May 16, 1950 F. E. BEEMS ET AL 2,508,090

HOOD LATCH

Filed Jan. 17, 1947 2 Sheets-Sheet 1

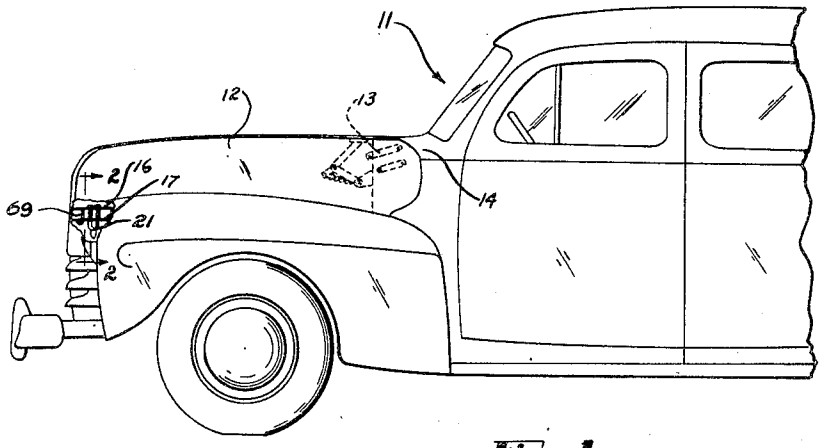


Fig. 1

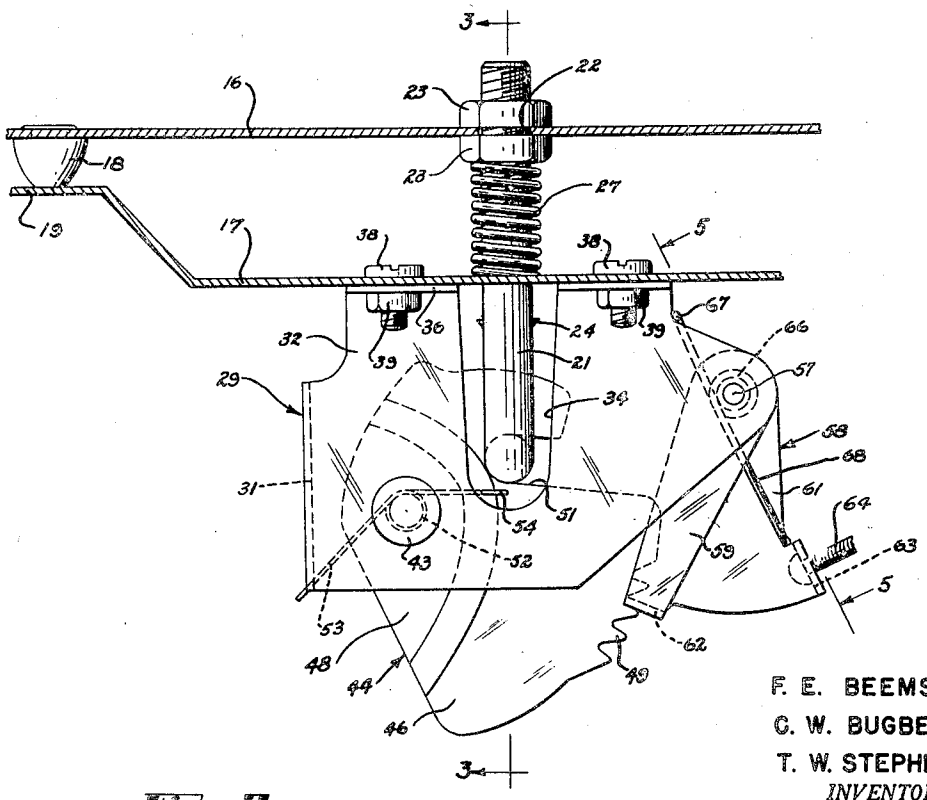


Fig. 2

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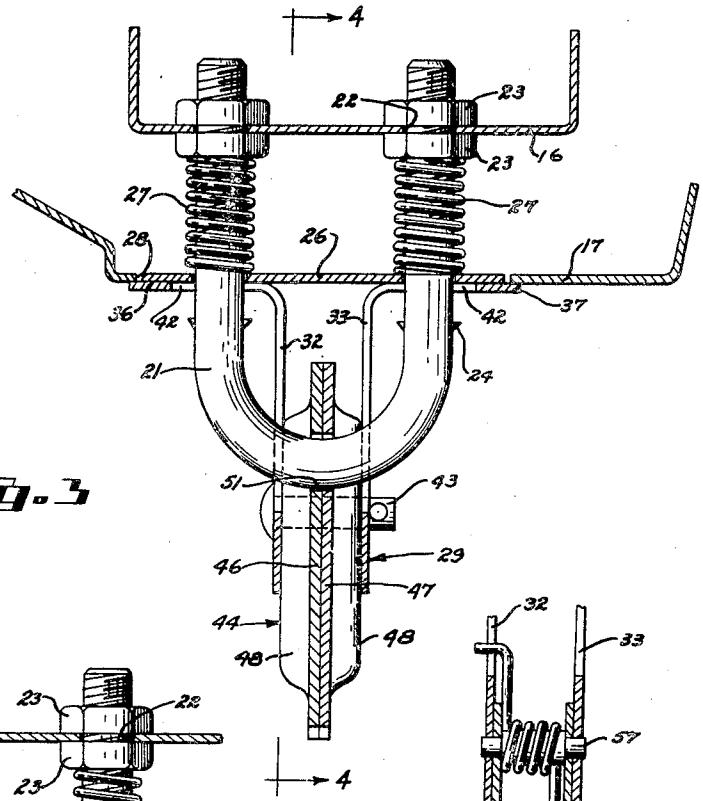


Fig. 3

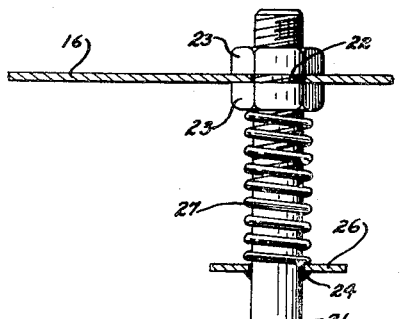


Fig. 5

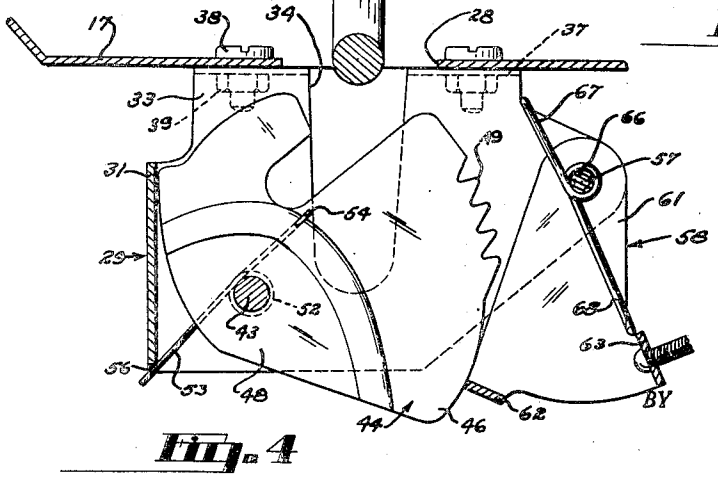


Fig. 4

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2,508,090

HOOD LATCH

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1 Claim. (Cl. 292—129)

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This invention relates generally to motor vehicles and particularly to latching and locking mechanism for the hoods of motor vehicles.

The engine compartments of present-day automobiles are provided with rearwardly hinged hoods which are equipped with suitable latching and locking mechanism at the forward ends thereof to lock the hood in closed position. The latch is released by means of a control knob on the dash connected to the latch through a Bowden cable. One of the principal disadvantages of the conventional construction has been the amount of effort necessary to release the latch. With the parts of the latch held tightly together by spring pressure, the force required to release the latch has been so great that in some instances it has been necessary to provide a special handhole upon the operating knob to enable it to be more firmly grasped by the driver. Frictional resistance of the mechanism also contributes to the stiffness of operation. It is accordingly a principal object of the present invention to provide a hood latch which may be released from the dash with a minimum of effort and yet which is positive in operation and which cannot become inadvertently disengaged. In fact, the only force necessary to release the latch is that required to move a pawl out of engagement with a ratchet member against a relatively moderate spring pressure. Ease of operation is also increased by the fact that the latch is so arranged that a direct pull of the pawl by the Bowden cable is possible. Furthermore, the friction to be overcome is negligible, and only a slight movement of the pawl is required.

A further object of the invention is to provide a hood latch which is self-centering in operation to automatically center the hood transversely of the vehicle when the hood is closed. Another object is to provide an automatic adjustment which compensates for manufacturing variations and which eliminates the final adjustment of the striker previously required during assembly of the vehicle. In addition, the hood latch of the present invention requires a minimum of easily fabricated parts, thus reducing the cost thereof.

Other objects and advantages of the invention will be made more apparent as this description proceeds, particularly when considered in connection with the accompanying drawings, in which:

Figure 1 is a side elevation of an automobile, partly broken away, and incorporating the hood latch of the present invention.

