segmental back. After the plate has solidified the segmental back drops and the flexible matrix is stripped from the type face of the cast plate. The core then turns to deliver the plate from the casting chamber. The plate is then lifted from the surface of the core; a conveyer then moves the plate past two saws to true up its side edges into an arch in which it is clamped so that a rotating knife can shave out the inside of the plate. Another conveyer then moves the plate out onto a delivery horse.

Referring now to the drawings I will describe the detail improvements which form the subject matter of this application.

A designates a suitable framing; B designates the segmental back, and C the core or cylinder. The annular space between the back and core forms the casting chamber.

Q designates the melting-pot. The same consists of a large cast-iron reservoir which is arranged over a grate formed in a suitable furnace. This furnace is made of such capacity that a large body of metal can be kept in molten condition, and at the right temperature in the reservoir. A single pump P is mounted in the melting-pot, and the same is arranged to act as a lifting pump to lift the molten metal from the melting-pot over into the casting chamber.

The framing A which extends out over the melting-pot, is provided with suitable

guides 63. These guides are secured to the framing by screws, and the lower guides may be adjusted vertically by means of set screws 64. See Fig. 6. Fitting in these guides are frames 65 which can slide back and forth therein. The pump cylinder 66 is carried by these frames. Fitted in these frames is a slider 67, secured to which is the piston-rod 68 on the end of which the piston 69 is arranged. A link 70 is attached to the slider 67 by pin 71. The other end of the link is secured to the double-pronged bell-crank lever 72 which is pivoted on shaft 73 secured in the framing A.

The pump-cam J is shown in Fig. 28. The same is arranged on a cam-shaft 74, which shaft is continuously rotated by the gearing hereinafter described. Engaging the groove of the cam is a roller 75 mounted on a lever 76 pivoted on a stationary stud. This lever 76 connects by link 77 to an arm 78 mounted on a shaft 79 journaled in the framing A. This shaft 79 has secured on the same a pronged lever 80, so that said arm 78 and said pronged lever 80 substantially form a bell-crank lever. Said pronged lever 80 is connected by pin 81 to a spider 82 which has extending arms 83 which are fitted on draw-bars 84, the ends of which draw-bars are fitted on a pin 85 passing through the double armed bell-crank lever 72. (See Fig. 7). The end of the spider is extended to form a yoke 86 which is fitted on said pin 85. Double springs 87 are arranged on the draw-bars, as shown in Fig. 7, the spring on the right-hand draw-bar being broken away to show the construction. Double springs are used to get a powerful push. The ends of the draw-bars 84 are screw-threaded, and fitted on the same are suitable nuts 88 by which the tension of the double springs 87 can be adjusted. The ends of the draw-bars are connected together by a suitable tying piece 89. By this arrangement an accurate spring relief will be provided. As the link 77 is pulled down by the cam, the spider 82 will be moved to the left, as shown in Fig. 5. This will cause the spider to push on the double springs on the draw-bars, and therefore the bell-crank lever 72 to rock and lift the pump piston 69 with a spring tension. This upward motion of the piston will lift the molten metal from the melting-pot over into the casting chamber. By adjusting the nuts 88 the pressure put upon the metal by the piston can be regulated, so that any desired pressure can be obtained in the casting chamber. By providing the spider 82 with the yoke 86 fitting on the pin 85, any tendency of the spider to cramp on the draw-bars will be eliminated.

The pump cylinder 66 is provided with an orifice, surrounding which is a valve seat 90. Engaging this valve seat is a valve 91 which

forms an induction valve for the pump. This valve is arranged on the end of a rod 92 fitted in a suitable bracket or brackets. An adjustable arm 93 is arranged on the valve rod in position to be struck by a stop on the pump piston, which stop may be formed by the lower part of the slider 67. By this arrangement the valve will be positively opened to allow the metal in the throat T to come down to the level of the metal in the pot Q as the piston 69 reverses at its lowermost point of travel, thereby insuring among other things, a continued molten condition of the metal lifted into the throat which did not reach the casting chamber on the previous stroke of the piston. It also will be noticed that this valve controls the action of the pump. That is, if this valve should be held open, the molten metal will flow in and out of the pump cylinder without being raised in the throat as the piston operates. Connections are carried to this valve from the mechanism which controls the action of the casting mechanism, preferably from the mechanism which actuates the segmental back, so that the valve will be held open and the pumping action stopped when the casting mechanism is thrown out of operation, so that the pump can only act when the casting chamber or mechanism is in operation. These connections are as follows:—A rigid dog or collar 94 having a projecting arm is fitted on the end of the valve rod 92. A small shaft 95 is arranged in suitable brackets, and the same carries a finger 96 which can strike on the said projecting arm of the dog 94. A lever 97 is arranged on the end of the shaft 96, and connects by link 98 to a pivoted bell-crank lever 99, which latter connects by link 100 to the starting and stopping lever F. By this arrangement when the lever F is raised to stop the operation of the parts which form the casting chamber, the valve 91 will be held in its open position, and the pumping action will be thereby stopped, although the pump-piston will continue to work. A muffler 101 is placed over the valve to prevent the molten metal from spouting up in the pot. Another small shaft 102 is journaled in suitable brackets, and the same carries a locking-arm 103 which may be snapped over the dog 94. On the end of this shaft is a lever 104, connected to which is a rod 105 having a knob 106. The rod extends through a suitable guide 107, and is provided with a notch 108 which may engage a pin 109 in said guide, so that the rod can be held in its innermost position. A compressed spring 108 is arranged between a stationary part and a small lever 109 on said shaft 102 so as to force the locking-arm normally to engage the dog 94. By these connections the operator can hold or set the valve in its open position, and thus render the pump inoper-

ative in case it is desired to have the casting mechanism go through its operation without receiving a charge of metal; as for example, when it is desired to position and

5 adjust the parts thereof.

The throat T connects the pump cylinder 66 with the casting chamber. The throat consists of a hollow casting secured on the pump cylinder as shown. This throat is 10 carried by suitable supports 110; the ends of which are fitted to slide in guides secured to the frame A. The throat terminates in an enlarged nozzle or mouth 111, which has a chamber 112, leading from which is an 15 outlet passage 113 which properly directs the molten metal into the casting chamber. See Figs. 9 and 12.

114 designates a shaft which is journaled in the framing. On the end of this shaft is 20 arranged a lever 115 which connects by link 116 to a lever 117 mounted on a shaft 118, as shown in Fig. 22, which latter has a slight oscillating movement by means hereinafter described. On shaft 114 are arranged short 25 levers 119 which connect by links 120 to ears on the supports 110, see Fig. 5. The links 120 are made in two parts, and are screwed together by turn-buckles 121 which have the 30 usual check-nuts 122 so that said links are adjustable. By this mechanism, the throat, and thereby the pump, will be moved back and forth a short distance. The movement of the pump will not interfere with the 35 mechanism which actuates the pump-piston, as the motion will be taken care of by the link 70. This mechanism is so timed that the throat will press tightly against the cylinder or core during the casting or charging operation, and so that the throat in its other 40 position will clear the small sprue which forms on the edge of the plate or cast and which projects slightly into the throat. By moving the throat backward to clear this sprue, the plate can be delivered from the 45 casting chamber as hereinafter described. The adjustable links are provided so that the action of the throat can be accurately adjusted.

The nozzle of the throat is provided with 50 knife edges 123, see Figs. 9 and 12, where it bears on the cylinder or core, so that it will come to a tight joint with the cylinder during the casting operation, regardless of the small pieces or flakes of metal that may be 55 in the way. If such small pieces or flakes of metal impede its closing against the cylinder, the knife edges will cut through the obstructions and the throat will come to a tight bearing.

