

A. VAN WORMER.
GEARING.
APPLICATION FILED JUNE 3, 1912.

1,038,239.

Patented Sept. 10, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

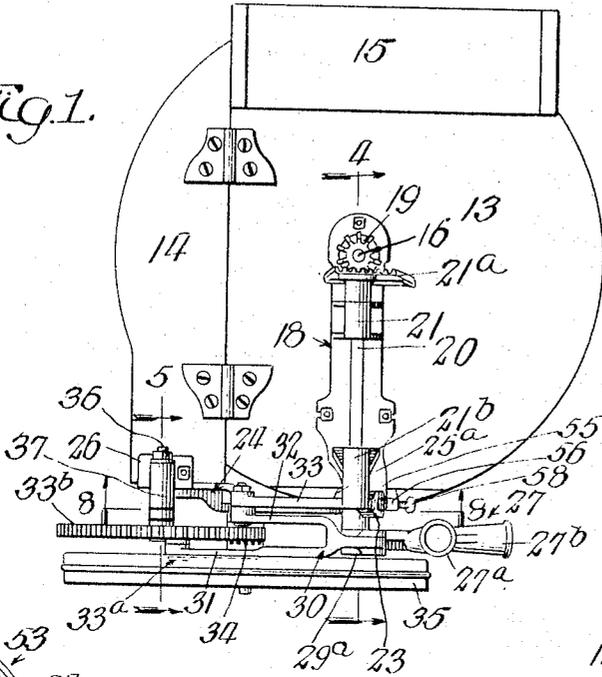


Fig. 7.

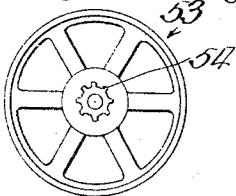


Fig. 2.

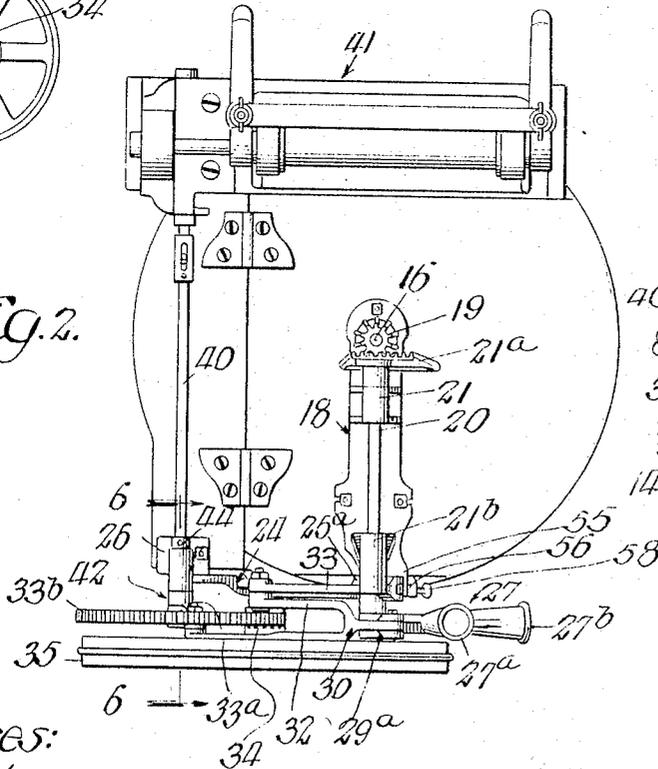


Fig. 5.

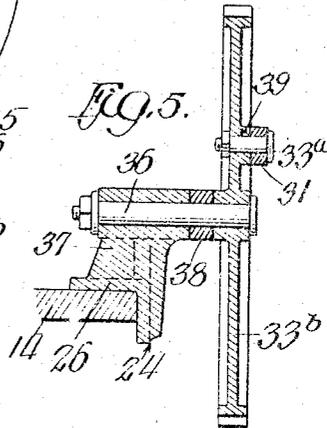
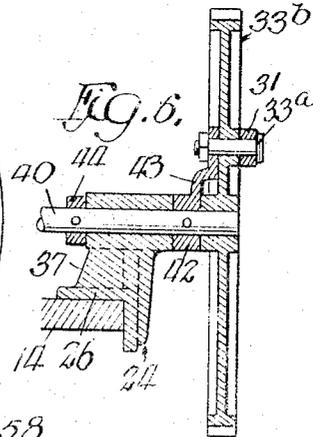


Fig. 6.



