Aug. 31, 1948. W. A. BARNES 2,448,409

SPRING LATCH MECHANISM

Filed Jan. 27, 1947

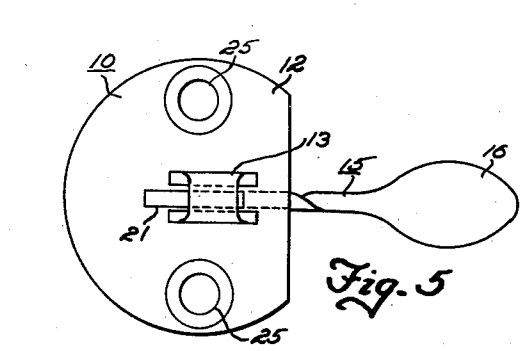

Fig. 5

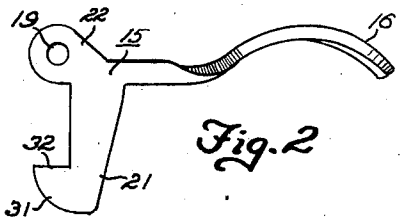

Fig. 2

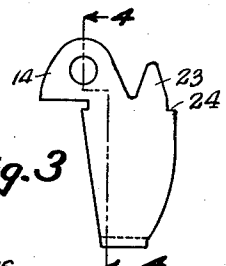

Fig. 3

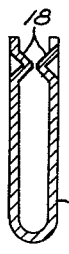

Fig. 4

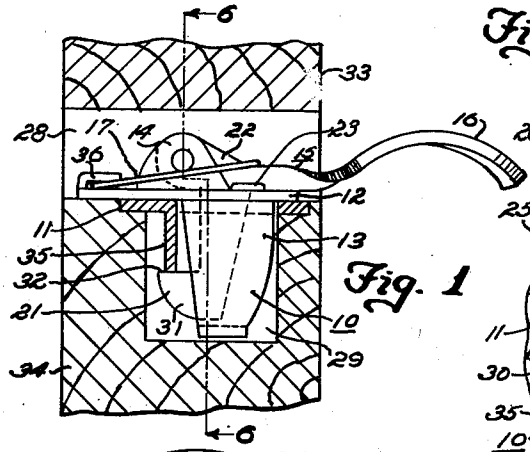

Fig. 1

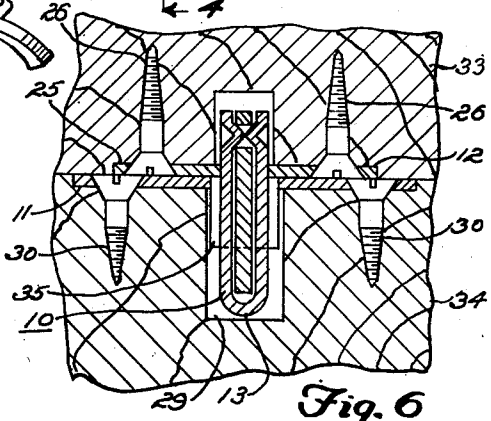

Fig. 6

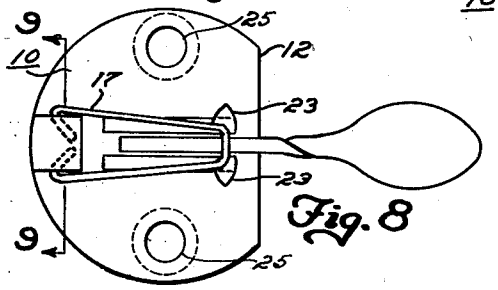

Fig. 8

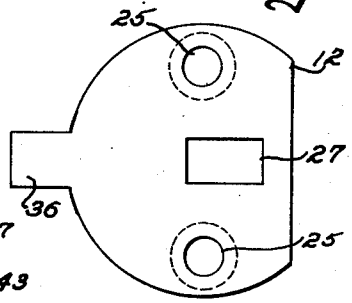

Fig. 7

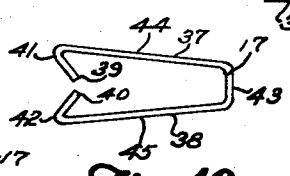

Fig. 10

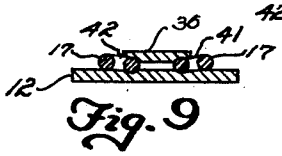

Fig. 9

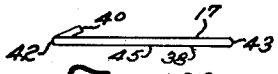

Fig. 11

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SPRING LATCH MECHANISM

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Application January 27, 1947, Serial No. 724,606

5 Claims. (Cl. 292—128)

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My invention relates generally to hardware and particularly to latches and the like.

