July 28, 1942. R. I. SCHONITZER 2,291,412

COMBINED DOOR-CHECKING AND DOOR-HOLDING DEVICE

Filed July 27, 1938 3 Sheets-Sheet 1

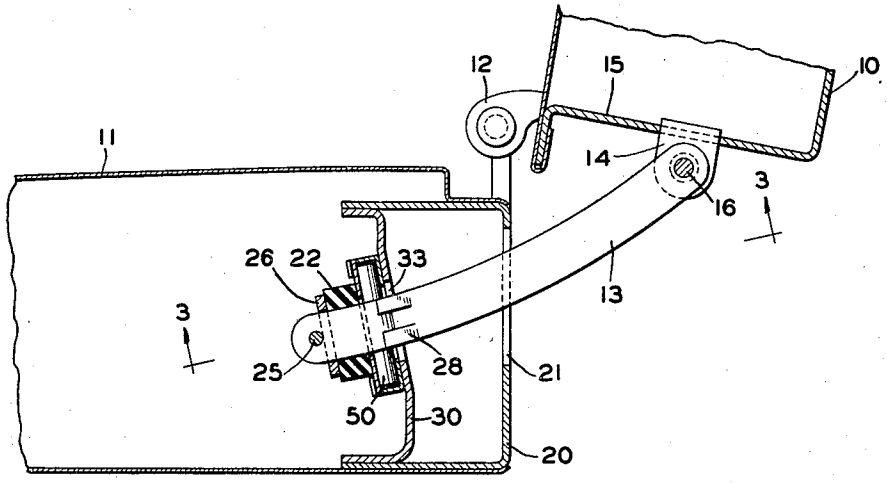


FIG.-1

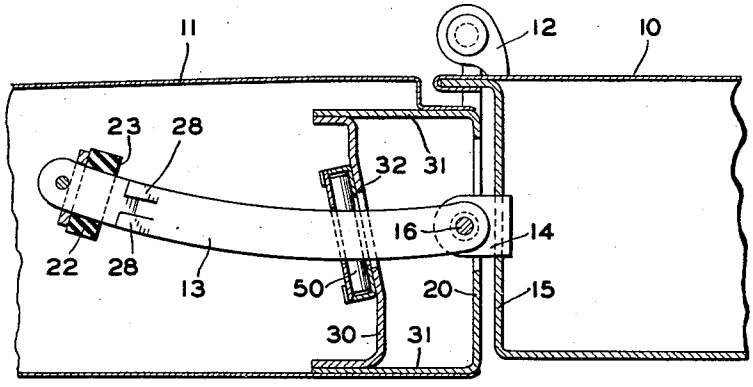


FIG.-2

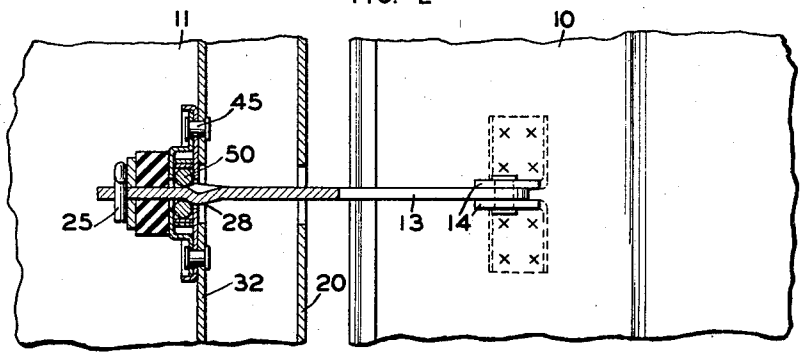


FIG.-3

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July 28, 1942. R. I. SCHONITZER 2,291,412

COMBINED DOOR-CHECKING AND DOOR-HOLDING DEVICE

Filed July 27, 1938 3 Sheets-Sheet 2

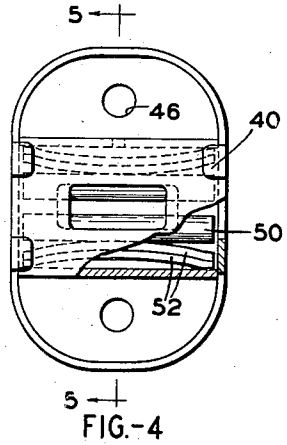


FIG.-4

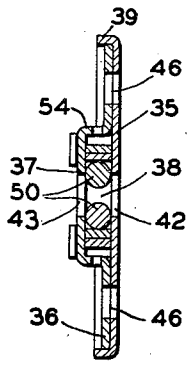


FIG.-5

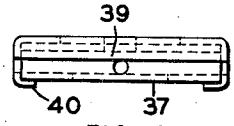


FIG.-6

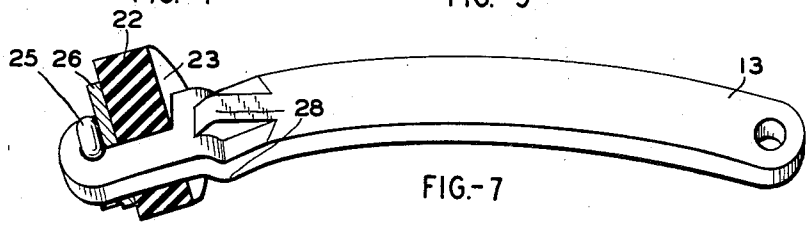


FIG.-7

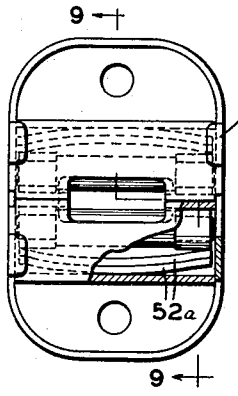


FIG.-8

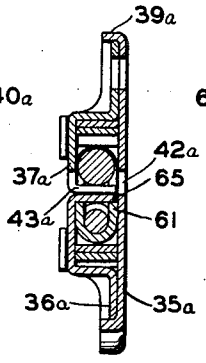


FIG.-9

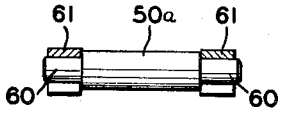


FIG.-10

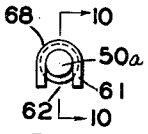


FIG.-11

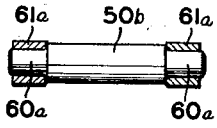


FIG.-12

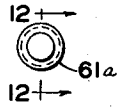


FIG.-13

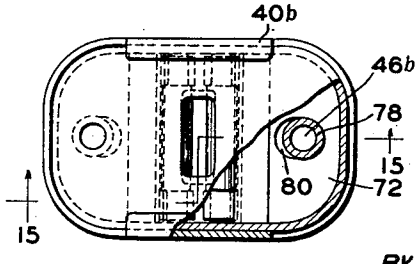


FIG.-14

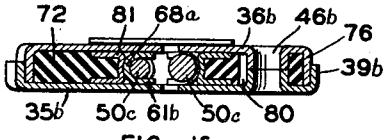


FIG.-15

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July 28, 1942. R. I. SCHONITZER 2,291,412

