(No Model.)

3 Sheets—Sheet 1.

D. BAKER.

CASTING PLANT.

No. 602,614. Patented Apr. 19, 1898.

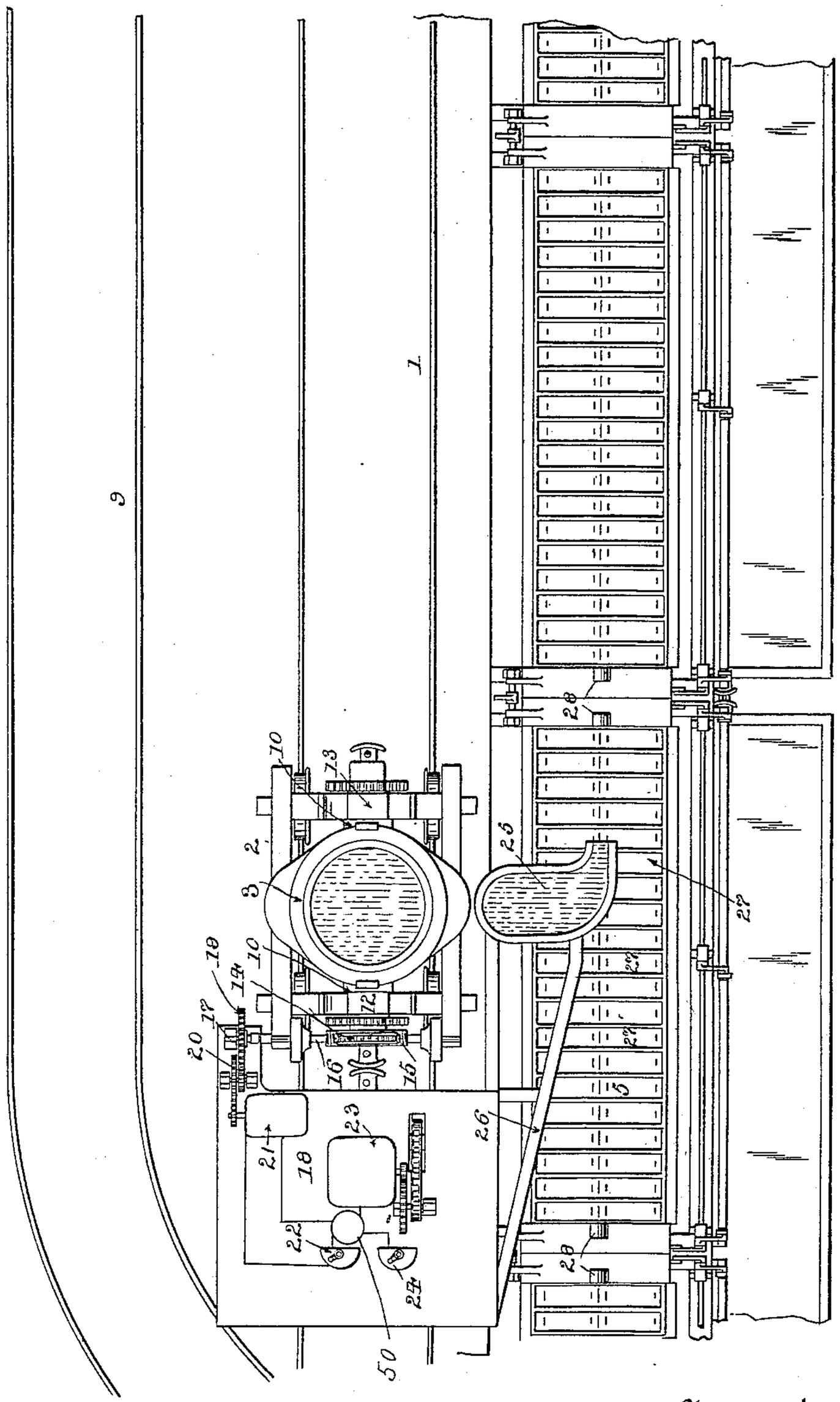

Fig. 1.

Witnesses.
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(No Model.)

