June 3, 1930. J. F. ROBB 1,761,801

AUTOMATIC TILTING TYPE CONCRETE MIXING MACHINE

Filed Sept. 22, 1928 3 Sheets-Sheet 1

Fig. 1.

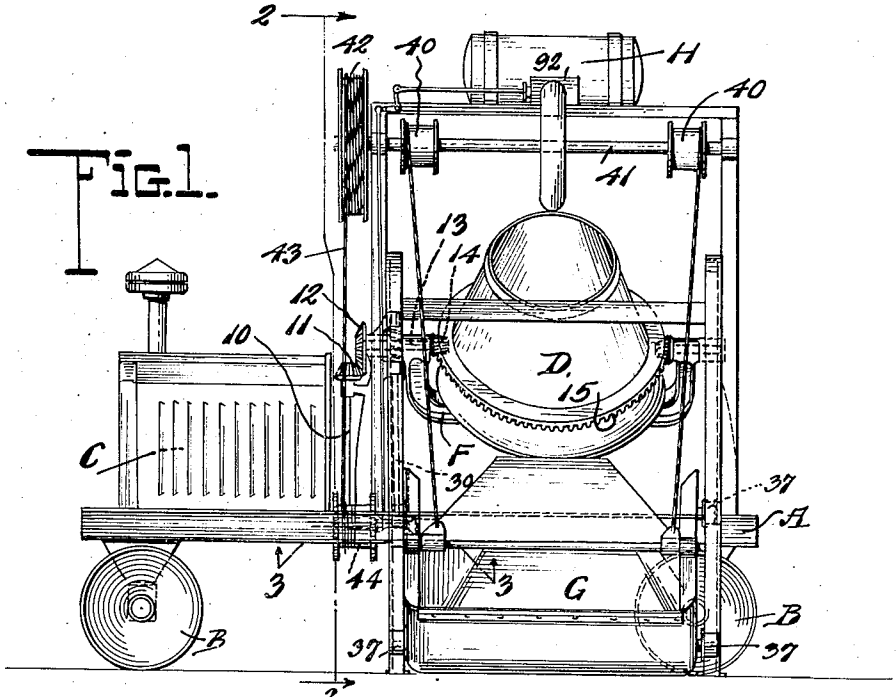
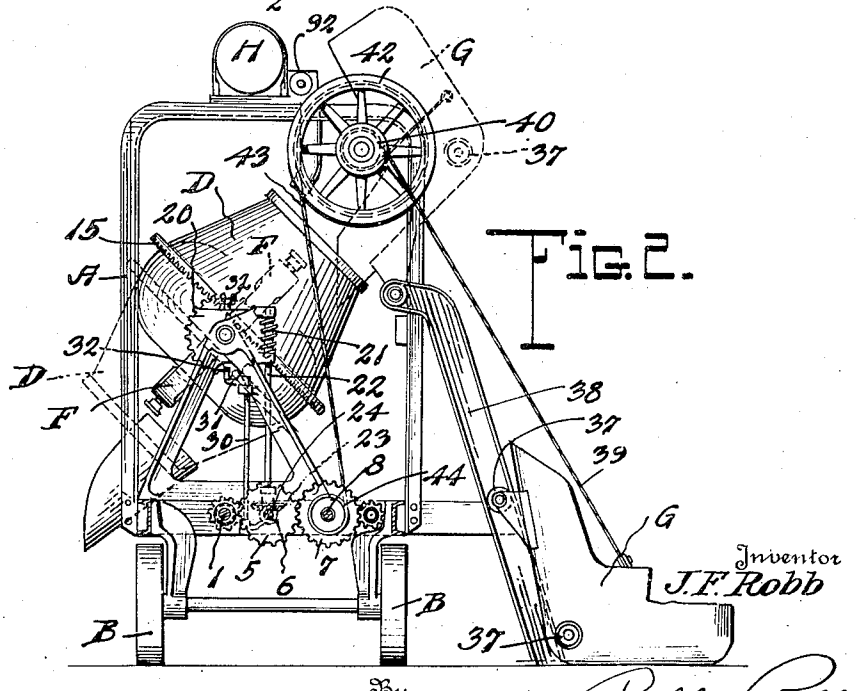


Fig. 2.



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AUTOMATIC TILTING TYPE CONCRETE MIXING MACHINE

Filed Sept. 22, 1928 3 Sheets-Sheet 2

Fig. 1.

