Dec. 23, 1952 H. ERDMANN 2,622,296

SLIDER FOR SLIDE FASTENERS

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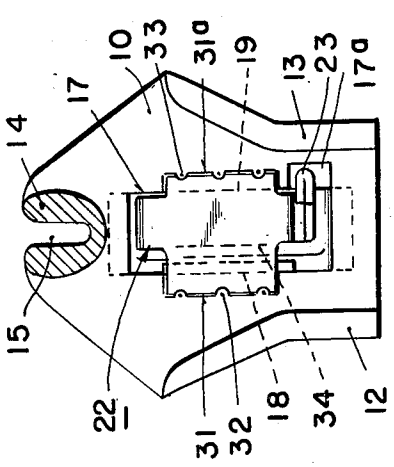


FIG. 4

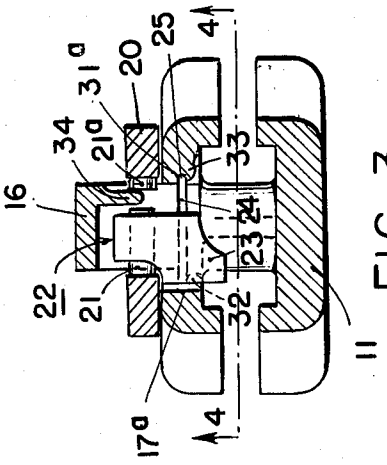


FIG. 3

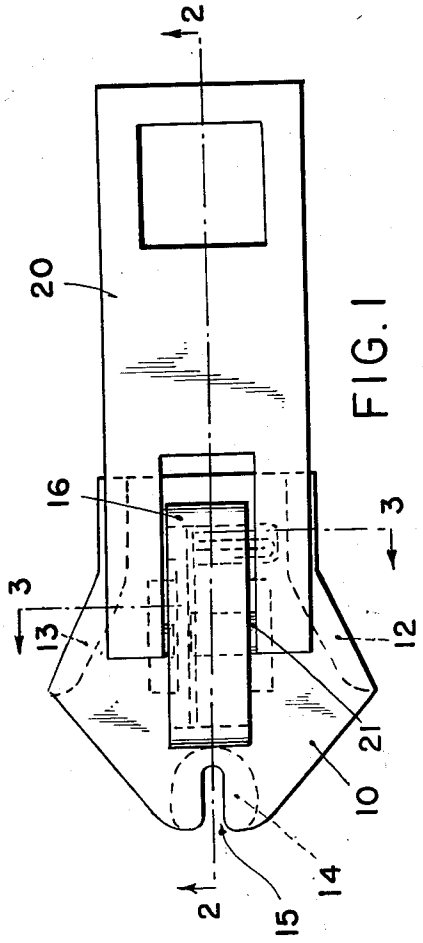


FIG. 1

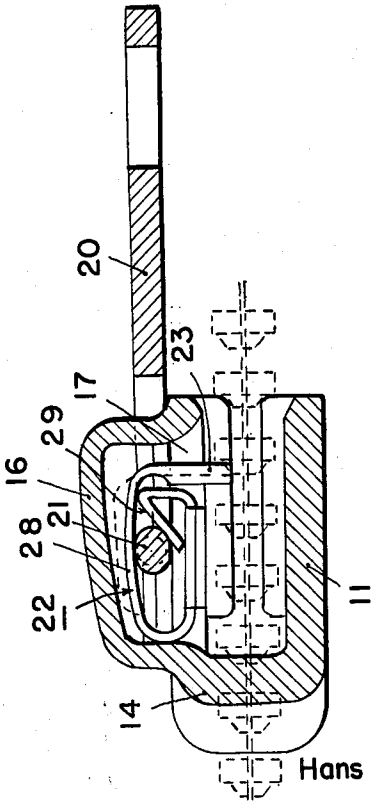


FIG. 2

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SLIDER FOR SLIDE FASTENERS

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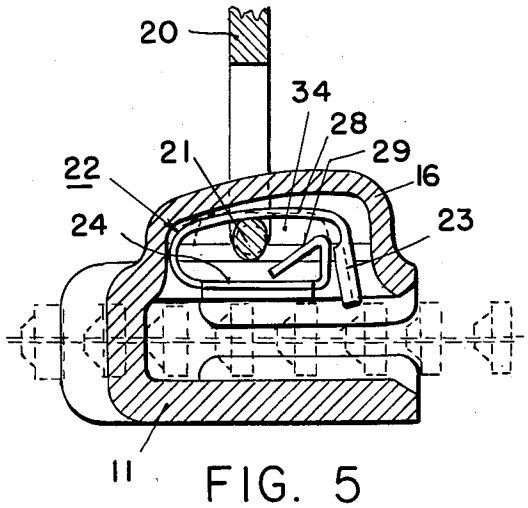


