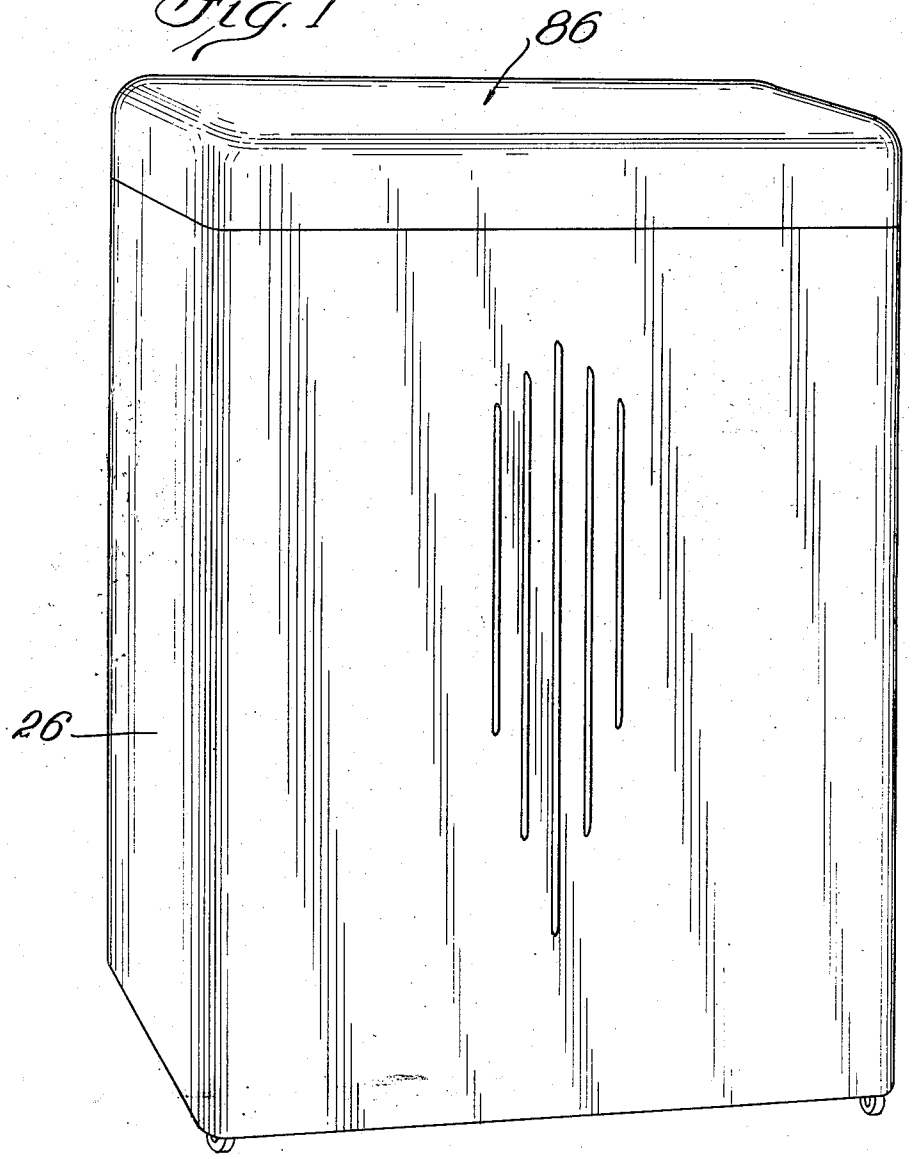
Nov. 23, 1943. D. A. LUNDY 2,334,780

DISAPPEARING WRINGER

Filed May 22, 1940 5 Sheets-Sheet 1

Fig. 1



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DISAPPEARING WRINGER

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Fig. 2.

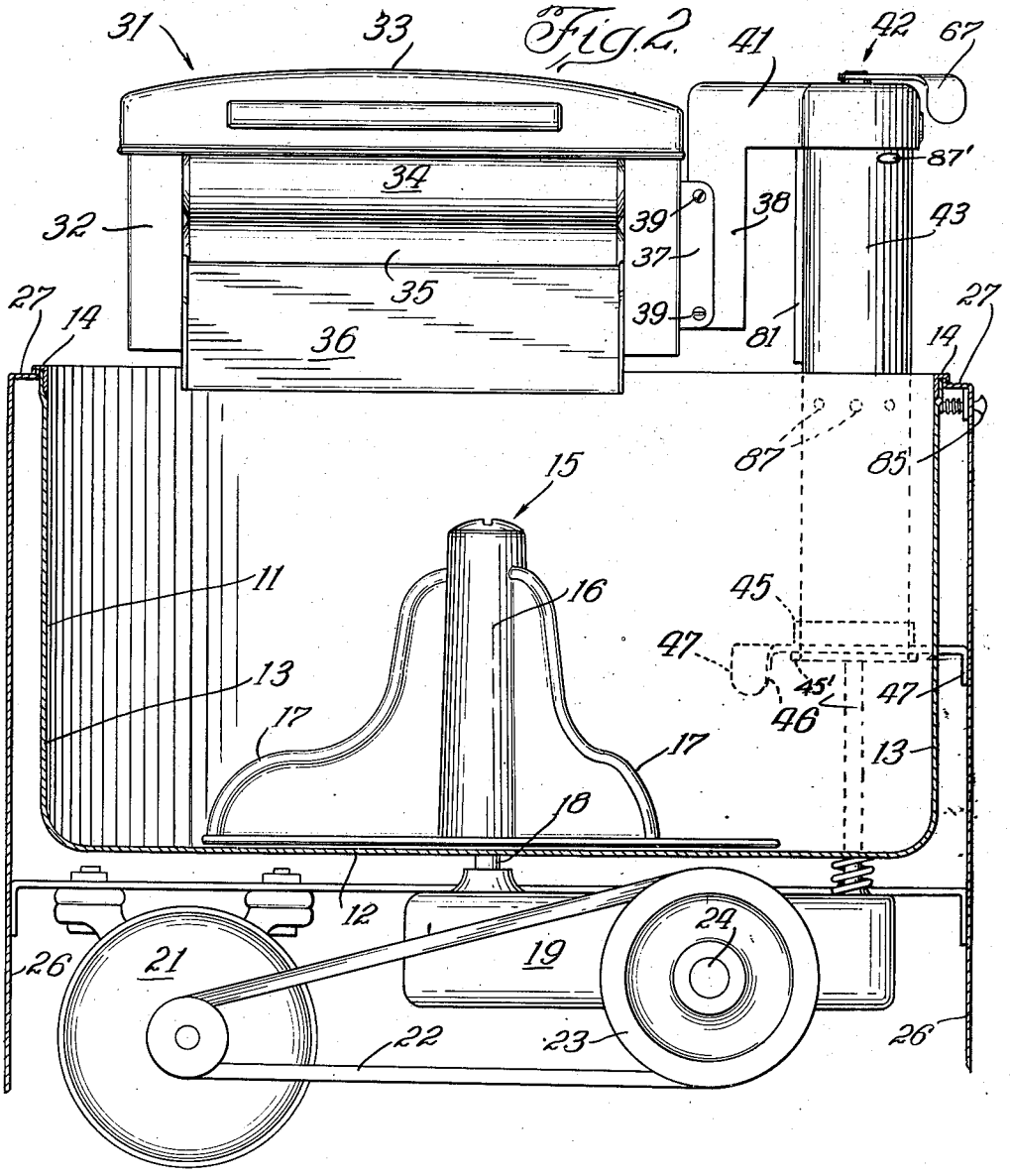
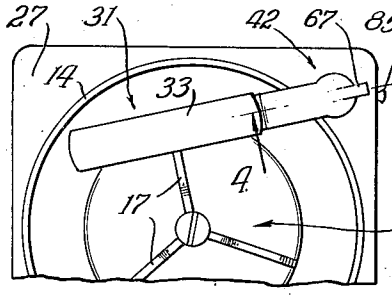


