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PATENTED AUG. 6, 1907.

L. C. ROBERTS, S. G. McTARNAGHAN & W. H. JEFFS.

CONCRETE MIXING MACHINE.

APPLICATION FILED JAN. 27, 1906.

4 SHEETS—SHEET 1.

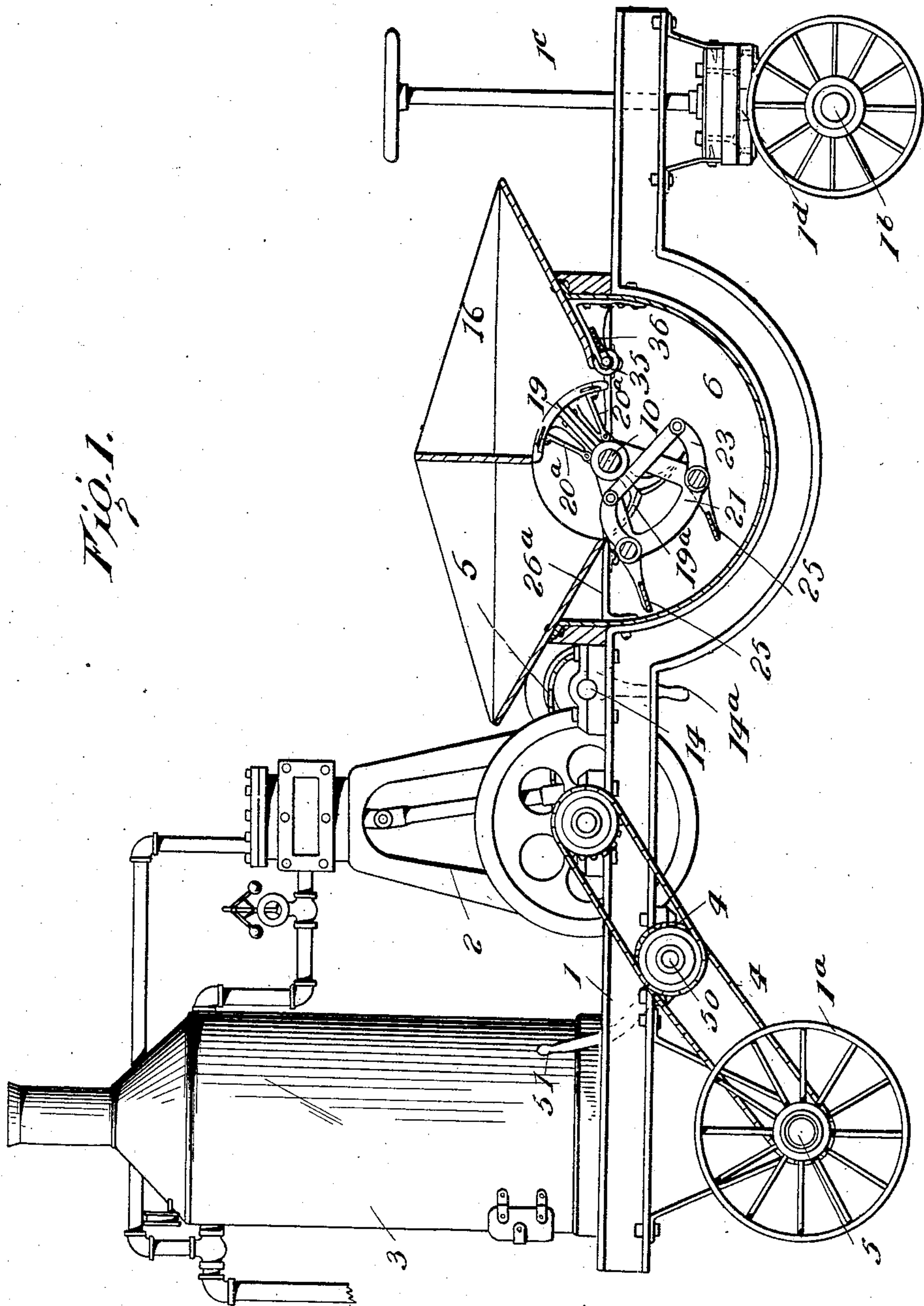


Fig. 1.

