

July 11, 1933.

W. J. BYRNE

1,917,358

REVOLVABLE HULL WASHING MACHINE

Filed May 13, 1931

3 Sheets-Sheet 1

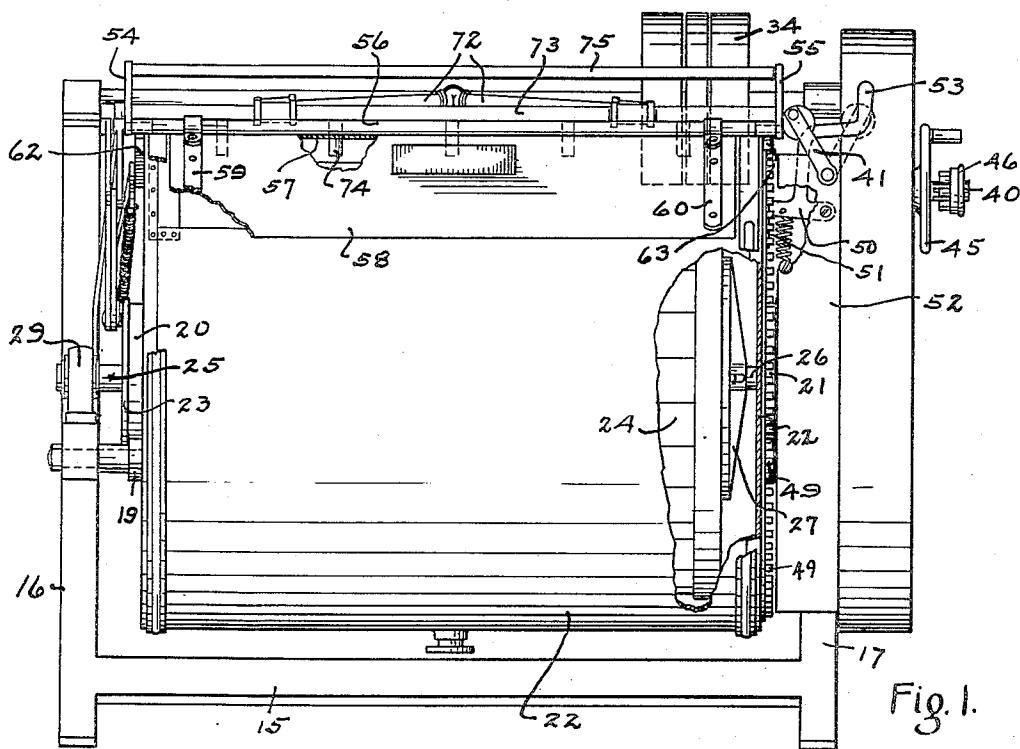


Fig. 1.

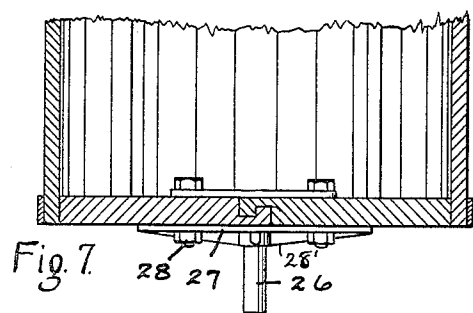


Fig. 7.

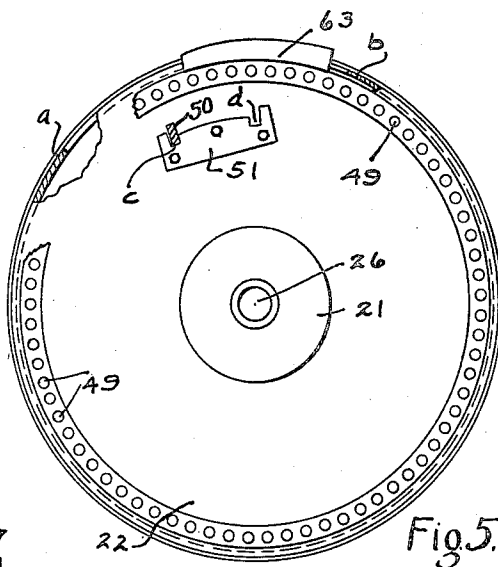


Fig. 5.

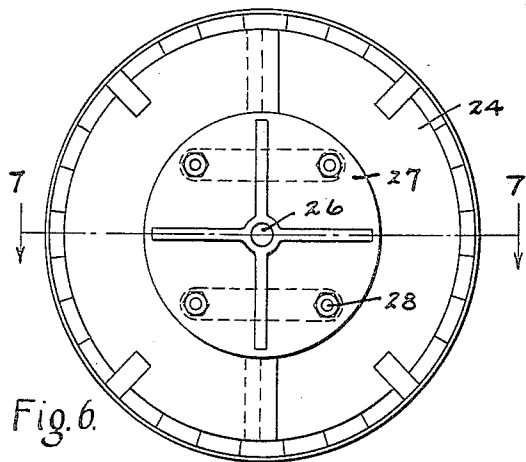


Fig. 6.

