

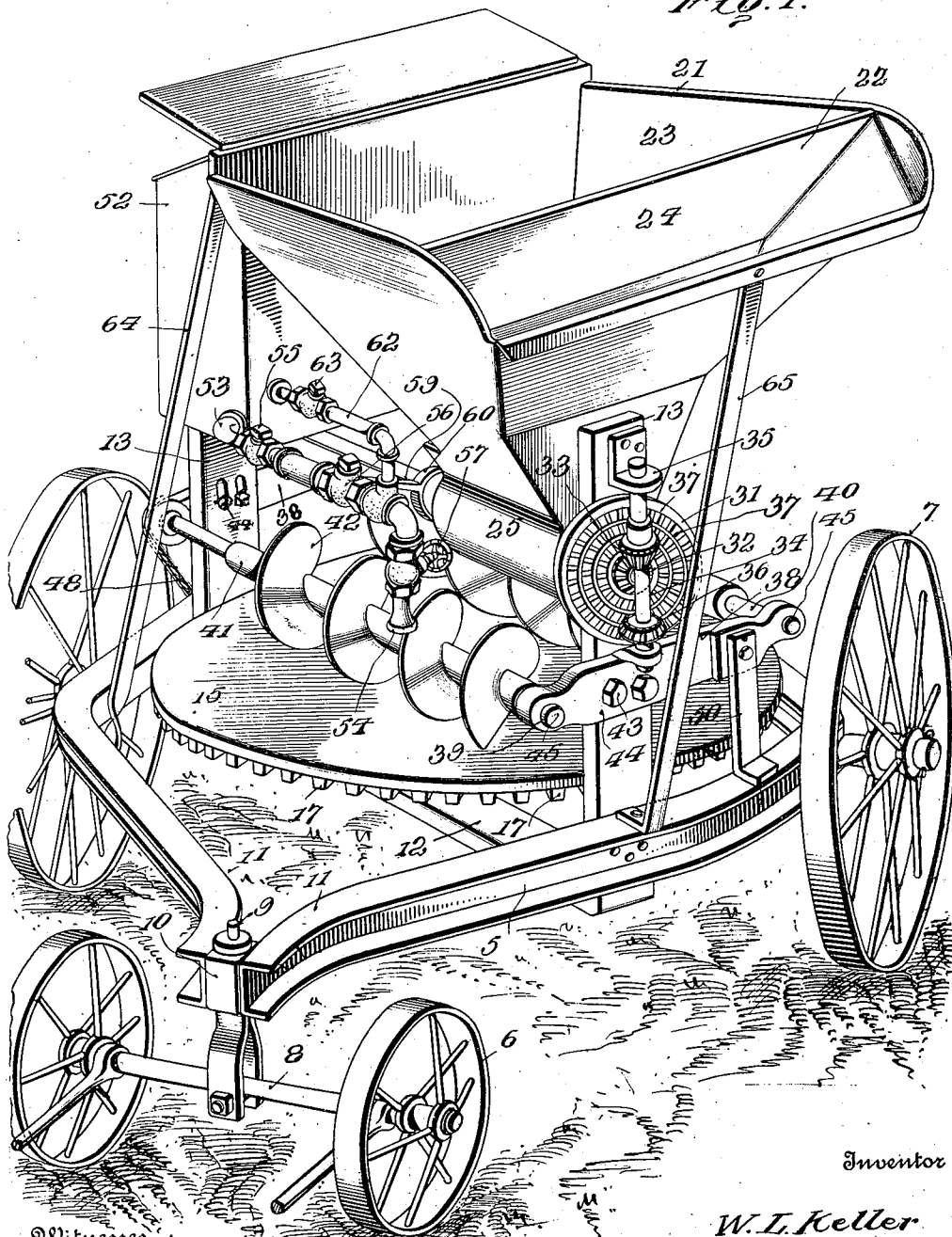
W. L. KELLER.
 CONCRETE MIXER.
 APPLICATION FILED APR. 15, 1910.

1,015,687.

Patented Jan. 23, 1912.

6 SHEETS—SHEET 1.

FIG. 1.