60 Suitable gas piping 124 is arranged so that the throat which projects up from the melting-pot can be kept hot by means of suitable gas flames.

One or more holes 125 are cored or bored through the top and bottom lips of the throat

nozzle near the cylinder. The object of this is to prevent the cylinder cooling the molten metal contained in the throat at the rear of these holes. Thus a natural cut-off is secured without the use of mechanical devices 70 or packing.

The segmental back B is provided with an extension D in line therewith. This extension is semi-cylindrical in shape, and of the same diameter as the back, and its purpose 75 is to aid in the insertion, registration, and removal of the flexible matrix M. Secured on the edges of the back and said extension are T-shaped guides 126. Fitted on these guides are slides 127. See Figs. 13-18. 80 Projecting up from these slides are ears 128 which carry shafts or studs 129, secured on which are the matrix clamping or holding devices for holding the edges of the flexible matrix. Each of these holding devices con- 85 sists of a bar 130 and a clamping strip 131 having a lip or ear 132 extending over the edge of the bar. Each clamping strip carries studs 133 which engage inclined slots 134 in the bar, so that by sliding the strip on the 90 bar, the lip 132 will be moved powerfully away from or toward the bar. To move the strips in this way, a lever 135 is pivoted on each bar and connects to its respective clamping strip by a link 136. Each link 136 95 is made in two parts, and is provided with an adjustable turn-buckle 137 for adjusting the action. The levers and links are so arranged as to have a toggle action, whereby, when the clamping strip is moved to clamp 100 the edge of the matrix, each lever will cause the link to pass slightly over the pivot point of the lever and thus to lock the clamping strip, see Fig. 15.

The matrix M is molded so as to have 105 bolsters or circular grooves *m* near its edges, and an additional lip or bead *m'* at one edge. One of the matrix holding devices, preferably the one at the front of the machine, is arranged to have the clamping 110 strip thereof bear on the matrix between the bolster and said lip with a slight tension, as shown in Fig. 11. The other clamping strip is preferably arranged to nip the 115 edge of the matrix tightly as shown in Fig. 12. By this arrangement there will be a slight lost motion between the matrix and the front matrix holding device, whereby as the plate solidifies and shrinks the matrix 120 will move with the plate without being put under tension, and whereby when the molten metal is next forced into the casting chamber, the matrix edge will return to position and conform to the segmental back again. 125 The lip or bead *m'* prevents the matrix from altogether leaving the front matrix holding device when the stripping action occurs.

The rear clamping strip 131 is provided with a lip or projection 138 which strikes 13

against a small inclined shoulder on the throat, which will allow a relief as the back commences to drop.

Each stud or shaft 129 nearest the levers 135 is extended through the ear 128, and secured on each shaft is a lever 139 which has a roll or pin 140. A spring 141 is arranged between each of said levers 139 and ears 128. Each spring is fitted on pins projecting from these parts, as shown in Fig. 16. Each spring is arranged so as to lift the matrix clamping device and normally hold the same in its raised position.

Each slide 127 has a projecting ear, pivoted on which is a cam-handle 142, each of which is arranged to engage one of the rolls 140, whereby by lifting the same, the matrix clamping devices can be brought to the positions they assume when the box is closed, and each locked by one of the cam-handles in such position as indicated by dotted lines in Fig. 13. Each bar 130 is provided with registering pins or gages 143, so that the matrix can be accurately set in position longitudinally of the slides. The slides 127 are connected together by a rod or bar 144 so that they will be constrained to move together.

The parts are so positioned that as the segmental back rises to close the casting chamber, the rear matrix clamping or holding device will strike on the throat and will be brought down tightly on top of the segmental back B, as shown in Fig. 12.

The framing is also provided with suitable steps or projections 145, so that as the segmental back rises to close the casting chamber, the front matrix holding or clamping device will be brought down tightly on the top of the segmental back, as shown in Fig. 11. The front clamping strip 131 closes the front edge of the casting chamber, as shown in said Fig. 11.

The way the matrix is inserted or changed is as follows:—The casting mechanism is stopped with the segmental back B in its lowermost position. The slides are drawn out so that the matrix clamping devices will come over the extension D, by handles 146 provided for this purpose. The parts will then substantially assume the position shown in Fig. 14. The matrix holding devices are then opened by operating the levers 135 which have suitable handles 147 for this purpose, so that if a matrix is in the machine, the same can be removed. The cam-handles 142 are then raised so that the pivoted matrix holding or clamping devices will be brought to the positions they assume when the segmental back is in its highest position to close the casting chamber. The matrix M which it is now desired to use is then laid in the bottom of the extension D, and is accurately set in position axially or longitudinally by means of the

gages or pins 143. The matrix is then secured in one matrix holding device at one edge, and then in the matrix holding device at the other edge by use of the toggle levers and links 135 and 136 before described. The cam-handles 142 are then lowered so that the pivoted matrix holding devices will assume the positions they naturally have when the casting mechanism or chamber is open. The slides, with the matrix holding devices and the matrix, are then pushed into position under the core or cylinder. Pins or stops 148 are fitted in the top of the extension D, so that the matrix holding devices have to be in their raised positions, as shown in Fig. 14, before the slides can be pushed back into operative position. If the cam-handles 142 are left raised, and the matrix holding devices down, the slides cannot be pushed back, as the matrix clamping devices will strike on said pins. In this way the delicate matrix cannot be pushed or forced against any part to be defaced or torn. In this way one matrix can be removed from the machine and another matrix inserted therein in accurate position in a very few seconds, and with the loss in time only of the period required for the casting of one plate.

The slides 127 are provided at their forward ends with a piece of suitable material 149 which conforms to the contour of the segmental back. This piece 149, which has a brush or felt surface 1490 sewed thereto with wire, thus practically forms a cleaner which will sweep out any scraps or chips of metal on the segmental back as the slides are pushed back into operative position; a necessary feature, as otherwise, pieces of metal or flakes might get under the matrix, or in position to interfere with the casting operation, or to clog the parts.

The previously described matrix holding mechanisms serve not only to hold the matrix for each cast, but form a mechanism for accurately stripping the matrix from the surface of each cast made.

The segmental back B is raised and lowered; that is, the back is raised to close the casting chamber, and is lowered to open the casting chamber after the plate is cast, and after the same has solidified, by the mechanism hereinafter described.

As the segmental back lowers in the operation of the machine, the pivoted matrix holding mechanisms at each side of the segmental back, by means of the springs 141 before mentioned, will pull or strip the matrix by its edges from off the surface of the cast plate in a very simple and efficient manner, without spoiling or distorting the type surface of the matrix, and the continued downward motion of the segmental back will complete the action and move the matrix entirely clear of the cast plate.

The matrix holding mechanism next the

throat T is allowed to have an extra movement, so that the matrix will lie under the mouth of the throat when the latter is moved back from the cylinder, to catch any drippings or flakes of metal that may drop from the throat when the casting box is open.

As the segmental back moves up to close the casting chamber, the matrix holding mechanisms will be forced down tightly on top of the edges of the back as before described, to reposition the matrix in its operative position.

The lever 139 next the throat is provided with an additional arm 150, which has a roll 151, which bears on a cam 152 secured to the frame of the machine to assist in the operation of the rear matrix clamping device, on account of the large motion given this matrix holding device, for the purpose before described.

The cylinder or core C is made hollow, as shown in Fig. 21, and the same is provided with a suitable pipe 153 which extends through one journal thereof, and which will spray water on the inner surface of the cylinder to keep the same cool. A siphon 154 connects by pipe 155 through the other journal of the cylinder to conduct water from the cylinder.

