Feb. 27, 1968 J. H. MARCHIONE 3,370,317

DOOR HINGES WITH TORSION BAR HOLD-OPEN MEANS

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Fig. 1

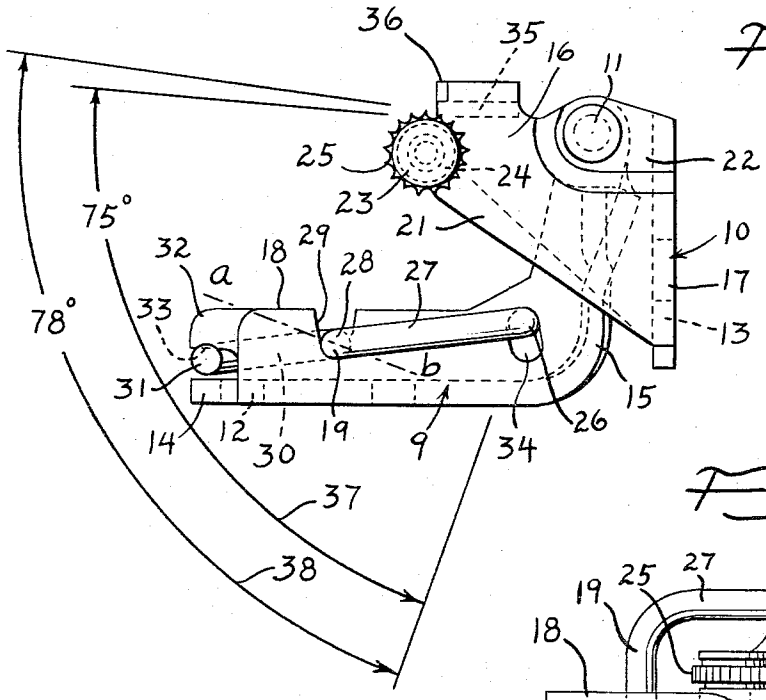


Fig. 2

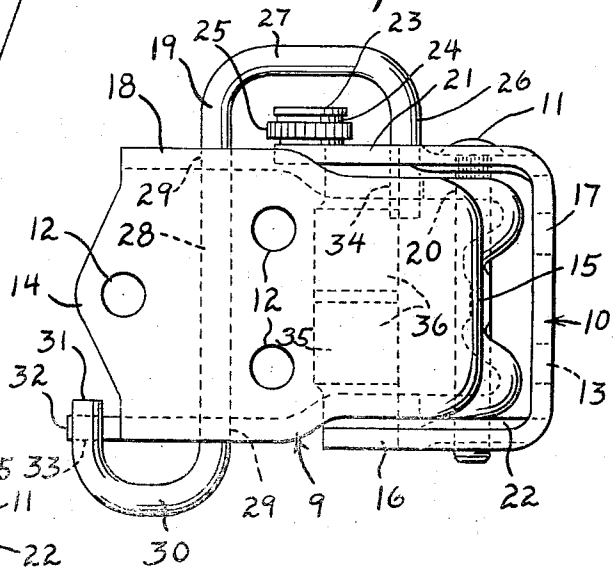
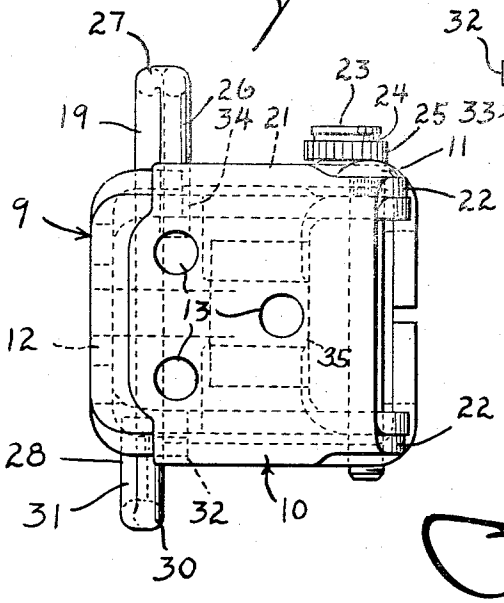


