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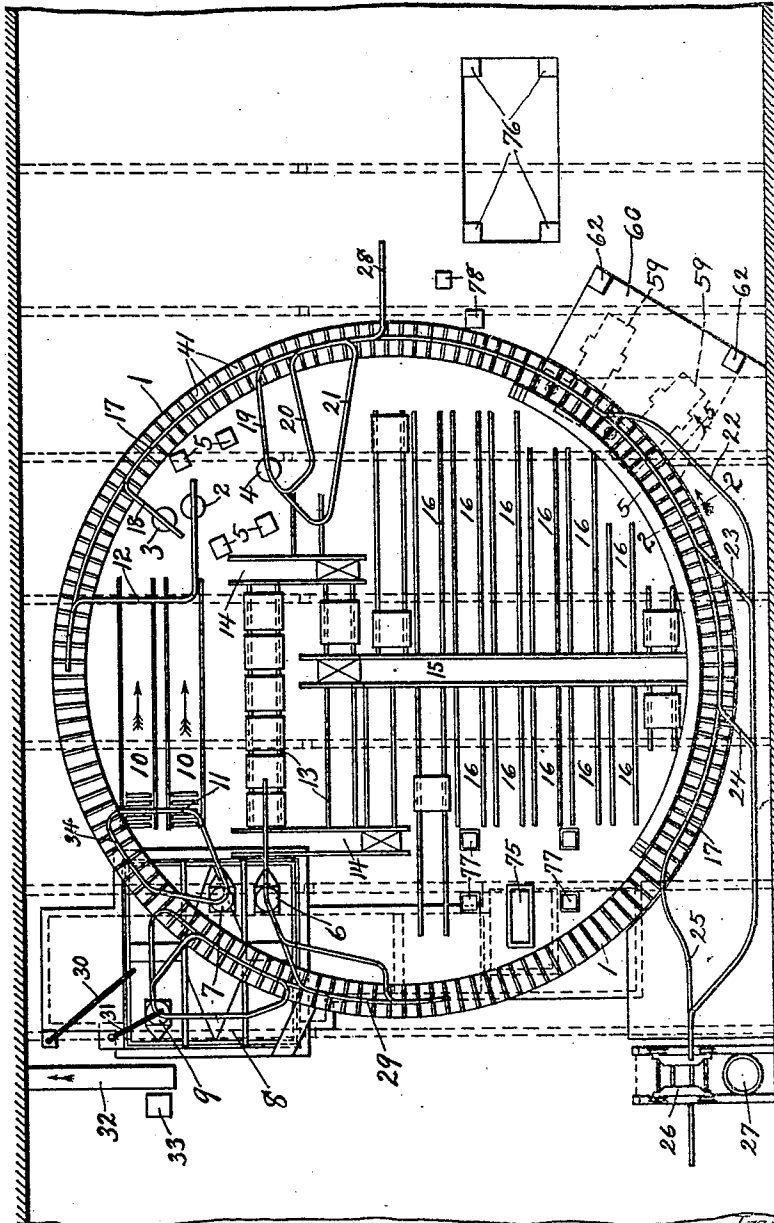
J. M. KELLER ET AL

WHEEL CASTING PLANT

Filed March 24, 1922

5 Sheets-Sheet 1

Fig. 1



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Fig. 2.

