June 26, 1923.

1,460,191

A. W. ALTORFER

DRIVING MECHANISM FOR WASHING MACHINES

Filed May 23, 1918

3 Sheets-Sheet 1

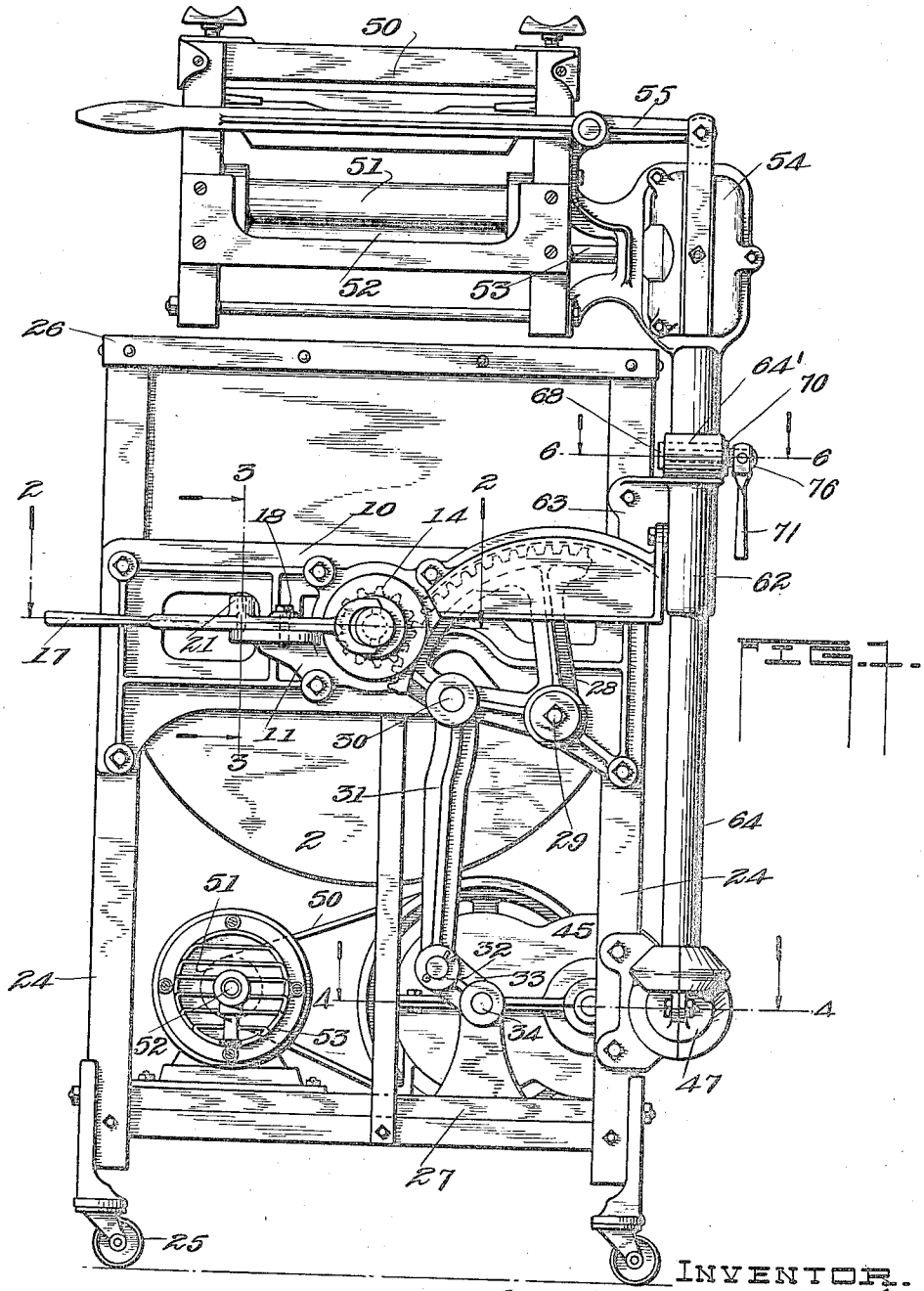


FIG. 1.

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FIG. 2.