Fig. 3.



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DISAPPEARING WRINGER

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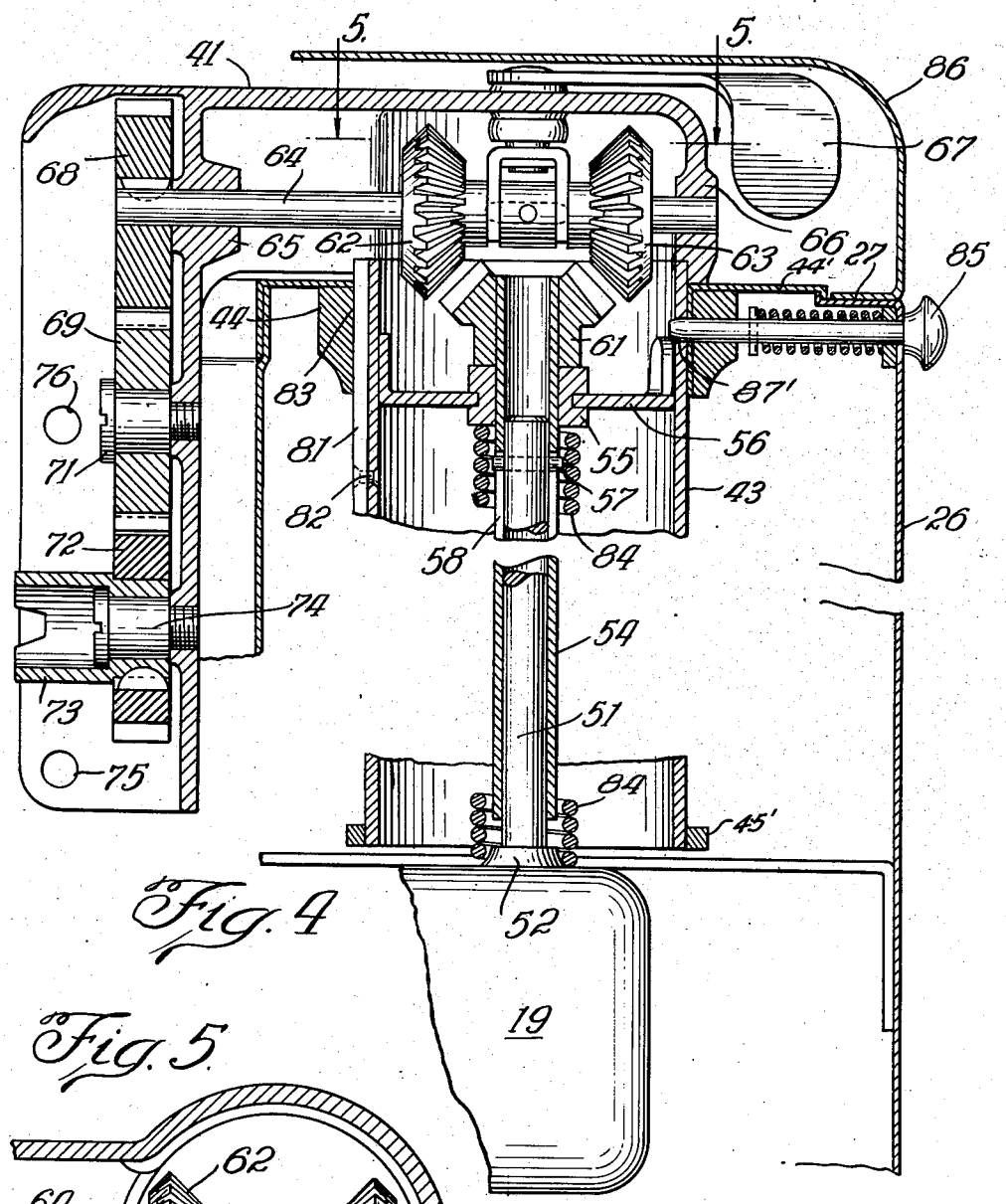
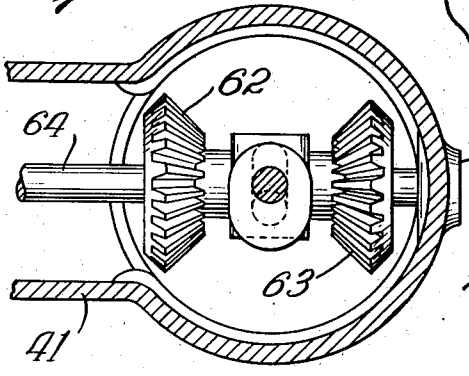


