

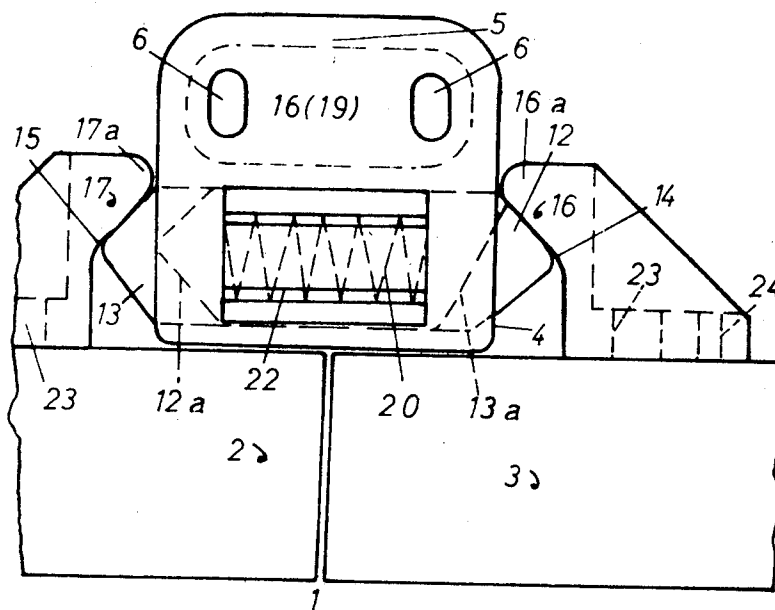
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[33] **Germany**
[31] **P 17 03 285.8**

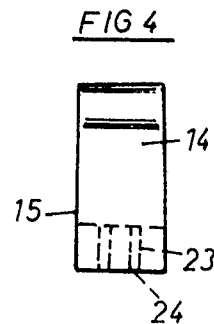
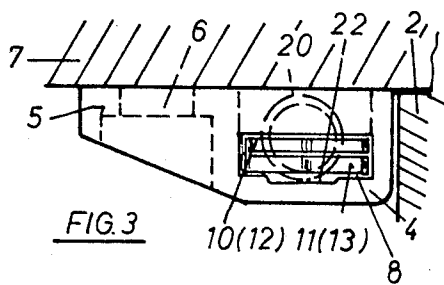
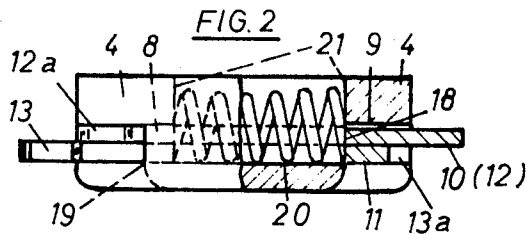
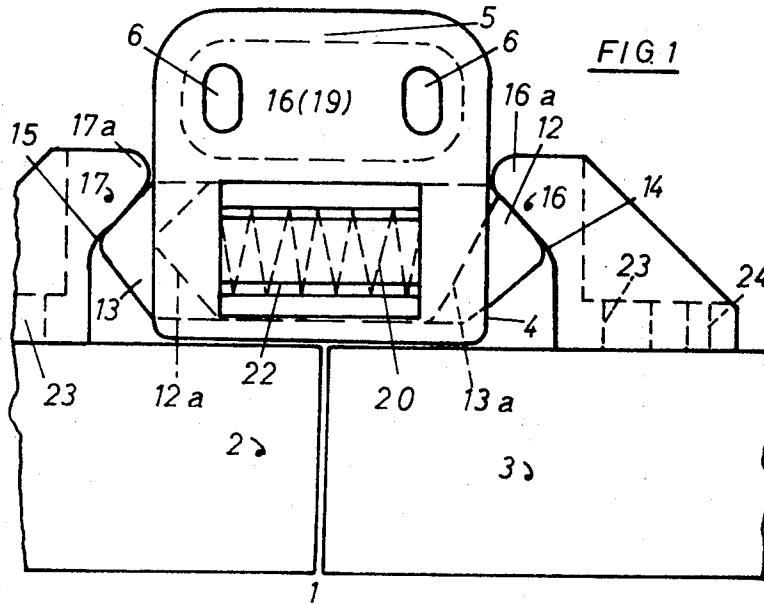
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[54] **SNAP ACTION LOCK MECHANISM FOR TWO-
WINGED DOORS FLAPS OR THE LIKE**
34 Claims, 9 Drawing Figs.

