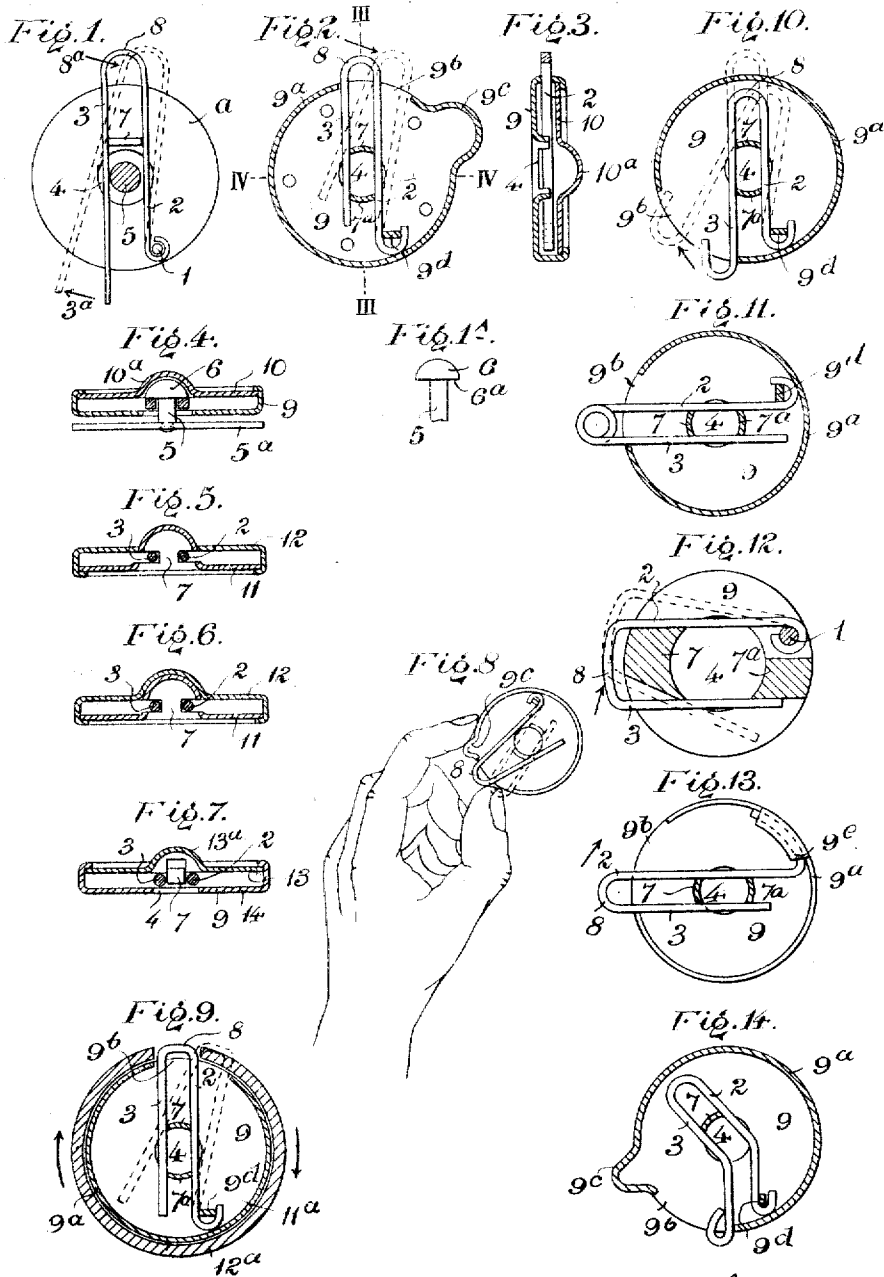


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 SPRING BUTTON AND LIKE FASTENING.
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UNITED STATES PATENT OFFICE.

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SPRING-BUTTON AND LIKE FASTENING.

1,009,278.

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To all whom it may concern:

Be it known that I, PAUL OTTO HERMANN BRÜNING, a subject of His Majesty the Emperor of Germany, residing at 30 Stralsunderstrasse, Berlin, Germany, have invented certain new and useful Improvements in Spring-Buttons and the Like Fastenings, of which the following is a specification.

This invention has relation to spring buttons and the like fastenings in which a male member of one part of the fastening is shaped so as to spread spring members associated with the other part of the fastening, in the act of pressing said parts together, and also so shaped as to provide a shoulder under which the spring members snap and against which they engage to hold the said parts together when these parts are fully pressed together.

In spring buttons and the like fastenings embracing various forms of spring members including fork or U-shaped springs, the arms or limbs of which have in themselves constituted the spring members, a difficulty which has been presented is the arrangement of the spring connection such that at one and the same time it shall offer a sufficiently easy disengagement or engagement of the parts, and yet not involve risk of the two parts becoming unintentionally disengaged during use. The incompatibility of these conditions has militated against the adoption of fastenings of the kind in question in many directions where they would otherwise have been employed.

It is the object of the present invention to overcome this difficulty by a spring catch arrangement that is at once simple and very effective, easy to construct and positive in its working, and which is characterized by a peculiar and novel action which admits of a better hold being attained than hitherto.

By the present invention the spring catch which closes in on either side of the male part is so constructed and arranged that, when it is desired to disengage the two parts of the fastening, it is moved out of engagement with both sides of the male part by applying a force in one direction to one part only of the catch. The catch as applied to a spring button or the like fastening, may comprise a U-shaped or forked spring catch capable of being opened from outside and of returning of itself into its normal position, and one of the members of the U or fork is held at its end while the other is free to

move and is arranged to cooperate with an abutment in such wise that by a movement of the catch about the point at which it is held the distance normally separating the catch members is increased and the catch is opened.

Thus the U-shaped or forked spring catch together with its abutment can be so arranged relatively to the center of the fastening device that when the catch for the purpose of opening the same is moved about the point at which it is held, the U or fork members will move equidistantly away from the center of the fastening.

The male part of the fastening can be provided with a locking face which is normal to, or disposed at an angle inclining from the outer edge of the face toward the forward end of the male part which angle is less than 90° with the axis of the male part, whereby a separation of the fastening, even under very strong pull becomes practically impossible. The movement of the catch to open the same may be effected by pressure applied either at the base of the U or fork or at the end of the free member or both. A stop or stops is or are provided to govern the return movement of the catch to normal position which function may be met by the aforesaid abutment, and a stop or stops may be provided to limit the releasing movement of the catch. The catch may be moved in any convenient manner by applied pressure and in some cases the pressure may be applied by a rotary movement of one part of the fastening relatively to the other part. Either one or both arms of the catch may be resilient.

In the drawings Figure 1 illustrates diagrammatically the principal characteristic features of the present invention showing an abutment and a U-shaped spring catch attached to the female portion or an independent plate or support arranged within or attached to the female portion; Fig. 1^a shows to a reduced scale a head and stem of a male portion; Fig. 2 shows in sectional plan the invention applied, in the form of a U shaped spring, to a spring button or dress fastener, Fig. 3 being a cross-section on the line III—III of Fig. 2, and Fig. 4 a cross-section on the line IV—IV of Fig. 2 showing the two parts secured together; Figs. 5, 6 and 7 are like sections illustrating modifications in the construction of the female portion; Fig. 8 is a view illustrating a mode of releasing the fastening.

ing the spring with the thumb and finger; Fig. 9 is a sectional plan illustrating a mode of releasing the spring by relative movement of the two parts of the fastening; Figs. 10-14 are sectional plan views illustrating modifications in the forms and in the mode of attachment of the spring and in the abutment for the same.

Referring to Fig. 1 of the drawing, illustrating diagrammatically a preferred form of spring fastening under the present invention, the female portion or an independent plate or support arranged within or attached to said portion is indicated by *a*. To the portion *a* is attached for instance by a pin 1 the end of one arm 2 of a U-shaped or forked spring catch or locking device, the other arm 3 of which is free to move away from the arm 2. The normal position of the spring catch is indicated in full lines with the arms 2 and 3 equidistant from the center of the hole 4 through which the head on the stem 5 of the male portion is passed, spreading the two arms 2 and 3 apart as shown in dotted lines until the head projects clear of the catch when the catch is free to return under the head to normal position. The head 6 on the stem 5 as shown in Fig. 1^a is made with a locking face 6^a at right angles as depicted, or less than right angles, to the axis of the stem so that a complete and perfect lock is insured with the catch in normal position. In order to enable the head to be released an abutment 7 is provided between the two arms of the catch and preferably in contact with the free arm 2 of the spring and located adjacent to the periphery of the hole 4 and between the hole and the base 8 of the spring. The abutment 7 may be a fixed abutment as shown or a rolling or rotating abutment may be substituted. To release the head on the stem 5, pressure is applied either at or near the base 8 of the spring in the direction of the arrow 8^a, or at the end of the free arm 3 in the direction of the arrow 3^a, whereupon the arms spread apart and move equidistantly from the center of the fastening as the arm 3 slides across the abutment 7. A stop or stops on the plate (not shown) may be provided to limit these movements of the arms. Further a stop or stops is or are provided to govern the return movement of the spring to normal position which may be effected by extending the abutment 7 as shown so as to be normally in contact with the arm 2 of the spring. As shown the spring catch may be resilient throughout. The two resilient arms 2 and 3 may however be connected by a rigid bridge piece to which the arms would be secured. It is however, not essential that both arms 2 and 3 be resilient as either might be a rigid arm to which the other and resilient arm would be secured. Pressure may be applied in any convenient manner at or near the fork end

to either arm, or at or near the end of the free arm 3, and either the fork end of the catch, or the free end of the arm 3, or both, may extend outside the fastening to enable pressure to be applied. Pressure may be applied to release the catch by a rotary movement of one part of the fastening relatively to the other part, the male portion for example being provided with a suitable abutment by means of which pressure may be transferred to the catch for the release movement in which case it is obviously not essential that either end of the catch should extend outside the female portion.

