A. J. FISHER.

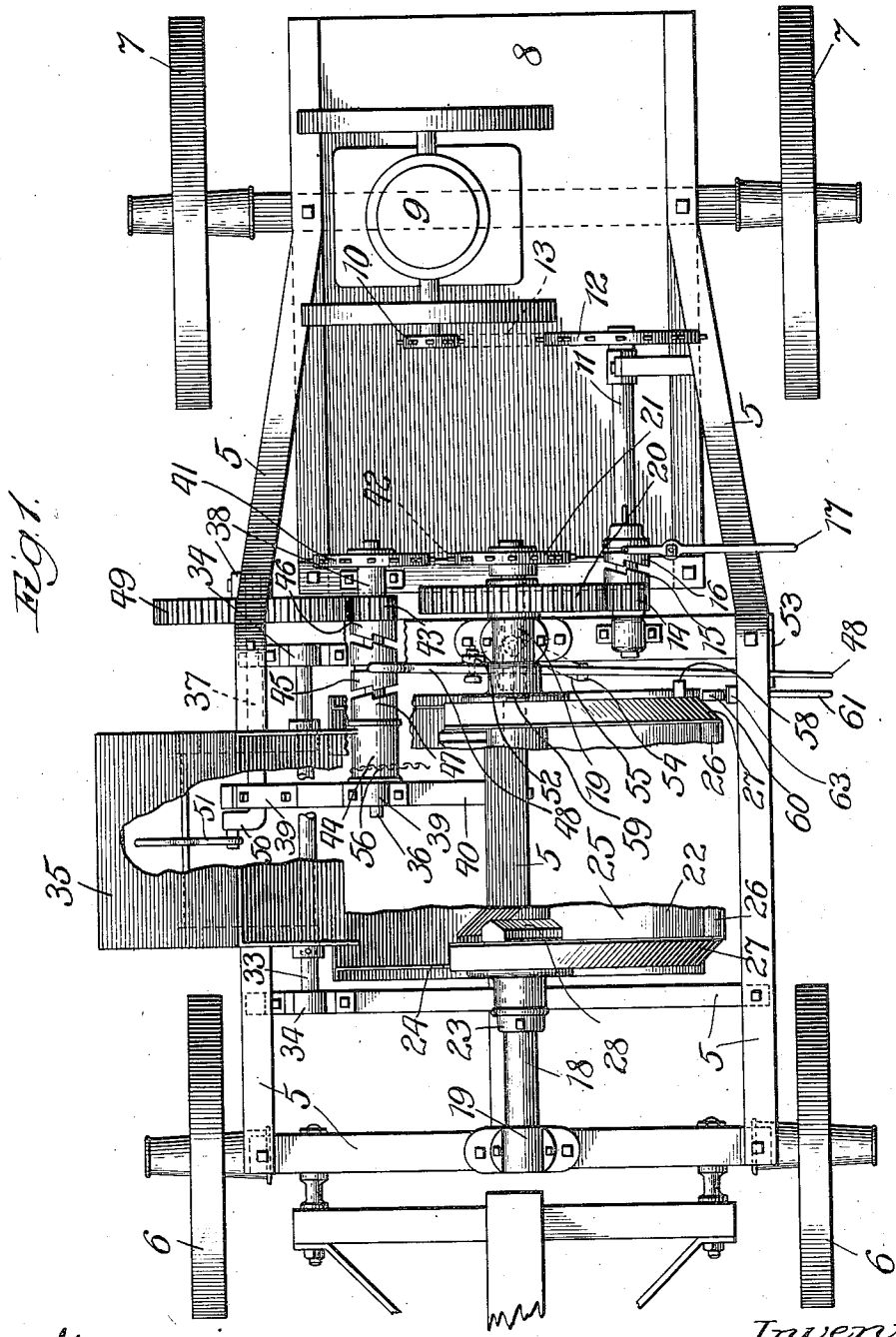
CONCRETE MIXER.

APPLICATION FILED JUNE 11, 1909.

