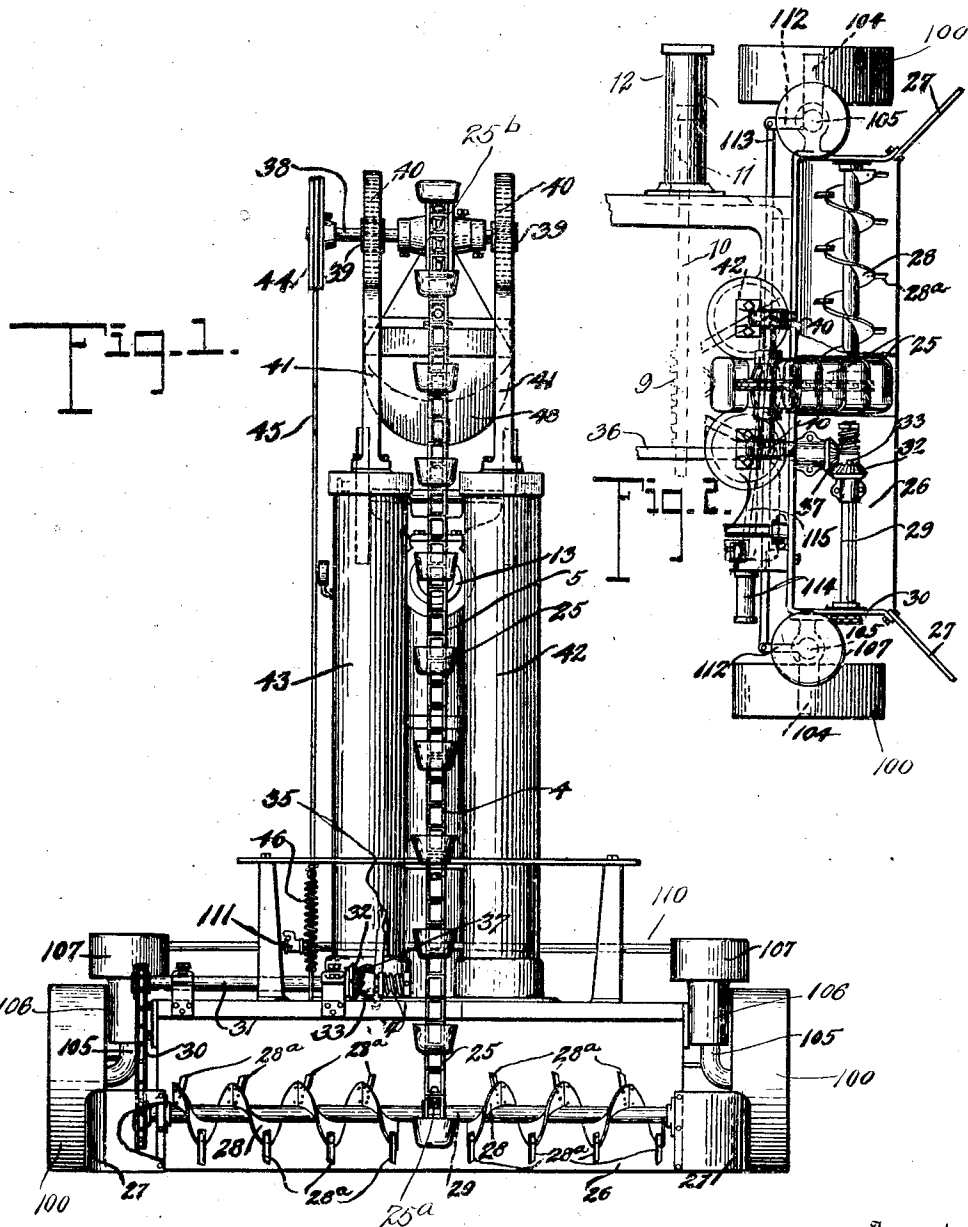


E. O. BEARDSLEY AND W. F. PIPER.
SAND GATHERING AND ELEVATING MACHINE.
APPLICATION FILED JAN. 30, 1919.

1,421,383.

