Dec. 8, 1959 A. R. DE VITO 2,915,778

DOOR HOLDING DEVICE

Filed Jan. 26, 1956 3 Sheets-Sheet 1

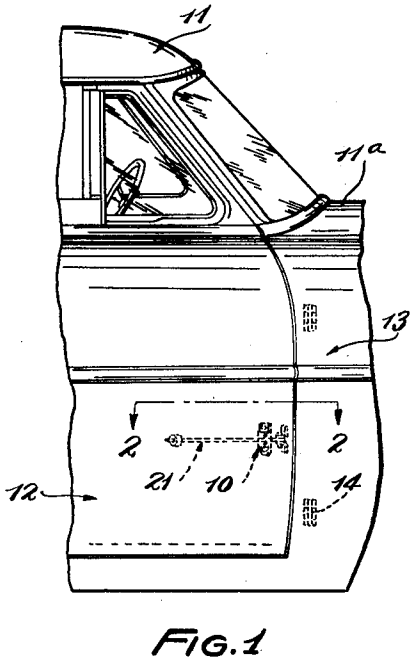


FIG. 1

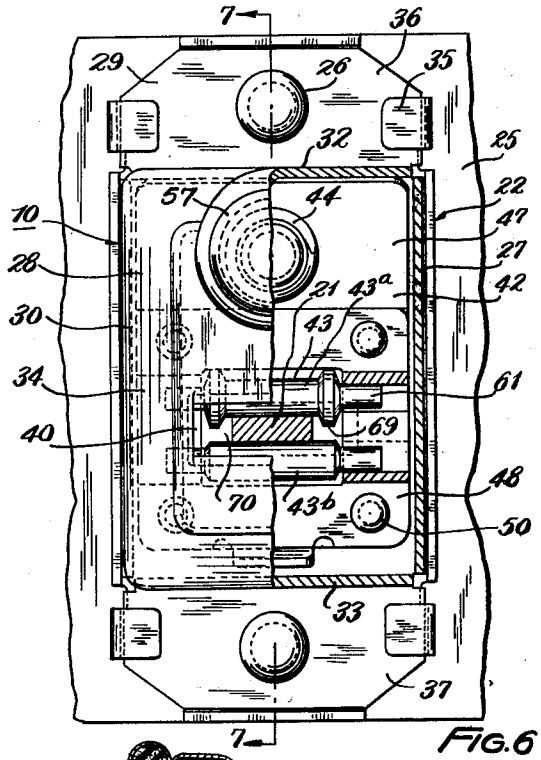


FIG. 6

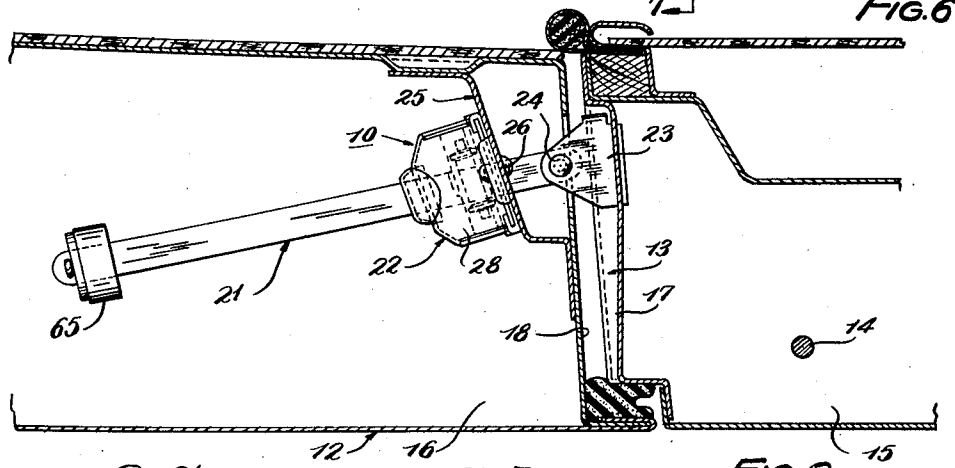


FIG. 2

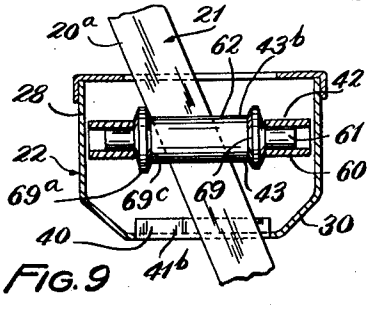


FIG. 9

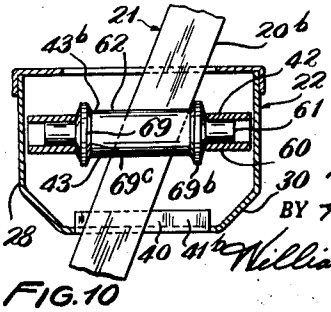


FIG. 10

