

March 29, 1927.

1,622,294

J. SAULNIER

MIXING MACHINE

Filed Oct. 16, 1925

2 Sheets-Sheet 1

Fig. 2.

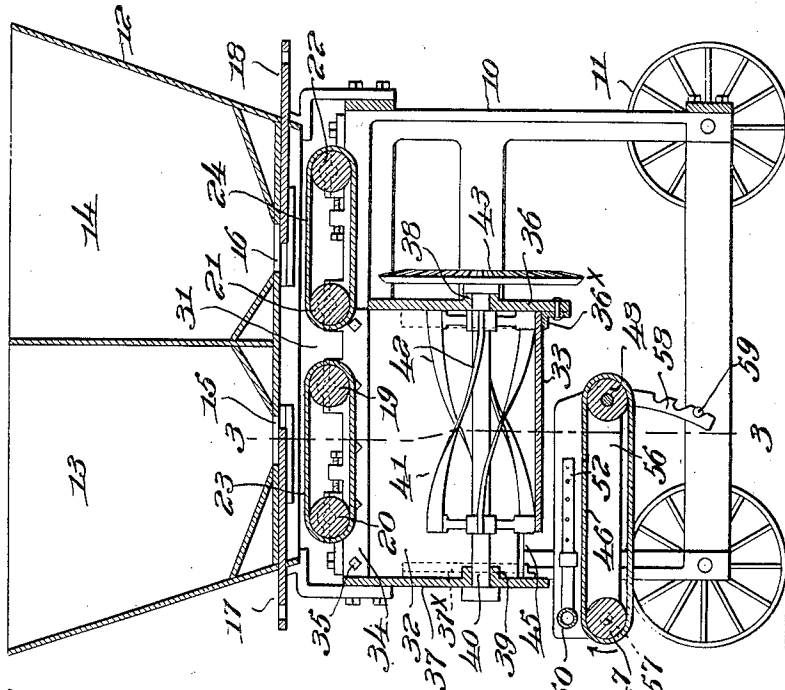
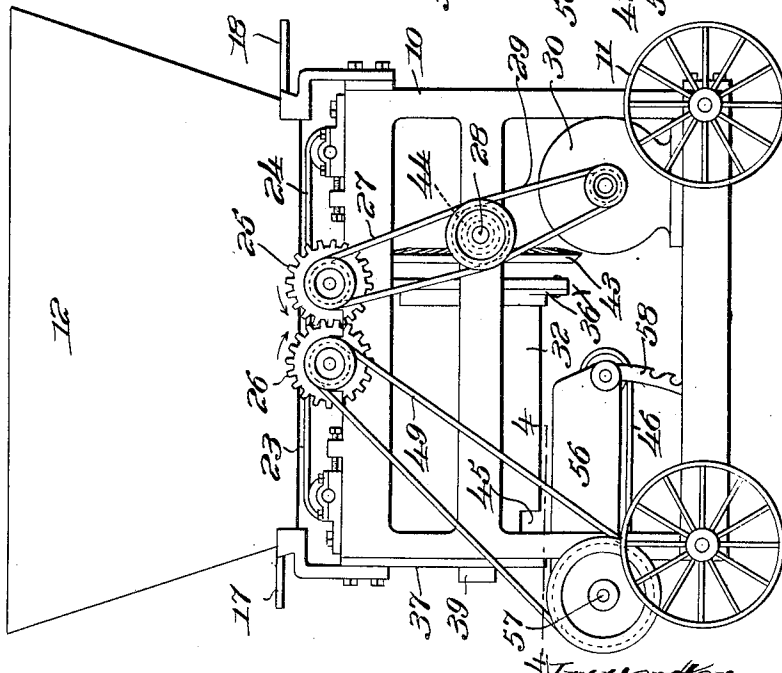


Fig. 1.



In witness whereof:
Joseph Saulnier,
by Edward F. Allen
his Atty.

March 29, 1927.

