July 20, 1943. D. MARINSKY 2,324,788

AUTOMATIC LOCK SLIDER

Filed Feb. 10, 1942

Fig. 1.

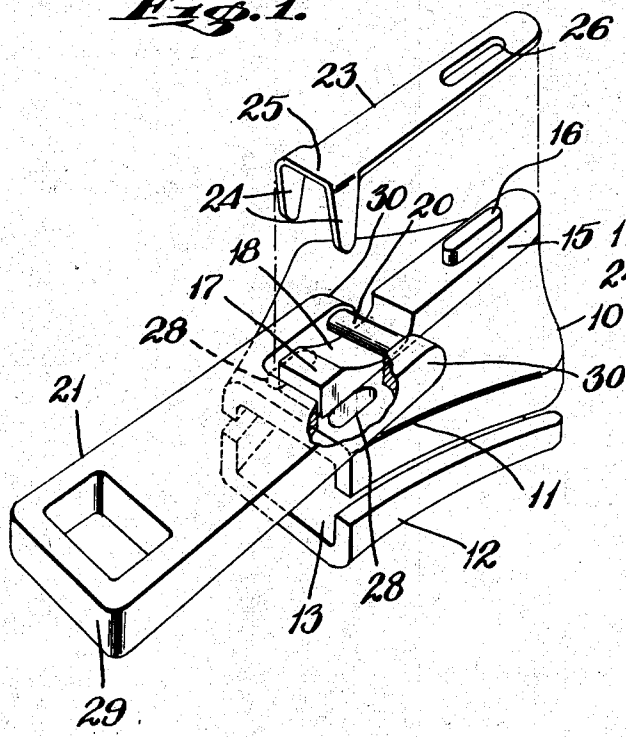


Fig. 2.

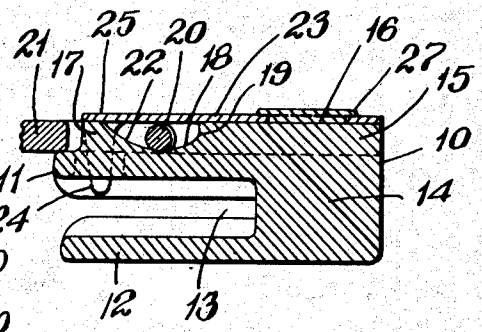


Fig. 3.

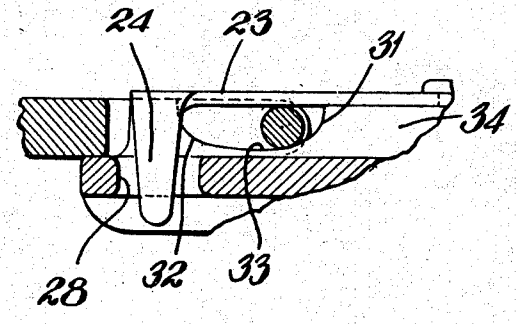
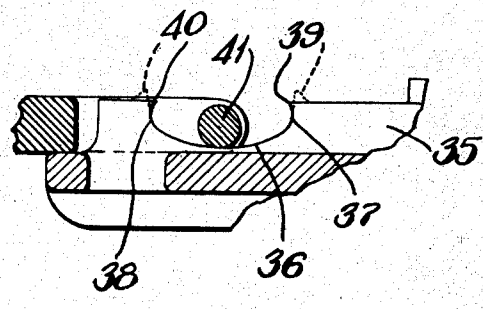


Fig. 4.



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AUTOMATIC LOCK SLIDER

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12 Claims. (Cl. 24—205.5)

This invention relates to sliders as employed on separable fasteners to couple and uncouple the stringers of devices of this class. More particularly the invention relates to a slider employing an automatic locking element in the form of a long spring arm having one or more locking pawls or pins at the free end portion of the arm with means on the slider supporting the element in a normal operative position. The novel features of the invention will be best understood from the following description when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed, and in which the separate parts are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is an exploded perspective view of a slider made according to my invention showing the lock element in spaced arrangement with respect to the slider body.

Fig. 2 is a longitudinal sectional view through a part of the slider illustrating the parts in assembled position.

Fig. 3 is an enlarged sectional detailed view of a part of a slider structure showing a modification, and

Fig. 4 is a view similar to Fig. 3 showing another adaptation of the invention.

In lock sliders of the class under consideration it has been the common practice to employ lock pin or pawl elements on the pull of the slider or directly actuated by the pull. It has also been known to employ spring fingers for engaging the stringer links with means controlling or checking movement of these spring fingers and still others have employed springs acting on independent and relatively free pin or lock parts. In most of these instances a positive locking engagement has been provided.