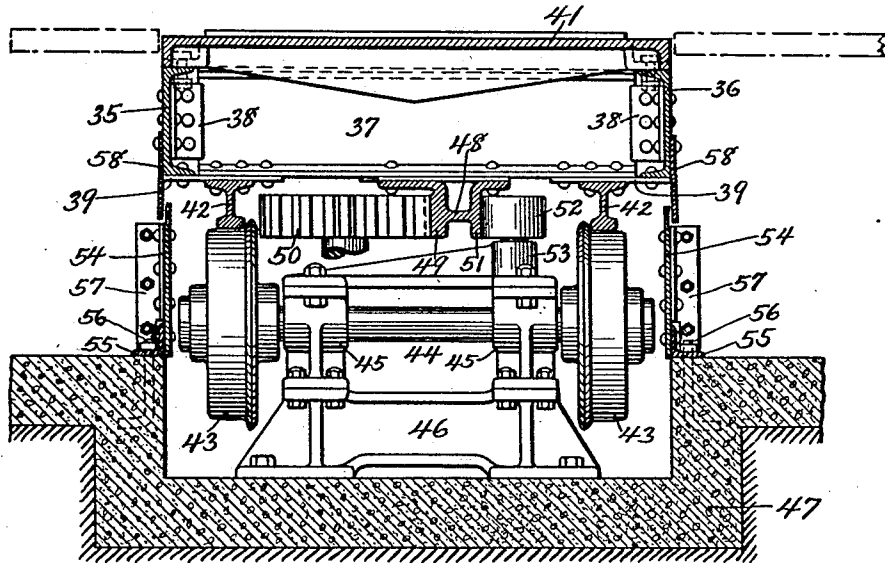
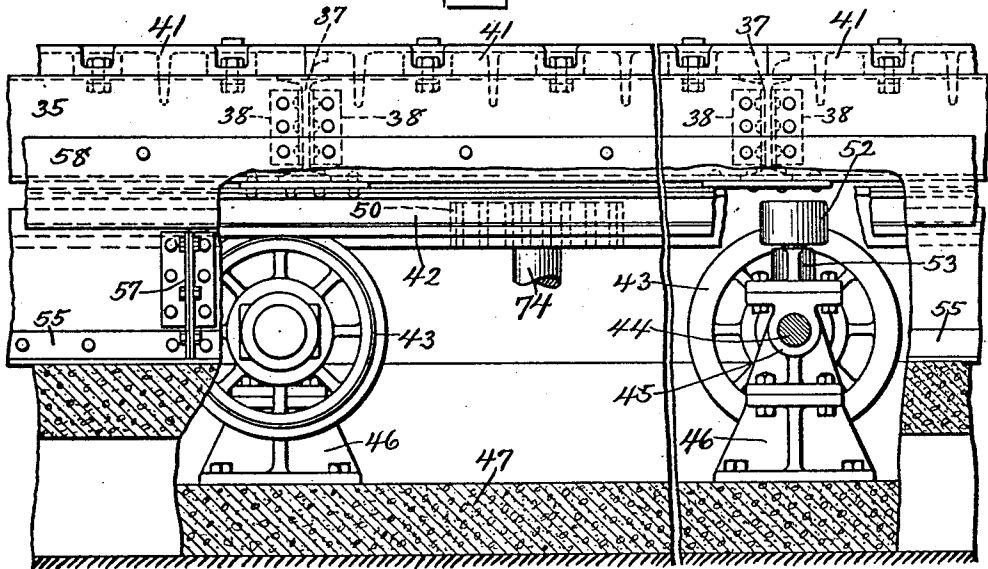


Fig. 3.



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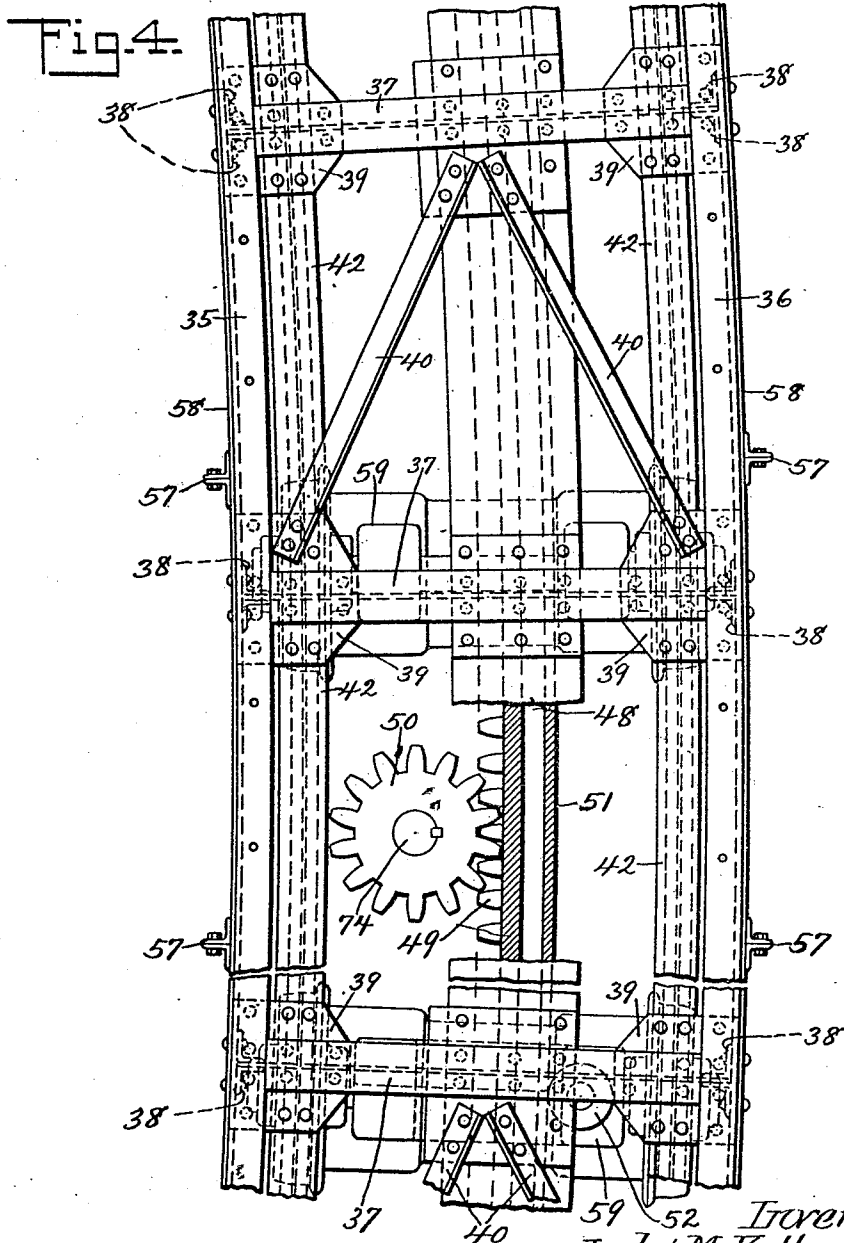
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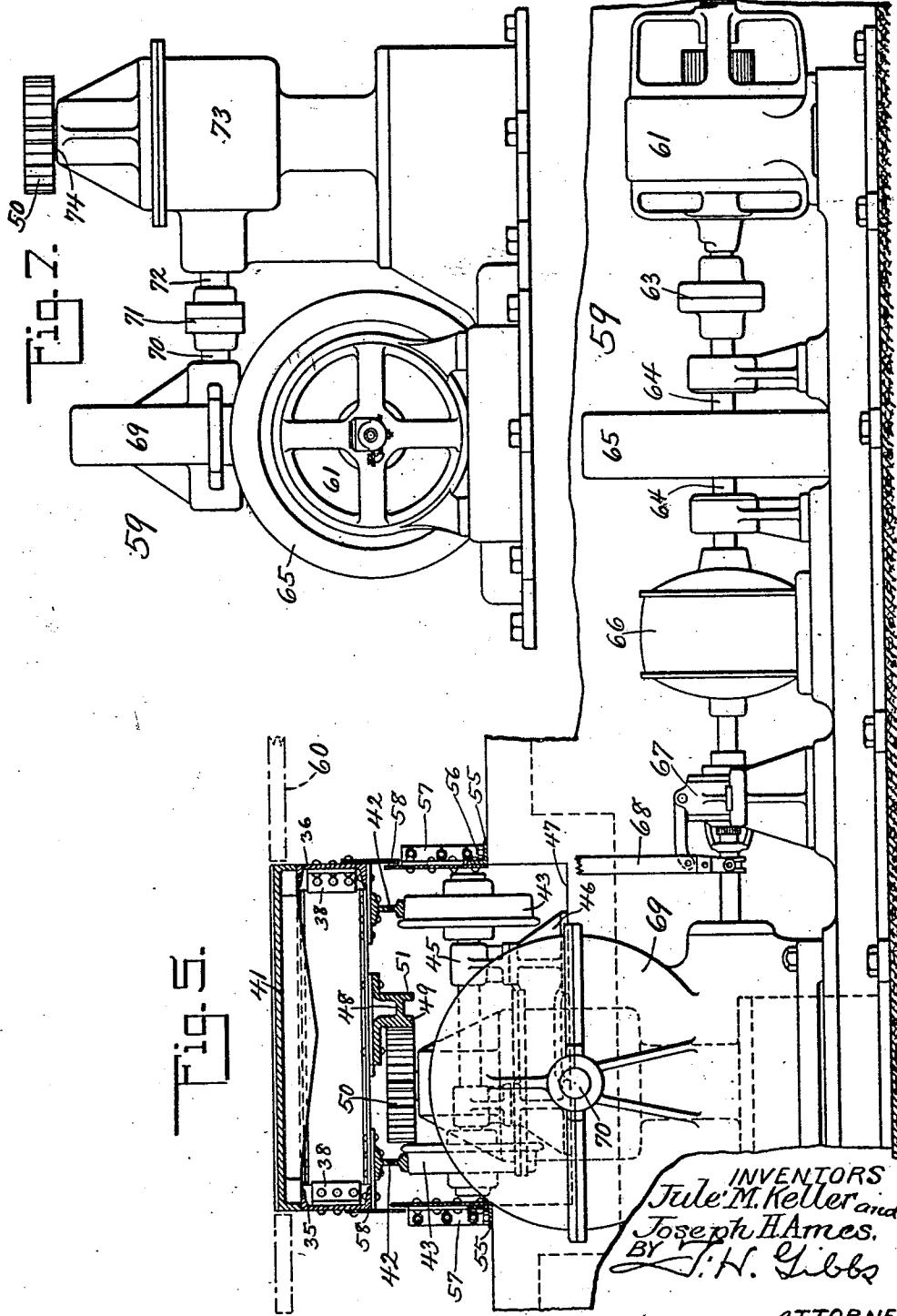


Fig. 5.

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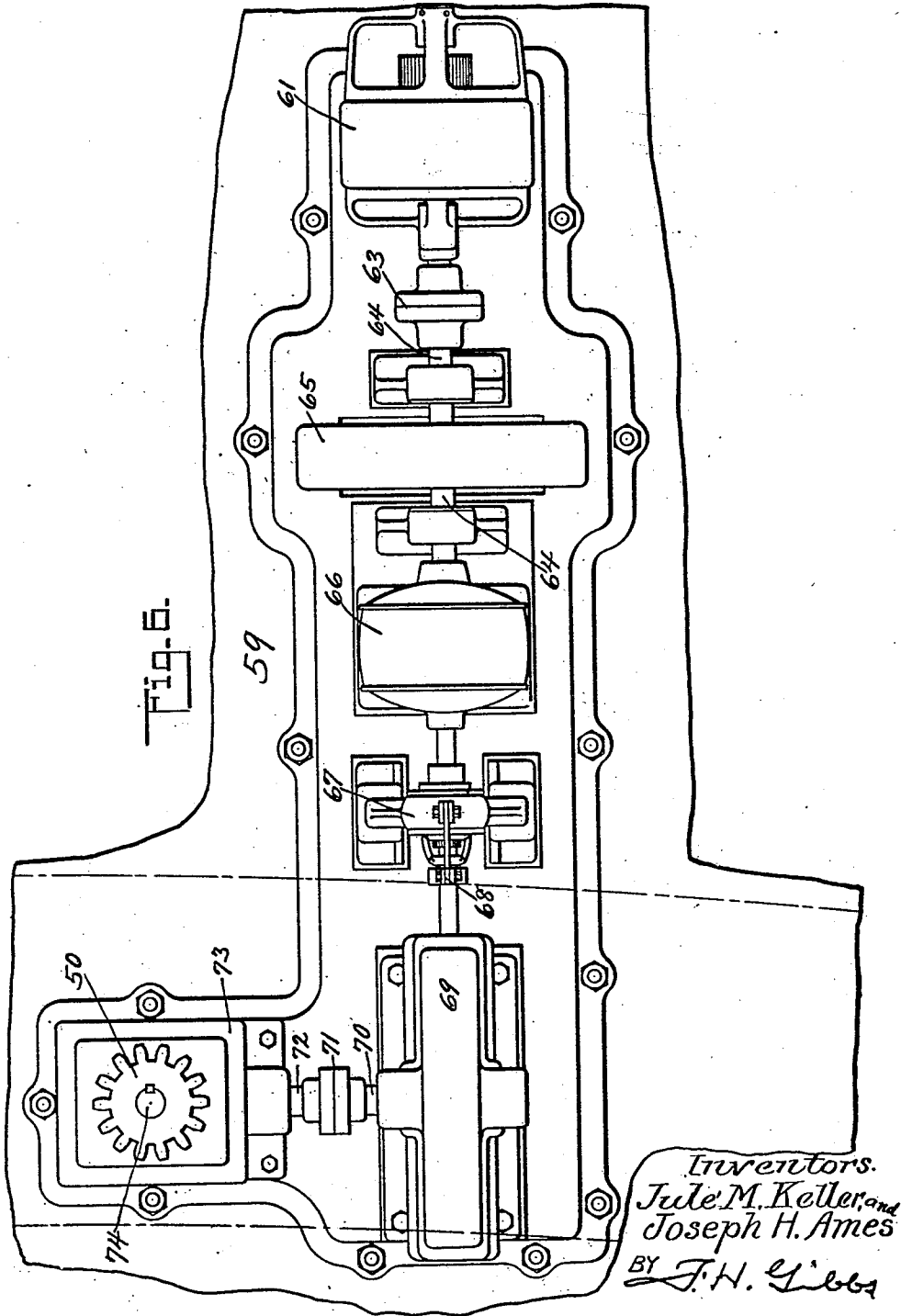
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J. M. KELLER ET AL

