April 6, 1937. A. KING 2,076,374

CASTING MACHINE

Filed Jan. 10, 1933 5 Sheets-Sheet 1

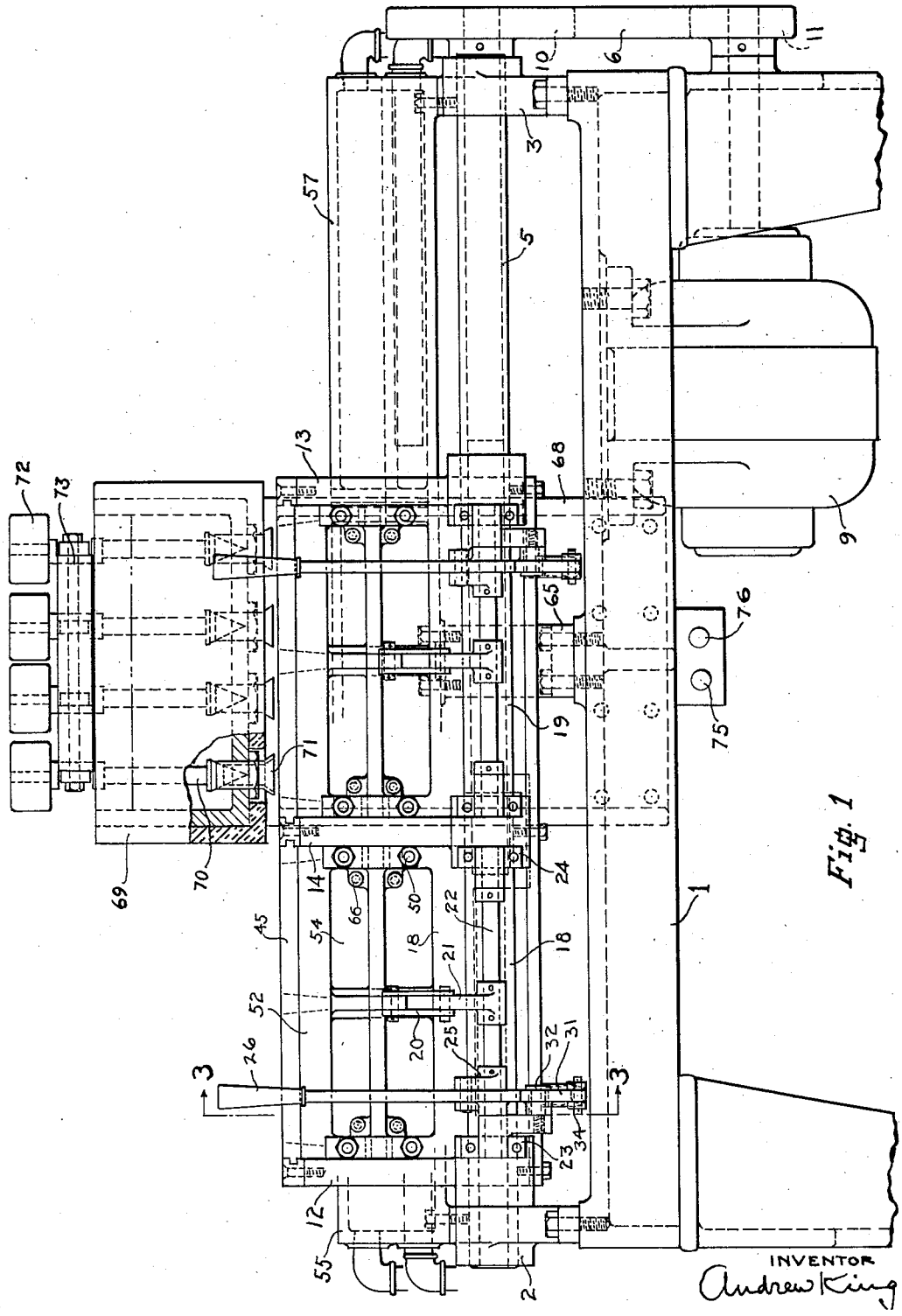


Fig. 1

