Feb. 15, 1966 H. H. KOBRYNER 3,235,299

WIRE SPRING CATCH FOR DOORS

Filed Feb. 2, 1962

FIG. 1.

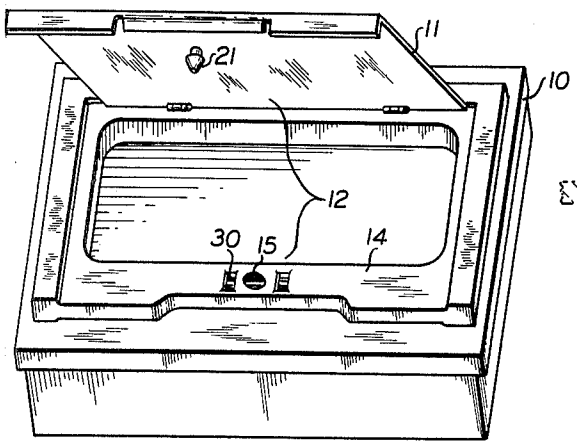


FIG. 3.

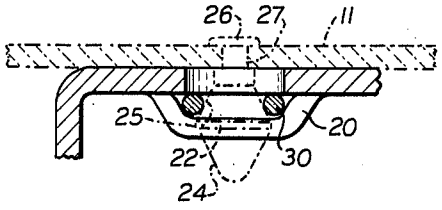


FIG. 4.

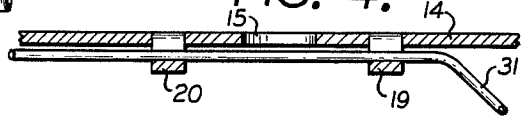


FIG. 2.

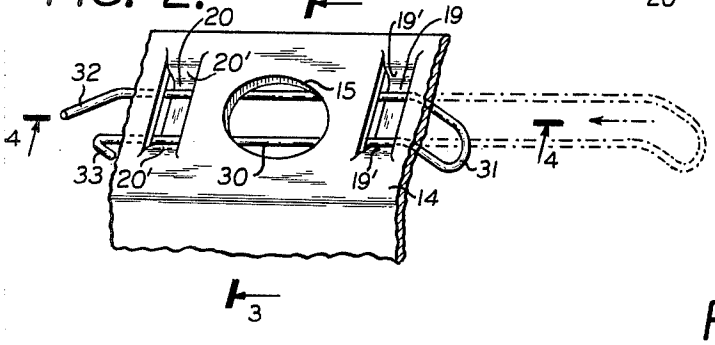


FIG. 5.

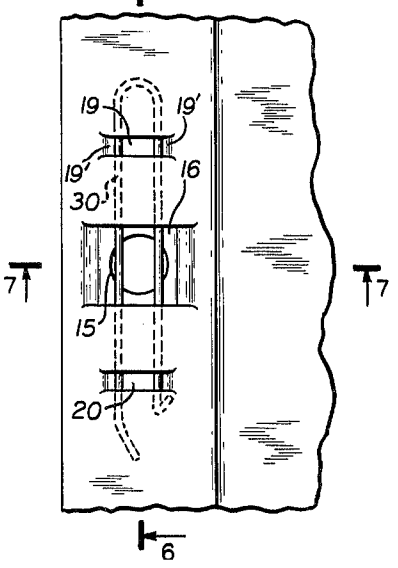


FIG. 6.

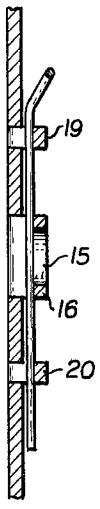


FIG. 7.

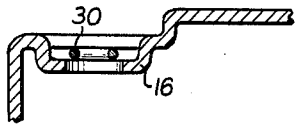
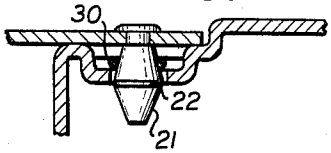


FIG. 8.