In Figs. 2, 3 and 4 the invention is shown applied to the female portion of a dress fastening comprising a cupped or flanged plate 9 from which two abutments 7 and 7^a are formed by stamping, or in other convenient manner. A portion of the radial flange 9^a is left out at 9^b to permit of the movement of the base or fork end of the catch 2, 3, which protrudes beyond the flange 9^a the ends of this slot limiting the movement of the spring catch. To enable the catch to be actuated to release the fastening by the thumb and finger, a nose or projection 9^c is provided against which the finger may rest while actuating the catch with the thumb as shown in Fig. 8. A lug, ear, pivot or equivalent 9^d which may be either secured to, or stamped out of the plate 9, is provided for the attachment of the end of the arm 2 of the catch. The catch is conveniently retained in position by a cover plate 10 which may be dished as shown at 10^a to receive the head 6 of the stem 5 of the male portion as shown in Fig. 4. The two plates 9 and 10 may be secured together in any convenient manner so as to secure the free movement of the catch. Instead of utilizing a cover plate to retain the spring in position relatively to the plate 9 the abutment 7 may be made deeper than the catch and undercut where contact is made with the arm 3. Holes may be provided for sewing the portion 9, 10 to the article of dress or the portion may be secured to the material in a well known manner, as for instance in a glove button, by a retaining washer, not shown. The stem 5 is shown secured to a plate 5^a which may be also provided with holes for attaching this portion to the article of dress by sewing.

In Fig. 5 both the covering dome for the head 6 and the two abutments 7 and 7^a are formed out of one plate 11 by first stamping out the dome to a greater depth than that of the head and then cutting away portions on opposite sides of the dome thus leaving the dome attached by two opposite pieces 7, one or both of which act as abutments for the arms 2 and 3 of the catch. The other flanged plate 12 is shown stamped out to receive the dome on the plate 11.

In Fig. 6 the construction is similar to that shown in Fig. 5 except that the plate 12 is not pierced but also domed to cover the dome on the plate 11 whereby the joint around the dome in Fig. 5 is avoided.

In Fig. 7 a plate 13 is domed at 13^a and an abutment 7 formed by stamping a suitable portion of metal partly out of the domed portion 13^a and partly out of the straight portion of the plate 13.

In the constructions of the female portion described with reference to Figs. 4 to 7, a projection 9^a for the finger may be provided as described with reference to Figs. 2 to 4. As indicated, however, in Fig. 9 the catch may be released by a rotary movement of a part of the fastening relatively to another part of the same, the part 11^a being the female portion and the part 12^a the male portion or a rotatable part detachably connected thereto. As shown the base 8 of the catch protrudes beyond the part 11^a and the part 12^a is correspondingly cut away. The free end of the arm 3 might however protrude instead of the base 8 and be engaged in like manner by the part 12^a. It is obvious however, that neither end of the catch need protrude beyond the limits of the part 11^a, as a suitable engagement with either arm near the base 8 or with the free end of the arm by an abutment correspondingly arranged on the part 12^a extending sufficiently far into the part 11^a to engage the catch.

Fig. 10 shows the base or fork of the catch 2, 3 within the limits of the female portion of the fastening and the free end of the arm 3 projecting outside and turned back so as to present a convenient gripping surface.

In Fig. 11 the forked end of the spring catch which projects outside the fastener is twisted in one or more coils 15 so as to increase the spring action.

Fig. 12 shows a modification in the form of the spring catch 2, 3, and the abutment 7, the end of the arm 2 being attached to the plate by a pin 1.

In Fig. 13 the end of the arm 2 is shown turned under a flap or extension 9^a of the flange 9^a which is bent inward over the arm 2.

The action of the spring may be modified by bending both arms 2 and 3, as shown in Fig. 14 for example.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a fastener of the kind described, comprising a male and a female portion, a spring catch held on the female portion and adapted to close in on opposite sides of the male portion, and means coöperating with said spring catch to open it and cause it to release the said male portion on moving the said spring catch about the point, at which it is held on the female portion.

2. In a fastening of the kind described, a spring catch comprising a forked shape spring locking device capable after being opened of returning of itself into its normal position, said device having one member held at its end while the other is free to move, and an abutment coöperating with said free member to increase the distance normally separating the members upon a movement of the device about the point at which it is held and about said abutment.

3. A fastening of the kind described comprising a male portion, a female portion, a forked spring locking device having the end of one arm attached to said female portion and the end of the other arm free and both arms normally located across the mouth of said female portion, a head on said male portion adapted to spread said arms during insertion, a locking face under said head for each of said arms, an abutment on said female portion for said free arm located between the arms and between said mouth and the forked end of said catch and means whereby said locking device may be moved about its point of attachment to said female portion and about said abutment so as to increase the distance normally separating the arms to release said head.

In testimony whereof I affix my signature in presence of two witnesses.

PAUL OTTO HERMANN BRÜNING.

Witnesses:

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EDWARD NICHOLAS PINK.