

No. 793,377.

PATENTED JUNE 27, 1905.

J. G. JOHNSTON.
CASTING PLANT.

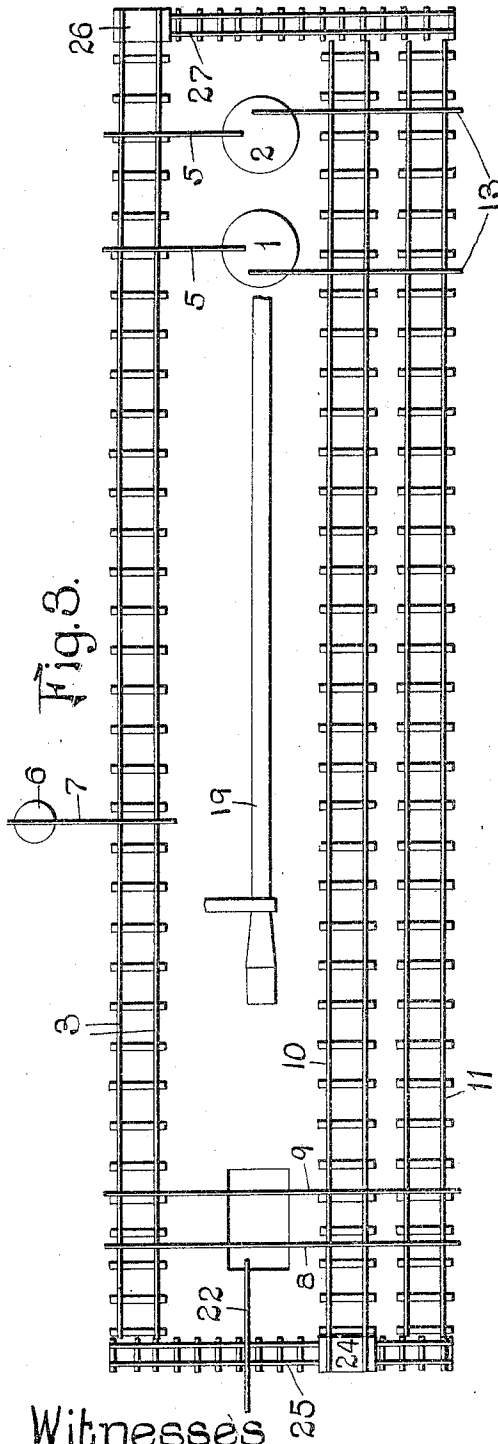
APPLICATION FILED APR. 10, 1905.

2 SHEETS—SHEET 1.

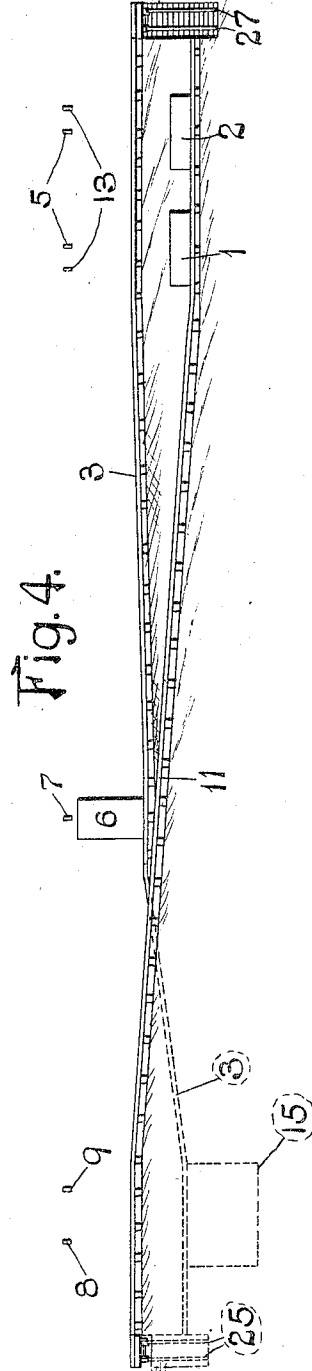
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOSEPH G. JOHNSTON, OF DETROIT, MICHIGAN, ASSIGNOR TO AMERICAN CAR & FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

CASTING PLANT.

SPECIFICATION forming part of Letters Patent No. 793,377, dated June 27, 1905.

Continuation of application Serial No. 203,706, filed April 18, 1904. This application filed April 10, 1905. Serial No. 254,835.

To all whom it may concern:

Be it known that I, JOSEPH G. JOHNSTON, a citizen of the United States, residing at Detroit, Michigan, have invented a certain new and useful Improvement in Casting Plants, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved casting plant. Fig. 2 is a sectional view on the line 2 2 of Fig. 1. Fig. 3 is a plan view of the tracks, and Fig. 4 is a side elevational view of the tracks.

