

Nov. 8, 1938.

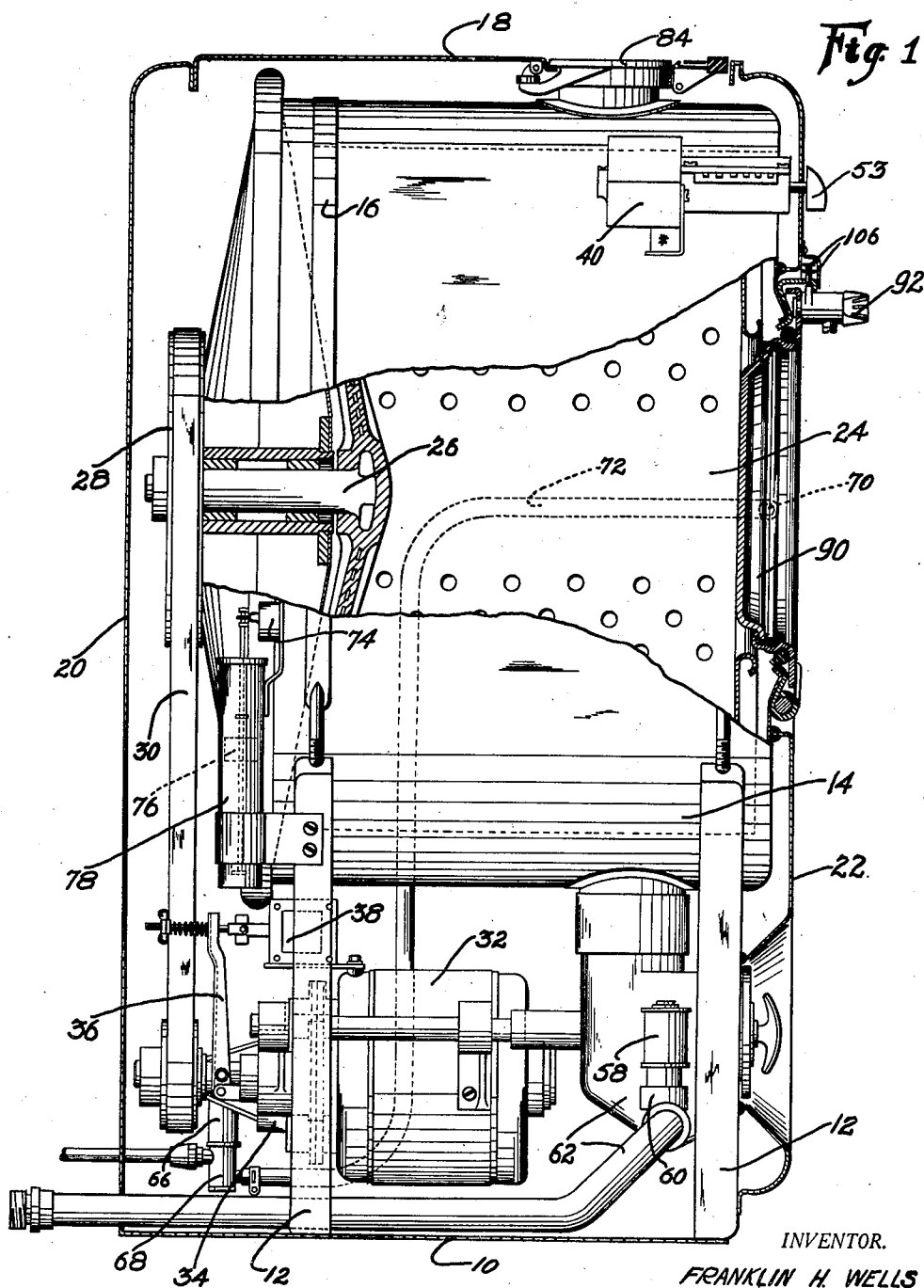
F. H. WELLS

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WASHING MACHINE

Filed July 17, 1937

2 Sheets-Sheet 1



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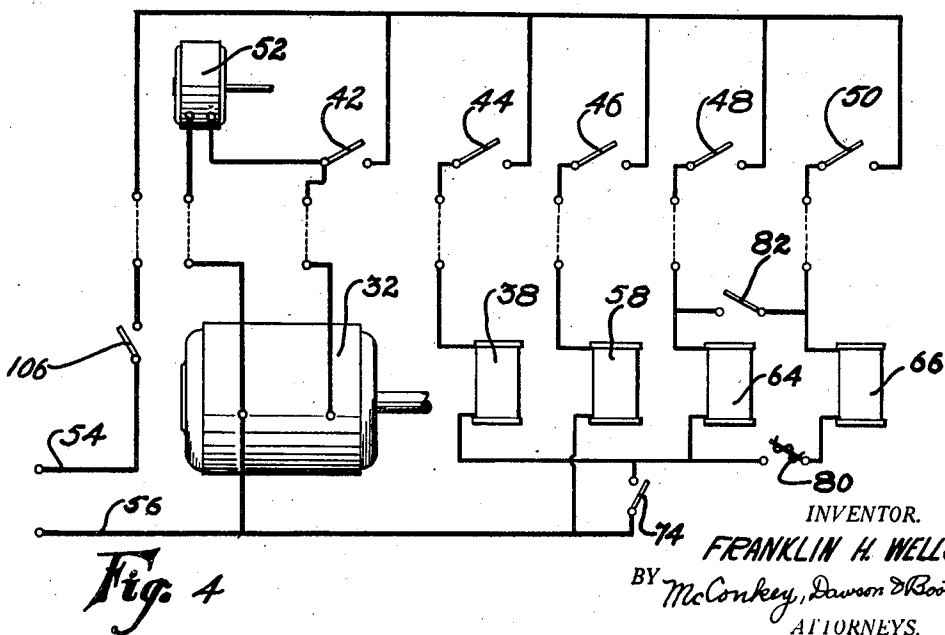
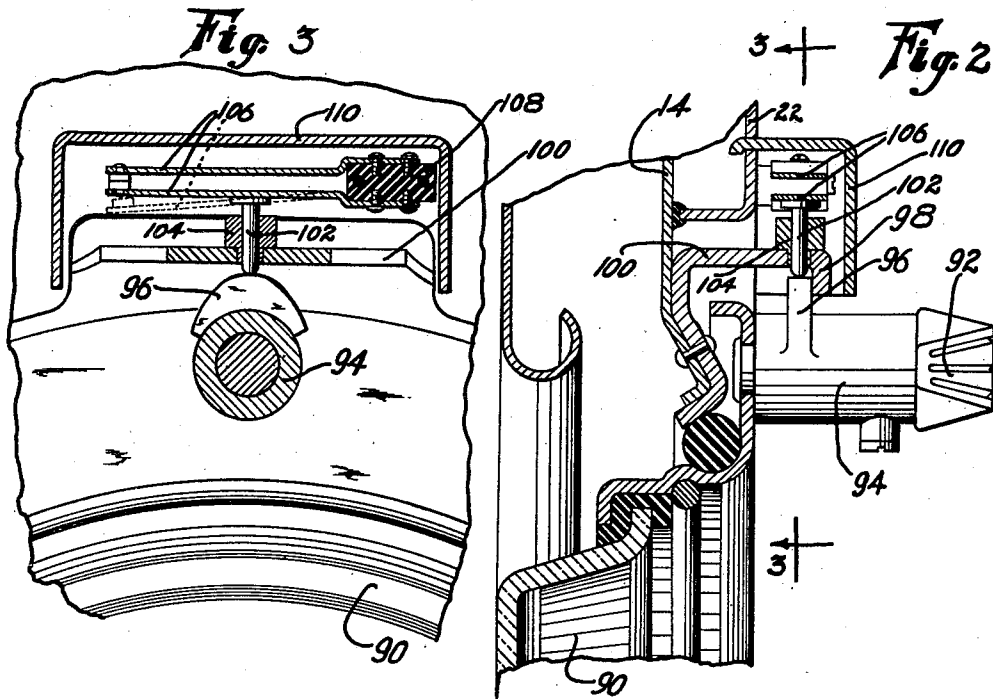
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UNITED STATES PATENT OFFICE

2,135,685

WASHING MACHINE

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Application July 17, 1937, Serial No. 154,115

2 Claims. (Cl. 192—135)

This invention relates to machines such as washing and other cleaning machines, which have doors for use in introducing the materials to be treated and which doors must be tightly closed when the machines are in operation. An object of the invention is to provide improved means for insuring that a machine of this character will not operate unless the door is closed and fastened.

In one desirable arrangement, the machine is provided with electrical operating means which has a control circuit containing a switch which is closed by fastening the door. Various features of novelty relate to the structure and the mounting of this switch and to its arrangement in the control circuit of an automatic machine of this character. These and other features of the invention, and additional objects thereof, will be apparent from the following description of the illustrative embodiment shown in the accompanying drawings, in which:

Figure 1 is a view, generally in vertical section, through the machine;

Figure 2 is a partial section through the switch, in the same plane as Figure 1 but on a larger scale;

Figure 3 is a partial section on the line 3—3 of Figure 2; and

Figure 4 is a wiring diagram.

The machine illustrated is an automatically controlled machine for washing, rinsing, and drying clothes. It includes a base 10, on which are mounted saddles 12 supporting a horizontal cylindrical tub 14 secured in place by means such as straps 16 which encircle it. This forms a chassis, about which are assembled top and side panels 18 and rear and front panels 20 and 22, to form a cabinet inclosing the machine.

Within the tub 14 is a perforated cylinder or drum 24 mounted on a shaft 26 journaled in bearings carried by the end members of the tub 14, and provided with a pulley 28 driven by a belt or the like 30. The belt 30 is driven by a power unit comprising an electric motor 32 driving a two-speed transmission 34 having a shift lever 36 operated to shift from low to high gear by energization of a solenoid 38.

The machine is operated automatically under the control of a motor-driven cyclic multiple switch 40 (Figure 1), comprising and automatically opening and closing a series of control switch contacts 42, 44, 46, 48 and 50 (Figure 4). The motor of this switch is indicated in Figure 4 at 52. The multiple switch can be advanced manually, by turning a knob 53, to close the

switch 42 which closes parallel circuits between power lines 54 and 56 through the motors 32 and 52, provided the safety switch described below is closed. This starts the machine in operation. The exact cycle depends on the shape of the cams (not shown) in the switch 40 which open and close the contacts 42—50.

The contact 44 controls the circuit through the solenoid 38 of the two-speed transmission. Contact 46 controls a circuit through a solenoid 58 which operates the valve 60 of a drain 62. Contacts 48 and 50 control circuits through solenoids 64 and 66 of hot and cold water inlet valves 68. The water is injected through a nozzle 70 connected to the inlet valves by a conduit 72.

The circuits through solenoids 38, 64, and 66, are all in series with a switch 74 opened when a float 76 rises to a predetermined position in a float chamber 78 connected to the interior of the tub 14. This shuts off the water when the tub is filled to a predetermined level, and also prevents shifting into high gear when the tub contains water.

A thermostatic switch 80 may be arranged in series with the solenoid 66, under the control of the temperature of the water in conduit 72, to maintain the temperature of that water substantially constant when the solenoids 64 and 66 are both energized. A manual switch 82 may be provided, if desired, to insure that the solenoid 66 will always be energized when the solenoid 64 is energized, regardless of the shape of the cam controlling the contact 50; this is used for example in washing woolsens, where extremely hot water must never be used. When the machine is first started, soap may be introduced through a door 84, in the top panel 18, controlling an opening in the top of the tub 14.

The particular machine described above is more fully described, and is claimed, in applications Nos. 129,429 and 129,412, filed March 6, 1937, by John W. Chamberlin and Rex Earl Bassett, Jr., and by Adiel Y. Dodge, respectively.

The clothes or other materials to be washed are introduced into the drum 24 through an opening in the end thereof, after opening a downwardly-swinging door 90 hinged at its lower edge on the front wall of the tub 14. The door 90 not only closes the opening in the front wall of the tub, but also has a portion substantially in the plane of the end wall of the drum 24, and partially closing the opening in the end of the drum, and which prevents the clothes from coming out of the drum during the operation of the machine.

The door 90 can be locked shut by turning a

handle 92 to rotate a short shaft 94 rotatably carried by the upper margin of the door 90, thereby causing a latch or locking lug 96 to interlock behind a flange 98 on a latch plate 100 shown riveted to the front wall of the tub 14.

The latch 96 simultaneously engages and lifts a plunger 102, guided in a bushing 104 carried by the latch plate 100, to close spring contacts 106 forming a safety switch in series with the entire multiple switch 40. Thus when contacts 106 are open, the door 90 being unlatched, the machine cannot be operated even if knob 53 is carelessly advanced. The contacts 106 are carried by a block 108 of insulating material, secured to the panel 22, or to the latch plate 100, or to the front wall of the tub 14, as may be convenient.

The above described safety switch is preferably inclosed and protected by a hood-shaped stamping 110 carried by the front panel 22.

In operation, when the door 90 is closed and the latch 96 interlocked with the flange 98, the safety switch 106 is closed automatically and the multiple control switch 40 is operative to cause the machine to go through its regular cycle of washing, rinsing, and drying the clothes. If, however, door 90 is open, or if it is closed but not fully latched, the switch 106 is open and the switch 40 cannot function.

While one illustrative embodiment has been described in detail, it is not my intention to limit the scope of the invention to that particular embodiment, or otherwise than by the terms of the appended claims.

I claim:

1. A washing machine or the like comprising a side wall provided with an opening for the introduction of materials to be cleaned, a door for said opening hinged to said wall at one side of the opening, a latch plate carried by said wall at the other side of the opening, a control circuit for the machine including a switch adjacent said latch plate, a device mounted in the latch plate and movable crosswise thereof to operate the switch, a hood-shaped stamping mounted on said wall and housing said switch and having said latch plate arranged substantially to close its open side, and a latch on the door manually operable to interlock with the latch plate and simultaneously move said device by direct engagement therewith to operate the switch.

2. A washing machine or the like comprising a side wall provided with an opening for the introduction of materials to be cleaned, a door for said opening hinged to said wall at one side of the opening, a latch plate carried by said wall at the other side of the opening, and provided with a locking flange, a control circuit for the machine including a switch adjacent said latch plate, a device mounted in the latch plate behind said flange and movable to operate the switch, a stamping mounted on said wall and cooperating with the latch plate to form a substantially closed housing inclosing said switch, and a manually-operable latch on the door having a part interlocking behind said flange and simultaneously engaging and shifting said device to operate the switch.

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