

No. 741,752.

PATENTED OCT. 20, 1903.

A. M. ACKLIN.
APPARATUS FOR CASTING METALS.
APPLICATION FILED MAR. 5, 1901.

NO MODEL.

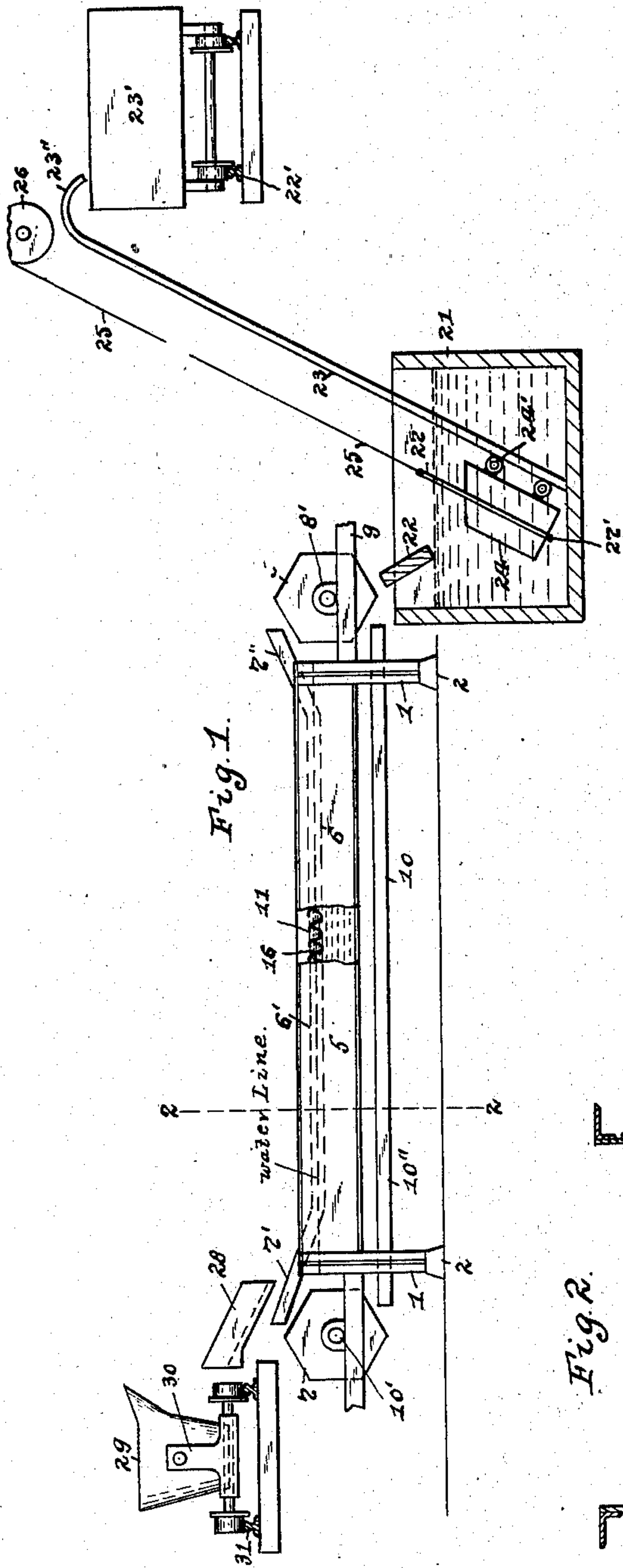


Fig. 1.

