

[54] **DOOR-CLOSING MECHANISM**
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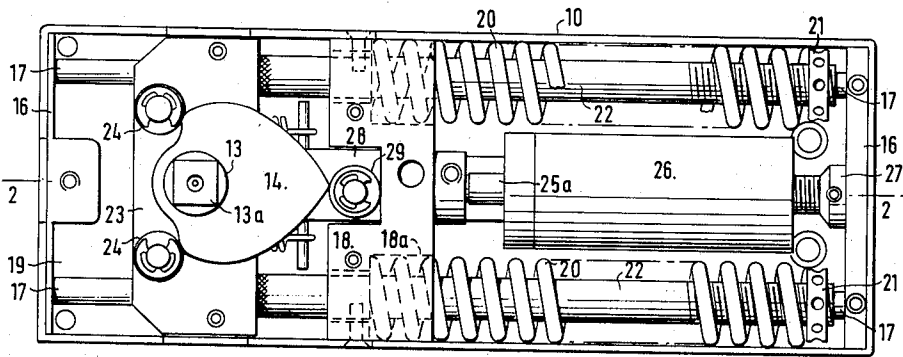
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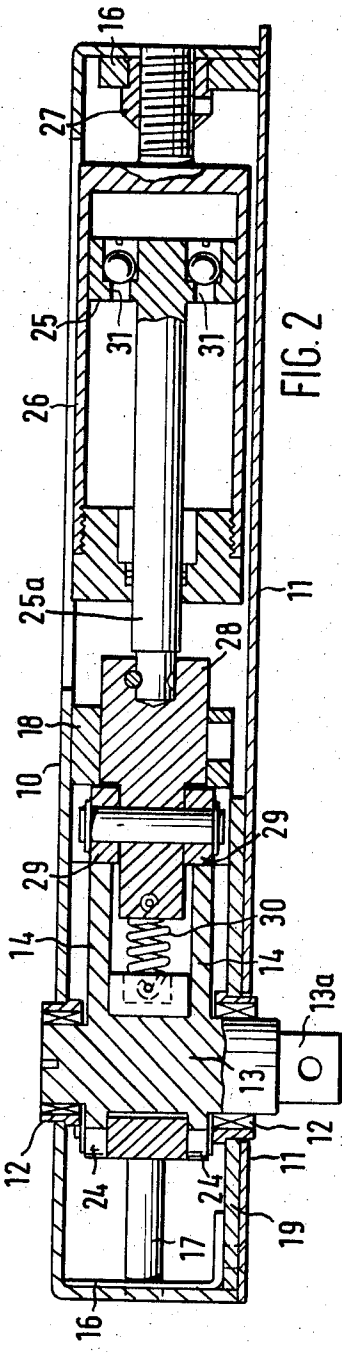
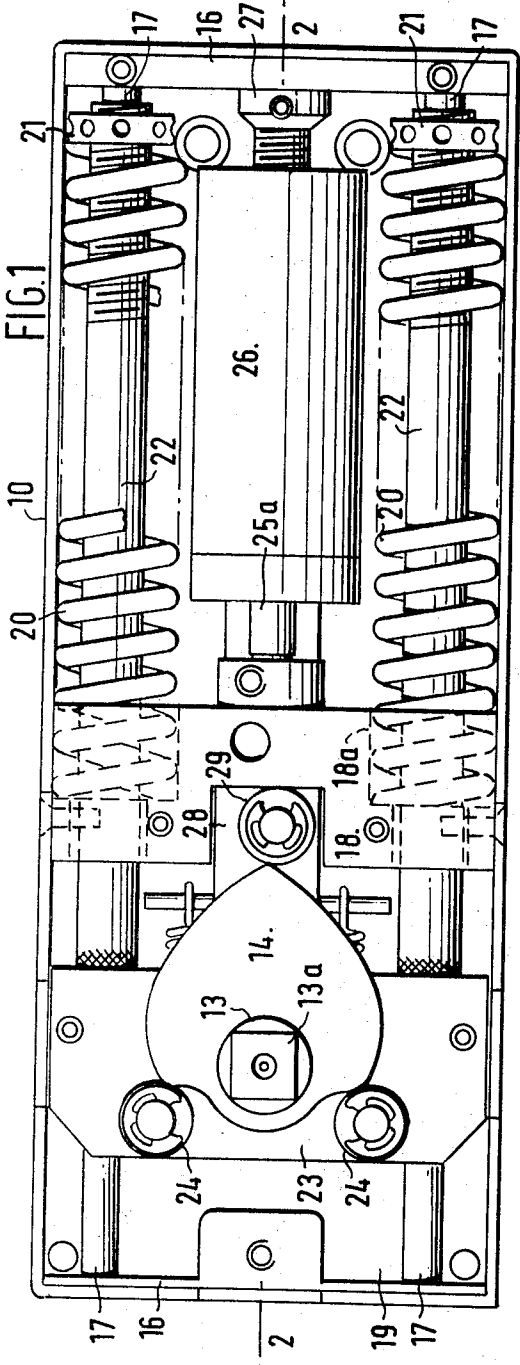
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[57] **ABSTRACT**
A door closer, suitable for fitting in the transom, has a pintle carrying cams with cam surfaces for stressing the return spring and setting the door check as the door is opened, the return spring and the check having separate cam followers disposed on opposite sides of the cam, the followers being connected by springs so as to be always held in contact with their respective cam surfaces.

1 Claim, 2 Drawing Figures





DOOR-CLOSING MECHANISM

This invention relates to door-closing mechanisms of the class comprising a return spring or springs arranged to be stressed during opening of the door and to cause door closure, and a fluid check which is effective to limit the rate of door closure under the action of the return spring or springs.

The invention is particularly, though not exclusively, concerned to provide a construction of such mechanism suitable for mounting above a door, in the transom or lintel, instead of in the floor which is more usual. However the mechanism of the invention may be floor-fitted.

According to this invention, the door-closing mechanism of the class above referred to is housed in a box casing with a pintle journaled in the box casing to engage and turn with a door, the pintle carrying a cam which in door-opening rotation stresses the spring and prepares the check for action through respective cam followers slidable in the box and resiliently interconnected to be urged against opposite sides of the cam.

This arrangement, as compared with arrangements in which stressing of closure spring and setting of the check action are operated by a single cam-actuated bridle, enables the cam to have separate and distinct profiles governing closure spring stressing and check actuation and allows the followers to maintain contact with both sides of the cam throughout turning.

The accompanying drawings illustrate by way of example one form of door-closing mechanism and in the drawings:

FIG. 1 is a plan view with parts of the box omitted, and

FIG. 2 is a section on the line 2—2 of FIG. 1.

The door-closing mechanism as shown is designed for mounting in a transom or lintel above a door, but can be floor-fitted, and is housed in a box casing 10 with attachable cover plates 11 which will face the door.

The casing and cover plates carry needle roller bearings 12 for a pintle 13 which has a squared end 13a for engagement with the door so that these turn together. The pintle 13 has in one with it axially-spaced identical cams 14 which are roughly heart-shaped.

The box casing 10 has mounted in it by means of end plates 16 a pair of parallel guide rods 17 which extend the full length of the box casing. The casing 10 at about its mid length has secured to it a transversely-extending bridge block 18 and, to one side of this and below the cams 14, a bearing plate 19.

There are two closure springs 20 each of which bears by one end in a recess 18a in the bridge block 18 and by its other end against a capstan nut 21. The capstan nuts 21 are threaded on adjacent ends of respective compression tubes 22 which slide on the guide rods 17 and in bearings in the bridge block 18 and which have their opposite ends secured in a bridle block 23. This block 23 is slidable on the guide rods 17 and located between the cams 14 and carries two pairs of rollers 24 which in use run on the cams 14 to one side of the pintle 13.

The door check is centrally between the springs 20 and comprises a piston 25 working in cylinder 26 filled with oil. The check is adjustably mounted in the box

casing 10 by a threaded tail on the cylinder engaging a threaded bush 27 mounted in one end plate 16. The piston rod 25a has its end secured in a slide block 28 which is mounted in the bridge block 18 and which carries a pair of rollers 29 to run on the cams 14 at the side of the pintle 13 remote from the rollers 24.

The bridle block 23, rollers 24, the slide block 28 and rollers 29 constitute the cam follower arrangement and, to ensure that the rollers 24 and 29 maintain contact with the cams 14 at all times, the blocks 23, 28 are interconnected by tension springs 30 which draw the blocks 23, 28 towards one another. Thus the ranges of movement of the two blocks 23, 28 can be different and appropriate for compressing the springs 20 and for preparing the fluid check for limiting the rate of door closure respectively whilst maintaining contact with the cams.

On rotation of the pintle from the position shown in FIG. 1, the bridle block 23 is moved along the guide rods 17 to compress the springs 20 and, at the same time, due to the effect of the springs 30 the rollers 29 are constrained to run down the cams 14 away from their peaks, so that the piston 25 is moved to the left, the fluid in the cylinder passing freely through valve controlled passages 31 in the piston.

When the pintle is released to allow the associated door to close, the closure springs 20 acting through the bridle block 23, rollers 24 and cams 14 cause the pintle and door to turn back to the initial position so forcing the slide block 28 and the piston 25 to the right, this movement being at a rate dependent on the restricted fluid flow past the piston 25.

We claim:

1. A door-closing mechanism comprising a box casing; a pintle journaled in said box casing adjacent one end thereof and adapted to engage and turn with the door; cam means carried by the pintle so as to turn therewith; return spring means comprising compression coil spring means, a bridge block fixed in said box casing adjacent the cam means on the side thereof remote from said one end of the box casing, said block forming a fixed abutment for the coil spring means, movable abutment means for the coil spring means, said movable abutment means being disposed adjacent the other end of the box casing and being movable towards and away from the cam means, and a cam follower connected to move with the movable abutment means and comprising a first block slidable in the box casing between the cam means and said one end of the box casing and first rollers mounted on the first block contacting the cam means; a fluid check within the casing adjacent the coil spring means and including a second block mounted to slide in the bridge block towards and away from the cam means and second rollers mounted on the said second block and contacting the cam means on the side thereof remote from said first rollers; and tension spring means interconnecting said slidable blocks and urging them towards the cam means; said cam means, upon rotation during door opening, moving said first block towards said one end of the box casing thereby compressing said coil spring means and increasing the tension in said tension spring means so as to move the said second block and prepare the fluid check for door closing operation.

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