April 7, 1925.

1,532,481

N. H. FORBES

HINGE

Filed Nov. 11, 1924

2 Sheets-Sheet 1

Fig. 1.

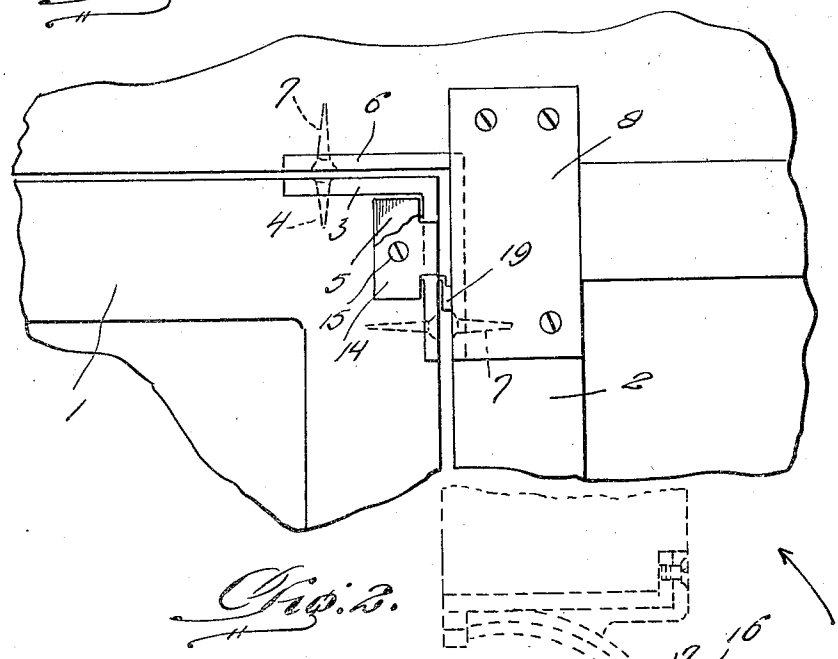


Fig. 2.

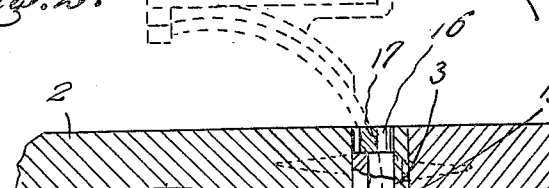


Fig. 3.

Nelson H. Forbes,

Inventor

By Clarence O'Brien.

Attorney

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Fig. 1.

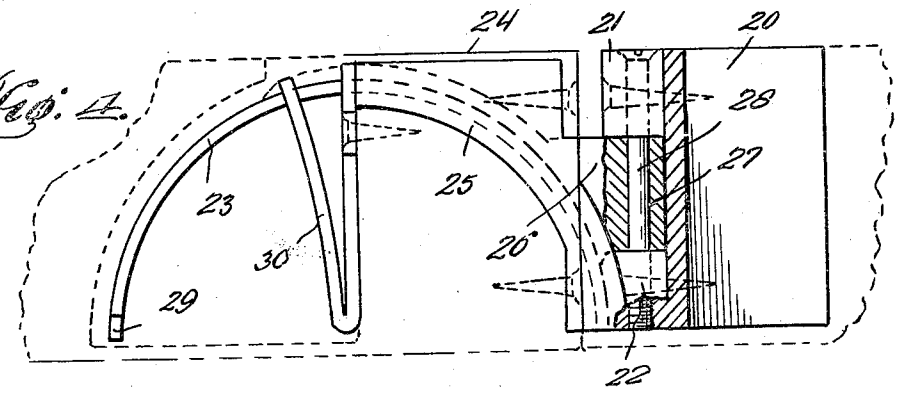


Fig. 5.

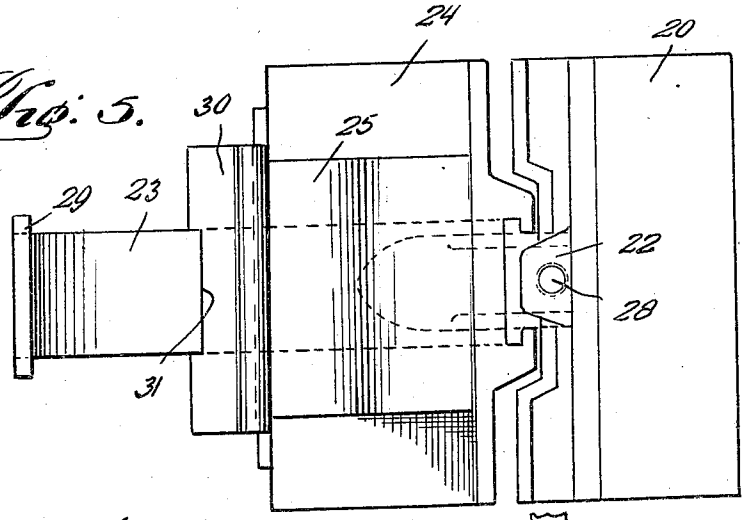


Fig. 6.

