970,870.

H. J. J. ALEXANDER.

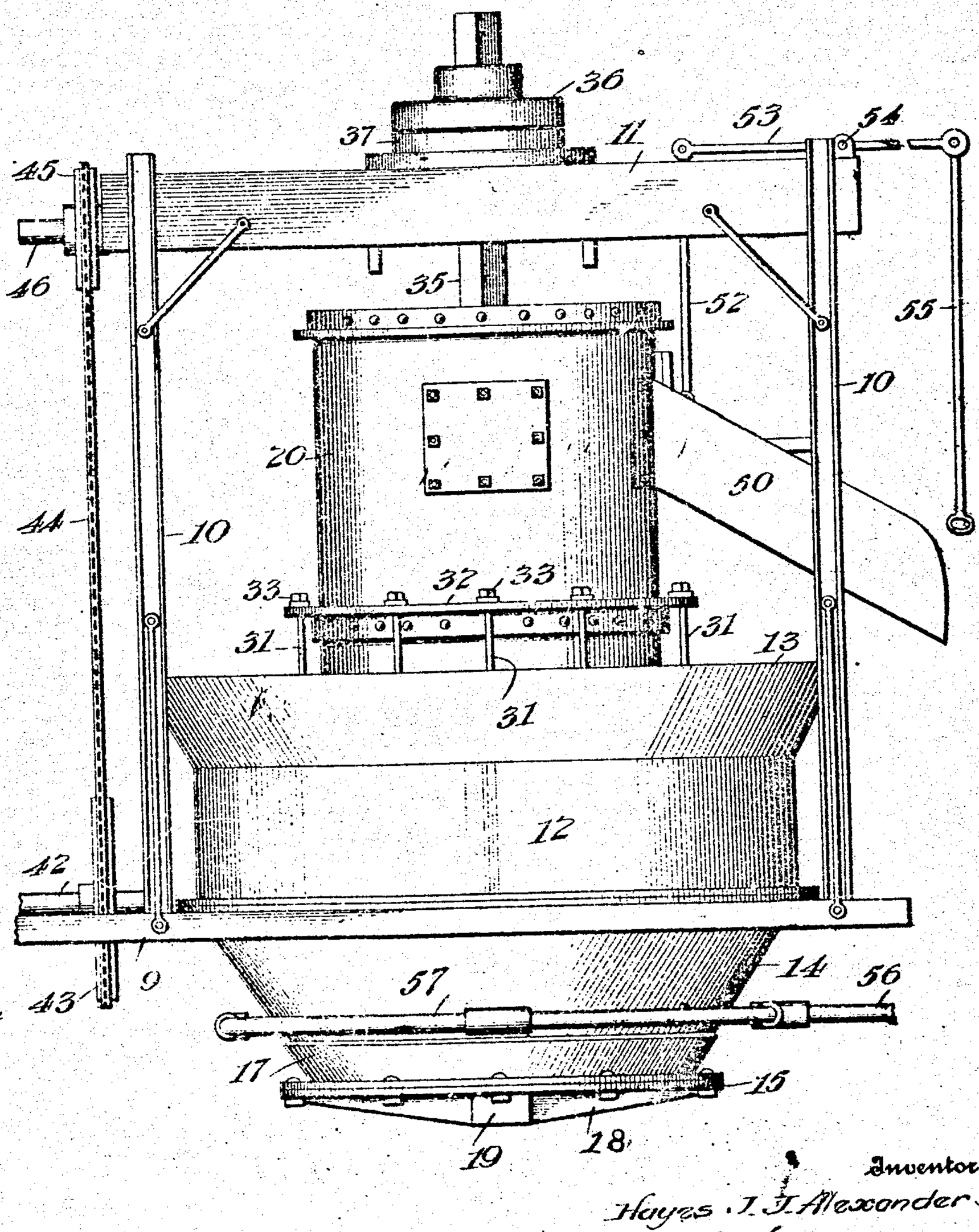
CONCRETE MIXING MACHINE.

APPLICATION FILED FEB. 19, 1910.

Patented Sept. 20, 1910.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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CONCRETE MIXING MACHINE.

APPLICATION FILED FEB. 16, 1910.

