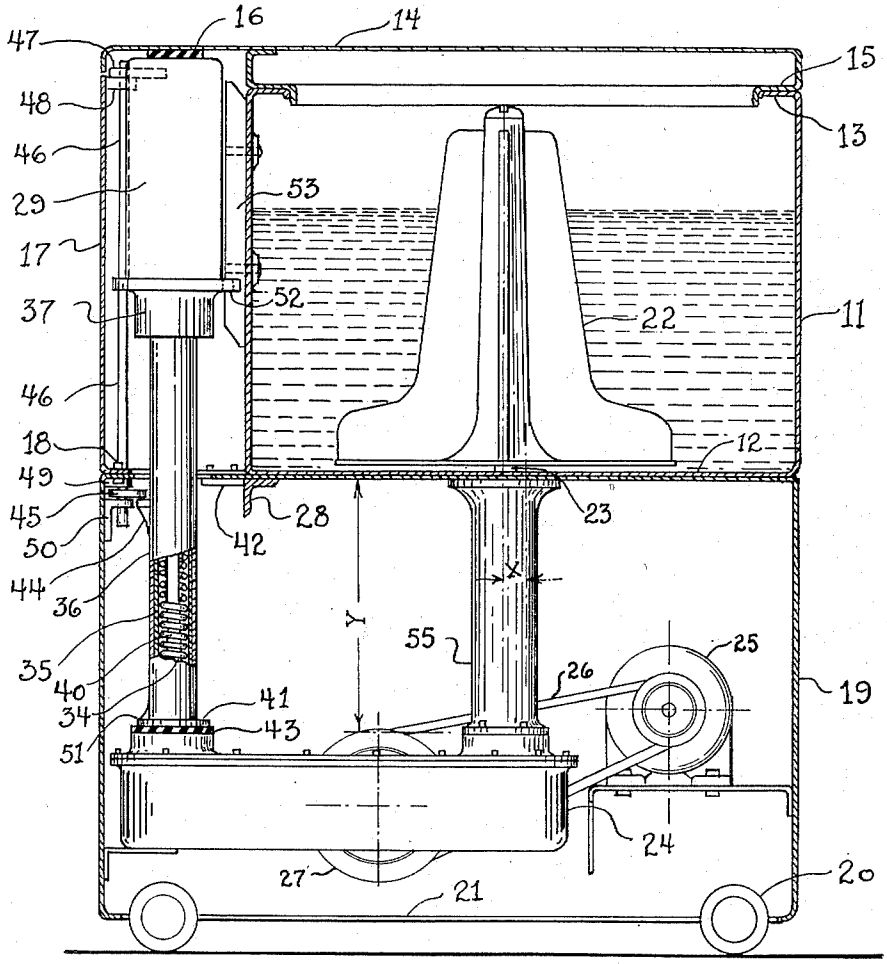
Jan. 9, 1951 D. A. LUNDY 2,537,935

CABINET WASHING MACHINE AND DISAPPEARING WRINGER

Filed March 10, 1945 3 Sheets-Sheet 1

FIG. 1



