

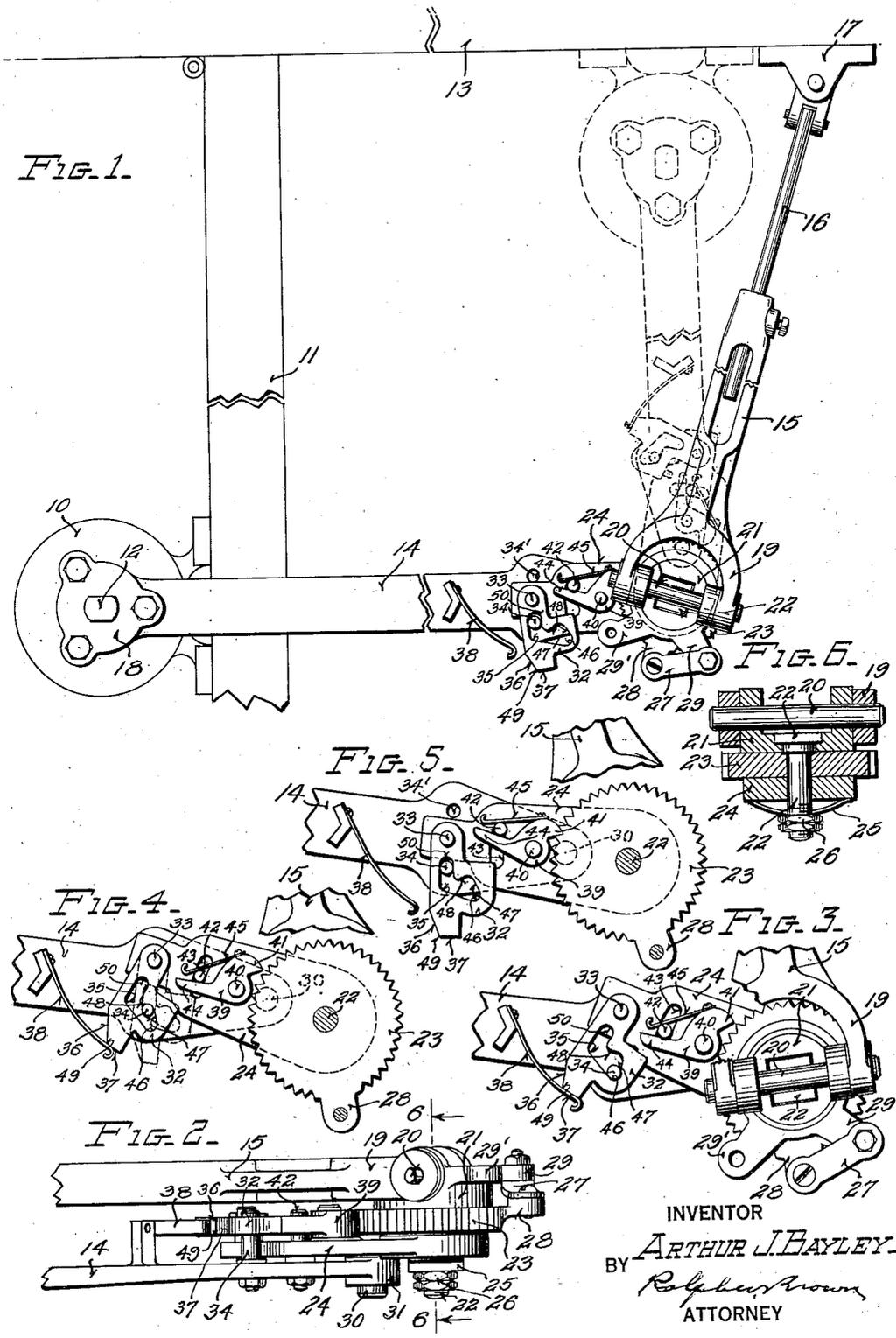
May 7, 1935.

