United States Patent

[11] **3,604,226**

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[54] **WRINGER RELEASE FOR LAUNDRY MACHINES**
12 Claims, 13 Drawing Figs.

[52] **U.S. Cl.** **68/263**
[51] **Int. Cl.** **D06f 45/00**
[50] **Field of Search** ..... 68/263 B, 263 A, 261

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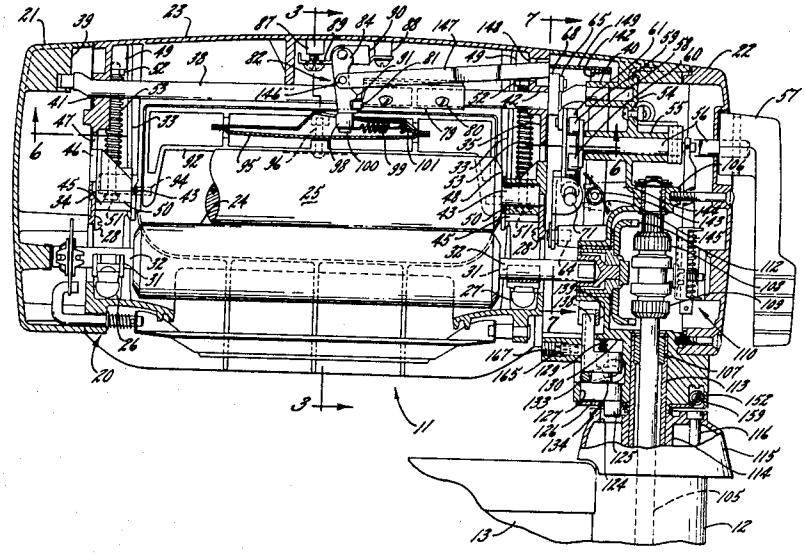
ABSTRACT: A laundry machine wringer-releasing mechanism having a one release linkage from a manual pressure bar and a second release linkage operated by an eccentric and cam arrangement for releasing the wringer upon excessive sidewise torque on the wringer head, the two linkages being independently operable.



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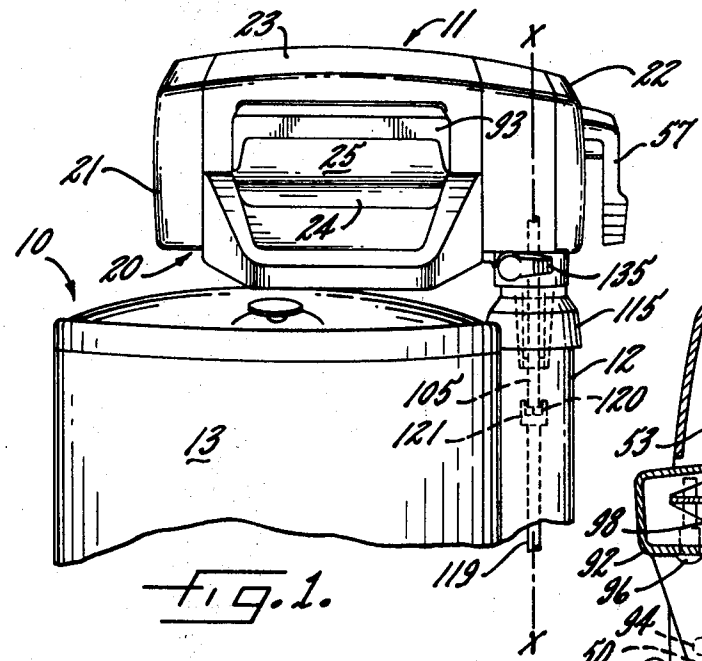

Fig. 1.

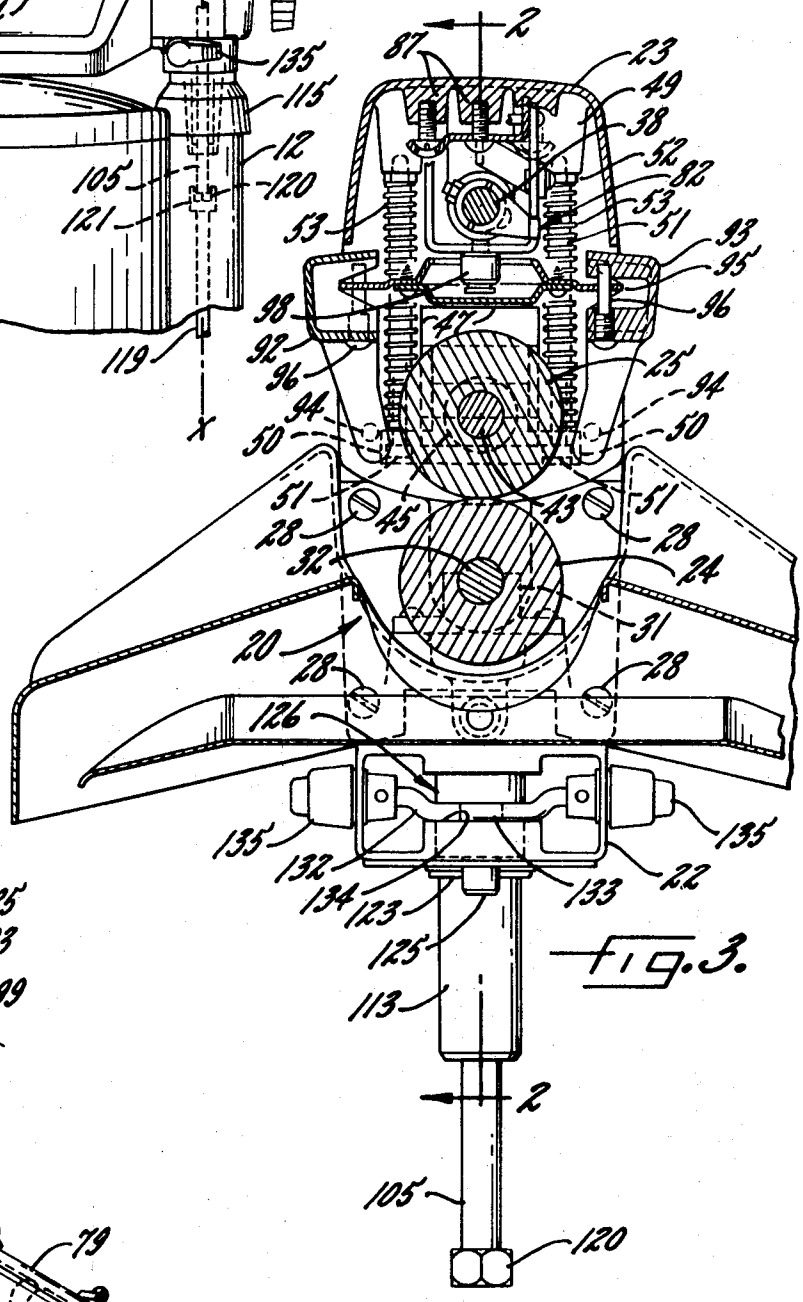

Fig. 3.

