

J. T. MORIE & J. MAGNANELLI.

AUTOMATIC STRIPPING INGOT MOLD.

APPLICATION FILED JUNE 24, 1909.

933,658.

Patented Sept. 7, 1909.

5 SHEETS—SHEET 1.

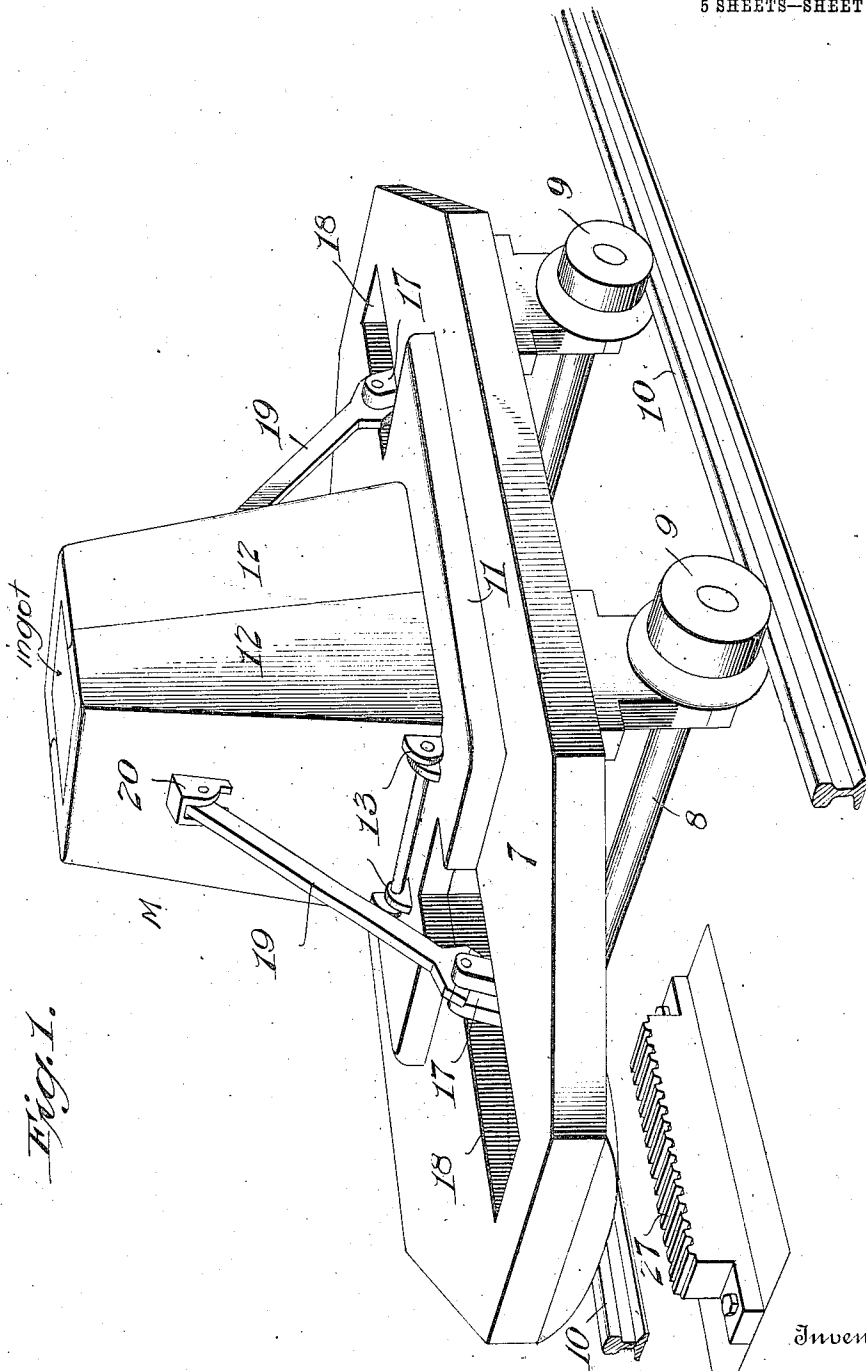


Fig. 1.