Patented July 4, 1922.

3 SHEETS—SHEET 1.



Witness
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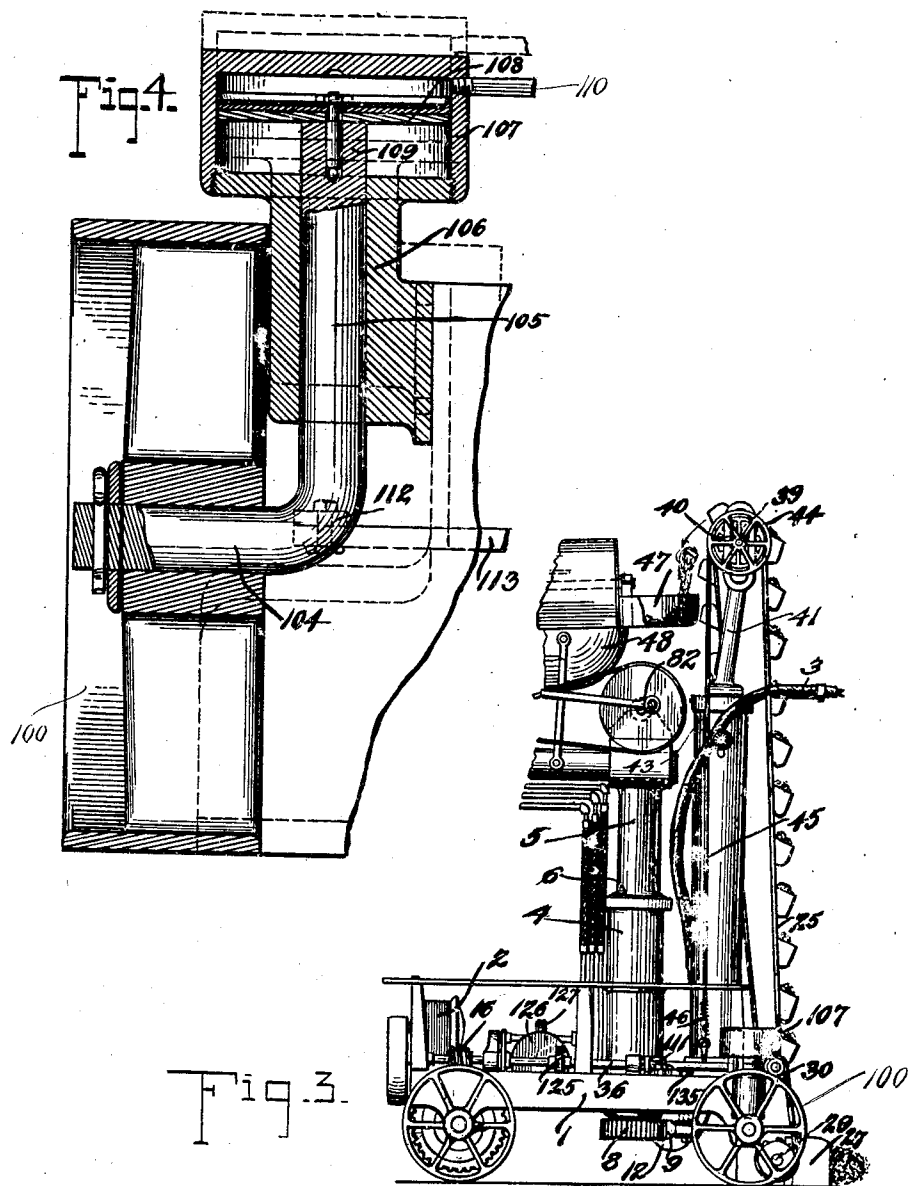
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Fig. 5.