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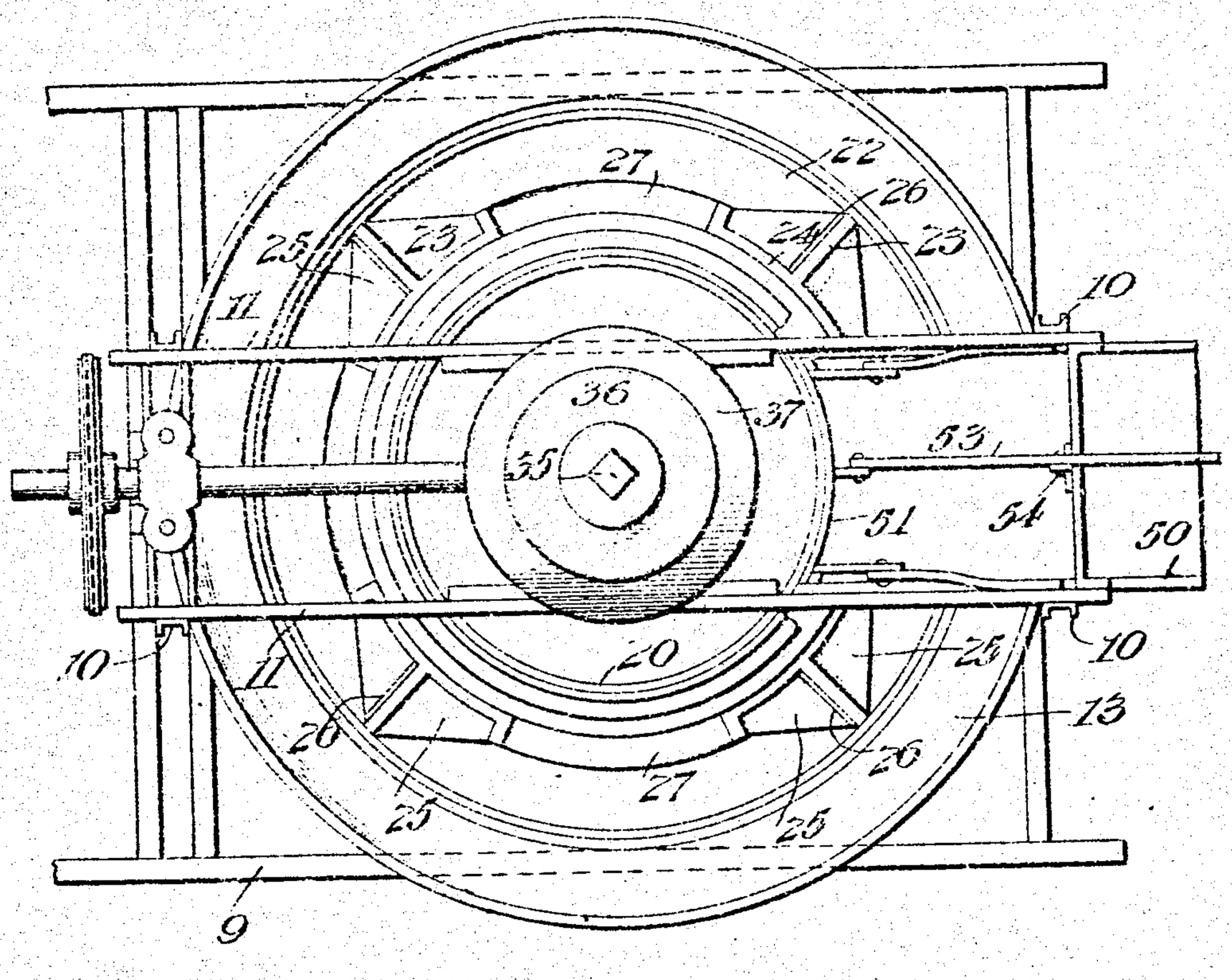
5 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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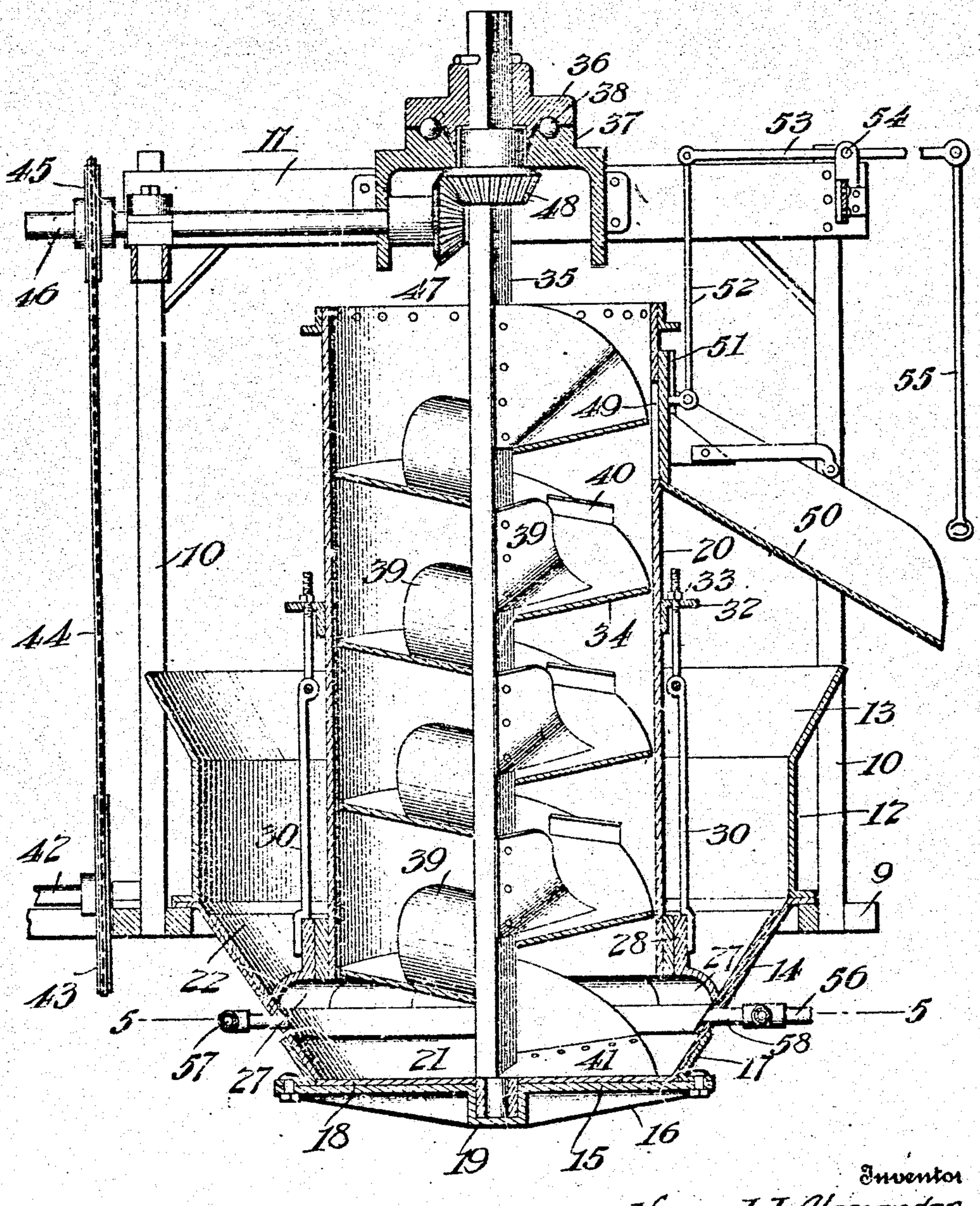
5 SHEETS—SHEET 3.

