

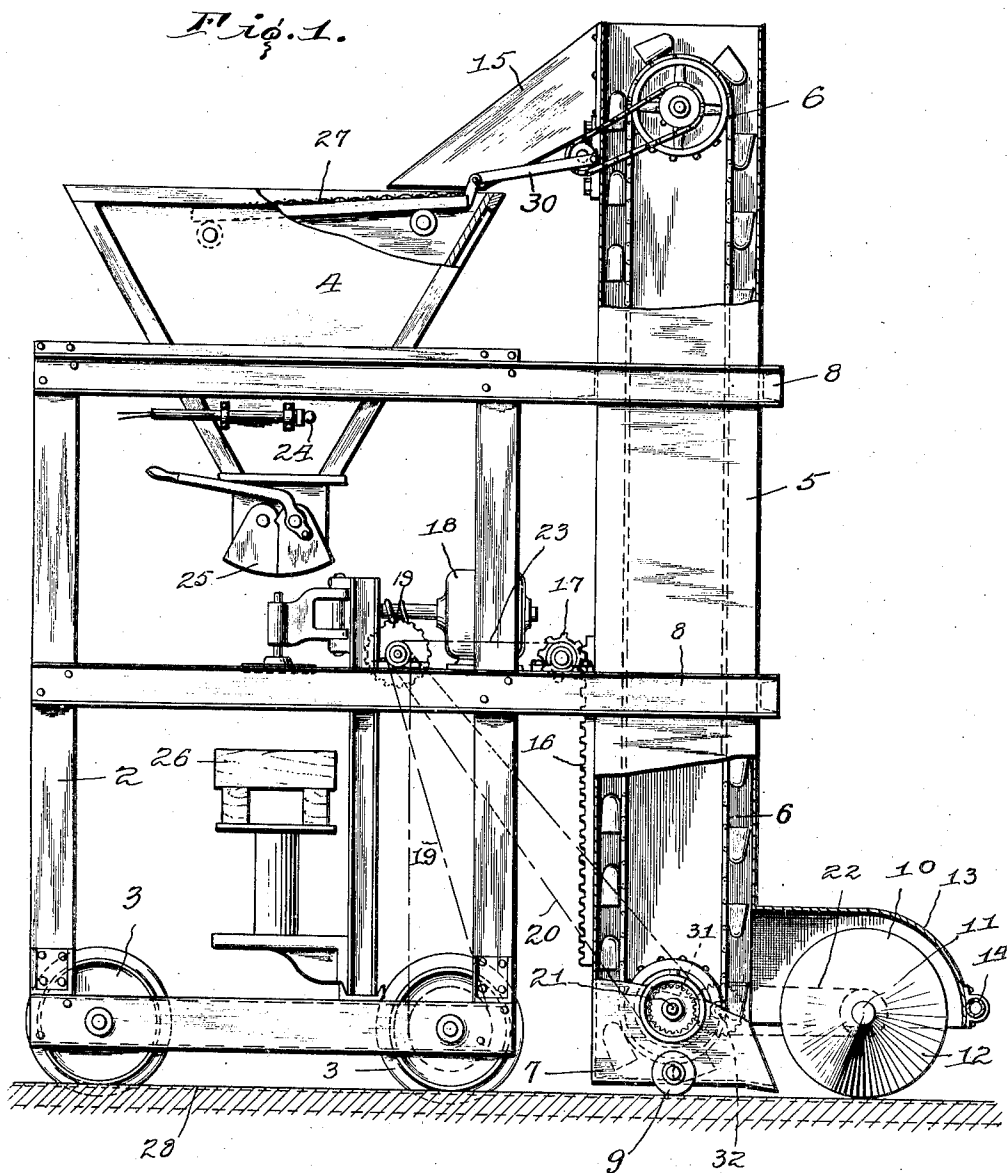
Sept. 22, 1925.