COMBINED DOOR-CHECKING AND DOOR-HOLDING DEVICE

Filed July 27, 1938 3 Sheets-Sheet 3

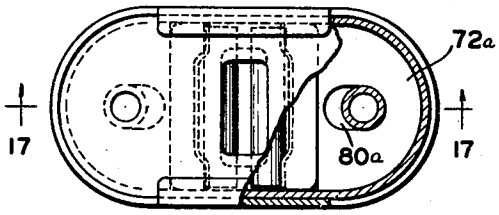


FIG.-16

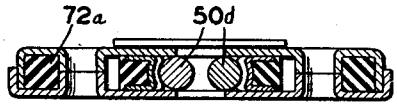


FIG.-17

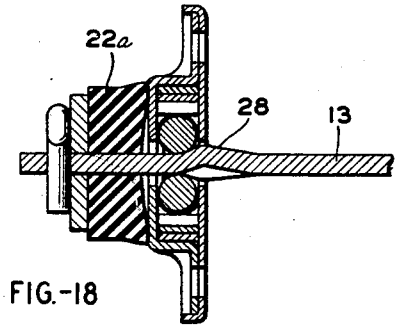


FIG.-18

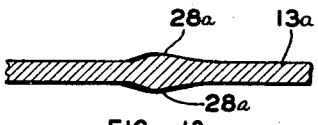


FIG.-19

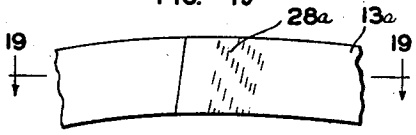


FIG.-20

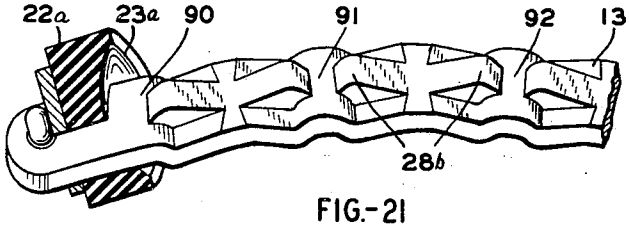


FIG.-21

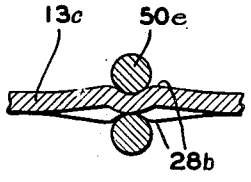


FIG.-22

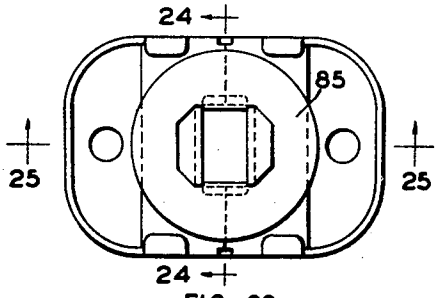


FIG.-23

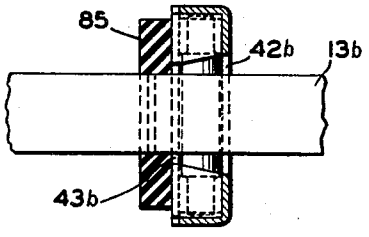


FIG.-24

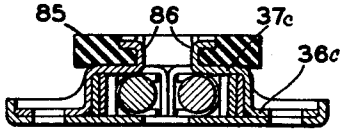


FIG.-25

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Patented July 28, 1942 2,291,412

UNITED STATES PATENT OFFICE

2,291,412

COMBINED DOOR-CHECKING AND DOOR-HOLDING DEVICE

Rudolph I. Schonitzer, Shaker Heights, Ohio

Application July 27, 1938, Serial No. 221,570

38 Claims. (Cl. 16—86)

This invention relates to a device for checking the opening movement of a hinged door, such as an automobile door, or for releasably holding or retaining such a door in an open position or condition, or for accomplishing both of such functions.

The general object of the present invention is the provision of a device of the type described which is of simple and inexpensive construction, of strong and sturdy character, and which performs in a particularly efficient manner its door-checking function or its door-holding function or its combined door-checking and door-holding functions.

A more specific object of the present invention is the provision of a device of the type described which includes two cooperatively related parts, one of such parts being adapted for securement to a door structure or to a supporting structure therefor, and the other of said parts being adapted for securement to the other of said structures, the cooperative relation of such parts being of such character as to enable the door structure to have its opening movement checked or to enable said door structure to be releasably held or retained in an open position or condition or in any selected one of a series of open positions or to enable both of such door-checking and door-holding functions to be accomplished.

Another specific object of the present invention is the provision of a device of the type described in which one of the aforesaid parts thereof includes an arm and the other of such parts includes yieldingly mounted rollable means arranged in oppositely spaced relation and between which said arm extends.

Another more specific object of the present invention is the provision of a device of the type described having rollable means so mounted as to reduce the liability of such rollable means sliding or slipping along the arm which extends therealong.

Another specific object of the present invention is the provision of a door-holding device which includes yieldingly mounted rollable means along which an arm extends, said arm being provided with means for cooperation with such rollable means in releasably holding or retaining a door structure against undesired closing or in an open position or condition.

Another specific object of the present invention is the provision of a door-checking and door-holding device which includes a casing structure provided with yieldingly mounted rollable means along which an arm extends, said arm being provided with means for cooperation with such rollable means in releasably holding or retaining a door structure in an open position and said arm also being provided with means for cooperation with such casing structure in checking the opening movement of said door structure.

Another specific object of the present invention is the provision of a door-checking and door-holding device so constructed and arranged that a multiple-stage checking action results, the first or preliminary stage being of yieldable character and relatively slight as compared with a later stage, with the consequent cushioning of the "closing in" movement of the retaining element or elements of such device, as will hereinafter more fully appear.

Other specific objects of the present invention are in part obvious and in part will appear more in detail hereinafter.

For the disclosure of the present invention, the accompanying drawings illustrate and the present specification describes several combined door-checking and door-holding devices, and parts therefor, constructed in accordance with the present invention, and an explanation will hereinafter be made as to the way in which any of such devices may be easily and simply converted into either a door-checking device only or a door-holding device only.

In said drawings, Fig. 1 is a horizontal sectional view of a portion of a standard automobile door and a portion of a standard automobile body on which such door is hinged, said door and said body having associated therewith, for door-checking and door-holding purposes, a device constructed in accordance with one embodiment of the present invention, the door being in the predetermined open position in which it may be releasably held or retained by such device; Fig. 2 is a similar view, with the door in closed position; Fig. 3 is a vertical view thereof, partly in section and partly in elevation, on the line 3—3, Fig. 1, the door being in the predetermined open position in which it may be releasably held or retained by such device; Fig. 4 is an elevation of the retaining unit of the device of Figs. 1 to 3 inclusive, a portion of the casing cover part of such unit being broken away to show interior parts; Fig. 5 is a longitudinal sectional view of such retaining unit, on the line 5—5, Fig. 4; Fig. 6 is an end view of such retaining unit; Fig. 7 is a perspective view of the arm of the device shown in Figs. 1 to 3 inclusive, the bumper means of such arm being in section; Fig. 8 is a view

similar to Fig. 4 but showing a modified form of retaining unit; Fig. 9 is a longitudinal sectional view of the retaining unit of Fig. 8, the view being on the line 9—9, Fig. 8; Fig. 10 is a side elevation of a rollable member of elongated form and the journal bearings therefor, as used in the retaining unit of Figs. 8 and 9, the journal bearings being in section on the line 10—10, Fig. 11; Fig. 11 is an end view of the rollable member and journal bearings shown in Fig. 10; Fig. 12 is a view similar to Fig. 10 but showing a rollable member of elongated form provided with a modified form of journal bearings, the journal bearings being in section on the line 12—12, Fig. 13; Fig. 13 is an end view of the rollable member and journal bearings shown in Fig. 12; Fig. 14 is a view similar to Figs. 4 and 8 but showing another modified form of retaining unit; Fig. 15 is a longitudinal sectional view of the retaining unit of Fig. 14, the view being on the line 15—15, Fig. 14; Fig. 16 is a view similar to Figs. 4, 8 and 14 but showing another modified form of retaining unit; Fig. 17 is a longitudinal sectional view of the retaining unit shown in Fig. 16, the view being on the line 17—17, Fig. 16; Fig. 18 is a sectional view of the retaining unit of Figs. 8 and 9 and an arm having a modified form of bumper means for multiple-stage checking purposes; Fig. 19 is a detail longitudinal sectional view of an arm provided with a modified form of projecting means for cooperation with the rollable means of a retainable unit in effecting the releasable retention of a door in a predetermined open position, the view being on the line 19—19, Fig. 20; Fig. 20 is a plan view of the portion of the arm shown in Fig. 19; Fig. 21 is a perspective view of a modified form of arm, as used for releasably holding or retaining a door in any one of a series of predetermined open positions, the bumper means (shown in section) of such arm being of the form illustrated in Fig. 18; Fig. 22 is a sectional view, showing two opposed rollers in retaining cooperation with a portion of the arm shown in Fig. 21, for the purpose of enabling a door to be releasably retained or held in one predetermined open position; Fig. 23 is a view similar to Fig. 8, but with the retaining unit of Figs. 8 and 9 provided with resilient means for guiding an arm through such unit; Fig. 24 is a cross-sectional view of the retaining unit shown in Fig. 23, the view being on the line 24—24, Fig. 23, and with a portion of an arm extending through such unit; and Fig. 25 is a longitudinal sectional view of the retaining unit shown in Fig. 23, the view being on the line 25—25, Fig. 23.