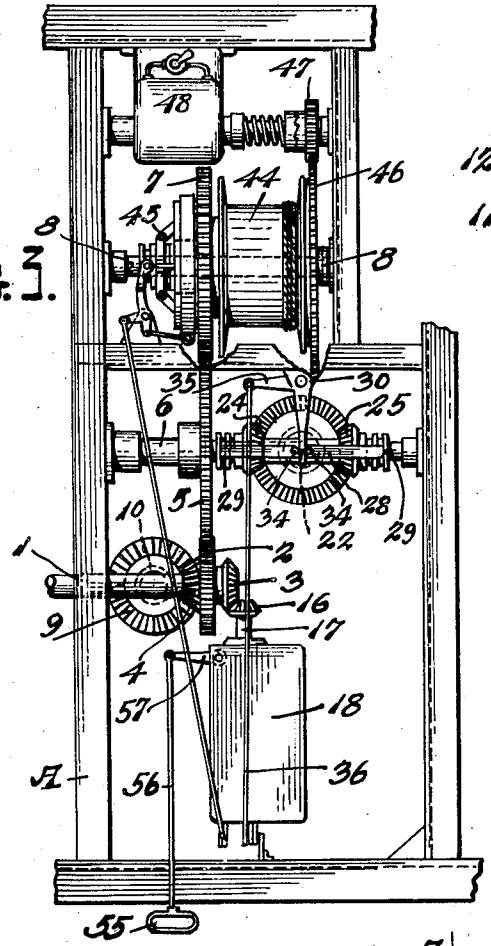


Fig. 4.

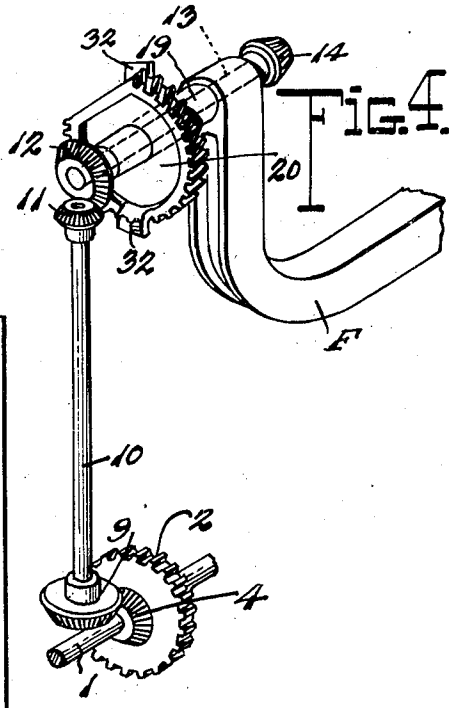


Fig. 5.

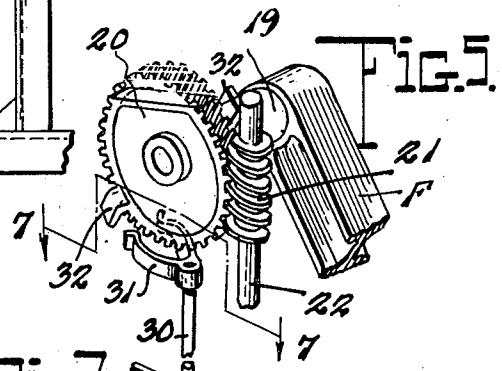


Fig. 6.

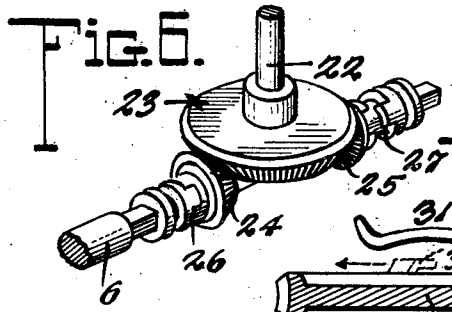
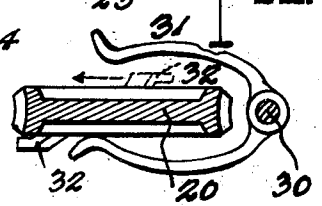
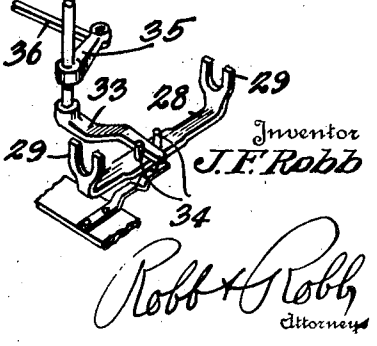


Fig. 7.