Fig. 3.



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CONCRETE MIXING MACHINE.

APPLICATION FILED FEB. 19, 1910.

970,870.

Patented Sept. 20, 1910.

5 SHEETS—SHEET 4.

Fig. 4.

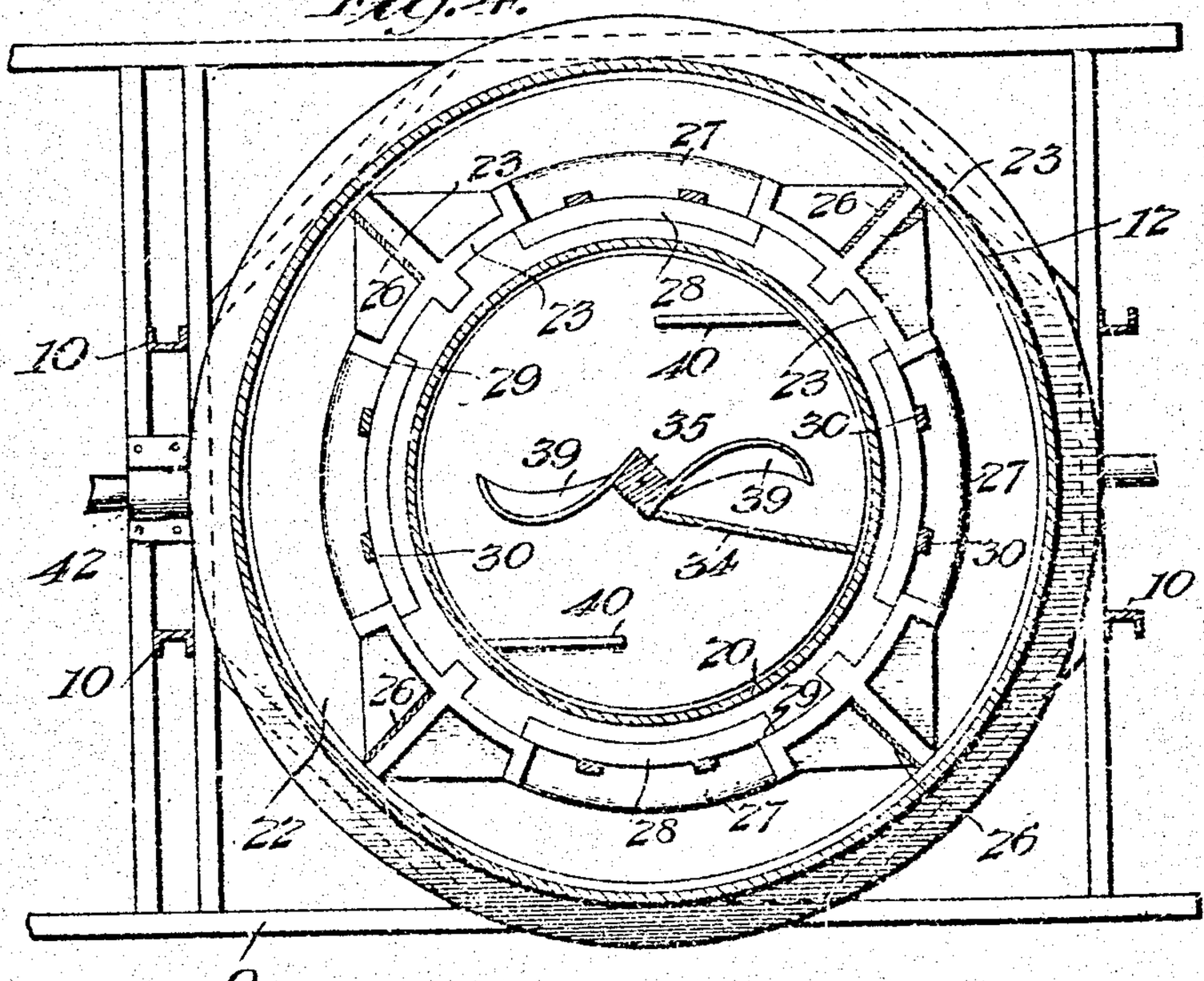
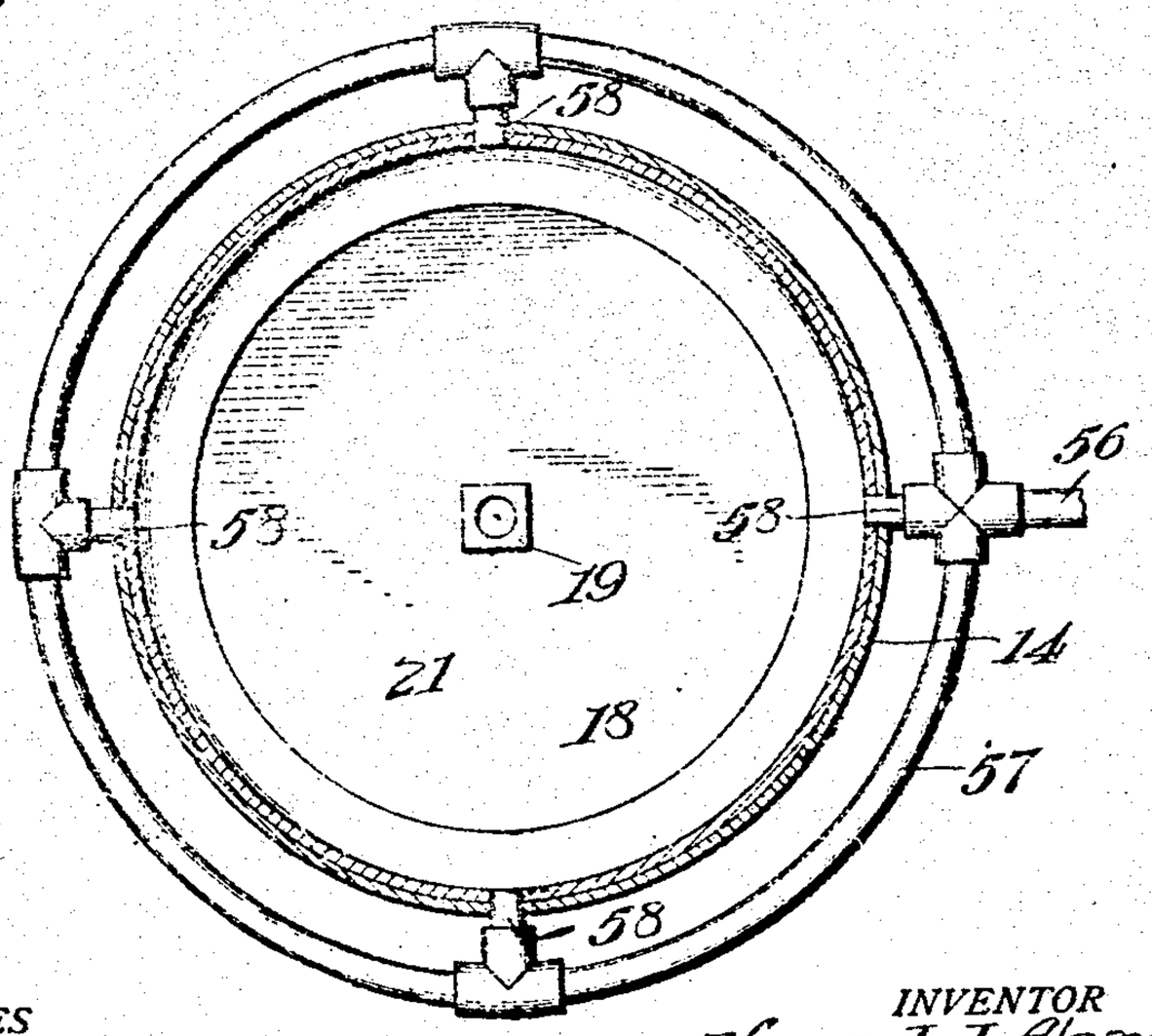


