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W. E. BOCK

POWER TRANSMISSION MECHANISM AND LUBRICATING MEANS THEREFOR

Filed Oct. 14, 1920

FIG-1-

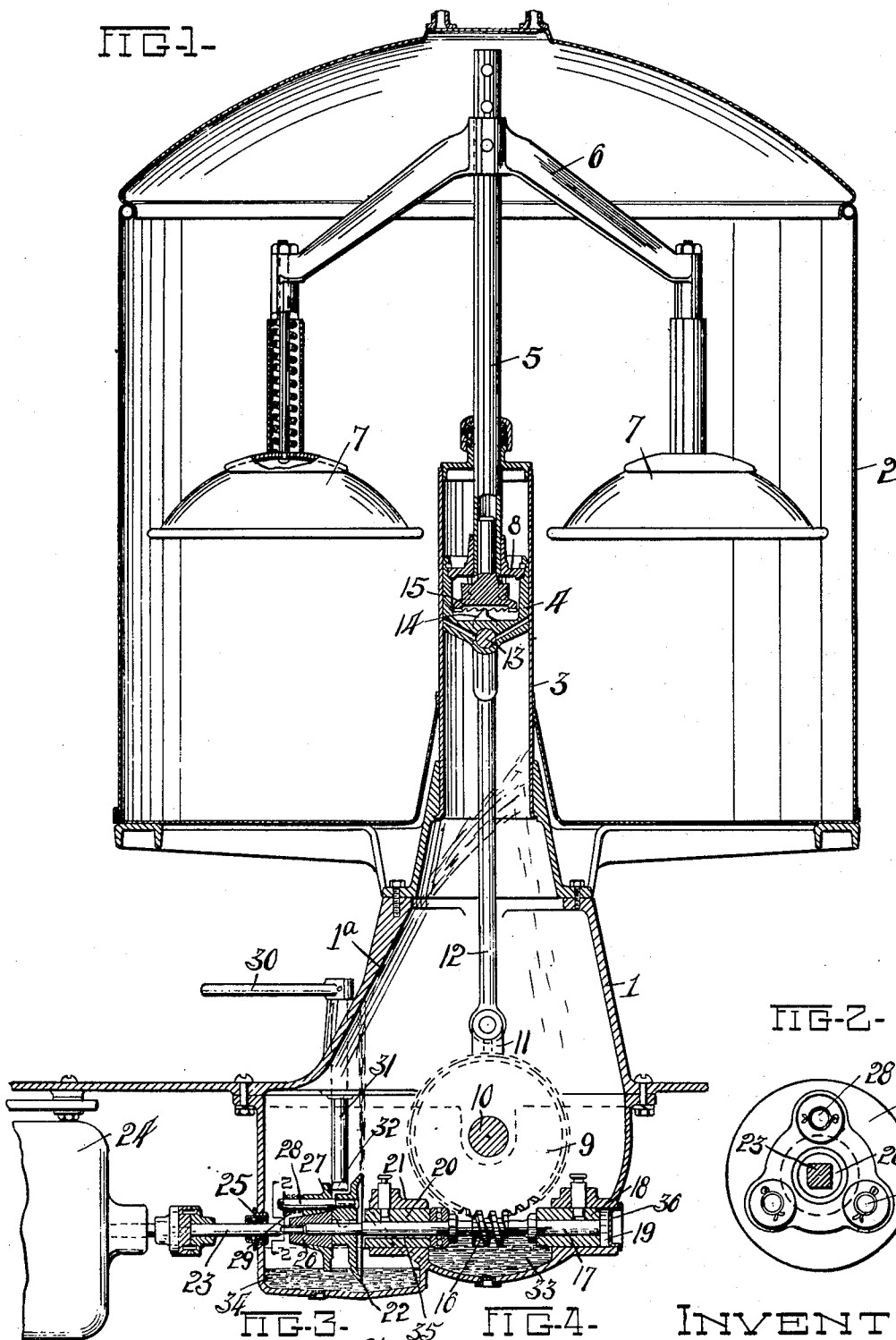


FIG-2-

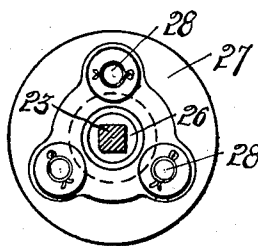


FIG-3-

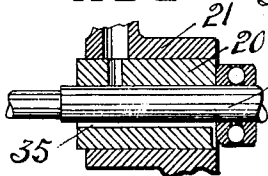
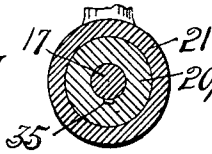


FIG-4-



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UNITED STATES PATENT OFFICE.

