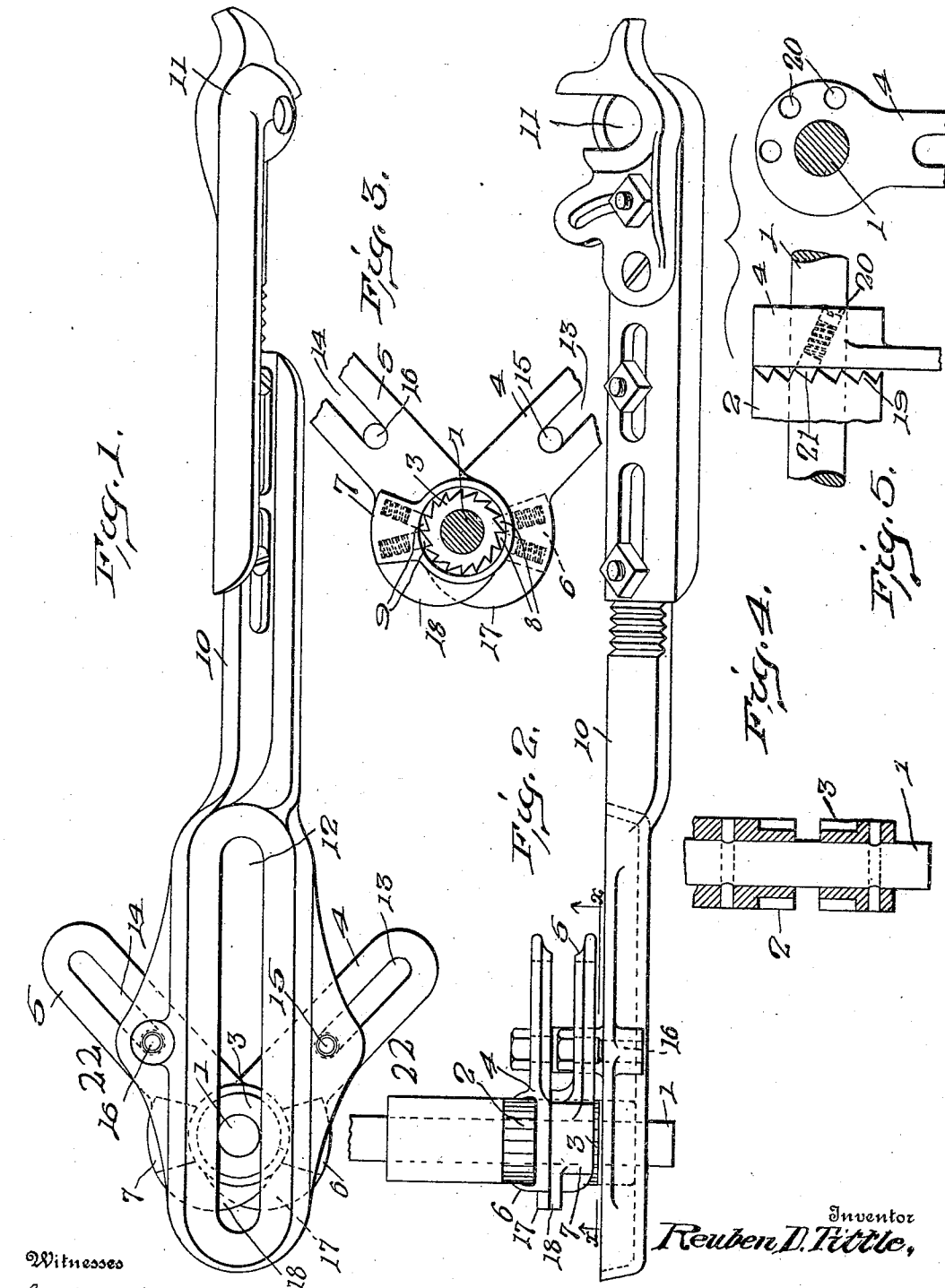


R. D. TITTLE.
 INTERMITTENT GRIP DEVICE.
 APPLICATION FILED MAR. 9, 1908.

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INTERMITTENT GRIP DEVICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, REUBEN D. TITTLE, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Intermittent Grip Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to pawl and ratchet mechanism and is designed more in particular for converting reciprocating motion into rotary motion.

