June 6, 1972 A. J. VARRIN ET AL 3,667,793

WEDGE-SLIDE LATCH

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FIG. 1.

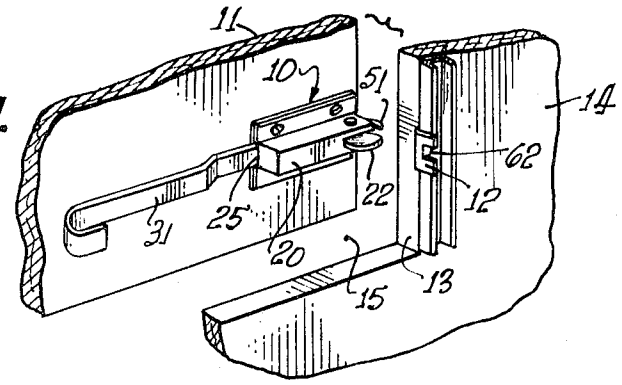


FIG. 2.

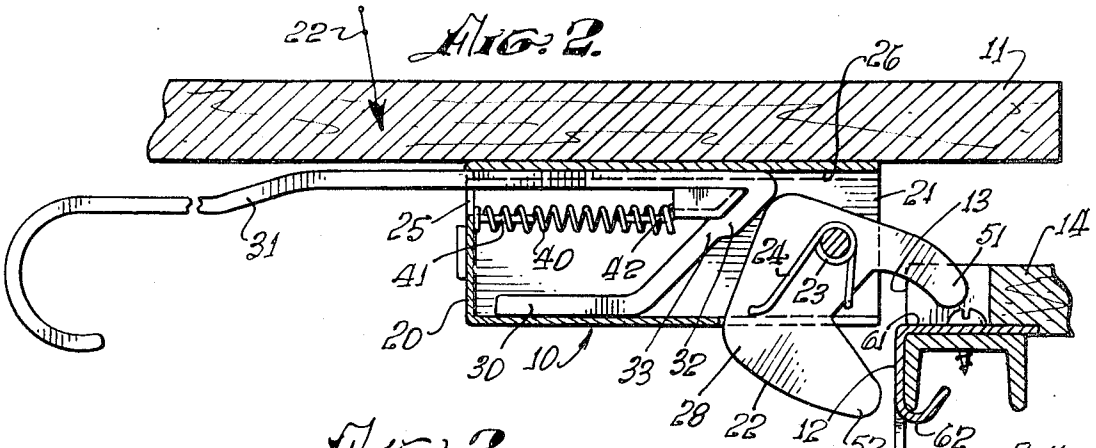


FIG. 3.

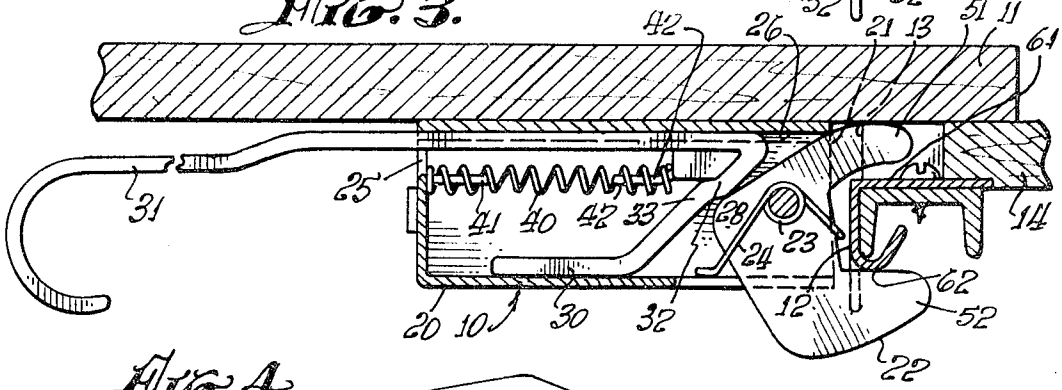
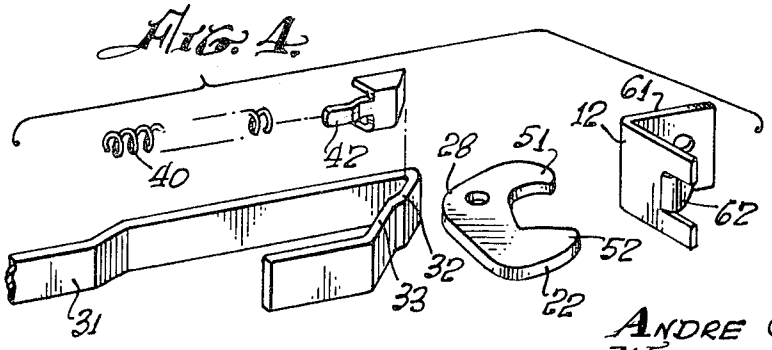


FIG. 4.



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WEDGE-SLIDE LATCH

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ABSTRACT OF THE DISCLOSURE

A latch having a latching cam pivotally mounted on a pivot pin transverse to an elongated latch housing, the cam having a configuration such that it is rotatably driven into locked position when a closure arm portion engages a catch. The latch housing contains an internally movable slide, which slide is resiliently urged into engagement with the internal part of said cam, but is retractable therefrom by the latch handle. The cam-engaging face of said slide is a surface which is shaped to wedge under a part of the cam, when the latter is counter rotated into locking position, against a torsion spring tending to rotate the cam into open position. Only when the slide is longitudinally retracted within the housing, by operation of the latch handle, does the cam again rotate into unlocked position, permitting the latch to be opened.

This invention relates generally to latches of the rotating cam type, and more particularly to such a latch in which the cam is resiliently urged into open position, but is locked in latching position, by a wedging wall on a slide which reciprocates internally of the housing of the latch.

Rotating cam latches are commonly used in automobile and truck doors, as well as on drop windows at the rear of station wagons and campers, and other closure doors in vehicles. The reason is that positive locking must be achieved instantly upon closure of the door, and the locking must be sufficiently secure to resist the vibration occurring in the vehicle during travel, and also to resist unwanted entrance from the outside.

However, most of the heretofore known latches must be built into the vehicle door and it is not practical to attach them to already existing construction. The latch of the present invention will find great utility in both original manufacture and also in application where it is desired to make a surface installation on an already fabricated closure door and door frame, whether in a vehicle or in other applications.

In the present invention, the latch housing forms an enclosed track which has two functions: First, the track determines the path of movement of a slide, which performs a locking function; secondly, the internal walls of the housing cooperate with the slide to hold it in wedging position against the locking cam involved in the invention. Because of this type of construction, the cam lock of the present invention may be sold as a completely assembled unit, for installation on the surface of an automobile door, by a relatively unskilled person, without dismantling the door. Most previously known cam locks have had to be built into the interior of the door during its construction, and the exterior ones, heretofore known, have not had the strength and reliability of the present invention.

A preferred specific embodiment of our invention is illustrated in the accompanying drawings and described in the following specification. In the drawings:

FIG. 1 is a perspective view of a preferred form of the latch and catch of the invention, shown mounted on a door and door jamb, respectively;

FIG. 2 is an enlarged cross-sectional view of the latch and catch, as viewed at the plane of cam rotation, as the door approaches the jamb;

FIG. 3 is a cross-sectional view corresponding to FIG. 2, except that the door has now moved into seating position on the jamb; and

FIG. 4 is an exploded assembly of the principal parts of the latch, and the catch, shown in perspective.

In FIG. 1, the latch **10** is seen mounted on a door, or first member **11**, such as the rear window of a station wagon or truck camper; and the catch **12** is seen mounted on the inner side of the jamb **13** at the rear wall **14** of the stationwagon or camper. The window or door opening is indicated at **15**.

In FIG. 2, the latch **10** and the catch **12** are seen in section, at a plane taken transversely through both latch and catch.

Latch **10** is illustrated with its parts, to be described hereinafter, in an unlocked condition, with the door **11** not yet closed but moving toward closure in what may be described hereinafter as in a down-movement direction indicated by the arrow **22**.

FIG. 3 is a sectional view similar to FIG. 2, but showing the parts of latch **10** now shifted into locking position, with the door **11** now closed into seating position on the door frame jamb **13**.

Sectional views FIG. 2 and FIG. 3 reveal that latch **10** has its working parts enclosed within a housing **20**, which in this preferred form, is sheet metal stamped into a rectangular housing. At the end of housing **20** adjacent catch **12**, there is an opening **21**, in which a cam **22** is rotatably mounted on a pivot pin shaft **23**. A spiral spring **24** on pivot pin **23** urges cam **22** in a clockwise direction, tending to hold it in the unlocked or open position illustrated in FIG. 2. It is only when cam **22** encounters the adjacent surfaces of catch **12**, upon closure as illustrated in FIG. 3, that cam **22** is forced into a counterclockwise rotation, hereinafter referred to as counter rotation, against the force of unlocking spring **23**, as illustrated in FIG. 3.

Locking of cam **22** in the locked position of FIG. 3, is achieved by a slide **30** which is reciprocally slidable in the interior of housing **20**. It will be seen that slide **30** may be conveniently formed of a folded piece of steel strap, as illustrated in perspective in FIG. 4.

At its left end, as viewed in FIG. 3, slide **30** has an extension **31** which serves as a handle for the operator to unlock latch **10**, when desired, from the interior of the vehicle. It will be seen that handle **31** extends through an opening **25** provided at the left end of housing **20**.

The right end of slide **30** is formed into an inclined surface **32**, which in its preferred form is provided with a step **33** for even stronger locking.

In locking action, slide **30** enters under cam **22**, as illustrated in FIG. 3 and wedges between cam **22** and the adjacent interior walls **26** of the housing **20**.

Slide **30** is urged at all times toward its locking wedging position of FIG. 3, by a resilient spring, illustrated in this preferred form as spiral spring **40**, which is retained in position by housing spring retainer **41** at the left end and slide spring retainer **42** at the right end.

A preferred co-acting construction for both catch **12** and cam **22** is illustrated in the preferred embodiment. It will be seen that cam **22** is provided with a pair of arms, a camming arm **51**, and a catching arm **52**. Camming arm **51** engages an outer surface of catch **12**, which may be referred to as its camming surface **61**. Upon closure, contact between camming surface **61** and camming arm **51** forces cam **22** to rotate into the position illustrated in FIG. 3, with catching arm **52** moving behind catch **12** and engaging catching surface **62**.

It will also be seen in the preferred form, that the part of cam **22** received inside of the housing **20** is formed with a protrusion **28** which cooperates with the double step or surface **26** to provide very positive locking.

What we claim is:

1. A latch for surface mounting on the interior of an outwardly opening door, said latch making locking engagement when said door closes in a down-movement closure direction to a closed position, with said door seated against a jamb, which latch includes:

a catch mounted on said jamb, said catch having a camming surface disposed substantially in a plane transverse to said door closure movement, and a catching surface substantially parallel to said camming surface, but spaced down-movement from said catching surface;

a latch housing mounted on the interior of said door, near an edge of said door which moves in a down-movement direction to said catch, said latch housing having a pair of internal slide tracks extending away from said catch, one of said tracks being down-movement from the other, and said housing having an opening at its door-edge end, which opening locates adjacent said catch when said door is seated in closed position on said jamb;

a cam rotatably mounted in said housing at said opening, and rotatable between locked and unlocked positions, said cam having a plane of rotation parallel to said slide tracks, and said cam having a pair of arms projecting from said housing opening, said arms comprising a camming arm adapted to engage said camming surface of said catch as said door moves into closed position seating on said jamb, and a catching arm adapted to lock on said catching surface of said catch, when said cam is rotated from its unlocked to its locked position by said catch;

cam spring means resiliently urging said cam toward counter-rotation to its unlocked position;

a slide for sliding within said housing to and from engagement with said cam, said slide comprising a wedge-end shaped to lock said cam against counter-rotation when said cam is in locked position, and a pair of slide arms extending from said wedge-end away from said cam location, one of each of said slide arms being closely received for sliding engagement in one of said pair of internal slide tracks;

resilient spring means between the end of said housing away from said cam, and the wedge-end of said slide, for urging said slide along said pair of tracks toward locking engagement with said cam; and

a slide retraction handle comprised of an extension of one of said slide arms, said handle extending to the exterior of said housing through an opening in the end of said housing, opposite the location of said cam.

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U.S. Cl. X.R.

292—207