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2 SHEETS—SHEET 2.

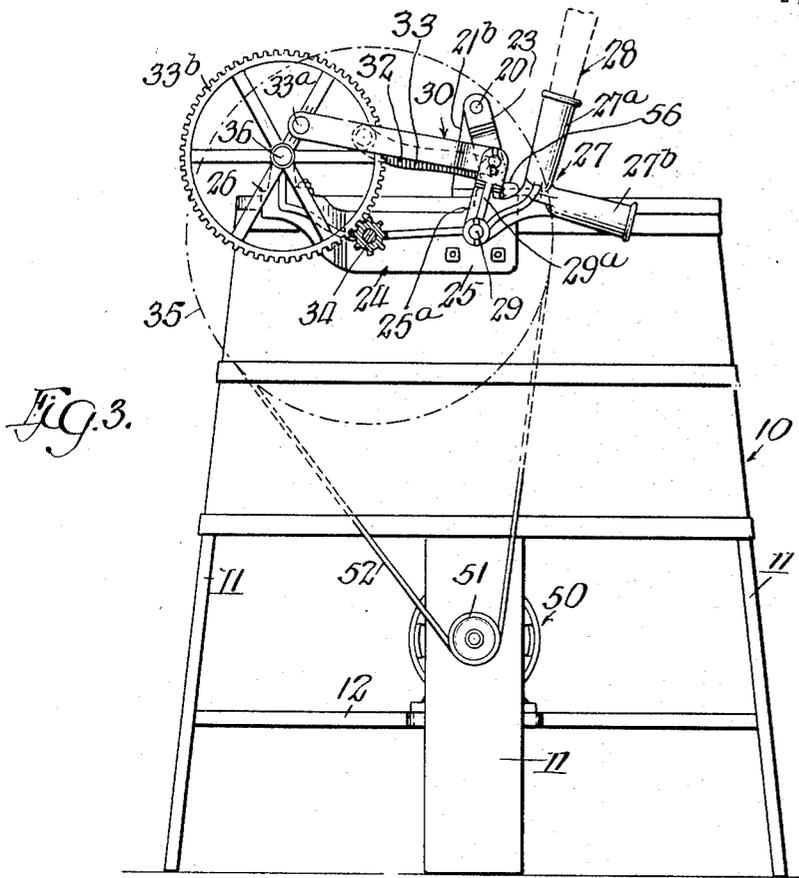


Fig. 3.

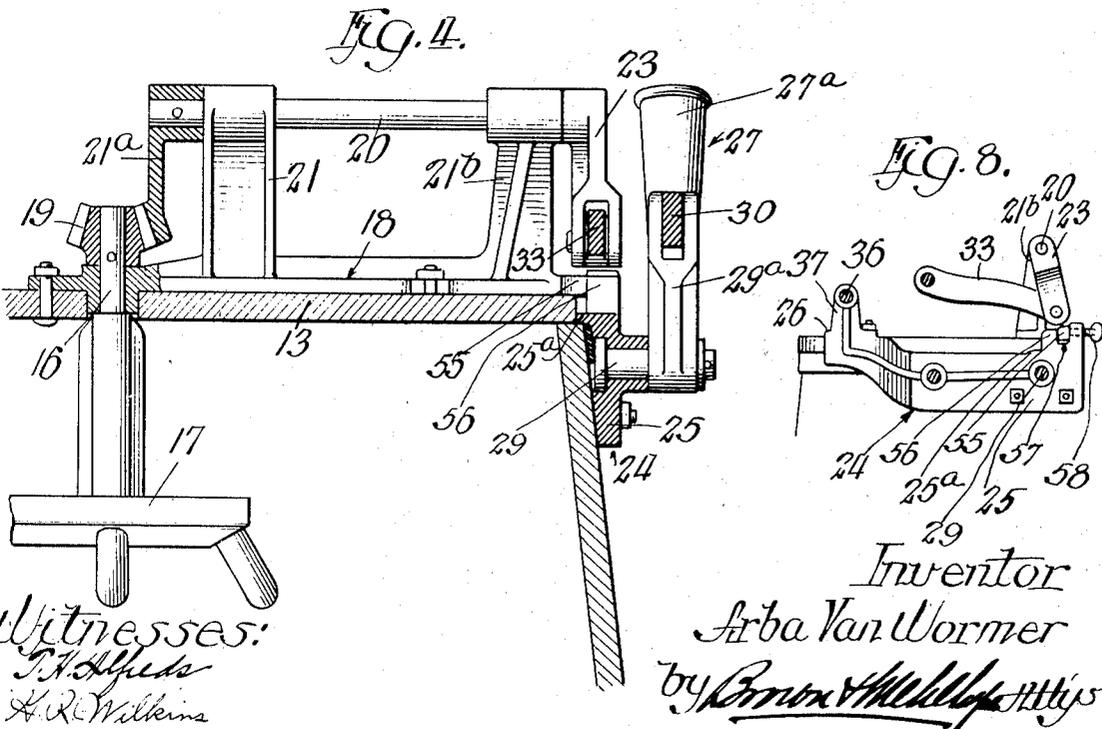
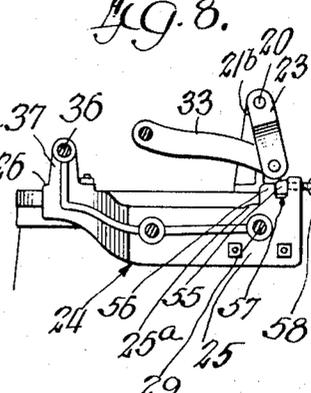