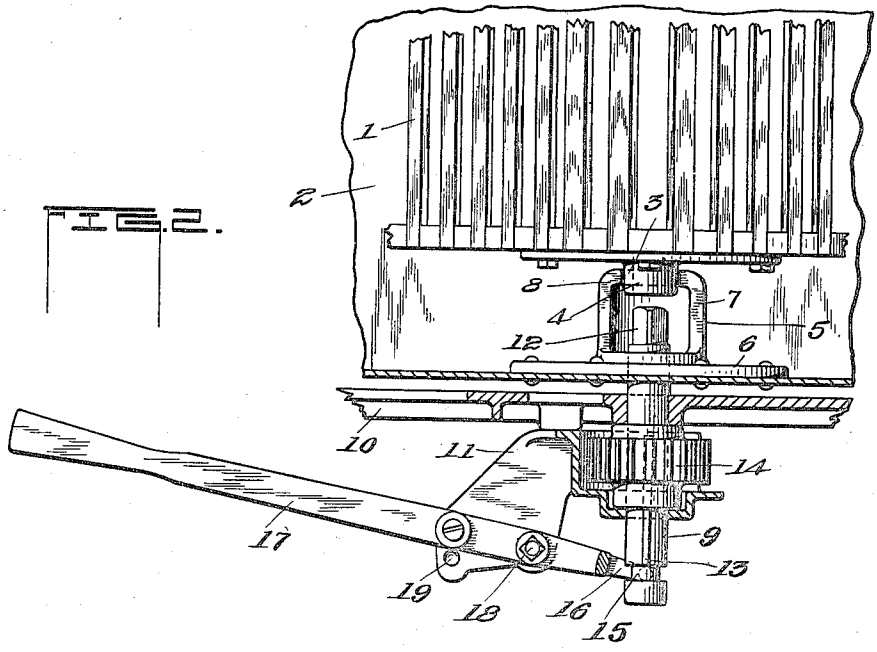
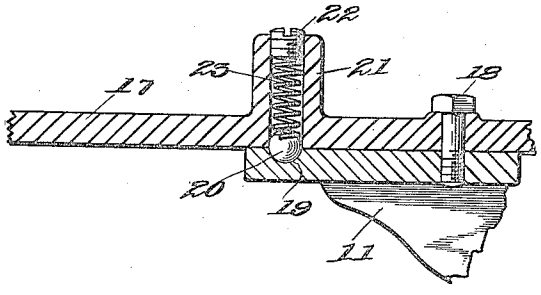


FIG. 3.



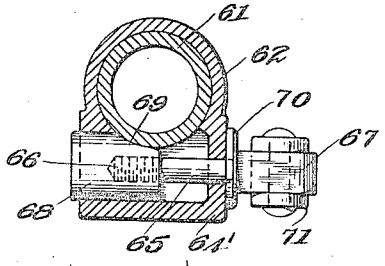


FIG. 4.

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Filed May 23, 1918 3 Sheets-Sheet 3

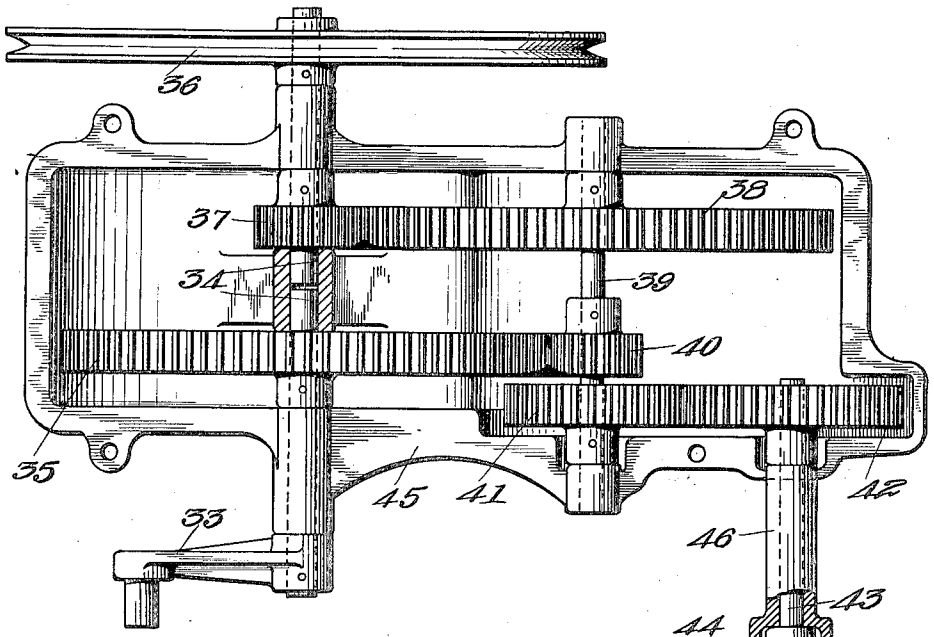


FIG. 4.