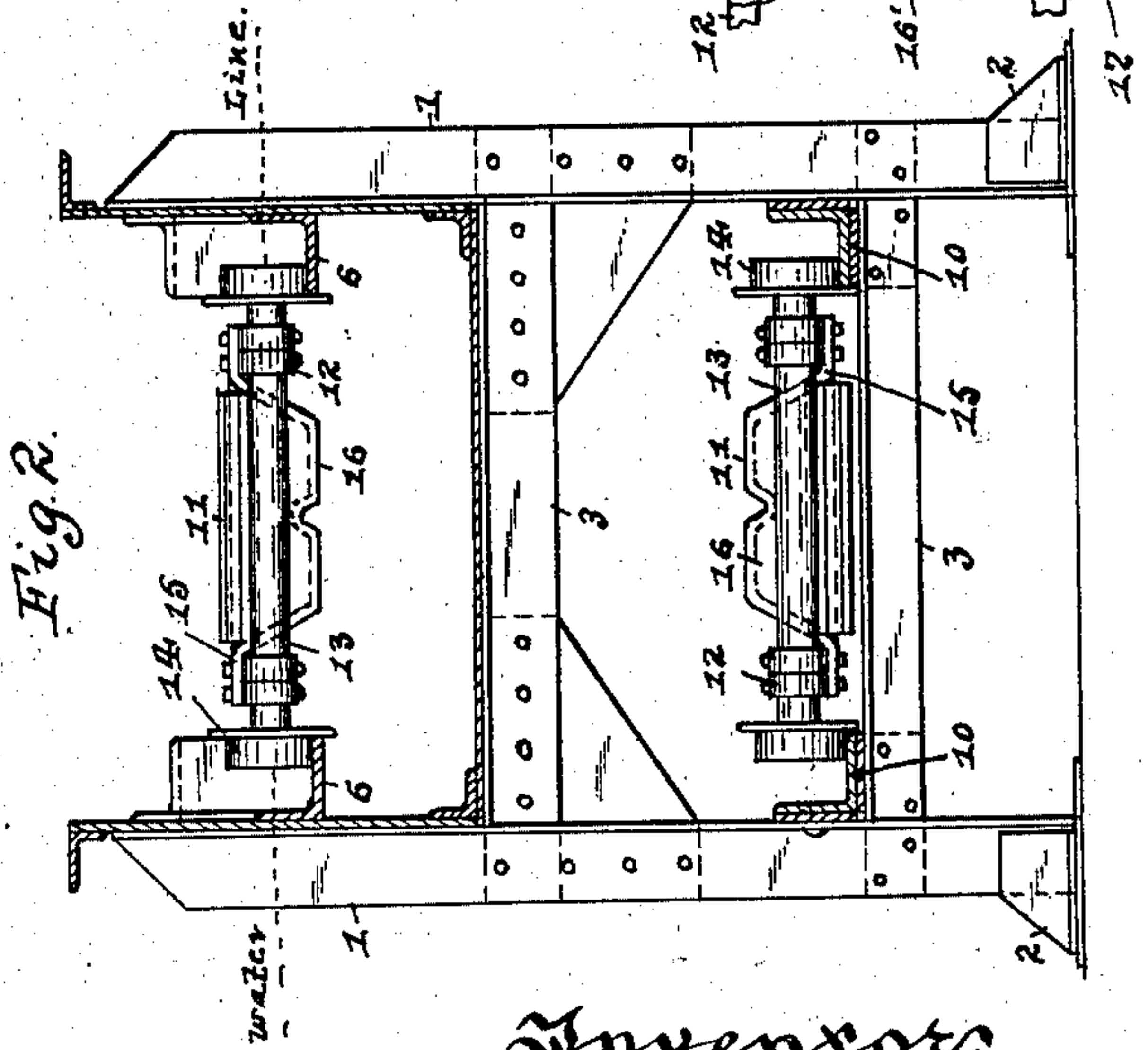


Fig. 2.

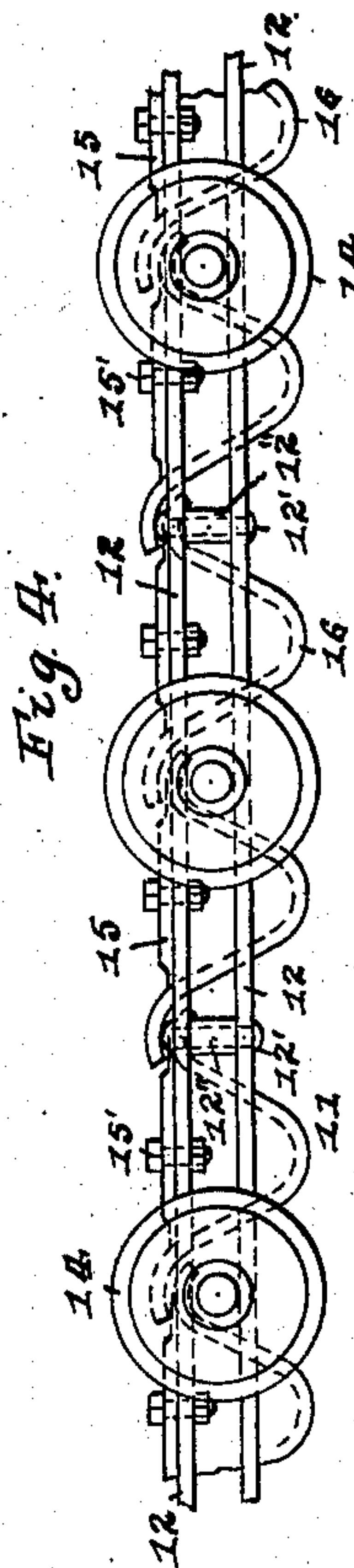


Fig. 4.