[52] U.S. Cl..... **292/16,**
292/74
[51] Int. Cl..... **E05c 7/06,**
E05c 19/06
[50] Field of Search..... **292/16, 14,**
74, 70, 75; 70/82; 49/366, 394; 287/20.92 E

ABSTRACT: A locking mechanism for two-winged door folds or the like, characterized by at least one axially movable latch bolt in a support housing which engages lockingly with a complementary counterpart at one of the wings while a counterpart at the other wing blocks the sliding latch bolt in the closing position.





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FIG. 5

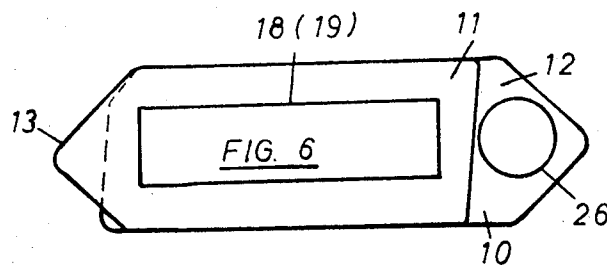
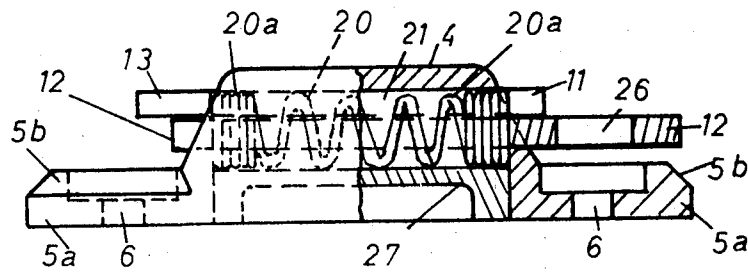


FIG. 7

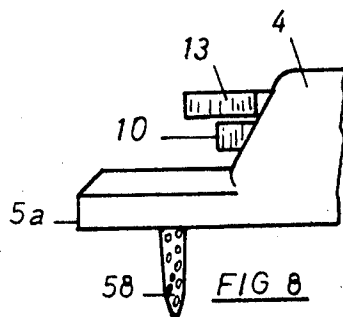
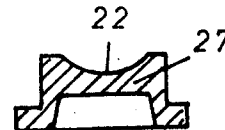


FIG. 8

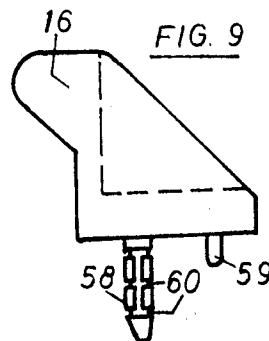


FIG. 9

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SNAP ACTION LOCK MECHANISM FOR TWO-WINGED DOORS FLAPS OR THE LIKE

The present invention relates to a snap-type lock mechanism for two-winged doors, flaps, or the like.

It is a prerequisite for a reliable closing of two-winged doors or flaps that at least one of the wings is initially accurately aligned in its closing position and is securely locked in the closing position before the other wing is brought into its closing position. An unconstrained and easy locking by means of a lock possibly provided at one of the wings is also assured thereby.

The latch of the initially closing wing, as a rule, the left wing, takes place heretofore by displaceable latch bolts mounted at the top and at the bottom of the wing whose latching ends engage into apertures disposed in front of them, for example, disposed in a floor and in a ceiling-board. The actuation of this latch bolt is complicated because one has to reach thereby laterally about the wing edge and during actuation of the lower latch bolt, for example, in doors and display cabinets and chests of drawers, one has to reach additionally deep down for the latching bolt. Even though such bolting precludes an undesirable opening of the wing, it is frequently either too loose or too tight in an undesirable manner because an accurately fitted assembly is difficult. Either the locking mechanism has too much play in its movements or too little and therefore becomes wedged or jams.

The present invention aims at constituting the latching operation automatic and to improve the effect thereof as regards the neat alignment of the wing in its closing position.

The present invention essentially consists of a mounting support fixedly arranged behind the wings for at least one movable or pivotal closure part which lockingly engages in a counterpart at the wing matched to the closure part and simultaneously aligning the wing in its closing position, and which is blocked in the closing position thereof by an abutment secured at the other wing.