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AUTOMATIC TILTING TYPE CONCRETE MIXING MACHINE

Filed Sept. 22, 1928 3 Sheets-Sheet 3

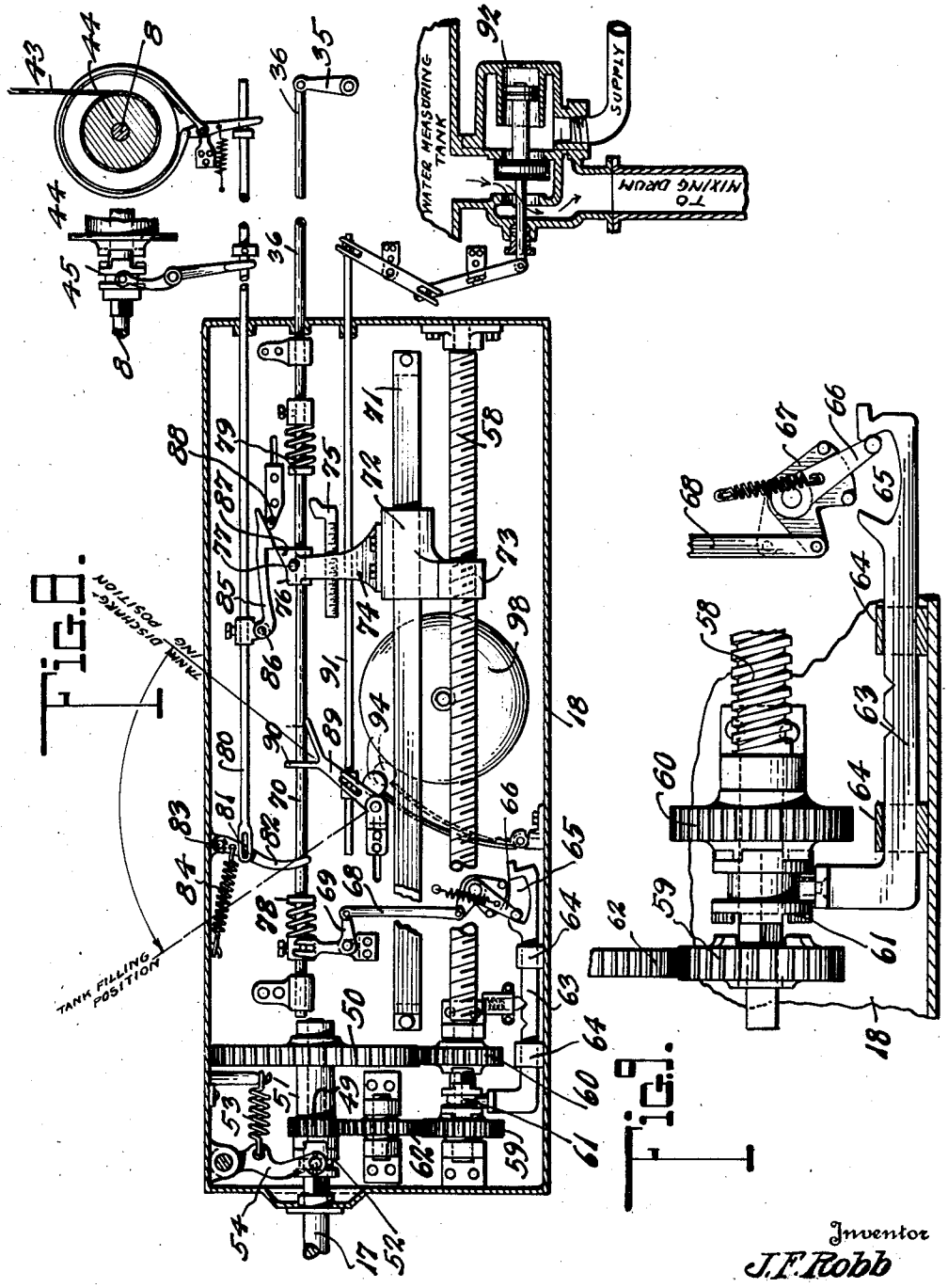

Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE

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AUTOMATIC TILTING-TYPE CONCRETE-MIXING MACHINE

Application filed September 22, 1928. Serial No. 307,580.

There are today in fairly wide usage, concrete mixing machines of the tilting mixer type in which the tumbler drum that mixes the aggregates is adapted to tilt from a mixing position to a discharging position in order to deliver the prepared concrete to any suitable distributing means.

An object of this invention is to provide with a mixing machine of the constantly rotating tilting drum type, means for automatically causing the drum or tumbler to tilt into a discharging position upon the termination of a predetermined mixing period. In attaining this end, I avail of novel control instrumentalities which preferably are power driven from the same power source that rotates the mixer and function to bring into operation certain driving means for tilting the tumbler under power at the termination of the mixing period.

It is a further object of the invention to provide means for automatically causing movement of the mixing tumbler from discharging position back to mixing position after it has been held in discharging position sufficiently long to discharge the contents thereof. This phase of operation of the mixer assumes importance because in the present day manual control of these mxing machines much time is wasted due to the operator maintaining the discharging position of the tumbler longer than is necessary for the discharging operation.

In carrying out the idea noted in the preceding paragraph, I avail of the same control instrumentalities which initiate movement of the drum into discharging position for likewise automatically initiating movement back to mixing position after it has been held in discharging position for a proper period of time. It will be seen therefore that I have provided control instrumentalities which function to automatically throw the drum into discharging position upon the elapse of the mixing period, and then at the elapse of a predetermined discharging period of time again function to automatically throw the drum back to mixing position and in accordance with the advance made by my invention, I propose to have the control instrumentalities function in repeated cycles as above noted, to render automatic the operation of the machine in the phases noted.

In developing my automatic machine my aim has been to provide for the tilting action of the drum to take place under power and to this end driving connections with the power plant of the mixer are provided which connections are under the control of the controlling instrumentalities above noted so that the driving connection is brought into effective operation at the proper times to cause the tilting actions, and with this feature of the invention another particular point of novelty arises. Inasmuch as the control instrumentalities function to initiate movement of the tumbler into either mixing or discharging position, I have provided means for discontinuing action of the power means causing this tilting action immediately the drum reaches its limit of movement in either direction, that is, when the drum is being tilted under power and reaches its discharging position, this means automatically functions to discontinue the drive to the tilting instrumentalities. Likewise, when the drum reaches its mixing position, the drive to the tilting instrumentalities is automatically discontinued.

The conventional construction of this type of concrete mixing machine includes a loading skip the function of which is to charge the mixing drum and an object in view in accordance with the invention is to provide instrumentalities for automatically initiating movement of the charging skip into a position wherein it charges the tumbler with its contents. Needless to say, the hoisting operation of the skip is under power and again I avail of the same control instrumentalities which control the tilting operation of the drum to automatically initiate this upward movement of the skip. In carrying out this idea a little further, it is an object to provide control instrumentalities for automatically initiating downward travel of the skip, and again the same control instrumentalities are employed for this purpose.

A long step forward toward the attainment of utmost efficiency in the operation of machines of this type, is the automatic con-

trolling of the operation of the loading skip and tilting drum in timed relation which is attained by the use of the control instrumentalities as above set forth. These may be properly adjusted so that at the same time the drum is being moved from discharging position into mixing position the skip is being moved from its loading position into its charging position. The overlapping or synchronizing of these actions provides for a big saving in time.

A further advantage provided by my invention is the provision of means for automatically causing the entry of the water for the batch into the mixing drum at the proper time. The same control instrumentalities are availed of to open up communication between the water measuring tank and the mixing drum at the proper time and to close said communication and open up communication between the tank and the water supply means, the well known three-way valve being employed in this connection. This feature is of no little importance inasmuch as the proper mixing of the concrete dictates that the water be in the drum for substantially the entire mixing period and it would not do to have the entrance of this water delayed. Accordingly, my control instrumentalities are designed to automatically cause the water to pass into the drum simultaneously with the discharge of the aggregates from the skip thereinto.

In view of the automatic control for the skip which I desire to provide by this invention, I have provided clutch knock-out means for discontinuing drive to skip hoist means upon the skip reaching its charging position, and also means to control downward travel of the skip so as to maintain the speed of same within a safe limit to prevent damage.

Inasmuch as the use of one of these mixing machines on the job is largely dependent upon the human element with such phases of operation as the loading of materials into the skip and distribution of the concrete, I propose to provide means whereby manual intervention in the operation of the control instrumentalities is accommodated. Should for any reason the skip be not properly loaded or the distributing means employed not properly functioning, this manual intervention means may be operated to cause discontinuance of the action of the automatic control instrumentalities whereby the various phases of automatic operation are at once cut out.

With these and other objects in view such as those associated with the provision of the various instrumentalities, means and connections essential to the building of an automatic machine such as hereinbefore outlined, the invention comprises certain novel construction, combinations and arrangement of parts as will be subsequently specified and claimed.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings wherein,

Figure 1 is a side elevation of a tilting concrete mixer machine made in accordance with this invention.

Figure 2 is an end view partly in elevation and partly in section of the machine shown in Figure 1, taken about on the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a bottom plan view partly in section taken about on the line 3—3 of Figure 1.

Figure 4 is a detail showing in perspective of the drive to the mixing tumbler causing constant rotation of the latter.

Figure 5 is a perspective view somewhat fragmentary, bringing out particularly the automatic means controlling the clutch mechanism that governs the delivery of power to the drum tilting instrumentalities.

Figure 6 is a detail perspective view somewhat enlarged, of the clutch means for controlling delivery of power to the drum tilting instrumentalities.

Figure 7 is an enlarged detail shown in section taken about on the line 7—7 of Figure 5.