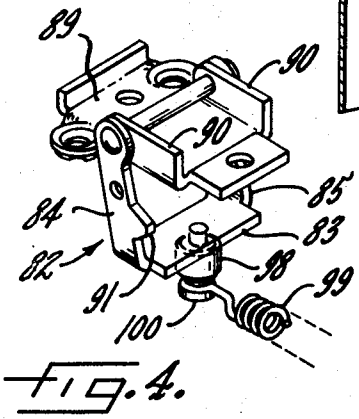

Fig. 4.

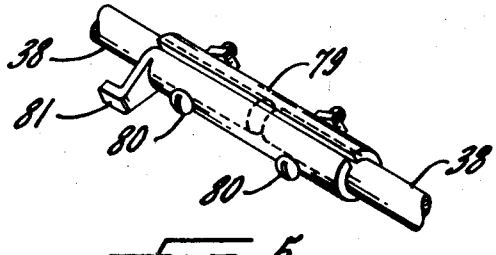

Fig. 5.

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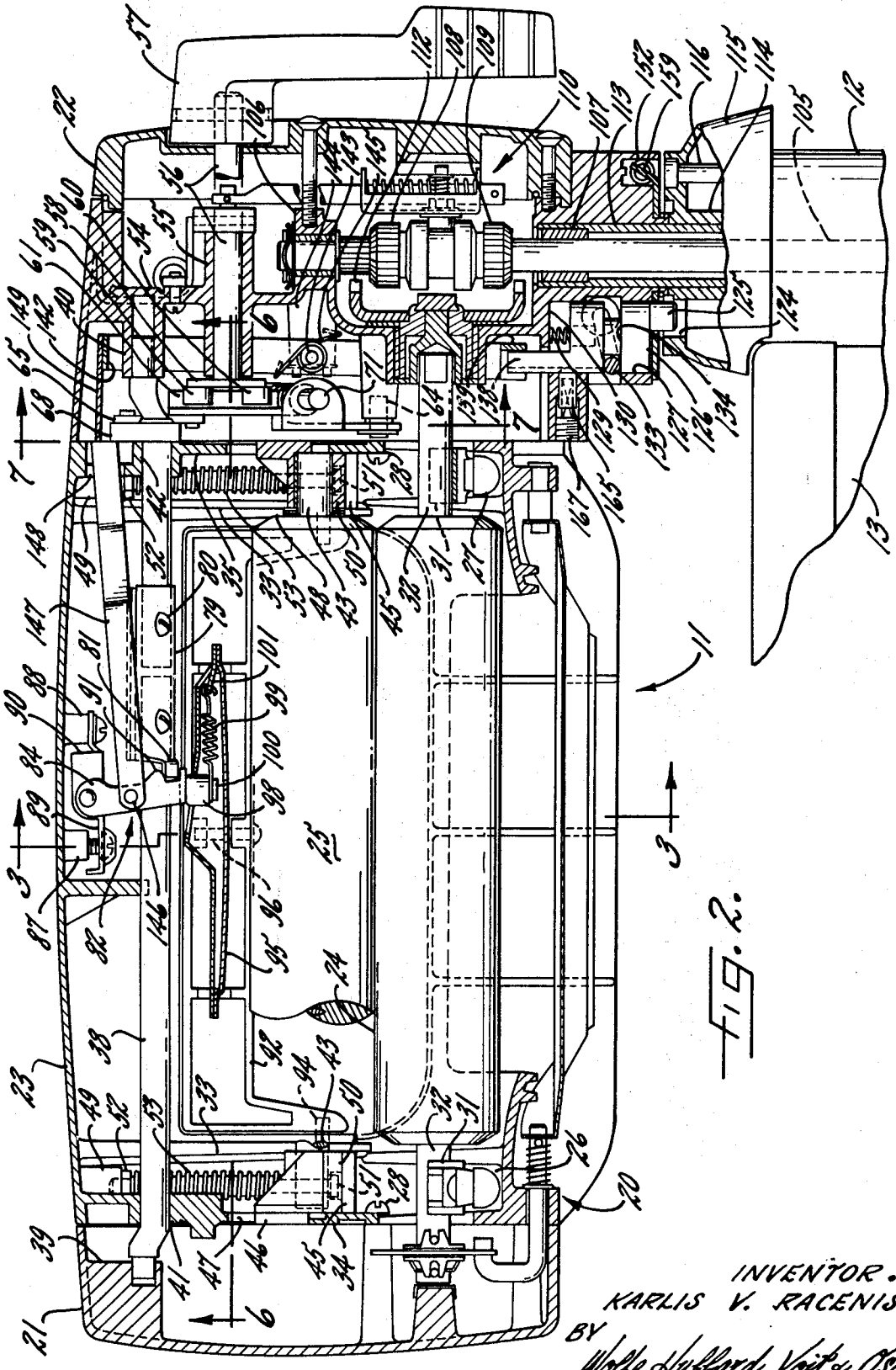

FIG. 2.