Before entering into an explanation of this invention, it will be understood that these devices are used particularly to hold down the covers of caskets and the main advantages arising from their construction are most apparent in connection with this class of containers, although it is obvious that they can be used for other purposes as well. The description, therefore, will be limited to the latch itself.

Although the latch on a casket is a relatively small and inexpensive portion as compared with the entire cost of the casket, it is very necessary that the latch be well constructed and dependable, because a breakdown in the latch after the casket has been shipped to a point, will necessitate the return of the entire casket to the manufacturing establishment, or the dispatch of a repairman to the location of the casket in order to replace or repair the faulty latch.

Because only the handle of the latch protrudes from under the surface of the casket lid, this handle is given a strong tug to unlatch the lid of the casket from the main portion thereof, and is then used to start the upward movement of the lid. Obviously then, a heavy strain is placed on the latch structure each time the lid is open. Further, these lids are opened and closed quite frequently during the construction period and afterwards in the display room and in actual use. It is desirable therefore, that the spring action of the latch be quite strong and reliable, and yet operate smoothly and evenly. Further, because of the frequent use of this latch, it is desirable that the spring be so constructed that a relatively large amount of movement may be experienced by the handle with an even application of spring pressure at all positions. Because of this relatively large amount of movement, the spring of most devices in use today is overtaxed and often is strain-hardened to the point of failure.

Also, because of the rather unique condition under which a casket lid latch is employed, it is extremely desirable that the pivot area and spring construction of the latch be kept to an over-all minimum width. Thus, free design of spring structure to provide springs which will produce an even tension throughout a wide range of fluxing without becoming work hardened is narrowly limited.

Accordingly, an object of my invention is to provide a compact pivotal connection between two relatively pivotable parts of a latch, whereby

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a recess of minimum size is required in a lid or other member to which the latch is to be secured.

Another object of my invention is to construct a latch which will be easy to build and in which the parts are so cooperative as to provide the maximum amount of strength with an even distribution of stress in the spring member thereof.

Yet another object of my invention is to provide an improved spring member for a compact pivotal spring member for the two relatively pivotable parts of a casket latch which will not require a substantial increase in the maximum size recess required in a lid or other member to which the latch is to be secured.

Another object of my invention is to provide a spring member for a casket latch which spring member is stressed by bending in one portion thereof, and by torsional stress in another portion thereof, the combination of bending and torsion stresses producing the complete spring action.

Other objects and a fuller understanding of my invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a side elevational view of a latch with which my invention may be used, showing a cross-section of a casket lid and body member with which the latch is cooperating;

Figure 2 is a side view of the hook part and handle of the latch;

Figure 3 is a side elevation of a shield member and pivotal support tabs of the latch:

Figure 4 is a cross-sectional view of the shield member and pivotal support tabs, taken along the line 4—4 of Figure 3;

Figure 5 is a bottom view of the latch showing the relationship of the shield and the hook member and handle thereof;

Figure 6 is a cross-sectional view taken along the line 6—6 of Figure 1 and shows the width of the recess required to mount the latch,

Figure 7 is a plan view of the anchor plate of the latch;

Figure 8 is a top view of the latch showing the relationship of the spring to the pivotal support tabs and to the hook part;

Figure 9 is a cross-sectional view along the line 9—9 of Figure 8;

Figure 10 is a plan view of the spring member before assembled with the latch; and

Figure 11 is a side view of the spring member of Figure 10.

With reference to Figure 1, I illustrate a type

of latch which may be used to secure a top lid or cover such as a casket lid. As is illustrated in the Figure 1, the latch 10 comprises an anchor plate 12, a shield member 13 extending downwardly from the anchor plate 12, pivotal support members 14 extending upwardly from the anchor plate, a hook member 15 comprising a hook 21, a handle 16, a shoulder 22, and a spring 17.

To better understand the construction of the latch 10, reference is made to the detail drawing of the component parts, the hook member of which is illustrated in Figure 2. The hook member 15 is preferably stamped from sheet material and the handle bent to a position substantially as indicated in the Figure 2. A hole 19 is the prefered embodiment, and is provided in the shoulder 22 by any suitable means such as by stamping or drilling, although a depression on each side of the shoulder, if preferred, may be provided, and need not be continuous through the shoulder.