Figure 8 is a horizontal section through the control instrumentalities somewhat diagrammatic, bringing out the relation of these control instrumentalities with the various mechanisms they control, and

Figure 9 is an enlarged fragmentary view of certain of the drive means constituting a part of the control instrumentalities.

While a preferred specific form of the invention is herein set forth, it is to be understood that I am not to be limited to the exact construction illustrated and described because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

Referring now to the drawings, particularly Figures 1 and 2, a concrete mixing machine of the tilting type is shown as comprising a frame construction A which is mounted on suitable traction devices referred to as B. Mounted on the main frame A is a power plant C which may take the form of a gasoline engine and which is used to drive the various mechanisms going into the construction. A mixing drum is desigated D and is of the tilting type being carried by the supporting U-shaped arm F which has pivotal mounting in the framework A.

A loading skip G is operable to charge the drum D in a manner to be hereinafter fully set out, and a water measuring tank H func-

tions to deliver measured quantities of water to the mixing drum at proper intervals.

Now directing particular attention to Figures 2 and 3, a main drive shaft 1 takes power from the engines and transmits the same to a pinion 2 to which are affixed for rotation the beveled gears 3 and 4. The shaft 1 will of course have suitable mounting in the frame structure A. A gear 5 is drivably mounted on a shaft 6 having suitable bearing in the frame structure and is in constant mesh with the pinion 2, while a third gear wheel 7 is non-rotatably mounted on shaft 8 which has a suitable bearing in the frame.

Briefly describing the transmission of power to the various instrumentalities and beginning first with the drive for constantly rotating the drum D, bevel gear 4 is in mesh with a complemental gear 9 that is drivably mounted on the drive shaft 10. At the other end, shaft 10 has a bevel gear 11 in mesh with a complemental gear 12 non-rotatably mounted on drive shaft 13. The drive shaft carries at its other end a bevel pinion 14 which is in mesh with the large ring gear 15 which encircles the drum D. Power is transmitted from the shaft 1 through the driving connections just described. The bevel gear 3 meshes with a complemental bevel gear 16 carried by the main control shaft 17 which supplies power to the control instrumentalities located in the casing 18 of my control device.

A sleeve 19 is operatively connected with the drum carrying frame F and this sleeve carries a worm gear 20 with which meshes a worm 21 carried by shaft 22. At its lower end shaft 22 carries a large bevel gear 23 which is in constant mesh with both the bevel pinions 24 and 25 which are loose on the shaft 6. Clutch instrumentalities shown at 26 are operable to clutch the gear 24 to shaft 6 while clutch instrumentalities 27 are operable to clutch the shaft 25 to the shaft 6. These clutches are controlled by operating means comprisng the arm 28 from which upstand yokes 29, one in engagement with each of the clutch instrumentalities 26 and 27 so that either both of the gears 24 and 25 are out of driving relation with respect to the shaft 6, or only one of them is clutched thereto. It is obvious that when the pinion 24 is clutched to the shaft, the worm shaft 22 will be rotated in one direction to cause tilting movement of the drum in a corresponding direction, while clutching of the pinion 25 to the shaft 6 causes a tilting movement in the other direction. When neither of these pinions is clutched to the shaft, the drum is held immovable so far as tilting action is concerned.

A rod 30 has suitable bearing in the frame structure A and carries at its upper end arms 31 defining a sort of yoke as shown in Figure 7, which is operable by engagement therewith of one of the cams 32 carried by worm gear 20 to impart rotation to the rod 30. Adjacent to its lower end this rod 30 carries another arm 33 which is adapted to engage either of the pins 34 to shift arm 28 so as to cause corresponding shifting of the clutches 26 and 27. It might be well to note at this point that this cam 32 engages the arm 31 to cause a movement of both clutches to a neutral position, and one of these cams engages the arm 31 at the moment the tilting drum reaches its limit of tilting movement in either direction, that is, when it assumes either its discharging or mixing position. Movement of the arm 28 to cause a clutching of either of the pinions 24 or 25 to the shaft 6 is caused by actuation of the rod 30 by an arm 35 which is operated from the control instrumentalities in the casing 18 by a link 36.

The skip G carries rollers shown at 37 which operate on tracks indicated at 38. Cables 39 have their ends anchored to the skip G and are taken up on drums 40 drivably mounted on shaft 41. At one end, shaft 41 carries a winding drum 42 on which is wound a cable 43 that is also wound on the skip hoist drum 44. This skip drum 44 is drivably mounted on the shaft 8 so that when the pinion 7 is clutched to the shaft 8 by clutch mechanism shown at 45, power will be transmitted to this drum to cause winding of the cables whereby the skip G is elevated into a position wherein it discharges its contents into the drum D, such as shown by the dotted line position of Figure 2. At one side the drum 44 may be operably connected with a large gear 46 that meshes with a pinion 47 whereby connection with a hydraulic governor indicated at 48 may be provided. This governor may be of any well known type and functions to prevent the speed of the skip in downward travel from exceeding a safe limit.