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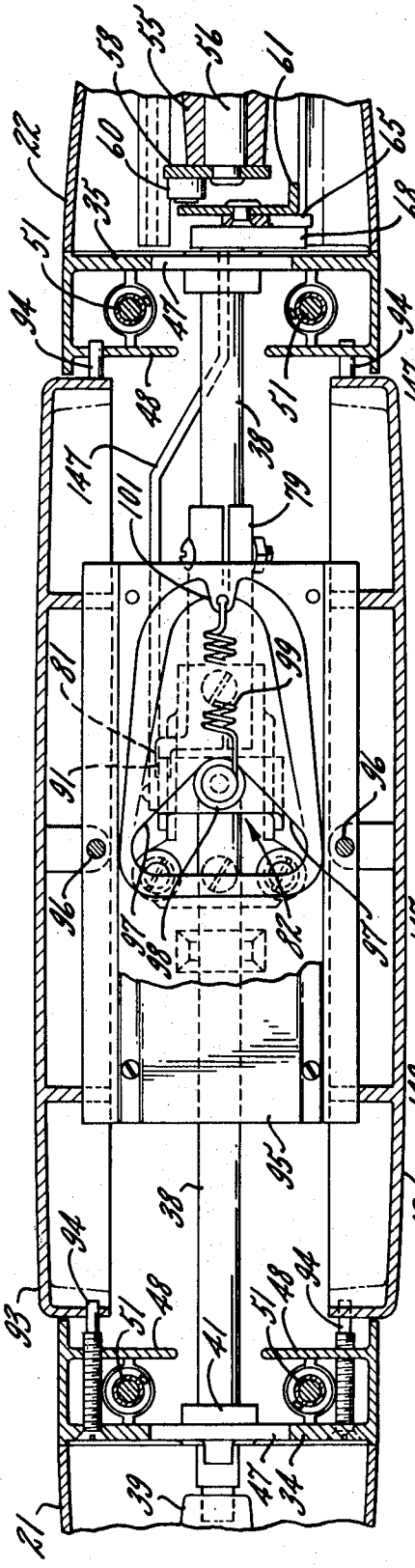

FIG. 6.

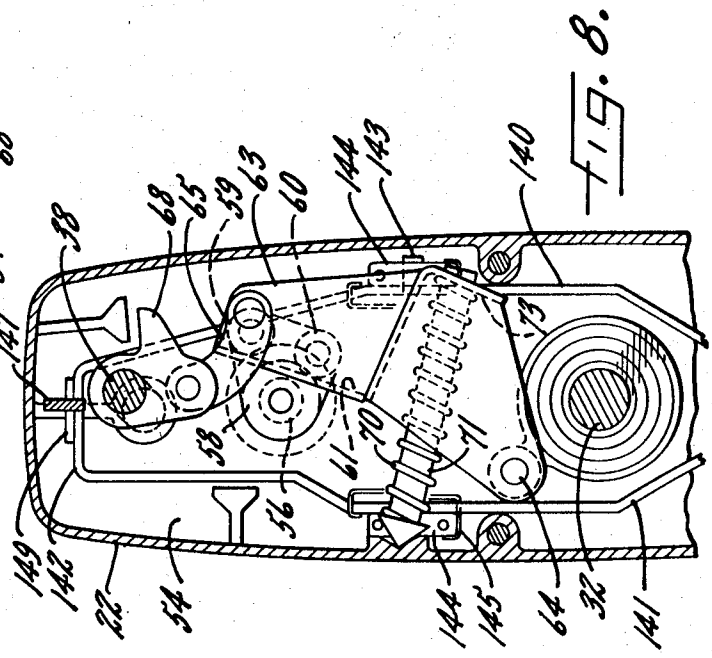

FIG. 8.

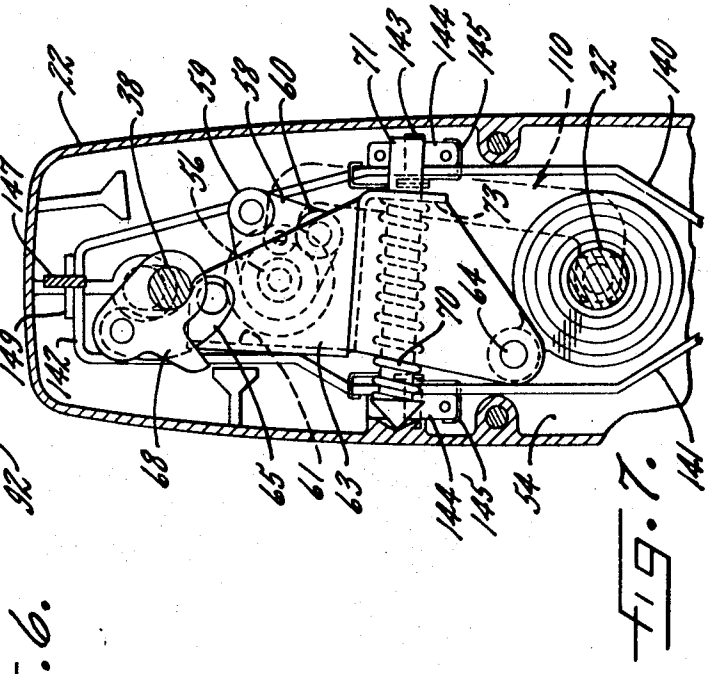

FIG. 7.

