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H. TAYLOR

**2,301,477**

LATCH

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*Fig. 1.*

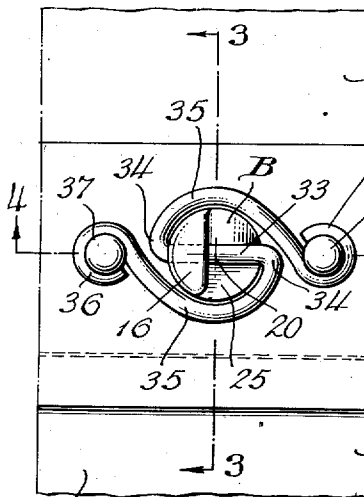


*Fig. 2.*

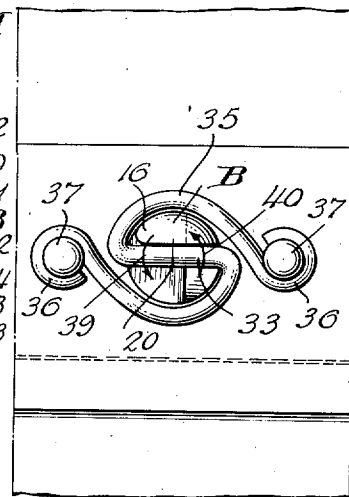
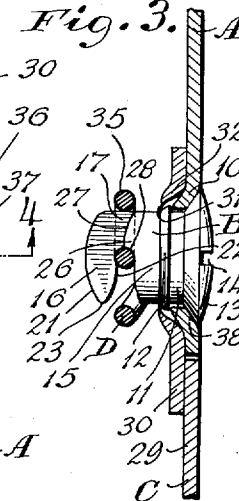


Fig. 3.  A



29 *Fig. 4.*

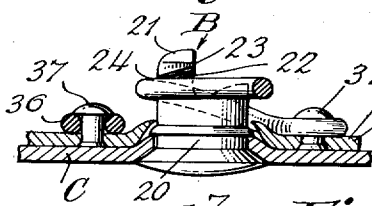


*Fig. 5.*

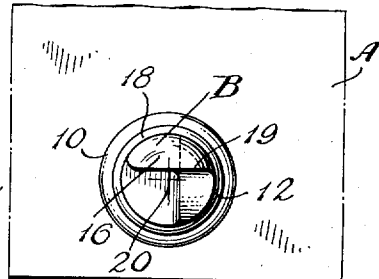


*Fig. 7.*

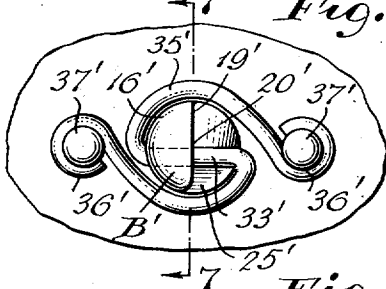


*Fig. 8.*

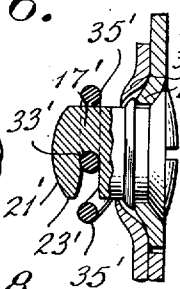


*Fig. 9.*

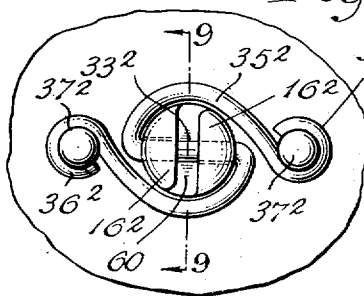
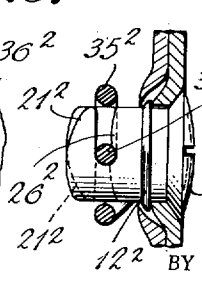


*Fig. 9.*



INVENTOR.

HARRY TAYLOR

Richardson & Geier  
ATTORNEYS

ATTORNEYS

## UNITED STATES PATENT OFFICE

2,301,477

## LATCH

Harry Taylor, West Babylon, N. Y.

Application March 4, 1941, Serial No. 381,634

9 Claims. (Cl. 24—221)

The present invention relates to a latching device and particularly to a latching device for attaching covers or panels of sheet metal.

In making semi-permanent, yet detachable closures or openings in airplane, automobile bodies and in sheet metal closures for other machines or mechanisms, considerable difficulty has been experienced in making a latch which would not substantially protrude and which, at the same time would firmly hold the closure in position, regardless of continued stress and strain and varying expansion and contractions of the body to which the closure might be attached.

A particular difficulty is experienced in airplane closures where it was desired to reduce air resistance to a minimum and where the closure must remain firmly in position and be readily detachable when access was needed to interior parts of the body of the airplane.

It is therefore among the objects of the present invention to provide an improved latch or closure device for sheet metal closures which may be inexpensively manufactured, readily attached without the structure, and which will not protrude so as to cause air resistance in connection with an airplane, and which will be reliable and positive in its action, and which may be readily manipulated for attachment or detachment of the closure from the opening.

Still further objects and advantages will appear from the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the invention.

In accomplishing the above objects, it has been found most satisfactory to provide a key member on one of the plates and preferably on the cover plate, and to provide a return bent spring member on the other plate to engage said key member.

In the preferred embodiment, the key member has a projecting finger or lip and a cylindrical base, which base is inserted into, and held in position by a dimpled connection to the cover plate.

The key member is fitted inside of semi-circular sections of the return bent piece of wire.

The finger in turn, cooperates with a hump or protuberance on the base to engage and snap over a connecting element of said return bent piece of resilient wire, particularly the portion thereof which connects the semi-circular portions thereof.

Referring to the drawing which illustrates several of the various possible embodiments of the present invention, but to which the present invention is by no means restricted since the

drawing is merely by way of illustration and not by way of limitation:

Fig. 1 is a rear plan view of the locking device of the present invention, somewhat larger than actual size, showing the cover plate and the base plate latched together.

Fig. 2 is a similar rear plan view with the key member unlatched or unlocked position, but with the key shown in the position which it will take before it has been turned to latch the plates together, or after it has been turned to unlatch them.

Figs. 3 and 4 are respectively transverse sectional views upon the lines 3—3 of Fig. 1.

Fig. 5 is a rear plan view of the key when the cover plate and the latching spring on the base plate are removed from one another.

Figs. 6 and 7 illustrate an alternative embodiment, Fig. 6 being a rear plan view similar to Fig. 1, and Fig. 7 being a transverse sectional view upon the lines 7—7 of Fig. 6.

Figs. 8 and 9 illustrate still another embodiment, Fig. 8 being a rear plan view similar to Figs. 7 and 1, and Fig. 9 being a transverse sectional view upon the line 9—9 of Fig. 8.

Referring to Figs. 1 to 5, the cover plate A carries a key B, while the base plate C carries a latching spring D.

The cover plate A is dimpled as indicated at 10 and fits into the groove 11 formed between the ridge 12 and the head 13 of the key B.

The head 13 is provided with a flatter slot 14 to enable the key B to be turned from the position of Fig. 1 to the position of Fig. 2 or vice versa.

The cylindrical shank 15 projects beyond the ridge 12 and is provided with an overhanging finger 16 connected by the neck 17 to the shank 15. As shown in Figs. 1, 2 and 5, the finger 16 has a semi-circular outside face 18 and a straight cut inside face 19, short of the axis 20 of the key B.

As best shown in Figs. 3 and 4, both the top face 21 and the lower face 22 of the finger 16 curve together to the point 23, while the outer portion of the face 22 extends downwardly as indicated best at 24 in Fig. 4. On the base 25 of the shank 15 there is a projecting portion 26, having a curved camming surface 27 and a relatively steep shoulder portion 28.

In respect to the base plate C, this plate has a main section 29, a superimposed section 30, having an opening 31, the periphery 32 of which is bulged or dimpled outwardly to conform to the bulge or dimple 10 of the cover plate A.

Extending diametrically over the opening 31 is the cross bar 33 forming part of the spring D. The cross bar 33 is connected at its ends 34 with the semi-circular portions 35, which terminate in the loops of circular terminal portions 36 which

are riveted at 37 to the plate 30. It will be noted by reference to Fig. 3 that the cross bar 33, as well as the portions of the semi-circular elements 35 adjacent the bends 34 lie in a plane substantially on the same level as the face 25 of the shank 15.

It will be noted that the head 13 has a curved bottom face 38, which fits closely against the dimpled portion 10 of the plate A.

In operation, the key B is inserted into position as indicated in Fig. 2, with the finger 16 fitting between the cross bar 33 and one of the semi-circular sections 35. Then the key may be turned by insertion of a tool in the slot. When this occurs, the finger 16 will move in a direction 39 over one side of the bar 33, forcing it downwardly until the bar snaps in back of the shoulder 28 and fits against the neck 17, as best shown in Fig. 3. When this connection has been made, the plates A and C will be held rigidly together against accidental displacement and there will be no rattling or loosening of the cover plate A upon the base plate C.

In assembling, the spring D may be readily mounted upon the plate C by the rivets 37, while the key B may be readily mounted upon the plate A.

It is thus apparent that the applicant has provided a simple inexpensive latch construction which is reliable and effective in its action.

In the alternative construction of Figs. 6 and 7, similarly functioning parts being designated by the same numerals primed, the cross bar 33' is placed to one side of the axis 20', while the inside face 19' of the finger 16' extends across the axis 20' and is in the plane of a diameter of the shank 30'. This construction will give more metal to the neck 17' and make it much stronger.

In the embodiment of Figs. 8 and 9 the key B<sup>2</sup> is provided with a double overhanging finger 16<sup>2</sup>, the space 60 between the overhanging fingers 16<sup>2</sup> being sufficient to receive the cross bar 33<sup>2</sup>. It will be noted that under each overhanging finger 16<sup>2</sup> there is provided a projecting portion 26<sup>2</sup> over which the cross bar 33<sup>2</sup> snaps.

It is apparent the specific illustrations shown above have been given by way of illustration and not by way of limitation and that the structures above described are subject to wide variation and modification without departing from the scope or intent of the invention, all of which variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. In a latch construction, a key having a shelf with a locking boss, an overhanging hook member extending outwardly from one side of said key and extending over said shelf and a resilient member having a semi-circular portion and a cross bar respectively to hold said hook member in position and to engage said hook member, said locking boss engaging said cross bar to lock the key in latched position.

2. In a latch construction, a key having an overhanging hook member and a resilient member having a semi-circular portion encircling said key and a cross bar respectively to hold said hook member in position and to engage said hook member, said overhanging finger being also provided with an underlying projecting portion to snap under said cross bar.

3. In a latch construction for two plates hav-

ing coinciding openings, a key having a shelf with a locking boss, an overhanging hook member extending outwardly from one side of said key and extending over said shelf, said hook member being mounted in one opening and the resilient member having semi-circular portions and a connecting cross bar mounted in the other opening, said hook member cooperating with said semi-circular portions and cross bar, said locking boss engaging said cross bar to lock the key in latched position.

4. A latching device comprising two plates to be latched together with matching openings, a key carried in one opening and a spring carried in the other opening, said spring having end portions riveted to the plate to which it is attached and having semi-circular portions extending around the periphery of said opening and a cross bar extending diametrically across said opening connecting said semi-circular portions together.

5. A latching device for two plates comprising a key on one plate and a wire spring on the other plate, said spring including a cross bar portion and two semi-circular portions connected by said cross bar and said key having a cylindrical portion engaging said semi-circular portions and a hook member engaging said cross bar.

6. A fastening device for two parts having cooperating openings, said parts carrying a turning key with an overhanging hook member and a fixed wire spring having semi-circular portions, said semi-circular portions encircling said key and holding it in position and a connecting cross bar, said key engaging said spring to fasten said parts together.

7. A latching device comprising two plates to be latched together with matching openings, a key carried in one opening and a spring carried in the other opening, said spring having semi-circular portions extending around the periphery of said opening and a cross bar extending diametrically across said opening connecting said semi-circular portions together, said key having a shelf with a locking boss, and an overhanging hook member extending upwardly from one side of said key, and extending over said shelf, and said locking boss engaging said cross bar to lock said key in latched position.

8. A latching device comprising two plates to be latched together with matching openings, a key carried in one opening and a spring carried in the other opening, said spring having semi-circular portions extending around the periphery of said opening and a cross bar extending diametrically across said opening connecting said semi-circular portions together, said key having overhanging hook members extending from opposite sides of said key, and spaced apart sufficiently to receive said cross bar, said space between said overhanging hook members extending transversely across the end of said key.

9. A latching device for two plates comprising a key on one plate and a wire spring on the other plate, said spring including a cross bar portion and two semi-circular portions connected by said cross bar and said key having a cylindrical portion engaging said semi-circular portions and a hook member engaging said cross bar, and a locking boss positioned on said key below said hook member to lock said key in latched position.

HARRY TAYLOR.