

[54] **ELECTRIC RELEASE STRIKE**

[72] Inventor: Robert E. Davidson, Santa Susana, Calif.

[73] Assignee: Adams Rite Manufacturing Company, Glendale, Calif.

[22] Filed: Jan. 13, 1969

[21] Appl. No.: 790,611

[52] U.S. Cl. 292/341.16, 292/201
 [51] Int. Cl. E05b 15/02, E05c 3/06
 [58] Field of Search 292/78, 341.16, 341.17, 341.15,
 292/201, 144, DIG. 43; 70/277, 280, 281, 282, 450,
 252

[56] **References Cited**

UNITED STATES PATENTS

2,655,030	10/1953	Schlage.....	70/450
2,943,880	7/1960	Joachim et al.....	292/201
3,081,078	3/1963	Lohr.....	268/74
3,134,253	5/1964	O'Brien.....	70/271
3,455,127	7/1969	Simon.....	70/277
3,148,524	9/1964	Yulkowski.....	70/107

FOREIGN PATENTS OR APPLICATIONS

313,939	7/1956	Switzerland.....	292/341.16
---------	--------	------------------	------------

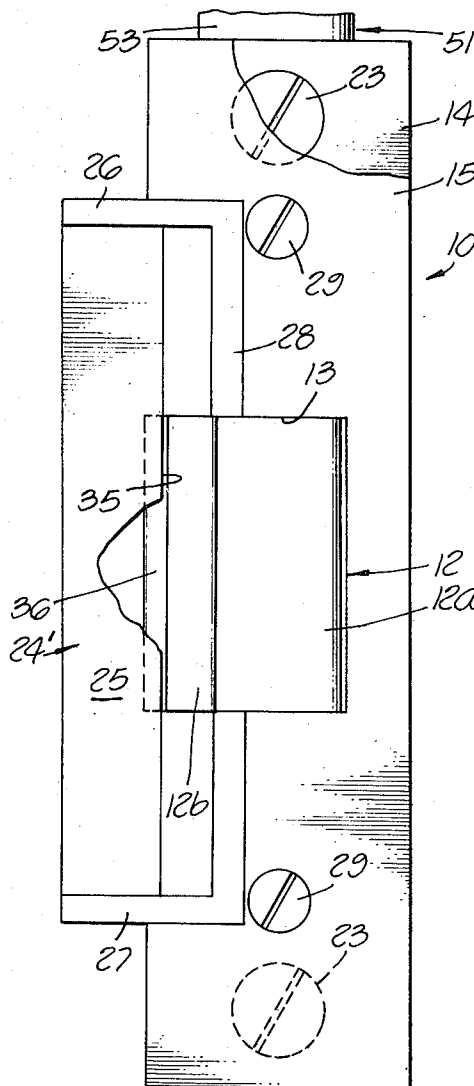
880,426	6/1953	Germany.....	292/341.16
1,026,193	3/1958	Germany.....	292/341.16
839,340	12/1938	France.....	292/341.16