After the plate is cast, and the matrix stripped therefrom as before described, the cylinder or core is given a half turn to carry the cast plate E out of the casting chamber. The mechanism for imparting this movement to the cylinder is arranged as follows, (see Fig. 22:) A gear 156 is fitted on the journal of the cylinder or core C. This gear has two oppositely disposed cut-away portions 157. A starter-piece 158 is also secured on the journal of the cylinder, which starter-piece consists of a bar having two teeth at 180° relatively to one another. A pivoted oscillating segment 159 is arranged to engage said gear 156. The said pivoted segment is arranged so that it can oscillate back and forth in one of the cut-away portions of the gear 156 without turning said gear. The segment is oscillated by a pitman 160 connected to a crank-disk 161 mounted on a shaft 162. Pivoted concentrically with said segment is a starter-lever 163 which has a notch at its end which can mesh with one of the teeth of the starter-piece. This starter-lever has a hook 164 connected thereto. The face of the crank-disk 161 is arranged to form a cam, as shown in Fig. 22, which will oscillate a lever 165 which carries a roller 166 engaging the groove of said cam. Said lever 165 carries a pin or roll 167 which can engage said hook. Said hook also has a tooth 168 which can engage a notch or groove 169 formed in a part secured to the frame of the machine. A cam I is secured on the cam-shaft 74. 170 designates a yoke which engages the

cam-shaft 74, and which has a roller 171 engaging the groove in said cam I. The cam-shaft 74 is geared to make one-fourth of a revolution for every revolution of the shaft 162 by gearing hereinafter described. The said yoke 170 connects to a lever 172 arranged on the shaft 118, and by this mechanism the shaft 118 which also connects to operate the throat mechanism, as previously described, is oscillated. Arranged on said shaft 118 is a lever 173 which connects by link 174 to a lever 175 mounted on shaft 176, which latter connects by lever 177 and link 1770 to said hook 164.

The parts are so arranged that the hook 164 will be held in its raised or inoperative position clear of the lever-roll 167 for three turns of the crank-disk and cam 161. When the hook is in its raised position, the cylinder will be securely locked in position by the tooth 168 on the hook engaging the notch 169 or part secured to the frame of the machine. The segment 159 will oscillate idly back and forth in one of the cut-away portions 157 of the gear 156 during this period. While the crank-disk and cam 161 makes its fourth revolution the cam I will lower the hook 164 to engage the pin on the oscillating lever 165 which has meanwhile been vibrating idly. This will cause the starter-lever 163 to start the cylinder in motion, the cylinder having meanwhile been stationary. The segment 159 will then engage the gear 156 and impart a half turn to the cylinder on the forward or left hand stroke of said segment, as the parts are shown in Fig. 22. The starter-lever 163 will then stop the cylinder in its new position by engaging the other tooth on the starter-piece 158. By this arrangement the cylinder or core C will be stationary for seven-eighths of each cycle. This will give about the proper time to the casting and cooling of the plate, and the turning of the cylinder or core to deliver the plate. I have found that this is about the proper relative proportion, although, of course, the same may be varied by changing the proportion of the gearing.

The mechanism before described is one that can be advantageously used, as it will give the cylinder a quick half turn with a crank motion, and will positively lock the cylinder while the casting is going on.

The ends of the casting chamber are stopped off by rims R which are hung on ears 178 projecting down from the framing. Each rim is secured to its ear by means of a pin 179. (See Fig. 13.) Springs 180 are arranged in recesses in said ears and said rims, which springs may be adjusted by screws 181. See Figs. 23 and 24. By this arrangement the rims are practically hung on pivots, and have a slight yielding action. By this arrangement the rims will adjust themselves between the back B and the core

C, and will have enough lost motion, so that with the shrinkage of the plate, the cylinder or core can turn to deliver the cast plate past the rims.

The cylinder or core is provided with grooves 182, so that the inner surface of the plate will be grooved, and also has suitable projections 183 to cause the plate to move with the cylinder. See Fig. 19.

10 The segmental back B is fitted so that it will have a vertical motion in slides or ways formed in the framing A. The back B is made hollow, and the two face sections thereof are connected together by small columns or pedestals 184. See Fig. 26. Suitable water pipes 1840 are arranged to circulate water through the back so as to keep the same cool.

20 The connections for raising and lowering the back are arranged as follows:—The cam K for this purpose is arranged on the shaft 74. See Fig. 29. 185 designates a lever which is pivoted on a shaft journaled in the framing, and which has a roll 186 engaging the groove of said cam K. The lever 185 carries at its end a roll or pin 187, which is arranged so that it can engage a hook 188. This hook connects to a short lever 189 mounted on a shaft 190. Short toggle-like levers are arranged on this shaft and connect by links 191 to the back. These links engage at their upper ends with studs 192. See Figs. 26 and 27. Each stud is made in three portions, the middle portion 193 which the links engage being eccentric to the other portions. Each stud has a projecting ear 194, engaging which are screws 195 tapped in eye-bolts 196 fitted in the back. By adjusting these screws 195, the studs can be slightly rotated, and in this way the connection of the links to the segmental back can be adjusted very accurately and very finely, so that the back can be brought up to the precise position desired. The other end of the hook 188 is carried by a link 197, which connects to a lever 1970 mounted on a shaft 198 on which the starting and stopping lever F of the casting mechanism is secured. See Fig. 2. The handle F may be held in its raised position, and the parts kept in operation by being engaged above a shoulder 199 on a guiding piece 200. The hook 188 is provided with a finished face 201, so that the lever-roll 186 can easily run thereon. The handle F by reason of this construction can only be moved down to start the casting mechanism into operation when the hook 188 can engage the roll 187 on the lever 185, whereby the casting mechanism will always be started into operation at the same point in the cycle of operation, so that there can be no incomplete operation, and so that the matrix cannot be broken. The handle or starting and stopping lever F also connects 65 by the connections before mentioned to the

pump valve 91, so that when the segmental back is thrown out of operation, the pump will also be thrown out of operation, whereby flooding cannot occur.

A catch 202 is arranged to engage a pin 203 on the lever F. This catch is pressed by a spring 204 so that the same will normally engage said pin 203. This catch is controlled by a lever 205 arranged on the end of the shaft 176 by a link 206, which 75 has a slot engaging a pin 207 on an arm projecting from said catch. This slot provides a lost motion, so that the lever F can be thrown down into position to start the machine at the proper time, the pin 203 then locking under the catch 202. The shaft 176 80 is controlled by the cam I and connections before described, so that the catch 202 will only be moved to clear the pin 203 when the segmental back is in its lowermost position. By this arrangement the handle F can only be raised to stop the casting mechanism, and to hold the casting chamber in its open position when the back is in its lowermost position, and the previously made cast has been 90 solidified. By these connections it is impossible to open the casting chamber or throw the same out of operation in such manner as to allow hot metal to flow out of the casting chamber to flood the machine, or injure 95 the operator. The connections previously described which operate the throat T are also controlled by this cam I, as the same is utilized as previously described to oscillate the shaft 118. 100

The back B is suitably counterweighted as by counterweight 208, which connects by chains 209 trained over pulleys 210 to the bottom of the guides extending down from the back, as shown in Fig. 31. 105

As the cylinder carries the plate from the casting chamber and approaches the limits of its motion, the front edge of the plate will strike on a suitable stop 211 arranged at the rear of the core over the throat, as shown 110 in Figs. 5 and 32. By this arrangement when the cylinder comes to rest in its new position, the plate will have been freed and jacked up to a position clear of the cylinder, except at its rear edge. 115

A lifter L is arranged to move under the rear edge of the plate and lift the same clear of the cylinder. This lifter is controlled from the cam K which raises and lowers the segmental back by the following connections. The lever 185 is rigidly secured on its shaft 212. Also secured on said shaft 212 is a lever 213 which connects by link 214 to a toggle-lever 215. The link 214 is made in two parts, and is provided with a 125 turn-buckle 216, and the usual check-nuts, so that the action of the lifter can be adjusted. The toggle-lever 215 connects by a similar adjustable link 217 to the ends of sliding frames 218 which are fitted on suit- 130

able guides 219. The lifter L is pivoted on a stud 220 in the ends of these frames. The lifter has a projecting arm 221, extending down from which is a shaft or link 222 which passes through a part or piece 223 attached to the sliding frame 218. A spring 224 is arranged on this shaft 222 between said piece 223 and an adjustable collar on said shaft. By this means the lifter will be normally pushed in toward the core C. This inward motion is limited by a pin 225 connecting the two frames 218 together at their top.

