Jan. 9, 1923. 1,441,643.

E. TOMAN.

CLUTCH MECHANISM.

ORIGINAL FILED JULY 16, 1919.

Fig. 1.

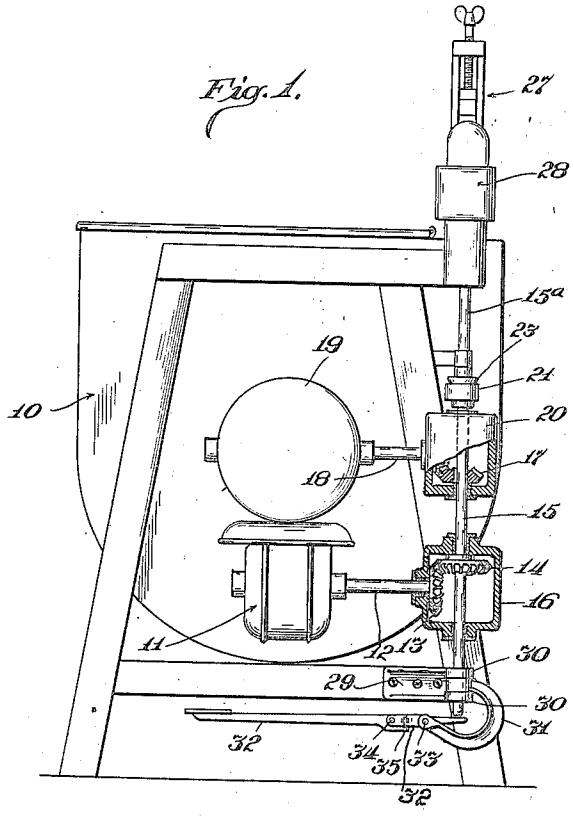


Fig. 3.

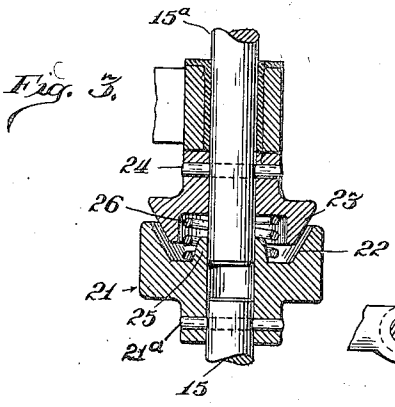
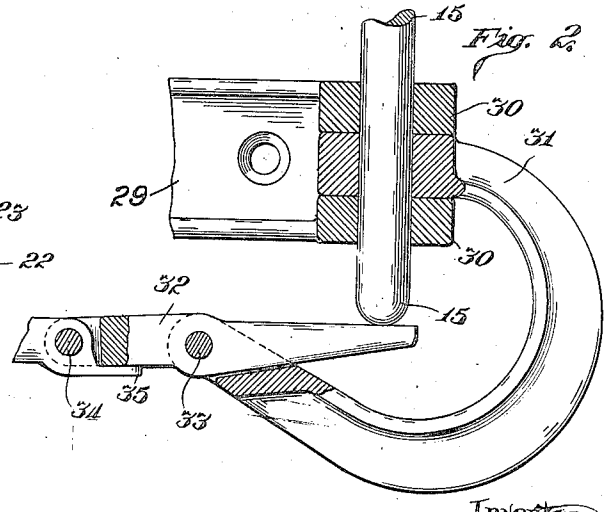


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD TOMAN, OF CHICAGO, ILLINOIS.

CLUTCH MECHANISM.

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To all whom it may concern:

Be it known that I, EDWARD TOMAN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Clutch Mechanism, of which the following is a description, reference being had to the accompanying drawing, which forms a part of my specification.

My invention relates to a safety device more especially intended for use on power driven washing machines intended for domestic use; and the invention has for its object the provision of a construction whereby the power-transmitting mechanism for the wringer, which is usually attached to machines of the class referred to, may be under the absolute control of the operator and the power to the wringer immediately shut off at the will of the operator, or through the change of the operator's position.

The object of my invention is to provide a construction whereby the power to the wringer will be so controlled, that in the event the fingers of the operator are caught between the rollers of the wringer, the operator need merely shift position or lift the foot, with the result that the power will be imediately shut off from the wringer and crushing of the fingers or hand prevented. As both hands of the operator are frequently employed in passing the clothes through the wringer, it is essential to provide mechanism which may be otherwise operated than by hand in order that the operation of the wringer will at all times be under control of the operator; and for that purpose I provide a foot-operated device which automatically assumes normal or inoperative position when the foot of the operator is withdrawn therefrom.