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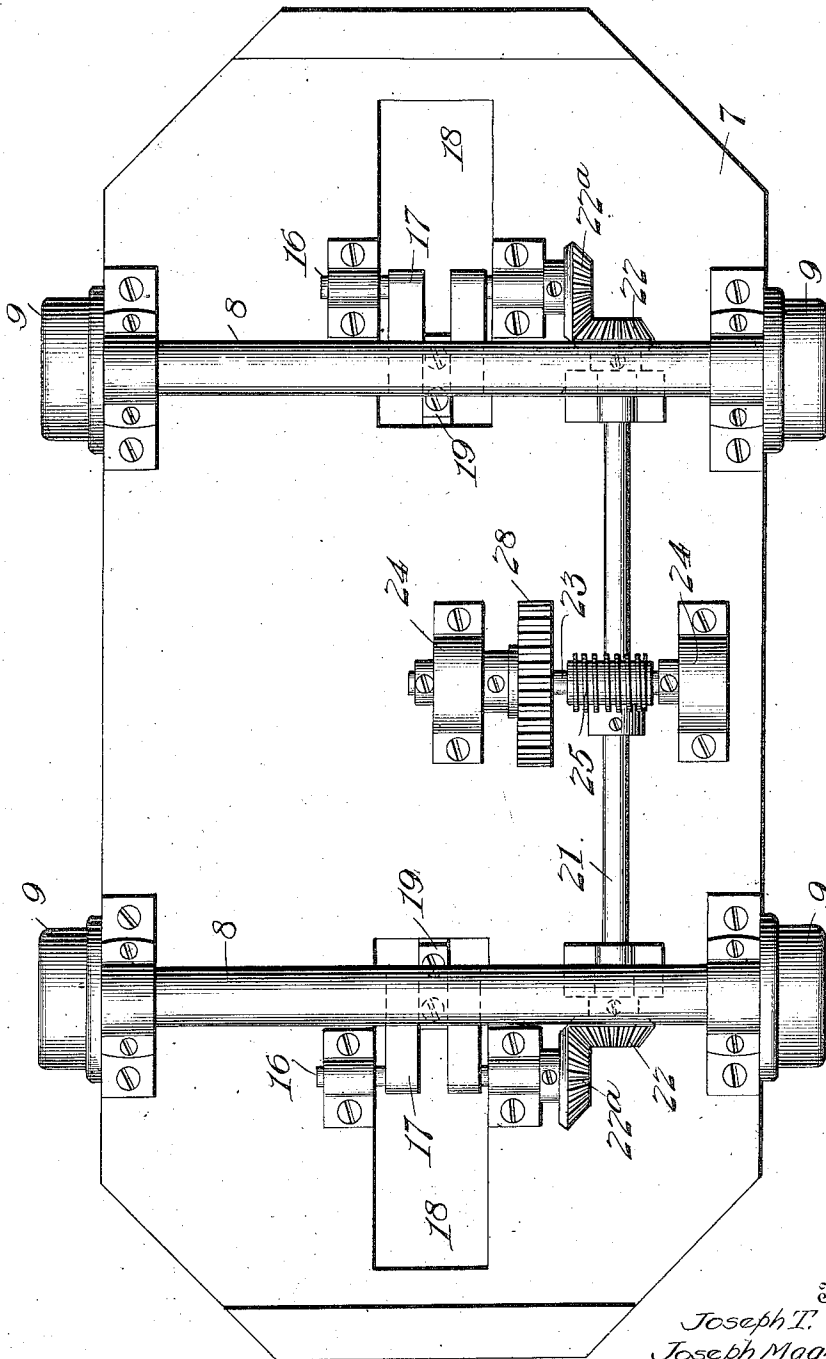
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Fig. 2.



