June 18, 1968 H. COLELL 3,388,939

DOOR LATCH

Filed Sept. 16, 1966

FIG. 1

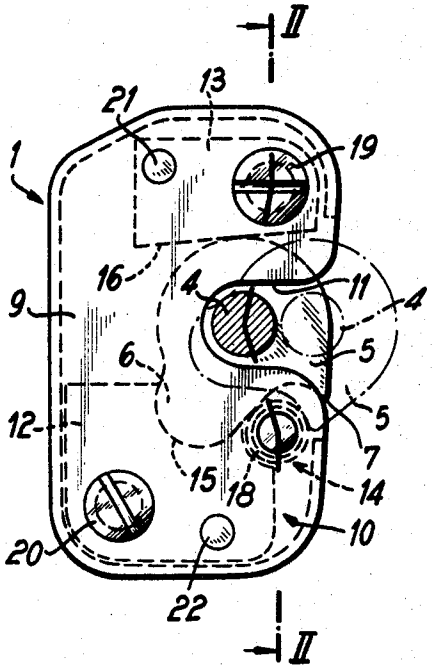
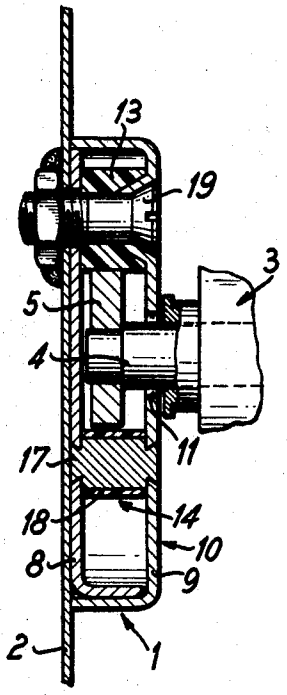


FIG. 2



INVENTOR:
Hans COLELL

BY Dicke & Craig

ATTORNEYS

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DOOR LATCH

Hans Colell, Schulhofstr. 11, Schwieberdingen, Germany

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7 Claims. (Cl. 292—198)

ABSTRACT OF THE DISCLOSURE

A motor vehicle door latch consisting essentially of a closing block fastened to the door frame, a lock fastened to the door, and having a turning handle for cooperation with the closing block, and a lock safety member engaging the block from the rear to prevent expanding of the door and the frame. The lock safety member consists of a single plate on the end of a stub shaft, with the plate consisting of a disc portion, a retaining extension for engaging in the recess of a retaining member of the closing block, and a nose portion for engaging the stop of the closing block to rotate the plate. The closing block is provided with an outer keeper wall having a parallel sided slot only slightly wider than and for receiving said shaft.

Background of the invention

It is known to provide a door latch with a closing block having teeth or similar recesses in the outer wall for engaging the turning handle. In this arrangement, it is known to provide a further disc-like member attached to the turning handle shaft for engaging the closing block from the rear to prevent expanding of the door and the frame or door post. The recesses in the outer wall of the closing block that receive the turning handle will weaken the outer wall and reduce the effective support surfaces for the safety disc-like member of the lock. In this type of prior art device, special precautions, especially reinforcements, must be provided to increase the strength of the outer wall to provide support for the safety member in the axial direction in an attempt to satisfactorily meet safety requirements. Furthermore, this type of prior art device has the additional disadvantage that the small outer wall portions between a recess and the edge of the closing block offers very little resistance to a radially directed load and tends to bend easily. This small outer wall portion between the recess and the outer edge of the closing block will wear very fast because of the interaction with the turning handle.

Summary of the invention

It is an object of the present invention to satisfactorily overcome the above-mentioned disadvantages of the prior art devices. Also, it is an object of the present invention to provide a simpler and more economical door latch that is sufficiently strong to meet safety requirements. More particularly, it is an object of the present invention to provide a door latch with improved strength with regard to both axially and radially directed loads and a more simplified economical construction. The foregoing and additional objects are obtained by the following illustrative embodiments of the present invention wherein the rotatable securing member of the door latch is provided with one or more extensions that form the turning handle, which cooperates with an internal rack member or cooperatingly shaped insert within the closing block. With this arrangement, the outer wall or keeper plate of the closing block requires only a small slot for receiving the shaft of the turning handle so that a large substantially uninterrupted outer wall or keeper plate is provided for the axial support of the turning handle safety member. In an advantageous manner, it is additionally contemplated that the

turning handle also constitutes the the safety member with the turning handle extension effectively enlarging the support surface of the safety member. More particularly, the safety member or turning handle consists of a tooth-like extension or finger, which can be brought into engagement with a correspondingly shaped recess formed in an insert within the closing block, and a nose portion, which will cooperate with a closing block stop to initiate the engaging movement or rotation of the tooth-like extension or finger. The cooperation between the turning handle and the closing block insert facilitates the provision of a relatively wide working surface for rigidly carrying the radial loads and substantially preventing any appreciable wear. Also, it is contemplated that the insert may be formed of an elastic synthetic material to prevent rattling and other similar noises within the door latch. Furthermore, it is contemplated that the safety member or turning handle may have an arcuate or cam surface for cooperating with a closing block ramp surface, which may be formed by an inelastic synthetic molded member, to provide the final rotational movement of the turning handle during closure. By means of this ramp surface and cooperating cam, the safety member or turning handle is rotated so that its finger or tooth-like extension is pressed into the yielding elastic insert and securely held without play.

