C. E. HOPKINS.

COOLING APPARATUS FOR STEREOTYPE PLATES.

APPLICATION FILED DEC. 9, 1911.

1,055,176.

Patented Mar. 4, 1913.

6 SHEETS—SHEET 1.

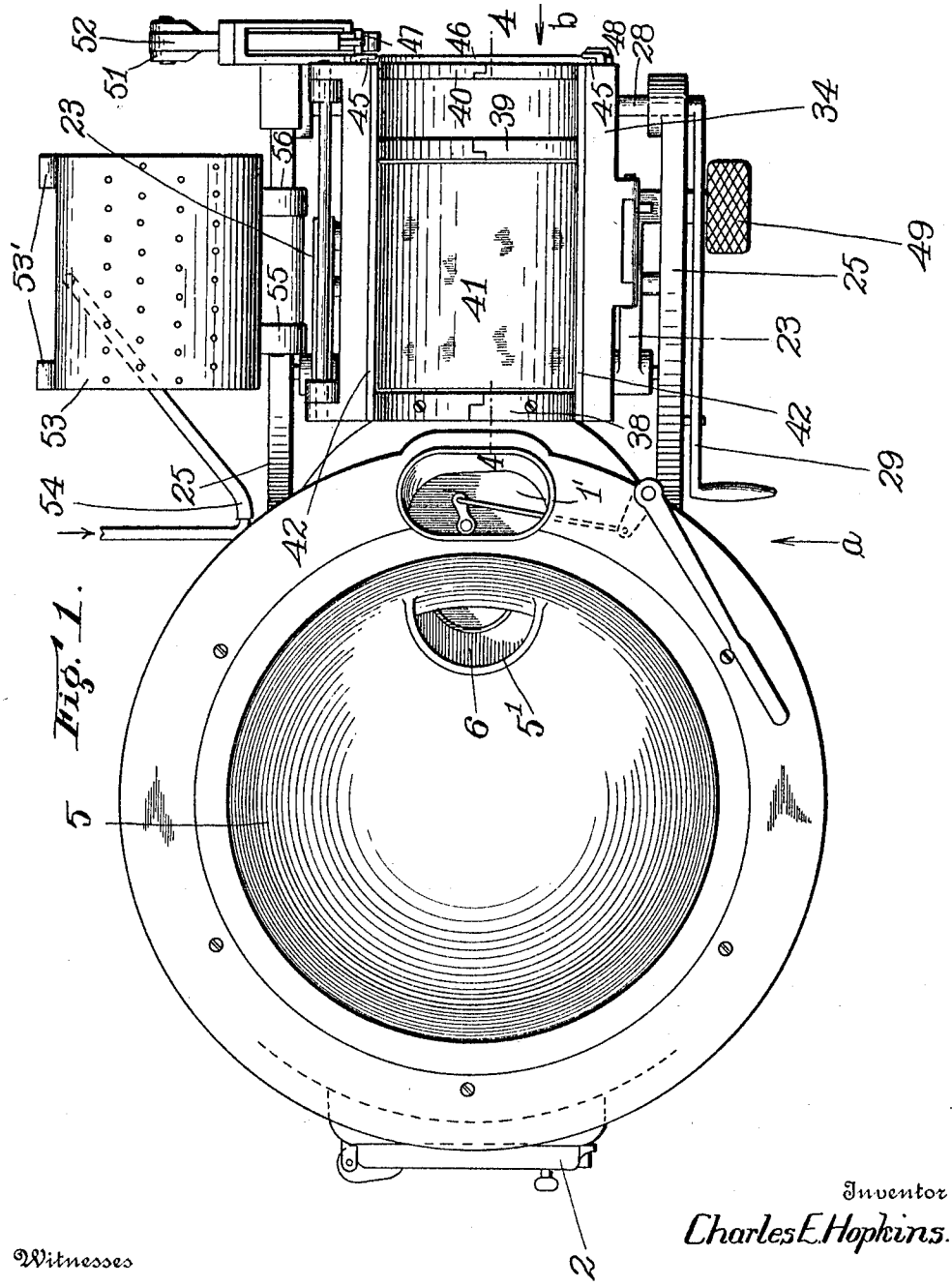

Fig. 1.

