Mar. 27, 1923.

B. CAPRA.

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REVERSIBLE DOOR CHECK.

FILED JUNE 5, 1922.

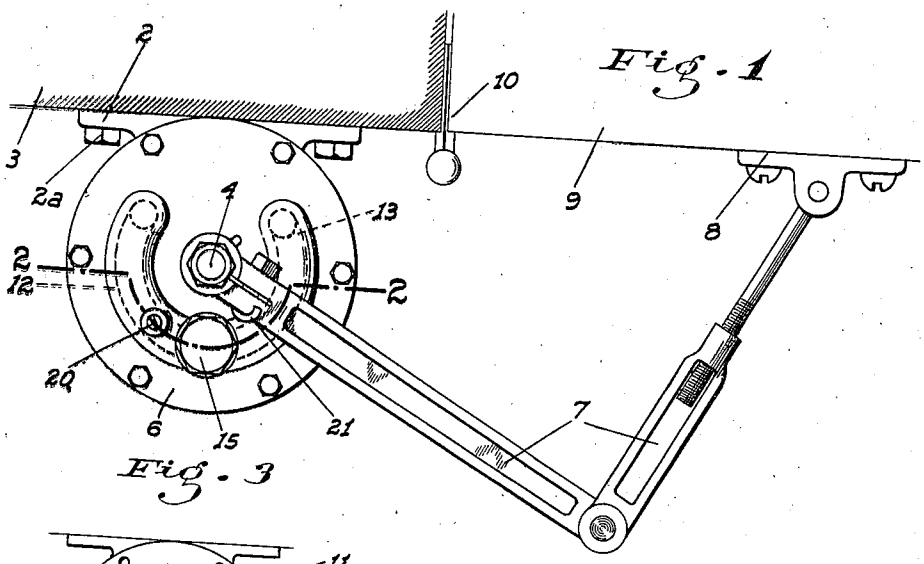


Fig. 1

Fig. 3

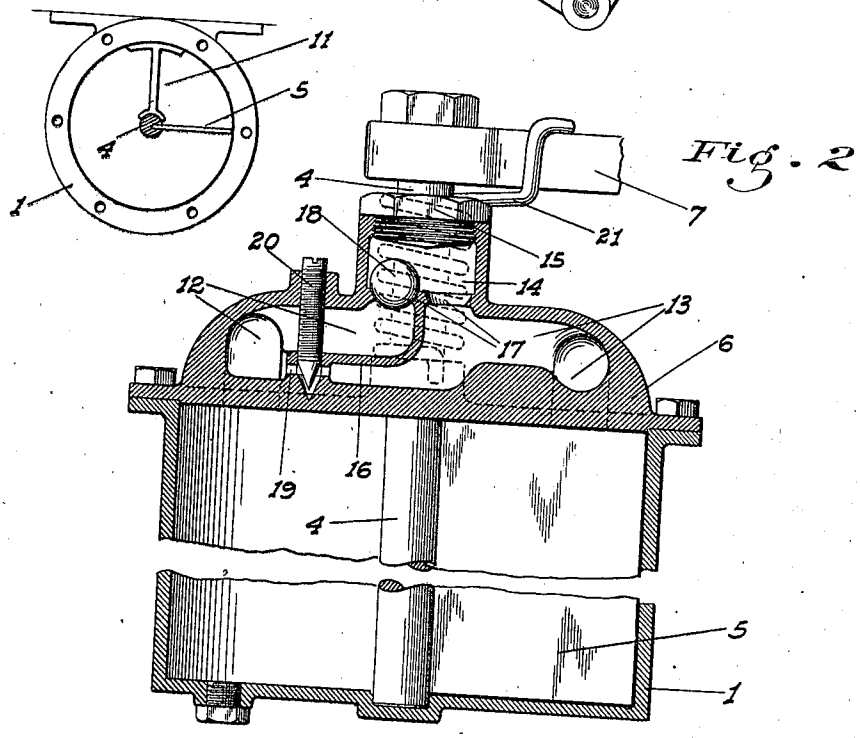


Fig. 2

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UNITED STATES PATENT OFFICE.

BENEDETTO CAPRA, OF SACRAMENTO, CALIFORNIA.

REVERSIBLE DOORCHECK.

Application filed June 5, 1922. Serial No. 565,837.

To all whom it may concern:

Be it known that I. BENEDETTO CAPRA, a citizen of the United States, residing at Sacramento, county of Sacramento, State of California, have invented certain new and useful Improvements in Reversible Doorchecks; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in door checks such as are used to automatically cause the closing of a door while checking the closing movement and preventing the slamming thereof, the principal object of my invention being to provide a device of this character which is reversible, and by making a simple adjustment may be used either for a door which opens in a right hand direction, or for one opening in the opposite direction.

I have also provided a simple means for controlling the speed of the closing movement of the door to which the device is attached.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a top plan view of the device, as installed in connection with a door and frame.

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1.

Fig. 3 is a detached top plan view of the casing and parts therein, with the cover removed.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a casing, preferably cylindrical and permanently closed on the bottom, and provided with ears or lugs 2 on the outside whereby it may be secured by bolts or screws 2^a to a door frame 3.

The axis of this casing is vertical, and extending axially thereof from top to bottom is a shaft 4, on which is fixed a vane 5 making a snug fit with the bottom and sides of the casing, as well as with the inner surface of a removable cover member 6 on the casing, and through which the shaft 4 projects, and in which it is journaled.

