Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 1

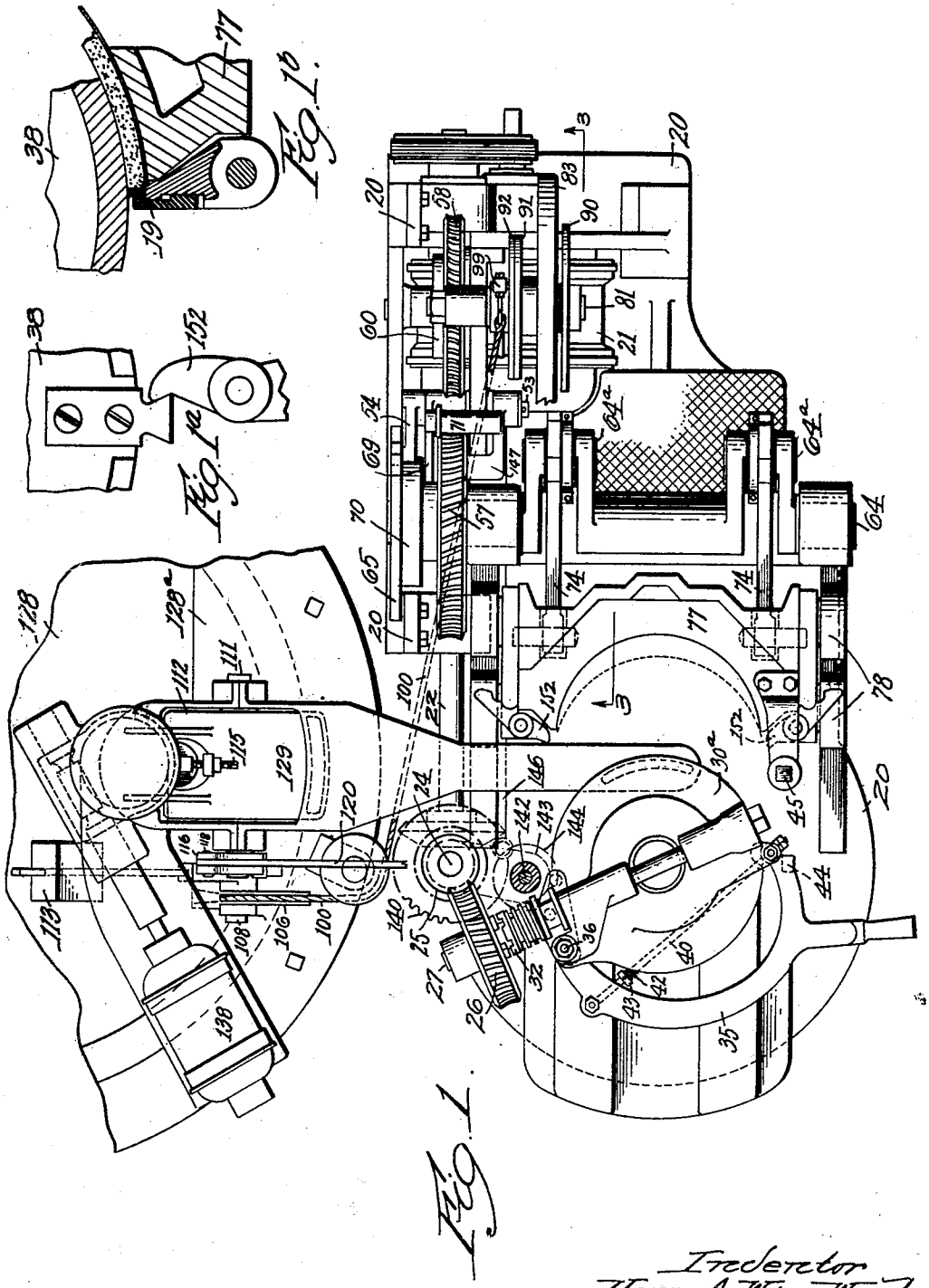


Fig. 1.

Witness
C. F. Neeve.

Inventor
Henry A. Wise Wood.
By attorneys
Southgate Fay & Hanby

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 2

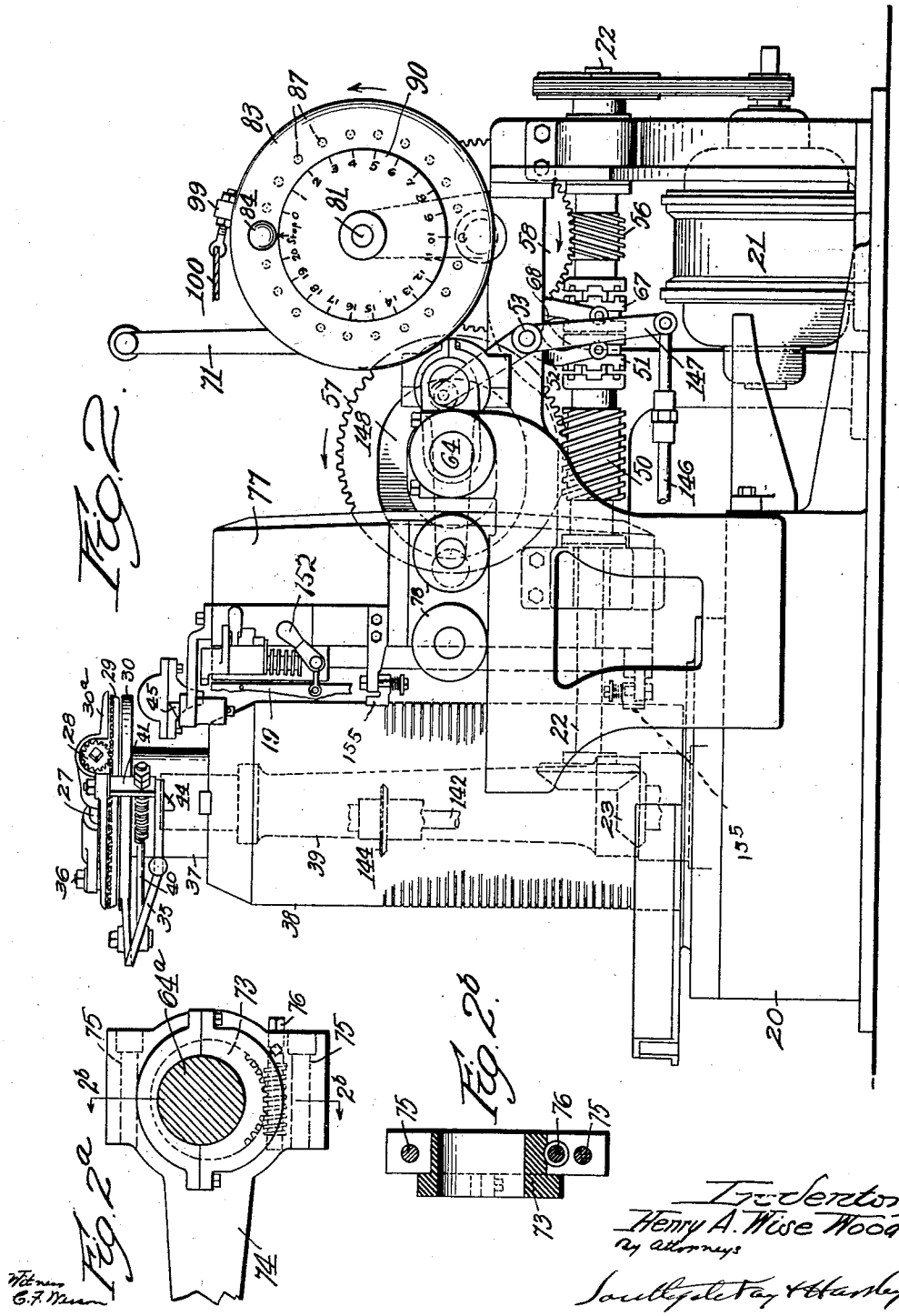


Fig. 2.

Fig. 2a.

Fig. 2b.

Witness
C. F. Burgess

Inventor
Henry A. Wise Wood
By attorneys
Southgate Fay & Hanley

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 3

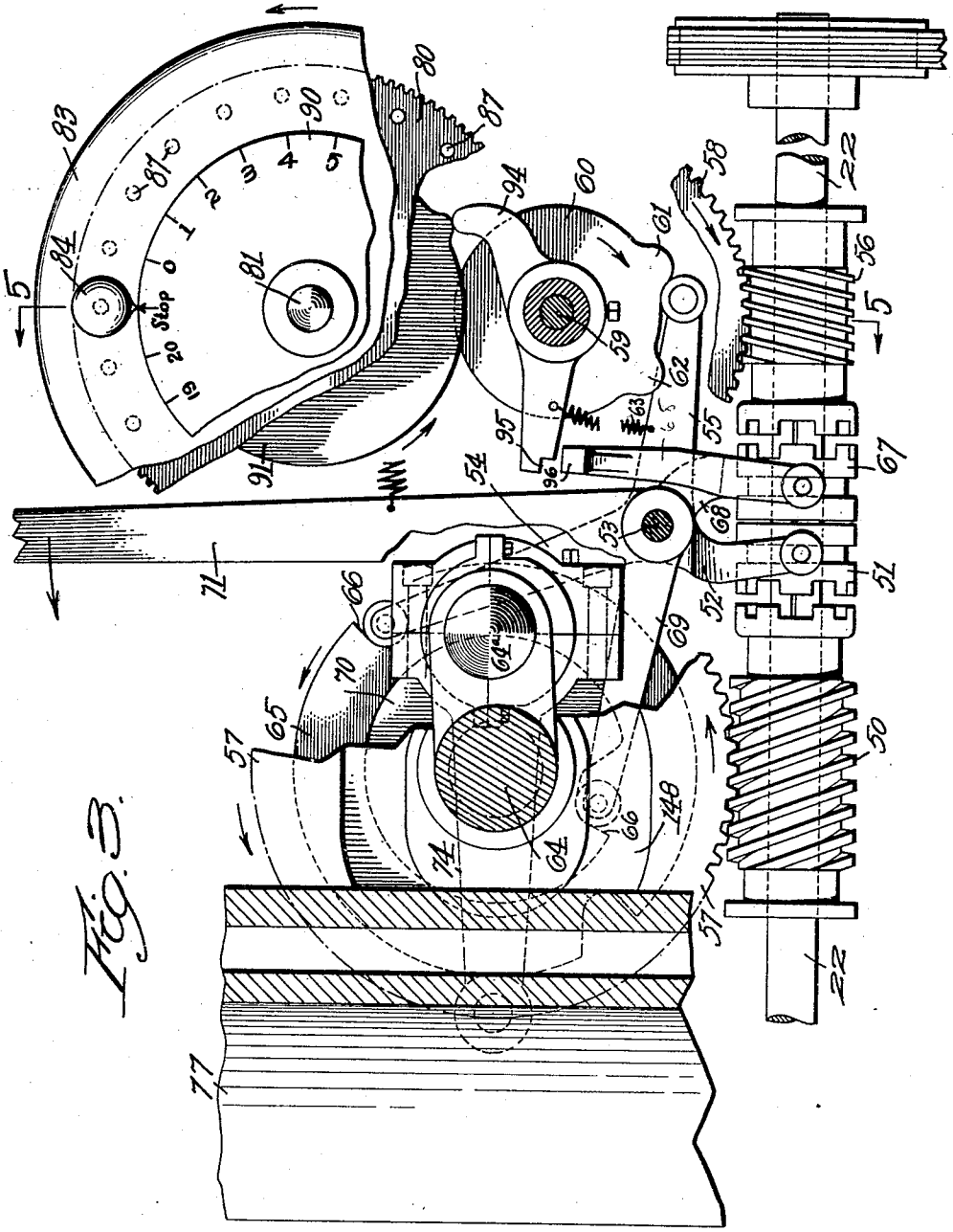


Fig. 3.