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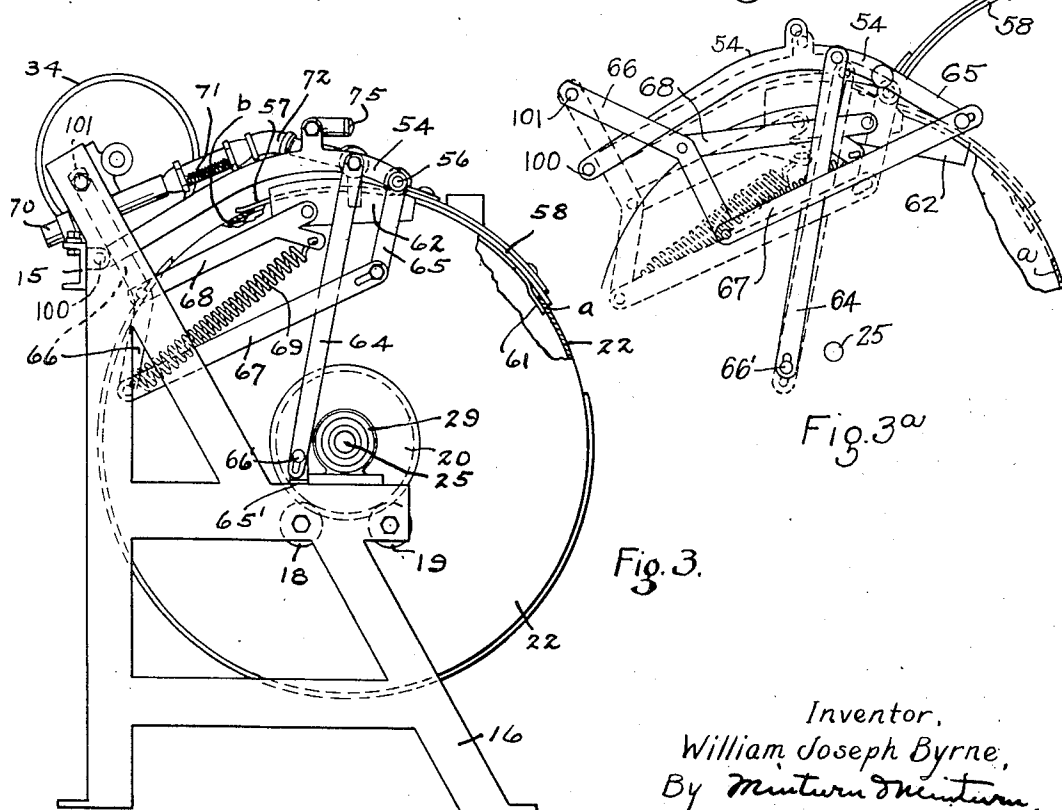
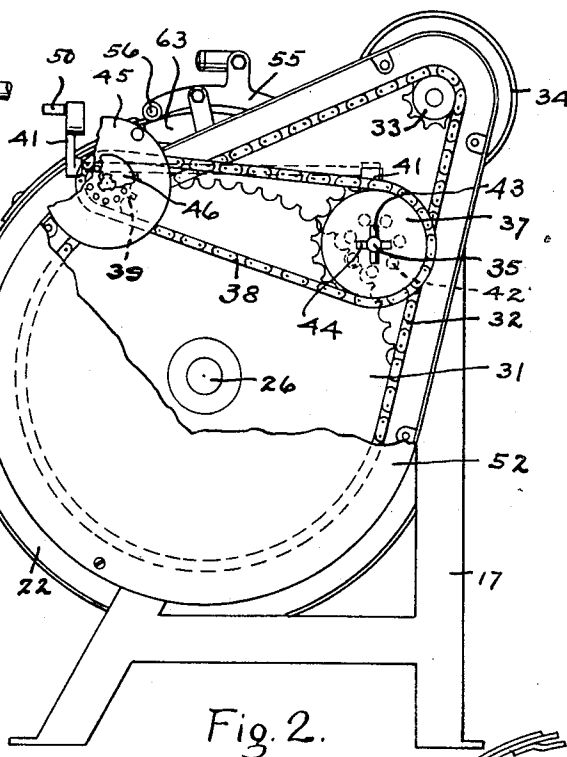
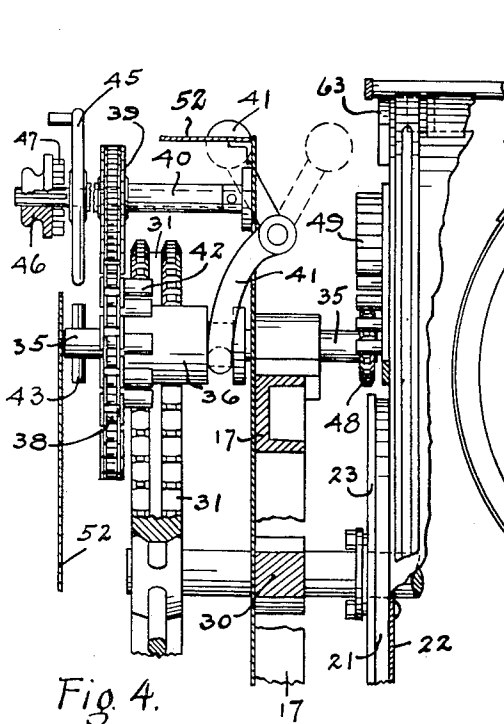
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3 Sheets-Sheet 3