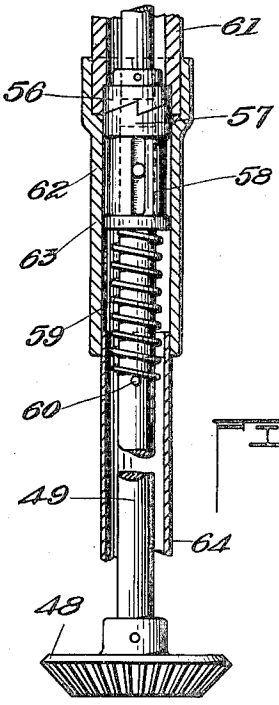


FIG. 5.

INVENTOR.

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Patented June 26, 1923. 1,460,191

UNITED STATES PATENT OFFICE.

ALPHEUS W. ALTORFER, OF PEORIA, ILLINOIS, ASSIGNOR TO ALTORFER BROS. CO., OF EAST PEORIA, ILLINOIS, A CORPORATION OF ILLINOIS.

DRIVING MECHANISM FOR WASHING MACHINES.

Application filed May 23, 1918. Serial No. 236,142.

To all whom it may concern:

Be it known that I, ALPHEUS W. ALTORFER, a citizen of the United States, a resident of Peoria, in the county of Peoria and State of Illinois, have invented new and useful Improvements in Driving Mechanism for Washing Machines, of which the following is a specification.

This invention has reference to washing machines, and relates particularly to washing machines of the cylinder type; that is, a machine having a washing cylinder and mechanism for revolving the cylinder alternately in opposite directions.

The invention has for its principal object, to provide bearings for the cylinder which will permit of the cylinder being removed from the machine with perfect ease, and in the provision of a driving element for the cylinder which may be moved into and out of operative relation with the cylinder, without disturbing other operative connections with the power.

The invention includes new and novel gearing connections between the motor or other source of power and the driving element for the cylinder, and also gearing connections between said first mentioned gearing and the operating means for a swingable wringer mounted on said machine.

That the invention may be more fully understood, reference is had to the accompanying drawings, in which—

Fig. 1 is a side elevation of a cylinder machine, with my invention applied thereto;

Fig. 2 is a detail sectional view, in plan, as the same would appear if taken on the line 2—2, Fig. 1;

Fig. 3 is a detail vertical sectional view as the same would appear if taken on the line 3—3, Fig. 1;

Fig. 4 is a detail in plan, partly in section, showing the reducing gearing between the motor or other source of power and the cylinder, also for operating the wringer, as the same would appear on the line 4—4, Fig. 1;

Fig. 5 is a detail vertical section view showing operating parts connecting the wringer and the reducing gearing, and

Fig. 6 is a sectional detail of parts, as the same would appear if taken on the line 6—6, Fig. 1.

Like characters of reference denote corresponding parts throughout the figures;

The clothes container washing cylinder 1 of the machine is not unlike other cylinders of this character and I need not, therefore, describe it in detail, except as to the manner of journaling it in the casing 2. On each side of the cylinder are secured trunnions 3, only one of which is shown, and this trunnion is formed with a clutch socket 4. To the opposite inside walls of the casing 2, are secured bearings 5, only one of which is shown. This bearing comprises a plate 6, secured to the casing 2, and projecting inwardly from said plate is a semi-spherical bearing member 7 having a bearing seat 8 into which is seated, as shown, the trunnion 3. The bearing 5 for the opposite trunnion 3 has a bearing seat similar to the bearing seat 8 referred to. This construction provides for a quick and easy removal of the cylinder 1 from the casing 2 and an easy replacement of the same.

The driving element for the cylinder 1 is the reciprocal shaft 9. This shaft passes through and has a bearing in the bearing 5, a casting 10 and a bracket 11. The inner end of the shaft has a clutch member 12 and for a portion of the length of said shaft, it is provided with a spline 13 fitting in a groove corresponding thereto in a pinion 14, journaled in the bracket 11; sidewise movement of the pinion being prevented by the casting 10 on one side and a wall of the bracket 11 on the other side. The outer end of the shaft 9 is formed with an annular groove 15 engaged by a yoke 16 on the end of a lever 17 fulcrumed at 18 on the bracket 11.

To clutch the shaft 9 to the cylinder 1, the outer end of lever 17 is swung away from the machine, moving the shaft 9 endwise inwardly, causing the clutch end 12 of the shaft to enter the clutch socket 4 in the trunnion 3, and when so connected, if the pinion 14 is rotated, corresponding rotation will be imparted to the cylinder 1. To disconnect the clutch parts, the lever 17 is swung in the opposite direction, as will be understood.

The bracket 11 is formed with a ball-seat 19, into which enters a ball 20, to lock the lever 17 in position when it is swung to cause the clutch parts 4 and 12 to engage. This ball 20 is located at the lower end of a tubular boss 21 on the lever 17, said boss closed with a screw-cap 22, between which

and the ball 20, in the boss, is a coil spring 23.

The casing 2 of the machine is preferably supported between four standards or legs 24, only two of which are shown, and which are preferably angle-irons. To two of these standards or legs is secured the casting 10. To the lower end of each standard or leg 24 is connected a caster-wheel 25 to permit the machine to be rolled from one place to another. 26 designates the top of the machine provided with the usual lid, not shown, and 27 is a platform at the base of the machine and between the standards or legs 24 on which is mounted the motive power and gearing for actuating the moving parts of the machine. In constant mesh with the teeth of the pinion 14 are teeth on a segment-rack 28 fulcrumed at 29 on the casting 10. At a point 30 there is pivotally connected with the segment 28 a pitman-bar 31, which, at its opposite end 32 is connected with a crank-arm 33, connected with one end of a two-part driving shaft 34. On the inner end of that part of shaft 34, to which is connected the crank-arm 33, is connected a large gear wheel 35. To the outer and inner ends, respectively, of the other part of said two-part shaft 34, is connected a pulley or sheave wheel 36, and a small pinion 37. The pinion 37 meshes with and drives a gear wheel 38, on a shaft 39. The gear wheel 38 is similar to gear wheel 35. On said shaft 39 is a pinion 40, similar to the pinion 37, and said pinion 40 meshes with and drives the gear wheel 35. Also connected with said shaft 29 is a gear wheel 41 meshing with a gear wheel 42 on one end of a shaft 43, on the opposite end of which is a bevel gear wheel 44.

The two-part shaft 34, the shaft 39 and the gear wheels 35, 37, 38, 40, 41 and 42 are encased in the two-part casing 45 mounted on the platform 27, said casing having marginal journal bearings for said shafts and an intermediate journal bearing for the inner ends of said two-part shaft, and on either side of which are located the gear wheels 35 and 37, respectively. The shaft 43 has a bearing in a sleeve 46 connected at its outer end in the bevel gear casing 47 secured to a standard or leg 24, and housing the bevel gear wheel 44 and also a bevel gear wheel 48 connected with the lower end of an upstanding or vertically disposed wringer operating shaft 49.

Passing around the pulley or sheave wheel 36 is a driving belt 50, and said belt, also passes over a smaller but similar wheel 51 on the shaft 52 of an electric motor 53 mounted on the platform 27.

It is understood that the motor 53 is connected with the ordinary dwelling current through a fixture, wall or ceiling socket, and that when the current is flowing through the motor, the two-part shaft 34 is in constant operation, actuating the gears 37, 38, 40 and 35, and the crank-arm 33, which in turn imparts movement, constantly, to the pitman-bar 31, and that the reciprocation of said bar will oscillate said segment-rack 28, first in one direction and then in an opposite direction, imparting an alternate rotary motion to said pinion 14, and said clutch shaft 9. Should the clutch part 12 of the shaft 9 be in engagement with the clutch socket 4 of the trunnion 3, the cylinder 1 will also be alternately rotated; but should said clutch parts be disconnected, the cylinder 1 will remain idle, although the mechanism described is in operation.