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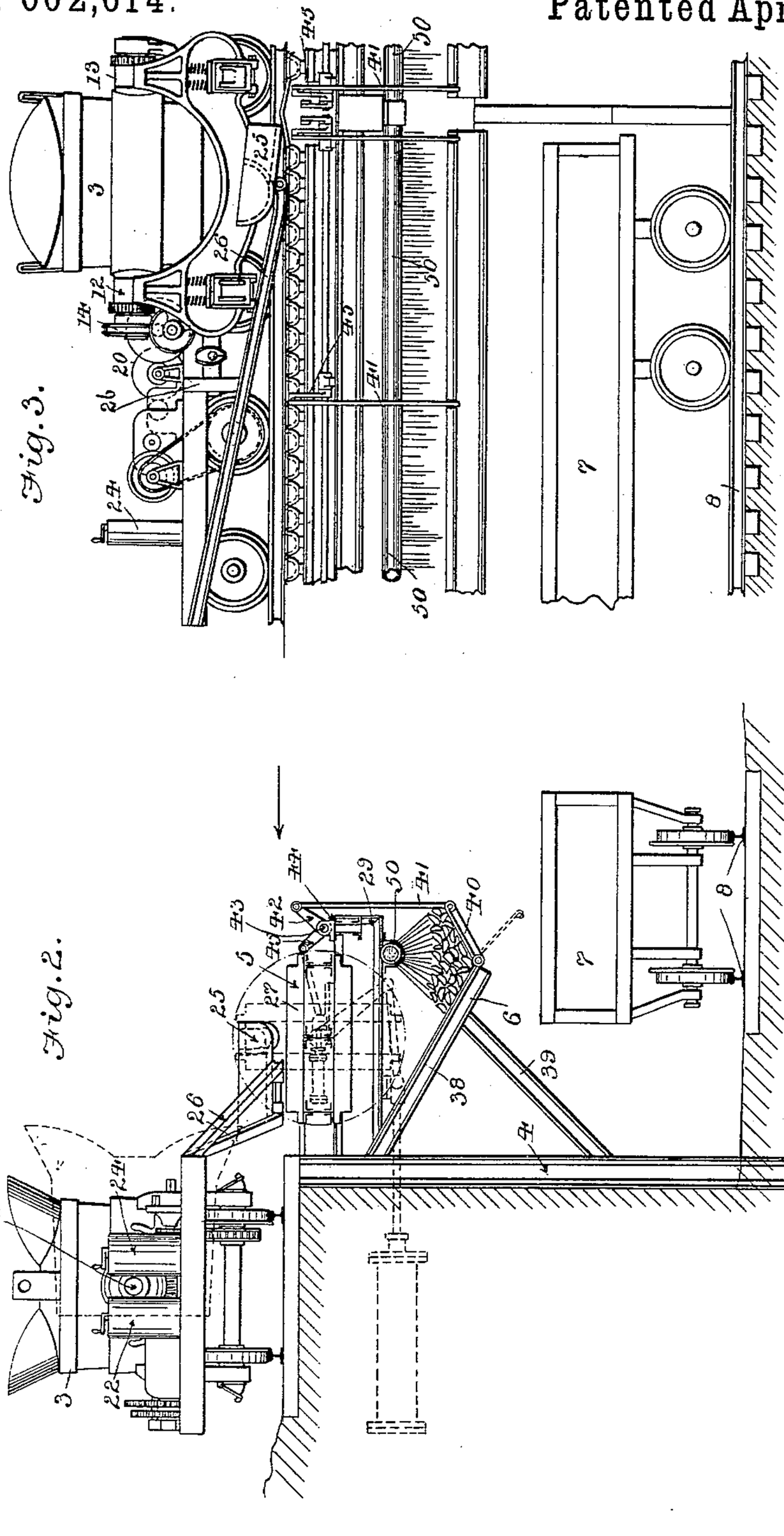

Fig. 3.

Fig. 2.

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(No Model.)

3 Sheets—Sheet 3.

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CASTING PLANT.

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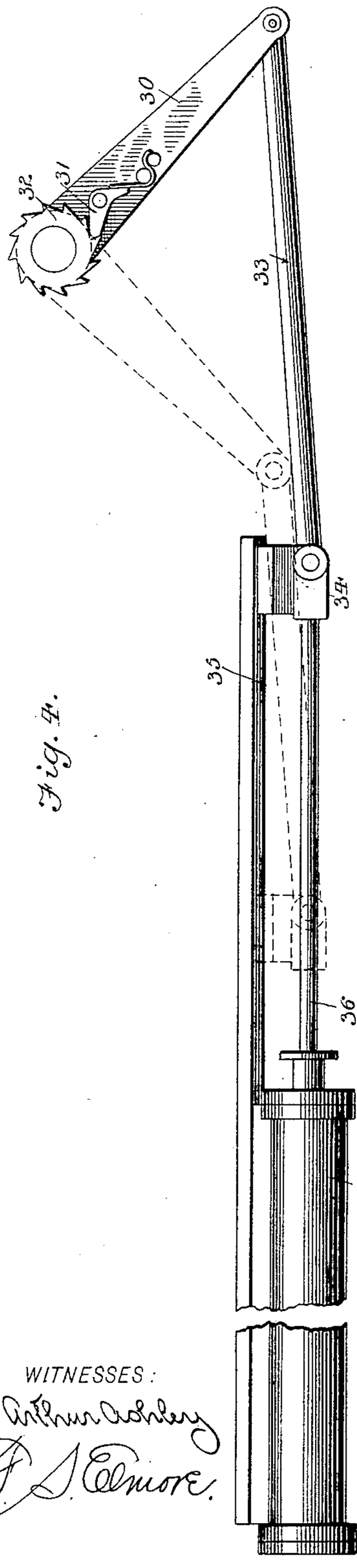

Fig. 4.

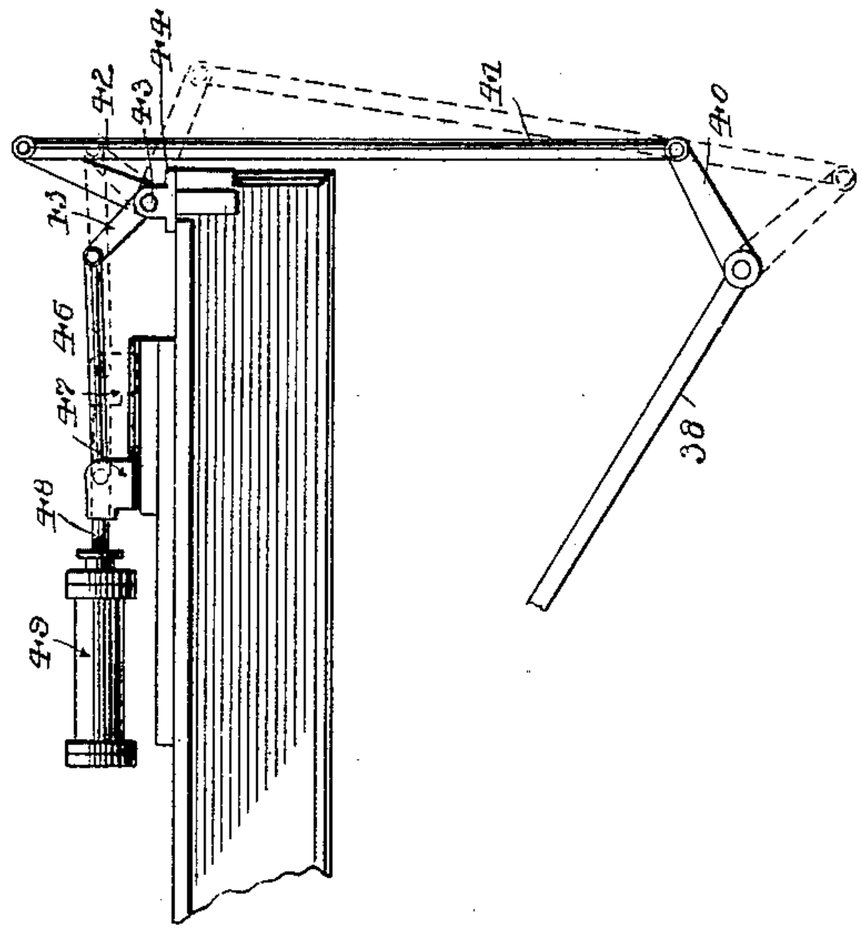

Fig. 3.

WITNESSES:
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INVENTOR
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UNITED STATES PATENT OFFICE.

DAVID BAKER, OF SPARROW'S POINT, MARYLAND.

CASTING PLANT.

SPECIFICATION forming part of Letters Patent No. 602,614, dated April 19, 1898.

Application filed July 3, 1897. Serial No. 643,356. (No model.)

To all whom it may concern:

Be it known that I, DAVID BAKER, of Sparrow's Point, county of Baltimore, and State of Maryland, have invented a new and useful Improvement in Casting Plants, of which the following is a specification.

This invention has reference to an improved casting plant, the aim being to provide for the handling of large quantities of metal at a minimum expense and a minimum loss of material in scrap.

With these ends in view my plant comprehends an improved construction and arrangement of a traveling receptacle or ladle adapted to hold a quantity of molten metal, a bed or beds of molds in which the metal is poured, and a receiving trough or receptacle into which the casting pigs or ingots are discharged from the molds. While in the trough, the castings may be sprayed to cool them, and they are finally discharged into cars for removal.

The invention further consists in various details of construction and arrangement of parts directed to simplicity, effectiveness in operation, and the rapid and economical handling of large quantities of metal.