Fig. 5.



WITNESSES

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5 SHEETS—SHEET 5.

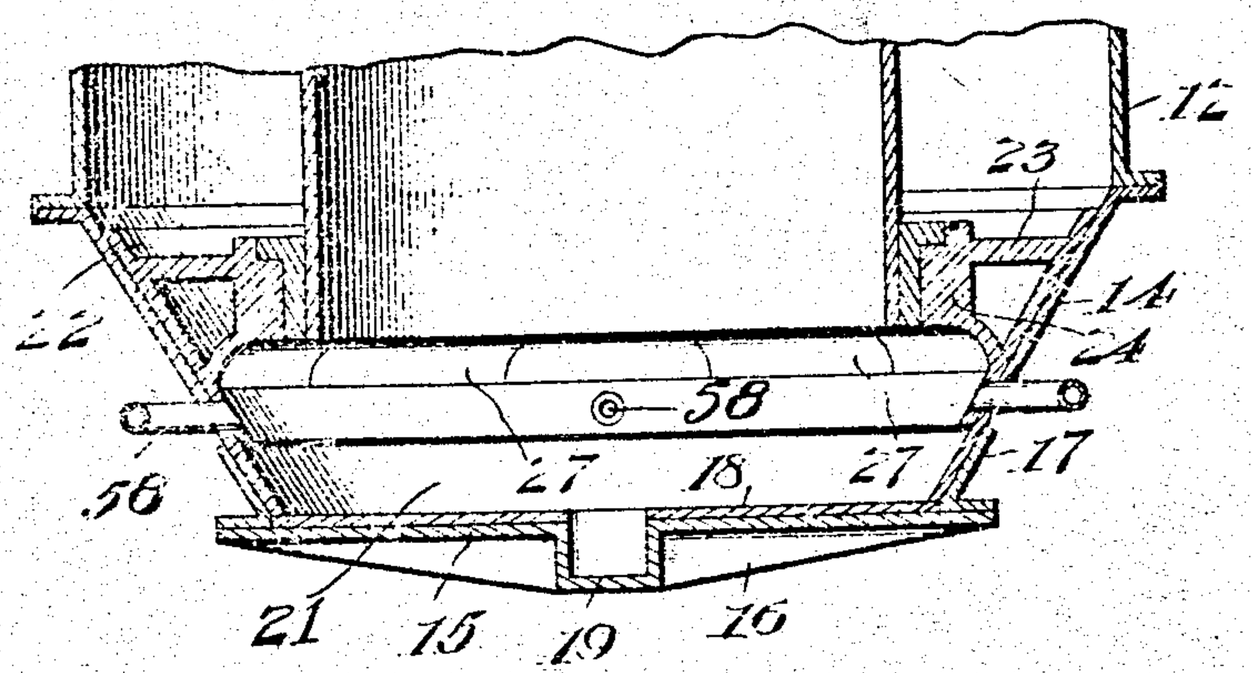

Fig. 6.