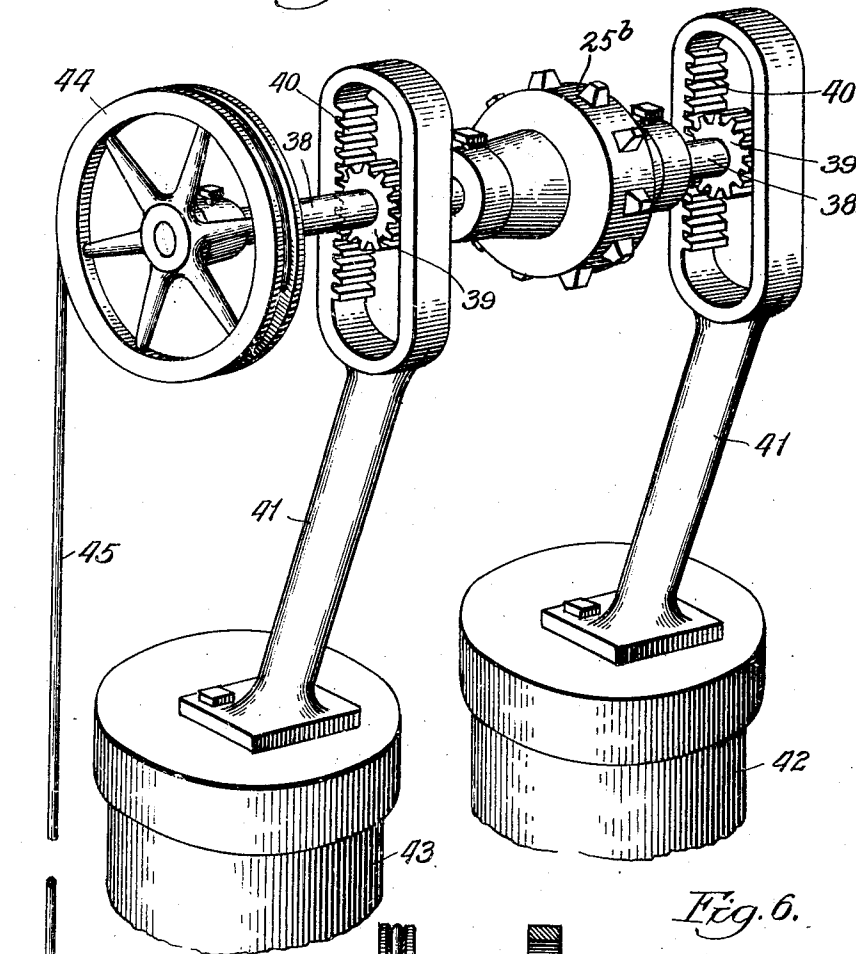
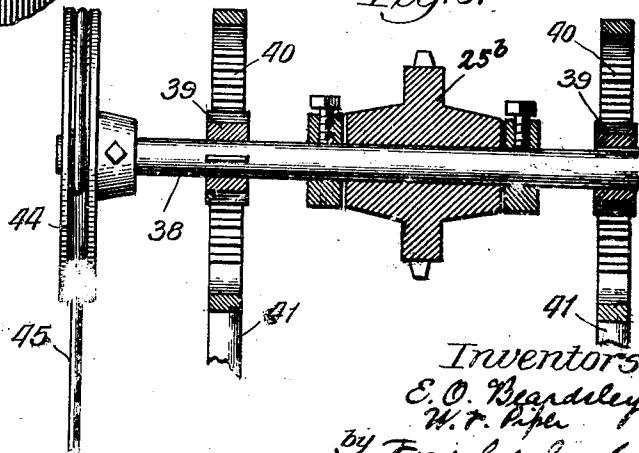


Fig. 6.



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UNITED STATES PATENT OFFICE.