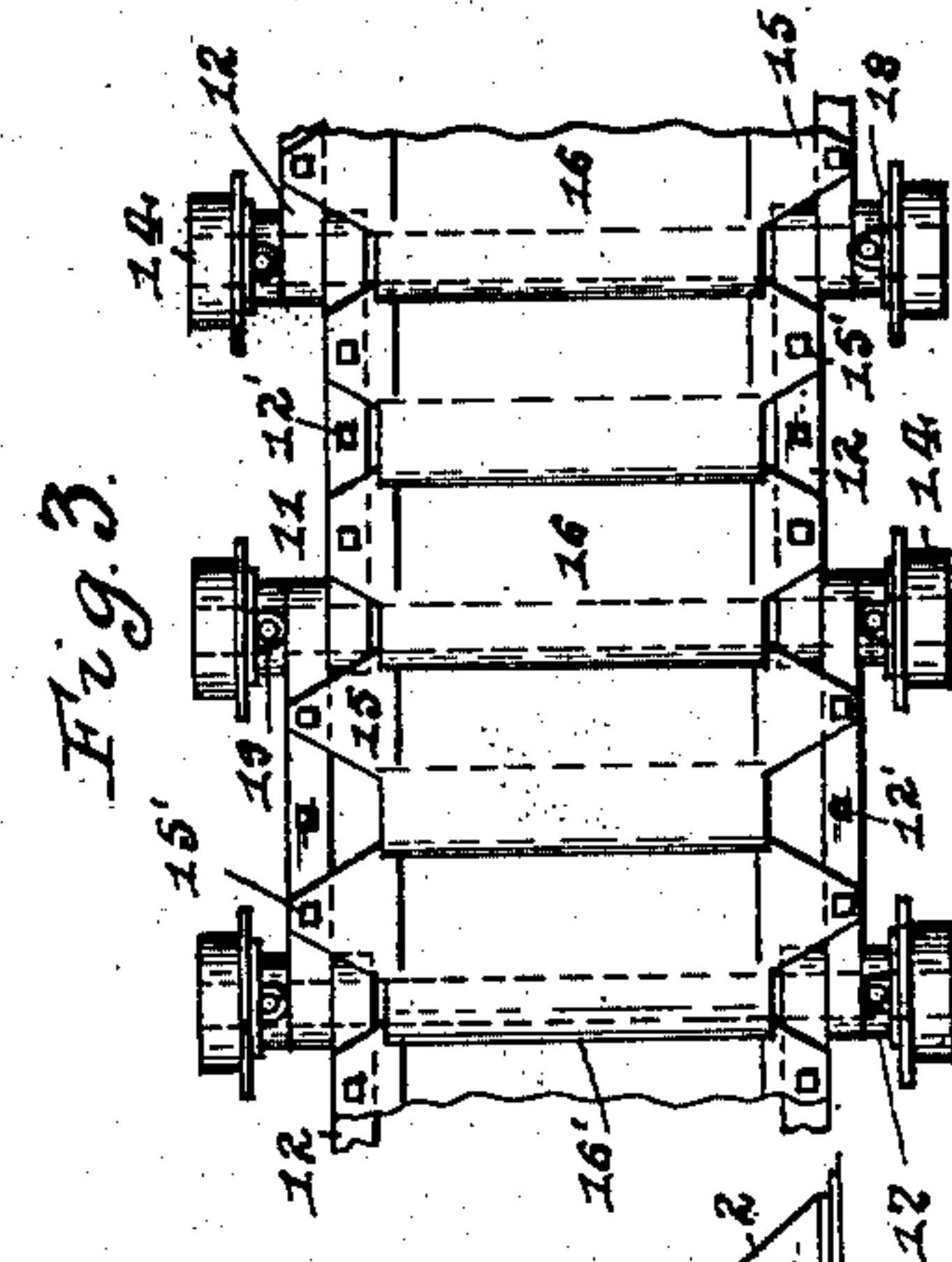


Fig. 3.

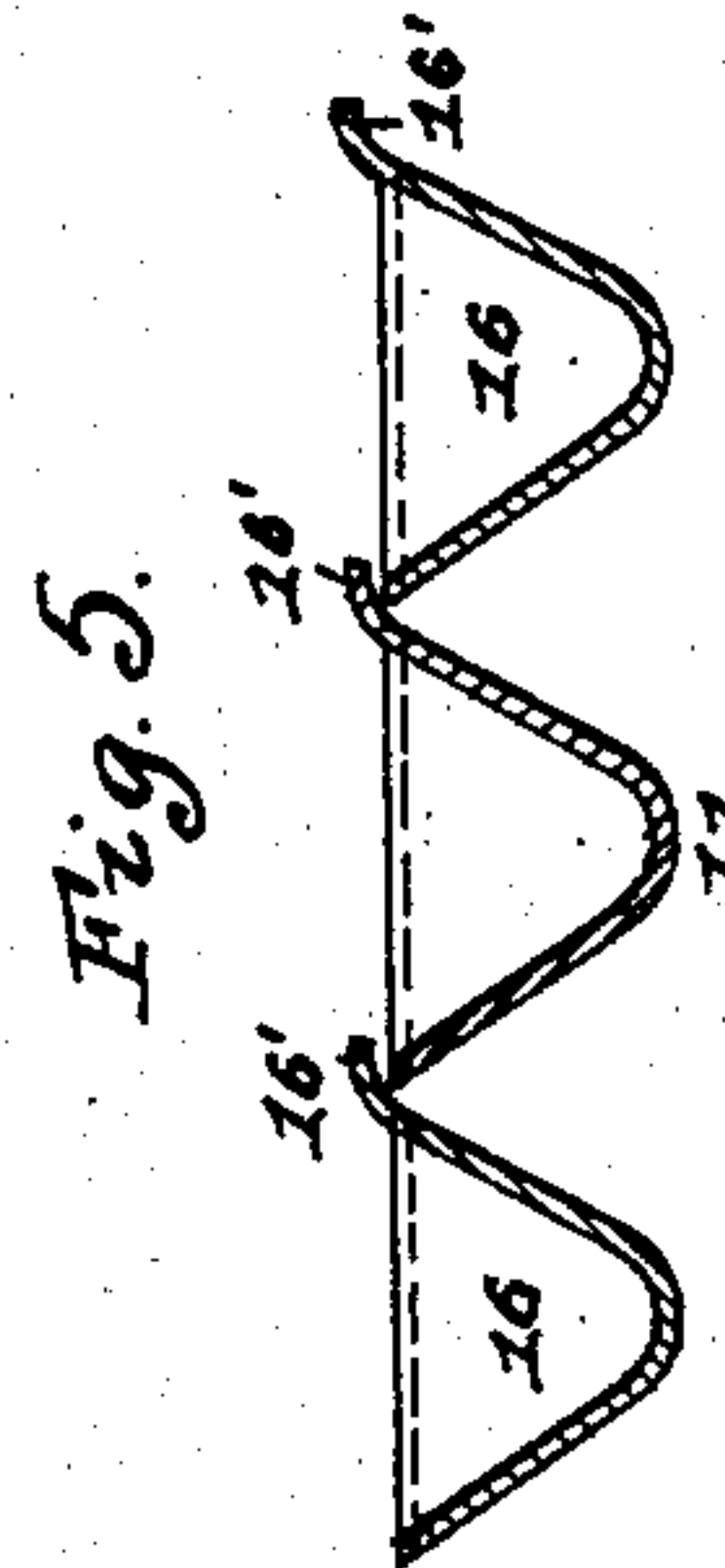


Fig. 5.

Witnesses:
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UNITED STATES PATENT OFFICE.

ALFRED M. ACKLIN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HEYL AND PATTERSON, OF PITTSBURG, PENNSYLVANIA, A FIRM.

APPARATUS FOR CASTING METALS.

SPECIFICATION forming part of Letters Patent No. 741,752, dated October 20, 1903.

Application filed March 5, 1901. Serial No. 49,815. (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 Apparatus for 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 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, such as is shown in Letters Patent No. 583,424, granted to me on May 25, 1897.

One of the difficulties attending the practice of the method above referred to is that an endless carrier of great length was required in order to allow the metal within the molds of the carrier to cool sufficiently for discharging into ordinary cars and necessitating considerable space for the apparatus and augmenting the amount, and consequently the cost, of the materials required for its construction and repairs. Another difficulty was that on account of the endless carrier being inclined upwardly from the exit end of the tank to the wheels for such carrier the stress or strain on the links and axles of the carrier, as well as upon the sprockets, was great, so as to cause breakage and increased cost for the renewal of the parts.