J. C. MERWIN

1,554,972

SAND GATHERING AND DELIVERING APPARATUS FOR MOLDING MACHINES

Filed April 16, 1921 3 Sheets-Sheet 1



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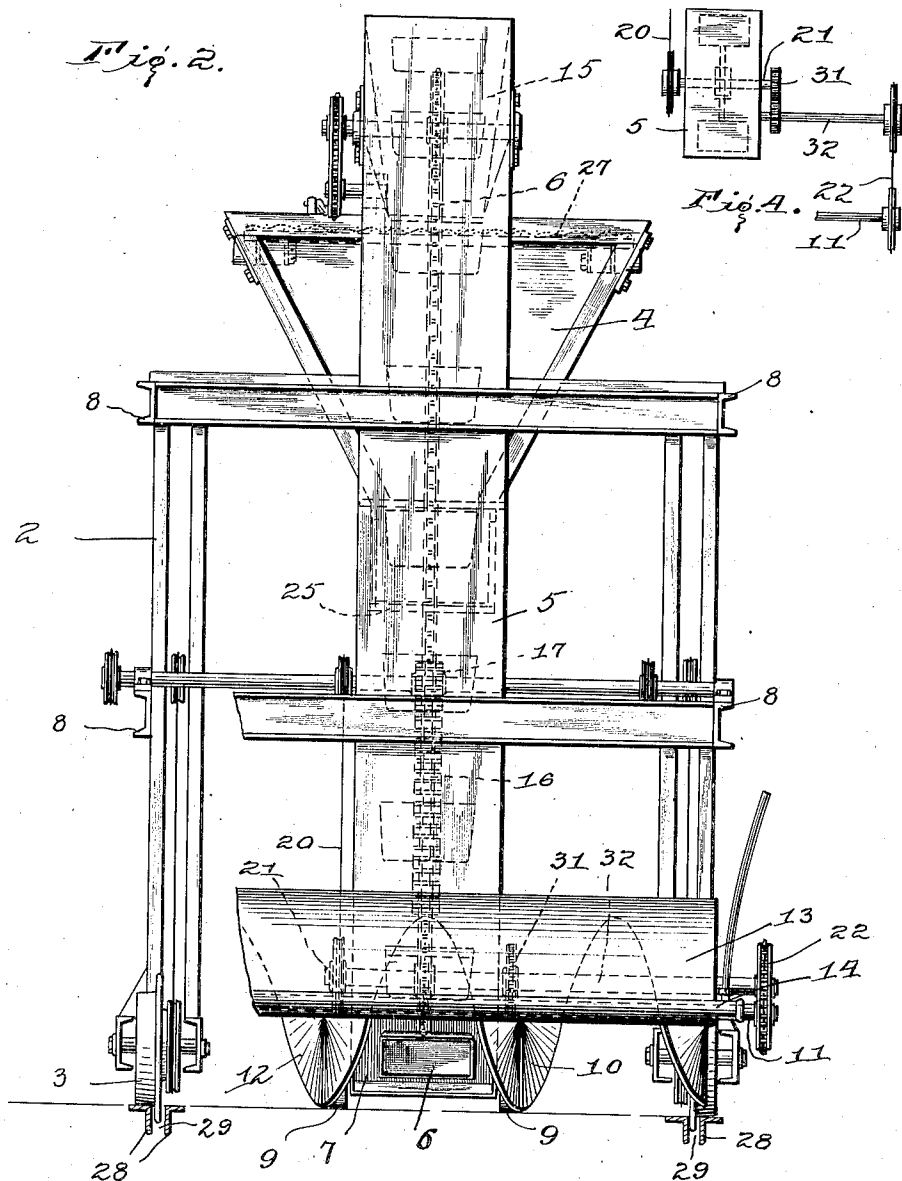
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3 Sheets-Sheet 2