Witnesses

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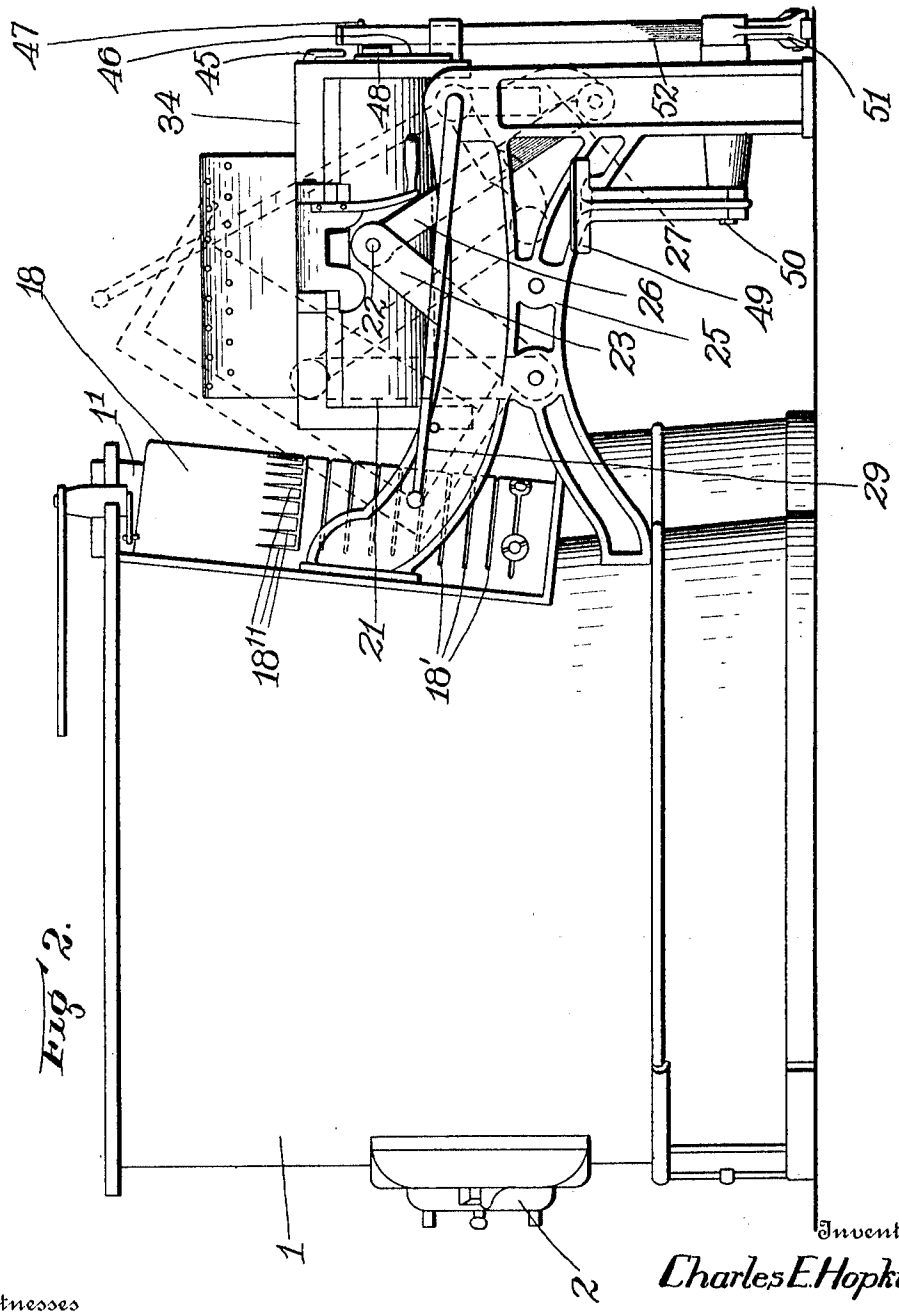

Fig. 2.