The object of my invention is to obviate these difficulties as much as possible and to provide an apparatus which will take up less space in general and one which will decrease the distance between the ladle-car track and the metal-car track, which decreased distance is a decided advantage in an ordinary blast-furnace yard, as well as one which will be more durable and lessen the cost of the renewal of the parts.

My invention consists, generally stated, in the novel arrangement, construction, and combination of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use the apparatus, I will describe the same more

fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of the apparatus employed, showing some of the parts broken away and in section. Fig. 2 is a cross-section of the tank on the line 2 2, Fig. 1. Fig. 3 is a plan view of a portion of the endless carrier. Fig. 4 is a side view of the same, and Fig. 5 is a sectional view of several of the molds.

Like numerals of reference herein indicate like parts in each of the figures of the drawings.

The framework of the apparatus may be of any suitable construction, that illustrated consisting of the standards 1, erected upon the base-plates 2 and connected by cross-bars 3. The brackets 4 connect said standards 1 and cross-bars 3 and act to brace the structure, and these standards are stationed at proper intervals, so as to support within the same the reservoir or tank 5. This tank 5 is made from sheet-metal plates properly joined together to prevent leakage, and secured to the inner walls of said tank are the tracks 6, which may be formed of angle-bars and extend from the front end of the framework beyond the tank 5 to the rear end of the frame, and where said tracks 6 are not within the tank 5 they are supported by the frame in any suitable manner. As stated, the tracks 6 begin at the front end of the frame adjacent to the hexagon wheel 7 and then slope down, as at 7', into the tank 5, after which they run in a horizontal line 6' through the tank to the rear end thereof and at a height within said tank as will permit the molds, hereinafter specifically referred to, moving along partially submerged by the water contained within said tank. From this horizontal line 6' the tracks 6 extend at an incline as they emerge from the tank 5, as at 7'', up to the hexagon wheels 8, which are mounted on a shaft 8', which is journaled in suitable bearings on the frame 9, extending out from the main frame of the tank 5 and being adapted to be driven in any suitable manner. A second line of tracks 10 is secured to the standards 1 below the tracks 6 and under the tank 5, these tracks 10 extending from the front

end of the apparatus at a point adjacent to and under the front wheels 7, mounted on the shaft 10' in a horizontal line 10'' and terminate at a point adjacent to the wheels 8 at the under side thereof.

The endless carrier 11 is adapted to travel on the tracks 6 and 10 and is preferably made up of the construction shown, in which the links 12 are open-looped shaped in construction and have bolts 12' extending through short pipe-sections 12'' between the same to stiffen and strengthen them. The ends of these links 12 overlap each other around the axles 13 and are loosely mounted thereon, while rollers or wheels 14 are loosely mounted around the ends of such axles for traveling on the tracks 6 and 10, while the links 12 engage with the hexagon faces on the wheels 7 and 8 as the endless carrier 11 travels over the same. Secured to the links 12 are the pans or molds 16, which have extensions 15 thereon, through which and the links 12 the bolts 15' pass for securing the same, and the pans or molds 16 have projecting lips 16' thereon, so as to overlap each other and prevent the molten metal while filling them from falling down between the molds 16. Collars 17 are formed on the axles 13, which are provided with arc-shaped projecting hoods 18 thereon for extending over the bosses of the wheels 14, and a set-screw 19 is secured within the hood 18, so as to enable said collars 17 to be securely clamped to the axles 13 by the turning of said set-screws 19 and the hoods 18 acting to protect the journals or bearings of the axle from the molten metal or other material which is liable to be splashed onto such journals or bearings in the pouring of the molten metal or from a sudden jar of the molds passing over the frame.

Located under the wheel 8 and below the endless carrier 11 is the tank 21, formed of any suitable material, which is adapted to be filled with water and into which a chute 22 leads from under the wheels 8 and carrier 11. A track 23 extends upward from the interior of said tank 21 at an incline to a metal-car 23', which is located on tracks 22', adjacent to said tank 21, and the upper ends of said track 23 are curved or bent downwardly, as at 23''. A "skip-car" 24, adapted to travel on said tracks 23 by its wheels 24', is located within said tank 21 and is raised and lowered by means of a rope 25, passing over a power-driven drum 26 and connected to a link or bar 27' to the rear end of the said car 24.