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DOOR HOLDING DEVICE

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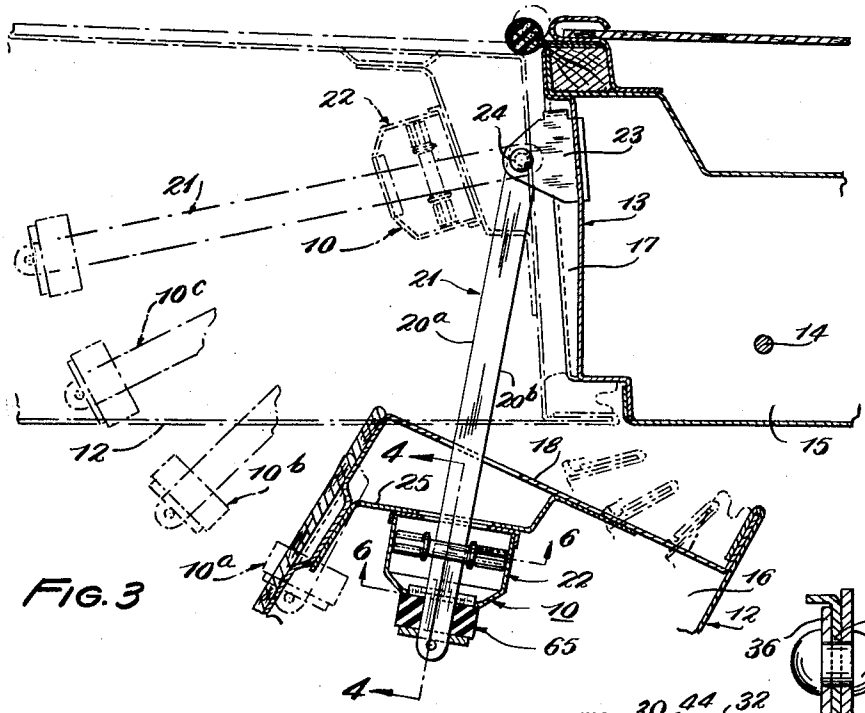


FIG. 3

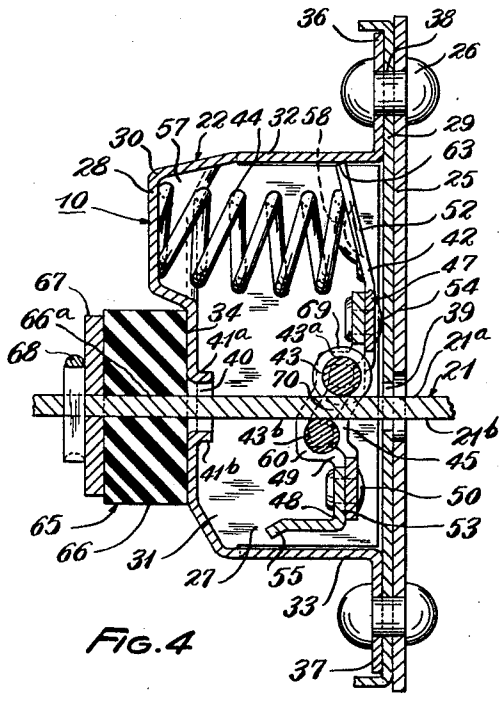


FIG. 4

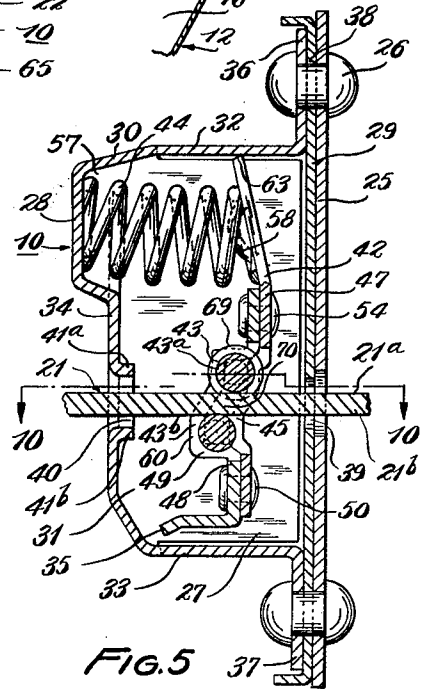


FIG. 5

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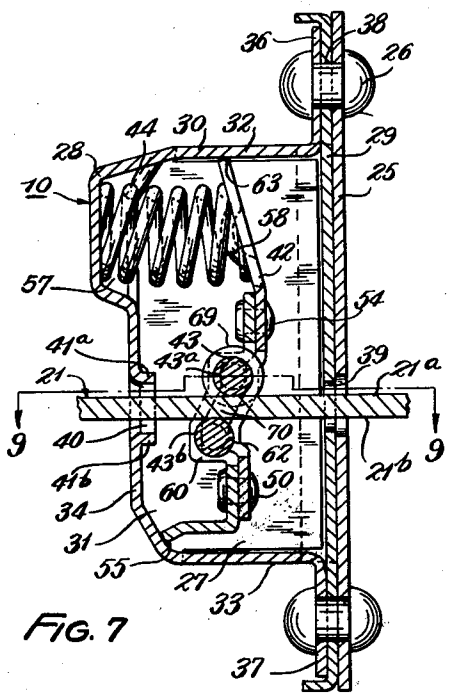