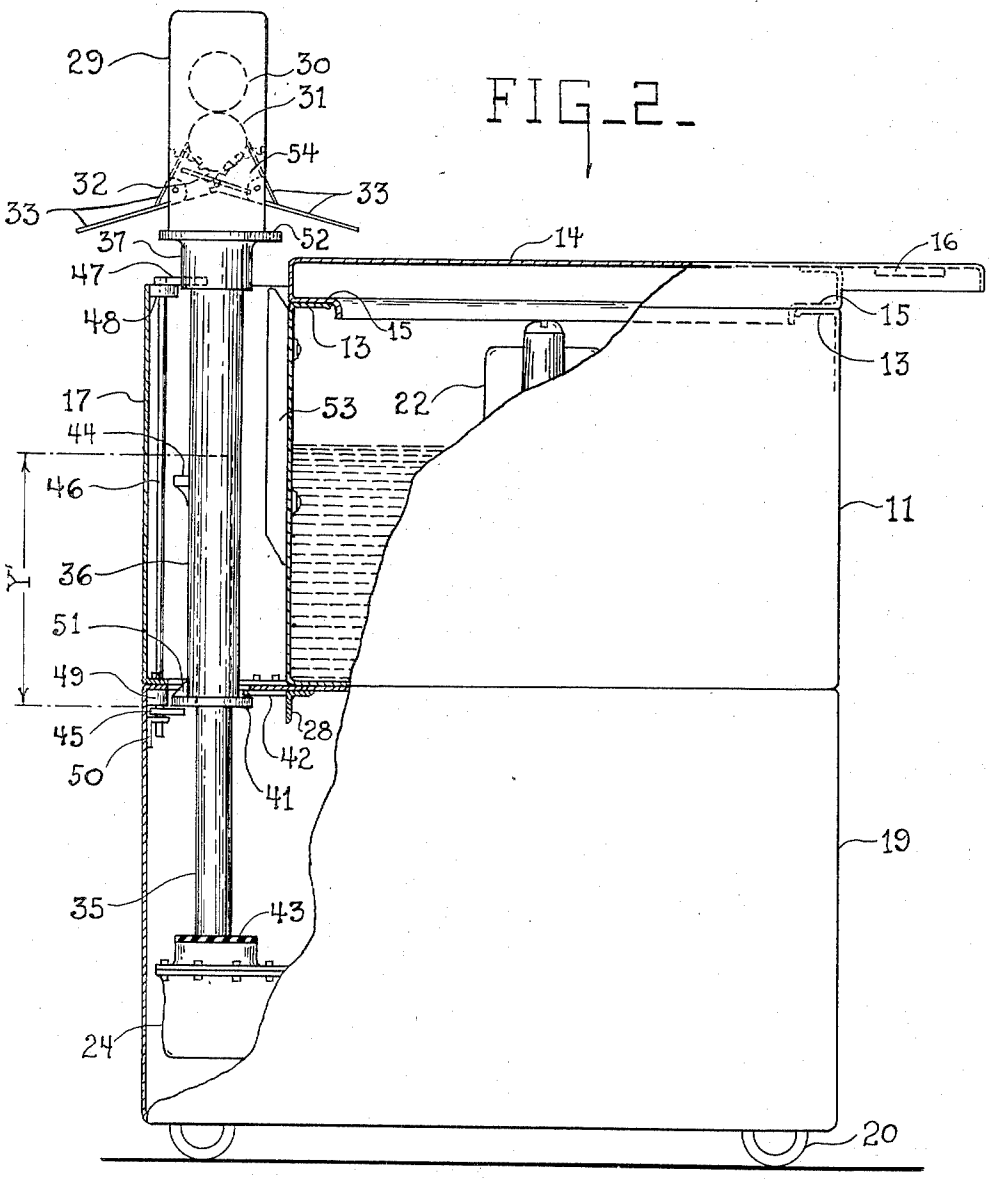
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CABINET WASHING MACHINE AND DISAPPEARING WRINGER

Filed March 10, 1945 3 Sheets-Sheet 2

FIG. 2.