ELMER O. BEARDSLEY, OF CHICAGO, AND WALTER F. PIPER, OF OAK PARK, ILLINOIS.

SAND GATHERING AND ELEVATING MACHINE.

1,421,383.

Specification of Letters Patent.

Patented July 4, 1922.

Original application filed June 22, 1917, Serial No. 176,354. Patent No. 1,335,641. Divided and this application filed January 30, 1919. Serial No. 274,096.

To all whom it may concern:

Be it known that we, ELMER O. BEARDSLEY and WALTER F. PIPER, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, and Oak Park, in the county of Cook and State of Illinois, respectively, have invented certain new and useful Improvements in Sand Gathering and Elevating Machines, of which the following is a specification.

The invention relates to foundry equipment. One object of the invention is to provide improved means for yieldingly keeping taut an endless chain and bucket elevator used to supply sand in predetermined quantities to a moulding machine. Another object of the invention is to provide improved means for adjustably sustaining a portable truck provided with a sand gathering device.

Another object of the invention is to provide improved means for conveying and disintegrating the sand in transit from the floor to the elevator.

This application is a division of the application filed June 22, 1917 for Letters Patent of the United States No. 1,335,641.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is an end elevation of a machine embodying the invention. Fig. 2 is a plan. Fig. 3 is a side elevation. Fig. 4 is an enlarged detail, partly in section, showing the means for adjusting the truck relatively to one of the ground wheels. Fig. 5 is a perspective of the mechanism for yieldingly supporting the upper end of the elevator and Fig. 6 is a transverse section.

The machine comprises a portable truck 1 equipped with driving mechanism to advance the truck slowly in the direction of a pile of previously tempered sand and to operate the truck at a higher speed when it is to be shifted from one place in the foundry to another. This driving mechanism is more fully set forth in the aforesaid Letters Patent No. 1,335,641. The truck 1 is driven by a suitable electric motor 2 which is mounted thereon and to which lead suitable conductors 3 which connect said motor with the source of supply

of current and any suitable automatic take-up suspension means may be employed for said conductors. A column 5 having a flange 6 for engaging the balls of an anti-friction bearing (not shown) is journaled for horizontal rotation in a hollow post 4 which is fixed to the truck 1. Column 5 extends through the post 4 and at its lower end has affixed thereto a gear 8 which is engaged by a rack 9 carried on the end of a piston rod 10. Said rod is connected with the working piston 11 in a cylinder 12 which is adapted to receive fluid under pressure to shift the rack 9 to turn the post 4 and correspondingly shift a jib and arm for movably supporting a sand projecting device, as set forth in the aforesaid Patent No. 1,335,641.

An elevator of the endless chain and bucket type is located adjacent one end of the truck and is adapted to raise previously tempered sand to the riddling mechanism supported on the truck. This elevator is disposed medially of a sand gathering device comprising a scoop-like casing 26 which is secured to the truck and outwardly inclined deflecting blades 27. As the machine advances into the long pile of sand, the device 26 will gather the sand thereinto. Screw-conveyors 28 are fixed to a shaft 29 which is mounted in the casing 26 and are reversely coiled, so that the sand gathered into the casing 26 will be conducted toward the center and at the point where the elevator 25 is located. The screws 28 are equipped with digging teeth 28^a for breaking up sand which may be caked, so that the sand delivered to the elevator will be in a properly reduced condition to be delivered to the riddle.

The elevator 25 and the screw-conveyor 28 are simultaneously driven, the shaft 29 having a sprocket wheel at one end connected by a sprocket chain 30 (Fig. 3) with a sprocket wheel on a countershaft 31 above shaft 29 and shaft 29 is provided with a sprocket-wheel 25^a around which the lower portion of the chain of the elevator 25 passes and whereby it will be driven. A bevelled gear 32 is loose on shaft 31 and is adapted to be operatively connected thereto by a clutch 33 which is normally held to keep said gear operative by a spring 34 on shaft 31. A lever 35 is provided to

shift the clutch 33. The teeth on clutch 33 and corresponding teeth on gear 32 are inclined so that the clutch will be inoperative to drive shaft 31 while the machine is being operated, except when the machine is being operated in a forwardly direction. A shaft 36 arranged longitudinally of the truck 1 is provided with a gear 37 adapted to be driven by mechanism more fully illustrated and described in the aforesaid Patent No. 1,335,641.

