(No Model)

A. M. ACKLIN.

METHOD OF CASTING METALS.

No. 583,424. Patented May 25, 1897.

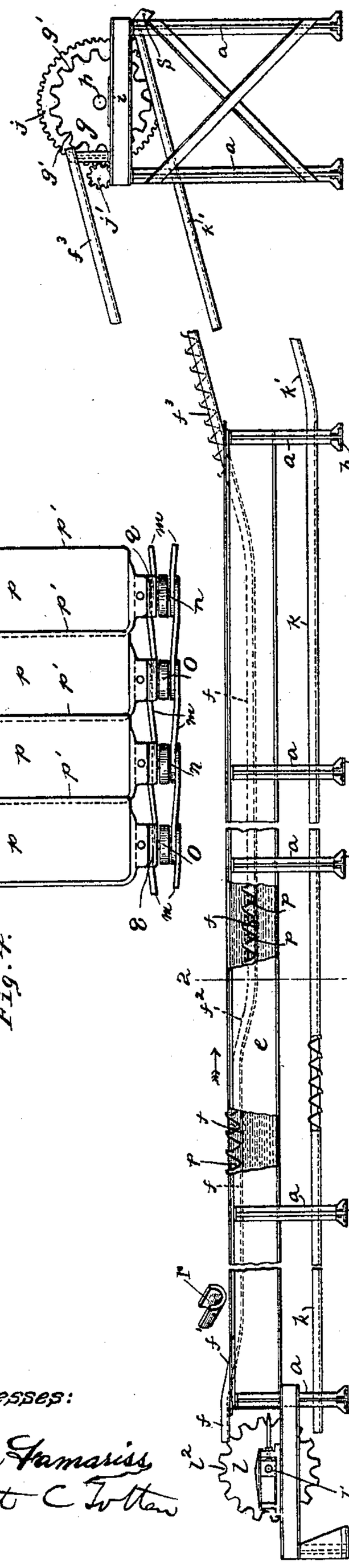

Fig. 1.

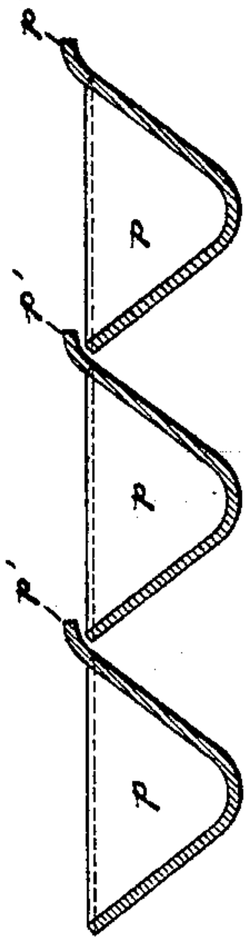

Fig. 3.

Fig. 4.

