No. 788,334. PATENTED APR. 25, 1905.

J. SCOTT.

APPARATUS FOR CASTING METAL.

APPLICATION FILED AUG. 31, 1899.

6 SHEETS—SHEET 1.

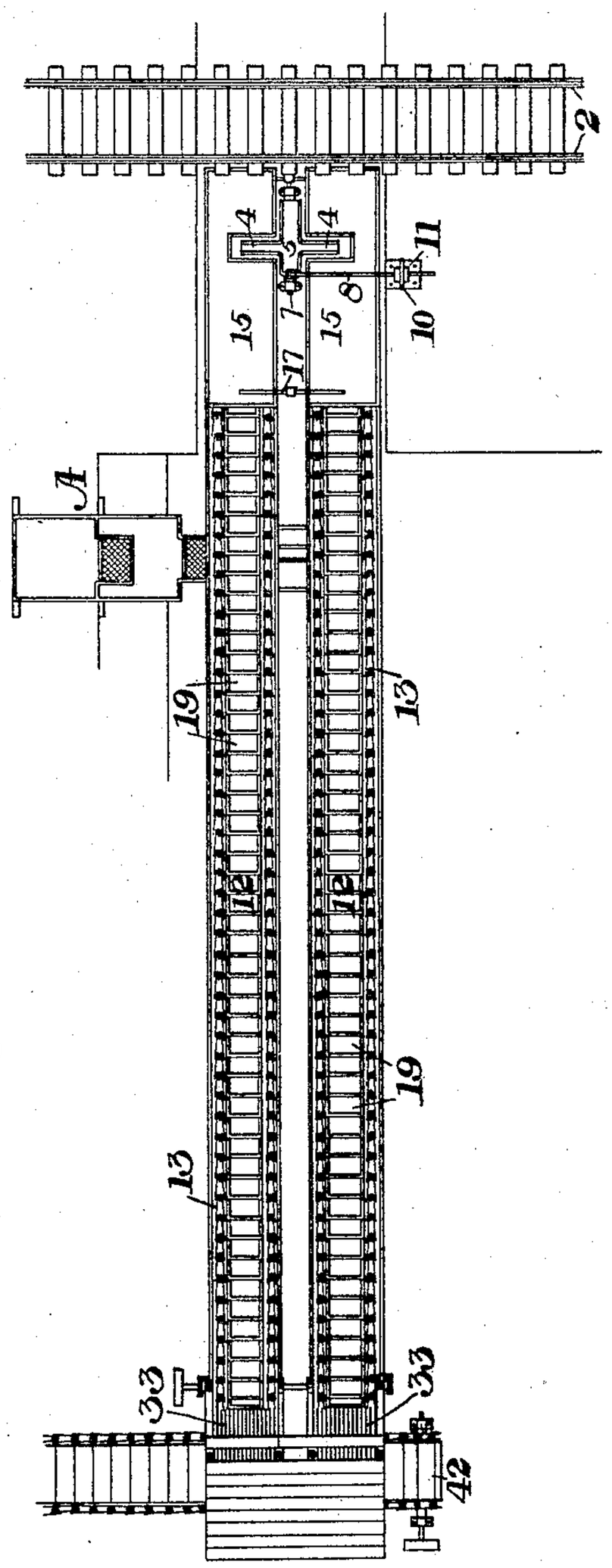

Fig. 1.

WITNESSES

Warren W. Swartz
G. B. Flemming.

INVENTOR

James Scott
by Bakewell & Bakewell
his atty's.

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6 SHEETS—SHEET 2.

