July 19, 1966 W. J. CAMPBELL 3,261,629

LATCHES FOR DOORS

Filed Dec. 20, 1963 2 Sheets-Sheet 1

FIG1

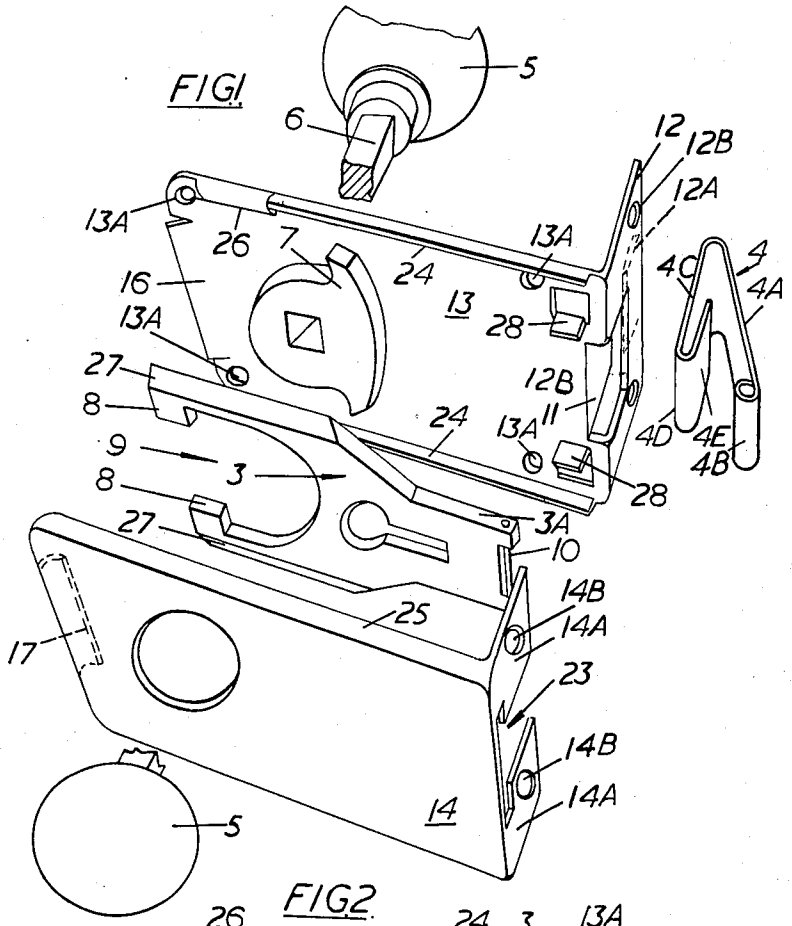
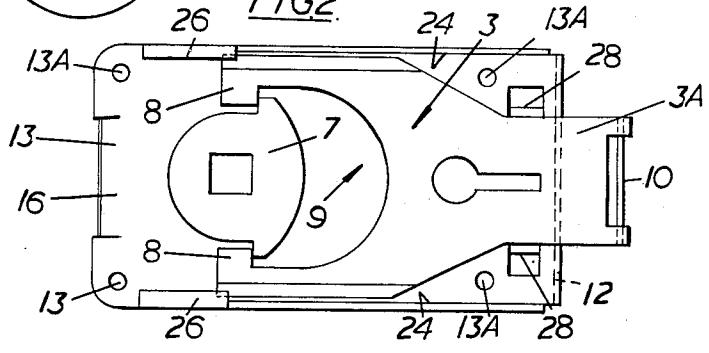


