Oct. 23, 1956 T. ULRICH 2,767,422

DOOR CHECK

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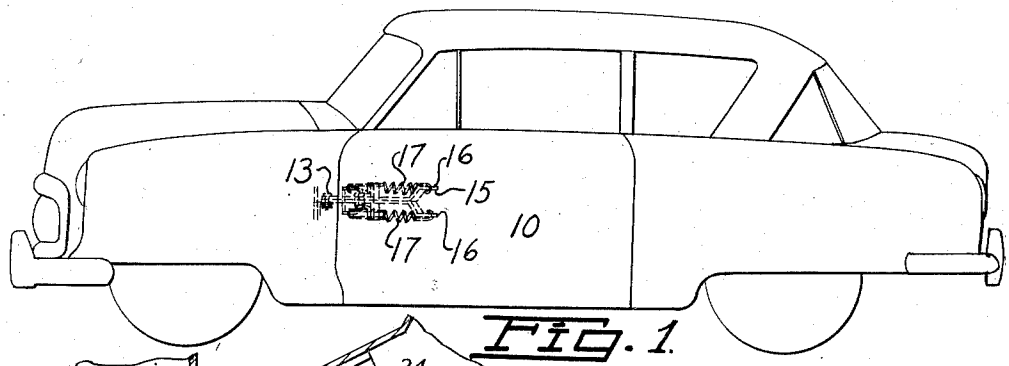


Fig. 1.

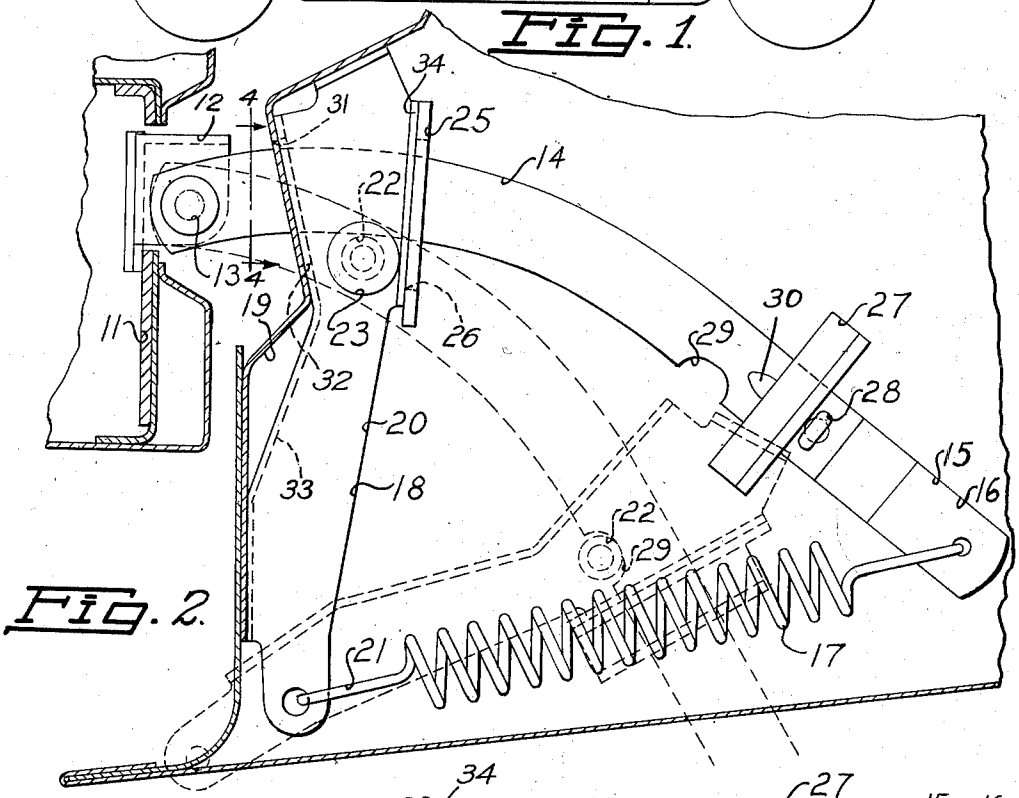


Fig. 2.