987,974. Patented Mar. 28, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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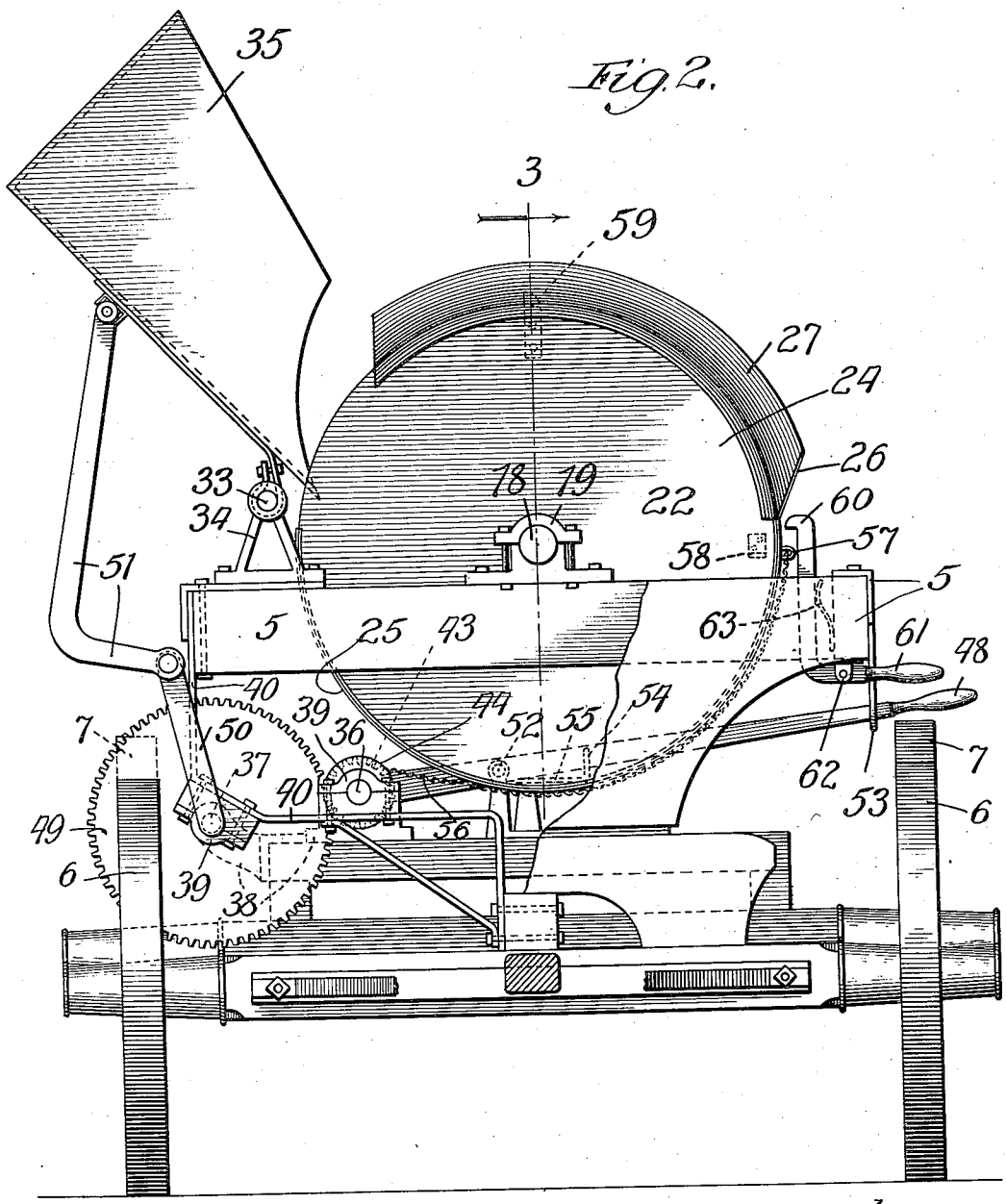
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

