Aug. 15, 1950 F. W. HOWLAND 2,518,548

AUTOMATIC SAFETY LOCK FOR CYLINDERS

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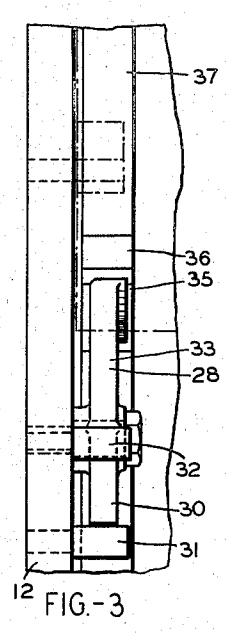

FIG.-3

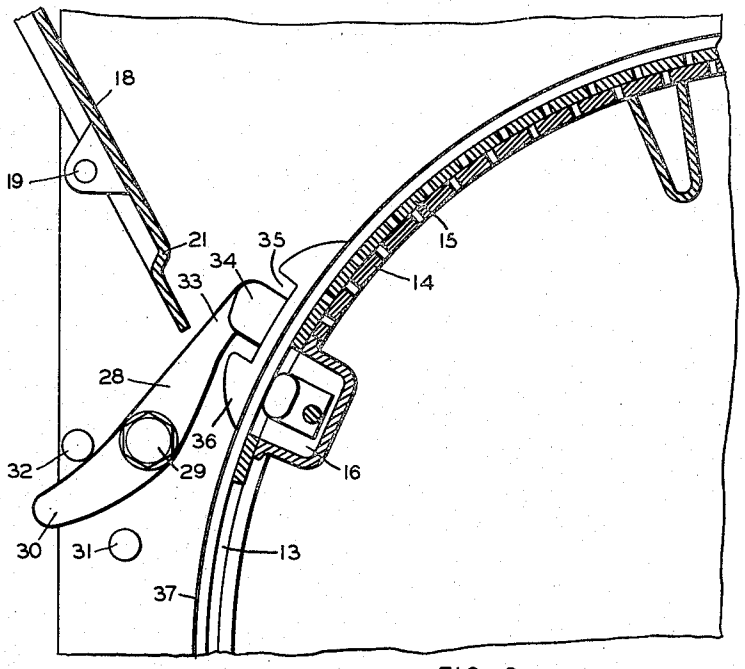

FIG.-2

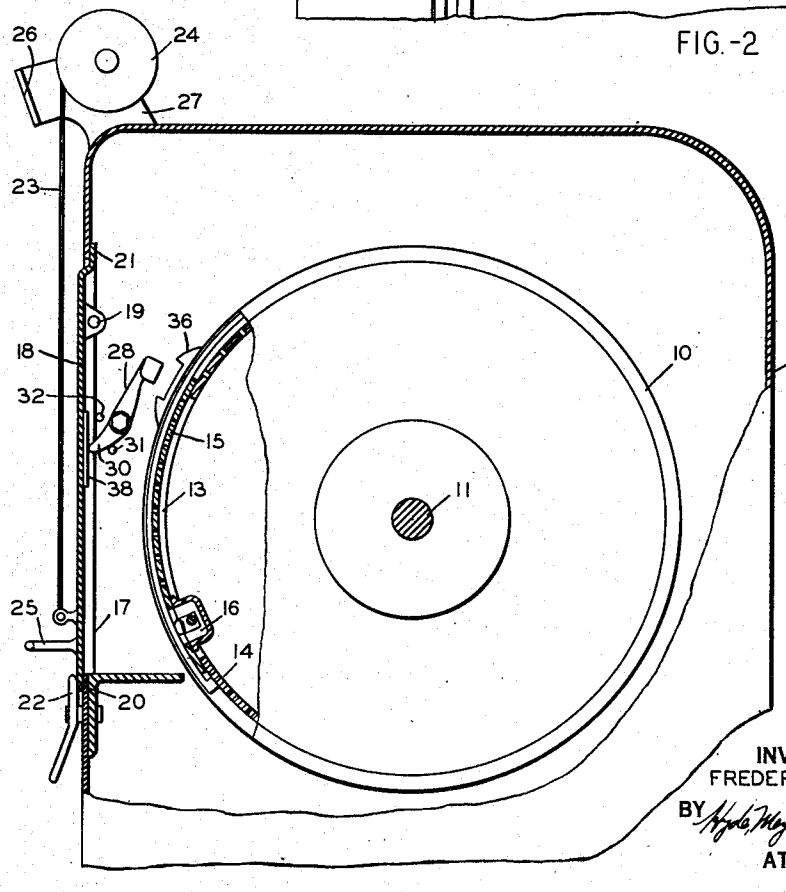

FIG.-1

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AUTOMATIC SAFETY LOCK FOR CYLINDERS

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2 Claims. (Cl. 192—129)

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This invention relates to automatic safety locks for the cylinders of safety drum machines, such as drying tumblers, washing machines or the like.

The object of the invention is to provide an improved safety lock which is entirely automatic and requires no attention by the operator, and which positively locks the drum or cylinder against rotation whenever the casing door is open and releases it for rotation when the door is closed.

A further object is to provide such an improved drum lock which is actuated by movement of the casing door to either of its open and closed positions, and in which a door operated part serves in door open position to positively prevent inadvertent release of the lock, such as might endanger the operator.

Another object is to provide an automatic lock of the character described in which the locking device is biased toward locking position, from which position it is moved to release position by opening the casing to gain access to the rotatable drum.

Further objects of the invention in part are obvious and in part will appear more in detail hereinafter.

In the drawings, which represent one suitable embodiment of the invention:

Fig. 1 is a cross section through the drum axis, showing the casing door closed, with the locking parts in release or unlocked position;

Fig. 2 is a similar view, on a larger scale, showing the door open, with the locking parts in locked position; and

Fig. 3 is a corresponding front elevation, with the casing door shown in dot-dash lines to give an unobstructed view of the locking mechanism.

The invention may be applied to any form of machine in which a rotatable drum or cylinder having a door closed opening in its cylindrical wall is housed within a door closed casing, and in which it is desirable, whenever the casing door is open, to prevent rotation of the drum and therefore prevent possible injury or damage either to the operator or to the work or the machine itself. Typical of such machines are washing machines and drying tumblers employed in laundries and dry cleaning plants. For convenience, and in no sense of limitation, the invention has been illustrated in the drawings in connection with a drying tumbler.

The tumbler shown includes a cylindrical drum 10 mounted to rotate on trunnions 11 in a chambered tub or casing 12. Drum 10 has an opening 13 in its foraminous cylindrical wall 14 closed by any suitable movable door, such as the sliding

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door 15 capable of being releasably locked in closed position by suitable locking means conventionally indicated at 16 and forming no part of the present invention.

Casing 12 is provided with an opening 17 which is closed by a door 18 when the machine is in operation with the drum rotating as is usual. This door may be movably mounted upon the casing in any suitable manner so as to slide or swing from closed to open position, or vice versa. As shown, it is hinged on pivot pins at 19, the lower edge of the door externally overlapping the edge of the opening at 20, and its upper edge internally at 21. A releasable latch 22 holds the door closed, while a cable 23 connected to the door winds up on a spring-actuated retriever pulley or drum 24 for the purpose of counterbalancing or of raising the door when the latch 22 is released. The door may be opened or closed manually by handle 25, and a stop 26 on the pulley bracket 27 limits its opening movement.

The locking devices of the present invention include cooperating lock and keeper members, one on the drum and the other on the casing, by means of which, under certain conditions the drum may be locked to or made fast with the casing. Preferably, these devices are controlled or operated by the casing door, so that no special attention need be given to them. Operation of the casing door in its usual manner takes care of the lock and insures the protection which it affords.

The locking devices shown for purposes of illustration include a locking dog 28 pivoted at 29 on one of the casing walls and having two arms, to wit a short release arm 30 working back and forth between fixed stops 31, 32, and a longer locking arm 33 having a finger 34. This finger is arranged to enter a recess 35 in a keeper 36 securely fastened to the body portion of the drum, i. e., to any suitable part of the drum other than its movable door. One of the end bands or straps 37 of the drum forms a suitable support for the keeper.

Operation

Fig. 1 illustrates the automatic locking device in release position. In other words, the casing door 18 is closed and is latched at 22, and the drum is free for rotation. The long locking arm 33 of the dog 28, with its finger 34, is heavier than the short release arm 30, and the stops 32, 31 limit swinging motion of the dog so that the heavy arm is always at one side of the pivotal axis 29. Therefore, the dog always is biased to

move by gravity in the clockwise direction Fig. 1. However, when the door is closed its inner surface, or a wear plate 38 secured thereto, engages the tail or end of the arm 30 and tilts the dog to the position shown in Fig. 1, thus moving its finger 34 out of the recess 35 in the keeper 36.

When the door is opened it swings to the position shown in Fig. 2, plate 38 moving away from the dog and permitting it to swing by gravity to the position shown, in which the short arm 30 engages stop 32 and locking finger 34 enters the recess 35. It is assumed of course that before opening the casing door the drum has been rotated and "inched" until the recess is opposite the finger. Usually the recess is made a little longer than otherwise might be necessary, to take care of slight inaccuracies in "spotting" the cylinder.

In the locked position of the parts, not only does the locking dog, by its engagement in the recess in the keeper, prevent rotation of the cylinder, but also the door may be provided with safety means for preventing inadvertent release of the dog, when the door is open. This may be any part attached to the door and arranged, when the door is open, to confine the dog in locking position. As shown, this is accomplished by that portion 21 of the casing door which extends and lies above its pivotal axis 19. The edge of the extension 21, when the door is opened, moves to a position in front of the long arm 33 of the locking dog. Consequently the door edge forms an obstacle which prevents the lock from being unlocked or released until the door has been closed.

The construction described is quite simple but is nevertheless sufficiently effective as a safeguard against possible injury of the operator or of damage to the machine by undesired rotation of the cylinder when the casing door is open.

Other advantages of the invention will be apparent to those skilled in the art.

What I claim is:

1. Apparatus of the character described, including a chambered casing provided with a charging opening, a door therefor, a work holding drum rotatable within the chamber of said casing, a keeper on the drum, and a two-armed dog cooperatively related to said keeper and pivotally mounted within the casing, said dog being biased by gravity for the movement toward locking position and having a locking arm located for engagement with the drum keeper and a release arm located for engagement by the door when the door is moved to closed position, to thereby positively release the dog from the keeper.

2. Apparatus of the character described in claim 1, including safety means carried and operated by the door and arranged when the door is opened to move to a position in which it obstructs motion of the dog to drum release position and thereby prevents drum rotation.

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