Fig. 4

Fig. 5



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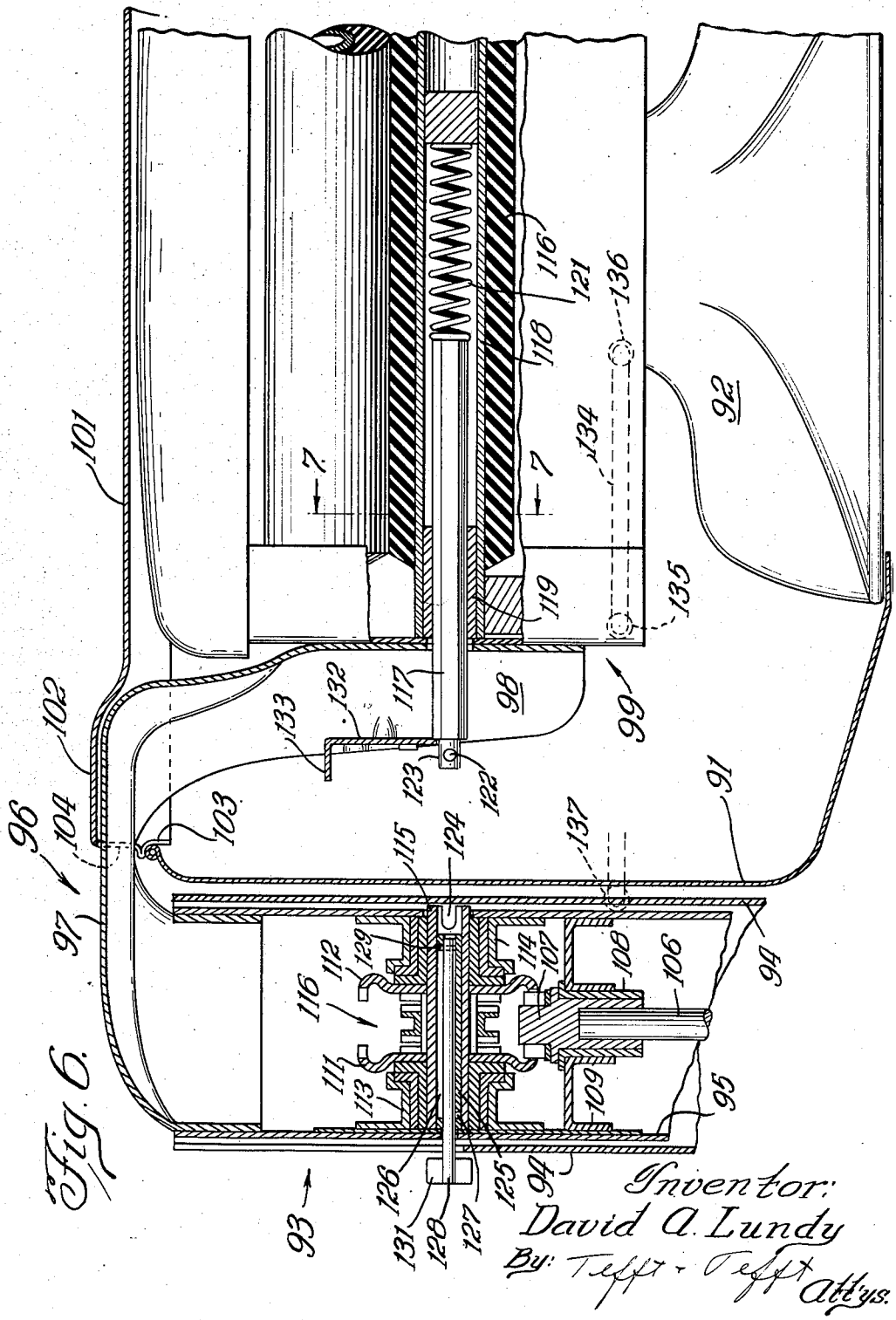


Fig. 6.

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DISAPPEARING WRINGER

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Fig. 8.

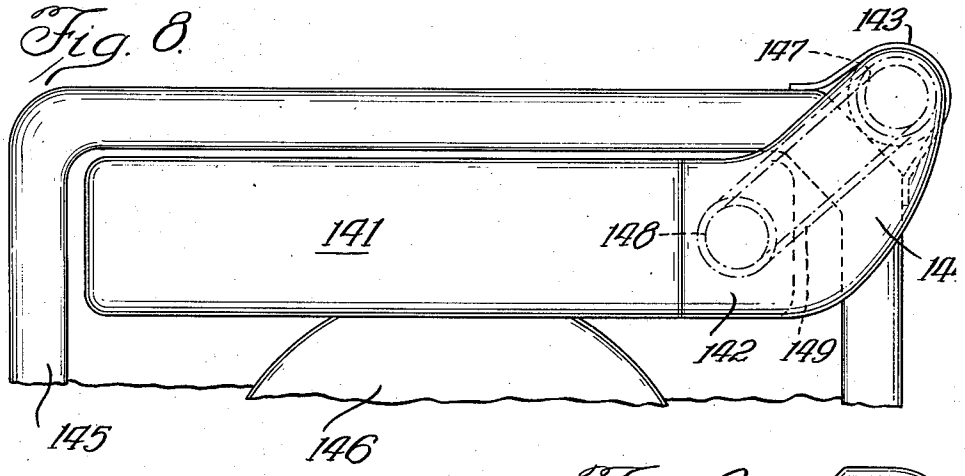


Fig. 12.

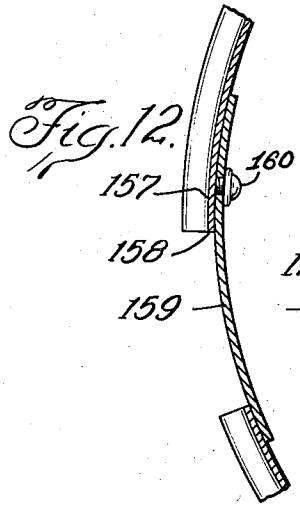


Fig. 11

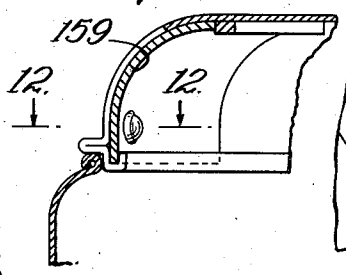


Fig. 9.

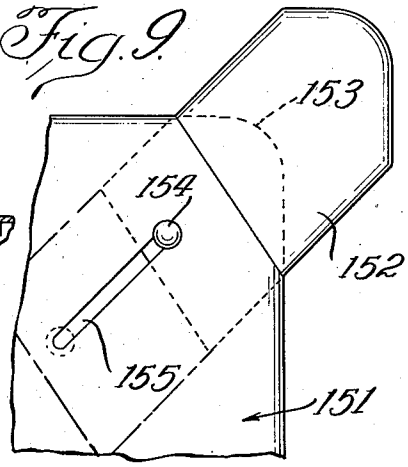


Fig. 10.

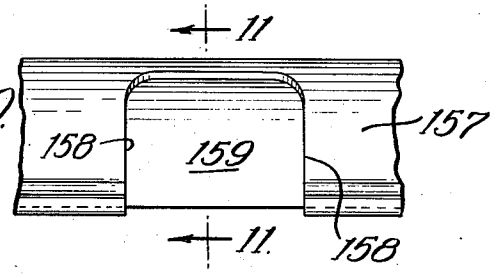
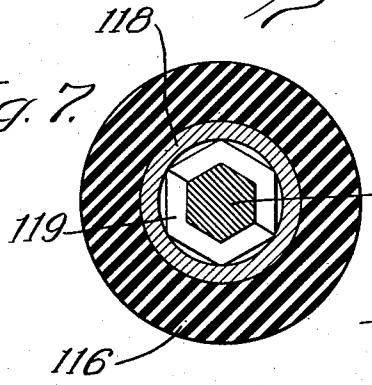


Fig. 7.



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UNITED STATES PATENT OFFICE

2,334,780

DISAPPEARING WRINGER

David A. Lundy, Riverside, Ill.

Application May 22, 1940, Serial No. 336,489

23 Claims. (Cl. 68—247)

The present invention relates to clothes wringers and refers particularly to the disappearing type of wringer arranged with a wringer mounting to permit the wringer to move into an inoperative position inside the tub of an ordinary domestic washing machine.

It is recognized that in the prior art numerous attempts have been made to provide a disappearing wringer of this general class, but to the best of the applicant's knowledge none of the prior art structures have been in any way successful and none have been accorded commercial recognition. It is believed that this fact results from the deficiencies of the prior art structures since each of these known to the applicant requires that the tub be made with extra space to accommodate the wringer, and in most instances the wringer mounting or certain parts thereof have been mounted inside of the washing machine tub.

In the present state of the industry practically all manufacturers have discarded the several old types of washing machines and have standardized on a small tub, bottom agitator model, which is not suited to the disappearing wringer structures known in the prior art.

It is, therefore, a principal object of this invention to provide a wringer mounting shiftable between the operating position above the rim of a washing machine tub and an inoperative position inside of the tub. In this connection this invention also aims to provide a structure wherein the wringer may be easily manipulated between the two positions and wherein the mounting includes means to guide the wringer into exact predetermined position with respect to the tub as the shifting occurs.

Another object of the invention is to provide a disappearing type wringer in connection with a washing machine having a smooth, uninterrupted, regularly formed interior surface of the washing machine tub, to the end that the tub may be easily cleaned and that the washing action of the machine will not be hindered.

A further object of the invention is to provide a disappearing type wringer mounted on a supported column positioned exterior of the washing machine tub and extending downwardly below the bottom wall of the tub in order that the driving motor for the agitator of the washing machine may also drive the wringer rolls.

A further object of the invention is to provide a disappearing wringer and washing machine cover arranged to provide a smooth uninterrupted table top surface.

Other objects will appear hereinafter.

These objects are accomplished in the present invention by the provision of a telescoping wringer drive column extending upwardly from the agitator gear housing outside of the side walls of the washer tub. At the upper extremity of the telescoping column any ordinary type of wringer may be mounted on a mounting bracket including a vertical offset position to extend over the rim of the tub. Thus, when the wringer is housed within the tub, it is supported by the vertical column on the outer wall of the tub, the arm portion extending more or less horizontally across the tub rim and the mounting bracket depending downwardly from the arm inside of the tub.

Referring now more particularly to the drawings:

Fig. 1 is a perspective view of a preferred embodiment of the present invention illustrating the machine cover in position on the tub;

Fig. 2 is a central sectional view of the preferred embodiment of the invention showing the machine cover removed and the wringer lifted into operative position;

Fig. 3 is a reduced scale plan view of the machine illustrating the position the wringer assumes when it is nested in the tub;

Fig. 4 is a detailed sectional view taken substantially on the plane of the line 4—4 in Fig. 3;

Fig. 5 is a detailed sectional view of the reverse gearing and is taken substantially on the plane of the line 5—5 of Fig. 4;

Fig. 6 is a sectional view similar to Fig. 4 illustrating a slightly modified form of the invention;

Fig. 7 is a detailed sectional view taken substantially on the plane of the line 7—7 of Fig. 6;

Fig. 8 is a plan view of a second modified form of the invention particularly adapted for use in connection with a square tub washer;

Fig. 9 is a fragmentary plan view of a machine covered for use in connection with the square tub structure illustrated in Fig. 8;

Fig. 10 is a side elevation of a preferred type of cover;

Fig. 11 is a detailed sectional view taken substantially on the plane of the line 11—11 in Fig. 10; and

Fig. 12 is a detailed sectional view taken substantially on the plane of the line 12—12 in Fig. 11.

The general washing machine structure

The usual type of modern washing machine includes a more or less cylindrical tub 11 having a bottom wall 12 and a surrounding side wall 13 terminating in an annular rim 14. An agitator 15 including a central column 16 and a plurality of agitator vanes 17 is mounted on a drive shaft 18 extending upwardly through the lower wall 12 of the tub and from a gear housing 19 which normally includes a reduction gearing and an oscillating agitator drive mechanism. A motor 21 operates through the me-

dium of a V-belt 22 to impart rotary driving movement to a pulley 23 on the shaft 24 of a gear housing 19.

The mechanism thus far described has been found to provide a very efficient and generally satisfactory washing machine and has been adopted by practically every manufacturer to the exclusion of the various other types of machines, as, for example, the old oscillating drum, suction cup, or dolly-type mechanisms. However, to obtain maximum efficiency of the mechanism, it is essential that the tub and agitator be dimensioned to very carefully calculated proportions, and it is also essential that the interior walls of the tub be smooth, regular and unobstructed. This is essential, of course, as a practical matter to facilitate cleaning of the tub after use, but it is also essential in order to permit proper water action and uniform water circulation throughout the entire tub area.

In addition to the essential washing machine elements heretofore described, the preferred embodiment of the invention illustrated includes a housing 26 comprising four wall panels terminating at approximately the same height as the rim 14 of the tub 11 and interconnected with the tub rim by horizontal portions 27. In the present structure this housing 26 acts as the supporting frame for the tub and driving mechanism, but it is understood that any other type of supporting frame may also be used.

Preferred wringer mounting

The wringer 31 illustrated in connection with the preferred embodiment of the invention includes a lower frame 32, an upper frame 33, a pair of cooperating wringer rolls 34 and 35, and folding drain boards 36. The lower frame 32 includes a pair of flanges 37, which may be secured to a wringer mounting bracket 38 in any desired way, as for example, by means of the mounting screws 39. It will be seen from examination of Fig. 2 that the mounting bracket 38 extends directly upwardly from the flanges 37 and includes an integral horizontal arm portion 41 extending laterally from the bracket 38 to the telescoping wringer column 42. The wringer column 42 includes a sliding tubular member 43 extending downwardly through a flange 44, carried by the stamping 44' attached to the horizontal surface 27 of the washing machine frame and a flange 45 carried on the supporting bracket 46. A shoulder ring 45' fixed on the tube 43 stops the wringer in its upper position by contact with the flange 45. The bracket 46 is positioned in the space outside of the vertical side wall 13 of the tub 12 and inside of the walls of the outer housing 26 and is secured in position by ears 47 welded to the tub and housing. The bracket 38 with its arm portion 41 supported on the tubular column 42 have the vertical portions thereof spaced from each other and form a substantially inverted U-shaped structure with a neck gap therein to clear the wall of the tub while the wringer is stored within the tub.

Driving power is transmitted from the motor 21 to the rolls 34 and 35 of the wringer 31 by mechanical driving connections extending from the gear housing 19 upwardly through the telescoping wringer housing 42, thence horizontally through the arm 41 and downwardly through the mounting bracket 38 to the shaft of the lower wringer roll 35. This structure is illustrated in detail in Fig. 4 and includes a vertical driving shaft 51 journalled for rotation in a boss 52 in the gear housing 19 and extending upwardly in telescoping relationship with a tube 54 mounted in a bearing 55 supported in coaxial relationship with the tube 43 by a flanged bracket 56 secured to the inner walls of the tube 43 adjacent its upper end.

A sliding driving connection between the shaft 51 and the tube 54 is established by the cross pin 57 mounted in the vertical shaft 51 and adapted to engage a pair of opposite longitudinal slots 58 in the walls of the sleeve 54. A bevel driving gear 61 is mounted at the extreme upper end of the sleeve 54 and is adapted to be engaged by beveled driven gears 62 and 63, each of which is mounted in sliding non-rotating relationship on horizontal drive shaft 64, which extends between the bearings 65 and 66 formed integral with the top arm 41 of the wringer support. This reversing mechanism is of conventional design and will not be described in detail except to point out that by the manipulation of the reversing handle 67, the gears 62 and 63 may be shifted longitudinally on the shaft 64 so that either gear may engage the driving pinion 61 and establish forward or reverse driving connections to the wringer.

The driving connections to the wringer 31 are completed by a gear train extending downwardly through the mounting bracket 38 and including a driving gear 68 keyed to the shaft 64, an intermediate gear 69 mounted on the stud 71 and a driven gear 72 including a notched driving sleeve 73 mounted on a stud 74. The notched driving sleeve 73 is of proper dimensions to engage, and establish driving connection with, the lower roll shaft of the wringer 31. Bolt holes 75 and 76 are provided in the walls of the mounting bracket 38 and are positioned to locate the drive shaft of the roll 35 in proper alignment with the driving sleeve 73. In this connection it might be pointed out that in the present state of the art, the dimensions of wringers have been quite well standardized, and the bracket here illustrated permits a standard type of wringer to be used.

In the operation of the mechanism it is essential that facilities be provided to guide the wringer into exact predetermined position in the tub for the reason that the wringer is of considerable mass and could not be satisfactorily housed within the tub unless adequate provision is made to prevent the wringer from striking the side walls of the tub and damaging the enamel or from striking the agitator and possibly damaging or breaking the agitator vanes. From an examination of Fig. 2, it will be seen that in the normal-sized tub illustrated there is sufficient room to position the wringer between the side walls of the tub and the agitator, but that the wringer must be moved into and out of position with some degree of precision to accomplish the close nesting essential to the satisfactory use of the device.

To guide the wringer into nesting position, the telescoping wringer column 42 is provided with a key 81 riveted to the tube 43 by a plurality of rivets 82, the key 81 being longitudinally slidable in a keyway 83 cut in the wall of the upper flange 44. The relative positions of the key 81 and the keyway 83 are such that the wringer will be positioned in exactly the correct angular relationship with the tub before it can be moved downwardly and will thus be guided into exact predetermined nested position inside of the tub.

It will be noted that the weight of the wringer

is balanced by a lifting spring 84 telescoped over the sleeve 54 and shaft 51 in such a manner as to urge the telescoping wringer column to its uppermost position. Preferably the spring 84 is of sufficient size to overcome the entire weight of the wringer and lift it to its uppermost position. Thus, when the operator desires to position the wringer inside of the tub she will move it downwardly against the force exerted by the spring and lock it in its lowermost position by means of the spring-pressed plunger 85 mounted in the sleeve 44 and arranged to register with the lowered locking orifice 87' in the tube 43. When the wringer is thus locked in its lowermost position, the machine cover 86 may be placed on the tub to provide a smooth, uninterrupted table top surface, as illustrated in Figs. 1 and 4.

To raise the wringer to its operating position, the cover 86 should be removed and the plunger 85 withdrawn to allow the spring 84 to lift the wringer to its uppermost operating position, as illustrated in Fig. 2. It will be noted that the length of the key 81 is such that it is completely withdrawn from the keyway 83 as the wringer reaches its uppermost position, in order that the wringer column may be swung to any one of a number of angular positions with respect to the tub and frame. The tube 43 is provided with a plurality of indexing openings 87 which may be engaged by the spring plunger 85 to maintain the wringer in any angular position desired. However, when the wringer is again lowered, the key 81 must first be brought into alignment with the keyway 83 so that the wringer is in proper angular relationship to nest inside of the tub 11 and so that it will be guided into the tub by the key 81.

Modified mounting structure

A modified form of the wringer mounting structure is illustrated in Fig. 6. In this structure it will be seen that the supporting arm for the wringer includes a vertical offset to extend upwardly above the rim of the tub and downwardly inside the tub to the wringer in much the same manner as the structure heretofore described and illustrated by parts 38, 41, 43 and companion parts. However, the driving connections to the wringer roll are not carried upwardly through this vertical offset bracket, but are established directly between the wringer driving column and the wringer rolls.

The structure illustrated in Fig. 6 includes the tub 91 and agitator 92. A telescoping wringer column 93 is mounted in vertical position immediately outside of the vertical side walls of the tub 91 and includes a stationary outer sleeve 94 and a vertically slidable inner sleeve 95 mounted therein. At the upper extremity of the sleeve 95 a vertical offset bracket 96 is provided and the bracket 96 includes a horizontally extending arm portion 97 and a downwardly extending mounting bracket 98 on which the wringer 99 may be mounted.

The tub 91 is provided with a cover 101 having a slightly raised portion 102 to enclose the arm 97 and a notch 103 is cut in the vertical side wall 104 of the cover to accommodate the arm. It will be noted that this leaves practically the entire surface of the machine cover smooth and flat and available for use as a table top and that the notch 103 is in a vertical portion of the cover wall where it is quite inconspicuous even when the wringer is lifted to its operating position. Further, the notch 103 is so small and so far above the water line of the tub 91 that there is no danger of splashing or overflow through the notch when the wringer is raised and the washing machine is in operation.

The driving connection to the wringer is established by a driving shaft 106 the lower end of which is in telescoping relationship with the power driving means (not shown) and the upper end of which carries a driving pinion 107 journalled for rotation in a bearing 108 carried in the bracket 109 affixed to the inner walls of the vertically movable sleeve 95.

A pair of reversing gears 111 and 112 are mounted in suitable bearings 113 and 114 and each of the gears 111 and 112 is freely rotatable on a sleeve 115. The shifting clutch element 116 keyed to the sleeve 115 may be shifted by means of a reversing control (not shown) to establish driving connection between either of the reversing gears and the sleeve 115.

The driving connection between the sleeve 115 and the lower wringer roll 116 of the wringer 99 is completed by means of a longitudinal sliding drive shaft 117 housed within the tubular shaft 118 of the wringer roll and held in splined relationship with the roll by the hexagonal splines 119 (see Fig. 7). A coiled compression spring 121 is positioned within the sleeve 118 to urge the shaft 117 toward the sleeve 115 in the vertical wringer column 93. Thus, when the wringer structure 99 is lifted outside of the tub, the sliding drive shaft 117 can move to the left, as viewed in the drawings, until the cross pin 122 on the reduced pilot portion 123 of the shaft engages the notches 124 on the driving sleeve 115. It will be seen that this completes the power drive connection to the wringer, since power transmitted from the vertical drive shaft 106 will cause the driving pinion 107 to drive the gears 111 and 112, while the clutch element 116 will couple one of these gears to the sleeve 115 and thence to the sliding drive shaft 117 and the lower wringer roll 116.

When the operator desires to lower this wringer structure into the tub, it is, of course, necessary that the sliding shaft 117 be withdrawn into telescoping relationship with the lower roll in order that it will not strike the upper annular rim of the tub as the wringer is lowered. To accomplish this result, a telescoping tube and plunger is arranged within the sleeve 115 by which the operator may force the telescoping drive shaft 117 into inoperative position. The plunger arrangement includes a tube 125 fitted within the sleeve 115 and provided with a longitudinal slot 126 having a bayonet portion 127 adjacent its extreme left end. An actuating plunger 128 is fitted within the tube 125 and is provided with a cross pin 129 positioned to slide in the slot 126—127.

Assuming now that the operator wishes to disengage the driving connection preparatory to lowering the wringer into nested position with the tub, she may grasp the knob 131 affixed to the extreme left end of the plunger 128 and draw it outwardly to the left until the cross pin 129 reaches the extreme left end of the slot 126. At this point she will rotate the rod 128 a fraction of a revolution to lock the cross pin 129 and the bayonet portion 127 of the slot and move the knob 131 back to the position shown in the drawings. This action will cause the tube 125 to bear against the end portion of the shaft 117 and force it into telescoping relationship with the lower wringer roll 116, and, as the shaft reaches the position

illustrated in the drawings, the sliding latch member 132 will drop by gravity to engage the notch between the hexagonal portion of the notch 117 and the reduced pilot portion 123. When this occurs the tube 125 may be withdrawn into the sleeve 115 and the wringer may be lowered into nested position within the tub.

When the wringer is again raised into operation position, the driving connections may be re-established by simply lifting the latch 132 by means of the finger portion 133 provided for the purpose and at that time the spring 121 will snap the shaft 117 to the left to re-establish driving connection to the wringer.

It is, of course, desirable that the arm 97 be of relatively small cross section in order that it be inconspicuous when the machine is closed, but it is also essential that the wringer mounting be of sufficient strength to provide a solid support for the wringer when in its operating position. To permit the use of a supporting arm of unusually small cross section, it is contemplated that a shiftable brace member 134 may be pivotally mounted at 135 and arranged to swing between an inoperative position 136 and a supporting position 137. It will be understood, of course, that the support will be moved to position 136 when the wringer is lowered into the machine tub and when the wringer is lifted to its operating position above the tub, the support may be moved to the position 137 wherein it will contact the sleeve 95 and lend additional support to the lower end of the wringer mounting bracket 98.

In any event, a limited amount of torsional flexing may take place in the arm, but this is not objectionable in the structure shown in Fig. 6, for the driving train does not extend through the arm.

In the form of the invention shown in Fig. 4, the flexing may also take place, but the twisting will be co-axial with the shaft 64 and will not interfere with its action. Similarly, the chain drive shown in Fig. 8 and hereinafter described will operate with entire satisfaction, notwithstanding a certain degree of flexing of the arm.

The lateral offset mounting

In the structure illustrated in Fig. 8 the wringer 141 is mounted on a bracket 142 interconnected to a telescoping column 143 by means of an arm 144 substantially similar to the supporting brackets, columns, and arms heretofore described and illustrated by parts 81, 84, 85, 87 and companion parts. However, it will be noted that the arm 144 extends angularly away from the center line of the wringer 141 and thus provides a lateral offset for the support. This construction is particularly advantageous when it is used in connection with a square tub machine, as for example, a machine having a square tub 145 in which the typical agitator 146 is mounted. In this connection it should be pointed out that in a square tube machine it is customary and desirable to position the wringer supporting column at one corner of the tub and that the lateral offset arm 144 permits the wringer to swing into a position such that it will fit closely within the confines of the side walls of the tub even though the tub dimensions are only very slightly greater than the length of the wringer. When the offset arm 144 is used, it may be found preferable to provide a sprocket 147 at the upper end of the vertical drive shaft within the telescoping column 143 and to interconnect the sprocket 147 with a similar sprocket 148 in the wringer mounting bracket by means of a chain 149. It is understood, of course, that the sprocket 148 may be geared to the pressure rolls of the wringer 141 by the use of any conventional power transmission mechanism (not shown). This transmission may also be provided by a train of spur gears in place of the chain transmission.

The cover for the square tub machine illustrated in Fig. 8 is shown in Fig. 9 and includes a body portion 151 of shape and dimensions to fit the tub 145 and a shiftable corner extension 152 mounted in sliding relationship with the main cover 151 and adapted to be shifted between solid line position in which the body portion 152 will extend over the lateral offset mounting 144 and the wringer column 143 and the dotted line position indicated at 153 in which the shiftable section 152 will completely close the tub when the wringer 141 is lifted to operating position. To facilitate manual shifting of the section 152 a button 154 is provided and the button 154 extends upwardly through a longitudinal slot 155 in the cover 151.

While the lateral offset mounting is particularly adapted for use with a square tub machine, its use is not limited thereto and it may be used to equal advantage on a round tub. When used with the round tub it is preferable to provide a cover 157 (Fig. 12), including a cut-away notched portion 158 to accommodate the arm 144. However, when the wringer 141 is raised to its operating position, the opening 158 may be closed by a shiftable sliding door 159 secured to the cover 157 by a screw 160. See Figs. 10, 11, and 12.

Operation

Assuming that the preferred embodiment of the invention illustrated in Figs. 1 to 5, inclusive, is in its inoperative, or closed position illustrated in Fig. 1, the mode of operation is as follows:

The operator will first remove the cover 86 and will then withdraw the spring plunger 85 to permit the lifting spring 84 to raise the wringer structure 31 out of the tub and to the uppermost position of the telescoping wringer column 42. As the wringer reaches this position the key 81 is withdrawn from the keyway 83 and the wringer may be swung around the column 42 to be indexed and locked in any position about the spring-pressed plunger 85 which may seat in any one of the indexing openings 87 in the tube 43.

