June 16, 1942. W. H. KRAUSE 2,286,740

CAMMING LATCH FOR ALLIGATOR TYPE HOODS

Filed Jan. 4, 1941 4 Sheets-Sheet 1

Fig. 1

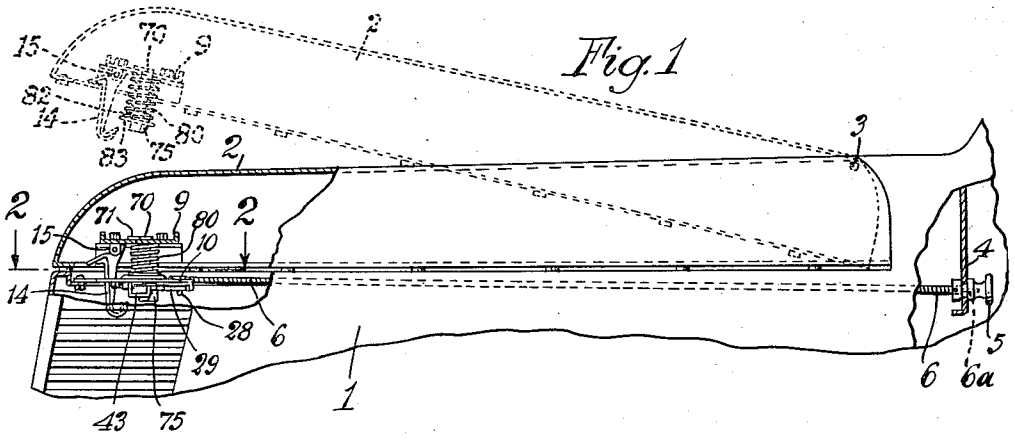
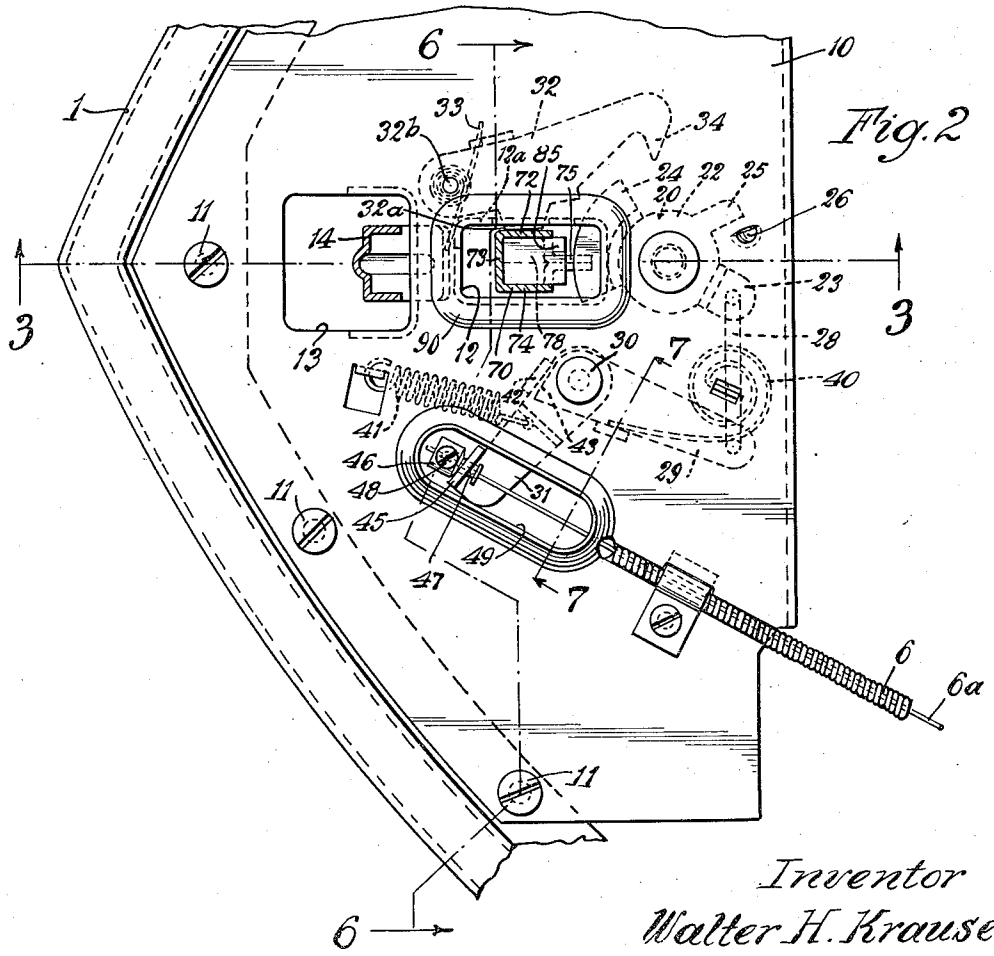


