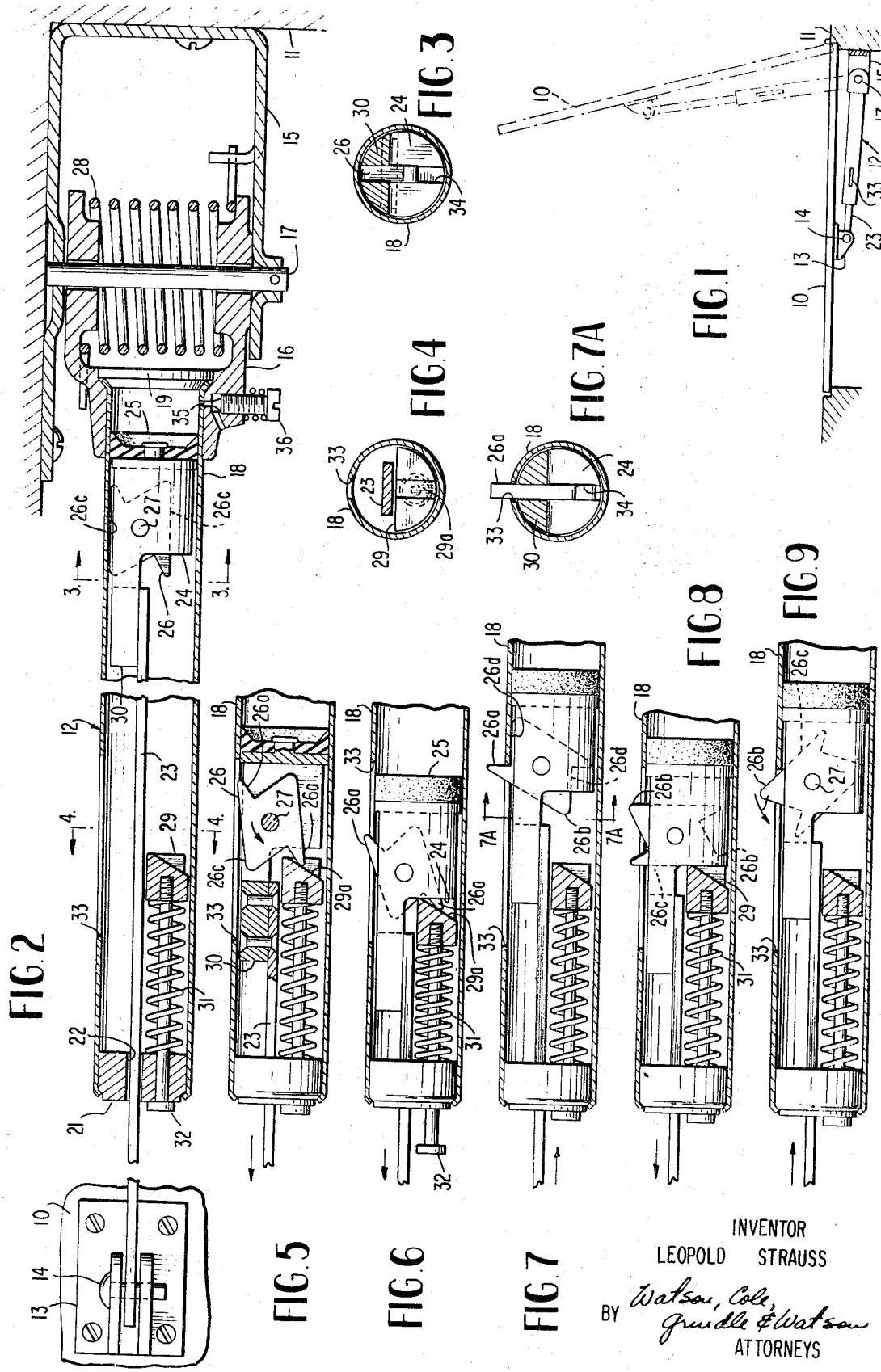
Nov. 10, 1970 L. STRAUSS 3,538,537

COMBINATION DOOR RELEASE AND DOOR CHECK

Filed Jan. 23, 1969



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United States Patent Office 3,538,537
Patented Nov. 10, 1970

3,538,537

COMBINATION DOOR RELEASE AND DOOR CHECK

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Filed Jan. 23, 1969, Ser. No. 793,343
Int. Cl. E05f 3/00
U.S. Cl. 16—66 5 Claims

ABSTRACT OF THE DISCLOSURE

A dashpot type door closer and door check having a latch means therewithin for maintaining the door in a fully open position and being easily releasable for allowing the door to close in a normal manner when desired.