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CASTING MACHINE

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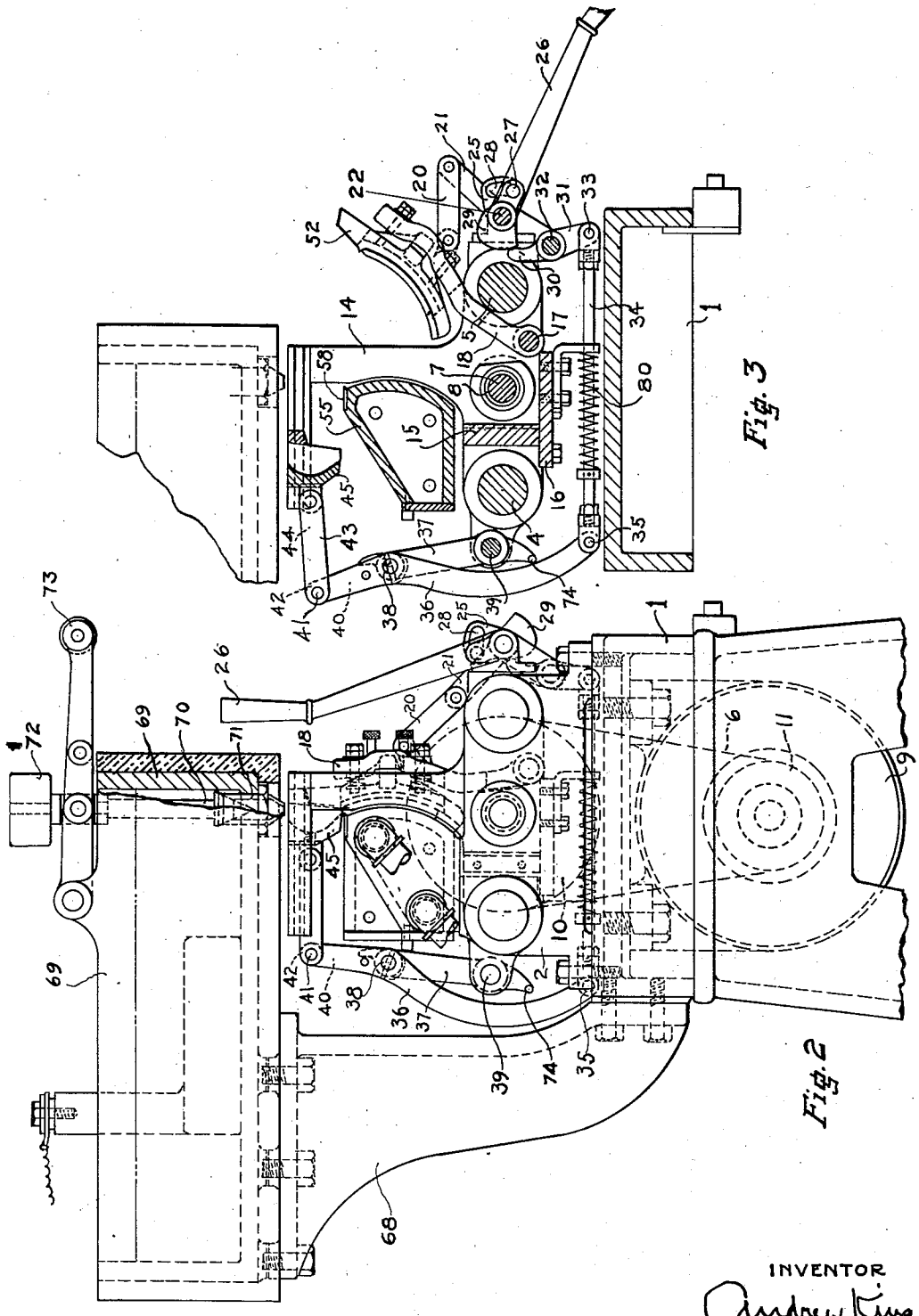