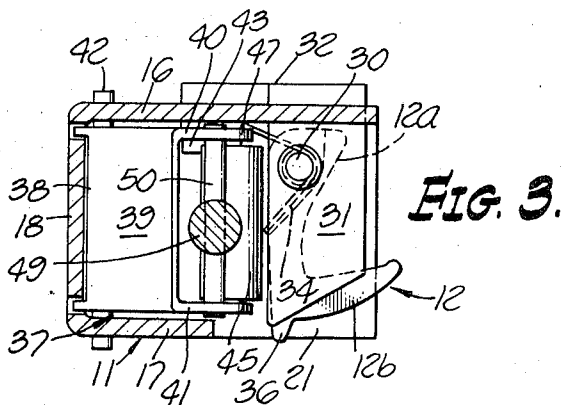
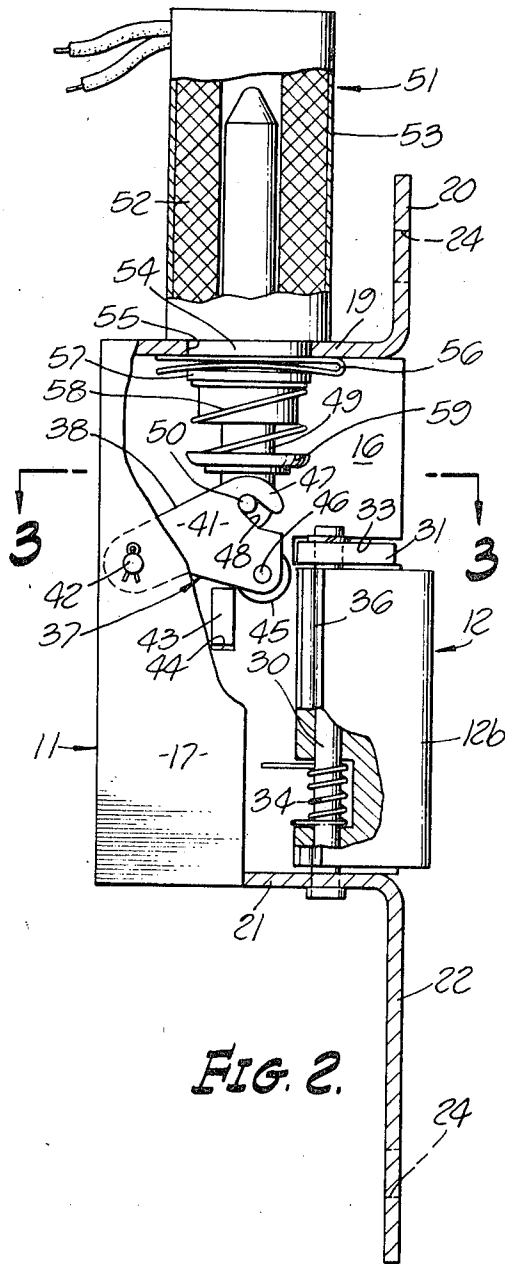
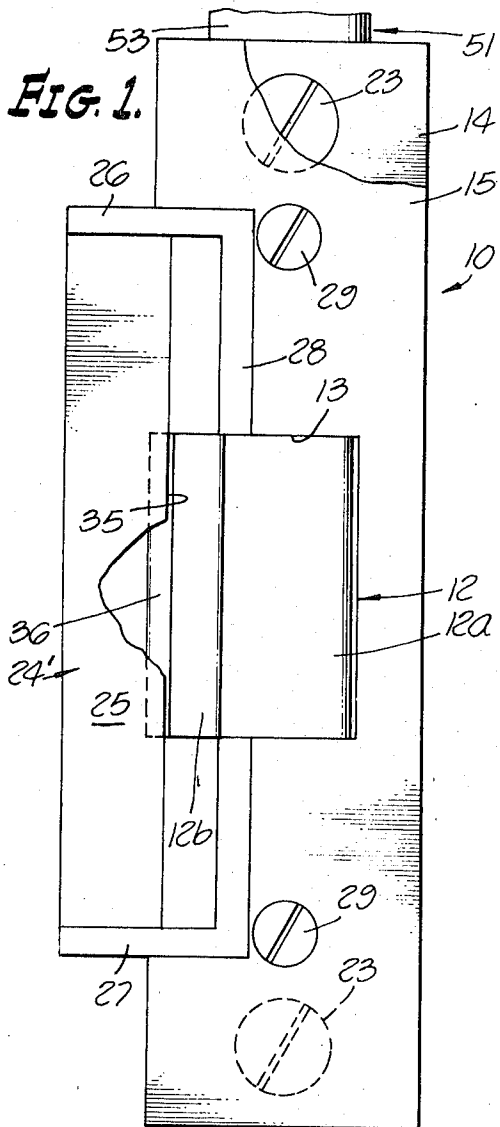
Primary Examiner—Robert L. Wolfe
 Attorney—Whann & McManigal

[57] **ABSTRACT**

An electric release strike in which a strike bolt is supported for swinging movement to a position projecting through a casing opening and to a retracted position, the bolt being spring urged to its projecting position. A latch in the casing is pivoted for swinging movement to latching and nonlatching positions, and in the latching position, to which it is spring urged, is pivoted overcenter to occupy a position in the path of movement of the strike bolt towards its retracted position. The latch is movable to a nonlatching position by a coupled actuator in the form of a solenoid plunger operatively associated with an energizable solenoid coil positioned exteriorly of the casing, the coil assembly being removably mountable from the exterior of the casing to permit ease of replacement or change to a coil having a different characteristic.

3 Claims, 3 Drawing Figures





ROBERT E. DAVIDSON
 INVENTOR
 WHANN & McMANIGAL
 Attorneys for Applicant
 BY

Sheela Whann

ELECTRIC RELEASE STRIKE**BACKGROUND OF THE INVENTION**

The invention relates generally to the field of latches.

Conventional devices heretofore available for the purpose described herein embody inherent undesirable features which not only present potential sources of trouble, but also make them more difficult to install and maintain in good operating condition.

For example, in one known conventional embodiment, the casing structure and strike plate are permanently connected, and the strike plate also functions as a faceplate. In such a construction, the faceplate portion cannot be varied to meet different aesthetic decorative effect.

In different localities, it is desirable to change the electric actuating coil of the device, for example, to operate under different voltages, or to replace a coil which has failed. In the conventional device noted above, the coil is mounted within the housing or casing of the device, which renders its accessibility difficult.

The actuating coil in this conventional device is associated with a relatively complicated latching mechanism that utilizes a multiplicity of parts which do not cooperate to latch the strike bolt in a positive manner. Also, the device has a release mechanism which includes a pivoted armature arrangement that coacts with other linkages to effect the latching operation, this armature being normally urged to a latching position by means of a leaf spring which presents a potential source of trouble, for example, failure due to metal fatigue when operated over a long period of time. Also, the manner in which this spring is mounted enables it to shift its position so as to produce malfunctions and prevent the desired proper operation of the device.

In the present invention, the above, as well as other inherent undesirable drawbacks in the construction of the conventionally available devices, have been overcome or for the most part eliminated.

SUMMARY OF THE INVENTION

The present invention relates generally to latching devices, and is more particularly concerned with improvements in devices conventionally known as "an electric release strike."

One object of the herein described invention is to provide a remotely releasable strike, which is of simple construction, embodies relatively few operative parts, and which will operate with a positive latching and releasing action of the strike bolt.

A further object is to provide in an electric release strike, an improved housing structure in which the strike plate and casing are releasably attached, and wherein a separate faceplate is attachable to the strike plate to provide variations in finish, length and other readily available changes so as to produce different desirable aesthetic appearances in different installations.

A still further object is to provide an improved latching mechanism which has positive operational movements, and wherein the latch member is directly positioned in the path of movement of the strike bolt, thus eliminating complicated linkages and reducing potential sources of failure.

Another object and feature of the invention resides in the provision of an antifriction roller carried by the latch member, the roller being arranged to engage the strike bolt. This contributes to the ease of operation of the door and movement of the latch member to unlatched position, after the strike bolt has been released.

Still another object resides in the mounting arrangement of the solenoid coil which permits the coil to be mounted exteriorly of the casing where it is readily accessible for interchange with coils of different rating characteristics, or for replacement of a damaged coil.

It is also an object of the present application to provide an electric release strike in which the strike bolt embodies an improved configuration which renders the device pickproof.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the accompanying drawings, which are for illustrative purposes only:

FIG. 1 is an elevational view of an electric release strike according to the present invention, looking towards the faceplate thereof;

FIG. 2 is a side view, partly in section and having cutaway portions to disclose the cooperative relationship of the various components; and

FIG. 3 is a transverse section through the same, taken substantially on line 3—3 of FIG. 2.

Description of the Preferred Embodiment

Referring more specifically to the drawings, for illustrative purposes, the present invention is shown as being embodied in an electric release strike unit as generally indicated by the numeral 10, wherein the essential components are mounted within a casing structure 11 and include a pivotally mounted strike bolt 12 which is normally urged into a position projecting through a casing opening and registered openings 13 in a strike plate 14 and overlying attached faceplate 15.