Fig. 2



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Filed Jan. 4, 1941 4 Sheets-Sheet 2

Fig. 3

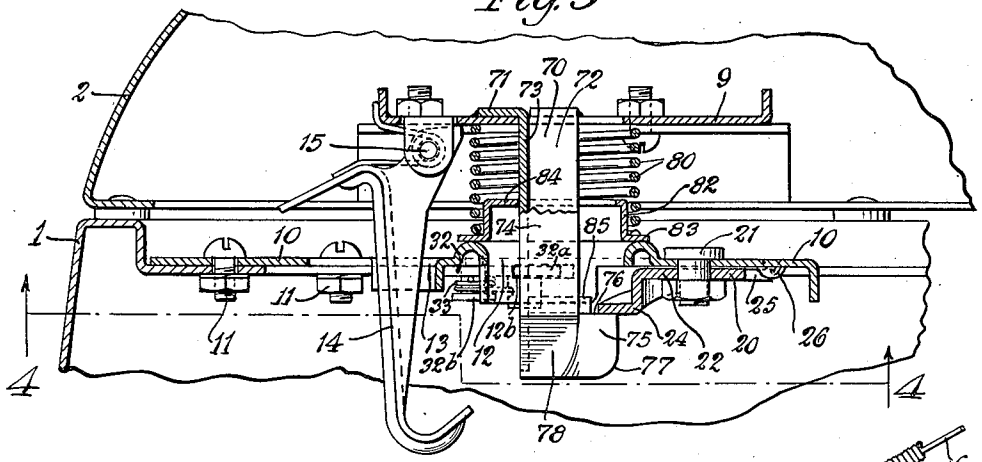
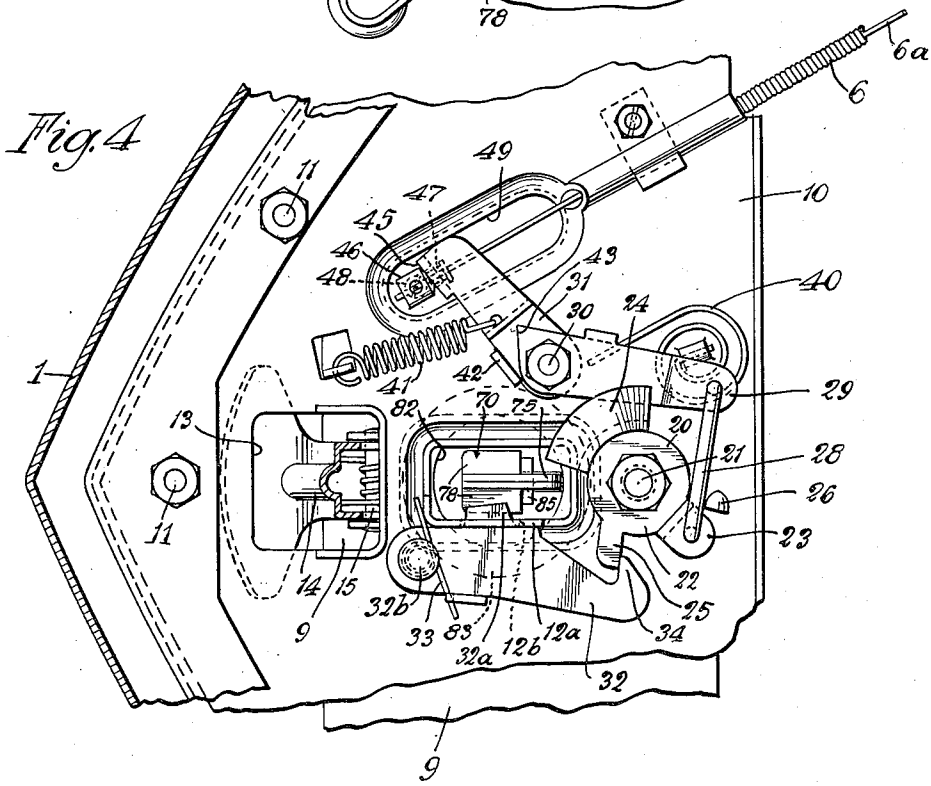


Fig. 4



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June 16, 1942. W. H. KRAUSE 2,286,740