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CABINET WASHING MACHINE AND DISAPPEARING WRINGER

Filed March 10, 1945 3 Sheets-Sheet 3

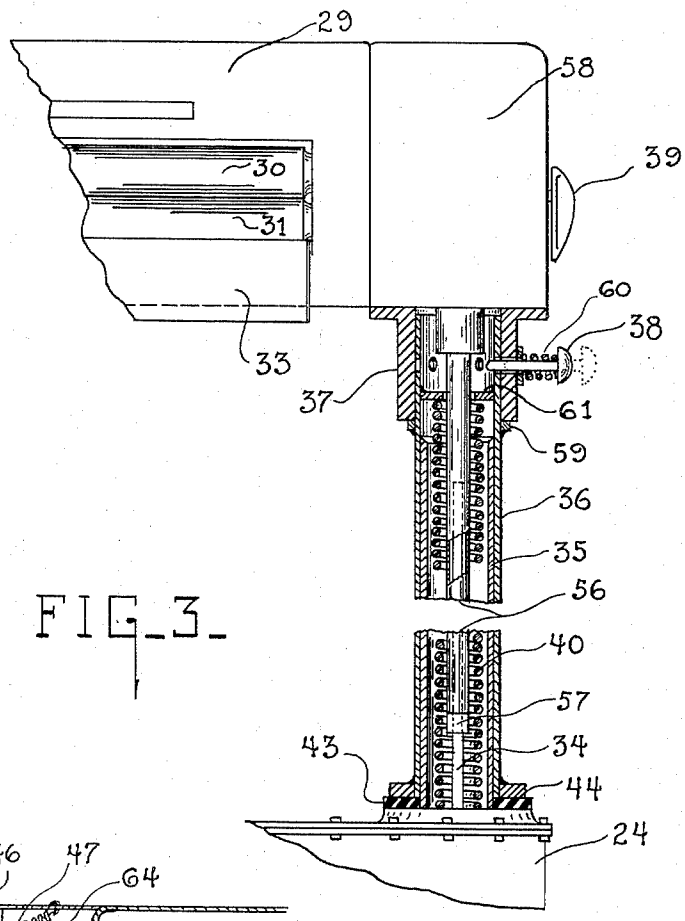


FIG. 3.

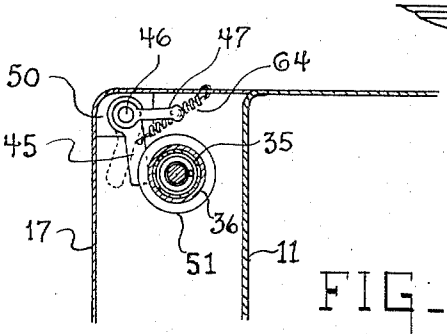


FIG. 4.

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UNITED STATES PATENT OFFICE

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CABINET WASHING MACHINE AND DISAPPEARING WRINGER

David A. Lundy, River Forest, Ill.

Application March 10, 1945, Serial No. 582,019

7 Claims. (Cl. 68—22)

1

This invention relates to new and useful improvements in laundry machines of the type commonly used in homes and commercially referred to as cabinet type washers.

There has been a definite need for a washing machine having a neat compact dustproof cabinet that would take less storage or shipping space and which will fit harmoniously in the rooms of the modern home in conjunction with new and modern appliances.

This invention provides a cabinet type washing machine that will provide features as ease of operation, compactness, a disappearing telescoping wringer, and a stream-lined flat table top cabinet which is integral to the tub, wringer and base support. The center of gravity of this cabinet washer has been brought down to provide a washer that is not top heavy when wheeled about as is the case in many of the prior art models.

It is recognized that in the prior art, attempts have been made to accomplish this by lowering the wringer from its usual position above the washer to a position substantially below the level of the washer itself, 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 deficiencies of the prior art structures and from special non-standard features which so greatly increase the cost as to seriously handicap sales acceptance.

The present popular market for washing machines is standardized on a relatively small tub washer having a submerged agitation means. In my Patent No. 2,334,780 issued November 30, 1943, I disclose a disappearing wringer which is shiftable to a position inside the tub of this popular type machine. Although the construction of this disclosure utilized a high percentage of standard parts, it still requires many special and expensive parts that increase the cost beyond the popular price range.

It is, therefore, a particular object of this invention to combine a washer and a disappearing telescoping wringer into a cabinet washer of compact design requiring a minimum of room.

Another object of this invention is to provide a disappearing wringer having drain boards which fold either by hand or automatically and which protect the rolls from dirt and dust during the storage period, said wringer being mounted on a telescoping support so that the wringer may be lowered when not in use and stored snugly

2

and compactly alongside the tub of a near standard washer with very little, if any, increase in the normal storage area.

