

H. A. W. WOOD.
 ROTARY CASTING MACHINE.
 APPLICATION FILED DEC. 18, 1911.

1,129,154.

Patented Feb. 23, 1915.

4 SHEETS-SHEET 1.

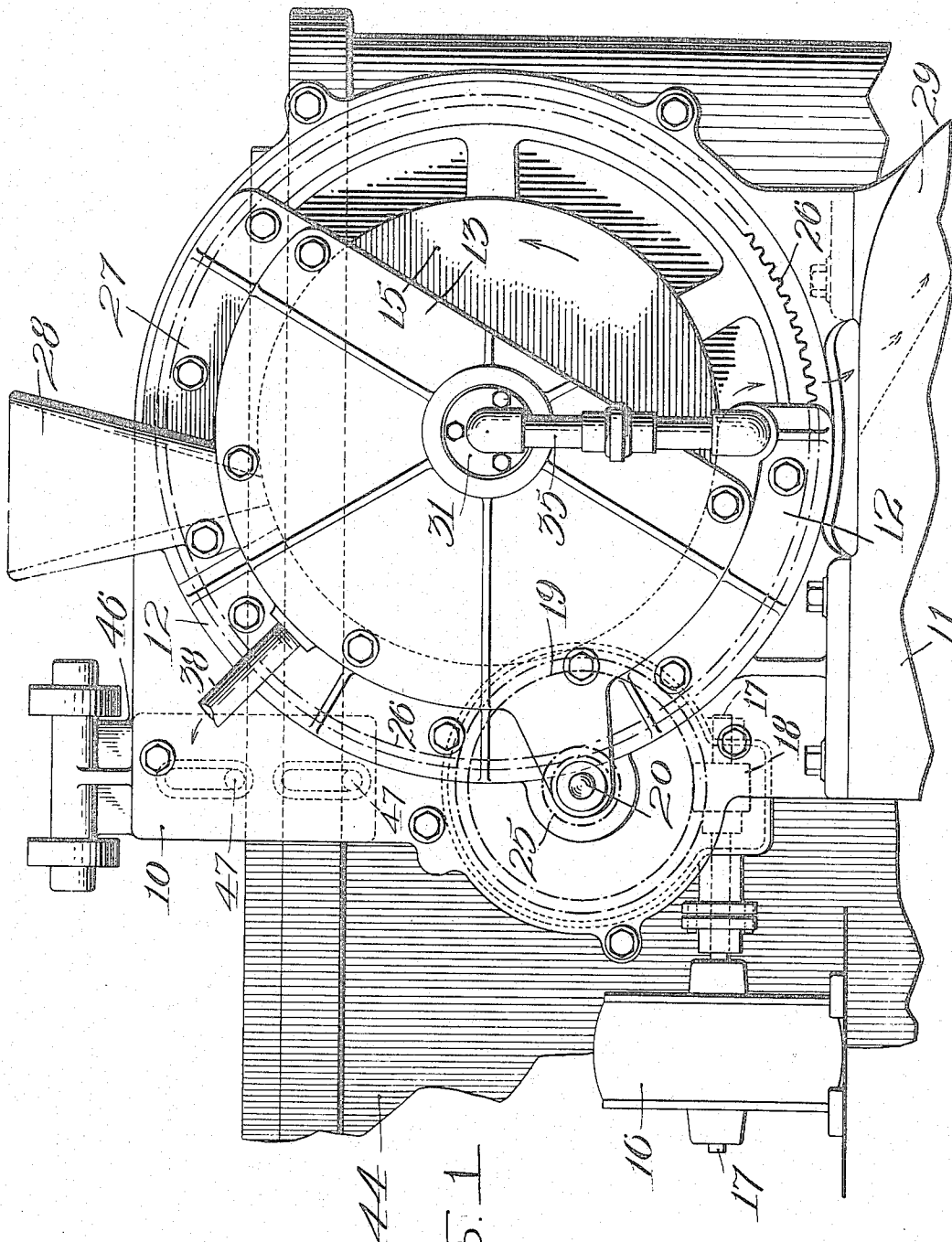


Fig. 1

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Inventor:
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 by (Attorney)
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1,129,154.