Fig. 3

Fig. 2

INVENTOR

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CASTING MACHINE

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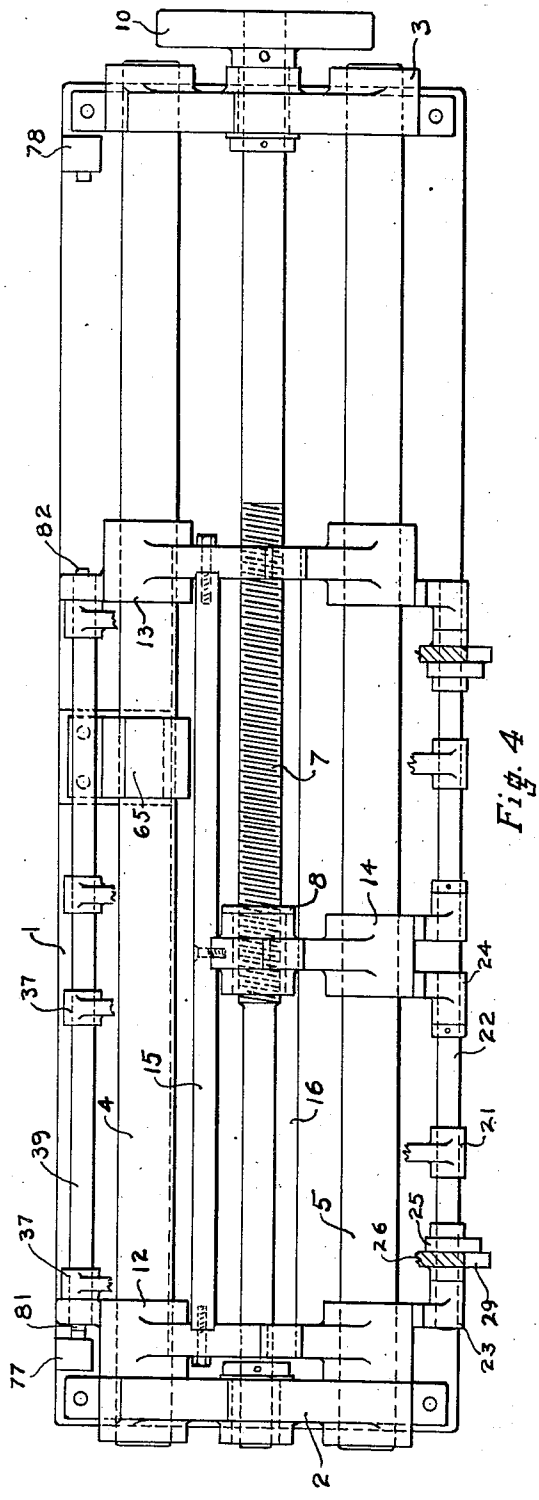