A further object of this invention is to provide a telescopic support whereby a standard wringer may be mounted on a standard unitary transmission unit and still provide sufficient overlap of the telescopic support members when in their extended position thereby eliminating the necessity of an additional upper cabinet structure, and said wringer being capable of being stored beside and below the washer tub without danger of accidental damage to the wringer or washer tub.

A further object of this invention is to provide a telescoping wringer in conjunction with a washing machine cover having a non-dirt catching seal at the juncture with the cabinet, said telescoping wringer and washing machine cover being so arranged as to provide a smooth uninterrupted table top surface.

A still further object of this invention is to provide a washing machine structure whereby a telescoping wringer may be easily manipulated between a lower or stored position and an upper or operating position.

These objects are accomplished in this invention by providing a washer cabinet in combination with a telescoping wringer in which an offset is provided either in the tub itself or in the placing of the tub in an offset position on its base so that the wringer which is mounted on a telescopic support may be lowered into this offset.

Unlike the special gooseneck construction shown in my Patent No. 2,334,780, this invention utilizes a standard wringer reverse mechanism and frame assembly by lowering the standard unitary transmission and providing sufficient overlapping of the telescopic support tubes without resorting to the special wringer construction in my aforementioned patent.

Other and further objects of this invention will be apparent from the disclosures in the drawing and specifications.

With the aforementioned objects in view, together with others which will appear as the description proceeds, the invention resides in the novel construction, combination of parts and arrangement thereof, as illustrated in the drawings, and which will be more fully described hereinafter, and particularly pointed out in the claims.

In the accompanying drawings on which are shown some of the various embodiments of my invention:

Fig. 1 is a sectional side view of the washer

showing the tub moved forward on its base thus providing a storage space to receive the wringer in its storage position, and showing details of the telescoping wringer and its operation and relationship to the tub and unitary transmission.

Fig. 2 is a sectional side elevation of the same washer design as shown in Fig. 1 except showing the telescoping wringer in its upper or operating position, the feed boards extended for use and the general cabinet structure and position of the washer cover when the washer is in operation.

Fig. 3 is a detailed sectional side view showing the telescoping wringer support tubes and their relationship to each other and adjacent parts when the wringer is in the lowered or stored position.

Fig. 4 is a detailed plan view of the wringer lock release mechanism shown in Fig. 1 and Fig. 2.

The general washing machine structure

Conventional modern washers consist of a square or rounded tub mounted on a skirt or base and having a unitary power transmission or geared unit which drives an agitator located within the tub and also providing a means of driving the wringer rolls. The agitator usually includes a central column and a plurality of agitator vanes and is mounted on a drive shaft extending upward through the lower wall of the tub from the aforesaid unitary power transmission. The standard unitary power transmission unit normally includes a reduction gearing and an oscillating drive mechanism. A motor operates through the medium of a V-belt to impart a rotary driving movement to a pulley on a shaft of the aforementioned unitary transmission. In my invention I have attempted to use as many standard conventional parts as possible thus reducing the cost and increasing the versatility of my invention to standardizing and mass production. However, it should be noted that the disclosures of my invention are not limited entirely to the use of the conventional and standard parts. Any agitating means whether the conventional type as disclosed or some other type may be readily used in my invention. Therefore, in the description of my invention I am disclosing several possible embodiments of my invention and its adaption to the conventional washing machine, however, other embodiments will be apparent from the disclosures in the drawings and specifications.

Detailed washer construction

Referring to Fig. 1 of the drawings which shows one embodiment of my invention, I have designated the washer tub by the numeral 11. This tub may be round or square, but it will be understood that I, insofar as possible, propose to use the conventional standardized tubs of the industry with slight modifications to suit the conditions of my invention. It should be noted that in Fig. 1 and in Fig. 2 the tub 11 is moved forward on its base 19 to provide a space for housing the telescoping wringer 29. In other cases I prefer to notch the tub 11*a* as shown in Fig. 6 which is another possible embodiment of my invention.