FIG. 7

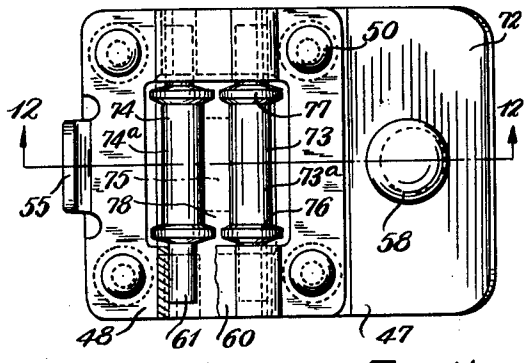


FIG. 11

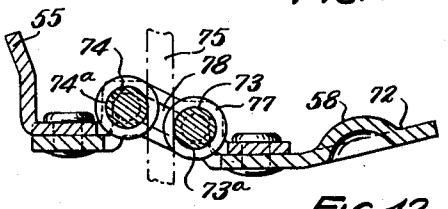


FIG. 12

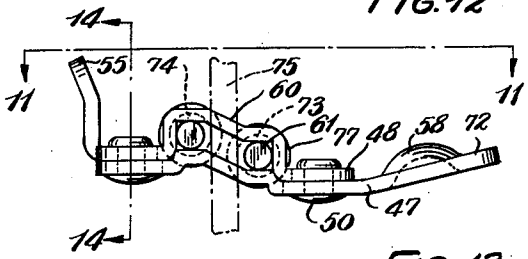


FIG. 13

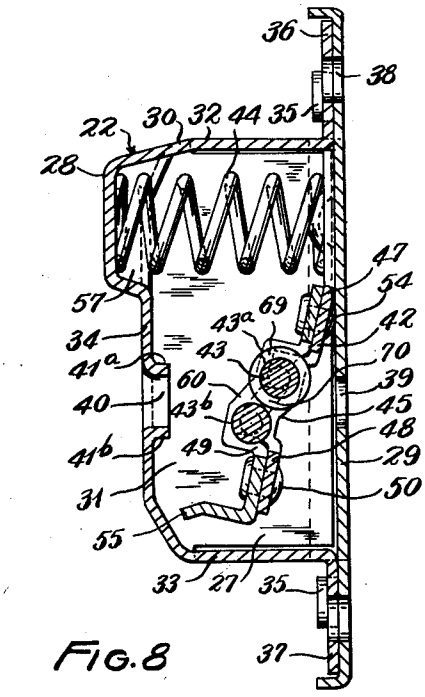


FIG. 8

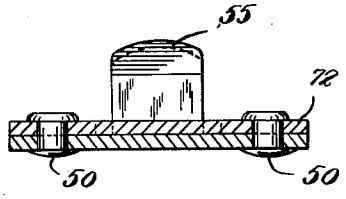


FIG. 14

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2,915,778

DOOR HOLDING DEVICE

Angelo R. De Vito, Cleveland Heights, Ohio, assignor, by mesne assignments, to Lisle W. Menzimer, Rockford, Ill., as trustee

Application January 26, 1956, Serial No. 561,564

12 Claims. (Cl. 16—82)

This invention relates to holding devices for preventing undesired movement between two relatively movable parts but which will also permit a relatively free movement between the parts whenever such relative movement is desired. The invention is applicable to a variety of uses but is especially useful in controlling the movement of a vehicle door and is therefore disclosed herein as applied to such a door but without any intention of limiting the invention solely to that use.

More particularly, this invention relates to holding devices for use between door and doorframe members and comprising an arm or the like connected to one of the relatively movable members, preferably to the doorframe, and a rollable clamping means preferably located on the door and adapted to apply a releasable clamping action to the arm at any point therealong in response to a tilting or couple-producing movement imparted to the clamping means. In the operation of a holding device of this kind the clamping means is automatically effective to clampingly grip the arm whenever the door is relatively stationary, and the clamping action is automatically released in response to movement imparted to the door in either direction.

In the holding devices of the present application, such a rollable clamping means is employed in this relation but is of a form which accomplishes an additional important purpose and advantage, namely that of guiding and confining the relative movement of the arm.

It is, therefore, an object of the present invention to provide a novel holding device for use between relatively movable parts, such as a door and a door frame, and comprising rollable clamping means effective on an arm or the like at any point therealong, and in which flange means associated with the rollable means constitutes a guide means for the arm.

Another object is to provide a holding device, of the character mentioned just above, having a clamping means comprising a pair of rollable elements between which the arm extends and which are subject to a tilting or couple-producing movement for causing the clamping action on the arm, and wherein means projecting from one or both of the rollable elements peripherally thereof constitutes a guide means for the arm.

Still another object is to provide a holding device of the kind above referred to in which a pair of rollers are effective to clamp or release an arm extending therebetween in response to tilting of a roller carrier, and in which flange means carried by the rollers in guidingly effective on the arm.

The invention can be further briefly summarized as consisting in certain novel combinations and arrangements of parts hereinafter described and particularly set out in the claims hereof.

In the accompanying sheets of drawings forming a part of this specification,

Fig. 1 is a partial side elevation of an automobile showing the holding device of the present invention in an installed position thereon and applied to one of the doors of the automobile;

Fig. 2 is a horizontal section taken through a portion of the automobile adjacent the installed position of the holding device, as indicated by the section line 2—2 of Fig. 1, and with the door shown in its closed position;

Fig. 3 is a horizontal section similar to that of Fig. 2 but showing the door in its fully opened position and showing the door holding device in section;

Fig. 4 is a vertical section taken through the holding device as indicated by section line 4—4 of Fig. 3 and showing the relative positions of the components of the holding device when the door is in its fully opened position;

Fig. 5 is a vertical section similar to that of Fig. 4 but showing the relative positions of the components of the holding device when the door is being held thereby;

Fig. 6 is an elevational view, partially in section, taken on lines 6—6 of Fig. 3;

Fig. 7 is a vertical section similar to that of Fig. 5 but showing the relative positions of the components when the door is in its fully closed and latched position;

Fig. 8 is a vertical section similar to that of Fig. 5 but showing the clamping unit in detached relation and prior to the assembly of the arm therewith;

Fig. 9 is a transverse section taken on section line 9—9 of Fig. 7 and showing the cooperation of the arm with the guide means of the rollers when the door is in its closed position;

Fig. 10 is a transverse section similar to that of Fig. 9 but showing the cooperation of the arm with the guide means of the rollers when the door is substantially in a half-open position, the view being taken as indicated by section line 10—10 of Fig. 5;

Fig. 11 illustrates a modified construction and is a front elevation of the roller carrier shown in detached relation but with the rollers thereon, the carrier being viewed as indicated by line 11—11 of Fig. 13;

Fig. 12 is a longitudinal section taken through the carrier and rollers of Fig. 11 as indicated by section line 12—12 thereof;

Fig. 13 is an edge view of this carrier when viewed as indicated by line 13—13 of Fig. 11, and

Fig. 14 is a transverse section of the same carrier of Fig. 11 taken on section line 14—14 of Fig. 13.