The object of the invention is to provide such a mechanism in which a stroke of maximum length can be secured without the mechanism becoming locked at a dead center; in which the power exerted upon the pawls will be substantially the same at all times, thereby exerting the maximum power upon the rotary member at all points of the movement of the pawls; and further, to so construct the mechanism that it will be strong and durable and simple in operation and will be provided with ample safeguards against injury to the operator.

In the accompanying drawings, Figure 1 is a side elevation of a mechanism embodying my invention; Fig. 2 is a top plan view of the same; Fig. 3 is a transverse sectional view, taken on the line *xx* of Fig. 2; Fig. 4 is a longitudinal sectional view of the two part ratchet wheel; and Fig. 5 is a detail view of a modification.

In these drawings I have illustrated the preferred form of my invention, which form is particularly designed to operatively connect a clothes wringer to the motor on a washing machine. As here shown, the rotary member consists of a rotary shaft 1 having mounted thereon a suitable pinion, which, in the present instance, consists of a ratchet wheel having two parts, 2 and 3, the teeth of the two parts extending in the same direction and both parts being rigidly secured to the shaft, thereby making in effect a single ratchet wheel. The adjacent ends of the portions 2 and 3 of the ratchet wheel are spaced some distance apart and upon that portion of the shaft 1 lying between the adjacent ends of the parts 2 and 3 there are journaled two levers 4 and 5, each lever being provided with a projecting portion 6 and 7 extending over the portions 2 and 3, respectively, of the ratchet wheel and located on opposite sides of the shaft 1. Each

of the projections 6 and 7 has mounted therein one or more spring-pressed pawls 8 and 9, respectively, facing in opposite directions. The outer ends of the levers 4 and 5 are pivotally connected to a suitable pitman or actuating rod 10 which is provided at one end with means for connecting the same to the piston rod of a reciprocating motor, as shown at 11, and having its other end slidably connected to the rotary shaft 1. In the present instance, the end adjacent to the shaft 1 is provided with an elongated slot 12 which fits over the end of the shaft 1 which forms a guide for the adjacent end of the rod 10.

The connection between the levers 4 and 5 and the rod 10 is preferably a sliding one, and, in the form here shown, the levers 4 and 5 are provided with elongated slots 13 and 14 adapted to be engaged by suitable pins or stud shafts 15 and 16 mounted on the rod 10 and forming a movable fulcrum for the levers. These pins are preferably mounted on projections 22 carried by the actuating rod 10 and arranged on the opposite sides thereof. The projections 22 extend across the slots in the levers 4 and 5, respectively, and have their edges inclined in opposite directions or diverging toward the actuating rod. The inclined edges of the projections move along the slots in the levers and form guards which tend to prevent the fingers of the operator or the clothes which are being handled from entering the slots and being pinched between the pins and the ends of the slots. The length of the slot 12 and of the slots 13 and 14 is such that the co-operating parts, such as the shaft 1 and the pins 15 and 16, do not at any time during the stroke of the pitman or actuating rod 10 come into contact with the ends of said slots, and, consequently, there is no possibility of injury to the operator by the operation of these parts, and, as a further safeguard, the projections 6 and 7 are provided with wings 17 and 18, which, at their point of connection to said projections are of a width substantially equal to the width of said projection and are of such a length that when the projections are in their open position, *i. e.*, the position in which they are separated farthest, one from the other, the adjacent ends of the wings 17 and 18 will overlap. Consequently, it is impossible for the operator to be pinched by the closing together of the two projections as the wings 17

and 18 serve as guards which prevent either the fingers or clothing of the operator from being inserted between these parts. These wings are preferably cast integral with the projections 6 and 7, and, in the preferred form, are tapered from their point of connection with the projections to their opposite ends, as shown in Fig. 3.

The operation of the device will be readily apparent from the foregoing description and it will be seen that when the parts are in the position shown in Fig. 1 and the pitman 10 is moved forwardly or toward the rotary shaft 1, the levers 4 and 5 will be moved about their pivotal centers and the pawls 9 of the lever 5 caused to engage the teeth of the ratchet wheel and thus rotate the shaft 1 throughout substantially a half revolution and that during the movement of the lever 5 about its pivotal center, the fulcrum point will constantly change so that it is at the shortest distance from the shaft 1 when the lever extends substantially vertically above the shaft 1 and the pull thereon is substantially a straight pull. As the lever moves from this vertical position and the pull thereon is exerted at more and more of an angle, the distance of the fulcrum from the shaft and, therefore, the amount of leverage exerted upon the ratchet wheel, is constantly increased and the increase of this leverage is such as to maintain the leverage or power which is exerted upon the rotary shaft 1 substantially the same at all points of the movement of the lever. When the pitman reaches the outer extremity of its movement and begins its rearward movement, the pawls 9 of the lever 5 will ride over the teeth of the ratchet wheel and the pawls 8 of the lever 4 will engage the teeth of the adjacent portion of the ratchet wheel on the opposite side of the shaft 1 and by the rearward movement of the pitman will rotate the shaft in the same direction as it was rotated by the forward movement thereof.