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POWER-TRANSMISSION MECHANISM AND LUBRICATING MEANS THEREFOR.

Application filed October 14, 1920. Serial No. 416,783.

To all whom it may concern:

Be it known that I, WILLIAM EMIL BOCK, a citizen of the United States, and a resident of Eagle Point Colony, in the
5 county of Wood and State of Ohio, have made an Invention Appertaining to Power-Transmission Mechanism and Lubricating Means Therefor; and I do hereby declare the following to be a full, clear, and exact
10 description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying draw-
15 ings, and to the characters of reference marked thereon, which form a part of this specification.

This invention in its present embodiment relates to washing machines of the reciprocatory pounder type and particularly to
20 the pounder actuating mechanism therefor and the system of oiling employed for such mechanism.

In power transmission mechanisms used in connection with washing machines and
25 in other connections where the splash system of oiling is employed, or is appropriate for use, and in which the drive shaft for the mechanism extends into the transmission case through a bearing in its wall, diffi-
30 culty is encountered in maintaining the parts properly lubricated and at the same time preventing an escape or leakage of oil from the case through the shaft bearing.

35 The primary object of my invention is the provision of an improved method of lubricating the transmission parts and particularly the worm and worm-wheel there-
40 of, if of such type, and at the same time having the oil level adjacent to the shaft bearing in the wall disposed below said bearing to prevent liability of oil leakage there-
through.

45 A further object of my invention is the provision of improved simple and efficient means for imparting step-by-step revoluble movements to the pounders as they are reciprocated, to repeatedly change the pound-
50 ing position thereof in the clothes container.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment

thereof is illustrated in the accompanying 55 drawings, in which,—

Figure 1 is a central vertical section of a washing machine embodying the invention with parts broken away. Fig. 2 is a section on the line 2—2 in Fig. 1 showing
60 the clutch mechanism. Fig. 3 is a fragmentary central vertical longitudinal section of the center bearing for the worm shaft with the shaft fragmentarily shown therein, and Fig. 4 is a fragmentary cross-
65 section of such bearing.

Referring to the drawings, 1 designates a case forming a crank chamber or hollow base frame which supports at its top a
70 cylindrical tub or clothes container 2 of a clothes washing machine. A cylinder 3 rises centrally within the tub from without its bottom and has its lower end in full open communication with the interior of the crank chamber. A hollow piston or
75 plunger 4 is mounted for reciprocatory movements in the cylinder 3 and has a rod 5 projecting upward therefrom through a stuffing box in the cylinder top and into the tub. This rod carries a cross-arm 6
80 at its upper end within the tub and from each end thereof depends a vertically yieldable pounder head 7, in the present instance of cup-form. The rod 5 has a hub or disclike enlargement 8 at its lower end
85 which is secured within the head against longitudinal movements relative thereto but is permitted to freely rotate therein so that the position of the pounders within the tub may be changed revolubly of the rod axis.
90

A worm-wheel 9 is mounted in the case 1 on a shaft 10 journaled in the case wall and has a crank 11 connected by a pitman or connecting rod 12 with the lower end
95 of the piston 4, whereby reciprocatory movements are imparted to the piston from a revolution of the crank. The connecting rod projects at its upper end above its piston pivot 13 into the hollow of the piston and has a tooth 14 for engagement with a set
100 of teeth on a ratchet wheel 15 carried by the lower end of the rod 5. It is thus evident that at each revolution of the crank 11 the connecting rod 12 is actuated to impart a slight rotary movement to the rod
105 5 and pounders to change the horizontal position of the latter in the tub.

The worm-wheel 9 is driven by a subja-

cent worm 16, the shaft 17 of which is journaled at one end in a bearing bushing 18 mounted in a bearing opening 19 in the case wall, while the other end thereof is journaled in a bushing 20 fitted in a bearing box 21 formed in elevated position in the case bottom interiorly thereof. The shaft 17 carries an oil distributing wheel 22 without the bushing 20, which wheel, in the present instance, is of slightly dished disc-form. A drive shaft 23, driven in the present instance by a motor 24 without the case, projects into the interior of the case 1 through a stuffing box 25 in its side wall in axial register with the inner end of the shaft 17 and fixedly carries a male cone clutch member 26, which loosely receives the adjacent end of the shaft 17. A female clutch member 27 is mounted around the member 26 and is carried for yielding axial movements relative thereto by pins 28 projecting from the wheel 22, whereby said wheel and the clutch member 27 are caused to turn together. Springs 29 on the pins normally hold the member 27 in clutch engagement with its pinion 26. A release of the clutch is effected by a movement in one direction of a control lever 30 disposed without the case 1, the shaft 31 of the lever projecting through the case wall and having an arm 32 at its lower end in engagement with the inner side of the clutch member 27.