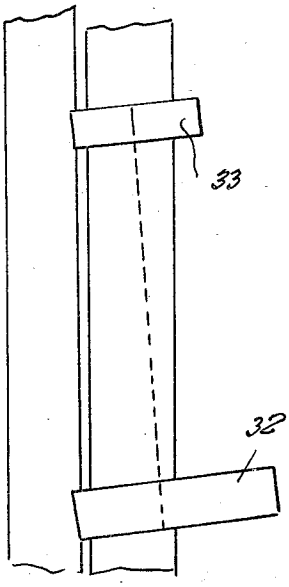
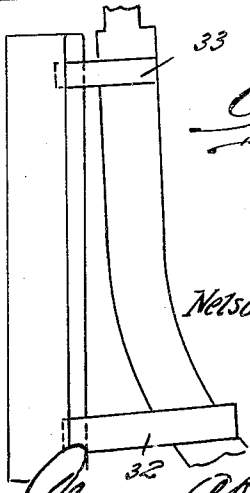


Fig. 7.



Nelson H. Forbes
Inventor

By Clarence A. O'Brien
Attorney

Patented Apr. 7, 1925. 1,532,481

UNITED STATES PATENT OFFICE.

NELSON HARRY FORBES, OF DETROIT, MICHIGAN.

HINGE.

Application filed November 11, 1924. Serial No. 749,233.

To all whom it may concern:

Be it known that I, NELSON HARRY FORBES, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in a Hinge, of which the following is a specification.

This invention relates to improvements in hinges of the character described and claimed in Patent 1,486,371, granted to me March 11, 1924.

One of the important objects of the present invention is to provide a hinge wherein means is associated therewith for detachably securing the same on an automobile door.

A further object of the invention is to provide a hinge of the above mentioned character, which includes a means for strengthening the portions of the door and frame of an automobile with which the same is associated, the hinge being of such construction as to be entirely concealed when the door is in a closed position.

A further object of the invention is to provide a hinge of the above mentioned character, which is simple in construction, inexpensive, strong and durable and furthermore adapted for the purposes for which it is designated.

Other objects and advantages of this invention will become apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals designate like parts throughout the same:

Figure 1 is a side elevation of the hinge embodying my invention showing the same applied.

Figure 2 is a horizontal sectional view, through a hinged structure such as shown in Figure 1, whereby the door and jamb are in reverse positions from that shown in Figure 1.

Figure 3 is a detail elevational view of the hinge.

Figure 4 is a view similar to Figure 2 showing a modification.

Figure 5 is an elevational view of the hinge illustrated in the modification and

Figures 6 and 7 are diagrammatic views of the bearings associated with the hinges showing the manner in which the same are disposed with relation to the door.

In the drawings, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates a portion of an automobile door, the frame usually associated therewith being illustrated generally at 2. A substantially L-shaped plate 3 is secured on the upper corner of the door 1 by any suitable fastening means shown at 4. The portion of the L-shaped bracket 3 which is disposed on the edge of the door 1 is provided with an extension 5 which fits in a suitable cut out portion provided therefor in the inner face of the door. The purpose of the extension will hereinafter be more fully described.

A similar L-shaped plate 6 is secured to the frame 2 in cooperative relation with the L-shaped plate 3, the same being secured to the frame and the usual roof rail of the automobile by the fastening elements 7. A face plate 8 is associated with the L-shaped plate 6 and is adapted to be secured to the frame on the inner side thereof as clearly illustrated in Figures 1 and 2 of the drawings. The L-shaped plate 6 is disposed on the frame 2 as is also the plate 8 in such a manner as to conceal the cavity 9 provided in the frame as clearly illustrated in Figure 2. The portion of the L-shaped plate 6 adjacent the edge of the door 1 has formed therein an arcuate slot. The reinforcing member 10 associated with the L-shaped plate 6 and the face plate 8 is also provided with an arcuate slot for cooperation with the arcuate slot formed in the L-shaped plate 6.