CAMMING LATCH FOR ALLIGATOR TYPE HOODS

Filed Jan. 4, 1941 4 Sheets-Sheet 3

Fig. 5

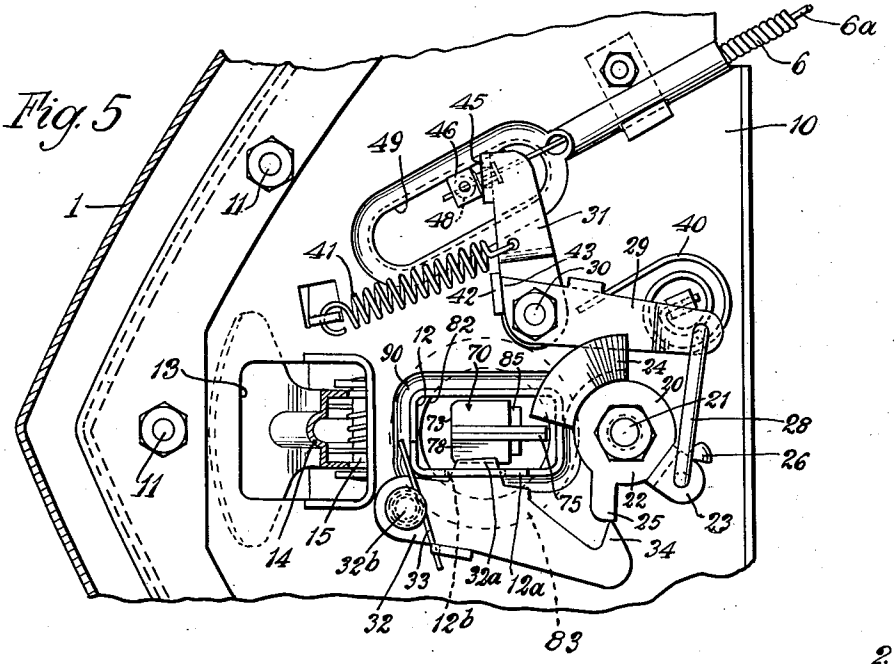


Fig. 6

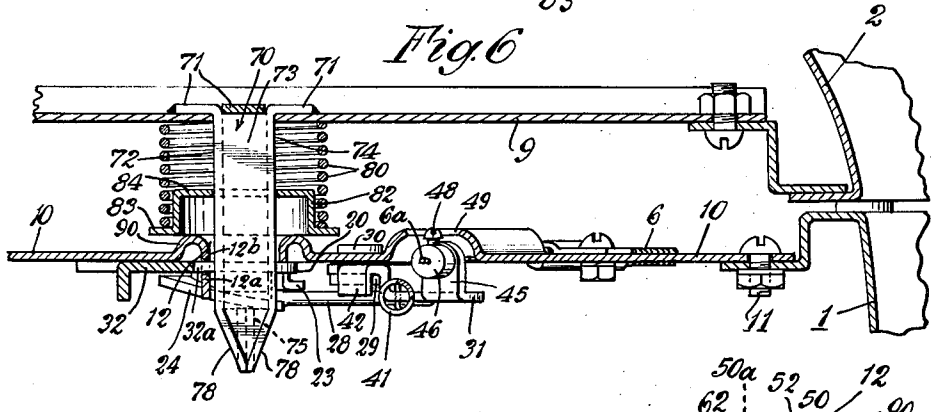
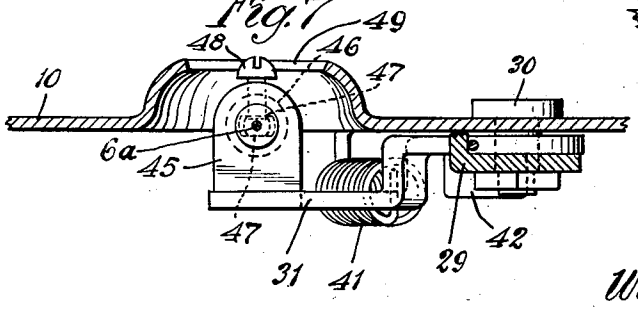


Fig. 7



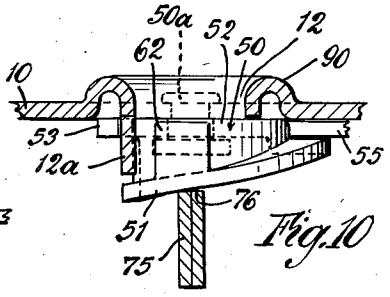


Fig. 10

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June 16, 1942. W. H. KRAUSE 2,286,740