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3,235,299

WIRE SPRING CATCH FOR DOORS

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5 Claims. (Cl. 292—17)

This application relates to an improved latch for use with relatively small frames and doors and relates more particularly to an improved spring latch for use with small box enclosures which accommodate electrical circuit elements, such as circuit breakers, bus bars and the like.

An object of this invention is to provide an improved latch which may be easily and quickly assembled.

A further object of this invention is to provide a latch having as few parts as possible.

A still further object of this invention is to provide a latch having a spring which engages a positive element in which the spring is easily positioned in a supporting frame.

A more particular object is to eliminate separate spring holding means and to provide a supporting frame having a channel for holding the spring in position.

Still, another object is to provide a latch assembly which may be mounted on a door and frame as one of the final steps in completing the product.

Briefly, this invention comprises a latch for a door or frame in which the positive element of the latch is a biconical striker. The frame has an aperture to accommodate the striker and on opposite sides adjacent the aperture or aligned with said aperture, at least two channels are stamped through which a U-shaped wire spring may be passed. The distance between the sides of each channel defines what may be termed a "slot" and the width of this slot is substantially equal to the width of the spring. The spring is snapped into the channels and is held in position by the walls thereof. As the biconical striker enters the aperture, it forces the sides of the spring apart until the widest diameter portion of the striker is reached, after which the spring by its inherent resilience grips the portion of the striker of smaller diameter as the striker passes further into the aperture.

In an important aspect of my invention, the entire U-shaped wire spring is formed in substantially one plane except for the base or transverse part of the U. The ends of the U are so shaped as to deflect the legs of the U inwardly when the spring is inserted into the slot, ends first.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawing, wherein:

FIG. 1 is a perspective view of a frame and door featuring the latch.

FIG. 2 is an enlarged fragmentary perspective view of the frame of FIG. 1 showing the wire spring in position.

FIG. 3 is a cross-sectional view along the vertical plane of the line 3—3 of FIG. 2 showing the position of the wire spring when the door is closed.

FIG. 4 is a cross-sectional view along the vertical plane of the line 4—4 of FIG. 2.

FIG. 5 is a fragmentary top view of the frame showing an alternative embodiment of the invention.

FIG. 6 is a cross-sectional view along the vertical plane of the line 6—6 of FIG. 5.

FIG. 7 is a cross-sectional view along the vertical plane of the line 7—7 of FIG. 5.

FIG. 8 is a cross-sectional view similar to FIG. 7 showing the door closed and the latch engaged.

Referring now to FIG. 1, there is shown a frame 10 having a door 11 swivably mounted about hinges. The latch 12 comprises a biconical striker 21 secured to the door 11 while the frame 10 has an aperture 15 in the base 14 thereof. The diameter of the aperture 15 is wider than the striker at its widest position. A wire spring 30 is mounted on frame 10 below aperture 15 to receive striker 21.

As shown in FIG. 2, substantially U-shaped channels 19 and 20 are formed by a stamping operation on opposite sides of aperture 15. The channels are parallel to each other and have a depth slightly greater than the diameter of the wire of spring 30. The channels 19 and 20 are shown as U-shaped, but each channel may be formed of opposed L-shaped channels, the upright sides of which have a height slightly greater than the diameter of the wires of spring 30. In either the L or U shaped channel, the transverse portion is used to seat the spring. The upright sides will also be spaced from each other by a distance slightly greater than the transverse distance between the outer edges of the wires of spring 30 (the width of the spring).

The biconical striker 21 comprises lower and upper conical members with a common base section. The conical members are arranged so that the upper member 25 is secured to door 11 at its end having the smallest diameter. Thereafter, the diameter increases moving away from the door until the common base section 22 is reached. The lower member 24 has a diameter which decreases moving away from the common base section. It is to be understood that while conical members are preferred other curvatures and shapes are possible and I mean by the term "biconical striker" a striker having a predetermined length with a maximum width or diameter along an intermediate section, and the parts above and below this intermediate section have widths or diameters which decrease gradually.

