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PATENTED MAR. 31, 1908.

T. L. SMITH.

MACHINE FOR MIXING CONCRETE AND THE LIKE.

APPLICATION FILED FEB. 24, 1905.

2 SHEETS—SHEET 1.

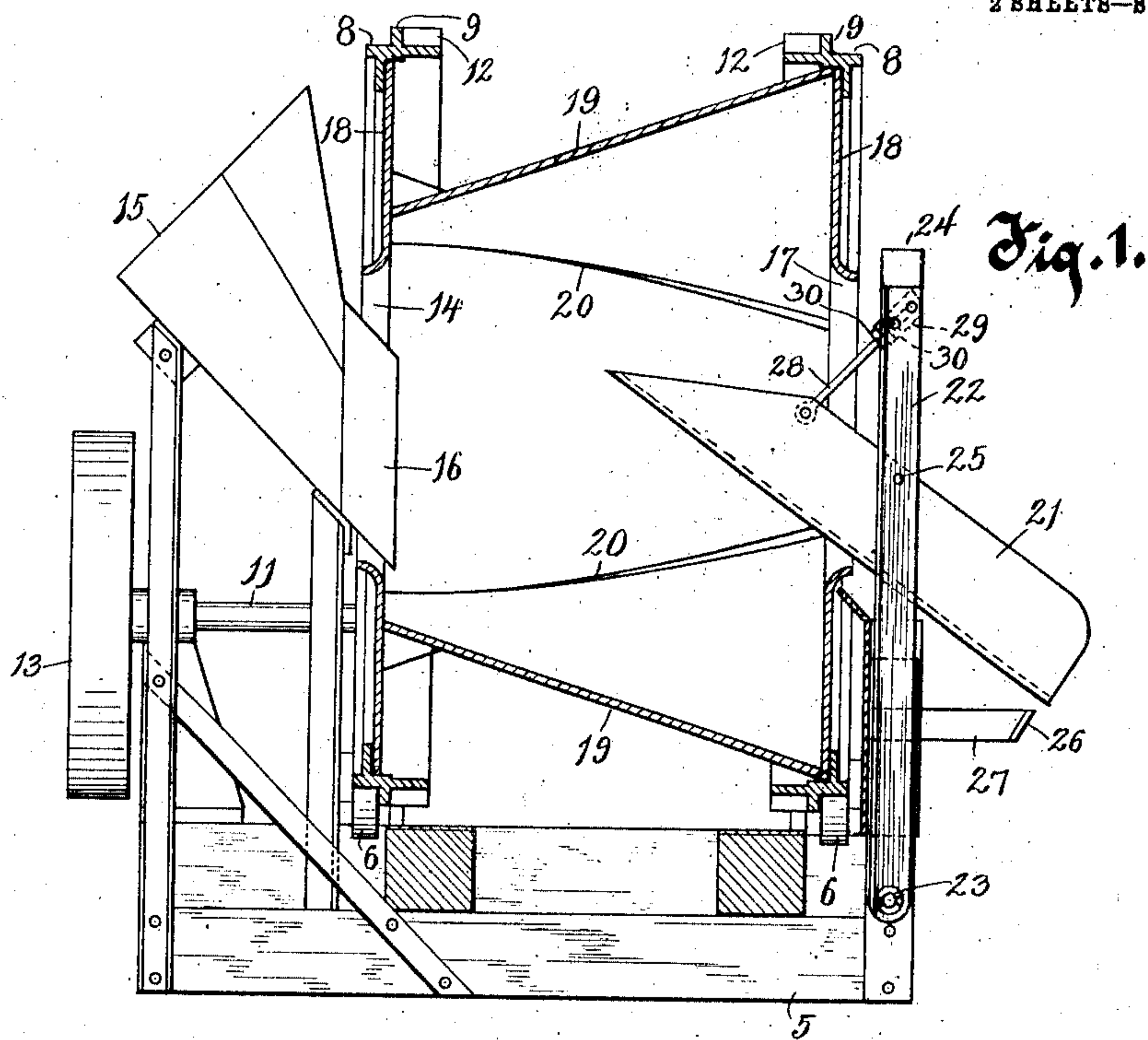
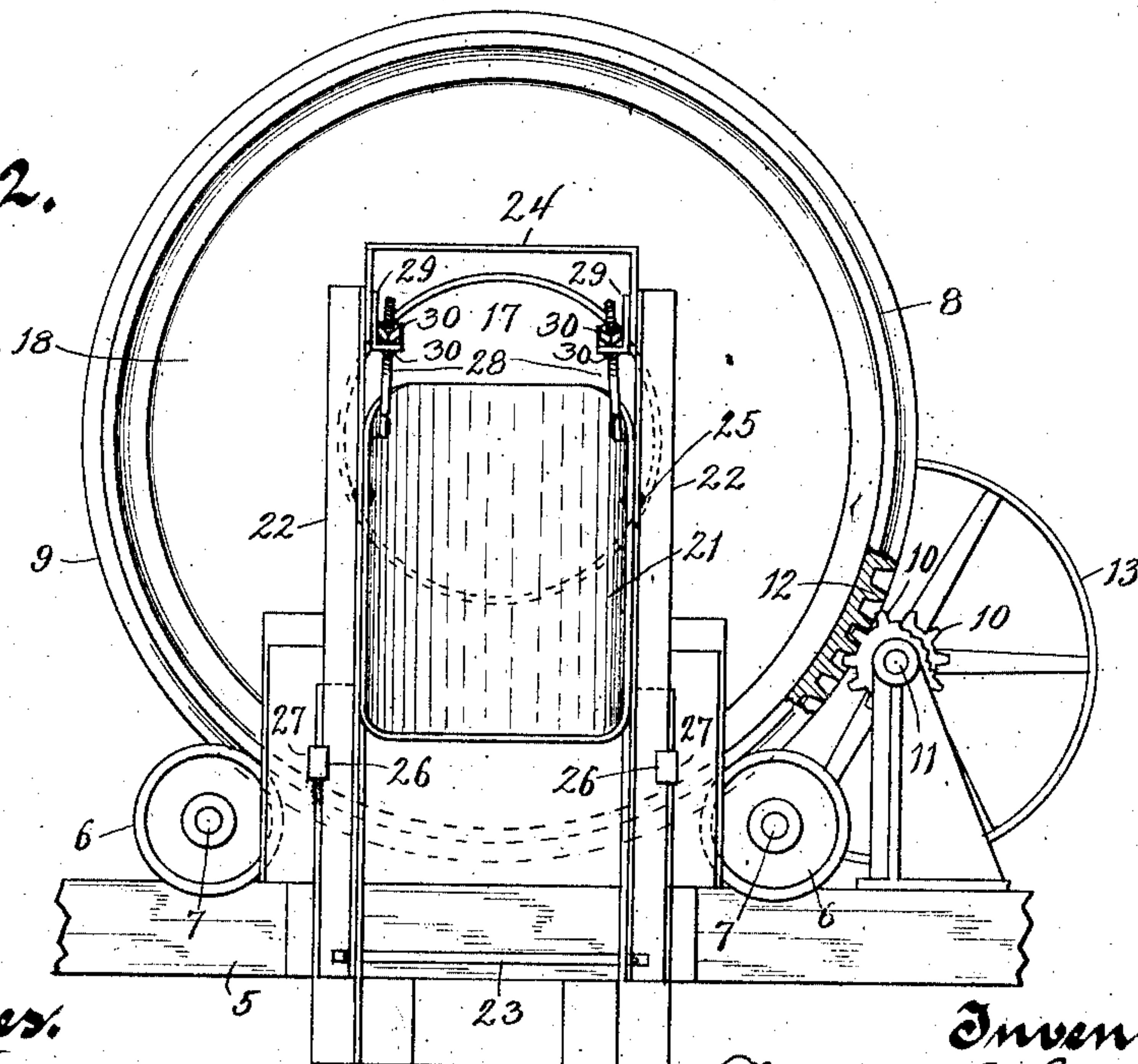


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

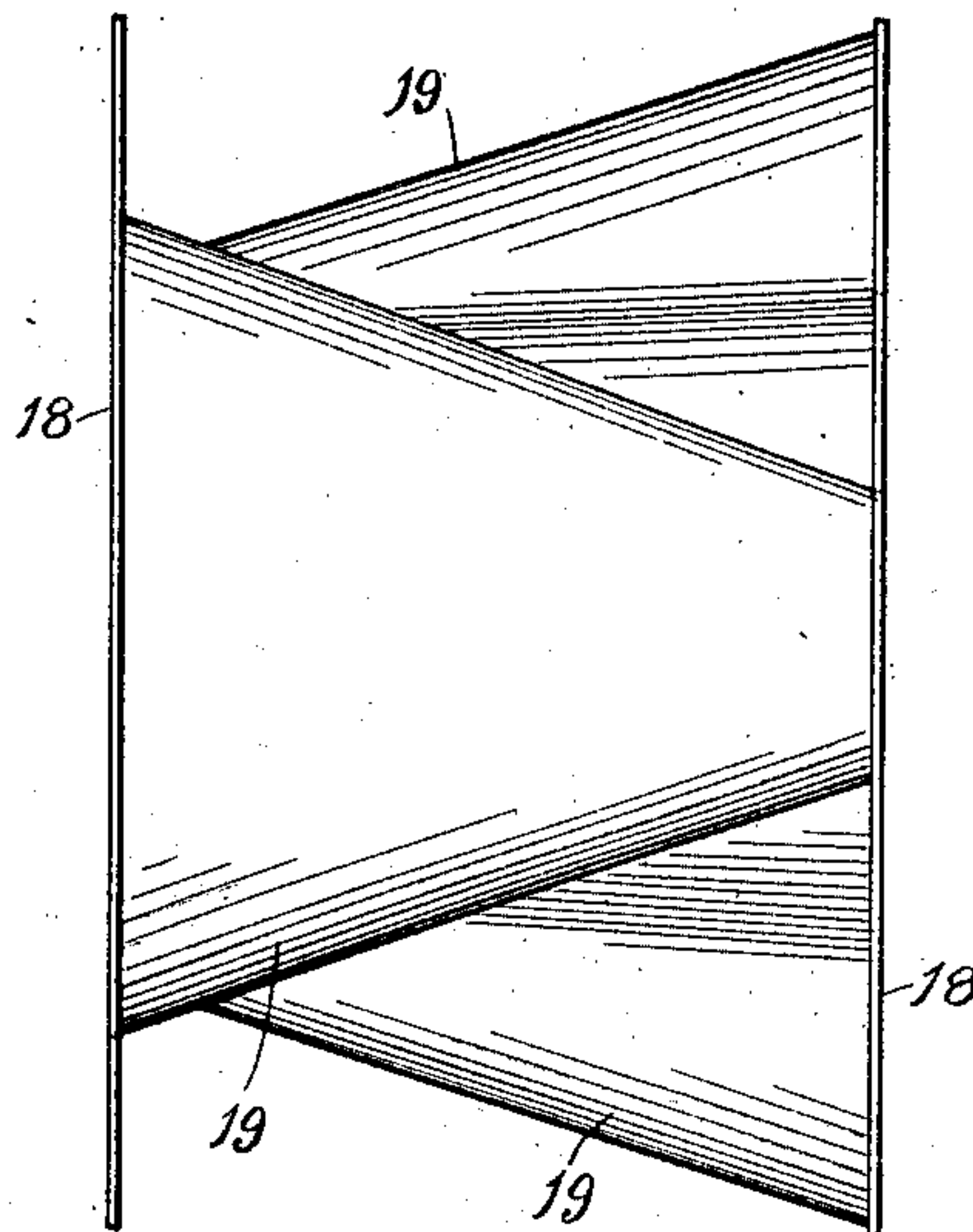
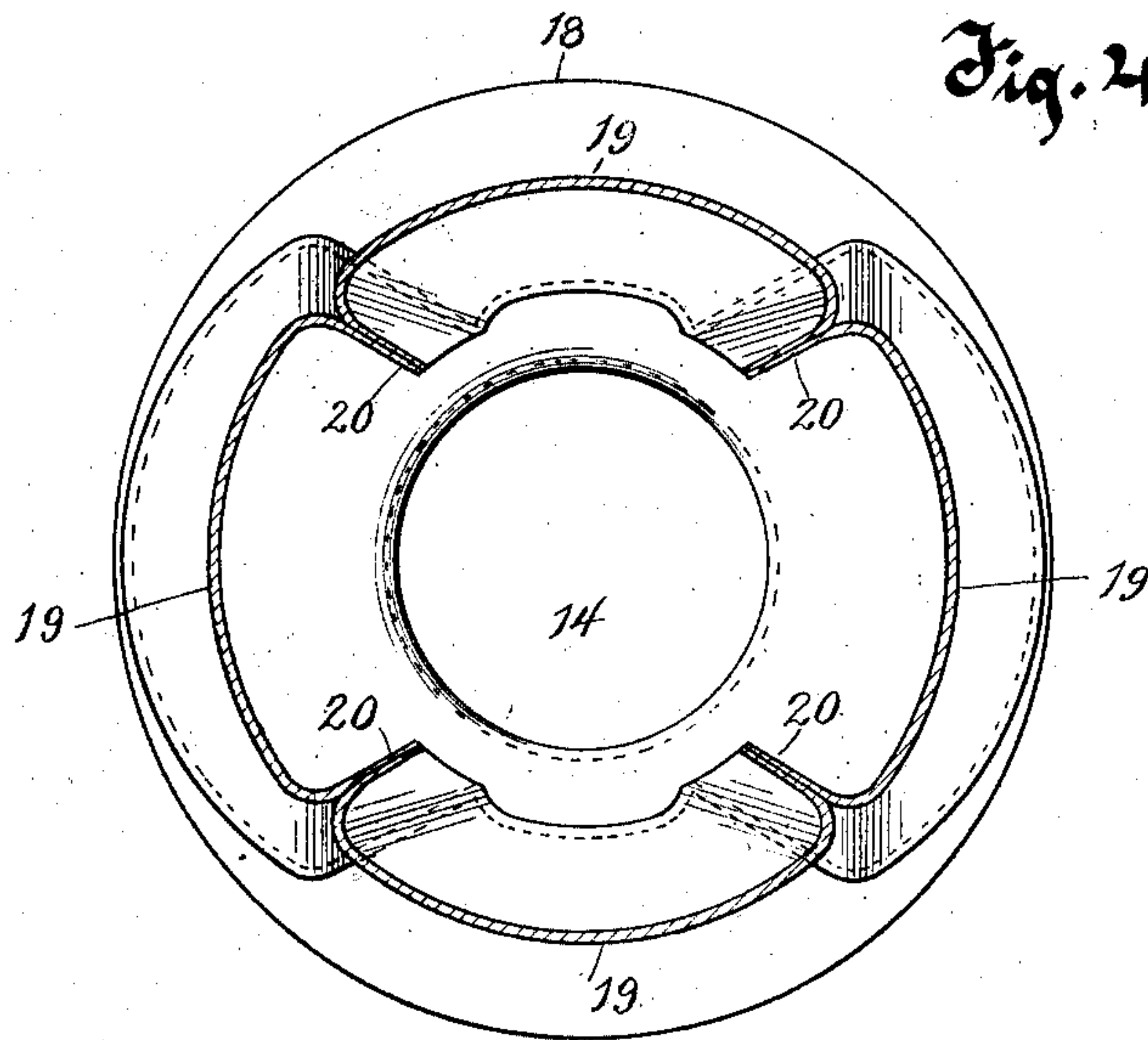


