July 7, 1931. G. W. BLAIR 1,813,227

SLIDER

Filed April 3, 1926

Fig. 1.

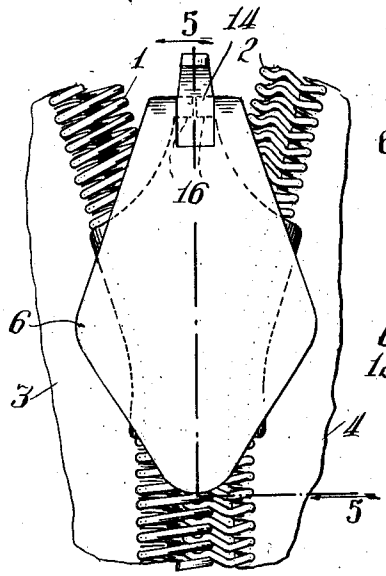


Fig. 3.

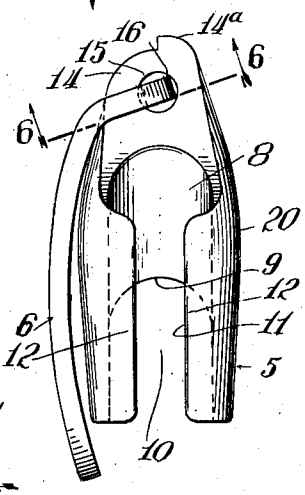


Fig. 5.

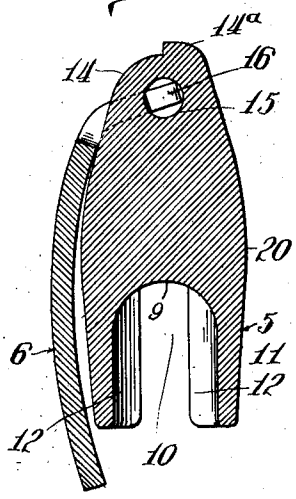


Fig. 2.

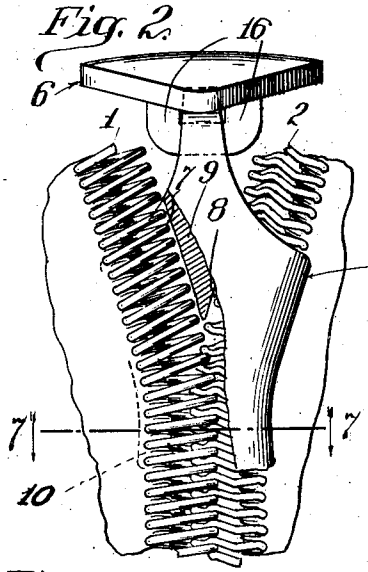


Fig. 4.

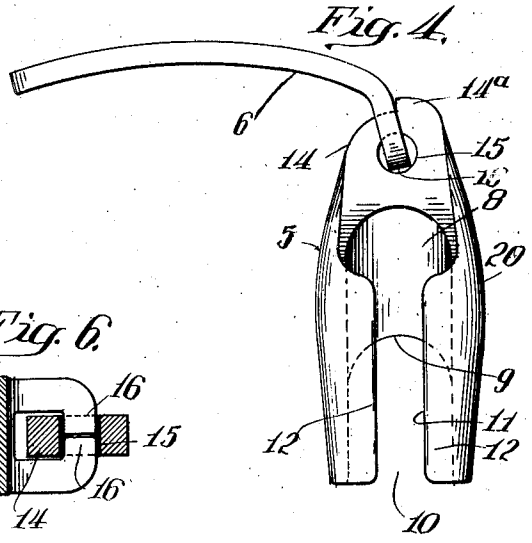


Fig. 6.

Fig. 7.

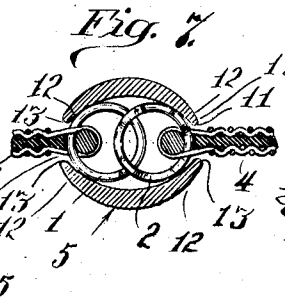
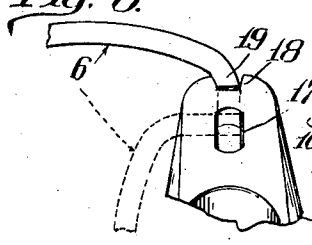


Fig. 8.



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Patented July 7, 1931 1,813,227

UNITED STATES PATENT OFFICE

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SLIDER

Application filed April 3, 1926. Serial No. 99,446.

My invention has reference more particularly to operating members which slide along opposed series of fastener elements and interlock the opposed series of elements by movement in one direction and release the elements by movement in the reverse direction.

In sliders or operating members of this character, it is necessary to construct the member so that it is strong and rigid and it is at the same time desirable that it be small and compact. It is also important to provide a finger grip for actuating the slider which is arranged so as to push and pull the slider without tilting or cramping on the elements and to form the finger grip and attach same so that projections are not required on the outer face of the slider body and so that the finger grip fits close against the slider body.

The principal objects of my invention are to construct the slider body in a neat and compact form; to insure ample strength and rigidity; to arrange the finger grip so that it properly controls the slider in both directions of movement; to prevent tilting and cramping of the slider on the series of fastener elements as it is operated therealong; to attach the finger grip so that the operating force is applied to the slider between the divergent portions of the two series of fastener elements; to permit any guiding of the slider that may be required to facilitate the operation of interlocking or releasing the fastener elements; to arrange the finger grip so that it folds close against the outer face of the slider when not in use; to permit use of the finger grip as a lever to tilt or guide the slider along the series of fastener elements; to automatically lock the finger pull in the outwardly extending or slider actuating position; and in general to simplify, improve and facilitate the manufacture of sliders or operating members for slider operated fasteners.

On the drawings:

Fig. 1 is a front view of my slider, showing portions of the two opposed series of fastener elements controlled thereby and with the finger grip lying against the front of the slider body;

Fig. 2 is a similar view showing the finger grip raised to the operating position and portions of the slider body broken away to disclose details;

Fig. 3 is a side view of the slider with the finger grip in the position of Fig. 1;

Fig. 4 is a similar view with the finger pull raised to the position of Fig. 2;

Fig. 5 is a sectional view of the complete slider on the line 5—5 of Fig. 1;

Fig. 6 is a detail sectional view on the line 6—6 of Fig. 3;

Fig. 7 is a detail sectional view on the line 7—7 of Fig. 2; and

Fig. 8 is a fragmentary side view of the upper end or pivot lug of the slider showing a modification.

Referring to the drawings, the reference numerals 1 and 2 indicate two opposed series of fastener elements which are, for the purpose of illustration, shown herein in the form of coils of spiral springs arranged so that the coils of one spring enter or nest between the coils of the other spring, the coils of one of the springs being plain convolutions as indicated at 1, while the coils of the other spring 2 are of wave-like form to afford offset or somewhat flat hook formations which serve to insure a dependable interlocking of the coils 2 between the coils 1. The springs 1 and 2 are mounted in any convenient manner on the parts which are to be connected, fragmentary portions thereof being indicated at 3 and 4.

The slider which serves to interlock the coils of the springs 1 and 2 in the usual manner by movement in one direction along the springs and to release same by movement in the reverse direction, consists of two parts, namely the slider body 5 and the finger grip or actuating means 6 which is usually grasped between the thumb and a finger of the operator to push or pull the slider body along the opposed springs 1 and 2.

The slider body 5 is preferably an integral piece of material such as a casting and is formed with divergent channels 7 and 8 between the front and rear walls of the slider and at opposite sides of the wedge shaped spreader 9 and the wedge or V-shaped spreader or wall 9 being flared toward and merged into the front and rear walls of the

slider to form channels that are circular in cross section to conform to the form of the springs 1 and 2, or they may be of other form when other fastener elements are used, and these channels 7 and 8 merge into a single main channel 10 at the lower end or apex of the spreader 9, said latter channel being widened out laterally as required to accommodate the interlocked springs 1 and 2. At each side of the slider body the channel 10 and branches 7 and 8 thereof have a contracted opening or slot 11, which straddles the edge of the respective part 3 or 4 to which the respective springs are attached, these contracted slots or openings being formed by inwardly extending edge portions 12 of the front and rear walls of the channels, said edge portions engaging against the rear sides of the springs 1 and 2 at opposite sides of the parts 3 and 4 for guiding the springs through the channels.

The formation of the inturned edge portions 12 at the time the slider body is made is somewhat difficult and I prefer therefore to construct the slider body initially with the edge portions 12 extending straight out and their inner faces substantially parallel as in my application Serial No. 44,638, filed July 18, 1925, and thereafter bend the edges in the required position as shown herein.

The parts 3 and 4 are usually of fabric or some material which is not highly resistant to wear, and the cast or molded form of slider body is preferred as the edges of the inturned portions at opposite sides of the parts 3 and 4 may be rounded smoothly without difficulty, as indicated at 13, in manufacturing so as to minimize any possible wear on the parts 3 and 4, whereas such rounded edges cannot be readily provided in a slider which is composed of parts stamped from sheet metal. Moreover, the cast form of slider body lends itself more readily to the shaping of same in a neat, compact and symmetrical form, and it is possible to distribute the metal so as to insure properly located and adequate reinforcing without irregular or abrupt formations on the exterior surfaces or without necessitating a cumbersome structure to afford the desired strength and rigidity.

