Nov. 12, 1929. H. A. SALLEY 1,735,620

SEPARABLE FASTENER

Filed May 14, 1929

Fig. 1.

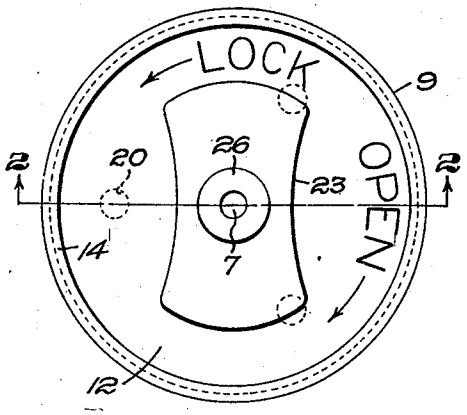


Fig. 2.

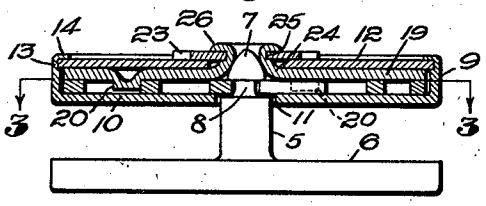


Fig. 3.

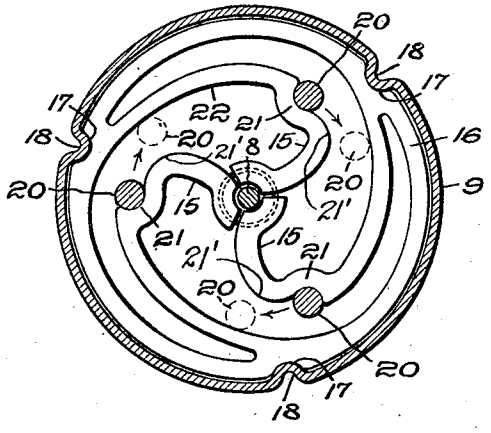
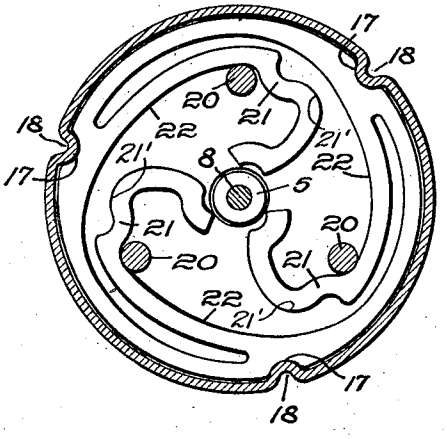


Fig. 4.



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SEPARABLE FASTENER

Application filed May 14, 1929. Serial No. 362,994.

This invention relates to separable fasteners of the class in which one of the separable parts comprises a stud, and the other means which clasps about and interengages with the stud to retain the two parts in their assembled relationship.

The invention aims to provide a compact fastener suitable for fastening buttons and emblems to garments, and for other uses, and to provide a fastener which shall be positive in its action, so that there shall be no accidental separation of the parts.

The invention will be best understood by reference to the following description, when taken in connection with the accompanying drawings of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is an elevation of a separable fastener exemplifying the invention;

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

Fig. 3 is a sectional view on line 3—3 of Fig. 2, showing the parts in their normal position—that is to say, locked; and

Fig. 4 is a similar sectional view, showing the parts as they appear when unlocked.

Referring to the drawings, and to the embodiment of the invention which is illustrated therein, there is shown a separable fastener comprising a stud 5, which may be attached to an appropriate base 6, such as a button. The stud is provided with a head 7, and is grooved to present a neck 8. The head has a rounded point to enable it to enter the other part easily. The other part comprises a shallow, cup-like casing 9, having a wall 10 provided with a central opening 11, which receives the stud. The casing is provided with a cover, herein a disk or plate 12, conveniently secured to the body of the casing, as by providing the latter with an annular groove 13 for the margin of the cover, the latter being secured in place by providing the body with an inwardly-directed flange 14, overlying the outer face of the margin of the cover. After the parts are assembled, this flange is pressed or spun down into the position shown in Fig. 2.