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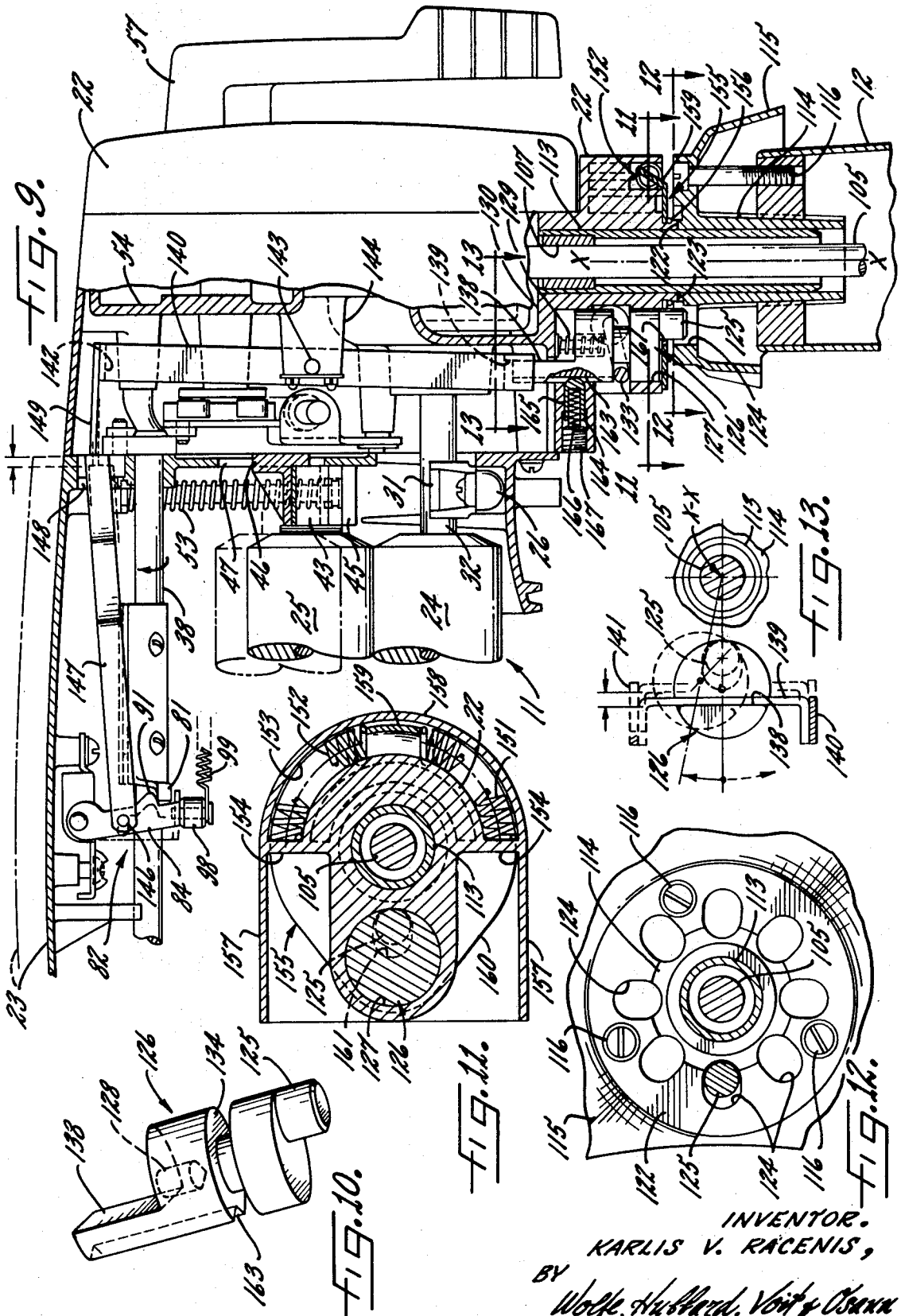

FIG. 9.

FIG. 10.

FIG. 11.

FIG. 12.

FIG. 13.

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WRINGER RELEASE FOR LAUNDRY MACHINES

It is an object of the present invention to provide an impulse wringer release mechanism for laundry machines which will release the pressure on the wringer rolls whenever excessive sidewise force is applied to the wringer head such as the pull or sudden reactive movement of a machine operator which normally results if a part of the operator's body or clothing become caught between the rolls. In another sense, the object of the invention is to provide a safety release mechanism for the wringer rolls which can be operable as a result of instinctive movement and reaction of the operator without conscious releasing action by the operator.

It is also an object of the invention to provide a wringer with such a release mechanism which permits manual swinging of the wringer head to any of a number of angular positions without release of the rolls but in which the safety release is operable at any of the angular positions.

Another object is to provide a wringer release mechanism having independently operable release linkages of which one includes a manually operated release bar for intentional wringer roll release by the operator and the other includes a linkage automatically responsive to sidewise force on the wringer head in excessive of a normal operating torque for releasing the rolls.

A more detailed object is to provide an eccentric means associated with the swinging support for the wringer head and a cam mechanism operated thereby for releasing the pressure on the wringer rolls upon limited swinging movement of the wringer head either toward or from the operator. A related object is to provide a release mechanism responsive to either a pushing or a pulling force on the wringer head in excess of a predetermined force.

Other objects and advantages of the invention will be apparent from the attached detailed description and from the drawings, in which:

FIG. 1 is a partial elevation of a laundry machine wit a wringer head incorporating the present invention;

FIG. 2 is a vertical section of a wringer head incorporating the present invention taken lengthwise of the head along the line 2—2 of FIG. 3;

FIG. 3 is a vertical transverse section taken along the line 3—3 of FIG. 2;

FIG. 4 is a partial perspective of the trigger latch and its mounting for the upper wringer roll;

FIG. 5 is a partial perspective of a latch finger and coupling mounted on the wringer pressure applying crank;

FIG. 6 is a partial horizontal section of the wringer head taken along the line 6—6 of FIG. 2;

FIG. 7 is a partial vertical transverse section of the wringer head taken along the line 7—7 of FIG. 2 showing the mechanism in latched position;

FIG. 8 is a partial vertical transverse section like FIG. 7 but showing the mechanism in unlatched position;

FIG. 9 is a partial vertical section of the wringer head showing in dot-dash lines the released position of the latch and movable head section;

FIG. 10 is a perspective of the eccentric and cam release member;

FIG. 11 is a horizontal section of the eccentric and centering mechanism taken along the line 11—11 of FIG. 9;

FIG. 12 is a horizontal section showing the positioning and locking plate and is taken along the line 12—12 of FIG. 9; and

FIG. 13 is a partial section taken along the line 13—13 of FIG. 9 showing the cam and lever release positions in dotted outline.

Referring now to the drawings, FIG. 1 illustrates a wringer-type washing machine 10 having a pressure roll-type wringer 11 supported on a vertical wringer post 12 which is attached to the side of the wash tub 13. The washing machine tub and drive mechanism may be of any suitable form of which various arrangements are well known in the art. As shown in FIG. 1, the wringer assembly 11 is mounted for horizontal swing about a vertical axis extending through the post 12, to permit angular positioning of the wringer at various positions relative to the tub.

An overall assembly view of a wringer mechanism incorporating the present invention is shown in FIG. 2. The general construction of the wringer housing, roll supports and drive mechanism is illustrated and described in further detail in Schroeder U.S. Pat. No. 2,288,847, granted July 7, 1942. For present purposes a brief description of the support and drive for the wringer rolls and reset mechanism after release of the rolls will be sufficient. The exemplary form of wringer structure embodies a frame comprised of a base section 20 having spaced upstanding end members 21, 22 arranged to support a relatively movable head section 23. The two frame sections 20, 23 each support one of a pair of cooperating wringer rolls 24, 25 respectively. Supporting the lower roll 24 for rotation in a fixed position is a pair of bearing brackets 26, 27 secured to the base section 20 as by screws 28. Each of the brackets 26, 27 is adapted to receive a bearing 31 for opposite end portions of the shaft 32 of the lower wringer roll.