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MIXING CONCRETE AND THE LIKE.

No. 883,498

Specification of Letters Patent.

Patented March 31, 1908.

Application filed February 24, 1905. Serial No. 247,080.

To all whom it may concern:

Be it known that I, THOMAS L. SMITH, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Machines for Mixing Concrete and the Like, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in concrete mixers.

The primary object of the invention is to provide an improved form of mixing receptacle of such construction that, when the machine is in operation, a continuous back and forth cross-wise motion, as well as turning motion, is imparted to the ingredients to be mixed, whereby a rapid, effective and uniform mixing of the contained ingredients is accomplished, without undue jarring and strain on the parts, which is present in the so-called "cubical" mixing receptacles, and also without danger of clogging of the interior, which danger is present in the use of mixing receptacles provided with the ordinary and usual form of interior agitating or mixing blades.

A further object is to provide an improved form of discharging mechanism, which shall not only be capable of effectively and quickly discharging the mixed up batch, but also capable of thoroughly draining itself of any clogging material which may adhere to the bottom thereof.

A still further object is the particular arrangement of the improved form of trough whereby provision is made for discharging from the receptacle desired quantities of the mixed materials.

With the above, and other incidental, objects in view, the invention consists of the devices and parts, or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a side view of the complete device, the receptacle being in section; Fig. 2 is an elevation of the discharging end of the machine, part broken away; Fig. 3 is a detail view of the receptacle; and Fig. 4 is a transverse section through said receptacle.

Referring to the drawings, the numeral 5 indicates a suitable frame work, above the base of which is the mixing receptacle, hereinafter to be described. The receptacle is rotatably supported on rolls 6 which are

loosely mounted on shafts 7, which shafts have their bearings in the frame work. These rolls engage annular rails 8, 8 arranged around the opposite head pieces of the receptacle, said rails provided with flanges 9 projecting at right angles therefrom, and against which rails the inner sides of the rolls bear, the said flanges of the rails preventing side-wise movement of the receptacle. The receptacle is positively driven or rotated by means of two pinions 10, (one only being shown) mounted on a transverse shaft 11, the said pinions engaging annular racks 12, 12 arranged around the heads of the receptacle. These racks are adjacent to and occupy an inner position with relation to the rails 8. As a matter of convenience in construction, each rail 8 and annular rack 12 may be formed on a single annulus or band surrounding the outer edge of each head piece, as shown in the drawings. The transverse shaft 11 is mounted in suitable bearings carried by the frame work, and the said shaft at one end has mounted fast thereon a belt wheel 13, around which a belt (not shown) extending from any suitable source of power is adapted to pass.

One of the head pieces of the receptacle is provided with an opening 14 through which the materials to be mixed may be fed into the receptacle, or in lieu of the materials being fed directly through the opening, a hopper 15 having a spout 16 leading through the opening may be provided. The opposite head piece of the mixing receptacle is provided with an opening 17 for the accommodation of the discharging mechanisms.

The mixing receptacle hereinbefore referred to, comprises the head pieces 18, 18, and the portion between said head pieces, the interior of said portion constituting a mixing chamber, and the head pieces forming closures for the ends of said chamber. This portion between the head pieces is made up of a series of divisions or sections, the main portion 19 of each of which may be specifically described as constituting a section of a hollow truncated cone, with the convex side outermost, and each having its side edges provided with inwardly extending flanges or side walls 20, 20 constituting interior mixing wings or blades. The devices or sections so constructed form mixing buckets and these buckets are so joined together that one will have its wide end extending from one head piece and gradually converged to and connect-

ed with the opposite head piece, while the next adjacent bucket will be disposed exactly the reverse, that is to say, its wide end will extend from the head piece to which the narrow end of the first referred to bucket is connected, and its wide end will extend to the head piece to which the narrow end of the first referred to bucket is connected, and so on alternately throughout the series. In other words, the sections of the hollow truncated cones are so joined together that the narrow end of one will be next to the wide end of the other. The bottoms of all of the buckets are on a gradual incline from the wide ends to the narrow ends thereof. The inwardly extending wings or blades 20, 20 gradually converge toward the narrow ends of the buckets, their convergence corresponding to the convergence of the bottoms of said buckets, and the inner edges of these blades may either point toward the center or axis of the receptacle, or to one side thereof.

By the provision of the construction of interior buckets above described, when rotation is imparted to the receptacle, the action upon the contained ingredients in one bucket is to cause the said ingredients to slide down the inclined bottom of said bucket and against one of the head pieces, the wings or blades 20 assisting and cooperating with the inclined bottom in throwing the material across in the direction of the slant of the bottom. With the continued rotation of the receptacle the ingredients contained in one bucket are dumped into the next adjacent bucket, and the ingredients so dumped into this adjacent bucket are, by reason of the oppositely inclined bottom and the cooperating side wings, deflected in the opposite direction, or toward the opposite head piece, and so on throughout the operation. The material is dumped from one bucket to another, when the bucket from which the dumping occurs reaches, through the rotation of the receptacle, a high enough position to discharge its contents, or a portion of its contents, into the next lower adjacent bucket, the balance of the contents of the discharging bucket being dumped into a bucket therebeneath, when said discharging bucket reaches a still higher position due to the rotation of the receptacle. It will thus be seen that the ingredients to be mixed are not only alternately deflected in opposite directions, but are also given a rotation as the receptacle is rotated, thereby resulting in a most rapid, effective, and uniform mixing of the contained ingredients.

While the discharge of the mixed ingredients in the receptacle may be effected in any desirable manner, yet I prefer to employ the improved form of discharging mechanism illustrated in the accompanying drawings. The several buckets are adapted to dump their contents by gravity into this dis-

charging mechanism, as said buckets or troughs successively assume, in the rotation of the receptacle, an uppermost position, or a position in which their concavities are pointed downwardly. The discharging mechanism referred to consists of a trough 21 which is fixed at an upward incline between two uprights 22, 22, the said uprights being pivoted at their lower ends on a transverse pivot shaft 23 mounted in the frame work. For the sake of strength and rigidity, the upper ends of the uprights are preferably connected by means of a transverse brace 24, which may also be used as a handle for tilting the uprights on their pivot. The sides of the trough pass between the uprights, and are secured to said uprights by means of short bolts or rivets 25. It will be understood that during the mixing operation it is not desirable that the trough should extend through the opening 17 into the receptacle, inasmuch as if it did so extend, the materials or ingredients under process of being mixed would be continually dumped by the buckets into the trough, and thereby interfere with an effective mixing operation. It is for this reason that I mount the trough between the pivoted uprights 22, whereby, by throwing the said uprights outwardly, the inner end of the trough is withdrawn from the opening 17, and when said uprights are turned inwardly the inner end of said trough is carried through the opening 17 and for a desired distance into the interior of the receptacle. When the uprights are thrown outwardly so as to withdraw the trough 21 from the position in which said trough extends through the opening 17, the outward throw of said uprights is limited by contact with stops 26, 26 formed by inwardly extending bends or flanges at the outer ends of projecting arms 27. When the uprights are turned to the position illustrated in Fig. 1 so as to project the trough through the opening 17, the parts are held in this position by the excess overbalancing weight to the left of the center of gravity.

In practice, under certain conditions, it will be desirable to vary or adjust the inclination of the trough 21. This may be accomplished in various ways, but I prefer to effect the adjustment by providing links 28, 28 which at their lower ends are connected to the upper edges of the sides of the trough, near the inner end of said trough. The upper ends of these links pass through openings in angular extensions from brackets 29, 29, which brackets are secured to the inner sides of the uprights, near the upper ends of said uprights. The upper ends of the links are threaded, and on the threads of each link are adapted to turn nuts 30, 30 arranged, respectively, above and below the angular extension of each bracket. It is obvious that by loosening the lower nuts and then

turning the upper nuts in the proper direction, the raising of the links is effected, and consequently the inner end of the trough is raised. When the desired adjustment of the inclination of the trough is obtained, the nuts are again tightened against the angular extensions of the brackets.

When it is desired to effect the mixing operation, the discharging trough 21 is adjusted outwardly as herein before explained. The materials to be mixed are then poured into the hopper 15, and from said hopper pass into the interior of the receptacle. During and after the charging operation, power is applied to the shaft 11 so as to effect the rotation thereof. Shaft 11 acts to rotate the receptacle through the gearing before described, and this rotation of the receptacle causes a thorough agitation and mixing of the contained ingredients by the action of the buckets on said ingredients, as herein before explained. After the mixing operation is effected, the discharge trough is adjusted inwardly through the opening 17, and with the continued rotation of the receptacle, the mixed batch is dumped into the trough 21 from the mixing buckets, and from said trough the said mixed batch is caught in wheelbarrows, or other suitable carrying devices, positioned beneath the discharging end of the trough.

Attention is here directed to the fact that the location of the pivots of the standards below the lower edge of the discharge opening of the receptacle secures most decided advantages. It is frequently important and necessary to regulate the amount of the mixed materials discharged from the receptacle. For instance, under some circumstances it may be desirable that only a bucketful be discharged, while under other circumstances an increased quantity, as for instance a wheelbarrowful, while under still other conditions the full discharging capacity of the trough may be desired. When the latter is the case the trough is thrown into the receptacle to the full extent, as illustrated in Fig. 1. When, however, a less quantity is desired to be discharged the trough is pushed into the receptacle only to a limited extent. This latter will have the effect of projecting the upper end of the trough through the discharge opening of the receptacle to a less extent than shown in Fig. 1 of the drawings, and hence the trough is, under such adjustment, incapable of catching as large a quantity of the mixed batch. The bucket, wheelbarrow or other device in which the mixed materials are to be caught, is placed below the outer end of the trough, and when said device is filled to the extent desired the trough is thrown outwardly so that its inner end will no longer project into the receptacle. In this manner it will be evident that the mixed

batch may be conveniently discharged from the receptacle in regulated quantities to suit requirements. Furthermore, by the particular construction adopted by me in which the trough is held to the trough-supporting device at an upward incline, and the said trough-supporting device is pivoted below the lower edge of the discharge opening of the receptacle, the trough is enabled to drain itself or discharge outwardly all clogging batches which may adhere to the bottom thereof, inasmuch as when the trough-carrying device is thrown outwardly the trough is brought to a position approximating a vertical plane, and hence said adhering particles or batches have every opportunity to slide down and out of the lower end of the trough. Also by reason of the provision for adjusting the inclination of the trough the rapidity of discharge may be regulated.

While the particular form of mixing buckets shown in the accompanying drawings is the preferred form, yet I do not wish to be understood as restricting myself specifically thereto, inasmuch as various modifications may be resorted to without departing from the broad spirit and scope of my invention.

It is to be further understood that it is not intended to restrict the invention to any particular number of the interior buckets, as any desired number may be employed.

What I claim as my invention is:

1. In a mixing machine, in combination with a mixing receptacle having head pieces and a portion between and connected to the head pieces and constituting a continuous rim, the said receptacle provided with a discharge opening, and the rim comprising a plurality of buckets or pockets extending from one head piece to the other and arranged about the receptacle axis, and alternately oppositely inclined with respect to each other from one head piece to the other, of means for charging the receptacle, and means for rotating said receptacle.

2. In a mixing machine, in combination with a mixing receptacle having head pieces and a portion between and connected to the head pieces, the said receptacle provided with a discharge opening, and the portion between the head pieces comprising a plurality of buckets or pockets extending from one head piece to the other and arranged about the receptacle axis and oppositely inclined with respect to each other from one head piece to the other, the said buckets or pockets being rounded, with the convex sides thereof outermost, of means for charging the receptacle, and means for rotating said receptacle.

3. In a mixing machine, in combination with a mixing receptacle having head pieces and a portion between and connected to said head pieces and constituting a continuous

rim, the said receptacle provided with a discharge opening, and the rim comprising a plurality of converging buckets or pockets extending from one head piece to the other
 5 and arranged in reverse order about the receptacle axis, and alternately oppositely inclined with respect to each other from one head piece to the other, means for charging the receptacle, and means for rotating said
 10 receptacle.