The wringer may now be operated in either forward or reverse position by moving the manual shifting control 67 into either position to complete the driving power connection between the motor 21 and the wringer roll 35. This driving connection includes the belt 22, pulley 23, shaft 24, the gear housing 19, the vertical driving shaft 51, the telescoping sleeve 54, and driving pinion 61, the driven pinions 62 or 63, the horizontal shaft 64, and the gears 68, 69, and 72.

To replace the wringer in nested position within the tub the operator will withdraw the plunger 85 and swing the wringer to an angular position, such that the key 81 is in registry with the keyway 83. The wringer may then be moved downwardly against the action of the lifting spring 84 and as the wringer moves into the tub, it will be guided into exact predetermined position between the tub side walls and the agitator by means of the key 81. As the wringer reaches its lowermost position the spring-pressed plunger 85 will spring into the locking orifice 87' in the tube 43 and will maintain the wringer in lowered position until the plunger is again withdrawn by the operator.

The structure illustrated in Fig. 6 may be op-

erated in exactly the same manner with the exception that the latch 132 must be manually lifted to permit the compression spring 121 to snap the hexagonal drive shaft 117 into coupled connection with the driving sleeve 115. Also, when the operator wishes to again lower the machine into the tub, the drive shaft 117 must be telescoped into the lower wringer roll by withdrawing the plunger 128, latching the pin 129 in the bayonet slot 127, and then moving the rod 128 to the right, as viewed in the drawings to cause the sleeve 125 to bear against the pilot portion 123 of the drive shaft 117 and force the drive shaft into the locked position illustrated.

From the foregoing description it will be apparent that by practicing the principles of this invention the applicant has provided a highly efficient and desirable disappearing wringer structure in which the wringer may be conveniently and easily shifted between a concealed position nested within the tub of the washing machine and an operating position above the upper rim of the tub. By utilizing the guiding means illustrated and disclosed in this application, it is entirely feasible to use a full size wringer in connection with a washing machine tub of ordinary dimensions and it is unecessary to provide extra housing space for the wringer.

Further, it will be seen that the use of the exterior driving column disclosed by this application permits the use of a driving motor common to the wringer and to the agitator of the washing machine and also provides a washing machine in which the entire inner tub surface is smooth and uninterrupted, so that the tub may be easily cleaned and so that the water action of the wash water is in no way hampered or hindered by the presence of wringer mounting parts or driving mechanism within the tub.

Having thus described my invention, I claim:

1. In a washing machine of the bottom agitator type, the combination of a tub including imperforate bottom and side walls terminating in a rim, power driving means for the agitator including a motor and reduction gearing positioned below said bottom wall of the tub, a wringer drive column extending upwardly from said driving means adjacent to said tub and exterior of said tub, said wringer drive column including a vertically shiftable tube, a laterally extending arm at the upper extremity of said tube, said arm being of sufficient length to extend inwardly beyond the rim of the tub, a downwardly extending wringer bracket on said arm, means in said bracket to facilitate mounting a wringer thereon, and power transmission means extending from the aforementioned power driving means upwardly through said wringer column and to said wringer bracket, said power transmission means comprising a vertical driving shaft housed in the wringer drive column, driving connections in said wringer bracket, and operating connections between the upper end of said telescoping shaft and the upper end of said driving connections.

2. In a washing machine of the bottom agitator type, the combination of a tub including imperforate bottom and side walls terminating in a rim, power driving means for the agitator including a motor and reduction gearing positioned below said bottom wall of the tub, a wringer drive column extending upwardly from said driving means adjacent to said tub and exterior of said tub, said column including a vertically shiftable tube, a laterally extending arm at the upper extremity of said tube, said arm being of sufficient length to extend inwardly beyond the rim of the tub, a downwardly extending wringer bracket on said arm, means for mounting a wringer on said bracket, and power transmission means extending from the aforementioned power driving means upwardly through said wringer column and to said wringer bracket, and a shiftable brace extending to said wringer drive column to brace the lower end of said wringer bracket.

3. In a washing machine of the bottom agitator type, the combination of a tub including imperforate bottom and side walls terminating in a rim, power driving means for the agitator including a motor and reduction gearing positioned below said bottom wall of the tub, a wringer drive column extending upwardly from said driving means adjacent to said tub and exterior of said tub, said column including a vertically shiftable tube, a laterally extending arm at the upper extremity of said tube, said arm being of sufficient length to extend inwardly beyond the rim of the tub, a downwardly extending wringer bracket on said arm, a wringer supported on said bracket, and power transmission means extending from the aforementioned power driving means upwardly through said wringer column and to said wringer, said power transmission means including an extensible driving element between said wringer and said drive column.

4. In a washing machine of the bottom agitator type, the combination of a tub including imperforate bottom and side walls terminating in a rim, power driving means for the agitator including a motor and reduction gearing positioned below said bottom wall of the tub, a wringer drive column including a longitudinal key, said column extending upwardly from said driving means adjacent to said tub and exterior of said tub, said wringer drive column including a vertically shiftable tube, a laterally extending arm at the upper extremity of said tube, said arm being of sufficient length to extend inwardly beyond the rim of the tub, a downwardly extending wringer bracket on said arm, a wringer mounted on said bracket, and power transmission means extending from the aforementioned power driving means upwardly through said wringer column and to said wringer.

5. In a washing machine of the bottom agitator type, the combination of a tub including imperforate bottom and side walls terminating in a tub rim, power driving means for the agitator including a motor and reduction gearing positioned below said bottom wall of the tub, a wringer drive column extending upwardly from said driving means adjacent to said tub and exterior of said tub, said wringer drive column including a vertically shiftable tube, a laterally extending arm at the upper extremity of said tube, said arm being of sufficient length to extend inwardly beyond the rim of the tub, a downwardly extending wringer bracket on said arm, means in said bracket to facilitate mounting a wringer thereon, and power transmission means extending from the aforementioned power driving means upwardly through said wringer column and to said wringer bracket.

6. A wringer assembly comprising the combination of a wringer frame including a plurality of pressure rolls mounted therein, a wringer column including a power driving mechanism housed therein, a supporting arm interconnecting said wringer frame and said wringer column at the upper extremities of each to define a gap

between the said frame and column, and mechanism to bridge said gap and operatively interconnect said rolls and aforementioned driving means, said mechanism including a tubular roll shaft having an internal spline, a longitudinally slidable drive shaft mounted in said spline, a coiled compression spring to urge said drive shaft toward the aforementioned wringer column, means associated with said wringer column to slide said drive shaft into the tubular roll shaft against the force of said spring, and a latch to maintain said drive shaft out of the gap.

7. A wringer assembly comprising a wringer frame including a plurality of pressure rolls mounted therein, a wringer column including a power driving mechanism housed therein, a supporting arm interconnecting said wringer frame and said wringer column at the upper extremities of each to define a gap between the said frame and column, and an extensible roll driving element to bridge said gap and operatively interconnect said rolls and aforementioned driving means, said roll driving element consisting of a longitudinally slidable wringer roll shaft.

8. A wringer assembly comprising a wringer frame including a plurality of pressure rolls mounted therein, a wringer column including a power driving mechanism housed therein, a supporting arm interconnecting said wringer frame and said wringer column at the upper extremities of each to define a gap between the said frame and column, and an extensible roll driving element to bridge said gap and operatively interconnect said rolls and aforementioned driving means.

9. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a wringer mounting to support a wringer in said tub, said wringer mounting comprising a wringer attaching bracket having a vertical portion extending above the tub rim, an arm portion extending horizontally above said rim and outside of the wall of said tub, a downwardly extending telescoping support for said arm exterior of the tub, and a shiftable brace extending to said telescoping support to brace the lower end of said attaching bracket.

10. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a telescoping wringer column exterior of said tub, a wringer bracket arranged to assume a position inside of said tub, an arm carried at the upper end of said telescoping column to support the aforementioned wringer bracket, and a cover for said tub, said cover including a portion extending substantially beyond the tub rim to enclose and cover the aforementioned arm and telescoping column.

11. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a telescoping wringer column exterior of said tub, a wringer bracket arranged to assume a position inside of said tub, an arm carried at the upper end of said telescoping column to support the aforementioned wringer bracket, and a cover for said tub, said cover including a cut-away orifice to accommodate said arm, and means to close said orifice and provide a smooth, uninterrupted contiguous top surface.

12. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a telescoping wringer column exterior of said tub, a wringer bracket arranged to assume a position inside of said tub, an arm carried at the upper end of said telescoping column to support the aforementioned wringer bracket, and a cover for said tub, said cover including a shiftable portion movable between a position in contiguous relationship with the top surface and an offset position.

13. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a telescoping wringer column exterior of said tub, a wringer bracket arranged to assume a position inside of said tub, an arm carried at the upper end of said telescoping column to support the aforementioned wringer bracket, and a cover for said tub, said cover including a substantially flat top, a downwardly extending side wall, and an orifice in said downwardly extending wall to accommodate said wringer support arm.

14. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a wringer column exterior of said tub, a wringer bracket having a neck gap arranged to support a wringer substantially within the tub and means to telescope the wringer column whereby the wringer may be nested in the tub or raised to operating position above the tub

15. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a wringer column exterior of said tub, a wringer bracket having a neck gap arranged to support a wringer substantially within the tub, means to telescope the wringer column whereby the wringer may be nested in the tub or raised to operating position above the tub, means to index the wringer in proper position for lowering into nesting position within the tub, and means to lock the wringer in lowered nesting position.

16. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a wringer column exterior of said tub, a wringer bracket having a neck gap arranged to support a wringer substantially within the tub, means to telescope the wringer column whereby the wringer may be nested in the tub or raised to operating position above the tub, means to index the wringer in proper position for lowering into nesting position within the tub, means to lock the wringer in lowered nesting position, indexing means to position the wringer radially around the tube in operating position, and means to stop the wringer in upper operating position.

17. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a cover for said tub, a wringer column exterior of said tub, a wringer bracket having a neck gap arranged to support a wringer substantially within the tub, and means to telescope the wringer column whereby the wringer may be nested in the tub and under the cover.

18. In a washing machine, the combination with a washing tub having an upstanding surrounding wall, of a wringer adapted to be mounted within the tub, a structure of substantially inverted U-shape having laterally spaced arms with a neck gap therebetween, one of said arms supporting the wringer thereon inside the tub wall while the other arm is located outside the tub wall, and mounting means connected directly

with the last-mentioned arm and supporting the U-shaped structure for mounting the wringer for storage in the tub and to move the wringer to an operating position substantially outside the tub.

19. In a washing machine, the combination with a washing tub having an upstanding surrounding wall, of a wringer adapted to be mounted within the tub, a structure of substantially inverted U-shape having laterally spaced arms with a neck gap therebetween, one of said arms supporting the wringer thereon inside the tub wall while the other arm is located outside the tub wall, and a wringer column including the last-mentioned arm and located outside the tub and supporting the U-shaped structure and wringer for adjustment to a stored position within and an operating position substantially above the tub.

20. In a washing machine, the combination with a washing tub having an upstanding surrounding wall, of a wringer adapted to be mounted within the tub, a structure of substantially inverted U-shape having laterally spaced arms with a neck gap therebetween, one of said arms supporting the wringer thereon inside the tub wall while the other arm is located outside the tub wall, a wringer column including the last-mentioned arm and located outside the tub wall and supporting the U-shaped structure and wringer for adjustment to a stored position within and an operating position substantially above the tub, and driving means for said wringer extending through the wringer column and U-shaped structure.

21. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a wringer mounting to support a wringer in said tub, said wringer mounting comprising a wringer attaching bracket having a vertical portion extending above the tub rim with the wringer in the tub, an arm portion extending horizontally above said rim and outside of the wall of said tub, and means for supporting said wringer mounting and wringer independently of the tub including a downwardly extending support for said arm exterior of the tub and carrying the mounting thereon, said supporting means being constructed to mount the wringer in the tub for storage and to raise the wringer to an operating position substantially outside the tub.

22. In a washing machine, the combination of a washing tub having an upstanding surrounding wall spaced from a vertical axis centrally of the tub, a wringer mounting to support a wringer in said tub, said wringer mounting comprising a wringer attaching bracket having a vertical portion extending above the tub rim with the wringer in the tub, an arm portion extending horizontally above said rim and outside of the wall of said tub, and means for supporting said wringer mounting and wringer independently of the tub including a downwardly extending support for said arm exterior of the tub and carrying the mounting thereon, said downwardly extending support including a slide and a spring to urge said slide to its uppermost position, said supporting means being constructed to mount the wringer in the tub for storage and to raise the wringer to an operating position substantially outside the tub.

23. In a washing machine, the combination of a washing tub having an upstanding surrounding wall, a wringer, and a mounting to support said wringer in said tub, said wringer mounting comprising a wringer attaching bracket having a vertical portion extending above the tub rim, an arm portion extending horizontally above said rim and angularly offset from the longitudinal center line of said wringer, said arm extending outside of the wall of said tub, and a downwardly extending support for said arm exterior of the tub, said wringer mounting and support being constructed to mount the wringer in the tub for storage and to raise the wringer to an operating position subtsantially outside the tub.

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