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, although in the drawings I have simply indicated a spout 28, into which the metal is poured from a ladle 29, mounted on a car 30, which is adapted to travel on the tracks 31 to and from the blast-furnace. The spout 28 is located at the front end of the carrier 11 over the tank 5, as I prefer to pour the metal into the molds

while the molds are partially submerged by the water within said tank, so that while the carrier 11 is moving in the direction of the arrow, Fig. 1, the metal is poured into the molds in the front end of the tank 5. 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 from the ladle 29 through the spout 28 said molds move along within the tank 5 in a horizontal line, the tracks 6 being at such a height that the molds are not completely submerged, the water-line being below the top edges of the molds. The molds are carried along at this height through the tank 5, which is of such length that the metal will set sufficiently to form crusts on the surface of the pigs until they ascend the inclined portion 7'' of the tracks 6 and pass over the wheels 8. As the molds pass up and over the wheels 8 they are inverted and the pigs are discharged therefrom, falling down the chute 22 into the tank 21, located below the wheels 8, where they are caught and held in the skip-car 24 and completely submerged by the water in said tank. When a sufficient number of pigs are contained within the car 24, the said car is raised up the inclined tracks 23 through the water in the tank 21 by the power-driven drum 26 and rope 25, passing around said drum and connected to said car, and when said car has reached the curved portion 23'' of said tracks 23 the pigs are dumped or discharged therefrom into the metal-car 23' on the tracks 22', while said car is held by the rope 25 and bar 27, from which point the metal pigs can be hauled to any point desired and the car 24 returned to place within the tank 21 for another operation. After discharging their pigs into the tank 21 the molds return in their inverted position along the tracks 10 until they pass up over the wheels 7 in position to enter the tank 5 again and receive another charge of metal.

By the above process the molds filled with metal are carried in a partially-submerged state through a body of water by which the metal is gradually cooled and allowed to set and when sufficiently cool is discharged therefrom and completely submerged and carried through another body of water, so that it emerges therefrom sufficiently cooled to permit it to be handled or discharged into cars for hauling or transportation. The carrier and tank are therefore just made sufficiently long to encrust the pigs as to keep them from "bleeding," so that the apparatus is not extended to any great length. At the same time the water keeps the molds comparatively cool, and the wear and tear on the molds are thus greatly reduced. Since the carrier and tank are of a comparatively short length, thereby reducing the cost and space, and since the

carrier is not provided with any great "lift" except what little is required to get over the rear end of the tank, the stress or strain upon the links, axles, and wheels therefore will be light.

It will be evident that another skip-car can be used on a track adjacent to the track 23 and connected by a rope to a power-driven drum in like manner as the skip-car 24, so that when one skip-car is traveling up the tracks and dumping the pigs therefrom another skip-car can be at rest within the tank receiving the pigs from the carrier, and so make a continuous operation. The pigs falling from the carrier or conveyer would be deflected into the right or left hand car, respectively, by a suitable movable switch or valve placed upon the chute 22, and these and various other changes and modifications in the various parts of the apparatus may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

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

1. In an apparatus for casting pig metal, the combination with a suitable frame, of wheels mounted thereon a longitudinal endless carrier passing around said wheels, rollers on said carrier, a water-trough, tracks located within and parallel to the sides of said trough upon which said rollers travel, a tank at the rear end of said carrier into which the pigs are discharged by the carrier, and a car within said tank adapted to catch the pigs as they are discharged by the carrier and to carry them from the tank, substantially as described.

2. In an apparatus for casting pig metal, the combination with a suitable frame, of wheels mounted thereon, a longitudinal endless carrier passing around said wheels, rollers on said carrier, molds on said carrier, a water-trough, tracks located within and parallel to the sides of said trough upon which said rollers travel, a tank at the rear end of said carrier into which the pigs are discharged by the carrier, inclined tracks extending into said tank, and a car on said inclined tracks adapted to catch the pigs as they are discharged by the carrier and to travel up said tracks to discharge the same, substantially as described.

3. In a pig-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, tracks located within and parallel with said tank upon which said rollers travel, a tank or reservoir arranged at the rear end of said carrier into which the pigs are discharged from said carrier, inclined tracks extending from within said tank and provided with bent or curved outer ends, and a car on said inclined tracks for catching the discharged pigs from the carrier, said car being adapted to travel up said tracks and engage with the bent or curved ends thereon for dumping the pigs.

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

ALFRED M. ACKLIN.

Witnesses:

J. N. COOKE,
J. L. TREFALLER, Jr.