Control instrumentalities

The control instrumentalities for controlling the operation of the various mechanisms hereinbefore described are all located in the casing 18 and comprise control drive shaft 17 which enters the casing and carries at its inner end a sleeve 51 on which are mounted the gears 49 and 50. Sleeve 51 is clutched to the shaft 17 by clutch mechanism shown at 52 and the driving relation is constantly maintained by spring 53 which affects arms 54 in proper manner to maintain this driving relation. However, the drive to the control instrumentalities may be discontinued by movement of the arm 54 against action of the spring 53, which may be accomplished by a pull on the handle 55 shown at Figure 3, which pull is transmitted through link 56 and arm 57 to the arm 54. A screw shaft 58 has bearing at each end in casing 18 and at one end has freely mounted thereon pinions

59 and 60. A clutch mechanism is shown at 61 which is operable to clutch either of the pinions 59 and 60 to screw shaft 58. Pinion 59 is in mesh with a reverse gear shown at 62 which in turn is in mesh with gear 49, while the pinion 60 meshes directly with the large gear 50. It is apparent that clutch 61 may be operated to clutch either of the pinions 59 or 60 to the screw shaft so that rotation is imparted to the shaft in reverse directions through the mechanism just described and when the driving relation is established through gear 50 and pinion 60, the speed of rotation is very much greater than when the reverse driving relation is established through parts 49, 62 and 59. An arm 63 is slidable in guides 64 in the casing and is connected with the clutch mechanism 61 so that movement of this arm causes movement of the clutch mechanism in one direction or the other. The one end of arm 64 terminates in a part having a recess shown at 65 in which is located an arm 66 of snapover mechanism shown at 67. This snapover mechanism is of conventional construction and functions to quickly throw clutch 61 in one direction or the other. A link 68 connects the snapover mechanism 67 with a bell crank 69, one end of which is carried by a rod 70.

A guide bar 71 is mounted on the wall of the casing 18 and slidable along this guide bar is a slide or block 72. Projecting from one side of the slide 72 is a portion 73 which is threaded and receives screw rod 58. At the other side of the slide 72 is fixed a bracket 74 which carries adjustable thereon an abutment member 75. At its extremity, the bracket 74 terminates in a tubular portion 76 having a bore which receives rod 70. A projection 77 protrudes from this tubular portion.

The rod 70 has adjacent to its connection with the bell crank 69 a spring pressed collar 78 and at its other end a somewhat similar spring pressed collar 79. This rod 70 passes through the wall of the casing and exterior thereof is referred to as the link 36, which operates the clutch mechanisms 26 and 27 to cause tilting action of the drum. The spring pressed collar 79 is adapted to be abutted by the abutment member 75 when the slide 72 moves to the right, while the tubular portion 76 is adapted to abut the collar 78 upon movement to the left.

A rod 80 has slidable bearing in the frame of the casing and at one end has a pin and slot connection shown at 81, with an arm 82 pivoted to the wall of the casing as shown at 83. A spring 84 maintains the pin of the pin and slot connection against one end of the slot in the arm 81. This rod 80 is connected to the skip hoist clutch and also to the skip hoist drum brake and is adapted to be shifted by engagement of the slide member therewith. The projecion 77 is adaped to engage the rod 80 upon movement in a leftwardly direction to initiate upward movement of the skip. A latch member 85 is pivotally carried by the rod 80 as shown at 86 and is adapted to be engaged by a projection 87 upon movement of the slide 72 to the right. This engagement between the projection 87 and latch 85 is discontinued when a pin 88 extending from the side of the casing engages the latch 85, upon shifting of the latter to the right, to discontinue this engaging relationship between abutment 87 and latch 85.

An arm 89 is pivotally mounted to a bracket which is fastened to the wall of the casing and terminates at one end in a yoke 90. This arm 89 has a pin and slot connection with a rod 91 which has bearing in the wall of the casing and which rod is connected with the three-way valve referred to generally as 92 which controls the supply of water to the mixing drum. This three-way valve is of the construction clearly set forth in the patent to Lichtenberg #1,525,100. The projection 77 is adapted to engage either arm or the yoke 90 upon movement in either direction to cause a proper actuation of the three-way valve 92.

A gong is shown at 93 and is adapted to be struck by a hammer 94 to indicate when the mixing period has elapsed and the machine is about to discharge. This hammer 94 is actuated by the abutment of the slide member 63 thereagainst.