Arranged between the guides 219 is a shaft 226 on which is pivoted a cam 227. This cam is normally held in one position by means of a shaft or link 228 projecting down therefrom, and through an ear 229 projecting from the guides. A spring 230 is arranged on the link 228. By this arrangement the cam will normally be held in one position, and a stop 231 is arranged to determine this position and to limit the movement of the cam. A roller 232 is arranged on the end of the lifter L. By this arrangement as the frames move down, this roller will contact with the cam, and the lifter will be moved away from the surface of the core. The continued downward motion of the frames will move the roller 232 clear of the cam and the same will snap under the cam. The upward motion of the frames will cause the roller 232 to lift the cam. By this arrangement as the lifter moves down it will have a motion away from the cylinder or core to clear the plate which is turning around with the core, but so that on its upward motion, the lifter will move in close to the cylinder to lift the rear edge of the plate clear of the cylinder, as before described. When the plate is brought to this position, that is clear of the core or cylinder, a conveyer will slide the plate along on a suitable guiding frame 233 past two cutting-off and truing saws S-S which will cut off and trim the edges of the plate. See Figs. 37 to 43.

Small rollers 234 are arranged in front of each saw to keep the plate in position before it passes to the saws. Each saw is provided, in addition, with a V-edged cutter 235, which will cut a small groove 236 in the plate near each edge, so that the plate can be accurately guided by said groove after it leaves the saws. Rollers 237 are arranged beyond the saws to engage these grooves, and guides 238 are arranged to project from the frame 233, so that the plate will be guided very accurately during and after the sawing operation. The saws are driven by a belt 239 from pulley 240. The belt is led around idler pulley 241, then around the pulleys 242 on the shafts which carry the saws, and then around an idler 243. The idler pulley 241 is journaled on a stud 244 projecting up

from a rod 245 which is mounted to slide in a bearing 246. A spring 247 is arranged between said bearing, and is kept under spring tension by check-nuts 248 threaded on the end of said rod 245. By this means the belt 239 will be kept under tension. The shafts of the saws are provided with fly or balance wheels 249. By this arrangement the belt will be kept under a tight spring tension, and the momentum of the fly or balance wheels will keep the saws evenly in operation as they strike the plate. The saws turn in opposition to the advancing movement of the plate. The saws are preferably boxed up or mounted in suitable casings 250, and suitable chutes 251 see Fig. 1 are provided so that the strips or shavings cut off by the saws will be carried out clear of the machine.

Brushes or other flexible means 252 are arranged between the casting mechanism and the saws to bear firmly on the plate as the same passes by the saws so as to prevent the saw-dust raised by the saws from passing back into the casting mechanism or clogging the various gearings of the machine.

The conveyer for sliding the plate from over the core or cylinder past the saws and into the arch hereinafter described, consists of a sliding-rack-bar 253 fitted to slide in suitable guides 254. The rack-bar is given a reciprocating motion by a gear 255 which is actuated as hereinafter described. The said rack-bar engages a pushing-head 256 which is fitted to slide on bars 257. See Fig. 5. The pushing-head is provided with notched engaging bars 258 for engaging the end of the plate. See Fig. 35. The rack-bar 253 is loosely fitted on said pushing-head 256, and is held in place thereon by gibs 259. See Figs. 33 and 34. The end of the rack-bar has a downwardly projecting ear 260, tapped into which is a screw 261 which is arranged in position to strike on the pushing-head. Projecting up from the rack-bar is a stop 262, engaging which are the free ends of bell-crank levers 263 which are tied together by spring 264. This arrangement provides for a lost motion between the rack-bar and the pushing-head.

When the pushing-head is brought to its extreme point of travel at the end of the machine, as shown in Fig. 3, the same will strike on the framing A, and the continued motion of the sliding-rack-bar will simply actuate the bell-crank-levers and put them under tension. When the sliding-rack-bar reverses its motion, and starts in the other direction, the screw 261 will pick up the sliding-head which will then move with the rack-bar. By adjusting this screw 261, the position in which the pushing-head stops at the other extreme can be adjusted, so that the point at which the plate will be left by the pushing-head can be accurately determined.

The bell-crank-levers and the springs before mentioned provide a mechanism so that the pushing-head can dwell in its position farthest away from the saws, so that the plate can turn up into position in front of the pushing-head. This dwell will be for some little period of time, as the sliding-rack is actuated by a crank motion, as hereinafter described.

As the plate is moved by the pushing-head past the saws S—S it passes into an arch U. See Figs. 44 to 46. A stop 265 is arranged at the delivery end of the arch. This stop is pivoted on the end of levers 266 which have pins 267 engaging cam grooves 268 cut in the sliding-rack-bar 253. These parts are so arranged that the stop will move down as the plate enters the arch, so that the plate will be brought up against it by the conveyer and accurately positioned in the arch so that it can be properly acted upon by the finishing mechanism hereinafter described. The cam grooves will lift the stop 265 out of the way as soon as the plate is positioned as hereinbefore described.

A framing 269 is secured on the end of the arch. In this framing is arranged a wedge 270 which engages an inclined face on said framing 269. A screw 271 is tapped into said framing 269, and the same carries a collar 272 engaging a groove cut in said wedge. The wedge is arranged to bear on the back of the stop 265 which is pivoted on its levers 266. By adjusting the screw 271 the wedge can be adjusted back and forth, and hence the position of the stop can be very accurately adjusted. By this means the plate can be registered in the arch, that is, centered exactly so that the edge finishing tools hereinafter mentioned may work exactly up to the type face of the plate without destroying the edges thereof.

As the plate passes into the arch, it is guided on one edge by guide 273 which engages the edge of the plate, and at its other edge by an extra spring-guiding jaw 274 which engages the groove 233 in the plate, and holds the plate so that the type face or edges thereof will not be matted or rubbed against the arch as the plate moves into the same. See Figs. 46 to 48. This extra jaw 274 is arranged in a clamping jaw 275, and is held in place between the same and the end of the arch by means of pins 276 which engage slots 277 in the extra jaw. Springs 278 are provided to keep the extra jaw normally in its raised position. The clamping jaw 275 is fitted to an ear or ledge 279 projecting down from the arch. The extra spring-jaw is arranged so that it will strike on the edge of the arch as the clamping-jaw 275 moves up, so that the plate will be lifted off of the extra clamping jaw 274 and clamped by the jaw 275.

A shaft 280 is arranged below the arch.

The same carries a cam 281, bearing on which is a roller 282 arranged upon an arm 283 secured on a shaft 284. The shaft 284 is provided with a finger 285 which engages check-nuts 286 threaded on a rod 287 secured to the clamping jaw 275. The clamping jaw is provided with two rods 288 which are fitted into hollow screws 289 threaded into ears 290 formed on the framing below the arch. Strong springs 291 are arranged on the rods 288 between the clamping jaw 275 and said screws 289. By this construction the clamping jaw 275 will be normally pushed up by the strong springs 291, the tension of which may be adjusted by the hollow screws 289. When the high face 292 of the cam 281 strikes the roller 282, the clamping jaw will be forcibly moved down, but when the low face 2920 of the cam strikes said roller 282 the clamping jaw will be moved up to clamp the plate by said springs 291. Thus a spring relief is obtained in the clamping mechanism. The cam 281 is geared to operate so that the clamping jaw will be in its lowermost position as the plate passes into the arch, and so that when the plate is in the arch, the plate will be rigidly clamped so that the finishing tools can operate on the inside and edges of the plate.