Brief description of the drawing

Further objects, features and advantages of the present invention will appear from the following description of a preferred embodiment shown in the accompanying drawing, in which:

FIGURE 1 is a front view of the closing block with the turning handle and its sectioned shaft in the closed or latched position, and

FIGURE 2 is a cross sectional view taken on line II—II of FIGURE 1, with additional members attached to the turning handle shaft.

Detailed description of the drawing

The door latch of the present invention comprises a closing block and a manually operable movable latch mechanism. The closing block **1** is rigidly attached to a frame portion or door post **2** of a conventional motor vehicle. The movable latch mechanism **3** is mounted in a known manner on a vehicle door and may be provided with the conventional door interior mechanisms and manual operating handle (not shown). The movable latch mechanism is provided with the conventional type stub shaft **4**. A plate **5** is rigidly attached to the stub shaft **4** and is provided on a circumference with a tooth-like extension **6** and a nose **7** to constitute the turning handle or safety member. The tooth-like extension **6** and the nose **7** operatively cooperate with the closing block **1** to carry out the latching action during closing of the door, that is, relative movement between the closing block **1** and the movable latch mechanism **3**.

A plurality of cooperatively shaped metal stampings **8**, **9** are rigidly assembled together to constitute the closing block housing **10**. The housing stamping or portion **9** is provided with a relatively small slot **11** having a width slightly larger than the diameter of the shaft **4** for receiving the shaft **4** in such a manner that the turning member **5** enters within the closing block **1**. Internally of the closing block **1**, that is, within the housing **10**, there is rigidly secured an insert **12**, a wedge stamping **13**, and a stop member **14**; all of these elements may be adjustably fastened within the housing **10** if desired. The insert **12** preferably consists of an elastic synthetic material that is provided with a recess **15**, which is shaped to correspond to and receive the tooth-like extension **6** of the turning handle **5**. The wedge stamping **13** is preferably made of an inelastic synthetic material and is

mounted within the housing **10** opposite to the insert **12**. The wedge stamping **13** is provided with a ramp surface or cam edge **16** for providing the final rotation of the plate **5** through cooperation with an arcuate or cam surface on the plate **5**. The stop **14** is mounted closely adjacent to the insert **12** and comprises a bolt **17** that securely joins the stampings **8**, **9**, and carries a freely rotatable sleeve **18**, which is preferably made of synthetic material. During the initial part of the closing of the latch, the nose **7** of the plate **5** will engage the stop **14** to provide the initial rotation of the plate **5**. The insert **12** and the wedge stamping **13** are preferably rigidly attached to the housing **10** by means of bolt **19**, **20** and rivets **21**, **22**, which also rigidly attach the stampings **8**, **9** to each other. Bolts **19** and **20** may have the additional function of mounting the housing **10** to the door post portion **2**.

When the door of the vehicle is closed, the shaft **4** enters the recess **11** of the closing block **1**. The plate **5** that is rigidly attached to the shaft **4** moves in a linear direction corresponding to the extent of the slot **11** until the nose portion **7** engages the stop **14**, as shown by the dot and dashed line indicating an initial position of the plate **5** in FIGURE 1. From this initial position, the shaft **4** and plate **5** are moved into the solid line position shown in FIG. 1 when the door is moved into its closed position. During this movement, the cooperation of the nose **7** and the stop **14** pivots the plate **5** so that the extension **6** is brought into engagement with the recess **15** of the insert **12**. With further movement of the door, the cooperation of the tooth-like extension **6** and the recess **15** tend to further rotate the plate **5**, and the upper arcuate or cam portion of the plate **5** engages the ramp surface **16** of the member **13** to finally rotate the plate **5** so that the tooth-like extension **6** is firmly pressed into the resilient insert **12**, where it is held under a considerable elastic force. The ramp surface **16** is formed so that the dimension, measured perpendicular to the linear movement of the shaft **4**, between the shaft **4** and the ramp surface **16** progressively decreases as the shaft **4** moves from right to left in FIGURE 1, and the cam surface of the plate **5** is formed with a progressively decreasing radius so that a counterclockwise rotating force is exerted on plate **5** by the caming action of the ramp **16** and the upper cam surface of the plate **5**. The wedging action of the ramp **16** and the elastic forces exerted by the compressed insert **12** will tend to prevent rattling of the lock mechanism when it is closed, and will assist in unlatching during opening of the door.