CAMMING LATCH FOR ALLIGATOR TYPE HOODS

Filed Jan. 4, 1941 4 Sheets-Sheet 4

Fig. 8

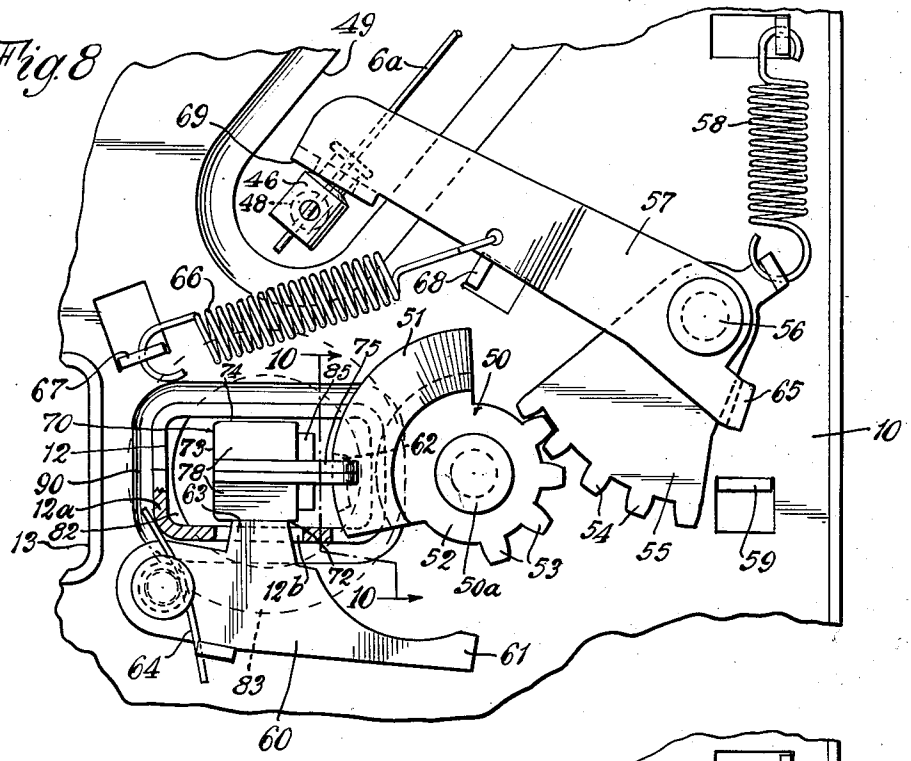
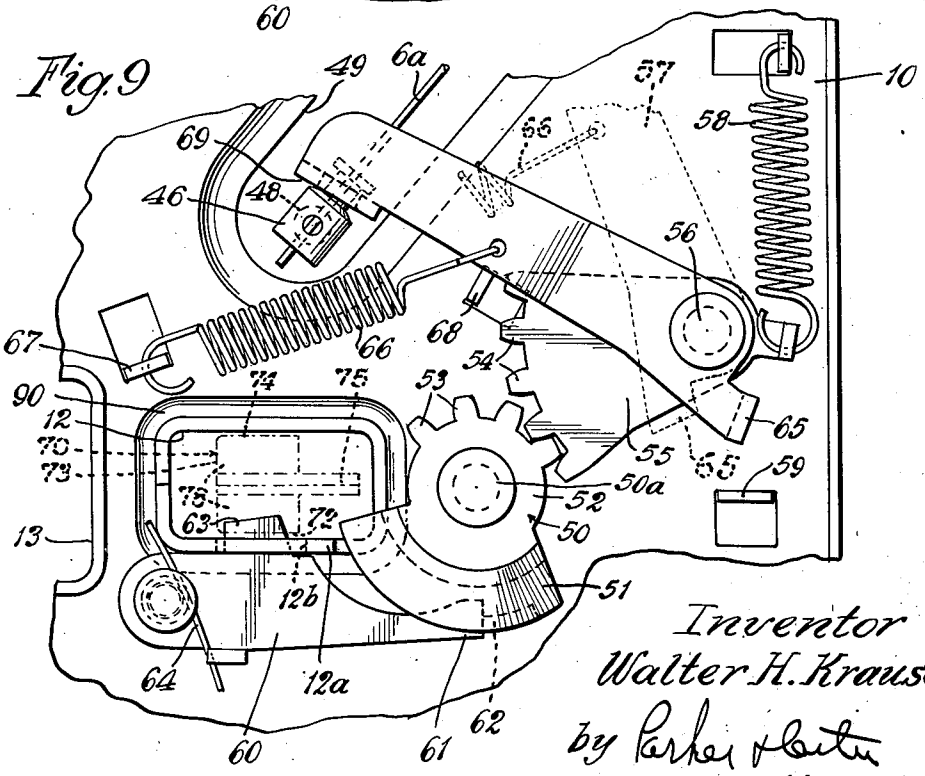


Fig. 9



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UNITED STATES PATENT OFFICE

2,286,740

CAMMING LATCH FOR ALLIGATOR TYPE HOODS

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Application January 4, 1941, Serial No. 373,111

9 Claims. (Cl. 292—336)

My invention relates to an improvement in hood latches and is particularly applicable to hood latches as applied to alligator type hoods, in which the hood closure is hinged or movably mounted at its rear end in such fashion that the forward end may be swung up to give access to the parts within the hood.

One purpose is the provision of an improved type of latch for an alligator hood closure in which the latch may initially be released only from within the car.

Another purpose is the provision of improved connecting means between the latch and the internally operable actuating or releasing means therefor.

Another purpose is the provision of an improved latch structure operable by remote control within the car.

Another purpose is the provision of an improved latch structure in which no vertical adjustment of the keeper is necessary, the adjustment being automatically provided by the latch itself.

Another purpose is the provision of a latch for use with alligator type hood closures in which a cam asosciated with or forming part of the latch is effective automatically to take up for wear or for variations in size, shape and location of the parts incidental to assembly line practice.

Another purpose is the provision of a latch in which a camming portion is yieldingly thrust into engagement with a keeper, which need not be adjusted, in such fashion that a spring and cam effect a takeup for wear and for variations in size, shape and location of parts incidental to assembly line practice.

Another purpose is the provision of a latch which shall be automatically held in release position once it has been released to permit the hood closure to be raised, and is not returned to latching position until the hood closure is returned to closed position.

Another purpose is the provision of means for releasing the latch to latching position in response to or at the time of the downward movement of the hood closure to closed position.

Other purposes will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein:

Fig. 1 is a side elevation with parts broken away;

Fig. 2 is a section on the line 2—2 of Fig. 1, on an enlarged scale;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a view similar to Fig. 4, with the parts in a different position;

Fig. 6 is a section on the line 6—6 of Fig. 2;

Fig. 7 is a section on the line 7—7 of Fig. 2;

Fig. 8 is a view similar to Fig. 4 of a variant form of the device;

Fig. 9 is a view similar to Fig. 8 illustrating the parts in a different position; and

Fig. 10 is a section on the line 10—10 of Fig. 8.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, 1 generally indicates an automobile hood, and 2 a hood closure, which may be hinged or otherwise movably secured at its rear end, a hinge 3 being diagrammatically illustrated. It will be understood, however, that in general some type of multiple or lever arm hinged structure may be employed. Since the details of the hinge do not of themselves form part of the present invention, the hinge 3 will be considered as merely a diagrammatic illustration of a hinge for movably supporting the rear end of the closure 2.

4 illustrates an instrument panel, upon which may be mounted any suitable control button 5, connected to the wire 6a in the conduit 6, whereby, as will later appear, a pull on the button 5 actuates the below described latch.

Referring for example to Fig. 3, 10 illustrates a combined centering member and latch keeper which may for example be of sheet metal and may have upper ears 11 permanently secured for example by welding to the plate or support 9, which in turn is mounted upon the hood closure 2 in any suitable manner. The keeper may include a generally rectilinear body of sheet metal, defined for example by sides 12, 13, and 14, and extensions on the sides 12 and 14 which terminate in parallel abutting vertical portions 15. These are located adjacent the bottom of the walls 12 and 14, as shown in Fig. 3, and their adjacent upper edges 16 serve as a latching ledge for the latch means below described. They may be rounded at their bottom outer corner, as at 17. At the bottom of the keeper the walls 12 and 14 converge, as shown in Fig. 6, as at 18. Thus the keeper is adapted to serve to some extent as a centering member.

I prefer to have the keeper and centering member above described fixed in relation to the hood closure in order to avoid the necessity of adjustment, but it will be understood that in the event of the necessity of adjustment of any par-

ticular unit, any suitable adjusting means not herein shown may be employed. Any suitable spring 80, herein shown as a coil spring, may surround the keeper and may be compressed for example between the bottom of the plate 9 and a cup 82, having a bottom outwardly extending flange 83 and a top flange 84 extending inwardly toward and conforming generally to the cross sectional contour of the keeper. 85 indicates any suitable stop for limiting the downward movement of the cup.

A lower plate or support, generally indicated as 10, is mounted in any suitable fashion, for example by bolts 11, on the hood 1, in vertical alignment with the support 9. It is apertured as at 12 to receive the keeper 70, as shown in Fig. 3, and is further apertured as at 13 to permit the penetration therethrough of a safety latch 14, pivoted as at 15, upon the support 9. The safety latch does not of itself form part of the present invention and will not be further described.