Witnesses

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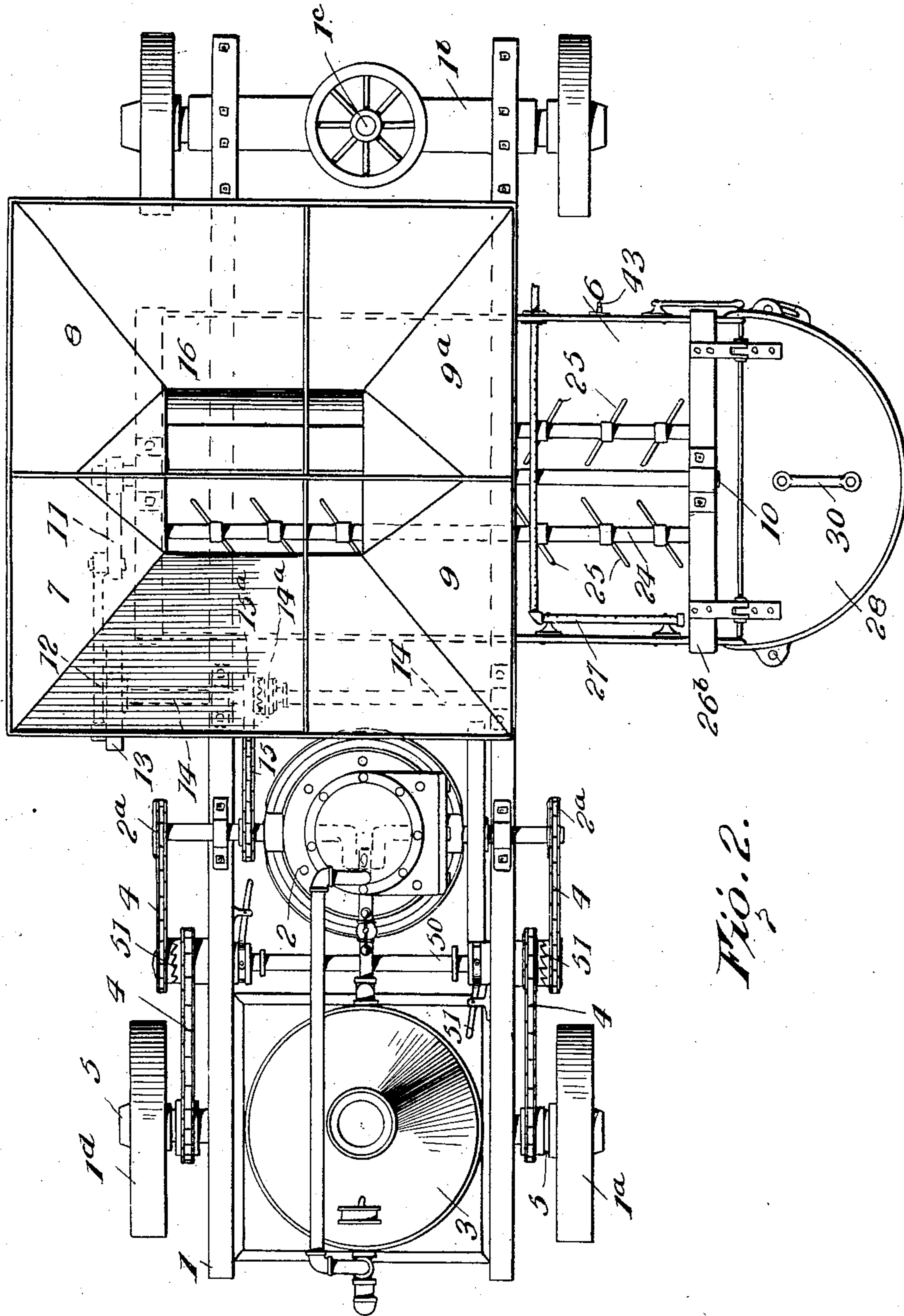


Fig. 2.

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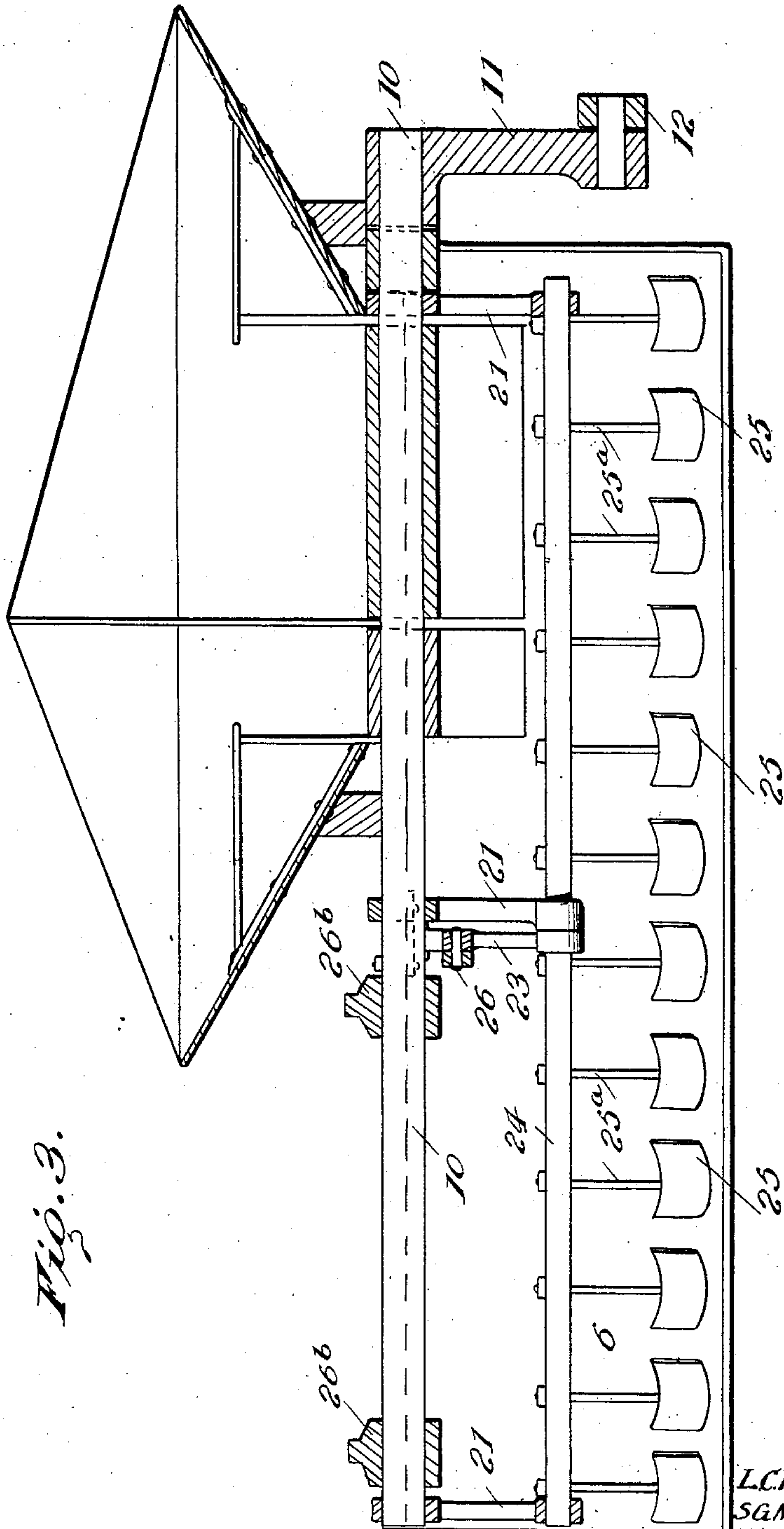


