No. 854,029. PATENTED MAY 21, 1907.

J. D. CAMPBELL.

MIXING MACHINE.

APPLICATION FILED FEB. 23, 1906.

4 SHEETS—SHEET 1.

Fig. 1.

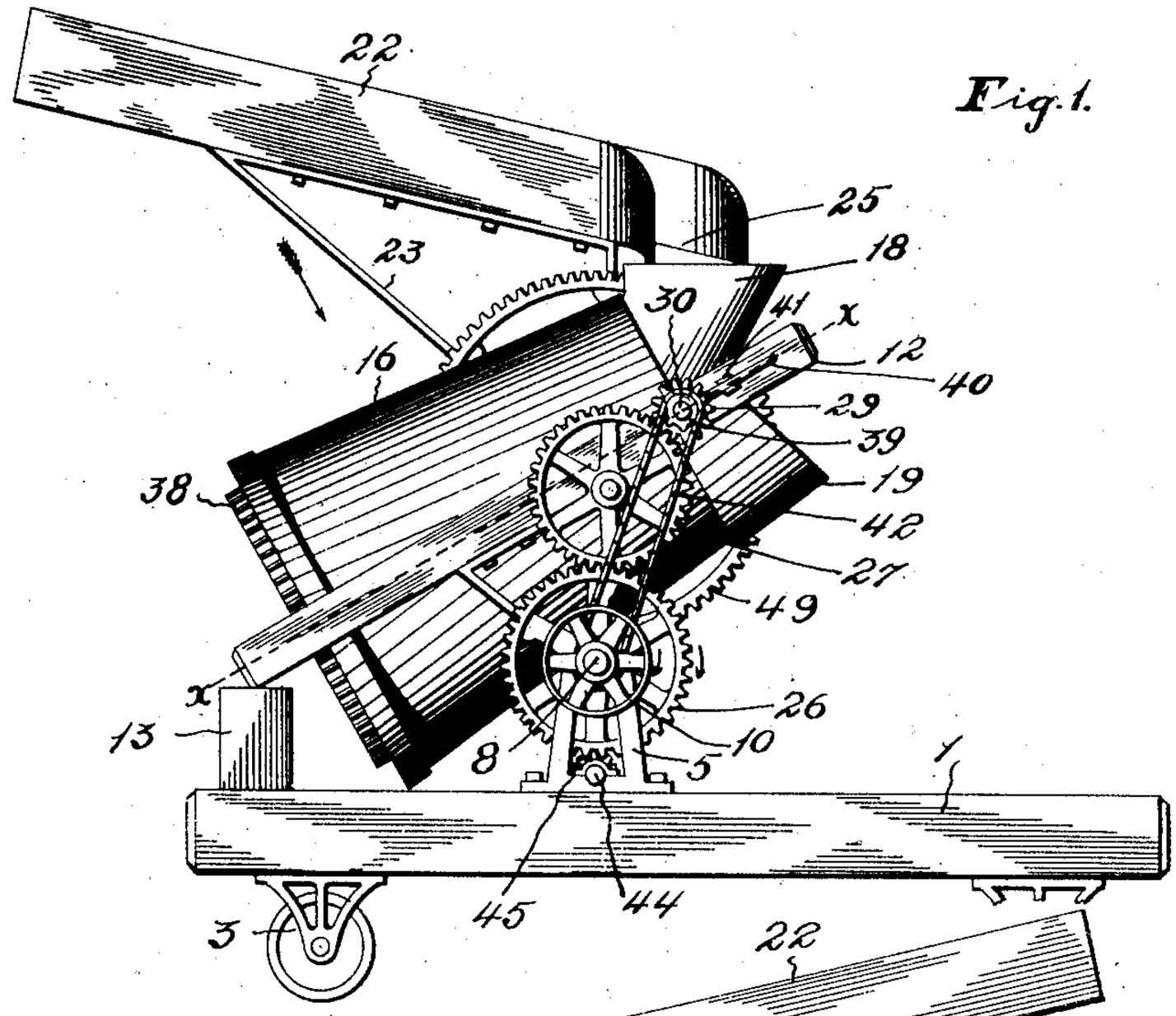
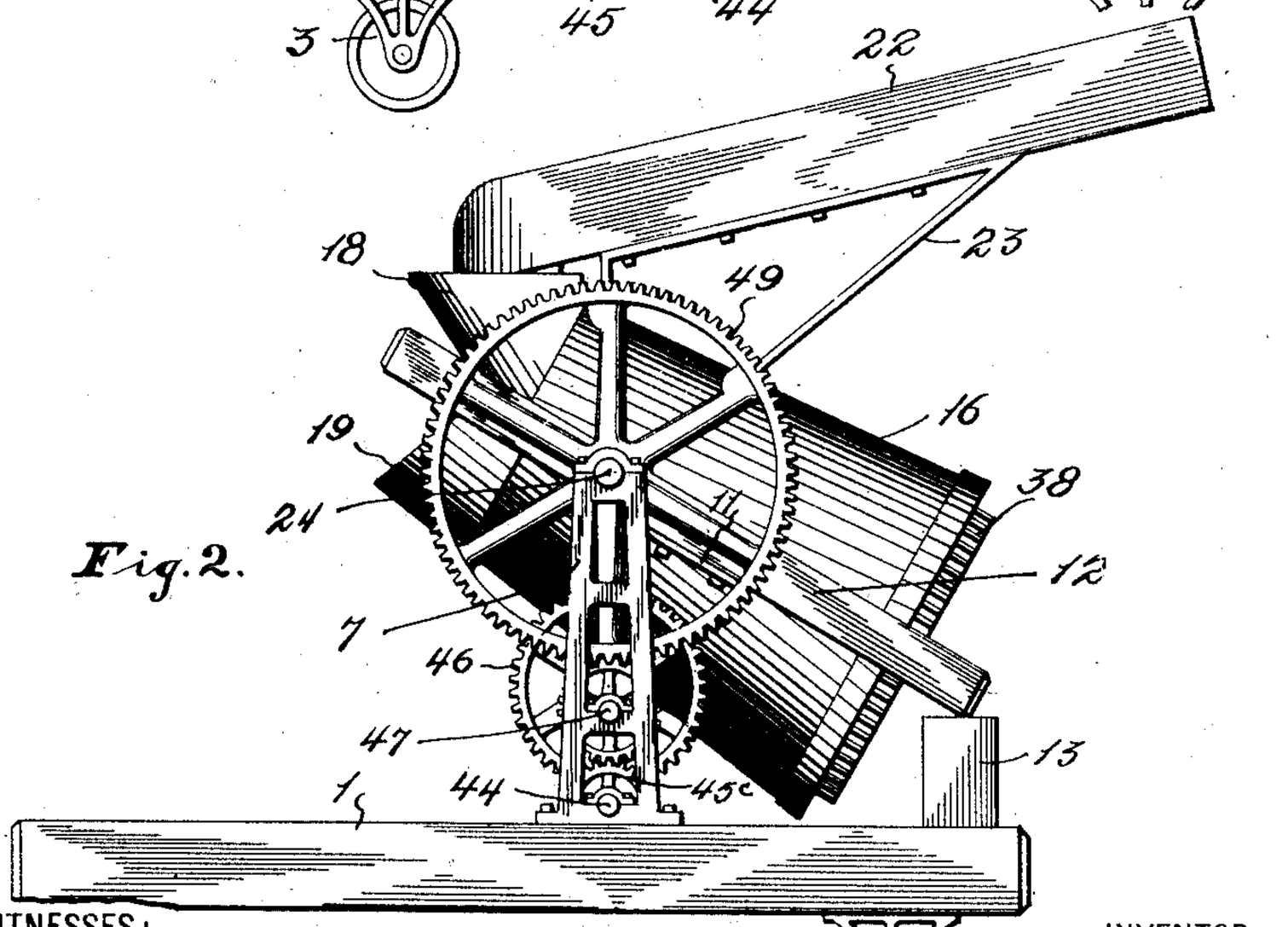


