

Feb. 13, 1945.

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2,369,333

WRINGER MECHANISM

Filed Nov. 18, 1940

3 Sheets-Sheet 1

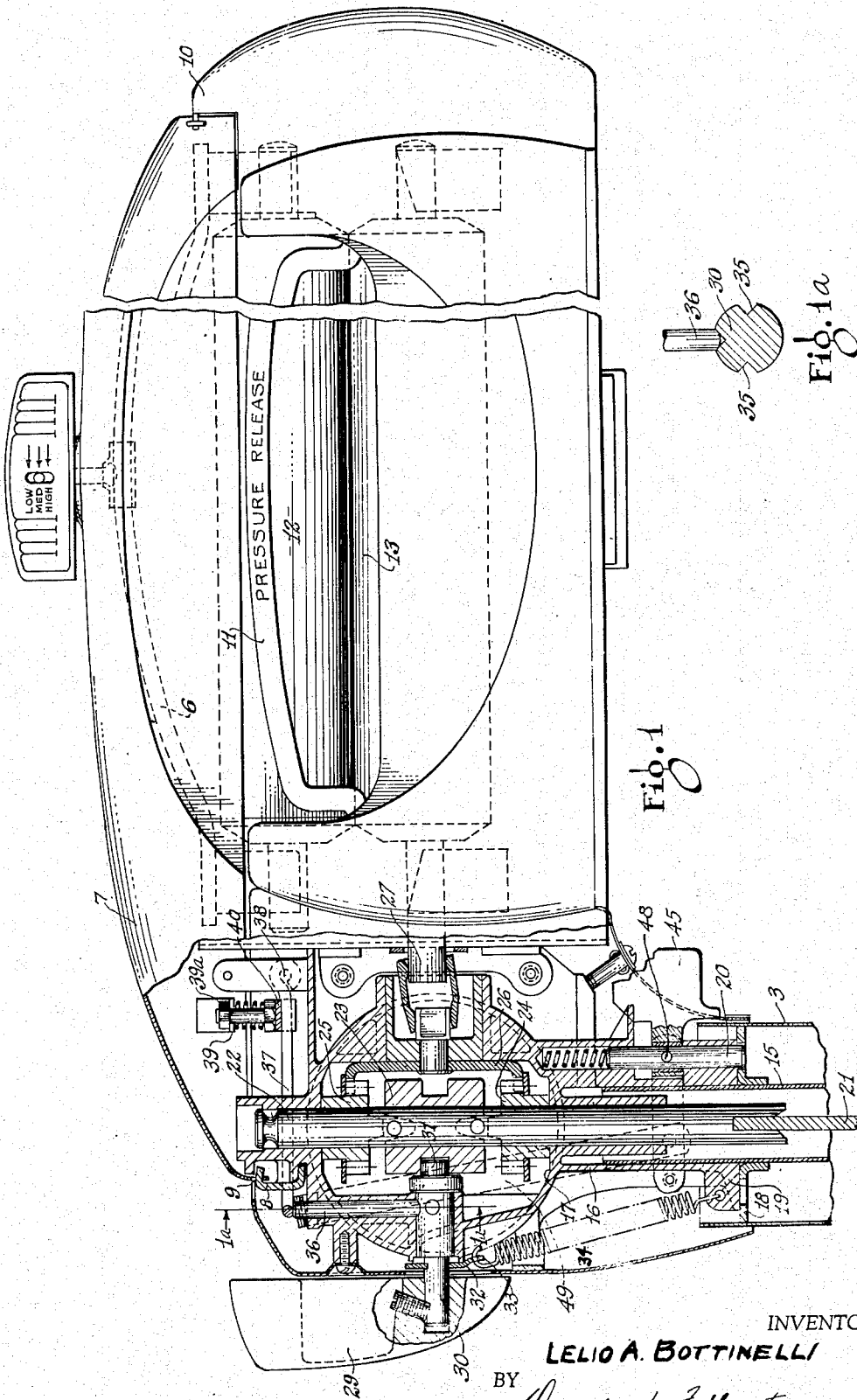


Fig. 1

Fig. 1a

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3 Sheets-Sheet 2

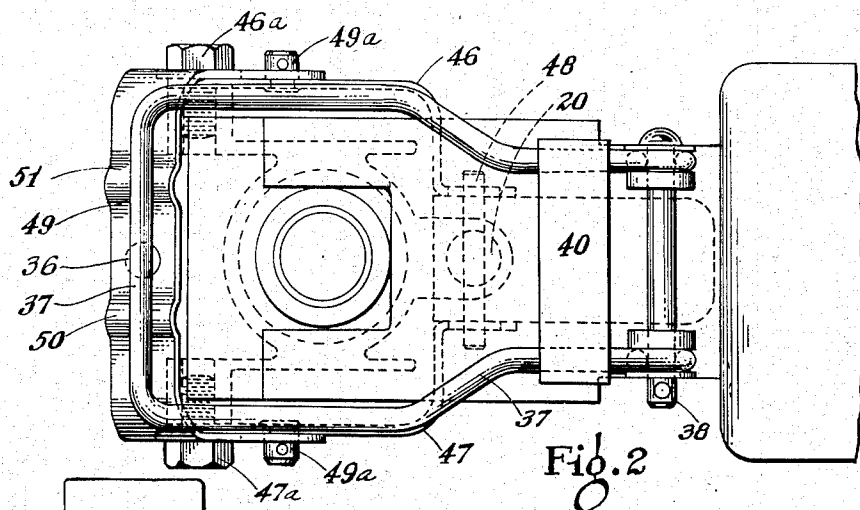


Fig. 2

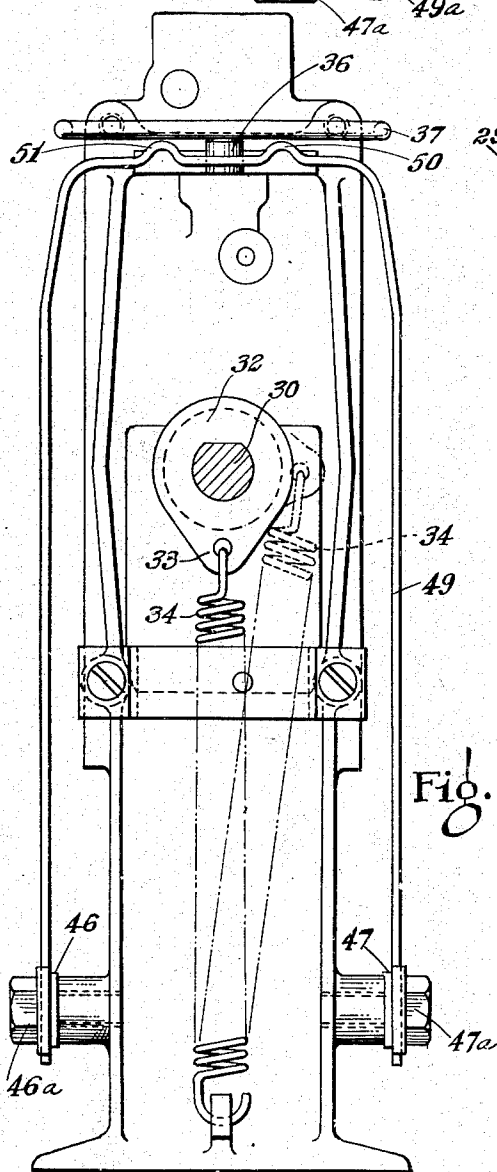


Fig. 3

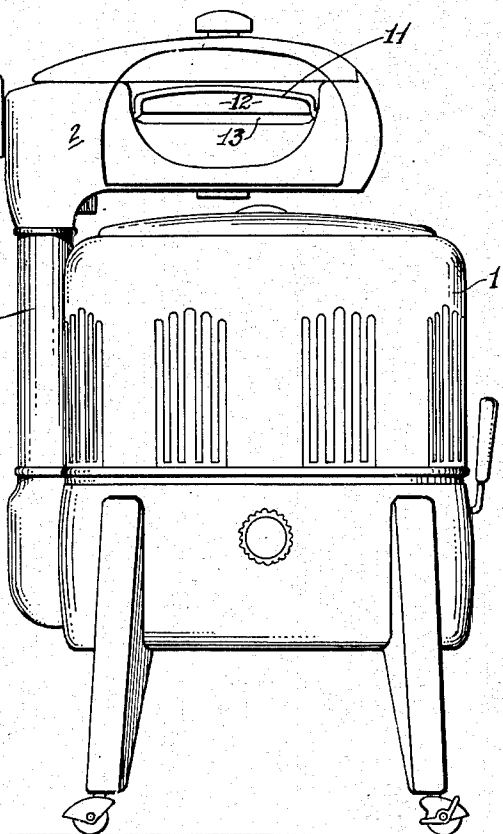


Fig. 4

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WRINGER MECHANISM

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7 Claims. (Cl. 68—249)

This invention relates to washing machines and more particularly to a safety device for a wringer used in combination with a power-driven washing machine.

It is among the objects of my invention to provide a wringer mechanism in which the gearing adapted to turn the wringer rolls is constructed and arranged so that upon operation of a pressure release for the rolls, the gearing will be placed in a neutral or non-driving position.

It is a further object of my invention to provide a wringer mechanism in accordance with the preceding object in which the swing lock or latching mechanism which is adapted to hold the wringer in a fixed position with respect to the washing machine tub is associated with the gearing so that upon release of said swing lock or latching mechanism the gearing is placed in a neutral or non-driving position.

It is a further object of my invention to provide a wringer mechanism according to the preceding objects wherein a manually-operated handle, which is adapted to shift a wringer clutch into and out of gear, is provided with means normally tending to place said handle in a neutral or non-driving position, and means associated with the roll pressure release on the wringer normally restrains said handle from swinging to neutral position.

It is a further object of my invention to provide a wringer mechanism in which the top bar of the wringer frame is adapted to move upwardly with respect to the wringer mechanism in response to release of the pressure means for the wringer rolls and such movement of the top bar is effective to permit the clutch control handle to swing to a neutral position in response to a spring normally tending to place said handle in said position.

Further objects and advantages relating to economy of manufacture, simplicity of construction and safety in operation of the wringer will appear from the following description of the appended drawings, wherein:

Figure 1 is an elevation with parts in section of a wringer mechanism made according to my invention; Figure 1a is a sectional view taken on the line 1a—1a of Figure 1; Figure 2 is a plan view of the wringerhead; Figure 3 is an end view of the wringer head; Figure 4 is an elevation of a combined washing machine and wringer; Figure 5 is a plan view with parts broken away of a modified form of my invention. Figure 6 is a sectional view taken along the plane 6—6 indicated in Figure 5. Figure 7 is a sectional view of the

wringer head including the modified form of release latch mechanism.

Referring to Figure 4 of the drawings; 1 indicates a combined washing machine and wringer in its entirety, wherein the wringer 2 is supported on a column 3 carried at the side of the washing machine tub. The wringer is mounted to swing about its support in a horizontal plane and to be latched in various positions about this support so that clothes may be wrung not only out of the washing machine but out of rinse tubs and bluing tubs which may be placed near the machine.

The wringer comprises the usual rolls 12 and 13 which are urged toward each other with considerable pressure by a spring carried within the wringer frame. A roll pressure release bar 11 extends across the opening leading to the wringer rolls and is adapted upon being moved to release the pressure on the rolls and to release a garment or a person which may be accidentally caught between the rolls.

It has long been the practice to provide wringers used as above described with safety release devices adapted to relieve the pressure on the rolls. Washing machine wringers of this type are also ordinarily provided with a reversing-gear mechanism controlled by handles such as the handle 29, so that a directional drive to the rolls may be reversed or may be interrupted entirely so that the rolls are idle.

Devices have also been proposed which are connected with the reversing-gear mechanism and with the safety release mechanism for the rolls, so that upon operation of the safety release for the rolls, the gears are rendered inoperative. The advantage of such an arrangement is that the stopping of the roll drive eliminates any tendency to draw a person or garment further into the rolls upon operation of the safety release.

The prior art patent to Woodrow 1,470,312 and the patent to Judelson 1,726,301 illustrate the advantage of the arrangement just described.

According to my invention, I propose to obtain the advantages of a wringer having a safety release that operates a roll stop by hinging the top bar of the wringer frame at the end thereof adjacent the wringer head and by connecting the clutch shifting device of the wringer head to a member depending from the top bar so that upon releasing movement of the top bar, the clutch is shifted to a neutral position.

Referring to Figure 1 of the drawings, the top bar or frame member 7 of the wringer is pivotally secured to the wringer head by means of a lug 8 carried on the wringer frame, extending

through an aperture 9 in the top bar. The other end of the top bar 7 is secured to the wringer frame by a toggle or latch member 10 which is adapted to be released by manual movement of the pressure release bar 11. The upper wringer roll 12 is urged against the lower wall by a leaf spring 6 carried within the top bar 7 of the wringer frame. The specific wringer frame construction and the springs and latches therefor form no essential part of the present invention and other types of wringer may be used so long as they are provided with an upwardly movable top bar or frame member such as 7 normally latched to the wringer frame and which is adapted to move upwardly upon actuation of a pressure release latch such as 11.

The wringer column 3 is provided with a vertically extending tube 15 which is adapted to fit within a bore 16 of the wringer head casting 17. A shoulder 18 within the wringer column supports a depending flange 19 on the wringer head casting so that the wringer in its entirety is rotatably mounted on the wringer column. The shoulder 18 is preferably apertured at suitable points to receive a spring-pressed latch 20 designed to hold the wringer in any selected position.

A vertically-extending, flat, power shaft 21 is arranged within the wringer column tube 15 and fits within a forked portion at the lower end of the vertical shaft 22 in the wringerhead. The flat shaft 21 is suitably driven by a power unit mounted within the skirt of the washing machine tub and this construction is such that the shaft 22 within the wringer head is continuously rotated when the power unit is in operation.

The reversing gearing within the wringer head casting comprises a driving clutch member 23 which is keyed or splined to the shaft 22 and which is adapted to be moved axially along the shaft 22 to clutched engagement with a pinion gear 24 or the pinion gear 25. The gears 24 and 25 are in constant mesh with a ring gear 26 which is coupled to the lower roll shaft 27. This construction provides that when the clutch member 23 is lowered into clutched engagement with pinion 24, the roll shaft 27 will be turned in one direction and when the clutch is moved into clutched engagement with gear 25, the roll shaft 27 will be rotated in an opposite direction. With the parts in the position as shown on Figure 1, the clutch 23 is in a neutral or midpoint position and thus the roll shaft is in neutral or idle position. The clutch is adapted to be moved into either of its clutched positions to effect a drive through the wringer by means of the handle and handle shaft 29 and 30, respectively. The handle shaft portion adjacent the clutch 23 is provided with a clutch pin 31 offset from the axis of the shaft 30 so that upon swinging the handle 29 to either side of its vertical position it will move the clutch 23 into one or the other of its clutched or driving positions.

A plate 32 is secured to the handle shaft on the exterior of the gear case and is provided with a depending ear 33 connected to the tension spring 34 and thus the tension spring 34 constantly tends to swing the handle 29 to its neutral position as shown. To enable the operator to maintain the gears in operative driving position and restrain the action of spring 34, the handle shaft within the gear case is provided with radially spaced recesses such as 35 (see Figure 1a) which are adapted to receive a vertically-slidable pin 36 resiliently urged into latch-

ing engagement with a recess 35 of the handle shaft by means of spring wire ball 37 pivoted on the wringer head casting as at 38. The spring wire ball 37 is in turn maintained in the position shown in Figure 1 by means of a bolt 39 depending from the top bar 7 of the wringer frame. The head of the bolt 39 is adapted to bear against a flat strap 40 extending across the bail 37 and the nut 39a is welded or otherwise secured to the top bar 7 so that the bolt may be turned to vary the spring tension in the bail 37.

From the construction described, it will be understood that the handle 29 may be turned so as to shift the clutch 23 into either of its clutching positions so as to drive the wringer rolls or to a neutral position and that such turning movement will force the pin 36 upwardly out of one of the recesses 35. When the rotating movement of the handle shaft has placed the gearing in driving engagement, the recess 35 will be brought into alignment with the pin 36 and said pin 36 will be urged into said recess 35 to hold the clutch in its shifted position. The recess 35 and the lower end of the pin 36 are so shaped that manual movement of the handle will cam the pin out of one recess and the spring wire ball will force the pin 36 downwardly into another recess. In the normal operation of the wringer, that is an operation wherein the wringer top frame part remains in its assembled position as shown, the pin 36 merely serves as a resilient latch to hold the clutch in its shifted position or resiliently maintains the clutch in its neutral position. When, however, the pressure release bar 11 is actuated and the top bar of the wringer frame is free to swing upwardly about its pivot 8-9, in response to the spring pressure exerted toward the rolls by spring 6, the abutment provided by the bolt 39 is removed from the bail 37 and the clutch shaft is free to rotate in response to the pull of the spring 34 so as to place the wringer clutch 23 in neutral position.

To insure that the wringer rolls will be idle whenever the wringer is swung about its support from one wringing position to another, I have provided an interlock between the roll stop mechanism and the swing lock latch 20. The latch 20 may be raised so as to free the same from the apertures in the shoulder 18 by manually raising the handle 45. A pair of links 46 and 47 are pivotally mounted on the lower part of the wringer head casting on studs 46a and 47a at each side thereof and the free ends of said links are engaged by a pin 48 carried by the latch pin 20, so that the links are rocked about their pivots by a raising and lowering movement of the pin 20. A U-shaped bail 49 is arranged on the wringer head casting between the spring wire bail 37 and the wringer head casting. The bight portion of the bail 49 is apertured to receive the pin 36 and is formed on each side of the pin 36 as at 50 and 51 to bear against the under side of the spring wire ball 37. The ends of the bail 49 are pivoted as at 49a to the links 46 and 47. The rocking movement of the links 46 and 47 in response to a lifting of the latch pin 20 is transmitted through the bail 49 and thence to the spring wire ball 37 so that the retaining effect of the spring wire ball with respect to pin 36 is interrupted. As soon as the retaining effect of the spring wire ball or the vertical pin 36 is interrupted, the tension spring 34 becomes effective so as to swing the handle shaft 30 and the clutch 23 to a neutral position.

From the foregoing description of that form

of my invention illustrated in Figures 1 to 4, it will be understood that a manual operation of the pressure release bar 11 will permit the top bar 7 of the wringer to move upwardly. The said upward movement will remove the abutment for the spring wire bail provided through bolt 39 so that the spring 34 will become effective to swing the clutch handle to its neutral position. It will also be understood that the spring 34 becomes effective so as to swing the handle to neutral position whenever the spring wire bail is raised through the medium of latch 20 and bail 49.

Although the preferred form of my invention, such as shown in Figure 1 is well suited for most wringer installations, certain manufacturing variations and flexibility in wringer frame parts may render that form of my invention shown in Figures 5 to 7, inclusive, more desirable. Figure 7 illustrates the wringer head and wringer assembly as a complete operating unit and Figures 5 and 6 are enlarged plan and section views respectively of the release mechanism per se.

In the form shown in Figure 7, the inherent resilience in the spring wire bail 121 is supplemented by a coil spring 127 arranged to bear through plate 125 against the upper side of the bail 121 so as to provide a uniform constant spring pressure against the vertical latch pin 132. A pivoted bearing plate 123 is mounted on the pivot 122 which connects the bail to the wringerhead and the plate 123 is normally urged upwardly by a heavy coil spring 128. The coil springs are conveniently assembled and retained in position on the wringerhead by a threaded stud member 124 having adjusting nut 126 to regulate the spring pressure transmitted by the spring 127 to the bail.

The arrangement above described is such that the heavy coil spring 128 is constantly urging the bail upwardly through the plate 123 having projecting arms 123a extending beneath the bail and the coil spring 127 is constantly urging the spring downwardly.

The heavy coil spring 128 is normally maintained in lowered position, as shown, by means of the bolt 130 carried by bracket 129 fixed to the top bar 133 of the wringer frame. The bolt 130 is preferably adjusted so that the head 131 thereon forces the plate 123 and its projecting arms to a position wherein the arms 123a are slightly spaced from the under side of the bail.

The reversing gear arrangement employed in connection with the modified form of my invention illustrated in Figs. 5 to 7 may be of the conventional three-gear and clutch design, such as the design illustrated in Fig. 1 hereof and in that of the patent to Little No. 2,236,319 dated March 25, 1941, wherein a pair of spaced, beveled gears are in constant mesh with a wringer roll drive gear and a clutch is arranged between the two beveled gears so as to selectively engage either of the beveled gears effecting a reversal in the direction of drive. The handle shaft 135 shown in Fig. 7 effects a shifting of the clutch member in the usual manner thereby effecting a drive in the alternate directions or obtaining a neutral position of the clutch, all in accordance with the disclosure of said Little patent above named. The handle 135, Fig. 7, effects a shifting of the clutch substantially as in the preferred form of my invention shown in Fig. 1.

During the normal operation of the wringer, the top 133 remains in its lowered position as shown and thus the spring 128 is ineffective to move the bail 121. When, however, the safety

release for the wringer is operated so as to swing the top bar 133 upwardly, the spring 128 is free to expand and is proportioned to overcome the coil spring 127 and move the bail 121 upwardly. This upward movement of the bail permits the latch pin 132 to move upwardly in response to the pull of the coil spring 134 connected to the handle shaft 135. This form of my invention also includes an interlock 137 constructed and arranged substantially as in the preferred embodiment heretofore described.

Among the advantages of this form of my invention is that the wringer frame parts may be relatively loose and may be flexed in response to heavy load without in any way affecting the latching effect of the bail 121. Any upward flexing in the top bar 133, for instance, merely moves the plate 123 upwardly within the limits of its adjustment in the space between the arms 123a and the under side of the bail.

It will be appreciated by those skilled in the art that the roll stop device which I have provided is suited for use with wringer frames and wringer roll release devices other than that illustrated herein and that my invention may be used in connection with wringer frames and release devices such as those shown in the patents to Kauffman 2,087,977 and 2,120,521.

Although I have shown and described two forms of my invention in considerable detail, it will be understood that numerous changes may be made therein without departing from the scope of the invention as defined in the following claims.

I claim:

1. In a wringer having a top bar adapted to be moved upwardly with respect to the wringer frame upon actuation of a safety release, reverse drive gearing for said wringer including a handle shaft, a spring normally tending to maintain said handle shaft in a neutral position, a pin adapted to engage said handle shaft when in driving position to restrain the same against movement to neutral position in response to said spring, a member arranged between said pin and the top bar of the wringer frame to hold said pin in restraining position, means to support said wringer for swinging movement about a vertical axis, a latch to hold said wringer in latched position when turned about said axis and means connected to said latch and said member to move said member to inoperative position with respect to said pin when said latch is moved to inoperative position, said member movement releasing said handle shaft for movement to a neutral position in response to said spring.

2. In a wringer having a frame, rolls and a top bar, a safety release operable to effect upward movement of said top bar, reverse drive gearing for said rolls, spring means normally acting to place said gearing in neutral, a member controlled by the position of said top bar adapted to oppose action of said spring and maintain said gearing in driving arrangement, said wringer mounted to swing about a vertical axis and a swing lock to control the position of the wringer with respect to said axis, a link connecting said swing lock and said member adapted to render said member inoperative upon unlocking of said swing lock.

3. A wringer mounted to swing about a vertical axis, a swing lock to control the position of the wringer with respect to said axis, said wringer comprising reverse drive gearing and a shiftable clutch movable to driving or neutral position, a

rotatable handle including a shaft to shift said clutch, spring means tending to move said handle to neutral position, a member adapted to engage said handle shaft to restrain movement thereof in response to said spring, spring means arranged to urge said member into restraining position with respect to said handle shaft, said swing lock connected to said last-named spring means to render the same inoperative and permit said handle shaft to be moved to a neutral position in response to said first-named spring means.

4. In a wringer having a top bar adapted to be released and move upwardly with respect to the wringer frame upon actuation of a safety release, reverse drive mechanism for said wringer including a handle shaft, a spring normally tending to maintain said handle shaft in a neutral position, a latch adapted to engage said handle shaft when in driving position to restrain the same against movement to neutral position in response to said spring, a member arranged between said latch and the top bar of the wringer frame to hold said latch in said restraining position, means to support said wringer for swinging movement about a vertical axis, a swing lock to hold said wringer in selected position with respect to said axis and means connected to said swing lock and said member to move said member away from its holding position with respect to said latch when said swing lock is moved to free the wringer for swinging movement.

5. In a wringer having a frame, rolls and a top bar, a safety release operable to effect upward movement of said top bar, gearing mechanism to drive said rolls, spring means tending to place said gearing mechanism in neutral, shifting means to establish a drive through said mechanism, a member controlled by the position of said top bar adapted to oppose action of said spring means and maintain said shifting means in selected position, said wringer mounted to swing about a vertical axis and a swing lock to control the position of the wringer with respect to said axis, means connecting said swing lock and said member adapted to render said member inoperative with respect to the shifting means upon release of said swing lock to permit swinging movement of the wringer.

6. A wringer comprising a wringer frame having a top bar, a wringer head supporting said

frame provided with reverse gearing mechanism, wringer rolls mounted in said frame, a safety release for said rolls operable to effect an upward movement of said top bar, said mechanism provided with a clutch to effect neutral, forward and reverse drive through said mechanism, a shifting device for said clutch comprising a rotatable shaft, radially spaced recesses in said shaft, spring means eccentrically connected to said shaft tending to maintain said shaft in a neutral clutch position, a slidable pin adapted to be moved into one of said recesses upon rotation of said shaft in response to said spring means, means to control the position of said slidable pin comprising a member pivoted at one end on the wringer head and having its other end adapted to bear against said slidable pin, a coil spring normally tending to move said member upwardly away from said pin, a second coil spring normally tending to move said member downwardly towards said pin and an abutment carried by the top bar operatively connected to said first spring to restrain its upward movement.

7. A wringer comprising a wringer frame having a top bar, a wringer head supporting said frame provided with reverse gearing mechanism, wringer rolls mounted in said frame, a safety release for said rolls operable to effect upward movement of said top bar, said mechanism provided with a clutch to effect neutral, forward and reverse drive through said mechanism, a shifting device for said clutch comprising a rotatable shaft, radially-spaced recesses in said shaft, spring means eccentrically connected to said shaft, tending to maintain said shaft in a neutral clutch position, a slidable pin adapted to be moved into one of said recesses upon rotation of said shaft in response to said spring means, means to control the position of said pin comprising a U-shaped wire bail having its free ends pivoted on the wringer head, and the bight portion thereof adapted to bear against said slidable pin, spring means arranged at the under side of said bail adapted to urge the bail upwardly, a second spring means arranged above the bail and adapted to urge the bail downwardly, and abutment means carried by said top bar normally restraining said first-named spring means.

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