Fig. 4

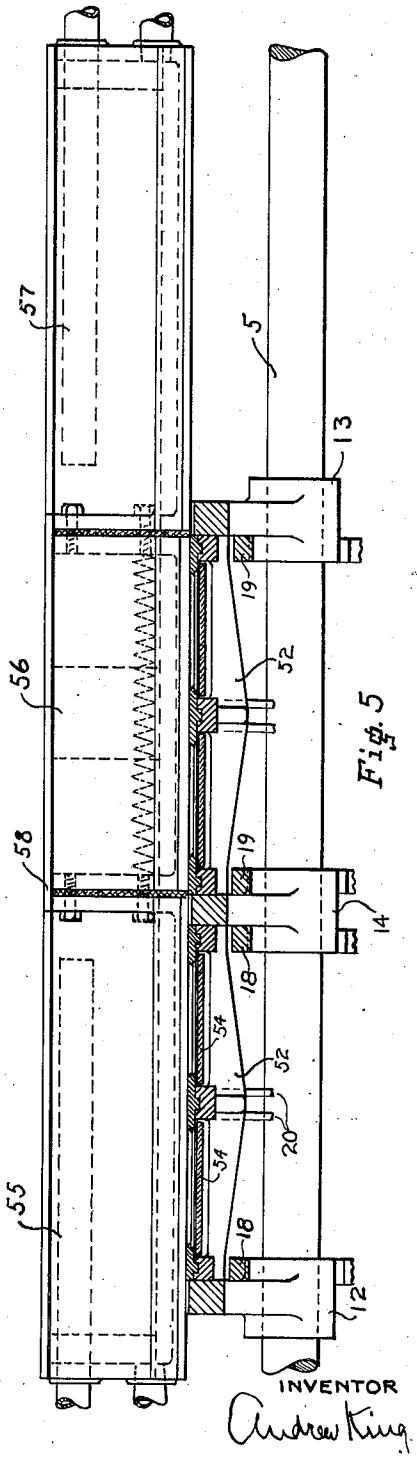


Fig. 5

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CASTING MACHINE

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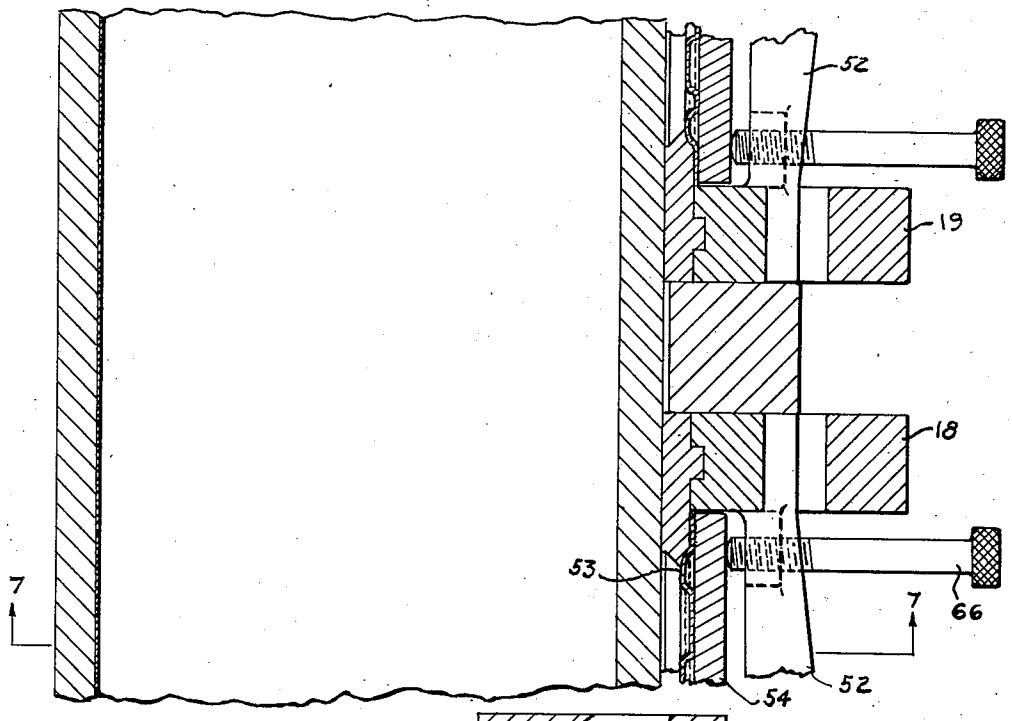