WHEEL CASTING PLANT

Filed March 24, 1922

5 Sheets-Sheet 5



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## UNITED STATES PATENT OFFICE.

JULE M. KELLER, OF ST. LOUIS, MISSOURI, AND JOSEPH H. AMES, OF NEW YORK, N. Y., ASSIGNORS TO AMERICAN CAR AND FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## WHEEL-CASTING PLANT.

Application filed March 24, 1922. Serial No. 546,540.

In the drawings:

Fig. 1 is a general plan view of our improved casting plant;

Fig. 2 is a sectional view of the traveling table or turntable taken on the line 2—2 of Fig. 1 and showing the means for supporting the traveling table;

Fig. 3 is a side elevation, partly broken away, of a portion of the table;

Fig. 4 is a partial plan view of the table with the top plates removed, and part of rack rail base broken away to show the driving pinion;

Fig. 5 is a broken sectional view taken on line 5—5 of Fig. 1 showing one of the table driving units in side elevation;

Fig. 6 is a plan view of one of the table driving units; and

Fig. 7 is an end elevation of one of the table driving units.

It is an object of our invention to provide an improved casting plant of the type wherein a moving table carries the molds past the point at which the metal is poured.

It is also an object of our invention to provide an improved traveling table for carrying the molds past the pouring point and to provide a suitable driving means for a table of the type described.

With these and other objects in view our invention comprises a circular traveling table or turntable 1 enclosing an area in which are placed the drag molding machine 2, roll-over machine 3 and the cope molding machine 4. These machines are positioned so as to be supplied with sand from an overhead sand bin carried upon the foundations 5. Within the area enclosed by the table there are also mounted a cope jolting machine 6 and a drag jolting machine 7, both machines being mounted so that the sand from the copes and drags will fall into a sand pit 8 formed beneath the jolting machines 6 and 7. The pit 8 extends beyond the traveling table 1 and mounted above this portion of the pit 8 is a wheel jolting machine 9. Between the jolting machine 7 and the molding machine 2 there are provided a plurality of gravity conveyors 10 that provide storage space for the drags while cooling and are served by traveling hoists on an overhead monorail 11 at one end and on an overhead monorail 12 at the other end

while between the jolting machine 6 and molding machine 4 there are a plurality of tracks 13 joined by transfer tracks 14 that provide a means for moving the buggies on which the copes and chills are carried. Leading from one track 13 is a transfer track 15 that provides a means for conveying the loaded buggies to the storage tracks 16.

The monorail 12 connects with a monorail 17 that extends above the center line of the table for more than half the circumference of the table and is provided with a spur or extension 18 which goes to the roll-over machine 3; spurs 19, 20, and 21 which join so as to form complete loops serving the molding machine 4; a spur 28 extending without the table area; and spurs 22, 23, 24 and 25 which join forming loops for the routing of a pouring ladle from a ladle hoist 26 in front of the bull ladle 27 to a pouring position over the traveling table and back to the ladle hoist 26.

In the operation of the plant, a drag is taken from the conveyor 10 and placed on the molding machine 2 by means of a hoist on the monorail 12. When filled with sand, the drag is turned over on the roll-over machine then picked up by means of a hoist on the monorail 18 and placed on the traveling table 1, the cores being placed after the drag is placed on the table. A cope and chill, secured together in any desired way, are brought from a storage track 16 and lifted from the buggy onto the molding machine 4 by means of a hoist on the monorail 21. When filled with sand, the cope and chill are lifted from the molding machine 4 by means of a hoist on the monorail 19, turned over while supported from the monorail, the chaplets placed and the chill oiled and then moved along on monorail 17 and lowered down and clamped in position on a drag that is being carried to the pouring position on the table 1.

The ladles, filled from the bull ladle 27 are raised by the ladle elevator 26 so as to be engaged and conveyed at a fixed height, by means of a traveling support on monorail 25, to a pouring position on monorail 17. The height of the ladle when supported from the monorail 17 is fixed so as to insure the pouring of all molds with the ladle at the

proper distance above the molds and the length of the monorail 17 permits of the pouring being at such a point that the casting will be at the proper temperature for removal from the mold when the movement of the table 1 brings the mold beneath the monorail 29. With the mold in position beneath the monorail 29, the cope and chill are removed by means of a hoist on the monorail 29 and placed on the jolting machine 6, from which, after the sand has been removed, they are placed on a buggy and moved to a storage track to cool. With the cope and chill removed from the mold, the head is broken from the casting and the casting is removed from the mold by means of a hoist on the monorail 29 and placed on the jolting machine 9. While on the jolting machine 9, the casting is cleaned by a power driven brush supported from the crane 30 and then placed by the crane 31 upon a gravity conveyor 32 upon which it travels to the soaking pits. A hub core reamer 33 removes the core from the hub while the casting rests upon the conveyor 32. The drag is removed from the table 1 to a jolting machine 7 from which it is removed, by means of a hoist on the monorail 34, to the gravity conveyors 10, where it cools as it moves toward the monorail 12, where it is again picked up for further use.

The sand deposited in the pit 8 is conveyed by means of belt conveyors, and an elevator 75 to a main storage bin carried on the foundations 76 from which it is conveyed by other conveyors and elevators to the supply bin carried on the foundations 5, the sand being tempered and conditioned while being moved. Foundations 77 and 78 carry part of the overhead structure of the elevators and conveyors but as the sand conveying apparatus forms no part of our invention it is not shown in detail.

The traveling table 1 comprises spaced circular channel members 35 and 36 connected at regular intervals by girder members 37 that are secured to the channel members 35 and 36 by angles 38 and gusset plates 39, additional reinforcing members 40, and a top consisting of a plurality of metal sections 41 bolted to the channel members 35 and 36. Secured to the undersides of the girder members 37 are supporting rails 42 that travel on wheels 43 journaled on axles 44. The axles 44 are supported in bearings 45 mounted on bearing bases 46 on a suitable foundation 47 that is in the form of a pit so as to bring the table top at the proper height above the floor level. To the undersides of the girder members 37, and between the supporting rails 42 is a member 48, substantially H-shape in cross-section, that has one leg formed into a rack 49 engaged by a drive pinion 50 and the other leg forming a guide 51 that engages guide rollers 52 carried by roller bases 53 secured on the bearings 45, the legs being

provided with flanges by which the member 48 is secured to the girder members 37. Plates 54, supported at each side of the pit by angles 55 secured to the foundation by bolts 56, are connected by angles 57 and serve to keep the pit clear. Secured to the outer faces of the channel members 35 and 36 are plates 58 which project below the channel members 35 and 36 and overlap the upper edges of the plates 54 and keep material from dropping from the table into the pit.