A. J. BAYLEY

2,000,574

DOOR CONTROLLER

Filed Dec. 5, 1932



INVENTOR
ARTHUR J. BAYLEY.
BY *Ralph Brown*
ATTORNEY

UNITED STATES PATENT OFFICE

2,000,574

DOOR CONTROLLER

Arthur J. Bayley, Milwaukee, Wis.; Allen A. Bayley administrator of said Arthur J. Bayley, deceased

Application December 5, 1932, Serial No. 645,705

9 Claims. (Cl. 189-49)

This invention relates to door controllers.

Modern door closers are not infrequently equipped with devices for retaining the door in open position. Such devices, as heretofore designed, are ordinarily of the friction type, so that the door is rather insecurely retained, and in general such devices are incapable of retaining the door in more than one particular position.

One object of the present invention is the provision of an improved retainer device for door closers which, by a simple manipulation of the door, may be rendered effective to securely hold the door in any of a multiplicity of positions or released to permit the door to close under the action of the closer.

Another object is the provision in a retainer device of the character mentioned of temperature responsive means for automatically releasing the device, to thereby permit the door to close in the event of fire.

Other more specific objects and advantages will appear from the following description of an illustrative embodiment of the present invention.

In the accompanying drawing:—

Figure 1 is a top plan view of a door closer equipped with a retainer device constructed in accordance with the present invention.

Fig. 2 is a side elevation of the retainer device.

Figs. 3, 4, and 5 are top plan views of the retainer device shown in Fig. 1 with the parts thereof in different operating positions.

Fig. 6 is a sectional view on the line 6-6 of Fig. 2.

The door closer shown comprises a conventional housing 10, fixed to the door 11, and supporting the usual spring actuated spindle 12, which is connected to the door frame 13 through the actuator arm 14, loop arm 15, link 16 and bracket 17.

In this instance the actuator arm 14 is fixed to the spindle 12 through an adapter hub 18, designed to fit that particular spindle, and removably fixed to the end of the arm; and the arm 14 is rockably connected to the loop arm 15, preferably in a manner about to be described, so that the spindle and arms normally function to close the door in the usual manner.

In this instance the loop arm 15 is provided with an end yoke 19 rockably mounted upon a horizontal hinge pin 20 carried by a head 21. A square headed bolt 22, anchored in the head 21, extends downwardly through a ratchet wheel 23, and through the outer end of a rocker plate 24, the bolt being tensioned by an appropriate

spring 25 interposed between the plate 24 and nuts 26 on the bolt.

The ratchet wheel 23 is additionally connected to the head 21 preferably through a fusible link 27 which normally prevents relative rotation between the ratchet wheel and head. In this instance opposite ends of the link 27 are fixed to ears 28 and 29 projecting from the head and ratchet wheel, respectively.

The frictional engagement between the plate 24 and ratchet wheel 23 tends to resist relative rotation therebetween, and the degree of this resistance may of course be regulated by adjustment of the nuts 26.

The plate 24 is rockably connected with the actuator arm 14 through appropriate means, such as a stud 30 which extends downwardly from an intermediate portion of the plate into an appropriate hub 31 on the end of the arm 14. The plate 24 thus constitutes a rockable extension of the actuator arm.

The rocking action between the plate 24 and actuator arm 14 is limited and controlled by a link 32, which is rockably connected, as at 33, to the inner end of the plate. An upright pin 34, fixed to the arm, projects into and coacts with an irregular cam slot 35 formed in the link. The free end of the link is provided with angular cam faces 36 and 37 which coact with a spring 38 carried by the arm 14 in a manner to be later described.

The rocker plate 24 carries a pawl 39 pivoted at 40 and having a tooth 41 for engagement with the ratchet wheel 23. The pawl is controlled by a pin 42 which projects upwardly from the arm 14 through an appropriate slot 43 in the plate 24. The pin 42 is engaged with and between a tail 44 on the pawl and a spring 45 fixed to the pawl.