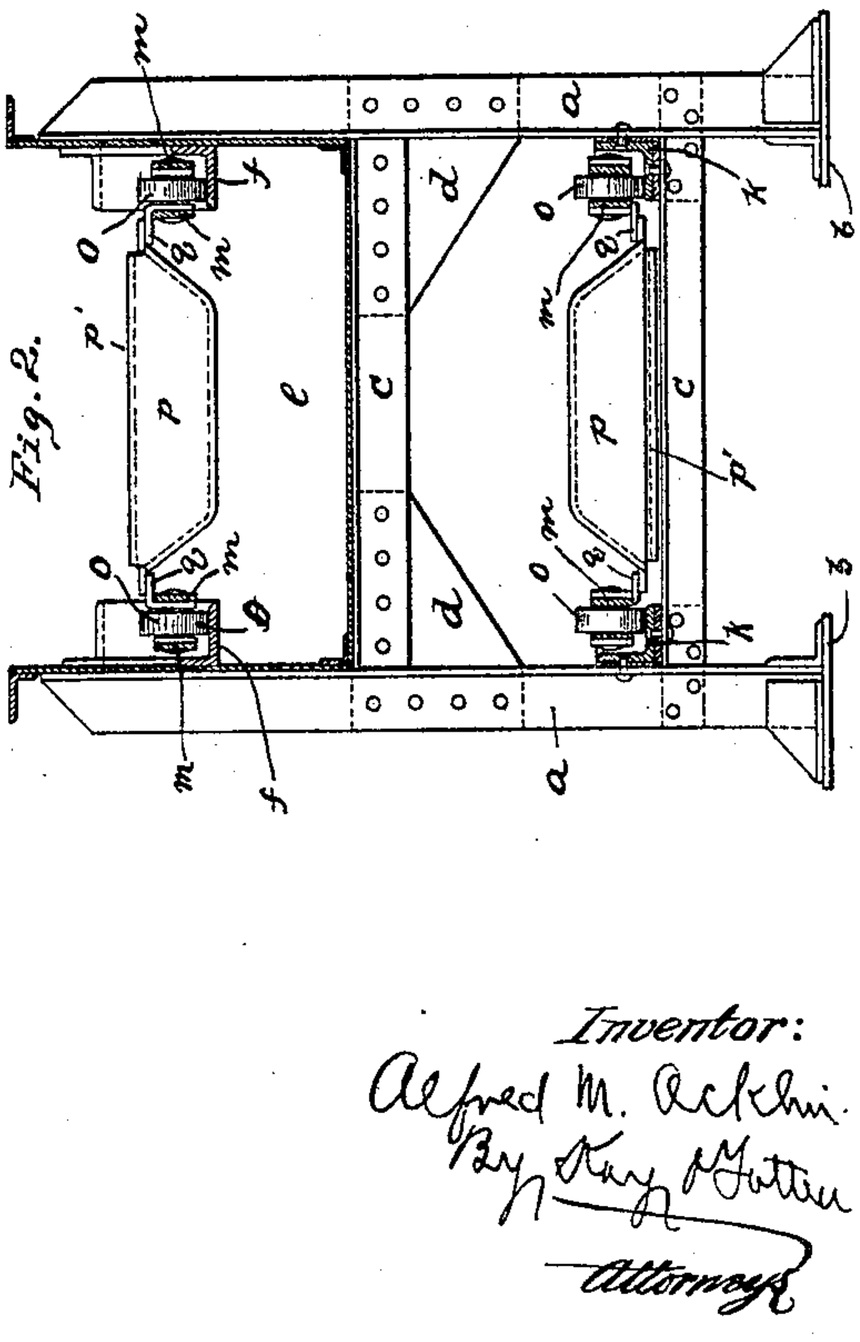

Fig. 2.

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UNITED STATES PATENT OFFICE.

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METHOD OF CASTING METALS.

SPECIFICATION forming part of Letters Patent No. 583,424, dated May 25, 1897.

Application filed March 1, 1897. Serial No. 625,608. (No model.)

To all whom it may concern:

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

My invention relates to the casting of pig metal, and it has reference more particularly to that method of casting in which the metal is fed into a series of molds mounted on a power-driven endless carrier.

One of the difficulties attending the practice of the method above referred to is that in order to allow for the cooling and setting of the metal sufficiently before it can be discharged from the molds it is necessary to extend the endless carrier to great length, thereby increasing the space for the apparatus, as well as the amount of material entering into the construction of same, thereby increasing the cost. Another objection is due to the action of the hot metal on the molds. The high heat of the molten metal contained within the molds tends to warp and crack the molds, so that they are constantly being replaced by new ones. This item of wear and tear on molds is of itself a great item of expense in connection with such a plant. The intense heat imparted to the links and their connections which go to make up the endless carrier, owing to their close proximity to the molten metal within the molds and the highly-heated molds themselves, is very severe on said links and soon causes them to wear out.

The object of my invention is to obviate these difficulties, at least in part, and increase the life of the apparatus.

In the accompanying drawings, Figure 1 is a side elevation, partly broken away, of my invention. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a sectional view of several of the molds. Fig. 4 is a plan view of a portion of the endless carrier.

Like letters indicate like parts in each of the figures.

The framework of the apparatus may be of any suitable construction, that illustrated consisting of the standards *a*, erected on the base-plates *b* and connected by the cross-bars *c*. The brackets *d* connect said standards and cross-bars and act to brace the structure. These standards *a* are stationed at proper intervals, and supported by said standards is the reservoir or tank *e*. This tank *e* is made of sheet-metal plates properly joined to prevent leakage. The tank *e* may be of any suitable length, according to the capacity of the apparatus. Secured to the inner walls of the tank *e* are the tracks *f*, which may consist of angle-bars. These tracks *f* extend from the front end of the framework beyond the tank to the rear end of the frame, and where said tracks are not within the tank they are supported by the frame in any suitable manner.

As stated, the tracks *f* begin at the front end of the frame adjacent to the sprocket-wheel *l* and then slope down, as at *f'*, into the tank. They then run in a horizontal line for a suitable distance within the tank at a height therein which will permit of the molds, hereinafter specifically referred to, moving along partially submerged by the water contained within said tank. From this horizontal line the tracks again slope gradually, as at f^2, to a lower level and extend at this level for a suitable distance, whence they gradually emerge from the tank, as at f^3. The track *f* then extends at an incline up to the sprocket-wheels *g*.