The purposes and advantages of my construction will be more readily comprehended from the following detailed description of the drawing, wherein:—

Figure 1 is a side elevation of a type of power-operated washing machine with a power-operated wringer and provided with my improved safety device; portions of the operating mechanism shown in section.

Figure 2 is an enlarged detail view, partially in section, illustrating a portion of the foot-control mechanism or lever.

Figure 3 is a detail sectional view of the clutch mechanism whereby the power-imparting shaft of the wringer is brought into operative relation with the main driving shaft of the machine.

In the exemplification of the invention, I have shown a well known type of power-driven washing machine, in side elevation, at 10, provided with an electrical motor illustrated at 11, the power-shaft 12 whereof is shown provided with a suitable gear 13 meshing with a gear 14 which is secured to a sectional driven shaft 15. The gears 13 and 14 are encased in a suitable housing, as at 16, all of which is properly supported on the side of the washing machine.

The sectional driven shaft is vertically disposed, with the lower section provided with a gear 17 which meshes with a gear secured to the laterally disposed driven shaft 18 which drives the cylinder within the washing machine, through the medium of suitable gearing, usually of an alternating or reversing type, enclosed in the housing or casing 19 at the side of the washing machine in alignment with the spindle or trunnion of the cylinder. The vertically disposed sectional driven shaft 15 is preferably shown extended through the housing 20, with the upper end of the lower section provided with a female member 21 of a friction clutch secured thereto in any suitable manner, as for example by the pin 21^a, see Figure 3, which causes the female member 21, to constantly rotate with the lower section of the vertically disposed driven shaft 15. The lower section of the driven shaft 15 is intended to have longitudinal or vertical movement and for that reason the gear 17 is slidably feathered on the lower shaft section so as to permit the lower shaft section to slide through the gear 17 and at the same time cause the gear to constantly rotate therewith.

The female member 21 on its upper side is provided with an inwardly tapered peripheral surface 22 corresponding with the taper or bevel of the male member or cone 23, so as to permit the latter to come into frictional relation with the inwardly tapered peripheral surface 22 when the lower section of the driven shaft 15 is forced upwardly. The cone or male member 23 is secured to the upper section 15^a of the driven shaft 15 in any suitable manner, as for example by the pin 24, so as to cause the upper shaft-section 15^a to rotate with

the cone or male member 23 when the latter has been brought into frictional or engaging relation with the female member 21. In order to provide suitable bearing for the lower end of the upper shaft-section 15ª, the latter is extended through and beyond the cone or male member 23 and into the female member 21; the latter being preferably provided with a central boss 25 to provide suitable bearing for the end of the shaft-section 15ª and also to provide a suitable guide or seat for the end of an expansion spring 26, the other end whereof extends into a countersunk portion or depression in the lower surface of the male member or cone 23, see Figure 3. The spring 26 normally assists in maintaining the members 21 and 23 in the separated, inoperative relation shown in Figure 3, when upward pressure on the lower shaft-section 15 has been removed.

The upper shaft-section 15ª leads to the wringer indicated at 27 in Figure 1, and by means of suitable gearing not shown, but enclosed within the housing 28, operates the rollers of the wringer when operative relation between the shaft-sections 15, 15ª is established.

The lower end of the lower shaft-section 15 extends through the housing 16 and has rotative bearing in a suitable bracket 29 secured to the side of the washing machine as shown in Figure 1. The bracket 29 is preferably provided with the separated lobes or ears 30 so as to receive a fulcrum member 31 therebetween and therefore maintain the member 31 in position but at the same time permit member 31 to oscillate about the end of the lower shaft-section 15.

The lower shaft-section 15 is disposed beyond the lower side of the bracket 29, see Figures 1 and 2, so as to be in contact with a foot-lever 32. The foot-lever is preferably made in two sections with its inner section fulcrumed at 33 on the fulcrum member 31 so as to permit vertical oscillation of the lever; and the two sections of the foot-lever are pivotally connected together at 34 so as to permit the outer end or foot-receiving section to be swung upwardly out of operative position and out of the way when desired.

The inner end of the outer section of the foot-lever is provided with a lip or extension 35 disposed beyond the pivotal point 34 and adapted to extend beneath the fulcrumed section of the foot-lever as shown in Figures 1 and 3, thereby not only limiting the downward movement of the outer section of the foot-lever, but also causing both sections of the foot-lever to oscillate together when downward pressure on the foot-lever is applied.

As is apparent from the construction shown and described, in order to provide operative relation between the driven shaft-sections 15, 15ª so as to transmit power to the wringer, the operator must depress foot-lever 32 and maintain the lever in the depressed position to force and maintain the lower shaft-section 15 upward, against the action of gravity as well as the action of spring 26 and thereby bring the clutch elements 21 and 23 into frictional and operative relation with each other. When clutch elements 21 and 23 are held in frictional relation, power will be transmitted to the upper shaft-section 15ª by the constantly rotating lower shaft-section 15 which is driven by the power shaft 12 through the operation of the motor.

With this construction, it is evident that the moment the operator's foot is taken off of foot-lever 32, the lower shaft-section 15 will be allowed to slide downwardly, both through the action of gravity and the positive action of the expansion spring 26 and further transmission of power to the wringer prevented.

During the operation of power-driven washing machines provided with power-operated wringers, operators have frequently caused their fingers or hands to be caught between the rollers of the wringers and because of the position of their hands, or through excitement, have been unable to shut off the power in time to prevent injury. It is apparent that with my construction, the power to the wringer is under the control of the operator regardless of the position of the hands, as the mere excitement will in itself induce the operator to shift position or lift the foot off of foot-lever 32, when the spring 26 will force the clutch elements 21 and 23 into separated, inoperative relation, with the result that further rotation of the rollers of the wringer will immediately stop.

With the fulcrum member 31 oscillatingly mounted between the lobes or ears of the bracket member 29 and with the foot lever 32 composed of the pivoted sections, the fulcrum member and foot-lever may be swung into any position desired and may also be moved out of the way when not in operation.

I have illustrated and described my improved construction as more especially adapted for use on power-driven washing machines, but it is evident that my invention may be applied to any power-driven device and injury to the hands of the operator thereby prevented; and while I have shown and described what I believe to be the simplest embodiment of the invention, it is apparent that it is susceptible of modifications embodying the spirit of my invention.

What I claim is:—

1. Clutch mechanism of the class described, comprising a shaft consisting of two

sections arranged in alignment, one section being adapted to have longitudinal movement, a clutch, one portion or element whereof is secured to the adjacent ends of each section of said shaft whereby operative relation between the two sections may be effected, a bracket member mounted adjacent the opposite end of said longitudinally movable section of said shaft, a fulcrum member oscillatingly mounted on said bracket member, and a foot-lever fulcrumed on said fulcrum member with the inner end of the foot-lever in operative relation with the end of said movable section of the shaft whereby pressure on the foot-lever will cause said longitudinally movable section of the shaft with its clutch element to be forced into operative relation with the clutch element of the other section of said shaft.

2. In a clutch mechanism of the class described, the combination of a vertically disposed shaft made in two sections arranged in alignment, the lower section being adapted to have longitudinal movement, the adjacent ends of the sections of said shaft being each provided with a clutch element whereby the two sections of said shaft may be brought into operative relation, a spring disposed intermediate of the clutch elements and normally tending to maintain the latter in separated relation, a fulcrum member oscillatingly mounted to swing laterally while the free end thereof is disposed to one side of the longitudinal axis of the lower shaft section, and a foot-lever fulcrumed intermediate of its ends, at the free end of said fulcrum member, so as to have the inner end of the foot-lever in operative contact with the lower end of the lower section of said shaft whereby downward pressure on the foot-lever will cause said lower section of said shaft to move upwardly against the action of said spring and force the clutch elements into clutching engagement with each other.

3. In a clutch mechanism of the class described, the combination of a vertically disposed shaft made in two sections, the lower section being mounted to have longitudinal movement, a cone-shaped clutch element secured to the end of the upper section to rotate therewith, with the lower face of the cone-shaped element being provided with a counter-sunk portion, a female or second clutch element secured to the end of the lower shaft section and provided with a downwardly and inwardly tapered surface adapted to receive the first element, said second element being provided with a central boss, a spring disposed about the boss of the second element and extending into the counter-sunk portion of the first element to normally maintain the elements and the shaft-sections in separated relation, the opposing faces of the elements being formed to permit compression of the spring and enable frictional relation between the elements to be effected, with a fulcrum member disposed adjacent the lower section of said shaft, and a foot lever fulcrumed on said fulcrum member with the inner end thereof in contact with the lower end of the shaft section so that downward pressure on the foot lever will force the lower shaft section with its clutch element upwardly against the action of the spring and cause frictional relation between the clutch elements.

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