Inventor

W. L. Keller

Witnesses
 W. A. Woodson

J. A. H. Tallin

By

R. A. M. Macey, Attorneys.

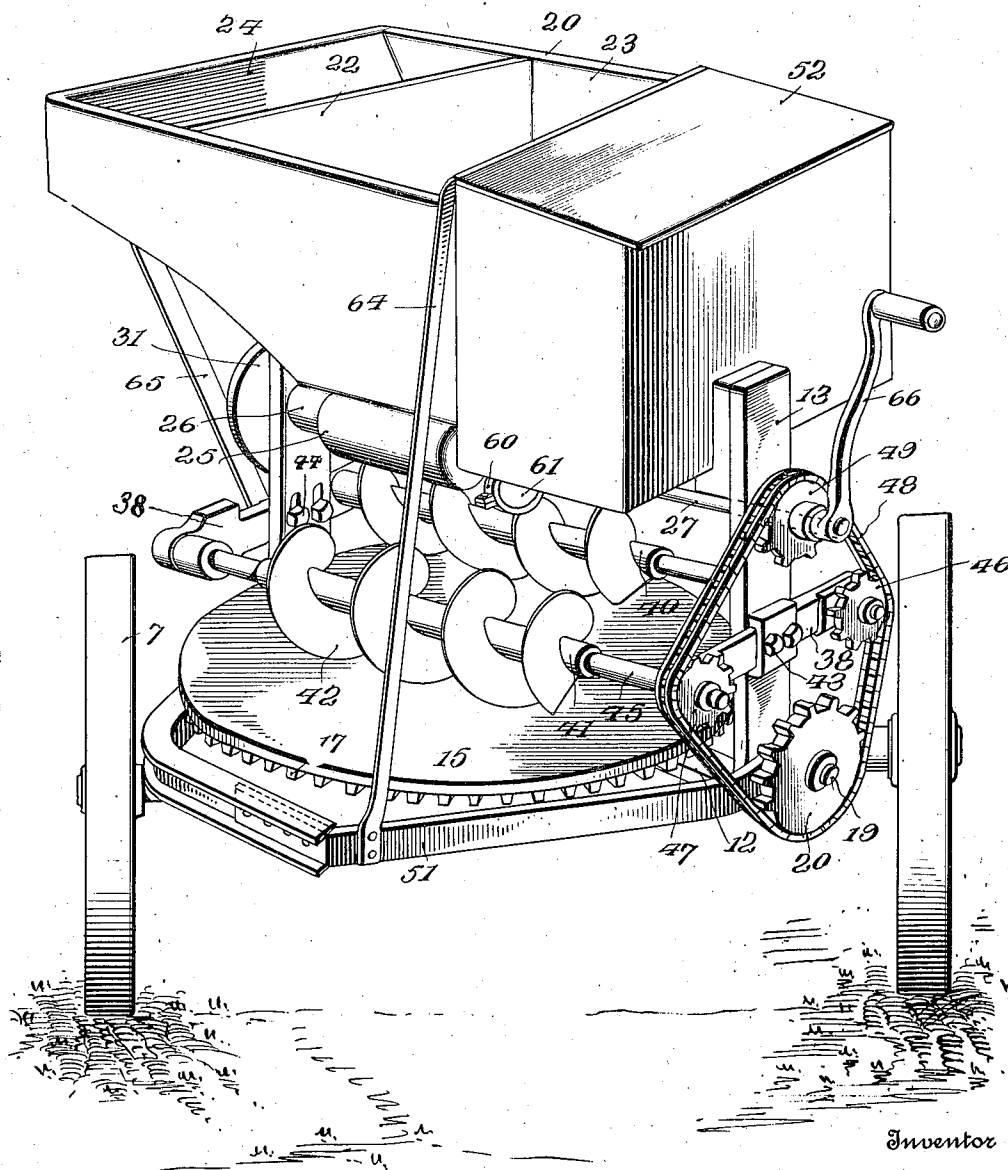
W. L. KELLER.
CONCRETE MIXER.
APPLICATION FILED APR. 15, 1910.

1,015,687.

Patented Jan. 23, 1912.

6 SHEETS—SHEET 2.

Fig. 2.



Inventor

W. L. Keller

Witnesses

W. L. Woodman

J. M. Fallon

By

W. L. Keller Attorney

W. L. KELLER.
CONCRETE MIXER.
APPLICATION FILED APR. 15, 1910.

1,015,687.

Patented Jan. 23, 1912.
6 SHEETS—SHEET 3.

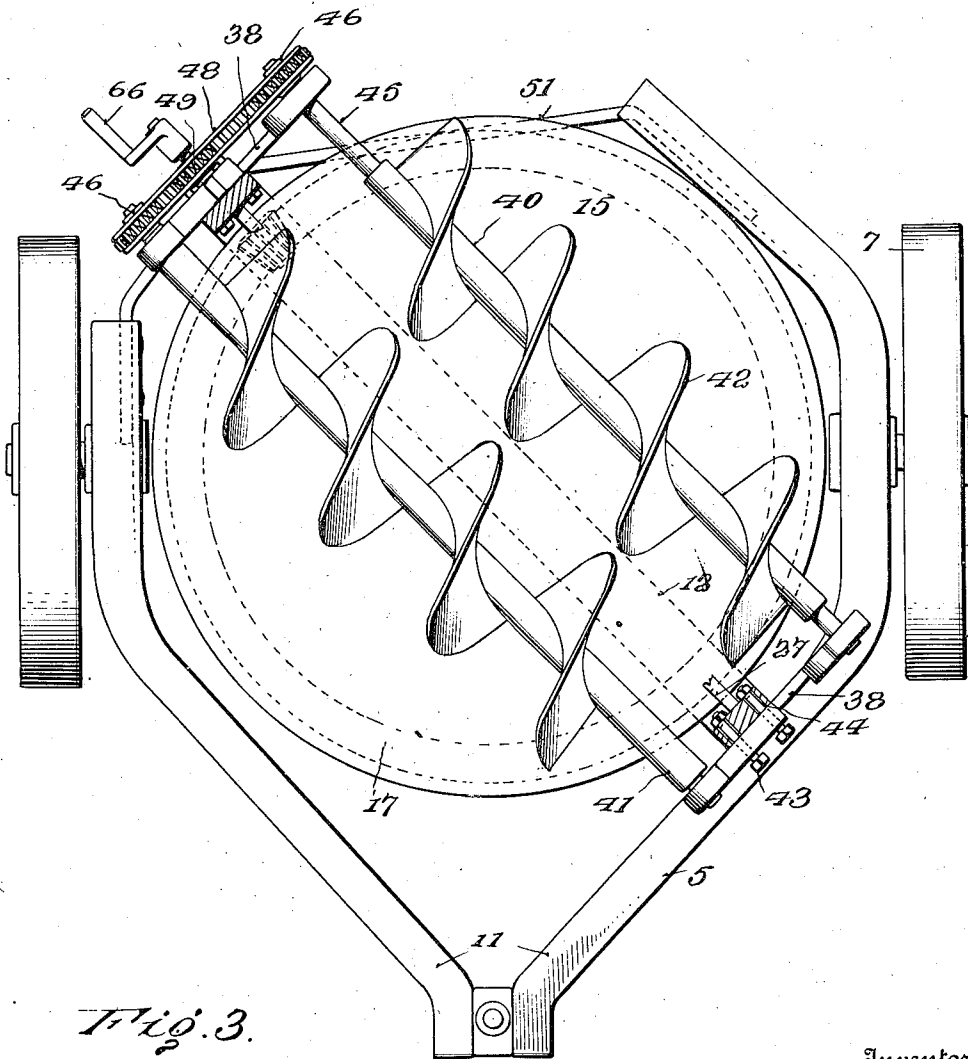


Fig. 3.

Inventor

W. L. Keller

Witnesses

W. J. Hootson

J. M. Fallon

By

H. A. Hootson Attorneys

W. L. KELLER.
CONCRETE MIXER.
APPLICATION FILED APR. 15, 1910.

1,015,687.

Patented Jan. 23, 1912.

6 SHEETS—SHEET 4.

Fig. 7.

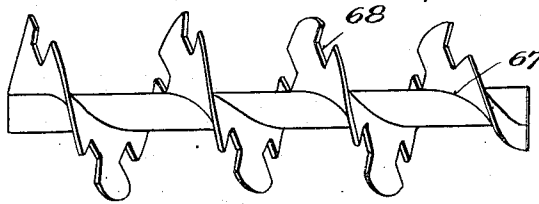


Fig. 4.

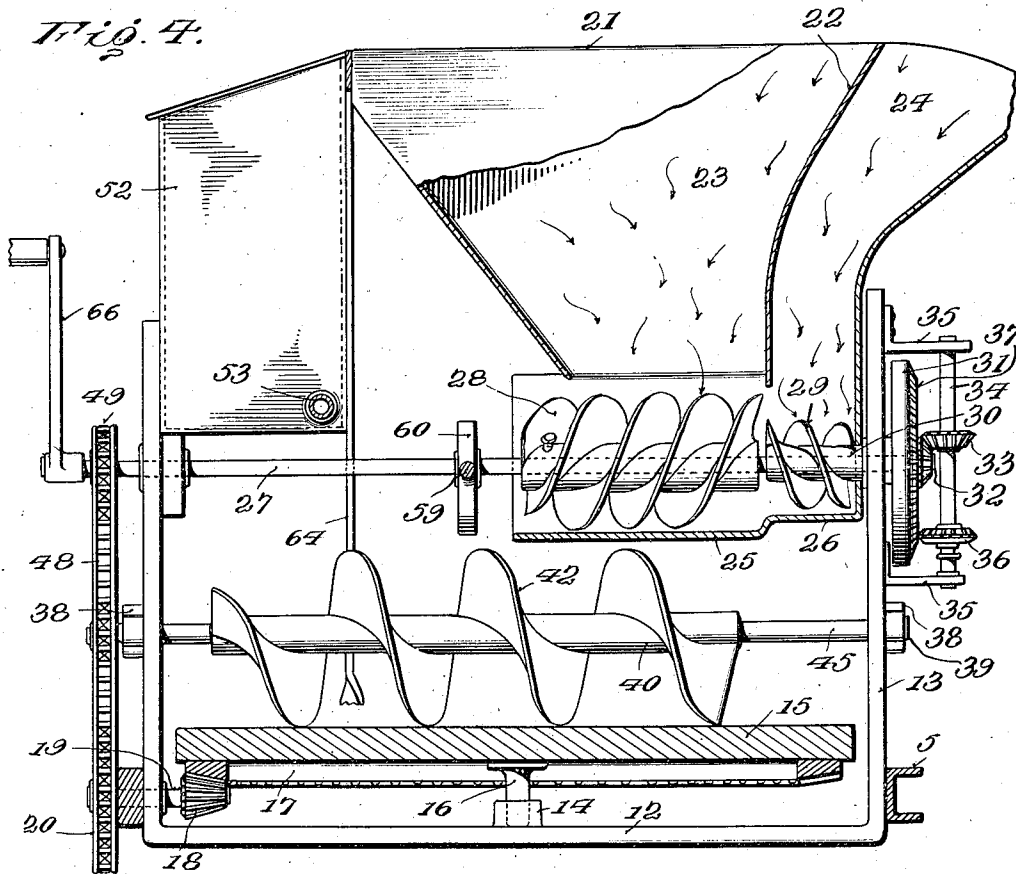
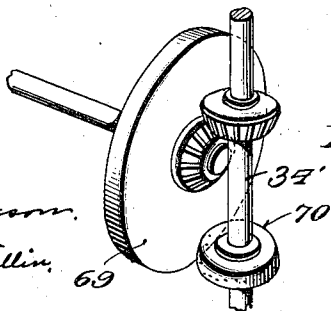