Before the present invention is described in detail, it is to be understood that such invention is not limited to the details of construction and/or the specific arrangement of parts herein illustrated and/or described, as the invention obviously may take other forms. It also is to be understood that the phraseology or terminology herein employed is for the purpose of description and not of limitation, as there is no intention and no desire to limit the present invention, as herein disclosed and as defined in the appended claims, beyond the requirements of the prior art.

For the illustration of the present invention, there is shown in the accompanying drawings a portion of a standard automobile door 10 and a portion of a standard automobile body 11 on which such door is mounted by suitable hinges of either the concealed or the exposed type, one such hinge, of the exposed type and designated by the reference numeral 12, being here shown. Associated with said door and said body, for checking the opening movement of said door when said door reaches a predetermined open position and for releasably holding or retaining said door in a predetermined open position, is a concealed type door-checking and door-holding device constructed in accordance with one embodiment of the present invention.

As will hereinafter more fully appear, each of the door-checking and door-holding devices here illustrated comprises a suitable retaining unit and a suitable arm assembly for cooperation therewith. As here shown, each such arm assembly comprises a rigid arm which extends through such a retaining unit and which is provided with suitable bumper means for cooperation with such retaining unit in checking the opening movement of a door when said door reaches a predetermined open position and which arm is also provided with suitable means for cooperation with such retaining unit in releasably holding or retaining such door in a predetermined open position. Each of the retaining units here shown is adapted to be rigidly secured to and enclosed by either a door structure or a supporting structure therefor, and each of the arms of the arm assemblies here shown is adapted to be pivotally connected to the other structure, the aforesaid two means of said arm, for door-checking and door-holding cooperation with such a retaining unit, being enclosed by the structure which encloses said retaining unit.

In the combined door-checking and door-holding device illustrated in Figs. 1 to 7 inclusive, the retaining unit is suitably secured to and enclosed by the automobile body 11, and the arm 13 of the arm assembly, which arm as here shown is of generally flat form and of metal or the like, is pivotally connected to the automobile door 10. For the pivotal connection of said arm to said door, a suitable two-part bracket 14 is spot-welded or otherwise rigidly secured to the hinge side edge wall 15 of the door 10, and on a pin 16 carried by said bracket is pivotally mounted one end of the arm 13. In the jamb wall 20 of the automobile body 11 is a suitable slot 21 through which said arm extends, the free end portion of said arm, located within said automobile body, being provided with suitable bumper means, such as the bumper member 22, for cooperation with the retaining unit (to be hereinafter specifically described) in checking the opening movement of the door 10 when said door reaches a predetermined open position, and the free end portion of said arm also being provided with suitable means, such as one or more depressions in or one or more projections on said arm, for cooperation with such retaining unit in releasably holding or retaining the door 10 in a predetermined open position.

The arm bumper member 22, as shown in Figs. 1 to 3 inclusive and in Fig. 7, is a simple block-like member of any suitable material, the shape and size of such member being unimportant insofar as the broad aspects of this invention are concerned. As here shown, said member 22 is of resilient material, such as rubber, and of generally cylindrical form with substantially flat end faces, the inner end face 23 of such member being a checking face for checking contact with a checking face of the retaining unit in yieldingly checking the opening movement of the door 10 when such door reaches a predetermined open position.

The bumper member 22 may be mounted on the free end portion of the arm 13 in any suitable manner and by the use of any suitable means. As here shown, said bumper member is provided with a suitable slot extending axially therethrough, to enable said member to be readily slipped onto the free end portion of such arm, and the retention of such bumper member on said arm end portion is here effected by a simple cotter pin 25, secured in a suitable aperture with which such arm end portion is provided. If desired, suitable backing means, such as a metal backing disc, may be provided for such bumper member, the metal disc 26 here shown being interposed between such cotter pin and the adjacent or outer end face of said bumper member.

Although the free end portion of the arm 13 may be provided with any suitable means, such as one or more recesses or one or more projections, for cooperation with the retaining unit in effecting the releasable retention of the door 10 in a predetermined open position, projecting means are preferred and are here utilized for such purpose. As clearly shown in Figs. 2 and 3, the free end portion of the arm 13 is here provided with one or more projections 28 on each of the two faces thereof, such projections being provided by a simple and inexpensivve deformation of the metal or other material of such arm end portion. As here shown, the free end portion of the arm 13 is provided, by means of a simple stamping operation, with two such projections 28 on one of its faces (one projection adjacent each longitudinal edge of such face) and with one such projection 28 on its other face, said single projection being located opposite the space between said two projections and hence being in spaced relation to the longitudinal edges of such last mentioned arm face. As a result of such spacing or arrangement of said three arm projections, the effect of torsional strain on the arm 13, during its cooperation with the retaining unit in releasably holding the door 10 against undesired closing, is effectively overcome or counteracted, as will be readily understood as the description of the present invention proceeds. If desired, however, such projections may be provided by initially forming the arm therewith, and in Figs. 19 and 20, there is shown a part of the free end portion of a rolled or cast metal arm 13a, such arm end portion being initially made of increased thickness at one point to there provide, on each of its two faces, a single solid projection 28a. The projections 28 of the arm 13, as best shown in Figs. 3, 7 and 18, and the projections 28a of the arm 13a, as best shown in Fig. 19, are of generally V-shape in longitudinal section, the oppositely inclined surfaces of each of said projections enabling the hereinafter described rollers of the retaining units to ride up and down such projections. As here shown, the two oppositely inclined surfaces of each such arm projection vary in pitch or inclination, the inclined surface toward the bumper means of each such arm being somewhat steeper than the other inclined surface, to provide the desired resistance to door-closing movement, as will be readily understood.

As heretofore pointed out, in the embodiment of the invention illustrated in Figs. 1 to 7 inclusive, the retaining unit is suitably connected to and enclosed by the automobile body 11. Although such retaining unit may be secured directly to the jamb wall 20 of such body (in which event, the arm bracket 14 would be extended inwardly into the door 10 from the edge wall 15 thereof, rather than extended outwardly from such edge wall, as here shown), such retaining unit is here secured to a transverse partition 30 with which the automobile body 11 is suitably provided. As best shown in Figs. 1 and 2, the present partition 30 is a simple metal member spot-welded or otherwise rigidly secured to side edge flanges 31 of the body jamb wall 20, the disposition of the intermediate portion 32 of such partition, to which portion the retaining unit is here secured, preferably being somewhat inclined relative to said body jamb wall 20, as shown. For the extension therethrough of the arm 13, such intermediate portion 32 of the body partition 30 is provided with a suitable slot 33, the length of which, if desired and as here shown, may be somewhat less than that of the body jamb wall slot 21.