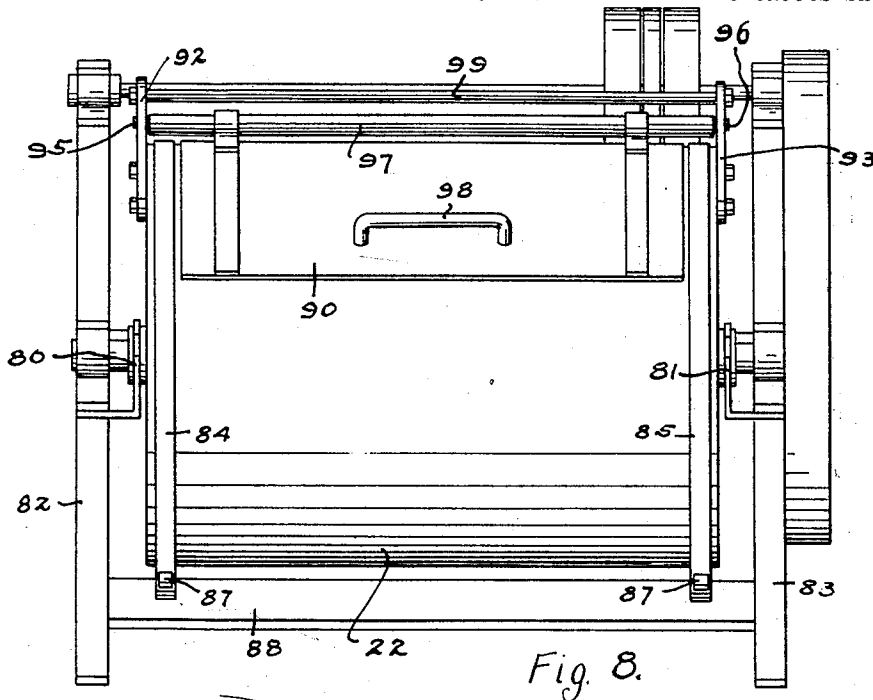


Fig. 8.

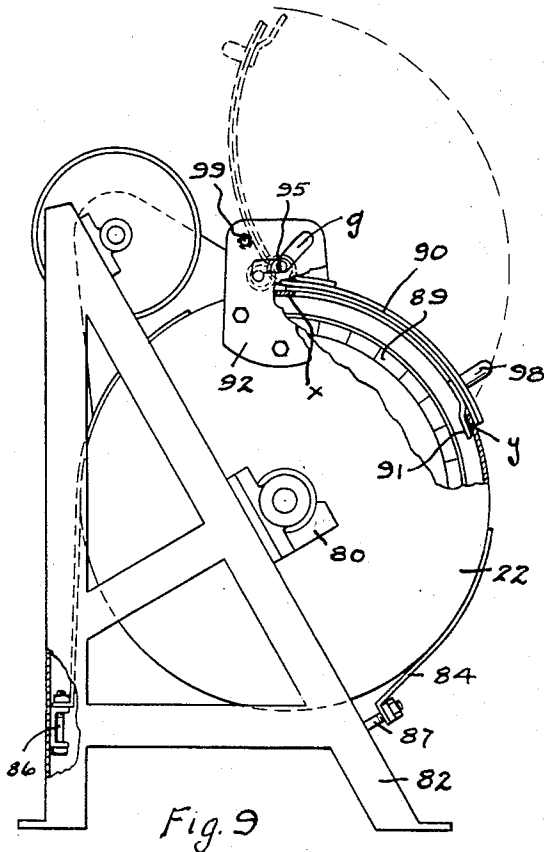


Fig. 9

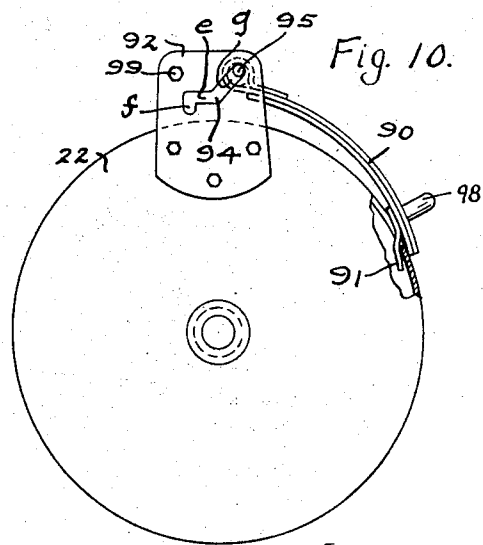


Fig. 10.

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UNITED STATES PATENT OFFICE

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REVOLVABLE HULL WASHING MACHINE

Application filed May 13, 1931. Serial No. 536,967.

This invention relates to the art of washing machines, particularly to a machine adapted to wash garments and the like in a cleaning fluid such, for example, as naphtha as is commonly employed in dry cleaning establishments, and is a continuation in part of my application for U. S. Letters Patent filed May 31, 1930, Serial Number 458,624, as relating to a safety blast relief cover.

