

A. M. MONDAY.

MIXER.

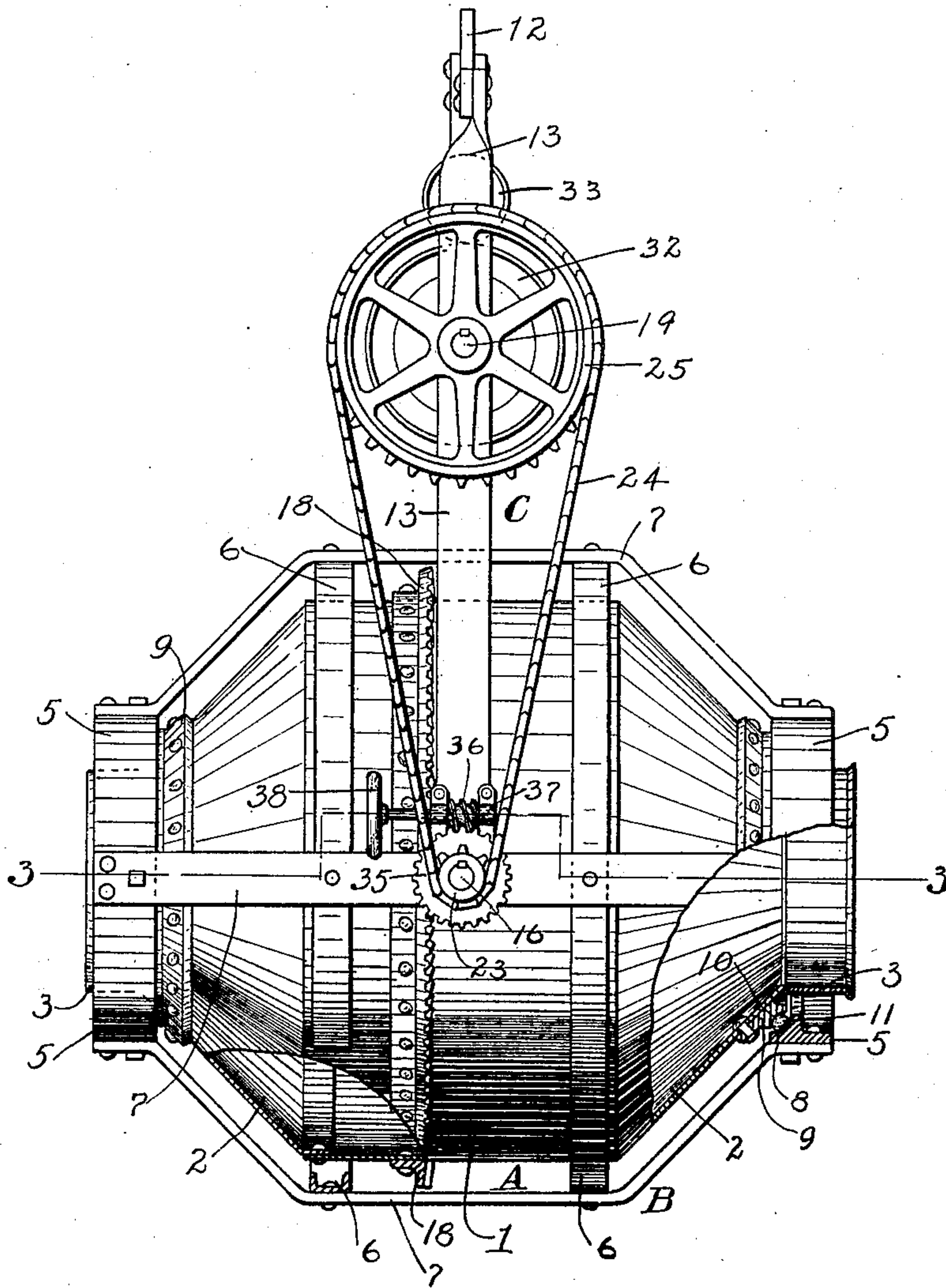
APPLICATION FILED DEC. 2, 1907.

914,495.

Patented Mar. 9, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



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Carrie T. Dwy

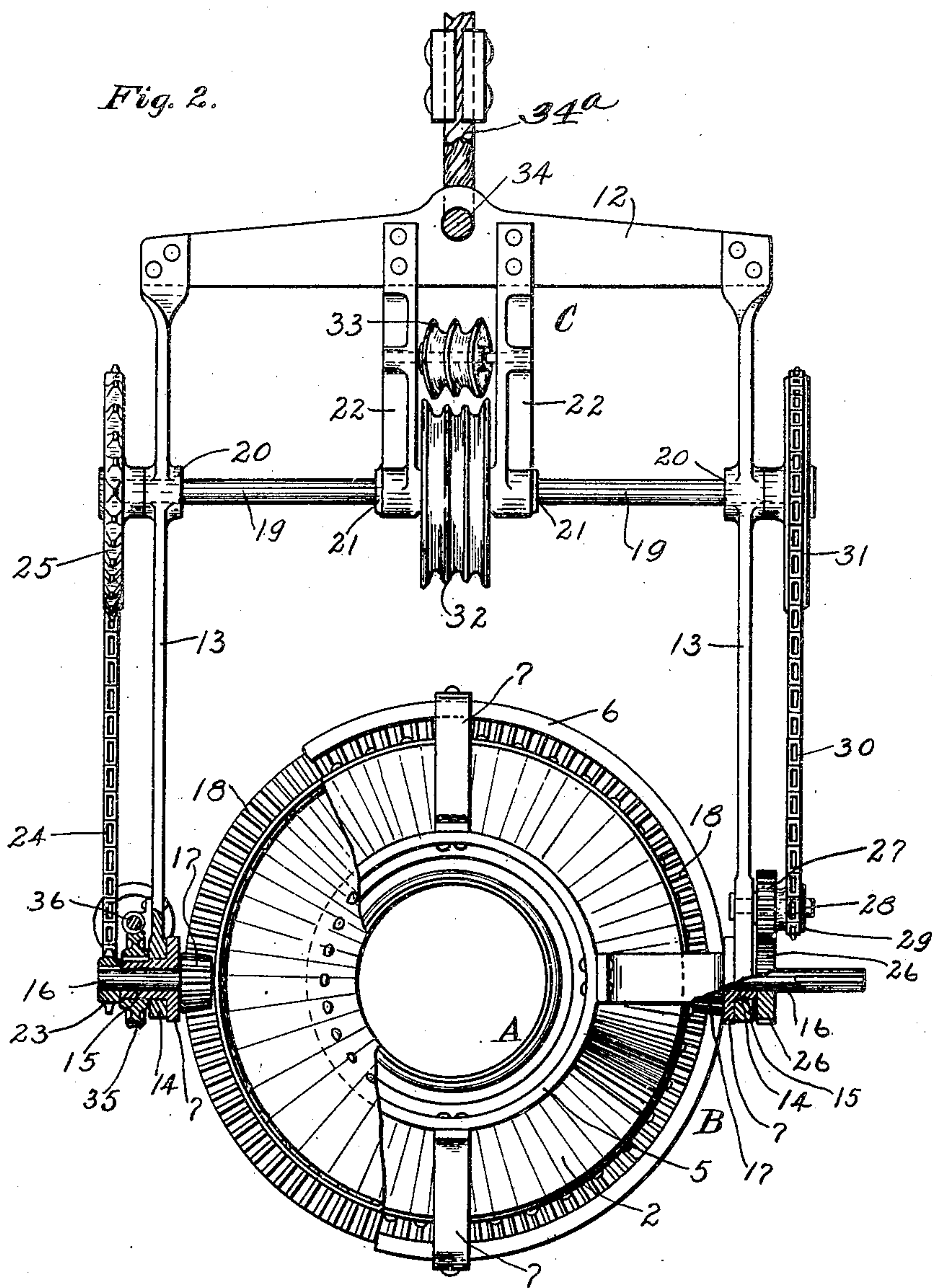
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MIXER.

Patented Mar. 9, 1909.

3 SHEETS—SHEET 2.

914,495.



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3 SHEETS—SHEET 3.

Fig. 3.