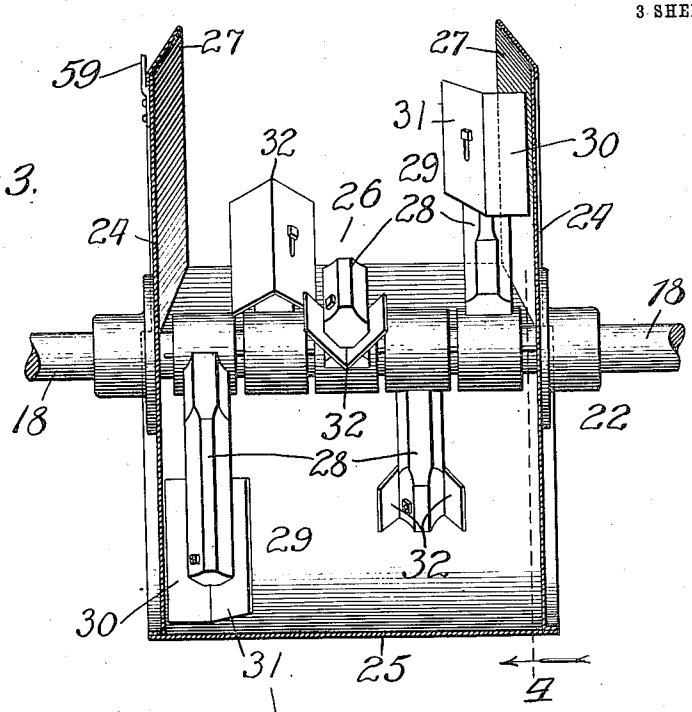
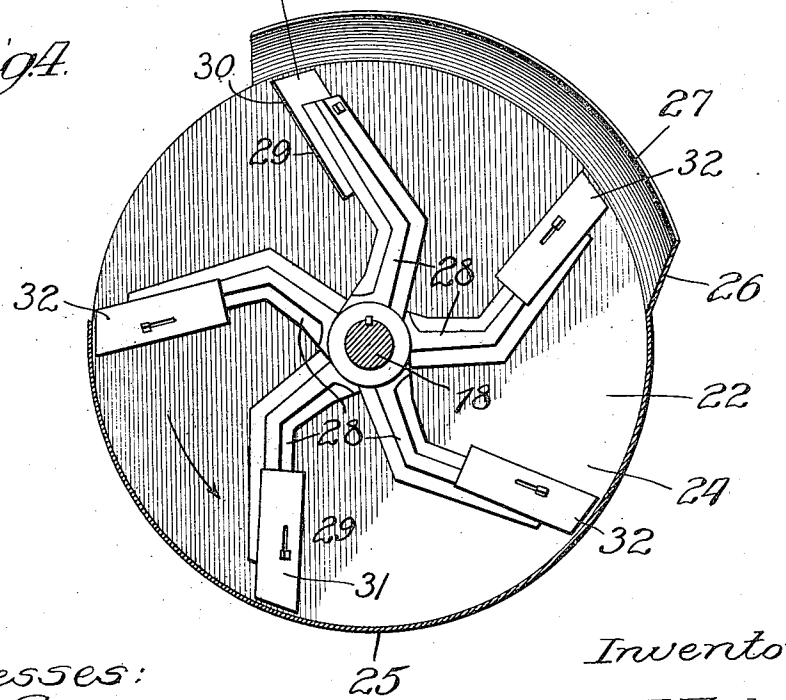


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CONCRETE-MIXER.

987,974. Specification of Letters Patent. Patented Mar. 28, 1911.

Application filed June 11, 1909. Serial No. 501,610.

To all whom it may concern:

Be it known that I, ANDREW J. FISHER, a citizen of the United States, residing at Buda, in the county of Bureau and State of Illinois, have invented a new and useful Improvement in Concrete-Mixers, of which the following is a specification.

My invention relates to improvements in that class of portable concrete-mixing machines intended more especially for use in mixing concrete for the construction of sidewalks, curbing, culverts, and the like, wherein it is desirable to move the machine as the work progresses, or to move the same from one locality to another without the necessity of dismantling the machine.

My object is to provide a machine of this character of simple construction and improved details, with the parts so disposed as to insure the most convenient and economical handling of material in the most expeditious manner.

Referring to the drawings:—Figure 1 is a broken plan view of my improved machine; Fig. 2 a view in end elevation regarded from the left-hand side of Fig. 1; Fig. 3 a view showing the mixing-shell in section at line 3, Fig. 2, with the mixing-arms or stirrers disposed about the shaft, in elevation, and Fig. 4 a view in sectional elevation of the shell and mixing arms as indicated by line 4, Fig. 3.