Witness
C. F. Wilson.

Inventor
Henry A. Wise Wood.
By attorneys
Southgate Fay & Hanley

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 4

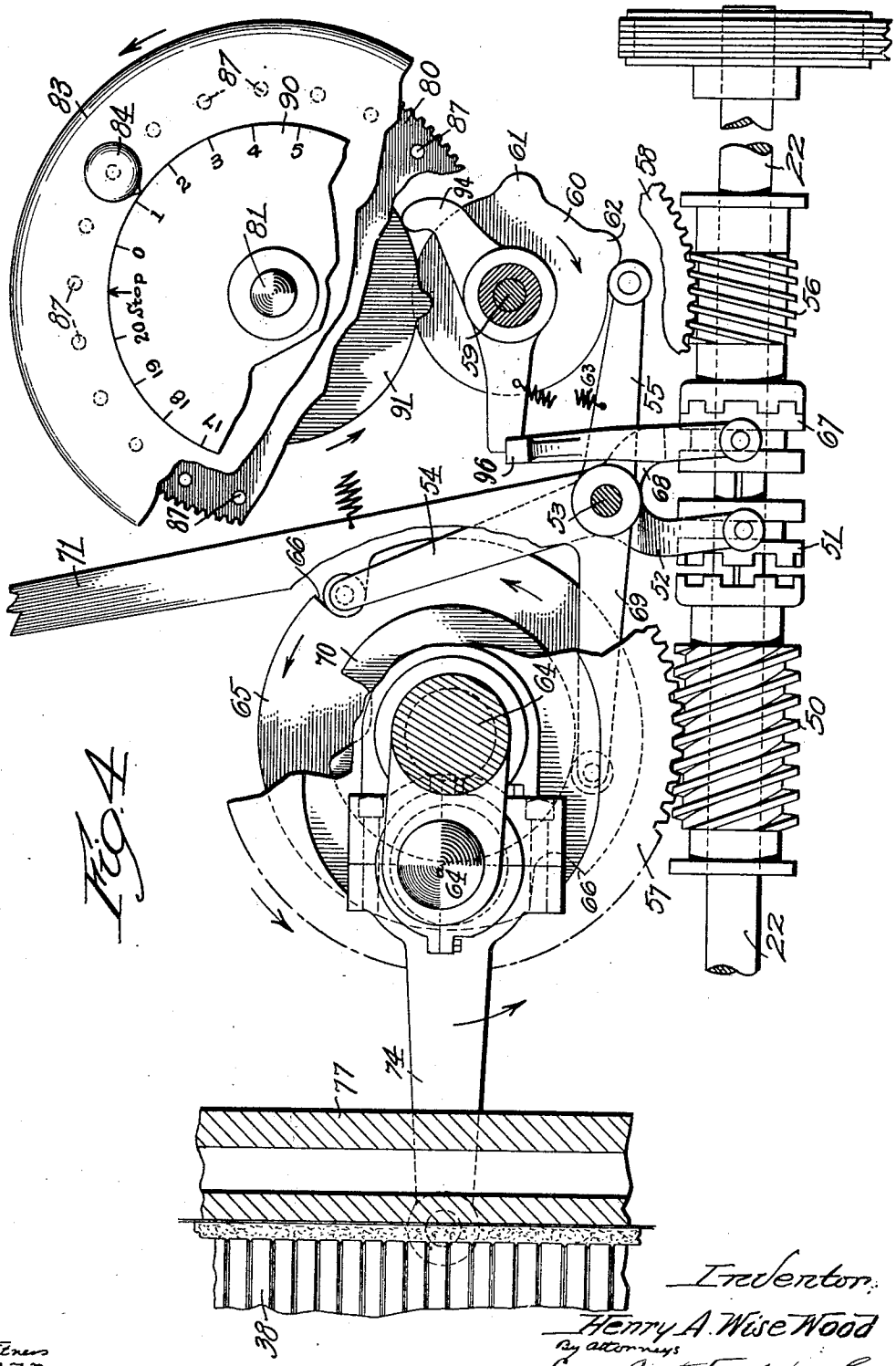


Fig. 4.

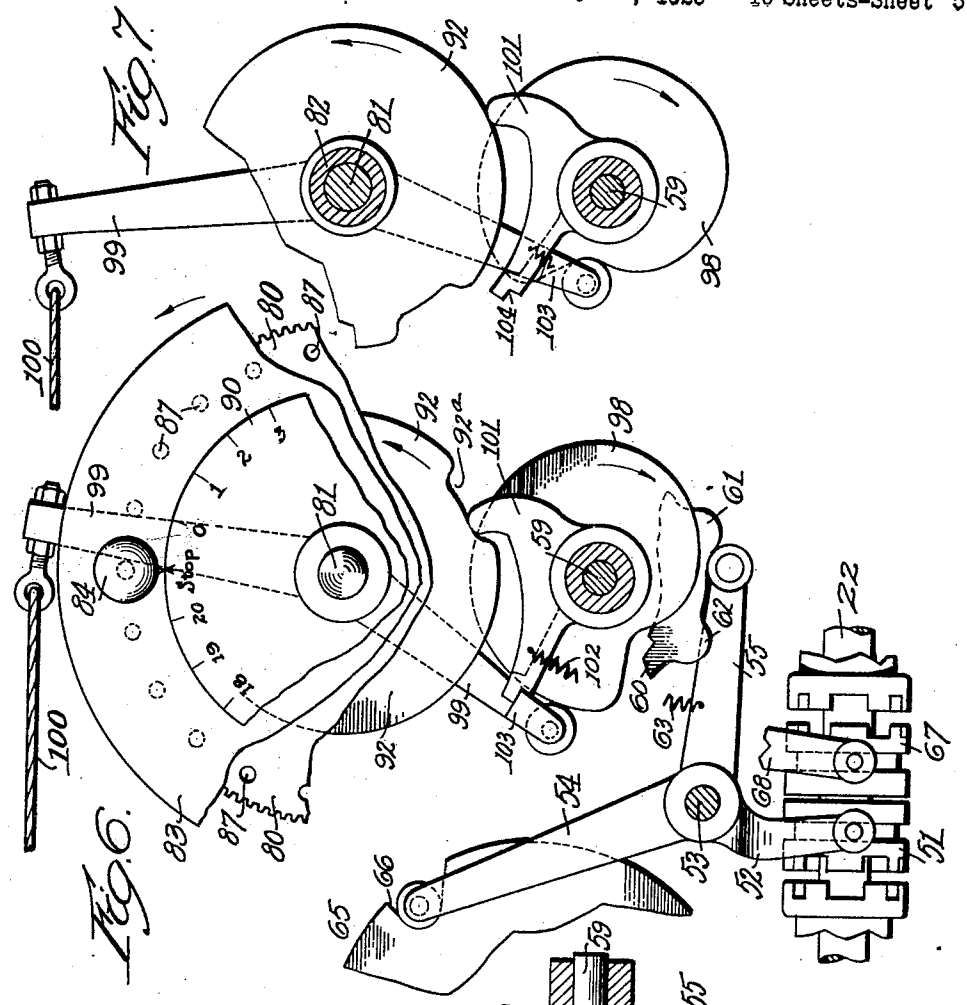
Witness
C. F. Mason.

Inventor:
Henry A. Wise Wood
By attorneys
Scull Gale Fay & Hawley

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 5



Inventor
Henry A. Wise Wood
By Attorneys
Scott Lyle Fay & Henley

Witness
C. F. Mason

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 6

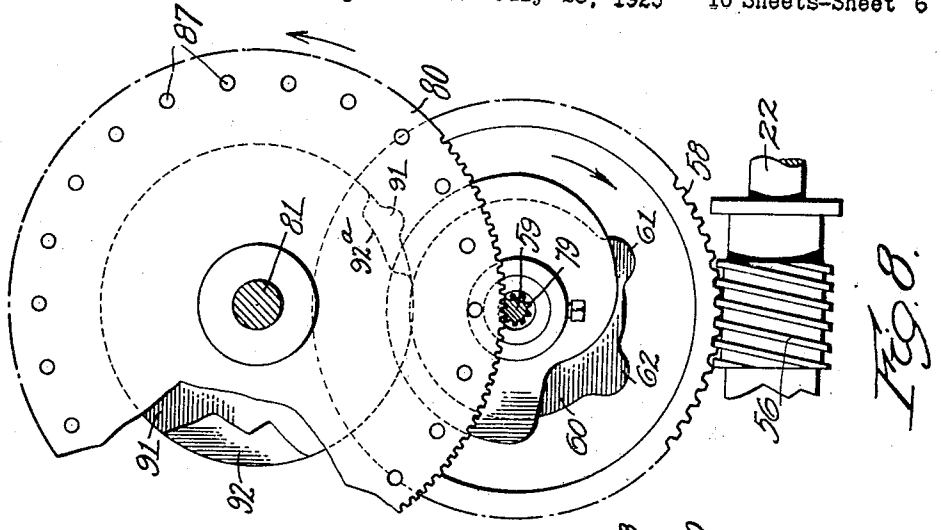


Fig. 8.

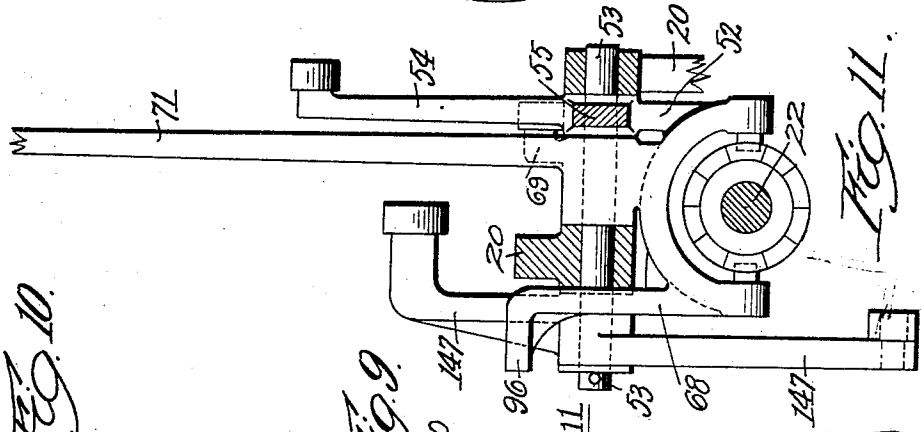


Fig. 11.

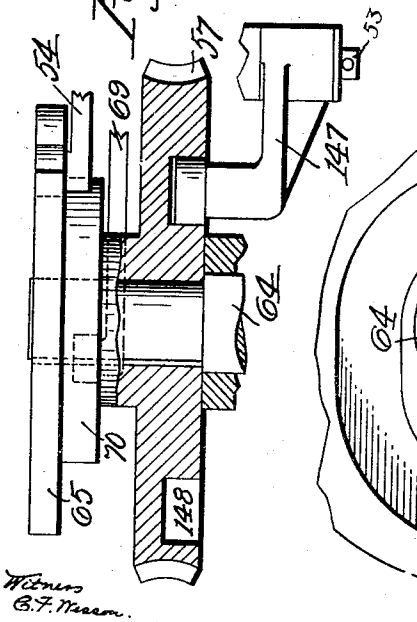


Fig. 10.