As best shown in FIGS. 2 and 3, the casing structure 11 is fabricated from a suitable metal or other material of generally uniform thickness to provide a boxlike structure having spaced sidewalls 16 and 17, the latter being of less depth than the former, which are rearwardly bridged by a backwall 18. casing is formed by a top wall 19 which extends forwardly and at the front of the casing is deflected to provide a right-angled projecting arm 20. The bottom of the casing is formed by a bottom wall 21 which is likewise provided at its forward end with a right-angled projecting arm 22, this arm being of greater length than the arm 20. As thus arranged, the casing is open on its front side, and the arms 20 and 22 provide mounting lugs for the attachment of the strike plate 14 by means of appropriate mounting screws 23—23 which are adapted to threadedly engage in tapped openings 24—24 respectively in the projecting arms 20 and 22.

As best shown in FIG. 1, the strike plate has at one side of its bolt opening, a recessed integrally formed side portion 24 which is defined by a depressed bottom wall 25, raised end walls 26 and 27, and an inner backwall 28 of conventional arrangement, the end walls 26 and 27 and backwall 28 projecting slightly above the plane of the strike plate proper.

The faceplate is attached to the strike plate by retaining screws 29—29, and along one side is shaped to conform to the configuration of the strike plate along the end walls 26 and 27, and wall 28. The provision of a separate faceplate is an important feature in that it provides a positive retainer for the underlying screws 23 and permits the use of faceplates of varied finish, length and general configuration in order to obtain different desirable aesthetic appearances as between different installations. This is not possible with the conventional integrally formed strike plate and faceplate.

The strike bolt 12 is transversely of a hook shape with a pivotally mounted leg portion 12a and an outer hook portion 12b as best indicated in FIG. 3. The strike bolt is mounted in the open side of the casing structure upon a pivot pin 30 having its lowermost end supported in the bottom wall 21, while the upper end of the pin is supported in an arm 31 of a bracket piece 32 secured as by welding or otherwise to the outer surface of the casing sidewall 16, the arm 31 projecting through an edge slot 23 provided in the sidewall 16. The strike bolt is normally urged towards a position projecting through the registered openings 13 by means of a coiled spring 34, one end of this spring bearing against the sidewall 16, and the other end bearing against the strike bolt. As thus arranged, the strike bolt is movable towards a retracted released position

against the force of this spring. In its projecting position, the strike bolt has an outer surface of its hook portion 12b extending adjacently along an edge 35 of the registered strike plate and faceplate openings 13. The strike bolt is provided with a lateral edge projection 36 which is arranged to occupy an overlapping position with respect to the edge 35, and thus close the space between this edge and the adjacent face of the strike bolt so as to provide against the insertion of a tool for unauthorized movement of the strike bolt to a released position. The edge projection thus provides an antipick flange as a safety feature of construction.

Latching means, as generally indicated by the numeral 37, are provided rearwardly of the strike bolt within the casing for normally opposing movement of the strike bolt to a retracted position, but being electrically movable to a nonlatching position in order to permit retracted movement of the strike bolt by moving the associated latched door in a door opening direction.

More specifically, as shown in FIG. 2 and FIG. 3, the latching means comprises a generally U-shaped latch 38 which is formed from a flat plate metallic material to provide a bridging wall 39 which extends between integrally formed sidewalls 40 and 41. The latch member is pivoted adjacent the backwall 18 of the casing upon a pivot pin 42 which extends through appropriate openings in the sidewalls 40 and 41 and has its opposite ends respectively supported in the casing sidewalls 16 and 17 to permit vertical swinging movement of the latch member, as seen in FIG. 2, into latching and nonlatching positions with respect to the path of movement of the strike bolt 12. Downward swinging movement of the latch member to its latching position is limited and determined by a stop 43 which constitutes an integrally formed arm of the bracket piece 32, the arm 43 projecting through an opening 44 in the sidewall 16 of the casing. The sidewalls 40 and 41 at the ends opposite their pivoted ends carries an antifriction roller 45 which is mounted upon a supporting pin or shaft 46 having its respective ends supported in the sidewalls 40 and 41 of the latch member. It will be observed that the axis of the shaft 46, in the latching position of the latch member, occupies an overcenter position with respect to the axis of the pivot pin 42 of the latch. Thus, any pressure exerted upon the strike bolt tending to force it towards its retracted position will cause the strike bolt to engage the roller and cause clockwise movement of the latch member so as to more forcibly engage the stop 43 and prevent opening of the door until the latch member is electrically released by means which will hereinafter be described in detail. The provision of the antifriction roller 45 permits movement of the latch member more easily to its nonlatching position.

Above the roller 45, the sidewalls 40 and 41 of the latch member are provided with a hooked portion 47 in each case to provide an inclined open-ended slot 48, the slots 48—48 being transversely aligned of the latch member.

An actuator plunger 49 extends above the latch member and has a lower end connected with the latch member by means of a connecting pin 50 having its respective ends positioned in the slots 48—48 of the sidewalls 40 and 41 of the latch member. The actuator in the present invention takes the form of a solenoid plunger which is operatively associated with and forms a component of a solenoid assembly 51 having an energizable solenoid coil 52.

The mounting of the solenoid coil provides an advantageous feature of the present invention. More specifically, the coil 52 is mounted within a coil housing 53 which is provided at one end with a tubular neck portion 54 adapted to be inserted from the exterior of the casing structure 11 through an opening 55 in the top wall 19 of the casing structure. The coil hous-

ing is retained in mounted position by means of a hair pin-type retaining clip 56 adapted to be inserted around the neck portion 54 within the casing 11 between the inner surface of the top wall 19 and a circumferential flange 57 formed on the neck portion. As shown, the neck portion is tubular and receives one end of the actuator solenoid 49 endwise therethrough. A coiled compression spring 58 is positioned around the neck portion with one end bearing against the flange 57, and its other end bearing against a circumferential flange 59 carried by the connected end of the actuator 49. The spring 58 normally urges the actuator in a downward direction and acts to resiliently retain the latch member in its latching position, as shown in FIG. 2. Energization of the solenoid coil 52 operates to swing the latch member in a counterclockwise direction to a nonlatching position, as limited by the engagement of flange 59 with the adjacent end of the neck portion 54. It will be noted, of course, that in this position, the latch member is raised so that the roller 45 will be moved out of the path of swinging movement of the strike bolt 12, thus permitting it to be moved to a retracted position during energization of the solenoid coil.

Mounting of the solenoid coil and its housing 53 from the exterior of the casing 11 is of tremendous advantage in merchandising this product. This voltage rating of the solenoid coil may vary depending upon field installation requirements. Thus, by having the coil exteriorly of the casing 11, it is possible to substitute coils of different voltage ratings in the field with ease, or in the case of a coil being damaged to replace this coil. In conventional structures, where the coils are mounted within the casing, replacement and interchange of coils becomes a very difficult task.

From the foregoing description and drawings, it will be clearly evident that the delineated objects of the invention will be accomplished.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention, and, hence, I do not wish to be restricted to the specific forms shown and uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. An electric release strike, comprising:
 - a. a case including a strike plate having an opening therein;
 - b. a strike bolt pivotally swingable to a position projecting through said opening and to a retracted position;
 - c. means normally urging said bolt towards its projecting position;
 - d. latch means pivoted at one side within the casing for swinging movement to latching and nonlatching positions relative to said bolt, and having an opposite side normally positioned in the path of swinging movement of the strike bolt from its projecting position to its retracted position, swinging movement of the latch means to its nonlatching position being operative to move said opposite side thereof out of said path of swinging movement of said strike bolt and enable movement of the bolt to said retracted position against the action of said urging means; and
 - e. means electrically energizable to move said latch means to said nonlatching position including a movable member coupled with said latch means.
2. An electrical release strike according to claim 1, wherein said opposite side of said latch means carries a pivotally mounted roller normally positioned in the path of said swinging movement of the strike bolt.
3. An electric release strike according to claim 1, wherein the latch means in latching position occupies a pivotal over-center position in the path of movement of said strike bolt.

* * * * *