Oct. 5, 1948. L. BROZEK 2,450,779

SLIDE FASTENER

Filed Oct. 28, 1944

Fig. 1

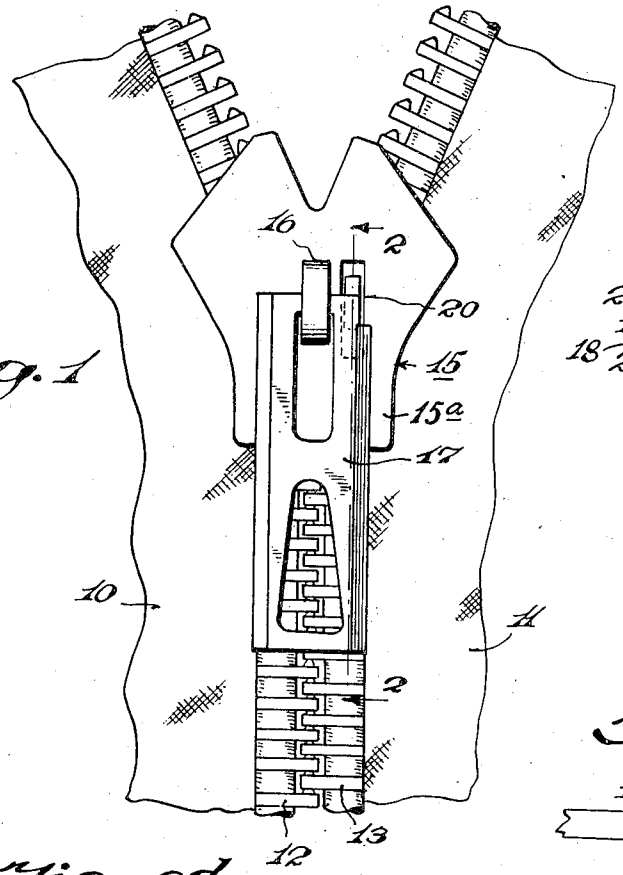


Fig. 2

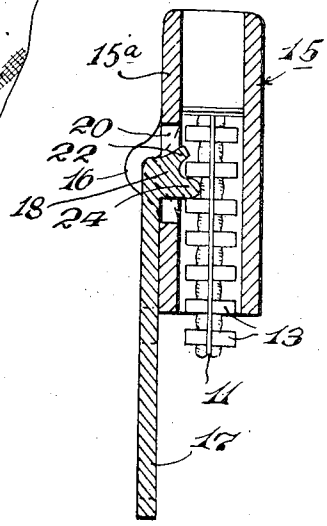


Fig. 3a

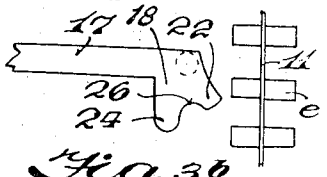


Fig. 3d

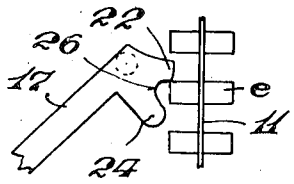


Fig. 3f

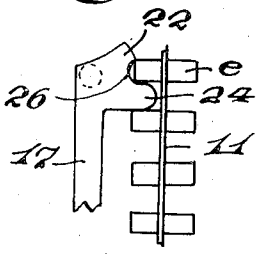


Fig. 3b

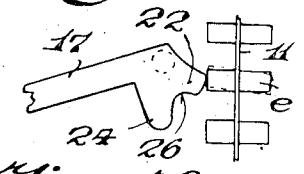


Fig. 3e

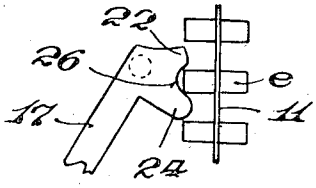
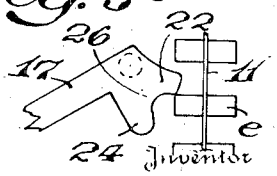


Fig. 3c



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SLIDE FASTENER

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Application October 28, 1944, Serial No. 560,849

6 Claims. (Cl. 24—205.14)

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This invention relates to improvements in slide fasteners and more particularly to a locking slider therefor of the type in which the slider tab is provided with a locking pin for projection through a slot in the slider wing into the space between adjacent elements of the slide fastener chain contained in the slider.

While locking sliders provided with tab-pin locks are known, as conventionally constructed they are open to the objection that when the tab is pressed down to lock the slider, the locking pin due to the relative position of the chain and slider may engage on a fastener element rather than projecting into the space between adjacent fastener elements as intended. Thereupon the tab must be forcibly pressed down to its full locking position, in which it lies flat against the upper face of the slider wing, to in turn forcibly project the pin into the space between elements. This results in excessive wear on the tip of the locking pin and possibly also in a permanent set of the tab, both of which conditions can seriously impair the effectiveness of the slider locking action.

Accordingly, the principal object of the present invention is to provide a thoroughly dependable locking slider which overcomes the above noted disadvantages of the prior devices by providing a slider tab-pin lock which controls the relative position of locking pin to the fastener elements of the chain to be locked, and thereby insures that the locking pin is always projected into the space between fastener elements. A further object is the provision of a tab-pin slider lock incorporating means to positively prevent engagement of the locking pin against the upper surface of a fastener element positioned in obstructing relation to the pin. A further object of the invention is to provide a tab-pin slider lock capable of effecting a required displacement of a fastener element out of obstructing position relative to the path of movement of the locking pin, thus to preclude interference therebetween and insure movement of the pin to its designed locking position between elements. A further and more detailed object is the provision of a slider lock including a locking pin assembly of simple and dependable construction and which incorporates means for positively guiding the locking pin into the space between fastener elements.

Other objects will be in part obvious and in part hereinafter pointed out in connection with the following analysis of the invention wherein is illustrated an embodiment of the invention in detail.

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In the drawings:

Fig. 1 is a plan view of a fastener chain and an operating slider therefor, the slider being provided with a tab-pin locking means according to the invention:

Fig. 2 is a section through the slider and lock taken along line 2—2 of Fig. 1;

Figs. 3*a*–3*f*, inclusive, are diagrammatic views illustrating successive positions assumed by the pin locking means from full raised position of the tab to full locking position thereof.

In the drawings, wherein like reference characters designate like parts throughout the several views, reference characters **10** and **11** designate fastener tapes or stringers, to the adjacent edge beads of which are secured longitudinal rows or chains of oppositely disposed fastener elements **12**, **13** adapted to be engaged and disengaged by a Y-shaped slider **15**. The upper slider wing **15***a* is provided with a bail **16**, on the axis of which a pull tab **17** operating the fastener is adapted to turn from the full raised or gripping position shown in Fig. 3*a* to a normal or locking position shown in Figs. 2 and 3*f*. As shown, the fastener and slider are of conventional construction and operation and no further detailed description thereof would appear to be necessary.

According to the invention, the pull tab **17** which is shown to have generally rectangular plan form is provided adjacent an upper corner with an angular arm or part **18** providing a locking pin assembly which depends from the under face of the tab and which can be advantageously formed integral therewith as by bending over a portion of the upper side edge of the tab. The locking pin assembly operates through a slot **20** cut through the upper wing or plate of the slider, the arrangement being such that when the tab is in its raised position (Fig. 3*a*) the locking assembly clears the upper surfaces of the fastener elements so that the latter can freely move through the slider; and that when the tab is swung to its full low position the locking assembly is projected through the slot **20** of the slider wing to lock with fastener elements disposed in the slider beneath the same as generally shown in Figs. 2 and 3*f*.

The locking pin assembly aforesaid provides two protruding parts or pins of different length, the shorter pin **22**, being hereinafter referred to as a control pin and the longer pin **24** as a locking pin. As shown, the pins are offset to opposite sides of the assembly center line which is normal to the plane of the tab, with the control pin **22** being canted or inclined relatively forwardly of the

locking pin 24 by a small angle ,so as to lead the locking pin in the direction of movement of the tab to locking position. Due to this offsetting, the pins are effectively spaced a distance which slightly exceeds the width of a fastener element and the space between pins is formed as a recess or concavity 26 which is shown to extend along an arc, thus to eliminate abrupt locking shoulders. As will be seen from Fig. 2, the length of the control pin 22 is such that in locking position of the tab it extends only a slight distance beyond the under face of the upper slider wing 15*a*, whereas the locking pin 24 is of length to extend substantially the full vertical depth of the space between the under face of the upper wing and the upper face of the stringer 11 carrying the chain of fastener elements 13.

The operation of a slider lock according to the invention will be clear from a consideration of Figs. 3*a*–3*f*, inclusive, wherein the tab and pin lock assembly are shown in the successive positions they assume in movement of the tab from a full raised to a full locked position. It will be assumed that due to the relative position of chain and slider the fastener element *e* is in the unfavorable position such that it would normally obstruct entry of the locking pin into the space between the element *e* and the next following locking element. According to the present construction, slight lowering movement of the tab results in counter-clockwise movement of the locking pin assembly about the axis of bail 16, with the result that the leading control pin 22 moves into engagement with the upper surface of the element *e*, (Fig. 3*b*). In spite of the unfavorable position of the latter, the control pin due to its relatively short length is enabled to move across the obstructing element *e* and even to effect displacement thereof the very minute distance necessary for the pin to clear the element, which displacement is permitted by the clearance between fastener element and inner surfaces of the slider. Upon the control pin clearing the unfavorably positioned element *e* (Fig. 3*c*), the tab may swing freely to its full low or locking position, the element *e* during such movement in effect moving into the concavity or recess 26 provided between the pins 22 and 24. Throughout this movement the edge of the recess 26 has a slight camming action on the upper corners of the element *e* which lines up or positions the element for entry of the longer locking pin 24 into the space between said element and the next adjacent element. This action of the recess edge is illustrated more particularly in Figs. 3*d* and 3*e*, wherein the element *e* is being lined up and positioned so that locking pin 24 can enter the space between it and the next following element. Fig. 3*f* illustrates the full locking position of the tab and pin lock, from which it will be seen that the pin lock 26 extends substantially the full depth of the recess as measured from the upper surfaces of adjacent locking elements to the upper face of the stringer 11 carrying said elements.

It will next be assumed that the relative position of slider on chain is such that the next following fastener element is in the unfavorable position such that the locking pin 24 would hit on same if no control pin 22 were provided. Under such a condition, the leading edge of the control pin engages the rear corner of the fastener element *e* prior to the locking pin lowering on the said next following element. Such engagement causes the slider to shift a slight distance relative to said elements, which is such that the locking pin 24 now registers with and may freely enter the space between the potentially obstructive element and the next following element, said obstructive element being accommodated in the space or recess between the pins.

In the more favorable relations of fastener elements to locking assembly than that shown and described above, the control pin 22 can move substantially freely into the space to one side of the element *e* and the locking pin 24 into the space to the other side of the element, without either substantially engaging the same and without the element interfering with such movement.

A slider locking device provided with a control pin according to the invention thus insures that a locking pin 24 of substantial length can always move into the space between fastener elements rather than engaging against the upper surface thereof as characteristic of the action of prior lock-pin sliders, due to the controlling and lining up action of the control pin on a fastener element disposed in normally obstructing position. Therefore a locking device of the invention permits the use of a longer locking pin than possible in the prior contructions, as well as a locking pin which can have greater width or thickness than the pins of the prior locking devices. Accordingly a better and more dependable locking action is obtained and one which insures long life of the lock, without danger of excessive wear of the pin and permanent set of the slider tab.

As many changes could be made in carrying out the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A locking slider for slide fasteners comprising a slider for engaging and disengaging the fastener elements, a tab hingedly secured to the upper wing of the slider, the upper wing having a slot therethrough and the tab carrying an angular part providing a pin-lock assembly adapted to be projected through the slot into the slider body upon movement of the tab from raised to locking position, said assembly comprising a leading control pin and a rearward locking pin, said pins being spaced a distance which is slightly greater than the width of the fastener elements, the locking pin having length such that it is adapted in its locking position to project a substantial distance into the space between any two fastener elements disposed in the slider, the control pin being shorter than the locking pin by an amount enabling it, upon engaging a fastener element disposed in obstructing relation to its movement into the slider body, to displace and clear said element and allow the locking pin to move into the space between said element and the next following element.

2. A locking slider for slide fasteners comprising a slider for engaging and disengaging the fastener elements, a tab hingedly secured to the upper wing of the slider, the upper wing having a slot therethrough and the tab carrying an angular part providing a pin-lock assembly adapted to be projected through the slot into the slider body upon movement of the tab from raised to locking position, said assembly comprising a leading control pin and a rearward locking pin, said pins being spaced a distance which is slightly greater than the width of the fastener elements,

the locking pin having length such that it is adapted in its locking position to project a substantial distance into the space between any two fasterner elements disposed in the slider, and the control pin being operative, when the slider is in such position relative to fastener elements disposed therein that the locking pin would engage on a fastener element disposed in its path of movement into the slider body, to engage against the next leading fastener element and thereby cause the slider to shift relative to said fastener elements by an amount allowing the locking pin to freely move into the space between said first-named element and the next following element.

3. A locking slider for slide fasteners comprising a slider for engaging and disengaging the fastener elements, a tab hingedly secured to the upper wing of the slider, the upper wing having a slot therethrough and the tab carrying an angular part providing a pin-lock assembly adapted to be projected through the slot into the slider body upon movement of the tab from raised to locking postion, said assembly comprising a leading control pin and a following locking pin which is spaced from the control pin a distance which is slightly greater than the width of the fastener elements, said locking pin having length such that it is adapted in its locking position to project a substantial distance into the space between adjacent fastener elements, said control pin being shorter than the locking pin by an amount enabling it to displace and clear any fastener element disposed in obstructing relation to its path of movement into the slider body and allow the locking pin to move into the space between said element and the next following element, and said control pin being further operative, when the

slider is in such position relative to fastener elements that the locking pin would engage on a fastener element disposed in obstructing relation to its movement into the slider body, to abut against the next leading fastener element and thereby cause the slider to shift relative to said fastener elements by an amount allowing the locking pin to move freely into the space between said obstructively disposed element and the next following element.

4. A locking slider for slide fasteners as set forth in claim 1, wherein the control pin is inclined forwardly and the locking pin is inclined rearwardly of a center line extending normal to the plane of the pull tab.

5. A locking slider for slide fasteners as set forth in claim 2, wherein the control pin is inclined forwardly and the locking pin is inclined rearwardly to a center line extending normal to the plane of the pull tab.

6. A locking slider for slide fasteners as set forth in claim 3, wherein the control pin is inclined forwardly and the locking pin is inclined rearwardly to a center line extending normal to the plane of the pull tab.

LAWRENCE BROZEK.

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