

No. 880,336.

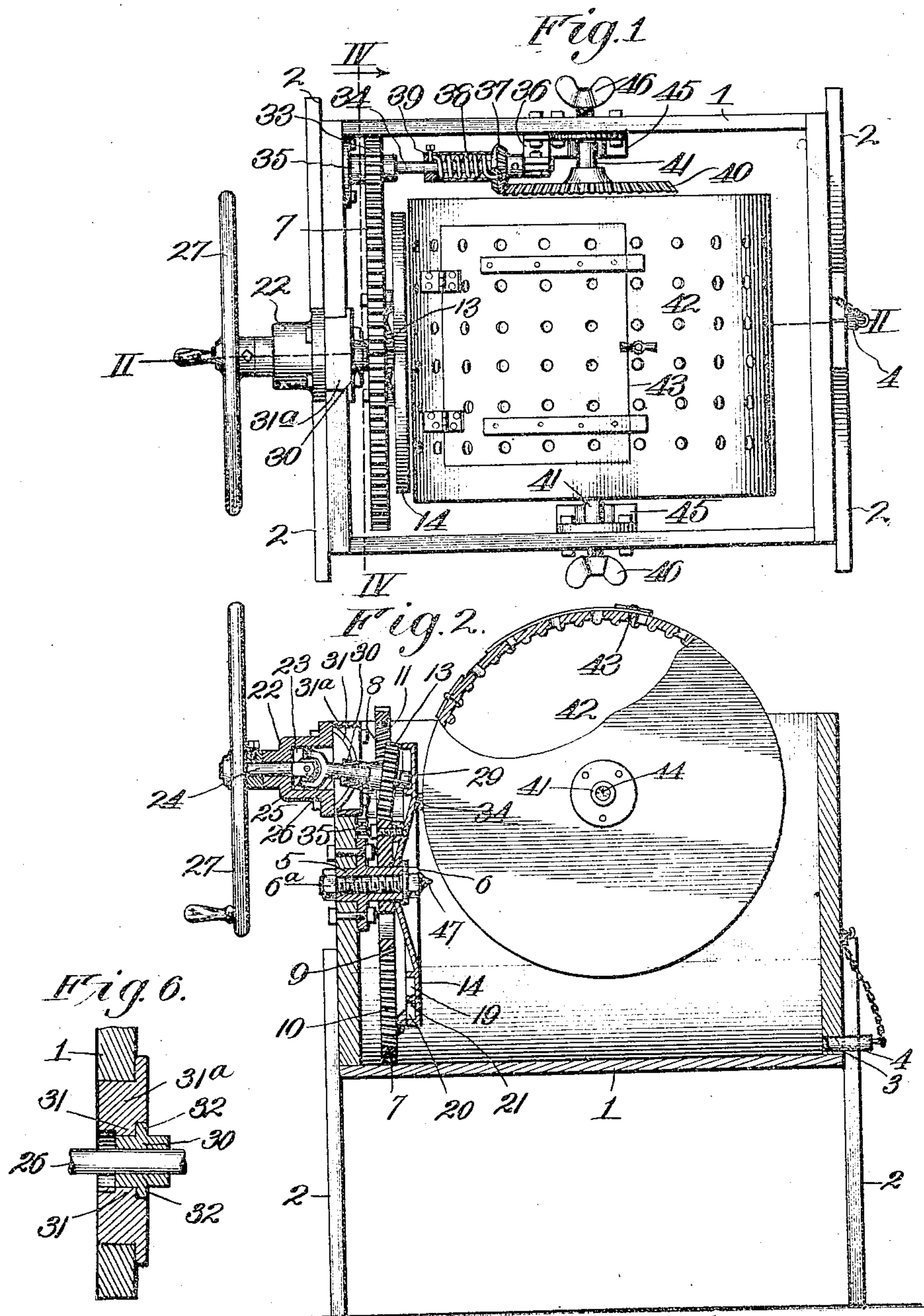
PATENTED FEB. 25, 1908.

C. A. SHIVE.

GEARING.

APPLICATION FILED OCT. 3, 1906.