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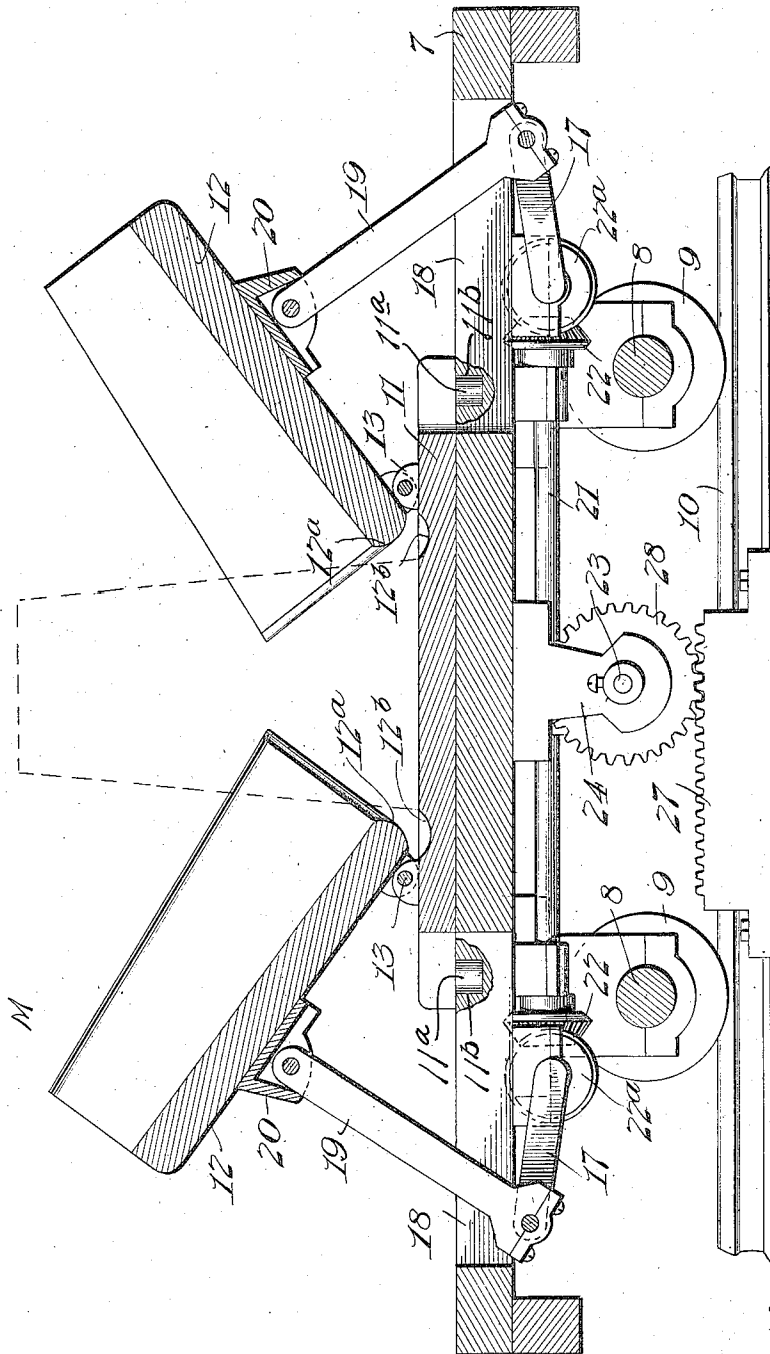
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Fig. 3.