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Fig. 4.

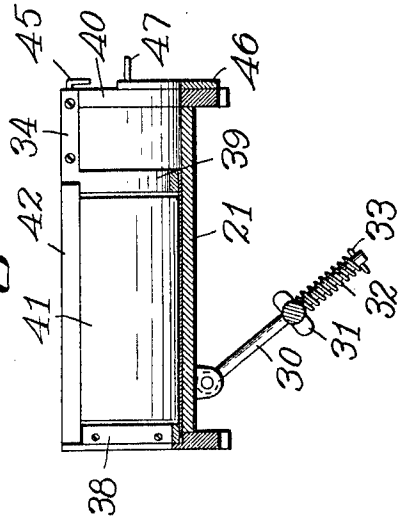

Fig. 3.

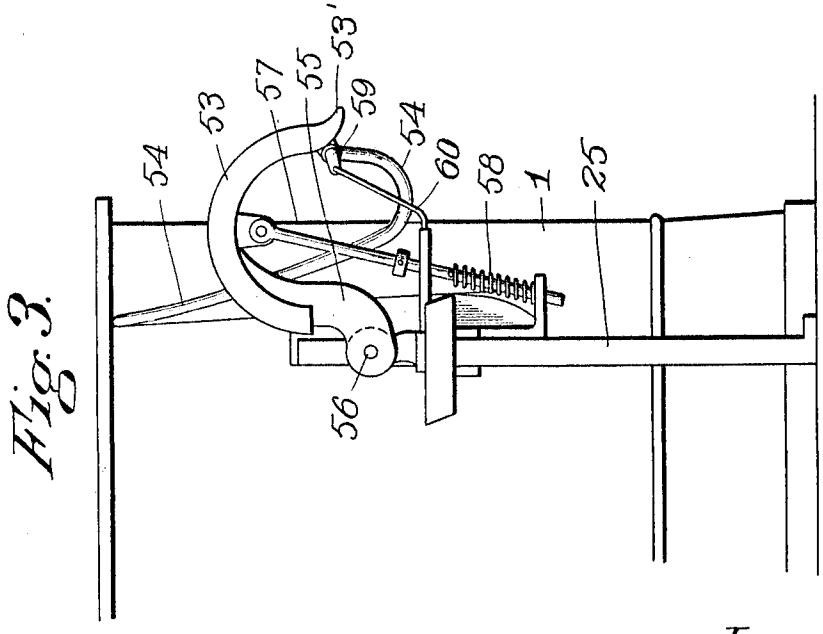

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Fig. 5.