Operation

Assuming that the engine is running and the machine is to be started into automatic operation. Materials will be placed in the skip whereupon the handle 55 will be released to start the control instrumentalities into operation. The slide 72 will move to the left or possibly first to the right and then to the left, depending of course upon its original position and the condition of the control instrumentalities. Upon this leftward movement, the projection 77 will strike one arm of the yoke 90 starting the flow of water into the measuring tank. Further movement to the left entails the abutment of this projection 77 with the arm 82 whereby the rod 80 is pulled to the left which action operates the clutch mechanism 45, through suitable connections shown in Figure 8 to cause hoisting action on the part of the loading skip. This leftward movement of the slide 72 continues until the tubular portion 76 abuts the spring pressed collar 78, whereupon the rod 70 is shifted to the left. Through the connection with the arm 35, the clutch mechanisms comprising parts 26 and 27, are operated to start a restoration of the mixing tumbler to mixing position and at the same time through the connections 69 and 68 snapover mechanism 67 and arm 63, the clutch mechanism 61 is operated to reverse the drive on the screw shaft 58, whereupon the slide 72 starts to move rightwardly. The mixing

drum will be moving into its mixing position at the same time the skip is being hoisted and the operations are so timed that mixing drum reaches its mixing position at substantially the same time that the skip reaches its charging position.

On movement of the slide 72 to the right, the projection 77 passes the arm 82 without affecting the latter due to the pin and slot connection 81, but this projection engages one arm of the yoke 90 to shift the same and through the rod 91 the three way water valve 92 is operated to shut off flow of water to the measuring tank and start water flowing from the measuring tank into the mixing drum. After a little more movement towards the right, the projection 87 engages the latch 85 whereby rod 80 is shifted to the right. This releases the brake shown at 93 that has held the skip in its upraised position, and permits the skip to descend under the control of the governor mechanism shown at 48.

The slide 72 continues to move toward the right under action of the screw rod 58, and the abutment 75 engages the spring pressed collar 79 whereupon the rod 70 is again shifted to operate the clutch 61 to reverse the drive on the screw shaft 58 and at the same time arm 35 is shifted so that tilting of the drum towards discharging position is initiated. As previously mentioned upon the drum reaching its discharging position, the drive to the tilting instrumentalities is automatically discontinued. At the same time that the drum is moved into discharging position, arm 63 strikes against hammer 94 causing the latter to strike the gong 93, whereby the audible alarm is sounded to indicate the termination of the mixing period for the batch.

This cycle of operation is repeated just so long as the mechanism is permitted to run. Whenever desired, the handle 55 may be availed of to discontinue the automatic operation of the various mechanisms.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a concrete mixing machine of the class described, the combination, with a mixing drum adapted to be tilted into a discharging position, of driving means for constantly rotating the drum during successive mixing and discharging cycles, and means for automatically tilting the drum into a discharging position.

2. In a concrete mixing machine of the class described, the combination with a mixing drum adapted to be moved into discharging and mixing positions by tilting action, of driving means for constantly rotating the drum during successive mixing and discharging cycles, and means for automatically initiating tilting action on the part of the drum upon the termination of a predetermined mixing period.

3. A concrete mixing machine of the class described, comprising, in combination, a mixing drum adapted to assume discharging and mixing positions, means for constantly rotating the drum, and means for automatically causing the drum to assume a mixing position after it has been held in the discharging position a predetermined length of time.

4. A concrete mixing machine of the class described, comprising, in combination, a constantly rotating mixing drum adapted to be tilted in discharging and mixing positions, control instrumentalities for maintaining the mixing drum in mixing position for a predetermined length of time and then automatically causing it to assume a discharging position and also functioning to maintain the drum in discharging position for a predetermined length of time and automatically initiate movement back to mixing position upon termination of the time period.

5. A concrete mixing machine of the class described, comprising, in combination, a mixing drum tiltable into a position wherein it discharges its contents, a skip for charging aggregates into the drum, and control instrumentalities for controlling the tilting operation of the drum and charging actions of the skip and causing them to take place in timed relation.

6. In a concrete mixing machine of the class described, the combination, with a mixing drum movable into discharging and mixing positions, and a loading skip for charging aggregates into the drum, of means for synchronizing the charging operation of the skip and movement of the drum into mixing position.

7. In a concrete mixing machine of the class described, the combination, with a mixing drum movable into discharging and mixing positions, of power means causing such movements on the part of the drum, and control instrumentalities for automatically affecting the power means whereby the latter is rendered effective at predetermined times.

8. A concrete mixing machine of the class described, comprising, in combination, a mixing drum movable into discharging and mixing positions, power means for causing such movements on the part of the drum, and means for automatically discontinuing delivery of power by the power means for such movements when the drum has assumed either its mixing or discharging position.