Fig. 3



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Fig. 4

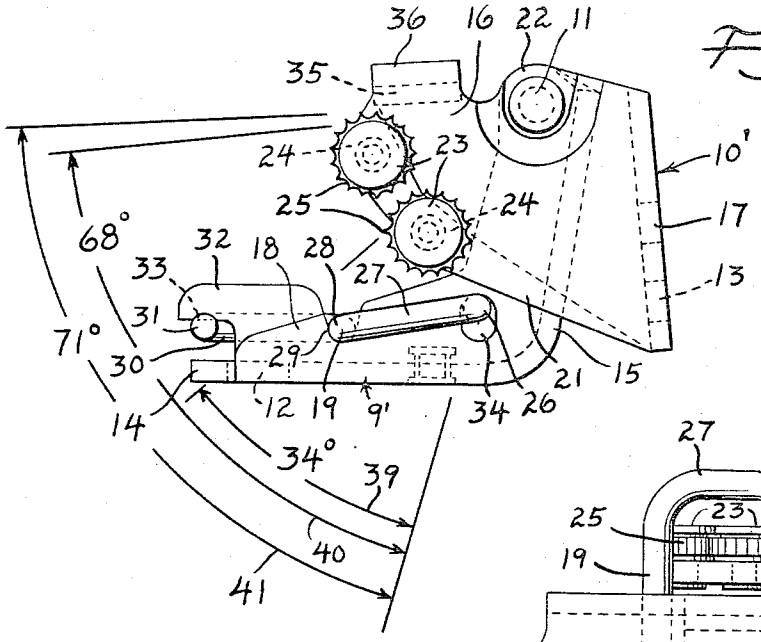


Fig. 5

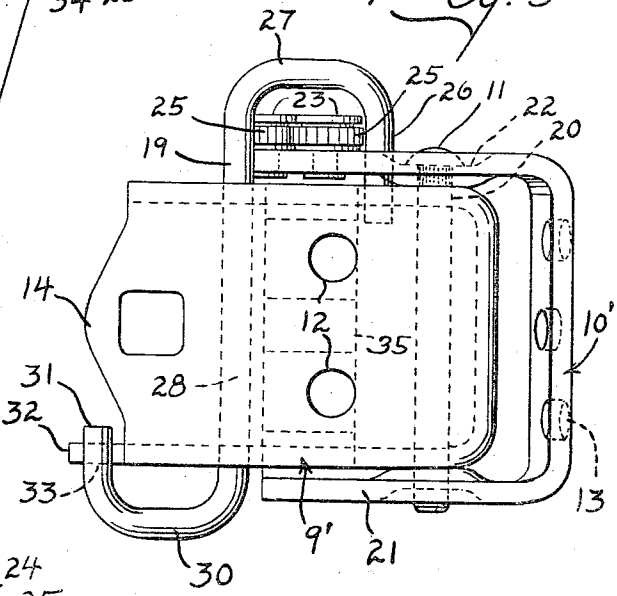
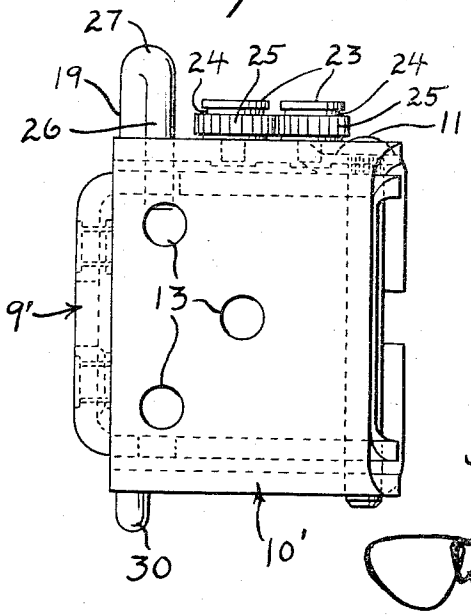