The slider body is extended beyond and between the upper ends of the divergent channels 7 and 8 in the form of a narrow lug 14 with a transverse aperture 15 to receive the inturned ends 16 of arms at the upper end of the finger grip 6 which is bifurcated at the upper end to form said arms, and these inturned ends 16 serve to pivotally attach the finger grip 6 to the slider body. The finger grip 6 may comprise a plate of suitable rigidity and may be of any desired form, preferably widened out between the ends and somewhat close to the lower end where the finger and thumb naturally grasp same, and has the upper end reduced so that a long lug 14 is not required and so that the portion thereof between the divergent springs 1 and 2 will not interfere with the said springs.

The slider body 5 is moved in opposite directions respectively to interlock and release the fasteners, and it is important that the finger grip 6 should be attached so as to insure smooth operation of the slider body without bending or cramping on the fastener elements. The pivot aperture 15 is therefore located substantially in a plane passing through the axes of the divergent channels 7 and 8, or approximately midway between the front and back of the slider, and the upper end of the finger grip 6 is inturned so that the said finger grip folds down against the outer face of the slider body in the inoperative position and may be lifted outwardly to an outwardly extending position as shown in Figs. 2 and 4 when the slider is to be operated to interlock or release the fastener. With this construction the operating force is applied through the finger grip to the slider in or quite near to the plane of resistance to movement of the slider and the latter is thereby caused to move smoothly and freely along the fastener elements without cramping or bending, which would occur if the finger grip were attached to the outer face of the slider or at a point considerably at one side of the plane of the channels 7 and 8. In such structures, an endwise tilting of the slider body results when operating force is applied to the finger grip, whereas it is obvious that such tilting or canting of the slider is avoided in my present construction. With this present construction a neater and more compact form also results as the finger grip 6, by reason of its manner of attachment, can fold down close against the front of the slider body giving an entirely smooth front devoid of any projections or irregularities which necessarily result if the finger grip is pivoted to the front face of the slider body. In my present construction the front face of the slider body is bellied or convex as shown in Figs. 3, 4 and 5 and the finger grip 6 is correspondingly curved or arched from end to end to conform to the front of the slider body.

In the movement of the slider to interlock the fastener elements 1 and 2, the finger grip 6 pulls the slider body and the latter naturally trails along, adjusting itself to the necessary course of movement. In the releasing operation, however, the slider body is pushed by the finger grip and in some cases, for example, in overshoes, when the fastener is more or less bent at the front of the ankle or instep, it may be desirable to have the finger grip arranged so as to be able to steer the slider around the bend. For this purpose the pivot lug 14 may be formed with a

stop 14ª against which the finger grip 6 contacts in the operating position so that the finger grip may be used as a lever to swing the lower end of the slider body outwardly if it should be necessary or desirable.

If a further interlocking of the finger grip with the slider body is desired to afford a leverage for rocking the slider in either direction when pushing the slider downwardly, a construction such as shown in Fig. 8 may be employed, wherein the pivot opening 17 is elongated slightly in the direction of the length of the slider body to form a short slot, in which inturned pivoting ends 16 of the pull member 6 are shiftable lengthwise of the slotted opening 17. The upper end of the lug 14 is notched as at 18, so that the portion of the inturned lip 19 at the upper end of the finger grip 6 between the pivot arms of the finger grip will seat in the notch 18 when the finger grip is turned to the outstretched position as shown in full lines in Fig. 8, and pushed downwardly. The inturned pivots 16 of the finger grip slide upwardly in the slot 17 to permit the lip 19 to ride up over the upper end of the lug 14 and when this lip registers with the notch 18, the downward push on the finger grip moves the inturned pivots 16 downwardly in the slot 17, and permit the lip 19 to enter the notch 18. Thus the finger grip when raised to the outstretched position and pushed downwardly, automatically engages in the notch 18 and holds the finger pull against pivotal movement on the upper end of the slider body while pushing the latter downwardly.

Moreover, the slider body 5 has the rear face bellied intermediate of its ends or convexly formed and this not only serves to reinforce the slider body but it also affords a high point 20 to minimize friction of the slider against any backing strip such as the tongue in overshoes, and causes the slider to operate very easily. This raised center 20 also serves in a measure as a fulcrum to permit the slider body to rock automatically as may be required to follow the course of the fastener elements and furthermore, since the finger grip 6 is attached near the end of the slider body, the rocking may be manually controlled by pushing in or pulling out in the finger grip which will cause the slider body to rock somewhat on the high center 20.

With this construction I have not only arranged for the application of the operating force at the proper point, that is, in or near to the plane of the axes of the channels 7 and 8 so as to avoid undesirable tilting or canting of the slider and consequent cramping and binding on the fastener elements, but I have rendered the slider easier of operation by reducing the frictional engagement and furthermore, have arranged for manual control of the slider so that it may be readily guided or steered as may be required, so that it will operate freely along the series of fastener elements without any possibility of interference.

While I have shown and described my invention in a preferred form, I am aware that various changes and modifications may be made without departing from the principles of my invention, the scope of which is to be determined by the appended claims.

I claim as my invention:

1. An operating member for a fastening device of the class described, said member comprising a substantially wedge shaped spreader with flanges extending outwardly therefrom to form divergent channels merging into a single channel, said flanges being gradually increased in thickness from the edges to the spreader for reinforcing said flanges against separating strain.

2. An operating member for a fastening device of the class described, said member comprising front and rear wings integral with an intermediate spacer and forming a pair of divergent channels at opposite sides of the spacer and meeting in a single channel at the end of the spacer, said wings being gradually increased in thickness from the edges to the spacer for reinforcing said wings against separating strain.

3. An operating member for a fastening device of the class described, said member comprising a substantially wedge shaped spreader with top and bottom flanges extending outwardly therefrom to form divergent channels merging into a single channel, said spreader having concave faces at opposite sides forming a continuation of the curved inner faces of the flanges and the flanges being of gradually increased thickness from the edges to the spreader for reinforcing said flanges against separating strain.

4. An operating member for a fastening device of the class described, said member comprising an integral block with front and rear faces convexly arched from end to end and from side to side and having a pair of divergent channels therein meeting in a common channel at one end of the member, and a substantially V-shaped wall separating the divergent channels, said convexly arched front and rear faces each having the apex of its arch substantially midway between the upper and lower ends of the member.

5. An operating member for a fastening device of the class described, said member comprising a unitary block having the front face convexly arched from end to end and an arched pull member pivoted at one end of the operating member to overlie the front face of the latter and corresponding substantially to the curvature of the front face of the operating member.

6. In a slider for interlocking and releasing opposed series of fastener elements, the combination of a member having a main chan-

nel and divergent branches with restricted openings along the outer sides, said member having an extension at the end remote from the main channel and being bellied at opposite sides from end to end, and a finger grip pivoted at one end to said extension on a transverse axis substantially in the plane of the axes of the divergent branch channels, said finger grip comprising a plate adapted to hang down against the front face of the member and arched to conform substantially to the bellied form of the front of the member.

7. An operating member for a fastening device of the class described, said member comprising a one piece block having a pair of flanges at the front and back respectively extending outwardly at each side and at one end and defining a pair of divergent channels merging into a single channel at said end, the outer portions of said side flanges extending inwardly toward one another with their inner edges spaced to form a restricted slot at the outer side of each divergent channel, and said flanges being gradually increased in thickness from the lateral edges to the center of the slider.

8. In a slider for interlocking and releasing opposed series of fastener elements, the combination of a member having a main channel and divergent branches with restricted openings along the outer sides, and a finger grip pivoted at its end to the member between the divergent branch channels and on an axis substantially in the plane of the axes of the divergent channels, and means for limiting the pivotal movement of the finger grip when the latter is swung to a position projecting outwardly from the member.

9. In a slider for interlocking and releasing opposed series of fastener elements, the combination of a member having a main channel and divergent branches with restricted openings along the outer sides, and a finger grip pivoted at its end to the member between the divergent branch channels and on an axis substantially in the plane of the axes of the divergent channels, and a stop adapted to be engaged by the finger grip when the latter is swung outwardly from the member.

10. In a slider for interlocking and releasing opposed series of fastener elements, the combination of a member having a main channel and divergent branches with restricted openings along the outer sides, a finger grip pivoted to the member for sliding the latter along the series of fastener elements, and interlocking means on the member and finger grip for holding the latter in an outwardly extending position at the front of the member.

11. In a slider for interlocking and releasing opposed series of fastener elements, the combination of a member having a main channel and divergent branches with restricted openings along the outer sides, a finger grip pivoted to the member, and interengaging means on the finger grip and member operable by pressure on the former to lock the finger grip in an outstanding position on said member.

12. In a slider for interlocking and releasing opposed series of fastener elements, the combination of a member having a main channel and divergent branches with restricted openings along the outer sides, a finger grip pivoted to the member for sliding the latter along the series of fastener elements, and means for interlocking the finger grip with the member against relative pivotal movement with the finger grip in a position extending outwardly from the front of the member, said finger grip being interlocked with the member in said position by pressure on the finger grip in a direction to slide the member along the series of elements.

13. In an operating member for a fastening device of the class described, the combination of a cast body with recesses at opposite sides between the top and bottom faces to form channels intersecting at one end of the body and diverging at the other end thereof, said channels being separated at the latter end of the body by a solid V-shaped wall which tapers toward the intersecting ends of the channels and unites the portions of the body above and below the channels and the portions of the body above and below the channels being gradually decreased in thickness from the V-shaped wall to the outer sides of the channels, and a finger pull having a pivotal connection with the said body.

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