Aug. 14, 1928.

1,680,362

R. H. BINNS

FLEXIBLE CLOSURE

Filed Feb. 18, 1925

Fig. 1.

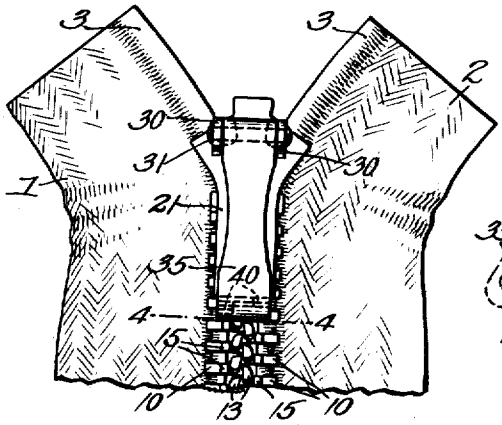


Fig. 2.

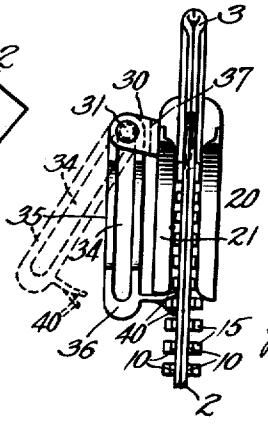


Fig. 3.

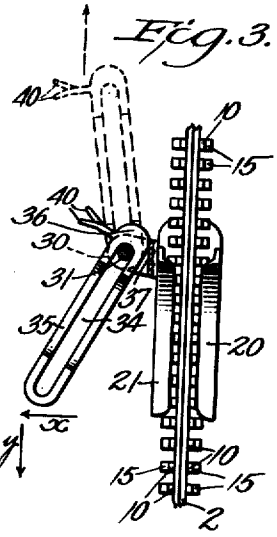


Fig. 4.

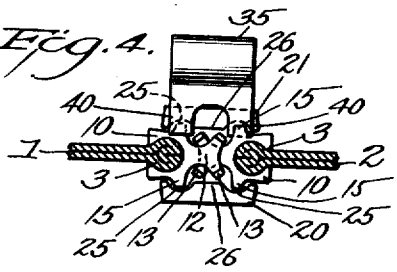


Fig. 5

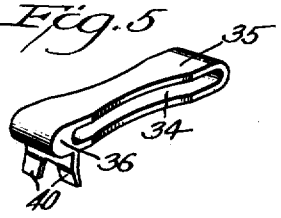


Fig. 6.

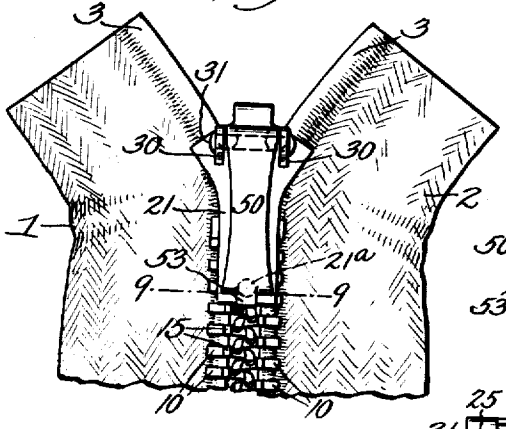


Fig. 7.

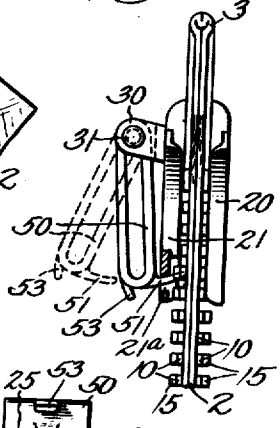


Fig. 8.