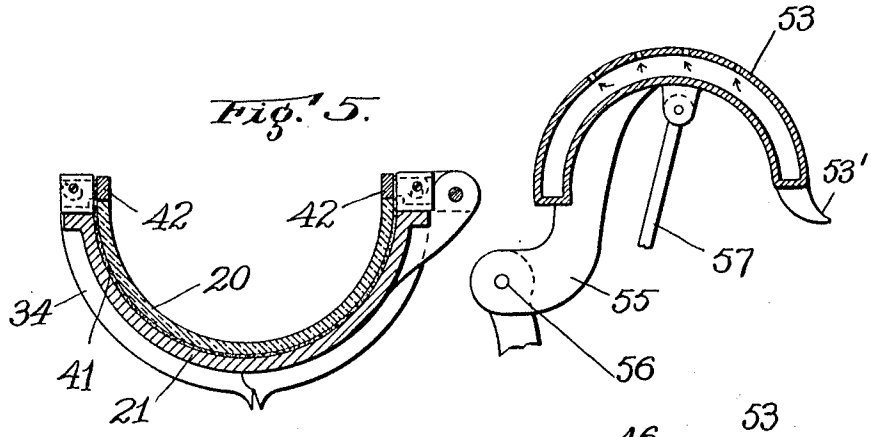
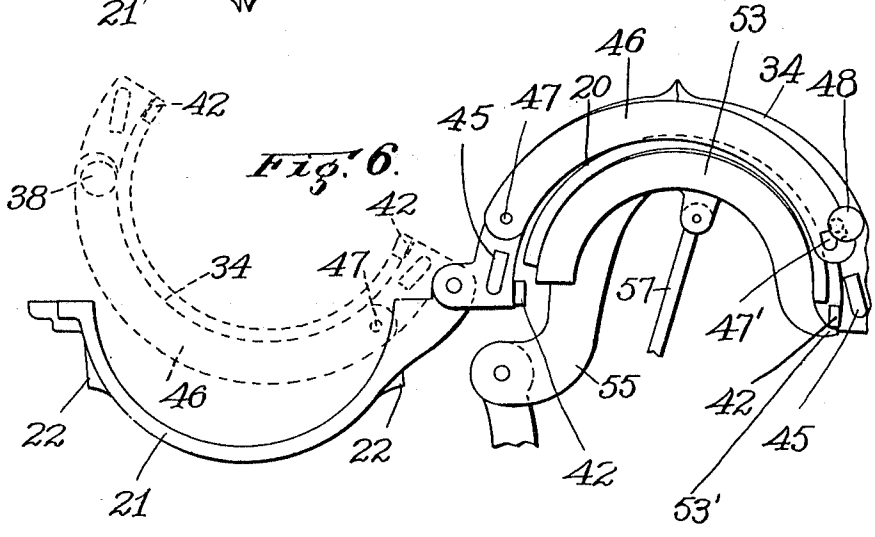


Fig. 6.



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6 SHEETS—SHEET 5.