On the upper end of the shaft is fixed one end of an adjustable and horizontal toggle-joint mechanism 7, the opposite end of which is pivoted onto a bracket 8 which is adapted to be secured to a door 9 a suitable distance from its hinged edge 10.

Either formed with, or filled in the casing 1, and extending from top to bottom and from the shaft to the adjacent casing wall is a division wall 11, preferably disposed radially with respect to the axis of the casing and at right angles to the plane of the lugs 2 and frame 3. This wall makes close contact with the different parts along all its edges.

Formed in the cover 6 and leading from the casing on opposite sides of the wall 11 are passages 12 and 13, extending to a chamber 14 common to both, said chamber being normally closed on top by a removable plug 15.

A transverse partition 16 below the chamber divides the passages, while seats 17 for a ball valve 18 are formed in the passageways on opposite sides of the partition at the junction of said passageways with the chamber 14.

A by pass 19 extends through the partition 16 from one passage to the other, the opening through the by pass being regulated by an adjustable needle valve 20 or similar device.

A spring 21 about the shaft acts, when the ball valve is positioned as shown, to hold the vane 5 opposite to the entrance of the passageway 12 into the casing, and the door 9 closed.

It is to be understood that the limit of movement or sweep of the vane is such that the passage inlets to the casing are always separated by said vane.

It is also to be noted that the plug 15 projects into the chamber 14 in such relation to the ball that while the latter is free to raise off which ever seat it occupies, it is held from such an extent of upward movement as would permit it to flop over onto the other seat.

In operation, the casing is partially or completely filled with oil. Assuming the valve to be seated as shown, and the door

to be opened, the movement of the vane will cause the oil to be forced from the casing ahead of the vane into the passage 13, and thence back to the casing behind the vane. These passages are made as large as possible, so as to offer but little obstruction to the flow of the oil, and so allows the door to be quickly opened.

When the pressure on the door causing the same to be opened is removed, the spring 21 acts on the toggle arms 7 to close the door, at the same time imparting a turning movement to the shaft 4 the reverse of that had when the door was opened, and so moving the vane 5 in the opposite direction to that previously had. The oil then will tend to be forced through the passage 13 and into the passage 12, but the ball 18 in the latter is now seated and prevents the flow of oil therepast. The only outlet for the oil is therefore through the by pass 19, which being relatively small, will allow only a slow movement of the vane and shaft, which controls the closing of the door, so that the latter will shut without a slam.

The extent of duration of this slow movement is governed by the quantity of the oil in the casing, since if the latter is only about half full, the initial closing of the door may take place quickly, owing to the action of the spring 21, before the oil is confined by the vane sufficiently for it to exert a cushioning action against further free movement of the vane.

If the device is to be placed in connection with a door opening in the opposite direction from that shown, the plug 15 is removed, and the ball shifted from one seat to the other, thus changing the direction in which the oil may flow freely from one passage to the other.

The spring 21 must also of course be replaced by one acting in the opposite direction, but otherwise no changes are necessary to adapt the device to a door opening as stated.

From the foregoing description it will be readily seen, that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing and having a working fit therein, passageways leading from the casing on opposite sides of the closure and communicating with a common chamber outside the casing, valve seats in said chamber above the passages, and a valve member interchangeable at will normally seating on one of said seats.

2. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing a vane on the shaft movable in the casing and having a working fit therein, passageways leading from the casing on opposite sides of the closure and communicating with each other outside the casing, a check valve interposed in the passageways and means whereby the setting of said valve may be altered at will to cause it to open with a flow through said passageways in a direction the opposite of that had with the first named position of the valve.

3. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing and having a working fit therein, passageways leading from the casing on opposite sides of the closure and communicating with a common chamber outside the casing, valve seats in said chamber above the passages and means whereby a free flow through the passages in either direction may be permitted while a flow in the corresponding opposite direction is prevented.

4. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing, passageways leading from the casing on opposite sides of the closure and communicating with each other outside the casing, a check valve interposed in the passageways, and a relatively small passage between the first named passageways and by passing around the check valve.

5. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing passageways leading from the casing on opposite sides of the closure and communicating with each other outside the casing, a check valve interposed in the passageways, and a relatively small passage between the first named passageways and by passing around the check valve, and an adjustable member for regulating the size of said by pass.

6. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing and having a working fit therein, passageways leading from

the casing on opposite sides of the closure and communicating with a common chamber outside the casing, valve seats in said chamber above passages, a valve member normally occupying one of said seats, and means whereby said valve may be shifted to the other seat at will.

7. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing and having a working fit therein, passageways leading from the casing on opposite sides of the closure and communicating with a common chamber outside the casing, valve seats in said chamber above the passages, a valve member normally occupying one of said seats, and a removable plug for said chamber above the valve, said plug allowing the valve to raise sufficiently to freely clear its seat but insufficient to allow it to shift over onto the other seat.

8. A door check comprising an enclosed casing, a shaft turnable therein, a closure between one edge of the shaft and the adjacent face of the casing, a vane on the shaft movable in the casing and having a working fit therein, passageways leading from the casing on opposite sides of the closure and communicating with a common chamber outside the casing, valve seats in said chamber above the passages, horizontal and spaced valve seats in the chamber at the adjacent ends of the passageways, a ball occupying one of said seats, and a removable plug for the chamber providing access thereto and acting when in position to prevent shifting of the ball from one sheet to the other.

In testimony whereof I affix my signature.

BENEDETTO CAPRA.