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W. H. VOSS.

MECHANICAL MOVEMENT.

APPLICATION FILED SEPT. 24, 1903.

NO MODEL.

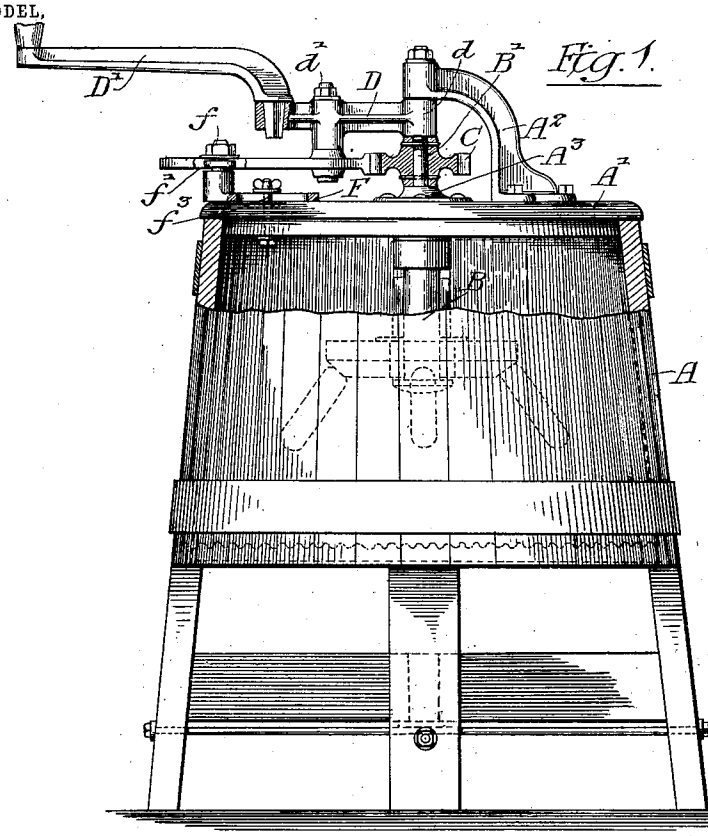


Fig. 1.

Fig. 2.

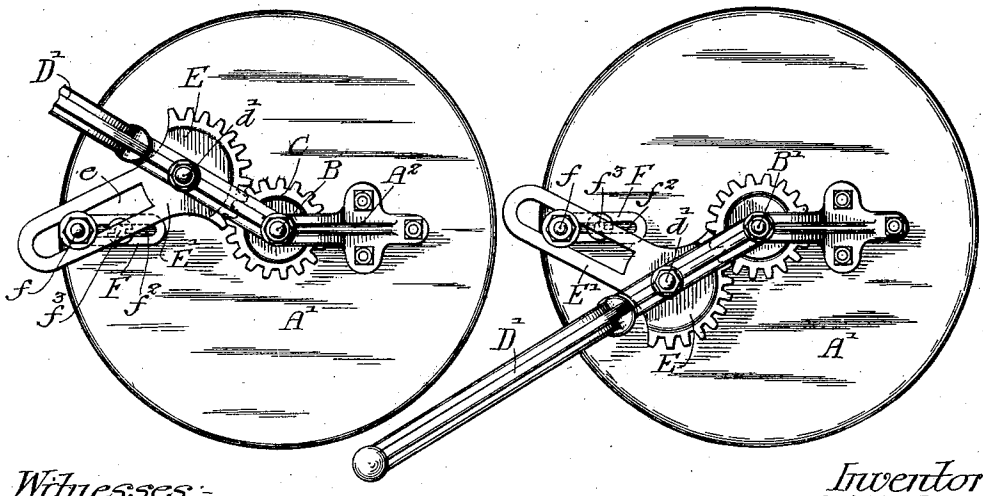


Fig. 3.

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No. 744,444. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM H. VOSS, OF DAVENPORT, IOWA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 744,444, dated November 17, 1903.