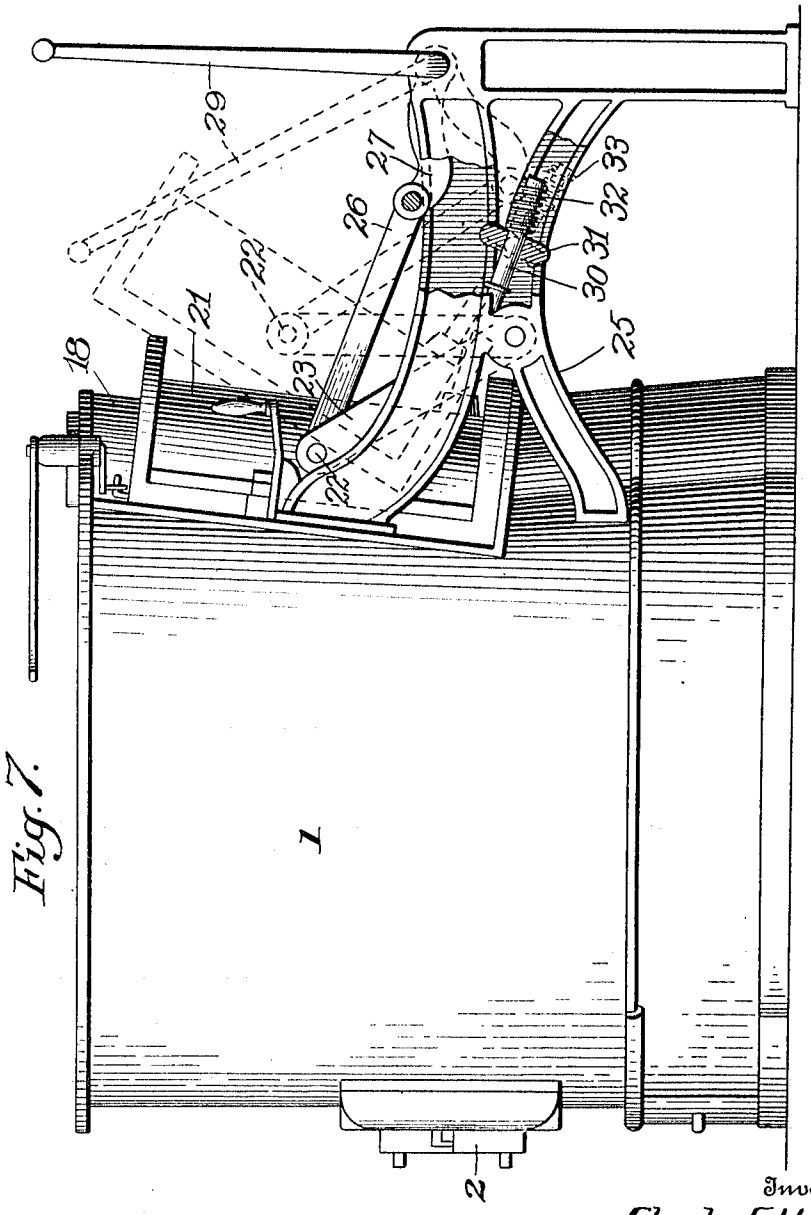

Fig. 7.

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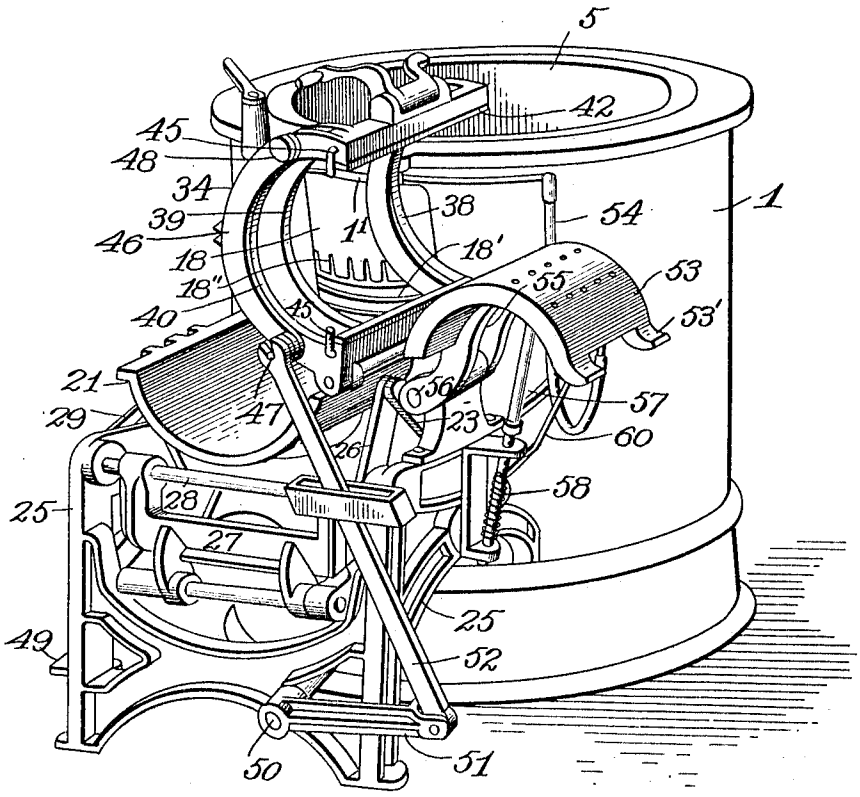
6 SHEETS—SHEET 6.

Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES E. HOPKINS, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO AUTOPLATE COMPANY OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

COOLING APPARATUS FOR STEREOTYPE-PLATES.

1,055,176. Specification of Letters Patent. Patented Mar. 4, 1913.

Original application filed September 7, 1901, Serial No. 74,707. Divided and this application filed December 9, 1911. Serial No. 664,737.

To all whom it may concern:

Be it known that I, CHARLES E. HOPKINS, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Cooling Apparatus for Stereotype-Plates, of which the following is a specification.

This is a division of my application for patent on a stereotype apparatus Serial No. 74,707, filed September 7, 1901, and the principal objects of the present invention are to provide means whereby a stereotype plate can be cooled after casting without touching the plate by the hands or carrying it from one machine to another for that purpose; to provide for applying a flowing cooling fluid on the surface of the plate; to provide for controlling the supply of cooling fluid to the plate; to provide for automatically turning on and off the cooling fluid, preferably actuated by the plate itself; to provide means in connection with the cooling device for bringing the plate from the casting box into position to be cooled; to provide an efficient form of cooling device for rapidly and uniformly cooling the plates; and to provide for directing the cooling fluid on the concave surface of a curved plate and spraying it on the entire extent of said concave surface.

Further objects and advantages of the invention will appear hereinafter.

Referring to the drawings: Figure 1 is a plan view of one form of stereotyping apparatus. Fig. 2 is a side view, looking in the direction of arrow *a*, Fig. 1, and showing by broken lines a different position of some of the parts. Fig. 3 is a front end view, looking in the direction of arrow *b*, Fig. 1. Fig. 4 is a vertical section, through some of the parts, taken at a point indicated by line 4—4 Fig. 1, looking in the direction of arrow *a* same figure. Fig. 5 is a cross section through the casting box, and the plate holder, with the plate in the box. Fig. 6 corresponds to Fig. 5, but shows one part of the casting box in its opposite position, and by broken lines an intermediate position. Fig. 7 is a side view of the apparatus with parts omitted and broken away in order to show the action of the spring in controlling the lower part of the box, and Fig. 8 is a perspective view of a portion thereof.

In the accompanying drawings 1 is a furnace or stove body, with a door 2. Within the furnace 1 extends a pot 5, which holds the metal for the casting, and having a division 5′ therein, forming a well 6. Leading from the lower part of the well 6 is an opening for the passage of metal from the pot 5. The core or cope 18 is hollowed on its inner surface, and of circular shape in cross section, corresponding to the shape of the plate to be cast, as is customary, and extends in a vertical direction around the convex circular extension 1′ on the furnace 1, and is secured thereto in a fixed or stationary position.

The casting box or drag is shown as made in two parts, and so constructed and operated, that both parts have a pivotal or swinging motion in a vertical plane, to carry the matrix into position, contiguous to the core 18, for the plate to be cast, and one part, which supports the plate after it is cast, has a pivotal motion at right angles to the first mentioned pivotal motion, to raise and transfer the cast plate on its supporting block. The main part 21 of the casting box, which only has one pivotal motion, has a trunnion 22 extending out from each side thereof.

The levers or rocking bars 23, forming the movable support are operated by a knuckle joint mechanism, comprising the arms 26 and 27 pivotally connected, and the arm 27 fast on a shaft 28 mounted in bearings on the frame 25. The shaft 28 has an operating arm 29 fast thereon, to turn said shaft and operate the knuckle joint mechanism, to move the casting box and carry it from its horizontal position to a vertical position, when the plate is to be cast, then return it to a horizontal position.

In connection with the casting box and its supporting mechanism, I employ a counterbalance device consisting in this instance of a rod 30 (see Figs. 4 and 7) pivotally attached at one end to the lower part of the box 21, and guided and sliding through an opening in a part 31 suitably supported on the frame 25 and having an expansion spring 32 thereon, compressed between the stationary part 31 and a pin 33 in the end of the rod 30. Said rod 30 acts to hold away the bottom or lower end of the casting box, from the core 18, when the box is raised, until the box reaches its vertical position;

it also acts to first move the bottom or lower end of the casting box away from the bottom of the core 18, when the casting box is moved into its horizontal position, allowing the cast plate to free itself from the recesses or corrugations 18′ and 18″ in the core 18. The rod 30 also acts to hold the casting box in its horizontal position.

On the outer end of the frame 34 is a rigid bar or yoke 45, pivoted at one end on a pin 47 fast in the frame 34 and provided with an off-set or angular slot 47′, at its other end (see Fig. 6) through which loosely extends a headed pin 48 secured to the end of the frame 34, to attach the slotted end of the bar or yoke 46 to said frame 34.

The frame 34 is raised, to transfer the cast plate to the plate holder, in this instance by means of a foot treadle 49, secured on a rock shaft 50, journaled in the frame 25, through an arm 51, fast on said shaft, and a lever 52 slotted at its upper end to receive the pin 47 which is held therein, when the treadle mechanism is operated, but is withdrawn when the whole casting box is moved into its vertical position.

I will now describe the plate holder or block, on which the cast plate is transferred from the casting box, by the frame 34, above described.

The plate holder or block in this instance consists of a cored casting 53, perforated on top, and connected with a water pipe, as 54 Fig. 3, through which water passes to cool the plate. The holder 53 is of a shape corresponding to the shape of the cast plate 20, and is preferably secured at one edge to a hinged frame 55, mounted on a shaft 56, journaled on the frame 25. The holder or block 53 is yieldingly held up in normal position in this instance by a spring actuated rod 57, having an expanding spring 58 encircling its lower end, see Fig. 3. When the cast plate 20 is transferred by the frame 34 on the holder or block 53, the weight of the plate will depress the holder or block 53, and the cam extensions 53′ on the outer edge of the holder or block 53 being engaged by the bar 42 of the frame 34 will cause hinged bars 38, 39, and 40 to spread, to release the cast plate 20 from the outer bar 42, and at the same time draw the matrix 41 away from the plate, releasing the matrix and leaving the cast plate 20 on the holder 53, see Fig. 6. During the spreading of the hinged bar referred to, the slotted end of the yoke 46 falls forward and the pin 47 engaging the slot holds the hinged bars in their spread position. In this way the bar 42 will pass on the outside of the plate 20 now resting on the holder when the frame 34 is returned to its position in the box 21. I have shown a valve 59 (see Fig. 3) for automatically controlling the flow of water through the pipe 54 to the holder 53, operated by a fixed rod 60, to open the valve, when the holder is pressed down by the weight of the cast plate thereon, and to close the valve when the plate is removed and the holder 53 rises. After the casting is made the casting box is moved back into its horizontal position, and the frame 34 disconnected from the main part 21 of the casting box, and raised by the treadle mechanism, to transfer the cast plate from the casting box on the holder 53, and as above described, the plate is released, the matrix 41 remaining in place, and the frame 34 is returned to its normal position in the casting box, ready for another casting. Water is turned on from the pipe connection 54 to the holder 53, to cool the cast plate, preparatory to removal.

It will be understood, that the details of construction of my improvements in stereotyping machines may be varied if desired. More than one casting box may be used if desired.

Having described my invention what I claim as new and desire to secure by Letters-Patent is:—

1. The combination of a cooling device for stereotype plates, and means for feeding plates into the cooling device.

2. The combination with a stereotype plate cooling device having means for applying a cooling fluid to a plate, of means for feeding plates to the cooling device.

3. In a stereotype plate cooling apparatus, a stereotype plate support, means for moving a stereotype plate to the support, and means for supplying water to the stereotype plate on the support.

4. In a stereotype plate cooling apparatus, a plate support, means for moving a plate to the support, tubes for conveying water to the plate, and automatic means for starting and stopping the flow of water, as each plate is delivered to or removed from the support.

5. In a stereotype plate cooling apparatus, a plate support, means for guiding a plate over the support, and delivering it onto said support, and tubes for conveying water to the plate.