2 SHEETS—SHEET 1



Witnesses
 Frank R. Gore
 H. C. Rodgers

Inventor:
 Calvin A. Shive.
 By George J. Thorpe Atty

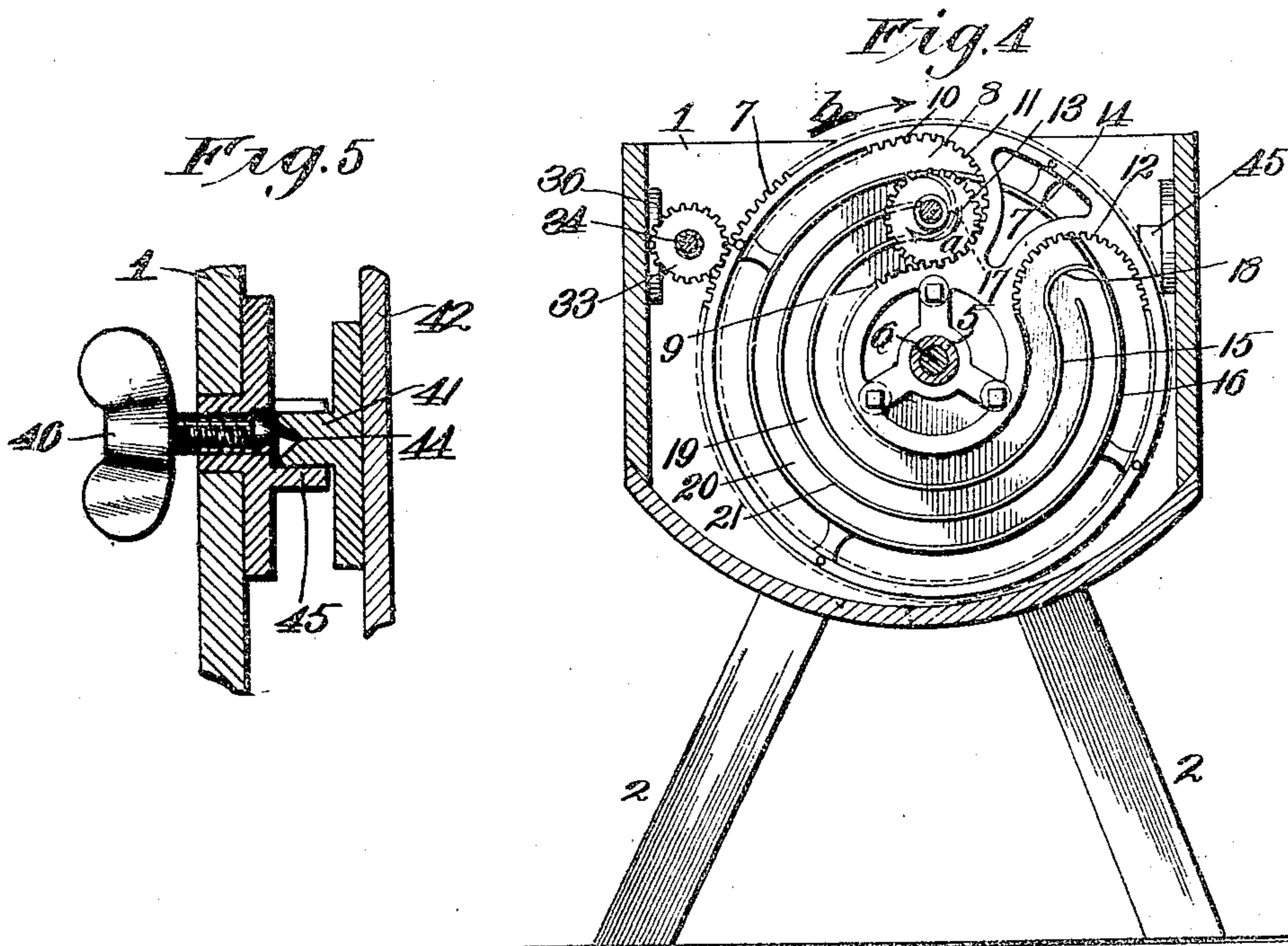