Fig. 6



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DOOR HINGES WITH TORSION BAR HOLD-OPEN MEANS

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Fig. 7

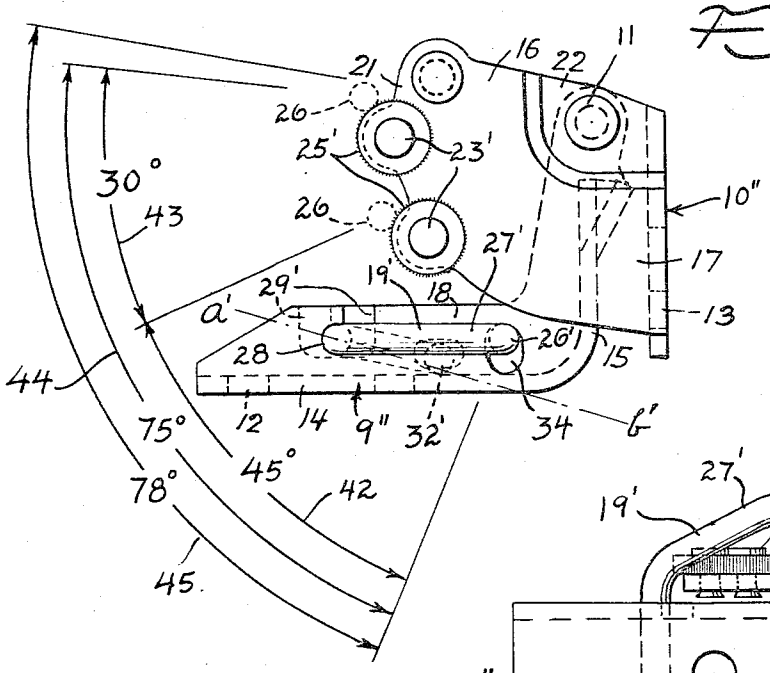


Fig. 8

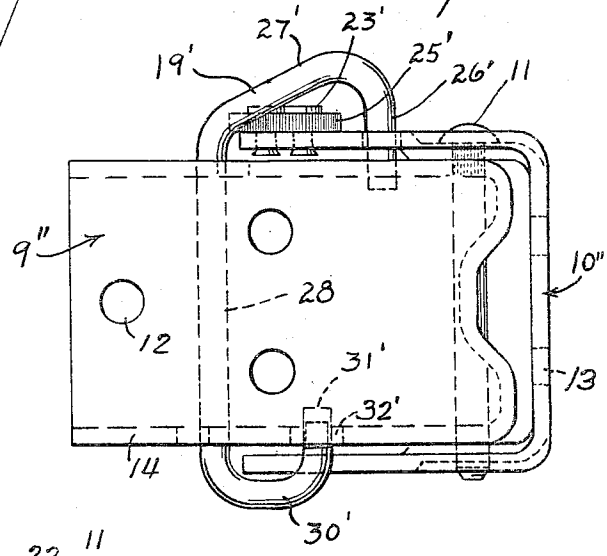
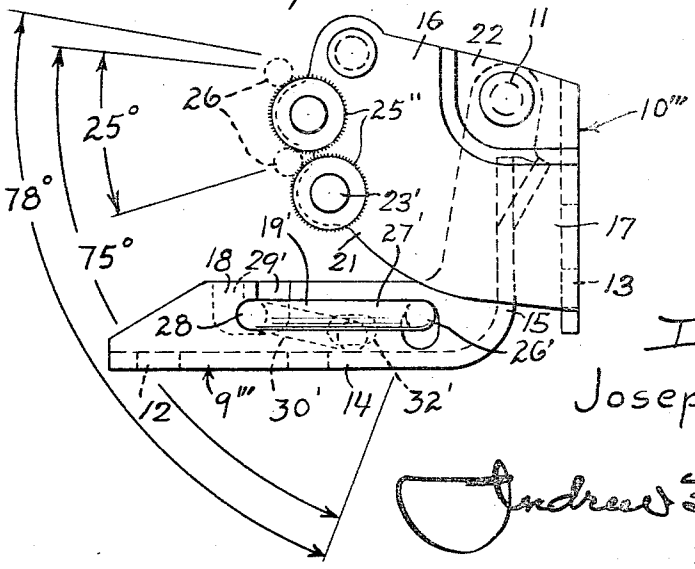


Fig. 9



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DOOR HINGES WITH TORSION BAR HOLD-OPEN MEANS

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25 Claims. (Cl. 16—145)

ABSTRACT OF THE DISCLOSURE

The hinge, in one form, has a single scalloped roller as a striker mounted on a vertical pin for rotation relative to one plate of the hinge, the other plate carrying a vertical torsion bar with the upper end bent in a semicircle to provide a laterally extending arm with a substantially vertical detent portion projecting from its outer end, which is supported on the plate independently of the other plate so as to maintain a preload spring tension, the detent portion being disposed in the path of arcuate movement of the striker roller and movable relative to the torsion bar by deflection of said arm by said roller in a direction to increase the spring tension in said bar when said roller comes into engagement with said detent in the door opening and closing movement of the door for a hold-open action in fully opened position, the scalloped periphery of the roller causing the detent to drop into a scallop upon each engagement, thereby forcing the roller to turn through a certain angularity in each movement of the roller past the detent. There is friction means resisting turning of the roller so that the same scallop is engaged by the detent in each operation in the door opening and closing operation until the roller is turned to a new position. In another form, two scalloped rollers are used on the same plate, disposed in laterally spaced relation, both arranged to engage and move past the same detent at different points in the door movement, where the door is to be held open in both the extreme open position and an intermediate mid-open position, the door swinging freely otherwise.