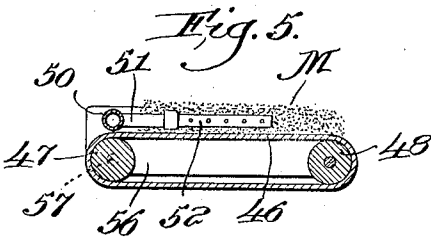
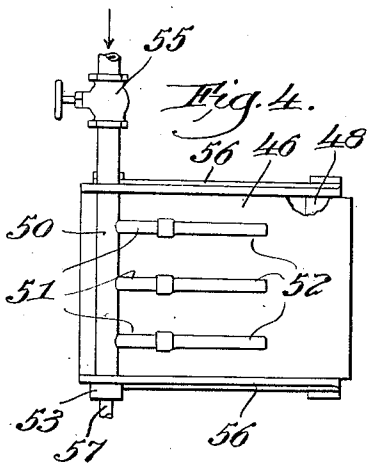
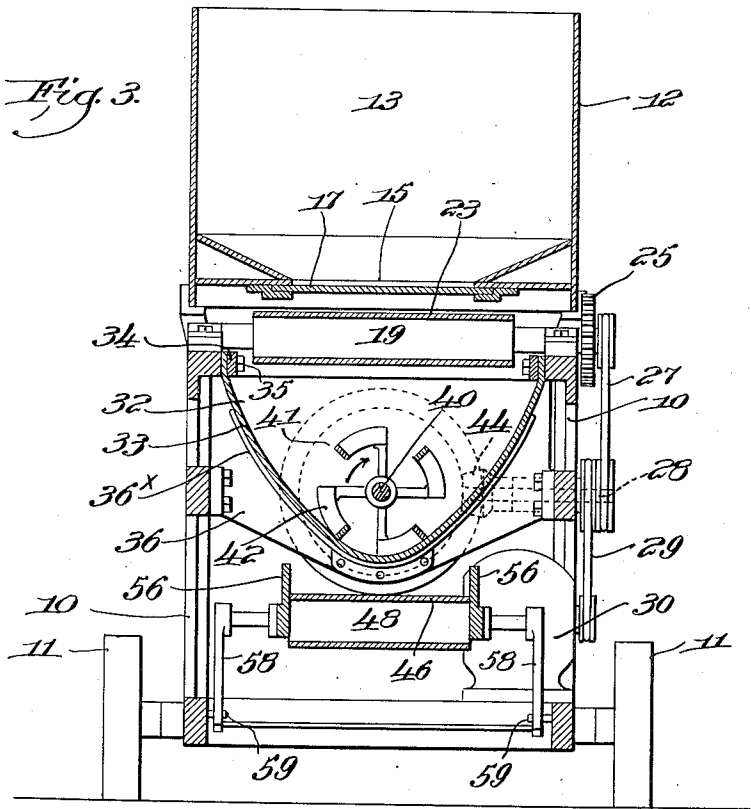
1,622,294

J. SAULNIER

MIXING MACHINE

Filed Oct. 16, 1925

2 Sheets-Sheet 2



In Witness Whereof:
Joseph Saulnier
by Edward F. Allen.
Attest.

UNITED STATES PATENT OFFICE.

JOSEPH SAULNIER, OF NEW BEDFORD, MASSACHUSETTS.

MIXING MACHINE.

Application filed October 16, 1925. Serial No. 62,866.

This invention relates to mixing machines and more particularly to machines for mixing concrete and the like.

It is an object of the invention to produce a machine of the above class that is simple and comparatively light in structure, and consequently cheap to manufacture, but which has the capacity of much larger and costlier, cumbersome machines now in use, and which, when working at its greatest capacity, may be driven by an inexpensive and low power motor.

It is a further object of the invention to so construct a machine of this class that the materials for the mixture are thoroughly mixed while in a dry state, and thereafter automatically passed on to the point where it receives the water or other moistening liquid which is applied thereto in a novel manner.

It is also an object of the invention to produce a mixing machine wherein the receptacle in which the materials are stirred about to cause a perfect mixture thereof has flexible walls which are capable of yielding outwardly, or even stretching, when or in the event that lumps of material become clogged or jammed between the mixing tool or implement and the said walls, which feature is an important one because of the fact that by reason of this construction, breakage of the mixing tool is eliminated, the machine will not be stopped because of clogging of the material, and less power is required to operate the mixing tool.

It is also an object of the invention to produce a mixing machine capable of furnishing a continuous supply of mixed material ready for use so long as the unmixed ingredients are fed thereto.

Another object of the invention is to produce a mixing machine of such construction and arrangement as to be capable of immediate use to deliver small or large quantities of mixed material, notwithstanding the fact that the machine may or may not have been in use immediately before; in other words, it is an object of the invention to produce a mixing machine of such construction and arrangement that the process of cleaning the machine between batches or after the final mixture for a day may be dispensed with.

A still further object of the invention is

to produce a mixing machine of the above type wherein all the material fed to the mixing receptacle will be brought into contact with the mixing implement in its travel therethrough.

A further object of the invention is to so construct and arrange certain parts of the machine with which the wet material contacts that they may be readily freed of the said material in the event that it should harden thereon.

Another object of the invention is to produce a mixing machine wherein the dry ingredients to be mixed are given a preliminary mixing upon their descent into the mixing receptacle proper; and wherein a rotary mixing tool simultaneously agitates the ingredients thereby causing a thorough mixture thereof, and forces it gradually toward an outlet provided therefor.

It is also an object of the invention to so arrange the ingredient supply means that given proportions thereof may be automatically continuously fed to the mixing receptacle, or so long as the ingredient containers are supplied with ingredients, and to so arrange the moistening devices for the mixture that a single operator may leisurely yet efficiently operate the machine to its fullest capacity.

Heretofore in machines of this general type the ingredients were fed to a revoluble drum through an opening in the side thereof, the said drum being provided with vanes fast therewith on the interior thereof, which picked the ingredients up on the upward movement of the vanes and from which they fell off when the vanes reached or neared their highest position, thus causing a mixture of the ingredients with the water or other liquid used, which, by the way, was poured into the drum prior to the rotation thereof.

This method required the use of extremely heavy machinery to withstand the wear imposed thereon, and therefore comparatively high power was required to drive it, and the services of from two to five men were necessary to properly serve it, and batches of mixed material were intermittently and not continuously prepared.

These machines were very cumbersome and could not be readily moved from place to place at short notice and in rapid time, and

accuracy of proportions of the dry ingredients and ingredients and liquid was not uniform, and the cost of the machines was in proportion to their size, weight and capacity.

In view of the last mentioned facts it is an object of the present invention to produce a mixing machine of such construction and arrangement as to be readily moved from place to place and operated by one attendant, and which is preferably driven by an electric motor of low power.

Other objects of the invention will be fully understood from a description of the drawings and the claims hereinafter given.

Of the drawings:

Figure 1 represents a side elevation of one form of mixing machine embodying the invention.

Figure 2 is a vertical longitudinal section through the machine, some of the parts being in elevation.

Figure 3 is a section on the line 3—3 Figure 1.

Figure 4 is a top plan view of certain of the parts seen below the line 4—4 Figure 1.

Figure 5 is a detail of some of the parts shown in Figure 2 under operating conditions.

Like characters represent like parts throughout the several figures of the drawings.

Referring to the drawings:

This invention is an improvement on an application Ser. No. 736,567 and is herein illustrated in connection with a lightly constructed portable machine, but it will be understood that it is not the intention to limit it to the precise construction and arrangement shown, as various changes might be made therein without departing from its spirit and scope.

In the present instance the frame 10 is mounted on wheels 11, and has removably mounted thereon a two-compartment ingredient container 12, one of its compartments 13 being reserved for cement, while the other compartment 14 is reserved for sand, for instance.

These compartments, preferably have bottoms which cause the materials therein to be directed towards outlets 15 and 16 which are controlled as to output by gates 17 and 18, so that accurate and given proportions of dry material may escape therefrom.

At the top part of the frame 10 and directly below the container 12 suitable bearings are provided for the rolls 19, 20, 21 and 22 which carry the endless belts or aprons 23 and 24 respectively.

Fast on the shaft of the roll 21 is a gear 25 which meshes with a like gear 26 fast on the shaft of the roll 19, the said roll 21 being driven in the direction of the arrow

by a belt 27 from a shaft 28 which in turn is driven by a belt 29 from an electric motor 30.

The belts or aprons 23 and 24 are arranged to receive the dry materials from the compartments 13 and 14 and carry them toward each other to a dumping point 31 located between the rolls 19 and 21 where they leave the aprons and receive their first or initial mixing on their descent into the mixing receptacle 32.

The rolls 20 and 22 are so mounted that the bearings therefor may be adjusted to regulate the tension of the aprons 23 and 24 which are preferably of rubber or like material and not susceptible to dampness, and which offer good frictional contact with the rolls so that simple driving means therefor may be employed.

The mixing receptacle 32 in the present instance is of novel construction, comprising a side and bottom portion 33 of flexible and preferably extensible material such as rubber or the like, which may be secured to the frame 10 by cleats 34 and bolts 35.

The end portions 36 and 37 of the said receptacle 32 are preferably of metal and are provided with bearings 38 and 39 for the shaft 40 of a mixing tool or implement 41 herein shown as spirally arranged blades 42.

The said end portions 36 and 37 have stop gap strips 36* and 37* secured thereto, the strip 37* being solidly secured and partaking of the cross sectional shape of the receptacle 32, aids in its support at that end thereof, while the strip 36* is preferably secured only at its lower part as seen in Figure 3, its upwardly extending parts 37^a also partaking of the cross sectional shape of the receptacle, aid in yieldingly supporting it at that end.

Fast on the shaft 40 is a bevel gear 43 in mesh with a bevel pinion 44 fast on the shaft 28, the direction of rotation of which is such as to rotate the implement 41 in the direction of the arrow in Figure 3 of the drawings.

The arrangement of the portion 33 and the implement 41 is such that the blades 42 are brought into light scraping contact with the said portion 33 at the bottom thereof, so that all the material fed to the receptacle will be acted upon by the blades for the mixing process and by them will be forced to traverse the length of the receptacle till the opening 45 at the end thereof is reached where it will fall upon another apron for final treatment.

It has been found that excellent results have been obtained by the use of a flexible receptacle portion such as 33, particularly when crushed stone or grout has been passed through the machine, because of the fact that the portion 33 would yield on occasions

when the stone had a tendency to jam or become clogged between the blades and the said portion, and in yielding the rotation of the implement 41 was not stopped but would pass over the obstacle, or the obstacle was dislodged from its position by the combined action of the flexible portion and the movement of the implement, thus preventing breakage of the implement and delay and curtailment in the output of the machine.

Up to this point the mixing process has been a dry one or approximately so, and since it requires less power to mix the materials when dry than it does when they are wet, it will be readily understood that considerably less power will be required to operate the present machine for a given amount of mixed material than for a like amount produced by the machines at present in use.

Upon leaving the mixing receptacle 32, the now thoroughly mixed dry material falls onto an endless belt or apron 46, which is preferably of rubber or like material and engages the rolls 47 and 48, the roll 47 being driven by a belt 49 from the shaft of the roll 19, its rotation being in the direction of the arrow seen in Figure 2.

At this time it is preferred to add the moistening liquid for which purpose a pipe 50 is installed, which has a plurality of nipples 51 tapped therein, the ends of which are open, and over which, short lengths of tubing 52 of rubber or like material are placed, the said tubing being preferably but not necessarily closed at their free ends, but having a plurality of openings along their sides so that liquid passing into the pipe 50, which has a closed end at 53, will find its way out of the holes to be absorbed into the dry mixture to the extent required.

Figure 5 of the drawings shows the apron 46 as it would appear when the machine is in operation, at which time a quantity of mixed material M has been deposited thereon and to such depth as to bury or completely cover the rubber tubing 52, and preferably so.

It is a feature of the present invention to make the apron 46 of rubber or similar material for the reason that cement will not permanently adhere thereto, and if it should harden thereon, it is very easily dislodged therefrom.

The same is true of the short lengths of rubber tubing which are imbedded in the now moistened mixture, and which if made of metal would accumulate cement to such extent as to become useless after a very short time.

It will be understood that the amount or quantity of liquid flowing to the dry mixture may be regulated by the valve 55 according to the needs of the mixture or speed of the apron 46.

It will also be understood that the travel

of the apron 46 will be timed so that an even depth of dry material will be received thereby from the receptacle 32, and when moistened will be dumped off at the roll 48 into the desired spot, or onto a conveyor or chute not shown herein.

The roll 48 has its bearings at the free ends of cheek plate members 56 which are pivoted on the shaft 57 of the roll 47, the said members serving as confining means for the material travelling with the apron 46, and also serving as means to support the pipe 50 which is fast therewith and intended to maintain its relative position with respect to the apron 46 as shown in Figure 2 of the drawings.

The depth of material M deposited on the apron 46 may be increased by lowering the roll 48 which may be accomplished by changing the relative position of the roll supporting arms 58 with respect to the pins 59 shown in Figures 1 to 3 inclusive of the drawings, the said arms being pivotally arranged on the stud or shaft about which the roll 48 revolves.

Having described the invention I claim:

1. A mixing machine of the class described comprising a frame; containers for the ingredients to be mixed; a mixing receptacle comprising flexible walls; means whereby ingredients from said containers will be conveyed to and dumped into one end of said receptacle; a mixing implement revolvably arranged in said receptacle; means to receive mixed material from said receptacle and convey it to a given point; and means to moisten said mixed material in its transit to a given point.