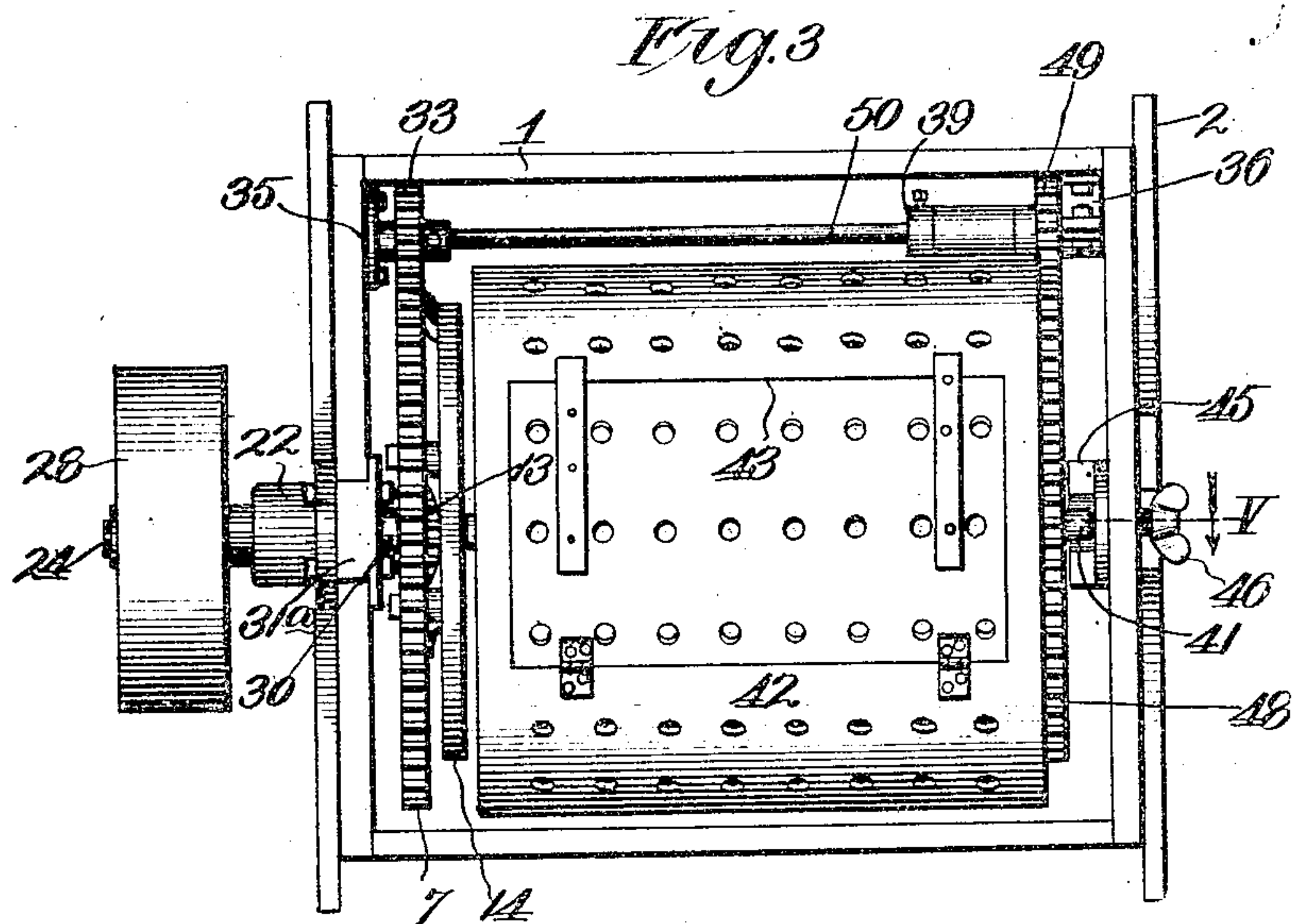
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C. A. SHIVE.
GEARING.