6. In a stereotype plate cooling apparatus, a plate support, means for guiding a plate to and moving it over the support, and means for supplying water to the plate as the plate is moved to a position over the support.

7. In a stereotype plate cooling apparatus, a plate support, means for moving a plate to the support, means for supplying water to the plate, and means constructed so that the movement of the plate will start the water as the plate is moved to the support, and stop the water as it is moved off the support.

8. In a stereotype plate cooling apparatus, a plate support, a water sprayer, means

for supplying water to the sprayer, and means for guiding a plate to the sprayer, so that the water can come in contact with and cool the plate.

9. In a stereotype plate cooling apparatus, a plate support, a water sprayer, means for supplying water to the sprayer, and means for moving a plate to the support, so that the sprayer can act to cool the plate.

10. In a stereotype plate cooling apparatus, a convex water distributing surface, arranged in practically horizontal position, tubes for conveying water to the distributing surface, and means by which a plate is moved over the distributing surface and stopped, so that water can act on the concavity of the plate to cool the same.

11. In a stereotype plate cooling apparatus, a convex water distributing surface, tubes for conveying water to the distributing surface, and means for moving a plate over the distributing surface to stop thereon, so that the water can act on the concavity of the plate to cool the same.

12. In a stereotype plate cooling apparatus, a plate support held in a frame, hollow connections arranged so as to convey water to and through the support, and means for moving a stereotype plate to the support so that the water can act on it to cool the plate.

13. In a stereotype plate cooling apparatus, the combination with a curved perforated water supply adapted to spray water from a curved surface thereof, and means for bringing a curved cast plate into position for its concave surface to be sprayed thereby.

14. A cooling device for stereotype printing plates comprising a support for such plates, a distributing device arranged adjacent to said support in operative position to cause a cooling agent to flow to cool a plate on said support, and means for controlling the supply of the cooling agent to said distributing device.

15. A cooling device for stereotype printing plates comprising a support for such plates, a device arranged adjacent to said support in operative position to deliver a cooling agent, and a device for controlling the supply of the cooling agent to said delivering device, said controlling device being arranged to be actuated by a plate when placed on said support.

16. A cooling device for stereotype printing plates comprising a support for such plates, a delivery pipe arranged adjacent to said support in operative position to deliver a fluid cooling agent, said delivery pipe having a multiplicity of jet openings therein, a supply pipe communicating with said delivery pipe, a normally closed valve for controlling the supply to said delivery pipe, and means for opening said valve and arranged to be actuated by a plate when placed on said support.

17. A cooling device for stereotype printing plates comprising a support for such plates, a device arranged adjacent to said support in operative position to deliver a cooling agent against a plate on said support, and a device for controlling the supply of the cooling agent to said delivering device, said controlling device being arranged to be actuated by a plate when placed on said support.

18. In a stereotype plate cooling apparatus, the combination with a support for a plate, of a water supply, and means for bringing a plate on the support and water supply into contact.

19. In a stereotype plate cooling apparatus, the combination of a water supply, and means for bringing a plate into position to be cooled by water therefrom.

20. In a stereotype making machine, a cooling apparatus arranged to receive a stereotype plate from the stereotype mechanism, means for conveying a plate from the machine to the cooling apparatus, water connections leading from a source of supply to the cooling apparatus, and means for controlling said water supply.

21. In a stereotype casting apparatus, a plate holder or block to receive the plate after it has been removed from the casting chamber, comprising a hollow casting perforated for the passage of water from the interior of the casting.

22. In a cooling device for stereotype printing plates, the combination with a supply pipe, of a valve for controlling the same, a cooler for supporting the plate, means whereby when the plate is located on the cooler it will move, and means for opening the valve when the cooler moves to allow the water to flow into the cooler.

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

CHARLES E. HOPKINS.

Witnesses:
ALBERT E. FAY,
J. ELMER HALL.