4. In a mixing machine, in combination with a mixing receptacle having head pieces and a portion between and connected to said head pieces, the said receptacle provided
 15 with a discharge opening, and the portion between the head pieces comprising a plurality of converging buckets or pockets extending from one head piece to the other and arranged in reverse order about the receptacle axis, and alternately oppositely inclined
 20 with respect to each other from one head piece to the other, and the said buckets or pockets being rounded with the convex sides thereof outermost, of means for charging the
 25 receptacle, and means for rotating said receptacle.

5. In a mixing machine, in combination with a mixing receptacle having head pieces and a portion between and connected to said
 30 head pieces, the said receptacle provided with a discharge opening, and the portion between the head pieces comprising a plurality of buckets or pockets extending from one head piece to the other and arranged
 35 about the receptacle axis and alternately oppositely inclined with respect to each other from one head piece to the other, the meeting edges of said buckets or pockets being extended inwardly to form inwardly projecting
 40 walls, constituting interior agitating wings or blades, of means for charging the receptacle, and means for rotating said receptacle.

6. In a mixing machine, in combination
 45 with a mixing receptacle having head pieces and a portion between and connected to said head pieces, the said receptacle provided with a discharge opening, and the portion between the head pieces comprising a plu-
 50 rality of buckets or pockets extending from one head piece to the other and arranged about the receptacle axis and alternately oppositely inclined with respect to each other from one head piece to the other, the meet-
 55 ing edges of said buckets or pockets being extended inwardly to form inwardly projecting walls, constituting interior agitating wings or blades, and the said buckets or pockets being rounded with the convex sides
 60 thereof outermost, of means for charging the receptacle, and means for rotating said receptacle.

7. In a mixing machine, in combination
 65 with a mixing receptacle having head pieces and a portion between and connected to said

head pieces, the said receptacle provided with a discharge opening, and the portion between the head pieces comprising a plurality of converging buckets or pockets extending from one head piece to the other and
 70 arranged in reverse order about the receptacle axis, and alternately oppositely inclined with respect to each other from one head piece to the other, the meeting edges of said buckets or pockets being extended inwardly
 75 to form inwardly projecting walls, constituting interior agitating wings or blades, of means for charging the receptacle and means for rotating said receptacle.

8. In a mixing machine, in combination
 80 with a mixing receptacle having head pieces and a portion between and connected to said head pieces, the said receptacle provided with a discharge opening, and the portion between the head pieces comprising a plu-
 85 rality of converging buckets or pockets extending from one head piece to the other, and arranged in reverse order about the receptacle axis, and alternately oppositely inclined with respect to each other from one head
 90 piece to the other, the meeting edges of said buckets or pockets being extended inwardly to form inwardly projecting walls, constituting interior agitating wings or blades, said wings or blades converged in the same di-
 95 rection as the convergence of the buckets or pockets, of means for charging the receptacle, and means for rotating said receptacle.

9. In a mixing machine, in combination
 100 with a mixing receptacle having head pieces and a portion between and connected to said head pieces, and said receptacle also provided with a discharge opening, and the portion between the head pieces comprising a
 105 plurality of buckets or pockets extending from one head piece to the other and around the receptacle axis, each bucket or pocket provided with inwardly extending converged walls constituting agitating wings or blades, the said wings or blades of each bucket con-
 110 verging oppositely to the convergence of the wings or blades of the next adjacent bucket, and so on alternately throughout the series, of means for charging the receptacle, and means for rotating said receptacle.
 115

10. In a mixing machine, the combination
 of a mixing receptacle having a discharge opening, a trough-supporting device pivotally mounted below the lower edge of the
 120 said discharge opening, a trough rigidly carried by the trough-supporting device and so secured thereto that when the trough-supporting device is swung toward the receptacle the trough will be projected through
 125 the discharge opening and will catch and discharge the mixed materials whether the trough-supporting device be swung inward to the limit of its movement or to a lesser degree, whereby the trough will catch and dis-
 130 charge more or less of the mixed materials as

may be desired, means within the receptacle for scooping up the mixed materials and depositing the same in the trough during the time the trough is projected into the receptacle, and means for charging the receptacle.

11. In a mixing machine, the combination of a mixing receptacle having a discharge opening, a trough-supporting device pivotally mounted below the lower edge of the said discharge opening, a trough rigidly carried by the trough-supporting device at an upward incline toward the receptacle, and so secured thereto that when the trough-supporting device is swung toward the receptacle the trough will be projected through the discharge opening and will catch and discharge the mixed materials whether the trough-supporting device be swung inward to the limit of its movement or to a lesser degree, whereby the trough will catch and discharge more or less of the mixed material as may be desired, means within the receptacle for scooping up the mixed materials and depositing the same in the trough during the time the trough is projected into the receptacle, and means for charging the receptacle.