As one practical embodiment of the present invention, Figs. 1 to 10 inclusive of the drawings show a novel holding device **10** in the form of a combined door holding and door check device applied to a vehicle **11** for controlling the movement of a door **12** thereof.

The vehicle **11** is here shown as being an automobile having a conventional body **11a** which includes doorframe structure **13** on which the door **12** is mounted for lateral swinging movement by means of suitable hinges **14**. As shown in Figs. 2 and 3, the doorframe structure **13** and the structure of the door **12** are both hollow structures, such that the doorframe structure has a wall space or chamber **15** therein and the door **12** has a wall space or chamber **16** therein. The doorframe structure **13** includes an upright end wall or jamb **17**, and the door **12** similarly includes an upright end wall **18** which moves into an adjacently opposed relation to the end wall **17**, as shown in Fig. 2, when the door is moved to its closed position.

The holding device **10** comprises, in general, a substantially rigid arm **21** and a clamping unit **22** through which the arm extends. The arm **21** has one end thereof connected with one of the relatively movable parts, in this instance the doorframe structure **13**, by means of a bracket **23** which is suitably mounted on the end wall **17**. The arm **21** is here shown as being a rigid substantially flat-surfaced metal bar and is pivotally con-

nected with the bracket 23 as by means of a suitable pivot pin 24.

The clamping unit 22 is connected with the other of the pair of relatively movable parts and, in this instance, is mounted on the door 12. The clamping unit 22 is preferably located within the door 12 by being disposed in the chamber 16 so as to be housed and concealed in the latter. The clamping unit 22 can be mounted on the door in this concealed position by being attached to a corner bracket 25 located in the chamber 16. In this instance the clamping unit 22 is attached to the bracket 25 by rivets 26.

Although the arm 21 and the clamping unit 22 have been described just above as being mounted respectively on the doorframe structure 13 and the door 12, it should be understood, however, that this relative arrangement can be reversed and, if desired, the arm 21 can be connected with the movable part or door and the clamping unit 22 can be connected with the relatively stationary part or doorframe structure.

The clamping unit 22 comprises a cage 28 which can be of any suitable shape and construction but is here shown as comprising a base plate 29 and a housing member 30 mounted on such base plate. The housing member 30 can be a stamped hollow sheet metal member having walls defining a pocket or chamber 31 and which walls include top and bottom walls 32 and 33, substantially parallel side walls 27 and a front wall 34.

The base plate 29 is a substantially flat sheet metal plate forming a mount for the housing member 30 and a cover for the chamber 31. The base plate preferably has stiffening and locating flanges along its end and side edges. The housing member 30 and the base plate 29 can be maintained in a connected relation as by means of bendable tabs 35 carried by the base plate and overlying end flanges 36 and 37 of the top and bottom walls 32 and 33 of the housing member.

The base plate 29 and the end flanges 36 and 37 of the housing member 30 have aligned openings therein to accommodate the above-mentioned rivets 26 by which the clamping unit 22 is attached to the corner bracket 25 of the door 12. The base plate 29 and the front wall 34 of the housing member 30 have substantially aligned openings 39 and 40 therein which accommodate the arm 21 and which are of a substantially greater width than the arm. The opening 40 preferably has lugs 41^a and 41^b at the top and bottom edges thereof formed by inturned integral portions of the wall 34.

The clamping unit 22 also includes as important parts thereof a carrier 42, rollable clamping means 43 on the carrier, and a resilient means 44 which exerts force against both the carrier and the cage 28. The carrier 42 and the resilient means 44 are here shown as both being located in the chamber 31 and the carrier is tiltable therein for causing the rollable means 43 to clamp or release the arm 21, as is explained in greater detail hereinafter.

The carrier 42 is preferably in the form of a plate structure having an opening 45 in an intermediate portion thereof through which the arm 21 extends and which is substantially aligned with the openings 39 and 40 of the cage 28. The carrier 42 is here shown as comprising two connected plate members 47 and 48 of which the plate member 47 forms the body of the carrier and the plate member 48 forms a retainer or bearing cap for the rollable clamping means 43. The plate member 48 is provided with an opening 49 therein and lies against the plate member 47 with its opening substantially opposite the opening 45 of the latter. The plate member 48 can be secured to the plate member 47 in this position by means of rivets 50.

The carrier 42 is of a bowed shape having upper and lower arm portions 52 and 53 located on opposite sides of the openings 45 and 49. The upper arm portion 52 is formed by the upper portion of the plate member 47 and the lower arm portion 53 is formed by the lower portion of the plate member 48. For a purpose to be explained hereinafter, the upper rivets form a contact element 54 which is engageable by the base plate 29 of the cage 28, as shown in Fig. 4, and an angularly disposed finger on the lower portion of the plate member 48 forms a lower contact element 55, which is engageable by the front wall 34 of the cage, as shown in Fig. 7.

The resilient means 44 preferably comprises a single helical compression spring which is disposed between the upper arm 52 of the carrier 42 and the front wall 34 of the cage 28. One end of the spring 44 engages a spring seat in the form of a locating pocket 57 formed on the wall 34 and the other end of the spring seats against the arm 52 in surrounding relation to a locating boss 58 formed thereon. As is apparent from Fig. 4, the spring 44 is under an initial compressive load between the wall 34 and the carrier 42.