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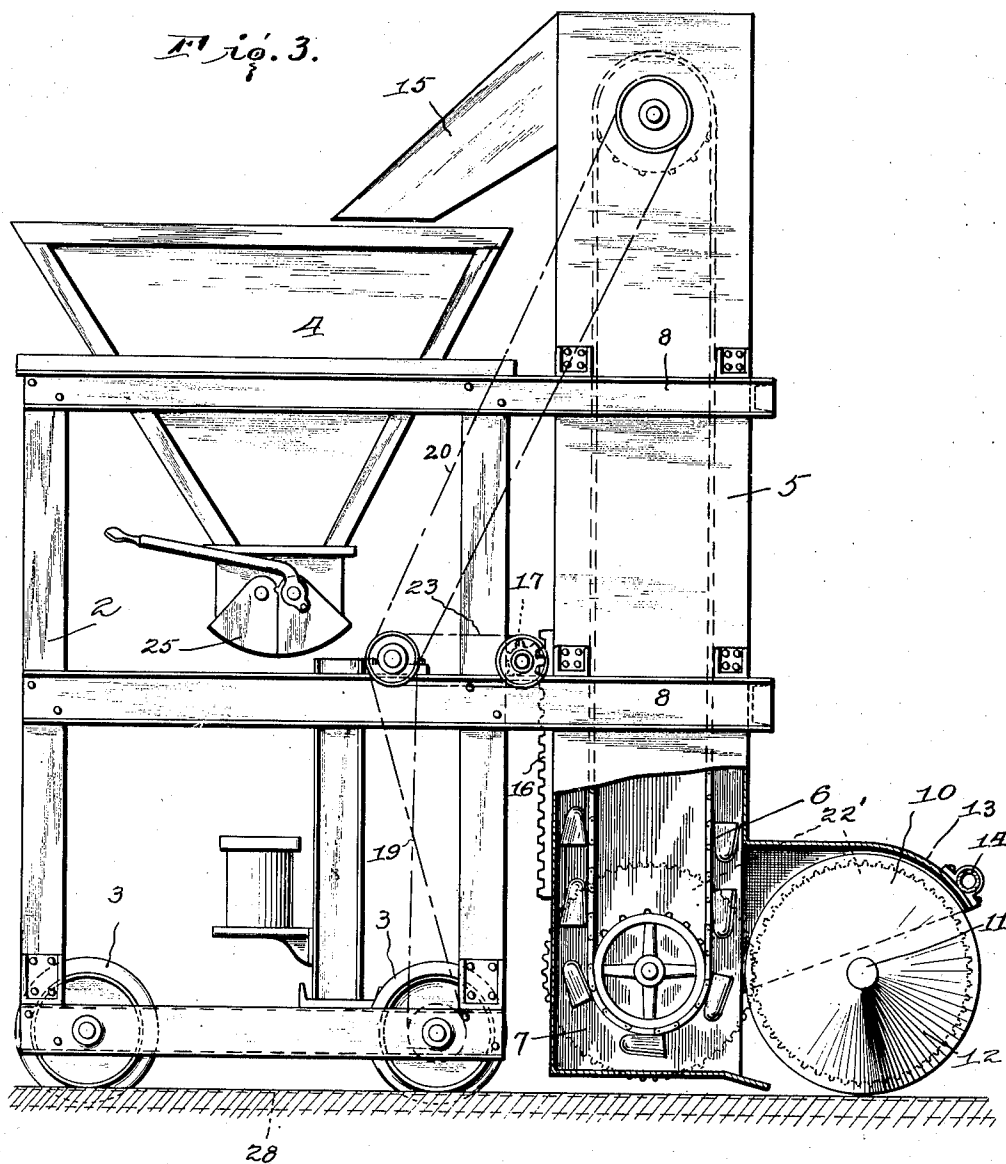
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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SAND GATHERING AND DELIVERING APPARATUS FOR MOLDING MACHINES.

Application filed April 16, 1921. Serial No. 461,844.

To all whom it may concern:

Be it known that I, JOHN CLIFFORD MERWIN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Sand Gathering and Delivering Apparatus for Molding Machines, of which the following is a specification.

10 This invention relates to apparatus used in foundries and comprises a portable carriage or truck that may carry one or more molding machines, and which is provided with a hopper for the molder's sand
15 used in making the molds and with apparatus for taking the loose sand from the floor of the foundry and delivering it to the hopper.

In foundry practice it is now quite common to employ power-driven molding machines supported upon portable trucks that are movable over the foundry floor. The molder upon one of these machines fills the molds from the sand contained in a hopper,
25 places the completed molds upon the floor of the foundry to one side of or behind the machine as it is advanced. The molds are subsequently poured and when the castings have cooled these are shaken out and the sand is deposited, usually in ridges, upon
30 the floor of the foundry to be subsequently taken up and used again.