FIG2



Inventor
WILLIAM J. CAMPBELL
By Young & Thompson
Attorneys

July 19, 1966 W. J. CAMPBELL 3,261,629

LATCHES FOR DOORS

Filed Dec. 20, 1963 2 Sheets-Sheet 2

FIG3

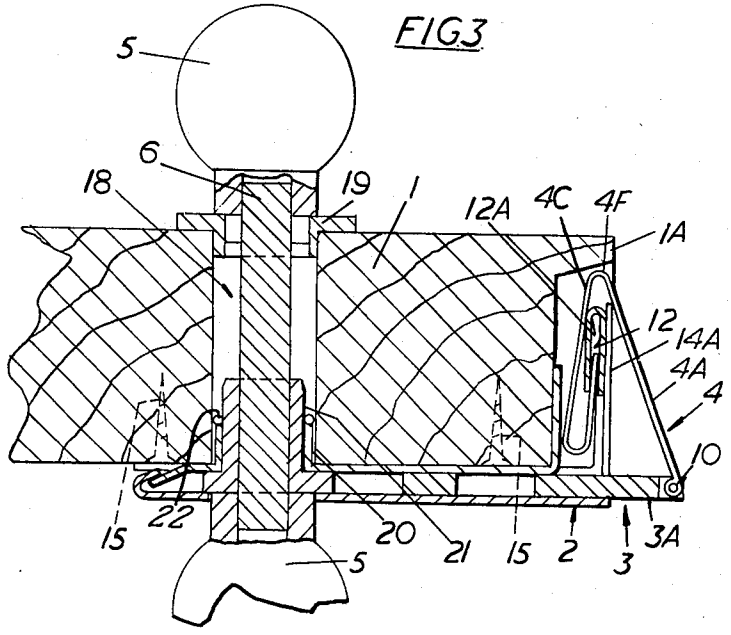


FIG4

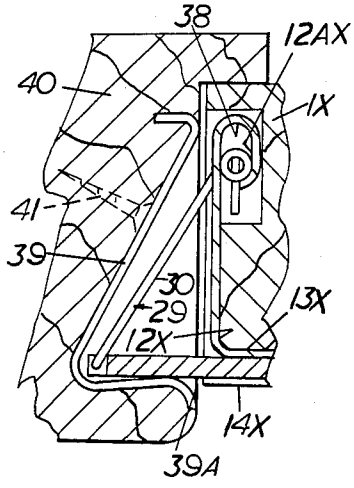
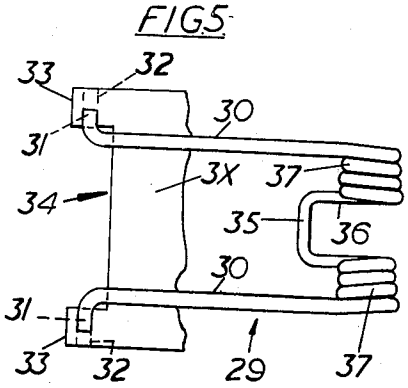


FIG5



Inventor
WILLIAM J. CAMPBELL
By Young & Thompson
Attorneys

United States Patent Office 3,261,629 Patented July 19, 1966

3,261,629

LATCHES FOR DOORS

William J. Campbell, 38 Mair St., Glasgow SW. 1, Scotland

Filed Dec. 20, 1963, Ser. No. 332,034
Claims priority, application Great Britain, Dec. 27, 1962, 48,618/62; Feb. 21, 1963, 6,935/63
6 Claims. (Cl. 292—169)

This invention relates to latches for doors, of the type having a casing for attachment to a face of a door and having a spring-loaded bolt within the casing projecting at one end from the casing for releasable engagement with a keeper in the lintel of a doorway.

At present such latches have a disadvantage in that the casing is of considerable breadth and therefore projects considerably from the face of the door, and an object of the present invention is to obviate or mitigate this disadvantage.

According to the present invention a latch for a door comprises a casing, a bolt slidably mounted within the casing and having one end projecting from the casing, and outside the casing a spring attached at one end to said projecting end of the bolt and attached at its other end to the casing so as to urge the bolt depressably to its projecting position.

Examples of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is an exploded perspective view of one embodiment of a latch for a door according to the present invention,

FIG. 2 is an assembled front view of the bolt and part of the casing corresponding to FIG. 1,

FIG. 3 is a sectional plan view corresponding to FIG. 1 showing the assembled latch attached to a door,

FIG. 4 is a fragmentary plan view of another embodiment, and

FIG. 5 is a rear view corresponding to FIG. 4 with parts omitted so as to show the spring and its connection to the bolt.

Referring to the drawings, a latch for a door 1 (FIG. 3) consists generally of a casing 2, a flat bolt 3 in the casing, and a spring 4 outside the casing 2 and acting on the bolt 3.

One end 3A of the bolt projects through a slot in an end wall of the casing 2. The bolt 3 is slidably mounted in the casing 2 and can be moved by handles 5 to withdraw its projecting end 3A inwards of the casing 2. The handles 5 are attached to a shaft 6 passing through the door 1 and the casing 2 and through a cam 7 within the casing 2 which engages abutments 8 on the bolt 3 which has a slot 9 to enable it to move across the shaft 6 when the latter is turned.

The spring 4 is of substantially V-shape, the free end of one leg 4A of the V being connected somewhat loosely to the projecting end of the bolt by a hooked or rolled portion 4B on the spring engaging around a pin 10 bridging a gap in the projecting end 3A of the bolt 3. The other leg 4C of the V is bent back inwards upon itself so as to form a U-shaped hooked portion 4D which is slidably located between inner and outer parallel external flanges 11, 12 on the casing 2. The free end 4E of the hooked portion 4D engages in a slot formed between the flange 12 and an inturned lip 12A on the latter.

In use, the casing 2 is attached to the face of the door 1, the flanges 11, 12 extending across the end side face 1A of the door and the outer flange 12 being secured thereto by screws (not shown) passing through holes 12B, and the door being suitably recessed to receive the flanges. The spring 4 then has its apex 4F adjacent the free end of the flange 12 and the front edge of the end side face 1A (FIG. 3), and the outer leg 4A of the spring 4 attached to the bolt 10 lies at an angle to the flange 12 and the face

1A of the door 1 and urges the bolt 3 to the position in which it projects from the casing 2. When the door is being closed, the outer leg 4A of the spring 4 engages the striker of a keeper on the lintel of the doorway and is depressed, pushing the bolt inwards of the casing until the door is fully closed. The spring 4 is then released and pulls the bolt 3 outwards of the casing 2 so that its projecting end 3A engages the keeper and holds the door closed. During these movements, the spring 4 has a limited sliding movement between the flanges 11, 12 and lip 12A towards and from the front and rear faces of the door, so that spring fatigue is reduced.

From the above, it will be seen that the spring, while acting as such, also simulates the angled or curved contact face of the tongue hitherto forming the projecting end of the bolt of a lock of the type aforesaid, and that the casing may be made very much narrower and generally smaller than hitherto, as there is no spring within the casing and the thickness of the bolt is reduced.

The casing 2 is formed by front and rear or inner and outer plates 13, 14, the inner plate 13 carrying the flanges 11, 12 and the cam 7 and being attached to the rear face of the door 1 by screws 15 passing through holes 13A. The plates 13, 14 are interconnected at their ends remote from the edge 1A of the door and from the projecting end 3A of the bolt 3 by co-operating tongues 16, 17 respectively on the plates 13, 14, and the outer plate 14 has at its other end flanges 14A which lie on top of the outer flange 12 of the inner plate 13 and are secured to the door by screws (not shown) passing through the holes 14B therein and the holes 12B in the flanges 12. No screws therefore pass through the outer plate 14 of the casing 2. The door 1 has a hole 18 for the shaft 6 and the hole 18 receives an escutcheon 19, and a retaining collar 20 on the rear of the inner plate 13 for a sleeve 21 on the cam 7, the sleeve 21 having a groove for a spring ring 22.

The flange 11 is formed by bending back a part of the plate 13 so that an opening is formed into which the hooked or rolled portion 4B of the spring 4 may be depressed, and a corresponding opening 23 is provided between the flanges 14B on the plate 14.

The plates 13, 14 have respectively overlapping spacing flanges 24, 25 at their upper and lower edges, portions of the flanges 24 being in-turned to form slideways 26 for the inner end portion of the bolt 3 which has chamfered edges 27 which slide on the slideways 26. The projecting end 3A of the bolt 3 is guided between tongues 28 pressed inwards from the plate 13.

The bolt may conveniently be wider than the spring and with a corresponding T-shaped opening in the keeper it will simultaneously present a combined latch and deadbolt effect.

The latch casing may also have a turnbuckle or slide knob of existing type whereby the bolt may be engaged to prevent retraction and constitute a lock. The handle above described may be replaced by a finger grip attachment projecting through the casing from the bolt and a fixed grip on the casing so that finger and thumb action may conveniently press the two grips together and simultaneously provide a means for retracting the bolt and pulling the door open.

FIG. 4 shows another embodiment which corresponds exactly with the embodiment above described except that a different type of spring is used and that consequential minor modifications have been made, and like numerals with the addition of the suffix X will be used for parts which are the same as those in FIGS. 1 to 3.

Thus, in FIG. 4, the spring is a torsion spring 29. One end of the spring 29 is formed by spaced parallel arms 30 having outwardly bent portions which form trunnions 31 and are sprung into holes 32 in the lugs 33 on opposite

sides of the gap **34** in the end of the bolt 3X (see FIG. 5). The other end of the spring is a U-shaped tail **35** of which each leg **36** is connected to an arm **30** by a coil **37**. The flange **12X** of the plate **13X** has a tongue **12AX** bent back so as to form between them a slot **38** in which the coils **37** are located, the tail **35** abutting the free end of the tongue **12AX** so that the arms **30** urge the bolt 3X to its projecting position. The slot **38** is of such length as to allow limited displacement of the coils **37** along the slot during operation of the latch. 1X indicates the door, and **14X** indicates the outer plate of the casing.

In FIG. 4, there is also shown a suitable form of keeper **39** attached to the lintel **40** of a doorway by a screw **41**. The keeper **39** has a curved striker portion 39A, and the lintel is correspondingly recessed to receive the keeper.

I claim:

1. In a latch for a hinged door comprising a casing for attachment to the front face of a door, a bolt slidably mounted within said casing, one end portion of the bolt projecting out of the casing at one end of the latter, a spring outside said casing, and end of said spring connected to the projecting end portion of the bolt, the spring urging the bolt depressibly to its projecting position, and turnable handle means operable to effect sliding movement of the bolt to a non-projecting position; a flange at said one end of the casing projecting laterally from the casing for connection to the side end face of the door, a connection between the other end of said spring and said flange, and a portion of said spring inclined laterally to the casing between said flange and said projecting end of the bolt and forming a lintel-engageable cam face between said flange and the outermost end of the projecting portion of the bolt.

2. In a latch according to claim **1** in which said spring is a two-legged leaf spring of substantially V-shape, means on the projecting end of said bolt defining a gap, a pin bridging said gap, a hooked portion on the free end of one of the legs of the spring engaging around said pin, an inturned lip on said flange, a portion of the other leg of the spring bent back inwards upon itself and forming a hook, a free end on the hook engaging slidably between said flange and said lip, and a second flange projecting laterally from the casing in the same direction as the first-mentioned flange and spaced from the latter and between which flanges said hook is slidably located.

3. In a latch according to claim **2**, a casing comprising an inner plate having holes for screws for attaching the plate to the front face of a door and having said flanges thereon, an outer plate, flanges on said outer plate overlying said first-mentioned flange, means on the latter defining holes for screws, means on the outer plate flanges defining holes for screws registering with the first-mentioned holes, and releasably interengaging tongues respectively on the ends of said plates remote from said flanges.

4. In a latch according to claim **3**, a flat bolt, slideways on said inner plate, chamfered edges on an end portion of said bolt remote from its projecting end and engaging in said slideways, lugs on said inner plate between which the bolt is guided adjacent its projecting end, and a rotatable cam mounted on said inner plate and operable by said handle means.

5. In a latch according to claim **1** in which said spring is a torsion spring, lugs on the projecting end of said bolt defining a gap, means on said lugs defining opposed holes, two spaced parallel arms forming said one end of the spring, bent portions at the free ends of said arms sprung into said holes, a U-shaped tail at the other end of said spring, coiled spring portions connecting said arms with the legs of the U-shaped tail, and a tongue bent back on said flange and defining a slot between the tongue and flange, said coiled portions and said tail being slidably located in said slot and said tail abutting the free end of said tongue.

6. In a door hinged in a doorway, a latch comprising a casing attached to the front face of the door, a bolt slidably mounted in the casing, one end portion of the bolt projecting out of the casing at one end of the latter and projecting beyond the side end face of the door, a leaf spring outside the casing, an end of the spring connected to the projecting end portion of the bolt, the spring urging the bolt depressibly to its projecting position, and turnable handle means for effecting sliding movement of the bolt to a non-projecting position; said casing comprising a rear plate, screws attaching said plate to the front face of the door, a front plate, releasably interengaged tongues respectively on said plates at their ends remote from said side end face of the door and connecting said plates at said ends, a first flange on said rear plate extending across said side end face of the door, a flange on said front plate overlying said first flange, screws passing through said flanges and securing same to the side end face of the door, a recess in said side end face of the door, a second flange on said rear plate spaced from said first flange and projecting into said recess, a lip on said first flange inturned into said recess, said spring being substantially V-shaped, a pivotal connection between said one end of the spring and the outermost end of said projecting portion of the bolt, a portion of the other end of the spring bent back inwards upon itself and forming a hook, said hook being located between said first and second flanges and its free end being located between said first flange and said lip, and a portion of said spring extending across said side end face of the door from said projecting end of the bolt into said recess and lying at an angle to the bolt and to said side end face of the door and forming a cam face on the bolt for engagement with a striker of a keeper on the lintel of the doorway when the door is being closed, and said bolt being flat.

References Cited by the Examiner

UNITED STATES PATENTS

410,535	9/1889	Corrigan	292—175
730,129	6/1903	Kern	292—175
2,733,788	2/1956	Farmer	292—175

EDWARD C. ALLEN, *Primary Examiner.*

J. R. MOSES, *Assistant Examiner.*