It is a purpose of my invention to provide a slider with an automatically actuated lock element which in itself and unaided or unassisted by the pull or any other part of the slider is moved into and maintained in operative or locked position. In a preferred adaptation of this invention I employ a lock element in the form of an elongated spring strip or bar, that is to say, a bar of a material having resilient or spring properties with means securing one end of the strip or bar to the slider wall, leaving the other end free to yieldably move relatively to the slider wall in moving one or more pawl or pin elements into and out of the channel of the slider and still further in providing on the slider wall adjacent the free end of said element a stop or seat limiting and controlling movement of the element into locked position. In addition to the foregoing I provide a slider structure wherein a shank of the lock element forms part of the pivot forming means of the pull, the pivot of the pull being freely movable on the slider and engaging the lock element only in the operation of drawing the slider along the stringers in coupling and uncoupling the same. Still another feature of my invention resides in the fact that no means is provided to check swinging movement of the element into inoperative position aside from the normal tension or rigidity of the strip or bar employed, thereby providing automatic movement of the lock element into inoperative position independent of the pull in forceable movement of the slider along the stringers in either direction.

In the adaptation of the invention illustrated in the accompanying drawing and particularly as shown in Figs. 1 and 2 of the drawing, a slider body is generally identified by the reference character 10 and this body employs the more or less conventional spaced top and bottom flanged walls 11 and 12 between which is formed the channel 13, the latter being divided at the wide end of the slider by the parting web 14.

Arranged longitudinally of the outer surface of the top wall 11 is a rib 15 having at one end an elongated rivet forming portion 16. The other end of the rib terminates in a flat stop block 17. Adjacent the block and extending longitudinally of the rib is a concave recess 18 terminating adjacent the wide end portion of the slider in a more or less abrupt and slightly rounded stop wall 19 adapted to check movement of the pivot pin portion 20 of a pull 21 in one directional movement on the slider. The other end portion of the recess 18 has a gradually curved cam surface 22 over which the pin 20 rides in moving a lock element 23 or the pin or pawl portions 24 thereof into inoperative position.

The rib 15 is substantially of the same width throughout its length and the long thin strip or bar which forms the element 23, which, in the form illustrated, is a flat spring, is also preferably of the same width as the rib except for the lateral extensions forming the pawl or pin elements 24 at the free end portion 25 of said element as will clearly appear upon consideration of Fig. 1 of the drawing.

The fixed end portion of the element 23 has an elongated aperture 26 which fits snugly over the rivet-forming projection 16, the latter acting as a key to maintain alignment of the element 23 on the slider and in assembling the

parts the projection 16 is riveted over or otherwise headed as seen at 27, note Fig. 2, to retain the element 23 against displacement from the slider.

It will be noted from a consideration of Fig. 2 of the drawing that the element 23 is substantially equal in length to the length of the rib 15, thus said element, in conjunction with the rib, gives the appearance of a single enlargement extending longitudinally of the slider. This construction adapts itself to fasteners used on garments which are often laundered, because they are not readily injured during the cleaning operation.

The top wall 11 of the slider at opposite sides of the stop block portion 17 of the rib 15 is provided with elongated apertures 28. These apertures are of sufficient length to provide free movement of the pins or pawls 24 into and out of the channel 13 of the slider. That is, aside from the tensional or spring properties of the strip 23, there is nothing which limits outward swinging movement of the end portion 25 of the element, the parts being arranged, however, so that the inner ends of the pins 24 are withdrawn from the channel 13 only enough to provide free movement of the slider along the stringers of the fastener. These stringers are not shown since they are very commonly known in the art to which applicant's invention relates.

In connection with this free movement of the element 23 it will be also understood that, in the event that the slider is strained in either direction along the stringers, the spring properties of the element 23 will permit movement of the slider along the stringers, thus minimizing possibility of breaking or destroying any part of the complete fastener which might otherwise be experienced. It will also be understood that the spring tension of the element 23 may be controlled to adapt itself to fasteners designed for different uses and the present invention is adaptable for use in connection with devices of the kind under consideration made from metal or plastic materials. If the device is in the form of a die cast body as illustrated in the accompanying drawing, the material will be of types and kinds capable of die cast formation.