The tub 11, illustrated in connection with the embodiment of my invention shown in Fig. 1 and Fig. 2 has a bottom wall 12 and a surrounding side wall terminating in an annular rim 13. A cover 14 is provided for tub 11 having an annular rim 15 cooperating with the annular rim 13 on the tub 11 to form a water seal. This seal is of a type which eliminates the usual dirt catching seals of the prior art. The cover 14 is provided with an overhanging portion which acts as a cover for the disappearing telescoping wringer when said wringer is in lowered stored position.

The disappearing telescoping wringer, when in its lowered stored position, assists to support and reinforce the cover 14. A pad 16, preferably of rubber or like material, is fastened to the cover 14 to act as a buffer and filler between the wringer frame 29 and the cover 14.

An enclosure 17 is provided to act as a housing for the disappearing telescoping wringer when in its lowered or stored position as illustrated in Fig. 1 and is bolted at 18 to the washer skirt or base 19. The washer has an open bottom 21 to allow circulation of air and easy access to the mechanical parts. An angle support 28 is provided for the tub.

A conventional agitator 22 is located in the bottom of tub 11 and is mounted on a drive shaft 23 extending upwardly through the lower wall 12 of the tub 11 and from a conventional gear housing 24 which normally includes reduction gearing and an oscillating agitator drive mechanism. A motor 25 operates through the medium of a V-belt 26 to impart a rotary driving movement to a pulley 27 on a shaft of the gear housing 24.

It should be noted that when the wringer is made to telescope into a lowered or stored position along side the washer tub and substantially under the cover of said tub, as shown in Fig. 1, the telescoping wringer support tubes 35 and 36 would be shortened beyond the length to provide the necessary overlap for rigidity and safety when the wringer is raised to its upper or operation position if the conventional mounting procedures would be followed. To overcome this I lower the standard conventional gear case 24 and provide an extension casting 55 for the distance Y as shown on Fig. 1 and thus provide the necessary length Y′ overlap of the telescoping tubes 35 and 36 as shown in Fig. 2.

It should be particularly noted that in my invention I provide only one thickness of metal for both the cabinet and the washer tub. In other words I do not place the washer tub and gear case inside a cabinet which would mean that the cabinet and the washer tub are separate cooperating parts, but I let the washer tub walls form the cabinet and thus produce a saving of metal and thereby reduce the cost of manufacture.

It will thus be observed that I am able to utilize a standard gear case 24 with most of the other parts standard to provide a cabinet type washing machine having a telescoping wringer 29 which may be lowered and stored snugly along side the tubs 11 and 11*a* of a near standard domestic washing machine.

Wringer construction

The wringer illustrated in Figs. 1, 2 and 3, in connection with my invention, is of a conventional design including a frame 29 and a pair of cooperating rolls 30 and 31, a tiller board 32 and folding drainboards 33. It should be noted that I replace the conventional stationary sidewise extending drainboards of prior art wringers with hinged drainboards 33 which are automatically operated through connecting linkage 54 as shown in Fig. 2. When the wringer is moved to the lowered or stored position along side the washer tub, the drainboards 33 will be forced into the closed position by the adjacent sidewall of the tub 11 where they will be held in such closed position. The drainboards in closed position will

effectively protect the wringer rolls from dust and dirt and thus make them promptly available for the next washing without cleaning. The drainboards 33 can also be closed manually.

Driving power is transmitted to the rolls 30 and 31 by mechanical driving connections consisting of a square drive shaft 34 which extends upwardly from the gear case 24 into a tubular drive shaft 56 extending downwardly from the wringer gear case 58 and having a swaged portion 57 at its lower end for engagement with the square drive shaft 34. The support tube 36 is keyed to and is slidably mounted on the stationary support tube 35. The wringer 29 is removably and pivotally mounted on the support tube 36 by the flanged bearing 37 and held in position by the boss 59.