9. A concrete mixing machine of the class described, comprising, in combination, a mixing drum, tilting instrumentalities for moving the drum into discharging and mixing positions, a power source for driving the tilting instrumentalities, controlling instrumentalities for automatically initiating delivery of power to the tilting instrumentalities

whereby the drum is caused to move from one position to the other, and means for automatically discontinuing delivery of power to the tilting instrumentalities when the drum has assumed either position as a result of the tilting action.

10. In a concrete mixing machine of the class described, the combination, with a mixing drum tiltable into discharging and mixing position, a loading skip for charging aggregates into the drum, and water supply means for supplying water necessary for the concrete, to the drum, of control instrumentalities for causing the operations of the loading skip and water supply means, and tilting actions of the drum to take place in timed relation.

11. In a concrete mixing machine of the class described, the combination, with a mixing drum tiltable into discharging and mixing positions, of means for constantly rotating the drum, charging means for the drum, and control instrumentalities for automatically causing the drum to assume discharging and mixing positions at predetermined times, said control instrumentalities also functioning to automatically cause charging actions on the part of the charging means at predetermined periods of time, whereby said control instrumentalities constitute a means for automatically causing repeated cycles of operation of the mixing machine.

12. In a concrete mixing machine of the class described, the combination with a mixing drum tiltable into a discharging position, of water supply means for the mixing drum, and control instrumentalities for the water supply means whereby the latter automatically supplies water to the drum at predetermined intervals.

13. In a concrete mixing machine of the class described, the combination with a mixing drum tiltable into discharging position, of water supply means for the mixing drum comprising a water measuring tank and a three-way valve controlling flow of water into and out of the tank, and control instrumentalities for causing operation of the three-way valve whereby water is supplied to the mixing drum at predetermined times and the measuring tank is filled from the supply line at intervals between the delivery of water to the drum.

14. In a concrete mixing machine of the class described, the combination, with a mixing drum tiltable into discharging position for mixing batches of concrete and delivering the same, of means for automatically causing repeated cycles of operation.

15. In a concrete mixing machine of the class described, the combination, with a mixing drum tiltable into discharging position for delivering mixed batches of concrete, of means for automatically causing repeated cycles of operation, and means which automatically function to indicate when batches of prepared concrete are about to be delivered.

16. In a concrete mixing machine of the class described, the combination, with a mixing drum tiltable into dischargng position, of means for charging the drum with aggregates, control instrumentalities for automatically causing tilting action of the drum and operation of the charging means at proper predetermined times, and means manually operable to render ineffective the automatic controlling instrumentalities.

17. A concrete mixing machine of the class described, comprising, in combination, a mixing drum movable into discharging and mixing positions, control instrumentalities for automatically controlling such movement of the discharge drum and causing said movements to take place at predetermined times, and manual means for rendering ineffective the controlling instrumentalities.

18. A mixing machine of the class described, comprising, in combination, a mixing drum tiltable into discharging and mixing positions, instrumentalities for causing such tilting action under power, and control instrumentalities for automatically controlling such tilting action consisting of a block, means for causing movement of the block at an even rate of speed, an abutment member adapted to be struck by the block, and connections between the abutment member and the tilting instrumentalities whereby the engagement of the former by the block initiates tilting action.

19. In a concrete mixing machine of the class described, the combination with a mixing drum tiltable into discharging and mixing positions, of tilting instrumentalities for causing said tilting actions to take place under power, a power source, and control instrumentalities for controlling said tilting actions, consisting of a casing, a screw shaft in said casing, connections between said screw shaft and the power source wherey the former is rotated by the latter, a threaded block on said screw shaft movable by rotation of the latter, an abutment member adapted to be engaged by the block, and connections between the abutment member and the tilting instrumentalities whereby abutment of the former by the block causes delivery of power to the tilting instrumentalities, whereby the mixing drum is automatically tilted into discharging position.

20. In a concrete mixing machine of the class described, the combination with a mixing drum tiltable into discharging and mixing positions, and means for charging the mixing drum with aggregates, of tilting instrumentalities for causing said tilting actions to take place under power, a power source, and control instrumentalities for controlling said tilting actions, consisting of a

casing, a screw shaft in said casing, connections between said screw shaft and the power source whereby the former is rotated by the latter, an abutment member adapted to be engaged by the block, connections between the abutment member and the tilting instrumentalities whereby abutment of the former by the block causes delivery of power to the tilting instrumentalities, whereby the mixing drum is automatically tilted into discharging position, a second abutment member, and connections between said second abutment member and the charging means whereby engagement of the block with the second abutment member causes operation of the charging means to charge the aggregates into the drum.

In testimony whereof I affix my signature.

JOHN F. ROBB.