The upper portion of the endless chain of the elevator 25 passes around an idler sprocket 25^b which is supported by and revolvable on a shaft 38. Pinions 39 are fixed to shaft 38, are positioned in slots 41^a of pedestals 41 and mesh with racks 40 at one side of said slots. Said pedestals are fixedly secured to the upper ends of cylinders 42 and 43. A grooved pulley, to which is fixed one end of a cable 45, is fixed to one end of shaft 38. Cable 45 extends downwardly from pulley 44 and is connected to a coil spring 46 which is, in turn, secured to the truck 1. The purpose of providing pinions 39, racks 40 and pulley 44 and applying the force of spring 46 to the pulley through the cable 45 is to permit the elevator chain and sprocket 25^b to yield downwardly, in event some obstruction should become caught between the lower sprocket wheel 25^a and the chain of the elevator and to automatically keep the conveyor chain taut.

In operation, the force of the spring 46 is applied through cable 45 to one side of the pulley 44 and the gear connection between pinions 39 and racks 40 serve as a movable fulcrum between the shaft 38 and the rim of the pulley 44 to which the force of spring 46 is applied by cable 45. The pull of spring 46 applied to the rim of the pulley 44 tends to lift the shaft 38, the pulley acting as a lever movably fulcrumed upon the interfitting gear connection between pinions 39 and racks 40. This construction exemplifies one in which a flexible connection is used to movably support the shaft 38 for the upper end of the elevator and in which the force of a spring is applied to the shaft through leverage provided by the pulley and the movable fulcrum. An inherent advantage of this construction is that a comparatively sensitive spring may be used to support the upper shaft for the elevator. For example, if shaft 38 were directly supported by springs, the latter would necessarily have to be so heavy and powerful in order to support the upper end of the elevator that the resiliency would be insufficient to permit the elevator to yield responsively to obstructions at the lower end thereof.

The sand raised by the elevator 25 is deposited into a hopper 47 of suitable rid-

dling mechanism, such, for example, as that set forth in the aforesaid Patent No. 1,335,641.

The end of the truck 1 located adjacent to the sand gathering device is supported by wheels 100 which are mounted on stub axles 104 on vertical spindles 105 which are journaled in suitable brackets 106 fixed to the truck frame. Cylinders 107 are provided at the upper ends of brackets 106. Each axle spindle 105 extends into one of the cylinders 107 and is there provided with a piston 108 having a ball-bearing connection 109 with the spindle. Pipes 110 provided with controlling valve 111 are adapted to supply suitable fluid under pressure to the cylinders to elevate that end portion of the truck which is supported by the wheels 100 and to hold it raised by the pressure of the fluid in the cylinders between the tops thereof and the pistons 108. By supplying fluid under pressure to the cylinders, one end portion of the truck with the gathering device may be raised a sufficient distance from the ground to clear all ordinary obstacles when the machine is not being operated in a pile of sand and is being removed from one place to another. Wheels 100 may be turned to steer the truck by steering arms 112 which are connected by a rod 113.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described our invention, what we claim as new is:—

1. In a foundry machine of the class described, the combination of a portable truck, an endless-chain and bucket elevator disposed thereon, a movable support for the upper end of the elevator, and yielding means applied to said support to sustain the upper end of the elevator, comprising a leverage device connected to the support and a spring applied to said device to yieldingly force the support into position to keep the chain taut.