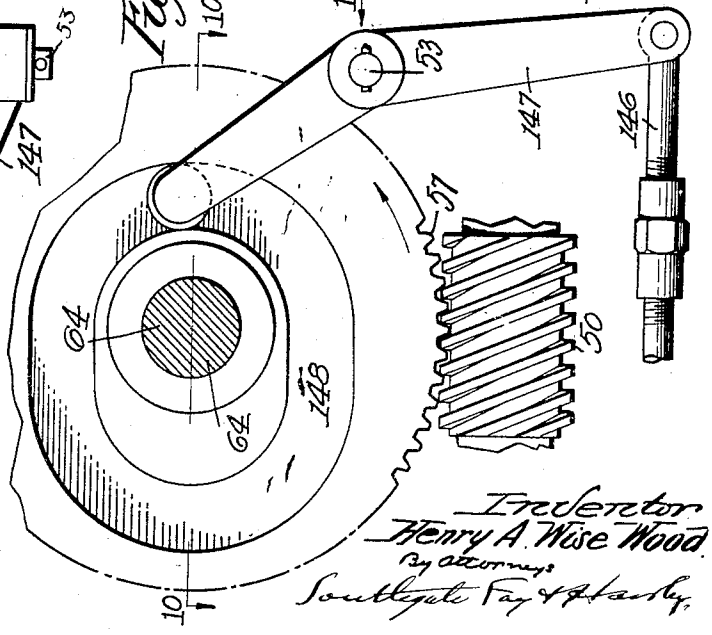


Fig. 9.

Witness
B. F. Mason.

Inventor
Henry A. Wise Wood
By attorneys
Southgate Fay & Hanley

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 7

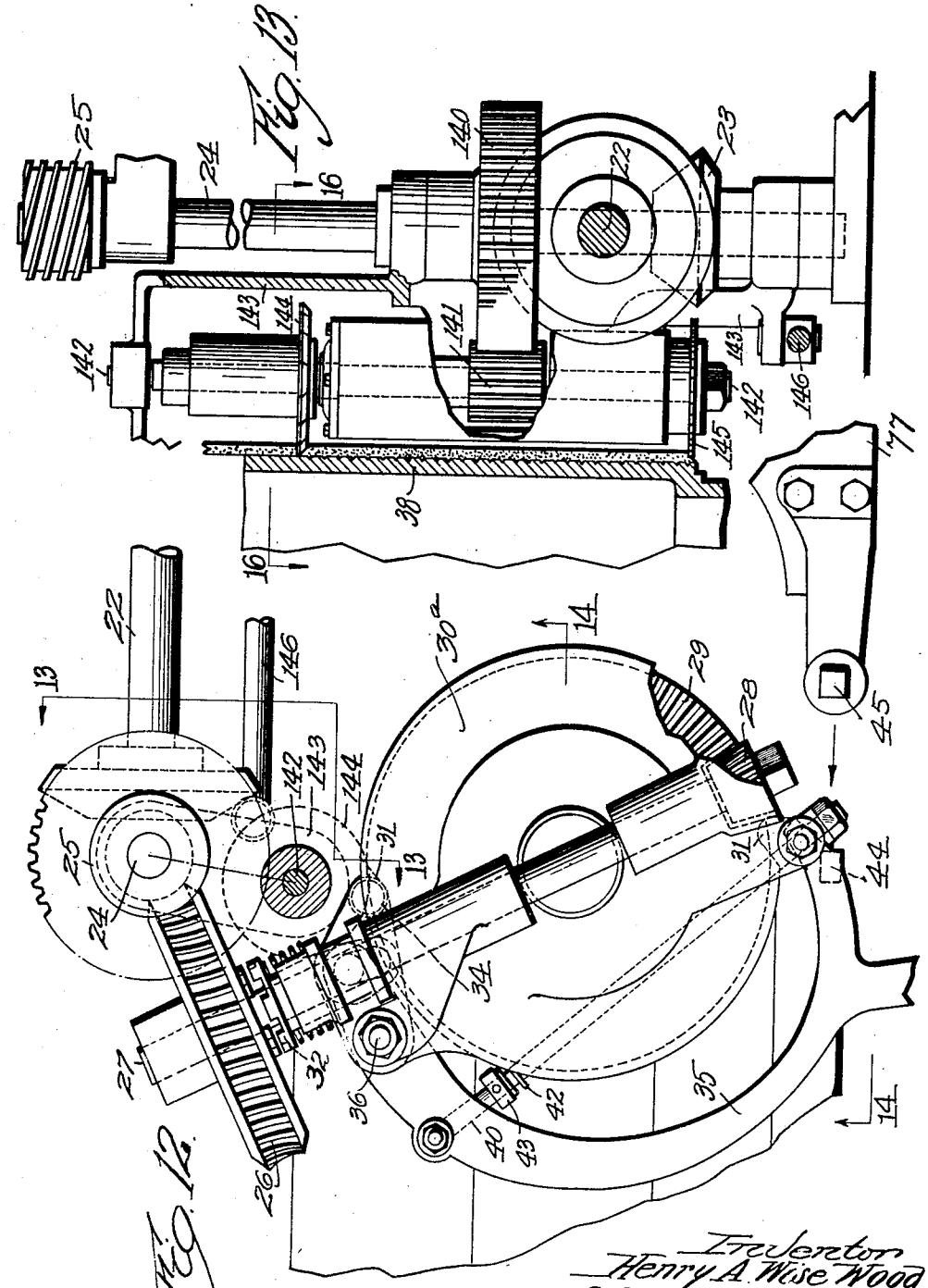


Fig. 13.

Fig. 12.

Witness
C. F. Wesson.

Inventor
Henry A. Wise Wood
By attorneys
Sandlyth Fay & Hanley

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 8

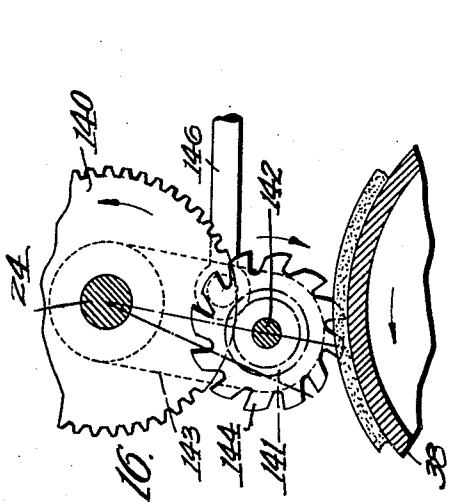


Fig. 16.

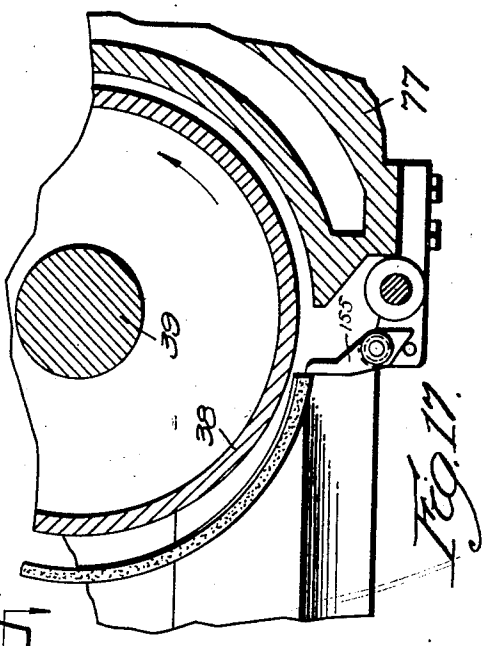


Fig. 17.

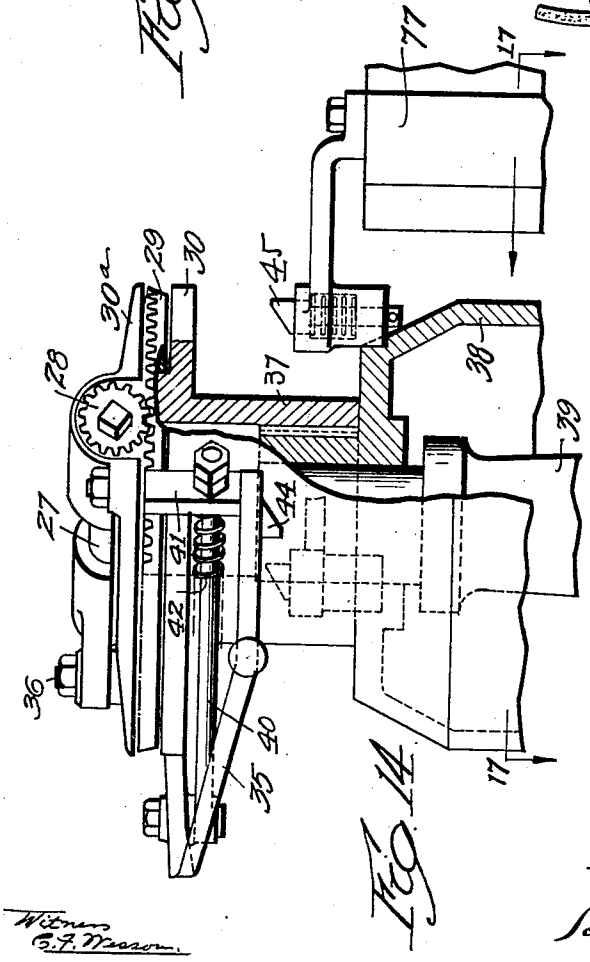


Fig. 14.

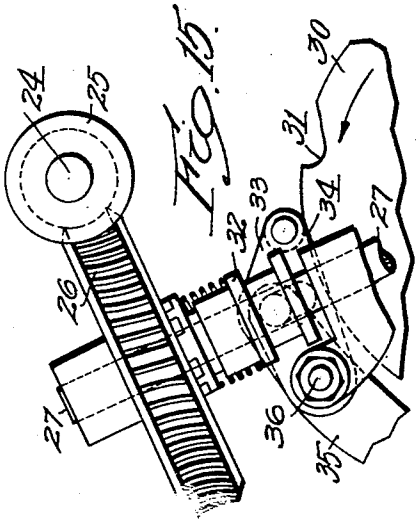


Fig. 15.