A suitable skeleton-frame 5 is mounted on front wheels 6 and rear wheels 7, and between the latter extends a platform 8 carrying a motor or engine 9 equipped with a sprocket-wheel 10 for the purpose of driving the mechanism employed in operating the machine. A counter-shaft 11, supported in properly arranged bearings on the frame, is provided on one end with a sprocket-wheel 12 connected with the sprocket 10 by a chain 13 indicated by dotted lines in Fig. 1. Loosely mounted on this shaft near its opposite end is a pinion 14 having a clutch-face 15, and adjacent thereto is a clutch 16 splined to the shaft for driving the pinion when it is thrown by an operating-lever 17 into engagement with the clutch-face 15. A shaft 18 centrally disposed on the frame to extend lengthwise thereof is journaled in bearings 19, 19 and equipped at its inner end with a gear 20, in mesh with the pinion 14, and with a sprocket-wheel 21, both the gear and sprocket being rigidly secured to the shaft. A semi-cylindrical mixing-shell 22 is loosely mounted on this shaft and confined against endwise movement thereon by a collar 23 and one of the bearings 19. The shell comprises two disk-shaped ends 24, 24 and a semi-cylindrical or segmental body-portion 25 extending between and part way about them. As shown in Fig. 4, one edge of the body 25 is bent outwardly at an angle to form a flange 26 which projects beyond the peripheries of the ends 24 throughout the length of the shell, and segmental peripheral flanges 27, 27 are secured to the outer sides of the ends to project inwardly at angles as shown in Fig. 3, extending from the flange 26 throughout the greater portion of the open face or mouth of the shell. Keyed to the shaft within the shell are rigid angular arms 28 provided with adjustable shoes for the purpose of mixing the materials fed to the shell. The two outer arms, or those nearest the ends 24, carry shoes 29 each having a flat face 30 and an oblique face 31. The faces 30 extend from practically the longitudinal centers of the arms, as shown in Fig. 3, nearly to the ends or heads of the shell and are in parallel planes with the shaft 18 while the faces 31 extend obliquely from the faces 30 toward the transverse center of the shell. The shoes 32 on the intermediate arms are V-shaped or formed with two oblique faces similar to the faces 31; and each shoe is a width to cause it to overlap, in its revolution, the path of the adjacent shoe.

As shown in Fig. 4, each arm 28 is of angular shape or formed with an offset, so that the point of the shoe which is attached thereto is always in advance of its heel as it is caused to revolve about the shaft 18. In other words, the heel of the shoe is at all times to the rear of a radial line drawn from the center of the shaft tangential to the point thereof. This arrangement insures a plowing rather than a scraping action of the shoe upon the material, with the result that the minimum of power is required to rotate the shaft. In the operation of the stirrers the flat surfaces 30 of the shoes scrape the materials from the heads 24 and prevent accumulation thereon of them, and each oblique surface merely turns the concrete as the shoe passes through it and does not throw it as is the case with many machines of this class, insuring a thorough and complete mixture

of the concrete with the least expenditure of power.

At one side of the shell 22 and parallel therewith is provided a shaft 33 confined in suitable bearings 34, on the frame, and mounted to swing freely thereon is a feeding-bucket 35 (Figs. 1 and 2), into which the materials to form the concrete are shoveled when the bucket is in a lowered position, the bucket being adapted to be raised into the position shown in Fig. 2 for discharging its contents into the shell.

Two shafts 36 and 37 each arranged like the shaft 33 parallel with the shell though somewhat below the shafts 18 and 33, are supported at corresponding ends in bearings 38 on the frame and at their opposite ends in bearings 39 on a hanger 40 suspended on the frame and disposed transversely to it. The shaft 36 carries at one end a sprocket 41 in line with the sprocket 21 and connected with it by a chain 42 indicated by dotted lines in Fig. 1, and loosely mounted on this shaft, respectively, adjacent to the bearings 38 and 39, is a pinion 43 and a drum 44, while between these two is splined to the shaft a double-acting clutch 45. The pinion is equipped with a clutch-face 46 and the drum with a similar face 47, so that when the clutch is shifted into engagement with either one or the other, by its operating-lever 48, motion will be imparted from the shaft to whichever is engaged by the clutch; but when the latter is in the position illustrated in Fig. 1, both pinion and drum are at rest and the clutch alone revolves. A gear 49 mounted on one end of the shaft 37 and in mesh with the pinion 43 is adapted to be driven by the latter through the clutch 45 to rotate the shaft 37, which carries a crank-arm 50. For raising and lowering the bucket 35 a link 51, pivotally secured to it, is connected with the crank 50 (Fig. 2). The clutch-lever 48 is pivoted at 52, its free end being movably confined in a loop 53; and near its pivot it is engaged for the purpose hereinafter explained by an upturned bifurcated end 54, of a bell-crank 55.