Application filed September 24, 1903. Serial No. 174,410. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. VOSS, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Mechanical Movements; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel mechanical movement designed to produce through the medium of a swinging actuating member alternate rotations or partial rotations of a shaft in opposite directions.

The mechanical movement herein illustrated is readily adaptable for operating the stirrer-blocks of washing-machines of that class wherein the block is rotated alternately in opposite directions to rub the clothes against the interior walls of the suds-box of the machine; but the mechanism may be employed generally wherever it is desired to impart a like movement to a part of any other machine.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation, with parts in section, of a washing-machine to which my novel mechanical movement is applied as the actuating mechanism for operating the stirrer-block. Figs. 2 and 3 are top plan views thereof, showing the parts of the actuating mechanism in two different positions.

As shown in the drawings, A designates the suds-box of a washing-machine, and B the stirrer-block thereof. The shaft B′ of the stirrer-block extends upwardly through the removable cover or lid A′ of the suds-box and is rotatively mounted at its upper end in a bracket A^2, rising from said lid or cover, and in a suitable sleeve A^3, attached to the upper side of said cover.

C designates a gear which is fixed to the stirrer-block shaft B′ just above the lid or cover A′.

D designates a horizontally-swinging actuating-lever having a bearing-sleeve *d* at its inner end, which is rotatively mounted on the stirrer-block shaft between said gear C and the head of the bracket A^2. Said actuating-lever is provided with a removable part or outer end D′, whereby, while providing ample lever power, the parts may be compactly arranged for shipping and storing.

E designates a gear which is located just beneath said swinging actuating-lever D, being rotatively mounted on a vertical pin or shaft *d*′, extending downwardly from said lever, and said gear meshes with the gear C. Said gear E is herein shown as made of segmental form. Said segmental gear E is provided with a rearwardly-extending guide-arm E′, which has guiding engagement with a stationary part of the machine to which the mechanism is applied, the purpose of which is to impart a positive rotary movement to the gear E during the swing of the lever D, which rotary movement is in turn transmitted to the gear to rotate the shaft B′. In the form of mechanism herein shown the guide-arm E′ is provided with a slot *e*, through which extends a guide-pin *f*, rising from a block or plate F, attached to the machine-cover A′ and adapted to be fixed stationary to said cover. Said pin *f* is preferably provided with an antifriction-roller *f*′, as shown in Fig. 1, thereby minimizing friction between the movable and stationary parts. The said block F, carrying the guide-pin *f*, is adapted to be adjusted toward and from the stirrer-block shaft B′, and for this purpose the said block is provided with a longitudinal slot f^2, through which extends the bolt f^3, by which the block is attached to the cover.

In the operation of the mechanism the lever D is swung horizontally from one limit of its movement to the other through the medium of the extension D′ thereof and in its swinging movement carries with it the gear E, which is in mesh with the gear-pinion C. By reason of the guiding engagement of the arm E′ of said gear E with the pin *f* or other stationary part of the device such swinging movement of the lever D imparts a positive rotary mo-

tion to the gear E, which in turn rotates the gear C and connected shaft B′. Inasmuch as the distance between the axes of rotation of the gears C and E is a fixed one and inasmuch as the distance between the axis of rotation of said gear E and the guide-pin *f* varies in different parts of the swing of the actuating-lever D it will be observed that during the swing of the said lever D and while the gear E is being carried around the gear C in mesh therewith the gear E and its guide-arm E′ shift outwardly toward the guide-pin, which is permitted by the slotted connection of the arm with said guide-pin or other analogous construction. In this manner the power applied to the lever D is transmitted through the gears E and C to turn or rotate the shaft B′, and the direction of rotation of such shaft is reversed at each reversal of the swinging movement of the lever D. The lever D and the gear E, together with its guide-arm E′, constitute, with their connections, a compound lever, the fulcrum of the primary lever D being the shaft B′, while the fulcrum of the secondary lever—to wit, the gear E and its arm E′—is the guide-pin *f*. Said latter fulcrum constantly changes during the swing of the lever D, owing to the shifting of the guide-arm E′ relatively to its guide-pin *f*. The length of the gear E is such relatively to the size of the gear C that said latter gear will be turned almost a complete rotation during each complete swing of the actuating-lever D. The relation of said gears may be varied, however, as desired in order to turn the shaft B′ more or less in each swing of the lever D.