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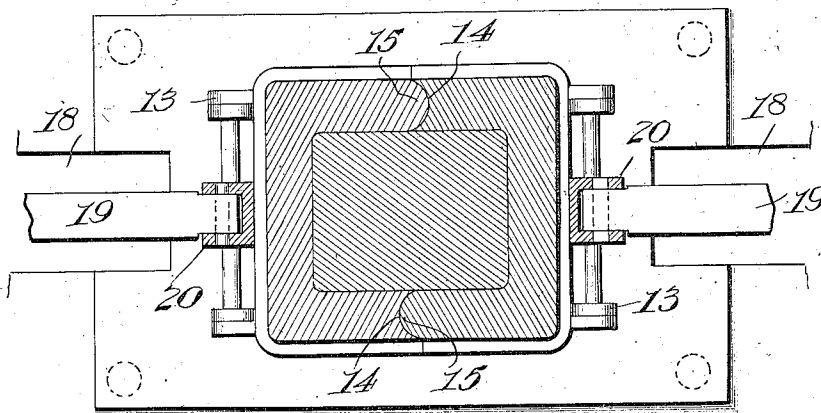
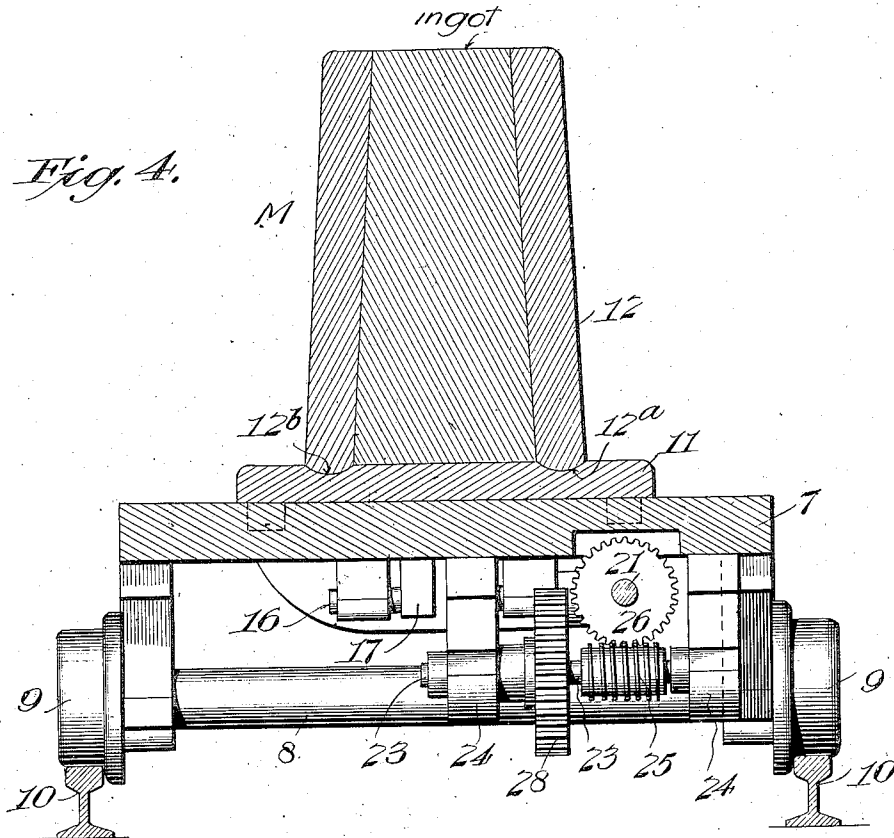
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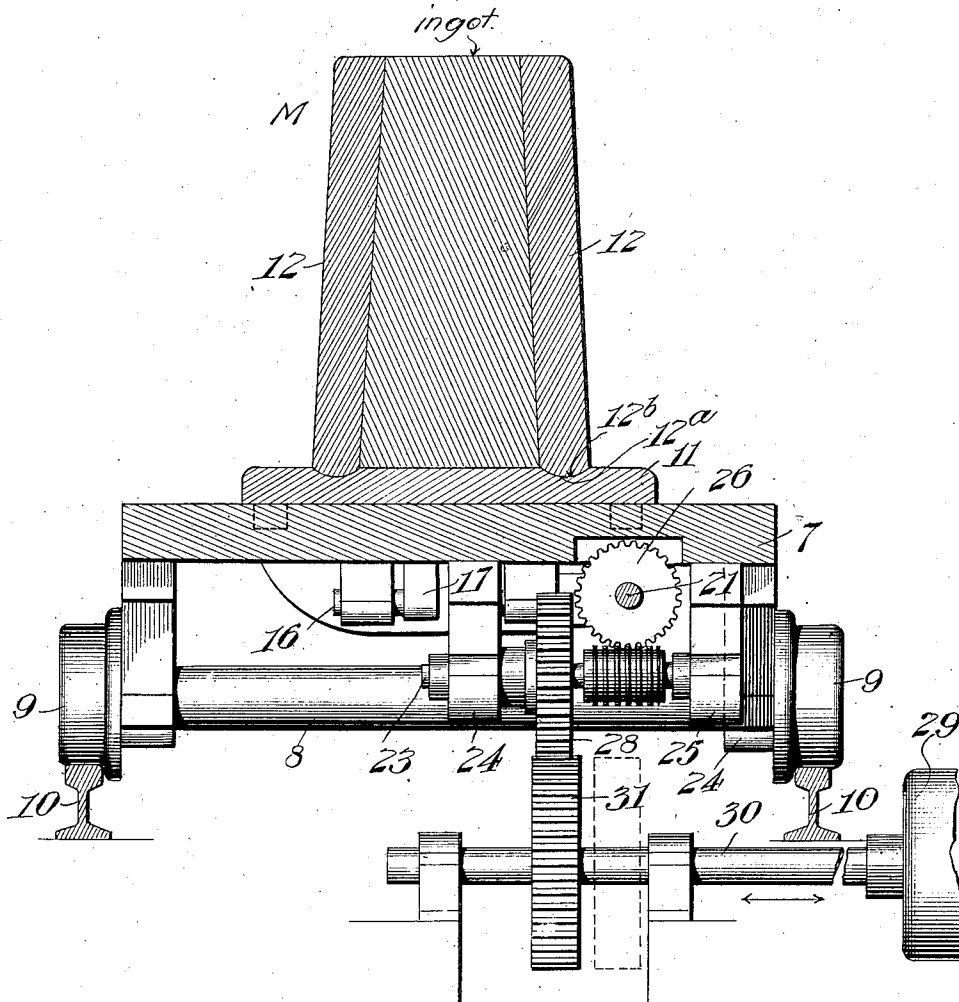
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5 SHEETS—SHEET 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH T. MORIE AND JOSEPH MAGNANELLI, OF YOUNGSTOWN, OHIO.