12. In a mixing machine, the combination of a mixing receptacle provided with a discharge opening, pivoted standards adjacent to the discharge opening, a trough supported between the standards, said trough when the standards are turned inwardly on their pivot adapted to be projected through the discharge opening and into the receptacle, and when the standards are turned outwardly on their pivot to be withdrawn through the discharge opening from within the receptacle, means within the receptacle for scooping up the mixed materials and depositing the same in the trough, and means for charging the receptacle.

13. In a mixing machine, the combination of a mixing receptacle provided with a discharge opening, pivoted standards adjacent to the discharge opening, a trough supported between the standards, said trough when the standards are turned inwardly on their pivot being adapted to be projected through the discharge opening and into the receptacle, and when the standards are turned outwardly on their pivot to be withdrawn through the discharge opening from within the receptacle, stops adapted to engage the standards when turned outwardly on their pivot, to thereby limit the outward movement of said standards, means within the receptacle for scooping up the mixed materials and depositing the same in the trough, and means for charging the receptacle.

14. In a mixing machine, the combination of a mixing receptacle provided with a discharge opening, pivoted standards adjacent to the discharge opening, an inclined trough supported between the standards, said trough when the standards are turned in-

wardly on their pivot adapted to be projected through the discharge opening and into the receptacle, and when the standards are turned outwardly on their pivot to be withdrawn through the discharge opening from within the receptacle, means for adjusting the inclination of the trough on its supports between the standards, means within the receptacle for scooping up the mixed materials and depositing the same in the trough, and means for charging the receptacle.

15. In a mixing machine, the combination of a mixing receptacle provided with a discharge opening, pivoted standards adjacent to the discharge opening, a trough supported turnably between the standards, said trough when the standards are turned inwardly on their pivot being adapted to be projected through the discharge opening and into the receptacle, and when the standards are turned outwardly on their pivot to be withdrawn through the discharge opening from within the receptacle, rods having their lower ends connected to the inner end of the trough and their upper ends connected to the standards, the connection at one of the ends of said rods being adjustable so as to provide for changing the inclination of the trough, means within the receptacle for scooping up the mixed materials and depositing the same in the trough, and means for charging the receptacle.

16. In a mixing machine, the combination of a mixing receptacle having a discharge opening, a trough-supporting device pivotally mounted below the lower edge of the said discharge opening, an adjustable trough rigidly carried by the trough-supporting device and so secured thereto that when the trough-supporting device is swung toward the receptacle the trough will be projected through the discharge opening and will catch and discharge the mixed materials, whether the trough-supporting device be swung inward to the limit of its movement or to a lesser degree, whereby the trough will catch and discharge more or less of the mixed material as may be desired, means within the receptacle for scooping up the mixed materials and depositing the same in the trough during the time the trough is projected into the receptacle, and means for charging the receptacle.

17. In a mixing machine, the combination of a mixing receptacle having a discharge opening, a trough-supporting device pivotally mounted below the lower edge of the discharge opening, a trough supported by the trough-supporting device at an upward incline toward the receptacle, linked connections between the inner end of the trough and the upper end of the trough-supporting device, the trough being so carried by the trough-supporting device that when said de-

vice is swung toward the receptacle the trough will be projected through the discharge opening, and will catch and discharge the mixed material whether the trough-supporting device be swung inward to the limit of its movement or to a lesser degree, whereby the trough will catch and discharge more or less of the mixed material as may be desired, means within the receptacle for scooping up the mixed material and depositing the same in the trough during the time the trough is projected into the receptacle, and means for charging the receptacle.

18. In a mixing machine, the combination of a mixing receptacle having a discharge opening, a trough-supporting device pivotally mounted below the lower edge of the said discharge opening, a trough rigidly carried by the trough-supporting device and so secured thereto that when the trough-supporting device is swung toward the receptacle,

the trough will be projected through the discharge opening and will catch and discharge the mixed material whether the trough-supporting device be swung inward to the limit of its movement or to a lesser degree whereby the trough will catch and discharge more or less of the mixed material as may be desired, stops with which the trough-supporting device contacts when thrown outwardly to limit the extent of the outward throw, means within the receptacle for scooping up the mixed materials and depositing the same in the trough during the time the trough is projected into the receptacle, and means for charging the receptacle.

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

THOMAS L. SMITH.

Witnesses:

A. L. MORSELL,

ANNA F. SCHMIDTBAUER