This invention relates to improvements in automobile door hinges, and is more particularly concerned with the provision in cage type hinges of novel torsion bar hold-open means designed to give a thoroughly reliable hold-open action in the fully or partially opened position of the door, the hold-open means locking and unlocking smoothly and quietly and being out of engagement otherwise so as to allow freedom of movement of the door throughout the rest of the opening and closing movements, which is especially important in doors designed to have an upward swing as they are opened as it is important in such cases to keep the opening effort at a minimum.

In accordance with my invention, a torsion type spring bar or rod of generally S or C-shape has one vertical end portion on one end arm entered in a hole in one side of the hinge cage and the other vertical end portion on the other end arm entered in a slot in the other side of said cage in such a way that a torsional stress is loaded therein in its mounting on the cage, the mounting being such that the bar is retained at four points of contact, namely, at opposite ends of the two end arms, the bar

being securely locked against vertical displacement by means of a notch in the one end portion, thereby becoming a tightly locked part of the cage or body half of the hinge adapted to be deflected by striker means on the door half of the hinge against its built-in spring action only at the one end, this requiring a force greater than the preload spring pressure. The striker means which is herein disclosed as a roller or rollers is arranged to deflect the movable end of the torsion bar against its spring action as the door reaches either fully opened position (using one roller) or both partially and fully opened positions (using two spaced rollers) to obtain the hold-open action, as the door cannot be closed until the movable end of the torsion bar is again deflected by the roller means moving in the opposite direction, the inter-engaging bar and roller parts being so arranged that considerably less effort is required for the roller means to deflect and pass the torsion bar in the door opening movement than is required for the roller means to deflect and pass said bar in the opposite direction in the door closing movement.

In the two preferred forms I provide scalloped or so-called star rollers, the scallops on the periphery being so close together as to be certain of a scallop seating on contact with the torsion bar in the first operation in the event there is not direct alignment of a scallop with the bar beforehand, and the scallops insuring that the roller will be forced to turn under all sorts of operating conditions, such as ice, rust, abrasives, and whatever might tend to cause the roller to stick or freeze and could otherwise cause malfunctioning or noisy operation. A wavy washer is preferably employed in connection with each roller to prevent its spinning freely after the torsion bar is passed in closing the door thus reducing likelihood of a scallop not being properly aligned with the torsion bar on the next opening of the door.

In two other forms, two knurled or serrated rollers are used in spaced relation and the hold-open action is obtained at one partially opened position by the first roller deflecting the movable spring end of the torsion bar out of the way in passing it in the door opening movement, the door being then held open with or without any freedom of movement depending upon whether the two rollers are disposed in appreciable spaced relation, or are disposed close together, the second roller in either case deflecting the bar to hold the door in the fully opened position. Here again, the serrations or knurling is important as it assures turning of the roller or rollers in each opening and closing of the door upon contact with the torsion bar, thereby reducing wear on the inter-engaging parts and insuring easier, smoother and quieter operation, and reducing likelihood of spring breakage.

In all four forms, the movable end of the torsion bar gets lateral bearing support by engagement with the sides of the slot, thereby preventing over-stressing and work hardening, which could cause the bar to fail to operate properly by assuming a set condition more or less backward away from its normal roller contacting position.

The invention is illustrated in the accompanying drawings, in which

FIG. 1 is a plan view of a cage type hinge embodying the improved hold-open means of my invention, showing the parts in what corresponds to the closed position of the automobile door;

FIG. 2 is a side view of FIG. 1;

FIG. 3 is an end view of FIG. 1;

FIGS. 4, 5 and 6 are views corresponding to FIGS. 1, 2 and 3, respectively, showing a similar hinge having similar hold-open means but utilizing two scalloped or star rollers in spaced relation on the body half of the hinge to hold the automobile door open either at a mid position or at a fully opened position, whereas the hold-open means of FIGS. 1–3 is limited to the fully opened position;

FIGS. 7 and 8 are views similar to FIGS. 4 and 5 showing still another hinge with comparable hold-open means but utilizing two knurled or serrated rollers in appreciably spaced relation for inter-engagement with a generally C-shaped torsion bar for hold-open action in both a mid position and the fully opened position of the door, the spacing of the rollers alowing a certain range of free movement of the door between the mid position and fully opened position, and

FIG. 9 is a view similar to FIG. 7 showing two knurled or serrated rollers in closely spaced relation giving hold-open action in two positions but without the freedom of door movement in the intermediate position permitted with the construction of FIGS. 7 and 8.

Similar reference numerals are applied to corresponding parts throughout the views.