Fig. 3.

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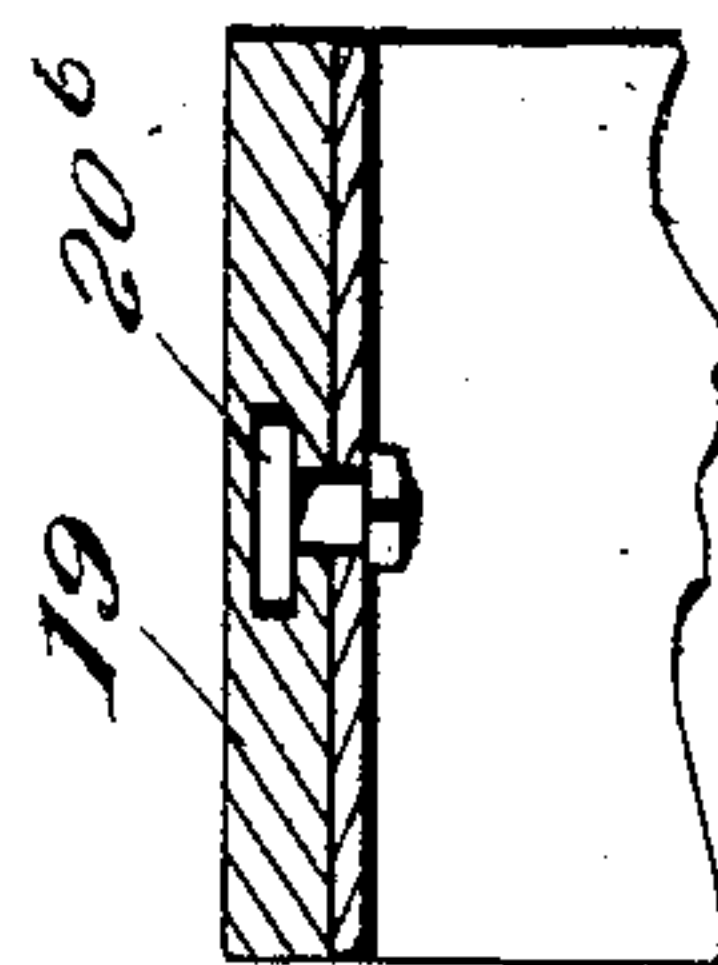
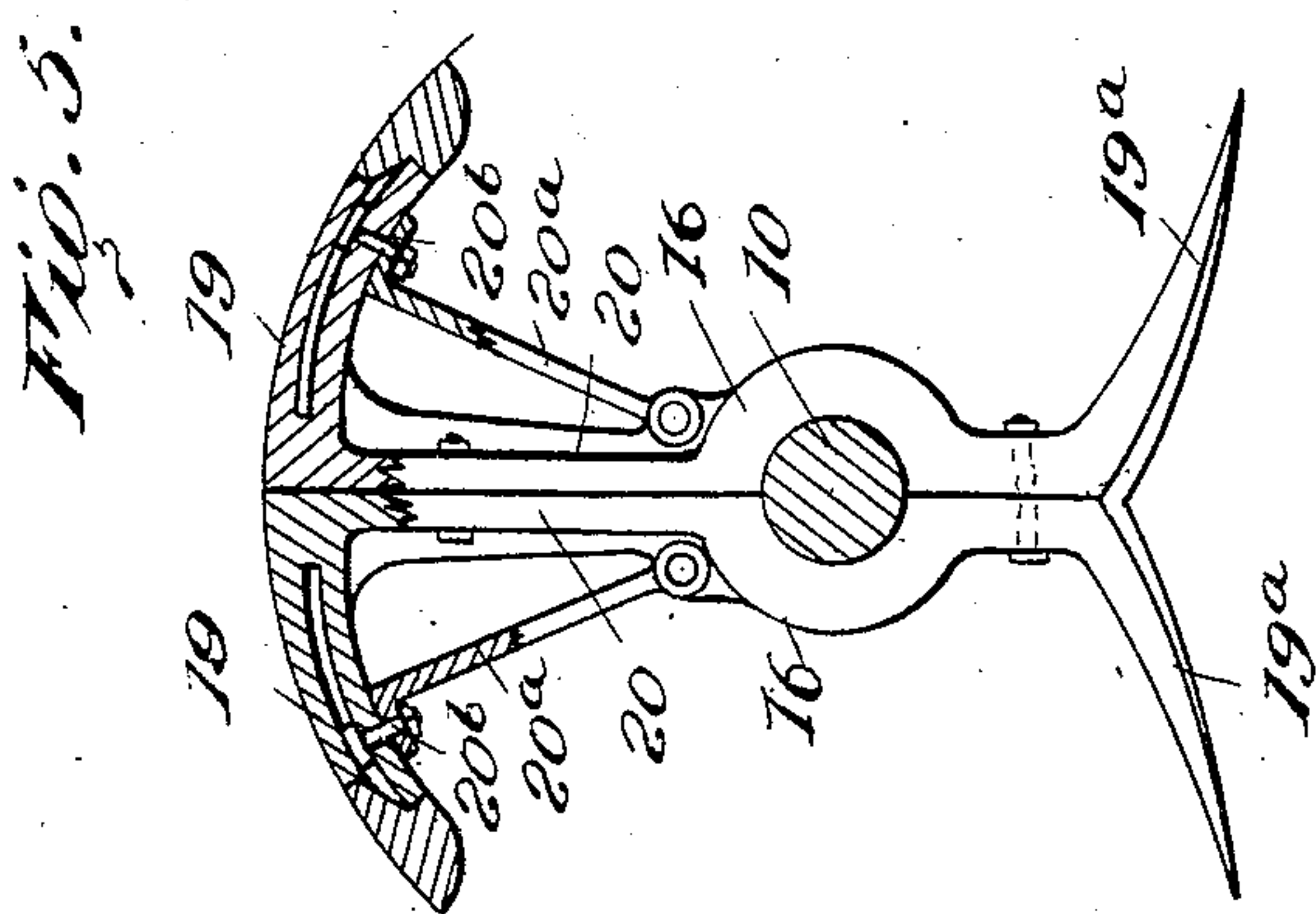