As shown in FIG. 3, the upper conical member 25 is secured to door 11 by suitable means, for example through an aperture 27 in the door by means of a rivet 26.

The wire spring 30 which is to be positioned within channels 19 and 20 has an elongated U-shape, the distance between the legs or side portions (the width) being less than the diameter of aperture 15 and also being less than the diameter of the base section of biconical striker 21.

The walls of each channel 19 and 20 are designated by the numerals 19′ and 20′ and serve to define a slot which has a width substantially equal to the width of the spring. Spring 30 is formed in substantially one plane except for the transverse base or bight 31 of the U-shaped spring. Part of the spring near base 31 is bent at an angle to this plane and acts as a handle or means for gripping the spring and also as a stop which acts against channel 19 to limit the movement of the spring. The free ends of the spring are each bent to facilitate the entry of the spring into the channel slot. One end 32 is bent inwardly while the other end 33 is bent outwardly as substantially a V-shaped hook. End 33 provides a part of the spring which extends beyond its width and bears against channel walls 19′ and 20′ to automatically urge one leg of spring 30 inwardly during the insertion step. When the hooked end 33 emerges from the slot, the spring expands to its previous shape and the hook serves as a stop which prevents the spring from moving back.

Referring now to FIGS. 5–8, there is shown a modified latch in which the aperture 15 is formed in a recessed section 16. The aperture 15 is also stamped to form a channel as shown more clearly in FIG. 6. The depth of

the recessed section is equal to the depth of channels **19** and **20** and the spring **30** passes over aperture **15** as shown in FIGS. 6–8.

It will be recognized that the spring **30** is securely fitted in its nesting providing by channels **19** and **20**. Therefore if the width of channels **19** and **20** is made relatively small compared with the width of the common base section **22**, the expansion force provided by striker **21** will subject spring **30** to a relatively greater tension thereby providing a more effective latch.

While the foregoing description sets forth the principles of the invention in connection with specific apparatus, it is to be understood that this description is made only by way of example and not as a limitation of the scope of the invention as set forth in the objects thereof and in the accompanying claims.

I claim:

1. A latch for a door and frame comprising

a biconical striker secured to said door,

an aperture in said frame to receive said striker,

a plurality of channels formed in said frame aligned with said aperture,

said U-shaped spring being bent at its bight part away tioned within said channels, said channels being integral with said frame and having transverse portions on which said spring may rest,

the sides of said spring being held in position adjacent said aperture,

the distance between said sides being less than the width of said aperture,

saih U-shaped spring being bent at its bight part away from the plane of the sides of the spring to securely fit said spring in said channels, whereby said bent bight part serves as a handle and also a stop which may contact one of said channels,

at least one free end of said spring being bent outwardly and rearwardly, whereby substantially a V-shaped hook is provided which may urge one side of said spring inwardly when passing within a channel and which may hook onto a channel to prevent rearward motion.

2. The latch of claim **1** in which said aperture is formed in one of said channels.

3. The latch of claim **1** in which the other free end of the U-shaped spring is bent inwardly.

4. A latch for a door and frame comprising

a biconical striker secured to said door,

an aperture in said frame to receive said striker,

a plurality of channels stamped in said frame on opposite sides of said aperture,

and a U-shaped wire spring positioned within said channels,

said spring being substantially planar except for the transverse bight section thereof, said bight section being bent, one free end of said spring being bent outwardly to form a V-shaped section,

the sides of said spring being held in position adjacent said aperture,

the distance between said sides being less than the width of said aperture.

5. A process for making the receiving member of a latch which is to be used to receive a biconical striker comprising the steps of

(1) forming an aperture in a supporting frame,

(2) stamping a plurality of channels in said frame in positions aligned with said aperture,

(3) providing a U shaped substantially planar spring having a bent down transverse bight portion and having an end bent backwards in a substantially V shape to form a projection,

(4) gripping said spring at said bent down portion and slipping said spring into aligned position in said channels, whereby said projection guides and said backwards bent end compresses said spring during movement and together with said bent down portion, provides secure retention of said spring in said frame.

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