Fig. 6

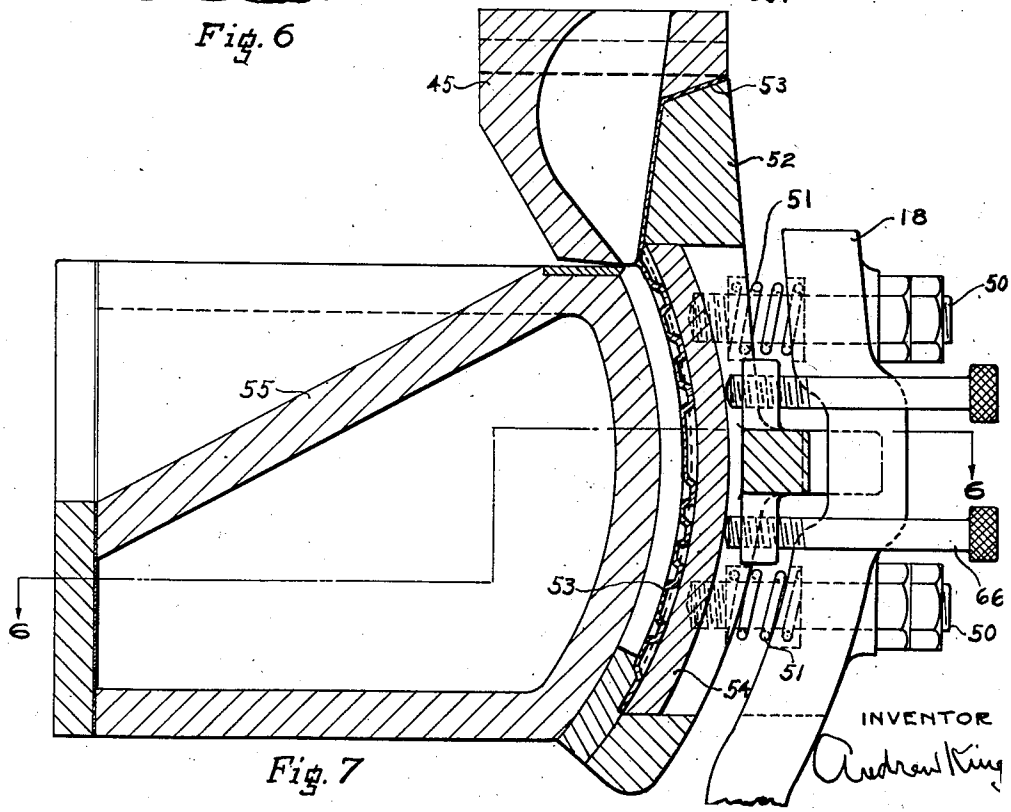


Fig. 7

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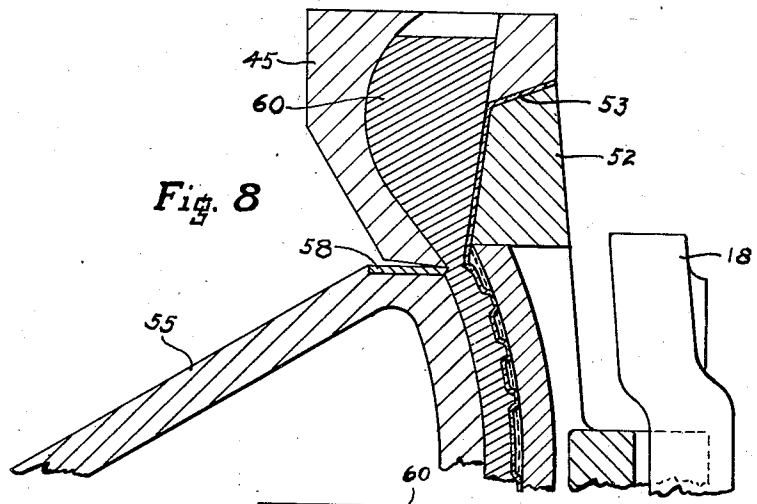


Fig. 8

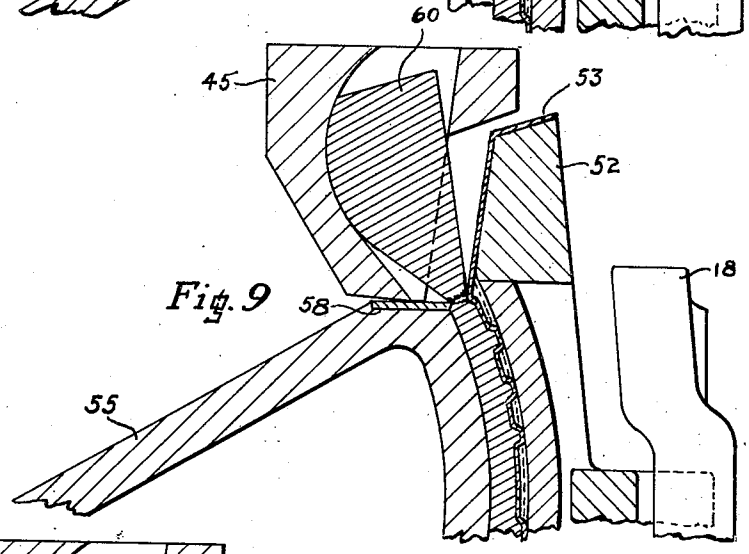


Fig. 9

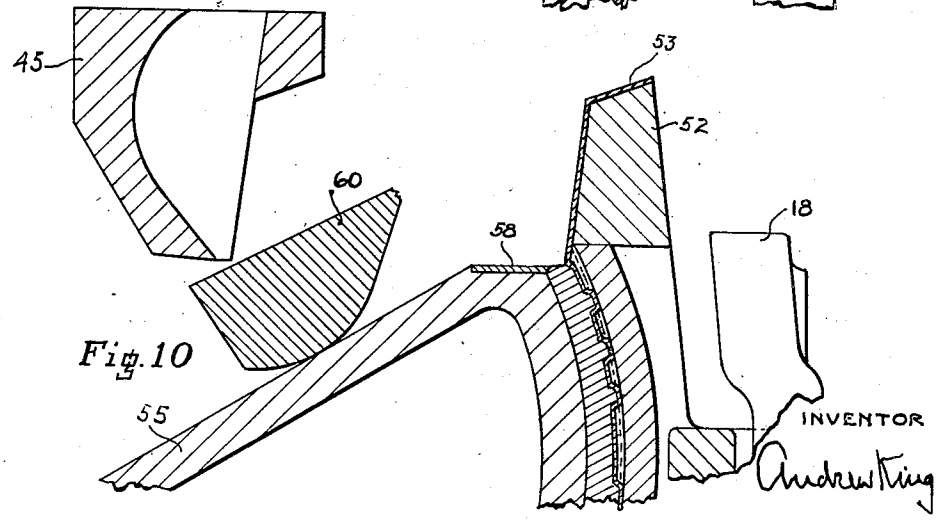


Fig. 10

INVENTOR

Andrew King

Patented Apr. 6, 1937

2,076,374

UNITED STATES PATENT OFFICE

2,076,374

CASTING MACHINE

Andrew King, Penn Valley, Pa.

Application January 10, 1933, Serial No. 650,984

13 Claims. (Cl. 22—2)

My invention relates particularly to means for casting, cooling and removing the tail from stereotype plates rapidly enough to make the use of these plates practical in printing the late news on a large newspaper where speed is a dominant factor. There are many advantages in the use of such plates but heretofore the time required for casting them has been too great, unless a large number of casting machines were used and this is too cumbersome and expensive.

The main object of this invention is to provide means for pouring the metal with the molds opposite a hot backing plate and of moving the poured plate and the mold together without waiting for the metal to set, to a position opposite a very cold surface in order to cool the plates off rapidly. By this means the time required for cooling the plate to where it can be taken out is greatly reduced.

Another object is to provide rapid means for removing the "tail", as the present practice of sawing it off involves additional operation and takes too much time.

I attain these objects by the means described in this specification and shown in the accompanying drawings and in which:

Fig. 1 is a front elevation.

Fig. 2 is a side elevation.

Fig. 3 is a section on a line 3—3 in Fig. 1.

Fig. 4 is a sectional plan view showing the carriage and means for driving it.

Fig. 5 is a view showing a plan of the hot and cold backing and shows part of the carriage in section.

Fig. 6 is a section thru the backing, the mat holders and one of the members which drive the mat frames on the carriage frame and is substantially a full size section of the central part of the main carriage in Fig. 5.

Fig. 7 is a full size section thru the pouring gate, the mat and the backing.

Figs. 8, 9 and 10 show how the "tail" is broken off by the movement of the pouring gate.

This machine consists substantially of a carriage in which are clamped a number of mats, in this case four, means whereby said carriage can be moved so as to bring the mats alternately from the position opposite a hot backing to where the backing is cold, means for pouring type metal while the mat is opposite the hot backing and means for breaking off the tail and taking out the plate opposite the cold backing. The backing forms part of the mold and the molten metal is moved along the surface of this backing and in direct contact with it.

In the drawings 1 is a base to which the side frames 2 and 3 are attached supporting the guides 4 and 5 on which the carriage rides driven by the screw 7 which engages the nut 8 in said carriage. The screw 7 is driven by the reversible motor 9 thru the sprockets 10 and 11 and the chain 6.

The carriage is built up of the side frames 12 and 13 and a center frame 14 rigidly attached together by the plates 15 and 16. The center frame 14 terminates at the plate 15 and carries the nut 8 rigidly mounted in it. Pivoted to the carriage at the point 17 are the mat carrying frames 18 and 19 which are capable of being moved independently about the pin 17 by the toggles 20 and 21. The toggle 21 is rigidly attached to a bar 22 which is pivoted in the side bearings 23 and 24 in the frames 12, 13 and 14. Rigidly attached to the bar 22 is the slotted member 25, and pivotally supported on the bar 22 is the operating lever 26 which has a laterally projecting pin 27 engaging the slot 28 in the member 25. Integral with said lever is a cam portion 29 which engages the end 30 of the lever 31 which is pivoted on the stud 32 mounted in the frame 12. Pivoted at 33 to the lever 31 is the connecting bar 34, the other end of which is pivoted at 35 to the lever 36 which is pivoted to the frame 37 by means of the bar 38. The frame 37 is pivoted in the carriage frames 12 and 13 by means of the bar 39 to which it is rigidly attached and thus the frame 37 as a whole pivots about the bar 39 moving the bar 38 and the levers attached to it in an arc about the pin 39. The levers 36 and 40 are rigidly attached to the bar 38 and form a frame similar to the frame 37 but pivoted about the bar 38. Attached to the points 41 and 42 are the connecting bars 43 and 44 which are attached to the pouring gate 45 and by which this gate is moved. A spring 80 brings the levers and gate back to normal position.

Mounted in the frame 18 by means of the studs 50 and the springs 51 is the floating frame 52 which is adapted to receive and have firmly clamped to it the mats 53 by means of the plate 54 and the screws 66, and this floating frame is brought into close contact with the hot and cold elements 55, 56 and 57 when the parts are in the position shown in Figs. 2, 6 and 7, which is the pouring position. The frame 19 is the same as frame 18 but the operating parts are of the opposite hand.

The object of the frame 37 and of the connecting levers 36 and 40 is to provide a greater

leverage for breaking off the tail and a quick movement thereafter to take the broken off tail out of the way, Figs. 3, 8, 9 and 10. The first movement of the lever 26 thru the cam 29 is to rotate the lever 31 on the stud 32 pulling on the tail gate 45 with the pin 38 as the fulcrum and this breaks off the tail 60 from the cast plate. In order to insure that the tail will break off at the proper place the knife edge 58 is attached to the top of the hot and cold units to neck down the casting at this point. After the tail is broken off the lever 36 contacts with the stop 74 integral with the frame 37 and thereafter the bar 39 becomes the fulcrum and the movement of the gate is rapid. Further movement of lever 26 pulls the frame 18 out, Fig. 3.

Rigidly attached to the side frames 2 and 3 and to a center support 65 are the cooling units 55 and 57 and a hot unit 56 which are rigidly attached together but separated by an insulating material which retards the passage of heat from the hot unit to the cooling units. The center unit 56 is preferably heated by electricity and the units 55 and 57 are water cooled.

The hot and cold elements 55, 56, and 57 are identically shaped on the faces which are opposite to the mats 53 and against it the floating frame 52 abuts. Thus the backing 55 and 56, or 57, the mat 53 and the frame 52 define a mold defining two major surfaces and three edges of a stereotype plate, and the mat 53 and frame 52 are movable with respect to the backing 55 and 56 or 57 so that the plate is actually shaped on one side by two molds, one hot and one cold.

Supported on a bracket 68 is the melting pot 69 in which the metal is melted, preferably by electricity. There are four valves 70 and the spouts 71 are flat slots to make a thin, wide stream of metal. The valves are provided with weights 72 to hold them shut and a lever 73 for operating them.

The operation of the machine is as follows:

The mats are placed in the frames 18 and 19 and clamped by means of the screws 66. The levers 26 are raised so as to bring the frames 18 and 19 against the backing. The metal is then poured and the push button 75 or 76 according to the position of the carriage, is held in until the stop 81 or 82 contacts with the circuit breaker 77 or 78 depending on the direction the carriage is moving, and the carriage stops. After a short interval, to be determined by experiment, the lever 26 is pulled down and this first breaks off the tail 60, and when the pin 27 reaches the end of the slot 28, the toggles 20 and 21 rotate the frame 18 into the position shown in Fig. 3. The plate is then lifted out, the molds closed and the molds which have been in the pouring position during this time, are poured and the operations repeated in the other direction with the frame 19.

This machine is shown as being used for casting stereotype plates but the same principle can be applied to other purposes where the objects molded can be moved along a fixed surface from a hot part to a cold part.

It is evident that it is possible to move the backing instead of the molds but the machine would not, in this case, be as fast. It is also evident that the machine can be varied in detail and I do not wish to be limited to the details shown herein. I also know that stereotype plate casting machines are not new and I therefore do not claim such devices broadly, but I claim:

1. In a means for casting stereotype plates, the combination of a stationary mold member, part of which is hot and part thereof cold; a second mold member capable of moving relative thereto, said second mold member having two compartments, one opposite said hot part of said first mold member and one opposite a cold part; means for pouring molten metal into the mold formed by the compartment opposite said hot part and means for moving said second mold member to transfer the compartment filled with hot metal to a position opposite a cold part of the stationary mold member.