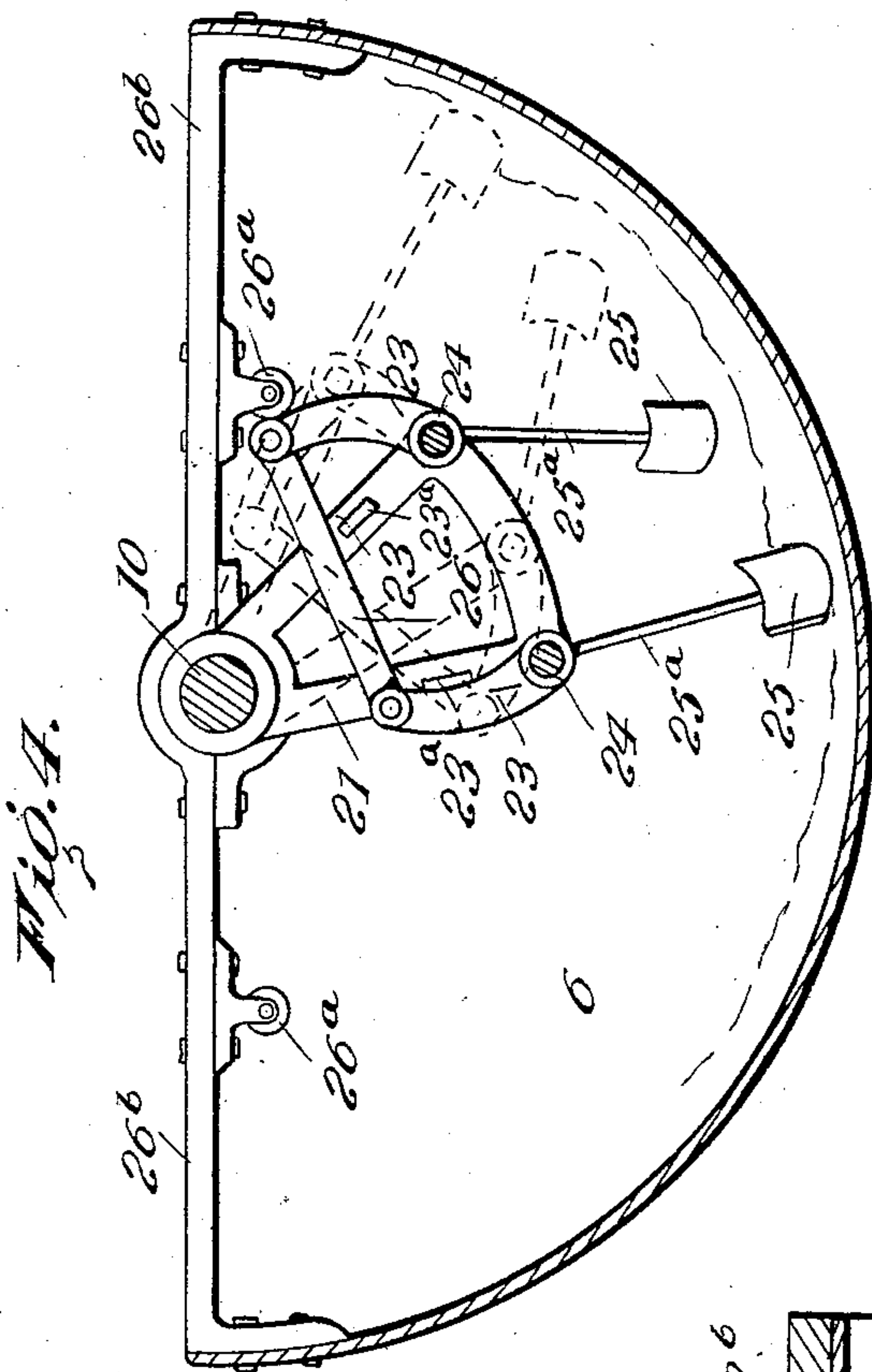
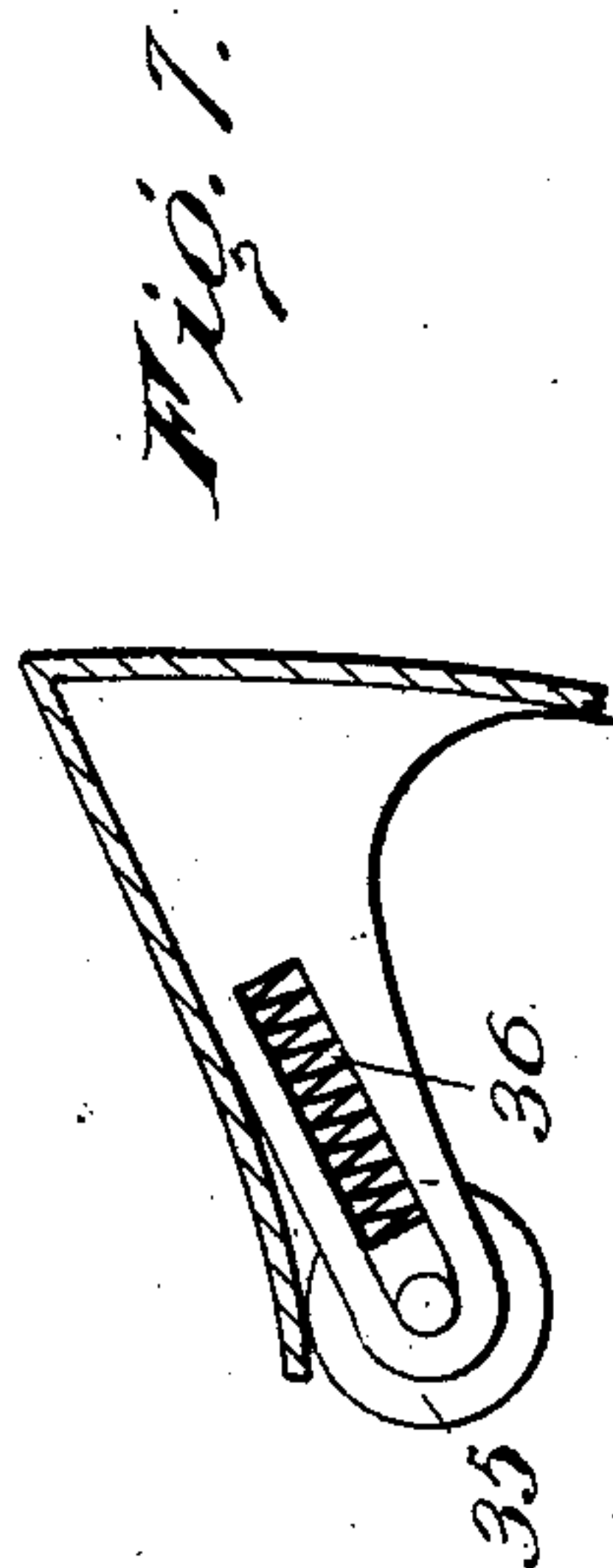
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4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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CONCRETE-MIXING MACHINE.