My invention has for its object to provide apparatus that takes the sand from the floor of the foundry, elevates it and delivers
35 it into the hopper in condition for use in making the molds.

In the accompanying drawings:

40 Figure 1 is a side view of an apparatus embodying my improvements;

Fig. 2 is a front end view thereof;

Fig. 3 is a side view of a somewhat different form of machine embodying my invention.

45 Fig. 4 is a diagrammatic plan view illustrating a portion of the train of gearing employed in the machine illustrated in Figs. 1 and 2.

50 In the drawings, 2 indicates a portable carriage supported upon wheels 3 and carrying a hopper 4 adapted to contain molder's sand. At one end of the carriage there is supported an upright frame 5 carrying an elevator 6 of suitable construction, that in-

55 dicated in the drawings being a bucket elevator, provided at its lower end with a boot 7 into which the lower end of the elevator extends and into which the material to be taken up by the elevator is delivered. The upright supplemental frame 5 is bodily ad-
60 justable relative to the carriage 5 so that its lower end may be moved nearer to or farther from the floor over which the machine moves, and to thus adjustably support it the carriage 2 is provided with ex-
65 tensions 8, 8 by which the frame 5 is supported and guided. In the form of machine shown in Figs. 1 and 2, the frame 5 is provided with a pair of supporting wheels 9 adapted to rest upon the floor surface
70 when the frame 5 is lowered into working position. However, these wheels may be omitted, as represented in Fig. 3, the weight of the frame 5 in that instance being carried entirely by the extension 8 of the car-
75 riage 2.

The frame 5 is provided with a gathering and conveying device 10 adapted to collect from the floor of the foundry the sand that may be deposited thereon and deliver it to
80 the elevator 6,—to the boot 7 thereof in the construction illustrated. This gathering device, which extends the full width of the portable machine or even somewhat beyond its sides, if this be found desirable, com-
85 prises a shaft 11 and collecting and conveying blades 12. These blades are suitably supported and are so disposed as to feed the material to the elevator. They serve not only to gather and feed the material but
90 also to disintegrate or break it up to a certain extent. The gathering device 10 is covered by a hood 13 at the lower forward edge of which is located a sprinkler pipe 14
95 by means of which the sand may be dampened whenever this is desirable.

The elevator discharges, at its upper end, into a chute 15 delivering to the hopper.

The frame 5 carries racks 16, vertically
100 disposed, with which engage driven pinions 17, by means of which the frame as a whole may be lifted so that the gathering device 10 will clear the material on the floor, as when the apparatus is being moved from place to place in the foundry without being
105 in operation.

The independent frame 5, which carries the elevator and the gathering devices, may

be vertically adjusted, as has been described, without disturbing the relations of the said parts which the frame carries to each other or to the portable carriage, or to the floor of the foundry, except as to its vertical relation to the latter two. The advantages of this arrangement are that no very heavy load has to be moved in adjusting the frame 5; and it is possible to lift the frame but a little and there hold it and then operate the machine with the gathering devices raised a little above the surface of the floor of the foundry and yet maintained in such relative position as to function properly. This may be desirable where there are obstructions or inequalities in the foundry floor which might be encountered by some of the parts of the gathering device if maintained as close to the floor as it would be desirable under normal conditions where the surface over which the carriage moves is perfectly smooth.

18 designates a motor supported upon the carriage 2. The motor shaft is connected by gearing 19 19 with one or more of the supporting wheels 3 and through this train, which should of course include a clutch, the apparatus may be propelled. The motor is connected through another train of gearing 20 with the shaft 21 carrying the lower turning wheel of the elevator 6 and through this gear train the elevator is driven, this drive, as is each other one in the machine, being provided, if desired, with a clutch, so that the part driven may be in operation or at rest as the operator of the machine may elect.