When the parts are in the closed position of Fig. 3, the spring 80 is compressed and the flange 83 of the cup 82 associated with the keeper 70 engages the upper face of the support 10. If desired, a raised bend 90, surrounding the aperture 12, may serve as a bearing surface for the flange 83. It will be understood that when the closure 2 is in raised position, the cup 82 is pressed downwardly about the keeper 70 until its upper flange 84 comes into engagement with the stop 85.

When the parts are in closed position and when the below described latch structure is released, the spring 80 is effective to raise the closure 2 a slight distance above the hood 1 and to raise the latching ledge 76 up out of alignment with the rotatable latch element 20, which may be rotatably mounted as at 21, and may for example have a hub 22 and an associated lug 23 and a cam latch element 24 extending outwardly from the hub. 25 is a stop member also extending outwardly from the hub and adapted when the latch is in full latching position to engage a limit element or stop 26 on the bottom of the plate 10. The lug 23 of the latch 20 serves as a means for rotating the latch member 20. It may be connected, for example, by a link 28 to a lever 29, pivoted as at 30 concentrically with the operating lever 31, the outer end of which may be secured to the wire 6a.

The keeper receiving aperture 12 may be provided with a downwardly projecting flange 12a, apertured as at 12b, to receive the projecting nose 32a of the catch 32, which is normally urged into latching position as by the spring 33, supported by the pivot pin 32b of the catch 32. The catch 32 is provided with a hook portion or hook 34 adapted to be engaged by the stop projection 25 of the hub 22 when the latch 20 is moved to release position, as shown in Fig. 4. Thus, after the keeper 70 has once been moved to release position, for example by a pull on the wire 6a, then the catch 32 is immediately moved by the spring 33 to the cocked position, in which it prevents rotation of the hub 22 and the camming latch element 24 out of release position. However, the projecting nose 32a is in line to be struck by one of the inclined faces 78 of the keeper 70 when the closure 2 is again moved to closing position, and when this occurs the offset portion 34 frees the stop projection 25 and permits the cam latch element 24 to be moved into latching position.

In order to urge the cam latch element 24 normally to latching position, and in order to move it as far as the size, shape and location of the opposed portion 75 of the keeper 70 will permit, I provide any suitable spring 40, which is effective normally to urge the lever 29 in such fashion as to move the cam latch element 24 into locking position, as shown in Fig. 2, through the link 28. I illustrate, for example, a coil wire spring 40, although it will be realized that any suitable shape or size of spring may be employed. It will be observed also that the lever 29, while preferably concentrically mounted with the operating lever 31, may move independently thereof to permit the cam latch element 24 to seat itself in proper relationship with the opposed portion of the keeper 70.

The stop 26 is adapted to serve as a limit for limiting the movement of the cam latch element 24 toward latching position; but it may normally be inoperative or not in use, since the parts are preferably so designed that the cam latch element 24 will engage and lock against the opposed upper face 76 of the keeper portion 75 before the projection 25 engages the stop 26. It is effective, however, to limit the movement of the latch toward latching position in the event that the catch 32 is tripped when the closure 2 is in the raised position.

In order to rotate the latch element 20 into release position, the user has merely to pull on the tension wire 6a, which has for effect to rotate the operating lever 31 through the connections below described. The operating lever 31 is normally held in the position in which it is shown in full line in Fig. 4, for example by the spring 41. It is then in inoperative position and has no effect on the movement of the lever 29. However, when the user pulls on the wire 6a, he gives the lever 29 a clockwise rotation, referring to the position of the parts in Fig. 5, and a lug or upturned portion 42 thereof engages the end 43 of the lever 29 and moves the lever to release position. As above set out, when the releasing movement is completed, the catch 32 is effective to hold the rotatable latch element 20 in release position until the closure 2 is again moved to closing position.

In order to connect the operating lever 31 with the wire 6a, I provide it with an upstanding flange 45, apertured to receive a fitting 46, through which the end of the wire is threaded. This fitting is flattened, as at 47 in Fig. 7, in the part which penetrates the flange 45. It is provided also with a set screw 48, effective adjustably to lock the end of the wire 6a in relation to the fitting. Any other suitable securing means may be employed, but the above is practical and permits a relative oscillation of the fitting 46 in relation to the flange 45 of the lever 31 through which it passes. This prevents any perceptible excess strain on the wire 6a and reduces or prevents fatigue or breakage. The flattening of the reduced portion of the fitting, as shown at 47, prevents rotation of the fitting in relation to the lever 31 and assures that the set screw 48 will be readily accessible through the aperture 49 in the plate 10. This is advantageous in assembly line practice in automobile plants since the workman can readily thread the wire 6a or its equivalent through the central aperture of the fitting 46, then insert and tighten the set screw 48 to make a proper adjustment in relation to the lever 31. The fact that the set screw 48 and the end of the wire 6a are always in alignment with the aperture 48 of the

plate 10 is a great convenience and time saver on the automobile assembly line.