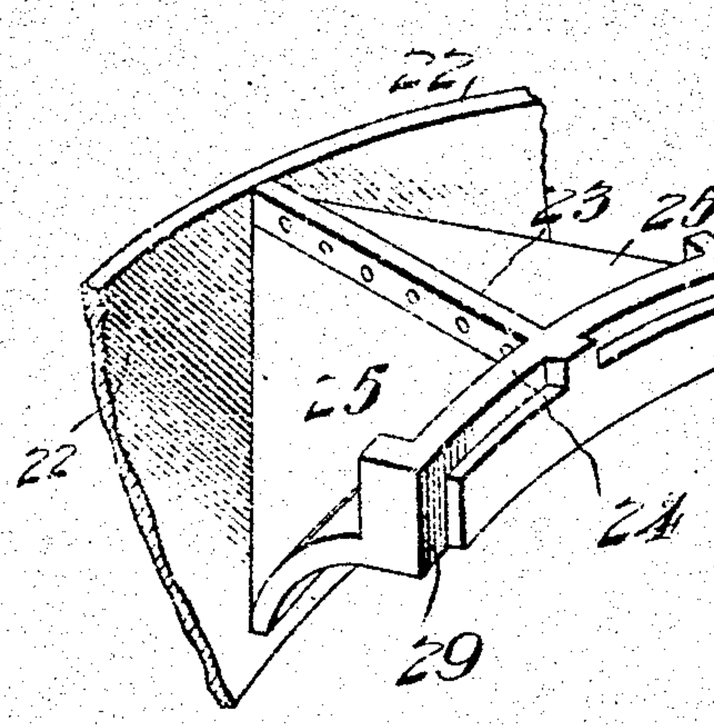

Fig. 7.

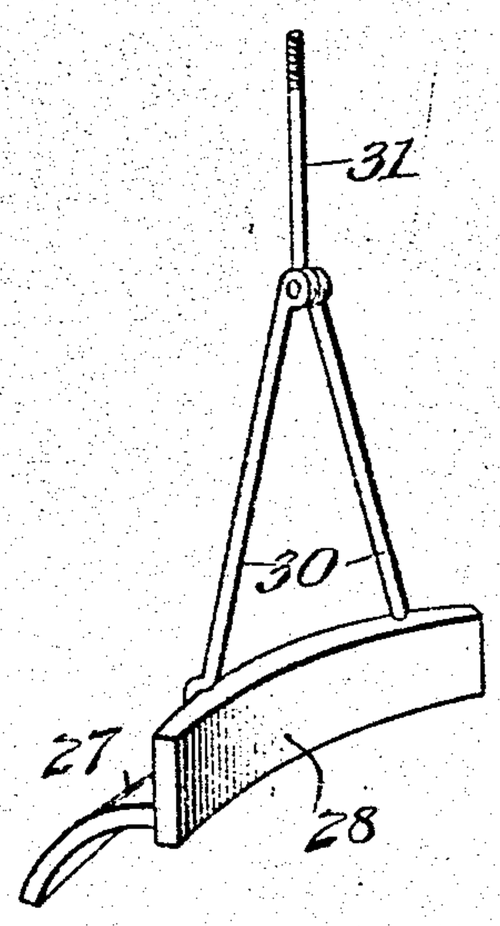

Fig. 8.

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UNITED STATES PATENT OFFICE.

HAYES J. J. ALEXANDER, OF YOUNGSTOWN, OHIO, ASSIGNOR OF ONE-HALF TO CHARLES L. BERRY, OF YOUNGSTOWN, OHIO.

CONCRETE-MIXING MACHINE.

970,870. Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed February 19, 1910. Serial No. 544,919.

To all whom it may concern:

Be it known that I, HAYES J. J. ALEXANDER, a citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Concrete-Mixing Machines, of which the following is a specification.

The present invention relates to means for mixing concrete or other analogous materials, and the primary object is to provide a structure, by means of which concrete can be continuously mixed and delivered, thereby avoiding the necessity of stopping the machine for receiving the unmixed materials, and for delivering the concrete after the same has been mixed.

A further and important object is to provide a structure that is simple and compact, so that it will occupy but little space, and can be readily transported from place to place.

One embodiment of the invention is disclosed in the accompanying drawings, but it will be obvious from an inspection of the claims hereto appended that the invention is by no means limited to the exact structure set forth.

In said drawings: Figure 1 is a side elevation of the mixer. Fig. 2 is a top plan view thereof. Fig. 3 is a vertical sectional view through the structure. Fig. 4 is a horizontal sectional view. Fig. 5 is a horizontal sectional view, on the line 5—5 of Fig. 3. Fig. 6 is a detail vertical sectional view through the lower portion of the machine. Fig. 7 is a detail perspective view of a section of the lower supporting spider. Fig. 8 is a detail view of one of the controlling gates.

Similar reference numerals designate corresponding parts in the several figures of the drawings.