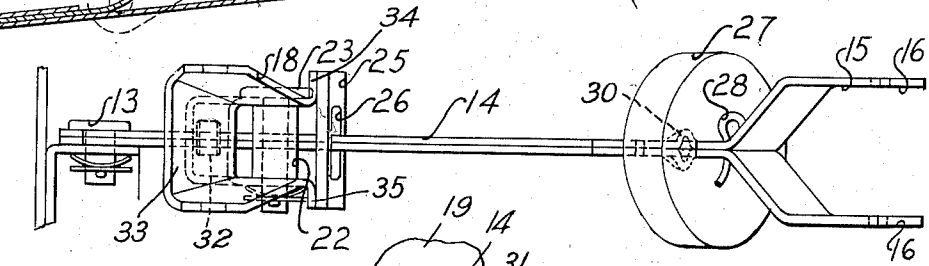


Fig. 3.

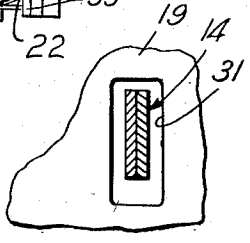


Fig. 4.

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DOOR CHECK

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3 Claims. (Cl. 16—85)

This invention relates to improvements in automobile door checks and the principal object of the invention is to provide a door check construction for automobiles whereby said door may be held in predetermined open position without danger of swinging back at inopportune times.

I am aware that the use of checks on doors is not broadly new. Under the circumstances it will be manifest that it is my chief aim to generally improve upon prior structures of the general type by providing an arrangement characterized by appreciable refinements and structural improvements especially adapted to serve their proportionate share in the development of an ingenious and dependable mechanism for the safety and convenience for use in an automobile when the door is opened.

The present invention is characterized by a door check assembly rotatably mounted on a door pillar support and extending through a slot in the door with spaced coiled springs mounted on the free end of said assembly. The assembly is notched at a predetermined point along its edge to engage with a roller on said door when the door is in open position. The springs keep the door under tension when in closed position and act as an additional check to prevent inadvertent closing when said door is arranged in open position.

A further object of the invention is to provide a door check arrangement which is of relatively simple construction, inexpensive to manufacture and install, and thoroughly efficient and reliable in operation and otherwise well adapted for the purpose for which it is designed.

The invention possesses other objects and features of advantage, some of which with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adapted within the scope of the invention as set forth in the claims.

Referring to the drawing:

Figure 1 is a side elevation of an automotive vehicle with a portion of the invented subject matter disclosed in dotted lines.

Figure 2 is a top plan view of door check apparatus embodying the invention, the door being shown in partly open position.

Figure 3 is a side view of the door check assembly per se less the springs.

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 2.

Referring now in detail to the drawing, the invention is shown as it may be used on an automotive vehicle indicated generally by the numeral **10** in Figure 1. Forming part of said body is a body pillar **11** having an L-shaped bracket **12** secured thereto. The horizontal flange of said bracket is apertured to receive a pin **13** which rotatably receives one end of a door check assembly as indicated by the numeral **14**.

The assembly **14** comprises two flat strips of steel which are secured together with the free ends of said strips bent outwardly and away from each other to form a yoke **15**. Each oppositely disposed leg **16** of said yoke is provided with an aperture of sufficient size to receive one end of a coil type tension spring **17**. There are two of these coil springs which are spaced apart and extend from the yoke **15** to a bracket member **18** which is secured to the edge wall **19** of the door. This bracket **18** is of substantial length and depth and is U-shaped. The opposed legs **20** making up the sides of the bracket are disposed cross-wise on the door wall **19** with one free end **21** of each coil spring **17** anchored to each leg adjacent the ends thereof.

A roller **22** is located between the legs **20** at the other end of said bracket **18** and held rotatively therebetween by a pin **23** passing through aligned apertures formed in said legs **20** and a central longitudinal bore formed through said roller **22**.