2. A mixing machine of the class described comprising a frame; containers for the ingredients to be mixed; a mixing receptacle comprising flexible and extensible walls; means whereby ingredients from said containers will be conveyed to said receptacle; a mixing implement in said receptacle; means to receive mixed material from said receptacle and convey it to a given point; and means to moisten said mixed material in its transit to a given point.

3. A mixing machine of the class described comprising a frame; a mixing receptacle supported by said frame; means to supply dry material to said receptacle to be mixed; means within said receptacle to mix dry materials presented thereto; said receptacle having an outlet for the passage of material when mixed; and means to moisten dry mixed material passing from said receptacle, said means being arranged to be covered by mixed material passing from said receptacle; and means to convey mixed and moistened material away from said moistening means.

4. A mixing machine of the class described comprising a frame; a mixing recep-

tacle mounted on said frame; means to supply dry material to said receptacle to be mixed; means within said receptacle to mix dry materials presented thereto; said receptacle having an outlet for the passage of material when mixed and means to moisten dry mixed material passing from said receptacle, said moistening means including flexible perforated tubing arranged to be covered by mixed material passing from said receptacle; and means to convey mixed and moistened material away from said moistening means.

5. A mixing machine of the class described comprising a frame; a mixing receptacle mounted on said frame; means to supply dry material to said receptacle to be mixed; means within said receptacle to mix dry materials presented thereto; said receptacle having an outlet for the passage of material when mixed; and means to moisten dry mixed material passing from said receptacle, said moistening means including a plurality of rubber tubes arranged to be covered by dry material passing from said receptacle; and means to convey mixed and moistened material away from said moistening means.

6. A mixing machine of the class described comprising a frame; a mixing receptacle mounted on said frame and composed in part of sheet rubber, the major portion of which is free to be flexed; and a mixing implement in said receptacle.

7. A mixing machine of the class described comprising a frame; a mixing receptacle mounted on said frame and composed in part of sheet rubber; said receptacle having an outlet for the passage of mixed material passing from said receptacle; a travelling rubber apron arranged to receive mixed material passing from said receptacle; and means to moisten material received by said apron while the material is travelling with said apron.

8. A mixing machine of the class described comprising a frame; a container for materials to be mixed and arranged in a plurality of compartments; said compartments having exits for the passage of material therefrom; a mixing receptacle mounted on said frame; means to receive material passing from each compartment and convey it toward material from another compartment and toward a predetermined dumping point whereby the materials receive an initial mixing at the dumping point and while on its way to said mixing receptacle; a mixing implement revolubly mounted in said receptacle; said receptacle having an outlet for the passage of mixed material; a travelling apron arranged to receive mixed material

passing from said receptacle and to vary the depth of material received by it; and means to moisten the material while being carried by said apron.

9. A mixing machine capable of producing a continuous supply of mixed material, comprising a frame; a container arranged in a plurality of compartments mounted on said frame, each of said compartments having an outlet for the passage of material therefrom; means to vary the amount of material passing through said outlets; travelling rubber aprons arranged beneath said outlets, each arranged to convey its material toward that of another to a predetermined dumping point whereby the dumped materials will receive an initial mixing prior to its entry into a mixing receptacle; a mixing receptacle arranged to receive the material dumped by said aprons; a mixing implement revolubly mounted and arranged to simultaneously mix the materials and cause the mixture to traverse the receptacle toward an outlet therefrom; said receptacle being provided with an outlet for mixed materials; a travelling rubber apron arranged beneath said receptacle outlet to receive material passing therefrom; and moistening means intermediate said receptacle outlet and said last mentioned apron and arranged in the path of mixed material passing from said receptacle outlet and to be covered by said material to thereby start the moistening thereof at approximately midway of the depth thereof.

10. A mixing machine capable of producing a continuous supply of mixed material, comprising a frame; a container arranged in a plurality of compartments mounted on said frame; each compartment being provided with an outlet for the passage of material therefrom; travelling rubber aprons arranged beneath said outlets, each arranged to convey its material toward that of another to a predetermined dumping point whereby the dumped material will receive an initial mixing prior to its entry into a mixing receptacle; means to actuate said travelling aprons; a mixing receptacle arranged to receive material dumped by said aprons; a mixing implement revolubly mounted in said receptacle; means to actuate said implement; a travelling apron arranged to receive mixed material from said receptacle and dump it at a given point; means to actuate said last mentioned apron; and means to moisten material carried by said last mentioned apron.

Signed by me at New Bedford, Massachusetts this 13th day of October, 1925.

JOSEPH SAULNIER,