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2 SHEETS—SHEET 2.



Witnesses
Frank R. Gore
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UNITED STATES PATENT OFFICE.

CALVIN A. SHIVE, OF CHERRYVALE, KANSAS, ASSIGNOR TO THE PEERLESS PROMOTING AND MANUFACTURING COMPANY, OF CHERRYVALE, KANSAS, A CORPORATION OF ARIZONA TERRITORY.

GEARING.

No. 880,336.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed October 3, 1906. Serial No. 337,303.

To all whom it may concern:

Be it known that I, CALVIN A. SHIVE, a citizen of the United States, residing at Cherryvale, in the county of Montgomery and State of Kansas, have invented certain new and useful Improvements in Gearing, of which the following is a specification.

This invention relates to washing machines and has for its object to produce a machine of that character embodying a mangle rack mechanism, in which the movement of the washing drum is cushioned each time its direction of movement is reversed in order to reduce the wear and tear on the machine and to render less laborious the operation of the machine by hand.

A further object is to produce a machine of this character of simple, strong, durable and comparatively inexpensive construction.

With these objects in view and others as hereinafter appear, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1, is a top plan view of a washing machine embodying my invention, the cover being omitted. Fig. 2, is a section taken on the line II—II of Fig. 1, but with the washing drum mainly in elevation. Fig. 3, is a top plan view of the machine as arranged to be driven by a belt and adapted for use in laundries. Fig. 4, is a vertical section taken on the line IV—IV of Fig. 1 but showing mainly the water receptacle and the mangle rack mechanism. Fig. 5, is an enlarged vertical section taken on the dotted line V of Fig. 3 but with the bearing screw withdrawn. Fig. 6, is a horizontal section taken through the tumbling shaft.

In the said drawings, 1 indicates a suitable tank mounted on legs 2, and adapted to be provided with a suitable cover, not shown, and with a drain hole 3 provided with a removable plug 4. 5 indicates a flanged box secured in the front side of the receptacle and 6 a bolt extending through the same and equipped with an angular nut 6^a at its outer end. A gear wheel 7 is journaled on the box and retained thereon by the head of the bolt, said gear wheel being formed with a curved slot 8 which extends concentrically of the axis of the wheel and has its inner wall toothed as shown at 9 and its outer wall toothed as shown

at 10, its semi-circular ends being toothed as shown at 11 and 12 respectively, this curved and continuous rack bar in conjunction with cog pinion 13 forming a mangle rack for reversing the operation of the wheel without reversing that of the pinion, and in order to properly guide the pinion, which has movement in a vertical plane, I cast with or secure rigidly to wheel 7, a casting 14, said casting being spaced inward of the wheel as shown in Fig. 2, in order to accommodate the angular positions assumed by the pinion in the up and down movement referred to. The casting is provided with a curved slot arranged concentrically of the axis of wheel 7 and centrally of the slot of the latter, the inner wall of said slot being numbered 15 and the outer wall 16, and the curved ends 17 and 18, and said slot is subdivided into the inner groove 19 and the outer groove 20, by the concentric partition wall 21.

22 indicates a casting secured to the front wall of the receptacle above the axis of wheel 7 and provided with a chamber 23 and journaled in said casting is a short shaft 24 universally joined as shown at 25 to the short or tumbling shaft 26 on which the pinion 13 is rigidly mounted so as to be capable of engaging the rack teeth 9, 10, 11 and 12, the pinion being compelled to engage said teeth because of the engagement of the inner end of the tumbling shaft with the grooved casting 14, the engagement of the inner groove 19 with said shaft causing the pinion to engage the teeth 9 for the full length of the said series of teeth, when assuming the pinion is rotating in the direction indicated by the arrow *a* Fig. 4 said shaft rides up on the rounded end wall 17 and into the outer groove 20 of the casting, this movement of the shaft compelling the pinion to ride upward on the end teeth 11 and engage the outer teeth 10. As the pinion travels upward in engagement with teeth 11, wheel 7 is practically stationary and as it engages the teeth 10, wheel 7 is rotated in the direction indicated by the arrow *b* Fig. 4, this movement continuing until said wheel has made almost a complete revolution when the opposite end of the slot and grooves 19 and 20 are vertically above their axes of movement. The pinion then travels downward in engagement with teeth 12 and its shaft moves from the outer groove 20 into the inner groove 19. It will thus be seen that under the continuous operation of the

pinion in one direction wheel 7 will rotate a most complete revolutions in opposite directions alternately.

The tumbling shaft may be driven by means of the hand wheel 27 or by a belt wheel 28 or its equivalent, the hand wheel being adapted to use on household machines and the belt for use in laundries where electric or other power is available.

To reduce to the minimum the friction between the tumbling shaft and the grooved casting 14, the former is preferably provided with an anti-friction roller 29 and to guide the tumbling shaft in its vertical movement and prevent it from moving laterally, it is equipped with a box 30 arranged to slide between curved guide ribs of a slotted casting 31, set in the receptacle, said box being provided with laterally projecting flanges 32 bearing against the convex side of the guide ribs so as to receive any outward end thrust of the tumbling shaft which might tend to effect disengagement between the pinion and the mangle rack.