In the accompanying drawings, Figure 1 is a top plan view of my improved plant. Fig. 2 is a vertical sectional elevation of the same. Fig. 3 is a front elevation of the same as viewed in the direction of the arrow in Fig. 2. Fig. 4 is an elevation, on an enlarged scale, of the mechanism for tilting the mold-beds to discharge the castings. Fig. 5 is an elevation, on an enlarged scale, of the mechanism for operating the hinged leaf to discharge the castings into the receiving-cars.

Referring to the drawings, 1 represents a track on which a truck 2, carrying a ladle or receptacle 3 for the molten metal, is adapted to travel. Adjacent to this track and below the level of the same are erected vertical columns 4, from which is supported a series of horizontal mold-beds 5 in such position that the molten metal may be poured into the molds as the ladle is moved along its track. Below the mold-beds receiving troughs or platforms 6 are supported, into which the castings from the molds are delivered and from which they are discharged into cars 7 or other receptacles, adapted to move on a track 8 beneath the trough. This track may lead to a point where the cars may be unloaded and may return to its starting-point beneath the trough by means of a track 9, extending at the opposite side of the track 1, as plainly shown in Fig. 1.

The ladle 3 is so mounted on its truck that it may be tipped on a horizontal longitudinal axis, it being provided on opposite sides with trunnions 10, mounted in front and rear bearings 12 on the truck. The forward trunnion is extended beyond its bearing, at which point it is provided with a worm-wheel 14, engaged by a worm 15 on a shaft 16, mounted in bearings at the forward end of the truck. This shaft is extended at one end beyond the truck, where it is formed to be detachably connected to a shaft 17, extending in line with the shaft 16 and mounted on a motor-car 18, coupled to the truck and adapted, as more fully described hereinafter, to move the same back and forth along the track. The shaft 17 is provided with a pinion 19, which is connected by a train of gearing 20 to an electromotor 21, governed by a suitable controller 22, mounted on the front of the car. By means of this motor and connecting-gearing described the worm may be revolved, so as to rotate the ladle on its trunnions in order to discharge its contents to fill the molds.

The car 18 is driven by a second electromotor 23, geared to the axles in any appropriate manner and governed by a suitable controller 24, located adjacent to the other controller, so that both mechanisms can be operated by a single attendant on the car.

The two electric motors referred to may receive their current from any source of electric supply—such, for instance, as a storage-battery 50, located on the car 18 or a current derived from a dynamo located at a distance, as is usual in electric railways.

By the apparatus described the attendant is enabled to move the ladle back and forth at the side of the mold-beds and cause the metal to be poured into the molds at any point and with uniformity and precision. When the ladle is turned on its trunnions by the means described, the molten metal is received in a pouring-spout 25, sustained at the side of the truck and slightly below the level of the same by an arm 26, connected at its forward end rigidly to the motor-car.

This spout has its mouth extended laterally rearward and arranged over the center of the mold-beds, so that the molten metal received from the ladle will flow from the mouth of the spout to the molds as the motor-car moves the ladle-truck slowly along its track.

The mold-beds 5 before alluded to are arranged end to end at the side of the track slightly below its level, and each bed is provided with a series of non-communicating mold-cells 27 on its opposite sides and has formed on its ends trunnions 28, mounted in bearings sustained by girder-frames 29, which extend at intervals horizontally from beneath the track 1 and the columns 4 before alluded to, the construction being such that the mold-bed may be turned on a horizontal longitudinal axis to discharge the castings contained in the cells on one side, thus bringing into position the opposite cells. The mold-beds are turned by means of a lever 30, mounted loosely at one end on one of the trunnions 28 and carrying a spring-pawl 31, which engages a ratchet-wheel 32, fixed to said trunnion. The other end of the lever is jointed to a pitman 33, which is extended inward and has its rear end jointed to a horizontal sliding head 34, mounted in guides 35 on the under side of the girder-frame 29. This sliding head is in turn connected to the end of a piston-rod 36, carrying a piston working in a hydraulic cylinder 37, fixed to the under side of the girder-frame beyond the guides. The relative size and arrangement of these parts are such that for every stroke of the piston the spring-pawl engaging the ratchet-wheel will turn the mold-bed a quarter-revolution, the first stroke moving the bed to an upright position and the second stroke turning the mold-bed completely around, thereby discharging the castings and bringing the opposite cells into position to receive a supply of metal. It will be understood, of course, that the invention in this respect in not limited to the mechanism described for turning the mold-beds, as the same is susceptible of various modifications, and other means for the purpose such as would suggest themselves to persons skilled in the art may be employed.

