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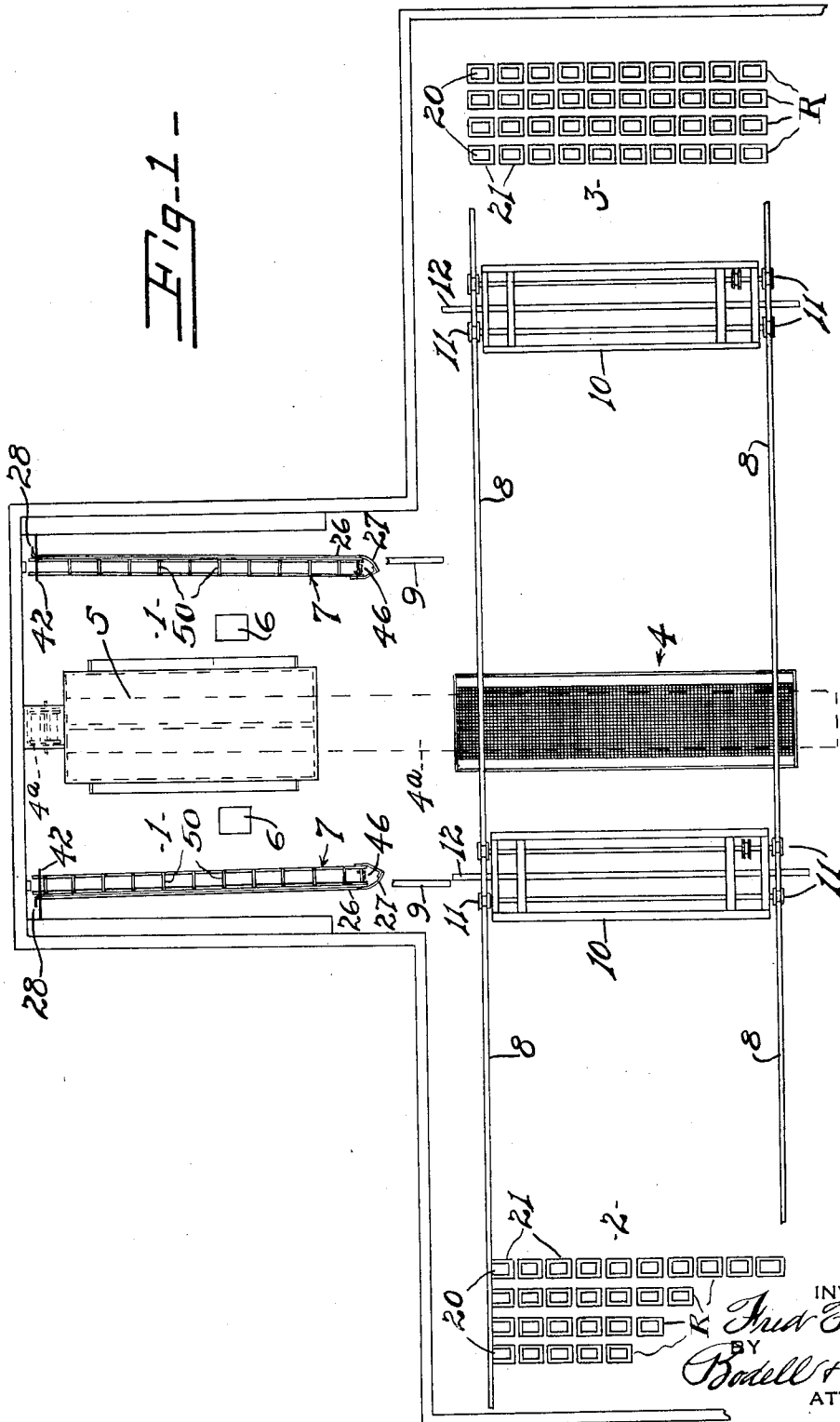
F. FRAZER

1,927,004

LIFTING AND DUMPING APPARATUS

Filed Oct. 21, 1931

4 Sheets-Sheet 1



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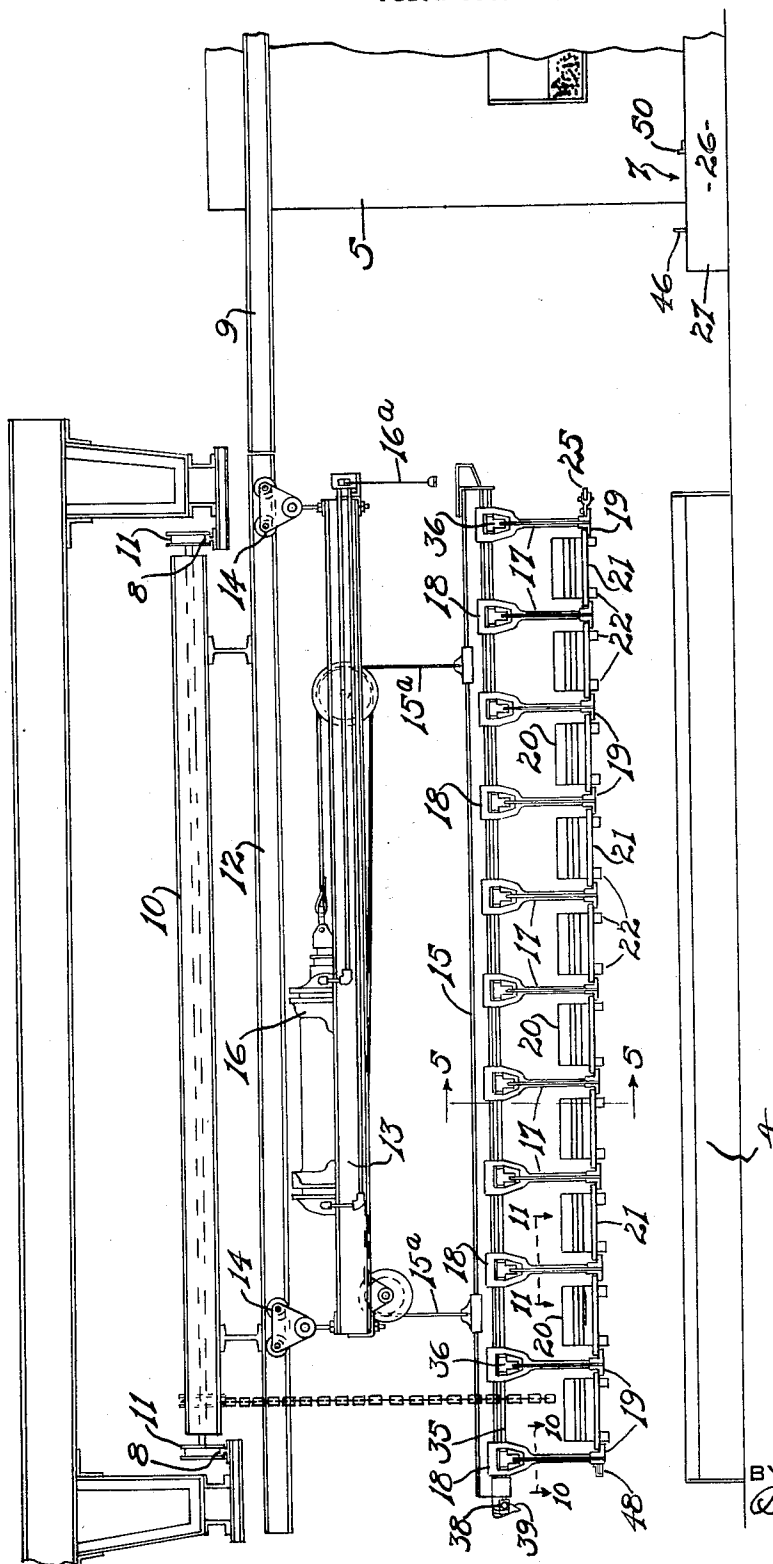


Fig. 2-

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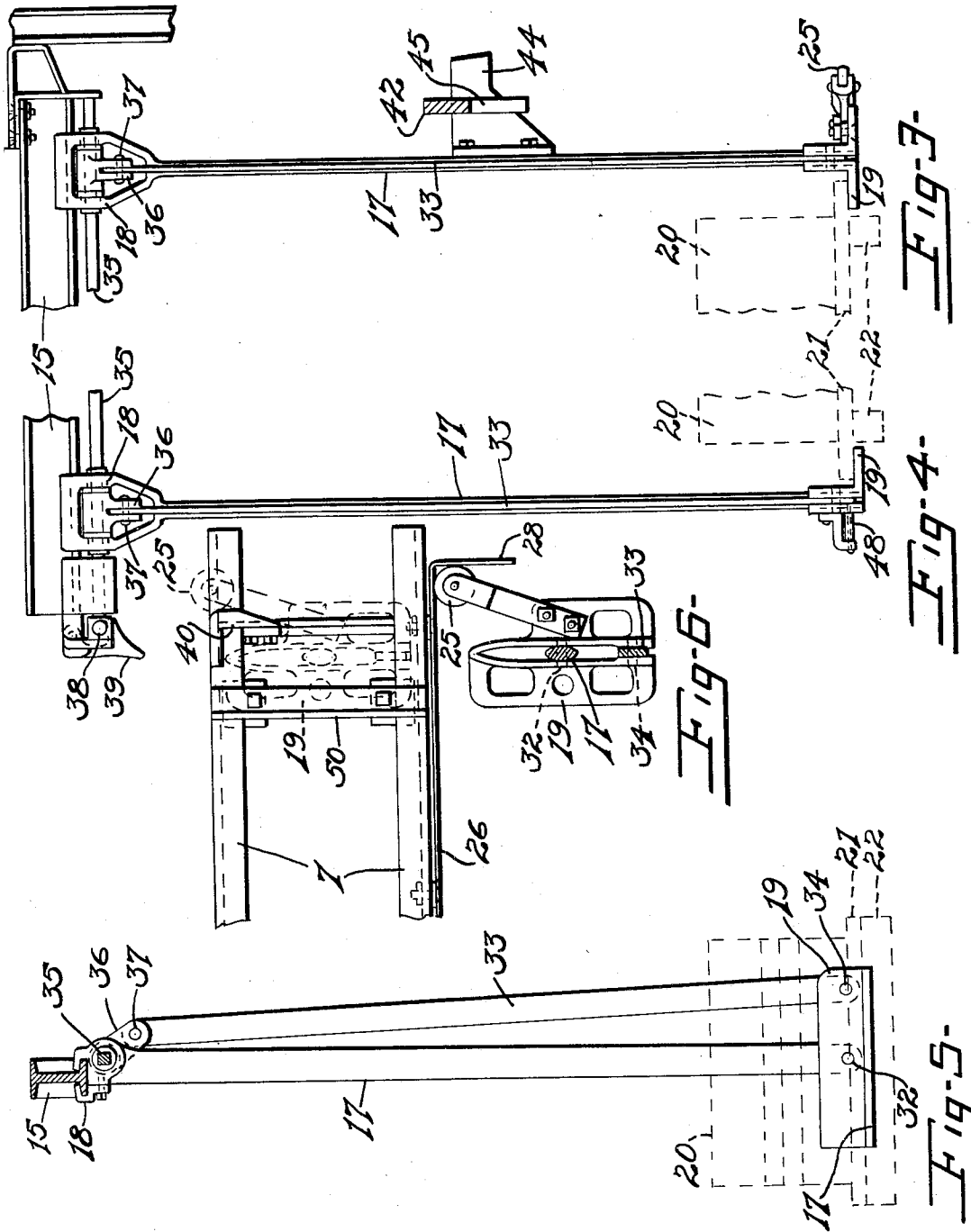
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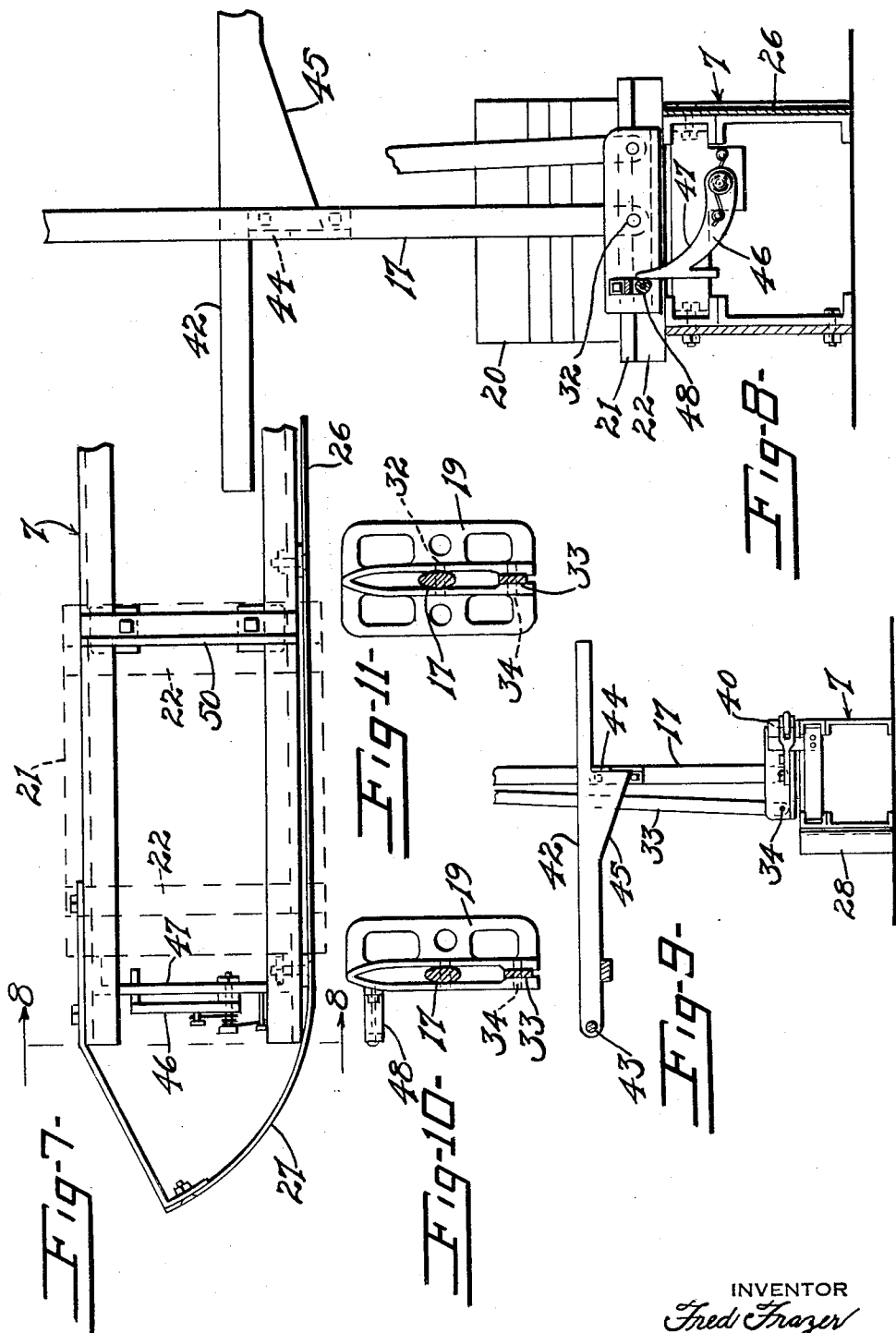
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1,927,004

LIFTING AND DUMPING APPARATUS

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Application October 21, 1931. Serial No. 570,117

2 Claims. (Cl. 212—11)

This invention relates to a foundry apparatus, and has for its object a particularly simple and efficient conveyor by which the finished molds are lifted and conveyed to the pouring stations and the molds with the finished castings therein conveyed to a delivery and break up station where they are dumped to separate the castings from the mold and bottom boards and to break up the mold, sift the sand, and return it to the molding station.

It also has for its object, a particularly simple and efficient arrangement of the parts of the foundry apparatus for facilitating the entire molding cycle from mold making to the breaking up of the mold.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings, in which like characters represent corresponding parts in all the views.

Figure 1 is a schematic view of this foundry apparatus.

Figure 2 is a side elevation of the conveyor.

Figures 3 and 4 are enlarged fragmentary side elevations of opposite ends of the carrier.

Figure 5 is a sectional view taken on line 5—5, Figure 2.

Figure 6 is a fragmentary plan view of the end of the support on which the articles or mold rests preparatory to being lifted by the lifters on the carrier.

Figure 7 is an enlarged fragmentary plan view of the opposite end of said support.

Figure 8 is a sectional view on line 8—8, Figure 7.

Figure 9 is an end elevation of the support and contiguous parts of the carrier.

Figure 10 is an enlarged sectional view on line 10—10, Figure 2.

Figure 11 is an enlarged sectional view on line 11—11, Figure 2.

This foundry apparatus comprises a double molding station 1, pouring stations 2 and 3, and a central delivery and mold breaking station 4, preferably located in a straight line midway between the pouring stations 2, 3, and the double mold making station at one side of the station 4, and midway between the stations 2 and 3, so that the stations are in the general form of an inverted letter T, with the pouring stations at the ends of the head of the T formation, and the mold making stations forming the leg of the T, tracks connecting the stations, the tracks inter-

secting at the delivery and break up station, a carriage movable along the tracks and shiftable at the breaking up station from the tracks leading to and from the mold making station, to tracks leading to and from the pouring stations, and vice versa. The mold making station 1 consists of a sand receptacle or pit 5, mold making machines 6 on the opposite sides thereof, and also supports 7 for the finished molds, these being arranged on opposite sides of the sand receptacle 5. Also, the molding machines 6 are located on opposite sides of the receptacle 5. The molding station, each pouring station, and the delivery station are thus arranged in right angular formation with the delivery and break up station 70 at the apex of the angular formation.

The delivery and break up station 4 consists of a screen on which molds, with their castings therein, are thrown to break up the molds and separate the castings therefrom and also separate the bottom boards of the mold, and metal bands around the mold. It will be understood that a mold consists of a bottom board, a mold or box of molding sand, and one or more bands encircling the box.

Suitable means is provided for conveying the sand passing through the screen of the station 4, back to the sand receptacle 5.

The castings are picked up off the screen and thrown or otherwise conveyed to one pile while the bottom boards and bands are thrown or otherwise conveyed to the station 1 to be used over again.

8 designates overhead tracks extending between the pouring stations 2 and 3, or between each pouring station 2 or 3, and the central station 4, these tracks forming the head of the T formation. 9 are the tracks leading from the mold making station 1 to the tracks 8. 10 designates a main carriage having trucks 11 movable along the tracks 8 and carrying a track section 12 below and at a right angle to the tracks 8 and movable into and out of alignment with the tracks 9.

Two main carriages 10 are shown, (one for each molding station), and the break up station 4 (or shake-out screen) is double, that is, it is wide enough to receive the molds from both pouring stations.

13 is the body of a carriage having trucks 14 movable along the track section 12 and the tracks 9. 15 is a lifter frame suspended from the body 13, as by cables 15a, so as to be capable of laterally shifting or swinging movement. These cables are connected to suitable hoisting engine

16, supported by the carriage 13, and controlled in any suitable manner by means of a handle 16a. The carriage 13 is also suspended from the trucks 14 by cables which facilitate the lateral swinging 5 of the lifter frame 15.

17 designates lifter members depending from the carrier 15, and secured thereto, as by brackets 18, the lifter members having shelves or feet 19 at their lower ends arranged to extend under the articles to be lifted. The articles to be lifted are, in this embodiment of my invention, molds 20 resting on bottom boards 21 having spacing pieces or cross bars 22 on their lower sides for resting on a support 7, the side edges of the board overhanging in order to provide spaces for the feet or shelves to hook under. The shelves extend in opposite directions from the lower ends of the lifter members 17 with the exception of the end lifters where a shelf is provided only on the inside 20 of each end lifter. These shelves or feet move laterally into and out of engagement with the bottom boards by the lateral swinging of the carriage 15 permitted by the fact that the carriage 15 is suspended by flexible cables. The main carriage 10 is propelled along the tracks 8 in any suitable manner, and likewise, the carriage 13 is propelled along the tracks 12 and 9 in any suitable manner.