2. In a foundry machine of the class described, the combination of a portable truck, an endless-chain and bucket elevator disposed thereon, a movable support for the upper end of the elevator, and yielding means applied to said support to sustain the upper end of the elevator comprising a spring connected to apply its force to the support to yieldingly keep the chain taut and to permit the support to yield and a flexible member connected to the truck and to the spring.

3. In a foundry machine of the class described, the combination of a portable truck, an endless-chain and bucket elevator disposed thereon, a movable support for the

upper end of the elevator, and a yielding connection applied to said support to sustain the upper end of the elevator comprising a leverage device connected to the support, a spring connected to the leverage device to force the support in position to keep the chain taut and to permit it to yield, and a flexible connection between the spring and the truck.

- 10 4. In a foundry machine of the class described, the combination of a portable truck, an endless chain and bucket type elevator disposed thereon, a floating support for the upper end of the elevator, yielding means
15 connected with said support to maintain the outer end of the elevator normally at the limit of its maximum upward movement including a shaft connected with the upper end of the elevator, pinions fixed to said
20 shaft, racks mounted on the truck and engaged by said pinions so that the latter may travel upwards and downwards on the racks as an incident to raising and lowering the elevator, and yielding means connected with
25 said shaft and normally exerting a force to maintain the pinions at the upper limit of their movements respecting the racks.

5. In a foundry machine of the class described, the combination of a portable truck,
30 an endless chain and bucket type elevator disposed thereon, a movable support for the upper end of the elevator, yielding means connected with said support to maintain the outer end of the elevator normally at the
35 limit of its maximum upward movement including a shaft connected with the upper end of the elevator, pinions fixed to said shaft, racks mounted on the truck and engaged by said pinions so that the latter may
40 travel upwards and downwards on the racks as an incident to raising and lowering the elevator, and a yieldable connection between the truck and the said shaft normally tending to turn the shaft in such
45 a manner as to cause the pinions to travel up said racks to hold the elevator at its position of maximum upward movement.

6. In a foundry machine of the class described, the combination of a portable truck,
50 an endless chain and bucket type elevator disposed thereon, a movable support for the upper end of the elevator, yielding means connected with said support to maintain the outer end of the elevator normally at the
55 limit of its maximum upward movement

including a shaft connected with the upper end of the elevator, pinions fixed to said shaft, racks mounted on the truck and engaged by said pinions so that the latter may travel upwards and downwards on the
60 racks as an incident to raising and lowering the elevator, a wheel fixed to said shaft, a cable passing about said wheel, and a spring connection between said cable and the truck normally tending to turn the
65 wheel so as to cause the pinions of the shaft to travel up the racks, substantially as described.

7. In a foundry machine of the class described, the combination of a truck, supporting wheels at one end of the truck, a sand gathering device comprising a scraper carried by the truck adjacent to said supporting means, connections between said supporting wheels and the truck operable
75 to elevate the truck whereby to raise the scraper relatively to the surface over which the track travels, said connections involving stub axles for the wheels, spindles connected with said stub axles, pistons cooperative with said spindles, and means to cause
80 a pressure medium to act upon said pistons to raise the truck on said spindles.

8. In a foundry machine of the class described, the combination of a truck, means
85 for propelling the truck into a pile of sand, and sand-gathering means including a conveyor formed of a helical blade provided with a periphery to continuously feed sand, and means for rotating the screw, the latter
90 being equipped with breaking up blades projecting radially from its periphery.

9. In a foundry machine of the class described, the combination of a truck, means
95 for propelling the truck into a pile of sand, sand-gathering means comprising a conveyor formed of a helical blade provided with a periphery formed to continuously feed the sand transversely, and an elevator for conveying the sand from the screw, and
100 means for rotating the screw and driving elevator, the screw being equipped with blades projecting radially from its periphery so as to break up the sand engaged thereby.
105

In testimony whereof we affix our signatures.

ELMER O. BEARDSLEY.
WALTER F. PIPER.