Adapted for slidable movement within the arcuate slots provided in the plate 6 and the reinforcing member 10 respectively is the curved arm 11, the inner portion of which is reinforced as illustrated at 12. The inner end of the curved arm 11 is secured in a detachable manner on the L-shaped plate 3 secured on the corner of the door 1 by means of the inward extension 13 which terminates in an angular portion 14 for cooperation with the extension 5 formed on the plate 3, a set screw 15 being threaded through the extension 14 and into a suitable threaded opening provided therefor in the extension 5 as clearly illustrated in Figure 2 of the drawings. A pin 16 is carried by the extreme forward end of the curved arm 11 and is adapted to be disposed in a suitable opening provided therefor indicated at

17 in the lug 18 which extends laterally from the opposite side of the portion of the L-shaped plate 3 which is disposed on the edge of the door 1. When the set screw 15 is in position within the openings provided therefor in the extensions 5 and 14 respectively, and the pin 16 is disposed in the opening 17, the curved arm is supported against displacement from the L-shaped plate 3 of the door 1 and when the door is in a closed position, the curved arm is disposed within the cavity 9 as clearly illustrated in Figure 2. When the door 1 is in its closed position, the hinge is entirely concealed and is not visible from the exterior of the car.

By swinging the door outwardly in the direction of the arrow, the curved arm 11 will slide within the arcuate slots provided therefor in the angular plate 6 as well as the reinforcement 10 associated therewith so the door may freely be swung to the position shown in the dotted lines in Figure 2. Also cooperating with the curved arm 11 are the guides 19 which are secured on the L-shaped plate 6 on opposite sides of the arcuate slots in the manner more clearly illustrated in Figure 3.

In Figures 4 and 5 of the drawing, a modification is shown wherein the angular plate 20 which is secured to the door 1 has supported on the portion thereof disposed over the edge of the door the detachable spaced lugs 21 and 22 respectively. The lugs are provided with registering openings and the opening in the lug 22 is preferably internally threaded. The arcuate or curved shaped arm 23 which is adapted for slidable movement through an arcuate slot provided in the angular plate 24 secured on the frame of the door and the reinforcement 25 associated therewith has associated on the inner end thereof the extension 26 which is adapted to be disposed between the lugs 21 and 22 and the extension 26 is provided with an opening 27 adapted for registry with the openings in the lugs 21 and 22 whereby a locking bolt 28 extends through the registering openings in the lugs and the extension 26 and is threaded into the threaded opening provided in the lug 22 whereby the arm 23 will be carried by the door.

The free end of the arm 23 has extending laterally therefrom the projections 29, the purpose thereof being to provide a means for limiting the disengagement of the curved arm from the substantially V-shaped spring 30 which is associated with the reinforcement 25 and is disposed within the cavity provided in the door frame, the end of the free arm of the V-shaped spring 30 being provided with a cut out portion 31 for receiving the curved arm 23 and through which the arm is adapted to slide when the door is moved to an open or a closed position. The lugs 29 will engage the V-shaped spring 30 and thereby prevent the displacement of the curved arm therefrom.

In Figures 6 and 7 of the drawings, the bearing associated with the hinges of the above mentioned character are illustrated and the same are disposed in such a manner with respect to the door of either a closed or open automobile as to permit the automobile door to be swung to a perpendicular open position regardless of the curvature of the automobile body. The bearings 32 and 33 are not in alignment with the face of the door and the frame but are arranged in such a manner as to be in alignment with each other whereby binding of the door will be prevented.

The provision of a hinge of the above mentioned character enables the same to be readily and easily secured in position on an automobile door and when it becomes necessary to detach the door from the hinges, it is only necessary to remove the set screw 15 with respect to the construction shown in Figures 1 and 2 whereby the pin 16 may be disengaged from the opening 17 and with reference to Figures 4 and 5 of the drawings, by removing the bolt 28, the door may be readily and easily detached. Furthermore the provision of the L-shaped plates in the manner above described will reinforce the door and the frame and render the same strong and durable.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention and the scope of the appended claims.

Having thus described the invention, what I claim is:—

1. A hinge comprising a pair of substantially L-shaped members adapted to be secured to a door and the adjacent edge of the usual frame therefor respectively, the L-shaped member associated with the frame being disposed over a cavity provided in the frame, a reinforcement associated with the L-shaped member carried by the frame and disposed within the cavity, said L-shaped member and said reinforcement having an arcuate slot provided therein, a curved arm slidable within said slot, the free end of said arm being adapted to be disposed within the cavity in the frame, and means for detachably securing the curved arm at its opposite end on the L-shaped member secured to the door.

2. A hinge comprising a pair of substantially L-shaped members adapted to be secured to a door and the adjacent edge of the usual frame therefor respectively, the L-shaped member associated with the frame being disposed over a cavity provided in

the frame, a reinforcement associated with the L-shaped member carried by the frame and disposed within the cavity, said L-shaped member and said reinforcement having an arcuate slot provided therein, a curved arm slidable within said slot, the free end of said arm being adapted to be disposed within the cavity in the frame, means for detachably securing the curved arm at its opposite end on the L-shaped member secured to the door, said means comprising an extension associated with the inner end of the curved arm and means for securing the extension on the L-shaped member secured on said door.

In testimony whereof I affix my signature.

NELSON HARRY FORBES.