2. Means for casting stereotype plates comprising two sets of compartments provided with suitable means against which molten metal can be poured, said means forming a back to said compartments, part of said back being hot and part cold; means for pouring metal into the compartments which are opposite the hot part of said back and means for moving said compartments into which the molten metal has been poured to a position opposite the cold part of said back, the empty compartments being brought into the pouring position opposite the hot part of said back.

3. Means for casting stereotype plates comprising two sets of compartments into which molten metal can be poured, one set adapted to be in pouring position while the other set is out of pouring position; stationary means forming a back to said compartments to complete the molds, part of said back being hot and part cold; means for pouring molten metal into the compartments in the pouring position opposite the hot part of said back and means for moving the compartments which have been filled with molten metal to a position opposite the cold part of said back and at the same time bringing the empty compartments into the pouring position.

4. In a stereotype plate casting machine, the combination of a stationary mold member one part of which is hot and another part thereof cold, a second mold member, means for moving said second mold member into contact with said hot part of said stationary mold member to form a complete mold, means for filling said mold with molten metal, and means for moving said second mold member while it is in contact with said first mold member and molten metal from the hot part to the cold part thereof.

5. In a stereotype plate casting machine, a source of supply of molten type metal, stereotype plate forming means, means for cooling said plates at a position spaced from said source of supply, and means for imparting reciprocal movement to portions of said plate forming means to move said plate between said source of metal supply and said cooling means and said portions of said plate forming means back to a position adjacent said source of supply.

6. In a stereotype plate casting machine, the combination of a stationary mold member, a matrix, a second mold member, means for moving said second mold member and matrix into contact with said stationary mold member to form a complete mold, means for filling said mold with molten metal, and means for moving said matrix and second mold member while it is in contact with said first mold member and molten metal from one part thereof to another part thereof.

7. In a stereotype plate casting machine, a source of supply of molten metal, stereotype plate forming means, means for solidifying the metal in said plates at a position spaced from said source of supply, and means for imparting recip-

rocal movement to portions of said plate forming means to move said portions and said plate, while the metal therein is still molten, between said source of supply and said cooling means and said portions of said plate forming means back to a position adjacent said source of supply.

8. In a stereotype plate casting machine, the combination of a longitudinal, stationary mold member, the median portion of which is heated and the end portions of which are cooled, a pair of second mold members fixed in spaced relationship to each other, and means for simultaneously moving said second mold members, one from the heated portion of said longitudinal mold member to the cooled portion thereof, and the other from the cooled portion to the heated portion.

9. In a stereotype plate casting machine, a stationary mold member, a plurality of movable mold members adapted to cooperate with said stationary member to form molds, means for simultaneously moving said plurality of mold members to position one adjacent said stationary member and one away from such location, and means for independently moving each of said second mold members toward and away from said first mold member.

10. In a stereotype plate casting machine, a stationary mold member, a plurality of movable mold members adapted to cooperate with said stationary member to form molds, means for simultaneously moving said plurality of mold members, and means, independent of said last named means, for individually moving each of said movable mold members radially.

11. In a stereotype plate casting machine adapted to form a plate having a tail thereon, a mold, means for moving a plate and at least a portion of said mold from a position at which the plate is poured to a position spaced therefrom, a knife edge included in said mold, means for moving said tail with respect to said knife edge as a pivot, and means for maintaining said plate stationary while said tail is being moved, whereby a bending force is exerted upon said tail to break it along said knife edge.

12. A stereotype plate casting machine adapted to form a plate having a tail thereon comprising means for moving a plate from a position at which it is poured to a position spaced therefrom, a knife edge, means for moving said tail with respect to said knife edge as a pivot, and means to maintain said plate stationary.

13. In a stereotype plate casting machine adapted to form a plate having a tail thereon, means for holding a plate in fixed position, means for withdrawing support from one side of said tail and exerting a force on the other side thereof, and a knife edge positioned to bear against said plate at the junction thereof with said tail on the side of said tail from which support is withdrawn, whereby the imposition of said force on said tail causes said tail to break from said plate at said knife edge.

ANDREW KING.