When the motor 53 is once connected with the house current, the driving parts usually remain in operation, and the disconnection of operative parts must be at the machine, hence this simple but effective clutch mechanism. The wringer is also arranged to be controlled at the machine, as I shall explain.

The wringer, designated as a whole as 50, is of the ordinary construction, including the wringer rollers 51 and 52 geared together, not shown, the shaft 53 of the roller 52 having one end journaled in a housing 54 and geared to the upper end of the shaft 49 through clutch controlled bevel gearing, not shown, under control of the operator through the lever mechanism 55. The clutch controlled gearing between the shaft 49 and the wringer shaft 53, is of a well known construction and need not be further described. It has for its object to permit the operator to reverse the operation of the wringer rollers 51 and 52, at will, or cause the same to remain idle, at will.

The shaft 49 is preferably made in two sections, see Fig. 5. To the lower end of the upper shaft section is secured a clutch member 56 adapted to have clutch connection with a clutch member 57 formed on the end of a sleeve 58 slidably carried on the upper end of the lower shaft section, in manner shown in Fig. 5 and yieldingly held in clutch connection with the clutch member 56 by means of a coil spring 59 carried on the lower shaft section and bearing between the lower end of the sleeve 58 and a pin 60 in the shaft.

The shaft 49 is encased in the housing 54 and passes down through a tubular extension 61, thereof and is also encased in the tubular part 62 of a casting 63, and a pipe 64 connecting with the bevel gear housing 47. The tubular extension 61 fits into the upper end of the tubular part 62 of the casting 63 and locking means is provided at this point for locking parts 61 and 62 to secure the wringer in adjusted position, which, as will be understood, may be swung into two or more different positions, whereby the clothes may be passed from the washing

cylinder through the wringer into blueing or wrinse water, and then again through the wringer into a basket or other receptacle.

This locking means consists in providing the upper end of the tubular part 62 with a transverse tubular sleeve 64'. Through this sleeve extends a stem 65 threaded on its inner end, as at 66 and having a head 67 on its outer end. The threaded end of said stem is screwed into a plug 68 having a beveled face 69 adapted to bear against the lower end of the tubular extension 61. On the stem 65 between its head 67 and the end of the sleeve 64, is a ring or washer 70, and to the head 67 is connected a handle 71 for turning the stem to tighten up the plug 68 or releasing the same, when desired.

The two part shaft construction 49 is a convenient arrangement when the machine is knocked down for shipment, i. e., the wringer 50 with the housing 54, tubular extension 61 and the upper shaft part 49, clutch part 56 and gearing in the housing 54 may be detached, upon the release of the locking means, and thus facilitate the crating of the machine and its parts.

It is believed the functions of the various parts and the operation of the machine, as a whole, is understood from the foregoing without further detailed description.

It is obvious that various changes may be made in the construction of the several elements, without departing from the spirit and scope of the invention, and I, therefore, do not wish to be confined to the details shown, except as the same may be specifically claimed.

What I claim is:—

1. In a washing machine, in combination, a casing, a clothes container removably supported in said casing and rotatable alternately in opposite directions, a trunnion connected axially with one side of said container and provided with a clutch socket, a shaft arranged to be moved endwise into and out of clutch engagement with said trunnion, a gear wheel for actuating said shaft and through which the latter may be moved, a hand lever to reciprocate said shaft, said lever extending to one side of said machine, and gearing arranged to continuously impart alternate rotary motion to said gear wheel and said shaft when said shaft is in clutch relation with or declutched from said trunnion.

2. In a washing machine, in combination, a casing, open bearing seats secured axially to the opposite inside walls of said casing, a clothes container, trunnions connected axially with said container and adapted to have a removable bearing relation with said bearing seats, one of said trunnions provided with a clutch socket, a bracket secured to said casing, a gear wheel having a bearing in said bracket, a shaft having a spline and groove connection with said gear wheel and movable endwise therethrough and through said casing and adapted to be moved into and out of clutch engagement with said socketed trunnion, a hand lever to reciprocate said shaft, said lever fulcrumed on said bracket and extending to one side of said machine, and gearing arranged to continuously impart alternate rotary motion to said gear wheel and said shaft when said shaft is in clutch relation with or declutched from said socketed trunnion.