One of the important objects of the invention is to provide a cover for a rotatable tub or hull which will automatically open upon a predetermined amount of revolution of the hull.

An important object of the invention is to provide a revolvable hull with a cover which upon accidental explosion of the vapors therewithin will automatically direct the blast of such discharge rearwardly away from the front side of the hull in order to avoid injury to an operator who may be standing thereby.

A further important object of the invention is to provide a cover for a revolvable hull which may automatically lift by its rear portion upon an explosion within the hull and which has a forward portion normally engaged with the hull to prevent opening of such forward portion until after a predetermined degree of rotation of the hull.

A further important object of the invention is to provide means for revolving an inner cylinder and the hull independently of each other.

A still further object of the invention resides in providing a hull with a one piece circumferential wall to have an opening to receive therethrough a section of an inner cylinder so that the cylinder may be installed and removed without necessity of having to open up joints in the hull itself.

These and other objects such as the particular combination of the various elements which will be pointed out specifically in the claims below, will become apparent in the following description of the invention as illustrated in the accompanying drawings, in which

Fig. 1 is a fragmentary front elevation of a washing machine embodying my invention;

Fig. 2, a fragmentary right hand end elevation;

Fig. 3, a fragmentary left hand end elevation;

Fig. 3A is a diagram of the linkage of Fig.

3 for raising a cover section, moved to the positions assumed when the cover is raised.

Fig. 4, a detail in fragmentary section of the hand mechanism for revolving the hull and cylinder;

Fig. 5, a right hand end elevation of the hull;

Fig. 6, an end elevation of the inner cylinder;

Fig. 7, a detail through the end of the cylinder on the line 7-7 in Fig. 6;

Fig. 8, a front elevation of a washing machine showing a modified form of a hull door;

Fig. 9, a fragmentary left hand end elevation of the modified form; and

Fig. 10, a left hand elevation of the hull alone of the modified form with the door shown in lifted position as would result from an internal explosion.

Like characters of reference indicate like parts throughout the several views in the drawings.

I provide a supporting frame 15 having the end standards 16 and 17 respectively. Each of the standards 16 and 17 carry rollers 18 and 19 spaced apart in the same horizontal plane to receive thereon the wheels 20 and 21 concentrically carried on the ends of the cylindrical hull 22 whereby the hull is free to revolve on and is supported by the rollers 18 and 19. The wheels 20 and 21 are preferably provided with an outer flange 23 to prevent endwise displacement on the rollers, the flanges 23 being on the outer sides of the rollers toward the standards.

The hull 22 is formed solely out of three pieces, the two circular heads or ends and the one piece circumferential wall terminating by the ends *a* and *b*, Fig. 5, to leave an opening entirely across the hull. The hull is mounted to be free to revolve completely around by the wheels 20 and 21 rolling between the rollers 18 and 19. The purpose of the hull 22 is to hold a quantity of washing fluid and a separate clothes container or cylinder 24 is provided to be carried entirely within the hull by the trunnions 25 and 26.

Since the opening into the hull between edges *a* and *b* is less than the diameter of the cylinder 24 to be carried therewithin, I preform a cylinder 24 in two semi-cylindrical sections to have heads divided on diametrical lines whereby one section at a time may be inserted through the opening into the hull

and then the other section to have the two sections come together into the finished cylindrical body by having the respective heads slidingly come into position by means of tongue and groove joints 28'.

The two sections of the cylinder are then retained in the assembled position within the hull by means of a plate 27 concentrically positioned on each head on the outer side thereof and there secured by bolts 28 through the two head sections. The trunnions 25 and 26 extend perpendicularly from the plates 27 and axially of the cylinder to project through the central holes in the ends of the hull 22 and therebeyond into supporting bearings 29 and 30 respectively carried on the standards 16 and 17. The hull 22 preferably carries packing glands about the trunnions where they extend through the hull ends so as to prevent the washing fluid from splashing out around the trunnions.

Reference is now made to the hull and cylinder revolving mechanism. On the outer end of the trunnion 26 beyond the bearing 30 is fixed a sprocket wheel 31 around which is passed a chain 32 from the driving sprocket 33 which in turn is operated through the belt pulleys 34. By suitable rotation of the pulleys 34 the cylinder 24 may be revolved within the hull in either direction and entirely independently of the position of rotation of the hull 22. The cylinder 24 is of the usual type employed in washing machines and has at least one door therein (not shown) which may be brought around to coincide with the opening into the hull in order to permit access to within the cylinder. Since the cylinder may stop at any position upon stopping the pulleys 34, it is usually necessary to revolve the cylinder 24 around by hand to bring its opening around to the hull opening.

In order to accomplish this additional movement of the cylinder independently of the power drive through the chain 32, I revolvably mount a shaft 35 on the standard 17. On the end of the shaft 35 which projects outwardly from the standard 17, I mount a sleeve 36 revolvably thereon and this sleeve has fixed thereto a sprocket 37 around which is wrapped a chain 38 which in turn is wrapped about a sprocket 39 on a second shaft 40, the shaft 40 being fixed in position against rotation and the sprocket 39 being rotatable therearound. The sleeve 36 is adapted to be moved longitudinally along the shaft 35 by means of a shifting lever 41 being pivotally mounted thereabove and having its lower end engaging within an annular groove around the collar. On the inner side of the sprocket 37 are a plurality of evenly spaced pegs 42 which are so spaced and shaped as to engage consecutively between the teeth of the sprocket wheel 31 when the sleeve 36 is in its inwardly shifted position.