This invention relates generally to a door movement apparatus and more particularly to an apparatus for holding a door in a fully open position and also acting as a buffer when released from such an open position and in the process of closing.

In the new and old building constructions of today, it has become generally customary to use storm doors, screen doors and the like as auxiliary closures mounted outside the primary doors. A dashpot or tension spring or both is customarily used to return and close such an auxiliary closure with controlled velocity after it has been released by the user. Although such means are relatively practical and economical they fail to maintain the auxiliary door in any position but closed, so that the user may be unable to control the door in open position and when closing, as when both arms are occupied, or when the user is in a wheelchair or the like, the spring or other closure means will exert a force to move the auxiliary closure to its closed position and interfere with the person's entry therethrough. Although the use of a dashpot lessens the return velocity of the closure as compared to that of a spring, the door is nevertheless moved into closed position in too short a period of time to permit unobstructed passage. Such a situation may prove hazardous especially to handicapped persons or one whose both hands are occupied.

Accordingly, it is an object of the present invention to provide a device for application to doors which will act as a door holder when desired, as well as a door check, that is, a buffer to close the door without any undue slamming, and a door closer.

Another object of the instant design is to provide a door holder capable of maintaining the door in a fully open position and which is conveniently and simply releasable upon only a slight motion of the door.

A still further object of the instant invention is to provide such an apparatus which is simple in design, economical in manufacture and easy to install on auxiliary doors of conventional construction.

In summary, the invention comprises a conventional type dashpot combination door closer and door check having a hollow cylindrical tube closed at both ends with a slidable piston head maintained therewithin and a rod attached thereto and extending through one end of the tube. A star wheel in the shape of an oblique parallelogram with projections thereon is rotatably mounted within the piston head, and a bumper head, coil spring and rod are fixed within the tube at one end. The tube is provided with an elongated slot near the bumper head so that, as the door is moved from a closed to a completely open position, the latch moves toward the bumper head and makes contact therewith whereby the latch is rotated out of the piston head through the slot and in engagement therewith for holding the door in an openly held position. The bumper and coil spring act to protect the door

from being overstrained since continued extension of the piston rod will bring the piston head into contact with the bumper head and will accordingly compress the spring. Also, the bumper spring provides a "feel" or extra force to the person opening the door signalling that the latching operating position has been reached. In order to release the latch and close the door the user simply ajars the closure from its latched or "hold" position so that the latch once again made to contact the bumper head and further rotate out of engagement with the slot, whereafter a still further rotation of the latch will take place as the latch and its piston head move away from the bumper head with the latch contacting the edge of the slot.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of an auxiliary closure door shown in its completely closed and open position;

FIG. 2 is a longitudinal side view in cross-section of the door apparatus according to the present design;

FIG. 3 is a cross-sectional view taken substantially along the line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken substantially along the line 4—4 of FIG. 2;

FIGS. 5 through 9 are partial longitudinal side elevational views similar to FIG. 2 showing the door latch in various positions of rotation as the door is open and closed; and

FIG. 7A is a cross-sectional view taken substantially along the line 7–A, 7–A of FIG. 7.

Referring now to the drawings wherein like reference characters refer to like and corresponding parts throughout the several views, there is shown in FIG. 1 a door **10** mounted for pivotal movement on a door jamb **11**. A combination door check and door holder **12** is secured to the door **10** by means of a door bracket **13** in a manner so as to pivot on a pin **14**, shown more clearly in FIG. 2. The opposite end of the door checker **12** is secured to the door jamb **11** by means of a jamb bracket **15** for pivotal movement about the pin **17**. So far, the door check **12** is of a conventional design and is mounted in a normal manner such that further detailed description thereof is not believed necessary.

Turning now to FIG. 2 of the drawings, a sectional longitudinal side view of the door check and its mounting apparatus can be seen wherein a hollow, elongated cylindrical tube **18** is provided with a cylinder head **21** at one end and a plug **19** at its opposite end. The plug end of the tube is mounted within a bearing bracket **16** of conventional construction which in turn is rotatably mounted for movement within the jamb bracket **15** by means of a shaft or a pin member **17**. The door **10** is urged from its fully open position, as shown in phantom in FIG. 1, to its closed position by means of a torsional closing spring **28** positioned concentric with the shaft **17** and extending between and through an arm of the bearing bracket **16** and a side wall of the jamb bracket **15**. The dashpot or door check **12** contains a piston head **24** mounted for longitudinal sliding movement within the tube **18**, a piston cup **25** of conventional design being secured to one end of the piston head. A rod member **23** is affixed to the piston leg **30** at one end and is extended through an aperture **22** to the outside of the tube **18** so that it may be pinned as at **14** to the door bracket **13**.

The description of dashpot **12** has so far not departed significantly from such devices operating in a normal manner since the disclosed door check merely acts to buffer the closing of the door **10** as the piston head travels from its position at rest, shown in FIG. 2, to its position of contact with bumper head **25** and back again to its re-

laxed position taking in air through aperture **35** as the door opens and compressing it therethrough as the piston head **24** returns to its position, as shown in FIG. 2. Also, it should be recognized that a conventional adjusting plug **36** can be provided to regulate the buffering action of the dashpot in the usual manner and that the inclusion of a closing spring **28** serves as a means for continuously urging the door **10** toward its closed position.

However, in order to provide the door-operating apparatus with a means for holding the door in its fully open position, a latch 26 is provided within piston head **24** and is mounted for rotational movement about a pin **27**, as clearly shown in FIG. 3. Also, an abutment or bumper head **29** is threaded to one end of a capped rod **32** which is inserted through a suitable aperture in the cylinder head **21** and a coil spring **31** is positioned concentric with the rod **32** between head **21** and head **29** so that when it is compressed, as is hereinafter described, the rod **32** will slide and extend out of the head **21**. The tube **18** is also provided with an elongated slot **33** of a width sufficient to accommodate the latch **26**, as shown in FIGS. 4 and 7A.

When the door **10** is closed and the piston head **24** is in its relaxed position, as shown in FIG. 2, it may be pushed open, as shown in phantom in FIG. 1, whereupon the latch **26** and piston head **24** with its attached cup **25** will approach the bumper head **29**, as clearly shown in FIG. 5. The latch **26** is in the shape of an oblique parallelogram with projections **26***a* provided, as shown, so that one of the flat edges **26***c* of the latch is always in sliding engagement with the inner wall of tube **18** as the latch approaches its position of FIG. 5. In this way, the latch is prevented from wobbling or partially rotating while it slides from its position of FIG. 2 to that of FIG. 5. When the door is fully opened, the projection **26***a*, as shown in FIG. 5, will begin to make contact with the bumper head **29** at the slanted surface **29***a* thereof which is merely a depression within the face of the bumper head. Accordingly, the latch **26** will begin to rotate in a counterclockwise direction, as shown by the arrow arc in FIG. 5, and the slot **33** will permit the opposite projection **26***a* of the latch to extend therethrough, as clearly shown in FIG. 6. At this point, the end of piston head **24** will make contact with the flat face of bumper head **29** such that, upon a slight further opening of the door, the spring **31** will begin to compress allowing the person opening the door to sense the spring **31** compression and be assured that the latch **26** has rotated to its position, as shown in FIG. 6, sufficiently through the slot **33**. As the door is then released by the user allowing the closing spring to move the door in a closing direction, the piston head and latch will begin movement to the right, as shown in FIG. 7, and the projection **26***a* will become fully engaged with one edge of the slot **33**. In this way, the door **10** is held in its open position since the projection **26***a*, in contact with the edge of slot **33**, and the side **26***b* of the latch, in contact with the tube **18**, will prevent return travel of the piston head to its relaxed position.

It should be recognized that, if the door is opened beyond its latch operating position, or wind or any other accidental force acts to continue door opening to an over travel position, this will cause compression of coil spring **31** and sliding movement of rod **32**, as clearly shown in FIG. 6, thereby preventing any overstrain of the door itself as the piston head **24** continues to contact the flat face of bumper head **29**. In order to unlatch the door from its rigidly-held position of FIG. 7, the user slightly ajars the door to a more fully open position so that the piston head and latch will again begin to move to the left, as shown in FIG. 8 of the drawings. Thereupon, the leg **26***b* of the latch will contact slanted surface **29***a* of the bumper head causing the latch to further rotate in a counterclockwise direction to a position where the flat edge **26***c* thereof is perpendicular to the longitudinal axis of the tube **18**. Again, the piston head **24** will make contact with the flat face of the bumper head **29**, and any further movement of the door to a more than fully open position will signal the user that the latch is in the position of FIG. 8 since any such further movement will begin to compress the spring **31**. The user then merely releases the door so that the piston head will begin to travel toward its relaxed position of FIG. 2 and, as the leg **26***b* of the latch contacts the edge of the slot **33**, as shown in FIG. 9, the latch **26** will complete its rotation and allow the piston head to complete its travel. As before, the flat side **26***c* of the latch will make sliding contact with the interior of tube **18** while returning to its position of FIG. 2.

From the foregoing, it can be seen that an extremely simple and efficient latch means has been devised for a dashpot type combination door closer and door check in a manner which is convenient to operate and easy to manufacture and readily adaptable to any door of conventional construction. The door operating apparatus of the above-described design not only urges the door to a buffered closing position but when desired permits the door to be latched in an open position and alternately released to its closed position by the user simply by ajarring the door to a further open position. This is done without the need for buttons or levers or without the use of any additional tools or separate latches or the like, but simply by means of a four point star latch wheel rotatably mounted within the piston head of the dashpot, a bumper means, and an elongated slot in the tube of the dashpot for allowing rotation of the latch through 180 degrees, all of which is installed as a compact unit in an otherwise conventional door operating apparatus. Also, since the bumper means includes a coil spring and slidable rod as aforedescribed, overstrain of the door itself is prevented every time the door is opened beyond its fully open position, and the user "feels" the latching position of the door.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. In a dashpot type door closing and door checking device comprising a first member pivotally mounted to a door jamb, a second member pivotally mounted to a door and slideable within said first member, latching means mounted in said second member, means for causing said latching means to engage with said first member in a first position to hold the door open, said means for causing engagement also causing disengagement of said latching means from said first member when said second member is moved to a second position, said engagement and disengagement means comprising an abutment for contacting said latching means in said first and second positions toward which said second member is moved.

2. In a dashpot type door closing and door checking device according to claim **1** wherein said latching means is shaped such that when said second member is sliding within said first member one side of said latching means is slideably guided by one side of said first member, and when said latching means contacts said abutment in said first position, said latching means is moved to a latch engaging position with said first member, and when said latching means contacts said abutment in said second position, said latching means is moved to a disengaged position with said first member.

3. In a dashpot type door closing and door checking device according to claim **2** wherein said first member comprises a hollow tube attached at one end to a pivot bracket, said tube having a longitudinal elongated slot in its tube wall near the end opposite said pivot bracket, said latching means being in the shape of an oblique parallelogram, whose sides are equidistant from its centroid, having projections at opposite obtuse corners thereof extending outwardly, one of said projections making

contact with said abutment in said first position, and the other of said projections engaging said slot for holding the door in its openly-held position.

4. In a dashpot type door closing and door checking device according to claim 3 wherein said second member comprises a piston head attached to a piston rod, said rod being keyed within said tube to prevent rotation and being slideable to extend out of one end of said first member, said latching means comprising a latch rotatably mounted in said piston head, the plane of said latch being coincident with the plane of said slot in said first member, and the axis of rotation of said latch being perpendicular to said plane.

5. In a dashpot type door closing and door checking device according to claim 4 wherein said abutment comprises a bumper head for contacting said latch when said rod is extended, and a compression spring, whereby said

spring compresses as said latch and said piston head contacts said bumper head, thereby permitting the door to open beyond its latch operating position and simultaneously rotate said latch to a latched position and alternately to an unlatched position.

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