AUTOMATIC-STRIPPING INGOT-MOLD.

933,658.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed June 24, 1909. Serial No. 504,136.

To all whom it may concern:

Be it known that we, JOSEPH T. MORIE, a citizen of the United States, and JOSEPH MAGNANELLI, a subject of the King of Italy, both residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Automatic-Stripping Ingot-Molds, of which the following is a specification.

This invention relates to the subject of casting steel or other metal ingots, and has special reference to an improved ingot mold comprising means for automatically stripping the mold from the ingot at the stripping station.

As is well known to those skilled in the art, it is ordinarily the practice to employ a non-sectional or solid mold arranged in an upright position upon the car platform. This car is first run to the point where the mold will receive the molten metal as it flows from the ladle, and when the mold is filled the car is run along the track to the stripping station, that is, to a point opposite what is called "the soaking pit". At this point, the mold is stripped or lifted off the ingot by the usual appliances employed for that purpose, but as is also well known, this stripping process, with the ordinary facilities and with the ordinary non-sectional mold, is frequently attended with difficulty, inasmuch as the ingot is liable to stick to the mold and under such circumstances it often becomes necessary to shatter the mold to effect its separation from the ingot.

It is therefore the purpose of the present invention to provide an improved ingot mold so constructed and operated as to effect an automatic stripping of the mold from the ingot at the stripping point, thus obviating all of the difficulties heretofore existing to the common stripping methods and at the same time providing reliable means for always leaving the ingot free from the mold, so that it can be readily removed from the car.

With these and many other objects in view, which will more readily appear to those familiar with the art as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangements of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention, involved in carrying out the objects above in-

dicated, are necessarily susceptible to a wide range of structural modification without departing from the scope of the invention, but certain preferred and practical embodiments thereof are shown in the accompanying drawings, in which:

Figure 1 is a perspective view of the car, with the mold thereon closed. Fig. 2 is a bottom plan view of the car, showing the separating mechanism. Fig. 3 is a longitudinal sectional view showing the mold open. Fig. 4 is a vertical cross sectional view. Fig. 5 is a horizontal sectional view through the mold. Fig. 6 is a view showing a slightly modified form of operating mechanism.

Like references designate corresponding parts in the several figures of the drawings.

In the embodiment of the invention disclosed in the drawings, the mold car includes in its general organization a body 7 carrying the wheel axles 8 on which are mounted the wheels 9 that travel on the track rails 10.

The platform of the car carries thereon a mold base 11, that is a base upon which is supported the ingot mold designated in its entirety by the letter M. This mold base 11 preferably consists of a separate plate detachably mounted or secured on top of the car platform. The detachable mounting of the mold base may be effected in a variety of ways, but a simple expedient that may be resorted to is suggested in the drawings, viz: the feature of providing the said base at its corners or other suitable points with depending holding lugs 11^a engaging in keeper sockets 11^b in the car platform, but it will be understood that equivalent fastenings may be utilized for the same purpose. In this connection, it will be observed that the idea of using a detachable and replaceable mold base is to permit the same to be readily replaced when burned out without in any wise interfering with the bed of the car or the mechanism carried thereby.

The ingot mold M is preferably of the upwardly tapering type, but according to the present invention, consists of a pair of matching sections 12, suitably hinged, as shown at 13, to the base. The lower edges of these mold sections 12 are preferably convex, as indicated at 12^a, to register in correspondingly concaved seats 12^b provided in the mold base, thus forming an interlocking sealing joint between the lower edges of said sections and the mold base. Likewise, similar joints, for a similar purpose, are pro-

vided between the meeting edges of the separate mold sections. To provide for the sealing joint between said meeting edges of the mold section, one of the vertical edges of each section has a concaved channel or seat 14, while the other or opposite edge is convexed or rounded as indicated at 15, the convexed edge of one section fitting into the concaved edge of the other section.

10 Journaled transversely to the under side of the car body and contiguous to the ends thereof are crank shafts 16, the cranks 17 of which operate through openings 18 formed in the car body. These cranks have pitmen connections 19 with the mold sections 12, the pitmen being pivoted to ears 20 projecting from the outer sides of the sections. A driven shaft 21, journaled longitudinally upon the under side of the car body, has bevel gear connections 22-22^a with the crank shafts, so that their simultaneous rotation in opposite directions is effected. A driving shaft 23, journaled in suitable boxes 24 upon the under side of the car body transversely thereof, has a worm 25 that meshes with a worm wheel 26 mounted on the shaft 21. It will thus be clear that if the driving shaft 23 is rotated, the shaft 21 will be turned, thereby rotating the crank shafts 16 and the cranks 17, forming parts thereof. As these cranks swing away from each other, the mold sections will be swung apart, and consequently stripped from the ingot cast in the mold. Upon the rotation of the shaft 23 in an opposite direction, the mold sections will be swung together or into assembled relation.

Different means may be employed for rotating the driving shaft 23. In the form of construction, which is probably preferred, a rack 27 is mounted between the track rails at or adjacent to the stripping point, and a gear 28, fixed to the driving shaft 23, is so positioned that it will engage the rack when the car is moved over said rack, thus the separating mechanism will be operated and the mold automatically stripped from the ingot. When the mold is opened, the ingot can be readily removed from the car, as will be obvious, and upon the return of the car from the stripping point, the mold will automatically close. The worm gear connection between the driving and driven shafts is important, as it constitutes a lock for holding the said sections against accidental movement.