Near the outer end of the shaft 35 is passed

therethrough a pin 43 which may be received within similarly shaped slots 44 formed in the outer face of the sprocket 37. Upon rocking of the lever 41 to the dotted line position, Fig. 4, the collar 36 is shifted outwardly along the shaft 35 to carry the pegs 42 outwardly beyond the path of the teeth of the sprocket 31 and to carry the sprocket 37 against the pin 43 to have the pin received within the slot 44 whereby the sprocket 37 then being rotated will carry the shaft 35 around therewith. A hand wheel 45 is fixed to the sprocket 39 as a means of revolving the sprocket and correspondingly through the chain 38, the sprocket 37.

To prevent rotation of the hand wheel 45, a clutch member 46 slidably splined on the outer end of the shaft 40 is pushed inwardly to have the pegs 47 thereon engage or be received within holes in the face of the hand wheel, and since the shaft 40 is stationary the wheel 45 is then held against rotation. The shaft 35 has a toothed wheel 48 fixed to its inner end adjacent the end of the hull 22 to have its teeth engage between posts 49 accurately spaced around on the end of the hull 22. When the collar 36 is shifted outwardly to carry the pegs 42 out of mesh with the sprocket 31 to have the sprocket 37 engage with the pin 43, rotation of the hand wheel 45 will then revolve the shaft 35 to cause rotation of the hull 22 through the wheel 48 and posts 49.

The hull 22 is here shown as being provided with a latch member 50 spring pulled against a plate 51 (see Figs. 1 and 5) at each end of which is a notch into which the latch may drop. The outer end of the latch is pivotally mounted on the stationary housing 52.

A handle 53 is provided as a means for rocking the latch upwardly out of either of the notches in the plate 51 to permit the hull 22 to be revolved. The plate 51 is so mounted on the end of the hull as to have the notches positioned whereby the latch 50 will drop into the notch *c* when the hull has its door opening in the upper or normal washing position and will have the notch *d* carried around to permit the latch to drop therein when the hull opening is brought around downwardly to have the edge *a* lowered to permit unloading of the cylinder 24. Of course the hull may be revolved beyond either of these two positions upon holding the latch handle 53 outwardly to permit the plate 51 to pass therebeyond. A pair of arms 54 and 55 is mounted to have the respective arms pivotally supported at 100 (see Fig. 3) on the frame 15 toward the upper ends of the standards 16 and 17 and rockably carries therebetween at the outer ends of the arms a shaft 56 which extends entirely across and above the hull 22. A cover is provided to be carried over the opening into the hull and

this cover is formed in two sections, namely, a rear section 57 which is rockably hinged by its forward end to the shaft 56 and a forward section 58 which is fixed rigidly to the shaft 56 by the straps 59 and 60. When the hull 22 is in the normal upper position, the rear cover section 57 laps over the edge *b* at the rear and rests thereon by gravity. The front section 58 has an under lip 61 which slips under the edge *a* while the forward section of the cover itself laps over on the outer side. Thus it is to be seen that while the section 57 may be raised and lowered in relation to the edge *b* of the hull, the front section 58 cannot be raised or lowered by reason of the projecting lip 61.

Now to permit access to within the hull 22, it is therefore necessary to revolve the hull 22 a distance sufficient to bring the edge *a* around downwardly from between the forward section 58 and the lip 61. During this travel cam blocks 62 and 63 fixed on the ends of the hull 22 come under ends of the shaft 56 to raise it and lift both sections 57 and 58 of the cover at their ends supported by the shaft to provide a vent for the hull whereby should there be sufficient vapor within the hull to form an explosion upon the admittance of air, such explosion that might then occur takes place before the cover section 58 can swing open by reason of the lip 61 being engaged against the underside of the edge *a*. Such an explosion would then blow the rear section of the cover upwardly since its rear end is free and permit the blast of the explosion to exhaust itself rearwardly and away from the operator who may then be standing in front of the machine.

On the left hand side of the washing machine is provided a linkage system for raising the front cover section 58 upon continued rotation of the hull 22 in lowering the opening edge *a*. A link 64 has its upper end pivotally engaged to the arm 54 at a point back of the shaft 56 and its lower end slotted and held along the bracket 65' by the pin 66' in such manner that by reason of the slot receiving the pin 66' therethrough, the shaft 56 may be raised only to the limit controlled by the length of the slot. This length is made to equal substantially the lift of the shaft 56 as produced by the cam blocks 62 and 63. The bracket 65' is fixed on the standard 16 back of the bearing 29. Fixed to the outer end of the shaft 56 is a lever 65 in such manner that upon forward rocking of the lever 65 by its lower end, the cover section 58 will be rocked open when the lip 61 is free from the edge *a*.