Fig. 2.



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4 SHEETS—SHEET 2.

Fig. 3.

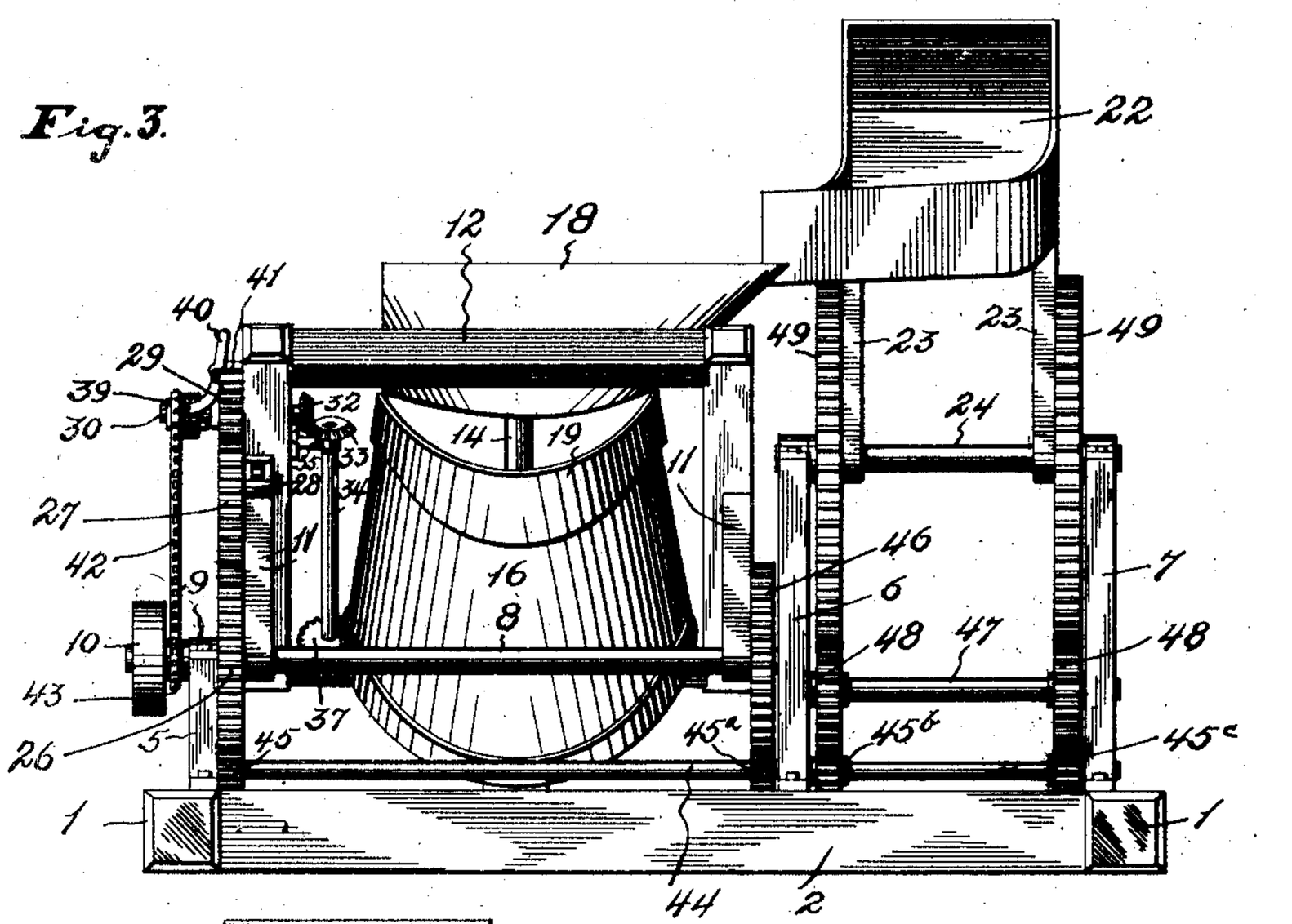
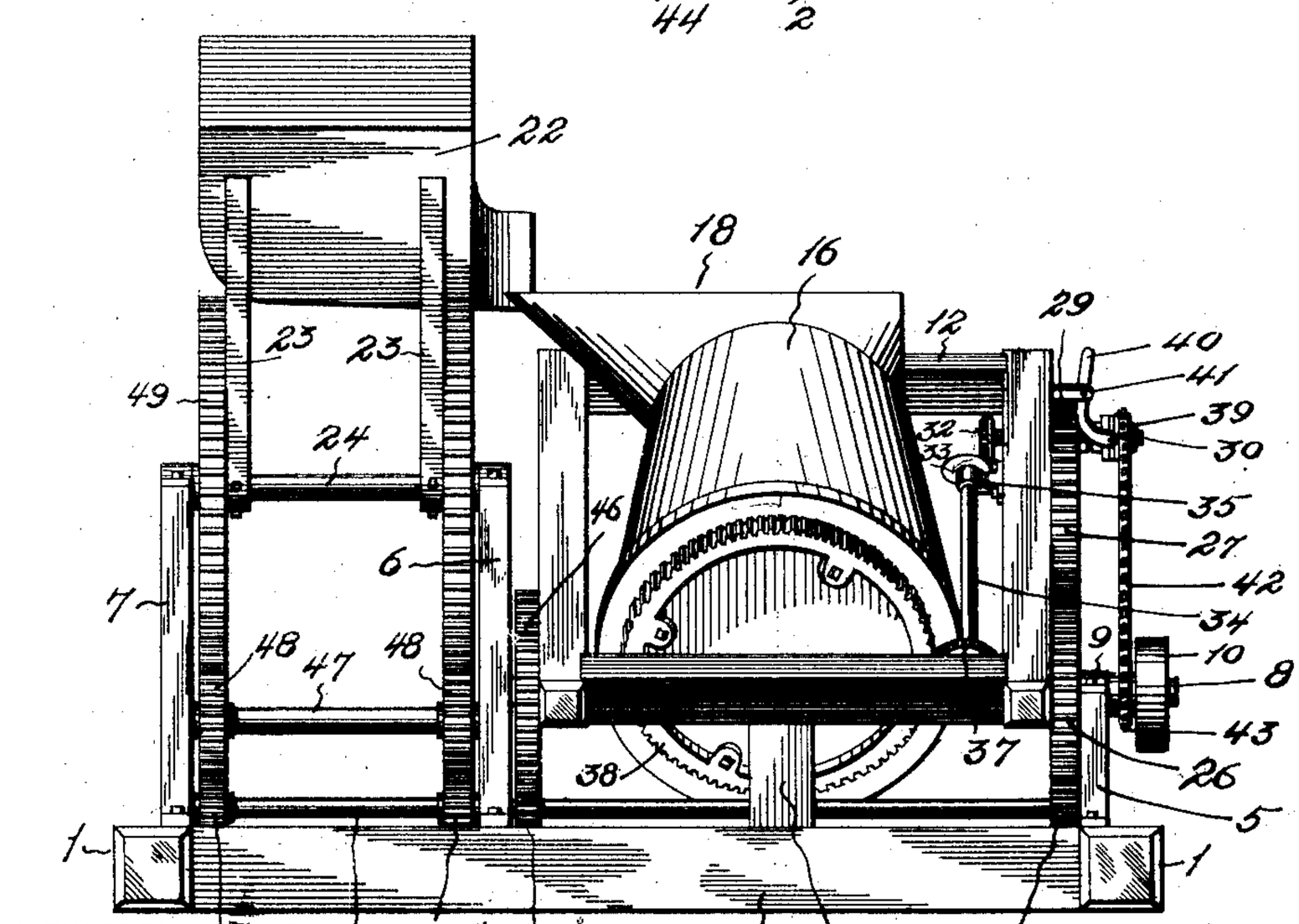