The wringer 29 is mounted to swivel about the axis of the tubular telescoping support tube 36 as shown in Fig. 3. The wringer may be locked in one of several desired positions by any suitable means. In the particular embodiments of my invention pivotal indexing is accomplished by a reciprocative plunger 38 mounted on the flanged bearing 37 and urged by a spring 60 to selectively enter any one of a plurality of holes in the support tube 36 to lock the wringer in any one of several possible desired positions.

The plunger 38 is retractable against the action of spring 60 by the operator when she desires to selectively position the wringer.

The rotation of the rolls 30 and 31 are controlled in the conventional manner and will not be described in detail except that the rotation is controlled by a conventional lever 39 located on the wringer gear case 58.

It may be noted that owing to the fact that the driving mechanism has telescoping features hereinbefore described, the operating relationship of the driving parts are undisturbed by the lowering or raising of the wringer. That is, the wringer rolls can be rotated by the power shaft 34 when the wringer is in its lowered or stored position just as well as when it is raised, this is not that it is desirable to do so, but to insure the wringer always being ready to operate without danger of its mechanism being out of order or place because of the lowering operation.

The lowering of the wringer 29 into its stored position along side the washer tub requires that the wringer be accurately indexed into the proper lowering position or else damage to the tub or wring drainboards may occur. To accomplish this I provide a keyway 52 in the flange of the wringer flanged bearing 37 and a mating key 53 fixed to the tub 11. Thus the wringer 29 may not be lowered until the key parts 52 and 53 are in accurate alignment which I assist by tapering the top of the key 53.

The weight of the wringer is balanced by the compression spring 40 which is telescoped over the sleeve 56 and drive shaft 34 and restricted at the top end by the bearing plate 61 and at the lower end by the gear case 24 in such a manner as to urge the telescoping wringer support tube 36 to its uppermost position. The lifting spring 40 is guided and held in proper place by being telescoped over the sleeve 56 and the drive shaft 34 and restricted by the inner wall of the support tube 35 thus preventing the spring 40 from bending and twisting. Preferably the lifting spring 40 is of sufficient size to overcome the entire weight of the wringer and lift the wringer to its uppermost or operating position. The wringer support tube 36 is provided with a flange 41 at its lower end for engagement with a stop 42 fixed to the washer skirt when the wringer is raised to its upper position as illustrated in Fig. 2. A rubber cushion 43 is provided at the gear housing 24 for smooth quiet operation.

The wringer support tube 36 is also provided with another flange 44 which engages a latch bar 45 fitted to an extension rod 46 which in turn is fitted with an operating handle 47. The extension rod is supported through bearings 48, 49 and 50 which are fixed to the skirt 19 and the wringer enclosure 17.

The latch bar 45 is fitted with a spring 64 shown in Fig. 4, said latch bar 45 being forced into constant engagement with either flange 51 or flange 44 by said spring 64, depending on the position of the wringer. Therefore, the wringer will always lock itself into either the upper operating or lowered stored position and only requires operation of the handle 47 to change the position of the wringer. Thus, when the operator desires to position the wringer in its lowered stored position she will first disengage the latch bar 45 from flange 51 by a slight turn of the handle 47, then she will move the wringer downwardly against the force exerted by the spring 40 and it will automatically lock in the lowered position when the latch bar 45 engages the flange 44. The same procedure is followed to raise the wringer except that the wringer will raise itself because of the compression spring 40, and lock itself in the upper operating position upon the turning of the handle 47 which releases the lock.

The lock release handle 47 is located beneath the cover 14 of the tub thereby preventing the release of the wringer to its upper operation position without first removing the cover 14 or turning its position on the tub as shown in Fig. 2.

Operation

Assuming that the embodiment of this invention as shown in Fig. 1 is in its inoperative or closed position, the mode of operation is as follows:

The operator will first remove the cover 14, then turn the handle 47 slightly to permit the lifting spring 40 to raise the wringer structure from its storage position along side of the washer tube to its upper or operation position. When the wringer reaches this position the plunger 38 is withdrawn and the wringer may then be swung around the telescoping support column to any position. The spring retained plunger 38 can seat in any one of several indexing openings in the support tube 36 thus locking the wringer in the selected position. The wringer may now be operated in either forward or reverse position by moving the manual shifting lever 39 into either position to complete the driving power connection between the motor and the wringer rolls 30 and 31.