The gear wheel 7 meshes with a small gear 33 rigidly secured on the longitudinal shaft 34 journaled at one end in a bearing 35 and at the other in a bearing 36 carried by the receptacle, and journaled on said shaft is bevel gear 37 secured rigidly to one end of a stiff helical incased spring 38 surrounding and rigidly secured to the shaft at one end through the medium of a collar 39 secured on said shaft. The bevel gear meshes with a large bevel gear 40 rigidly secured on one of the trunnions 41 projecting from the opposite ends of a perforated washing drum 42, said drum being provided with a suitable door-closed opening 43 through which the work is inserted and removed, the door being adapted to be secured in its closed position during the washing operation through any suitable fastening.

The trunnions are provided with conical recesses 44 and when the drum is first placed in the receptacle they rest on the recessed shelves 45 with the axes of the trunnion recesses 44 slightly below the conical-pointed set screws 46 adjustable in the castings of which the shelves 45 form a part, so that when said set screws are screwed home their conical ends will enter the eccentrically disposed recesses 45 and raise the drum until its trunnions are out of frictional contact with the shelves 45, the raising of the drum incidentally throwing wheel 40 into engagement with pinion 37 so that the reversing action of the gear wheel 7 shall be imparted to the perforated drum. As each reversing movement of the mangle rack occurs the spring 38 yields so as to cushion the arrest of the drum instead of bringing it to an abrupt and sudden stop which would not only be destructive to the machine but also increase the labor of a person turning wheel 27 by hand. It will thus be seen that the

drum is reversed without any injurious shock or jar, it being understood of course that the speed of the drum will be greater when the pinion 13 is engaging teeth 9 than when it is engaging teeth 10, but that such difference in speed will be hardly perceptible to one observing the machine.

As the drum is revolved the water standing in the receptacle to the required depth pours in and out through the perforations of the drum, which action of the water in conjunction with the rubbing of the clothes by the roughened interior of the drum serves to effect a thorough and expeditious cleansing operation.

In Fig. 3, certain parts are arranged in different positions from those they occupy in Fig. 1, that is to say, the drum is shown as arranged with its axis in longitudinal alinement with bolt 6, one of the trunnion cavities being mounted on the pointed end 47 (see Fig. 2) of said bolt, the other trunnion being journaled on set screw 46, it being understood that in this rearrangement the casting carrying the last-named set screw will be secured in the rear end wall of the receptacle, as indicated in Fig. 3. In this construction, the drum instead of being provided with a bevel gear 40 will be provided with a peripherally-toothed gear 48 meshing with a pinion 49, employed in lieu of bevel gear 37, and the last-named gear will be journaled on a long shaft 50 employed as a substitute for the short shaft 34, the bearing bracket 36 being shifted in the receptacle to accommodate the long shaft. The same spring 38 and collar 39 will be employed as a connection between the pinion 49 and the shaft 50, in order that each reversing action of the drum shall be cushioned as hereinbefore explained with reference to the construction shown in Fig. 1. A machine of the type shown in Fig. 3 is peculiarly adapted for use in a steam or other power laundry.

From the above description it will be apparent that I have produced a washing machine possessing the features of advantage enumerated as desirable and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described, as modifications which are not a departure from the principle and scope of the appended claims, may be resorted to without departing from the spirit of the invention.

Having thus described the invention what I claim as new and desire to secure by Letters Patent, is:—

The combination of a support, a gear wheel journaled thereon and provided with a concentric curved slot having semi-circular ends and an endless series of teeth on its ends and facing walls, a casting rigid with the inner side of said wheel and provided with a pair of concentric curved and communicating

grooves, a driving shaft suitably journaled upon the receptacle, a tumbling shaft universally joined at one end to the driving shaft, and having its opposite end playing in the grooves of said casting, a pinion rigid on said shaft engaging the teeth of said curved slot in the gear wheel, a boxing journaled on the tumbling shaft, guiding means for said boxing to compel the same and the tumbling shaft to move radially of the wheel and casting as the shaft is passing from one groove of the casting to the other, a shaft geared to

said gear wheel, a wheel journaled on said shaft, a spring rigid at its opposite ends with said shaft and the wheel journaled thereon, and a driven member carried by the support and geared to said wheel. 15

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

CALVIN A. SHIVE.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.