FIG. 5

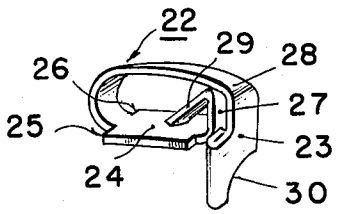


FIG. 7

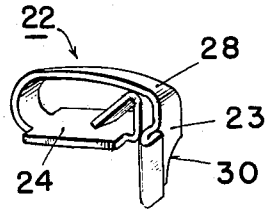


FIG. 8

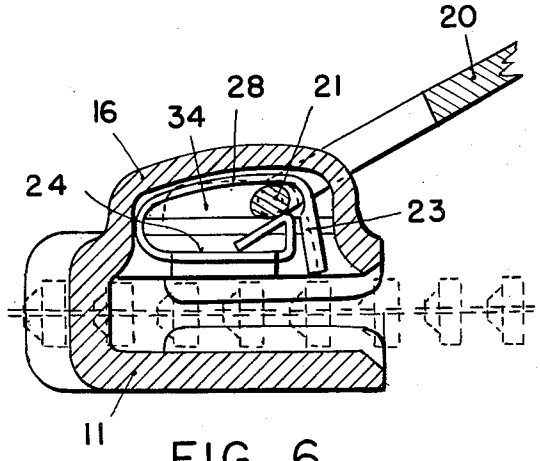


FIG. 6

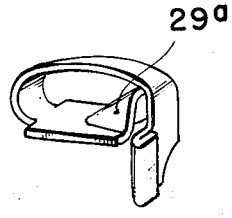


FIG. 9

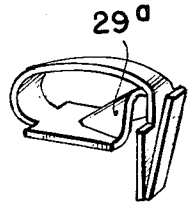


FIG. 10

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SLIDER FOR SLIDE FASTENERS

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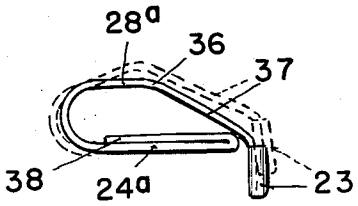


FIG. 11

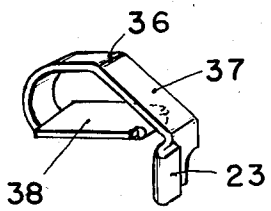


FIG. 12

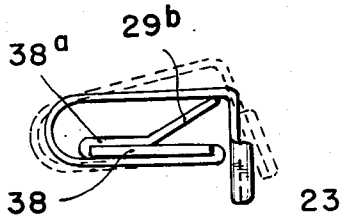


FIG. 13

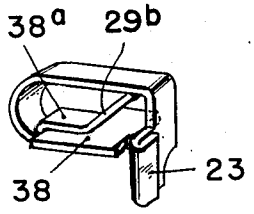


FIG 14

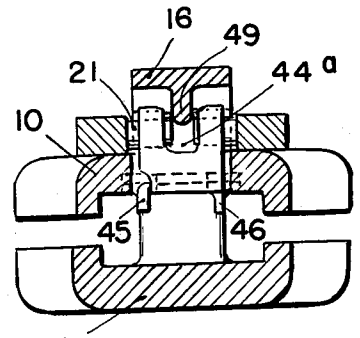


FIG. 18

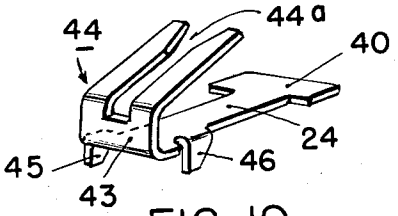


FIG. 19

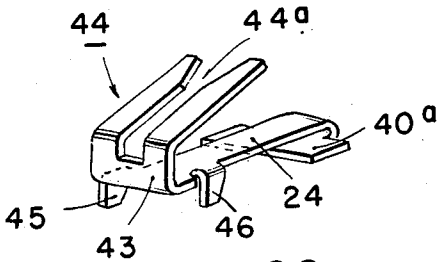


FIG. 20

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Dec. 23, 1952 H. ERDMANN 2,622,296