These and further objects, features, and advantages of the present invention will become more obvious from the following description when taken in connection with the accompanying drawing which shows, for purposes of illustration only, several embodiments in accordance with the present invention, and wherein:

FIG. 1 is a plan view on two wing ends with a lock mechanism operating by means of two axially springily supported latch bolts, in the closing position thereof;

FIG. 2 is a side view, partially in longitudinal cross section, of the latch bolt housing of the embodiment of FIG. 1;

FIG. 3 is an end view of the housing of FIG. 2;

FIG. 4 is an end view of a counter-latch-bolt according to the embodiment of FIG. 1;

FIG. 5 is a side elevational view, partly in longitudinal cross section, through a further embodiment of a latch-bolt guide system and associated spring means in accordance with the present invention;

FIG. 6 is a plan view on two superposed sliding latch-bolts of the arrangement according to FIG. 5;

FIG. 7 is a cross-sectional view through a bottom cover of the sliding latch-bolt housing according to the embodiment of FIG. 5;

FIG. 8 is a partial elevational view of the housing of the embodiment of FIG. 5 with a plug-pin at the securing flange; and

FIG. 9 is a side elevational view of a counter-latch-bolt according to FIG. 1 with a glue-dowel-pin and stop-bolt.

Referring now to the drawing wherein like reference numerals are used throughout the various views to designate like parts, and more particularly to the embodiment of FIGS. 1 to 4, there is fixedly arranged behind the gap 1 of the wings 2 and 3, a housing 4 bridging the gap 1 under an angle of 90°. The housing 4 is supported thereby by a mounting plate 5 disposed along the longitudinal edge thereof which is provided with two elongated apertures 6 disposed transversely to the housing longitudinal axis for the passage of securing screws; the

distance of the housing 4 from the wings 2 and 3 may be finely adjusted and fixed by means of the securing screws engaged in the elongated apertures 6. Such a housing can be provided at the top and/or at the bottom of a floor- or ceiling-board or may also be provided at an intermediate board. A strip or a small mounting block may also possibly suffice.

Two cross-sectional areas 8 and 9 of the same height and of equal length are disposed opposite one another in each end face of the housing 4 for the passage therethrough of two sliding latch-bolts 10 and 11 disposed directly one above the other, which project at the outer ends thereof with a wedge-shaped nose portion 12 and 13, respectively, out of the housing 4 and which are supported against the inclined surfaces 14 and 15 of two abutment lugs 16 and 17 acting as counter-latches or abutment members and provided at the wings 2 and 3. Both sliding latch bolts 10 and 11 are supported in an axially springy manner. For that purpose, they are provided with a respective elongated rectangular aperture 18 and 19 for the accommodation of one or several compression springs 20 which are supported at the end edges of the apertures 18 and 19 and at the end walls of the housing space 21. It is of advantage to make the apertures 18 and 19 and the spring space 21 of the housing 4 of equal length. The spring 20 is inserted with a certain prestress, however, it still possesses a sufficient spring path for the axial movements of the sliding latch-bolts. It should also be mentioned that the sliding latch-bolt 11 is provided with only one wedge-shaped nose portion 13 and its other end, as viewed from the wings, is constructed only as rising at an inclination (13a). The other sliding latch-bolt 10 possesses, in addition to the wedge-shaped portion 12, also a wedge-shaped nose portion at its other end 12a. The wedge-shaped nose portions 12 and 13 extending out of the housing ends are slightly displaced back with respect to the sliding latch-bolt longitudinal axes so that the inclined edges facing the wings become longer. Finally, the housing 4 is provided with a spring support channel 22.

OPERATION

The operation of the arrangement described above is as follows:

During closing of both wings 2 and 3, at first wing 2 is pivoted in the direction toward the housing 4. The nose position 17a of the counterlatch or abutment part 17 thereby abuts against the forward edge of the wedge-shaped nose portion 13 and presses the sliding latch-bolt 11 by stressing the spring 20 back against the housing 4 so far until the nose portion 17a has passed the wedge tip of nose portion 13 and the latter comes into contact with the inclined surface 15 at the counterlatch or abutment part 17. Thereupon, the spring 20 urges the sliding latch-bolt 11 again out of the housing 4, and the pressure thereof against the inclined surface 15 pulls the wing completely into its closing position. During the subsequent pivoting of the wing 3 toward the housing 4, the same operation takes place between the sliding latch-bolt 10 and its wedge-shaped nose portion 12 in front of the counterlatch or abutment part 16.