Fig. 8.



Inventor

W. L. Keller

Witnesses
W. H. Woodson.

J. M. Fallon.

By

H. H. Macy, Attorneys

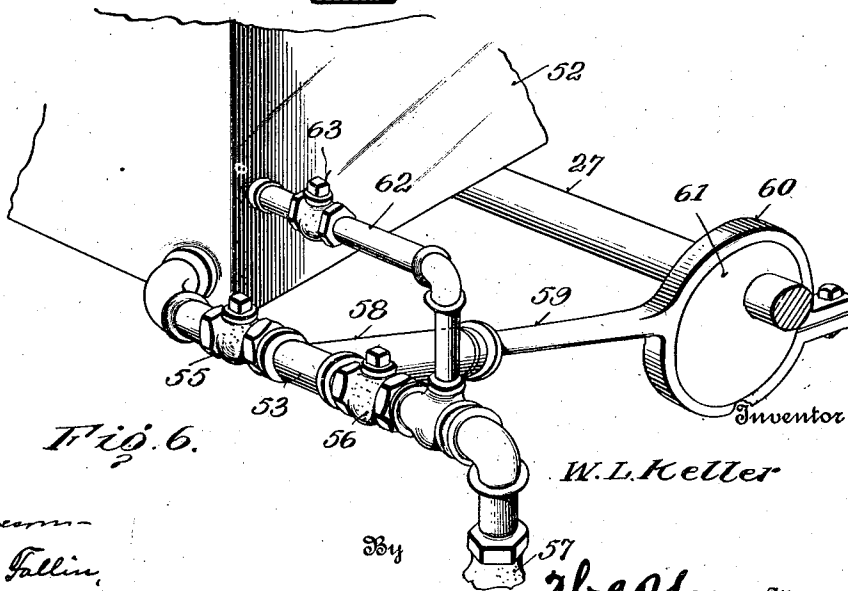
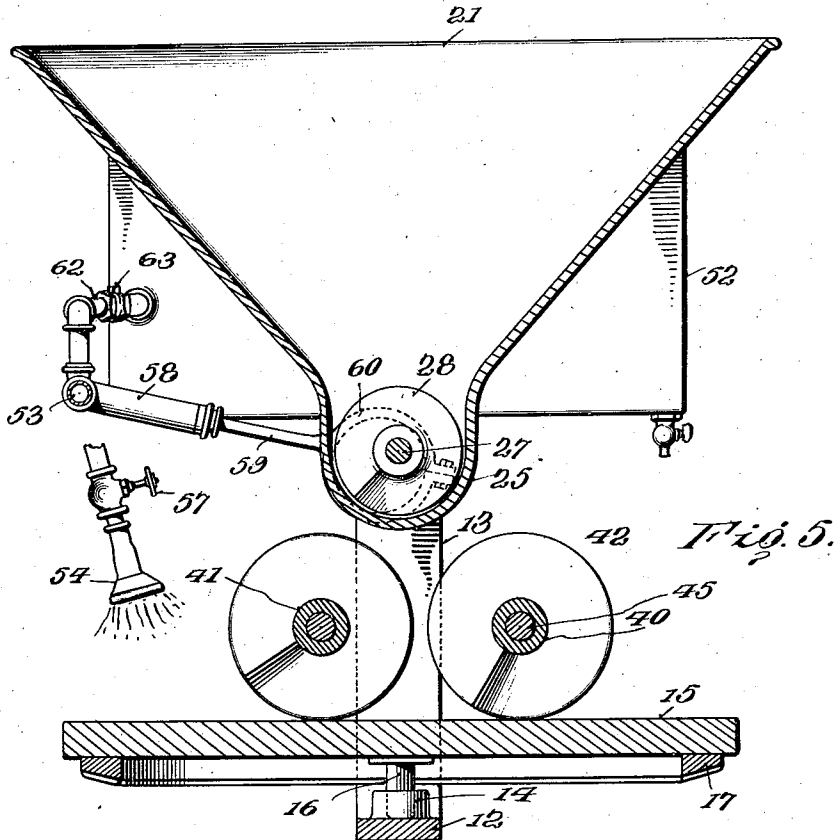
W. L. KELLER.
CONCRETE MIXER.

APPLICATION FILED APR. 15, 1910.

1,015,687.

Patented Jan. 23, 1912.

6 SHEETS—SHEET 5.



Witnesses
H. J. Woodcock
Juana M. Fallon.

W. L. Keller

W. L. Keller, Attorneys

W. L. KELLER.
CONCRETE MIXER.
APPLICATION FILED APR. 15, 1910.

1,015,687.

Patented Jan. 23, 1912.

6 SHEETS—SHEET 6.

Fig. 9.

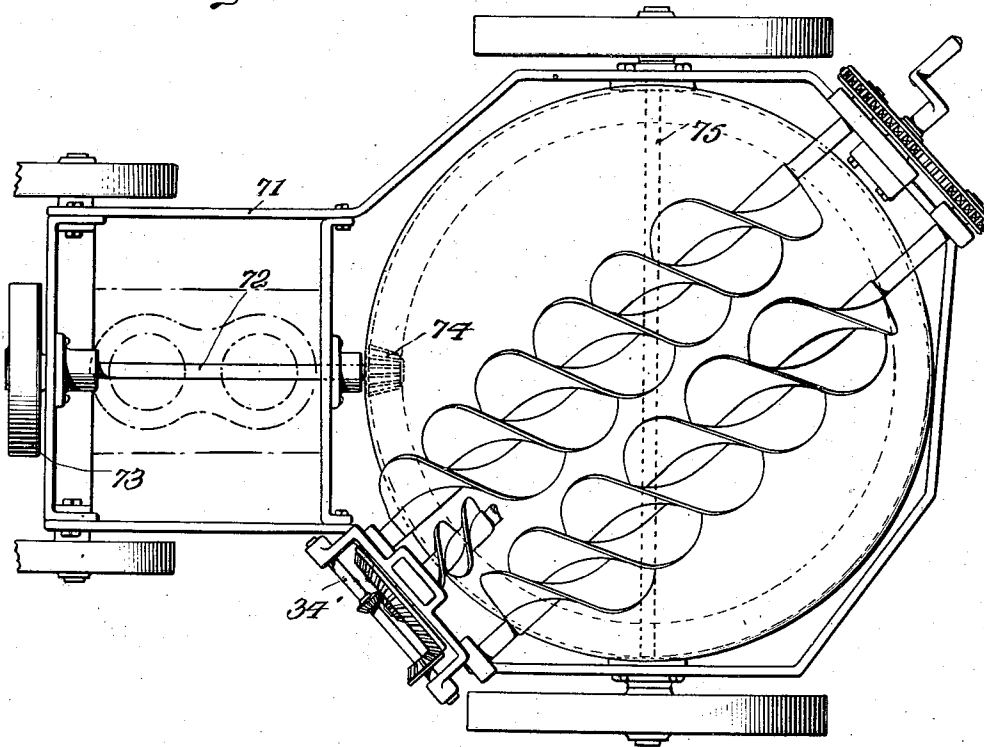
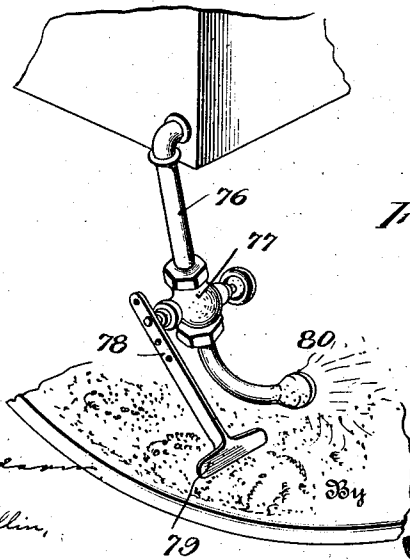


Fig. 10.



Witnesses

H. H. H. H. H.

John M. Tallin,

Inventor

W. L. Keller

J. H. M. M. M. Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM L. KELLER, OF KEARNEY, NEBRASKA.

CONCRETE-MIXER.

1,015,687.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed April 15, 1910. Serial No. 555,679.

To all whom it may concern:

Be it known that I, WILLIAM L. KELLER, citizen of the United States, residing at Kearney, in the county of Buffalo and State of Nebraska, have invented certain new and useful Improvements in Concrete-Mixers, of which the following is a specification.

This invention relates to mixing machines and more particularly to a machine especially designed for mixing sand, cement, gravel and similar materials preparatory to molding the same into the desired shape.

The object of the invention is to provide a mixing machine in which the different materials are fed in predetermined quantities to a revolving mixing table and thoroughly mixed and blended, while exposed to view.

A further object is to provide means for spraying the materials during the mixing operation, and means for discharging the mixture at one end of the machine.

A further object is to provide a mixing table having co-acting mixing elements mounted for rotation above the same and movable in a plane at right angles to the plane of rotation of said table.

A further object is to provide means for rotating the mixing table and mixing elements at different speeds, thereby to constantly shift or change the location of the materials on the surface of the table and thus effect a thorough mixing of said materials.

A further object is to provide a machine, the construction of which is such that the same may be operated continuously or used as a batch mixer.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a mixing machine constructed in accordance with my invention, looking at the front thereof; Fig.

2 is a similar view looking at the rear end of the machine; Fig. 3 is a horizontal sectional view; Fig. 4 is a vertical sectional view; Fig. 5 is a vertical transverse sectional view of the hopper and its associated parts; Fig. 6 is a detail perspective view of the water tank or reservoir, showing the manner of operating the pump; Fig. 7 is a detail perspective view illustrating a modified form of mixing element; Fig. 8 is a similar view, showing a different manner of driving the feeding device; Fig. 9 is a top plan view illustrating a further modification; Fig. 10 is a detail perspective view of a modified form of liquid sprayer.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The machine comprises a supporting frame 5 preferably formed of channel-iron and provided with front and rear ground wheels 6 and 7 by means of which the machine may be readily transported from one place to another. The front wheels 6 are connected by an axle 8 having a king bolt 9 which projects through a head block 10 interposed between the converging ends 11 of the supporting frame, as shown, so as to allow free pivotal-movement of the front wheels and thus permit the machine to make relatively short turns.

Extending diagonally across the supporting frame 5 is a U-shaped frame 12, the side bars 13 of which are bolted or otherwise rigidly secured to the adjacent channel-bars of the supporting frame, while the lower end of the frame 12 is provided with a centrally disposed boss 14 having a socket formed therein which constitutes a bearing for a mixing table 15. The mixing table 15 is mounted for rotation in a horizontal plane and is provided with a depending trunnion or pin 16 which fits within the socket of the boss 14 so as to permit rotation of the table on the U-shaped frame 12. Secured to the bottom of the mixing table 15 is a circular rack 17, the teeth of which mesh with a bevel pinion 18 carried by a stub shaft 19, the latter being journaled in the main supporting frame and provided with a terminal sprocket wheel 20. Disposed above the mixing table 15 and secured in any suitable manner to the

side bars 13, is a hopper 21 having a transverse partition 22 defining independent compartments 23 and 24, one of which is adapted to contain sand or sand and gravel and the other cement.

Secured to or formed integral with the bottom of the hopper 21, is a cylindrical casing 25 having one end thereof reduced at 26 and its other end open so as to permit the discharge of the sand and cement onto the mixing table when the machine is in operation.

Journalled in suitable bearings in the side bars 13 is a transverse driving shaft 27 to which is keyed or otherwise rigidly secured a feeding device, preferably in the form of a screw conveyer 28, the latter being mounted for rotation within the enlarged portion of the casing 25 and beneath the discharge end of the sand compartment 23. Loosely mounted on the driving shaft 27 and arranged to rotate within the contracted portion 26 of the casing, is a feeding device or screw 29 for feeding cement from the compartment 24 to the mixing table. The blades of the feeding device 29 are secured to a sleeve 30, the latter being journalled in the adjacent side bar 13 and provided with a gear wheel 31 having a centrally disposed opening formed therein to permit the passage of the adjacent end of the driving shaft 27. Secured to the projecting end of the shaft 27 is a bevel pinion 32 which meshes with a pinion 33 formed on a vertically disposed stub shaft 34. The shaft 34 is journalled in suitable brackets 35 extending laterally from one of the side bars of the U-shaped frame 12 and keyed to and mounted for vertical sliding movement on said stub shaft is a pinion 36, the teeth of which are adapted to mesh with any one of a series of concentrically disposed teeth 37 formed on the gear wheel 31, thereby to rotate the feeding device 29. Thus it will be seen that by adjusting the pinion 36 vertically of the stub shaft 34, the speed of the feeding device 29 may be controlled at will so as to feed the sand and cement in predetermined quantities to the mixing table.

Mounted on the side bars 13 are horizontally disposed bars 38 having terminal bearings 39 in which are journalled mixing devices 40 and 41. The mixing devices 40 and 41 are provided with spirally disposed blades 42 adapted to feed the materials transversely of the mixing table as the latter revolves, thus to thoroughly mix the materials preparatory to molding the same into the desired shape.