The supports 7 are merely suitable tables or benches extending lengthwise of the station 1 on opposite sides of said receptacle 5, and are set inclined slightly out of parallelism with the vertical plane of the overhead truck 9.

In operation, the molder makes the mold on the molding machine 6, taking the sand from the receptacle 5, the mold being built or placed upon a bottom board 21, the bottom boards are then placed upon the support 7, the spacers or cross pieces 22 extending transversely of the support. The main carriage 10 is moved along the tracks 8 until the track section 12 is in line with the track section 9 and then the carriage 13 moved from the track section 12 on to the track section 9 in order to carry the lifter member 17 into position to pick up the molds on the support 7.

The support 7 and the frame 15 or some part carried thereby are provided with means for swinging the frame 13 laterally relatively to the support in order to carry the shelves or feet 19 into a position at one side of the support 7, and as here shown, the advance end lifter member is provided with a roller 25 movable along a track 26 on the support 7, the track having a deflected or nose portion 27 at one end arranged in the path of the roller. The track 26 is also provided with a stop 28 at its rear end. Thus, when the carriage 13 is shifted so that its trucks 14 pass from the track section 12 to the track section 9, the roller 25 engages the nose 27 and deflects or swings the carriage 13 and lifter frame 15 laterally, this being permitted by reason of the carriage 13 and frame 15 being flexibly supported by the cables. The lateral swinging of the lifter means to one side of the article support is facilitated by the slight inclination of the support out of the vertical plane of the overhead tracks 9. Thus, the shelves are carried to one side of the molds on the support 7 and the lifters 17 are swung out of a vertical plane. The carriage 15 is then lifted until the shelves pass above the upper edge of the track 26 so that the carriage 13, frame 14 and lifter member 17 now swing into a vertical plane carrying the shelves under the overhanging portions of the bottom boards so that now when the carriage 15 is hoisted farther, the molds

are lifted thereby. The carriage 13 is then shifted back along the track of track section 12, of the main carriage 10, and the main carriage 10 shifted to carry its load to one end or the other of the pouring stations 2 or 3, where the bottom boards with the molds thereon are deposited in rows R on the floor of said pouring stations.

The lifter frame 15 is then lowered slightly permitting the shelves or feet 19 to lower relatively to the overhanging portions of the bottom boards, and then the carriage 10 backed off, permitting the shelves to clear the molds.

As before stated, these molds are deposited in rows at the pouring stations, and after the castings have hardened in the molds, the carriage 10 is moved up to the first row at the pouring station and lowered, so that the feet 19 are below the level of the bottom boards, then the carriage moved farther inwardly to carry the feet under the bottom boards, and then the frame 14 hoisted to cause the row of molds with the castings therein to be lifted. The main carriage 10 is then moved along the tracks 8 to the delivery and break up station where the molds and bottom boards are dumped.

The dumping mechanism will now be described. Each of the shelves 19 is pivoted at 32 to the lower end of the companion lifter member 17 about midway between the sides of the shelf so that it is capable of tilting on its pivot relatively to the lifter member 17 and it is normally held from tilting by means operable to tilt and dump the mold and bottom board. This means is here shown as a link 33 extending lengthwise of each lifter member 17 and pivoted at 34 and at its lower end to the shelf at one side of the pivot 32 and connected to operating means at its upper end, which operating means is carried by the lifter frame 15 on the brackets 18. The operating means consists of a rock shaft 35 extending lengthwise of the frame 15 and having rock arms 36 thereon, one for each lifter 17 and links 33 are pivoted at 37 at their upper ends to the rock arms. The rock shaft 35 is turned by a suitable handle 38 at one end which is normally locked from turning by a pivoted latch 39 coacting with a square hub of the handle 38.

In operation, after the main carriage 10 has been shifted along the tracks 8 to delivery and break up station 4, the handle 38 is turned, thus tilting the shelves 19 about their pivots 32 and dumping or throwing and completely inverting the molds, bottom boards, and the castings in the molds on the screen where the molds break up, and the sand thereof sifts down through the screen to the conveyor 4a and is carried to the molding station 5, where it is reused. The castings are picked up off the screen and deposited in one pile while the bottom boards and the mold bands are returned to the molding machine 6 where they are reused.

The support is provided with suitable locating strips 50 between which, the bottom boards with the molds thereon are placed by the operator in order to accurately locate them, so that the shelves can swing under them.

The strips 50 are adjustable for bottom boards of different widths. Also the lifter members 17 of the bracket 18 are adjustable lengthwise of the frame 15 to conform to the widths of the bottom boards. The latch 46, to be presently described, is also adjustable lengthwise of the support and its pivot to coact with the end shelf in any adjustment of the strip 50 and lifters 17.

Means is provided for centering the shelves

19 when they have been swung over the support or bench 7 by the swinging of the lifter frame 15, this means preventing overthrow of the shelves or feet 19 and also rebound thereof. The means for preventing overthrow comprises a shoulder 40 mounted on the end of the support or bench 7 remote from delivery station 4, and arranged to engage the bracket of the guide roller 25 when the carrier 13 swings over the bench or support 7. Rebound is prevented by latch means located at opposite ends of the lifter frame, one of these being a latch 42 pivoted at 43 to a fixed point and coacting with a shoulder 44 on the lifter member 17 located at the end of the lifter frame 13 remote from the delivery station 4, this latch having a cam or inclined surface 45 with which the shoulder coacts while the lifter frame 15 and lifter members 17 are swinging over the bench 7. When the bracket of the guide roller 25 engages the shoulder 40, the shoulder 44 has cleared the cam surface 45 and then latch 42 drops over the shoulder, as seen in Figure 8. The end of the carriage 15 toward the station 4 is held from rebound by a spring pressed latch 46 pivoted to the bench 7, and having a cam surface 47 coacting with a shoulder 48 provided from the shelf 19 at the end of the carriage 15 toward the center station 4. When the carriage 15 swings to carry the shelves 19 over the bench 7, the shoulder 48 engages the cam surface 47 of the latch 46 and presses it downwardly, and as soon as the shoulder 48 passes by the latch, the spring of the latch 46 reacts moving the latch in front of the shoulder 48, as shown in Figure 8. Thus the lifter frame 15 and the lifter members 17 are held from swinging movement. When the carriage 15 is hoisted, the shoulder 48 clears the latch or is lifted above the latch and also the latch 42 is lifted upwardly with the carriage or the adjacent lifter member 17. When the carriage

13 is moved along the track on to the tracks 9, the shoulder 44 passes out from under the latch.

What I claim is:

1. In a conveyor, an overhead track, a carriage including a body movable along the track, and lifter means depending from the body and connected thereto to shift laterally relatively to the body and having depending members provided with shelves at their lower ends for hooking under articles to be lifted, a support for said articles located under the track, means for raising and lowering the lifter means, the support and the carriage having coacting means for shifting the lifter means laterally relatively to the articles on the support, and for releasing the lifter means from its laterally shifted position permitting the same to shift to carry their shelves under said articles.

2. In a conveyor, an overhead track, including a body, a carriage movable along the track, and lifter means depending from the body and connected thereto to swing laterally relatively to the body and having depending members provided with shelves at their lower ends for hooking under the side edges of articles to be lifted, a stationary support for said articles, the support and the carriage having coacting means for swinging the lifter means to one side of the support during the movement of the carriage into a position over the support, means for holding the lifter means in its position assumed when swung to one side of the support, and means operable to lift the lifter means and release the carriage from the holding means whereby said members swing by gravity into position in which the shelves pass under the articles on the support, and means for lifting the carriage.

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45	120
50	125
55	130
60	135
65	140
70	145
75	150