The clamping means 43 comprises a pair of rollers 43^a and 43^b between which the arm 21 extends. These rollers are supported by the carrier 42 in a substantially parallel relation and for rotation about their axes. The rollers 43^a and 43^b are located on the carrier 42 so as to be exposed from opposite sides thereof by the openings 45 and 49 of the plate members 47 and 48. The roller 43^b is laterally offset with respect to the roller 43^a, such that its axis lies in an offset position relative to a plane passing through the axis of the roller 43^a and extending in a transverse perpendicular relation to the arm 21.

The rollers 43^a and 43^b are mounted on the carrier 42 by means of the plate member 48 whose side portions on opposite sides of the opening 49 are formed or boxed to define retainer straps or bearing caps 60 overlying the relatively reduced end portions or journals 61 of the rollers. The bearing caps 60 limit the separating movement of the rollers to a predetermined value in relation to the thickness of the arm 21 extending therebetween, such that the upper and lower surfaces 21^a and 21^b of the arm will always be engaged by the cylindrical intermediate roller body portions 62 of the rollers 43^a and 43^b.

When the carrier 42, having the rollers 43^a and 43^b thereon, is in its assembled position in the clamping unit 22 as shown in Figs. 3, 4 and 5, it is supported in the chamber 31 by the arm 21 with the upper edge 63 of the plate member 47 slidably bearing against the inner surface of the top wall 32 of the cage 28. The carrier 42 is of a width such that it will be loosely guided in the chamber 31 between the side walls 27 of the cage 28, as shown in Figs. 3 and 6, and will have a relatively free tilting movement therein for producing a swinging of the pair of rollers 43^a and 43^b relative to the arm 21 and which swinging can be conveniently referred to as a couple-producing movement of these rollers. The swinging movement of the rollers 43^a and 43^b produces a clamping or releasing effect on the arm 21, depending upon the direction of the swinging movement, as will be further explained hereinafter. From the assembled location shown and described herein for the carrier 42, it will be seen that the carrier is fulcrumed on the arm 21 and will produce a very effective lever actuation of the rollers during its tilting movements in the chamber 31.

The arm 21 is prevented from being withdrawn from the cage 28 and from between rollers 43^a and 43^b by stop means 65 provided on the outer end of the arm and which is engageable with the cage of the clamping unit 22 for this purpose. This stop means also limits relative movement between the relatively movable connected parts, that is to say, opening movement between the door 12 and its doorframe structure 13.

The stop means 65 is here shown as comprising a bumper element 66 in the form of a cushion block made of rubber, or the like, and having an opening or slot

66[a] therein by which it is mounted on the arm 21. The stop means 65 also comprises a backing plate 67 engaged by the outer face of the bumper block 66 and a cotter pin 68, or the like, extending through an opening of the arm for retaining the backing plate in position thereon.

In accordance with the present invention, the movements of the arm 21 relative to the clamping unit 22 are guided by a guide means associated with the roller means 43. This guide means comprises radial annular projections 69 located on axially opposite sides of the intermediate roller body portion 62 of one or both of the rollers 43[a] and 43[b], so as to be engageable by the side edges of the arm 21 when the latter assumes relatively inclined positions as shown in Figs. 9 and 10. The projections 69 are shown in Figs. 4 to 8 inclusive as being a pair of axially spaced radial annular flanges carried by the roller 43[a] and preferably formed by integral portions of this roller. The guide flanges 69 preferably have inclined or beveled annular side faces 69[c] thereon.

Although the guide flanges 69 are shown in Figs. 4 to 8 inclusive as being provided on only one roller, they can if desired be provided on both rollers as shown in the modified construction of Figs. 11 to 13 inclusive, and in the latter case, the two rollers will be identical in form. If desired, one flange can be omitted from each roller in the modified construction of Figs. 11 to 13 such that the remaining pair of guide flanges will be in a staggered relation on opposite sides of the arm 21 and, in that case, the rollers again will be identical in form.

To describe the tilting movements of the carrier 42 by which the arm clamping and arm releasing functions of the rollers 43[a] and 43[b] are produced, it is pointed out that Fig. 7 shows the relative positions of the components of the clamping unit 22 when the door 12 is in its closed and latched position. At this time the spring 44 is in a further compressed or loaded condition between the cage 28 and the carrier 42 and the lower contact element 55 is adjacent to or in engagement with the wall 34 of the cage. The expansive action of the spring 44 is now imparting a tilting force to the carrier 42 in a clockwise direction by which the upper roller 43[a] is being forced downwardly against the upper surface 21[a] of the arm 21, and the lower roller 43[b] is being forced upwardly against the lower face 21[b] of the arm. This tilt thus imparted to the carrier 42 causes the above-mentioned couple-producing movement of the rollers 43[a] and 43[b], as the result of which these rollers exert a positive clamping action on the arm whereby the carrier 42 is temporarily connected to the arm in a relatively fixed relation.

With respect to the action of the rollers 43[a] and 43[b], it is important to understand that when the clamping action of these rollers on the arm 21 is released, the arm can move freely in a longitudinal direction between the rollers but when the rollers are forced against the surfaces of the arm in clamping engagement therewith by the above-mentioned couple-producing movement, they strongly grip the arm to thereby resist or prevent longitudinal movement thereof. When the clamping action of the rollers on the arm has been released, the rollers function as bearing and guiding rollers, at which time they rotate relatively freely about their axes to facilitate and guide longitudinal movement of the arm 21 through the cage 28. When the couple-producing movement of the rollers causes them to clamp the arm 21, they no longer act as rollers but then function as relatively non-rotatable gripping elements for gripping and holding the arm.