4 SHEETS--SHEET 2.



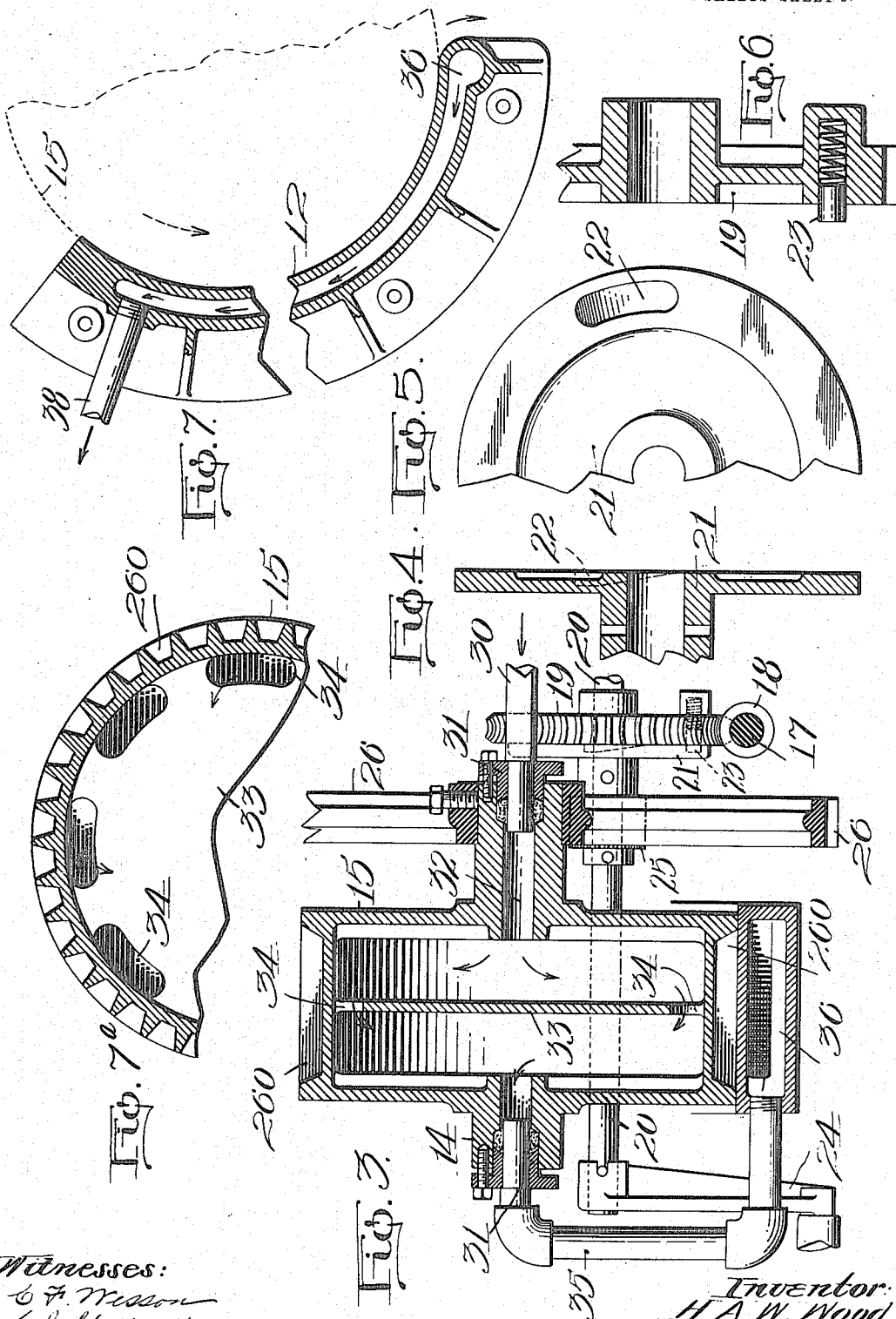
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H. A. W. Wood
BY ATTORNEYS
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Witnesses:
 C. F. Wilson
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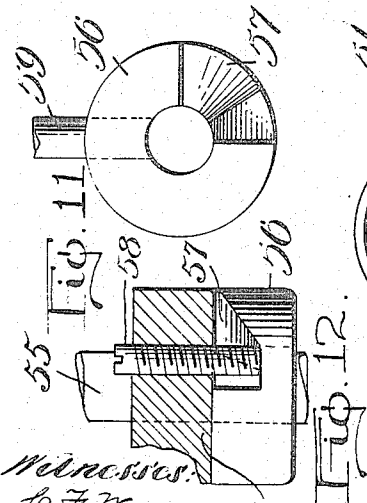
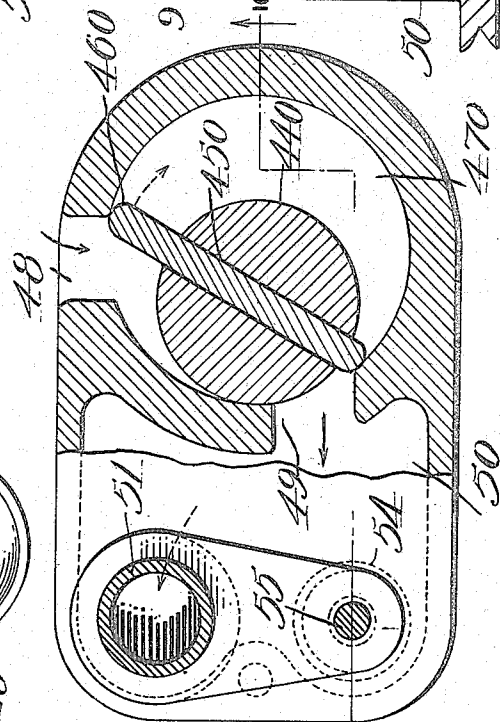
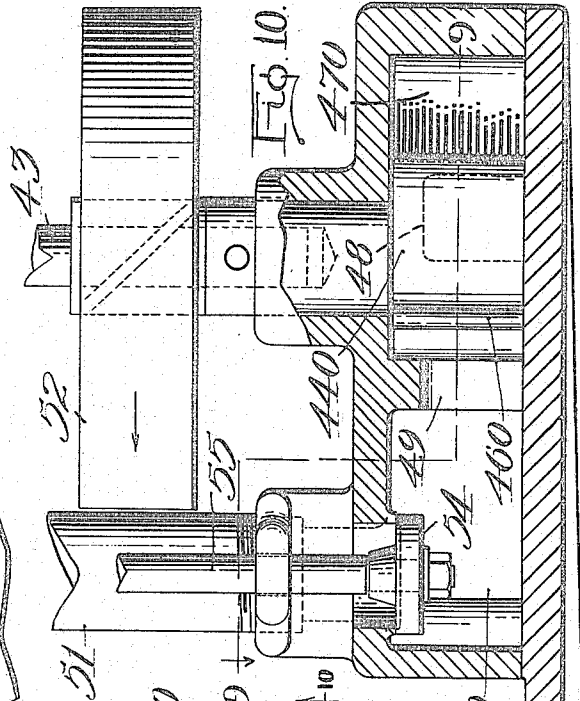
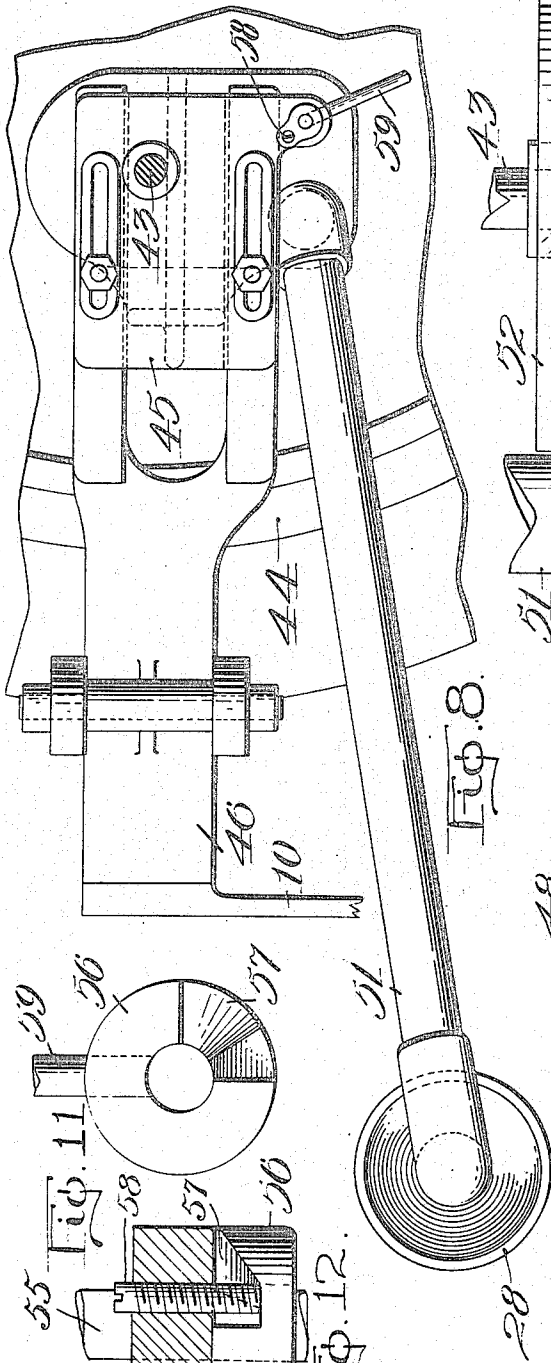
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4 SHEETS—SHEET 4.



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Fig. 9.
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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO AUTOMATIC FURNACE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ROTARY CASTING-MACHINE.

1,129,154.

Specification of Letters Patent.

Patented Feb. 23, 1915.

Application filed December 13, 1911. Serial No. 666,525.

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 Rotary Casting-Machine, of which the following is a specification.

This invention relates to a machine for casting soft metal ingots in large quantities.

The principal objects of the invention are to provide a practicable and efficient machine whereby such ingots can be cast rapidly in a continuous manner; to provide a construction in which the supply of metal to the molds will be proportionate to the rate of delivery of the ingots from the molds; to provide a construction in which an endless series of molds can be moved by a motor or other convenient source of power and the metal supply operated by the same source of power at the same time; and to provide means whereby the molds can be operated independently of the power without necessitating the attention of an attendant to the disconnection of any of the parts.

Another important object of the invention is to provide an improved cooling system for the molds which by a continuous current of water will cool the inner surfaces of the molds both while they are filled and while they are empty, and will also cool the outer surfaces of the molds which at the time are filled with metal.

Other objects of the invention are to provide an improved form of rotary mold wheel in the circumference of which the molds are located, and an improved metal pump.

Further objects and advantages of the invention will appear hereinafter.

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

Figure 1 is an end elevation of a rotary casting apparatus constructed in accordance with this invention; Fig. 2 is a side view of the same showing the metal supply device in central longitudinal section; Fig. 3 is a sectional view vertically through the center of the casting wheel showing certain parts in elevation; Fig. 4 is a central sectional view of the power transmitting disk shown in Fig. 3; Fig. 5 is a fragmentary elevation of the same; Fig. 6 is a central sectional view of a worm wheel for operating the said disk; Fig. 7 is a fragmentary sectional view of the cylinder casing; Fig. 7^a is a fragmen-

tary central sectional view of the mold wheel; Fig. 8 is a plan of the pump; Fig. 9 is a horizontal sectional view of the pump on the line 9—9 of Fig. 10; Fig. 10 is a sectional view on the line 10—10 of Fig. 9; Fig. 11 is a plan of a detail; and Fig. 12 an elevation thereof with an adjacent part in section.

The invention is shown in a form comprising a main frame 10 supported on a base 11. The frame is provided with a cylindrical casing 12 extending therefrom on one side and provided at the end with a plate 13 which I will call a cylinder cover. The casing is in the form of a circle cut away on an inclined chord for a reason that will appear hereinafter. Journaled in bearings on this frame and casing respectively are trunnions 14 of a rotary mold wheel 15. For the purpose of driving this mold wheel a motor 16 is shown having a driving shaft 17 provided with a worm 18 driving a worm wheel 19. This worm wheel is loose on a shaft 20 which is journaled on the frame and a projection of the plate 13. Fixed on this shaft 20 is a driving disk 21 having a depression 22 in the face thereof adjacent the worm wheel. This depression is beveled and has a square shoulder at one end. The worm wheel is provided with a spring-pressed plunger 23 adapted to enter said depression and to bring up against said shoulder when the worm wheel is rotated. This forms a positive connection between the worm wheel and disk so that the shaft 20 will be driven positively by the motor. But it will be observed that if the shaft 20 is rotated in the same direction, as for instance, by means of a removable hand crank 24, the shaft will be rotated without interfering with the worm wheel because the plunger 23 will ratchet over the depression 22. A pinion 25 on the shaft 20 constantly meshes with a large gear 26. This gear 26 is fixed on the end of one of the trunnions 14 so that the mold wheel will be operated positively either by the motor or by the crank handle.

The mold wheel is provided on its circumference with an endless series of cavities 260 constituting molds. The main frame 10 is provided with a member 27 removably secured thereto and having an integral funnel 28 projecting upwardly therefrom at the top of the frame. It will be understood, of course, that this mold

wheel fits within the interior cylindrical casing and as it passes the funnel, metal therein will flow into the molds. The wheel is intended to be rotated in the direction of the arrow in Fig. 1 with sufficient rapidity to allow the metal to congeal in the molds and form ingots or pigs. When each mold comes around to the bottom each ingot, then being bottom side up and not supported at its outer side, will drop down into a delivery chute 29. The reason for making the casing constitute only a little more than half a circle will be obvious now as the cut away portion exposes the mold wheel and leaves an open space through which the ingots are discharged.

In order to cool the metal effectively so that the mold wheel can be operated with sufficient rapidity for practical purposes, cooling water is introduced through a pipe 30 which extends through a stuffing box 31 into an axial passage 32 in one of the trunnions of the mold wheel. The mold wheel is hollow and is provided with a partition 33 centrally located and transverse to its axis. This partition is imperforate at the center but is provided with a series of perforations 34 near its edge, adjacent to the inner walls of the molds 260. Therefore the water entering on one side of this partition will pass to the other side through these perforations and come into direct contact with the heated inner walls of the molds. It will then pass through the other trunnion and through a discharge pipe 35. It is then directed preferably into a space 36 in the casing 12 which constitutes the outer wall of the molds as they pass from the receiving to the discharge point. The water is discharged through a pipe 38 or the like. It will be seen that in this way the interior walls of the molds are cooled constantly by fresh cool water whether they contain metal or not. The outer walls of the molds that contain the metal are cooled by the water in the passage 36 and the remaining molds after they have been emptied are cooled on the outside only by passing through the air. In this way a thorough cooling of the molds is secured and the metal is hardened therein in a minimum of time so that the wheel can be operated with a practical degree of rapidity.

On the shaft 20 is located a pulley 40 which by means of belt or rope drive 41 drives a pulley 42 on a shaft 43. This shaft is located in a pump in a molten metal pot 44 which pump is mounted by means of an adjustable plate 45 on a bracket 46. This bracket is vertically adjustable by means of bolts 47 and slots on the frame 10. On the lower end of the shaft 43 is fixed a bottom plate holder 440 having in the lower end thereof a diametrical slot 450 in which is a slidable bottom plate 460. These parts are

carried in a cylindrical chamber 470 in the bottom of the pump. The shaft 43 enters this cylinder at a point at one side of its center. Therefore as the bottom plate holder revolves, the bottom plate is made to slide with respect to it in the chamber. This causes the metal to flow from the body of the melting pot through an opening 48 into the chamber 470 and out through an opening 49 into a chamber 50. From here it passes into a pipe 51 which carries the molten metal into the top of the funnel 28. The shaft 43 is shown as provided with a mixer 52 above the chamber 470.

The chamber 50 is provided with a relief valve 54 in the top thereof mounted on a shaft 55, the upper end of which passes through a hole in the plate 45. Fixed to the shaft 55 is a collar 56 underneath the plate 45 having a cam surface 57 which engages the end of a screw 58 on the plate 45. The collar 56 has a handle 59 by which it can be turned to force the valve 54 down by means of the cam surface 57 on the collar. By leaving this valve open, the pump can be run without forcing metal through the pipe 51. In this case the metal simply circulates around into the melting pot.

With the machine running and the relief valve closed, the metal will run constantly in proportion to the rapidity of rotation of the shaft 20 from the mouth of the pipe 51 into the funnel. Thus it fills the molds as they pass under the funnel. As the ingots are cooled on both sides they are discharged from the machine and then the molds continue to be cooled by the water inside until they complete the cycle. When the casting operation is to be completed, the relief valve may be opened allowing the machine to continue its rotation without receiving any more metal so that all the ingots can be delivered. Another way of accomplishing the same result is to stop the motor. The mold wheel can then be turned around by the handle 24 to empty the molds.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described, but

what I do claim is:—

1. In a rotary casting machine, the combination with a driving shaft, of a wheel rotatable thereby having a series of molds around its circumference, a pump operated by said shaft for normally supplying metal to the molds when the shaft rotates, and means for rendering the pump inoperative while the shaft continues to operate.

2. In a casting machine, the combination

with a driving shaft, of a series of molds operated thereby, means operated by said shaft for constantly supplying metal to the molds when the shaft rotates, a crank handle, and means connected with the crank handle for moving the molds by hand independently of said shaft.

3. In a casting machine, the combination of a driving shaft, a wheel having a series of molds in the edge thereof, means comprising a second shaft adapted to be rotated by the driving shaft for rotating said wheel, and means whereby the second shaft can be rotated by hand independently of the driving shaft.

4. In a casting machine, the combination of a driving shaft, a wheel constantly connected therewith and adapted to be driven thereby, a second shaft on which said wheel is loosely mounted, a disk on the second shaft, means for transmitting motion to the disk from said wheel, a series of molds, and means connected with said shaft for rotating the molds.

5. In a casting machine, the combination of a driving shaft, a wheel constantly connected therewith to be driven thereby, a second shaft on which said wheel is loosely mounted, a disk fixed on the second shaft, a ratchet device for transmitting a motion of rotation from said wheel to the disk, a series of molds, means connected with said second shaft for rotating the molds, and manually operated means for rotating said disk and molds independently of the wheel.

6. In a casting machine, the combination of a driving shaft, a wheel connected therewith to be operated thereby, a second shaft on which said wheel is rotatably mounted, a disk fixed on the second shaft, means for transmitting a motion of rotation from said wheel to the disk in one direction and not in the other, and a series of molds connected with said second shaft to be rotated thereby, whereby the independent rotation of the second shaft in the same direction will rotate the molds without moving said wheel.

7. In a casting machine, the combination of a driving shaft, a wheel driven thereby, a second shaft on which the wheel is loosely

mounted, a disk fixed on said second shaft and provided with a series of inclined notches in the face thereof, a spring-pressed plunger carried by the wheel in position to enter said notches as the wheel rotates and cause the disk to rotate with the wheel, a series of rotatable molds, and means operated by the second shaft for rotating said molds about a center.

8. In a casting machine, the combination with a frame, of a driving shaft journaled thereon, a second shaft, a disk fixed on the second shaft, a wheel constantly connected with the driving shaft, means for transmitting a motion of rotation from said wheel to the disk, a series of molds, means connected with the second shaft for rotating the molds, and means for rotating said disk and molds independently of the wheel.

9. In a casting machine, the combination of a hollow rotary mold disk having integral mold cavities at its circumference and provided with a partition transverse to its axis of rotation having a row of perforations closely adjacent to the cavities, means for introducing cooling fluid on one side of the partition and discharging it on the other, and means for leading the cooling fluid in a path adjacent to the exterior of said mold cavities.

10. In a casting machine, the combination of a hollow rotary mold disk, an exterior cooling device for said disk, and means for connecting the exterior cooling device with the interior of the disk.

11. In a casting machine, the combination with an endless series of movable molds adapted to receive metal at one point and discharge castings at another, of means for cooling all the molds on one side, and means for cooling on the other side those molds moving from the receiving point to the discharging point.

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

HENRY A. WISE WOOD.

Witnesses:

BLODWEN W. JONES,
LILLIAN C. JONES.