In the embodiment disclosed, a suitable frame is employed, comprising a base 9 having uprights 10, carrying cross beams 11. In the base is mounted an outer casing comprising a cylindrical side wall 12 having a flared upper margin 13 and a hopper bottom 14, provided with a flat and substantially horizontal portion 15. The latter is strengthened with ribs 16, and is secured to the hopper bottom by an angle bar connection 17. A wear plate 18 is preferably located on the flat bottom 15. The said bottom is furthermore provided with a central bearing step 19.

Arranged centrally in the outer casing is a cylindrical inner casing 20 having an open bottom disposed above and in spaced relation to the bottom wall 15 of the outer casing, forming what may be termed a receiving chamber 21. This inner casing is supported by a spider structure comprising an outer frusto-conical rim 22 having inwardly extending arms 23 and curved flanges 24 that are fitted against and suitably secured to the lower portion of the cylindrical casing 20. The arms 23 are provided with oppositely extending downwardly inclined flanges 25 that form mouths communicating with the receiving chamber 21, as hereinafter explained. The rim 22 registers within the hopper bottom 14.

The arms 23 constitute the lower ends or bases of partition walls 26 that are secured to said arms and extend radially between the outer and inner casings, thus forming material holding compartments, which communicate with the receiving chamber 21, through the before mentioned mouths. The passage of material to said chamber from the magazines, is controlled by a plurality of vertically sliding gates 27 that operate over the mouths, and have vertically disposed flanges 28 that slide upon the inner casing 20, the ends of these flanges operating in guideways 29, formed by the overhanging ends of the spider flanges 24. The gates are operated and held in different positions by means of hangers comprising convergent arms 30, secured to the gates 27 and connected at their upper ends to links or rods 31, which slidably pass through an angle bar in the form of an annular ring 32 secured to the outer side of the inner casing. Nuts 33, adjustably threaded on these rods and bearing upon the angle bar, serve to hold the gates at different heights.

For the purpose of mixing and elevating the material in the inner casing 20, a screw or worm 34 is employed within said inner casing, and is carried by a shaft 35, the lower end of which is journaled in the box 19, the upper end carrying a supporting collar 36 secured thereto, and operating over a box 37 that is fastened to the cross bars 11 of the frame. Bearing balls 38 are preferably, though not necessarily, interposed between the members 36 and 37, and it will thus be

evident that the weight of the screw and the thrust thereof is taken entirely by this upper bearing. The said screw is provided with a plurality of inner bowed deflector blades 39 of sheet metal, which are secured at intervals to the shaft 35, and are located upon the upper surface of the said screw. Oppositely disposed deflector blades 40 in the form of straight metal strips are preferably mounted on the outer portions of the screw or worm. It will be noted that the said elevating and mixing screw or worm extends below the lower end of the inner casing 20, and thus into the receiving chamber 21, and its lower end is preferably provided with a scraper blade 41, which operates upon the wear plate 18 on the upper face of the bottom 15.

The conveyer and mixer is driven from a drive shaft 42 which is operated from any suitable source of power. This drive shaft is provided with a sprocket wheel 43, around which passes a sprocket chain 44. The latter also passes around a sprocket chain 45, fixed to a countershaft 46 that is journaled in the upper portion of the frame. The countershaft carries a beveled gear 47 meshing with a beveled gear 48 mounted on the worm shaft 35.

The concrete or other material, after it has been mixed and elevated, is delivered through a discharge opening 49 formed in one side of the upper portion of the inner casing 20, and associated with this discharge opening, is a downwardly inclined chute 50. A controlling gate 51 operates over the discharge opening, and is connected by a link 52 with one end of a lever 53. The lever is fulcrumed between its ends, as shown at 54, on the supporting frame, and its outer end has an actuating link 55 suspended therefrom.

In order to supply the necessary moisture to the material, a pipe 56, leading from any suitable source of water supply, is connected to a pipe 57 surrounding the lower portion of the outer casing, and this pipe 57 has a plurality of inwardly extending delivery nozzles 58 that communicate with the receiving chamber 21.

Briefly described, the operation of the machine is as follows. The different elementary materials are placed in the different magazines formed between the inner and outer casings and the proportions fed to the conveyer and mixer can be governed by elevating the different gates to a greater or less extent. Having supplied the magazines with the materials, the machine is placed in operation, a proper amount of water is admitted to the pipe 56 and the worm or screw will thereupon remove the materials as they gravitate into the receiving chamber and carry them upwardly in the inner casing. During this upward movement, they are thoroughly agitated, and mixed, and are finally delivered through the discharge opening 49 down the chute 50, into any desirable receptacle. It will be evident that by keeping the magazine supplied, the operation of the machine will be continuous, and no stoppage required to supply materials and discharge the product. Moreover, the structure is exceedingly simple and compact, so that it can be built at comparatively small cost and can be readily transported from place to place, as need may require.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

I claim:

1. In a machine of the character set forth, the combination with a casing, of a rotary mixer and elevator operating therein, a plurality of material holding magazines having discharge mouths delivering to the lower portion of the casing, and means for individually controlling the mouths.