The retaining unit illustrated in Figs. 1 to 6 inclusive includes a suitable casing, here formed of two simple and inexpensive sheet metal parts, namely, a casing base part 35 (see Fig. 5) and a casing cover part 36, the middle portion 37 of such cover part being outwardly offset to provide within the casing a suitable chamber 38. For the economical securement of the two casing parts in assembled relation, the casing base part 35 is here provided with a laterally extending peripheral flange 39 which snugly surrounds the casing cover part 36, the side portions of said flange being provided with suitable tabs 40 which may be readily bent over into engagement with the offset middle portion 37 of the casing cover part 36. As a result, the two casing parts are securely locked or held in assembled relationship.

For the extension of the arm 13 through the chamber 38 of this retaining unit casing, a suitable slot 42 is provided in the casing base part 35 and a suitable slot 43 is provided in the offset intermediate portion 37 of the casing cover part 36, the casing slots 42 and 43 being in alignment, as clearly shown in Figs. 4 and 5.

Any suitable means may be utilized in securing this retaining unit casing to the intermediate portion 32 of the body partition 30, with the aligned slots 42 and 43 of such casing in alignment with the partition slot 33. As here shown, two rivets 45 are utilized for rigidly securing said retaining unit casing to such body partition, the end portions of the casing base plate 35 and the casing cover plate 36 and the intermediate portion 32 of said body partition being provided with suitable apertures (see Fig. 3) for the reception of such rivets, the apertures in the two casing parts being indicated in Figs. 4 and 5 by the reference numeral 46.

To facilitate the movement of the arm 13 through the casing of this retaining unit (or the movement of such casing along such arm, in the event that the retaining unit is connected to and movable with the automobile door 10), and for cooperation with the projections 28 of such arm in releasably retaining the door 10 in a predetermined open position, suitable rollable means are arranged within the chamber 38 of the casing of such retaining unit. In this particular retaining unit, the rollable means comprises two elongated rollable members 50 arranged in opposed relation and between which the arm 13 extends at all times, the rollable members 50 here shown being simple plain metal rollers of uniform diameter throughout their length, as clearly indicated in Figs. 1 to 6 inclusive.

In the embodiment of the invention illustrated

in Figs. 1 to 7 inclusive, the retaining unit rollers 50 are yieldingly maintained in engagement with the opposite faces of the arm 13 by suitable spring means, such as the metal leaf springs 52. Although a single leaf spring 52 may be provided for each roller 50, two such leaf springs are here provided for each such roller, the effect of which is to materially prolong the life of such springs. The two springs 52 for each roller 50 are located between such roller and a lateral shoulder 54 of the casing cover part 36, said shoulders being formed by the offsetting of the intermediate portion 37 of such casing cover part. As best shown in Fig. 4, the leaf springs 52 are of longitudinally arched form, with the arches of such springs cooperating with the medial portions of the rollers 50 in normally urging them toward each other and into yieldable engagement with the two faces of the arm 13. Although the rollers 50 here shown are of relatively small diameter, deflection of such rollers by the arm 13 is effectively prevented, due to the fact that the pressure of the leaf springs 52 is exerted upon or applied to intermediate portions of such rollers, as will be readily understood.

Because of the connection of the arm 13 to the automobile door 10, such arm, upon opening movement of said door, is drawn or pulled along and between the two retaining unit rollers 50 of the automobile body, the arm during such movement being yieldingly supported on the lower roller 50 and being yieldingly engaged from above by the upper roller 50. Continued opening movement of such door results in the projections 28 of the arm 13 being brought into engagement with the retaining unit rollers, said rollers moving in opposite directions or divergently, against the pressure of their springs 52, sufficiently to permit such arm projections to pass therebetween. Immediately thereafter, the rollers 50 move, by the pressure of their springs, toward each other and behind the more abrupt inclined surfaces of such arm projections, with the consequent releasable retention of the door 10 in a predetermined open position. Although the opening movement of the door may be manually checked or arrested at this point, opening movement of such door is normally continued, with the result that the flat end checking face 23 of the arm bumper member 22 is brought into checking contact with the outer surface or checking face of the offset intermediate portion 37 of the retaining unit casing cover part 36. As a consequence, further opening movement of the door 10 is yieldingly checked or arrested, the rollers 50 remaining in engagement with the arm 13, between the projections 28 thereof and such checking end face 23 of the arm bumper member 22, and the door 10 being releasably held or retained in an open position, as here shown.

Upon closing movement of the door 10, the arm 13 is pushed by such door in the reverse direction, said arm moving between the rollers 50 of the retaining unit, as will be readily understood. Upon initiation of such door-closing movement, the arm projections 28 are moved between and through such rollers and thereafter the door may be freely swung to closed position. Due to the provision of the inclined surfaces of the arm projections 28, exceedingly little manual effort is necessary to move such arm projections between and through the rollers 50, either during door-opening movement or during door-closing movement, the rollers 50 riding up and down the inclined surfaces of said arm projections. As heretofore pointed out, those inclined surfaces of the arm projections 28 which are toward the arm bumper member 22 are the retaining surfaces of such arm projections, and hence such inclined surfaces are more abrupt than the other inclined surfaces of such arm projections. For that reason, therefore, somewhat more effort is necessary to move the arm projections through the rollers 50 during door-closing movement than is necessary to move such arm projections through such rollers during door-opening movement, as will be readily understood.

In the retaining unit shown in Figs. 1 to 6 inclusive, some slippage or sliding movement of the rollers 50 relative to the arm 13 is inevitable. In the modified form of retaining unit illustrated in Figs. 8 to 11 inclusive, the two elongated rollers 50*a* of such unit are so mounted in the chamber thereof as to materially reduce the slippage of such rollers relative to the arm which is used with such unit, such as the arm 13, Fig. 7, the arm 13*a*, Fig. 19, or the arm 13*c*, Fig. 21. The reduction in slippage of the rollers 50*a* of this modified form of retaining unit is accomplished by providing such rollers with slidable journal bearings, upon which is exerted or to which is applied the pressure for yieldingly maintaining such rollers in engagement with the arm which extends therebetween in the use of such retaining unit.

As best shown in Figs. 10 and 11, the rollers 50*a* of this retaining unit have reduced end portions 60, for which are provided suitable journal bearings, such as the sheet metal horseshoe journal bearings 61. For a reason which will later appear, the cover of the casing of this particular retaining unit is made in two parts, each such casing cover part 36*a* having an offset portion 37*a* which together provide the checking face of this retaining unit and which together constitute the outer wall of the casing chamber in which are arranged the rollers 50*a*. By providing registering notches in the free edge portions of said offset casing cover portions 37*a*, a suitable slot 43*a* is provided in said casing cover for the extension therethrough of the arm which is used with this retaining unit, the casing base part 35*a* of this retaining unit having a suitable slot 42*a* in alignment with the casing cover slot 43*a* for the reception of such arm. As best shown in Fig. 9, the roller journal bearings 61 are arranged in the chamber of this retaining unit casing with the generally parallel side portions of such bearings in slidable engagement with the casing base part 35*a* and the offset casing cover portions 37*a* and with the openings 62 (see Fig. 11) of adjacent and opposed journal bearings toward each other.