Referring to the drawings and at first mainly to FIGS. 1 to 3, the reference numeral **9** designates the inner or body half of a cage type hinge to which the outer or door half **10** is pivotally connected by means of a pintle **11**. The parts **9** and **10** are both of formed sheet metal construction, and part **9** has three bolt holes **12** for reception of bolts for fastening it to the body, and part **10** also has three bolt holes **13** for reception of bolts to fasten it to the door. The parts **9** and **10** are both generally L-shaped, one leg **14** of part **9** being fastened to the body while the other leg **15** carries the pintle **11** on its outer end for pivotal connection with an intermediate portion of the length of one leg **16** of part **10**, the other leg **17** of which is fastened to the door. Both parts are of generally channel-shaped cross-section and it is on the flanges **18** of part **9** that the hold-open torsion bar **19** is mounted and bearings **20** are provided for the pintle **11**. The flanges **21** of part **10** have inwardly embossed and perforated portions **22** for reception of the pintle **11** and for bearing engagement with the top and bottom flanges of the inner part **9**, as seen in FIGS. 2 and 3. The upper flange **21** on part **10** also provides support at the outer end of leg **16** for the shouldered rivet **23** on which are mounted a wavy spring-washer **24** and a scalloped or star roller **25** at a predetermined radius from pintle **11** for inter-engagement with the downwardly bent end portion **26** of the upper arm **27** of the generaly S-shaped torsion bar **19**. The latter has its intermediate portion **28** disposed vertical and parallel to the downwardly bent end portion **26** previously mentioned and this portion **28** is engaged in vertically aligned notches **29** provided in the upper and lower flanges **18** of part **9**, while the lower arm **30** of said torsion bar has an upwardly bent vertical end portion **31** interlocked with a lug **32** provided on the end of the lower flange **18** of the inner part **9**, the interlocking being by engagement of said lug in a groove **33** milled transversely of the end portion **31** wide enough to receive the lug **32**. The torsion bar **19** is bent from high carbon steel round bar stock with the lower arm **30** normally at an angle relative to upper arm **27** as indicated by the dotted line *ab* in FIG. 1, which is merely illustrative of an angle and not intended to represent the specific angle required, as that might be larger or smaller than the angle shown, depending upon the requirements of the hinge so far as preload spring tension in the torsion bar **19** is concerned. The torsion bar is heat treated before assembly on the inner hinge part **9**, and, in the assembling operation, the intermediate portion **28** of the torsion bar **19** is first entered in the notches **29** so that the downwardly bent end portion **26** is in vertical alignment with the slot **34** in the upper flange of part **9** into which this end portion **26** is to be entered, the torsion bar being then moved downwardly to enter the end portion **26** in said slot far enough to locate the upwardly bent end portion **31** of the bar below the lower flange of the inner hinge part **9**, whereupon the lower arm **30** of the torsion bar is given a twist in a counterclockwise direction, as it is seen in FIG. 2, sufficient to permit moving the bar upwardly and locate the bent end portion **31** behind the lug **32** and enter said lug in groove **33**. In this way I preload the torsion bar to the desired extent and make it a permanently assembled spring part of the inner hinge part **9**, while permitting a limited amount of spring restrained oscillation of the upper arm **27** as required for the hold-open action when the roller **25** engages and deflects the end portion **26** when the automobile door is swung to its fully opened position, the end porton **26** engaging in one of the scallops of the roller **25** as the roler engages this end portion and moves past it, the roller in this operation being turned through a small angle locking the door in the fully opened position with the arm **15** of the inner part **9** in engagement with a stop plate **35** that is welded to lugs **36** bent downwardly and upwardly from the top and bottom walls respectively of the outer hinge part **10**. A small amount of latitude for door movement is left after the roller **25** has deflected and passed the end **26** of bar **19**, as seen by the arcs **37** and **38** in FIG. 1, the slightly shorter arc **37** measuring the swing of the door from closed to its hold-open position, and the longer arc **38** measuring the full range of door movement from fully closed to fully opened position. While only 3° difference is indicated, no limitation is to be thereby inferred, as the hinge shown happens to be one for a rear door. More free movement would usually be provided for a front door.

In operation, the scalloped or star roller **25** will be turned through whatever small angularity may be necessary to engage one of its scallops with the end portion **26** of the torsion bar **19** upon engagement of the roller with said bar in the first opening of the door, and, of course, the roller is turned through a certain angularity as it rolls on the end portion **26** in deflecting and passing it as the door reaches fully opened position. The wavy spring washer **24** exerts sufficient frictional drag on the roller to hold it against any further turning the moment the roller gets out of mesh with the torsion bar. Consequently, the two parts mesh perfectly upon each and every engagement thereafter, the roller being turned each time only through a small angle, one way in opening the door, the reverse in closing. Thus, there is no likelihood of the hold-open means ever failing to operate properly due to ice, rust, grit, or any other cause. The operation is always smooth and quiet and requires very little effort. Due to the difference in mechanical advantage by virtue of a more favorable angularity of the parts in relation to one another in the opening of the door, it requires less effort on the part of the operator to engage the hold-open means than is required to release the hold-open means in the closing operation. This is considered quite advantageous because it gives better assurance of the door not being closed accidentally by sudden wind pressure or by someone accidentally brushing against the open door when not intending to close it. The fact that the door swings freely throughout all but the last portion of the door opening movement is also considered a big advantage, especially in those installations where the door has an upward swing in opening and it is desirable on that account not to add any resistance to the door opening movement. Another advantage in this construction lies in the fact that the majority of door operations involves opening the door only part-way, as when parking in a confined space in a garage or parking lot, and, with the present construction, the hold-open means does not come into play throughout that range. In passing, another important advantage of the present construction lies in the fact that the springable movable end portion **26** of the torsion bar **19** receives lateral support by bearing engagement with

the sides of the slot 34 throughout the deflection thereof by the roller 25 and there is, therefore, no likelihood of the torsion bar ever being overstressed and taking a set in a direction away from the roller 25 to any appreciable extent which might result in malfunctioning of the hold-open means or unreliable hold-open action. The torsion bar should easily last the life of the car and longer and there should never be any necessity for replacing this part because of breakage or wear, and the same is of course true in respect to the roller 25 and its spring washer 24. If the roller 25 ever shows any wear on the scallop used it can easily be turned enough to make use of another scallop. The necessity for that, however, it not considered likely.

Referring next to FIGS. 4, 5 and 6, this construction is closely similar to that shown in FIGS. 1, 2 and 3 and corresponding parts have been numbered alike. However, two scalloped or star rollers 25 are shown on hinge part 10', the one first coming into engagement with the torsion bar in the door opening movement serving to hold the door open at an intermediate position, as indicated by the arc 39, and the other roller in further door opening movement serving to hold the door open in the fully opened position, as indicated by the arc 40. A certain amount of free movement of the door is possible while it is in the intermediate position, due to the spacing of the two rollers 25, and a smaller amount of free movement of the door is possible when the door is in its fully opened position, as indicated by a comparison of arcs 40 and 41. Otherwise, the operation of this hinge is very much the same as that of FIGS. 1, 2 and 3.

Referring next to FIGS. 7 and 8, the torsion bar 19' shown in these two figures is generally C-shaped due to the fact that the lower arm 30' is bent in the same direction with respect to the intermediate portion 28 as the upper arm 27' and locked in a slot 32' in the lower wall of part 9'. In its free condition this bar 19' has the lower arm 30' extending at an angle to the upper arm 27', like that indicated by line *a'b'* in FIG. 7, but not necessarily this specific angle. In the installation of the bar 19' on inner hinge member 9', the upper arm 27' is connected with part 9' first by insertion of end 26' in slot 34' in the same way as in the other forms, after which the lower arm 30' is swung in a counterclockwise direction, as viewed in FIG. 7, until the upwardly bent end 31' is aligned with the slot 32' and then the bar 19' is raised as a unit to interlock the grooved side of the upwardly bent end 31' in the slot 32'. Otherwise, the operation of the torsion bar 19' is the same as that of the torsion bar 19 in FIGS. 1 to 6. Bayonet slots are provided at 29' in lieu of the V-notches 29 of FIGS. 1 to 6. The rollers 25' are only knurled or serrated and turn freely on their shouldered rivets 23'. The operation is similar to that of the form of FIGS. 4–6, free limited movement of the door being possible while it is in the intermediate hold-open position, and still less while it is in fully opened position. See arcs 42–45.

A variation of the construction of FIGS. 7 and 8 is shown in FIG. 9 where the rollers 25'' are shown close together to give a hold-open action nearer the fully opened position of the door, without any freedom, this construction operating otherwise the same as that of FIGS. 7 and 8.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. A hinge comprising in a pair of plates pivotally connected by pintle, one of which is adapted to be secured to a body and the other to a door swingable to and from open position relative to the body about a substantially vertical pintle axis, the improvement consisting in the provision of an elongated substantially vertical torsion bar mounted on one of said plates with a preload spring tension therein, the bar having a laterally extending arm on one end with a substantially vertical detent portion projecting from its outer end, said detent portion being supported on said plate independently of the other plate so as to maintain the preload spring tension and being movable relative to said torsion bar plate by deflection of said arm in a direction to increase said spring tension in said bar, and a striker mounted on and projecting from the other of said plates so that it comes into engagement with the detent to deflect said arm to increase said spring tension in said torsion bar above preload spring tension and go past said detent in the door opening and closing movement of the plates relative to one another for a hold-open action.

2. A hinge structure as set forth in claim 1 wherein the arm carrying the detent is disposed at such an angle in relation to the striker that a greater force is required to deflect said arm by engagement of the striker on the detent in a door closing direction than in a door opening direction.

3. A hinge structure as set forth in claim 1 including means positively limiting the pivotal movement of said plates with respect to one another when the door reaches fully opened position, this position of the plates being with the striker in a predetermined spaced relationship to the detent, whereby to predetermine the extent of any freedom of movement of the door in the fully opened position.

4. A hinge structure as set forth in claim 1 including means positively limiting the pivotal movement of said plates with respect to one another when the door reaches fully opened position, this position of the plates being with the striker in a predetermined spaced relationship to the detent, whereby to predetermine the extent of any freedom of movement of the door in the fully opened position, the construction further including another striker mounted on and projecting from the same plate as the first mentioned striker so that it comes into engagement with the detent on said torsion bar arm to deflect said arm to increase said spring tension in said tension bar above preload spring tension and go past the detent in the door opening and closing movement of the plates relative to one another to hold the door open in an intermediate position.

5. A hinge structure as set forth in claim 1 including means positively limiting the pivotal movement of said plates with respect to one another when the door reaches fully opened position, this position of the plates being with the striker in a predetermined spaced relationship to the detent, whereby to predetermine the extent of any freedom of movement of the door in the fully opened position, the construction further including another striker mounted on and projecting from the same plate as the first mentioned striker so that it comes into engagement with the detent on said torsion bar arm to deflect said arm to increase said spring tension in said torsion bar above preload spring tension and go past the detent in the door opening and closing movement of the plates relative to one another to hold the door open in an intermediate position, the two strikers being spaced to predetermine the extent of any freedom of movement of the door in the intermediate hold-open position.

6. A hinge structure as set forth in claim 1 wherein the striker is a rotary roller which has a non-skid surface on the periphery thereof to insure taking hold on the detent upon engaging the same and turn in passing the same.

7. A hinge structure as set forth in claim 4 wherein both strikers are rotary rollers which have a non-skid surface on the periphery thereof to insure taking hold on the detent upon engaging the same and turn in passing the same.

8. A hinge structure as set forth in claim 1 wherein the striker is a rotary roller which has a scalloped periphery so that the detent upon engaging said periphery drops into a scallop, thereby forcing the roller to turn

through a predetermined angularity in the movement of the roller past the detent.

9. A hinge structure as set forth in claim 1 wherein the striker is a rotary roller which has a scalloped periphery so that the detent upon engaging said periphery drops into a scallop, thereby forcing the roller to turn through a predetermined angularity in the movement of the roller past the detent, the construction including means frictionally resisting turning of the roller so as to insure proper positioning of the scallop engaged by the detent so that the same scallop is engaged by the detent in each operation in the door opening and closing movements.

10. A hinge structure as set forth in claim 4 wherein both strikers are rotary rollers which have the same scalloped peripheries so that the detent upon engaging the periphery of either roller drops into a scallop, thereby forcing the roller to turn through a predetermined angularity in the movement of the roller past the detent.

11. A hinge structure as set forth in claim 4 wherein both rollers have the same scalloped peripheries so that the detent upon engaging the periphery of either roller drops into a scallop, thereby forcing the roller in turn through a predetermined angularity in the movement of the roller past the detent, the construction including means for frictionally resisting turning of both rollers so that the same scallop on each roller is engaged by the detent in each operation in the door opening and closing movements.

12. A hinge structure as set forth in claim 1 wherein the torsion bar has another laterally extending arm on the other end opposite the detent carrying arm by means of which the torsion bar is adapted to be cranked for the preloading thereof, this additional arm having a substantially vertical end portion having abutment with the plate in the assembled position of said bar on said plate to retain the preload spring tension in said bar.

13. A hinge structure as set forth in claim 1 wherein the torsion bar has another laterally extending arm on the other end opposite the detent carrying arm by means of which the torsion bar is adapted to be cranked for the preloading thereof, this additional arm having a substantially vertical end portion having abutment with the plate in the assembled position of said bar on said plate to retain the preload spring tension in said bar, said vertical end portion having means on the plate cooperating therewith to hold the same against endwise movement, whereby to hold the detent end of the other arm also against endwise movement from a predetermined operative position in relation to the striker means on the other plate.