For easy manufacture and solidity of structure, the shield member 13 and the tab supporting members 14 may be cut or stamped from a single sheet of material and bent in substantially a U form as illustrated in Figure 4. The Figure 3 illustrates the side profile form of the combination of shield member and tab members as described. Shoulder stops 24 and locking ears 23 are provided on the shield member 13 to lockingly hold the shield member 13 and the tab members 14 upon the anchor plate 12. Protruding surfaces 18, as best illustrated in the Figure 4, are provided on the tab member 14 and extend inwardly toward one another from their respective tabs. The protruding surfaces 18 may be preferably stamped from the material of the tabs 14 and are integral with the tabs 14. The protruding surfaces 18 extend into the hole 19 of the hook member 15 and are shown as short conical protrusions for forming bearings for the pivotal connection.

The anchor plate 12, as best illustrated in Figure 7, is stamped or provided from sheet material and may be of any suitable outside form, such as the semi-circular form illustrated. Chamfered screw openings 25 are provided to permit the anchoring of the anchor plate 12 and the latch 10 to the door or lid on which it is operating by means of bolts or screws such as the screws 26. A rectangular opening 27 is provided in the anchor plate to mount the shield part 13 with the tabs 14 and the hook member 15 therein. A clamping member 36 is integrally formed with the anchor plate 12, as best illustrated in the Figure 7. This clamping member 36 may be folded along the edge of the anchor plate 12, that is the division line between the anchor plate 12 proper and the extension clamping member 36 thereof, as illustrated in the Figure 1 of the drawings.

I have found that a vastly improved spring action for the type of latch illustrated may be accomplished by combining and balancing pure bending action with torsion bending. In order to accomplish this balance of bending stresses, I have found that a spring structure as illustrated in the Figure 10 is most suitable and to be preferred. This spring 17 comprises generally a first leg portion 37 and a second leg portion 38. The leg portion 37 includes a lever anchor portion 39 and a transverse torsion portion 41. Likewise, the leg portion 38 includes a lever anchor portion 40 and a transverse torsion portion 42. As illustrated in Figure 11, the lever anchor portions 39 and 40 are preferably bent to lie at an angle to the plane of the remainder of the spring.

To assemble the latch 10 for operation, the tabs 14 may be inserted into the rectangular opening 27 until the stop shoulders 24 of the shield 13 comes in contact with the edges of the opening 27. The locking ears 23 are then bent over tightly to the surface of the anchor plate 12 and the combination of shield plate 13 and tab member 14 are thus securely held in place. The hook member 15 may be inserted into place by spreading the tabs 14 a slight distance apart and inserting the hook 21 therethrough and into the loop of the shield member 13. The hole 19 is placed into position to be engaged by the protruding surfaces 18 of the tabs 14 when the tabs 14 are again returned to the normal position. Upon returning the tabs 14 to their normal position, the protruding surfaces 18 extend into the hole 19 and thereby pivotally lock the hook member 15 to the tabs 14.

My improved spring 17 may be placed in position after the assembling of the latch has been done as heretofore described. In assembling the spring 17, the tab 36 is preferably bent back upon the plate 12 to some extent, but not tightly thereagainst. The spring 17 is then placed with a contact end 43 thereof pressing down upon the top surface of the hook member 15 at a position on the side of the opening 27 opposite the tab member 36. The lever anchor portion 39 and 40 are placed beneath the folded tab member 36, and the transverse torsion portion 41 and 42 extend outwardly from the cover of the tab member 36. Thereafter, the tab member 36 may be thrust a hard blow to tightly secure the portions 39 and 40 between the surface of the anchor plate 12 and the tab member 36. By thus pressing the portions 39 and 40, an initial tension will be placed on the spring 17, because of the upward bend given to the portions 39 and 40; see Figure 11. As illustrated best in the Figure 9, the blow used in pressing the tab member 36 tightly upon the portions 39 and 40 is sufficient to embed the spring portions 39 and 40 into the metal of the anchor plate and the tab member 36. Longitudinal grooves are thereby formed in the plate 12 and the tab 36 and tightly hold the spring 17 against displacement during use. It is possible to thus form the longitudinal groove and embed the spring into the metal of the plate 12 and the tab 36, because the spring metal of the spring 17 is considerably harder than the metal normally used for the plate 12 and the tab 36.

As before mentioned, and as is best illustrated in the Figure 8, the transverse torsion portions 41 and 42 of the spring 17 extend from beneath the tab member 36. Thus, during operation when the spring 17 is flexed as the handle 16 is moved, a bending action will take place in the interconnecting spring arm 44 and 45 of the legs 37 and 38 respectively, whereas a torsion portion or twisting action will take place in the portions 41 and 42. Thus, a vastly improved spring action for this type of latch is produced by my improved spring structure.

It is apparent from the drawings and the discussion given hereinbefore, that the type of pivotable mounting means illustrated is simple to construct, easy to assemble, and eliminates exterior protruding surfaces which would require an extra large recess to fit into, and which would also require a larger anchoring plate 12 in order that the screw openings 25 could be spaced far enough to clear a large recess. A small recess 28 is re-

quired in a lid member, and the resulting safe distance between the recess 28 and the screws 26 is illustrated in Figure 6 of the drawing.

To mount the latch 10 for operation, the lid or door 33 with which the latch is to operate need be recessed, as by recess 28, to a very narrow width to permit entry of the tab part 14 and the spring member 17 of the latch. The latch 10 is then mounted as illustrated in Figure 6 and held in place by screws 26. The latch is adapted to engage a catch 11 which is illustrated in Figure 1 in cross-section and may be made from a rectangular piece of material having a latch receiving opening therein. The material cut from the latch receiving opening of the catch 11 is bent along one side thereof in a perpendicular direction to the rim of the catch 11 to form a catch member 35.

A recess 29 is provided in the body 34 to which the lid or door 33 engages to provide clearance for the shield 13 and the catch member 35 to extend into. The catch plate as before described may then be secured by means of screws 30 to the body part 34 to form a rim about the recess 29, and form a catch member 35 extending into the recess 29.

The lid or door is locked to the stationary part of the device by allowing the lid, which is carrying the latch 10 to extend upon the stationary part with the shield 13 and the hook member 21 of the latch 10 extending into the recess 29. As the rounded edge 31 of the hook 21 strikes the catch 11, the hook member 15 is pivoted about the protruding surfaces 18 against the force of the spring 17. The shield 13 and the hook 21 are thus able to extend into the recess 29. After full penetration of the hook 21 and shield 13 into the recess 29, the catch engaging surface 32 of the hook 21 is free to be snapped by the spring 17 under the perpendicular edge of the catch 11 and secure the latch 10 to the catch 11 thereby locking the lid to the stationary body part.

To release the lid from the stationary body part, the handle 16 is deflected upward to pivot the hook member 15 about the tabs 14 and move the flat surface 32 and the perpendicular part of the catch 11 apart. The lid is thus released to be raised from its position from the body part.

Although I have described my invention with a certain degree of particularity in its preferred form, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. In a latch adapted to engage a catch, the said latch comprising an anchoring plate having an aperture therethrough, two tab members spaced on opposite sides of said aperture extending upwardly from said plate, a hook member with a handle, said hook member having a pivot portion with a pivot hole extending transversely therethrough, said hook member being positioned with the pivot portion thereof positioned between the spaced tab members and with a latch portion thereof extending swingably through said aperture, the combination of protruding inside surfaces formed integrally with the spaced tab portions and extending into the said hole of the pivot portion to pivotally engage the pivot portion to said tab portions, and spring means to constrain the hook member to a latched position, the said spring means comprising a first leg portion and a second leg portion, each said leg portion including an anchor end, a contact end, and an interconnecting spring arm interconnecting said ends, said anchor end of each leg including a lever anchor portion and a transverse torsion portion, fastening means for fastening said anchor ends to said anchor plate on one side of said pivot hole, said interconnecting spring arm of each leg extending away from said fastening means in a direction toward said handle, said transverse torsion portion of each leg extending in a direction at an angle to the direction of said spring arm, and said lever anchor portion of each leg extending in a direction at an angle to the said transverse torsion portion, said contact end pressing on said hook member on said other side of said pivot hole and constraining said hook to a latched position.