In the variant form of Figs. 8, 9 and 10 I illustrate a rotatable latch element 50, pivoted as at 50a, with a camming latch 51, projecting outwardly from the hub 52, the hub 52 being also provided with a plurality of teeth 53, in mesh with corresponding teeth 54 on a segment 55, pivoted as at 56 preferably concentrically with the operating lever 57. The spring 58 normally urges the segment to full latching position, an ultimate limit being provided for example by the offset portion 59 on the bottom of the plate 10. The catch 60 includes a portion 61 adapted to be overridden by a lug 62 formed on the top of the camming portion 51 of the latch. The catch 60 also has a projecting portion 63, adapted to operate like the projecting portion 32a of the corresponding catch 32, and the spring 64 similarly moves the catch 60 into cocked position. The segment 55 may be moved to releasing position for example by an offset 65 on the operating lever, which engages the segment 55, as illustrated in dotted lines in Fig. 9, which in turn rotates the latch element to the release position illustrated in full line in Fig. 9.

When the operator releases the knob 5 associated with the wire 6a, a spring 66, connected at one end to a lug 67 on the plate 10 and at the other end to the operating lever 57, returns the lever to the full line position of Fig. 9, against a stop 68 on the plate 10. The operating lever is provided with a lug 69 to receive the fitting 46 for the wire 6a.

It will be realized that, whereas I have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting me to my precise showing.

I claim:

1. In a latch assembly for automobile hoods, a latch support apertured to receive a keeper, and a latch rotatably mounted on said latch support and including a cam portion adapted to engage said keeper in latching relationship, yielding means effective normally to urge said latch toward latching position, including a lever, and a spring cooperating with said lever, and an actuating connection between said lever and said latch, and manually operable means for moving said latch to release position, including a second lever mounted coaxially with said first mentioned lever, and having a portion adapted to move said first mentioned lever in response to movement of said second lever, and manually operable means for moving said second lever.

2. In a latch assembly for automobile hoods, a latch support apertured to receive a keeper, and a latch rotatably mounted on said latch support and including a cam portion adapted to engage said keeper in latching relationship, yielding means effective normally to urge said latch toward latching position, including a lever, and a spring cooperating with said lever, and an actuating connection between said lever and said latch, and manually operable means for moving said latch to release position, including a second lever mounted coaxially with said first mentioned lever, and having a portion adapted to move said first mentioned lever in response to movement of said second lever, and manually operable means for moving said second lever, and yielding means for normally urging said second lever toward release position.

3. In a latch assembly for automobile hoods, a latch support apertured to receive a keeper, and a latch rotatably mounted on said latch support, and including an arcuate concentric cam portion adapted to engage said keeper in latching relationship, yielding means effective normally to rotate said latch and thereby to urge said cam portion toward latching position, including a member and a spring cooperating with said member, and an actuating connection between said member and said latch, and manually operable means for moving said latch to release position, including a lever having a portion adapted to move said member in response to movement of said lever, and manually operable means for moving said lever to release position.

4. In a latch assembly for automobile hoods, a latch support apertured to receive a keeper, and a latch rotatably mounted on said latch support, and including an arcuate cam portion adapted to engage said keeper in latching relationship, yielding means effective normally to rotate said latch and thereby to urge said cam portion toward latching position, including a lever, and a spring cooperating with said lever, and an actuating connection between said lever and said latch, and manually operable means for moving said latch to release position, including a second lever having a portion adapted to move said first lever in response to movement of said second lever, and manually operable means for moving said second lever to release position.

5. In a hood latch for automotive vehicles and the like, a centrally apertured latch plate adapted to be penetrated by a keeper, a latch rotatably mounted on the plate adapted to engage the keeper after it has penetrated the aperture to lock the keeper against displacement, a catch pivotally mounted on the plate adapted to engage the latch and hold it out of engagement with the keeper, a member on the catch adapted to project into the path of the keeper when the latch and catch are in engagement, said member being adapted to be engaged by the keeper as the keeper enters the aperture and to be forced and held out of alignment with the aperture by the keeper to cause disengagement of catch and latch, a latch lever and an actuating lever pivoted on the plate, a connection between the latch lever and the latch whereby rotation of the latch lever causes rotation of the latch, yielding means for rotating the latch lever toward the latch locking position, manually actuated means associated with the actuating lever for rotating it toward the latch unlocking position and means interposed between the two levers for preventing relative angular movement when the actuating lever moves in the latch unlocking direction, while permitting relative angular movement when the actuating member moves in the opposite direction, yielding means tending to thrust the catch into latch engaging position and yielding means tending to force the actuating lever in the latch locking direction.