The relatively small and smooth slot **11** in the outer wall or stamping **9** of the closing block **1** provides a minimum amount of weakening of the stamping **9**, which therefore constitutes a relatively high strength keeper plate that will strongly resist axial forces in the direction of the shaft **4**; this strength is further enhanced by the provision of the bolt **17** immediately adjacent to the slot **11**. It is contemplated that the stop **14** may be provided with part of a tooth and may be entirely constructed of one material, particularly a synthetic material. As a further safety feature, the stop **14** has the additional function of preventing the extension **6** from breaking out of the closing block **1**.

The foregoing specifically described device has been set forth as an illustrative preferred embodiment of the present invention; it is contemplated that numerous additional embodiments and modifications may be made within the spirit and scope of the present invention as defined only by the following claims.

I claim:

1. A door latch, particularly for motor vehicles, comprising: a closing block for mounting on a door frame; latch means for mounting on the door to cooperate with said closing block and having a stub shaft and a single plate rigidly mounted on the outer end of said stub shaft; said closing block having a keeper wall outwardly facing said latch means with an outwardly opening slot for receiving said stub shaft; said latch means plate constituting safety plate means located in the latched position internally of said closing block behind and engaging said keeper wall for preventing expansion of the door and the door frame; said plate having an outer arcuate edge and an opposite tooth; said closing block having a receiving portion behind said keeper wall formed with at least one abutment means for engaging and retaining said tooth within said housing and having an opposed inelastic wedge immovably mounted with respect to the door frame engaging said outer edge during the last portion of the movement of said safety plate means into said closing block to force said safety plate means into said abutment means in its locked position.

2. The door latch according to claim **1**, wherein said abutment means is an elastic insert with an edge portion defining a recess corresponding in shape to said tooth.

3. A door latch, particularly for motor vehicles, comprising: a closing block for mounting on a door frame; latch means for mounting on the door to cooperate with said closing block; said latch means having a stub shaft mounted for rotation about an axis and a single plate rigidly mounted on the outer end of said stub shaft to constitute the only latch means parts in said closing block in the latched position; said closing block having a wedge and a keeper wall outwardly facing said latch means with an outwardly opening substantially parallel side walled slot only slightly wider than said stub shaft; said latch means plate constituting safety plate means located in the latched position internally of said closing block behind and engaging said keeper wall for preventing expansion of the door and the door frame; said plate having an outer circumferential edge consisting of a first wedge engaging single arc portion, a second single tooth defining portion lying substantially completely radially beyond the largest radius of said first portion, a third single nose defining portion of less circumferential extent than said second portion lying substantially completely radially beyond the largest radius of said first portion, and a fourth transistion single arc portion smoothly connecting said second and third portion; said first, second and fourth portions overlapping said keeper wall in the latched position; said closing block having a stop and a receiving portion behind said keeper wall formed with at least one abutment means for engaging and retaining said tooth portion within said housing; said nose portion constituting means engaging said stop and rotating said plate to engage said tooth portion with said abtument means during movement of said door latch into its latched position.

4. The door latch according to claim **3**, wherein said receiving portion is constructed of relatively resilient synthetic material with said abutment means being a recess corresponding in shape to said plate tooth.

5. The door latch according to claim **4**, wherein said wedge is constructed of a relatively inelastic material and is rigidly mounted with respect to the door frame.

6. The door latch according to claim **5**, wherein said wedge is a molded member constructed of an essentially inelastic synthetic material; said closing block includes an outer cup-shaped metal stamping constituting said keeper wall and an inner stamping; said stop is rigidly attached to each of said stampings and extends between them to reinforce said keeper wall immediately adjacent said slot; said molded member extending between and engaging each of said stampings; a plurality of rigid fastening members extending through said molded member to rigidly secure said stampings and said molded member together; said receiving portion extending from inner face to inner face of said stampings; said closing block having a plurality of rigid fasteners rigidly fastening said stampings and said receiving portion together; and at least one of said rigid fasteners having means to rigidly fasten said closing block to said door frame.

7. The door latch according to claim 3, wherein said closing block includes an outer cup-shaped metal stamping constituting said keeper wall and an inner stamping.

References Cited

UNITED STATES PATENTS

2,499,165	2/1950	Roethel	292—341.12
2,795,448	6/1957	Johnson	292—216

2,814,193	11/1957	Roethel	70—142
2,819,138	1/1958	Betz.	
2,931,677	4/1960	De Vito et al.	
2,943,879	5/1960	Allen.	
3,118,703	1/1964	White et al.	

RICHARD E. MOORE, *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,388,939 June 18, 1968

Hans Colell

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

In the heading to the printed specification line 3, "Schulhofstr. 11, Schwieberdingen, Germany" should read -- Schwieberdingen, Germany, assignor to Firma Dr. Ing. H.c.F. Porsche KG, Stuttgart-Zuffenhausen, Germany --.

Signed and sealed this 11th day of November 1969.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents