Dec. 22, 1936. A. J. HOLLANDER 2,064,832

TIMING DEVICE

Filed April 5, 1933 2 Sheets-Sheet 1

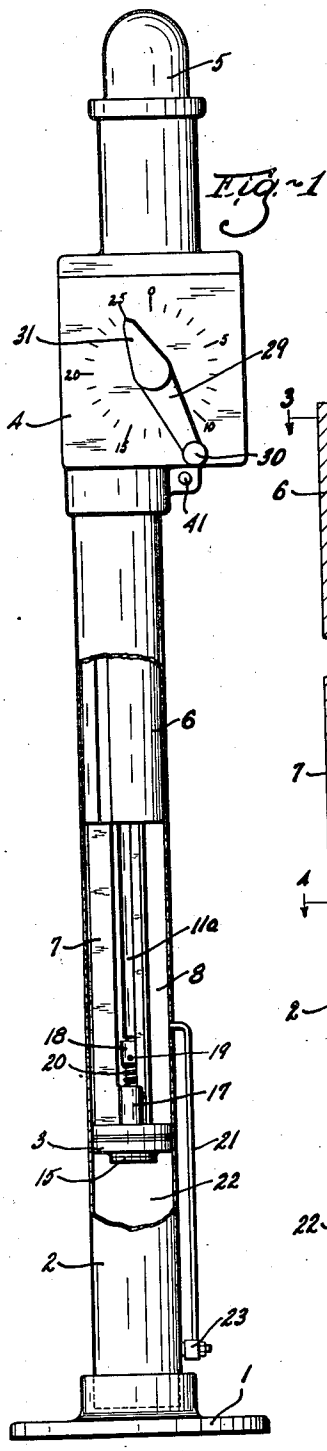


Fig. 1

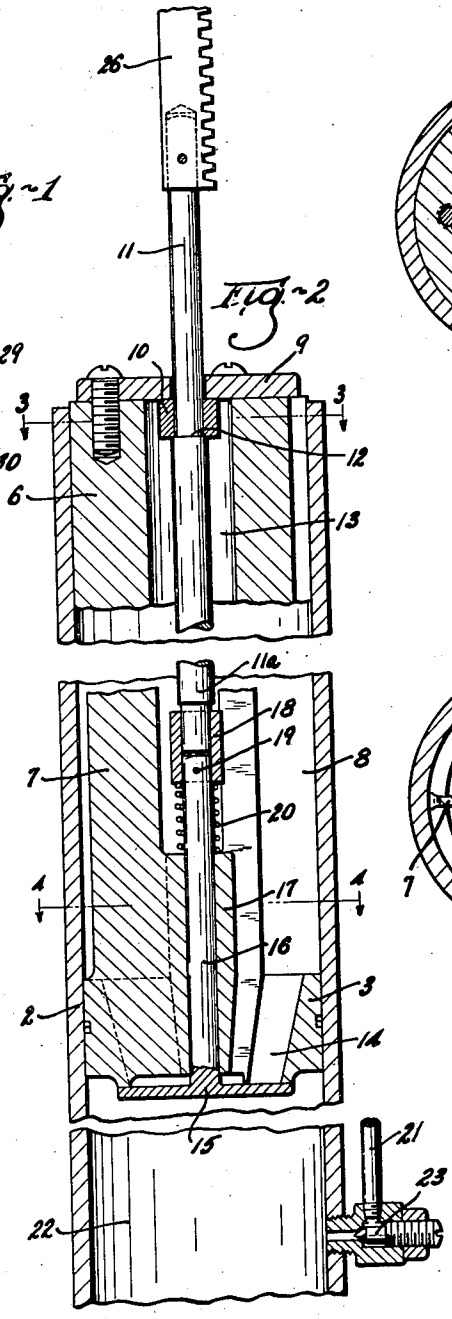


Fig. 2

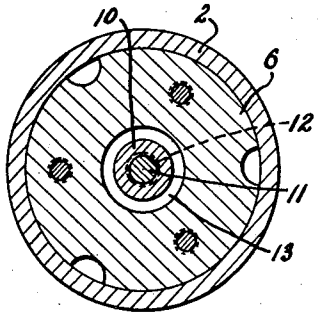


Fig. 3

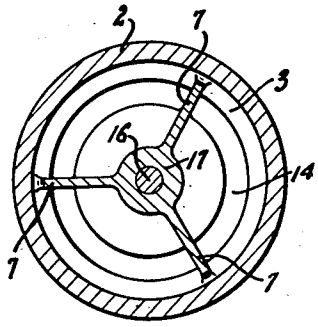


Fig. 4

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TIMING DEVICE

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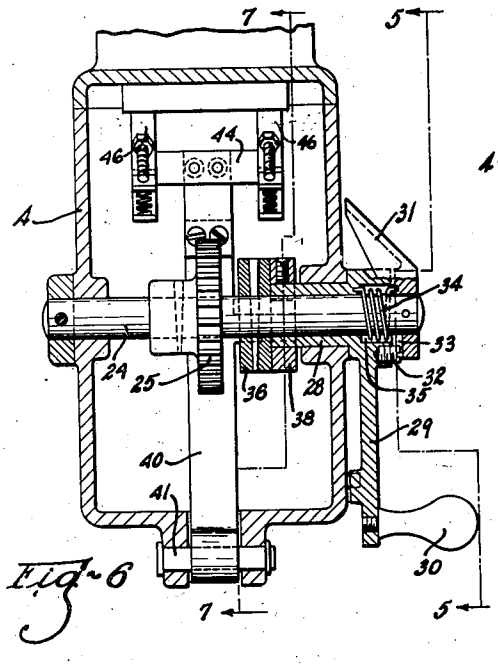


Fig. 6

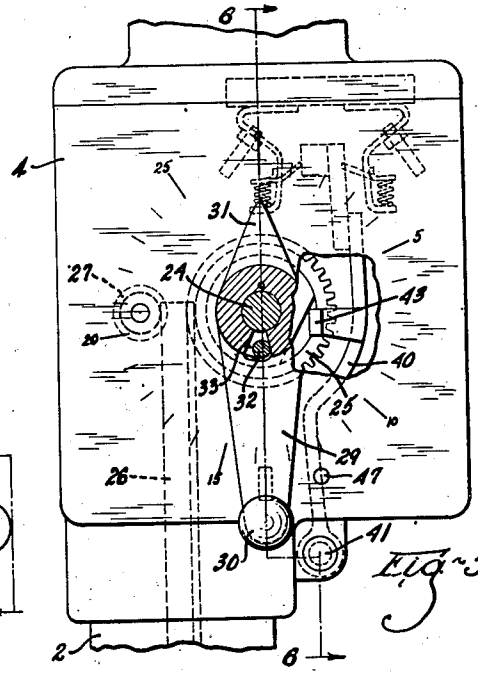


Fig. 5

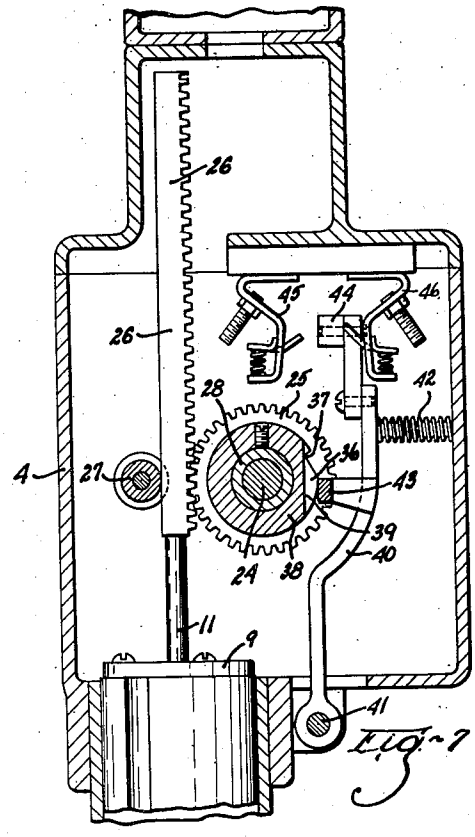


Fig. 7

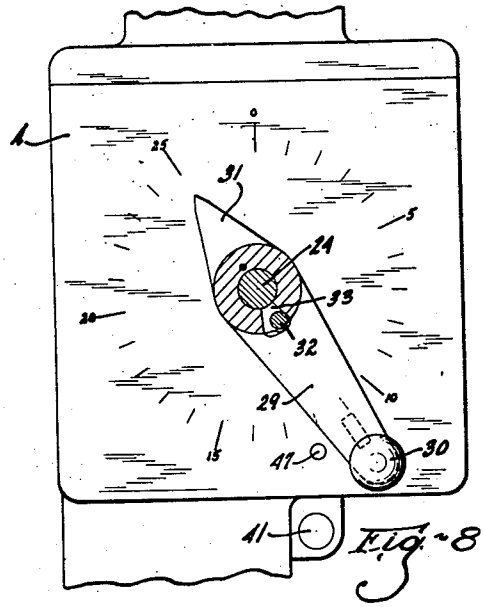


Fig. 8

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2,064,832

TIMING DEVICE

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Application April 5, 1933, Serial No. 664,598

4 Claims. (Cl. 161—1)

This invention relates to timing devices of the dashpot type such as are employed for controlling the duration of operations of machines such as commercial laundry washers.

Such a device should be capable of resetting at any time, either ahead or behind, and an object of this invention is to provide for such operation. A further object of the invention is to provide that such operations may be performed at a minimum effort and instantly, by improved means, as will appear.

The exact nature of this invention together with further objects and advantages thereof will be apparent from the following description taken in connection with the accompanying drawings, in which Fig. 1 is a front elevation of a timer embodying the invention, parts being broken away to show details of construction; Fig. 2 is an enlarged sectional detail of the dashpot mechanism appearing in Fig. 1; Figs. 3 and 4 are transverse sections of the same, as in the planes of lines 3—3, 4—4 respectively, Fig. 2; Fig. 5 is an enlarged detail generally in front elevation of the control head of the timer, parts being broken away to show details of construction and with parts in section as indicated by the line 5—5, Fig. 6; Fig. 6 is a sectional elevation as indicated by the line 6—6, Fig. 5, the parts in Figs. 5 and 6 being shown as in zero position; Fig. 7 is a sectional elevation as indicated by the line 7—7, Fig. 6, but the parts being shown as in set position; and Fig. 8 is a front elevation of the parts positioned as in Fig. 7, certain parts being broken away to show details of construction.

With reference now to the drawings, the parts of the timer appearing Fig. 1, are a base 1, a pair of cooperative dashpot cylinder and plunger parts 2 and 3, a head 4 mounted on the upper end of the dashpot cylinder and containing mechanism to be described, and a signal device 5.

With reference first to the dashpot parts, the dashpot itself is formed simply by the cylinder 2 closed at its lower end by the base 1, and in which the plunger moves, upwardly in setting direction, and downwardly in timing direction, as will appear.

The plunger 3 is weighted as by the heavy part 6 spaced well above the plunger proper as by webs 7, three being shown, so that a cavity 8 of very substantial volume is provided between the head and weight parts 3 and 6 of the plunger and around the web parts 7. All of these plunger parts may be integral, to slide as a unit in the cylinder 2, as indicated. That the plunger may be raised when desired for adjustment in setting direction, its upper end is provided with a cap 9, engageable by a collar 10 secured upon a rod 11 as by a shoulder 12, the collar 10 lying within a central opening 13 in the plunger. The rod 11 is a loose fit in the cap 9 so that the rod may have relative downward motion in the plunger, from the position indicated Fig. 2, but will raise the plunger if moved upwardly from that position.

For fluid pressure release during adjustment of the plunger, the head part 3 of the plunger has a through opening 14 closed by a valve 15, having its stem 16 extending upwardly through a boss 17 between the webs 7, where it carries a collar 18 secured as by a pin 19. The rod 11 extends downwardly so that its lower end 11*a*, positioned within the collar 18, lies adjacent the end of the stem 16 of the valve 15 when the valve is seated. A compression spring 20 is arranged about the valve stem 16, to bear between the boss 17 and collar 18 to yieldably maintain the valve 15 seated.

A pipe connection 21 is provided on the dashpot between the cavity 8 above the plunger head 3 and the cavity 22 therebelow. The connection 21 includes a needle valve 23 as indicated Fig. 2, whereby flow through the connection is restricted and adjustable and the rate of plunger movement in timing direction thereby controlled; the ends of the connection 21 joining the cylinder at points which will always be on opposite sides of the plunger head.

Operation of the dashpot mechanism will be as follows, commencing with the cavities 8 and 22 full of fluid such as liquid oil, and the plunger at the bottom of its stroke. If the rod 11 be raised it will raise the plunger, and the pump plunger will move freely because the valve 15 will automatically open, permitting flow from the cavity 8 to the cavity 22, past the plunger head 3 by way of the passage 14.

If the rod 11 be released thereafter, the valve 15 will automatically seat, and the weight of the plunger will force the liquid to flow from the cavity 22 to the cavity 8 by way of the connection 21. Such flow being restricted by the needle valve 23, the plunger will move downwardly slowly, at a constant speed and one dependent upon the setting of the valve 23.

If the rod 11 be lowered relative to the plunger during this time, its end 11*a* will unseat the valve 15, permitting flow from the cavity 22 to the cavity 8 by way of the opening 14 so that the plunger will move freely with the rod until the latter is released.

It will be observed that the connection 21 com-

prises a restricted plunger bypass for timing the plunger motion, and the valved opening 14 provides a pressure relief for the plunger, automatically opening dependent upon operation of the rod 11 in either direction.

With reference now to Figs. 6–8 of the drawings the head 4 is in the form of a housing fitting over the upper end of the dashpot cylinder 2. A shaft 24 upon which is secured a pinion 25 is mounted in this housing, and a rack 26 is secured upon the upper end of the rod 11 and arranged to mesh with the pinion 25, as by a backing roller 27. Obviously the arrangement is one whereby adjustment of the shaft 24 controls that of the rod 11 and consequently that of the plunger as described.

The shaft 24 at one end bears in the housing 4 only through the bushing effect of a sleeve extension 28 on a lever 29 handled as at 30. At the end of the shaft 24 an indicator or pointer 31 is secured, to move over the graduated dial appearing on the face of the housing. The extension 28 is rotatable in the housing, as is the shaft 24 in the extension; but a limited relative motion only is permitted between the extension and the shaft, by a pin 32 carried by the lever 29 and extending into a short segmental slot 33 in the indicator 31 secured with the shaft. A torsion spring 34 is arranged as indicated Fig. 6, in a hollow 35 in the lever 29 to yieldably maintain the lever and indicator and their associated parts in the relative position indicated, Figs. 5 and 8.

A cam 36 having a notch 37 is secured upon the shaft 24. An adjacent cam 38 having a flat 39 is secured upon the sleeve 28. The relation of these cams to the lost motion connection provided by the pin and slot 32, 33, is such that when the handle and indicator parts 29 and 31 are related as urged by the spring 34, the notch 37 will be uncovered by the flat 39 of the cam 38; whereas when the handle 30 is moved clockwise relative to the pointer 31, to the limit of motion permitted by the slot 33, Figs. 6 and 8, the cam 38 will move to register with the slot 37, forcing from the latter whatever may lie therein and extend into the path of the cam 38.

A latch lever 40 pivoted as at 41 is urged toward the cams by an associated compression spring 42, and carries a latch dog 43 adapted to enter the notch 37 when the two cams 36 and 38 are indexed as indicated Fig. 5.

The operations which follow adjustment of the control handle 30 will be as follows, appreciating that when the control handle and pointer 31 are in zero position as in Figs. 5 and 6, the dashpot plunger is in lowermost position.

Adjustment of the handle 30 in the usual setting direction, clockwise Fig. 5, first moves the pin 32 to the far end of its notch 33, against the spring 34. This shifts the cam 38 in corresponding direction, relative to the cam 36, which is thus far stationary, to engagement with the dog 43, and thus moves the lever 40 against the action of its spring 42, to clear the notch 37. The parts are so proportioned and arranged that the dog 43 clears its notch as the pin 32 completes its lost motion. When this lost motion is completed, continued rotation of the handle through the desired angular adjustment is possible, the indicator following the handle. Motion of the indicator is accompanied by corresponding motion of the gear 25, which motion is transmitted through the rack 26 and rod 11 to the dashpot plunger.

The dashpot is thus raised to the desired level, which is limited by a pin 47 or other suitable means engageable with the adjusting lever 29, as indicated Figs. 5, 6, and 8.

Immediately upon release of the adjusting handle 30 it is moved by the spring 34 to its usual position opposite the indicator 31, and the dashpot plunger is released to the described slow timed downward motion, the dial on the face of the housing 4 being suitably calibrated, as in minutes, so that the ensuing downward timing stroke of the plunger will be of known duration.

Should it be desired to adjust the plunger in timing direction before the completion of its timed stroke, a counterclockwise adjustment of the handle 30 may be made at any time, the plunger relief valve 15 being automaticaly opened during this adjustment as has been described. Otherwise, as the plunger attains the lower extremity of its stroke, the latch dog 43 is caused by the spring 42 to engage the notch 37 of the cam 39, shifting the lever 40 and stopping the adjusting handle 30 and indicator 31 in zero position.

Controller means, for the apparatus whose operation is to be controlled by the device, is associated with the latch dog 43 to have movement between on and off positions responsive to the latch mechanism. As here shown, electric controller means are employed, including switch mechanism having open and closed positions.

A bridging contactor 44 is mounted upon the latch lever 40 to make bridging contact alternately between a pair of contactors 45 and a pair of contactors 46 dependent upon the position of the latch lever.

The contactors 46 may be arranged in the control circuit of the laundry washer or other machine with which the timing apparatus is to be employed. Thus setting of the adjusting lever 30 from zero position automatically starts the machine in motion and, dependent upon the position to which adjustment is made, presets the timing device to automatically stop the machine at the end of the timed period.

The contactors 45 may be arranged in the circuit of a lamp or other signal device within the head 5 or elsewhere. Thus at the completion of the timed period, the signal device will automatically become operative to indicate that the timed operation has been completed and consequently that the machine is in condition for further attention.

What I claim is:

1. In a timing device, a dashpot having a part movable in setting and timing directions, and means providing for free adjustment of said movable part at the will of the operator and comprising an operator-controlled control member, means connecting said movable part to said control member and permitting some motion therebetween, fluid pressure relief means for said dashpot including a yieldably seated valve arranged to automatically open during setting motion of said movable part, and means effective between said connecting means and said valve to unseat the latter when said connecting means is operated in the direction to adjust said movable dashpot part in timing direction.

2. In a timing device of the class described, a dashpot having a part movable in setting and timing direction, means for indicating positions of said part and having a cam with a notch, means for manually adjusting said part and including a cam, means operatively connecting said adjusting means with said movable dashpot part, and providing a lost motion therebetween, latch

means cooperative with both said cam means to engage the notch of said indicating means cam dependent upon the position thereof and the relative position of the adjusting means cam.

3. In a timing device of the class described, a dashpot having a part movable in setting and timing direction, means for indicating positions of said part and having a cam with a notch, means for manually adjusting said part and including a cam, means operatively connecting said adjusting means with said movable dashpot part and providing a lost motion therebetween, latch means cooperative with both said cam means to engage the notch of said indicating means cam dependent upon the position thereof and the relative position of the adjusting means cam, and controlled means operatively connected with said latch means to have on or off position dependent upon seating of said latch means in said notch.

4. In a timing device of the class described, a dashpot having a part movable in setting and timing direction, means for indicating positions of said part and having a cam with a notch, means for manually adjusting said part and including a cam, means operatively connecting said adjusting means with said movable dashpot part and providing a lost motion therebetween, latch means cooperative with both said cam means to engage the notch of said indicating means cam dependent upon the position thereof and the relative position of the adjusting means cam, spring means effective between said cams to yieldably relate them in latch-receiving position, and controller means operatively connected with said latch means to have on or off position dependent upon seating of said latch means in said notch.

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