By a corresponding distance of the counterparts or abutment members 16 and 17, care is taken that in the locking position of the movable parts illustrated in FIG. 1, the spring 20 has been slightly compressed and therewith its end-stress is still greater by a slight amount than its prestress determined by the length of the housing space 21. The end-stress, however, can only be so large that an opening of the wing, for example, by means of a door handle or with the aid of the key of a lock arranged at the wing, is possible again. As a result of the counterlatch or abutment part 16, disposed in its locking position with its nose portion 16a closely in front of the end of the sliding latch bolt 13a, the locking of the wing 2 is blocked. The counterbolts or abutment members 16 and 17 are also provided with elongated apertures 23 extending in the direction of the spring axis for a fine adjustment of their distance and with an additional aperture 24 for fixing the same.

The arrangement and operation of the embodiment of FIG. 5, 6, and 7 corresponds in principle to that of the embodiment of FIGS. 1 to 4. Only the purely structural difference exists that the securing flanges 5a are arranged at the end faces of the housing 4 and one of the sliding latch-bolts, for example, the sliding latch-bolt 10 is extended and provided with an aperture 26 as access to the securing slot 6 disposed therebelow. Additionally, the spring space 21 is closed off by a cover 27 provided with the spring support channel 22, and the spring ends are wound by means of turns closely abutting against each other into support bushings 20a. Appropriately, the spring space 21 of the housing 4 is as high as the spring outer diameter. Within the spring space 21 the spring supports itself with one-third of its diameter at the spring space end walls and with its remaining two-thirds at the end edges of the sliding latch-bolt apertures 18 and 19.

The wedge shapes 12 and 13 of the sliding latch-bolts are in the illustrated embodiment constructed symmetrically to the longitudinal axes thereof. The ends of the securing flanges 5a extend approximately in semicircular shape, for example, concentrically about the bore 6, and the upper edges thereof are either rounded off or, as illustrated in FIG. 5, beveled off at an inclination (5b). This beveling forms an abutment edge for the wing to be pivoted toward the same and has the purposes to lift a wing which is, for example, somewhat loose in its hinges or slightly sags, into its correct closing position. Of course, it is also possible to mount bushings, made separately, over the ends of the spring 20. With the exception of the spring 20, all of the parts described above may be made of synthetic resinous material, preferably in such a manner that they can be conventionally injection-molded or extruded by a simple movement of two mold halves without sliding part or core molds. Also, the described closure parts may be simply screwed onto the wing inside or may be arranged recessed in recesses provided for the accommodation thereof.

For the operationally correct assembly, it is of advantage to provide the front side of the housing 4 facing the wings with a closed or embossed mark.

As illustrated in FIGS. 8 and 9, instead of the securing slots and fixing apertures 6 and 23, there may also be arranged plug-and-stop-pins 58 and 59 projecting directly from the abutment surface of the securing parts 5 and 5a or from the housing 4, especially glue pegs or dowel-pins. For the purpose of an intimate connection between these pins or pegs with the glue mass, the former are roughened at the outer surfaces thereof in any known manner, for example, by projections or bosses or in particular by means of glue-escape-channels 16.

While I have shown and described two embodiments in accordance with the present invention, it is understood that the same is not limited thereto but is susceptible of numerous changes and modifications as are known to a person skilled in the art, and I therefore do not wish to be limited to the details shown and described herein but intend to cover all such changes and modifications as are within the scope of those skilled in the art.

I claim:

1. A lock mechanism, for two-winged doors, flaps or the like, characterized by support means arranged to the rear of the wings within the area of the gaps defined thereby, two axially movable slide bolt means in said support means and provided at the ends thereof with inclined abutments surfaces for lockingly engaging with a counterbolt means forming an abutment means matched thereto and provided at one of the wings and simultaneously aligning the closing position of said one wing, said slide bolt means being controllable in opposite directions by common spring means, further means including counterbolt means forming an abutment means at the other wing for blocking said bolt means in the closed position, and said slide bolt means being provided with end portions engaging into complementary surfaces of the abutment means at the wings, wherein the support means includes a housing forming a spring space and in that the slide bolt means are constructed as flat slide members each provided with aperture means

forming a frame for the common spring means, the common spring means being supported with the ends thereof at the end edges of the aperture means as well as at the end walls of the spring space, and the end walls being disposed substantially flush with the end edges.

2. A lock mechanism according to claim 1, characterized in that the spring space of the housing is provided with at least one spring support channel means.