To prevent the production of a compressing effect upon the generally parallel side portions of the roller journal bearings 61, and the consequent prevention of a binding effect upon the reduced end portions 60 of the rollers 50*a*, the free side edge portions of the two offset casing cover portions 37*a* are provided, at the ends of the arm-receiving slot 43*a*, with turned in flanges 65 which engage those portions of the casing base part 35*a* which lie at the ends of the arm-receiving slot 42*a* thereof. As a result, the depth of the casing chamber of this particular retaining unit, between the casing base part 35*a* and the offset casing cover portions 37*a*, is not reduced by the application of pressure to the checking face of such offset casing cover portions, such as the pressure applied to such casing cover

portions by the assembly-maintaining tabs **40a** of the casing base part flange **39a** or the checking presure applied to such casing cover portions by an arm bumper member (such as the bumper member **22** shown in Figs. 1 to 3 inclusive and Fig. 7 or the hereinafter described bumper member **22a** shown in Figs. 18 and 21) when such bumper member engages such casing cover portions in the production of a door-checking or door-arresting action.

As in the retaining unit of Figs. 1 to 6 inclusive, suitable spring means, such as the metal leaf springs **52a**, are utilized in the retaining unit of Figs. 8 to 11 inclusive for yieldingly maintaining the rollers **50a** in engagement with the two faces of the arm which extends therebetween in the use of such unit. As best shown in Fig. 8, however, the disposition of the leaf springs **52a** in the casing chamber of the retaining unit of Figs. 8 to 11 inclusive is reverse to that of the leaf springs **52** in the casing chamber of the retaining unit of Figs. 1 to 6 inclusive. In other words, in the casing chamber of the retaining unit of Figs. 8 to 11 inclusive, the end portions of the leaf springs **52a**, rather than the arched intermediate portions thereof, cooperate with or are effective upon the rollers **50a** in yieldingly maintaining them in engagement with the arm which normally extends therebetween. As shown in Fig. 8, however, the ends of the leaf springs **52a** do not directly engage the rollers **50a** but the curved portions **68** (see Fig. 11) of the journal bearings **61** therefor, with the result that such rollers are free at all times for rotation within their journal bearings.

To prevent possible deflection of the rollers **50a** by the arm which extends therebetween in the use of this embodiment of the present invention, the diameter of each of the rollers **50a** is somewhat larger than that of each of the rollers **50** of the retaining unit of Figs. 1 to 6 inclusive, as will be readily apparent from a comparison of the rollers **50** and **50a**. As clearly shown in Fig. 11, however, the diameter of the rollers **50a** is less than the depth of the journal bearings **61** therefor, so that there is no liability of such rollers contacting the casing parts of this retaining unit with the production of a retarding effect upon the free rolling action of such rollers.

If desired, journal bearings of tubular or annular form may be utilized with the reduced end portions **60** of the rollers **50a**, rather than the U-shaped or horse-shoe journal bearings **61** shown in Figs. 8 to 11 inclusive. In Figs. 12 and 13 of the accompanying drawings, the reduced end portions **60a** of the elongated roller **50b** are provided with such tubular or annular journal bearings, said bearings being indicated by the reference numeral **61a**. Because of their economical formation by a simple stamping operation, and because of their greater surface contact with the casing base and cover parts, the horse-shoe journal bearings of Figs. 8 to 11 inclusive are probably preferable to the tubular or annular journal bearings **61a** of Figs. 12 and 13, although the use of either form of journal bearing is satisfactory.

In the modified form of retaining unit illustrated in Figs. 14 and 15, suitable resilient material, such as rubber or the like, is utilized for yieldingly maintaining the elongated rollers **50c** of such unit in engagement with the arm (such as the arm **13**, Fig. 7, the arm **13a**, Fig. 19, or the arm **13c**, Fig. 21) which extends between such rollers in the use of such retaining unit. As there shown, a generally flat block of rubber or like resilient material **72** is provided for such cooperation with each of said rollers **50c**, said rollers and the journal bearings **61b** therefor being identical with those utilized in the retaining unit of Figs. 8 to 11 inclusive. Unlike the casing chambers of the retaining units heretofore described, the chamber of the casing of the retaining unit of Figs. 14 and 15 is substantially coextensive in size with such casing, the generally flat one-piece cover part **36b** of such casing having practically its entire area spaced from the corresponding area of the casing base part **35b** for the formation of such casing chamber. Although any suitable spacing means for the casing base and cover parts **35b** and **36b** may be utilized, the means shown in Figs. 14 and 15 for such purpose includes the laterally extending peripheral flange **76** of said casing cover part, which flange engages or abuts the casing base part **35b** and lies just inside the oppositely extending peripheral flange **39b** thereof. In addition, the casing base and cover parts **35b** and **36b** here shown are provided around the aligned apertures **46b** thereof (apertures which are provided for the reception of attaching rivets or the like) with tubular bosses **78** which extend into the casing chamber for inter-engagement or abutting relationship. As a result, substantially the entire areas of the casing base and cover parts **35b** and **36b** are positively or rigidly maintained in spaced relation, the two casing parts being maintained in assembly by the bent over tabs **40b** of the casing base part flange **39b**.

Although the resilient blocks **72** may be of any suitable size and shape, the two here shown conform in size and shape with the casing chamber in which they are arranged, said blocks here having a press fit relationship with the casing cover part **36b**. As a result, the assembly of such yieldable blocks with said casing cover part **36b** is easily effected and readily maintained during the assembly and disassembly of the casing cover and base parts of this retaining unit, the assembly of such casing cover and base parts being maintained by the bent over tabs **40b** of the casing base flange **39b**, as heretofore referred to. Suitable apertures **80** are provided, of course, in the blocks **72** for the reception of the casing bosses **78**, and to conveniently provide the necessary space for displacement of the rubber or like material of such blocks, when the rollers **50c** with which they cooperate are moved further apart by the passage therebetween of the arm projections heretofore referred to, the block apertures **80** are made of larger size than such casing bosses, as clearly shown in Figs. 14 and 15. However, other cavities than those formed by enlargement of the apertures **80** may be utilized for the displacement of the material of the blocks **72**, as will be readily understood.

If desired, the journal bearings **61b** for the rollers **50c** may be directly engaged by the adjacent end surfaces of the resilient blocks **72**. Preferably, however, suitable bearing elements or plates are provided for such block end surfaces and the roller journal bearings **61b** are engaged by such bearing plates. The metal bearing plates **81** here utilized for such purpose are of channel form in cross-section, as clearly shown in Fig. 15, and are securely maintained upon the adjacent end portions of the blocks **72** by the elastic character of said blocks, as will be readily understood. If desired and as here

shown, each of the bearing plates **81** may be provided with a longitudinal groove of concave form, to conform with the curvature of those portions **68***a* of the roller journal bearings **61***b* which such bearing plates engage.

In Figs. 16 and 17, a retaining unit similar to the retaining unit of Figs. 14 and 15 is illustrated. In the retaining unit of Figs. 16 and 17, however, no journal bearings are provided for the elongated rollers **50***d*, such rollers being plain metal rollers like the rollers **50** of the retaining unit of Figs. 1 to 6 inclusive, although the rollers **50***d* preferably have a diameter somewhat greater than that of the rollers **50** for increased strength and rigidity. As clearly shown in Fig. 16, the intermediate portions of the bearing plates **81***a* for the resilient blocks **72***a* are depressed or inwardly offset relative to the rollers **50***d*, with the result that only the end portions of said rollers and said bearing plates are in engagement. Because of the rigid character of such rollers, however, they are not deflected by the movement therebetween of the arm which extends between such rollers in the use of this retaining unit.

The retaining unit illustrated in Figs. 23 to 25 inclusive differs from the retaining unit of Figs. 8 to 11 inclusive only in that it has associated therewith a guiding and cushioning member **85** for the arm **13***b* which extends through such unit and through the guiding and cushioning member thereof. The function of such guiding and cushioning member, as its name indicates, is to guide and cushion such arm in its movement through said unit, and thereby prevent any high velocity contact between the longitudinal edges of such arm and the end edges of the casing slots **42***b* and **43***b* of this retaining unit. The arm guiding and cushioning member **85**, as shown in Figs. 23 to 25 inclusive, is a generally flat ring-like member of rubber or other resilient material, and is maintained in assembly with this particular unit by the tongues **86** of the intermediate offset portions **37***c* of the casing cover parts **36***c*. In the production of the door-checking action with this particular retaining unit, the bumper member (not shown) of the arm **13***b* contacts the checking face of this resilient guiding and cushioning member **85**, rather than the rigid or substantially rigid offset casing cover portions **37***c* thereof. As a result, a yieldable checking action is produced, even if such bumper member is of rigid character. If desired, arm guiding and cushioning means, such as the member **85** of Figs. 23 to 25 inclusive, may be associated with any of the other retaining units here illustrated, as will be readily understood.

As heretofore pointed out, with a door-checking and door-holding device of the character of the one shown in Figs. 1 to 7 inclusive, the opening movement of the door **10** is yieldingly checked or arrested by the engagement of the generally flat end checking face **23** of the resilient bumper member **22** with the generally flat rigid or substantially rigid checking face of the retaining unit of such device (the checking face of such retaining unit being, of course, the outer surface of its offset casing cover portion **37**). In order to enable the door **10** to be releasably held against undesired closing, with a device like that of Figs. 1 to 7 inclusive, the checking of such door must be delayed, of course, until after the retaining unit rollers **50** "close in" behind the more or less abrupt retaining shoulders of the arm projections **28**. Inasmuch as the "closing in" force exerted upon such rollers by their leaf springs **52** is very great, the velocity of the "closing in" movement of such rollers is quite high. Inasmuch as it is frequently necessary, because of some particular vehicle door or body construction, to locate the arm projections **28** at an angle greater or less than ninety degrees to the line of the pull of such arm, the aforesaid "closing in" movement of the rollers **50** produces a very considerable side thrust on said arm. As a result, said arm is thrown with considerable velocity toward the ends of the slots through which it moves (such as the retaining unit slots **42**, **43**) and if such sidewise movement of said arm is arrested by a metallic surface or the like, a more or less objectionable clicking noise is produced. If a resilient cushioning member is provided for such sidewise movement of said arm (such as the resilient arm guiding and cushioning member **85** to be hereinafter referred to in connection with the retaining unit illustrated in Figs. 23 to 25 inclusive), the aforesaid clicking noise is temporarily avoided, but the velocity of the sidewise movement of such arm is frequently so great that the effectiveness of such an arm cushioning member is not of long duration, so far as the cushioning of such arm sidewise movement is concerned. Moreover, the sudden uncushioned arresting of the "closing in" movement of the retaining element or elements (such as the rollers **50** in the device of Figs. 1 to 7 inclusive) produces a more or less objectionable clicking noise, as will be readily understood.

These objections to door-checking and door-holding devices of the character of the one shown in Figs. 1 to 7 inclusive may be easily, effectively and more or less permanently avoided by so constructing the checking means of such a device as to produce a multiple-stage checking action. As the result of the initial or preliminary stage of such checking action (a checking stage which is of yieldable character and relatively slight as compared with a later stage), the "closing in" movement of the retaining elements or rollers is effectively retarded and thereby cushioned, with a consequent retardation of sidewise movement of said arm and the avoidance of the aforesaid clicking noises.

Although such a multiple-stage checking action can be produced in several ways, one simple and economical manner of effecting its production is by making the checking face of the arm bumper member of concave or hollowed-out form, an example of which is the checking face **23***a* of the arm bumper member **22***a* of Figs. 18 and 21. In the use of a door-checking and door-holding device having an arm bumper member of the character shown in Figs. 18 and 21, a relatively small area of the checking face of such bumper member, namely, the projecting lip at the periphery of such face, initially engages the checking face of the retaining unit of such device during door-opening movement and the relatively slight checking action thus produced effectively cushions the "closing in" movement of the retaining elements or rollers, as will be readily understood. Thereafter, the final checking stage occurs, the checking resistance of the bumper member during such final stage being sufficient to properly check or arrest the opening movement of the door with which such checking and holding device is used.

If it is desired to releasably hold or retain a door in any one of a number of predetermined open positions, an arm of the character disclosed

in Figs. 21 and 22 may be utilized. As clearly shown in Fig. 21, the arm 13c is provided on each of its two faces with a plurality of longitudinally spaced projections 28b, the formation of which, like the formation of the projections 28 of the arm 13, may be effected by a simple stamping operation. By the use of an arm of the character illustrated in Fig. 21, three longitudinally spaced areas, indicated by the reference numerals 90 to 92 inclusive, are provided for cooperation with retaining unit rollers, such as the rollers 50e of Fig. 22, in releasably holding or retaining a door in any one of a corresponding number of predetermined open positions.

Although each of the retaining units here illustrated and described includes two opposed elongated rollers for engagement with opposite faces of the arm which extends between such rollers in the use of such retaining unit, it is obvious that a retaining unit having but a single roller for engagement with such arm may be utilized, if desired. For example, the lower roller and the means for normally maintaining it in yieldable supporting engagement with such an arm may be dispensed with, and said arm supported on the casing of the retaining unit for slidable movement therealong. In such an event, the lower face of said arm will be free of any retaining projections, recesses or the like. Or, if desired, the lower roller may be utilized and the upper roller (and the means for maintaining it in yieldable engagement with such an arm) may be dispensed with. A retaining unit having two yieldable rollers between which such an arm extends is preferable, however, as it enables variations in the mounting of the door to be readily taken care of or compensated for, as will be readily understood.

In each of the embodiments of the present invention here illustrated, the retaining unit rollers are yieldingly maintained in engagement at all times with the arm which extends therebetween. In order to enable a hinged door, such as the automobile door 10, to be releasably held or retained against undesired closing or in an open position or condition, it is not necessary, of course, that there be such engagement of the roller or rollers of a retaining unit and the arm used with such unit. If desired, a retaining unit may be utilized in which the roller or rollers thereof are normally spaced from the arm which extends through such unit, the retaining unit roller or rollers being located for cooperation only with the projection or projections of said arm, in the manner heretofore referred to, in releasably holding or retaining the door in an open position. Resilient means for each such roller would be provided, of course, to enable such cooperation to be effective for releasable door retention, and movement of each such roller in a direction away from said arm would be yieldingly resisted by the resilient means for such roller, all as will be readily understood.

From the foregoing description of the devices here illustrated, it will be apparent that such devices are each adapted to perform the twofold function of checking the opening movement of a hinged door, such as an automobile door, and of releasably holding or retaining such a door against undesired closing or in an open position or condition.

If a door-checking device only is desired, it is merely necessary to eliminate from any of the arms here shown the retaining projections thereof, such as the projections 28 from the arm 13, for example. If a door-holding device only is desired, it is merely necessary to eliminate from any of the arms here shown the bumper means thereof, and to otherwise so check the opening movement of the door with which such device is used that disassembly of the arm and the retaining unit will not be effected during door-opening movement, all as will be readily understood.

Other features and advantages of the present invention will be readily apparent to those skilled in the art to which it relates.

What I claim is:

1. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with an elongated roller, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said roller in releasably holding or retaining said door structure in an open position, and said retaining means having slidable journal bearings of horseshoe form for the end portions of the roller thereof and also having resilient means effective upon said journal bearings for yieldingly resisting movement of said roller in a direction from said arm.

2. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with rollable means, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said rollable means in releasably holding or retaining said door structure in an open position, said retaining means having resilient means of rubber-like material for yieldingly resisting movement of said rollable means in a direction from said arm, and a bearing element carried by said resilient means for engagement with said rollable means.

3. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with an elongated roller, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said roller in releasably holding or retaining said door structure in an open position, said retaining means having resilient means for yieldingly resisting movement of said roller in a direction from said arm, and an elongated bearing element interposed between said roller and said resilient means and upon which said resilient means is effective, said bearing element having engagement with said roller only at the end portions thereof.

4. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with an elongated roller, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said roller in releasably holding or retaining said door structure in

an open position, and said retaining means having a longitudinally arched leaf spring for yieldingly resisting movement of said roller in a direction from said arm, the arched intermediate portion of said leaf spring being engageable with an intermediate portion of said roller.

5. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with rollable means, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said rollable means in releasably holding or retaining said door structure in an open position, and said retaining means having two associated leaf springs for yieldingly resisting movement of said rollable means in a direction from said arm.

6. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with an elongated roller, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said roller in releasably holding or retaining said door structure in an open position, and said retaining means having journal bearings for the end portions of the roller thereof and also having a leaf spring for yieldingly resisting movement of said roller in a direction from said arm, the end portions of said leaf spring being engageable with said journal bearings.

7. A device for yieldingly checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising retaining means adapted to be associated with one of said structures, an arm adapted to be associated with the other of said structures and to extend through said retaining means, said retaining means being provided with resilient guiding means for said arm, said arm having means for cooperation with rollable means with which said retaining means is provided in releasably holding or retaining said door structure in an open position, said retaining means also being provided with resilient means for yieldingly resisting movement of the rollable means thereof in a direction from said arm, and said arm also having bumper means for checking contact with the resilient arm-guiding means of said retaining means in yieldingly checking the opening movement of said door structure.

8. A device for checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising a generally flat chambered casing adapted to be associated with one of said structures, an arm adapted to be associated with the other of said structures and to extend through said casing and the chamber thereof, rollable means in said casing chamber, means on said arm for cooperation with said rollable means in releasably holding or retaining said door structure in an open position, resilient means in said casing chamber for yieldingly resisting movement of said rollable means in a direction from said arm, and resilient bumper means on said arm for checking contact with said casing in yieldingly checking the opening movement of said door structure.

9. A device for checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising retaining means adapted to be associated with one of said structures, and an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having longitudinally spaced projections for the releasable retention therebetween of rollable means with which said retaining means is provided, whereby said door structure may be releasably held or retained in an open position, one of the projections of said arm having checking contact with said retaining means in checking the opening movement of said door structure.

10. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with an elongated roller and with spaced bearings therefor, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said roller in releasably holding or retaining said door structure in an open position, said roller and its bearings being movable toward and from said arm, and said retaining means also having resilient means effective upon both of said bearings for yieldingly resisting movement of said roller and its bearings in a direction from said arm.

11. A device for checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising retaining means adapted to be associated with one of said structures and provided with oppositely spaced rollers of elongated form, an arm adapted to be associated with the other of said structures and to extend between the spaced rollers of said retaining means, said arm having projecting means for cooperation with at least one of said rollers in releasably holding or retaining said door structure in an open position, said retaining means also being provided with resilient means for each of the rollers thereof for yieldingly resisting movement of each such roller in a direction from said arm, and said arm also having bumper means for checking contact with a part of that structure with which the rollers are associated in checking the opening movement of said door structure.

12. A device for checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising retaining means adapted to be associated with one of said structures, and an arm adapted to be associated with the other of said structures and to extend along said retaining means, said retaining means being provided with a retaining element movable toward and from said arm and said arm having longitudinally spaced projections for the releasable retention therebetween of said retaining element, whereby said door structure may be releasably held or retained in an open position, one of the projections of said arm being of resilient character and having checking contact with said retaining means

in yieldingly checking the opening movement of said door structure.

13. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and having two oppositely spaced surfaces, an arm adapted to be associated with the other of said structures and to extend through such retaining means, said retaining means being provided with an elongated roller and with spaced bearings therefor, said roller and its bearings being movable between such oppositely spaced surfaces toward and from said arm and said roller being spaced from such surfaces by its bearings, said retaining means being also provided with resilient means effective upon said bearings for yieldingly resisting movement of said roller and its bearings in a direction from said arm, and said arm being provided with means for cooperation with said roller in releasably holding or retaining said door structure in an open position.

14. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and having two oppositely spaced surfaces, an arm adapted to be associated with the other of said structures and to extend through such retaining means, said retaining means being provided with an elongated roller and with spaced bearings therefor, said roller and its bearings being movable between such oppositely spaced surfaces toward and from said arm, said bearings having engagement with said surfaces and being of such size as to maintain said roller spaced therefrom, said retaining means being also provided with resilient means effective upon said bearings for yieldingly resisting movement of said roller and its bearings in a direction from said arm, and said arm being provided with means for cooperation with said roller in releasably holding or retaining said door structure in an open position.

15. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising a generally flat chambered casing adapted to be associated with one of said structures and having two oppositely spaced walls, an arm adapted to be associated with the other of said structures and to extend through said casing and the chamber thereof, spaced journal bearings in said casing chamber engageable with and movable along said oppositely spaced casing walls, an elongated roller rotatably mounted in said journal bearings, resilient means effective upon said journal bearings for yieldingly resisting movement of said roller and its bearings in a direction from said arm, the diameter of said roller being less than the corresponding dimension of each of said journal bearings so that said roller is spaced from such oppositely spaced casing walls by said bearings, and said arm being provided with means for cooperation with said roller in releasably holding or retaining said door structure in an open position.

16. A device for yieldingly checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising an arm adapted to be associated with one of said structures, a retaining element adapted to be associated with the other of said structures and being movable toward and from said arm, resilient means normally urging said retaining element toward said arm, said arm being provided with means for cooperation with said retaining element in releasably holding or retaining the door structure in an open position, said retaining element being movable toward said arm in effecting such cooperation, and checking means carried by said arm for checking contact with a checking means of that structure with which the retaining element is associated, with the consequent checking of the opening movement of the door structure, the construction of at least one of said checking means being of such character as to produce a multiple-stage checking action, the first or preliminary stage being of yieldable character and relatively slight as compared with a later stage, with the consequent cushioning of the movement of said retaining element toward said arm in effecting the aforesaid cooperation.

17. A device for yieldingly checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising an arm adapted to be associated with one of said structures, a retaining element adapted to be associated with the other of said structures and being movable toward and from said arm, resilient means for normally urging said retaining element toward said arm, said arm being provided with means for cooperation with said retaining element in releasably holding or retaining the door structure in an open position, said retaining element being movable toward said arm in effecting such cooperation, and checking means carried by said arm for checking contact with a checking means of that structure with which the retaining element is associated, with the consequent checking of the opening movement of the door structure, one of said checking means being provided with resilient projecting means for producing a multiple-stage checking action, the first or preliminary stage being of yieldable character and relatively slight as compared with a later stage, with the consequent cushioning of the movement of said retaining element toward said arm in effecting the aforesaid cooperation.

18. A device for yieldingly checking the opening movement of a door structure hinged on a supporting structure and for releasably holding or retaining said door structure in an open position, said device comprising an arm adapted to be associated with one of said structures, a retaining element adapted to be associated with the other of said structures and being movable toward and from said arm, resilient means normally urging said retaining element toward said arm, said arm being provided with means for cooperation with said retaining element in releasably holding or retaining the door structure in an open position, said retaining element being movable toward said arm in effecting such cooperation, and checking means carried by said arm and having a checking face for checking contact with a checking face of that structure with which the retaining element is associated, with the consequent checking of the opening movement of the door structure, one of said checking faces being of generally concave form for producing a multiple-stage checking action, the first or preliminary stage being of yieldable character and relatively slight as compared with a later stage, with the consequent cushioning of

the movement of said retaining element toward said arm in effecting the aforesaid cooperation.

19. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with rollable means, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said rollable means in releasably holding or retaining said door structure in an open position, and said retaining means also having a longitudinally arched leaf spring for yieldingly resisting movement of said rollable means in a direction from said arm, the arched intermediate portion of said leaf spring being effective upon said rollable means.

20. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with an elongated roller, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said roller in releasably holding or retaining said door structure in an open position, and said retaining means also having a leaf spring for yieldingly resisting movement of said roller in a direction from said arm, the end portions of said leaf spring being effective upon the end portions of said roller.

21. In a device for releasably holding or retaining in an open position a door structure hinged upon a supporting structure, a retaining unit comprising a generally flat chambered casing having base means and cover means, said base means and said cover means being provided with aligned apertures for the reception of an arm, two rollable means in the chamber of said casing on opposite sides of said aligned apertures, resilient means in said casing chamber for normally urging said two rollable means toward each other, and means carried by one of said casing means for limiting the movement of said two rollable means toward each other.

22. In a device for releasably holding or retaining in an open position a door structure hinged upon a supporting structure, a retaining unit comprising a generally flat chambered casing having base means and cover means, said base means and said cover means being provided with aligned apertures for the reception of an arm, two rollable means in the chamber of said casing on opposite sides of said aligned apertures, resilient means in said casing chamber for normally urging said two rollable means toward each other, and means carried by one of said casing means and engaging the other casing means for limiting the movement of said two rollable means toward each other.

23. In a device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, a retaining unit comprising a generally flat chambered casing having base means and cover means, said base means and said cover means being provided with aligned slots for the reception of an arm, two rollable means of elongated form in the chamber of said casing on opposite sides of said aligned slots, resilient means in said casing chamber for normally urging said two rollable means toward each other, and means carried by one of said casing means adjacent the ends of said aligned slots for limiting the movement of said two rollable means toward each other.

24. A device for releasably holding open a door structure hinged on a supporting structure, said device comprising oppositely spaced retaining elements adapted to be associated with one of said structures, an arm adapted to be associated with the other of said structures and to extend between said retaining elements, said arm being provided with projections for cooperation with said retaining elements in releasably holding the door structure open, there being two such projections on one face of said arm, one adjacent each longitudinal edge thereof, and there being another such projection on the opposite face of said arm in spaced relation to the longitudinal edges thereof, whereby the effect of torsional stress on said arm during the aforesaid cooperation is counteracted, and resilient means for yieldingly resisting movement of each of said retaining elements in a direction from said arm.

25. A door check comprising a bracket and an arcuately bent rigid element movable relative thereto, resilient means in said bracket and engaging opposite sides of said rigid element, said rigid element having a portion of its length formed with outwardly diverging surfaces immediately adjacent one of its ends adapted to be engaged by said resilient means upon relative movement of said bracket and element, the length of said portion comprising a small fraction of the length of said rigid element.

26. A device of the character described, for association with two relatively movable members, comprising an arm connected to one of said members, a cushioning member connected to the other of said members, means including a buffer formed on said arm for defining a recess thereon, and a retractable element carried by said cushioning member for entering said recess.

27. In a cushioning device for association with an arm of a door check or the like, the combination of means defining an enclosing housing having openings in the opposite sides thereof to accommodate said arm, a pair of opposed resilient members disposed in said housing and positioned with said openings between the opposed faces thereof, and a pair of bearing elements freely received in said housing in abutting relation to said faces and biased by said members to yieldingly grip said arm.

28. In a cushioning device for association with an arm of a door check or the like, the combination of means defining an enclosing housing having openings in the opposite sides thereof to accommodate said arm, a pair of opposed resilient members disposed in said housing and positioned with said openings between the opposed faces thereof, and a pair of generally cylindrical bearing elements in said housing in abutting relation to said members and biased by said members to grip said arm, said elements being disposed to be gradually rotatively moved by movement between the arm and the device so as to equalize wear thereon.

29. A device of the character described for association with two relatively movable members comprising an arm connected to one of the members and having an abutment thereon, and a cushioning means provided with an opening therethrough connected to the other member for cooperating with said abutment to form a positive limit to movement of said movable members, said arm extending through said opening in all positions of said members and being disposed to

project into the other member, said cushioning means comprising a bearing means adapted to slidably engage the arm, and a resilient means acting on the bearing means so as to cause the bearing means to frictionally hold the arm in any of a plurality of intermediate positions of the movable members.

30. A device of the character described for association with two relatively movable members, comprising an arm connected to one of the members and having an abutment thereon, said arm being disposed to project into the other member, and a cushioning means connected to the other member and adapted to cooperate with the abutment to form a positive limit to movement of the members, said cushioning means having an opening therethrough through which said arm extends in all positions of the members, said cushioning means comprising means adapted to slidably engage the arm, and a resilient means acting on the bearing means so as to cause the bearing means to frictionally hold the arm in any of a plurality of positions, and said arm having a recess therein to receive a part of the cushioning means and retain said members in a predetermined position.

31. In a cushioning device for association with an arm of a door check or the like, the combination of a housing comprising spaced inner and outer enclosing surfaces provided with openings through which said arm may move, bearing means confined between said surfaces and adapted to engage said arm, and resilient means confined between said surfaces for urging said bearing means into engagement with the arm.

32. In a cushioning device for association with an arm of a door check or the like, the combination of a housing comprising spaced inner and outer enclosing surfaces provided with openings through which said arm may move, and a pair of retractable members confined between said surfaces and adapted to yieldingly grip the arm between them.

33. A door check comprising a bracket and an arcuately bent rigid element movable relative thereto, resilient means in said bracket and engaging opposite sides of said rigid element, said rigid element having a portion of its length formed with outwardly diverging surfaces immediately adjacent one of its ends adapted to be engaged by said resilient means upon relative movement of said bracket and element, the length of said portion comprising a small fraction of the length of said rigid element, and said rigid element having notches immediately adjacent the narrowest part of said diverging portion and adapted to be engaged by said resilient means.

34. In a cushioning device for association with an arm of a door check or the like, the combination of a housing formed of a pair of telescopically related cup-like members, opposed resilient elements received in said housing, and opposed bearing elements positioned between said compressible elements and adapted to receive said arm between them and yieldingly grip said arm.

35. In a cushioning device for association with an arm of a door check or the like, the combination of a housing comprising a pair of telescopically related cup-like elements having openings through the bases thereof to accommodate said arm, and retractable means confined within said housing and adapted to yieldingly grip the arm between them.

36. In a door check, a lengthwise movable element having a cushion on one end thereof, an abutment on said movable element spaced from said cushion, bearings engaging opposite sides of said slidable element, resilient means supporting said bearings spaced apart a distance less than the thickness of said abutment, said slidable element having opposed cam-like surfaces adapted to act respectively in conjunction with said bearings in impelling lengthwise movement of said movable element in opposite directions.

37. In a door check, a lengthwise movable element having a cushion on one end thereof, an abutment on said movable element spaced from said cushion, opposed anti-friction bearings adapted to engage opposite sides of said movable element, and resilient means normally supporting said bearings spaced apart a distance less than the thickness of said abutment, said slidable element having opposed cam-like surfaces adapted to act respectively in conjunction with said bearings in impelling lengthwise movement of said movable element in opposite directions.

38. A device for releasably holding or retaining in an open position a door structure hinged on a supporting structure, said device comprising retaining means adapted to be associated with one of said structures and provided with rollable means, an arm adapted to be associated with the other of said structures and to extend along said retaining means, said arm having means for cooperation with said rollable means in releasably holding or retaining said door structure in an open position, said retaining means having resilient means of rubberlike material for yieldingly resisting movement of said rollable means in a direction from said arm, and a bearing element for engagement with said rollable means, said bearing element being interposed between said resilient means and said rollable means.

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