14. A hinge structure as set forth in claim 1 wherein the torsion bar has another laterally extending arm on the other end opposite the detent carrying arm by means of which the torsion bar is adapted to be cranked for the preloading thereof, this additional arm having a substantially vertical end portion having abutment with the plate in the assembled position of said bar on said plate to retain the preload spring tension in said bar, the vertically extending end portion on the last mentioned arm having a notch provided in one side thereof into which a projection on the plate is arranged to engage to hold the torsion bar against endwise movement and accordingly hold the detent end of the first mentioned arm in a predetermined operative relationship to the striker means on the other plate.

15. A hinge structure as set forth in claim 1 wherein the torsion bar has another laterally extending arm on the other end opposite the detent carrying arm by means of which the torsion bar is adapted to be cranked for the preloading thereof, this additional arm having a substantially vertical end portion having abutment with the plate in the assembled position of said bar on said plate to retain the preload spring tension in said bar, said construction including walls on said plate in one of which a slot is provided in which the detent is engaged, the slot affording a predetermined latitude of deflection of said first mentioned arm, the other wall having an edge portion arranged to engage in a notch provided in the vertical end portion of the other arm whereby to hold the torsion bar against endwise movement and accordingly hold the detent end of the first mentioned arm in said slot.

16. A door hold-open device mounted between two relatively hinged members, such as the door and door pillar of a vhicle, comprising a torsion bar secured to one of the members and having a laterally extending arm on the outer end of which is provided a detent supported under spring tension in said bar independently of the other member, and a striker mounted on the second of the two members and adapted to cooperate with the detent to deffect it to increase spring tension in said torsion bar, the striker remaining out of contact with the arm and detent throughout the greater part of the relative hinging movement of the two members but coming into engagement with the detent during the remainder of the relative hinging movement in a manner such that the arm is deflected against the increased torsional resistance of the torsion bar and provides a resilient check or hold-open position in the relative hinging movement.

17. A door hold-open device as set forth in claim 16 in which the detent extends substantially parallel to the torsion bar, the hinge axis being substantially parallel to the torsion bar and the striker moving with the second hinged part in an arcuate path in a plane normal to the hinge axis, the torsion bar supporting the detent in the path of the striker thereby to provide a resistance to the striker passing the hold-open position.

18. A door hold-open device as set forth in claim 16 in which the arm carrying the detent is disposed at such an angle in relation to the path of the striker that a greater force is required to deflect the detent in the closing direction than in the opening direction of relative hinging movement.

19. A door hold-open device as set forth in claim 16 in which the striker is a roller rotatably mounted on a fixed axis parallel to the hinge axis.

20. A door hold-open device as set forth in claim 19 including means positively limiting pivotal movement between the relatively hinged members to define a fully opened position, this position of the relatively hinged members being with the roller in a predetermined relationship to the detent, which relationship determines the extent if any of the freedom of movement of the relatively hinged members at the fully opened position.

21. A door hold-open device as set forth in claim 19 in which the roller has a serrated or knurled peripheral surface adapted to engage the detent on contact therewith such that the roller is positively turned on passing the detent.

22. A door hold-open device as set forth in claim 19 in which the roller is formed with a series of peripheral projections spaced apart by recesses adapted to receive and be engaged by the detent, said device further comprising means which frictionally resist turning of the roller thereby to insure correct positioning of the recess engaged by the detent so that the same recess is engaged each time the roller passes the detent.

23. A door hold-open device as set forth in claim 16 in which means are provided to limit the extent to which the detent blocks the path of the striker, these means comprising an elongated slot in the hinged member on which the torsion bar is carried, the detent extending into the slot and one end of the slot defining a limiting position for movement of the detent in the direction of the path of the striker.

24. A door hold-open device as set forth in claim 16 in which the torsion bar carries a second laterally extending anchor arm at the end opposite to the detent-carrying arm by means of which the torsion bar can

be cranked for preloading thereof, the anchor arm having an end portion extending substantially in the direction of the hinge axis, which engages an abutment in the hinged member carrying the torsion bar to retain a preload spring tension in the torsion bar.

25. A door hold-open device as set forth in claim 24 in which the end portion of the anchor arm engages the abutment in a manner such as to retain the torsion bar against endwise movement in a direction for disconnection of the anchor arm from the hinged member to which it is attached.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,370,317 February 27, 1968

Joseph H. Marchione

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, line 68, for " A hinge" read -- In a hinge --; column 6, line 39, for "tension" read -- torsion --; column 7, line 20, for "rollers" read -- strikers are rotary rollers which --; line 22, for "in" read -- to --; column 8, line 15, for "second" read -- other --.

Signed and sealed this 15th day of July 1969.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents