

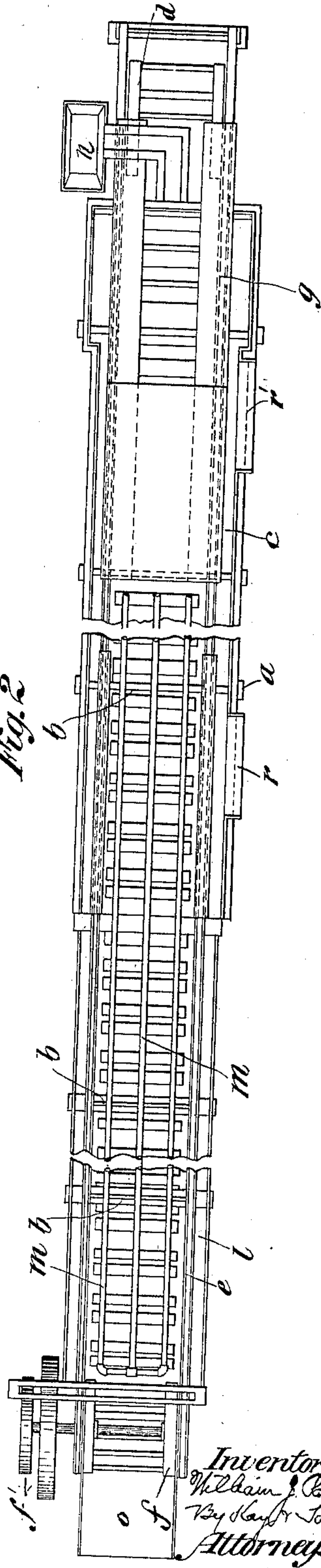
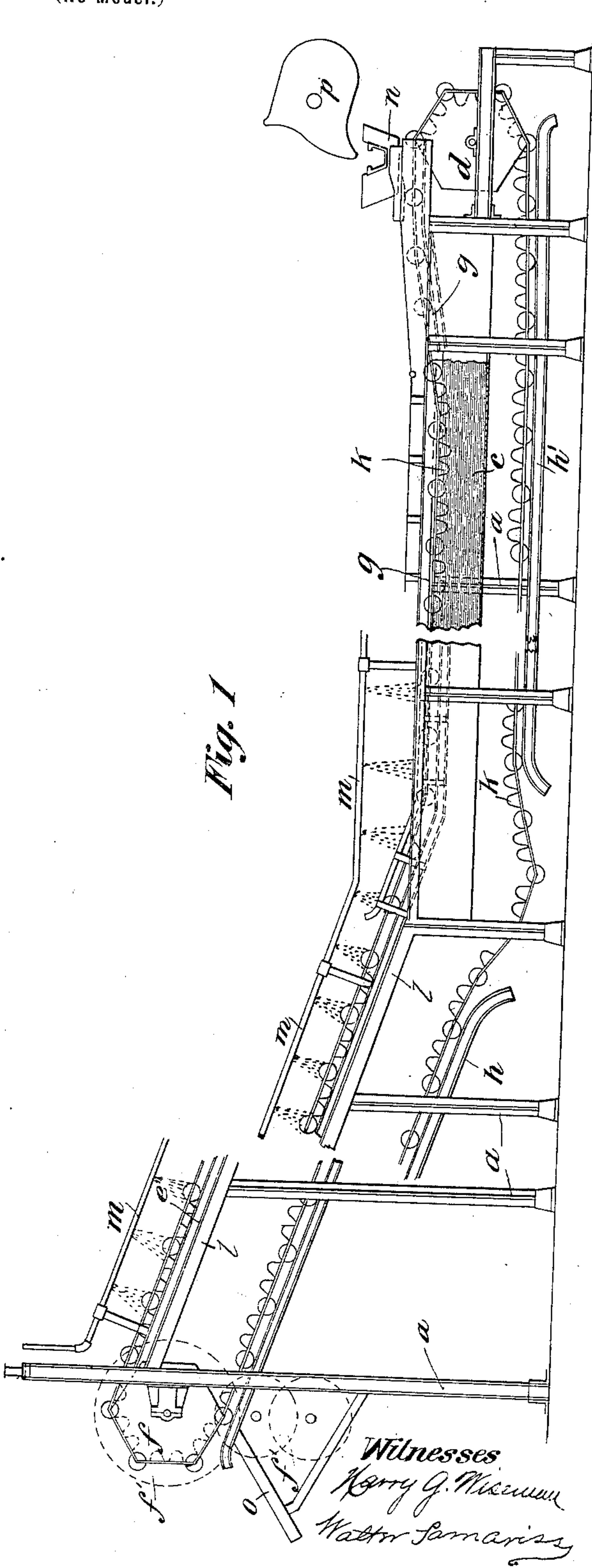
No. 657,070.

W. J. PATTERSON.  
CASTING METAL.

Patented Aug. 28, 1900.

(Application filed July 31, 1899.)

(No Model.)





# UNITED STATES PATENT OFFICE.

WILLIAM J. PATTERSON, OF PITTSBURG, PENNSYLVANIA.

## CASTING METAL.

SPECIFICATION forming part of Letters Patent No. 657,070, dated August 28, 1900.

Application filed July 31, 1899. Serial No. 725,605. (No specimens.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. PATTERSON, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Casting Metals; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the casting of metal, and directly, though not exclusively, to the casting of pig metal, the invention relating to the same general class as Letters Patent No. 583,424, granted to A. M. Acklin May 25, 1897. That patent provided for the casting of the molten metal in an endless connected series of traveling molds, the metal being then carried in the molds for a certain distance while the molds were partially submerged in a body of water, and the molds being then carried down into the body of water being completely submerged therein, so that the water flowed over the metal contained in the molds to cool and set such metal.

The object of the present invention is to provide for the proper cooling of the metal in a machine of that general character and without the necessity of entirely submerging the molds within the body of water.

It consists, generally stated, in pouring the metal into an endless connected series of traveling molds and first cooling such metal by partially submerging the molds in water, and after the metal is sufficiently set for direct contact with water further cooling the same by spraying water upon the metal when in the molds, it being preferred that during a portion of such spraying action the molds shall still be partially submerged in the water.

It also consists in certain other improvements, which will be hereinafter fully described and claimed.

To enable others skilled in the art to employ my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view, partly broken away, illustrating the apparatus employed in practicing the invention; and Fig. 2 is a top plan view of the same.

Like letters indicate like parts in each of the figures.

In practicing the invention I may employ

any suitable apparatus, such as the apparatus referred to in said Acklin patent, No. 583,424, except that it is constructed to carry the molds through the tank or body of water without entirely submerging the molds—that is, carrying said molds when partially submerged for the full length of the tank. I will describe the preferred form of apparatus, such as illustrated in the drawings.

The framework of the apparatus may be of any suitable construction, being illustrated as consisting of the standards *a*, connected by a series of cross-bars *b* and braced in any suitable way, and having extending for a considerable portion of its length the tank *c*, while at the receiving end, beyond said tank, is the sprocket *d*, and beyond the tank, toward the delivery end, is the inclined trackway *e*, at the upper end of which is the sprocket *f*, which is driven from any desired source of power through suitable gearing *f'*.

The machine is provided with suitable track *g*, which extends from the receiving end down into the tank, extending on such level within the tank that the molds are partially submerged therein—that is, submerged to such height that the water cannot flow over the tops of the molds, and thus be brought into direct contact with the molten metal—the track then extending at the incline up over the inclined trackway *e* to the sprocket-wheel *f* and below said sprocket, the return-tracks *h h'* extending back to the sprocket-wheel *d*, a gap being preferably left between these tracks *h h'* to provide for expansion and contraction of the series of traveling molds *k*. The series of traveling molds *k* are preferably formed of wrought plate metal and are connected together and mounted on these tracks in any suitable way, so that the molds will be partially submerged in the water in the tank, as above stated.

Back of the tank *c* and in line with the inclined trackway *e* and in fact forming part of the same is the inclined trough *l*, which extends down from the delivery end of the machine to the tank *c*, so as to deliver any water from the spraying of the molds into said tank. Extending over this trough and preferably over a good portion of the tank *c* are the spray-pipes *m*, which, as shown in Fig. 2, are adapted to spray the molds in the latter part



of their course through the tank *c* and in their course up the inclined trackway *e*, so providing for the cooling of the molds in large part by such water spray. The water  
 5 from the spraying of the molds will of course pass down into the trough *k* and run thence into the tank *c* and may be utilized in said tank for the cooling of the metal in the molds. At the receiving end of the appara-  
 10 tus is provided the metal-pouring trough *n*, into which the metal is poured from the traveling ladle *p*, transporting the same from the furnace, the trough providing for the pouring of a continuous controllable stream into  
 15 the traveling molds *k*.

In practicing the invention the metal is poured in a continuous controllable stream from the ladle *p* and trough *n* into the molds *k* as they travel at regular speed under the  
 20 trough. As the molds receive the molten metal they pass into the tank *c*, the molds being partially, but not altogether, submerged therein, so that the only cooling action of the water in the tank itself acts through the thin  
 25 walls of the wrought-metal molds, such cooling action taking place for the entire length of the tank. When the metal first enters the molds, its heat is so high that the water coming in contact with the unset top face there-  
 30 of causes the metal to boil and honeycombs such top face, and such honeycomb is liable to break off in the subsequent handling of the pig. The molds are therefore carried within the tank, while the metal is protected  
 35 from contact with water until the metal is sufficiently set to be brought into contact with the water. They may be carried to the full length of the tank in this way without being sprayed, or the spraying action may  
 40 take place during a part of the cooling action in the tank. The water spray falling upon the metal when at a comparatively-high heat will of course generate steam; but as a  
 45 spray is used free escape is provided for the steam, and the metal in the molds is cooled quickly by the repeated fresh contacting of the water dropping from the spray-pipes into direct contact with the metal and a rapid  
 50 cooling thereof is effected, this action being continued up the inclined trackway *e*, so that by the time the molds reach the upper end thereof the pigs are set and cold and ready to be discharged from the molds into a chute *o*, which guides them to the car or such other  
 55 receptacle as may be employed to receive them. The water from the spray-pipes over the inclined trackway is caught in the inclined trough *k*, which directs it down into the tank, the water from the spray-pipes  
 60 maintaining the supply for the tank, which has overflows at suitable points, as at *r r'*, for maintaining the proper water-level, one such overflow being placed at the receiving end of the tank, so as to carry sufficient wa-  
 65 ter to that end for cooling the pig when first cast and one or more overflows between the

ends being arranged to carry off the excess of water from the spray-pipes. The water from the pipes extending over the tank is of course caught in the tank itself. In this  
 70 way I am enabled to cool the metal rapidly, first by water-cooling when it is protected from direct contact with water and then by water-cooling both by contact of the mold-  
 75 bodies with the water and by direct contact of water with the metal itself through the repeated fresh contacting of the water from the spray-pipes therewith, the necessity for en-  
 80 tirely submerging the molds within the tank being overcome. I am also enabled to get re-peated contact of cold water with the metal  
 85 itself and at the same time provide free escape for the steam generated by the hot metal, so obtaining the best conditions for cooling practicable. I also utilize the water to ad-  
 90 vantage by continuing the spraying after the molds pass from the tank and utilizing the water for subsequent cooling purposes.

No claim is made in this application for the apparatus above described, as the same is em-  
 95 bodied in a separate application filed October 16, 1899, Serial No. 733,764.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The herein-described method of casting  
 95 metals which consists in pouring the metal into an endless connected series of traveling molds, partially submerging the loaded molds in a body of water and at the same time keep-  
 100 ing the contents of the molds out of contact with water until the metal is sufficiently set, and subsequently spraying the metal with wa-  
 105 ter while it is still contained within the molds.

2. The herein-described method of casting  
 105 metals which consists in pouring the metal into an endless connected series of traveling molds, partially submerging the loaded molds in a body of water and at the same time keep-  
 110 ing the contents of the molds out of contact with water until the metal is sufficiently set, and subsequently spraying the metal with water when the molds are so partially sub-  
 115 merged.

3. The herein-described method of casting  
 115 metals which consists in pouring the metal into an endless connected series of traveling molds, partially submerging the loaded molds in a body of water and at the same time keep-  
 120 ing the contents of the molds out of contact with water until the metal is sufficiently set, and subsequently spraying the metal with water while the molds are partially submerged, drawing the molds from the body of water and continuing the spraying of the metal  
 125 therein.

In testimony whereof I, the said WILLIAM J. PATTERSON, have hereunto set my hand.

WILLIAM J. PATTERSON.

Witnesses:

JAMES I. KAY,

ROBERT C. TOTTEN.