The sprocket-wheels *g* are mounted on the shaft *h*, said shaft being journaled in suitable bearings of the frame *i*, which is supported on the elevated end of the frame. This shaft is driven by the large gear-wheel *j*, meshing with the pinion *j'* on a power-driven shaft.

A second track *k* is secured to the standards *a* below the track *f*. This track *k* extends from the front end of the apparatus at a point adjacent to the front sprocket-wheels *l*, mounted on the shaft *l'*, in a horizontal line until they begin to ascend, as at *k'*, and terminate at a point adjacent to the sprocket-wheels *g* at the lower side thereof.

The endless carrier M is adapted to travel on the tracks *f* and *k*, and this carrier is made up of the following parts: The links *m* overlap each other and are connected by the bolts or pins *n*, on which are mounted to revolve freely the rollers *o*. The molds or pans *p* are

connected at their ends to the plates q on the bolts n, and in this manner an endless carrier with molds attached thereto is formed. These molds may be formed of wrought or cast iron and have the lips p', the lip of one pan overlapping the adjoining edge of the preceding pan throughout the series to prevent the spilling of the metal during the pouring operation.

The rollers o engage with the recesses g' and l^2 of the sprocket-wheels g and l, respectively, as said endless carrier travels over the same.

By causing the endless carrier to travel on rigid tracks the sagging of the said carrier is prevented and the strain on the links and connections which make up said carrier is greatly reduced. The weight of the metal within the molds is borne largely by the tracks, and consequently the strain on the links is reduced.

In practice the apparatus is located adjacent to the blast-furnace and the molten metal may be conveyed in any suitable manner to the molds of the carrier. In the drawings I have simply indicated a spout r, from which the molten metal is poured into the molds. This spout is located at the front end of the carrier over the tank e, as I prefer to pour the metal into the molds while said molds are partially submerged by the water within said tank. Accordingly, while the carrier is moving in the direction indicated by the arrow, Fig. 1, the metal is poured into the molds as they are in the front end of the tank. By pouring the metal into the molds in this manner the hot metal does not act to heat said molds to such a high degree, and consequently there is less tendency of the molds bending and warping due to expansion and contraction.

As the metal is poured into the molds said molds move along within the tank in a horizontal line, the tracks f being at such a height that the molds are not completely submerged, the water-line being below the edges of the molds. The molds are carried along at this height for a suitable distance, or until the metal has set sufficiently to form a slight crust on the surface thereof, when they descend the slope f^2 and pass below the water-line, so as to be completely submerged. The molds travel below the water-line for a suitable distance until the metal has become properly cooled and then emerge therefrom, traveling up the slope at f^3. As the molds pass up and over the sprocket-wheels g they are inverted and the metal pigs are discharged therefrom, falling down the chute s to a suitable receptacle below. The empty molds return in their inverted position along the tracks k until they pass up over the sprockets l in position to enter again the tank and receive another charge of metal.

By the above process the molds filled with molten metal are carried in a partly-submerged state through a body of water, by which the metal is gradually cooled and allowed to set. When sufficiently cool, the molds are then completely submerged and carried through the water, so that when they emerge therefrom the metal has become sufficiently cooled to permit of the pigs being discharged. In this manner the metal is cooled without extending the apparatus to great length, while at the same time the cooling action of the water greatly reduces the wear and tear on the molds.

By having the carrier with rollers traveling on a rigid track the molds travel down into and through the tank on a level, and the varying heights at which they are carried through the tank can be arranged for without difficulty.

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

1. The method of casting pig metal, consisting in pouring the metal into molds partially submerged in water, passing said molds in a horizontal course through said water in the partially-submerged state, and then passing said molds in a horizontal course through said water in a completely-submerged state, substantially as set forth.

2. In pig-metal-casting apparatus, the combination with a suitable frame, of an endless carrier passing around suitable wheels thereon, rollers on said carrier, molds on said carrier, a tank, and tracks parallel with said tank upon which said rollers travel, said tracks being arranged at different levels, substantially as set forth.

3. In pig-metal-casting apparatus, the combination with a suitable frame, of an endless carrier passing around suitable wheels thereon, rollers on said carrier, molds on said carrier, a tank, and tracks secured to the inner walls of said tank, substantially as set forth.

In testimony whereof I, the said ALFRED M. ACKLIN, have hereunto set my hand.

ALFRED M. ACKLIN.

Witnesses:
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ROBERT C. TOTTEN.