293 designates a shaft which is journaled concentrically of the arch. See Figs. 49 to 51. Arranged on the same is a suitable arm 294 which carries a knife 295 for smoothing or trimming the ribs formed on the inner side of the plate. Secured on said arm 294 are brackets 296, in which is journaled a roller 297 which is arranged to bear on the inner side of the plate back of the knife 295 so as to smooth out and roll down any irregularities left by said knife. Edge finishing tools 298 for the plate are also arranged on said arm 294. These edge finishing tools are arranged to cut off the small bur left on the end of the plate between the end rims and the type, and also to just cut off the sharp edge or corner on the edge of the plate bevel. A brush or flexible means 299 is arranged to clean the knife 295, and the tools 298, as they rotate past the same, so that no chips or shavings will be left thereon to mar or deface the inner surface of the plate.

When the finishing operation is completed, a conveyer 300 moves into the arch. This conveyer has a notched engaging piece 301. When this conveyer is wholly within the arch, and the piece 301 is beyond the end of the plate, the clamping jaw 275 releases the plate, and the forward motion of the conveyer pulls the finished plate out upon a delivery stand H. See Figs. 52 to 54. This second conveyer is actuated by a gear 302 which has an oscillating motion imparted to it as hereinafter described. The

independent conveyers are thus used; one to transfer the plate from over the casting mechanism past the saws into the arch, and the other to transfer the plate from the arch and deliver the same. By this arrangement as the first conveyer must move a long distance the same can have a powerful motion given to it, to push the plate positively past the saws, while the second conveyer need only have sufficient power to convey the plate from the arch to the delivery stand a short distance. By making the first conveyer work above the plate, and the second conveyer below the plate, these motions can be obtained.

The arch U is made hollow, as shown in Fig. 47, and suitable water pipes 303 are arranged to circulate water through the same. It is especially desirable to water-jacket the arch, as by doing this, the same will be prevented from heating and losing its shape, and the plate will be cooled as far as is possible. By keeping the arch in exact shape the plate will be very accurately finished and forced to precise cylindrical shape as it receives the final operation.

The gearing for actuating the various parts will now be described.

304 and 305 designate the usual tight and loose pulleys by which power is applied to the machine. See Fig. 37. A lever 306 carrying belt-fingers 307 is arranged to shift the belt from one pulley to the other. The lever 306 has an extending arm 308 which engages a pivoted lever 309, which carries a brake-shoe 310 which bears on a fly-wheel 311, so that when the belt is shifted on to the loose pulley, the brake-shoe will engage the fly-wheel and quickly stop the machine. Suitable belt-tighteners 312 are arranged above the tight and loose pulleys. The lever 306 connects by link 314 to a lever 313, arranged on a shaft 315 which extends past the casting mechanism and which has a handle 316 thereon. The operator generally stands near the casting mechanism, and this handle is arranged at this point, so that the operator can have the mechanisms under his control.

The driving shaft 317 on which the pulleys are arranged carries a worm 318 which drives a worm-wheel 319 secured on a shaft 320. This shaft 320 has a pinion 321, which, by means of intermediate 322 drives a gear 323 secured on the cam-shaft 74. This gearing is arranged so that the cam-shaft 74 will make four turns for each turn of the shaft 320. Also arranged on the shaft 320 is a pinion 324 which engages a gear 325 mounted on a stud and carrying a pinion 326. This pinion 326 engages an intermediate 327, which latter meshes with and drives a gear 328 on the cam-shaft 280. The gear 328 drives a gear 329 on the shaft 293 which carries the finishing tools. A gear

330 is also arranged on the shaft 320, and the same meshes with and drives a gear 331 on the shaft 162 on which the crank-disk 161 is arranged. The gears 330 and 331 are of the same size, so that the shaft 162 will make four turns for every turn of the cam-shaft 74.

The shaft 317 is carried across the machine, and carries a miter-gear 332 which engages another miter-gear 333 on a short shaft 334, which carries a miter-gear 335 at its end which meshes with and drives a miter-gear 336 on the vertical shaft 337 on which the pulley 240 which drives the saws is arranged. See Fig. 38.

The cam-shaft 74 is provided with a bevel-gear 338 which meshes with a bevel-gear 339 on a short stud 340. A crank-arm 341 is arranged to turn with bevel-gear 339, and actuates a sliding-rack 342 which is fitted to slide in a frame 343 pivoted on shaft 344. The said sliding-rack 342 engages a pinion 345 fitted on said shaft 344. The gear 255 which engages the sliding-rack-bar 253 is arranged on the other end of the shaft 344. By this arrangement the first conveyer will be given a crank-actuated reciprocating motion. Another bevel-gear 346 is arranged on said cam-shaft 74, and engages a bevel-gear 347 arranged on a short shaft 348. A crank-arm 349 is arranged on the end of this shaft 348, and actuates a sliding-rack 350 mounted to slide in a frame 351 hung on shaft 352. The said sliding-rack frame engages a pinion 353 on said shaft 352, and the gear 302 which engages the second conveyer 300 is also arranged on this shaft. By this gearing, the second conveyer will have a crank-actuated reciprocating motion imparted thereto. This gearing is arranged so that the parts will operate synchronously to accomplish their respective functions, as previously described, the cam-shaft 74 making one revolution for each complete cycle of operation. As thus arranged, the mechanism has been brought to work in a commercial way at the speed before indicated.

The operation of the entire machine has been so fully detailed in describing the respective parts that the same can readily be followed.

Details of the finishing mechanism itself are claimed in a divisional application for patent filed by me March 14, 1903, Serial No. 147,743, in pursuance to Patent Office requirements.

Many other arrangements and details can be worked out for accomplishing the operations described without departing from the combinations expressed in the claims.

Having thus fully described the improvements, what I claim and desire to secure by Letters-Patent is:—

1. The combination in a stereotype print-

ing plate casting mechanism, of a casting chamber, a pump, means for actuating the pump comprising a cam, connections therefrom to a bell-crank lever, a spider actuated by said lever, draw-bars, springs between said draw-bars and spider, and connections from said draw-bars to the pump piston.

2. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a pump, and means for operating the pump consisting of a cam, a bell-crank lever actuated thereby, a spider actuated by the bell-crank lever, draw-bars, springs arranged on said draw-bars and engaging said spider, a second bell-crank lever engaged by said draw-bars, and connections from the second bell-crank lever to the pump-piston.

3. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a pump for charging the same, and means for operating the pump consisting of a cam, a bell-crank lever actuated thereby, a spider connected to the bell-crank lever, draw-bars, adjustable springs for the spider and draw-bars, and connections from the draw-bars to the pump piston.

4. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a pump connected to charge the same, and means for operating the pump consisting of a bell-crank lever, a cam for actuating the same, a spider connected to the lever, draw-bars, adjustable springs mounted thereon and engaging the spider, a bell-crank lever connected to the draw-bars, and connections therefrom to the pump piston.

5. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a melting pot, a pump for introducing the molten metal into the casting chamber, and a valve for controlling the action of the pump.

6. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a melting pot, a lifting pump for lifting the molten metal from the melting pot over into the casting chamber, and a valve for controlling the action of the pump.

7. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a melting pot, a lifting pump for introducing the molten metal into the casting chamber, a valve for controlling the action of the pump, and a stop or projection arranged on the pump piston rod to positively open the valve.

8. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a pump for forcing molten metal therein, a throat connecting the pump and casting chamber, a valve for the pump, and an operating mechanism for actuating the valve as the piston reaches its limit of motion preparatory to charging the casting chamber.

9. The combination in a stereotype printing plate casting mechanism, of a casting chamber, a melting pot, a pump, a throat extending from the pump cylinder to the casting chamber, an induction valve in the pump cylinder, and a stop or projection on the pump piston rod to positively open the valve to allow the molten metal to fall back in the throat.

10. The combination in a stereotype printing plate casting mechanism, of a casting chamber, mechanism for operating the parts of the same, a pump for charging the chamber, a valve controlling the action of the pump, and connections to the valve arranged so that the pump can only act when the casting chamber is in operation.

11. The combination in a stereotype printing plate casting mechanism, of a casting chamber formed by a core and segmental back, means for opening and closing the casting chamber, a pump for forcing metal into the casting chamber, a valve controlling the pump, and connections from the mechanism for opening and closing the casting chamber, to this valve.

12. The combination in a stereotype printing plate casting mechanism, of a casting chamber formed by a segmental back and core, means for moving the back to open and close the chamber, a pump for charging the chamber, a valve controlling the pump, and connections from the means actuating the back to this valve arranged so that the pump will only act when the casting chamber is in operation.

13. The combination in a stereotype printing plate casting mechanism, of a casting chamber formed by a segmental back and core, means for moving the back to open and close the chamber, a pump for charging the chamber, mechanism for continuously operating the pump piston, a valve in the pump, and connections from the means actuating the back to control said valve so that the pump will not operate when the back is thrown out of operation, although the pump piston continues to work.

14. The combination in a stereotype printing plate casting mechanism, of a casting chamber formed by a segmental back and core, means for actuating the back to open and close the chamber, a lifting pump for charging the casting chamber, an induction valve for the pump, mechanism for continuously operating the pump piston, and connections to the said valve from the means actuating the segmental back, arranged so that when the back is thrown out of operation said valve will be held in its open position and the pumping action thereby stopped although the piston continues to work.

15. The combination of parts making up a stereotype printing plate casting chamber,

means for operating the parts thereof, a pump, and means for rendering the pump inoperative without stopping the operation of the casting chamber.

16. The combination of the casting chamber, means for actuating the parts thereof, a pump for charging the casting chamber, a valve controlling the pump, and means for holding the valve in position to stop the pumping action so that the casting chamber can go through its operations without receiving a charge of molten metal.

17. The combination of the casting chamber comprising a core and back, a throat connecting to the chamber, means for charging the chamber with molten metal, and means for moving the throat so that the same will bear on the core during the charging operation, and will thereafter move away to clear the sprue on the cast.

18. The combination of the casting chamber comprising a core and back, means for moving the core to deliver the cast, a throat for conducting the molten metal into the casting chamber, and means for moving the throat to bear on the core during the charging operation, and to clear the core as the same moves.

19. The combination of the casting chamber comprising the core and back, and a throat for conducting the molten metal into the chamber, said throat being provided with knife edges to bear on the core.

20. The combination of the casting chamber comprising the core and back, a throat provided with knife edges to bear on the core for conducting the molten metal into the casting chamber, and means for moving the throat toward and away from the core.

21. The combination in a stereotype printing plate casting mechanism of the core and back, a pump, a throat connected to the pump, sliding frames carrying the pump, and mechanism for moving the throat, whereby the throat and pump will have a movement toward and away from the core.

22. The combination in a stereotype printing plate casting mechanism, of the core and back, a melting pot, a pump arranged therein, a throat connected to and leading from the pump, sliding frames extending into the melting pot and carrying the pump, and means for actuating the parts, whereby the pump and throat will have a movement toward and away from the core.

23. The combination in a stereotype printing plate casting mechanism, of the core and back, a melting pot, a pump therein, a throat connected to and leading from the pump, connections to move the throat, and means for adjusting these connections so that the pressure of the throat on the core can be determined.

24. The combination of the casting chamber, and a throat for conducting molten

metal thereto, said throat being constructed and arranged near its lips or edges which extend into the casting chamber to prevent the low temperature of the chamber from cooling the metal in the throat.

25. The combination of the casting chamber comprising the back and core, and a throat for conducting molten metal thereto, the edges of the throat near the casting chamber being constructed so as to prevent the low temperature of the casting chamber from chilling by conduction through the walls of said throat the molten metal contained therein.

26. The combination of the casting chamber comprising the back and core, means for cooling the chamber, and a throat for conducting molten metal to the chamber, said throat being constructed so as to prevent the low temperature of the casting chamber from working back by conduction through the walls thereof into the molten metal contained therein.

27. The combination of the casting chamber, and a throat for conducting molten metal thereto, the walls of said throat being cored or bored out near the casting chamber, to prevent the low temperature of the casting chamber from working back into the molten metal contained in the throat.

28. The combination of the casting chamber, and a throat for conducting molten metal thereto, the top and bottom lips of the throat being cored or bored out to prevent the low temperature of the casting chamber from cooling the metal in the throat.

29. The combination in a stereotype printing plate casting mechanism, of the core and segmental back with an extension in line with the back to aid in the insertion, registration or removal of the flexible matrix.

30. The combination in a stereotype printing plate casting mechanism, of the core and segmental back with a semi-cylindrical extension in line with said back to aid in the insertion, registration or removal of the flexible matrix.

31. The combination in a stereotype printing plate casting mechanism, of the core and segmental back with a semi-cylindrical extension in line with the said back of the same diameter as the segmental back to aid in the insertion, registration or removal of the flexible matrix.

32. The combination in a stereotype printing plate casting mechanism of the core and segmental back, a semi-cylindrical extension in line with the back, and matrix holding or clamping devices fitted on said back, and arranged so as to slide out over said extension.

33. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, a semi-cylindrical extension in line with the back, matrix holding or

clamping devices carried by said back, and arranged to slide out over the extension, and registering or adjusting devices for the matrix.

34. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, sliding pivoted matrix holding or clamping devices arranged on said back, and an extension in line with the back.

35. The combination in a stereotype printing plate casting mechanism, with the core and segmental back, of spring-actuated matrix holding or clamping devices movably mounted on the segmental back for stripping the matrix from the surface of the cast plate.

36. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, means for raising and lowering the back, and spring-actuated matrix holding or clamping devices pivoted on the edges of the segmental back.

37. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, means for raising and lowering the back, matrix holding or clamping devices pivoted on the edges of the back, and stops or cams, these parts being so arranged that as the back lowers the pivoted clamping devices will strip the matrix by its edges from the cast plate, and the continued downward motion of the back will entirely remove the matrix therefrom, and so that the upward motion of the back will bring said devices against the stops or cams and reposition the matrix for the next cast.

38. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, means for raising and lowering the back, spring-actuated matrix holding or clamping devices pivoted on the edges of the segmental back, and stops or cams, these parts being so arranged that as the back lowers, the spring-actuated clamping devices will strip the matrix by its edges from the cast plate, and the continued downward motion of the back will entirely remove the matrix therefrom, and so that the upward motion of the back will bring said devices against said stops or cams and reposition the matrix for the next cast.

39. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, slides fitted on the back, and a matrix clamping device consisting of a bar and clamping strip pivoted on each of said slides.

40. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, slides fitted on the back, and a matrix clamping device consisting of a bar, and a clamping strip having a lip extending over the edge of the bar, fitted on each of said slides.

41. The combination in a stereotype print-

ing plate casting mechanism, of the core and segmental back, slides fitted on the back, and a matrix clamping device fitted on each of said slides consisting of a bar and clamping strip, said strip carrying studs engaging slots in the bar, and means for moving the strips on the bar.

42. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, slides fitted on the back, and a matrix clamping device fitted on each slide consisting of a bar and clamping strip, and means for operating each strip consisting of a lever pivoted on the bar and connected by a link to the strip so as to have a locking toggle action.

43. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, slides fitted on the back, and a matrix clamping device fitted on each slide consisting of a bar and clamping strip, each strip carrying studs engaging slots in the bar, and means for moving each strip on its bar consisting of a lever pivoted on the bar and connected by a link to the strip so as to form a locking toggle.

44. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, slides fitted on the back, and a matrix clamping device fitted on each slide consisting of a bar pivoted on the slide, a clamping strip on the bar, and means for actuating each clamping strip relatively to its bar.

45. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, and matrix holding devices arranged to hold the matrix in position for the cast with a yielding tension, so that the matrix can move or shift as the cast solidifies.

46. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, and two matrix holding devices for holding the matrix in position, one of said holding devices being arranged to hold one edge of the matrix firmly, and the other so that the matrix can yield, whereby the matrix can shift as the plate solidifies, and whereby the matrix will be accurately held during the charging operation.

47. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, and two matrix holding devices, one clamping the matrix rigidly, and the other so that there will be a lost motion between the same and the matrix.

48. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, a matrix having bolsters near its edges, and a lip at one edge, and two matrix holding devices, one holding the matrix at the edge with the single bolster, and the other between the other bolster and lip, the first holding device bearing tightly

on the matrix, and the other bearing on the matrix with a slight tension.

49. The combination in a stereotype printing plate casting mechanism, of a matrix having a bolster at or near one edge, a bolster near the other edge, and a lip beyond this last named bolster, and means for holding the matrix in position in the mechanism.

50. The combination in a stereotype printing plate casting mechanism, of the core and moving segmental back, slides fitted on the back, matrix clamping devices carried thereby, and cam-handles for moving the matrix holding or clamping devices into the position they assume when the segmental back is raised.

51. The combination in a stereotype printing plate casting mechanism, of the core and moving segmental back, slides fitted on the back, spring-actuated matrix clamping devices carried thereby, and cam-handles for moving and holding the matrix clamping devices into and in the position they assume when the segmental back is raised.

52. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, sliding matrix holding devices fitted on the back, and a tie or brace connecting said slides together so that they will be constrained to move together.

53. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, an extension in line with the back, sliding matrix holding devices fitted on the back, and a tie or brace connecting said devices together arranged under and to clear said extension.

54. The combination in a stereotype printing plate casting mechanism, of the core and back, matrix clamping or holding devices fitted to slide on the back, and stops or pins arranged so that the clamping devices can only be pushed into position under the core when they are properly adjusted.

55. The combination in a stereotype printing plate casting mechanism, of the core and back, spring-actuated sliding matrix clamping devices fitted on the back, handles for moving the same when withdrawn from under the core into the position they assume during the casting operation, and stops for preventing the clamping devices from being pushed back under the core until the handles are released.

56. The combination in a stereotype printing plate casting mechanism, of the core and the raising and lowering segmental back, means arranged so that the mechanism will stop with the back in its lowermost position, sliding pivoted matrix clamping or holding devices fitted on the back, handles for moving the same when withdrawn into the position they assume when the back is raised, and stops arranged so that said devices can only be pushed back when they are in the

position they assume when the back is in its lowermost position.

57. The combination in a stereotype printing plate casting mechanism, with the core and back, of a sweeping or cleaning device for sweeping or cleaning out the chamber between the core and back.

58. The combination in a stereotype printing plate casting mechanism, of the core and back, sliding matrix holding devices fitted on the back, and a cleaning or sweeping device attached thereto for cleaning or sweeping out the back as the holding devices are pushed into place.

59. The combination in a stereotype printing plate casting mechanism, of the core and back, sliding matrix holding devices fitted on the back, and a strip or brush conforming to the back attached to the inner ends of said devices.

60. The combination in a stereotype printing plate casting mechanism, of the casting chamber formed by the core and moving back, a moving throat for leading the molten metal into the casting chamber, and matrix holding and operating devices arranged to bring the matrix, when the chamber is opened and the throat moved back, into position under the throat to catch any drippings therefrom.

61. The combination in a stereotype printing plate casting mechanism, of the casting chamber formed by the core and moving back, a moving throat for leading the molten metal into the casting chamber, and two matrix holding and operating devices, the one next the throat having an extended motion to bring the matrix, when the chamber is opened and the throat moved back, into position under the throat to catch drippings therefrom.

62. The combination in a stereotype printing plate casting mechanism, of the casting chamber formed by the core and moving back, a moving throat for leading the molten metal into the casting chamber, matrix holding and operating devices arranged to bring the matrix, when the chamber is opened and the throat moved back, into position under the throat to catch drippings therefrom, and a cam to bring this device back to position as the back raises to close the chamber.

63. The combination in a stereotype printing plate casting mechanism, of the core and back, and means for turning the core to deliver the plate, consisting of a gear fitted to turn the core and having a cut-away portion, a segment vibrating in this cut-away portion, a segment vibrating in this cut-away portion, and means for starting the core in motion and meshing the gear with the segment.

64. The combination in a stereotype printing plate casting mechanism, of the core

and back, and means for imparting a half turn to the core, consisting of a gear fitted to turn the core and having two cut-away portions, a segment vibrating in one of these portions, and means for starting the core in motion and meshing the gear with the segment.

65. The combination in a stereotype printing plate casting mechanism, of the core and back, and means for turning the core to deliver the plate, consisting of a gear fitted to turn the core and having two cut-away portions, a crank-actuated vibrating segment, and means for starting the core in motion and meshing the gear with the segment.

66. The combination in a stereotype printing plate casting mechanism, of the core and back, and means for imparting a half turn to the core, consisting of a gear fitted to turn the core, and having two cut-away portions, a vibrating segment, and a starter lever and starter-piece for starting the core in motion and meshing the gear with the segment.

67. The combination in a stereotype printing plate casting mechanism, of the back and core, and means for giving a half turn to the core to deliver the plate, consisting of a gear having two cut-away portions, a vibrating segment, a starter-piece having two oppositely disposed teeth, and a starter-lever for engaging the starter-piece and starting the core into operation and meshing the gear with the segment.

68. The combination in a stereotype printing plate casting mechanism, of the back and core, and means for giving a half turn to the core to deliver the plate, consisting of a gear having two cut-away portions, a vibrating segment, a starter-piece secured to the core, and having two oppositely disposed teeth, a starter-lever, a hook attached to said starter-lever, and a lever for actuating the hook.

69. The combination in a stereotype printing plate casting mechanism, of the back and core, and means for giving a half turn to the core to deliver the plate, consisting of a gear having two cut-away portions, a vibrating segment, a starter-piece secured to the core, a starter-lever, a hook attached to said lever, a vibrating lever for the core, and a cam for engaging the hook with the vibrating lever.

70. The combination in a stereotype printing plate casting mechanism, of the back and core, and means for giving a half turn to the core to deliver the plate, consisting of a gear having two cut-away portions, a vibrating segment, a starter-piece and a starter-lever, a hook attached to the starter-lever, a vibrating lever for actuating the hook, means for connecting and disconnecting the hook and vibrating lever, and a lock which the hook will engage when disengaged from the vibrating lever.

71. The combination in a stereotype printing plate casting mechanism, of the back and core and means for giving a half turn to the core to deliver the plate, consisting of a gear having two cut-away portions, a vibrating segment, a starter-piece and a starter-lever, a hook secured to the starter-lever, a cam-actuated vibrating lever, a cam for engaging and disengaging the hook and vibrating lever, and a stationary part or lock which the hook will engage to lock the core when disengaged from said lever.

