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D. B. MARTIN ET AL

1,453,634

CONCRETE MIXER

Filed Dec. 15, 1921

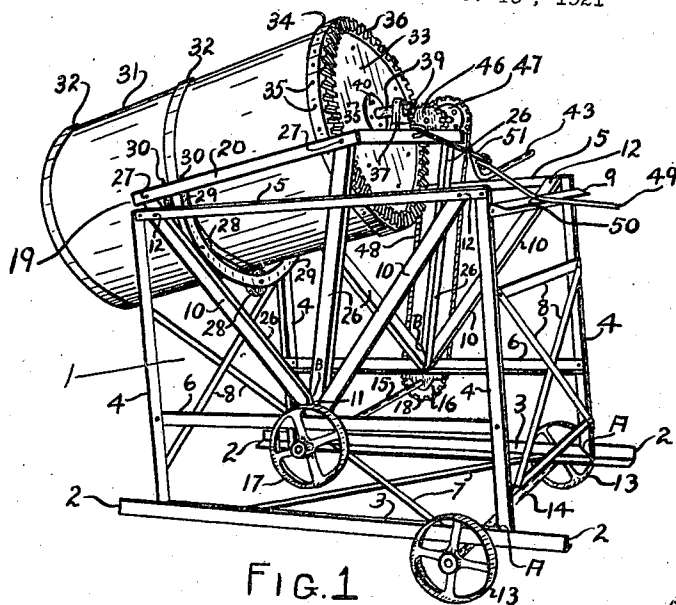


FIG. 1

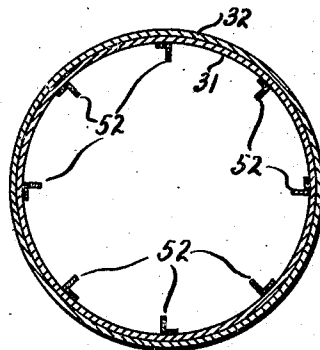


FIG. 3.

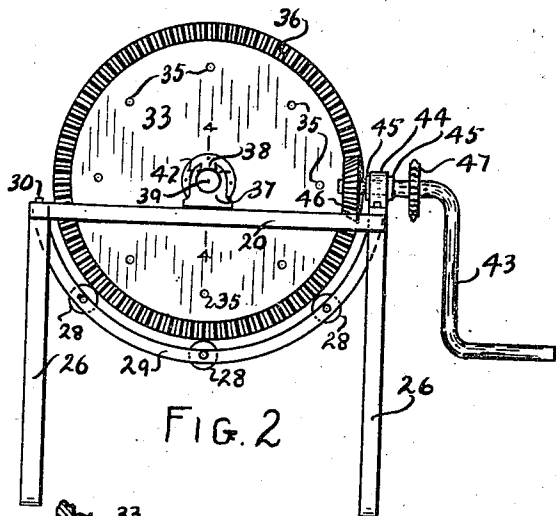


FIG. 2

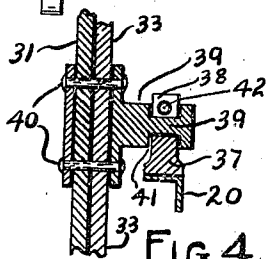


FIG. 4

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UNITED STATES PATENT OFFICE.

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CONCRETE MIXER.

Application filed December 15, 1921. Serial No. 522,572.

To all whom it may concern:

Be it known that we, DAVID BUFFINGTON MARTIN and JOHN WESTERBY, of the village of Hagersville, in the County of Haldimand, in the Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Concrete Mixers, of which the following is a specification.

Our invention relates to improvements in concrete mixers with more particular reference to the smaller type adapted to be operated by hand or motor, and the objects of the invention are among others to devise a machine which will be of strong and durable construction but which may be produced at small cost; a further object is to devise a machine which may be conveniently operated by hand and may also be readily fitted for power drive; and a still further object is to produce a machine which will be efficient in operation.

Our invention consists essentially of a rigid portable main frame, a rocking frame freely supported within the main frame, a mixer drum open at one end closed at the other end rotatably supported by the rocking frame in a substantially horizontal position, the drum adapted to be tilted downwardly and upwardly as the rocking frame is rocked within the main frame and means for rotating the drum about its longitudinal axis, all as hereinafter more particularly described and illustrated in the accompanying drawings in which,

Fig. 1 is a general perspective view of our invention showing the mixer drum in the dumping position.

Fig. 2 is a rear end elevation of the rocking frame and mixer drum.

Fig. 3 is a transverse section through the mixer drum showing a series of angle bars secured to the interior of the drum and constituting vanes or paddles therein.

Fig. 4 is a vertical section on the line 4, 4 of Fig. 2 showing the method of mounting the rear end of the mixer drum.

In the drawings like characters of reference indicate corresponding parts in the different views.

1 indicates the main frame having the two base side members 2 made of angle bars.