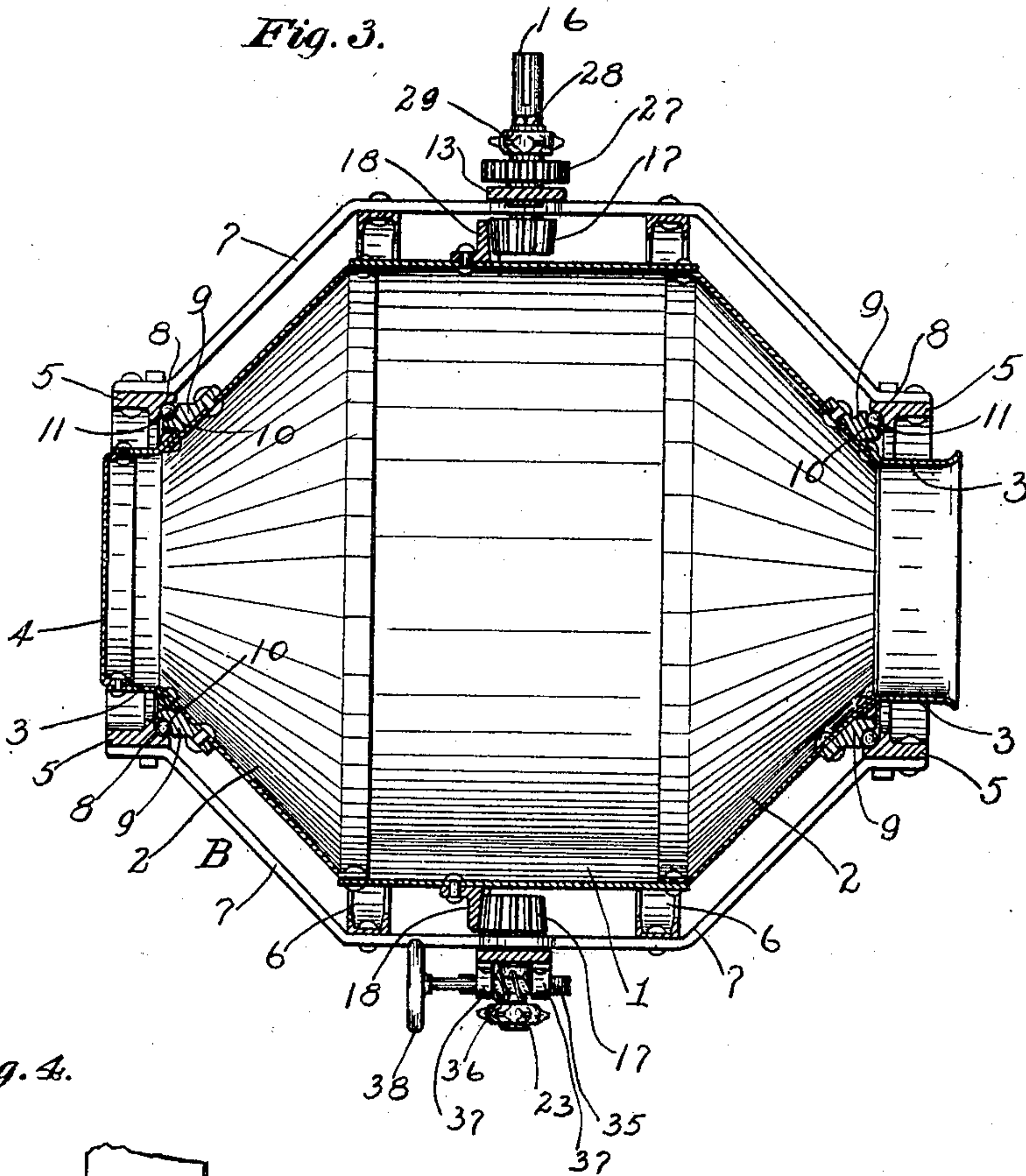
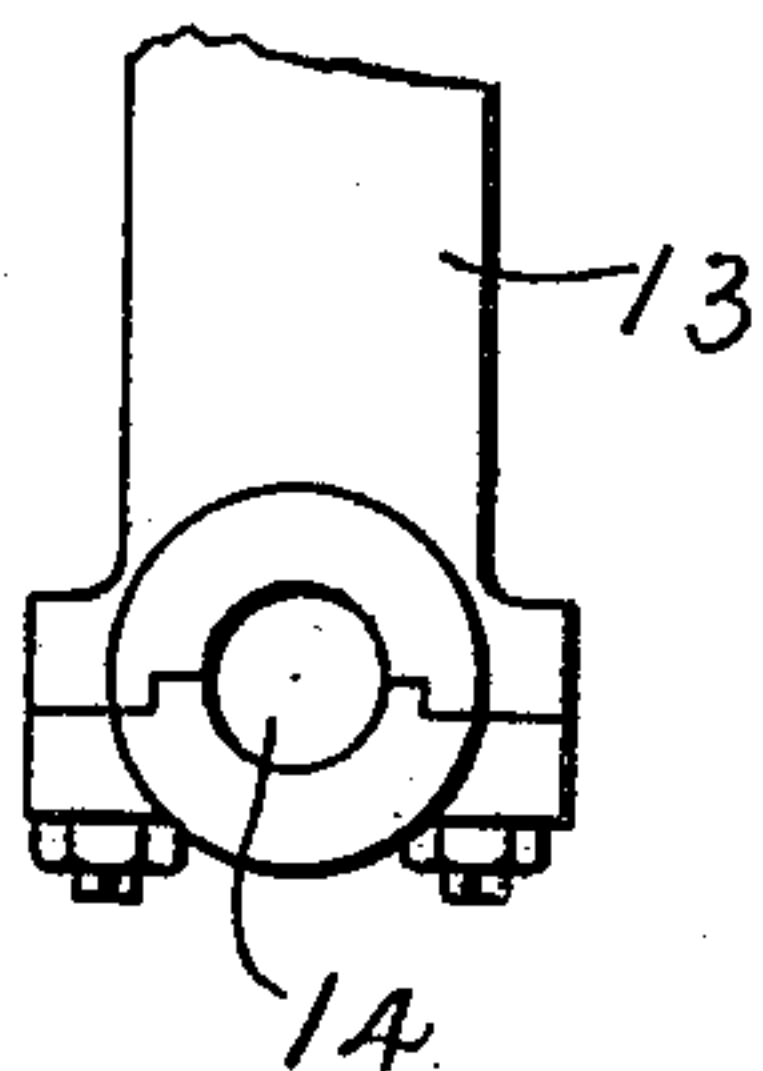