Figs. 9 and 10 illustrate the guiding cooperation of the flanges 69 with the arm 21 during the endwise movements of the latter through the clamping unit 22. The flanges 69 and the roller body portions 62 together define the space or pass 70 between the rollers 43[a] and 43[b] and through which pass the arm 21 extends. During its endwise movement through the clamping unit 22, the arm 21 swings in its own plane from one to the other of the angular positions of Figs. 9 and 10, with the fulcrum point for this swinging movement being located at or in the roller pass 70. Fig. 9 shows the angular position assumed by the arm 21 with the side edge 20[a] thereof in engagement with the guide flange 69[a] when the door 12 is in its closed position and Fig. 10 shows the angular position assumed by the arm 21 with its opposite side edge 20[b] in engagement with the guide flange 69[b] when the door is in its half-open position.

The operation of the door holding device 10 will be described in greater detail in the following paragraphs.

When the latch of the door 12 is manually released the spring 44 expands from its fully loaded condition shown in Fig. 7, and since the carrier 42 is then held in a relatively fixed relation by the arm 21, the carrier serves as an abutment against which the spring reacts such that the expansive movement of the spring takes place in a direction away from the carrier and imparts opening movement to the door 12 through the cage 28. This expansive action of the spring 44 thus assists the initial opening movement of the door until the parts of the clamping unit 22 assume the relative positions shown in Fig. 5, in which the spring 44 is in a partially expanded condition and the wall 34 of the cage has been moved away from the contact element 55.

Fig. 4 shows the condition of the clamping unit 22 when the door 12 is in its fully opened position, in which it is shown in full lines in Fig. 3, and while the operator's hand still remains on the door. When the operator's hand is removed from the door, the normal tendency for the door to swing in the closing direction causes the base plate 29 to be moved away from the contact element 54 whereupon the parts of the clamping unit 22 assume the relative positions shown in Fig. 5 of the drawings. Fig. 5 is also representative of the condition of the clamping unit 22 when the door is relatively stationary in any of its intermediate positions between the fully closed position and the fully open position, such as in one of the intermediate positions represented in Fig. 3 by the broken line showings 10[a], 10[b], and 10[c] of the holding device.

With the parts of the clamping unit 22 in the relative positions shown in Fig. 5, the spring 44 is still in a partially loaded condition and its expansive action maintains the carrier 42 in a tilted relation by which the tendency to impart a clockwise couple-producing movement to the rollers 43[a] and 43[b] causes the latter to maintain a clamped engagement with the arm 21 by which the carrier is substantially rigidly connected with the arm, and which rigid connection is maintained as long as the spring holds the carrier in a tilted position. By reason of this clamped engagement between the rollers and the arm, the door will be firmly held in any intermediate position in which it is left standing. The partially loaded condition of the spring 44, just above mentioned, results from its initial compression at assembly augmented by the compression load thereon by the door 12 while the spring is resisting or counterbalancing the normal tendency of the door to swing shut.

If the door 12 is standing in a partially open position and is to be opened further by a manual movement imparted thereto, the tendency will be for the cage 28 to be moved along the arm 21 in a direction toward the left, as seen in Fig. 5. Since the carrier 42 is now being temporarily held in a relatively fixed connection with the arm by the clamping engagement of the rollers 43[a] and 43[b] on the latter, the cage 28 will move with the door and relative to the carrier 42, causing the base plate 29 to engage the contact element 54. This engagement of the base plate with the contact element 54 causes tilting of the carrier 42 about the arm 21 and in a counterclockwise direction, as seen in Fig. 5, to thereby produce a swinging movement of the rollers in a releasing direc-

tion, whereby their clamping engagement with the arm is released.

As long as the opening movement being imparted to the door is causing a pushing action of the base plate 29 against the contact element 54, the tendency to produce a counterclockwise swinging movement of the rollers will continue and the clamping action of the rollers will be released and they will function merely as rollers, permitting a relatively free movement of the arm 21 therebetween. When the operator's hand is removed from the door at the completion of such further opening movement, the components of the clamping unit 22 will automatically assume the relative positions shown in Fig. 5 in which the carrier 42 is again tilted by the spring 44 in a direction to cause a clockwise couple-producing movement of the rollers, whereby the carrier is again rigidly connected with the arm and thus holds the door in the position in which it is left standing.

If the opening movement of the door is continued to its fully opened position of Fig. 4, the bumper element 66 of the stop means 63 will be engaged by the cage 28 and will prevent any further opening movement. If the operator's hand is now removed, the door will tend to swing shut and will move a short distance in a closing direction against the resistance of the spring 44 until the parts of the clamping unit 22 again automatically assume the holding position shown in Fig. 5, whereupon the door will be firmly held in such fully opened position.

If the operator desires to move the door 12 toward its closed position from any position in which it is being held open by the holding device 10, the manual closing movement imparted to the door tends to cause shifting of the cage 28 along the arm 21 toward the right, as seen in Fig. 5. Since the carrier 22 is then being held in a relatively fixed connection with the arm by the clamping engagement of the rollers 43^a and 43^b on the latter under the influence of the spring 44, the carrier remains relatively stationary until the wall 34 of the cage engages the contact element 55 whereupon the carrier is tilted in a counterclockwise direction to impart a counterclockwise or releasing movement to the rollers 43^a and 43^b, whereby the latter release their clamped engagement with the arm.

The release of the carrier 42 from the arm 21 permits the clamping unit 22 to move freely along the arm as long as the door-closing movement is being manually imparted to the door. If the door-closing movement is interrupted at any time by the removal of the operator's hand from the door, the carrier 42 will automatically assume its clockwise tilted relation to thereby produce the above-explained clamping engagement of the rollers with the arm 21 for firmly holding the door in any position in which it is left standing. If the closing movement being imparted to the door is sufficient to move the door to its fully closed and latched condition, the parts of the unit 22 again assume the relative positions shown in Fig. 7 in which the spring 44 has been compressed to the above-mentioned further loaded condition to provide the above-described action in assisting the initial opening movement when the door is subsequently unlatched.

Fig. 8 of the drawings shows the relative positions of the component parts of the clamping unit 22 before the arm 21 has been inserted through the cage 28 and between the clamping rollers 43^a and 43^b of the carrier 42. During the insertion of the arm 21 the carrier 42 is tilted to the position shown in Fig. 4, thereby completing the initial loading of the spring 44. The rollers 43^a and 43^b are preferably hardened to a suitable degree so as to prevent the occurrence of wear such as might otherwise produce flat spots thereon. The metal of the rollers is preferably relatively harder than that of the arm 21. As shown in the drawings, the upper and lower surfaces 21^a and 21^b of the arm are relatively flat and smooth for substantially the full length of the arm.

Figs. 11 to 14 inclusive of the drawings show a carrier 72 which is similar to the above-described carrier 42 but which is of a modified construction in that the clamping rollers 73 and 74 between which the arm 75 extends are each provided with a pair of guide flanges 76 and 77. The guide flanges 76 and 77 are located on axially opposite sides of the roller body portions 73^a and 74^a, and preferably comprise integral portions of these rollers. As shown in Fig. 11, the pairs of rollers 76 and 77 are located in an opposed relation such that, in cooperation with the roller body portions 73^a and 74^a, they define the pass 78 through which the arm 75 extends.

It will be understood that the modified carrier 72 will constitute a part of a clamping device which is otherwise of substantially the same construction as the clamping device 10 and functions in the same manner, and wherein the pairs of rollers 76 and 77 act as a guide means for the arm 75 in a manner similar to the guide function accomplished by the flanges 69 and with the fulcrum point for the swinging movements of the arm 75 being located in or adjacent the pass 78.

From the accompanying drawings and the foregoing detailed description it will now be readily understood that this invention provides holding devices of a simple and practical form which will be noiseless and durable in use and which can be readily applied to a door of a vehicle so as to constitute both a holding device for retaining the door in any desired open position in which it is left standing and a door check for limiting the extent of opening movement of the door. It will also be understood that the holding action is produced by the clamping engagement of a roller means with an arm and that projecting means associated with the roller means, and preferably in the form of flanges on the latter, constitutes a guide means for the arm. Additionally, it will be seen that when the clamping action of the rollers on the arm is released, they rotate freely to facilitate and guide the movements of the arm therebetween.

Although the present invention has been illustrated and described herein to a somewhat detailed extent it will be understood of course that the invention is not to be regarded as being limited correspondingly in scope since it is intended to include all changes and modifications coming within the terms of the claims hereof.

Having thus described my invention, I claim:

1. In a holding device for use between a pair of relatively movable parts, an arm adapted for connection with one of said parts, said arm having substantially flat parallel surfaces on opposite sides thereof, means adapted for mounting on the other of said parts and including rollable means continuously in contact with said surfaces at points offset longitudinally along said arm, resilient means acting to cause said rollable means to be pressed against said surfaces at said offset points and rendered substantially nonrotatable for clamping said arm at any location along the latter for normally preventing relative movement between said parts, releasing means effective in opposition to said resilient means and in response to relative movement between said parts for causing said rollable means to release said arm, and flange means on said rollable means and guidingly effective on said arm.

2. In a holding device for use between a pair of relatively movable parts, an arm adapted for connection with one of said parts, said arm having substantially flat parallel surfaces on opposite sides thereof, means adapted for mounting on the other of said parts and comprising a carrier tiltable relative to said arm, a pair of rollers on said carrier and engaging the respective flat surfaces of said arm, means for actuating said carrier to tilt the same in one direction to cause said rollers to be pressed against said surfaces and rendered substantially nonrotatable for clamping said arm for normally preventing relative movement between said parts, and means for tilting said carrier in the opposite direction in response to relative movement between said parts for causing said

rollers to release said arm, and flange means projecting from said rollers and having guiding cooperation with said arm.

3. In a holding device for use between a pair of relatively movable parts, an arm adapted for connection with one of said parts, means adapted for mounting on the other of said parts including a swingable carrier having thereon a pair of rollers between which said arm extends, said rollers being normally in rollable engagement with opposite sides of said arm at longitudinally offset points along the arm and having a couple-producing movement in response to swinging of said carrier for pressing the rollers against said arm at said offset points and thereby rendering the rollers substantially nonrotatable for clamping said arm to normally prevent relative movement between said parts, means for causing the swinging of said carrier, and axially spaced annular flanges on at least one of said rollers for guiding cooperation with edge portions of said arm.

4. In a holding device for use between a pair of relatively movable parts, an arm adapted for connection with one of said parts, means adapted for mounting on the other of said parts including a swingable carrier having thereon a pair of rollers between which said arm extends, said rollers having a couple-producing movement in response to swinging of said carrier for pressing the rollers against said arm and rendering the rollers substantially nonrotatable for clamping said arm to normally prevent relative movement between said parts, resilient means tending to produce the swinging of said carrier for rendering the rollers automatically effective to clamp said arm at any point therealong, and axially spaced annular flanges on at least one of said rollers for guiding cooperation with edge portions of said arm.