SLIDER FOR SLIDE FASTENERS

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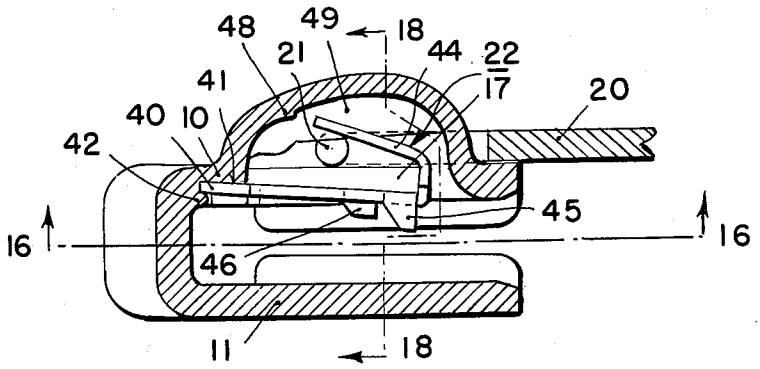


FIG. 15

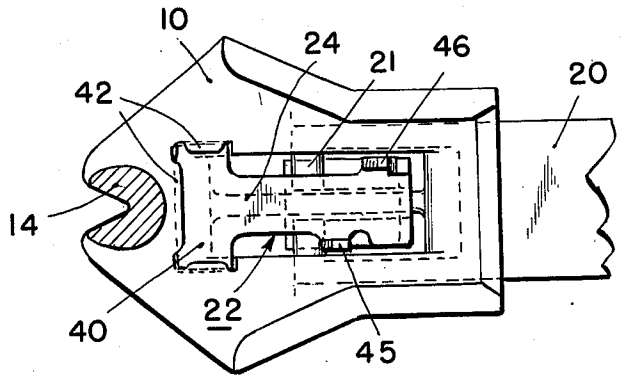


FIG. 16

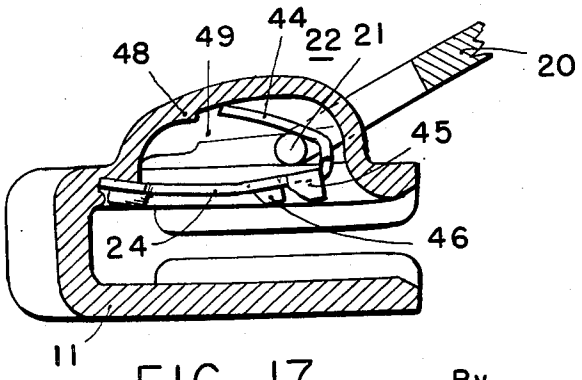


FIG. 17

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Patented Dec. 23, 1952 2,622,296

UNITED STATES PATENT OFFICE

2,622,296

SLIDER FOR SLIDE FASTENERS

Hans Erdmann, Maplewood, N. J., assignor to Waldes Kohinoor, Inc., Long Island City, N. Y., a corporation of New York

Application January 4, 1950, Serial No. 136,689

21 Claims. (Cl. 24—205.14)

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This invention relates to improvements in sliders for slide fasteners, and more particularly to an automatic lock slider of the type in which a locking spring mounted between slider upper wing and bail carries a locking pin which extends through the upper wing and is spring-projected into the space between two adjacent fastener elements on the same fastener chain. Accordingly, the locking pin is adapted normally to lock the slider at any point of its travel but can be lifted out of its locking position in response to pull tab actuation, the hinge pin or trunnions of the pull tab usually serving as a means for raising the locking pin out of the path of the elements.

An especially effective locking slider functioning as aforesaid is disclosed in my earlier patent application Serial No. 26,113, filed May 10, 1948, in which a locking pin of special shape is employed, the rear spring end of which is secured in an opening between upper wing and rivet, the latter (as is well known in the art) connecting the two slider wings just below the neck portion of the slider and having one end formed to extend over the upper or front wing of the slider to form the bail which secures the pull tab. The locking spring end of the locking pin is so formed as to permit locking and unlocking movement of the pin in a plane substantially normal to the plane of the fastener elements. A further characteristic feature of my prior lock slider resided in the provision of a hump portion on the upper wing serving as a cam over which the hinge pin of the pull tab rides when the pull tab is actuated and which is so dimensioned as to impart a certain pre-tension to the locking spring.

Continuing experience with the lock slider according to my application aforesaid has shown some room for improvement. In the first place, the locking spring employed therein depends on a slider having a rivet-type connection between wings thereof, since the rivet is used to secure the rear end of the spring. Therefore, the locking spring cannot be used in another common form of slider, namely, the so-called deep-neck slider in which the neck portion is reinforced by a bend or indentation of substantial depth and approximate U or V-shape, which also serves as the divider for separating the fastener elements in opening movement of the slider.

Another drawback of my earlier lock slider results from the fact that the provision of the hump portion on the upper slider wing requires a special operation and complicates the fabrication of the slider blank.

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Broadly stated, a principal object of this invention is generally to improve the lock slider, and especially the locking spring thereof as shown in my earlier application as aforesaid, in such manner as to facilitate the manufacture of the slider and to provide a slider locking spring which is easy to assemble and which can be securely seated in any kind of slider including the so-called deep-neck slider, in addition to possessing the advantages of my earlier disclosed lock slider.

A more specific object of my invention is the provision of a locking spring characterized in that it can be easily inserted in the space between upper wing and bail before the slider is folded in the manufacturing process, namely, by seating the spring in a correspondingly shaped opening in the upper wing from the under surface thereof. To effect firm and rigid securement of the locking spring, the base thereof is provided with extended portions dimensioned to fit into one or more recesses in the upper wing adjacent the opening through which the spring is inserted, and the locking spring is positively secured in said recesses by pressing adjoining material over the edges of its base.

Another object of the invention is to provide secure seating of the locking spring in transverse direction, i. e. the prevention of any sidewise movement thereof. Such may be achieved either directly or indirectly, for example, by providing a rib on the bail which cooperates with the hinge pin or trunnions for the pull tab or which fits into a slot in a fork-like shaped arm of the locking spring, the rib in both cases restraining the spring against turning or shifting in a plane parallel to the upper wing.

Still another object of the invention is the provision of a lock slider employing the hump portion functioning as a cam as disclosed in my earlier application, but in which the hump portion is an integral part of the locking spring itself rather than being formed on the upper wing of the slider, with the result that an operation required in the manufacture of the slider is eliminated and the locking spring is formed as a self-contained unit which can readily be handled in assembly. Preferably, the hump provided in the locking spring is so dimensioned as to impart a certain spring tension thereto, thus rendering the spring more rigid and thereby facilitating its handling in assembly.

A further feature of the invention resides in the design of the hinge pin or trunnions of the pull tab, which permits lifting of the locking pin upon actuation of the pull tab in two stages

rather than in a single stage. When this lifting action is performed in a single quick movement, as heretofore, it may happen that the pressure of the locking pin against an adjacent fastener element is sufficiently large as to cause the locking pin to stick. The improved hinge pin design moreover facilitates the back push of the pull tab when it is released, and therefore a quick and secure return of the locking pin to its normal locking position is achieved.

The above and other objects and advantages of my improved lock slider will be apparent from the following detailed description accompanied by drawings, in which—

Fig. 1 is a plan view of the improved lock slider according to the invention;

Fig. 2 is a longitudinal section taken on line 2—2 of Fig. 1, with the locking pin in its normal locking position in which it extends into the space between adjacent fastener elements of the same which are shown in dotted lines;

Fig. 3 is a section taken on line 3—3 of Fig. 1;

Fig. 4 is a section taken on line 4—4 of Fig. 3;

Fig. 5 is a view similar to Fig. 2, with the locking pin raised thru one stage of its movement;

Fig. 6 is a view similar to Fig. 5, showing the locking pin in its fully raised position;

Fig. 7 is a perspective view of the locking spring employed in Figs. 1–6;

Figs. 8, 9, 10, 12, 14, 19 and 20 are perspective views of modified forms of locking springs;

Figs. 11 and 13 are side elevations of the locking springs shown in Figs. 12 and 14, respectively, the views illustrating the locking pins in their locking and unlocking positions;

Figs. 15 and 17 are longitudinal sections of a slider employing the modified locking spring illustrated in Fig. 19, Fig. 15 showing the locking pin in its locking position, and Fig. 17 in its unlocking position;

Fig. 16 is a section taken on line 16—16 of Fig. 15; and

Fig. 18 is a section taken on line 18—18 of Fig. 15.

Referring first to Figs. 1–7, reference characters 10, 11 designate, respectively, the upper and lower wings of a slider, the wings having side flanges 12, 13 for guiding the elements in their travel through the slider as is well known in the art. The wings 10 and 11 are connected by a web or neck portion 14 which, as shown in Figs. 1 and 4, is formed with a deep indentation 15 of approximate U or V-shape for neck reinforcement, the indentation also serving as a wedge or divider for separating the connected fastener elements in the opening movement of the slider. A bail 16 is struck out of the upper wing 10, leaving the opening 17 which is broadened as at 17*a*, and recessed along its side edges 18 and 19 for a purpose to be explained. The bail 16 provides for connection of a pull tab 20 which is hingedly connected to the bail by hinge pin or trunnions 21, 21*a*.

Operative in the space between upper wing 10 and bail 16 is a locking spring generally designated 22 whose one end provides a locking pin 23 which normally projects through wing opening 17 at its broadened end part 17*a* into the path of the fastener elements (shown in dotted lines, Fig. 2), thereby to arrest movement of the slider when the pull tab is in its lowered or released position as also shown in Fig. 2. The locking spring of the slider embodiment shown in Figs. 1–6, is illustrated in perspective in Fig. 7. It is shaped generally as a U turned to lie on one side or arm which functions as a base 24 being provided with widened side portions 25, 26 which correspond approximately to the recesses in edges 18, 19 of the wing opening 17. The free end of the base portion 24 is bent upwardly at about a right angle, thus to provide a forwardly extending leg portion 27 disposed about normal to base 24 and is then bent in the direction of the base (rearwardly) at an angle of approximately 35–45°, thereby to provide an inclined hump or cam portion 29. The top edge of leg portion 27, i. e. the corner between leg and inclined portions 27 and 29, acts as a stop for the other U-arm 28 of the spring which bears on said edge with a predetermined spring tension. Said other arm 28 of the spring, which, it will be understood, acts as a leaf spring, is continued beyond the vertical leg 27 of the base portion 24 and is bent downwardly (rearwardly) to lie approximately parallel to said leg portion, terminating in the locking pin or protrusion 23. Preferably, the width of the locking pin is reduced near its free end, as by notching as at 30, as required to allow the locking pin to enter the space between two fastener elements on the same chain. The locking pin 23 is shown to be reinforced by folding one of its side edges inwardly (Fig. 7) or outwardly (Figs. 8, 9, 12 and 14), it being noted that Fig. 10 illustrates a special form of reinforcement wherein the entire length of the downwardly bent pin is folded over to provide an especially strong reinforcement for the locking pin.

It will be observed that the described locking spring provides a specially formed base 24, a spring leaf portion 28, a rigid locking pin 23, and an inclined hump portion 29 functioning as a cam, it being a further feature that the spring leaf portion 28 is under a certain tension, even in the normal or locking position of the locking pin 23. Accordingly, a locking spring as described forms a self-contained unit which can easily be handled and assembled and which is further characterized by sturdiness and dependability in operation.

According to a further important feature of the invention, a locking spring as aforesaid is assembled and secured in such manner as to facilitate manufacture of the slider and at the same time to provide a firm seat for the spring, which latter has presented a serious problem in the art. The aforesaid facilitated assembly results from the fact that the locking spring is assembled on the slider front wing before the slider is folded and while the inner surfaces of the slider are readily accessible. To this end, the lower surface of the upper wing is recessed or countersunk to provide edge recesses 31, 31*a* which extend along the major length of the side edges 18, 19 of the wing opening 17. The broadened base portion 24 of the spring is so dimensioned that the widened side portions 25, 26 thereof fit into the recesses 31, 31*a*, in which they are positively secured in suitable manner, for example, by pressing over material of the slider wing along the edges of the recess at spaced points indicated at 32, 33 (Fig. 4). When so assembled, the base portion 24 of the spring is contained and accommodated within the opening 17 of the upper slider wing 10, with the spring leaf portion 28 of the spring extending through opening 17 into the space between wing and bail 16, in position such that the locking pin 23 of the spring projects through widened end portion 17*a* of said opening. The locking spring

being securely anchored as aforesaid, the wings are folded into parallelism without in any way disturbing the locking spring securement, and thereby the overall assembly of the slider is materially facilitated.

While a locking spring of the form illustrated in Fig. 7 functions in very satisfactory manner, variant forms thereof are possible. For example, according to the modified form of locking spring illustrated in Fig. 9, the hump portion **29***a* is formed by embossing rather than by bending as in Fig. 7 form of spring. In the variant form of locking spring illustrated in Figs. 11 and 12, the hump portion **29** (or **29***a*) is dispensed with and, instead, the arm **28***a*, which functions as the leaf spring, is bent downwardly (rearwardly) from a point **36** intermediate its length so as to form a slant or inclined section **37** which functions as a cam to be engaged by the hinge pin **21** of the pull tab. As shown, the base **24***a* of the locking spring may be formed long and its extra length folded over on itself to overlie said base. The overlying portion **38** substantially reinforces the base of the spring and thus prolongs the life thereof, at the same time rendering the spring more flexible in its action.

According to the variant form of spring illustrated in Figs. 13 and 14, the overlying base portion **38** is bent back on itself as at **38***a* and is continued at an inclination to provide a cam or hump portion **29***b*, the leaf spring portion **28** being formed straight, or substantially straight, as in Fig. 7, and bearing on the edge of the inclined portion with spring tension.

The operation of a locking slider employing the improved locking spring or springs in any one of the forms described above will be obvious to those skilled in the art. Normally, locking spring **22** and pull tab **20** are in their respective positions illustrated in Fig. 2. However, when the pull tab is actuated to in turn actuate the slider in fastener-opening direction, the hinge pin will ride up the hump or cam portion **29** (or **29***a*, or **39**) of the spring, thereby to lift spring arm **28** until it engages the under side of bail **16**, whereupon locking pin **23** is raised from its locking position between adjacent fastener elements, with the result that the slider may be freely actuated along the length of the fastener chain. A similar effect is achieved with a locking spring of the type shown in Figs. 11 and 12, wherein the inclined portion **37** of the arm portion **28** functions as a cam portion in effecting lifting of the locking pin when engaged by the hinge pin **21**.

If desired, operation of the slider may be further improved by a novel formation of the hinge pin **21**. In conventional sliders, the locking pin is moved out of locking engagement with the elements in a single stage of movement. When this movement is sudden, the locking pin may press against one of the elements with which it locks and tends to stick. To positively avoid this possibility, hinge pin **21** may be provided with oval rather than circular section, as indicated particularly in Figs. 2, 5 and 6. Due to the oval section of hinge pin, when the pull tab **20** is lifted and before a pull is applied thereto, the hinge pin, due to its oval section will lift spring arm **28** of the locking spring slightly, resulting in corresponding limited lifting of the locking pin **23**, which is not sufficient to clear the fastener elements. Now, when pull is applied to the pull tab, the hinge pin **21** will ride up the hump or cam portion **29** of the spring, as indicated in Fig. 6, and effect full lifting movement of the locking pin **23**. In addition to the advantages of the two-stage pin movement in releasing the locking pin, the oval formation of hinge pin also is of advantage in facilitating the return movement of the pull tab to its normal locking position.

According to a further feature of the invention, any sidewise displacement of the locking spring is positively prevented through the provision of a rib **34** formed to depend from the inner (under) surface of the bail **16**. As shown in Fig. 3, the rib is offset from the center line of the bail so as to provide adequate width for the locking spring **22**, the rib extending into a gap provided between the hinge pin sections **21**, **21***a*, of which the hinge pin section or trunnion **21** has greater length, as shown. By serving as a guide for the pull tab, the rib **34** indirectly prevents sidewise displacement of the locking spring.

Referring to Figs. 15–19, disclosing a locking spring differing in detail from that described and the manner of its attachment, the modified locking spring as shown in Fig. 19 has the free end of its base part **24** broadened as at **40**. This broadened part is inserted in a recess **41** formed in the upper slider wing near the neck portion of the slider and which opens through the under face of the wing to permit ready insertion of the broadened attaching portion of the said base. Securement of the locking spring is effected by pressing over some of the material of the wing adjacent the recess, as indicated at **42**, it being understood that the aforesaid spring attaching operation may be achieved before folding of the slider wings, as in the prior described modification.

Like the base part **24** of the prior described locking springs, the base part of the modified spring is contained and accommodated within the slider wing opening **17** and at its free ends is bent upwardly (forwardly) so as to form a vertical leg portion **43** which extends through the slider wing opening **17** into the space between upper wing **10** and bail **16**. Arm **44** extends from the vertical leg portion **43**, being upwardly inclined to overlie the hinge pin **21**, as shown in Fig. 15. Two locking pins **45**, **46** are provided near the end of the base part **24** from which the vertical leg portion **43** extends, said locking pins being formed along the side edges of the base part and being adapted to depend therefrom into the space between adjacent fastener elements of a fastener chain within the slider body. It will be obvious that the locking pins **45**, **46** will be lifted out of the path of the elements when pull tab **20** is actuated so as to cause hinge pin **21** to enter the narrower end of the space between base part **24** and inclined arm **44** of the spring. To prevent the hinge pin **21** from working into the space between arm **44** and the inner face of the bail, which would result in putting the slider out of operation, the bail is formed with an inwardly thickened portion **48** which stops entry of the locking pin into said outer space.

Instead of forming the broadened part **40** so that it is contained in the plane of the base part **24** of the locking spring, as in Fig. 19, the broadened part **40***a* may be formed as a forward extension of the base part proper, being bent to underlie the base part as illustrated in Fig. 20. Such modified spring construction has the advantage of providing greater spacing between the wedge or divider **14** and the anchored end of the locking spring than is possible with the Fig. 19 form of spring, without, however, increasing the overall length of locking spring.

The modification under description provides positive means for preventing sidewise movement of the spring, thus contributing to its firm seating and the security of the assembly. To this end, bail **16** is provided with an inwardly depending rib **49** formed on its longitudinal center line, and the spring arm **44** is forked to provide a slot **44***a*. As seen in Figs. 15 and 17, the bail rib **49** extends into the slot **44***a* and thus positively secures the spring against any sidewise or angular shifting movement. It will be observed, also, that the rib **49** insures that the end of the spring carrying the locking pins **45**, **46** always moves in its proper plane and thus in effect provides securement for the free or unsecured end of the spring.

Without further analysis, it will be appreciated that this invention provides an automatic lock slider whose parts coact to insure a thoroughly reliable locking slider with no loose connections and with a locking spring which is a self-contained unit that may readily be assembled and has a secure seat, without any restriction as to the type of slider with which it may be employed.

As many changes could be made in carrying out the above constructions 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 lock slider for slide fasteners comprising spaced upper and lower wings connected by a neck portion, a bail struck up from the material of the upper wing and forming therewith an eye and leaving an elongated opening in the upper wing which underlies the bail, a pull tab pivotally connected to the bail by trunnion means extending into the bail eye, and a substantially U-shaped locking spring, one arm of the spring being secured to the upper wing from beneath the same and being contained in said opening, and the other arm extending through said opening into the eye of the bail, said locking spring carrying a locking pin which normally projects into the space between said wings and into locking engagement with fastener elements disposed in the slider, said trunnion means coacting with said other spring arm to effect lifting of the locking pin from said space.

2. A lock slider for slide fasteners comprising spaced upper and lower wings connected by a neck portion, a bail struck up from the material of the upper wing and forming therewith an eye and leaving an elongated opening in the upper wing which underlies the bail, a pull tab pivotally connected to the bail by trunnion means extending into the bail eye, and a substantially U-shaped locking spring, one arm of the spring being contained in said opening and having an end thereof seating in a recess opening through the under face of the upper wing, the other arm extending through said opening into the eye of the bail, said locking spring carrying a locking pin which normally projects into the space between said wings and into locking engagement with fastener elements disposed in the slider, said trunnion means coacting with said other spring arm to effect lifting of the locking pin from said space.

3. A lock slider for slide fasteners as set forth in claim 2, wherein said locking pin is formed at the free end of said other arm.

4. A lock slider for slide fasteners as set forth in claim 2, wherein the locking pin depends from said one arm.

5. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from the upper wing and forming an eye, a pull tab pivotally connected to the bail, the upper wing having an elongated opening disposed beneath the bail, and a substantially U-shaped locking spring, one arm of the locking spring being contained in said opening and having an extended width portion seating and anchored in a recess provided in the under face of the slider wing, the other arm extending through said opening and being arranged as a leaf spring extending longitudinally in the eye of the bail and being cooperatively related to the pull tab pivot, the free end of said other arm being bent downwardly to provide a locking pin which projects through the opening into locking engagement with fastener elements disposed in said slider.

6. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from the upper wing and forming an eye, a pull tab pivotally connected to the bail, the upper wing having an elongated opening disposed beneath the bail, and a substantially U-shaped locking spring, said opening having a widened portion and the edges of the non-widened portion being countersunk to provide side recesses opening to the under face of the upper wing, one arm of the spring being contained in said opening and having an extended width portion seating and anchored in said recesses, the other arm extending through said opening and being arranged as a leaf spring extending longitudinally in the eye of the bail and being cooperatively related to the pull tab pivot, the free end of said other arm being bent rearwardly to provide a locking pin which extends through the widened portion of said opening into locking engagement with fastener elements disposed in the slider.

7. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from the upper wing and forming an eye, a pull tab pivotally connected to the bail, and a substantially U-shaped locking spring, said upper wing having an elongated opening disposed beneath the bail and an under face recess adjacent the neck portion of the slider and communicating with said upper wing opening, one arm of the spring having extended width at its free end seating and anchored in said recess, and said one arm being accommodated in the opening and extending longitudinally thereof, the other arm extending through said opening into the bail eye for cooperation with the pull tab pivot, said one arm carrying a locking pin depending from its other end into locking engagement with fastener elements disposed in the slider.

8. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from theh upper wing and forming an eye, the upper wing having an elongated opening disposed beneath the bail, a pull tab connected to the bail by a hinge pin extending into the bail eye, a substantially U-shaped locking spring having one arm extending longitudinally in said opening and having one end thereof anchored in a recess provided in the under face of the upper wing and which communicates with said opening, the other arm

extending through said opening into the bail eye and being arranged between hinge pin and bail, said locking spring carrying a locking pin extending through said opening into locking engagement with fastener elements disposed in the slider and having an inclined portion formed on one of said arms and being disposed within the bail eye, said hinge pin coacting with said inclined portion to lift the locking pin out of said locking engagement.

9. A lock slider for slide fasteners as set forth in claim 8, wherein the inclined portion is provided at the free end of said one arm and the locking pin is formed at the free end of said other arm.

10. A lock slider for slide fasteners as set forth in claim 8, wherein said one arm is provided at its free end with a right-angularly disposed leg extending into the bail eye, and said inclined portion comprises an angularly bent continuation of said leg, and wherein said locking pin is formed at the free end of said other arm.

11. A lock slider for slide fasteners as set forth in claim 8, wherein said one arm is provided at its free end with a right-angularly disposed leg extending into the bail eye for a distance such that it engages said other arm and tensions the latter and said inclined portion comprises an angularly bent continuation of said leg, and werein said locking pin is formed at the free end of said other arm.

12. A lock slider for slide fasteners as set forth in claim 8, wherein said one arm is provided with an extra length portion which is folded back and forth on itself and terminates in a slanted section forming said inclined portion.

13. A lock slider for slide fasteners as set forth in claim 8, wherein said inclined portion is provided in said other arm of the locking spring.

14. A lock slider for slide fasteners as set forth in claim 8, wherein the locking pin extends from the free end of said other arm and said inclined portion is provided in said other arm adjacent the locking pin.

15. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from the upper wing and forming an eye, the upper wing having an elongated opening disposed beneath the bail, a pull tab connected to the bail by trunnions extending into the bail eye, a substantially U-shaped locking spring having one arm contained in said opening and anchored in a recess provided in the under face of the upper wing, the other arm extending through said opening into the bail eye and being arranged between hinge pin and bail, said locking spring including a locking pin extending through said opening into locking engagement with fastener elements disposed in the slider, said pull tab trunnions coacting with said other spring arm to effect lifting of the locking pin out of said locking engagement, and means carried by said bail for preventing lateral movement of the locking spring.

16. A lock slider for slide fasteners as set forth in claim 15, wherein said means includes an inwardly directed rib on the bail extending into a space provided between the adjacent ends of the pull tab trunnions, said rib preventing lateral movement of the pull tab and thereby of the locking spring.

17. A lock slider for slide fasteners as set forth in claim 15, wherein said means includes an inwardly directed and longitudinally extending rib on the bail which extends into a slot provided in the other arm of the locking spring.

18. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from the upper wing and forming an eye, the upper wing having an elongated opening disposed beneath the bail, a pull tab having a hinge pin connection with the bail, a substantially U-shaped locking spring whose one arm is contained in said opening and has a widened free end portion seated and anchored in a recess provided in the under face of the upper wing and carrying at least one locking pin depending from its other end into locking engagement with fastener elements disposed in the slider and whose other arm extends through said opening into said eye, said other arm being disposed intermediate the hinge pin and bail and being inclined away from the upper face of the upper wing, whereby pull on the pull tab effects lifting of the locking pin out of said locking engagement through engagement of hinge pin with said inclined other arm.

19. A lock slider for slide fasteners as set forth in claim 18, wherein said other arm is forked to provide a longitudinal slot and said bail is provided with an inwardly directed, longitudinal rib extending into said slot.

20. A lock slider for slide fasteners as set forth in claim 18, wherein said widened portion of said one arm is formed as a forward extension of said one arm which is disposed to underlie the same.

21. A lock slider for slide fasteners comprising upper and lower wings connected by a neck portion, a bail extending from the upper wing and forming an eye, the upper wing having an elongated opening disposed beneath the bail, a pull tab having a hinge pin connection with said bail, a substantially U-shaped locking spring carrying a locking pin extending through said opening and being normally spring-pressed into locking engagement with fastener elements disposed in the slider, one arm of the locking spring being disposed within said opening and secured to the upper wing from beneath the same and the other arm extending through the opening into the bail eye, and means including said hinge pin and an inclined portion of the locking spring for effecting a two-stage lifting movement of the locking pin out of said locking engagement.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,936,096	Norton	Nov. 21, 1933
2,027,327	Gilmore	Jan. 7, 1936
2,053,463	Conlin	Sept. 8, 1936
2,057,126	Wintritz	Oct. 13, 1936
2,373,523	Winterhalter	Apr. 10, 1945

FOREIGN PATENTS

Number	Country	Date
190,601	Switzerland	of 1937
238,508	Switzerland	of 1945
417,781	Great Britain	of 1934
532,431	Great Britain	of 1941