A chain 56 is secured at one end to the shell, as shown at 57 in Fig. 2, and its opposite end is connected with the drum 44, so that as the drum is rotated, the shell will be swung sufficiently to discharge at the proper time its mixed contents. When the clutch 45 is thrown into engagement with the drum for the purpose of turning the shell, such movement is continued until a lug 58 on the shell is brought into engagement with the shorter or free end of the bell-crank 55 (Fig. 1), to turn the latter on its fulcrum and through its engagement with the lever 48, shift or disengage the clutch from the drum to afford an automatic release. Just prior to the time this disengagement takes place a cam-shaped finger 59 on the shell passes beneath a hooked end 60 in its path, of a bent lever 61 pivoted at 62 to the frame of the machine. As the finger passes below the hook 60, the lever is at once swung back over it by a spring 63 to hold the shell in its discharging position where it remains until released by the attendant by the disengagement of the lever from the finger 59. When the shell is thus released it turns by gravity to its initial or filling position, as shown in Fig. 2, paying out the chain from the drum 44. The throw of the shell from the filling to the discharging position is practically ninety degrees (90°), as shown in the drawings, but this may be either increased or diminished as required to suit varying conditions.

For constructing sidewalks, gutters, sewers, and the like, it is found in practice that for the most convenient, economical and expeditious handling of materials and the laying of concrete, it is advantageous to deposit the materials for the concrete mixture, in a continuous pile parallel with and spaced a few feet from the grading, excavation, trench, or line of the structure to be formed, to use a portable mixing-machine placed between the materials and line of work, to be advanced from time to time as the work progresses, and to employ a feeding bucket, into which the material can be introduced into the machine at one side thereof and to enable its contents to be discharged from its opposite side adjacent to the line of work. It is primarily with a view of providing a machine capable of being used in this manner that I have devised my improved concrete mixer.

The operation is as follows:—While the machine is in use the engine runs continuously and the clutch 16 is in mesh with the clutch-face 15 of the pinion 14 which rotates the shafts 18 and 36 until for any reason the clutch is disengaged by the operator who is stationed in ready access to the levers 17, 48 and 61, by which means he is enabled to control the operation of the machine. Assuming the bucket 35 to be in its lower position the concrete materials are shoveled into it in proper proportion and quantities whereupon the operator throws the clutch 45 to the right through the medium of the lever 48 to rotate the shaft 37 and through its connections with the bucket, to raise it to the position shown in Fig. 2, to discharge the material into the shell 22, whereupon the bucket is again lowered (preparatory to being refilled), either by allowing the shaft 37 to make a complete revolution, or by disengaging the clutch 45 and allowing the bucket to drop by gravity to this position. When the material has been thus deposited in the shell, water is introduced through a pipe (not shown), as is customary with concrete-mixers, and the material is allowed to remain until the revolv-

ing arms 28 and shoes 29 and 32 have thoroughly mixed the concrete, when the operator throws the lever 48 to cause the clutch 45 to engage the clutch face 47 of the drum 44 to turn the shell to its discharging position whereupon the clutch is disengaged by contact of the lug 58 with the bell-crank 55, and the shell is held in the discharging position against returning by the engagement of the finger 59 with the lever 61. While the shell remains in this position the concrete slides and is scraped therefrom by the revolving mixing-arms, after which the shell is swung by gravity to its normal position upon the release of the finger 59, by the operator who rocks the lever 61 on its pivot freeing the finger. The flanges 26 and 27 afford extensions to the drum at the open side or mouth to prevent the material from being spattered or thrown through the opening during the mixing process and to deflect the concrete toward a common point as it is discharged from the shell.

What I claim as new and desire to secure by Letters Patent is—

In a portable concrete mixer, the combination with a frame, of a rotary shaft journaled to extend lengthwise of the frame, means for rotating the shaft, a mixing-shell rotatably suspended on the shaft provided with a receiving and discharging opening, a lug on said shell, a second shaft provided with a drum and pinion, disposed in a parallel plane to said first-named shaft and geared thereto, a slidable clutch on said second shaft interposed between the drum and pinion, an operating lever connected with the clutch and adapted to shift it into and out of engagement with either the drum or pinion, a chain secured at its ends to said drum and shell, adapted to turn the shell upon rotation of the drum for dumping its contents, a bell-crank pivoted to said frame with one of its arms connected with the operating lever and with its free arm in the path of movement of said lug, operating to disengage said clutch from the drum upon turning of the shell to dump the contents thereof, and means connected with said pinion to be actuated thereby for charging materials to be mixed into the shell, for the purpose set forth.

ANDREW J. FISHER.

In presence of—
B. F. WAITE,
H. M. WAITE.