Fig. 4.



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4 SHEETS—SHEET 3.

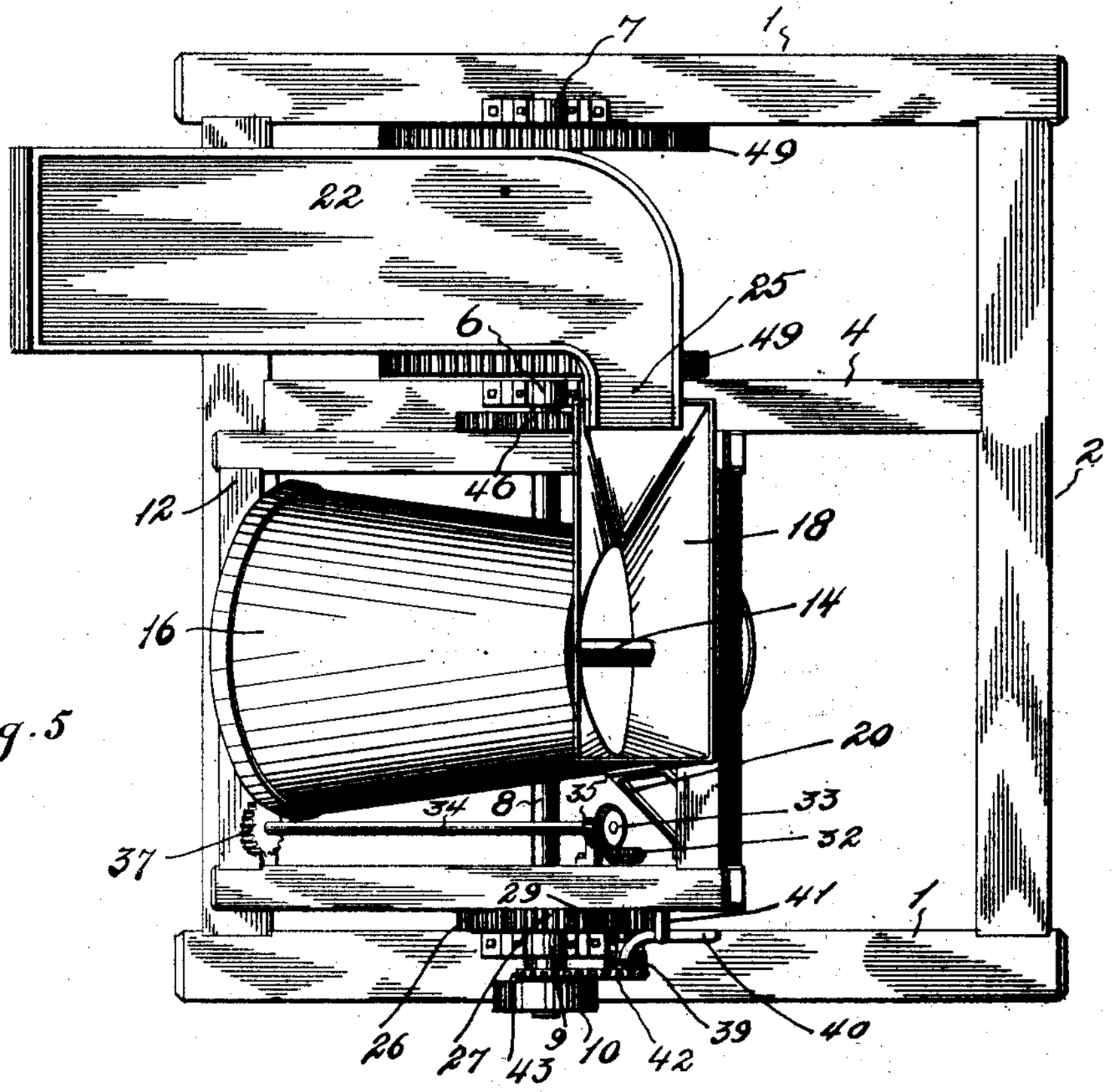

Fig. 5

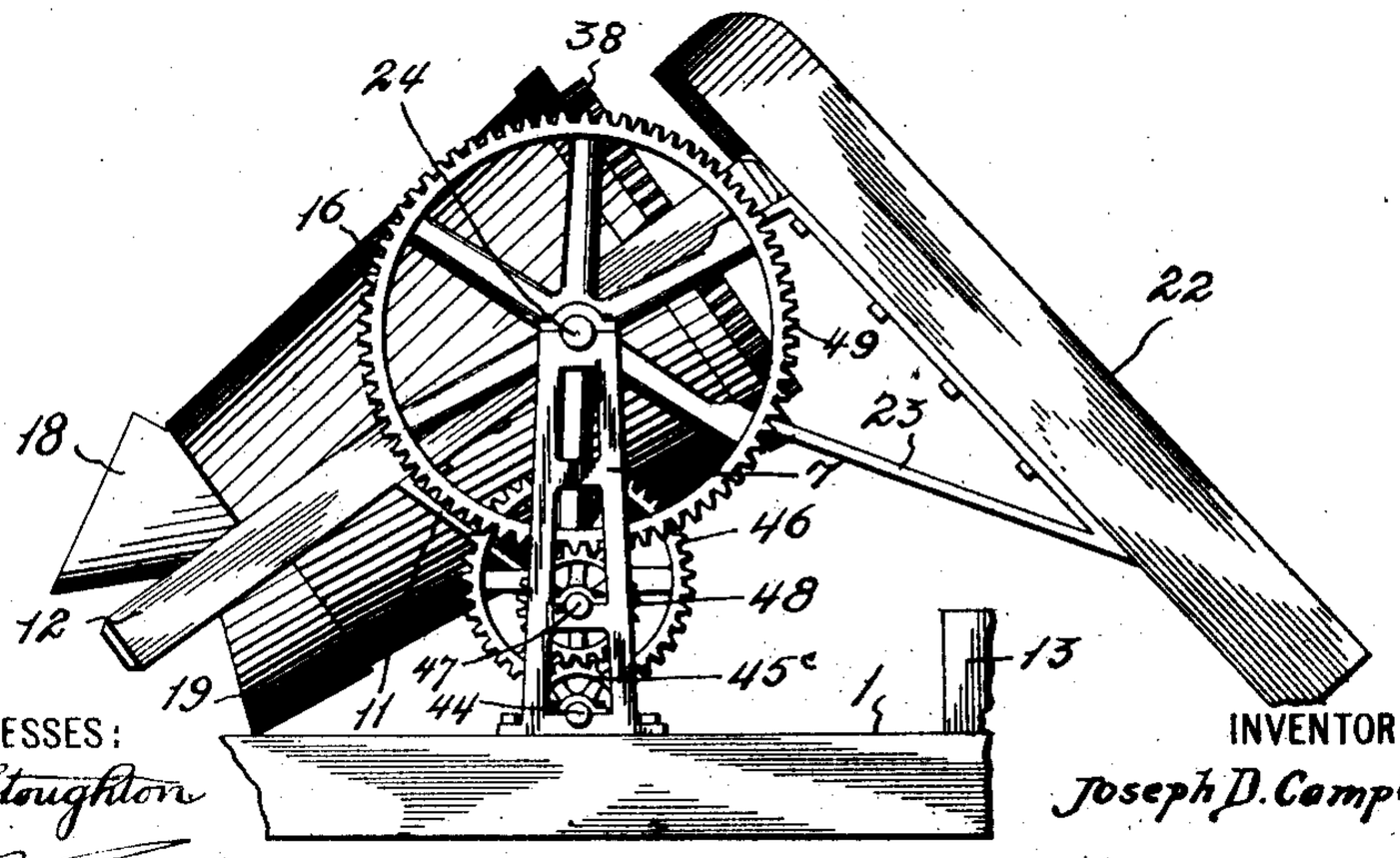

Fig. 7.

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4 SHEETS--SHEET 4

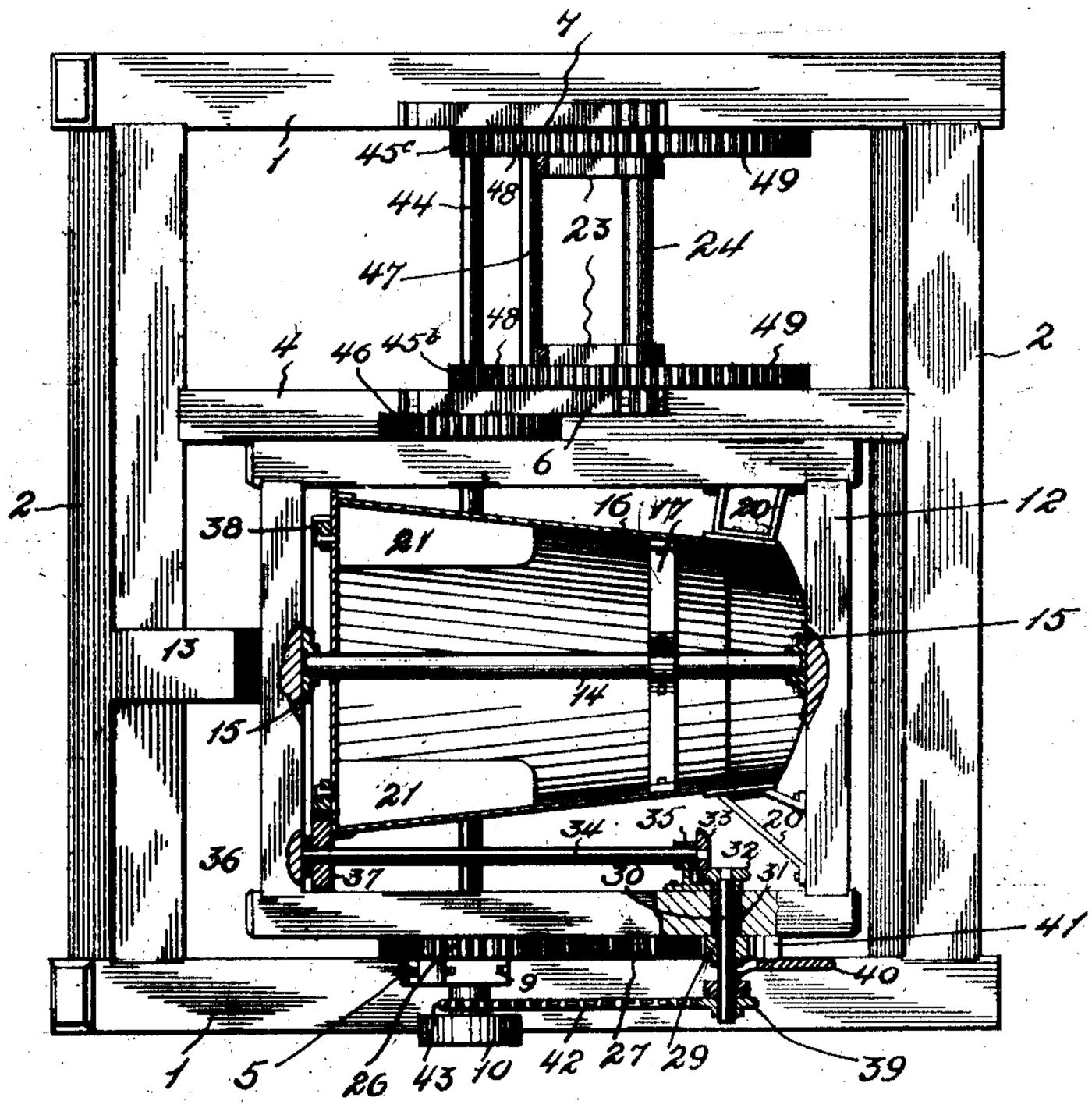

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOSEPH D. CAMPBELL, OF COLUMBUS, OHIO, ASSIGNOR TO THE AMERICAN CONCRETE MACHINERY COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF OHIO.

MIXING-MACHINE.

No. 854,029. Specification of Letters Patent. Patented May 21, 1907.

Application filed February 23, 1906. Serial No. 302,381.

To all whom it may concern:

Be it known that I, JOSEPH D. CAMPBELL, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Mixing-Machines, of which the following is a specification.

This invention relates to new and useful improvements in concrete mixers.

The object of the invention is to provide a mixing machine, so constructed as to obviate the use of conveyers and platforms and to provide one which may be operated from a common level.

Another object is to provide a device of the character described that will be strong, durable and efficient and one in which the several parts will not be liable to get out of working order.

With the above and other objects in view, the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of my machine. Fig. 2 is an elevation of the opposite side. Fig. 3 is an end elevation. Fig. 4 is an elevation of the opposite end. Fig. 5 is a plan view. Fig. 6 is a view looking in the direction of the arrow in Fig. 1, taken on the line $x\,x$, and, Fig. 7 is a side elevation showing the drum in its discharging position and the trough in its loading position.

In the drawings the numeral 1 designates the side beams and 2 the end beams of an open base frame, which is preferably mounted upon suitable wheels 3. Upon the side beams 1 and an intermediate parallel beam 4, which is placed to one side of the frame, I mount standards 5, 6 and 7. Two of these standards 6 and 7 are considerably higher than the standards 5, as will be apparent from an obvervation of Fig. 3. A transverse drive shaft 8 extends from the standard 5 to the standard 6 having one end suitably supported in the latter, while near its opposite end it is supported in a bearing box 9. On its extreme end which projects beyond the standard 5, a driving pulley 10 is loosely mounted. About the shaft 8, the lower ends of brackets 11 are mounted so as to freely swing on said shaft. On their upper sides, the brackets are suitably secured to and support a rectangular frame 12 which is normally disposed at an angle and so maintained by a block 13 arranged on the upper side of one of the end beams 2, the lower end of said frame resting on the block.

A longitudinal shaft 14 extends centrally of this frame and is suitably supported at each end in bearings 15 carried by the frame 12. The shaft is free to revolve in the bearings and supports a conical or tapering drum 16 closed at its larger end, which is normally its lower end. Within its smaller or upper end the drum is supported and caused to revolve with the shaft by means of a transverse brace 17, see Fig. 6. The upper end or mouth of the drum terminates a sufficient distance from the end of the frame 12 to permit the lower end of a hopper 18 to project into the drum. This hopper while having its lower end projecting into the drum is fixedly supported on the frame 12 and has one end projecting over the side of the same, which will be hereinafter referred to. Beneath the hopper a discharge spout 19 snugly fitting about the lower half of the mouth end of the drum, is arranged. This discharge spout is suitably supported by angle brackets 20 secured to the frame 12 as best shown in Fig. 6.

From the description so far as given, it will be apparent that the drum is free to revolve independently of the hopper 18 and the spout 19. It is also to be noted that any suitable construction may be arranged in the drum for mixing and agitating the materials, although in the drawings I have merely illustrated blades 21 disposed at the bottom or large end of the drum.

Before proceeding with the description of the means for revolving the drum, I will describe the means for delivering the materials to be mixed to the hopper 18. Heretofore the materials have been delivered to the hopper of a mixing machine in various manners and it has been more often the practice to build a platform or incline about the hopper or to install an elevator and conveyer, so that the materials might be carried up and readily dumped into the hopper, the latter usually being from four to twelve feet above the ground or common level. I do not wish it to be understood that the foregoing is always the case, but that in the actual practice the

methods of loading described, are the most common.

In carrying out my loading scheme, I provide a suitable trough or chute 22. This trough is supported upon the upper flat sides of triangular brackets 23, which at their lower ends are secured to a transverse shaft 24, so as to be supported and swung thereby. The trough is supported so as to project over one end of the frame and some distance from the shaft 24 to permit one end being swung downward as will be hereinafter described. The trough in its normal or elevated position is disposed at an angle, its outer end being higher and closed, while its inner end is contracted and curved to provide a mouth or discharge portion 25 which extends over that portion of the hopper 18 projecting over one side of the frame 12, as hereinbefore set forth. From this it will be apparent that materials placed in the trough 22, when the same is swung upward, will travel by gravity to the mouth 25 and from there into the hopper 18 to the drum 16; thus the necessity of a platform or elevator and conveyer, is obviated.

I will now proceed to describe the gearing and mechanism for swinging the drum and trough respectively: On the transverse shaft 8, I key a spur gear 26 between the standard 5 and the bracket 11. This spur gear meshes with a smaller spur gear 27 supported in a bearing box 28 on the underside of the frame 12. The spur gear 27 meshes with a pinion 29 loose upon a short horizontal shaft 30. The shaft 30 extends through a bushing 31 in the frame 12 and carries on its inner end a beveled gear 32 which meshes with the beveled gear 33 carried on the end of a longitudinal shaft 34. The shaft 34 is supported within the frame in a hanger 35 and a bearing 36. Near the bearing 36, the shaft 34 carries a pinion 37 which is adapted to mesh with a gear ring 38 carried on the bottom or large end of the drum 16, the said gear ring being suitably secured to the drum, so as to revolve the same. It is to be understood that motion is not delivered to the shaft 30 by the gears 26 and 27 and the pinion 29, but by a sprocket clutch member 39 which is keyed on said shaft 30 and adapted to be moved longitudinally thereon by a lever 40 pivotally supported in a bracket 41 on the side of the frame 12. By means of the lever 40, the clutch sprocket may be moved longitudinally on the shaft into and out of engagement with the pinion 29. The said clutch sprocket is driven by a sprocket chain 42 engaging at its lower end with a sprocket 43 connected with and revolved by the band wheel 10.

Normally or during the mixing operation, when the parts are in the positions shown in Figs. 1, 2 and 6, the clutch sprocket 39 is out of engagement with the clutch pinion 29, so that while motion is being imparted to the drum by way of the shafts 30 and 34 and pinion and gear 37 and 38 respectively, the gears 26 and 27 and the pinion 29 are idle.

The gears 26 and 27 form a part of the mechanism for swinging the drum and the trough, which I will now describe. Beneath the shaft 8, I arrange a transverse shaft 44 extending from the standard 5 through the standard 6 to the standard 7. On this shaft I key pinions 45, 45^a, 45^b, and 45^c. The pinion 45 meshes with the underside of the gear 26, while the next pinion 45^a meshes with a gear 46 keyed on the shaft 8 between the bracket 11 and the standard 6, the said gear 46 being a substantial duplicate of the gear 26 as best shown in Fig. 3. Above the shaft 44 and between the standards 6 and 7, I loosely mount a shaft 47 which has fixed thereon intermediate gears 48 arranged directly over and meshing with the pinions 45^b and 45^c respectively. Rigidly secured on the shaft 24 between the brackets 23 and the standards 6 and 7 are large gears 49 which mesh with the intermediate gears 48. The brackets 23 may be secured to the gears 49 if desired, it being apparent that when motion is transmitted to said gears, the trough 22 which is supported by the brackets 23 will be swung.

Having described the different parts of my mixer, I will now proceed to set forth the operation of the same. We will assume that the parts are in their normal or mixing position as shown in Figs. 1 and 2. With the parts so operating, motion of course having been imparted to the band wheel 10 and the same revolving in the direction of the arrow as shown in Fig. 1, the clutch sprocket 39 will be separated from the clutch pinion 29.

When it is desired to discharge the mixed batch from the drum 16 and reload the same, the operator swings the lever 40 so that the clutch sprocket 39 is moved into engagement with the clutch pinion 29. Motion is immediately imparted to said pinion and the same caused to turn to the right, reference being had to Figs. 1, 5 and 6. The gear 27 meshing with the pinion 29 is revolved to the left and in turn revolves the gear 26 to the right, which latter meshing with the pinion 45, revolves the same and its shaft 44 to the left, reference being had to Fig. 1. The shaft 44 thus being revolved to the left, causes its pinions 45^a, 45^b and 45^c to revolve in the same direction. The gear 46 meshing with the pinion 45^a and being secured on the shaft 8, like the gear 26, will assist the latter in swinging the frame 12 so that the spout 19 is depressed and the large end of the drum elevated as indicated in Fig. 7, which view shows the parts in the reversed direction with relation to Fig. 1, therefore in the said figure, the shaft 44 would revolve to the right, and the gear 46 and consequently the shaft 8 to the left, resulting in the swinging

of the frame 12 and the drum 16 as before described. It will be apparent that by reason of the intermediate gears 48, the gears 49 will be revolved in an opposite direction to the gears 26 and 46, thus referring to Fig. 7 in which the shaft 44 revolves to the right, the gears 49 will also be caused to revolve to the right by the intermediate pinions 48 which revolve to the left. In this manner the trough by means of its brackets 23 is swung down to the base frame of the mixer, so as to be readily loaded while the mixed batch is being discharged from the drum 16, the latter being continually revolved. When the drum and the trough are swung down as shown in Fig. 7, it is necessary to again swing the lever so as to throw the clutch sprocket 39 out of engagement with the clutch pinion 29 and prevent further rotation of the swinging gears as will be apparent.

When the trough 22 has been loaded and the mixed batch discharged from the drum and it is desired to return the parts to their normal or mixing position, the power means which transmits motion to the band pulley 10 is reversed so as to cause the same to revolve in an opposite direction and the lever 40 swung to again move the clutch sprocket 39 into engagement with the clutch pinion 29. This will of course revolve the gears in an opposite direction, so that the trough and drum are swung upward to the positions shown in Figs. 1 and 2 and upon the arrival of the same at the said position, the lever 40 is again moved so as to disconnect the clutch sprocket 39 and clutch pinion 29, thus preventing further rotation of the gears. The power means is again reversed so that the band pulley 10 will be caused to revolve in its normal direction.

What I claim, is:

1. In a mixing machine, the combination with a supporting frame of a mixing drum, means for feeding the materials to be mixed to the drum, and a common mechanism carried by the supporting frame for simultaneously moving both the drum and the feeding means to unload the former and to move the latter into such position that it may be loaded.

2. In a mixing machine, the combination with a supporting frame of a mixing drum, means for feeding the materials to be mixed to said drum, and a common mechanism carried by the supporting frame for bodily moving the drum and the feeding means simultaneously in opposite directions to unload the former and move the latter into such position that it may be loaded.

3. In a mixing machine, the combination with a supporting frame, of a tilting frame, a mixing drum rotatably mounted in said tilting frame, a hopper carried by the tilting frame and adapted to conduct material to the drum, a tilting trough adapted to conduct material to the hopper, and common mechanism for simultaneously tilting the drum to discharge the contents thereof and tilting the trough downwardly into such position that it may be loaded.

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

JOSEPH D. CAMPBELL.

Witnesses:
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M. B. SCHLEY