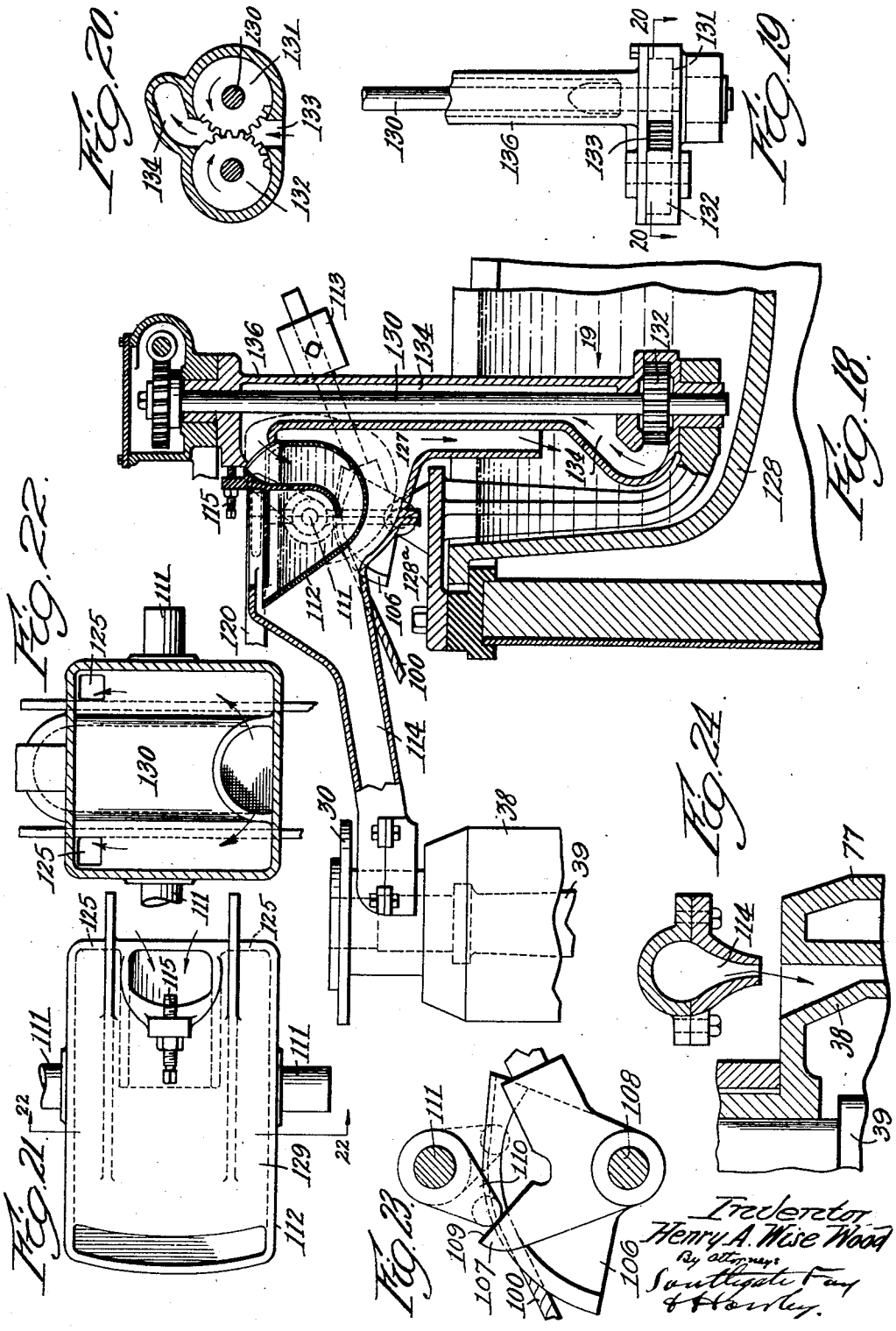
Witness
E. F. Mason

Inventor
Henry A. Wise Wood
By attorneys
Southgate Fay & Hanley

Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

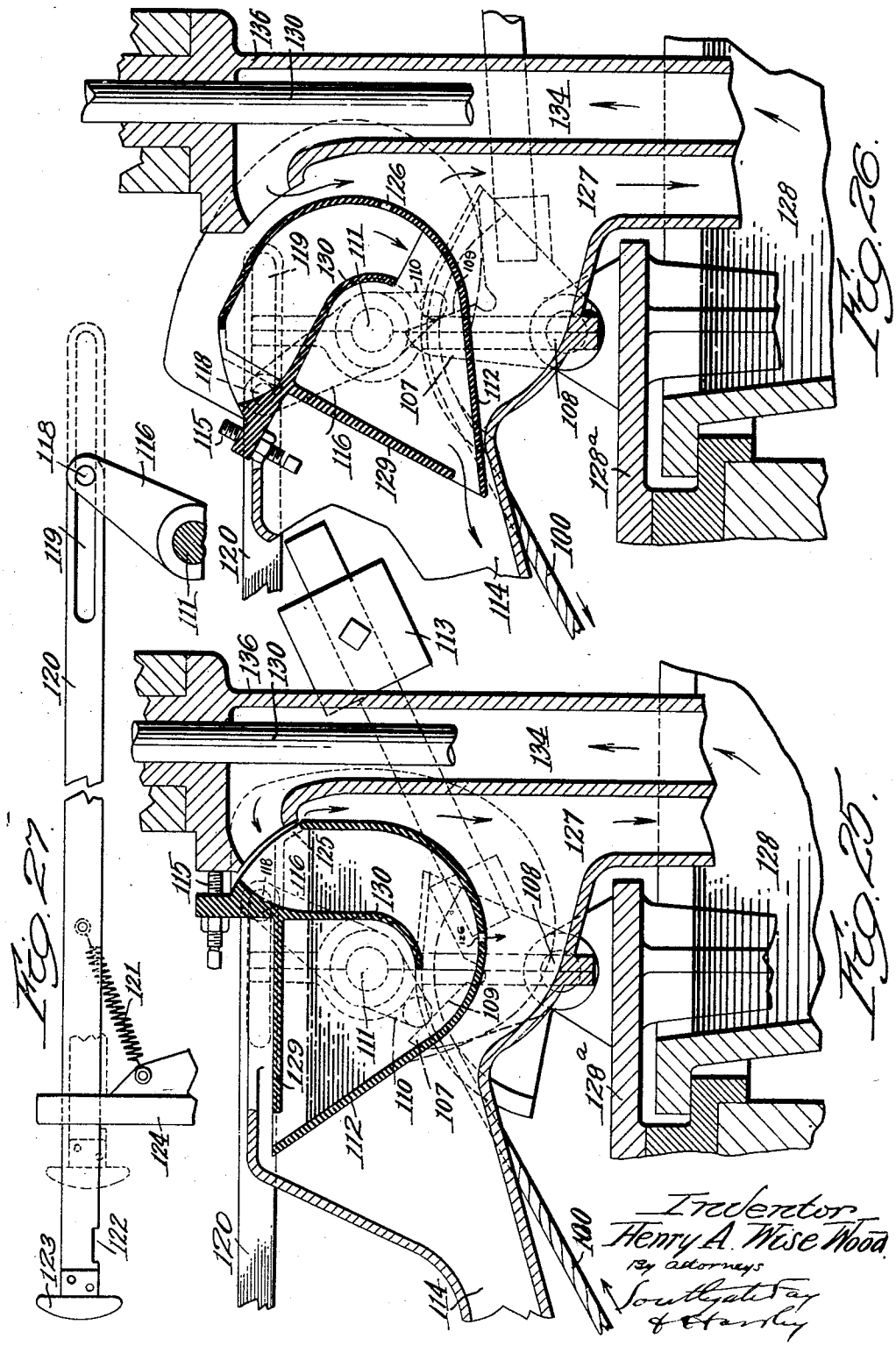
Original Filed July 28, 1925 10 Sheets-Sheet 9



Jan 6, 1931. H. A. W. WOOD 1,787,462

STEREOTYPE PLATE CASTING MACHINE

Original Filed July 28, 1925 10 Sheets-Sheet 10



Patented Jan. 6, 1931

1,787,462

UNITED STATES PATENT OFFICE

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO WOOD NEWSPAPER MACHINERY CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA

STEREOTYPE-PLATE-CASTING MACHINE

Application filed July 28, 1925, Serial No. 46,682. Renewed January 11, 1930.

This invention relates to a machine for casting stereotype printing plates adapted for producing one or more plates from each matrix.

The principal object of the invention is to provide for the casting of plates in a continuous manner without any manual labor beyond that required in the original setting and starting of the machine.

The invention involves the provision of mechanism by which the machine can be set in a very simple manner to go through any desired number of casting operations within limits without attention on the part of the operator; by which the machine will automatically stop when the predetermined number of casting operations has been completed and the last plate delivered; by which the operations take place in the following way:—First, the back is advanced to the core, then metal is run into the mold to form the plate. The machine of course remains at rest long enough to solidify the plate, then the back moves away from casting position, a revolving saw and trimming cutter are brought into position at the side of the core, the core revolves while the saw trimming tools rotate on their own axes so that the plate is trimmed off at the bottom and the riser also cut off and both the riser and plate are brought into proper position for removal from the machine. Not only are these operations performed without any attention on the part of the operator, but then the machine performs them over again as many times as the machine is set for, then delivers the last plate and comes to rest in position for starting whenever the operator moves the starting handle.

The invention also involves improvements in various details of construction and combinations of parts all cooperating for the above purposes as will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a plan of a complete machine for casting curved stereotype plates constructed in accordance with this invention;

Fig. 1^a is a fragmentary plan of the top of the core, matrix bar, and locking cam;

Fig. 1^b is a fragmentary sectional view through the core and back showing the matrix holding clip and with the matrix and casting plate in position;

Fig. 2 is a side view of the machine;

Fig. 2^a is a sectional view of the crankshaft for operating the back with the operating arm in side elevation;

Fig. 2^b is a sectional view on the line 2^b—2^b of Fig. 2^a;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1 on enlarged scale showing the back operating means and the counting mechanism in elevation with the back drawn clear to the rear and the machine at rest;

Fig. 4 is a similar view showing the back in casting position and just ready to move to the rear;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a view of the counting mechanism and the pump operating control with the parts in the same position as in Fig. 3;

Fig. 7 is a similar fragmentary view with parts removed showing these parts in position for operation of the pump;

Fig. 8 is a side view of the counting mechanism and the timing shaft with connected parts showing the machine at rest as in Figs. 3 and 6;

Fig. 9 is a side view of the saw-operating cam and connected parts;

Fig. 10 is a sectional view on the horizontal line 10—10 shown in Fig. 9;

Fig. 11 is an end edge view of the saw-operating parts shown in Fig. 9 and with other features connected therewith;

Fig. 12 is a plan of the core and the saw-operating mechanism connected therewith;

Fig. 13 is a sectional view of the core and cast plate thereon with the saws and operating mechanism therefor shown mostly in elevation;

Fig. 14 is a side view partly in section on the line 14—14 of Fig. 12 of the mechanism at the top of the core and also showing the co-operation of the back therewith;

Fig. 15 is a fragmentary plan thereof showing the running position;

Fig. 16 is a sectional view on the line 16—16

of Fig. 13 showing the sawing operation;

Fig. 17 is a horizontal sectional view through the core and back on the line 17—17 of Fig. 14 showing the releasing of the plate;

Fig. 18 is a radial sectional view of the metal supplying pump and co-operating parts and showing the core in elevation in proper relation thereto;

Fig. 19 is a side view of the inside parts of the pump;

Fig. 20 is a sectional view on the line 20—20 of Fig. 19;

Fig. 21 is a plan of the ladle;

Fig. 22 is a sectional view on the line 22—22 of Fig. 21;

Fig. 23 is a side view of the means for turning the ladle on its trunnions;

Fig. 24 is a sectional view of the top of the ladle and pouring spout showing the operation of pouring;

Fig. 25 is an enlarged sectional view like Fig. 18;

Fig. 26 is a similar view showing the parts in the position they assume when the ladle is operated; and

Fig. 27 is a side view of the emergency rod for preventing the pouring of metal.

This invention relates to the casting of stereotype printing plates in rapid succession. Most of the features of the invention relate to the casting of these plates in the usual semi-cylindrical form although other features thereof are capable of casting flat plates.

I have shown an embodiment of the invention in which the parts are all mounted on a frame 20 and operated by a motor 21 located on the frame. This motor operates the main driving shaft 22 by means of a belt or sprocket chain. On the end of this shaft is shown a bevelled gear operating a bevel gear 23 on a vertical shaft 24. On the top of this vertical shaft is a worm 25 which operates a worm wheel 26 loose on the horizontal core driving shaft 27 extending diametrically over the top of the core 38.

The shaft 27 is provided with a pinion 28 for operating a bevel gear 29 at the top of the core for the purpose of turning the latter when desired. On the top of the core also over the gear is a stationary top plate 30^a. Under the gear is a cam 30 having a pair of diametrically opposite stop notches 31. On the shaft 27 is a clutch 32 for operating the shaft from the wheel 26 and controlled by a lever 33 having a roll 34 adapted to engage in the notches 31. When this roll is in one of the notches as shown in Fig. 12, the clutch is inactive and the wheel 26 rotates without rotating the shaft 27. This lever 33 is on a clutch operating lever 35 having a handle for operating it. This lever is pivoted on a stud 36 on the cover 30^a and is adapted to swing on this pivot either by operation of the handle or automatically as will appear from the position shown in Fig. 12 to that shown in Fig. 15. When turned to the latter position, the clutch is connected and the shaft 27 operates so as to rotate the gear 29. This gear is fixed on the cam 30 which is part of a sleeve 37 pinned to the core 38. The core rotates on a stationary vertical shaft or standard 39.

Extending across the clutch operating lever 35 which is of bow-shape, is a rod 40 pivoted at one side of this lever and passing through a perforation in a bracket 41 connected with the cover 30^a. A spring 42 is located on the rod and held by a collar 43 pinned to it near the opposite end. This spring therefore exerts a constant pressure on the lever to force it out. A projecting tooth 44 at the bottom of the lever 35 is bevelled on one side and vertical on the other. This is capable of being moved in one direction by a moving pawl 45 as will appear for the purpose of automatically operating this clutch lever and closing the clutch 32 to assist in the production of repeated castings.

On the shaft 22 is a worm 50 adapted to be clutched to the shaft by a clutch 51 operated by a lever 52. This lever is pivoted loosely on a shaft 53 and provided with two other arms 54 and 55 so that these three arms work together. On the shaft 22 there is also another worm 56. The worm 50 has a much quicker pitch than the worm 56 so that it rotates its worm wheel 57 faster than the worm 56 rotates its wheel 58. This wheel 58 is fixed on a timing shaft 59 which also carries fixed upon it a starting cam 60 and makes one revolution while one plate is being made, cooled, and removed. This starting cam is circular in shape nearly all the way around, but has two starting projections 61 and 62, one 61 starting the back forward and the other 62 returning it. These control a roll on the end of the arm 55 to swing that arm out and in, a spring 63 of course being used to keep the roll in contact with the cam. When this roll is pushed out, the clutch 51 will be closed to clutch the worm 50 to the shaft 22 and rotate the worm wheel 57. Thus the two projections 61 and 62 control the movement back and forth of the back.

The worm wheel 57 is fixed on a crankshaft 64 on which also are two crank arms 64^a. On the crankshaft 64 is a back control cam 65 having two opposite notches 66 for receiving a roll on the end of the arm 54. The turning of the arm 55 for the purpose of throwing in the clutch 51 also moves this roll out of the notch 66 and allows the roll to run on the concentric surface of the cam until it comes around to the opposite notch when it will automatically slip into that and the spring 63 will turn this three-armed lever to disconnect the worm. It will be noticed that the motion of the three-armed lever 52,

54, 55 in this direction to stop the operation of the back is not positive but is controlled merely by the spring 63 so that if anything is brought into place to positively hold the lever in the operative position, the operation of the machine will be completed.

A clutch 67 on the shaft 22 for engaging the worm 56 to that shaft is operated by another three-armed lever fixed on the shaft 53. This comprises an arm 68 for operating the clutch; an arm 69 having a roller for engaging a stopping cam 70 on the crankshaft 64, and a starting lever 71. These three arms operate together at all times. This starting lever is moved to connect the clutch 67 to start the parts to operating through the starting cam 60.

Each crank 64ª of the crankshaft 64 has a link 74 connecting it with the back 77 of the mold for reciprocating it on its rollers 78. The back carries the spring pressed pawl 45 for pulling the tooth 44 and closing the clutch 32 when the back 77 is retracted. Each crank pin 64ª is provided with an adjusting eccentric 73 thereon which can be turned to vary its relation to the links 74 whose relation to the crankpin of the crankshaft is controlled by this eccentric. The end of this arm is split to receive the crankpin and the eccentric is turned to the desired adjusting position and then the parts are fastened up by a pair of bolts 75. Adjustment is secured through a worm 76 in the side thereof.

It will be seen that when the starting lever 71 is turned to connect up the worm 56 the timing shaft 59 will rotate, as the arrow in Fig. 4 indicates, and immediately the starting projection 61 will force out the arm 55, connect the worm 50 on the crankshaft, and move the arm 54 out of stopping position and the arm 52 to close the clutch 51. Now the crankshaft rotates a half revolution to move the back 77 up to casting position as shown in Fig. 4. As the starting cam at that time holds the roller on the arm 55 out, the crankshaft continues to rotate through a half revolution when the roller on the arm 54 will drop into one of the notches 66 and the machine will stop in casting position. The stopping cam 70 has only one notch and therefore the clutch 67 cannot open until the crankshaft has made a complete revolution.

On the timing shaft 59 is a pinion 79 driving a gear 80 which I will call the counting wheel. This is located on a stud 81 to which it is not directly fixed but is freely rotatable on a sleeve 82 free on the stud 81. Over the counting wheel 80 is a guard 83 shown integral with the sleeve 82 and rotatable on the stud. It extends around and protects the gear 80. This guard is provided with a knob 84 which is located in fixed position thereon and has a plunger 85 which is pressed inwardly by a spring 86 so that the knob can be drawn up and forced back into any one of a series of depressions or perforations 87 arranged in a circle and equally spaced around the gear 80 to divide it into a number of equal arcs. These perforations are spaced so that the gear 80 rotates the distance between them during each rotation of the shaft 59. The stud 81 is fixed in a hub 89 so as not to rotate and fixed to it on its outer end is a stationary disc 90 which is provided with a scale having radial marks spaced the same as the perforations to identify them as will appear. These marks are shown as designated from 0 to 20 with one marked "Stop." The 20 indicates the maximum number of plates to be cast from a single matrix without stopping. The knob is intended to rotate from the point on the scale at which it is set to the point marked "Stop" to produce the number of plates indicated by the original setting of the knob on the scale.

Keyed on the sleeve 82 is throw-off cam 91 and a pump throw-off cam 92. It will be seen therefore that when the knob is operated to force its plunger into one of the holes 87 of the guard 83, the two cams 91 and 92 and the guard 83 will rotate with the gear 80 positively.

Now the throw-off cam 91 is provided with a single projection which engages a lever 94 pivoted on the shaft 59 and yieldingly held up by a spring against the cam 91. On the end this lever has a notch 95 which engages an arm or projection which extends from the arm 68. From comparison of Figs. 3 and 4 it will be seen that during most of the rotation of the gear 80, the spring holds this lever 94 in such position as to keep the clutch 67 closed but when the projection on the cam acts on the lever 94, this positive stop is removed and the spring connected with the starting lever 71 pulls it over into stopping position so as to disengage the clutch 67. This occurs when the stopping cam 70 on the crankshaft 64 comes around to a position to allow the roller on the arm 69 to drop back toward the center. This latter stopping feature is effective at the proper times in every cycle of operation. The cam 91 is so set on the sleeve 82 that the lever 94 will be operated when the knob 84 reaches the "stop" position shown in Fig. 3.

On the shaft 59 there is a pump cam 98 fixed to the starting cam 60. This pump cam operates a roller on a lever 99 which is pivoted on the shaft 81 and this lever by means of a cable 100 controls the pump as will appear. Freely mounted to turn on the shaft 59 is a pump throw off pawl 101. A spring 102 always holds this pawl as shown in Figs. 6 and 7 in contact with an offset 103 in the lever 99 and the other end in contact with the cam 92. When in the position shown in Fig. 7 this does not affect the action of the lever 99 but when the offset 103 is once pulled out beyond the notch 104 in this pump throw-off

cam the lever 99 is locked in that position. It is only when the pump cam 98 throws the lever 99 out that the parts can become locked in this manner. Then a notch 92ª in the cam 92 allows the pump throw-off pawl 101 to swing out to the position shown in Fig. 6. This happens when the gear 80 rotates around to bring the knob 84 to zero on the scale. It will be seen that the setting of the knob 84 also sets the throw-off cam 91 and the pump throw-off cam 92.

Referring now to Figs. 18 to 27, it will be seen that the cable 100 passes over a segment 106 being fastened thereto at the end. Secured to this segment is an operating cam 107 both fixed on a shaft 108. This operating cam 107 has a slanting surface 109 for engaging a roller or end on an arm 110 fixed to the trunnions 111 of the ladle 112. Mounted on the segment 106 is a weight 113 for moving it over about its pivot. This cam 107 operates to turn the ladle from the position shown in Fig. 25 in which the ladle is filled with metal to the position shown in Fig. 26 in which the metal is dumped over into the spout 114 and delivered to the mold. This is accomplished by the loosening of the cable 100 by the action of the cam 98.

This ladle is provided with an adjustable stop pin 115 for an obvious purpose. It is also provided with an arm 116 having a pin 118 operating with a slot 119 in an emergency rod 120 for operating that rod. Said rod is normally held forward by a spring 121 engaging a stationary part of the machine but is provided with a notch 122 and a handle 123 by which it can be raised and released from engagement with a wall 124 and then pushed forward to hold the ladle and prevent its being dumped. The ladle is provided with two overflow drain openings 125 so that it cannot be filled with more than a certain amount of metal. It is also provided with a small drain 126 in the bottom and both these drains discharge into a chute 127 and back into the melting pot 128. The ladle is shown as provided with a protecting top 129 and a wall 130 constituting a skim wall.

The melting pot 128 is of the usual construction and the parts of the ladle above mentioned are mounted on the bracket 128ª fixed thereon.

The pump shown is of the gear type and I have shown an operating shaft 130 on which one of the gears 131 is mounted. The other gear 132 is mounted to mesh with the first gear. When they are rotated they draw metal in through an inlet 133 and force it up through a spout 134 where it runs over into the top of the ladle.

On the top of the pump casting 136, which is stationary, is a bearing for the shaft 130 which is operated by a motor 138 in a continuous manner. It will be obvious that on account of the drain openings the pump can be operated continuously and the metal will always run back into the pump. This keeps up constant circulation and the pump is always ready for operation.

On the shaft 24 is fixed a gear 140 meshing with a pinion 141 on a vertical shaft 142 which is mounted to swing on a frame 143 centered on the shaft 142. On this shaft 142 are two saws 144 and 145, one for cutting off the riser of the plate and the other for trimming off the bottom of the plate. The operation of the saws is very simple and these saws require very little power when rotating on their axis all the time.

The movement of the saw hanger 143 is accomplished by a link 146 which is adjustable and connected by a lever 147 with a roller and operated by a saw cam 148 on the crankshaft 64. Therefore during each rotation of this crankshaft, the hanger is turned on its axis to operative position to cause the rotating saws to be held against the plate on the core after the back is moved away as indicated in Fig. 16.

Operation

The operation of the machine is as follows: The two motors 21 and 138 are operating all the time as above mentioned. The former causes the shaft 22 and also the shaft 24 and the worm 26 to rotate all the time. Now assuming the parts to be at rest as shown in Figs. 1, 2, 3, 12 and 18 with the mold open, the operator puts the matrix in the back, secures it by the matrix clips 19, sets the knob 84 to a position on the scale indicating the number of the plates to be cast from that matrix, and sets the plunger 85 into the corresponding hole 87. This turns the cams 91 and 92 through the desired angle. Let us assume that three plates are to be cast and the knob registers with the mark 3 on the scale.

Now the operator moves the starting lever 71 back in opposition to the spring from the position shown in Fig. 3 to that shown in Fig. 4. The first effect of this is to throw in the clutch 67 which can be done as the arm 69 of course can move outwardly to bring its roller out of the notch in the stopping cam 70. This also moves the arm 96 to the left as will be seen by comparison of Figs. 3 and 4.

The clutching of the worm 56 to the shaft 22 starts the gear 58 rotating which is designed to rotate one revolution for the casting of each plate. This gear being fixed on the timing shaft 59, it and the starting cam 60 also on this shaft rotate at the same rate. It will be noticed that in the initial position shown in Fig. 3 the roll on the arm 55 is on the concentric part of the starting cam 60 between the starting projections 61 and 62. The cam now rotates in the direction of the arrow and this arm 55 is pushed down by the projection 61 which performs the starting

operation which explains the name chosen for describing this cam. The motion of the arm 55 in opposition to the spring 63 brings the roller on the arm 54 out of the notch 66 so that the back control cam 65 no longer holds the crankshaft 64. It also closes the clutch 51 and starts the crankshaft into operation. The effect of this is to move the back from the position shown in Fig. 3 to the position shown in Fig. 4, that is from open to closed position.

During this motion the spring pawl 45 hooks under the tooth 44 and at the end of it the back is locked to the core by cams 152. The core at this time is not rotating because the clutch 32 is open, the clutch operating lever 35 is held open by the spring 42 and by the fact that the roll on the arm 34 is in the notch 31. The saw hanger is drawn back on account of the saw cam 148 on the crankshaft. Although the pump is operating for the lifting of metal, the ladle cannot of course dump the metal because the cable 100 is held taut by the pump throw off pawl 101 engaging the offset 103 on the lever 99. But as soon as the mold is closed (Fig. 4), the roll on the arm 54 enters one of the diametrically opposite notches 66. An instant before the back control cam 65 had been holding the arm 54 up and the arm 55 down away from the starting cam. Now the clutch 51 is opened by the notch 66 receiving the roll on the arm 54 and the crankshaft stops with the mold closed. If a plate has been cast during the previous operation it is located on the back side of the core and is detached by the closing of the mold, the strippers 155 engaging the edges of the plate and pushing it off the core. At the same instant the pump throw off cam 92 comes around into a position to throw the pump throw off pawl 101 out as shown in Fig. 7 releasing the arm 99 and allowing the cable to be moved forward by the action of the weight 113 under the control of the cam 98. At that time the cam 107 actuates the trunnions 111 and dumps the metal out of the ladle into the chute to fill the mold. The continuous operation of the pump is not affected by this as the metal is delivered against the back of the ladle as shown in Fig. 6 and returns back into the melting pot.

The mold stays closed of course for a considerable period of time while the motors are running and the timing shaft 59 and counting gear 80 are also running. This time is allowed for the metal to solidify in the mold. Finally the projection 62 closes the clutch 51 and the back is retracted during a half revolution of the crankshaft. The pawl 45 pulls the tooth 44 back and starts the cam to rotating. The core is rotated half a revolution by the closing of the clutch 32 by the drawing back of the lever 35. During this rotation the cam 148 swings the saw and trimming cutter into position so that they will cut off the riser and trim the plate. When the cam 30 has rotated one half a revolution, its notch 31 permits the spring 42 to force the roller on the lever 35 into the notch. This stops the core.

Now if the knob has been set in position No. 1 to cast only one plate, the throw-off cam 91 comes into position to actuate the throw-off pawl 94 to release the arm 96 on one of the compound levers and allow the proper spring to swing this lever and open the clutch 67 through the arm 68. This can be done only when the stopping cam 70 on the crankshaft 64 is positioned to receive the roll on the end of the arm 69 so that if the throw off pawl 94 is actuated at any time prior to this position of the parts, the clutch 67 will be thrown out only at the proper time as timed by the stopping cam 70 and when the crankshaft is around to the rear position of the back shown in Fig. 4. That stops all the operating parts except the two motors and the shafts which they run continually. Consequently the parts are restored to the open position of the mold referred to at the beginning of the description of the operation and shown in Fig. 3. Then the casting is removed by the plate strippers 155 and the matrix taken out and changed.

If, however, it is intended to cast more than one plate at a time, the knob 84 is set to put the plunger 85 into some one of the holes in the gear 80. Assuming that fifteen plates are to be cast with one matrix, the knob is put into the hole 15. As stated the relations are such that for every revolution of the timing shaft, the knob will move through a part of the circle equal to the angle between two of these perforations. Each casting operation is performed as described above but the cam 91 does not act to release the clutch 67 and the cam surface 92^a does not permit the locking of the pump lever 99 until fifteen plates have been cast and the knob gets to zero. It is necessary for the timing shaft 59 to make one more revolution than the numeral on the scale registering with the knob before the knob is brought opposite the position marked "Stop" to disengage the clutch and the notch 92^a is made wide enough to cover two operations. This extra operation has to take place after the pump is stopped to enable the last plate cast to be detached from the core by the strippers 155. It will be obvious therefore that it is necessary to move the timing shaft through sixteen revolutions in this case to bring the machine to an automatic stop, the reason for this being that it is necessary to deliver the last plate. The operation always brings the knob back to the "Stop" position on the scale when the desired number of plates have been cast and delivered. Thus it is ready to be reset from that position.

Although I have illustrated and described only one form of the invention I am aware of the fact that modifications can be made therein without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to the details herein shown and described but what I do claim is:—

1. In a stereotype plate casting machine, the combination with a vertically arranged mold having a matrix, of a crank shaft for successively closing and opening the mold automatically a predetermined number of times and mechanically controlled means for then stopping the crank shaft.

2. In a stereotype plate casting machine, the combination with a vertically arranged mold having a matrix, of adjustable mechanically operated means for successively closing and opening the mold to receive successive charges of metal against the matrix, and release the cast plates, said adjustable mechanically operated means being adapted to be set mechanically to perform said operations a predetermined number of times and then stop automatically.

3. In a stereotype plate casting machine, the combination with a vertical mold core and back, of means for bringing them together to provide for casting a plate, and mechanically operated means for limiting the number of times they will be brought together for casting a predetermined number of plates from one matrix.

4. In a stereotype plate casting machine, the combination with a vertical mold core and back, of means for bringing them together to provide for casting a plate, adjustable mechanically operated means for causing them to come together a predetermined number of times and mechanically controlled means for then stopping said adjustable means automatically for casting said predetermined number of plates from one matrix.

5. In a stereotype plate casting machine, the combination with a cylindrical vertical mold core and a semi-circular back, of means for moving the back toward and from the core repeatedly in a horizontal direction to provide a space for casting a plate each time, means for controlling the movements of the back, mechanically operated means for adjusting the controlling mechanism to cause the back to move up to casting position a plurality of times, deliver the last plate cast, and then stop automatically in open position and horizontally movable means for removing the casting from the core to a position at the level of the core.

6. In a stereotype plate casting machine the combination with a vertical mold having a matrix, of mechanically operated means for successively closing and opening the mold automatically a number of times, then stopping the operation, and mechanically controlled means for introducing molten metal into the mold at its end each time it closes except the last one.

7. In a stereotype plate casting machine, the combination with a vertical mold having a matrix, of adjustable means for successively closing and opening the mold, means for introducing successive charges of metal from the end of the mold against the matrix, means for setting said adjustable means to perform said operations a predetermined number of times and then stop them automatically, and to introduce the metal each time the mold closes except the last one.

8. In a stereotype plate casting machine, the combination with a vertical mold having a matrix, of adjustable means for successively closing and opening the mold automatically a number of times, then stopping the operation, means for introducing molten metal into the mold at its end each time it closes except the last one, and means for separating the last plate cast from the mold when it closes the last time.

9. In a stereotype plate casting machine, the combination with a vertical rotatable core and a movable back adapted to support a matrix, of mechanically operated and controlled means for moving the back up to the core and closing the mold a number of times and then stopping the motion of the back, means for filling the mold each time it closes except the last one, and mechanical means located directly above the core whereby the movement of the back away from the core will cause the core to rotate half way around and then stop.

10. In a stereotype plate casting machine, the combination with a core rotatable on a vertical axis and a movable back adapted to support a matrix, of means for moving the back up to the core and closing the mold a predetermined number of times and then stopping the motion of the back, means for filling the mold at its end each time it closes except the last one, means whereby the movement of the back away from the core will cause the core to rotate half way around and then stop with the plate on the core on the vertical side opposite said back, and means whereby when the back moves up to the core the next time, the plate will be detached from the core by the back and delivered on a shelf at the level of the bottom of the core.

11. In a stereotype plate casting machine, the combination with a vertical rotatable core and a movable back adapted to support a matrix, of means for automatically moving the back up to the core and closing the mold a predetermined number of times and then stopping the motion of the back, mechanically actuated means for filling the mold each time it closes except the last one, mechanically actuated means whereby the movement of the

back away from the core will cause the core to rotate half way around and then stop, and mechanically actuated means in position at the side of the core to engage the cast plate as the core rotates and trim off its ends.

12. In a stereotype plate casting machine, the combination with a cylindrical core and a semi-circular back, of means for moving the back toward and from the core repeatedly to provide a space for casting a plate each time, means for controlling the movements of the back, means for adjusting the controlling mechanism to cause the back to move up to casting position a number of times, deliver the last plate cast, and then stop automatically, a saw frame having rotary saws mounted to swing, and means movable with the back for swinging the saw frame into a position adjacent the core to trim the ends of the plate and detach the riser while the plate is being delivered.

13. In a stereotype plate casting machine, the combination with a mold having a matrix, of adjustable means for successively closing and opening the mold automatically a number of times and then stopping the operation, and means for automatically trimming the ends of each plate cast in the mold while the plate still adheres to one part of the mold.

14. In a stereotype plate casting machine, the combination with a reciprocable concave back, of a rotatable core, a shaft for rotating the core, a clutch for controlling the connection of the shaft with a source of power, a lever for operating the clutch, a spring for holding the lever in a position to open the clutch, a cam rotatable with the core having two opposite depressions for receiving the end of the lever at the end of a half revolution and allowing the spring to open the clutch, and means movable with said back for actuating said lever to close the clutch when the back moves away from the core.

15. In a stereotype plate casting machine, the combination with a reciprocable concave back, of a rotatable core, a shaft for rotating the core, a clutch for controlling the connection of the shaft with a source of power, a lever for operating the clutch, means for holding the lever in a position to open the clutch, and means movable with said back for actuating said lever to close the clutch when the back moves away from the core, said means comprising a tooth on the lever, and a spring pressed pawl on the back.

16. The combination with a casting box comprising a movable back and a core, of a crankshaft connected with the back to move it up to casting position and back by a complete rotation of said crankshaft, a driving shaft, a clutch for connecting said driving shaft with the crankshaft to drive it, and a cam rotating with the crankshaft for preventing the closing of the clutch except when the crankshaft is in a position to hold the back in one of its extreme positions.

17. The combination with a casting box comprising a movable back and a core, of a crankshaft connected with the back to move it up to casting position and back by a complete rotation of said crankshaft, a driving shaft, a clutch for connecting said driving shaft with the crankshaft to drive it, and a cam rotating with the crankshaft for preventing the closing of the clutch except when the crankshaft is in a position to hold the back in one of its extreme positions, and means operated by the back for starting the core to rotating on its own axis when the back withdraws, for delivering the cast.

18. The combination with a casting box comprising a reciprocable back and a core, of a crankshaft connected with the back to move it up to casting position and back by a complete rotation of said crankshaft, a driving shaft having a worm loose thereon, means for rotating the crankshaft from said worm, means for clutching the worm to said driving shaft, a cam rotating with the crankshaft, and means controlled by the cam for preventing the closing of the clutch except when the crankshaft is in one of its extreme positions.

19. The combination with a casting box comprising a reciprocable back and a core, of a crankshaft connected with the back to move it up to casting position and back by a complete rotation of said crankshaft, a driving shaft having a worm loose thereon, means for rotating the crankshaft from said worm, means for clutching the worm to said driving shaft, a cam rotating with the crankshaft, means controlled by the cam for preventing the closing of the clutch except when the crankshaft is in one of its extreme positions, and means driven by said driving shaft for operating said clutch to open it when the cam is in a position to allow it to open.

20. The combination with a casting box comprising a reciprocable back and a rotatable core, of a crankshaft connected with the back to move it up to casting position and back to delivering position, a constantly rotatable driving shaft having a worm loose thereon connected with the crankshaft for operating it, means for clutching the worm to said driving shaft, a cam for controlling the operation of the last-named means, and a cam rotating with the crankshaft for preventing the closing of the clutch except when the crankshaft is in a position to hold the back in one of its extreme positions.

21. The combination with a casting box comprising a reciprocable back and a rotatable core, of a crankshaft connected with the back to move it up to casting position and back to delivering position, a constantly rotatable driving shaft having a worm loose thereon connected with the crankshaft for operating it, means for clutching the worm

to said driving shaft, a cam for controlling the operation of the last-named means, a cam rotating with the crankshaft for preventing the closing of the clutch except when the crankshaft is in one of its extreme positions, a clutch for connecting the first named cam with the driving shaft, and means on the crankshaft for controlling the last named clutch.

22. In a casting machine, the combination with a core and a reciprocable back, of a crankshaft having a crank thereon directly connected with said back for moving the back into casting position against the core and back, a driving shaft, a clutch on the driving shaft, means operated from the clutch for rotating the crankshaft, a starting shaft, means adapted to be clutched to the driving shaft for rotating the starting shaft, means operated by the starting shaft for closing said clutch, and means connected with said lever comprising a cam on the crankshaft for controlling the disconnection of the starting shaft with the driving shaft at the end of a complete rotation of the crankshaft.

23. In a casting machine, the combination with a core and a reciprocable back, of a crankshaft having a crank thereon directly connected with said back for moving the back into casting position against the core when the crank is in one extreme position and moving it back for delivering the casting and replacing the matrix when in the other extreme position, a driving shaft, means loosely mounted on the driving shaft for rotating the crankshaft, said means comprising a clutch for clutching it to the driving shaft, a hand operated lever, a starting shaft, means connected with said lever for simultaneously connecting the starting shaft with the driving shaft and releasing the crank shaft so that it can rotate, and means controlled by the starting shaft for closing said clutch.

24. In a casting machine, the combination with a core and a reciprocable back, of a crank shaft having a crank connected with said back for moving it back and forth, a driving shaft, a clutch loosely mounted on the driving shaft for rotating the crankshaft, a hand operated starting lever, means controlled by the starting lever for operating said clutch, and means connected with said lever comprising a cam on the crankshaft for disconnecting the crank shaft from the power at the end of a complete rotation of the crankshaft.

25. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, two worms loose on the driving shaft, two clutches for locking said worms to the driving shaft and operating them positively therefrom, two worm wheels meshing with said worms, a crank shaft to which one of said worm wheels is fixed having connections for moving the back toward and from the core, a starting shaft fixed to the other worm wheel, a starting cam on the starting shaft, a lever having three arms, one in position to be controlled by the starting cam, one for controlling the clutch on the worm for operating the crankshaft, and a cam on the crankshaft having two opposite depressions for receiving the third arm twice during each revolution of the crankshaft, moving the first arm into position to engage the starting cam, and allowing the clutch to open and disconnect the crankshaft from the driving shaft, so that the starting cam will close the clutch as the starting cam rotates.

26. In a casting device, the combination with a core and reciprocable back, of a driving shaft, a worm loose on the driving shaft, a clutch for locking said worm to the driving shaft and operating it positively therefrom, a worm wheel meshing with said worm, a crankshaft to which said worm wheel is fixed having connections for moving the back toward and from the core, a lever having three arms, one for controlling the clutch on the worm for operating the crankshaft, a cam on the crankshaft having two opposite depressions for receiving the third arm twice during each revolution of the crankshaft and allowing the clutch to open and disconnect the crankshaft from the driving shaft, means for operating the first arm of the lever automatically to open and close the clutch subject to the control of said cam, and another cam on the crankshaft having connections for controlling said lever arm operating means.

27. In a stereotype plate casting machine, the combination with a reciprocable back and a crankshaft having cranks and links connected with the back for moving the back by the rotation of the crankshaft, a circular cam on the crankshaft having two opposite depressions, means controlled by said cam for connecting the crankshaft with a source of power except when one of said depressions is in a certain position, a circular cam on the crankshaft having a single depression positioned to reach operative position when one of the first named depressions is in the position specified, and means controlled by the second cam for stopping the machine when said single depression is in operative position.

28. In a stereotype plate casting machine, the combination with a reciprocable back and a crankshaft having cranks and links connected with the back for moving the back by the rotation of the crankshaft, a circular cam on the crank shaft having two opposite depressions, means controlled by said cam for connecting the crankshaft with a source of power except when one of said depressions is in a certain position, a circular cam on the crankshaft having a single depression positioned to reach operative position when one

of the first named depressions is in the position specified, means controlled by the second cam for stopping the machine when said single depression is in operative position, and a cam on said crankshaft for controlling the trimming of a plate cast in the back.

29. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, two worms loose on the driving shaft, two clutches for engaging said worms to the driving shaft and operating them positively therefrom, two worm wheels meshing with said worms, a crankshaft fixed to one of said worm wheels for operating the back, a starting shaft fixed to the other worm wheel, a starting cam on the starting shaft having most of its periphery circular and two projections spaced apart, a lever having three arms, one movable to and from a position to be operated by the projections on the starting cam, one for controlling the clutch on the worm for operating the crankshaft, a cam on the crankshaft having two opposite depressions for receiving the third arm twice during each revolution of the crankshaft, allowing said clutch to open and disconnect the crankshaft from the driving shaft, and moving the first arm into the range of the starting cam projections, and a second lever having three arms, one a manually controlled starting lever, a second arm controlling the clutch for connecting the starting shaft with the driving shaft, and the third arm projecting into a position near the crankshaft, and a cam on the crankshaft having a single depression for allowing the third arm of the second lever to move nearer the crankshaft after a complete revolution thereof, and allowing the clutch to open to disconnect the starting shaft from the power shaft.

30. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, two worms loose on the driving shaft, two clutches for engaging said worms to the driving shaft and operating them positively therefrom, two worm wheels meshing with said worms, a crankshaft fixed to one of said worm wheels for operating the back, a starting shaft fixed to the other worm wheel, a starting cam on the starting shaft, a lever having arms, one movable to and from a position to be operated by the starting cam, one for controlling the clutch on the worm for operating the crankshaft, and a second lever having arms, one a manually controlled starting lever, and a second arm controlling the clutch for connecting the starting shaft with the driving shaft.

31. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, a crankshaft for operating said back, two worms loose on the driving shaft, two clutches for engaging said worms to the driving shaft and operating them positively therefrom, two worm wheels meshing with said worms, one of said worm wheels being fixed to the crankshaft, a starting shaft fixed to the other worm wheel, a starting cam on the starting shaft, a lever having three arms, one a manually controlled starting lever, a second arm controlling the clutch for connecting the starting shaft with the driving shaft, and the third arm projecting into a position near the crankshaft, and a cam on the crankshaft having a single depression for receiving the third arm of the lever after a complete revolution of the crankshaft and allowing the clutch to open to disconnect the starting shaft from the driving shaft.

32. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, a worm loose on the driving shaft, a clutch for engaging said worm to the driving shaft, a worm wheel meshing with said worm, a starting shaft fixed to the worm wheel, a starting cam on the starting shaft, and a lever having three arms, one a manually controlled starting lever, a second arm controlling the clutch, and the third arm for operating the other two.

33. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, a worm loose on the driving shaft, a clutch for engaging said worm to the driving shaft, a worm wheel meshing with said worm, a starting shaft fixed to the worm wheel, a starting cam on the starting shaft, a lever having three arms, one a manually controlled starting lever, a second arm controlling the clutch, and the third arm for operating the other two, the second arm having a projection extending therefrom, a pivoted lever having a notch in which said projection engages to hold the clutch closed, a throw off cam operated by the starting shaft for engaging said pivoted lever and releasing the clutch, and yielding means for opening the clutch when released.

34. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, a worm loose on the driving shaft, a clutch for engaging said worm to the driving shaft fixed to the worm wheel, a starting cam on the starting shaft, a lever having three arms, one a manually controlled starting lever, a second arm controlling the clutch, and the third arm for operating the other two, the second arm having a projection extending therefrom, a pivoted lever having a notch in which said projection engages to hold the clutch closed, a throw-off cam operated by the starting shaft for engaging said pivoted lever after the starting shaft has made a predetermined number of revolutions and releasing the clutch, yielding means for opening the clutch when released, and means for setting the throw-off cam so that the clutch will be disconnected

after a desired number of rotations of the starting shaft.

35. In a casting machine, the combination with a driving shaft and means connected therewith for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis from the starting shaft through one of said arcs at each complete rotation of the starting shaft, and means adapted to be set at the end of any of said arcs for controlling the number of times the mold will be closed before the starting shaft clutch is disconnected.

36. In a casting machine, the combination with a driving shaft and means connected therewith for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis from the starting shaft through one of said arcs at each complete rotation of the starting shaft, a depression at the end of each arc, a disc rotatable relatively to the counting wheel and carrying a plunger adapted to be projected into any of said depressions to fix the disc in a predetermined position on the counting wheel, and means whereby after the disc and counting wheel have rotated part of a revolution and the starting shaft has rotated a number of revolutions equal to the number of said arcs through which the counting wheel has rotated according to the setting of said plunger, the starting shaft clutch will be disconnected automatically.

37. In a casting machine, the combination with a driving shaft and means connected therewith for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis from the starting shaft through one of said arcs to each complete rotation of the starting shaft, a depression at the end of each arc, a disc rotatable relatively to the counting wheel and carrying a plunger adapted to be projecting into any of said depressions to fix the disc in a predetermined position on the counting wheel, means for automatically introducing metal into the mold when it closes, and means whereby after the disc and counting wheel have rotated part of a revolution according to the setting of said plunger, the metal introducing means will be stopped.

38. In a casting machine, the combination with a driving shaft and means connected therewith for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis from the starting shaft through one of said arcs at each complete rotation of the starting shaft, a depression at the end of each arc, a disc rotatable relatively to the counting wheel and carrying a plunger adapted to be projected into any of said depressions to fix the disc in a predetermined position on the counting wheel, means for introducing molten metal into the mold, a cam for controlling the operation of the metal introducing means connected with the disc so as to be set with it when the plunger is set in one of said depressions, and means controlled by the cam for stopping the action of the metal introducing means, said cam being arranged to prevent pouring of metal into the mold the last time it closes.

39. In a casting machine, the combination with a driving shaft and means connected therewith for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis from the starting shaft through one of said arcs at each complete rotation of the starting shaft, a depression at the end of each arc, a disc rotatable relatively to the counting wheel and carrying a plunger adapted to be projected into any of said depressions to fix the disc in a predetermined position on the counting wheel, and means for introducing molten metal into the mold, a cam for controlling the operation of the metal introducing means connected with the disc so as to be set with it when the plunger is set in one of said depressions, means controlled by the cam for stopping the action of the metal introducing means, said cam being arranged to prevent pouring of metal into the mold the last time it closes, and means operated by the back for detaching a casting from the core the last time the mold closes.

40. In a casting machine, the combination with a driving shaft and means connected therewith for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis from the starting shaft through one of said arcs at each complete rotation of the starting shaft, means adapted to be set at the end of any of said arcs for controlling the number of times the mold will be closed before the starting shaft clutch is disconnected, and means controlled by the last named means for introducing metal into the mold every time it closes except the last time in the series.

41. In a connecting and controlling device for a casting machine, the combination with a starting shaft having means for starting the casting machine, of a counting wheel having its circumference divided into a number of equal arcs and geared to the starting shaft to rotate through one of said arcs at each complete rotation of the starting shaft, a fixed stud on which said wheel rotates, a disc loose on the stud, a controlling knob having a plunger on the disc, the plunger being adapted to be fixed to the wheel at the end of any of said arcs, a circular fixed scale on said stud divided into divisions of the same angular width as said arcs, said divisions being numbered consecutively except one just beyond the zero division, and means rotatable with said disc for stopping the starting shaft in accordance with the setting of the disc and knob.

42. In a counting and controlling device for a casting machine, the combination with a starting shaft having means for starting the casting machine, of a counting wheel having its circumference divided into a number of equal arcs and geared to the starting shaft to rotate through one of said arcs at each complete rotation of the starting shaft, a disc, a controlling knob having a plunger on the disc, the plunger being adapted to be fixed to the wheel at the end of any of said arcs, a circular fixed scale divided into divisions of the same angular width as said arcs, said divisions being numbered consecutively, and means rotatable with said disc for stopping the starting shaft in accordance with the setting of the disc and knob.

43. In a counting and controlling device for a casting machine, the combination with a starting shaft having means for starting the casting machine, of a counting wheel having its circumference divided into a number of equal arcs and geared to the starting shaft to rotate through one of said arcs at each complete rotation of the starting shaft, a disc, a controlling knob having a plunger on the disc, the plunger being adapted to be fixed to the wheel at the end of any of said arcs, a circular fixed scale divided into divisions of the same angular width as said arcs, said divisions being numbered consecutively, means rotatable with said disc for stopping the starting shaft in accordance with the setting of the disc and knob, means for introducing metal into a mold each time the starting shaft rotates, and means rotatable with the disc for stopping the metal introducing means the next to the last time the starting shaft rotates in a series.

44. In a counting and controlling device for a casting machine, the combination with a starting shaft having means for starting the casting machine, of a counting wheel having its circumference divided into a number of equal arcs and geared to the starting shaft to rotate through one of said arcs at each complete rotation of the starting shaft, a disc, a controlling knob having a plunger on the disc, the plunger being adapted to be fixed to the wheel at the end of any of said arcs, a circular fixed scale divided into divisions of the same angular width as said arcs, said divisions being numbered consecutively, means for introducing metal into a mold each time the starting shaft rotates, and means rotatable with the disc for stopping the metal introducing means the next to the last time the starting shaft rotates in a series.

45. In a mold filling device, the combination with a starting shaft, a cam thereon, means operated by the cam for starting the machine into action and closing a mold, a metal introducing means, a pump cam on the starting shaft, a fixed stud, a lever pivoted on said stud and connected to the metal introducing means for operating it and normally operated by the pump cam once during each revolution of the starting shaft to fill the mold, a pump throw-off pawl pivoted loosely on the starting shaft and having means for holding said lever in inoperative position out of the path of said pump cam, a pump throw off cam rotatable on said stud and having means for moving said pump throw off pawl into locking position when the cam has rotated to a certain position, a counting wheel loose on said stud and geared to be rotated by the starting shaft, a disc to which the pump throw off cam is fixed having a setting device arranged in definite relation to the pump throw off cam, said setting device being adapted to be fixed to the counting wheel at points equally distant circumferentially therearound, whereby said filling device can be set to fill a predetermined number of molds automatically and then be thrown out of action by said pump throw off cam and pawl.

46. In a mold filling device, the combination with a starting shaft, a cam thereon, and means operated by the cam for starting the machine into action and closing a mold, of a metal introducing means, a pump cam, a lever connected to the metal introducing means for operating it and normally operated by the pump once during each revolution of the starting shaft, a pump throw off pawl, means for holding said lever in inoperative position out of the path of said pump cam, a pump throw off cam having means for moving said pump throw off pawl into locking position when the cam has rotated to a certain position, and a setting device arranged in definite relation to the pump throw off cam, whereby said filling device can be set to fill a predetermined number of molds automatically and then be thrown out of action by said pump throw off cam and pawl.

47. In a mold filling device, the combination of a starting shaft, a cam thereon, means operated by the cam for starting the

machine into action and closing a mold, a metal introducing means, a pump cam, a lever connected to the metal introducing means for operating it and normally operated by the pump cam, a counting wheel geared to be rotated by the starting shaft, a disc to which the pump throw off cam is fixed having a setting device arranged in definite relation to the pump throw off cam, said setting device being adapted to be fixed to the counting wheel at points equally distant circumferentially therearound, whereby said filling device can be set to fill a predetermined number of molds automatically and then be thrown out of action by said pump throw off cam and pawl.

48. In a mold filling device, the combination with a pump, of a ladle in position for receiving metal from the pump, means for operating the pump continuously, a counting wheel adapted to be set to stop automatically after a predetermined number of operations have been completed, a continuously operating pump cam, a lever adapted to be operated by the pump cam once during each rotation thereof and connected with the ladle for dumping its contents, a pump throw off pawl for holding said lever out of reach of the pump cam, a pump throw off cam arranged to rotate with the counting wheel and to stop therewith and to throw the pawl into operation after the number of operations for which the counting wheel has been set so as to stop the dumping of the metal from the ladle.

49. In a mold filling device, the combination with a pump, of a ladle in position for receiving metal from the pump, means for operating the pump continuously, a counting wheel adapted to be set to stop automatically after a predetermined number of operations have been completed, and means for dumping the contents from the ladle once for each operation of the machine until after the number of operations for which the counting wheel has been set to stop the dumping of the metal from the ladle.

50. In a casting machine filling device, the combination with a ladle and a pumping device operating constantly to discharge metal into the ladle, said ladle having drain outlets, the ladle having trunnions provided with a projecting arm, a pivoted cam for engaging the arm and turning the ladle over on its trunnions to dumping position, a flexible member for holding the came back in inoperative position, means for turning the cam when released by the flexible member, a lever for operating the flexible member, means for moving the lever to loosen the flexible member, and means adapted to be set to allow the last named member to move a predetermined number of times and then stop it.

51. In a casting machine filling device, the combination with a ladle and a pumping device operating constantly to discharge metal into the ladle, said ladle having drain outlets, the ladle having trunnions provided with a projecting arm, a pivoted cam for engaging the arm and turning the ladle over on its trunnions to dumping position, and means for operating the cam a number of times and then stopping it automatically, said means being capable of being set to make a predetermined number of castings before stopping.

52. In a casting machine filling device, the combination with a ladle and a pumping device operating constantly to discharge metal into the ladle, said ladle having drain outlets, the ladle having trunnions provided with a projecting arm, a pivoted cam for engaging the arm and turning the ladle over on its trunnions to dumping position, and means for operating the cam a number of times.

53. In a mold filling device for a casting machine, the combination of a pivoted ladle having an arm projecting from one pivot, an oscillatable cam for engaging and swinging said arm so as to discharge the contents of the ladle, a weighted arm on the cam for operating it, a cable connected with the cam, a lever connected with the other end of the cable for pulling against the weight, adjustable means for controlling the lever to loosen up on the cable a predetermined number of times and let the weight dump the ladle and then hold the lever in position to hold the ladle upright, and means for constantly supplying the ladle with molten metal.

54. In a mold filling device for a casting machine, the combination of a pivoted ladle having an arm projecting from one pivot, an oscillatable cam for engaging and swinging said arm so as to discharge the contents of the ladle, a weighted arm on the cam for operating it, a cable connected with the cam, a lever connected with the other end of the cable for pulling against the weight, and means for operating the cable.

55. In a casting machine, the combination with a driving shaft and means for opening and closing a mold, of a starting shaft, a clutch for connecting the starting shaft with the driving shaft, a counting wheel divided circumferentially into a plurality of equal arcs, means for rotating the counting wheel on its axis through one of said arcs at each complete rotation of the starting shaft, and means adapted to be set at the end of any of said arcs for controlling the number of times the mold will be closed before the starting shaft clutch is disconnected.

56. In a casting device, the combination with a core and a reciprocable back, of a driving shaft, a worm loose on the driving shaft, means for engaging said worm to the driving shaft, a worm wheel meshing with said

worm, a starting shaft fixed to the worm wheel, a starting cam on the starting shaft, and a lever comprising a manually controlled starting lever, an arm for controlling the clutch, and an arm for operating the other two.

57. In a mold filling device, the combination with a nozzle for discharging into the mold, of a ladle therein, and means for continually discharging metal into the ladle, of means for emptying the ladle into the mold through the nozzle to supply the mold with a complete charge of metal.

58. The combination with a melting pot and spout of a ladle in the spout, with a nozzle for discharging the metal, means for continually discharging metal into the ladle, and means for emptying the ladle into the mold through the nozzle to supply the mold with a complete charge of metal.

59. In a stereotype plate casting machine, the combination with a reciprocable concave back, of a rotatable core, a shaft for rotating the core, a clutch for controlling the connection of the shaft with a source of power, a lever for operating the clutch, means for holding the lever in a position to open the clutch, means rotatable with the core for receiving the end of the lever at the end of a half revolution and allowing the first named means to open the clutch, and means movable within said back for actuating said lever to close the clutch when the back moves away from the core.

60. In a stereotype plate casting machine, the combination with a vertical rotatable core and a movable back adapted to support the matrix, of means for automatically moving the back up to the core and closing the mold, mechanically actuated means for filling the mold each time it closes, mechanically actuated means whereby the movement of the back away from the core will cause the core to rotate half way around and then stop, and mechanically operated means in position at the side of the core to engage the cast plate as the core rotates and trim off its ends.

61. In a stereotype plate casting machine, the combination with a vertically arranged mold having a matrix, of mechanically operated means for successively closing and opening the mold to receive successive charges of metal against the matrix, and release the cast plates, said adjustable mechanically operated means being adapted to be set mechanically to perform said operations a number of times.

In testimony whereof I have hereunto affixed my signature.

HENRY A. WISE WOOD.