The arrangement is such that opening movement of the door causes the arm 14 to swing counter-clockwise with respect to the arm 15 and ratchet wheel 23. Since the rocker plate 24 is frictionally restrained against rocking movement with respect to the ratchet wheel 23 and arm 15, the arm 14 swings counter-clockwise with respect to the plate 24 during the initial opening movement of the door, and the pin 42, carried by the arm 14, acts on the tail 44 of the pawl 39 in such direction as to pull the tooth 41 thereof away from the ratchet wheel, and at the same time the pin 34, also carried by the arm 14, moves into the outer end 46 of the slot 35 in the link 32, causing the parts to assume the position shown in Fig. 3.

During continued opening movement of the

door, the plate 24 and arm 14 swing, as a unit, in a counter-clockwise direction with respect to the arm 15 and ratchet wheel, the pawl 39 and link 32 retaining their relative positions, as indicated in Fig. 3. In this position of the link 32 the spring 33 bears squarely against the cam face 37 of the link.

Then if the door is released and permitted to move freely toward closing position, by the action of the closer, the arm 14 first swings clockwise with respect to the plate 24, so that the pin 34 leaves the outer end 46 of the slot 35 in link 32 and, following the wall 47 of the slot, engages a stop shoulder 48 in the slot, as indicated in full lines in Fig. 4. During this action the pin 42, acting on the spring 45, shifts the pawl 39 slightly but not far enough to effect engagement of the tooth 41 with the ratchet wheel. The engagement of the pin 34 with the stop shoulder 48 prevents further relative movement between the arm 14 and plate 24, so that thereafter the arm 14 and plate 24 swing, as a unit, in a clockwise direction with respect to the ratchet wheel and arm 15, and the door completes its closing movement.

If it be desired, however, to secure the door in open position, the closing movement of the door is manually interrupted, and thereafter the door is given a slight opening movement from the point of interruption, followed by a closing movement. This sequence of operations shifts the tooth of the pawl 39 into engagement with the ratchet wheel 23, in a manner about to be described, so that the plate 24 and arm 14 are locked against clockwise movement with respect to the ratchet wheel and arm 15, thereby causing the door to be locked in the position in which this engagement occurs.

As above pointed out, it will be again noted that during initial closing movement of the door the pin 34 moves from the outer end 46 of the slot 35 into engagement with the shoulder 48, and, as it follows the wall 47 of the slot, it shifts the link 32 slightly, so that the spring 33 ultimately bears against the high point 49 between the cam surfaces 36 and 37 of the link in such manner as to urge the link toward the right. (See Fig. 4.) The spring 38 is ineffective to tilt the link 32 however, during closing movement of the door, by reason of the engagement of the pin 34 with the shoulder 48. But when the closing movement of the door is interrupted and the door given a slight opening movement, the pin 34 withdraws from engagement with the shoulder and the link 32 promptly swings into the dotted line position of Fig. 4, under the action of the spring 38. Then when the door is again released and permitted to continue its closing movement, the arm 14 swings clockwise with respect to the plate 24 until the pin 34 engages the inner end 50 of the slot 35. (See Fig. 5.) During this further relative movement between the arm 14 and plate 24, the pin 42 acts against the spring 45 on the pawl so as to urge the tooth of the pawl into engagement with the ratchet wheel 23. When this engagement occurs the arm 14 and plate 24 are locked against further clockwise movement with respect to the ratchet wheel 23 and arm 15, and the door is thus securely held against further closing movement.

Thus by proper manipulation of the door the ratchet mechanism above described may be rendered effective to positively secure the door against closing movement in any of a large number of positions between its fully open and completely closed position.

To release the door from a held position, the

door is merely swung further open until, by the consequent counter-clockwise movement of the arm 14 relative to the plate 24, the pin 34 has again been shifted into the outer end 47 of the slot 35 in the link 32, and until the pin 42, acting on the tail 44 of the pawl, has withdrawn the pawl from engagement with the ratchet wheel 23. The pawl 39 and link 32 are thus returned to the positions shown in Fig. 3, and the door, when manually released, is free to effect a complete closing movement in the manner previously described.

Provision is also made for automatically releasing the door from a held position so as to permit prompt closing thereof in the event of fire. In this instance this is accomplished by the use of the fusible link 27, which normally holds the ratchet wheel 23 against rotation relative to the arm 15. If the link 27 is destroyed by the heat of a fire, the ratchet wheel 23 is of course released and the arm 14 is then free to swing with respect to the arm 15 even though the pawl 39 and ratchet wheel are engaged.