Still another gear train connects the shaft 21 of the elevator with the shaft 11 of the gathering device 10. This gear train may include a chain belt or other flexible form of driving connection, as shown in Fig. 1, or a train of gear wheels 22' as represented in Fig. 3. The gear train just referred to and illustrated in Figs. 1, 2 and 4, comprises a pair of spur gears 31 connecting the shaft 21 of the elevator with the shaft 32 supported in the frame of the elevator parallel with the shaft 21, and a belt 22 connecting shafts 32 and 11. Another gear train including a belt 23 connects the motor shaft with the shaft carrying the pinions 17 by which the frame 5 is adjusted with reference to the floor surface.

The hopper 4 is provided with gates 25 by which the flow of sand to the molds 26 may be controlled. In order to insure a free flow of sand from the hopper whenever the delivery gates or controlling valves are opened, I provide the hopper with a vibrator 24. Any suitable form of vibrator may be used of sufficient power to impart the necessary agitation to the contents of the hopper, an electrical vibrator of usual construction being well adapted for this use.

A riddle or sand screen 27 is preferably

interposed between the elevator and the sand hopper. The screen 27 is represented as being operated by a pitman 30 connected with a crank driven from the head wheel of the elevator 6, as shown in Fig. 1.

In order to utilize the floor space of the foundry to the best advantage the machines such as I have described, should, in their ordinary uses, follow directed courses or paths, and for this purpose I provide rails with which the wheels 3 of the portable machine engage. These rails should not project above the floor of the foundry and I therefore preferably form each rail of a pair of parallel angle irons 28 spaced apart to leave a groove 29 between them in which travel the flanges of the wheels 3. One flange of each angle iron is substantially flush with the floor surface and the other constitutes a wall bounding the groove 29.

The operation of the apparatus herein described is as follows, it being assumed that the articles from a previous cast have been shaken out of the molds and removed and that the sand from which the molds were formed has been left on the floor of the foundry, and that a molder is about to begin the making and placing of the molds preparatory to another casting operation. The machine is run to one end of the pile of sand, the frame 5 being adjusted so that the gathering device 10 is lifted substantially above the floor space to clear the sand. Arriving at the end of the sand ridge the frame 5 is adjusted to working position and advanced toward the pile of sand with which the gathering means 10 engage. The blades 12 of this gatherer break up any large lumps or pieces of sand as the latter is moved toward the boot of the elevator where it is taken up, through the frame 5, and delivered to the hopper, being further broken up, screened and mixed by the riddle 27 before reaching the hopper. From the hopper the molder draws the sand as required by him in making his molds, the vibrator 24 insuring that the sand shall flow freely from the hopper whenever the delivery valves or gates are opened.

The mechanism for operating the molds is not shown, as this may be of usual or preferred construction. The apparatus may be, and usually will be, moved intermittently, as the molder fills the space on the foundry floor in rear of the machine with the completed molds. Whenever the machine advances the gatherer 10 takes up the sand and delivers it to the elevator which in turn delivers to the sand hopper as has been described.

While I have described my invention as embodied in apparatus intended to be used in the making of sand molds for metal castings, I do not thereby wish to be understood as restricting its useful applications to such

apparatus as it may be used in other apparatus adapted to gather loose material from a floor surface over which the portable machine is caused to travel.

5 Having described my invention, what I claim and desire to secure by Letters Patent is:

10 1. The combination with a carriage of a containing hopper carried thereby, an elevator for delivering material to the hopper, gathering means for collecting loose material from a floor surface over which the carriage moves and delivering it to the elevator, and a frame that carries both the elevator and the gathering means and is adjustable toward or from the floor surface
15 relative to the carriage so that the gathering means may pass over more or less of the ma-

terial on the surface without engaging therewith. 20

2. The combination with a carriage, a hopper carried thereby, a supplemental upright frame, extensions from the carriage for supporting and guiding the upright supplemental frame and permitting it to be adjusted bodily up and down, an elevator in the upright frame delivering to the hopper, a gathering device for taking material from the floor over which the carriage moves and delivering it to the elevator, and means for adjusting the supplemental frame bodily in its supports whereby the gathering device
25 may be caused to be nearer to or farther from the floor surface. 30

JOHN CLIFFORD MERWIN.