Referring now to Fig. 3, the stud is normally locked by means interlocking therewith, comprising a plurality of spring arms 15, herein conveniently formed as integral parts of a disk or plate 16, conveniently held against rotation in the casing, as by providing the plate with one or more notches 17 to receive projections 18 formed by squeezing the circumferential wall of the casing into the notches.

The arms are actuated by rotary actuating means, herein a disk or plate 19 (see Fig. 2), interposed between the plates 12 and 16, and presenting a plurality of actuators, herein bosses 20, which are normally engaged with the respective arms 15 to hold the latter positively in interlocking engagement with the stud. This is conveniently accomplished by providing each of the arms with a concave seat 21 to receive one of the bosses. Before the boss reaches the depression it has to ride over a slight hump 21′ and thus spring the arm very slightly before the boss can enter the depression. Conversely, the boss has to ride over this hump and thus spring the arm before the latter can be unlocked. The arms also present cam-paths 22, appropriately formed for cooperation with the bosses 20, so that when the actuating plate is rotated clockwise, as viewed in Figs. 1 and 3, from the position shown in Fig. 3 to the position shown in Fig. 4, the bosses will ride up inclines presented by the cam-paths, and will force the arms out of engagement with the stud. The arms will then be locked in this position until the actuating plate is rotated in the opposite direction. When the arms are thus retracted, the stud may be withdrawn from the casing.

Thus it is evident that the fastener is positively locked and unlocked by the rotation of the actuating plate, and that when the stud is locked in place, accidental separation of the parts is impossible. Rotation of the actuating plate is conveniently accomplished by providing on its outer face an appropriately-shaped finger-piece 23, conveniently secured to the plate, as by providing the latter with an integral, hollow boss 24, shouldered as at 25 to receive the finger-piece, and flanged over

as at 26 to secure the finger-piece fixedly to the plate. This hollow boss, by the way, provides a space to receive the head 7, and this construction contributes in constituting an extremely shallow, compact fastener.

To indicate the proper direction in which the locking plate should be turned to lock and unlock the fastener, the cover may be inscribed with suitable words and arrows, as shown in Fig. 1.

Having thus described one embodiment of the invention, but without limiting myself thereto, what I claim and desire by Letters Patent to secure is:

1. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising stud-locking means interlocking with said stud, and rotary actuating means to cause said stud-locking means to move into and out of interlocking engagement with said stud, said stud-locking means having provision for cooperating with said actuating means to utilize the latter to lock said stud-locking means positively in such interlocking engagement.

2. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising a plurality of stud-locking, spring arms interlocking with said stud, and rotary actuating means to cause said stud-locking arms to move into and out of interlocking engagement with said stud, said stud-locking means having provision for cooperating with said actuating means to utilize the latter to lock said stud-locking means positively in such interlocking engagement.

3. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising a plate presenting a plurality of stud-locking, spring arms interlocking with said stud, and rotary actuating means to cause said stud-locking arms to move into and out of interlocking engagement with said stud, said stud-locking means having provision for cooperating with said actuating means to utilize the latter to lock said stud-locking means positively in such interlocking engagement.

4. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising a plurality of stud-locking arms interlocking with said stud, and rotary actuating means comprising a plurality of actuators each of which, when moved in one direction, moves one arm out of engagement with said stud, and when moved in the opposite direction locks another arm in interlocking engagement with said stud.

5. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising a plurality of stud-locking arms interlocking with said stud, and a rotary actuating plate presenting a plurality of bosses each of which, when moved by the rotation of said plate in one direction, moves one arm out of engagement with said stud, and when moved in the opposite direction locks another arm in interlocking engagement with said stud.

6. In a separable fastener, the combination of a stud having a head and a neck, a casing having an aperture through which said stud extends into said casing, stud-retaining means housed in said casing, and rotary actuating means to move said retaining means toward and from said neck, said stud-retaining means having provision for cooperating with said actuating means to utilize the latter to lock said stud-retaining means in its normal position.