The purpose of the adjustment of the guide-pin *f* is to vary the amplitude of partial rotation or throw of the gear E and therefore vary the length of rotary movement of the shaft B′ in either or both directions. Thus it will be seen that if the pin *f* be adjusted toward the shaft B′ it will have the effect of lengthening the throw of the gear E, so that said gear and the gear C and shaft B′ will be rotated farther in each swing of the lever D. On the other hand, if the guide-pin be adjusted outwardly away from the shaft B′ the gear will not be carried so far in each swing of the lever D, thereby limiting the length of rotation of the gear C and shaft B′ for each swing of the lever D. It will be seen, therefore, that with a given relation or proportionment of the gears E and C various degrees of movement of the shaft B′ with respect to the length of rotation thereof may be provided. It will also be observed that, assuming the lever D be swung backward and forward at a uniform speed when the parts are adjusted for the longer throws of the gear E, the shaft B′ will be moved at a greater speed than when adjusted for the shorter throws of said gear E. The slot *e* of the guide-arm of the gear E is of such length as to be engaged at its ends by the guide-pin *f* at the ends of the throw of the parts, so as to prevent the gear E from getting out of mesh.

It will be understood that the form of the gear E may be varied while retaining the capability thereof of amplifying movement of the actuating-lever *b*, which is imparted to the shaft B′, and, furthermore, that the form of guide connection between the gear-lever D′ and stationary part of the device, as the guide-pin *f*, may be varied.

I claim as my invention—

1. In a mechanical movement, a rotative shaft, a gear thereon, a second gear meshing with said shaft-gear, an actuating member having a to-and-fro movement and on which the second gear is rotatively mounted, and a stationary part coöperating with said second gear for imparting positive rotation to the second gear during the swing of the lever and therethrough to said shaft.

2. In a mechanical movement, a rotative shaft, a gear thereon, a second gear meshing with said shaft-gear, an actuating member having a to-and-fro movement and on which the second gear is rotatively mounted, a stationary part coöperating with said second gear for imparting positive rotation to the second gear during the swing of the lever and therethrough to said shaft, and means for varying the extent of angular movement of said second gear relatively to the length of to-and-fro movement of said actuating member.

3. In a mechanical movement, a rotative shaft, a gear on the shaft, a lever swinging on an axis concentric with the axis of the shaft, a rotative gear carried by said lever and connections between the said last-mentioned gear and a stationary part coöperating with the gear to impart a positive rotary motion thereto during the swing of said lever.

4. In a mechanical movement, a rotative shaft, a gear on the shaft, a second rotative gear meshing with the shaft-gear, a swinging lever on which the second gear is carried, and a guide on said second gear having guiding connection with a fixed or stationary part.

5. In a mechanical movement, a rotative shaft, a gear on the shaft, a second rotative gear meshing with the shaft-gear, a swinging lever on which the second gear is carried, a slotted guide-arm on said second gear and a stationary guide-pin extending through said slotted arm.

6. In a mechanical movement, a rotative shaft, a gear on the shaft, a second rotative gear meshing with the shaft-gear, a swinging lever on which the second gear is carried, a slotted guide-arm on said second gear and a stationary guide-pin extending through said slotted arm, and means for adjusting the guide-pin toward and from the rotative shaft.

7. In a mechanical movement a rotative shaft, a gear on the shaft, a second rotative gear meshing with the shaft-gear, a swinging

lever on which the second gear is carried, a slotted guide-arm on said second gear, a fixed guide-pin extending through the slot of the guide-arm, and an antifriction-roller on said pin.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 19th day of September, A. D. 1903.

WILLIAM H. VOSS.

Witnesses:
WILLIAM E. PULS,
EDWARD L. GULDNER.