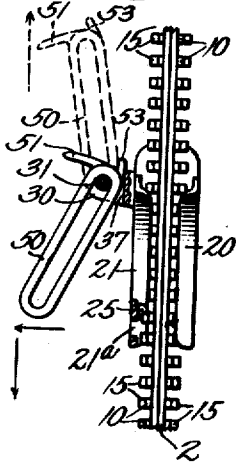
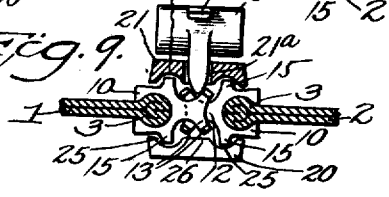


Fig. 9.



WITNESS

Oliver W. Holmes

INVENTOR

RALPH H. BINNS

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ATTORNEYS

Patented Aug. 14, 1928. 1,680,362

UNITED STATES PATENT OFFICE.

RALPH H. BINNS, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR OF TWO-SEVENTHS TO EDWARD H. BINNS, OF PITTSBURGH, PENNSYLVANIA.

FLEXIBLE CLOSURE.

Application filed February 18, 1925. Serial No. 10,074.

The present invention relates to an improved form of pull member or operating device for the cam slider for flexible closures of the type in which flexible stringers carry spaced interlocking devices controlled by the movement of the slider which embraces said devices.

The main purpose of the present invention is to so improve the operating pull member that it can effectively move the slider either upwardly or downwardly from a single point of attachment. The pull member is made in the form of a slotted link which engages a pin carried by ears or lugs upon the slider body, so that the link can project from the pin in either direction. The slotted pull member is formed with a heel or projection that is adapted to engage the slider in one position to limit the angular movement of the pull member and thereby afford a leverage control of the position of the slider in its movement in one direction upon the fastening devices. The connecting pull pin may be attached to the slider at either end or between the ends, but is preferably mounted adjacent to one end. The slotted pull member is preferably reversible, so as to afford a direct pull in moving the slider in one direction and an angularly controlled pull in the opposite direction. The reversible pull member is preferably provided with a locking detent arranged to engage parts of the interlocking fastening devices in their interlocked position.

In order that the invention may be fully understood it will first be described with reference to the accompanying drawings and afterwards more particularly pointed out in the annexed claims.

In said drawings—

Fig. 1 is a front elevation of a portion of a flexible closure embodying the present invention;

Fig. 2 is a detail side elevation of the same;

Fig. 3 is a similar view showing the pull member in reversed position;

Fig. 4 is a detail transverse sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a detail perspective view of the improved reversible slotted link pull member detached from the slider;

Fig. 6 is a view similar to Fig. 1 showing a slight modification;

Figs. 7 and 8 are views similar to Figs. 2 and 3, respectively, showing the modified form of pull member; and

Fig. 9 is a view similar to Fig. 4 illustrating the modified form of pull member taken on line 9—9 of Fig. 6.

In the type of flexible closure to which the present invention relates, two flexible strips or stringers 1, 2 are formed at their inner edges with beads or thickened portions 3 upon which are secured interlocking fastening devices.

Each interlocking fastening device is preferably formed with a U-shaped yoke 10 embracing and compressed upon the beaded or thickened edge 3 of a flexible stringer, a narrow neck 12, a forked hook 13, and the opposite riding lugs or shoulders 15. The specific form and operation of the fastening devices of the preferred construction will be more fully understood by reference to the application of Binns, Binns and De Hart, filed July 5th, 1924, Serial No. 724,355.

The operating cam slider is preferably constructed as set forth in the above named application of a back-plate 20 and a fore-plate 21 mounted in spaced relation upon a binder post not shown. The inner faces of the back-plate and fore-plate are provided with controlling grooves 25 separated by a central guide rib 26. The riding lugs 15 of the fastening devices operate in the controlling grooves 25.

The fore-plate 21 of the slider is formed adjacent to one end with the outwardly presented ears or lugs 30 carrying the transverse pull pin 31, which passes through the slot 34 of the link form of pull member 35. This link pull member 35 is elongated and slotted from end to end, so that it can be shifted to project upwardly or downwardly from the pull pin 31 and can be reversed by turning it upon the pin in the manner presently to be explained.