The arrangement of the levers carrying the pawls being such that it is practically impossible for the same to reach a dead center, it will be apparent that practically a complete revolution of the rotary member can be secured for each complete reciprocation of the pitman; further, it will be apparent that the power exerted upon the rotary member is, as above described, substantially the same at all points during the movement of the pawls; and further, that the device is so safe-guarded that injury to the operator, or any other person who may be near, is practically impossible, thereby making the device one peculiarly adapted for domestic use, such as its application to a clothes wringer, which wringer may be operated from the motor which actuates the washing machine.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art. For instance, in Fig. 5 of the drawings I have shown a modified form of the ratchet and its engaging pawl. In this form each ratchet wheel has its teeth formed in the lateral face thereof, as shown at 19, while the cooperating lever is provided with one or more apertures 20 extending through the same at an angle to the shaft 1 upon which the lever is mounted. In this inclined aperture is mounted a spring-pressed dog or pawl 21 adapted to engage the teeth 19 on the lateral face of the ratchet wheel, both the ratchet teeth and the pawl being so inclined that when the lever is moved in one direction, the pawl will engage the teeth, and, when the lever is moved in the opposite direction, the pawl will ride over the teeth.

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

1. In a device of the character described, the combination, with a rotary shaft, a ratchet mounted on said shaft, levers mounted on said shaft near said ratchet, each of said levers having a longitudinal slot near one end thereof, a projection carried by each of said levers and extending over said ratchet, and pawls carried by said projections and arranged to engage the ratchet on opposite sides of the shaft, of an actuating rod having a guideway adapted to engage said shaft to form a support therefor, and pins carried by said actuating rod on opposite sides of said guideway and adapted to engage the slotted ends of said levers.
2. In a device of the character described, the combination, with a rotary shaft, ratchets mounted on said shaft, levers pivotally mounted on said shaft near said ratchets, each of said levers having a longitudinal slot near one end thereof, a projection carried by each of said levers extending over the adjacent ratchet, and pawls carried by said projections and arranged to engage the respective ratchets on opposite sides of said shaft, of an actuating rod having a guideway adapted to engage said shaft and form a support therefor, and pins carried by said actuating rod on opposite sides of said guideway and adapted to engage the slotted ends of said levers.
3. In a device of the character described, the combination, with a rotary shaft, a pair of ratchets mounted on said shaft and spaced a short distance apart, a pair of levers pivotally mounted on said shaft between said ratchets, each of said levers having a longitudinal slot near one end thereof, a projection carried by each of said levers and extending over the adjacent ratchets, pawls carried by said projections and arranged to

engage the respective ratchets on the opposite sides of said shaft, of an actuating rod having a guideway adapted to engage said shaft and form a support therefor, and pins carried by said actuating rod on opposite sides of said guideway and adapted to engage the slotted ends of said levers.

4. In a device of the character described, a rotary shaft, ratchet wheels mounted on said shaft, a pair of levers pivotally mounted on said shaft and extending on opposite sides thereof, pawls mounted on said levers and adapted to engage said ratchet wheels, means for moving said levers about their pivotal centers, and guards carried by said levers for closing the space between the same.

5. In a device of the character described, a rotary shaft, a ratchet wheel mounted on said shaft, a pair of levers pivotally mounted on said shaft and extending on opposite sides thereof, pawls carried by said levers, an actuating rod, means for slidably con-

necting the outer ends of said levers to said actuating rod, and guards carried by said levers for closing the space between the same. 25

6. In a device of the character described, a rotary shaft, a ratchet wheel mounted on said shaft, a pair of levers pivotally mounted on said shaft extending on opposite sides thereof, radial projections extending from said levers, pawls mounted on said levers adapted to engage said ratchet wheel, means for moving said levers about their pivotal centers, and wings extending from the adjacent side of each of said projections, said wings being of such a length that their ends overlap when said projections are spaced at the greatest distance one from the other. 30 35

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

REUBEN D. TITTLE.

Witnesses:

A. C. LINK,
EDWARD L. REED.