6. In a hood latch for automotive vehicles and the like, a centrally apertured latch plate adapted to be penetrated by a keeper, a latch rotatably mounted on the plate adapted to engage the keeper after it has penetrated the aperture to lock the keeper against displacement, a catch pivotally mounted on the plate adapted to engage the latch and hold it out of engagement

with the keeper, a member on the catch adapted to project into the path of the keeper when the latch and catch are in engagement, said member being adapted to be engaged by the keeper as the keeper enters the aperture and to be forced and held out of alignment with the aperture by the keeper to cause disengagement of catch and latch, a latch lever and an actuating lever pivoted on the plate, a connection between the latch lever and the latch whereby rotation of the latch lever causes rotation of the latch, yielding means for rotating the latch lever toward the latch locking position, manually actuated means associated with the actuating lever for rotating it toward the latch unlocking position and means interposed between the two levers for preventing relative angular movement when the actuating lever moves in the latch unlocking direction, while permiting relative angular movement when the actuating member moves in the opposite direction, the axes of latch and catch being perpendicular to the latch plate.

7. In a hood latch for automotive vehicles and the like, a centrally apertured latch plate adapted to be penetrated by a keeper, a latch rotatably mounted on the plate adapted to engage the keeper after it has penetrated the aperture to lock the keeper against displacement, a catch pivotally mounted on the plate adapted to engage the latch and hold it out of engagement with the keeper, a member on the catch adapted to project into the path of the keeper when the latch and catch are in engagement, said member being adapted to be engaged by the keeper as the keeper enters the aperture and to be forced and held out of alignment with the aperture by the keeper to cause disengagement of catch and latch, a latch lever and an actuating lever pivoted on the plate, a connection between the latch lever and the latch whereby rotation of the latch lever causes rotation of the latch, yielding means for rotating the latch lever toward the latch locking position, manually actuated means associated with the actuating lever for rotating it toward the latch unlocking position and means interposed betwen the two levers for preventing relative angular movement when the actuating lever moves in the latch unlocking direction, while permitting relative angular movement when the actuating member moves in the opposite direction, yielding means tending to thrust the catch into latch engaging position and yielding means tending to force the actuating lever in the latch locking direction, the axes of latch and catch being perpendicular to the latch plate.

8. A hood latch for automotive vehicles and the like, including a centrally apertured latch plate, adapted to receive a keeper, a latch mounted on the plate for rotation about an axis perpendicular thereto having a cam surface adapted to interlock with the keeper and draw it through the plate, a lock out lever mounted for rotation on the plate about an axis perpendicular thereto and located in substantially the same plane as the latch, a projection on the lock out lever and a hook on said lever adapted to engage the latch, the relationship of the parts being such that when the hook engages the latch to hold it out of engagement with the keeper, the projection extends into the path of the keeper whereby movement of the keeper into the aperture will engage the projection and disengage the lock out lever from the latch, a latch lever and an operating lever mounted for concentric rotation on the plate about an axis substantially perpendicular thereto, said levers being located in substantially the same plane as the latch, a connection between the latch lever and the latch, yielding means tending to rotate the latch lever toward latch locking position, a connection between the latch lever and the operating lever whereby movement in one direction of the operating lever tends to rotate the latch lever in a direction to release the latch, and hand operated means on the plate adapted to move the operating lever in latch opening position, yielding means tending to move the operating lever in the latch closed position, a stop interposed between the latch and the plate to limit the rotation of the latch in the closing direction, and means tending to urge the lock out lever into position to engage the latch and hold it out of latch position.

9. In a hood latch for automotive vehicles and the like, a centrally apertured latch plate adapted to be penetrated by a keeper, a latch rotatably mounted on the plate adapted to engage the keeper after it has penetrated the aperture to lock the keeper against displacement, a catch mounted on the plate adapted to engage the latch and hold it out of engagement with the keeper, a member on the catch adapted to project into the path of the keeper when the latch and catch are in engagement, said member being adapted to be engaged by the keeper as the keeper enters the aperture and to be forced and held out of alignment with the aperture by the keeper to cause disengagement of catch and latch, a latch lever and an actuating lever pivoted on the plate, a connection between the latch lever and the latch whereby rotation of the latch lever causes movement of the latch, yielding means for rotating the latch lever toward the latch locking position, manually actuated means associated with the actuating lever for rotating it toward the latch unlocking position and means interposed between the two levers for preventing relative movement when the actuating lever moves in the latch unlocking direction, while permitting relative movement when the actuating member moves in the opposite direction, yielding means tending to thrust the catch into latch engaging position and yielding means tending to force the actuating lever in the latch locking direction.

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