To replace the wringer 29 in its storage position along side the tub the operator will index the wringer into the proper position so that the keyway 52 will fit over key 53 which will then permit the lowering of the wringer. The handle 47 is turned slightly to release the wringer lock and then the wringer may be moved downwardly against the action of the lifting spring 40. As the wringer reaches its lowermost position it is locked in such position by the engagement of the bar 45 with the flange 44 and will maintain the wringer in the storage position alongside the washer tub until the operator desires to use it again.

From the foregoing description it is apparent that the applicant has provided a highly efficient and desirable cabinet washer having features such as ease of operation, compactness, a streamlined table-top cabinet, and a disappearing wringer structure in which the wringer can be easily shifted between a lowered or storage position along side the washer tub and an operating position above the upper rim of the tub.

It may accordingly be seen that the applicant has provided a cabinet washer which efficiently fulfills the several objects hereinbefore described in a thoroughly practical manner.

As many possible embodiments may be made of the above invention and because many changes may be made without departing from the spirit of my invention in the embodiments set forth herein, or shown in the drawings, it is understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a washing machine having a wringer of the type adapted for operation in an upper position and for storage in a lowered position, drive mechanism for said wringer comprising: a gearcase, an upwardly directed drive shaft connected with said gear case, a downwardly extending tube enclosing and engaging said drive shaft for rotation therewith and being telescopable thereover, said tube at its upper portion engaging other wringer drive mechanism for imparting movement to the rolls thereof, an inner support tube mounted on said gear case and a wringer support tube mounted on said wringer and being telescopable over said inner support tube for imparting lateral rigidity to said structure.

2. In a washing machine having a wringer of the type adapted for operation in an upper position and for storage in a lowered position, drive mechanism for said wringer comprising: a gearcase, an upwardly directed drive shaft connected with said gear case, a downwardly extending tube enclosing and engaging said drive shaft for rotation therewith and being telescopable thereover, said tube at its upper portion engaging other wringer drive mechanism for imparting movement to the rolls thereof, a helical spring encompassing said drive shaft and said tube, an inner support tube mounted on said gear case and a wringer support tube mounted on said wringer and being telescopable over said inner support tube for imparting lateral rigidity to said structure.

3. Structure as set forth in claim 2 including latch means associated with said wringer support tube for holding the wringer in fully extended or fully retracted position.

4. Structure as set forth in claim 3 in which said latch means comprises an outwardly directed circumferential flange positioned along the bottom of said wringer support tube and another outwardly directed flange spaced above said first-named flange, and a horizontally swingable latch engageable with the lower surfaces of said first-named flange in the extended position of said wringer and with the upper surfaces of said last-named flange in the retracted position of said wringer.

5. In a washing machine having a wringer associated therewith the combination comprising: a tub-supporting base of substantially less height than the overall height of said machine, a tub mounted on said base, said tub being of less length than said base and three sides of said tub being aligned with corresponding sides of said base and when so interrelated forming at one side of said tub and above one end of said base an offset portion, a gearcase, vertically disposed wringer drive mechanism extending between said gearcase and the roller drive gears of said wringer, said drive mechanism including a shaft and tube interengaged for rotation and being telescopable one over the other, and a pair of other tubes encompassing said shaft and first-mentioned tubes and telescopable one over the other, one of said pair being mounted on said wringer, the other being mounted on said gearcase.

6. Structure as set forth in claim 5 including a compressible helical spring encompassing said interengaged shaft and tube urging said wringer into extended position.

7. Structure as set forth in claim 6 including a housing enclosing the space above the offset between said tub and said base, said wringer being concealed by said housing when fully retracted.

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