72. The combination in a stereotype printing plate casting mechanism, of the core and back, and means for imparting a half turn to the core to deliver the plate, consisting of a gear having two cut-away portions, a vibrating segment, a starter-piece, a starter-lever, a hook secured to the starter-lever, a cam for vibrating the starter-lever in substantial time with the segment, a cam making one turn for every four turns of the first named cam, and connections therefrom to said hook whereby the core will be given a half turn in one-eighth the time of each cycle.

73. The combination in a stereotype printing plate casting mechanism, of the back and core, and means for imparting a half turn to the core, comprising a gear on the core having two cut-away portions, a double-toothed starter-piece, a vibrating segment and a starter lever arranged to engage one tooth of the starter-piece to start the core in operation and to mesh the gear with the segment, and then to engage the other tooth of the starter-piece to stop the core in its new position.

74. The combination in a stereotype printing plate casting mechanism, of the core and segmental back with means for raising and lowering the back comprising an oscillating lever, a hook, connections from the hook to the back, and means for engaging and disengaging said lever and hook to throw the back into and out of operation.

75. The combination in a stereotype printing plate casting mechanism, of the core and segmental back with means for raising and lowering the back, comprising a cam-actuated oscillating lever, a hook, connections from the hook to the back, and means for engaging and disengaging said lever and hook to throw the back into and out of operation.

76. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, with means for raising and lowering the back, comprising an oscillating lever, a hook, connections from the hook to the back, and a starting and stopping lever connected to said hook to engage or disengage the same with the oscillating lever.

77. The combination in a stereotype print-

ing plate casting mechanism, of the core and segmental back, with means for raising and lowering the back, comprising an oscillating lever, a hook engaging the same, said hook being connected to oscillate a shaft, and levers on said shaft connected by links to the back.

78. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, with means for raising and lowering the back, comprising an oscillating lever, a hook engaging the same, said hook being connected to oscillate a shaft, and levers on said shaft connected by adjustable means to the back.

79. The combination in a stereotype printing plate casting mechanism, of the casting mechanism, means for operating the same, a handle connected to throw said mechanism into and out of operation, and means arranged so that said handle can only be actuated to stop the mechanism at a predetermined time in the operation.

80. The combination in a stereotype printing plate casting mechanism, of the casting chamber, means for opening and closing the same, a handle connected to start and stop the operation, and means whereby the operation can only be stopped with the parts in a predetermined position.

81. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, means for raising and lowering the back, a handle connected to start and stop the operation, and means whereby the mechanism can only be stopped with the back in its lowest position.

82. The combination in a stereotype printing plate casting mechanism, of the casting chamber formed by the space between a segmental back and core, with means for opening and closing the chamber, comprising mechanism to raise and lower the back, a handle provided with connections for throwing the back into and out of operation, and connections whereby the handle can only be operated to start or stop the operation at predetermined times.

83. The combination in a stereotype printing plate casting mechanism, of the core and back, with means for operating the back, comprising an oscillating lever, a hook connected to raise and lower the back, a handle for engaging the hook and lever, and a cam-actuated catch for said handle, the parts being so arranged that said back can only be thrown into and out of operation at predetermined times.

84. The combination in a stereotype printing plate casting mechanism, of the casting chamber, mechanism for operating the parts thereof, a handle for throwing the same into and out of operation, a pump for charging the chamber, and connections from said handle to the pump arranged so that the

pump will be stopped when the casting chamber is thrown out of operation.

85. The combination in a stereotype printing plate casting mechanism, of the casting chamber, means for operating the parts thereof, a handle for throwing the same out of operation, a pump for charging the chamber, a valve controlling the action of the pump, and connections from said handle to said valve, arranged so that the pumping will be stopped when the casting chamber is thrown out of operation.

86. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, means for raising and lowering the back, a handle for throwing the same out of operation, mechanism arranged so that the segmental back can only be thrown out of operation when in its lowest position, a pump, and connections from said handle to stop the pumping action when the back is thrown out of operation.

87. The combination in a stereotype printing plate casting mechanism, of the core and back, mechanism for raising and lowering the back, a handle for starting and stopping this operation, and a cam-actuated spring-pressed catch arranged so that the back can only be thrown out of operation when in its lowest position.

88. The combination in a stereotype printing plate casting mechanism, of the core and back, means for turning the core to deliver the plate, a stop on which the edge of the plate strikes, and a single lifter to raise the plate by its other edge.

89. The combination in a stereotype printing plate casting mechanism, of the core and back, means for turning the core to deliver the plate, a stop on which the edge of the plate strikes, a lifter to raise the plate by its other edge, and mechanism for operating the lifter so that as it moves down it will clear the plate, and so that as it moves up it will move in close to the core to engage the plate.

90. The combination in a stereotype printing plate casting mechanism, of the core and back, means for turning the core to deliver the plate, a stop on which the edge of the plate strikes, a lifter, means for raising and lowering the same, and a cam arranged so that as the lifter moves down it will clear the plate, and so that as it moves up it will move in close to the cylinder to engage the plate.

91. The combination in a stereotype printing plate casting mechanism, of the core and segmental back, and means for lifting the plate from the core, comprising sliding frames, means for moving the same up and down, a lifter pivoted therein, and a pivoted cam for controlling the position of the lifter relatively to the core.

92. The combination in a stereotype printing plate casting mechanism, of the core and back, and means for lifting the plate from the core, comprising sliding frames, means
5 for moving the same up and down, a lifter pivoted therein, a spring normally holding the lifter in one position, and a spring-pressed cam, the parts being so arranged that as the lifter moves down it will engage
10 said cam and clear the plate, and so that as it moves up it will turn the cam so that the same will not affect its position.

93. The combination of stereotype printing plate casting mechanism, finishing mechanism, a conveyer for moving the plate from the casting mechanism to the finishing mechanism, mechanism for actuating the conveyer, and connections arranged so that the part of the conveyer which engages the plate will have a dwell over the casting mechanism, so that the plate can be moved into position to be engaged thereby.

94. The combination of stereotype printing plate casting mechanism, truing devices for cutting off the edges of the plate, a conveyer for moving the plate from the casting mechanism past said truing devices, and connections for actuating said conveyer arranged so that the part thereof which engages the plate will have a dwell over the casting mechanism.

95. The combination of stereotype printing plate casting mechanism, truing devices for cutting off the edges of the plate, a conveyer for moving the plate from over the casting mechanism past the truing devices, a head carried by said conveyer for engaging the plate, and spring actuated connections between said conveyer and head, whereby the head can dwell in position over the casting mechanism.

96. The combination of stereotype printing plate casting mechanism, a conveyer for

moving the stereotype printing plate therefrom, comprising a sliding rack-bar, mechanism for giving the same a reciprocating motion, a head carried thereby for engaging the printing plate, spring-connected bell-crank levers for engaging said rack-bar to allow a lost motion between said rack-bar
50 and head.

97. The combination of a stereotype printing plate casting mechanism, edge finishing mechanism for the plate, mechanism for finishing the inside of the plate, a conveyer
55 for moving the plate from the casting mechanism past the edge finishing mechanism into the mechanism for finishing the back of the plate, and a second conveyer for moving the plate out of the mechanism for
60 finishing the back of the plate.

98. The combination of stereotype printing plate casting mechanism, of edge finishing mechanism, mechanism for finishing the back of the plate, a conveyer moving over the plate for moving the same from the casting mechanism through the edge finishing mechanism into the mechanism for finishing the back of the plate, and a conveyer
65 moving under the plate for moving the same out of the mechanism for finishing the back of the plate.

99. The combination in a stereotype printing plate casting mechanism with the core and segmental back, of a matrix holding device movably mounted on the back and arranged to strip the matrix from the surface of the cast plate by an independent movement relative to said back.

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

H. A. WISE WOOD.

Witnesses:

SEYMOUR CONOVER,
JOSEPH H. WEBER.