Another lever 66 has its upper end rockably attached to the inner side of the standard 16 at the upper end of the standard at 101 and to its lower end which terminates below the level of arm 65 is pivotally secured a connecting link 67 the other end of

which has a slotted connection with the lower end of the arm 65. The bar 66 is preferably bent near its middle toward the cam block 62 and between the pivot points of the lever 66 and the lever 67 at the bend is a bar 68 pivotally secured thereto by one end and by its other end to the end of the hull 22, or as here shown as being pivotally attached to the cam block 62 which is attached to the hull. A spring 69 is secured under tension between the lower end of the lever 66 and a downwardly projecting finger near the forward end of the bar 68.

Now as the hull 22 may be revolved clockwise, Fig. 3, as the cam blocks 62 and 63 have come under the shaft 56 to raise it and the edge *a* has been withdrawn from over the lip 61, the bar 68 having traveled with the hull 22 pulls the lever 66 forwardly to carry the link 67 forwardly also to the limit of the slot in the forward end after which, continued travel of the link 67 rocks the arm 65 to in turn rock the upper end forwardly of the cover section 58. Thus it is to be seen that an automatic front cover section opening mechanism is provided.

Means for introducing the washing fluid are provided. A supply pipe 70 is fixed to the frame 15 between the upper ends of the standards 16 and 17 and through a flexible hose connection 71 is connected to a Y 72 the outer ends of which discharge into the transverse pipe 73 which is supported between the arms 54 and 55 to be raised and lowered therewithin. From the underside of the pipe 73 are extended a plurality of discharge nipples 74 which project through the rear cover section 57 in such a manner that the section may be raised and lowered about the nipples.

In order to provide a positive stop against which the front cover section 58 may rest when in the open position, I provide a bar 75 carried above and between the arms 54 and 55 against which the cover section may drop when opened up.

When the front cover section 58 has been opened upon rotation of the hull 22 as above described, the hull 22 is held in a fixed position by means of the latch 50 dropping into the notch *d* of the plate 51, the rotation of the hull 22 having been effected by pushing the lever 41 inwardly, pulling out the clutch member 46 and revolving the hand wheel 45. When the latch 50 is dropped into the notch *d*, the lever 41 is then pulled outwardly to shift the pegs 42 into engagement with the teeth of the sprocket 31 and the hand wheel 45 is then revolved to bring the cylinder 24 around to the desired position under the opening through the hull 22. When the machine is to be used again, the lever 41 is pushed rearwardly to the dotted line position, Fig. 4, to shift the sprocket wheel 37 out away from the sprocket wheel 31 where-

upon the hull 22 is then revolved in the reverse direction by means of the hand wheel 45 to bring the plate 51 around to permit the latch 50 to drop into the notch *c* and to then have the cover 58 lowered through the operation of the linkage above described and to have the lip 61 again brought under the edge *a* of the hull opening. The clutch member 46 is then pushed inwardly to prevent further movement of the hull 22 in addition to the latch 50 and the cylinder 24 is then ready to be revolved again upon rotation of the pulleys 34.

Where a cheaper type of washing machine is desired, the modified form as shown in Figs. 8, 9 and 10, may be employed. In this modified form the hull 22 is revolvably mounted between bearings 80 and 81 on the standards 82 and 83 respectively but the hull 22 is held in fixed position by means of the straps 84 and 85 being passed around the hull and pulled tightly thereagainst by the bolts 86 and 87 carried by the frame 88 of which the standards 82 and 83 are a part.

A cylinder 89 of the usual and well known type of construction is revolvably carried within the hull 22 and is driven independently of the hull. The hull 22 in this modified form is provided with a door opening toward its upper side as defined between the edges *x* and *y* of the circumferential wall thereof. I form an arcuate door 90 to fit over this opening into the hull circumferentially therearound and provide the lower or front end of the door 90 with an under lip 91 which is adapted to pass under and inside of the edge *y* of the hull wall.

On the ends of the hull 22 on the upper sides thereof are mounted the vertically projecting hinge plates 92 and 93 respectively. These plates are each provided with similarly disposed irregular slots 94 into which project pins 95 and 96 from the ends of a bar 97 to which the rear end of the door 90 is fixed.

Referring now to the shape of the slots 94, each slot is provided with a central horizontally disposed portion *e* from the rear end of which is downwardly cut a notch *f*. From the forward end of the horizontal portion *e* of the slots is a diagonally upwardly extending slotted portion *g*. The door 90 is provided with a lifting handle 98 and when the door is pushed to the closed position as indicated in Figs. 8 and 9, the lip 91 is on the back or inner side of the hull wall at the edge *y* and the pins 95 and 96 are still in the horizontal portions *e* of the slots 94 but at the forward ends thereof at the bottoms of the upwardly inclined portions *g*.

Should an explosion take place within the hull 22 with the door in the position as above described, the front portion of the door cannot swing open by reason of the lip 91 being behind the hull wall edge, but the rear portion of the door may lift under the force of

the explosion and allow the pins 95 and 96 to travel upwardly along the slot portions *g* and thereby allow the blast of the explosion to strike the under side of the door and be deflected around rearwardly from the front side of the hull. When the force of the explosion has spent itself, the door will drop down by the pull of gravity and allow the pins 95 and 96 to return to the horizontal slot portions *e*.

When the door 90 is to be opened to permit access to within the hull, the handle 98 is grasped and pulled upwardly and around to bring the lip 91 upwardly from behind the hull wall to permit its being passed thereover. At the same time the pins 95 and 96 have been carried rearwardly through the slotted portions *e* and have dropped into the notches *f* around in which they may revolve as the door is swung open as shown by the dotted lines in Fig. 9. The depth of the notches *f* is such that the pins 95 and 96 do not bottom therein until after the door has been raised somewhat on account of the fact that the pins are at a greater distance from the surface of the hull wall than is the door 90 itself. The notches *f* serve as means to prevent the rear part of the door, the lower part when the door is raised, from kicking forwardly when the door is in the open position. A transverse bar 99 is fixed between and carried by the plates 92 and 93 to serve as a stop against which the door 90 may rest when in the open position.

The hull 22 may be completely revolved. In many cases, particularly in washing with water, it is desirable to turn the hull around to bring its opening to the underside to dump the fluid quickly over the edge.

While I have here shown and described my invention in the particular form as now best known to me, it is obvious that structural changes may be made without departing from the spirit of the invention, and I, therefore, do not desire to be limited to that precise form nor any more than may be required by the following claims.

I claim:

1. In a washing machine, the combination with a revolvable hull having an opening therethrough, of a movable cover for said opening fixed in relation to circumferential travel of the hull, and means normally securing the front end of the cover to the hull, said cover having its rear end contacting said hull without attachment thereto to permit movement of the rear end away from the hull.

2. In a washing machine, the combination with a revolvable hull having an opening therethrough, of a movable cover for said opening fixed in relation to circumferential travel of the hull, and means normally securing the front end of the cover to the hull comprising an under lip passing inside of the

edge of the hull wall, said cover having its rear end contacting said hull without attachment thereto to permit movement of the rear end away from the hull, said cover securing means being formed to engage the hull against outward movement of the cover therefrom and to be released upon rotation of the hull.

3. In a washing machine, the combination with a revolvable hull having an opening therethrough of a movable cover for said opening retained over the hull in fixed relation to circumferential travel of the hull, and lip means normally engaging the lower end of the cover with the hull upon rotation of the hull thereto, the upper end part of the cover being free to be raised away from the hull.

4. In a washing machine, the combination with a revolvable hull having an opening therethrough of a movable cover for said opening retained over the hull in fixed relation to circumferential travel of the hull, and bifurcated means normally engaging the lower end of the cover with the hull upon rotation of the hull in counter-clockwise direction, the upper part of the cover being divided from and hinged to a lower part and free to be raised away from the hull, and means actuated by reverse rotation of the hull in a clockwise direction for raising said hinged end of the cover, said securing means being released upon continued clockwise rotation of the hull.

5. In a washing machine, the combination with a revolvable hull having an opening therethrough of a movable cover for said opening retained over the hull in fixed relation to circumferential travel of the hull, and bifurcated means normally engaging the lower end of the cover with the hull upon rotation of the hull in counter-clockwise direction, the upper part of the cover being divided from and hinged to a lower part and free to be raised away from the hull, and means actuated by reverse rotation of the hull in a clockwise direction for raising said hinged end of the cover, said securing means being released upon continued reverse rotation of the hull, and cover rocking means actuated by travel of the hull following the release of said engaging means to raise the cover at the rear for vapor discharge.

6. In a washing machine in combination with a revolvable cylindrical hull having an opening, a movable cover for said opening, a hinge bar carrying the cover fixed at one end and movable at the other in relation to rotation of the hull, and a cover opening and closing linkage carried by the hull and connected with the movable end of the bar and actuated by rotation of the hull.

7. In a washing machine in combination with a revolvable cylindrical hull having an opening, a movable cover for said opening, a hinge bar carrying the cover fixed in rela-

tion to rotation of the hull, and a cover opening and closing linkage carried by the hull and connected with the movable end of the bar and actuated by rotation of the hull, and a cam block carried by the hull adapted to raise said hinge bar by the movement of the bar over the cam block upon rotation of the hull preliminary to the rocking of the cover by said linkage.

8. In a washing machine, the combination with a revolvable hull having an opening therethrough of a movable cover for said opening retained over the hull in fixed relation to circumferential travel of the hull, and bifurcated means normally engaging the lower end of the cover with the hull upon rotation of the hull thereto, the upper part of the cover being free to be raised away from the hull, and a washing fluid supply pipe discharging through said cover and having a flexible portion whereby the pipe is adapted to be raised and lowered therewith.

9. The combination with a frame and a cylindrical hull revolvably carried by the frame, said hull having an opening through its circumferential wall, a pair of arms hinged at one of their ends to and rockably carried by the frame, a movable cover for said hull opening hinged to the free ends of the arms, a lip on one end of the cover adapted to engage under an edge of the hull opening upon rotation of the hull edge thereto, a cam block on the hull adapted to raise the free ends of said arms upon rotation of the hull counter-clockwise to lift the rear end of said cover, and cover opening levers carried by said hull and connected with said arms, said levers being actuated by rotation of the hull and having slotted connections delaying opening of the cover until said hull has been rocked sufficiently clockwise to have released said lip and to have carried said cam block around to have contacted the arms and lifted the cover about its hinged portion.

10. The combination with a frame and a cylindrical hull revolvably carried by the frame, said hull having an opening, a pair of arms pivoted adjacent one end to said frame to extend over the hull, a hinge bar carried by the other end of the arms, a front cover section fixed to the bar, a rear cover section hinged to rock about the bar, said two cover sections enclosing said hull opening when the hull is in its upper normal washing position, a lip on the front section normally engaging the hull and releasable therefrom upon rotation of the hull counter-clockwise, a cam block positioned on the hull adjacent to said openings to pass under and lift said bar before said lip is released, a lever fixed to said bar, and linkage between said lever and said hull adapted to swing the lever upon rotation of the hull.

11. The combination with a frame and a

cylindrical hull revolvably carried by the frame, said hull having an opening, a pair of arms pivoted adjacent one end to said frame to extend over the hull, a hinge bar
 5 carried by the other end of the arms, a front cover section fixed to the bar, a rear cover section hinged to rock about the bar, said two cover sections enclosing said hull opening when the hull is in its upper normal washing
 10 position, a lip on the front section normally engaging the hull and releasable therefrom upon rotation of the hull counter-clockwise, a cam block positioned on the hull adjacent to said opening to pass under and lift
 15 said bar before said lip is released, a lever fixed to said bar, and linkage between said lever and said hull adapted to swing the lever upon rotation of the hull, said linkage having a slotted connection permitting delayed
 20 movement of the lever.

12. The combination with a frame and a cylindrical hull revolvably carried by the frame, said hull having an opening, a pair of arms pivoted adjacent one end to said
 25 frame to extend over the hull, a hinge bar carried by the other end of the arms, a front cover section fixed to the bar, a rear cover section hinged to rock about the bar, said two cover sections enclosing said hull opening
 30 when the hull is in its upper normal washing position, a lip on the front section normally engaging the hull and releasable therefrom upon rotation of the hull counter-clockwise, a cam block positioned on the hull adjacent
 35 to said opening to pass under and lift said bar before said lip is released, a lever fixed to said bar, and linkage between said lever and said hull adapted to swing the lever upon rotation of the hull, and a washing fluid
 40 supply pipe carried by the said arms discharging through said rear cover section.

13. In a washing machine, the combination of a cylindrical revolvable hull having a
 45 circumferential opening, a movable cover for said opening, plates on the hull having slots therethrough, each slot having a central horizontal portion, a notch at the rear lower side of the central portion and an upwardly for-
 50 wardly inclined portion from the front end of the central portion, hinge pins extending from the rear of said cover into said slots, and a member on the cover normally engaging said hull to maintain the cover in closed position, said member being released upon shifting the cover circumferentially back around the hull.

14. In a washing machine, the combination with a revolvable hull, a cylinder revolvably
 60 carried within the hull, a cylinder trunnion extending through the hull, a sprocket on the trunnion, a revolvable shaft, power communicating means between said shaft and said hull for revolving the hull upon rotation of the

shaft, a driving member on the shaft normally free to revolve thereon and revolve said sprocket, means connecting said member to said shaft, means for shifting said member away from said sprocket to said connecting means, and operating means connected with said member to revolve therethrough selectively said sprocket and said shaft.

15. In a washing machine, the combination with a revolvable hull, a cylinder revolvably
 75 carried within the hull, a cylinder trunnion extending through the hull, a sprocket on the trunnion, a revolvable shaft, power communicating means between said shaft and said hull for revolving the hull upon rotation of the shaft, a driving member on the shaft normally free to revolve thereon and revolve said sprocket, means connecting said member to said shaft, means for shifting said member away from said sprocket to said connecting means, and operating means connected with said member to revolve therethrough selectively said sprocket and said shaft, and stop means selectively retaining said operating means in a fixed position.

16. In a washing machine, a cylindrical hull having two circular heads and cylindrical
 90 sides connecting the heads formed from a single sheet of metal less than the circumference of the hull to leave an opening into the hull defined by the ends of the metal sheet, and a cylinder adapted to be revolvably carried within the hull, said cylinder being greater in diameter than the size of the opening into the hull and formed in two longitudinal sections each smaller than the hull
 95 opening to permit one section at a time to be passed through said opening to within the hull and securing means for joining together the two cylinder sections within the hull.

17. In a washing machine, a cylindrical hull having a one piece circumferential wall with an opening therethrough less in width than the length of the diameter of the hull, a cylinder adapted to be revolvably carried within the hull, said cylinder being formed in two separate longitudinal sections whereby one section at a time may be inserted within the hull through said opening, the ends of said cylinder having locking joints assembled with each other by endwise sliding movement of one section over the other into position, and trunnion carrying plates secured to the ends of the cylinder overlapping the two sections to secure one to the other.

18. In a washing machine, a hull having a side with a single opening, and a cylinder revolvably carried within the hull and greater in diameter than the size of the opening and formed in two sections each smaller than the hull opening and securing means for joining the two cylinder sections together when within the hull.

In testimony whereof I affix my signature.
 WILLIAM JOSEPH BYRNE.