No. 862,848.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed January 27, 1906. Serial No. 298,269.

To all whom it may concern:

Be it known that we, LEONARD C. ROBERTS, SAMUEL G. McTARNAGHAN, and WILLIAM H. JEFFS, citizens of the United States, residing at Nunda, in the county of Livingston and State of New York, have invented certain new and useful Improvements in Concrete-Mixing Machines, of which the following is a specification.

The object of our invention is to provide a novel and improved mixing machine particularly designed for producing concrete, mortar or the like, and arranged to insure thorough mixing of the ingredients to produce a mass of uniform composition throughout.

The invention consists in certain constructions, arrangements and combinations of parts hereinafter fully described and particularly pointed out in the appended claims.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of our improved mixing machine. Fig. 2 is a plan view thereof. Fig. 3 is a transverse sectional view on an enlarged scale, the section being taken approximately on the line of the shaft that carries the mixing devices. Fig. 4 is a sectional view of the mixing trough and mixing devices, at right angles to Fig. 3. Fig. 5 is a detail sectional view illustrating the feeding devices. Fig. 6 is a detail sectional view of a portion of one of the feeding devices. Fig. 7 is a detail view illustrating the safety slide for the mouth of one or more of the hoppers.

In the practical embodiment of the invention illustrated in the accompanying drawings our improved mixing machine is shown as mounted upon a support 1 which in the present instance is a traveling vehicle that may either be self propelled or drawn by any suitable mechanism from place to place. The traveling support 1 preferably supports, in addition to the mixing machine, the actuating mechanism for the same, and in the present embodiment of the invention, the traveling support 1 is self propelled and is mounted at its rear end upon traveling wheels 1^a and at its front end upon a truck 1^b. The truck 1^b is pivotally mounted so as to direct the movement of the vehicle and is steered by means of a shaft 1^c.

The actuating mechanism for propelling the vehicle and for driving the mixing device may be a prime mover or motor of any description and in the present instance it embodies a steam engine 2 of the vertically reciprocating type carried upon the support 1, and a steam boiler or similar generator 3 also mounted there-

on. The traveling support or vehicle 1 is here shown for the purposes of illustration only, as provided with its own propelling means which includes the prime motor 55 or mover 2, the shaft of which carries sprocket wheels 2^a connected by sprocket chains 4 with similar sprocket wheels on the rear axle 5. Preferably near its forward end the support or vehicle 1 has its body or frame work depressed to form a support for a transversely extending 60 mixing trough 6.

The body of the traveling support 1 carries at its forward end hoppers, which are in the present instance four in number and are designated 7, 8, 9, and 9^a respectively. The said hoppers are designed to contain 65 the different ingredients to be mixed together to form the concrete or mortar and are so mounted in the support that their discharge ends are in registry with the top of the mixing trough, as shown in the drawings. A transverse shaft 10 is mounted in suitable boxings on 70 the body of the vehicle or traveling support 1 and the said shaft extends preferably centrally of the mixing trough 6. The shaft 10 is provided at one end with a crank 11 to which a pitman 12 is connected. The pitman 12 is in turn connected to the eccentric 13 carried 75 by a countershaft 14 which is journaled on the support and extends transversely thereof and is preferably connected to the main shaft of the engine 2 by sprocket and chain gearing 15. By this means it will be understood that as the main shaft of the engine or motor 2 rotates, 80 thereby effecting the rotation of the countershaft 14, the eccentric and pitman connection between said countershaft and the shaft 10 and crank 11 thereof, will effect the rocking of the shaft 10 about its longitudinal axis. The rocking shaft 10 carries feeding devices 85 adapted to operate underneath the discharge ends of the hoppers and to vibrate back and forth to expose first one discharge opening and then the other, as the shaft 10 is rotated back and forth. The feeding devices are designated 16, and as best seen in Fig. 5, they em- 90 body pockets and segmental outer faces 19 which together constitute cut-offs for the discharge openings of the hoppers.

The feeding devices are produced by means of plates bolted together on opposite sides of the shaft 10 and 95 consist of a body portion 20 provided at one end with a segmental arm constituting a cut-off face 19 and provided at its other end with a laterally extending wing 19^a. It is to be noted that the parts 19 and 19^a are on opposite sides of the shaft 10 and together constitute 100 cup shaped receptacles. As the shaft 10 is rocked back and forth, the two faces 19, will first cut off the discharge opening of one hopper, as indicated in Fig. 1, while at this time, the cup shaped receptacle formed

between the parts 19 and 19^a of one of these plates which provides the feeding devices, will be presented to the other hopper and be filled. Then, upon the opposite movement, this material will be dumped down into the
5 trough.

In order to regulate the amount of material that each of the feeding devices shall thus contain and carry down into the feeding trough, each one of said devices is provided with regulating means. This regulating means
10 in the present instance consists of a plate 20^a that is pivotally connected at one end of the body portion 20 near the hub portion thereof and has its other end adjustably secured by means of a set screw and slot 20^b to the under side of the part 19 of the feeding device. By
15 this means the plate 20^a may be swung upon its pivot and held adjusted in different angular positions with respect to the part 20 to which it is attached, so that the cup-shaped receptacle before referred to may be regulated as to size by the said plate or proportioning device. Hence very accurate proportions of the material or ingredients may be determined by regulating the
20 proportioning device 20^a, and uniform amounts may be deposited in the mixing trough.