The case 1 is provided in its bottom with an oil pocket 33 below the worm 16 and with an oil pocket 34 below the oil distributing wheel 22 and adjacent to the stuffing box 25, the pocket 33 being preferably of less depth than the other. A communicating or drainage passage 35 is provided between the pockets through the bushing 20 at the bottom of its opening. The lower portion of the wheel 22 is intended to be submerged a greater or less extent in the oil of the pocket 34 so that a rapid rotation of such wheel will throw the oil upward against a vertically registering inclined surface 1^a of the crank case wall, and the oil will be deflected thereby up into the lower portion of the cylinder 31 to lubricate its wall, the surplus oil then falling down into the pocket 33, which is in vertical register with the cylinder. This maintains the oil supply in the pocket 33 above the drainage passage 35 and in submerging relation to the worm to thoroughly lubricate the same during a running of the machine and at the same time keeps the level of the oil in the pocket 34 below the bearing 25 to prevent leakage of oil therethrough. In practice it is preferable to maintain a sufficient quantity of oil in the crank case so that when the machine is idle and the oil in the pocket 33 has lowered to a line with the drainage passage 35 the level of the oil

in the pocket 34 will be below the bearing 25, substantially as indicated by the dotted line in Fig. 1. The outer end of the bearing receiving opening 19 is closed by a cap 36 to prevent any oil which may pass around the bushing 18 or through the same, from escaping from said opening.

It is evident that in the operation of a machine embodying my invention all of the parts requiring lubrication are sufficiently lubricated by the oiling means employed, the oil in the pocket 33 being maintained at a sufficient level to thoroughly lubricate the worm and worm-wheel while the oil in the pocket 22 is maintained at a level below the worm shaft to prevent leakage of oil from the crank case around the shaft bearing. It is also evident that at each revolution of the crank 11 the rod 5 and pounder 7 carried thereby will be rotated a fraction of a turn by reason of the upper end of the pitman 12 acting on the ratchet wheel 15 in the manner of a pawl.

I wish it understood that my invention is not limited to any specific construction, arrangement, or form of the parts, as it is capable of numerous modifications and changes, without departing from the spirit of the claims.

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

1. In combination, a hollow case having a plurality of aligned bearings, one being an open bearing through the case wall and also having an oil distributing pocket and an oil receiving pocket in its bottom spaced longitudinally of the bearings and having drainage communication one with the other, a shaft journaled in the bearings and extending at one end without the case through the open bearing, the normal level of oil in the distributing pocket which is adjacent to the open bearing being below the bearing and the normal level of oil in the other pocket partially submerging the adjacent bearings, and means operable by a rotation of the shaft to discharge oil from the distributing pocket to the receiving pocket.

2. In combination, a hollow case having an outside bearing and an inside bearing in axial alignment and having a distributing oil pocket adjacent to the outside bearing and a second oil pocket adjacent to the inside bearing with said pockets in drainage communication, the normal level of oil in the first pocket being below the bearings and the normal level of oil in the second pocket being in partial submerging relation to the inside bearing, a shaft journaled in said bearings, and means operated by a rotation of the shaft to transfer oil from the first pocket to the second pocket.

3. In combination, a hollow case having an inside bearing and an outside bearing

and having two oil pockets spaced axially of the bearings with one adjacent to the outside bearing and one adjacent to the inside bearing, the inside bearing having provision for drainage therethrough of oil from one pocket to the other, the normal level of oil in the pocket adjacent to the outside bearing being below said bearing and the normal level of the oil in the other pocket being at a height to partially submerge the inside bearing, a shaft journaled in said bearings, and means operated by a rotation of the shaft to cause a distribution of oil from the pocket of lower oil level to the other.

4. In combination, a crank case, a cylinder above the case in communication therewith, a side wall of the case being inclined toward the cylinder and the case having in its bottom portion an outside bearing, a distributing oil pocket and a receiving oil pocket with the latter adjacent to the bearing and below the inclined side wall of the case, an interior shaft bearing between the pockets axially aligned with the outside bearing, a plunger in the cylinder, a plunger driving mechanism in the case having a drive shaft journaled in said bearings, a distributing wheel carried by the shaft in the distributing pocket and adapted to throw oil from the distributing pocket up against the inclined side wall of the case and thence into the cylinder, the surplus oil falling down into the receiving pocket, a restricted drainage between the pockets, the normal level of the oil in the distributing pocket being below the bearings and the normal level of the oil in the receiving pocket being adjacent to the shaft in lubricating relation to the interior bearing.

In testimony whereof I have hereunto signed my name to this specification.

WILLIAM EMIL BOCK.