5. In a holding device for use between a pair of relatively movable parts, an arm adapted for swingable connection with one of said parts, means adapted for mounting on the other of said parts and having a pair of rollers between which said arm extends, said rollers being normally in rollable engagement with opposite sides of said arm at offset points along the arm, said rollers having a couple-producing movement in one direction relative to the arm for clamping said arm therebetween and being swingable in the reverse direction for releasing said arm, means for tilting the roller-mounting means in opposite directions relative to said arm for selectively causing the couple-producing movement and the reverse swinging movement of said rollers, and pairs of spaced-apart annular flanges on said rollers for guiding cooperation with edge portions of said arm.

6. In a holding device for use between a pair of relatively movable parts, an arm adapted for connection with one of said parts, means adapted for mounting on the other of said parts including a swingable carrier having thereon a pair of rollers between which said arm extends, said rollers having a couple-producing movement in response to swinging of said carrier for clamping said arm to normally prevent relative movement between said parts, resilient means tending to produce the swinging of said carrier for rendering the rollers automatically effective to clamp said arm at any point therealong, releasing means effective to produce a swinging movement of the carrier to cause the rollers to release said arm, and a pair of axially spaced annular projections on at least one of said rollers for guiding cooperation with said arm.

7. In a holding device for use between a pair of relatively movable parts, an arm adapted for swingable connection with one of said parts, means adapted for mounting on the other of said parts and having a pair of spaced rollers between which said arm extends, the intermediate portions of said rollers being in guiding engagement with said arm on opposite sides thereof and at offset points longitudinally of the arm, said rollers being swingable in one direction relative to the arm for clamping said arm therebetween and being swingable in the reverse direction for releasing said arm, resilient means effective to produce said swinging of said rollers in said one direction, and releasing means effective to produce said swinging of the rollers in said reverse direction and in opposition to said resilient means, said rollers having pairs of substantially radially opposed flanges thereon for guidingly confining said arm in the space between said rollers.

8. A holding device for use between a pair of relatively movable parts comprising, a support adapted for mounting on one of said parts, a carrier, a pair of rollers on said carrier, an arm adapted for connection with the other of said parts and extending between said rollers, said carrier being tiltable relative to said support and arm to impart couple-producing movement to said rollers for causing the latter to clamp said arm, means for imparting the relative tilting movement to said carrier, and a pair of axially spaced flanges on at least one of said rollers for guiding cooperation with said arm.

9. A holding device for use between a pair of relatively movable parts comprising, a cage adapted for mounting on one of said parts, a carrier in said cage, spaced apart substantially parallel-axis rollers on said carrier, an arm having substantially flat surfaces on opposite sides thereof, said arm being adapted for connection with the other of said parts and extending between said rollers, the intermediate portions of said rollers being in engagement with said flat surfaces, said carrier being tiltable in one direction to produce a swinging movement of said rollers for causing the latter to clamp said arm and tiltable in the opposite direction to produce a reverse swinging movement of said rollers for causing the latter to release said arm, spring means effective between said cage and carrier tending to tilt the latter in said one direction, releasing means for causing tilting of said carrier in said opposite direction in response to relative movement between said parts, and spaced-apart flanges on at least one of said rollers for guiding cooperation with said arm.

10. A holding device for use between a pair of relatively movable parts comprising, a support adapted for connection with one of said parts, a carrier, a pair of rollers, retainer means mounting said rollers on said carrier in a spaced apart substantially parallel relation and for rotation about their axes, an arm adapted for connection with the other of said parts and extending between said rollers, said carrier comprising plate means having an opening therein substantially in alignment with the space between said rollers and through which said arm extends and said carrier being movable relative to said support to impart swinging movement to said rollers for causing the latter to clamp or release said arm, means for imparting the relative movement to said carrier, and spaced-apart flanges on at least one of said rollers and located in said opening for guiding cooperation with said arm.

11. In a holding device for use with a hinged door structure and its associated frame structure and one of which structures is hollow, a cage adapted to be mounted within the hollow one of said structures, an arm adapted to be connected with the other of said structures and being of a length to extend through said cage for all operative relative positions of said structures, a carrier tiltable in said cage and having an opening therein, a pair of rollers on said carrier, said rollers having a space therebetween through which said arm extends and which space is substantially aligned with said opening, said rollers being clampingly effective on said arm to grip the same at any point therealong in response to a couple-producing movement of said rollers caused by tilting of said carrier, a spring in said cage tending to tilt said carrier to cause gripping of said arm by said rollers whenever said door structure is relatively sta-

tionary, and a pair of spaced-apart flanges defined by roller portions in guiding cooperation with said arm.

12. In a holding device for use with a hinged door structure and its associated frame structure and one of which structures is hollow, a cage adapted to be mounted within the hollow one of said structures and having substantially opposed walls, an arm adapted to be connected with the other of said structures and extending through said cage, a carrier tiltable in said cage and having an opening therein, a pair of spaced apart rollers on said carrier and between which said arm extends, said rollers being located with the space therebetween substantially aligned with said opening, contact elements on said carrier on opposite sides of said pair of rollers, said cage and carrier having limited relative movement therebetween for mutual engagement between said opposed walls and the respective contact elements in response to said limited relative movement, a spring in said cage tending to tilt said carrier to cause a couple-producing movement of said rollers for causing the latter to clampingly grip said arm at any point therealong whenever said door structure is relatively stationary, tilting of said carrier in the opposite direction to cause said rollers to release said arm being responsive to engagement between said cage and one of said contact elements upon movement of said door structure in one direction and responsive to engagement between said cage and another of said contact elements upon movement of said door structure in the other direction, and a pair of spaced-apart flanges defined by annular roller projections and having guiding cooperation with said arm.

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