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DOOR HANDLE ASSEMBLY

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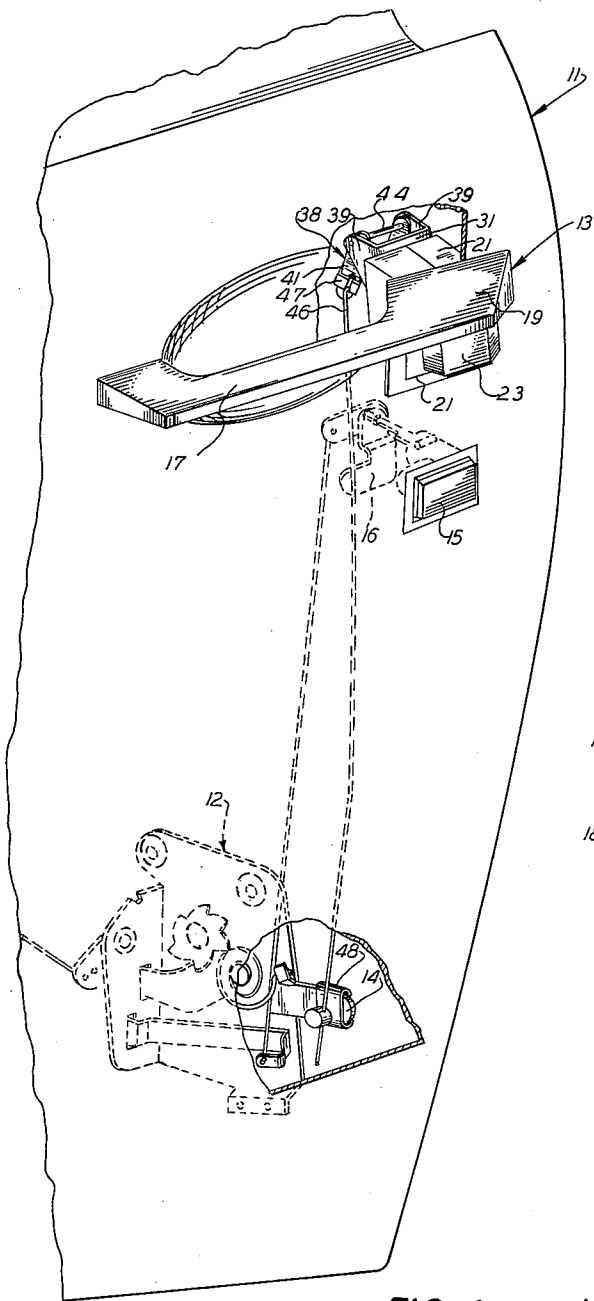


FIG. 1

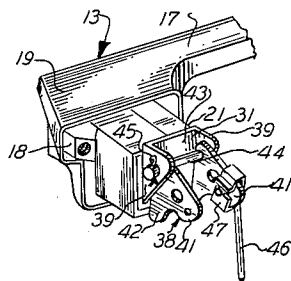


FIG. 2

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DOOR HANDLE ASSEMBLY

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2 Claims. (Cl. 292—336.3)

This invention relates to a vehicle door latch mechanism actuating assembly adapted to be mounted on an exterior surface of a vehicle door panel.

In recent years, the evolutionary design of vehicle doors has made it impossible to maintain the conventional placement of the door latch mechanism in horizontal alignment with the manually operable means for operating the latch mechanism to unlatch the vehicle door. This is particularly true of the relationship between the latch mechanism and the outer manually operable means, such as the outside door handle provided with a push button type latch mechanism actuator. It is desirable to maintain the door handle at or slightly above the belt line of the vehicle. Yet the latch mechanism must frequently be located somewhere intermediate the lower edge of the door and the vehicle belt line. Accordingly, it has become necessary to couple the outside actuator, such as the push button, to the latch mechanism through a bell crank lever and appropriate linkage. The mounting of this bell crank lever has presented a problem. In some vehicle doors, the bell crank lever is mounted on a bracket secured or positioned on a frame member of the door. This arrangement presents problems of alignment of the push button to the bell crank and of the final line of attachment of the bell crank to the latch mechanism. It has also been proposed to overcome these alignment problems by mounting the bell crank lever on a pivot shaft supported on an integral extension of the portion of the door handle housing the push button. Since the door handle and the push button housing are usually a one-piece die casting, the provision of an additional bracket to support the bell crank creates a difficult casting problem.

It is an object of the present invention to provide a simple and effective structure for supporting the bell crank on the door handle assembly prior to its installation in the vehicle door, thus eliminating all problems of alignment and line of attachment of the bell crank to the latch mechanism.

In the construction and arrangement embodying the present invention, the portion of the door handle housing the push button also houses a spring for normally urging the push button outwardly. The spring is retained within the bore of the housing by a sheet metal retainer plate. The retainer plate is provided with an aperture through which the push button stem projects. The retainer plate is also provided with parallel flanges at the side edges thereof adapted to receive a pivot member or pin on which the bell crank member is swingably mounted. The bell crank member is provided with a paddle portion or web adapted to be engaged by the end of the push button stem. When the push button is manually actuated or pushed inwardly, its motion is transmitted by the push button stem to the bell crank lever. A suitable rod or link extends from the bell crank lever to the latch mechanism element intended to be actuated by actuation of the push button. Since the spring retainer is a simple sheet metal stamping the addition of the flanges presents no great problem. Since the retainer is a part which is already required to be assembled to the door handle to retain the spring in place, no additional assembly problem is presented. The door handle casting remains relatively simple since the handle is unencumbered by any projections or protuberances which would create difficulty in casting the article.

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

FIG. 1 is a fragmentary view of a part of a vehicle door illustrating the operative relationship of the vehicle door latch mechanism actuating device embodying the present invention to the latch mechanism contained within the door;

FIG. 2 is a fragmentary perspective view of a portion of the actuating device as it would appear from the inside of the vehicle door;

FIG. 3 is a plan view of the actuating device; and

FIG. 4 is a sectional view taken substantially on the line 4—4 of FIG. 3.

Referring now to the drawings, there is illustrated in FIG. 1 a portion of a vehicle door 11 provided with a latch mechanism 12 mounted within the interior of the door structure and a latch mechanism actuating device 13 mounted on the exterior of the outer panel of the door. For convenience, the latch mechanism actuating device 13 may hereinafter be referred to as the outside door handle assembly.

For a number of reasons, which it is not believed necessary to explain for an understanding of the present invention, it oftentimes becomes necessary to mount the door latch mechanism 12 somewhat below the belt line of the vehicle body. The location of the door handle assembly, however, is somewhat restricted to a position on or near the belt line of the vehicle. With the trend toward lower belt lines, even with this location it often becomes necessary for a person desiring to enter the vehicle to stoop or bend over in order to actuate the latch mechanism to unlatch the door.

The details of the latch mechanism 12 are of no particular importance to the present invention. It should be sufficient to note that it is provided with a lever 14 which is the element controlling the latch releasing mechanism and is therefore the element which must be operated upon actuation of the outside door handle assembly 13, as will be more fully explained. The front doors of vehicle bodies are usually provided with a key cylinder operated mechanism for placing the latch mechanism in latch locked or unlocked condition. Such a mechanism is generally indicated at 15. The bell crank lever 16 operated by this mechanism is also illustrated (see FIG. 1) but forms no part of the present invention and therefore is not described in detail.

Referring now more particularly to FIGS. 2, 3 and 4, the outside door handle assembly 13 comprises an elongated hand grip member 17 adapted to be secured to the exterior surface of the vehicle door outer panel. The hand grip member may be secured to the outer door panel in any conventional manner, the securing means usually including at least one screw element (not shown) adapted to be inserted into a threaded boss 18 located at the butt end 19 of the hand grip member 17. The butt end 19 of the handle carries an enlarged portion 21 which is illustrated as being of square cross section, although it may be circular or any other convenient shape. This enlarged portion 21, which may be referred to as the push button housing, extends transversely of the longitudinal axis of the hand grip member 17 and, as perhaps best seen in FIG. 3, it extends transversely inwardly from the plane of attachment of the handle to the door panel. The door panel is provided with a suitable aperture (not visible) to receive this push button housing 21. As seen in FIG. 3, the push button housing 21 is substantially hollow, as at 22, and receives a slidable push button 23. The cross section of the push button is of a shape complementary to the cross section shape of the hollow interior of the push button housing 21. At its inner end

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24 the push button is provided with a shoulder or lip 25 adapted to engage an edge 26 of a counterbore in the housing, the edge 26 defining the outward limit of movement of the push button.

The push button 23 is provided with an inner centrally located boss 27 which receives one end of a stem member 28. The boss 27 also provides a centering means for a coil spring 29 which is adapted to maintain a push button at its normal outer limit of movement. The coil spring is retained in the push button housing by means of a retainer plate 31. The retainer plate 31 comprises a sheet metal stamping having a turned over flange 32 at one end provided with an upstanding lug 33 which hooks into a notch 34 on the underside of the housing. The retainer plate is provided with a centrally located aperture having a sleeve 35 inserted therethrough which provides a support and guide means for the free end of the push button stem 28. In addition to the retention by means of the lug 33, the retainer plate is secured to the inner face of the push button housing 21 of the hand grip portion by means of a screw 36 which is threaded into a suitable threaded aperture 37.

In order that inward movement of the push button stem 28 may be transmitted to the lever 14 of the latch mechanism 12, a suitable bell crank and connecting link are interposed between the push button stem 28 and the latch mechanism lever 14.

It has been proposed to mount such a bell crank on a bracket or the like secured to the door frame structure. If this is done, serious problems of alignment of the various movable elements are created because of the wide variation in manufacturing tolerances encountered in body sheet metal structures, such as vehicle doors. It has also been proposed to support the bell crank lever on an appendage cast directly on the enlarged housing portion 21 of the butt end 19 of the door handle. The difficulty with this solution is that an ordinary door handle presents little difficulty in obtaining good castings. But as soon as various appendages are hung on to the simple shell structure, the problem of getting good door handle castings becomes much more complicated. The extraneous appendages may require machining operations to insure good bearing surfaces for any swinging arms or levers to be carried. In handling such castings through the plating process and in simply transporting them from one place to another, these appendages are easily broken off with the result the whole handle must be scrapped.

In the present invention, the support of the bell crank lever, which is herein designated 38, is effectively and simply provided by utilizing the retainer plate 31 and providing the latter with spaced side flanges 39. As seen in FIG. 3, in plan view the flanges present a U-shaped channel section appearance. The bell crank lever 38 in plan view also has a general U-shaped appearance. It is provided with two parallel spaced crank arms 41 which, as seen in FIG. 4, extend inwardly and slightly downwardly and a pair of downwardly extending crank arms 42 which are connected by a web or paddle 43. The bell crank lever 38 is pivotally mounted on the flanges 39 at their upper end by means of a simple headed pin 44 which extends between the two flanges. The pin 44 is retained in place by a cotter pin 45. It will be noted that the pivot axis of the bell crank lever 38 substantially parallels the outer panel of the vehicle door. Stated in another way, this pivot axis extends transversely and is located above the longitudinal axis of the push button and its stem 28. Thus, when the push button is pushed inwardly the bell crank lever is swung in a clockwise direction as viewed in FIG. 4 to cause the outer end of its arms 41 to be raised.

A rod or link 46 is coupled to one or the other of the bell crank lever arms 41 and is retained in position by a suitable retention clip 47. As seen in FIG. 1, the rod 46 extends down to the lever 14 of the latch mechanism and is suitably coupled or retained on the end of the lever

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14 by any suitable retention device as indicated at 48. Either one of the arms 41 may be used, the two arms being provided so that optimum alignment conditions of the rod 46 between the bell crank lever 38 and the latch mechanism lever 14 may be obtained regardless of any variation in position of the handle on the door panel resulting from manufacturing tolerances.

The use of the retainer plate 31 as a mounting plate for the bell crank lever 38 thus has several advantages. It eliminates the necessity of making a complicated casting out of the simple handle casting presently required. The cost of the sheet metal retainer plate with the flanges is of insignificant difference over the cost of the retainer plate without the flanges. Any damage to the retainer plate during handling of the handle assembly does not require that the whole handle be scrapped. Since the bell crank is in effect directly mounted on the portion of the handle housing the push button, no problem of alignment of the push button stem with the bell crank is presented.

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 claims.

I claim:

1. A vehicle door latch mechanism actuating device adapted to be mounted on a vehicle door panel, said device comprising a housing extending from the outer side through an opening to the interior side of the panel, said housing having a longitudinally extending bore therethrough, a push button assembly slidably seated within said bore and having an end portion projecting outwardly of said housing at said outer side of the panel, said push button assembly having a longitudinal stem portion extending beyond the end surface of said housing on the interior side of said panel, spring means contained within said bore urging said push button assembly in a direction outwardly of said panel, a sheet metal retention member, means externally securing said retention member to said end surface of the housing to close the bore opening and retain said spring means therein, said securing means comprising tab means on one edge portion of said retention member engaged with a wall of an aperture in said housing and a fastening device inserted through an aperture in an opposite edge portion of said retention member and holding the latter to said end surface, said retention member having an aperture through which said stem portion projects, spaced parallel flanges on said retention member, a bell crank member, and means pivotally supporting said bell crank member on said spaced flanges, said bell crank member having a paddle portion engageable by said push button stem and a link means receiving portion, said bell crank means being adapted to transmit actuating movement of said push button assembly to a latch mechanism element connected thereto by a link means.

2. A vehicle door latch mechanism actuating device adapted to be mounted on a vehicle door panel, said device comprising a housing extending from the outer side through an opening to the interior side of the panel, said housing having a longitudinally extending bore therethrough, a push button assembly slidably seated within said bore and having an end portion projecting outwardly of said housing at said outer side of the panel, said push button assembly having a longitudinally extending stem projecting beyond the end surface of said housing on the interior side of said panel, spring means contained within said bore urging said push button assembly in a direction outwardly of said panel, a sheet metal retention member, means externally securing said retention member to said end surface of the housing to close the bore opening and retain said spring therein, said securing means comprising tab means on one edge portion of said retention member engaged with a wall

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of an aperture in said housing and a fastening device inserted through an aperture in an opposite edge portion of said retention member and holding the latter to said end surface, said retention member having an aperture, a cylindrical sleeve in said aperture through which said stem projects, spaced parallel flanges on said retention member, a bell crank member, and a shaft means pivotally supporting said bell crank member on said spaced flanges for swinging movement about an axis located above the longitudinal axis of said stem, said bell crank member having a depending paddle portion engage-

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able by said push button stem and a link means receiving portion, said bell crank means being adapted to transmit actuating movement of said push button assembly to a latch mechanism element connected thereto by a link means.

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