2. In a machine of the character set forth, the combination with an outer casing having a bottom, of an inner casing having an open lower end terminating short of the bottom, forming a receiving chamber, a mixer and elevator operating in the inner casing and in the receiving chamber, a plurality of partitions interposed between the outer and inner casings and forming material holding magazines communicating with the receiving chamber, and means for governing the passage of material from the magazines into the chamber.

3. In a machine of the character set forth, the combination with an outer casing having a bottom, of an inner casing having an open lower end terminating short of the bottom, forming a receiving chamber, a mixer and elevator operating in the inner casing and in the receiving chamber, and a plurality of partitions interposed between the outer and inner casings and forming material holding magazines communicating with the receiving chamber, said partitions having downwardly inclined deflector flanges.

4. In a machine of the character set forth, the combination with an outer casing having a bottom, of an inner casing having an open lower end terminating short of the bottom, forming a receiving chamber, a mixer and elevator operating in the inner casing and in the receiving chamber, a plurality of partitions interposed between the outer and inner casings and forming material holding

magazines communicating with the receiving chamber, said partitions each having oppositely extending and downwardly inclined deflector flanges forming contracted mouths, and gates controlling the mouths.

5. In a machine of the character set forth, the combination with an outer casing, of an inner casing located therein, a mixer and conveyer operating in the inner casing, partitions interposed between the casings and forming material holding magazines that communicate with the inner casing, and controlling gates mounted on said inner casing for governing the passage of material from the magazines.

6. In a machine of the character set forth, the combination with an outer casing, of an inner casing located therein and having an open lower end, a mixer and conveyer operating in the inner casing and extending into the lower end of the outer casing, partitions interposed between the casings and forming material holding magazines communicating with the lower end of the inner casing, vertically sliding gates controlling such communication, hangers for suspending said gates, and actuating and holding devices mounted on the inner casing and connected to the hangers.

7. In a machine of the character set forth, the combination with an outer casing, of an inner casing having an upper delivery and a lower inlet portion arranged within the outer casing, partitions interposed between the casings and forming material holding magazines, said partitions having oppositely disposed deflector flanges, vertically sliding gates operating between the flanges, and a rotary conveyer and mixer arranged within the inner casing.

8. In a machine of the character set forth, the combination with a frame, of an outer casing mounted therein and having a hopper bottom, an open ended inner casing arranged within the outer casing and terminating short of the bottom, partitions interposed between the casings and forming material holding compartments, gates for controlling the passage of material from the compartments into the space below the inner casing, a screw mixer and elevator arranged within the inner casing and having a shaft projecting above the same, a rotary bearing for the upper end of the shaft supporting the same and the screw conveyer, means for rotating the shaft, and a gate for controlling the delivery of material from the upper end of the inner casing.

9. In a machine of the character set forth, the combination with a casing, of a mixing screw operating therein, oppositely disposed agitators carried by the screw, and means for feeding material to the screw.

10. In a machine of the character set forth, the combination with a casing, of a rotary mixing screw located therein and comprising a shaft and a worm mounted on the shaft, agitator blades secured to the shaft and extending over the worm, and means for feeding material to the worm.

11. In a machine of the character set forth, the combination with a casing, of a rotary mixing screw located therein and including a shaft, and a worm mounted thereon, outwardly extending agitator blades secured to the shaft and located upon the worm, agitator blades secured to the outer portion of the worm, and means for feeding material to the screw.

12. In a machine of the character set forth, the combination with an outer casing, of an inner open ended casing located therein and terminating short of the same, a mixer and conveyer screw operating in the inner casing, gates located between the casings and controlling the supply of material to the screw, and means for delivering water into the outer casing below the gates.

13. In a machine of the character set forth, the combination with a frame, of an outer casing located therein and having a tapered bottom, an inner casing arranged within the outer casing and terminating short of the bottom, gates controlling the passage of material to the bottom of the inner casing, an elevating and mixing screw arranged within the inner casing and in the lower portion of the outer casing, means for suspending said screw and permitting its rotation, means for rotating the same, and means for delivering water to the lower portion of the casing.

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

HAYES J. J. ALEXANDER.

Witnesses:

S. L. CLARK,

ISABEL GEIS.