2. In a latch adapted to engage a catch, the said latch comprising an anchoring plate having an aperture therethrough, two tab members spaced on opposite sides of said aperture extending upwardly from said plate, a hook member with a handle, said hook member having a pivot portion with a pivot hole extending transversely therethrough, said hook member being positioned with the pivot portion thereof positioned between the spaced tab members and with a latch portion thereof extending swingably through said aperture, the combination of protruding inside surfaces formed integrally with the spaced tab portions and extending into the said hole of the pivot portion to pivotally engage the pivot portion to said tab portions, and spring means to constrain the hook member to a latched position, the said spring means comprising a first leg portion and a second leg portion, each said leg portion including an anchor end, a contact end, and an interconnecting spring arm interconnecting said ends, said anchor end of each leg including a lever anchor portion and a transverse torsion portion, a clamping member formed integrally with an edge of said anchoring plate on one side of said pivot hole, said clamping member having longitudinal grooves therein corresponding to each of the lever anchor portions of the leg members of the spring means, said anchor plate having longitudinal grooves therein corresponding to each of the lever anchor portions of the leg members, said clamping member being folded along said edge back upon said anchor plate and thereby fastening the lever anchor portions of the spring means between said clamping member and anchor plate in said corresponding longitudinal grooves, said interconnecting spring arm of each leg extending away from said fastening means in a direction toward said handle, said transverse torsion portion of each leg extending in a direction at an angle to the direction of said spring arm, and said lever anchor portion of each leg extending in a direction at an angle to the said transverse torsion portion, said end pressing on said hook member on said other side of said pivot hole and constraining said hook to a latched position.

3. In a latch adapted to engage a catch, the said latch comprising an anchoring plate having an aperture therethrough, two tab members spaced on opposite sides of said aperture extending upwardly from said plate, a hook member with a handle, said hook member having a pivot portion with a pivot hole extending transversely

therethrough, said hook member being positioned with the pivot portion thereof positioned between the spaced tab members and with a latch portion thereof extending swingably through said aperture, the combination of protruding inside surfaces formed integrally with the spaced tab portions and extending into the said hole of the pivot portion to pivotally engage the pivot portion to said tab portions, and spring means to constrain the hook member to a latched position, the said spring means comprising a first leg portion and a second leg portion, each said leg portion including an anchor end, a contact end, and an interconnecting spring arm interconnecting said ends, said anchor end of each leg including a lever anchor portion and a transverse torsion portion, a clamping member formed integrally with an edge of said anchoring plate on one side of said pivot hole, said clamping member being folded along said edge back upon said anchor plate and thereby fastening the lever anchor portions of the spring means between said clamping member and anchor plate, said interconnecting spring arm of each leg extending away from said fastening means in a direction toward said handle, said transverse torsion portion of each leg extending in a direction at an angle to the direction of said spring arm, and said lever anchor portion of each leg extending in a direction at an angle to the said transverse torsion portion, said end pressing on said hook member on said other side of said pivot hole and constraining said hook to a latched position.

4. An improved wire spring for a latch, said latch having an anchoring plate and having a handle member pivotably mounted on said anchoring plate, said anchoring plate having a tab portion on one side of said pivotal mounting folded back upon said plate, said spring comprising a first leg portion and a second leg portion, each leg portion including an anchor end, a contact end, and an interconnecting spring arm interconnecting said ends, said contact ends of the first and second leg portions being integral to join the first and third leg portions as one continuous wire spring, said anchor ends of the first and second leg portions comprising lever anchor portions in hook relationship with the adjacent interconnecting spring arm portion, substantially transverse portions interconnecting each said leg

portion with the respective anchor portions, said anchor portions being held between said anchor plate and the folded tab thereof, and said interconnecting spring arms extending said contact ends to contact the handle member on the opposite side of said pivotal mounting.

5. An improved wire spring for a latch, said latch having an anchoring plate and having a handle member pivotably mounted on said anchoring plate, said anchoring plate having a tab portion on one side of said pivotal mounting folded back upon said plate, said spring comprising a first leg portion and a second leg portion, each leg portion including an anchor end, a contact end, and an interconnecting spring arm interconnecting said ends, said contact ends of the first and second leg portions being integral to join the first and second leg portions as one continuous wire spring, said anchor ends of the first and second leg portions comprising lever anchor portions in hook relationship with the adjacent interconnecting spring arm portion, said interconnecting spring arm portions tending to lie in a first plane, said lever anchor portion tending to lie in a second plane at an angle to said first plane, substantially transverse portions interconnecting each said leg portion with the respective anchor portions, said anchor portions being held between said anchor plate and the folded tab thereof against the natural position of the anchor portions in said second plane to urge the said spring flat against the anchoring plate in one common plane, and said interconnecting spring arms extending in a plane at an angle to said anchoring plate to position the contact ends in contact with the handle member on the opposite side of said pivotal mounting, whereby the spring is given an initial tension to press the handle in a given position.

WALLACE A. BARNES.

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