This invention relates to a new and useful improvement in a casting plant, one of the objects being to enable the manufacture of castings to be conducted expeditiously and at the same time considerably reduce the labor and expense of manufacturing castings as compared with the system ordinarily employed.

Another object of the invention is to provide means whereby the completed molding-flasks can be transferred upon a conveyer and moved adjacent the pouring-ladle to receive the molten metal, and after the casting has been set means are provided for expeditiously returning the flask, cope, drag, and chill-rings to the molding-machines, and at the same time means is provided for shaking the sand from the flasks into a suitable sand-pit, so that it can be tempered for subsequent use.

Novel means is also provided for expeditiously removing the castings to the annealing-pits without unnecessary handling.

In the drawings, the numerals 1 and 2 designate molding-machines, of which there may be any number, although two are generally found to be sufficient. Adjacent to the molding-machines is a conveying means, illustrated as comprising tracks which incline from the molding-machines, which tracks are disposed in ways below the surface-level, so that the mold-carrying conveyers 4 (shown as cars) will be in a plane approximately parallel with the table of the molding-machines. Super-

posed above the conveyers and the molding-machines are transversely-disposed tracks 5 5, which extend over portions of the molding-machines and the tracks of the conveyers in order that the several parts of the mold may be transferred from the molding-machines to the respective carriers, on which the assembled molds may be moved step by step to a point opposite the cupola 6. The tracks 3 are provided with intermediate horizontal portions directly opposite the cupola, so that when the cars carrying the flasks reach the proper positions where the molds can be filled the gravitation of the cars will cease, and they will remain stationary until they again move past the horizontal portion of the track to gravitate toward the end thereof.

A traveling pouring-ladle is movable on the track 7 to supply the molds with the necessary metal, and after the castings are in the molds the carriers will be moved toward the rear end of the tracks to points opposite the transversely-disposed tracks 8 and 9. During the passage of the carriers from a point opposite the cupola to a point opposite the tracks 8 and 9 the castings will have had sufficient time within which to solidify, and at the latter point the drags, copes, and chill-rings will be removed and conveyed over the tracks 8 and 9 to the conveyers 10^a and 11^a, which travel approximately parallel with the tracks 3 on tracks oppositely inclined with relation to the tracks 3, so that the carriers may return the copes, drags, and chill-rings to the forward part of the plant opposite the molding-machines 1 and 2, onto which the parts of the mold can be placed and assembled in an obvious manner. The conveyer-tracks 13 13, superposed above the conveyers 10^a and 11^a, are for the purpose of permitting the disassociated parts of the flask to be conveyed to the molding-machines. During the passage of the several parts of the mold from the carriers on the tracks 3 to the carriers on the tracks 10 and 11 they will have passed over a sand-grate 14 beneath the tracks 8 and 9, which grate covers a pit 15, into which the sand may be deposited. A closure is pro-

vided for the pit, which is illustrated in Fig. 2 as comprising a pair of hinged doors 15^a, normally held in a horizontal position by a counterweight 15^b, so that a predetermined
 5 amount of sand of sufficient weight to overcome the counterweight will cause the doors to open the entrance to the pit and permit the sand to drop thereinto.

A reciprocating conveyer 16 is illustrated
 10 in Fig. 2 as communicating with the pit 15 and with a pit 17, so that the tempered sand from the pit 15 can be conveyed into the pit 17, from which it will be elevated by the endless elevator 18, interposed between the conveyers, and discharged into a chute 19, from
 15 whence it can subsequently be fed into the flasks from the hoppers 21, positioned over the molding-machines and receiving the sand-supply from the openings 20 in the chute.
 20 The track 22, arranged at the rear ends of the conveyers and adjacent to the screen 14, is provided for the purpose of conveying the castings to the annealing-pits 23, in which they will be deposited to slowly cool in the
 25 manner usually practiced.

After the cars have passed the tracks 8 and 9 they will have been rid of their load, and they will pass onto a shuttle-car 24, movable from one conveyer to the other on the inclined tracks 25. The tracks 25 are inclined,
 30 so that the ends of the tracks 25, on which the conveyers 24 move, are in a plane below the plane of the tracks 3 of the said conveyers 4, whereby the tracks transversely disposed
 35 on the shuttle-car will be in approximately the same plane as the tracks 3, so that the conveyers or cars 4 may readily be transferred from the tracks to the shuttle-car and thence to the tracks 10 and 11. They will
 40 then be moved beneath the tracks 8 and 9 to receive the chill-ring, cope, and drag to return them down the inclined tracks 10 and 11 to points opposite the molding-machines, as heretofore described.

In view of the fact that in making certain castings—such as car-wheels, for instance—what is known as a “chill-ring” forms a part of the mold, and during the casting the chill-ring becomes hot. The tracks (designated 10
 50 and 11) must be of sufficient length and number to afford storage-room during the cooling process. In actual operation the tracks 10 and 11 would when work is commenced be filled with flasks, all of which are in condition
 55 to be used. The flasks would first be taken from track 10 and placed on the machines. At the same time this track would be filled with the flasks just used. If the flasks just used were too warm when they reached the
 60 machines, the flasks would be allowed to remain on 10 while those on 11 were being used and the track refilled. While in ordinary practice two tracks would be sufficient, any number may be used.

65 If desired, a screen 28 can be used in con-

nection with the conveyer 18 to remove any foreign matter which might be contained in the retempered sand, which foreign matter can be removed by the conveyer 29.

This present application is a substitute for
 70 and continuation of a former application filed by me on or about April 18, 1904, serially numbered 203,706, for substantially the same subject-matter.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from
 80 the nature and principle of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a plant for the manufacture of castings, oppositely-inclined tracks approximately
 85 parallel with each other, and oppositely-inclined tracks disposed at the ends of the first-named tracks and extending transversely of the first-named tracks; substantially as described.
 90

2. In a plant for the manufacture of castings, the combination with two sets of approximately parallel tracks oppositely inclined with relation to each other, cars carried on said tracks, a pouring-ladle track trans-
 95 versely of one set of tracks, superposed tracks above the opposite set of tracks having devices for removing chill-rings and flasks from the cars, and shuttle-cars at the respective
 100 ends of the two sets of tracks for transferring cars from one set of tracks to the other set of tracks; substantially as described.

3. In a plant for the manufacture of castings, the combination with oppositely-inclined longitudinally-disposed tracks, carriers on the
 105 respective tracks, transversely-disposed tracks at the respective ends of the first-named tracks, and shuttle-cars carried on the transverse tracks for moving the carriers from one track to the other; substantially as described.
 110

4. In a plant for the manufacture of castings, the combination with a molding-machine, of an inclined track having carriers upon which the flasks are placed, a track adjacent to the first-named track and providing a way for the
 115 pouring-ladle, a series of gravitating carriers for returning the empty flasks back to the molding-machine, tracks for supporting the carriers, a track for removing the flasks from the carriers to the molding-machine, a track
 120 for supporting the removed castings, and shuttle-cars for transferring the carriers from the first-named tracks to the gravitating-carrier tracks and vice versa; substantially as described.
 125

5. In a plant for the manufacture of castings, the combination with oppositely-inclined longitudinally-disposed tracks, of cars on said tracks, flasks on said cars, means for moving
 130 said cars from one track to the other, and in-

dependent means for carrying the flasks from one track to the other while the cars are being moved; substantially as described.

5 6. In a plant for the manufacture of cast-
ings, oppositely-inclined tracks substantially
parallel with each other, a flask-carrying car
adapted to run on said tracks, means for trans-
ferring the car from the lower end of one track
to the adjacent higher end of the other track,
10 and independent means adjacent to each end
of the track system for lifting the flask from
the car when on one track and replacing it
when the car has been transferred to the other
track; substantially as described.

15 7. In a plant for the manufacture of cast-
ings, oppositely-inclined tracks substantially
parallel with each other, and oppositely-in-
clined tracks disposed at the ends of the first-
named tracks and extending transversely of
20 the first-named tracks; substantially as de-
scribed.

8. In a plant for the manufacture of cast-
ings, the combination with oppositely-inclined
longitudinally-disposed tracks, of cars on said
25 tracks, transversely-disposed tracks at the re-
spective ends of the first-named tracks, and
transfer-trucks carried on the transverse
tracks for moving the cars from one track to
the other; substantially as described.

30 9. In a plant for the manufacture of cast-
ings, the combination with a molding-machine,

of a track having carriers upon which the
flasks are placed, of a superposed track extend-
ing over a portion of the first-named track and
providing a way for a pouring-ladle, a series 35
of carriers for returning the emptied flasks
back to the molding-machine, tracks for sup-
porting the carriers, a track for removing the
flasks from the carriers to a molding-machine,
a track for supporting the removed castings, 40
and shuttle-cars for transferring the carriers
from the first-named tracks to the third-named
tracks; substantially as described.

10. In a plant for the manufacture of cast-
ings, tracks parallel with each other, cars on 45
one of the tracks for supporting the flasks to
be moved from the molding-machine toward
one end of said track, a shuttle-car at the end
of the track for transferring the cars to the
opposite track, and a shuttle-car at the end of 50
the track opposite to the end at which the first-
named shuttle-car is located to transfer the
cars from the last-named track to the first-
named track; substantially as described.

In testimony whereof I hereunto affix my 55
signature, in the presence of two witnesses,
this 7th day of April, 1905.

JOSEPH G. JOHNSTON.

Witnesses:

PERCY M. FRASER,
JAMES B. HICKEY.