Figure 2 is a cross sectional view taken substantially on the plane indicated by the line 2—2 of Figure 1, illustrating the hood latch in front elevation and in its locked position.

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Figure 3 is a longitudinal cross sectional view taken substantially on the plane indicated by the line 3—3 of Figure 2.

Figure 4 is a transverse cross sectional view taken substantially on the plane indicated by the line 4—4 of Figure 3, but illustrating the latch mechanism in released position.

Figure 5 is a fragmentary cross sectional view taken substantially on the plane indicated by the line 5—5 of Figure 2, illustrating the pawl mechanism.

Referring now more particularly to the drawings, the reference character 11 indicates an automobile having a hood 12 covering the engine compartment and hinged at its rearward edge by hinges 13 to the cowl 14 of the vehicle body. The hood is adapted to be opened by lifting the forward edge thereof and swinging the hood upwardly.

At its forward end, the hood 12 is provided with a channel shaped cross brace 16 extending between opposite sides of the hood and suitably welded or riveted thereto. Directly below the cross brace 16 of the hood in its closed position is a crossbar 17 forming a front structural member of the vehicle body and extending transversely between the front fenders thereof. The hood brace 16 carries a pair of transversely spaced rubber stops 18 engageable with flats 19 formed on the crossbar 17 at opposite sides. These stops limit downward movement of the hood and provide a resilient support therefor.

A U-bolt or striker 21 is mounted upon the hood brace 16 in alignment with the longitudinal center line of the hood. The legs of the U-bolt extend through apertures 22 in the brace and are secured thereto by nuts 23. Ears 24 are struck outwardly from the lower portions of the legs of the U-bolt and provide stops for a plate 26 which is slidably mounted upon the bolt. A pair of coil springs 27 are mounted upon the legs of the U-bolt between the nuts 23 and the plate 26 and serve to normally urge the plate downwardly into engagement with the ears 24.

The crossbar 17 of the body is provided with an elongated opening 28 extending longitudinally of the vehicle directly beneath the U-bolt 21 carried by the hood and is of such size as to permit the U-bolt to pass therethrough as the hood is lowered. A bracket 29 is provided for supporting the latching mechanism beneath the crossbar 17, and is arranged generally transversely of the ve-

hicle. The bracket comprises a web 31 at one side formed integrally with front and rear flanges 32 and 33 respectively, which flanges are formed with vertical slots 34 forming clearance for the U-bolt 21. Bent forwardly and rearwardly respectively from the upper edges of the front and rear flanges 32 and 33 and extending generally horizontally are attaching flanges 36 and 37. These flanges are secured to the crossbar 17 by means of bolts 38 and nuts 39. Longitudinally extending slots 42 are formed in the attaching flanges 36 and 37 in alignment with the slots in the front and rear flanges of the bracket to provide clearance for the U-bolt. It will be noted that the slots are substantially in alignment with the elongated opening 28 formed in the crossbar, but that the opening in the crossbar is slightly larger to expose portions of the attaching flanges 36 and 37 through the opening. The spring urged plate 26 carried by the U-bolt thus seats upon the exposed edges of the attaching flanges 36 and 37, and in the closed position of the hood is moved upwardly from the ears 24 formed upon the U-bolt to compress the coil springs 27. The shock of lowering the hood to its closed position is thus cushioned.

A pivot pin 43 extends between the front and rear flanges 32 and 33 of the bracket 29 and pivotally supports a ratchet member 44. The ratchet member 44 is formed of two complementary halves 46 and 47 spot-welded together to form a unit. Each half of the ratchet member is provided with an outwardly extending boss 48 and the distance between the bosses 48 of the two halves corresponds generally to the distance between the front and rear flanges of the bracket so as to provide bearing surfaces therebetween to guide the ratchet member for rotation in a transverse plane. A plurality of teeth 49 are formed along one edge of the ratchet member, and the latter is also formed with a locking slot 51 for receiving the lower portion of the U-bolt 21. In the closed position of the hood the ratchet member 44 takes the position shown in Figure 2 in which the locking slot 51 is substantially horizontal and effectively prevents upward movement of the U-bolt. On the other hand, in its released position the ratchet member 44 is swung upwardly to the position shown in Figure 4 in which the locking slot 51 is inclined upwardly and permits upward movement of the U-bolt and the hood. A torsion spring 52 encircles the pivot pin 43 and has extending end portions 53 and 54. The spring end 53 is seated in a notch 56 formed in the lower edge of the web 31 of the bracket, while the spring end 54 extends through an aperture formed in one of the bosses 48 of the ratchet member. Torsion spring 52 is thus arranged to normally urge the ratchet member upwardly to its open or released position.

