

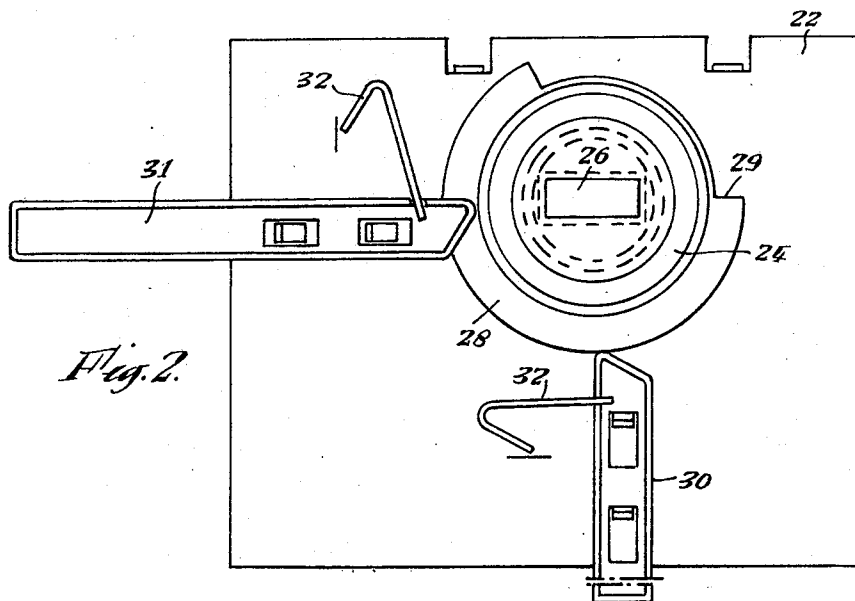
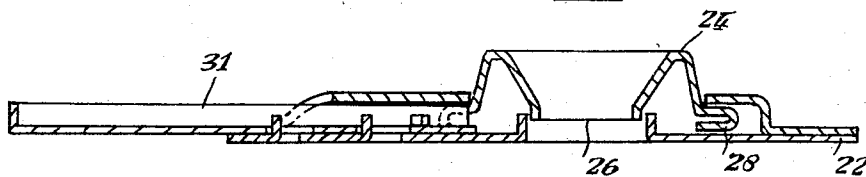
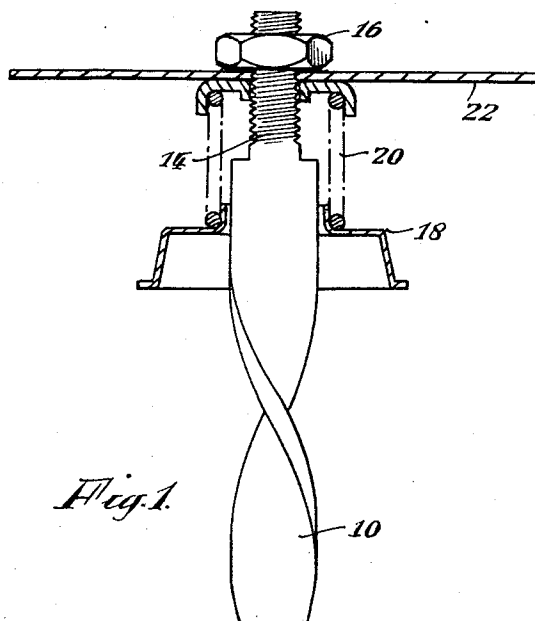
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F. R. FORSTER

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LOCKS

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3,505,840
LOCKS

Felix R. Forster, Strode Road, Willesden Green,
London, NW. 10, England

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6 Claims

ABSTRACT OF THE DISCLOSURE

A lock formed in two parts for securing together two components such as the bonnet or hood of an automobile, the arrangement being such that when the lock is closed it can only be opened by performing two or more separate and sequential operations. One part of the lock such as that mounted on the bonnet or hood includes a helically twisted metal tongue whilst the other part mounted on the body of the automobile includes a rotatable member having a slot into which the tongue can engage to rotate the member which on passing two or more given points is prevented from rotation in the opposite direction by spring loaded plungers until the plungers are sequentially released in the correct order.

The present invention relates to improvements in locks. More particularly the invention relates to a lock which has to be released by at least two operations, the operations being performed at two distinct localities which help to ensure that the lock cannot be accidentally opened.

Such a lock has important applications, more particularly for the securing of automobile bonnets to prevent them being accidentally opened when the vehicle is in motion. At present, the majority of automobiles are fitted with two separate locking devices, the first a spring loaded locking device being capable of release from inside the vehicle and the second a catch arrangement which comes into operation as soon as the spring loaded lock is released, this catch being only releasable from outside the vehicle. Thus, if the first lock is accidentally operated when the vehicle is in motion, the catch ensures that the bonnet cannot be lifted by the wind.

The above described lock arrangement has the disadvantage that the manufacturer has to fit and test two separate lock devices, and it is therefore an object of the present invention to obviate the above mentioned disadvantage by providing a single lock.

According to the present invention there is provided a lock formed in two parts for securing together two components to which the respective parts are secured, which when closed can only be opened by performing two or more separate and sequential operations.

These operations may be performed at the same or different locations although in certain applications of the invention it is absolutely essential that they be performed at separate locations, for example when applied to the bonnet of an automobile.

The present invention will now be described in greater detail by way of example with reference to the drawing, which accompanied the provisional specification, wherein:

FIG. 1 is a front elevation of a preferred form of lock as applied to the bonnet of an automobile; and

FIG. 2 is a plan view of that part of the lock attached to the body of the automobile.

Referring to the drawing, the lock comprises two parts, one part attached to the bonnet and the other to the body. The former includes a metal tongue 10 which is evenly twisted along its length in form of a helix through 180°. This tongue 10 is bolted to the bonnet 12 by means of a

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threaded shank 14 to which it is secured and a nut 16. A hood 18 surrounds the upper part of the tongue 10 and is resiliently mounted on the bonnet by means of a spring 20. The other part includes a plate 22 secured to the body out the automobile, and a cup shaped portion 24 having a rectangular slot 26 therein for receiving the tongue 10. In alternative forms the slot may be square or any suitable profile to enable the tongue 10 to engage it for rotation. The cup-shaped portion 24 is adapted to be rotatably mounted within the plate 22 and is provided with a peripheral flange 28 which extends about two thirds the way around the cup-shaped portion. A pair of plungers 30 to 31 spaced apart by 90° in relation to the cup-shaped portion 24 are guided for longitudinal movement towards and away from the centre of the cup-shaped portion and are biased towards its centre by means of springs 32. The ends of the plungers 32 thus engage with the flange 28 and when the cup-shaped portion 24 is rotated clockwise the plungers 30 and 31 in turn move inwards when the edge 29 of flange 28 passes them. Thus once the edge 29 passes a plunger, the cup-shaped portion 24 cannot be rotated backwards past that point until the plunger is released from abutment with the edge 29.

In operation, the lock is in the position shown when the bonnet is open and it will be appreciated that mechanism is incorporated to ensure that the angular position of the tongue is in alignment with that of the slot so that the former can enter the latter when the bonnet is closed. When the bonnet is closed the tongue 10 engages with the rectangular slot 26 and rotates the cup-shaped portion 24 clockwise through 180° as the tongue moves into the rectangular slot. As the edge 29 of the flange 28 passes the plungers 30 and 31 sequentially, the plungers are urged forwards by means of the springs 32. In the closed position the flange 28 has been rotated by 180° and the edge 29 is in abutment with the plunger 31. The hood 18 comes down fully over the cup-shaped portion and by means of the spring 20 eliminates any rattle or movement of the bonnet when the automobile is in motion. To release the bonnet lock first the plunger 31 is pulled back which allows the cup-shaped portion 24 to rotate through 90° and then the second plunger 30 is pulled back to completely free the lock. The operating mechanisms for the two plungers are located at different positions within the vehicle.

Whilst the above example illustrates a lock provided with two plungers, more than two plungers may be provided if desired.

The above described lock is entirely safe and easy and simple to install requiring only one actual lock mechanism instead of two as at present used.

What I claim and desire to secure by Letters Patent is:

1. A lock comprising in combination, a male element arranged to be mounted on a first component, a female element arranged to be mounted on a second component which is to be releasably secured to said first component, said female element having an aperture configured for entry of said male element and being angularly displaceable with reference to the latter between a locking position, an intermediate position and a release position; and releasable first and second arresting means cooperating with said female element for preventing angular displacement of the same from said locking position, said first and second arresting means being sequentially operable for permitting successive angular displacement of said female element to said intermediate position and to said release position respectively.

2. A lock as defined in claim 1, said first and second arresting means engaging said female element at angularly spaced locations of the latter.

3. A lock as defined in claim 1, said male component

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comprising an elongated helically twisted portion, and said aperture being configured for permitting entry of said portion in a sense, effecting angular displacement of said female element from said release position to said locking position in automatic response to entry of said portion into said aperture.

4. A lock as defined in claim 3, said portion having a longitudinal axis; and further comprising mounting means mounting said female element for rotation about an axis of rotation coincident with said longitudinal axis.

5. A lock as defined in claim 4, said female element comprising a part-circular flange projecting radially with reference to said axis of rotation and having a pair of circumferentially spaced radial abutment shoulders extending inwardly from a periphery of said flange; and wherein each of said first and second arresting means abuttingly engages one of said abutment shoulders in response to movement of said female element to said locking position.

6. A lock as defined in claim 5, said first and second arresting means each including a plunger member slidable radially with reference to said axis of rotation between

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an advanced position in which its leading end abuts against one of said shoulders, and a withdrawn position in which its leading end is retracted radially outwardly of said periphery of said flange; and further comprising biasing means permanently biasing each of said plunger members to said advanced position thereof.

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RICHARD E. MOORE, Primary Examiner

R. L. WOLFE, Assistant Examiner

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70—181, 240; 292—198, 207, 341.17