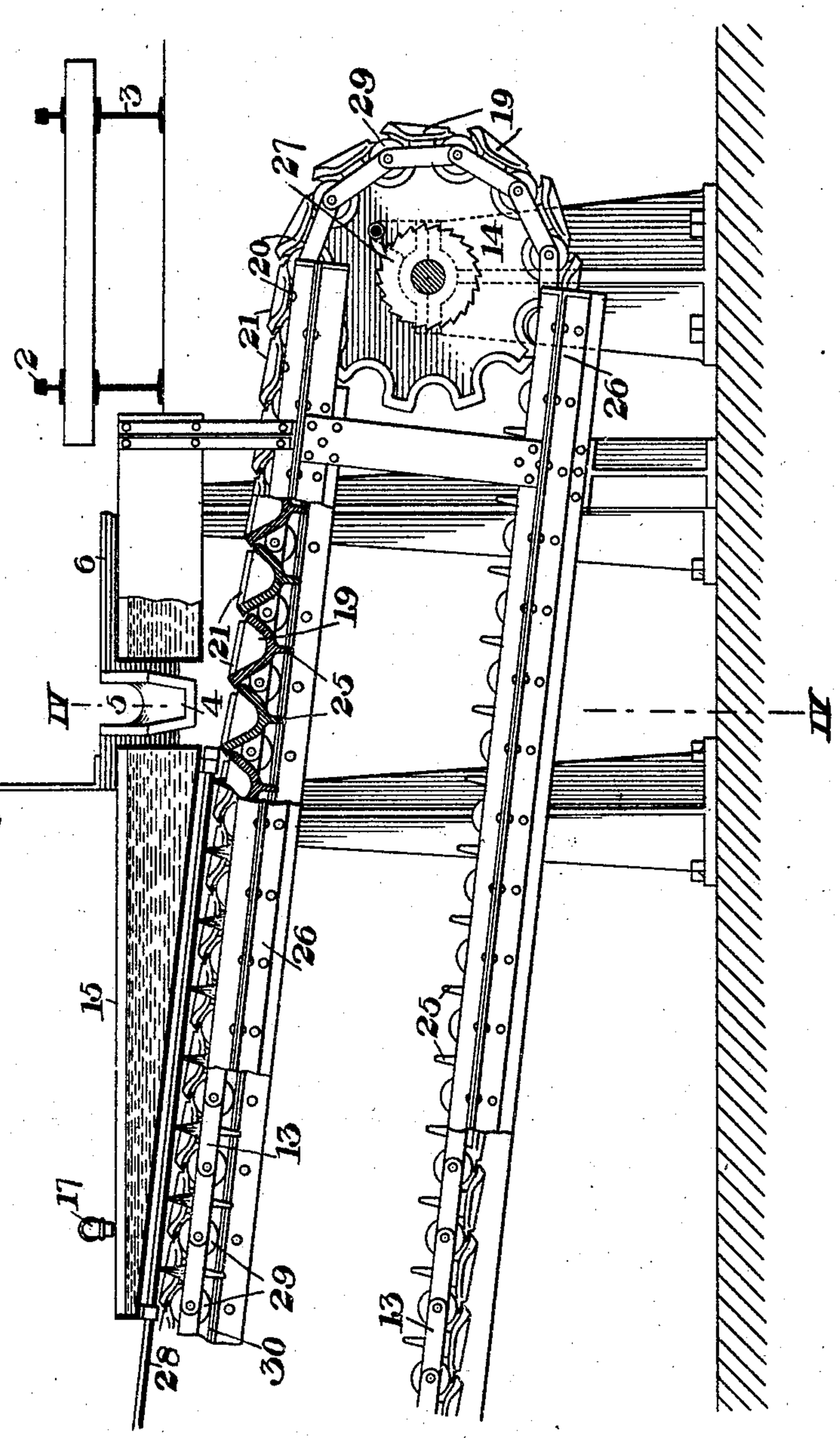

Fig. 2.

WITNESSES

Warren W. Swartz
G. B. Flemming

INVENTOR

James Scott
by Baldwin & Baldwin
his atty's.

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6 SHEETS—SHEET 3.

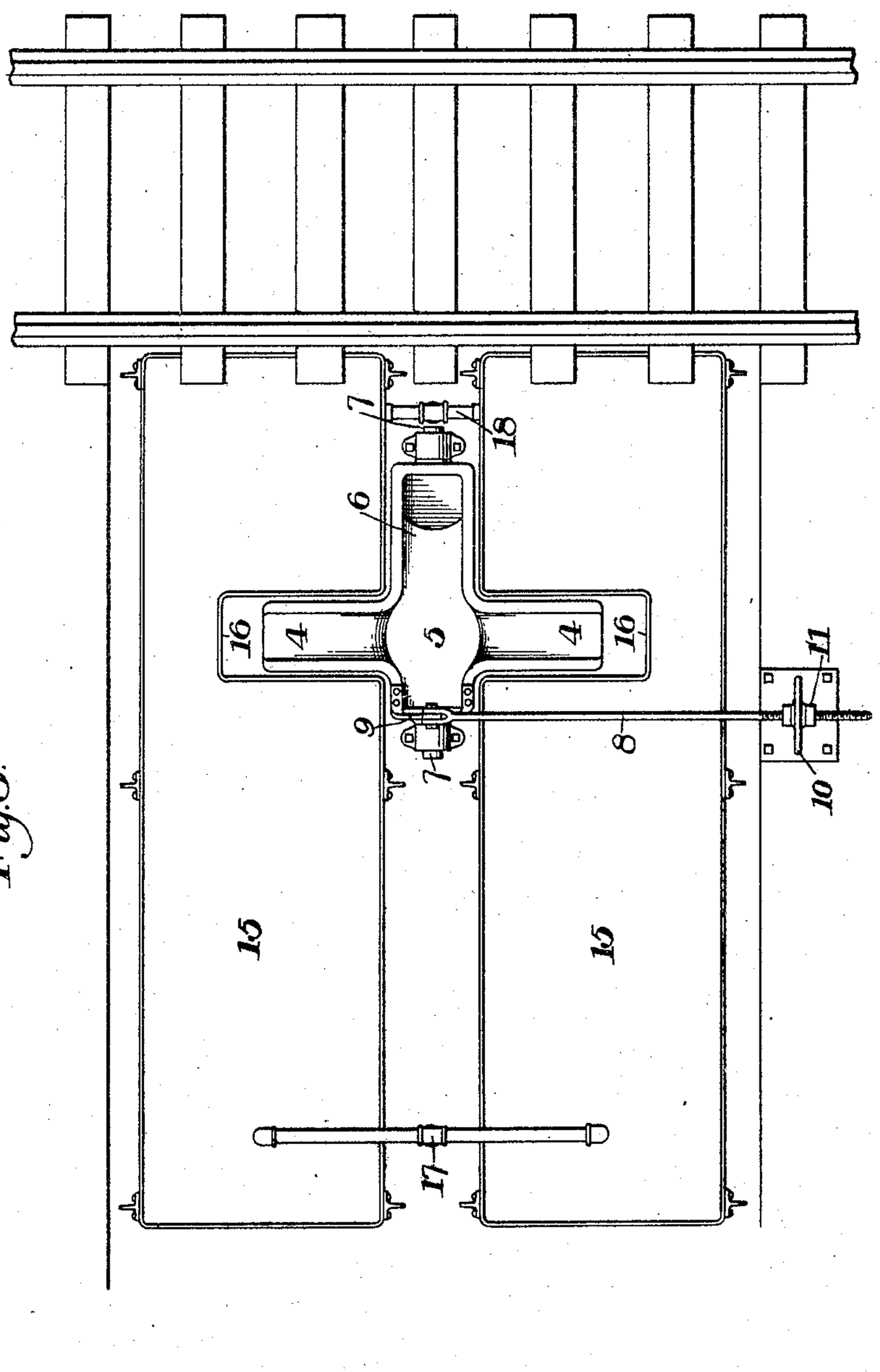

Fig. 3.

WITNESSES

Warren W. Swartz
G. B. Blenning

INVENTOR

James Scott
by Baker & Burnett
his attys.

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J. SCOTT.

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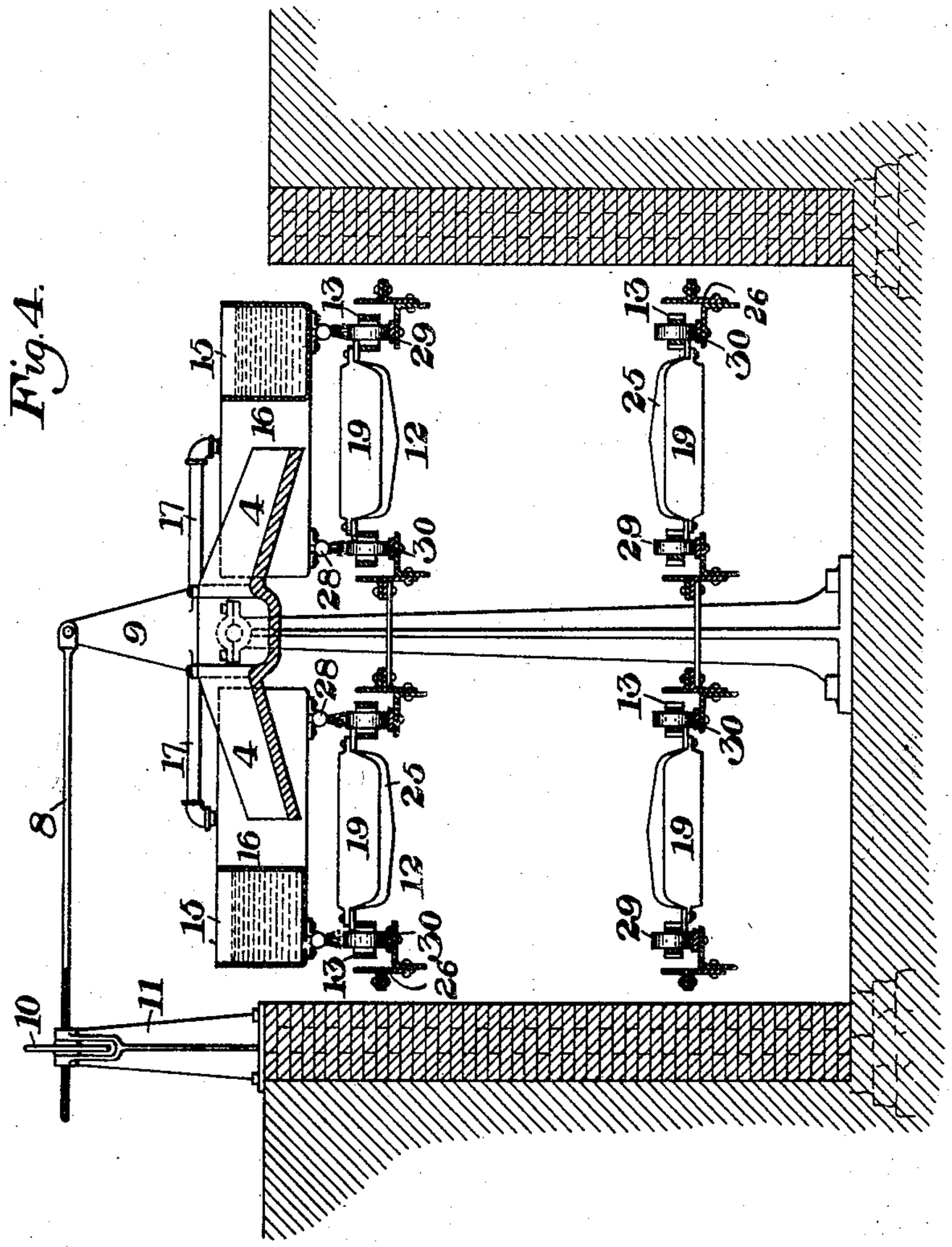
6 SHEETS—SHEET 4.

Fig. 4.



WITNESSES

Warren W. Swartz
G. B. Blemming

INVENTOR

James Scott
by Baldwin & Baldwin
his atty's.

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6 SHEETS—SHEET 5.

Fig. 5.

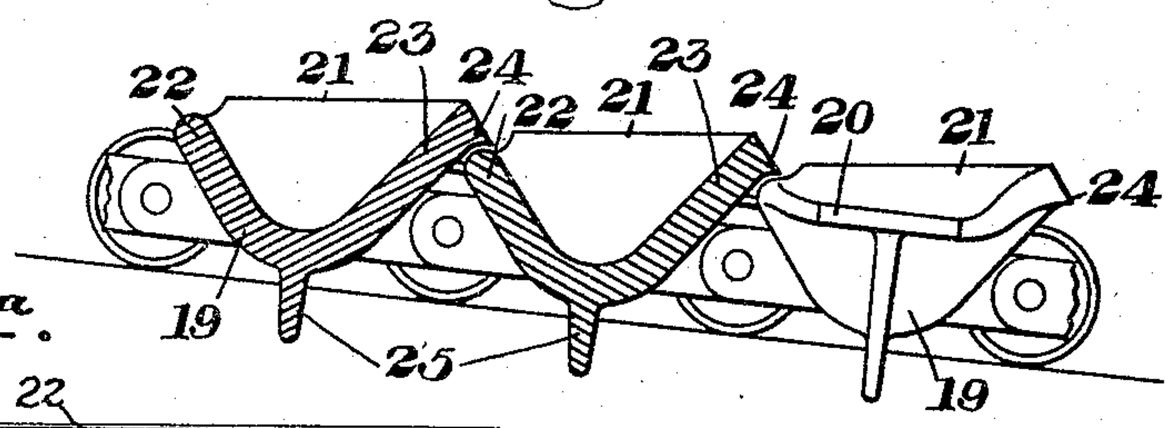


Fig. 5a.

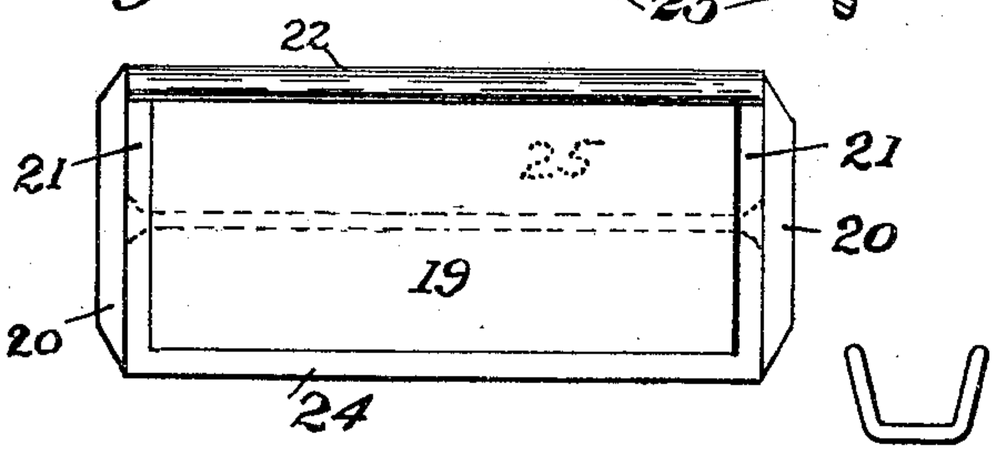


Fig. 6.

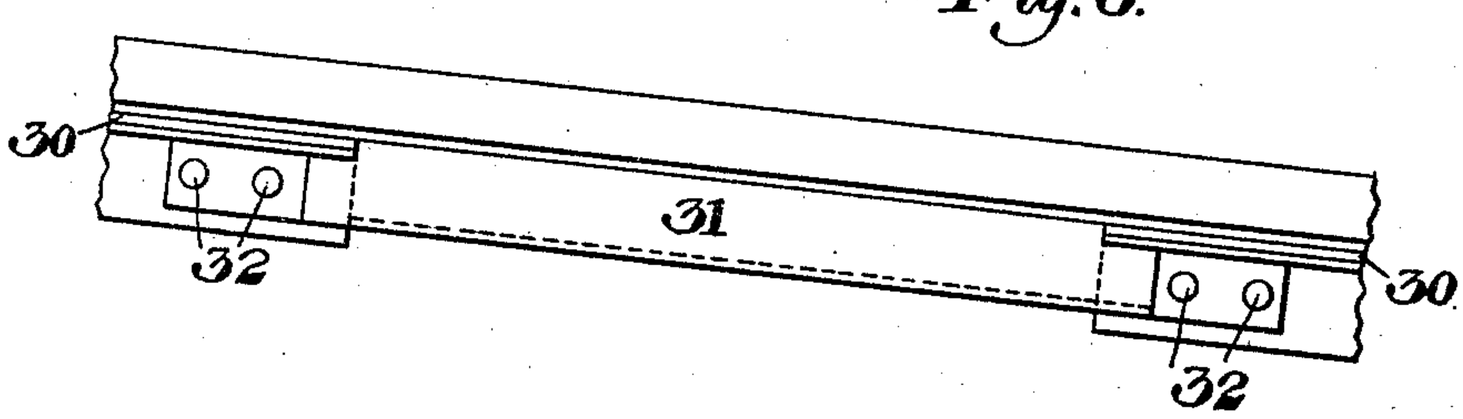


Fig. 7.

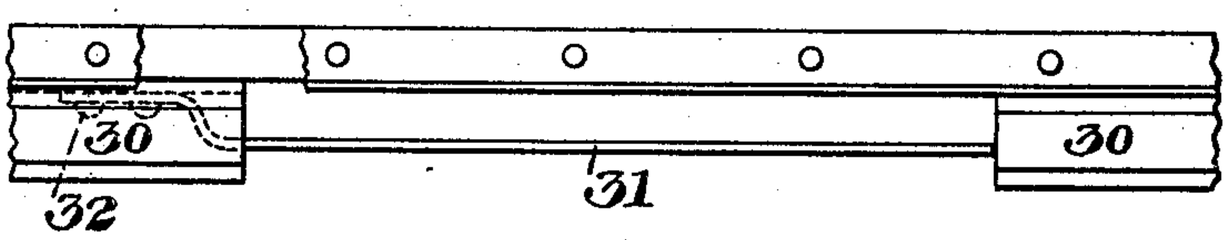
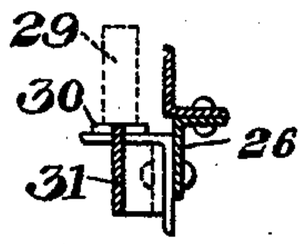


Fig. 8.



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Warren C. Swartz
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6 SHEETS—SHEET 6.

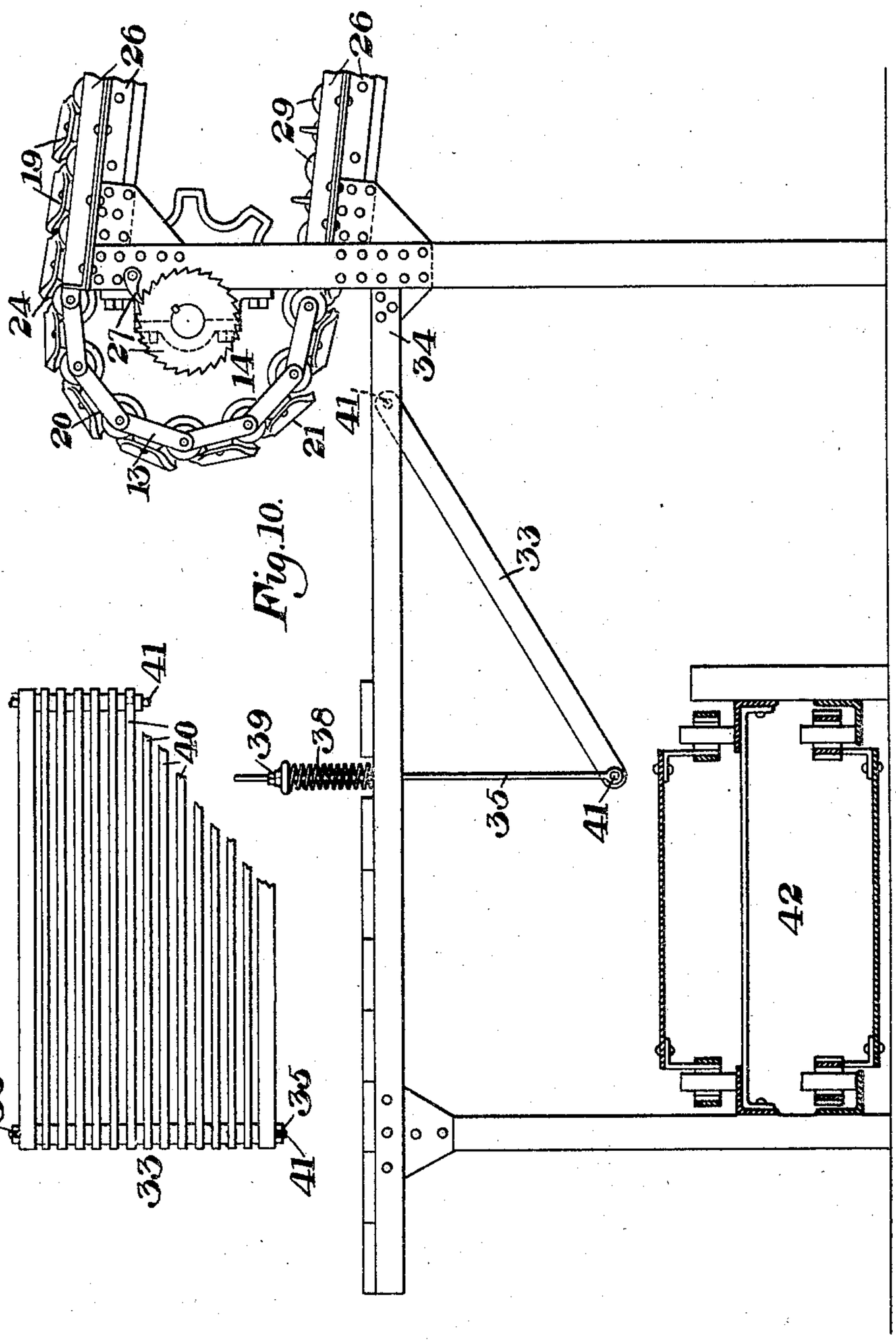

Fig. 10.

Fig. 9.

WITNESSES

Warren W. Swartz
G. B. Blumberg

INVENTOR

James Scott
by Baldwin & Baldwin
his attys.

No. 788,334. Patented April 25, 1905.

UNITED STATES PATENT OFFICE.

JAMES SCOTT, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO AMERICAN CASTING MACHINE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

APPARATUS FOR CASTING METAL.

SPECIFICATION forming part of Letters Patent No. 788,334, dated April 25, 1905.

Application filed August 31, 1899. Serial No. 729,097.

To all whom it may concern:

Be it known that I, JAMES SCOTT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Casting Metal, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic plan view of casting apparatus constructed in accordance with my invention. Fig. 2 is a sectional side elevation of the receiving end of the apparatus. Fig. 3 is a plan view of the same, and Fig. 4 is a transverse section taken on the line IV IV of Fig. 2. Fig. 5 is a sectional side elevation of a series of the molds used. Fig. 5ª is a plan view of one of the molds. Fig. 6 is a side elevation of a portion of the carrier-track at the pouring end, and Fig. 7 is a plan view of the same. Fig. 8 is a cross-sectional view of the track portion shown in Fig. 5. Fig. 9 is a plan view, partly broken away, of the chute at the discharge end of the apparatus; and Fig. 10 is a sectional side elevation showing the discharge end of the apparatus with the chute in place.

My invention relates to apparatus for casting metal, such as shown and described in Letters Patent No. 548,146, granted to Edward A. Uehling on October 15, 1885, and is especially adapted for the casting of pig-iron, though it may be used in casting other metals, such as lead, copper, &c.

The object of the invention is to improve the construction of such apparatus, to prevent its injury by the molten metal, to lengthen the life of the apparatus, and to simplify the construction.

To that end the invention consists in certain constructions and arrangements of the parts, as hereinafter more fully described, and set forth in the claims.

In the drawings, referring to Figs. 1, 2, 3, and 4, 2 represents a track for the ladle-car which conveys the molten metal to the casting apparatus. This track is carried on a suitable frame 3. The molten metal is poured from such ladle-car into a pouring-pot having lateral oppositely-directed discharge-troughs 4 4, leading from a central well 5, and provided with a longitudinal rearwardly-extending trough 6. The pot is mounted upon front and rear trunnions 7 7 and may be tilted sidewise by a rod 8, pivotally connected to a standard 9 on the pot and having at its outer end a screw-threaded portion engaged by an internally-threaded hand-wheel 10, carried in a stationary support 11. By turning the hand-wheel in either direction the pot may be tilted on its trunnions and the flow of metal thus increased through either of the side troughs, and at the end of the pouring operation the metal in the central well may be discharged by further tilting of the pot. The side spouts discharge the molten metal into two sets of molds 12 12, each set being carried upon a chain 13, carried upon end sprocket-wheels 14, and to prevent the molten iron from contacting with the carrier, as well as to hasten the solidification of the molten metal in the molds, I provide water-pans 15, which extend over the carriers and are provided with recessed portions 16 around the spouts 4. Each pan preferably extends longitudinally beyond the limits of the pouring-pot and is made with an inclined bottom, as shown in Fig. 2, to bring it into parallelism with the line of movement of the molds, the carrier preferably extending upwardly from the feeding toward the discharge end. A water-supply is fed into each pan through a pipe 17 near the shallow end and is taken off by the overflow-outlet pipe 18 near the other end. As the water-pan preferably covers the molds and chains, it prevents particles of molten iron from entering the links of the carrier and also assists in cooling the metal in the molds without direct contact with it.

The molds or buckets 19 for the metal are

of peculiar shape, as shown in Fig. 5, they being of greater width than length in the direction of movement and having side flanges or ears 20. At each side edge above the flange is a projection 21 to prevent the metal from spattering out sidewise upon the chain. The rear end of the mold 22 is shorter than the front end 23, and this front end terminates in a curved projection having an upper sharp edge 24. The nose or projection overlaps the rear wall of the preceding mold, and the sharp edge divides the stream of metal from the spout, splitting the stream without spattering the metal outwardly. Each mold is provided with a depending integral reinforcing-rib 25, giving an increased thickness of metal at this point to provide for slower expansion and contraction. The rib strengthens the mold at this point, which is liable to fracture while admitting the refractory wash, and gives this part of the mold the same relative expansibility in its upper portions.

The molds may be mounted upon chains or carriers of any desirable character in order to prevent injury to the workmen arising from breakage in any part of the apparatus. I preferably provide drums over which the chains pass with pawl-and-ratchet connections 27, which in case of breakage prevent the recoil of the drums and to a certain extent the collapse of the carrier. 26 represents the guard-rails for the track 30, presently to be described. In order to prevent the heating of the links of the chains and to cool and lubricate the links, I provide water-pipes 28, which extend longitudinally above the chains and are provided at suitable intervals with perforations, through which the water drops upon the links and the rollers 29, carried therein, thus cooling and lubricating them without injuring the molds by sudden cooling.

In order to prevent difficulty arising from iron which might spatter upon the flat track 30 for the rollers of the chains, I preferably remove the track for a short distance each side of the pouring-spouts and provide in its place a narrow vertical track 31, as shown in Figs. 6, 7, and 8. This track is secured by suitable bolts 32 and is located in the center line of the main track, the rollers moving on this edge portion.

At the discharge end of the apparatus I provide a chute 33, which is common to both sets of molds and is pivoted at its rear end to the framework 34, its other end being supported upon rods 35, which extend up through the frame and are provided with surrounding spiral springs 38, bearing upon adjustable nuts 39. The chute is composed of a series of parallel bars 40, secured together upon the end rods 41, to one of which the supporting links or rods 35 are connected. A transverse conveyer 42 may be located beneath the outer end of the chute, or, if desired, a car or other receptacle may be placed at this point.

In using the apparatus the refractory material may be applied to the interior of the molds on their return pass and at the point marked A in Fig. 1 by any of the usual devices for this purpose. The chains being actuated in the usual manner, the metal flowing from the pot through the lateral spouts enters and fills the continuously-traveling molds or buckets. The buckets passing closely beneath the water-pans cause rapid cooling and solidifying of the metal. The cooled pigs dropping at the opposite end of the chains onto the chute are thereby directed into a receptacle or upon a conveyer, and the molds are coated upon their return travel by a spraying device or other apparatus used therefor.

The advantages of the invention result from preventing the molten iron from contacting with the chains, from the peculiar feeding device, from the rapid cooling of the metal, and the simplicity of the apparatus, which is not liable to get out of order.

Many variations may be made in the form and arrangement of the parts without departing from my invention, since

I claim—

1. In casting apparatus, the combination with two or more adjacent sets of molds, having mechanism for moving them, of an intermediate casting-pot provided with a well, and troughs integral with and leading from it, and means for tilting the pot, whereby the liquid metal may be directed into either set of molds, or in equal or varying streams into both sets; substantially as described.

2. In casting apparatus, the combination with one or more sets of molds, of mechanism for moving them, and a casting-pot arranged to receive molten metal, said pot having a well and one or more integral lateral troughs, substantially as described.

3. In casting apparatus, the combination with molds, of means for moving them horizontally, and a protective water-pan located above the line of movement of the molds, and sufficiently close thereto to aid in the cooling of the contained metal; substantially as described.

4. In casting apparatus, the combination with molds, of means for moving them, a pouring-pot having lateral discharge-troughs, and a water-pan extending above the molds and about the pot and arranged to protect the mold-carrier from the molten metal and aid in cooling the molten metal; substantially as described.

5. In casting apparatus, a mold having at its sides upwardly-projecting splashers; substantially as described.

6. In casting apparatus, the combination with an endless carrier, and molds carried thereon, of a discharge-chute consisting of inclined parallel bars, having a spring-supported carrying-rod; substantially as described.

7. In casting apparatus, the combination with an endless carrier having molds, of a discharge-chute composed of parallel bars having at one end a supporting-rod hinged to the frames, and at the other end a supporting-rod carried by a vertically-extending spring-support; substantially as described.

In testimony whereof I have hereunto set my hand.

JAMES SCOTT.

Witnesses:
GEO. B. BLEMMING,
C. BYRNES.