The pull 21 of the slider, in so far as the finger piece end 29 is concerned, may be of any desired construction but the pivot end portion which supports the pivot pin 20 preferably terminates in side arms 30 which are spaced apart sufficiently to clear the outer surface of the pins or pawls 24 so that the pull is free to drop into horizontal position upon the slider wall as illustrated in Fig. 1 of the drawing. Preferably, the cross sectional contour of the pivot pin end 20 of the pull is such that the pin is freely disposed within the recess 18 particularly when in the central position of this recess. However, movement of the pin 20 toward either end of the slider will cause the pin to engage the under surface of the shank of the element 23 and withdraw the pins 24 from the channel 13 of the slider. With the construction shown in Figs. 1 and 2, if the pin 20 is moved in the direction of the wall 19 this wall will check the movement of the pull, whereas movement in the opposite direction will be checked by engagement of the pin 20 with the pin or pawl members 24.

In Fig. 3 of the drawing is shown a slight modification of the structure shown in Figs. 1 and 2 which consists simply in providing two stop walls 31 and 32 at opposite ends of the recess 33. The stop wall 31 is substantially equivalent to the wall 19, whereas the stop wall 32 is employed instead of the cam surface 22. Otherwise, the structure in Fig. 3 will be the same as that shown in Figs. 1 and 2, and for identification purposes, the element is shown at 23, one of the pawl or lock pins at 24 and one of the apertures 28. In Fig. 3 the section is taken through one of the apertures 28 which will thus show the element 23 in side elevation.

In Fig. 4 of the drawing the element 23 has been omitted for sake of clarity but otherwise the showing in this figure is generally the same as in Fig. 3, the structure being modified to the further extent of providing in the rib 35 a recess 36 having in-turned curved stop walls 37 and 38, the in-turned features being made possible by the flanges 39 and 40 which, in originally forming the casting, are cast in the upward direction indicated in dotted lines and then, by the use of suitable tools, are forced downwardly and inwardly producing the in-turned 39 and 40 which provide the rounded stop walls 38 and 39 conforming substantially to the peripheral contour of the pivot pin portion 41 of the pull. With this construction it will appear that movement of the pivot pin portion in both directions on the slider is definitely checked by the stop walls 38 and 39 while permitting the pivot pin 41 to move outwardly a sufficient distance to disengage the lock pin parts of the lock element employed.

Where freely flexible materials are employed in the construction of the element 23 it would be possible to flex this element sufficiently to completely withdraw the pin parts 24 not only from the apertures of the slider wall but beyond the stop blocks, for example the block 17, to facilitate attachment and detachment of different pulls with the slider.

In the construction shown it will be apparent that the relatively flat and thin lock element 23 is supported by the outer surfaces of the rib in a position parallel to the outer wall of the slider and the long bearing surface of the rib reinforces the element against crushing strain. The element forms part of the pivot forming means of the pull and the pivot of the pull also acts as a reinforcement against any crushing strain which might be applied to the element where it bridges the recess in the rib.

Having fully described my invention what I claim as new and desire to secure by Letters Patent, is:

1. An automatic lock slider of the class described comprising a rib extending longitudinally of one side wall of a channeled slider body, the outer surface of the rib intermediate the ends thereof having a recess, a pull having a pivot end extending across the recess of said rib, a yieldable lock element arranged upon the outer surface of the rib and bridging said recess to retain the pivot of the pull against displacement from said recess, means securing one end of said element to the slider, the other end of the element being freely movable toward and from the slider wall, and said last-named end of the element having a lock pin normally projecting into the channel of said slider.

2. An automatic lock slider of the class described comprising a rib extending longitudinally of one side wall of a channeled slider body, the outer surface of the rib intermediate the ends thereof having a recess, a pull having a pivot end extending across the recess of said rib, a yieldable lock element arranged upon the outer sur-

face of the rib and bridging said recess to retain the pivot of the pull against displacement from said recess, means securing one end of said element to the slider, the other end of the element being freely movable toward and from the slider wall, said last-named end of the element having a lock pin normally projecting into the channel of said slider, means to cause the lock pin to move out of the channel when said pivot is moved longitudinally of the recess, and means limiting such longitudinal movement of the pivot.

3. An automatic lock slider of the class described comprising a rib extending longitudinally of one side wall of a channeled slider body, the outer surface of the rib intermediate the ends thereof having a recess, a pull having a pivot end extending across the recess of said rib, a yieldable lock element arranged upon the outer surface of the rib and bridging said recess to retain the pivot of the pull against displacement from said recess, means securing one end of said element to the slider, the other end of the element being freely movable toward and from the slider wall, said last-named end of the element having a lock pin normally projecting into the channel of said slider, means to cause said pivot end to engage said element in both directional movements of said pivot end to withdraw the pin of said element from the channel of the slider, and means limiting movement of said pivot end in both directions longitudinally of the recess of said rib.