Attention is directed to the assembly **14** wherein the strips which make up the check arm are arcuately shaped throughout a major portion of their lengths. In assembled relationship the free end of said check assembly is inserted through an opening **31** in the edge wall **19** of the door and through a similar opening **32** in the base wall **33** of bracket **18** with said yoked end **15** and aforementioned coil springs **17** disposed within the interior of the door. The arcuate edge of the assembly bears on and rolls over the roller **22** as the door is opened or closed. A rectangularly shaped plate **25** is secured to the outwardly turned flanges **34** and **35** on bracket **18** adjacent said roller **22**. This plate is provided with an enlarged rectangularly shaped opening **26** which is in substantial registry with openings **31** and **32** in the door wall and bracket. A disk-shaped buffer plate **27** is mounted on said assembly **14** which is limited in the direction toward the yoke **15** by a cotter pin **28** secured in the strips and is also limited in movement in the other direction by upsetting the assembly as indicated by the numeral **30**. The plate **27** may be made of any suitable material such as felt with a metal backing cup to retain such felt in position. The particular function of the buffer plate **27** is to butt against the plate **25** as the door is swung to open position and act as a cushion for the assembly.

A notch **29** of substantial depth and width is cut through the outer edge of the assembly **14**. As will be seen by referring to the Figure 2, this notch is spaced near the yoke **15** and when the door is swung to open position said notch will engage with the roller **22** and fall into place on said roller **22**. The engagement of said notch **29** with the roller **22** definitely limits the opening of the door and holds the door in said open position until inward pressure against said door is exerted to close it. When the door is closed, the coil springs **17** will be extended and when such door is unlatched from closed position such springs will automatically retract and pull said door open and aid in swinging said door to the position where the notch **29** will engage with the roller **22**. When the door is in fully opened position, the roller is received in notch **29** and as the door is moved toward closed position, the tension exerted by the springs on the check arm against the roller provides appropriate resistance assuring that the door will not close too rapidly. By providing a tension spring on either side of the check arm **14**, the tension springs being of common size and capacity, a condition of balance is obtained tending to maintain the check arm in a centralized position, substantially mid-way between the side walls of the bracket **18**, and thereby eliminating any tendency of the check arm to bind relative to the bracket and door wall during opening or closing

movement of the door relative to the vehicle body. Additionally, the use of two tension springs makes it possible to obtain the required amount of tension for providing the needed resistance during door closing.

It is thought that the construction, manipulation, utility, and advantages of this invention will now be apparent to those skilled in this art without a more detailed description thereof.

The present embodiment of the invention has been described in considerable detail merely for the purposes of exemplification since in actual practice it attains the features of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim is:

1. In a motor vehicle body having a body pillar and a hollow door hinged thereon, said door having a slotted door pillar, a door check assembly, said door check assembly comprising a pair of opposed flat faced rods of substantial length rotatably mounted at one end to said body pillar and arranged horizontally through the slot in said door pillar, the free ends of said rods bent outwardly in the shape of a yoke, a pair of tension springs having similar ends secured to the sides of said yoke, said tension springs having similar free ends anchored to said door pillar, a roller mounted on said door pillar and arranged in contact with said rods, said rods provided with a notch, said notch engaging said roller upon predetermined swinging movement of said door to open position, said engagement arresting the degree of door opening.

2. Door check structure for controlling swinging movement of a hollow door part to and from closed position in an opening in a hollow frame part, the door and frame parts including edge walls which are substantially parallel and closely spaced when the door is closed, one of the edge walls having a slot therethrough: said door check structure comprising a pivot support adapted to be secured to the other edge wall and disposed adjacent the edge wall slot when the door part is closed, a rigid check arm pivoted at one end to said pivot support and including an enlarged head at its other end, a unitary guide means cooperable with said check arm and adapted to be secured as a unit to the inner surface of the slotted edge wall, said means comprising a channel including a slotted web spaced inwardly from the slotted edge wall with its slot substantially aligned with the slot in the edge wall, and said channel also including spaced side walls, a roller extending across said channel and pivotally mounted to a fixed axis extending between the side walls thereof, the enlarged head on the check arm being engageable with said channel to limit opening movement of the door, spaced spring mountings on said unitary guide means, said check arm including spaced spring mountings at the end remote from that end which is pivoted on the pivot support; a tension spring connecting one spring mounting on the unitary guide means with one spring mounting on the check arm and a second tension spring connecting the other spring mounting on the unitary guide means with the other spring mounting on the check arm, said springs cooperating with each other to urge the check arm against the roller and toward the hinge axis of the door.

3. Apparatus as set forth in claim 2 wherein the check arm is fabricated of separate stampings held together unitarily, the spring mountings on said check arm being formed by spreading the free ends of the stampings apart from each other at the headed end of the check arm.

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