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MIXER.

No. 914,495.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed December 2, 1907. Serial No. 404,774.

To all whom it may concern:

Be it known that I, ABNER M. MONDAY, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Mixers, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to apparatus for both mixing and conveying concrete and like material. The apparatus is at the same time adapted to serve as a bucket for receiving and carrying various materials in larger quantities than can be conveyed with buckets carried by hand.

The object of the invention is to provide an efficient and durable apparatus which may be conveniently used for a variety of mixing and carrying work under varying conditions.

In the accompanying drawings, Figure 1 is a side elevation of an apparatus embodying my improvement, portions of the apparatus being broken away; Fig. 2 is an end elevation of the same apparatus, portions being broken away; Fig. 3 is a horizontal section on the line 3—3 of Fig. 1; Fig. 4 is a detail elevation of one of the arms of the bail by which the mixing drum or receiver is suspended.

Referring to said drawings, A is the mixing drum or bucket. This is composed of a middle annular section, 1, a tapering section, 2, at each side of the annular section, and a cylindrical, journal-form neck, 3, applied to the small end of each of the tapering sections. One of said necks, 3, has an end wall, 4, while the other of said necks is open. Said drum, A, is supported in a frame, B. Said frame comprises rings, 5, extending around the necks, 3, rings, 6, extending around the annular portion, 1, of the drum, and longitudinal bars or ribs, 7, extending transversely across the rings, 5 and 6, and suitably riveted or bolted or otherwise secured thereto. The rings, 5, are larger than the necks, 3, and each is provided with a ball-race, 8, directed toward the adjacent tapering portion, 2, of the drum; and upon said tapering portion is mounted an annular ring, 9, having a ball-race, 10, directed toward the adjacent ball-race, 8. Balls, 11, are located in said ball-races between said rings, 5, and said annular ring, 9, filling the space between said rings and thus forming an engagement between the drum, A, and the frame, B, and

permitting the drum or bucket to rotate within said frame. A bail, C, supports said frame, B. Said bail has a cross-head, 12, and depending arms, 13, and the lower end of each such arm has an eye, 14, into which extends a trunnion, 15, extending horizontally from one of the bars or ribs, 7, of the frame, B, midway between the ends of said frame. Thus said drum or bucket is supported so as to be rotatable upon two axes which intersect each other at right angles. In other words, said drum may be rotated upon its longitudinal axis or it may be turned upon a transverse axis so as to move its open end up or down into position for receiving or discharging material or to stand at any desired angle of inclination while the drum is being rotated on its longitudinal axis for mixing.

Through each trunnion, 15, extends a short rotary shaft, 16, the inner end of which bears a bevel gear wheel, 17, meshing with an annular gear girdle, 18, surrounding the annular section, 1, of the drum, A. By the rotation of said shafts, 16, (in opposite directions) the frame, B, will be rotated in the roller bearings formed around the necks, 3, as will now be understood from an inspection of the drawings. Power is transmitted to the shafts, 16, from the cross-shaft, 19, mounted in bearings, 20, in the arms, 13, and in bearings, 21, in the lower ends of the arms, 22, extending downward from the middle of the cross-head, 12. On the outer end of one of the shafts, 16 (the left hand in Fig. 2), is mounted a sprocket wheel 23, and a sprocket chain, 24, extends around said wheel and around a sprocket wheel, 25, on said cross-shaft, 19. On the other shaft, 16, is mounted a spur gear wheel 26, which meshes with another spur gear wheel, 27, mounted on a short fixed shaft, 28, extending horizontally outward from the adjacent arm, 13, of the bail, C; and attached to said spur gear wheel, 27, is a sprocket wheel, 29, similar to the sprocket wheel, 24, and a sprocket chain, 30, extends around said sprocket wheel, 29, and a sprocket wheel, 31, on the adjacent end of the cross-shaft, 19, which wheel, 24, is similar to the sprocket wheel, 25, on the opposite end of said shaft. Thus, it will be seen, that the rotation of the shaft, 19, will apply power to two diametrically opposite points on the drum, A. And it will be seen that the two bevel gear wheels, 17, which mesh with the gear girdle, 18, must