3. A lock mechanism according to claim 2, characterized in that several spring support channel means are provided.

4. A lock mechanism according to claim 2, wherein the spring means controlling the slide bolt means is provided at the ends thereof with pressure bushings aligning the spring.

5. A lock mechanism according to claim 4, characterized in that the pressure bushings are formed by several spring end-windings disposed closely adjacent one another.

6. A lock mechanism according to claim 2, characterized in that the spring space of the housing is closed off by a detachable cover means which is provided on the inside thereof with a spring support channel means.

7. A lock mechanism according to claim 6, wherein the bottom of the housing is provided with said cover means.

8. A lock mechanism according to claim 6, characterized in that also the side of the spring space opposite the side provided with a spring insert opening is provided with the spring support channel means.

9. A lock mechanism according to claim 2, characterized in that the spring space of the housing is as high as the spring diameter and the spring means is supported with about one-third of its diameter at the end walls of the spring space and with the other two-thirds of the diameter at the end edges of the aperture means.

10. A lock mechanism according to claim 1, characterized in that the ends of the slide bolt means run out in wedge-shaped means in such a manner that on the sides facing the wings, longer abutment surfaces are provided.

11. A lock mechanism according to claim 10, wherein the wedge-shaped means are disposed symmetrically to the longitudinal axis.

12. A lock mechanism according to claim 10, wherein the wedge-shaped means are disposed asymmetrically to the longitudinal axis.

13. A lock mechanism according to claim 1, characterized in that a lateral securing flange means is provided at the housing.

14. A lock mechanism according to claim 1, characterized in that said housing is provided with one securing flange means each at its end faces.

15. A lock mechanism according to claim 13, characterized in that the ends of each securing flange means extend in a substantially semicircular shape.

16. A lock mechanism according to claim 13, characterized in that the upper edge of each securing flange means is rounded off.

17. A lock mechanism according to claim 13, characterized in that the upper edge of each securing flange means is beveled off.

18. A lock mechanism according to claim 14, characterized in that the securing flange means are provided with elongated securing aperture means disposed transversely to the longitudinal axis of the housing.

19. A lock mechanism according to claim 13, characterized in that at least one of the sliding bolt means is provided in an extension thereof with an access aperture for the securing slot disposed therebelow in the securing flange means.

20. A lock mechanism according to claim 1, wherein small lug means with projecting rounded-off nose portions serve as abutment means at the wings, said nose portions passing over on the inner sides thereof into inclined surfaces matched to the wedge-shaped edges of the slide bolt means and which together with the respective wing form a pocket for the accommodation of the end portions of the slide bolt means.

21. A lock mechanism according to claim 20, wherein the small lug means are provided also with securing slots.

22. A lock mechanism according to claim 21, wherein the securing slots are disposed in the axial direction of the housing.

23. A lock mechanism according to claim 21, wherein the securing slots extend parallel to the longitudinal axis of the housing.

24. A lock mechanism according to claim 21, wherein the small lug means are provided with additional stop aperture means.

25. A lock mechanism according to claim 1, wherein the slide bolt means are axially guided in slotted aperture means provided in the end walls of the housing.

26. A lock mechanism according to claim 1, characterized in that the housing is provided with a marking at the front side thereof in order to facilitate the correct assembly.

27. A lock mechanism according to claim 1, characterized in that the housing and abutment means are threadably secured on respective parts.

28. A lock mechanism according to claim 1, characterized in that the housing and abutment means are arranged recessed.

29. A lock mechanism according to claim 1, characterized in that with the exception of the spring means all parts are made of synthetic resinous material.

30. A lock mechanism according to claim 1, characterized

in that plug and stop pin means are provided which extend from abutment surfaces of the securing parts and which are roughened on the outside thereof.

31. A lock mechanism according to claim 30, wherein said securing parts include glue dowel pins provided with glue-escape-channels.

32. A lock mechanism according to claim 2, characterized in that also the side of the spring space opposite the side provided with a spring insert opening is provided with spring support channel means.

33. A lock mechanism according to claim 1, characterized in that the spring space of the housing is as high as the spring diameter and the spring means is supported with about one-third of its diameter at the end walls of the spring space and with the other two-thirds of the diameter at the end edges of the aperture means.

34. A lock mechanism according to claim 2, wherein small lug means with projecting rounded-off nose portions serve as abutment means at the wings, said nose portions passing over on the inner sides thereof into inclined surfaces matched to the wedge-shaped edges of the slide bolt means and which together with the respective wing form a pocket for the accommodation of the end portions of the slide bolt means.

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