The relatively movable head section 23 is a channel-shaped member longitudinally dimensional for extending between end members 21, 22. Depending arms 33 at the ends of head section 23 extend downwardly toward the upper edges of the brackets 26, 27. Sidewalls on brackets 26, 27 are spaced apart to receive the arms 33 in telescoping fashion to maintain vertical alignment of the respective sections 20, 23. For supporting the head section 23, a shaft 38 has its ends pivoted in bosses 39, 40 in the end members 21, 22 respectively. Between its ends the shaft is offset, as may be seen in FIG. 2, to provide a longitudinal central crank portion upon which the head 23 is rotatably mounted by bearings 41, 42 on end walls 34, 35 of arms 33 of the head 23. The shaft 38 thus supports the head for swinging relative to the base section and rotation of the shaft produces a vertical shifting of the head, the extend of offset being sufficient to shift the head between an elevated position clear of the brackets 26, 27 and a lowered, telescoped position between the sidewalls of the brackets 26, 27.

The upper roll 25 is supported for sliding movement longitudinal of the arms 33. The ends of the upper roll shaft 43 are journaled in movable bearing supports 45 having end plates 46 slidably fitted in vertically elongated slots 47 in end walls of the depending arms 33. Guard walls or plates 48 between the bearing assemblies and the ends of the upper roll are fixed to the head section and prevent outward movement of the upper roll and its bearings from the bearing supports.

Extending from each side of the bearing supports are ears 50 which are apertured to provide seats for the heads of bolts 51 extending vertically inwardly of the arms 33 along opposite sides thereof. The upper or inner ends of the bolts carry nuts 52 and compression springs 53 around the bolts bear between the nuts 52 and ears 50. The upper or inner ends of bolts 51 are seated loosely in recesses provided in bosses 49. The springs 53 are not compressed except when the head section is moved downwardly with the upper wringer roll in operative engagement with the lower wringer roll. Operative engagement is caused by rotation of the shaft 38 to lower its central crank portion by which the upper roll moves downwardly into contact with the lower roll after which continued downward movement of the head compresses the springs 53. A latch mechanism for holding the head in lowered position against the compressive force of the springs 53 will be described hereinafter.

For moving the head downwardly a wringer reset lever 57 is provided, and in the illustrative structure, the lever also serves to start, stop and reverse the direction of rotation of the wringer rolls. The reset lever 57 is fixed to the outer projecting end of a longitudinally extending shaft 56 which is journaled for rotation in a bearing sleeve 55. The sleeve 55 is rigidly supported by a vertical, transverse partition wall 54 spaced inwardly from the outer face of the end housing 22. The inner end of the lever shaft 56 carries a crosswise crank plate 58 on the inner face of which are mounted a pair of transversely

spaced apart rollers **59, 60** in eccentric relation to the shaft **56**. The rollers **59, 60** are positioned for engagement with side flange **61** formed on one side of a toggle plate **63** pivoted near its lower end by pin **64** fixed to the partition **54** for swing parallel thereto. Near its upper end the toggle plate **63** carries a pivotally attached link **65** which in turn, is pivoted to the outer end of an arm **68** rigidly mounted on the offset portion of the crank shaft **38**. A spring **70** surrounding a guide pin **71** bears against an inturned flange **73** on the central portion of the toggle plate **63** in the direction of its swinging movement to cause the link **65** and arm **68** to swing offset portion of the crank shaft **38** to its upper position above the axis of the shaft.

The operation of the wringer reset mechanism thus far described is as follows. When the wringer is in inoperative position, the head section **23** is elevated by the springs **53**. The wringer rolls **24, 25** are separated and the offset portion of shaft **38** is above the shaft axis. The toggle plate **63** and associated parts are urged to one side of the end housing **22** by the spring **70** as shown in FIG. **8**, with the plate flange **61** in engagement with toggle plate rollers **59, 60** respectively. Rotation of the hand lever **57** and the reset shaft **56** in either direction causes one or the other of the rollers **59, 60** to press against its mating flange **61** and to swing the toggle plate **63** in a counterclockwise direction as viewed from the outer end of housing **22**. This movement of the toggle plate **63** transmits a force to toggle link **65** which in turn swings the arm **68** and shaft **38** in a clockwise direction to lower the offset portion of the shaft **38** and lower the head section **23** for engagement of the wringer rolls **24, 25**.

Prior wringer constructions have been provided with quick manual release means for latching the head section in its lowered operative position. A preferred form of the latch and release mechanism best shown in FIGS. **2, 4, 5** and **6** will now be described. The crank shaft **38** has a rigid cylindrical coupling **79** fixed as by screws **80** around part of the offset portion, one end of which terminates adjacent the middle of the shaft with a radially offset finger **81** extending parallel to the shaft **38**. Cooperating with the offset finger **81** is a vertically disposed trigger member **82** formed with a flat bottom strap **83** and upstanding legs **84, 85** at the ends thereof. The trigger is pivotally supported at its upper end by depending bosses **87, 88** mounted on the underside of the upper housing wall. A strap **89** fastened to the bosses **87, 88** has upturned flanges **90** on its opposite side edges to which upper ends of legs **84, 85** are pivotally connected for swing toward and from the end of the offset finger **81**. One of the legs **84** of the trigger **82** is aligned with the finger **81** and has a latch detent **91** having a flat bottom face or edge for engaging the finger **81** to hold the shaft **38** in its lowered position. The upper face or edge of the detent is sloping to cam and swing the trigger **82** away from the coupling **79** upon downward rotary movement of the finger **81**.

To operate the trigger **82**, manual wringer release bars **92, 93** extending across the open wringer space immediately above the wringer rolls are provided At each end of the release bars is a support arm having a pivot pin connection, as at **94**, to the guard plates **48** to allow swinging movement of the release bar toward the movable housing for unlatching and releasing the wringer rolls. For this purpose, a horizontal cam plate **95** is placed between the two release bars **92, 93** and above the upper wringer roll **25**. Each of the bars is connected at its center to the adjacent side of the cam plate **95**, as by a screw **96** such that by pressing inwardly on one bar the cam plate is moved edgewise in the open space below head section and pushes the release bar on the opposite side outwardly. The sidewise, transverse movement of the cam plate is transmitted to the trigger **82** for releasing the head section by the edges **97** of a triangular cutout section of the cam plate engaging a roller **98** depending into the cutout section from the bottom strap of the trigger **82**. The cam edges **97** are inclined at about 45° angles with respect to the direction of movement of the cam plate such that the movement causes one or the other of the cam edges **97** to push the trigger away from the offset finger **81** and release the shaft **38** for upward rotation of the offset portion. A coil tension spring **99** interconnected between the roller support stud **100** and the control end **101** of the cam plate **95** resiliently urges the roller **98** against the cam edges **97** and toward latched position.

In accordance with the present invention means are also provided for releasing the upper head section **23** in response to the normal reflex action of a machine operator should the operator's clothing or a part of his body be engaged by the wringer rolls. Such reflex action is normally a push or a pull on the head of the wringer and means are therefore provided for release upon the application of a side force to the head greater than a predetermined amount. Such release means is associated with the releasable positioning mechanism which restricts the angular position of the wringer with respect to the vertical post or column which supports the wringer on the washing machine. In the present embodiment of the invention, the side or horizontal force responsive release mechanism acts independently of the previously described release bars such that either the release bars or the force responsive mechanism are available at all times to release the wringer rolls.

To describe the preferred embodiment of the invention, reference will now be made in more detail to the support and drive means for the wringer assembly **11**. Within the support column or post **12** is a vertical power shaft **105** for delivering rotary power from a suitable power source, such as an electric motor, to drive the lower wringer roll **24**. In the illustrated construction, the power shaft is journaled at its upper end in a bearing **106** in a horizontal boss integral with the partition **54** and at its center section by a second bearing **107** in the bottom wall of the end housing **22**. Intermediate the two bearings, a pair of integral reversing gears **108, 109** are splined on the power shaft **105** for axial sliding under the control of the handle **57** through a crank linkage, indicated generally at **110**. Swing of the handle **57** in one direction moves the gear unit upwardly so that the upper drive gear **108** engages the top side of a crown gear **112** fixed to drive the lower wringer roll **24** in one direction. Swing of the handle **57** in the opposite direction moves the gear unit downwardly to engage the lower drive gear **109** with the lower side of the crown gear **112** for reverse rotation of the bottom roll **24**, A central sliding position of the gear unit disengages both gears and disconnects the drive to the wringer roll. For a more detailed description of the power drive gearing and control linkage therefor reference is made to said U.S. Pat. No. 2,288,847.

Surrounding the drive shaft **105** for positioning the wringer head on the support column is a guide tube **113** which slides into a receiving aperture formed in an elongated vertical bearing member **114** in a wringer support casting **115** which is fixed by bolts **116** to the top of the support column or post **12**. To permit removal of the wringer head, the drive shaft **105** extends below the guide tube **113** and has an axially slidable power transmitting connection with the upper end of a permanently mounted power shaft **119** in the support column. In the present embodiment, the slidable connection comprises a flat sided nut **120** which is fixed to the lower end of the drive shaft **105** and is slidably received in a complimentary flat sided socket **121** on the upper end of the power shaft.

Positioning the wringer head vertically with respect to the machine tub are a flat annular upper face **122** on the support casting **115** and a mating flat annular face **123** depending from the bottom wall of the wringer control housing **22**. The flat mating surfaces **122, 123** together with the sliding fit between the guide tube **113** and the sides of the vertical bearing sleeve **114** in the support casting **115** position the wringer head relative to the machine and prevent vertical tilting of the head but permit horizontal swing about the axis of the guide tube and the inner drive shaft, indicated as *x—x* in FIGS. **1** and **13**. This relative horizontal swing is utilized until certain conditions for releasing the wringer rolls in the manner now to be described.

In carrying out the present invention, releasable and torque responsive indexing means are provided for holding the wringer head in one or more predetermined positions of horizon-

tal swing of the head relative to the support column. The predetermined positions of swing are determined in the illustrative construction by a series of spaced apart holes **124** formed in a circular pattern concentric with the turning axis *x*—*x* of the head as determined by the guide tube bearing **114**. Cooperating with the indexing holes **124** is a vertically movable indexing pin **125** mounted on the bottom portion of the wringer head such that the pin can enter and retract from each of the indexing holes to locate the head in predetermined angular positions. For purposes to be explained, the indexing pin **125** is eccentrically mounted on the lower end of a cylindrical plunger **126** slidably received in a vertical cylindrical bore **127** located adjacent the guide tube **114**. The upper end of the plunger has a shallow, central bore **128** for receiving and locating a compression indexing spring **129**, the upper end of which bears against a horizontal flange **130** on the partition wall **54**. The indexing spring **129** urges the plunger **126** and the integral indexing pin **125** to the lower holding position but permits upward releasing movement of the pin upon actuation of a swing release handle assembly. The latter comprises a rod **132** having an offset center portion **133** which is received in an annular slot **134** in the central portion of the plunger **126**. The ends of the rod project through bearing holes in the respective sides of the control head housing **22**. On each of the portions of the rod extending beyond the sides of the housing is radially mounted handle **135** for rotating the release rod to retract the index pin **125** against the resilient force of the spring **129** when it is desired to swing the wringer head from one position to another.

The cylindrical shape of the indexing plunger **126** and its cylindrical receiving bore **127** in the housing allow not only vertical linear movement of the plunger and the indexing pin, but also permit rotary motion of the plunger which motion is used in practicing the present invention for release of the wringer rolls. For this purpose, the indexing pin **125** is positioned eccentrically with respect to both the rotating axis of the plunger and the swing axis *x*—*x* of the wringer head as previously described. By such relative location of the indexing pin, a swinging movement of the head when the pin is projecting into an indexing hole causes the pin **125** to act as a crank to rotate the plunger **126**. One or the other side of the engaged indexing hole **124** restrains the pin **125** from following a swinging or angular motion of the head while the longitudinal axis of the plunger is forced to swing with the head. The relative motion causes the pin to lag behind the bodily translation of the plunger and thus rotate the plunger through an appreciable angle.

Cooperating with the plunger motion, force translating means are provided for releasing the wringer rolls in response to the angular rotation of the plunger. For this purpose, cam means are formed on an upward extension of the plunger **126** for operating a release linkage. As shown in the drawings, an upper portion of the plunger is cut away leaving an upright cam piece having a flat vertical cam surface **138** facing and parallel to the axis of plunger rotation. In engagement with the cam face is a short horizontal follower bar **139** which interconnects the lower ends of two spaced-apart vertical levers **140, 141**. Force transmitting levers **140, 141** are also interconnected by a horizontal bar **142** at their upper ends which terminate adjacent the top of the control housing generally in line with the wringer trigger release assembly **82**. Intermediate their ends the levers **140, 141** are pivotally mounted by horizontal pins **143** journaled in bosses **144** formed on the side of the housing partition **54**. Around one or both of the horizontal lever pivot pins **143** is a small coil torsion spring **145**. One end of the spring **145** presses against the supporting boss **144** and the other presses against the lever for resiliently urging the follower bar **139** on the lower end of the lever against the plunger cam face **138**. Any rotation of the plunger from its normal position will rock one or the other side edges of the cam face **138** toward the follower bar **139** causing it to swing the bottom of the lever assembly toward the drive shaft and gearing, that is, away from the lower wringer roll. At the same time the upper end of the lever assembly is swung in the opposite direction toward the roll release trigger **82**.

To transmit the motion of the upper end of the lever to the trigger **82**, a generally horizontal push rod or lever **147** is pivoted at one end **146** to the release trigger leg **84** at a point intermediate its own pivotal support and the latch detent **91**. The other end of the push lever **147** extends under the top wall of the movable wringer housing **23** toward the control housing **22** and through a guide slot **148** formed in the end wall **35** of the housing. In order to permit independent movement of the movable housing, the push lever **147** terminates at its second end substantially in alignment with the end face of the housing **23**. For operative engagement between the push lever **147** and the upper end of the vertical levers **140, 141**, the lever crossbar **142** has a rigid abutment **149** which projects toward the end of the push lever in axial alignment therewith. The projection **149** extends to the inner end of the control housing **22** and may touch lightly, or be spaced by a small amount from, the end of the push lever **147**. Any movement of the top ends of the vertical levers **140, 141**, toward the trigger release mechanism **82** will be transmitted through the rigid projection **149** to the end of the push lever **147** which in turn will swing the release trigger away from the latch finger **81** on the roll pressure shaft **38**.

As thus far described, it will be seen that after the indexing pin **125** has been set in an indexing hole **124** to hold the wringer head in a given angular position, any movement of the head from that position will cause the indexing plunger **126** to be rotated and the cam surface **138** to swing the vertical lever assembly in a direction to move the top of the assembly toward the wringer release trigger **82** and release the movable housing and upper roll. It is desirable, however, to restrict the swinging of the wringer head such that a minimum predetermined torque is required before the releasing mechanism will operate. The minimum required torque should be greater than the force resulting from the torque developed by the drive gearing in normal operation. It will be appreciated that without a restraint against swinging of the wringer, the gearing on the vertical drive shaft could swing the wringer about the drive shaft rather than drive the lower wringer roll. Means are therefore provided to permit swinging of the wringer head and consequent release of the upper housing **23** only when a given sidewise force is applied.

In the illustrated machine, two means are shown which provide a resistance to horizontal swing of the wringer head **11** about the support axis *x*—*x*. One means includes a pair of centering springs **151, 152** which resiliently tend to hold the indexing pin **125** in its neutral or center position. The springs **151, 152** are coil compression springs placed in an open arcuate groove or channel **153** formed in the bottom face of the control housing. Preferably the slot **153** is about 180° in length and located on the side of the control housing base opposite from the indexing pin. The end walls of the slot form respective abutments **154** for the ends of the springs **151, 152**. Holding the springs in the slot and also transmitting their restraining force is a force plate **155** held against the open bottom of the housing base by a retainer ring or washer **156**, an annular groove being formed in the center drive shaft supporting boss to receive the retainer ring or washer **156**.

In cross section the base section of the control housing has parallel sides **157** which are closed at the outer end by a semicircular wall **158**. The force plate **155** is located in the downwardly opening recess defined by the base walls **157, 158** and is generally circular in shape to conform to the outline of semicircular portion of the recess for limited rotation relative to the wringer head. For transmitting the force of the centering springs **151, 152** the force plate **155** has a short section or tab **159** approximately midway between the ends of the spring receiving slot, turned upwardly between the adjacent ends of the springs **151, 152** such that they engage and press against respective sides of the upturned section. The portion of the plate **155** immediately beneath the indexing pin **125** comprises a generally triangular shaped extension **160** and has a

radially elongated hole **161** to receive the downwardly projecting pin. Since the springs **151**, **152** oppose each other and resiliently press against opposite sides of the upturned section **159** of the plate, they resist any rotation of the plate with respect to the control housing **22**. The sides of the plate aperture **161** which receives the indexing pin **125** transmit this resistance to the pin and plunger **126**. Swing of the wringer head **11** is thus prevented unless the force tending to swing the head exceeds the resistance of the springs. Preferably, one of the springs has a greater resilient strength than the other to take into account the torque caused by the roll drive shaft and gearing. The spring of greater strength is the one which pushes the plate in a direction opposite to that of drive shaft rotation. By so adjusting the resilient force of the springs, the operating force for the release mechanism can be better balanced in the two directions of swing of the wringer head.

The second means for applying a resistance to relative swing of the head **11** and to establish a minimum sidewise force or torque necessary to release the wringer rolls includes a vertical groove **163** formed in one side of the indexing pin plunger **126** and a centering release pin **164** resiliently urged into the groove **163** for releasably holding the plunger **126** against turning relative to the head. As shown in FIG. **9**, the release pin **164** is slidably supported in a hole **165** in the inner side wall of the control housing **22** which hole is aligned with the groove **163** when the plunger **126** is in its center or neutral position. The projecting end of the release pin **164** that enters the groove **163** is rounded or tapered, as are the sidewalls of the groove, so that relative turning of the plunger **126** cams the pin out of the groove. Providing resistance to this camming action is a compression spring **166** which is compressed between the inner end of the pin **164** and a holding screw **167** threaded into the outer end portion of the pin supporting hole **165**. By increasing or decreasing the compressive strength of the spring **166** the amount of force on the wringer head needed to permit the plunger **126** to rotate and release the rolls can be predetermined. It will be understood that either one or both of the described centering means may be used depending on the release action desired and the details of the particular wringer construction.