The troughs 6, before alluded to, into which the castings are discharged from the mold-beds, each consists of a downward-sloping floor 38, projecting from the columns 4 beneath the girder-frames and rigidly sustained by diagonal braces 39, as clearly shown in Fig. 2. This floor has arranged on its lower edge a leaf 40, adapted to be held in an upwardly-inclined position, as shown in full lines in Fig. 2, in which position it will form a trough in connection with the downwardly-sloping floor, and also adapted to be adjusted to a downwardly-inclined position, as shown in dotted lines in said figure, in which position it will form a continuation of the sloping floor and will allow the castings to slide by gravity thereover into the car or other receptacle or track beneath. For controlling the movement of this leaf I pivot to its edge the lower ends of one or more rods 41, which are extended vertically and have their upper ends pivoted to arms 42, fixed to a horizontal rock-shaft 43, mounted in bearings 44, sustained by the girder-frames. The rock-shaft at one end has fixed to it a crank-arm 45, to which is connected one end of a pitman 46, which extends transversely of the rock-shaft and has its opposite end connected to a sliding head 47, mounted in guides on the girder-frame. The sliding head is connected to a piston-rod 48, carrying a piston working in a hydraulic cylinder 49, also fixed to the girder-frame. By means of this cylinder and the connections described the forward stroke of the piston will lower the vertical rods 41 and the leaf connected to them, which will permit the castings to be discharged. The movement of the piston in the opposite direction will lift the rods and the leaf connected to them to the position indicated by full lines in Fig. 2, so that the leaf will form, in connection with the sloping floor, a trough to hold the casting.

Before the discharge of the castings from the troughs it is desirable that they be cooled, and to conveniently accomplish this I extend beneath the girder-frame a water-pipe 50, having perforations in its under side through which the water may be sprayed on the castings lying in the trough beneath.

The operation of my improved plant is as follows: The ladle being filled with molten metal from the furnace, the motor-car and truck are started at one end of the track, and the attendant, by means of the motors, causes the ladle to be tipped on its trunnions, thereby filling the pouring-spout with molten metal. The motor-car then moves slowly over the track, carrying the ladle and pouring-spout along, and the metal flows from the pouring-spout into the successive mold-cells. When the cells have all been filled and the metal hardened, the piston of the hydraulic cylinder 37 is operated and the mold-bed turned completely over, thereby discharging the casting into the trough beneath and bringing the opposite cells into position to receive a supply of metal. The castings in the trough are subjected to the action of the cooling-spray from the pipe 50, and when sufficiently cooled the piston of the hydraulic cylinder 49 is operated, by which the leaf 40 is lowered, thereby discharging the castings into the cars beneath. These operations may be repeated without interruption by the mechanism described.

By providing a series of mold-beds arranged end to end, as described, with means for tipping them independently it will be seen that the beds may be successively filled, and by the time those at the end of the line have been filled the others have had time to harden and may be tipped to discharge the castings and the opposite cells brought into position and ready to receive a supply of metal from the

ladle, which in the meantime will have been returned to the head of the line. The operation may therefore be continuous, the ladle filling the cells in one bed while those previously filled are tilted to discharge the castings. In this way large quantities of metal may be handled with regularity, economy, and with little loss of scrap, all of which are items of importance to be considered in the practical operation of casting plants.

Having thus described my invention, what I claim is—

1. In a casting plant the combination with a mold-bed, of a truck adapted to travel adjacent to the same, a ladle or receptacle for the molten metal mounted on said truck, a motor-car coupled to the truck and adapted to propel the same, and a pouring-spout sustained by the motor-car in position to receive the metal from the ladle and deliver the same to the molds.

2. In a casting plant the combination with a mold-bed of a truck adapted to travel adjacent to the same, a tilting ladle mounted on said truck, a motor-car coupled to the truck, mechanism located on the car for propelling the same, a second mechanism located on the motor-car independent of the propelling mechanism and suitable connections between the second mechanism and the tilting ladle whereby a single operator is enabled by the two mechanisms to move the ladle to any point of the mold-bed and to operate the tilting ladle independently to fill any desired mold.

3. In a casting plant the combination with a mold-bed and means for operating the same to discharge the casting, of means for filling the molds with molten metal, a downwardly-sloping platform in position to receive the castings from the mold-bed, a leaf hinged to the lower edge of the platform and mechanism for adjusting said leaf to form a trough in connection with the platform to retain the castings; or a sloping continuation of the same to discharge the castings.

In testimony whereof I hereunto set my hand, this 24th day of June, 1897, in the presence of two attesting witnesses.

DAVID BAKER.

Witnesses:

GEO. H. WOOD,

TROW WOODRUFF.