7. In a separable fastener, the combination of a stud having a head and a neck, a casing having an aperture through which said stud extends into said casing, stud-retaining means housed in said casing, and rotary actuating and locking means to move said retaining means toward said neck and to lock the said means adjacent thereto, and to move said retaining means from said neck and to lock the same in its retracted position.

8. In a separable fastener, the combination of a stud having a head and a neck, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining arms disposed within said casing about said neck, and a rotary member provided with a plurality of projections each of which, when moved in one direction moves one arm from said neck and when moved in the opposite direction locks another arm in its stud-retaining position.

9. In a separable fastener, the combination of a stud having a head and a neck, a casing having an aperture through which said stud extends into said casing, a plate disposed within said casing and presenting a plurality of stud-retaining spring arms about said neck, and a rotary plate presenting a plurality of bosses each of which, when moved in one direction, moves one arm from said neck and, when moved in the opposite direction, locks another arm in its stud-retaining position.

10. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, stud-retaining means housed in said casing and normally received in said groove, and rotary means for actuating said stud-retaining means to cause the same to move into and out of said groove, said stud-retaining means having provision for cooperating with said rotary means to utilize the latter to lock said stud-retaining means positively in its normal position in said groove.

11. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-

retaining arms housed in said casing and having portions normally received in said groove, and actuating means having two positions, one in which it engages and locks one arm in place in said groove and another position in which it engages another arm and holds it out of said groove.

12. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining, spring arms housed in said casing and tending to spring into said groove, and actuating means having two positions, one in which it engages and locks one arm in place in said groove, and another position in which it engages another arm and holds it out of said groove.

13. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining arms housed in said casing and having portions normally received in said groove, and actuating means which, when moved in one direction, move one arm into said groove and, when moved in another direction, move another arm out of said groove.

14. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining arms housed in said casing and having portions normally received in said groove, and actuating means which, when moved in one direction, move one arm into said groove and lock the same therein and, when moved in another direction, move another arm out of said groove and lock the same out of said groove.

15. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining arms housed in said casing and having portions normally received in said groove, and rotary actuating means having two positions, one in which it engages and locks one arm in place in said groove, and another position in which it engages another arm and holds it out of said groove.

16. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining, spring arms housed in said casing and tending to spring into said groove, and rotary actuating means having two positions, one in which it engages and locks one arm in place in said groove, and another position in which it engages another arm and holds it out of said groove.

17. In a separable fastener, the combination of a stud presenting a groove, a casing having an aperture through which said stud extends into said casing, a plurality of stud-retaining arms housed in said casing and having portions normally received in said groove, and rotary actuating means which, when moved in one direction, move one arm into said groove and lock the same therein and, when moved in another direction, move another arm out of said groove and lock the same out of said groove.

18. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising a cup-like casing provided with an aperture in which said stud is received, a cover secured to said casing, a plate housed within and secured to said casing and presenting a plurality of stud-locking, spring arms interlocking with said stud, each arm having a cam-path and a seat, a rotary plate housed within said casing and having a plurality of bosses normally seated in said seats, respectively, and locking said arms in interengagement with said stud, but adapted to be brought into engagement with said cam-paths, respectively, to withdraw said arms from such engagement, said plate having also a central boss extending through said cover and carrying on the outer face of the latter a finger-piece by which said plate may be rotated to actuate said arms.

19. In a separable fastener, the combination of two separable parts, one comprising a stud, and the other comprising a cup-like casing provided with an aperture in which said stud is received, a cover secured to said casing, a plate housed within and secured to said casing and presenting a plurality of stud-locking, spring arms interlocking with said stud, each arm having a cam-path and a seat, a rotary plate housed within said casing and having a plurality of bosses normally seated in said seats, respectively, and locking said arms in interengagement with said stud, but adapted to be brought into engagement with said cam-paths, respectively, to withdraw said arms from such engagement, said plate having also a hollow central boss which receives the inner end of said stud, and a finger-piece secured to said boss exteriorly of said casing, for rotating said plate to actuate said arms.

In testimony whereof, I have signed my name to this specification.

HOWARD A. SALLEY.