Preferably at the discharge end of those hoppers
25 which are intended to contain and feed the coarser material, there is mounted a safety slide designated 35. Said slide 35 in the present instance comprises a roller the trunnions of which are mounted to move in a slot 35^a in a suitable bracket at the discharge end of the
30 hopper or hoppers and pressed upon by a spring 36. The roller slide 35 is designed to project out over the edge of the hopper to which it is secured in the path of a feeding device. Hence should particles of the material tend to become wedged between the feeding device
35 and the adjacent edge of the hopper that is being closed by said feeding device, the safety slide will yield and retract so as to increase the opening in the mixing trough and thereby prevent any strain or breakage of the machinery. The roller slide 35 not only prevents
40 breakage but also minimizes friction. It is to be understood that these roller slides are of the same width as the feeding devices with which they coact.

On the shaft 10 are mounted two series of shovels or wings, the wings of each series being set in a plane oblique to the transverse plane of the mixing trough, and the shovels of one series extend oppositely to the shovels of the other series, as shown in Fig. 2. These shovels are designed to mix the materials in the trough 6 and by their angular or oblique relation, to move the
50 materials as they are being mixed, gradually towards the discharge end of said trough. The said shovels or wings, designated 25, are carried upon standards 25^a that are rigidly secured to transverse shafts 24. The shafts 24 are in duplicate and are mounted to turn about
55 their longitudinal axes, and are journaled at their ends and preferably also at their middle in preferably triangular hangers 21 that are secured at their apices rigidly to the shaft 10 and carry the said shafts 24 at their two opposite lower corners as shown. Arms 23 are secured
60 at their lower ends in a rigid manner to the shafts 24 and are connected together at their upper ends by means of a link rod or similar device 26. The arms 23 are provided on their outer sides with cam surfaces which in the present instance are constituted by the curvatures
65 of the arms themselves. Rollers 26^a are mounted in

suitable boxings on the under side of cross bars 26^b extending across the mixing trough, one of said rollers being provided at each side of the shaft 10.

In the practical operation of the two series of mixing shovels, as the shaft 10 is rocked back and forth in the
70 manner above described, it will sweep the two series of shovels bodily back and forth from one side of the mixing trough to the other. As the two series move together, (being both carried by the hangers 21) that series of shovels which is in advance according to the
75 direction of movement, will yield upon contact with the mass of material in the trough whereas the opposite or rearmost series according to the direction of movement will act upon the material and be prevented from moving relatively rearward by means of the re-
80 spective arm 23 of that series bringing up against the block or abutment 23^a on the intermediate or middle hanger 21. Thus the rearmost series of shovels according to the direction of movement will be held in a rigid manner upon the hangers and will both agitate and
85 commingle the ingredients. It is important to note, however, that the arrangement of parts is such that at a predetermined point in the sweep of the two series of shovels, one of the rollers 26^a will come into contact with the upper end of the more advanced arm 23 and,
90 in the continued sweep of the series will cause the arm to ride as a cam upon said roller. This action will cause, at this predetermined point, and by means of the connection 26 between the two arms 23, the foremost series of shovels to be brought out of its inoperative
95 relation to an operative relation, while at the same time the other or rearmost series of shovels will be swung upwardly and cut up sharply through the ingredients so as to assume an inoperative position with respect to the mass of ingredients. Then, upon the
100 reverse swing of the two series the other roller 26^a and arm 23 will effect a corresponding movement of the parts. Hence it will be seen that at a predetermined interval in the sweep of the two series of shovels, they
105 automatically change their respective positions, so that one series is moved from an inoperative to an operative position, while the other series is simultaneously moved from its operative to an inoperative position.

As shown in Fig. 2, a water pipe 27 is mounted in
110 such relation to the trough 6 at the discharge end of the same, that, being connected to a suitable water supply, it may discharge jets of water or steam into the mass contained in said trough, it being understood that the ingredients are first mixed in a dry state after
115 leaving the feed hoppers and are finally mixed with water just previous to being discharged from the mixing trough. The discharge end of the mixing trough 6, is provided with a gate 28 which may be hinged to one of the beams 26^b, and which may be provided with
120 a handle 30. At their outer ends the pins 29 extend through openings 40 in the end gate 28. If it be desired to hinge the end gate 28 this may be done by means of knuckle joints 31 and 39 secured respectively to the end gate 28 and one of the beams 26^b. When
125 the end gate is thus hinged, its lower or free end may be held in different angular positions by means of a ratchet bar 41 pivoted to a side of the mixing trough at 42 and designed to extend through an opening 44. When not in use the said bar may be swung back in a
130

socket 43. 30 designates a handle attached to the said end gate 28.

Any form of clutch mechanism or reversing gear may be employed with the improvements of our invention. For the purposes merely of illustrating an operative construction, we have shown a friction clutch 14^a on the counter shaft 14, said clutch being arranged for engagement with the sprocket wheel 15^a on said shaft by any desired means actuated from any desired point of the machine. By this means the mixing part of the apparatus may be started and stopped at will. A counter shaft 50 may also be interposed in the gearing between the main shaft of the motor 2 and the axle 5 and said shaft may also be provided with suitable friction clutches 51 actuated at any convenient point so as to couple or uncouple the motor and the axle to start and stop the vehicle whenever desired.