3 are side members composed of angle bars each of which is suitably mitered at "A" and bent upwardly at each end to form the corner uprights 4.

5 are top frame members also composed of angle bars and connect the tops of the corner uprights 4.

6 are longitudinally disposed angle bar members each secured at its ends to the corner uprights 4 intermediately of the length thereof.

The lower portion of each side member 3 is secured to the adjacent base member 2.

7 are lattice strips connecting the base members 2 while 8 are lattice strips connecting the corner uprights 4.

9 is a transverse bar secured to the rear corner uprights 4 adjacent to the top thereof.

10 are two V-shaped members each formed from a single angle bar having a portion of the web cut away at 11 to permit the bending to the bar to form the V-shaped member. One of these members is mounted at each side of the main frame, the apex of the V resting upon the top of the longitudinal bar 6 and the upper ends being secured to the top members 5 at 12.

The V-shaped members 10 are located diametrically opposite each other within the main frame at each side thereof with the internal angles of the bars facing inwardly and thus constituting a rocker guide frame within the main frame.

13 are a pair of road wheels supported below the rear end of the main frame upon the axle 14.

15 is a cross shaft journaled in bearing blocks 16 supported below the members 6. The ends of the shaft project beyond the sides of the main frame.

17 is a pulley rigidly carried by one end of the shaft 15 outside of the main frame and 18 is a sprocket wheel carried by the other end of said shaft.

19 is a rocking frame comprising a rectangular top portion 20 composed of angle bars suitably secured together and a pair of V-shaped depending portions 26.

The V-shaped portions 26 are made from angle bars mitered at "B" to permit bending of the bar to the V form and the upper ends are secured at 27 to the top frame portion 20.

The V-shaped portions 26 are located one at each side of the rocking frame and the apex angle thereof is considerably less than that of the V-shaped members 10 in the main frame, while the perpendicular altitude of

the V is greater than in the case of the member 10.

28 are a series of rollers rotatably supported between arched frame portions 29 extending transversely of the rocking frame and secured to the side members of the top 20 at 30.

31 is a cylindrical mixer drum open at its front end and closed at its rear end.

32 are strengthening circumferential hoops carried by the drum.

33 is a circular plate provided with the circumferential flange 34 and encases the rear end of the drum 31 being secured thereto by the rivets or bolts 35.

36 is a bevel crown wheel which is secured concentrically to the plate 33 so that the gear teeth thereof face rearwardly.

37 is a bearing block secured to the rear cross member of the portion 20 of the rocking frame and has the metal above the bearing orifice therein cut away at 38 for a purpose as will presently appear.

39 is a flanged stub shaft extending axially rearwardly from the drum to which it is secured by the rivets 40.

The shaft 39 is provided near its outer end with an annular recess 41, the width of the recess being slightly greater than that of the bearing block 37 and the reduced portion of the shaft forming a journal engaging the bearing surface of the block 37.

42 is a cotter pin extending through the bearing block 37 adjacent to the top thereof.

43 is a transversely disposed hand operating crank mounted in a bearing bracket 44 carried at one side of the rocking frame at the rear thereof, 45 being thrust rings carried by the crank at each side of the bearing bracket 44.

46 is a bevel pinion carried by the inner end of the crank 43 and meshes with the teeth of the crown wheel 36.

47 is a sprocket wheel carried by the crank 43 and is in alignment with the sprocket 18.

48 is a chain operatively connecting the sprockets 18 and 47.

49 is a bent dumping handle which is pivotally mounted upon the bar 9 at 50.

The inner end of the handle 49 is connected to the rear of the rocking frame by a link 51.

52 are a series of spaced angle bars secured to the inside of the drum 31 and extending longitudinally thereof. These bars constitute baffle vanes within the drum.

The construction and operation of our invention is as follows:—

It will be evident that the main frame constitutes a portable rigid frame of simple and inexpensive construction.

The rocking frame 19 is adapted to be detachably mounted within the main frame so that the V-shaped portions 26 engage the interior angles of the V-shaped portions 10,

the apices of the members 26 engaging the apices of the members 10.

Since the apex angle of the rocking frame 19 is less than that of the rocker guide frame 10 it will be evident that the rocking frame is free to be rocked back and forth within the main frame, the axis of oscillation being disposed transversely of the main frame and passing through the apices of the V-shaped portions and, it is further to be noted that since the altitude of the V-shaped portions 26 is greater than that of the members 10 that the rocking frame 19 will project above the top of the main frame.

The drum 31 is rotatably mounted upon the rocking frame the journal portion of the stub shaft 39 engaging the bearing orifice in the block 37 and the front end of the drum being supported by the intermediate hoop 32 engaging the rollers 28.

In the mounting of the drum the bearing block 37 engages the annular recess 41 in the stub shaft 39, the journal portion of said shaft passing downwardly through the cut away portion 38 of the block 37 and having bearing engagement with the bearing orifice therein. Accidental disengagement is prevented by the cotter pin 42.