3. In a washing machine, in combination, a casing, a clothes container removably supported in said casing and rotatable alternately in opposite directions, a trunnion connected axially with one side of said container and provided with a clutch socket, a shaft arranged to be moved endwise into and out of clutch engagement with said trunnion, a gear wheel for actuating said shaft and through which the latter may be moved, a hand lever to reciprocate said shaft, said lever extending to one side of said machine, a segment gear in mesh with said gear wheel, a train of gearing, a pitman bar connecting said segment gear with said gearing, and means to continuously impart alternate rotary motion to said gear wheel and said shaft through said gearing, pitman and segment gear when said shaft is in clutch relation with or declutched from said trunnion.

4. In a washing machine, in combination, a casing, a clothes container removably journaled in said casing and rotatable alternately in opposite directions, an operating shaft arranged to be moved into and out of axial clutch engagement with said container, and gearing arranged to continuously impart alternate rotary motion to said shaft when the latter is in clutch relation with or declutched from said container.

5. In a washing machine, in combination, a casing, a clothes container removably journaled in said casing and rotatable alternately in opposite directions, an operating shaft arranged for longitudinal movement axially whereby it may be moved into and out of axial clutch engagement with said container, a hand lever to reciprocate said shaft, said lever extending to one side of said machine, and gearing arranged to continuously impart alternate rotary motion to said shaft when the latter is in clutch relation with or declutched from said container.

6. In a washing machine, in combination, a casing, a clothes container removably supported in said casing and rotatable alternately in opposite directions, means to actuate said container, including a driving element movable into and out of axial clutch engagement with said container, and a lever to reciprocate said driving element, the lat-

ter movable into and out of such clutch engagement with said container without disturbing its operative relation with said actuating means.

7. In a wasning machine, in combination, a casing, a clothes container removably supported in said casing, a casting mounted exteriorly of said casing, a bracket supported by said casting, a longitudinally movable shaft journaled in the casting and bracket and arranged to have an axial clutch connection with said container, a gear wheel connected to rotate said shaft and held between the casting and said bracket, means to rotate said gear wheel alternately in opposite directions, a lever fulcrumed on said bracket and connected with said shaft, whereby the later may be moved endwise into and out of clutch engagement with said container, the endwise movement of said shaft in no wise disturbing its operative relation with said gear wheel.

8. In a washing machine, in combination, a casing, a clothes container therein, a clutch member connected axially to said container, a casting supported exteriorly of said casing, a bracket supported by said casting and together therewith forming a retainer to receive a gear wheel, a gear wheel, an operating shaft movable axially through said gear wheel, a clutch part on the inner end of said shaft adapted to be moved into and out of clutch engagement with the clutch member on said container, a segment rack in mesh with said gear wheel, means to oscillate said rack, and a lever for reciprocating said shaft, the reciprocation of said shaft in no wise disturbing its operative relation with the actuating means therefor.

9. In a washing machine in combination, a casing, a clothes container therein, a clutch member connected axially to said container, a casting supported exteriorly of said casing, a bracket supported by said casting and formed with a seat to receive a gear wheel, a gear wheel, an operating shaft movable axially through said gear wheel, a clutch part on the inner end of said shaft adapted to be moved into and out of clutch engagement with the clutch member on said container, a segment rack in mesh with said gear wheel, a pitman pivotally connected with said rack, a crank to operate said pitman, gearing to operate said crank, a motor to operate said gearing, and a lever for reciprocating said shaft, the reciprocation of said shaft in no wise disturbing its operative relation with the actuating means therefor.

10. In a washing machine, in combination, a casing having marginal journal bearings and an intermediate journal bearing in axial alignment with certain of said marginal bearings, spaced parallel disposed shafts journaled in said marginal bearings, one of which is a two-part shaft and the inner ends of which are journaled in said intermediate bearing, a driving member on the outer end of one end of said two-part shaft and a driven member on the outer end of the other end of said two-part shaft, speed reducing gears between the respective ends of said two-part shaft and a second parallel shaft, a driven member on one end of a third parallel shaft, and gearing connecting the second and last mentioned shafts.

In witness whereof, I have hereunto affixed my hand this 9th day of May, 1918.

ALPHEUS W. ALTORFER.