A second pivot pin 57 is mounted in the side portions of the front and rear flanges 32 and 33 of the bracket and supports a pawl 58. The pawl 58 comprises a one-piece stamping having side flanges 59 and 61, a lower connecting web 62 and an actuating flange 63. The actuating flange 63 is apertured to receive one end of a Bowden cable 64 which extends through the engine compartment to the dash of the vehicle, and is connected to a suitable control knob (not shown) for actuation by the operator. It will be noted that with the latching mechanism arranged transversely of the vehicle as shown, the Bowden cable 64, which normally extends longitudinally along one side of the engine compartment and then swings inwardly toward the center line of the vehicle at the front of the hood, exerts a direct pull upon the actuating flange 63 of the pawl. A torsion spring 66 encircles the pivot pin 57 of the pawl and has end portions 67 and 68 seated respectively upon the front flange 32 of the bracket and upon the side flange 61 of the pawl to normally swing the pawl in a clockwise direction as viewed in Figures 2 and 4 and to move the web 62 into locking engagement with the teeth 49 formed upon the ratchet member 44. A pull upon the Bowden cable, of course, swings the pawl 58 against the action of the torsion spring 66 to release the web from engagement with the teeth.

The operation of the device is now apparent. Actuation of the dash control knob to pull the Bowden cable 64 swings the pawl 58 out of engagement with the teeth 49 upon the rachet member 44 and the coil springs 27 upon the U-bolt together with the torsion spring 52 upon the ratchet member, move the hood 12 upwardly, the ratchet member moving to the position shown in Figure 4. In this position the locking slot 51 in the ratchet member extends generally upwardly and the U-bolt is free from locking engagement therewith. To open the hood, it is then only necessary to release the usual safety lock 69 conventionally provided at the forward edge of the hood and adapted to be manually operated at that point, after which the hood can be swung upward to open position. It will be noted that the torsion spring 66 automatically swings the pawl 58 to the position shown in Figure 4, ready for the closing of the hood.

Closing the hood automatically operates the latching mechanism to lock the hood in its lowermost position. As the hood is lowered the U-bolt strikes the ratchet member 44 and swings the latter in a clockwise direction from the position shown in Figure 4 to that shown in Figure 2. Simultaneously, the pawl 58 indexed over the teeth 49 upon the ratchet member and seats in locking engagement with one of the teeth. By providing a plurality of teeth, it will be noted that regardless of manufacturing variations the hood will automatically lock in its lowermost position. This eliminates the assembly operation usually required with conventional type hood latches which required the vertical adjustment of the striker member to suit each individual job. This is not necessary with the present construction, although if desired for any reason, the U-bolt 21 can be adjusted vertically relative to the cross brace 16 of the hood by means of the nuts 23.

It will readily be seen that little effort is required to release the hood latch. The only force required is that necessary to swing the pawl against the action of its torsion spring through a relatively short distance, sufficient to cause the web of the pawl to clear the teeth of the ratchet member. The friction involved is relatively small, and the pull by the Bowden cable is direct, the result being that the effort required by the driver to release the latch is negligible. The construction, however, does not sacrifice safety since the latch mechanism provides a positive lock which cannot become inadvertently released except by operation of the dash control knob.

A further advantage of the present construction resides in the fact that the U-bolt 21 carried by the hood tends to center itself with respect to the ratchet member 44 and thus centers the hood transversely with respect to the vehicle.

It will be understood that the invention is not

to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention, as defined in the appended claim.

What is claimed is:

In a motor vehicle having a pivotally mounted hood with a striker member depending therefrom and a body member beneath the forward end of the hood having an opening for the striker member to pass through, a latch member comprising a U-shaped bracket having front and rear walls positioned beneath said body member and extending generally transversely of the vehicle in a vertical plane, an opening formed in said bracket aligned with the opening in said body member, a latch member pivotally disposed between said front and rear walls for swinging movement in a vertical plane and comprising a pair of complementary stampings secured together and having embossed portions engageable with the front and rear walls of said bracket to guide the swinging movement of said latch member, the remaining portions of said latch member being in juxtaposition one with the other, a series of teeth formed along one edge of said last-mentioned portions, a

U-shaped pawl member having an open and a closed end, said open end being pivotally mounted between the front and rear walls of said bracket for swinging movement of said pawl member in a substantially vertical transverse plane, said closed end adapted to engage the teeth upon said latch member, an ear formed on said pawl member, a Bowden wire secured to said ear, and means within said vehicle for operating said Bowden wire to pivotally release said pawl from the teeth on said latch member.

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