rotate in opposite directions. This is accomplished by the use of the spur gear wheels, 26 and 27, on the right hand in Fig. 2, said spur gear wheels serving to reverse the movement transmitted to the sprocket wheel, 29, which is attached to the spur gear wheel, 27.

Power is transmitted to the shaft, 19, in any suitable manner, as by means of a cable (not shown) passing around the grooved pulley, 32, which is fixed around said shaft. Said cable may be guided by means of another grooved pulley, 33, located above the pulley, 32, between the upright arms, 22.

The cross-head, 12, has a hole, 34, through which the bail may be engaged by any suitable rope or chain, 34^a, extending downward from a derrick or other form of lifting and carrying mechanism. The rope or cable for driving the pulley, 32, may come from the same derrick or other carrying mechanism and be operated independently of the tackle used for lifting and carrying the bail, and the load supported thereby.

On one of the trunnions, 15, is mounted a worm gear wheel, 35, and above said wheel and engaging therewith is a horizontal worm shaft, 36, resting in bearings, 37, secured to the outer face of the adjacent arm, 13, of the bail. On one end of said shaft is a hand wheel, 38, by means of which said shaft may be rotated. By rotating said shaft, the spur gear wheel and the adjacent trunnion may be turned and the frame, B, turned on the axial line of said trunnions (which is also the transverse axis of the drum). And such turning is without limit either as to direction or extent. Said frame may be turned so as to merely incline the drum or so as to bring it into the upright position with either end above. And it will be seen that the mechanism for rotating the drum upon its longitudinal axis (within the frame, B) may proceed regardless of the position of the frame and drum with reference to the trunnion axis. Thus the drum is adapted for mixing while it is located at various angles, and it may be rotated while it is tilted for discharging. Furthermore, the drum may be used merely as a bucket for conveying sand, gravel, earth, crushed stone, etc., or for taking water or mud from pits or basins.

I claim as my invention:

1. In an apparatus of the nature described, the combination of a drum which is smaller at its ends than at its middle portion, a frame surrounding said drum and having bearings at its ends engaging the ends of said

drum, a gear girdle on said drum, a bail pivoted to said frame on a line transverse to the longitudinal axis of the drum, oppositely-rotating gearing supported by said bail and engaging said gear girdle at opposite sides of the drum, and mechanism for turning said frame in said bail.

2. In an apparatus of the nature described, the combination of a drum having a journal-form neck at each end, a frame surrounding said drum and having bearings engaging said necks, a gear girdle on said drum, a bail pivoted to said frame on a line transverse to the longitudinal axis of the drum, oppositely-rotating gearing supported by said bail and engaging said gear girdle at opposite sides of the drum, and mechanism for turning said frame in said bail.

3. In an apparatus of the nature described, the combination of a drum which is smaller at its ends than at its middle portion, a frame surrounding said drum and having bearings at its ends engaging the ends of said drum and having trunnions on its sides, a gear girdle on said drum, a bail engaging said trunnions, means connected with said bail for raising and lowering the same, shafts extending through said trunnions, gear wheels on said shafts, mechanism for oppositely rotating said shafts, and mechanism for tilting said frame on said trunnions.

4. In an apparatus of the nature described, the combination of a drum which is smaller at its ends than at its middle portion, a frame surrounding said drum and having bearings at its ends engaging the ends of said drum and having trunnions at its sides, a gear girdle on said drum, a bail engaging said trunnions, means connected with said bail for raising and lowering the same, shafts extending through said trunnions, gear wheels on said shafts, a rotary shaft resting in bearings in said bail above said frame, mechanism connecting said shaft with the shafts extending through said trunnions for oppositely driving said last mentioned shafts, and mechanism for tilting said frame on said trunnions.

In testimony whereof I have signed my name, in presence of two witnesses, this 30th day of November, in the year one thousand nine hundred and seven.

ABNER M. MONDAY.

Witnesses:

CYRUS KEHR,
C. A. MORSE.