By way of illustrating the wide range of modification that may be resorted to in carrying out the invention, there is suggested in Fig. 6 another form of operating mechanism that may be employed. According to this suggested construction, a suitable motor 29 may be arranged alongside of the track providing means for driving a longitudinally shiftable shaft 30 carrying a gear

wheel 31. This shaft is intended to be shifted longitudinally by any suitable mechanical means (not shown) to provide for shifting the gear wheel 31 into and out of mesh with the gear wheel 28. Hence, when the car is moved to the stripping station, the shaft 30 is shifted into engagement with the gear wheel 28, as shown in Fig. 6, whereupon it will be obvious that the mold can be opened and closed as described.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

We claim:

1. The combination with a car, of an ingot mold mounted on the car and comprising separable sections, and mechanism mounted on the car for effecting the separation of said sections.
2. The combination with a car, of an ingot mold mounted on the car and comprising separable sections hinged to the car, and mechanism mounted on the car and connected to the sections for effecting their separation.
3. The combination with a car, of an ingot mold mounted on the car and comprising separable sections hinged to the car, and mechanism mounted on the car and connected to the sections for effecting their separation, said mechanism also constituting means for locking the sections in assembled relation.
4. The combination with a car, of an ingot mold mounted on the car and comprising oppositely swinging sections hinged to the car, cranks journaled on the car, pitmen connecting the cranks and sections, and means for rotating the cranks.
5. The combination with a car, of an ingot mold mounted on the car and comprising separable sections, crank shafts journaled on the car, connections between the cranks of the shafts and the sections, a driven shaft geared to both crank shafts, and means for rotating the driven shaft.
6. The combination with a car, of an ingot mold mounted on the car, and comprising separable sections, crank shafts journaled on the car, connections between the cranks of the shafts and the sections, a driven shaft geared to both crank shafts, and means for rotating the driven shaft, having a worm gear connection therewith.
7. The combination with a car, of an ingot mold mounted on the car and comprising separable sections, crank shafts journaled on the car, connections between the cranks of

the shafts and the sections, a driven shaft geared to both crank shafts, a driving shaft geared to the driven shaft, and means located at the stripping point for rotating the driving shaft.

8. The combination with a car, of an ingot mold mounted thereon and comprising separable sections, means mounted on the car separating the sections, and operating mechanism for the means, said car being movable to carry the means into engagement with the operating mechanism.

9. The combination with a track, of a car movable therealong, an ingot mold mounted on the car and comprising separable sections, means mounted on the car and connected to the sections for separating the same, and operating mechanism for said means located at a predetermined point on the track, said car carrying the separating means to a position to be operated on by said mechanism.

10. The combination with a track, of a car movable on the track, an ingot mold mounted on the car and comprising two outwardly swinging separable sections hinged to the car, crank shafts journaled transversely on the car, pitmen connection between the cranks of the shafts and the sections, a driven shaft journaled longitudinally on the

car and geared to the crank shafts, a driving shaft journaled transversely on the car and having a worm connection with the driving shaft, operating means mounted at a predetermined point along the track, and a gear mounted on the driving shaft, said car being movable to carry the gear to a position to be engaged by the operating means.

11. The combination with a car, of an ingot mold mounted on the car and comprising separable mold sections hinged to the car and having an interlocking sealing joint between their meeting edges.

12. In an apparatus of the class described, the car having a platform, a mold-carrying base detachably engaged with the car platform, and an ingot mold comprising separable mold sections hinged to the base, said mold sections having an interlocking sealing joint between their meeting edges and also with the mold base.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

JOSEPH T. MORIE.

JOSEPH MAGNANELLI.

Witnesses:

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LENA J. BUEHLER.