Longitudinal movement of the drum is prevented by the engagement of the sides of the annular recess 41 with the sides of the bearing block 37.

The crank handle 43 is now mounted and the sprockets 18 and 47 connected by the chain 48.

For power drive the pulley 17 may be connected by a belt (not shown) to any suitable motor.

In Fig. 1 the device is shown in the dumping position in which its front open end is tilted downwardly.

In the charging and mixing position the rocking frame would be oscillated backwardly so that the rear arms 26 of the rocking frame would be resting upon the rear arms 10 of the main frame, in which position the open end of the drum would be tilted upwardly.

Considering first the application to a hand operated machine, the operation is as follows.

The rocking frame is oscillated rearwardly to place the drum in the charging position and the desired mixture is put into the drum after which, upon turning the crank 43, the drum is rotated, the vanes 52 assisting in the thorough mixing of the concrete. The front end of the drum rolls on the rollers 28.

The machine is dumped by simply oscillating the rocking frame forwardly by the dumping handle 49 and as soon as the rocking frame has passed the centre of its swing it falls forward by gravity and stops with a jar in its forward position (see Fig. 1)

as the front arms 26 of the rocking frame engage the front arms 10 of the main frame. This sudden jar greatly assists in the dumping of the drum.

5 The application of power drive is very simple as it is simply necessary to connect a belt from a suitable motor to the pulley 17 and the operation of the machine is identical with that already described, the drum 10 being rotated through the medium of the sprockets 18 and 47 and the chain 48.

In order to overcome any serious loosening of the chain 48 as the frame 19 is oscillated the shaft 15 is located to coincide as 15 nearly as possible with the axis of oscillation of the frame, i. e. to the apices of the V-shaped members 26 and 10.

Hitherto in concrete machines the drum has been rotated by a spur gear wheel encircling the circumference of the drum 20 which has been engaged by a spur pinion having its axis parallel to the longitudinal axis of the drum. This has involved the use of a longitudinally extending operating 25 shaft with the crank handle extending rearwardly of the machine.

This construction has rendered operation inconvenient since the rise and fall of the handle has been considerable as the drum is 30 tilted. Also the application of power drive has been complicated.

With our machine by the use of the bevel crown wheel at the rear end of the drum, the teeth of which face rearwardly, this is overcome and it is possible to have the crank 35 handle extend laterally from the frame.

A further valuable feature of our machine is the convenient form in which it may be placed for transporting since the entire 40 rocking frame with the drum is simply removed from the main frame, turned upside down and the drum is accommodated within the main frame.

Formerly in these machines the frame 45 was pivotally mounted upon a carriage and the drum was tilted as a unit with the main frame, no independent tilting of the drum being provided for. This involved a large cumbersome machine and further, considerable trouble and inconvenience in operation was experienced due to the vibration 50 caused by the method of supporting the machine upon a carriage with the consequent movement and vibration of the road wheels. This is overcome in our machine due to the 55 construction whereby the drum may be independently tilted within a rigid frame which is directly supported upon the ground without the use of any carriage.

From the foregoing it will be apparent 60 that we have devised valuable improvements in concrete mixers which will enable the cost to be greatly reduced by simplifying the construction and which will also render the operation and use of this type of machine 65 more convenient.

Various modifications may be made in our invention without departing from the spirit thereof or the scope of the claims and therefore the exact construction shown is 70 to be taken as illustrative only and not in a limiting sense.

What we claim as our invention is:

1. In a concrete mixer the combination with the rigid main frame thereof, of a V- 75 shaped rocker guide frame within the main frame, a rocking frame comprising a depending V-shaped portion the apex angle of which is less than that of the aforesaid guide frame, the rocker frame freely mounted 80 within the main frame so that the external apex of the depending V-shaped portion thereof engages the internal apex of the guide frame, the rocking frame being free to be oscillated about the engaging apices, 85 and a mixing drum rotatably carried by the rocking frame.

2. In a concrete mixer the combination with the rigid main frame thereof, of a rocker guide frame within the main frame 90 and comprising a pair of angle bars bent to V-shape and secured to the main frame at each side thereof and disposed longitudinally thereof, a rocking frame comprising a top frame portion and a depending V- 95 shaped portion carried at each side thereof, said depending portions made of suitably bent angle bars, and the apex angle thereof being considerably less than that of the rocked guide frame, the altitude of the rocking frame being greater than that of the 100 rocker guide frame, the rocking frame being freely mounted within the main frame so that the apices of the depending portions thereof engage the apices of the rocker 105 guide frame, the inclined members of the rocking frame adapted to engage the inclined members of the guide frame for limiting the oscillation of the rocking frame therein and a mixing drum rotatably carried 110 by the rocking frame and disposed longitudinally thereof, said drum being open at one end and closed at the other.

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Witnesses:

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