Fig. 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

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GEARING.

1,038,239.

Specification of Letters Patent. Patented Sept. 10, 1912.

Application filed June 3, 1912. Serial No. 701,130.

To all whom it may concern:

Be it known that I, ARBA VAN WORMER, a citizen of the United States, and a resident of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Gearing; 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 improvements in operating gearing and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The improvement in gearing, as shown herein, is applied to a washing machine and is used for imparting oscillating, rotary movement to the beater or dolly shaft of a washing machine. Said gearing is of the type which may be operated by an oscillatory lever and includes a continuously rotative fly-wheel which, by its acquired momentum, acts to reduce the effort necessary to keep the gearing in operation after it has started.

In the drawings:—Figure 1 is a view representing a top plan of a washing machine provided with my improved gearing. Fig. 2 is a view representing a similar plan showing a slightly modified form of the construction. Fig. 3 is a view representing a side elevation of the machine shown in Fig. 1. Fig. 4 is a view representing on an enlarged scale a partial vertical section through the gearing in a plane indicated by the line 4—4 of Fig. 1. Fig. 5 is a view representing a vertical section, on an enlarged scale, through the gearing shown in Fig. 1 in a plane indicated by the line 5—5 of Fig. 1. Fig. 6 is a view representing a like section taken in a plane indicated by the line 6—6 of Fig. 2. Fig. 7 is a detail side elevation of a pulley and pinion fixed thereto which may be used when the gearing is intended to be driven from a main power shaft. Fig. 8 is a view representing a vertical section through the gearing in a plane indicated by the line 8—8 of Fig. 1.

Referring now to that embodiment of my invention illustrated in the drawings, 10 indicates the support for the operating mechanism or gearing which in this case is

a washing machine tub of familiar construction standing on upright legs 11, 11, which are connected by cross-braces 12. The support has a hinged member 13, which, in this case, consists of the hinged lid of the tub.

14 indicates a fixed horizontal board attached to the top of the tub and constituting a part of the top closure thereof. The top is also usually provided with a second fixed part 15 which, as shown, extends at right angles to the fixed part 14 and acts as a support for the wringer where a wringer is used.

16 indicates the usual dolly shaft which depends within the tub. Said shaft carries a dasher or beater 17 at its lower end and its upper end extends through the hinged lid 13. As shown, said dolly shaft 16 has bearing in a bearing plate 18 bolted to the lid and extending from the center of the lid in a direction parallel to the hinged side of the same.

19 indicates a beveled pinion fixed to the upper end of the dolly shaft 16 and having thrust bearing on the top of the bearing plate 18. The pinion thus acts as a stop to prevent the shaft 16 from dropping into the tub.

20 indicates a horizontal shaft spaced above the top of the lid 13 and having bearing in upright arms 21, 21^b, that rise from the base-plate 18. At the inner end of said shaft 20 near the center of the tub lid and on the side of the bearing 21 nearest said center there is fixed to said shaft a beveled segmental gear 21^a which meshes with the beveled pinion 19. At the outer end of the shaft 20 and on the outer side of the bearing arm 21^b there is fixed to the shaft 20 a crank arm 23, which, as shown, has a bifurcated end. The shaft 20 is retained against longitudinal movement in its bearing by means of the segmental gear 21^a and the crank-arm 23 which have thrust bearing against the faces of the bearing arms to which they are adjacent.