To operate the table there are provided a plurality of driving units 59 which are placed in a pit beneath the control and pouring platform 60. These units are identical except that they are designed to operate the table at different rates of speed. The units are, therefore, adapted to serve as spare or emergency units for each other and, with the range for the pouring and opening points given by the monorails 17 and 29, they provide means for moving the molds from pouring point to opening point in the proper time for castings differing greatly in weight. Each unit 59 comprises an electric motor 61 controlled from a controller box 62 on the platform 60 and connected by a coupling 63 to shaft 64 of a weighted fly-wheel or kinetic energy device 65, the shaft 64 being connected at its opposite end to the shaft of a spur gear speed transformer 66. The shaft of the spur gear speed transformer 66 is connected through a reversing clutch 67 controlled by a lever 68 from the control platform 60. The clutch 67 operates a worm which, in turn, operates a worm wheel in the casing 69. The worm wheel operates a shaft 70 which is connected through a coupling 71 to a shaft 72 which operates a pair of bevel gears in the casing 73. The bevel gears in the casing 73 drive the vertical shaft 74 upon which the driving pinion 50 is secured. The parts of the coupling 71 are adapted to be disconnected so that only the drive pinion and bevel gears of the spare or idle set will be operated during the operation of the table. While we have shown the drive units mounted upon integral bases, the various elements of the drive units may be mounted upon separate bases or grouped upon a plurality of bases as desired.

What we claim is:

1. In a casting plant, molding and jolting machines, means for conveying the drag and cope from the jolting machines to the molding machines and a turntable surrounding said machines and means.

2. In a casting plant, drag molding and jolting machines, a gravity conveyor connecting said machines and a turntable surrounding said machines and conveyor.

3. In a casting plant, cope molding and jolting machines, tracks forming a means for conveying the cope from one machine to

the other, storage tracks connected to said first mentioned tracks and a turntable surrounding said machines and tracks.

4. In a casting plant, a turntable, molding means for preparing the flask parts, means for assembling the flask on the table, a pouring means, means for separating the flask parts and removing the casting, means for removing the sand from the flask parts and means for returning the flask parts to the molding means, said molding and sand removing means being positioned within said turntable.

5. In a casting plant, a turntable, a drag molding machine, means for removing the drag from the machine and placing it on the table, a cope molding machine and means for removing the cope from the machine and placing it on the drag.

6. In a casting plant, a turntable, molding means for the drag and cope, means for assembling the drag and cope on the table, pouring means, means for separating the drag, cope and casting, jolting means for the drag, cope and casting and means for returning the drag and cope to the molding machines.

7. In a casting plant, a traveling annular table, means for placing the drag on the table, means for placing the cope on the drag, pouring means, means for removing the cope and casting from the drag, means for removing the drag from the table and means, surrounded by said table, for storing the cope and drag until cool and returning to the molding machines.

8. In a casting plant, a turntable, means for filling the drag, means for placing the filled drag on the table, means for filling the cope, means for placing the filled cope on the drag, pouring means, means for removing the cope from the drag, means for emptying the cope, means for removing the casting from the drag, means for removing the drag from the table, means for emptying the drag and means for returning the cope and drag to the filling means.

9. In a casting plant, drag molding and jolting machines, a gravity conveyor connecting said machines, a turntable surrounding said machines and conveyor, a continuously operating motor for driving said turntable and means adapted to connect said motor and turntable intermittently.

10. In a casting plant, cope molding and jolting machines, tracks forming a means for conveying the cope from one machine to the other, storage tracks connected to said first mentioned tracks, a turntable surrounding said machines and tracks, a continuously operating motor, a kinetic energy device driven by said motor and means adapted to connect said motor and kinetic energy device to said turntable and disconnect them therefrom.

11. In a casting plant, cope molding and jolting machines, tracks for conveying the copes from the jolting to the molding machine, storage tracks for said copes, and a turntable for conveying said copes from the molding to the jolting machine, said turntable surrounding said tracks.

12. In a casting plant, drag molding and jolting machines, gravity operated means for conveying the drags from the jolting to the molding machine and a turntable surrounding said machines and means, said turntable conveying the drags from the molding to the jolting machine.

13. In a casting plant, molding and jolting machines, a turntable for conveying flasks from the molding machines to the jolting machines, and means surrounded by said turntable for conveying the separated flask parts from the jolting to the molding machines.

14. In a casting plant, molding and jolting machines, a turntable for conveying flasks from the molding to the jolting machines and tracks and a gravity conveyor surrounded by said turntable for conveying the separated flask parts from the jolting to the molding machines.

15. In a casting plant, molding and jolting machines, a turntable for conveying flasks from the molding to the jolting machines, a gravity conveyor for returning the drags from the drag-jolting machine to the drag molding machine and tracks providing a means for storing and for returning the copes from the cope jolting machine to the cope molding machine, said turntable surrounding said conveyor and tracks.

In witness whereof we have hereunto set our hands.

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