The device hereinabove described is shown applied to a right handed door, but it may be readily converted for use on a left handed door by connecting the fusible link 27 to a second ear 29' on the ratchet wheel instead of to the ear 29; by inverting the pawl 39, link 32, and spring 38; by transferring the pin 34 into a second hole 34' in the arm 14; and by similarly transferring the pin 42.

Various changes may be made in the embodiment of the invention hereinabove specifically described without departing from or sacrificing the advantages of the invention as defined in the appended claims.

I claim:—

1. In a door controller the combination of a door closer, door retainer mechanism, means responsive to manipulation of the door for rendering said mechanism effective to lock the door against closing, said mechanism being releasable in response to other manipulation of the door, and temperature responsive means for rendering said mechanism ineffective to thereby render said closer effective to close the door in the event of fire.

2. In a door controller the combination of a door closer, door retainer mechanism operable to lock the door against closing in any of a plurality of positions of the door, means responsive to manipulation of the door to render said mechanism effective in any of said positions, said mechanism being releasable in response to other manipulation of the door, and temperature responsive means for rendering said mechanism ineffective to thereby render said closer effective to close the door in the event of fire.

3. In a door controller the combination of a door closer having a pair of interconnected relatively movable arms, an element rockably connected with one of said arms and pivotally connected with said other arm, means for yieldably resisting pivotal movement between said element and said last mentioned arm, a ratchet on said last mentioned arm, a pawl on said element engageable with said ratchet, means responsive to rocking movement between said first mentioned arm and said element for shifting said pawl into and out of engagement with said ratchet, and means controlled by said first mentioned arm for controlling the extent of rocking movement between said first mentioned arm and said element.

4. In a door controller the combination of an arm having a rockable extension, a second arm pivotally connected with said extension, ratchet mechanism operable to prevent pivotal movement
5 between said extension and said second arm in one direction, means responsive to relative rocking movement between said first named arm and said extension for rendering said ratchet mechanism effective or ineffective, and means for controlling relative movement between said first
10 named arm and said extension.
5. In a door controller the combination of an arm having a rockable extension, a second arm pivotally connected with said extension, ratchet
15 mechanism operable to prevent pivotal movement between said extension and said second arm in one direction, and means responsive to certain sequential movements of said first named arm relative to said extension to render said ratchet
20 mechanism effective and also responsive to certain other sequential movements of said first named arm relative to said extension to render said ratchet mechanism ineffective.
6. In a door controller the combination of a
25 door closer, a ratchet, a pawl engageable with said ratchet to control said closer, and means responsive to manipulation of said door for advancing or withdrawing said pawl into or out of engagement with said ratchet to thereby alter-
30 natively hold the door in any of a plurality of open positions or permit the same to close.
7. In a door controller the combination of two parts connected to a door and door frame, respectively, and relatively movable in response to movement of the door, a ratchet on one of said parts, a coacting pawl movable with the other of said parts, and means movable relative to both of said parts in response to manipulation of the door for advancing or withdrawing said pawl into or out of coacting engagement with said ratchet to thereby alternatively hold the door in any of a plurality of open positions or permit the same to close. 5
8. In a door controller the combination of two
10 parts connected to a door and door casing, respectively, and relatively movable in response to movement of the door, an element movably connected with both of said parts, a ratchet on one of said parts, a coacting pawl movable with the
15 other of said parts and means responsive to relative movement between said element and said other of said parts for advancing or withdrawing said pawl into or out of coacting engagement with said ratchet. 20
9. In a door controller the combination of two parts connected to a door and door casing, respectively, and relatively movable in response to movement of the door, an element rockably connected with both of said parts, means for frictionally resisting relative movement between said
25 element and one of said parts, a ratchet on said last mentioned part, a pawl on said element, and means responsive to relative movement between said element and the other of said parts for advancing or withdrawing said pawl into or out of
30 coacting relation with said ratchet.

ARTHUR J. BAYLEY.