On the vertical side of the support, in this case of the washing machine tub, is secured a bearing plate 24 which has a vertical part 25 bolted to the side of the tub and a horizontal flange 26 at its upper edge near one end which is bolted to the fixed part 14 of the tub top. Said bearing plate also has preferably a narrow flange 25^a (see

Fig. 4) in the vertical plane of the shaft 20, said flange engaging the upper edge of the tub and the hinged lid being cut away in the neighborhood of said flange to permit such engagement. Said plate is provided with suitable bearings to support the usual fly-wheel and pinion, the enlarged gear wheel for operating said pinion and the swinging lever that in the case of a hand-operating machine acts as the prime mover of the gearing, all of the said parts being located in parallel vertical planes.

27 indicates a rocking member which is journaled to swing in a vertical plane and which is adapted for the attachment of a wooden bar or rod (shown in dotted lines 28) which constitutes the operating lever. Said rocking member 27 is fulcrumed on a pin 29 secured in an apertured boss on the bearing plate 24. The axis of said fulcrum pin is in a vertical plane below the longitudinal central axis of the horizontal operating shaft 20 on the tub lid. Said rocking member has two sockets, 27^a, 27^b, arranged substantially at right angles to each other, the one 27^a being adapted to hold the operating lever in a substantially upright position so as to provide a simple forward and back movement for the operator in operating the gearing, whereas the other, 27^b, is in a substantially horizontal position so as to provide an up and down pump-handle motion for operating the gearing.

29^a indicates an arm forming part of the rocking member 27, said arm extending, as shown, in a direction parallel to the axis of the socket 27^a and in a direction at right angles to the axis of the socket 27^b. Said arm is bifurcated and between its bifurcated ends there is pivoted one end of a link 30. The opposite end of said link is divided and has two laterally spaced arms 31, 32, the latter being shorter than the former. The end of the link-arm 32 is connected by a link 33 with the bifurcated end of the crank-arm 23 on the end of the shaft 20. The link arm 31 constitutes a pitman or connecting rod and is pivotally connected to a crank-pin 33^a on a large gear 33^b rotatively supported by the bearing plate 20 and in mesh with a pinion 34 fixed to or made rigid with the hub of a fly-wheel 35, that is also rotatively supported by the bearing plate 24 in a vertical plane spaced from the plane of the large gear 33^b. The pitman 31 thus extends between the planes of the gear 33^b and the fly-wheel 35.

In that form of my invention shown in Figs. 1 and 5 of the drawings, the large gear 33^b is loosely mounted on a horizontal stub-shaft 36 that has bearing in an arm 37 rising from the horizontal flange 26 at the rear end of the bearing plate 24. The plane of the gear 33^b is laterally spaced from the bearing arm 37, the space being filled by a washer or sleeve 38. I prefer to provide the

gear wheel 33^b with an aperture 39 formed, as shown, in one of its spokes at a point radially spaced from its center, which aperture is adapted to receive a bolt which constitutes the crank-pin 33^a.

The construction described is for use where hand power is used and the wringer, when placed on the tub is not connected with the gearing that operates the dolly. For use when the gearing is operated by a motor or other power device, as will presently be described, I provide a shaft which may be readily substituted in place of the short stub-shaft 36, said auxiliary shaft being provided with a coupling by means of which it may be connected with a reversing mechanism for operating the wringer. Such shaft is shown in Figs. 2 and 6, the same being indicated at 40. Said shaft extends parallel to the operating shaft 20 on the tub-lid and thus at right angles to the axis of a wringer 41 that is secured on the fixed part 15 of the tub top. In connection with this shaft I provide a sleeve 42 having a radial arm 43 with an aperture which when the sleeve 42 is on the shaft will register with the aperture occupied by the crank-pin bolt 33^a above referred to. I also provide a second washer 44 to be located on the shaft 40 at the inner side of the bearing arm 37. Thus when the machine is intended to be used as a power washer and the gearing is to be used in connection with a reversing gearing adapted for operating a wringer, the shaft 40 may be substituted for the stub-shaft 36, the washer 42 for the washer 38 and its radial arm connected to the crank-pin bolt. Said washer is pinned to the shaft and the washer 44 is placed on the other side of the bearing arm 37 and pinned to the shaft. In this way the large gear is rigidly attached to the shaft 40.

The operation of my improved gearing is apparent from the above description. By swinging the lever 28 oscillatory motion is imparted to the radial arm 29^a of the rocking member and from said radial arm by the link 30 and particularly the arm 32 thereof, said oscillatory motion is converted into a rotary continuous movement of the gear 33^b which, through the pinion 34, causes a continuous rotation of the fly-wheel 35. Through the arm 32 of the link 30 and the link 33, an oscillatory movement is communicated to the crank-arm 23 which, through the operating shaft 20 and segmental gear 21^a, is imparted to the bevel pinion 19 at the upper end of the dolly shaft, causing a rotary oscillatory movement of said dolly shaft. If desired, the gearing may be driven by a motor mounted below the tub instead of by hand through the lever 28. In this case the drive pulley of the motor is connected by a belt to the fly-wheel, as indicated by dotted lines in Fig. 3. 50 indicates an electric motor supported in any con-

venient manner on the cross-bars 12 that connect the legs of the tub and having a shaft which projects through the leg and carries a pulley 51. 52 indicates a belt connecting
 5 said driving pulley with the fly-wheel 35 which is provided with a groove in its periphery to accommodate the belt. Instead of the small motor carried by the tub itself the mechanism may be driven from a main
 10 power shaft that is used for driving other machinery. For such purpose, I prefer to provide the pulley 53 and pinion 54 fixed thereto illustrated in Fig. 7, which may be substituted in place of the fly-wheel 35 and
 15 its pinion 34. To lock the hinged lid 13 of the tub in closed position during the washing operation, I provide a projecting lug 55 on the bearing plate 18 carried by the tub lid. 56 indicates an upright lug on the bearing
 20 plate 24 carried at the side of the tub. Said lug has an upwardly opening notch 57 adapted to receive the lug 55 when the lid is closed. A thumb-screw 58 threaded through one side of the lug 56 is adapted for en-
 25 gagement against the side of the lug 55 so as to hold it frictionally within the notch 57.

I claim as my invention:—

1. Gearing for washing machines and the like comprising, in combination with a sup-
 30 port, a vertical rotary reciprocatory operating shaft, a horizontal rock-shaft operatively connected to said operating shaft, a rock-arm fixed to the outer end of said rock-shaft, a rocking prime-mover, a main link
 35 pivotally connected thereto, a large gear and a fly-wheel operated thereby, said main link having horizontally separated arms one of which is operatively connected to said large gear, and a secondary link connecting the
 40 end of the other arm of said main link with the rock-arm of said rock-shaft.

2. Gearing for washing machines and the like comprising, in combination with a sup-
 45 port having a hinged member, a vertical rotary reciprocatory operating shaft carried by said hinged member, a horizontal rock-

shaft mounted on said hinged member operatively connected to said operating shaft, a rock-arm fixed to the outer end of said rock-
 shaft, a rocking prime-mover mounted on a
 50 fixed part of said support, a main link pivotally connected to said prime-mover having horizontally separated arms, a long arm and a short arm, a large gear and a fly-wheel
 55 operated thereby both mounted on a fixed part of said support, the long arm of said link being operatively connected to said large gear, and a second link connecting the short arm of said main link with the rock-
 60 arm on said rock-shaft.

3. Gearing for washing machines and the like comprising, in combination with a sup-
 port having a horizontal hinged member, a vertical rotary reciprocatory operating shaft,
 65 a horizontal rock-shaft connected to said operating shaft, both shafts being carried by said hinged member, a rock-arm fixed to the outer end of said rock-shaft, a rocking prime-mover mounted on the side of said
 support and having its axis of movement
 70 horizontal, a second horizontal shaft parallel to said rock-shaft mounted above said support on a fixed part thereof, a large gear
 on said second horizontal shaft, a fly-wheel
 75 mounted on the side of said support operated by said large gear, a main link pivotally connected to said prime-mover and having horizontally separated arms, an outer long arm and an inner short arm, the long
 80 arm being operatively connected to said large gear, and a second link connecting the short arm of said main link with the rock-arm on the rock-shaft.

In testimony, that I claim the foregoing as my invention I affix my signature in the
 85 presence of two witnesses, this 29th day of May A. D. 1912.

ARBA VAN WORMER.

Witnesses:

A. H. PETERS,
 F. C. PETERS.