In the normal locked position of the link pull member 35, as shown in Figs. 1 and 2 of the drawings, it will be observed that the locking detents 40 project inwardly across the lower edge of the slider fore-plate 21 and engage the staggered riding lugs 15 of adjacent fastening devices. It will be noted that these locking detents 40 are presented in parallel transverse planes, that is, are staggered with relation to each other so

as to effectively engage the alternating or zigzag fastening devices as clearly shown in the drawings.

It will be noted that the pull member 35 is formed with a thickened wall 36 at one end which in effect produces a heel or projection which acts as a thumb piece for moving the detents 40 into and out of locked position (Figure 2), and as a fulcrum heel when the pull member is reversed into the position shown in full lines in Figure 3. This combined thumb piece and fulcrum or stop 36 extends slightly beyond the pull pin 31 when the pull member is reversed from the position shown in full lines in Fig. 2 to the position shown in full lines in Fig. 3. In reversing the pull member in this way, it will be understood that the pull member is moved outwardly on the pin 31 as a pivot by outward pressure on member 36 passing through the dotted position shown in Fig. 2 to the dotted position shown in Fig. 3 and then slid longitudinally upon pin 31 to bring it into the position shown in full lines in Fig. 3. In this latter position of the pull member, it will be observed that the heel or enlargement 36 engages the face of fore-plate 21, or the raised surface 37 upon the fore-plate, so that the pressure outwardly in the direction indicated by arrow x in Fig. 3 affords a positive leverage hold upon the slider through the pull pin 31 and fulcrum heel 36, by which the angular position of the slider upon the stringers of fastening devices can be accurately controlled as the slider is moved downwardly in the direction of arrow y by the downward pressure, combined with the stated outward pull. This action produces an easy unlocking movement of the slider, because it prevents the objectionable digging in or slight inward projection of the lower end of the slider, which would be induced by pulling the slider downwardly from the attachment at the upper end of the slider.

In moving the slider upwardly the pull member 35 is moved into the position shown in dotted lines in Fig. 3 to give it a direct upward pull upon the pin 31.

In Figs. 6 to 9, I have shown the slightly modified form of link pull member for the operating slider. In this form of the device, the link pull member 50 is mounted upon a pull pin 31 in exactly the same way as above described with reference to the preferred form. This modified link pull member is a shorter link than the preferred form and is formed at one end with a central inwardly projecting prong or detent 51, which is arranged to extend through an opening 21^a of the slider fore-plate and engage in a recess between adjacent interlocked fastening edvices as shown particularly in Fig. 9.

The pull link 50 is also provided with a projecting lug or heel 53 at the end of the link above the prong 51, which member 53 acts as a thumb piece for moving the detent 51 into and out of locked position and as a fulcrum heel or extension when the link is reversed from the position shown in full lines in Fig. 7 through the dotted positions shown in Figs. 7 and 8 into the position shown in full lines in Fig. 8. The operation of the device with the modified form of link pull member is substantially the same as above described in connection with the preferred form.

I claim:

1. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member mounted upon said slider and movable thereon upon an axis transverse to the movement of the slider, said pull member having means limiting its angular movement upon said slider, whereby leverage control of the slider is provided.

2. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member pivotally mounted upon said slider on an axis transverse to the slider movement, and a fulcrum heel or projection on the pull member in position to engage the slider and limit the angular movement of the pull member to afford leverage control of the slider in its movement over the fastening devices.

3. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member having pivotal connection with said slider adjacent to one end of the slider and on an axis transverse to the slider movement, said pull member being formed with a fulcrum heel or projection adjacent to its pivot end in position to engage the slider and limit the angular movement of the pull member upon the slider, and afford leverage control of the slider as it is moved upon the fastening devices by the pull member.

4. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member in the form of a link having an elongated slot and a pin carried by the slider and extending through the slot of said link pull member and forming a slidable connection therefor.

5. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member in the form of a link having an elongated slot and a fulcrum heel or enlargement at one end, and a pin mounted upon said slider and extending through and engaging said slotted link pull member, the pull member being thereby slidably mounted upon the slider and having its angular movement upon the slider pin limited by the engagement of said fulcrum heel with the slider.

6. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a link pull member having pin and slot connection with said slider, and a locking detent upon said pull member in position to engage interlocked fastening devices.

7. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a link pull member formed with an elongated slot, and a pin upon said slider adjacent to one end extending through the slot of said link pull member, and forming a slidable mounting therefor, said pull member being angularly and reversibly movable upon said pin.

8. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a slotted link pull member formed with a fulcrum heel or enlargement at one end, and a pull pin mounted upon said slider and extending through the slot of said link pull member, said pull member having slidable connection with said pin and being thereby reversibly mounted and angularly movable upon said slider.

9. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member reversibly connected with said slider and having a projecting heel or lug acting as a stop in one position and a thumb piece in another position.

10. In a flexible closure or fastener, the combination with flexible stringers carrying spaced interlocking fastening devices formed with riding lugs or shoulders, said fastening devices alternating or zigzagging in their interlocked position, and an operating slider formed with internal controlling grooves engaging said riding lugs or shoulders, with a link pull member movably mounted upon said slider and formed with staggered inwardly projecting locking detents adapted to engage riding lugs of adjacent interlocked fastening devices.

11. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, said slider being provided with outwardly presented ears or lugs, a pull pin member mounted upon said ears or lugs, and a reversible pull member having an elongated slot and slidably engaging said pull pin.

12. A slider for separable fasteners of the class described said slider having a pull device pivoted thereto to swing freely about an axis transverse to the path of movement of the slider, said pull device being provided with a stop element engageable with a fixed part of the slider to limit swing of the pull device in one direction.

RALPH H. BINNS.

CERTIFICATE OF CORRECTION.

Patent No. 1, 680,362. **Granted August 14, 1928, to**

RALPH H. BINNS.

It is hereby certified that the above numbered patent was erroneously issued to the inventor and Edward H. Binns, as assignee of two sevenths interest in said invention, whereas said Edward H. Binns should have appeared as owner of five sevenths interest, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of September, A. D. 1928.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

5. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a pull member in the form of a link having an elongated slot and a fulcrum heel or enlargement at one end, and a pin mounted upon said slider and extending through and engaging said slotted link pull member, the pull member being thereby slidably mounted upon the slider and having its angular movement upon the slider pin limited by the engagement of said fulcrum heel with the slider.

6. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a link pull member having pin and slot connection with said slider, and a locking detent upon said pull member in position to engage interlocked fastening devices.

7. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a link pull member formed with an elongated slot, and a pin upon said slider adjacent to one end extending through the slot of said link pull member, and forming a slidable mounting therefor, said pull member being angularly and reversibly movable upon said pin.

8. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, with a slotted link pull member formed with a fulcrum heel or enlargement at one end, and a pull pin mounted upon said slider and extending through the slot of said link pull member, said pull member having slidable connection with said pin and being thereby reversibly mounted and angularly movable upon said slider.

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10. In a flexible closure or fastener, the combination with flexible stringers carrying spaced interlocking fastening devices formed with riding lugs or shoulders, said fastening devices alternating or zigzagging in their interlocked position, and an operating slider formed with internal controlling grooves engaging said riding lugs or shoulders, with a link pull member movably mounted upon said slider and formed with staggered inwardly projecting locking detents adapted to engage riding lugs of adjacent interlocked fastening devices.

11. In a flexible closure or fastener, the combination of flexible strips or stringers having spaced interlocking fastening devices, and a slider embracing and sliding upon said fastening devices for interlocking and unlocking them, said slider being provided with outwardly presented ears or lugs, a pull pin member mounted upon said ears or lugs, and a reversible pull member having an elongated slot and slidably engaging said pull pin.

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(Seal)