From the foregoing description it will be seen that a wringer release mechanism is provided which is responsive to manual release of the wringer rolls, in particular release of pressure on the upper roll **25**, through the operation of the horizontal release bars **92**, **93** immediately above the opening in the wringer head. These bars **92**, **93** operating through the cam plate **95** and its diagonal cam edges **97** move the release trigger **82** toward the free end of the wringer and release the locking engagement between the trigger detent **91** and the latching finger **81** fixed for rotation with the pressure shaft **38**. Upon such release, the pressure springs **53** rotate the offset portion of the shaft **38** upwardly, lifting the movable head **23** and separating the rolls. Independently of the release bars, the eccentric positioning of the indexing pin **125** with respect to both the swing axis *x—x* of the wringer and the turning axis of the plunger **126** is operative to likewise release the wringer rolls through the cam action of the plunger face **138**, the cam follower bar **139**, links **140**, **141**, projecting link **149** and push rod **147**.

By providing two one-way force transmitting connections, the independent release by each of the two release mechanisms is obtained. One such connection in the preferred form is between the cam edges of the cam plate **95** and the roller **98** on the trigger **82**. The second of these connections is the abutting engagement of the second end of push rod **147** and the projecting link **149**. Force is transmitted through each of these connections in a direction to cause wringer release independently of the other. It will also be appreciated that by providing a vertical cam face **138** on the indexing plunger **126**, a slip connection is provided between the plunger and the cam follower bar **138** in which the cam face can move parallel to the follower to permit raising and lowering of the plunger for manually indexing the wringer to a new angular position without releasing the pressure rolls. A versatile release mechanism incorporating the safety features of a manual release and an impulse or reaction release is therefore provided.

I Claim:

1. A release mechanism for a wringer-type washing machine having a releasable wringer roll movable between operative and inoperative positions, a mounting head therefor, a pivotal support on said machine for swing of said head about a vertical axis and a power shaft concentric with said pivotal support axis for driving the wringer comprising in combination:

a. releasable latch means for holding said roll in operative position,

b. means including an indexing member for holding said head in predetermined angular positions,

c. means responsive to a predetermined minimum torque tending to swing said head around said vertical axis when in one of said predetermined angular positions, said torque-responsive means including mounting means for said indexing member for movement thereof in one direction for releasably maintaining said head in a predetermined angular position and movable in another direction in response to said predetermined minimum torque for releasing said latch means,

d. and manually operable means releasing said latching means independently of said torque-responsive means.

2. The release mechanism of claim **1** in which resilient means are provided for maintaining said indexing member in a neutral position for torque less than said predetermined minimum.

3. A release mechanism for a wringer-type washing machine having a releasable wringer roll movable between operative and inoperative positions, a mounting head therefor, a pivotal support on the washing machine for swing of said head about a vertical axis and a vertical power shaft concentric with said pivotal support axis, comprising in combination:

a. indexing means for angularly positioning and maintaining said head in predetermined angular positions relative to said machine including an indexing member mounted for movement in one direction for engaging and disengaging said indexing means and movable relative to said head in another direction from a neutral position in response to limited angular swing of said head relative to an indexed position thereof,

b. latch means for holding said wringer roll in operative position,

c. force-transmitting means having an operative connection with said latch means for releasing the latter,

d. motion-translating means interposed between said force-transmitting means and said indexing member for moving said force-transmitting means in a latch releasing direction upon movement of said indexing member in said other direction from neutral position,

e. and means for maintaining said indexing member in neutral position below a predetermined torque tending to swing said head relative to an indexed position.

4. The release mechanism of claim **3**, in which said indexing member is mounted for movement in said one direction on an axis parallel to said pivotal support axis and in said other direction in a plane transverse to said pivotal support axis.

5. The release mechanism of claim **3** in which said indexing means includes means rigid with said indexing member and defining a depression having sloping sidewalls, a latch pin supported in said head for movement into said depression when said indexing member is in neutral position and adapted to be cammed out of said depression by said sloping walls upon movement of said indexing member from neutral position and resilient means urging said latch pin into said depression for resiliently resisting movement of said indexing member from neutral position.

6. The release mechanism of claim **3** in which said means for maintaining said indexing member in neutral position includes a pair of springs resiliently acting on said member in opposed directions.

7. The release mechanism of claim 6 in which said wringer head defines an arcuate groove around said pivotal support axis, said springs being located in said groove in opposed relation, a plate overlying said groove and rotatable on said pivotal support axis, said plate engaging said indexing member and having a projection interposed between said springs whereby said springs resiliently urge said plate and said indexing member to a neutral position.

8. The release mechanism of claim 3 in which said indexing means includes a circular series of spaced holes around said pivotal support axis, said indexing member is a pin movable into and out of said apertures for engaging and releasing said indexing means and means for mounting said pin includes a cylinder supported for linear movement parallel to said pivotal support axis for indexing said head and for rotary movement about an axis parallel to and offset from said pivotal support axis upon limited angular swing of said head in either direction relative to an indexed position.

9. The release mechanism of claim 8 in which said cylinder defines a transverse groove, crank means on said head having an offset portion in said groove and a handle for manually moving said cylinder in said linear direction for engaging and releasing said indexing means and said motion translating means including a sliding connection for linear movement of said cylinder independently of said force transmitting means.

10. The release mechanism of claim 8 in which said indexing pin is eccentrically mounted on said cylinder in alignment with the centers of said series of apertures and in which said motion-translating means includes a projection on said cylinder defining a flat surface parallel to the axis of rotation of said cylinder.

11. The release mechanism of claim 10 in which said motion-translating means also includes a bar for engaging said flat surface and spring means for holding said bar in engagement with said surface for movement of said bar in a given direction upon rotary motion of said cylinder in both forward and reverse directions and for sliding contact between said surface and said bar upon linear movement of said cylinder.

12. A release mechanism for a wringer-type washing machine having a releasable wringer roll movable between operative and inoperative positions, a mounting head therefor, a pivotal support on said machine for swing of said head about a vertical axis and a power shaft concentric with said pivotal support axis for driving the wringer comprising in combination:

a. releasable latch means for holding said roll in operative positions, said latch means including spring means for resiliently forcing the same to latch position,

b. means for holding said head in predetermined angular positions,

c. means responsive to a predetermined minimum torque tending to swing said head when in one of said predetermined angular positions for releasing said latch means, said torque-responsive means including a linkage engaging said latch means and having a push rod and a first one-way force-transmitting connection means, said one-way connection means including an end portion of said push rod and an abutment member on said linkage movable into engagement with each other for moving said latch means against the force of said spring means,

d. and manually operable means including a second one-way force-transmitting connection for releasing said latching means independently of said torque-responsive means, said second one-way connection including a cam follower on said latch means and a cam operable by said manual means, said spring means urging said follower against said cam.