As the operation of the respective parts of our improved mixing machine has been described along with a description of the construction, further detailed description of the operation is believed to be unnecessary, as the operation of the entire machine is manifest from the foregoing, to any one versed in the art to which this invention appertains.

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

1. A mixing machine comprising a support, a mixing trough thereon, a hopper mounted on said support above the mixing trough, a rocking shaft, means for rocking the shaft, two series of alternately acting mixing devices carried by said shaft, and oppositely acting feeding devices also carried thereby and designed to open and close the discharge end of said hopper.
2. A mixing machine comprising a support, a mixing trough thereon, a shaft mounted on said support, means for rocking said shaft back and forth, two series of mixing devices carried by said shaft and extending into the said trough, and means whereby each series will alternately yield in one direction only, as and for the purpose set forth.
3. In a mixing machine, the combination of a mixing trough, two series of mixing devices mounted therein, means connected therewith for sweeping said devices back and forth in said trough, and means connected with said mixing devices for permitting the advance series to yield while the other series remains rigid.
4. In a mixing machine, the combination of a mixing trough, two series of mixing devices mounted therein, means connected therewith for sweeping both series of mixing devices simultaneously back and forth in said mixing trough, and means connected with said mixing devices for automatically causing the series to alternately assume different positions at the end of the sweep.
5. In a mixing machine, the combination of a mixing trough, two series of mixing shovels mounted thereon, means connected therewith for sweeping both series simultaneously back and forth in said mixing trough, both series being arranged to rock relatively to the support that carries them, means connected with said mixing shovels for permitting the advancing series to yield upon contact with the material in the trough, means for holding the other series unyielding, and means for automatically and at a predetermined point causing the said unyielding series to yield and said yielding series to become unyielding.
6. In a mixing machine, the combination of a mixing trough, a transverse shaft mounted therein, hangers carried by said shaft, means for rocking the said shaft back and forth to oscillate said hangers, two series of shovels

mounted to rock on said hangers, a connection between the two series whereby they will rock simultaneously, and means for permitting that series of shovels which is foremost, according to the direction of movement, to yield while the other series remains unyielding.

7. In a mixing machine, the combination of a mixing trough, a rock shaft mounted therein, hangers carried by said shaft within the trough, two shafts carried by said hangers and mounted to turn therein, two series of shovels carried by said shafts, arms secured to said shafts, a connection between said arms whereby the two series of shovels will rock or oscillate simultaneously, and means arranged to contact with the advancing arm whereby to change the relative positions of both series of shovels, as and for the purpose set forth.

8. In a mixing machine, the combination of a mixing trough, a rocking shaft mounted therein, means for rocking said shaft, hangers secured to said shaft, shafts or rods mounted to turn in said hangers, two series of shovels, each series being carried by one of said shafts or rods, arms connected to said shafts or rods and provided with cam surfaces and projecting upwardly from the said rods, a connection between said arms, and rollers supported by opposite sides of said shaft and arranged to contact with said cam surfaces at a predetermined point to alternately change the relative positions of said series.

9. In a mixing machine, the combination with a trough, mixing devices therein, and hoppers arranged to discharge their contents to the mixing devices, of a rocking shaft on which the mixing devices are carried, means for actuating said shaft, and feeding devices also carried by said shaft and adapted to open and close the discharge ends of said hoppers, said feeding devices being located on the shaft in a substantially diametrical relation to the mixing devices, whereby as the mixing devices and feeding devices are rocked back and forth, the material will be fed into the trough in advance of the mixing devices and for ready action thereby.

10. In a mixing machine, the combination with a trough, mixing devices therein, and a hopper arranged to discharge its contents to the mixing devices, of a feeding device designed to open and close the discharge end of said hopper, and constituting a receptacle arranged to receive the material and carry it positively into the trough, a rocking shaft upon which the mixing devices are carried, and means for rocking said shaft back and forth, the feeding device having a segmental end constituting a cut-off for the discharge end of the hopper, said end being located with respect to the shaft in diametrical relation to the mixing devices, as and for the purpose set forth.

11. In a mixing machine, the combination of a trough, a series of mixing devices mounted therein, means for sweeping both series of mixing devices simultaneously back and forth in said mixing trough, means whereby one series of shovels is permitted to yield and the other series held unyielding with the two series moving in one direction, and means for automatically causing the series to alternately assume different positions at the end of the sweep and to cause the unyielding series to cut up sharply through the material.

12. In a mixing machine, the combination of a mixing trough, two series of shovels mounted therein, oscillating supports for said shovels, the shovels being mounted to rock on their supports, means for oscillating said supports whereby to sweep the shovels back and forth in the trough, and means for automatically causing the series to alternately assume different positions with a rocking movement, relative to their supports, at the end of the sweep.

In testimony whereof we affix our signature in presence of two witnesses.

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WILLIAM H. JEFFS. [L. S.]

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