4. An automatic lock slider of the class described comprising a rib extending longitudinally of one side wall of a channeled slider body, the outer surface of the rib intermediate the ends thereof having a recess, a pull having a pivot end extending across the recess of said rib, a yieldable lock element arranged upon the outer surface of the rib and bridging said recess to retain the pivot of the pull against displacement from said recess, means securing one end of said element to the slider, the other end of the element being freely movable toward and from the slider wall, said last-named end of the element having a lock pin normally projecting into the channel of said slider, and the top of said rib forming spaced flat bearing portions on the outer surface thereof adapted to support said element in parallel relation to the slider wall.

5. An automatic lock slider of the class described comprising a rib extending longitudinally of one side wall of a channeled slider body, the outer surface of the rib intermediate the ends thereof having a recess, a pull having a pivot end extending across the recess of said rib, a yieldable lock element arranged upon the outer surface of the rib and bridging said recess to retain the pivot of the pull against displacement from said recess, means securing one end of said element to the slider, the other end of the element being freely movable toward and from the slider wall, said last-named end of the element having a lock pin normally projecting into the channel of said slider, said first-named means comprising an elongated rivet keying said element against lateral movement on said slider.

6. A lock slider comprising a channeled body, an elongated spring lock element arranged centrally and longitudinally of said body, means securing one end of the element to said body, the other end of said element being freely flexible toward and from the channel of said body and having a lock pin portion normally extended into the channel of said body by the spring properties of said element, means limiting inward movement of the pin end of said element while permitting unlimited outward movement of said end, a pull having a pin end portion, and means on the slider wall forming, in conjunction with part of said element, a free mounting of the pin end of the pull on said slider.

7. A lock slider comprising a channeled body, an elongated spring lock element arranged centrally and longitudinally of said body, means securing one end of the element to said body, the other end of said element being freely flexible toward and from the channel of said body and having a lock pin portion normally extended into the channel of said body by the spring properties of said element, means limiting inward movement of the pin end of said element while permitting unlimited outward movement of said end, a pull having a pin end portion, means on the slider wall forming, in conjunction with part of said element, a free mounting of the pin end of the pull on said slider, and said last-named means including means adapted to urge the pin end of the pull into engagement with said element to displace the pin lock of the element from the slider channel in the movement of the pull in either direction on the slider.

8. A lock slider comprising a channeled body, an elongated spring lock element arranged centrally and longitudinally of said body, means securing one end of the element to said body, the other end of said element being freely flexible toward and from the channel of said body and having a lock pin portion normally extended into the channel of said body by the spring properties of said element, means limiting inward movement of the pin end of said element while permitting unlimited outward movement of said end, a pull having a pin end portion, means on the slider wall forming, in conjunction with part of said element, a free mounting of the pin end of the pull on said slider, said last-named means including means adapted to urge the pin end of the pull into engagement with said element to displace the pin lock of the element from the slider channel in the movement of the pull in either direction on the slider, and means to check both directional movements of the pull on the slider wall.

9. In a lock slider of the class described, a spring lock element comprising an elongated thin strip of resilient material, one end of the strip having means facilitating attachment of the element to a slider, and the other free end of said element having an angularly directed pin lock part disposed at one side edge portion of said end of the element.

10. In a lock slider of the class described, a spring lock element comprising an elongated thin strip of resilient material, one end of the strip having means facilitating attachment of the element to a slider, the other free end of said element having an angularly directed pin lock part disposed at one side edge portion of said end of the element, and the other side edge portion of said end of the element having a corresponding pin lock part.

11. In a lock slider, an elongated channeled slider body having spaced walls joined at the wide end thereof in a connecting web, one wall of said body having an elongated rib extending centrally and longitudinally of the outer surface thereof, said rib having a transverse recess intermediate the ends thereof for receiving the pivot end of a pull, said recess dividing the outer surface of the rib into longitudinally spaced flat

bearing surfaces, said wall of the slider at one side of one of said bearing surfaces having an elongated aperture, and the other bearing surface having an outwardly projecting elongated key part.

12. The combination with a slider for separable fasteners of the class described, of outwardly projecting bearings on and spaced longitudinally of one wall of the slider, an elongated spring seating on both of said bearings and forming between it and the spaced bearings and slider wall an elongated recess for receiving the pivot end of a pull, one end of the spring being secured to one of said bearings and boundary walls of said recess defined by adjacent surfaces of said bearings forming stop walls to check movement of the pull pivot in either direction in said recess.

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