The horizontal bars 38 are secured to the side bars 13 by bolts or similar fastening devices 43, which latter pass through suitable slots 44 formed in said side bars so as to permit a slight vertical movement of the feeding devices 40 and 41 and thus prevent

injury to the blades 42 should the latter strike a stone or other obstruction in the sand or cement.

The shafts 45 of the mixing elements are projected longitudinally beyond the bearings in one of the horizontal bars 38 to form supports for sprocket wheels 46 and 47 over which passes a sprocket chain 48, the latter also engaging the teeth of the sprocket wheel 20 on the stub shaft 19 and a similar sprocket wheel 49 mounted on the adjacent end of the driving shaft 27. The sprocket wheels 46 are of different sizes so as to cause one of the mixing elements to rotate faster than the other and thus insure a thorough mixing of the different materials. Fingers 50 are secured to the horizontal bars 38 and adapted to rest on the supporting frame 5 so as to prevent the spiral blades of the mixing elements from dragging on the upper surface of the table during the mixing operation.

Attention is here called to the fact that the mixing devices 40 and 41 are mounted for rotation in a plane at right angles to the plane of rotation of the mixing table so as to move the materials transversely across the table and thus effect a thorough blending of the same. The mixing devices being arranged to travel at different speeds and mounted to rotate faster than the table 15, the materials deposited on said table from the hopper will be first mixed and then discharged at the rear end of the frame, the channel bars constituting the frame being cut-away at 51 to permit the ready discharge of the mixture into a wheel-barrow or other suitable receptacle designed to receive the same. It will here be noted that the materials are exposed to view during the mixing operation so that the operator can see the amount of each material forming the mixture.

Disposed on one side of the hopper 21 is a tank or reservoir 52 adapted to contain a quantity of water for spraying the materials during the mixing operation. Extending laterally from one side of the tank 52, is a supply pipe 53 having a depending nozzle 54 and provided with check valves 55 and 56, there being a turning plug or valve 57 disposed above the spraying nozzle 54 for controlling the flow of liquid to the mixing table. Extending laterally from the supply pipe 53 is a pump 58, the piston 59 of which terminates in an eccentric strap 60 which engages an eccentric 61 mounted on the driving shaft 27 so that as the shaft 27 rotates, the water in the tank 52 will be forced through the pipe 53 and nozzle 54 to the materials on the mixing table. The check valve 55 prevents the water from being forced back into the tank 52 on the outward stroke of the piston 59, while the check valve 56 prevents the discharge of water

through the nozzle 54 when the pump is operated to draw water into the supply pipe. An overflow pipe 62 forms a source of communication between the supply pipe 53 and tank 52 for conducting excess water back into the tank 52 should the pump work too rapidly, there being a check valve 63 formed in the overflow pipe, as shown.

The hopper 21 is reinforced and strengthened by the provision of an inverted U-shaped brace 64 having its opposite ends rigidly secured to the supporting frame 5 and its intermediate portion extended between the tank 52 and said hopper and rigidly secured to the latter. An inclined brace 65 is also preferably disposed on one side of the machine for supporting the forward end of the hopper 21.

Detachably secured to one end of the shaft 27 is a crank 66 by means of which said shaft may be rotated to actuate the several parts of the machine. If desired however, the front or converging end of the supporting frame 5 may be widened and provided with a platform upon which may be mounted a motor for operating the machine.

In operation, the sand and cement is shoveled or otherwise introduced into the compartments 23 and 24, and the shaft 27 rotated by turning the crank 66, motion being transmitted through the medium of the sprocket chain 48 and bevel gear 18 to the mixing table to rotate the same, and through the medium of the sprocket wheels 46 to the mixing devices 40 and 41, as before stated. As the crank 66 is rotated, the feeding devices or screw conveyers 28 and 29 will feed the materials from the compartments 23 and 24 in predetermined quantities to the casing 25, which materials will be discharged through the open end of the casing onto the mixing table between the mixing devices 40 and 41. As the shaft 27 revolves, the pump 58 will force water from the tank 52 through the supply pipe 53 to the spraying nozzle for the purpose of wetting the materials during the mixing operation, the amount of liquid discharged through the spraying nozzle being controlled by the valve 57. During the rotation of the mixing devices and table, the materials deposited on the latter will be taken up by the mixing devices and moved transversely across the table, the mixture being discharged at the rear of the machine into a wheel-barrow or other suitable receptacle, as before stated.

In Fig. 7 of the drawings, there is a modified form of the invention in which the mixing blades 67 are provided with peripheral recesses or notches 68 for the purpose of assisting in agitating and mixing the materials as the table revolves. If desired, a flat friction disk 69 may be substituted for the gear wheel 31, in which case, a relatively

small friction disk 70 will be keyed to the stub shaft 34' for engagement with the large disk 69 for operating the conveyer 29. It will be understood that by adjusting either the pinion 36 shown in Fig. 4 of the drawings or the small disk 70 shown in Fig. 8 of the drawings, the speed of the feeding devices or screws may be varied at will so as to regulate the proportions of materials fed to the mixing table.

In Fig. 10 of the drawings, there is illustrated a further modification, in which the frame of the machine is preferably formed of flat metal and provided with a rectangular portion 71 adapted to receive and support a motor or engine. In this case, a driving shaft 72 is journaled in the rectangular portion 71, one end of said shaft being provided with a belt pulley 73 for connection with the engine and the other end thereof provided with a pinion 74 which meshes with the rack on the bottom of the revolving table, as shown. The stub shaft 34' is also preferably disposed in a horizontal plane, while the rear axle 75 is journaled in a depending bracket and extends transversely across the frame beneath the revolving table.

In Fig. 10 there is shown a spraying device for automatically controlling the flow of water to the materials deposited on the mixing table, the quantity of water delivered to the table being regulated according to the amount of material deposited thereon. In this case, the liquid supply pipe 76 is provided with a valve 77 to one end of which is secured a cut off lever 78 having a terminal blade or paddle 79, which latter normally rests on the upper surface of the mixing table, as shown. Thus it will be seen that as sand and cement is deposited on the mixing table, the materials, by contact with the blade 79 will elevate the latter and open the valve 77 so as to permit the water to flow through the nozzle 80. When the concrete is discharged from the revolving table, the blade 79 will drop by gravity in contact with the upper surface of the table and thus automatically cut off the flow of water to the discharge nozzle. The supply of water to the mixing table may also be automatically cut off by reversing the direction of rotation of said table, as will be readily understood.

From the foregoing description it is thought that the construction and operation of the device will be understood by those skilled in the art and further description thereof is deemed unnecessary.

Having thus described the invention, what is claimed as new is:

1. In a mixing machine, a table, means for rotating the table in one direction to carry the material in said direction, a mixing element co-acting with and extending across the upper face of the table for sub-

stantially the entire width thereof and operable to feed the material transversely of said table, and means for rotating the mixing element in a different direction, said table and mixing element co-acting to eject the material at a given point on the periphery of the table.

2. In a mixing machine, a table, means for rotating the table in one direction at a predetermined speed to carry the material in said direction, co-acting mixing elements extending transversely across the upper face of the table for substantially the entire width thereof, said mixing elements being mounted for rotation in the same direction relative to each other and operable to feed the material transversely of the table, and means for rotating the mixing elements at different speeds and in a direction opposite to the direction of rotation of the table, said mixing elements and table co-acting to eject the material at a given point on the periphery of said table.

3. In a mixing machine, a table, means for rotating the table in one direction to carry the material in said direction, a mixing element mounted for rotation in a different direction above the table and provided with spiral blades operable to feed the material transversely of the table, said mixing element being freely movable in a vertical plane toward and from said table, and means for rotating the mixing element at a different rate of speed from that of the table, said mixing element and table co-acting to eject the material at a given point on the periphery of said table.

4. In a mixing machine, a revolving table mounted for rotation in one direction at a predetermined speed for carrying the material in said direction, co-acting mixing elements freely movable in a vertical plane toward and from the table for feeding the material transversely of said table, and means for rotating the mixing elements at different speeds, each greater than that of the table, said table and mixing elements co-acting to eject the material at a given point on the periphery of the table.

5. In a mixing machine, a table mounted for rotation in one direction for carrying the material in said direction, a hopper, co-acting mixing elements extending across the upper face of the table for substantially the

entire width thereof and provided with spiral mixing blades operable to feed the material transversely of the table, means for rotating the mixing elements in the same direction, but in a direction opposite to the direction of rotation of the table, means for conveying the materials from the hopper to the mixing blades, and means for spraying the materials during the mixing operation, said mixing elements and table co-acting to eject the material at a given point on the periphery of said table.

6. In a mixing machine, a supporting frame, a table mounted for rotation in one direction on the frame and provided with a rack, a stub shaft having a bevel pinion meshing with the rack and provided with a sprocket wheel, a driving shaft having a sprocket wheel secured thereto, coacting mixing elements mounted for rotation in the same direction above the table freely movable in a vertical plane toward and from said table, a sprocket wheel secured to each mixing element, and a sprocket chain engaging the sprocket wheels of the mixing elements and extending over the sprocket wheels on the stub shaft and driving shaft, respectively, said table being mounted for rotation in a different direction and at a different rate of speed from the mixing elements.

7. In a mixing machine, a supporting frame, a supplemental frame mounted on the supporting frame and provided with a bearing, a table mounted for rotation in one direction in said bearing for carrying the material in said direction, co-acting mixing elements disposed above the table and mounted for rotation in a different direction to feed the material transversely of the table, said co-acting mixing elements being free to move vertically in the supplemental frame toward and from the upper face of the table, and means for rotating the mixing elements, said table and mixing elements co-acting to eject the material at a given point on the periphery of said table.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. KELLER. [L. s.]

Witnesses:

M. J. GRAHAM,
H. F. NEAL.