April 4, 1950 F. R. TABERLET 2,502,901

SLIDER FOR ADJUSTABLE FASTENERS

Filed Nov. 11, 1944 2 Sheets-Sheet 1

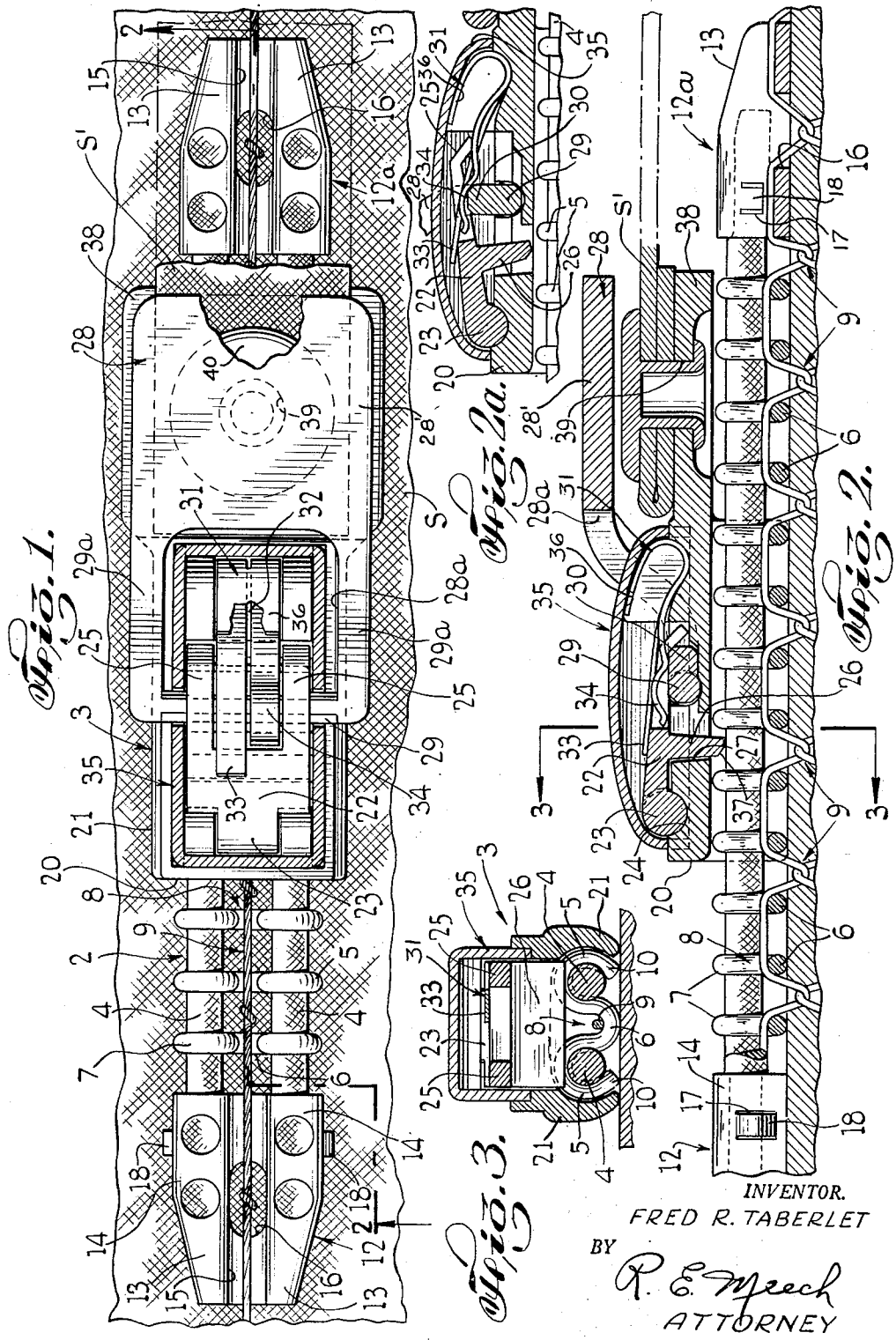


Fig. 1.

Fig. 2a.

Fig. 2.

Fig. 3.

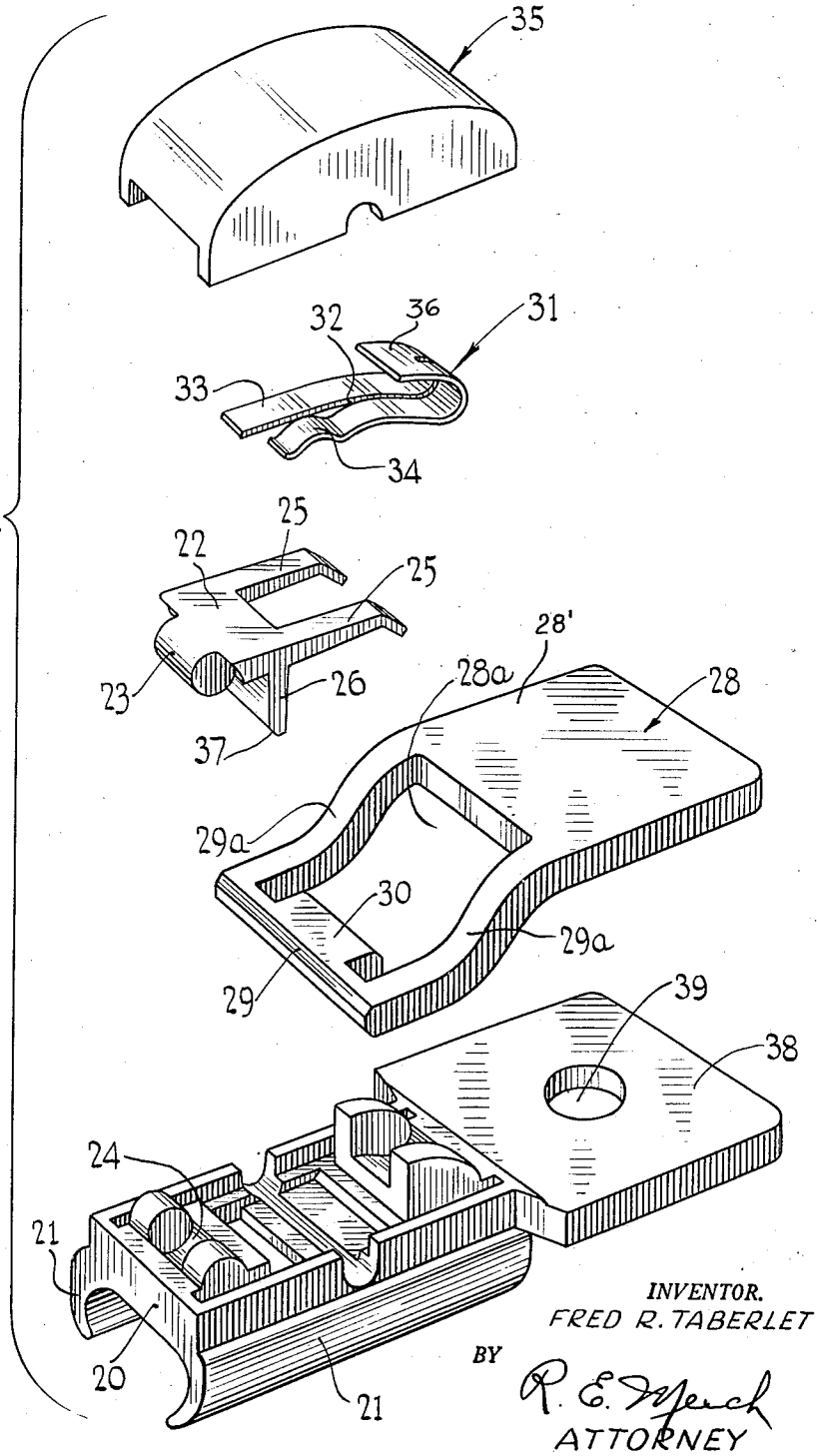
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Fig. 4.



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SLIDER FOR ADJUSTABLE FASTENERS

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3 Claims. (Cl. 24—206)

1

This invention relates to adjustable fasteners of the type comprising a flexible track including a series of spaced-apart stops or the like supported in a flexible manner, and particularly, to an improved slider for such a fastener which is movable longitudinally along the track and is adapted to be locked selectively in various adjusted positions thereon.

It is one of the objects of the present invention to provide an improved slider for adjustable fasteners which is strong and rugged in its construction and efficient and effective in its use.

It is another object of the invention to provide an improved slider for the track of adjustable fasteners having means incorporated therewith which will lock automatically to prevent unintentional movement of the slider along the track in one direction and which will permit the slider to be moved along the track in the opposite direction.

It is a further object of this invention to provide an improved slider for the track of adjustable fasteners which is normally operative to lock the slider against movement at least in one direction along the track having means incorporated therewith which makes the slider locking means selectively ineffective thereby permitting the slider to be moved freely in either direction along the track.

It is still another object of the present invention to provide an improved automatic lock slider for the track of adjustable fasteners which will lock automatically at various points of selective adjustment along the track.

Various other objects and advantages of this invention will be more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown for the purpose of illustration, one embodiment which my invention may assume in practice.

In these drawings:

Fig. 1 is a plan view partly in section of my improved slider showing it on the track of an adjustable fastener;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1;

Fig. 2*a* is a longitudinal fragmentary sectional view through my improved slider, similar to Fig. 2, showing the locking member in unlocked position;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2; and

Fig. 4 is an exploded perspective view showing

2

the parts of the slider of the present invention in detail.

The adjustable fastener shown in Fig. 1 is of the general type illustrated in the patent to Noel Statham, No. 1,887,826, granted November 15, 1932, in that it comprises a track generally designated at 2, which is secured to the article or supporting member, for example, one end of a belt, and which track is adapted slidably to support a slider, generally designated at 3, which is secured to another part of the article or supporting member or the other end of the belt, and which slider may be selectively adjusted longitudinally of the track and locked in any desired position therealong.

Referring more particularly to the drawings, the track may be of any suitable construction and as illustrated herein, is of the same construction as disclosed in my co-pending application Serial No. 562,990, filed November 11, 1944, which issued into Patent No. 2,441,377, dated May 11, 1948. Such a construction comprises a pair of spaced-apart substantially parallel, longitudinally extending, flexible members 4, each of which consists of a fabric or metallic cord, wire or the like. Extending between the flexible members or cords 4 substantially perpendicular thereto, there is positioned a series of spaced substantially parallel stop elements or members 5, which are attached to the flexible members in a manner hereinafter to be described. Each of the stop elements 5 consists, preferably, of a round piece of metallic wire bent so as to form a central substantially U-shaped connecting portion 6 and a substantially loop-shaped clamping portion 7 on each end thereof, with the loop-shaped portions being bent reversely from the U-shaped connecting portion 6 and extending thereabove. The extreme ends of the wire are bent and arranged so as to extend to a point adjacent the bottom of the central connecting portion 6 substantially in alignment therewith for a purpose to be described and the center connecting portion 6 and the loop-shaped clamping portions 7 of each of the stop elements are disposed substantially in the same plane. The clamping portions 7 of each of the elements 5 are bent around the flexible members or cords 4 so as to form loop-shaped portions through which the flexible members extend and by means of which they are securely attached thereto. In such construction it will be seen that the stop elements 5 are in alignment with each other and that there is provided centrally of the track, a channel 8 extending longitudinally therealong between the loop-shaped

portions 7 of the stop elements and between the flexible members 4.

The flexible track is attached to the article or supporting member with which it is to be used, by means of the central connecting U-shaped portions 6 of each of the stop elements 5. The track is positioned on the article or supporting member and is attached thereto preferably by means of stitching 9 extending over and around the central connecting portions of the fastener elements, as more clearly shown in Fig. 2 of the drawings, so that the track is attached to the article or supporting member throughout the length thereof. In other words, the stitching 9 is disposed in the channel 8 between the flexible members 4 and extends successively over the central connecting portions 6 of the succeeding stop elements. In applying the track to the article or supporting member, it will be understood that the ends 10 of the wire which are disposed substantially in under the loop-shaped portions 7, rest upon the surface of the article or supporting member, as shown in Fig. 2 of the drawings, so as to stabilize the track, thereby preventing it from turning or twisting relative to the article or supporting member.

There is arranged at each end of the flexible members or cords 4, preferably end members 12 and 12*a* which are adapted to act either as a guide for threading the slider 3 on to the track 2, or as a stop member for limiting the longitudinal movement of the slider therealong, so as to prevent unintentional removal of the slider therefrom. Each of the end members 12 and 12*a* consists of an elongated body member preferably made from sheet metal, having preferably a tapered portion 13 arranged on the outer end thereof. Each of these end members, like each of the stop elements 5, also has preferably a loop-shaped clamping portion 14 arranged to either side thereof by means of which the end member is securely clamped to the ends of the flexible members or cords 4. Between the loop-shaped clamping portions 14, there is provided centrally of the body member, a longitudinally extending channel 15 so as to provide a member having substantially the same cross-section as each of the stop elements 5. In the bottom wall of the channel 15 of each of the members 12 and 12*a*, there is provided preferably an opening or holes 16 through which the stitching 9 passes for securing these end members to the article or supporting member. Each of the end members 12 and 12*a* is spaced from the endmost fastener element 5 of the track substantially the same distance that each of the stop elements 5 are spaced from each other.

In each of the outer side walls of each of the end members 12 and 12*a* adjacent the inner end thereof, there is provided a rectangular-shaped slot or recess 17 which is formed by cutting or striking up from the material of the end member, a rectangular-shaped finger-like portion 18. These finger-like portions 18 are adapted, if desired, to be bent so as to extend or project outwardly from the sides of the end member and track, as shown in Fig. 1 of the drawings, for limiting the movement of the slider along the track in a manner to be described.

According to the present invention, there is provided a slider 3 which slides along the track and over the stop elements thereof, comprising an elongated body member 20 which is preferably die cast and has arranged on one side thereof, a pair of spaced-apart curved flange portions 21 which are positioned along the marginal edges of the body member so as to provide a longitudinally extending channel on that side thereof for slidably receiving the stop elements 5 of the track 2.

On the opposite side of the body member 20 there is arranged at one end thereof, a locking member 22 having an enlarged portion 23 arranged on one end thereof which is journalled or pivoted in a recess 24 in that end of the body member so as to provide substantially a knuckle joint. Extending outwardly from the enlarged journal portion 23 of the locking member, there is provided a pair of spaced-apart arm-like members 25 which extend toward and beyond the center of the body member. Between the enlarged bearing portion 23 and the outer ends of the arm-like portions 25, there is carried thereby a locking projection 26, which is disposed transversely of the body member and extends through an opening 27 and projects into the channel on the opposite side of the body of the slider, for a purpose hereinafter to be described.

There is provided a pull or slider actuating member 28 in the form of a rectangular plate having on the inner end thereof a rectangular aperture 28*a* which forms at that end a pair of spaced legs or arms 29*a* and a transversely extending trunnion or pivotal portion 29, which is disposed centrally of the body member 20 and has a cam portion 30 arranged integrally therewith on the inner side thereof within the rectangular aperture 28*a*. The pivotal portion 29, together with the cam portion 30, is positioned between the slider body 20 and the arm-like portions 25 of the locking member 22 and cooperates therewith for a purpose and in a manner hereinafter to be described.

On the opposite end of the body member 20, there is arranged a U-shaped spring 31 having one leg thereof split as at 32 substantially centrally thereof, so as to provide a relatively long leaf-like spring portion 33 and a relatively short leaf-like spring portion 34. Both these leaf-like spring portions 33 and 34 extend preferably between the arm-like portions 25 of the locking member. The longer leaf-like portion 33 is of such length as to rest on the upper side of the locking member 22 adjacent the lock-projection 26 thereof, as shown in Fig. 2. It is one of the purposes of this longer leaf-like portion to urge and maintain the locking projection 26 in locked position in the channel of the slider body. The shorter leaf-like portion 34 of the spring 31 extends over and is disposed on the pivotal portion 29 together with the cam portion 30 of the pull member 28, and is adapted to urge and maintain the pull member 28 to position against the slider body substantially parallel thereto when the pull member is disposed in either extended direction, so as to prevent accidental movement of the pull member.

There is provided a cap or housing member 35 preferably made of sheet metal, which is assembled on and attached to the body member in any suitable manner, preferably by indentations and projections (not shown) on the slider body and cap member, respectively, so that the cap can be merely snapped into position on the slider body. This cap or housing member encloses the locking member 22, the pivotal portion 29 together with the cam portion 30 of the pull member 28, and the spring 31. The outer leg portion 36 of the spring 31 is forced against the inner side of the

cap member when the latter is assembled and attached to the slider body so as to make the spring effective. It will be seen that this cap or housing member not only encloses all of the above members, but also cooperates with the slider body to maintain them in their assembled and operable positions, so as to prevent any one of the members from being displaced from its operable position.

It will be understood that the flexible track and slider are applied to members that are usually under tension and, accordingly, it will be seen that it is necessary that the slider be locked only against movement in one direction along the track or in the direction of the tension. In such a case, one side of the locking projection **26** is relieved or beveled, as at **37**, so that the locking projection will ratchet over the stop elements **5** when the slider is moved in one direction, whereby the locking projection is ineffective when the slider is moved in such direction. By providing a locking projection of such construction, it will be seen that the slider can be easily moved along the track merely by pushing the slider along the track in that direction.

At one end of the slider body **20**, there is provided an extended portion **38** preferably having a hole or aperture **39** arranged therethrough to which the other side or part of the article or supporting member, is attached by means of a grommet or eyelet **40** or any other suitable attaching means.

The improved slider of my invention is used and functions in the following manner. After the flexible track **2** has been attached to one part of the article or supporting member S by means of stitching **9**, and the slider **3** is attached to the other part of the article or supporting member S' as hereinbefore described, the fastener is ready for use.

The slider is then threaded on to the track **2** over one of the end members **12** and **12***a* at one end thereof with the tapered portion **13** of the end member acting to thread and guide the stop elements **5** into the channel of the slider body, due to the cooperation of the circular flange portions **21** thereof, with the outer sides of the loop-shaped clamping portions **7** of the stop elements. The end member **12** at the outer end of the track is usually adapted to act as a stop for limiting the outward movement of the slider therealong. In such case, the finger-like portions **18** on either side of this end member, are bent outwardly from the recesses **17** so as to project to either side of the end member, as shown in Fig. 1. When these finger-like portions are disposed in such extended positions, it will be seen that the outer ends of the flange portions **21** of the slider body will strike the same when and if the slider body is moved to the outer end of the fastener, thereby preventing removal of the slider from that end of the track. Also, if desired, the finger-like portions **18** of the end member **12***a* at the inner end of the track may be bent outwardly from the sides of this member, in order to prevent displacement or removal of the slider from either end of the track, which may be desirable in certain applications of the fastener.

As the slider body passes over the track, it will be seen that the flange portions **21** of the slider body cooperate with the loop-shaped clamping portions **7** of the stop elements **5** as the slider is moved along the track, so as to guide the slider in its movement therealong. In other words, the circular flange portions **21** conform substantially to the shape of the outer side portions of the loop-shaped clamping portions **7** with which they cooperate to guide the slider therealong, as shown in Fig. 2. When the slider is disposed on the track, it will be understood that the transverse locking projection **26** of the locking member **22** extends normally through the recess **27** in the slider body and projects into the channel thereof so as to be disposed between any two aljacent stop elements **5** thereby locking the slider against movement in one direction along the track. It will be seen that the slider can be moved along the track in a direction toward the outer end thereof without manipulating the pull member **28**, that is, merely by pushing the slider body therealong. This is due to the fact that the outer side of the locking projection **26** is bevelled at **37** which permits the locking member to ratchet over the loop-shaped clamping portions **7** of the stop elements against the action of the leaf-like spring portion **33** of the spring **31** when the slider is moved in such direction. However, when the slider is again brought to rest with the locking projection **26** extending into the slider channel, it will be seen that while the slider may be continually moved in that direction along the track, that is, in a direction toward the outer end of the track, it is prevented from moving in the opposite direction, due to the abruptness of the inner side of the locking projection which cooperates with the adjacent stop element to lock the slider. Thus, it will be seen that the slider may be moved in one direction along the fastener track to any selected point of adjustment and is prevented from moving in the opposite direction due to the action of the locking member. Of course, the locking projection **26** could be constructed and arranged so as to lock the slider against movement in either direction, if desired.

When it is desired to move the slider along the track by means of the pull member **28**, the pull is lifted from its extended position at either end of the slider so as to be disposed substantially perpendicular to the slider body and the track, as shown in Fig. 2*a* of the drawings. In moving the pull to such position, it will be seen that the cam portion **30** of the pivotal portion **29** thereof cooperates with the arm-like portions **25** of the locking member **22**, thereby moving the locking arm about its pivotal connection at **23** and the locking projection **26** carried thereby out of the channel of the slider body and, of course, out of engagement with the stop elements disposed therein. It will be seen now that the slider is unlocked and free to move in either direction along the track. If it is desired again to lock the slider, the pull member is moved about its pivotal connection toward the slider body and when the pull reaches an angle in the vicinity of 45 degrees, it will tend to be snapped downwardly against the slider substantially parallel thereto and to the track, as shown in Fig. 2 of the drawings. After the pull member is released and assumes such inoperative position against the slider, it will be seen that the locking member **22** is moved about its pivotal connection at **23**, due to the action of the leaf-like spring portion **33** of the spring **31**, thereby moving the locking projection **26** again into the channel of the slider and in engagement with the stop elements disposed therein. It will be understood that the pull member is constructed and arranged with respect to the slider body so that it can be arranged in extended position to

either end thereof substantially flat against the slider body.

It will be seen that the arm-like portions 25 of the locking member 22 rest at all times upon the pivotal portion 29 and the cam portion 30 of the pull member. In other words, the arm-like members 25 act as followers for the cam 30 throughout the manipulation of the pull member 28. It is the dual purpose of the leaf-like spring portion 33 of the spring 31, to urge and maintain the locking projection 26 in extended position in the channel of the slider body and to maintain the arm-like members 25 in contact with the cam portion 30 of the pull member.

If desired, the tab portion 28' of the pull member 28 may be offset from the pivotal portion 29 thereof as shown in Fig. 3 of the drawings, so that the tab portion will cover the extended portion 38 of the slider body and, at the same time, not interfere with the locking action thereof.

As a result of my invention, it will be seen that there is provided a slider for adjustable fasteners which is so constructed and arranged that all of the operable parts are entirely enclosed so as to prevent foreign elements from interfering with the action thereof. In addition, it will be seen that there is provided a slider which is relatively narrow and neat appearing. It will be seen also that my improved slider is not only adaptable for use with the type of track disclosed in my aforementioned co-pending application, but can also be used with other types of track of a similar construction.

While I have shown and described one embodiment which my invention may assume in practice, it will be understood that this embodiment is merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention as defined in the appended claims.

What I claim as my invention is:

1. A slider for an adjustable fastener of the class described comprising a body member having a channel for slidably receiving the track of said fastener, a locking member loosely pivoted on one end of said body member, said locking member having an arm-like portion extending toward the center of said body member, a locking projection carried by said locking member between said pivotal connection and said arm-like portion which extends normally through a recess in said body member into the channel thereof for preventing movement of the slider in one direction along the track and permitting the slider to move freely in the opposite direction therealong, a pull member having a pivotal portion and a tab portion, said pivotal portion being positioned transversely and centrally of said body member and disposed between said body member and the arm-like portion of said locking member, a cam portion carried by the pivotal portion of said pull member for moving the locking member about its pivotal connection and the locking projection out of said slider channel to unlocked position, resilient means mounted in the opposite end of said body member which cooperates with said locking member for maintaining the arm-like portion thereof against the pivotal portion of said pull member and for urging the locking projection into the channel of said body member, and a cap member attached to said body member enclosing and holding the locking member, the pivotal portion of said pull member and the resilient means in their operative positions.

2. A slider for an adjustable fastener, as defined in claim 1, including yieldable means for urging and maintaining the pull member against the body member substantially parallel thereto and in inoperative position when said pull member is extended in either longitudinal direction from said body member.

3. A slider for an adjustable fastener of the class described comprising a body member having a channel for slidably receiving the track of said fastener, a locking member loosely pivoted on one end of said body member, said locking member having an arm-like portion extending toward the center of said body member, a locking projection carried by said locking member between said pivotal connection and said arm-like portion which extends normally through a recess in said body member into the channel thereof for preventing movement of the slider in one direction along the track and permitting the slider to move in the opposite direction therealong, a pull member having a pivotal portion and a tab portion, said pivotal portion being positioned on said body member transversely and centrally thereof and disposed between said body member and the arm-like portion of said locking member, a cam portion carried by the pivotal portion of said pull member for moving the locking member about its pivotal connection and the locking projection out of said channel to unlocked position, a spring member mounted loosely on the opposite end of said body member, said spring being split centrally thereof so as to provide two leaf-like portions extending toward the center of said body member, one of said leaf-life portions cooperating with the locking member for the dual purpose of maintaining the arm-like portion of said locking member against the pivotal portion of said pull member and for urging the locking projection into the channel of said body member, the other of said leaf-like portions cooperating with the cam means of the pivotal portion of said pull member for urging and maintaining the same in inoperative position against the body member substantially parallel thereto when said pull member is disposed in either direction, and a cap member attached to said body member enclosing and holding the locking member, the pivotal portion of said pull and said spring member in their operative positions.

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