Oct. 20, 1970 G. E. SWANSON 3,534,992

LOW PROFILE CATCH FOR A PACKING CASE OR THE LIKE

Original Filed Oct. 22, 1965

FIG. 1

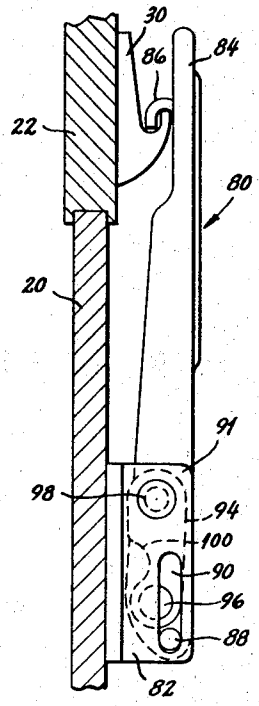


FIG. 2

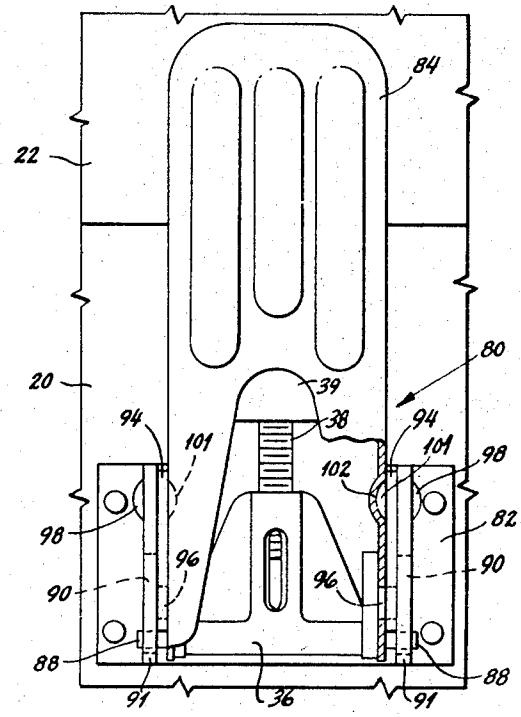
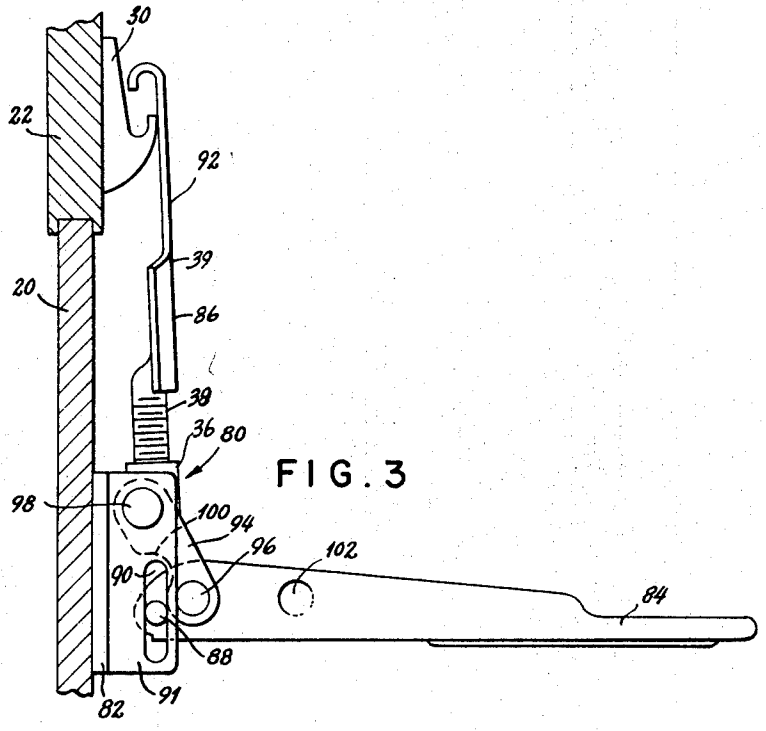


FIG. 3



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LOW PROFILE CATCH FOR A PACKING CASE OR THE LIKE

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Original application Oct. 22, 1965, Ser. No. 501,425, now Patent No. 3,428,348, dated Feb. 18, 1969. Divided and this application May 20, 1968, Ser. No. 730,379

Int. Cl. B65d *43/24;* E05c *19/14*

U.S. Cl. 292—113 7 Claims

ABSTRACT OF THE DISCLOSURE

A catch for releasably securing two parts of a packing case or the like includes a base, an adjustable length pivotal drawbar, and an operating lever movable between open and closed positions for moving the drawbar between open and closed positions relative to an associated strike. In its closed position the operating lever overlies the drawbar, and a sliding and link connection between the operating lever and the base permit movement of the operating lever between its open and closed positions with substantially no extra clearance being required in the base, thereby allowing the catch to be made with a relatively low profile when closed.

CROSS REFERENCE TO RELATED APPLICATION

This application is a division of pending application Ser. No. 501,425 filed Oct. 22, 1965, now Pat. No. 3,428,348.

BACKGROUND OF THE INVENTION

This invention relates to catches for releasably securing together two separable parts such as the body and cover of a packing box or the like, and deals more particularly with a catch of the over-center action type having a pivoting and adjustable length drawbar which is moved into and out of engagement with an associated strike by means of a pivoting operating handle.

The general object of this invention is to provide a catch of simple construction and operation which is adjustable to accommodate differences in the distance between its base and the associated strike, and to obtain a desired clamping pressure between two secured parts when closed, and which may be constructed so as to have a relatively low profile.

SUMMARY OF THE INVENTION

A catch for releasably securing two separable parts includes a base and an operating lever connected at its rear end to the base by a pin carried by the lever and riding in longitudinally extending slots in the base, thereby restraining the rear end of the lever to longitudinal sliding and pivotal movement relative to the base. The operating lever is additionally connected to the base by a laterally spaced pair of similar short links each having a rear end pivotally connected to the operating lever forwardly of the pin and a forward end pivotally connected to the base forwardly of its rear end, so that as the operating lever is pivoted about the axis of the pin the pin and the rear end of the lever are caused by the links to slide along the longitudinal base slots. An adjustable length drawbar is pivotally connected at its rear end with the pin so that as the pin is moved in the base slots by the movement of the operating lever the drawbar is also moved longitudinally of the base.

BRIEF DESCRIPTION OF DRAWING

FIG. 1 is a side view of a catch embodying the present invention.

FIG. 2 is a front elevational view of a catch showing the same in a closed condition and with various parts being broken away to reveal the structure of other parts.

FIG. 3 is a side view of the catch showing the same in a partially open condition.

Referring now to the drawings in greater detail, the figures show a catch, indicated generally at **80**, embodying the invention and adapted to releasably secure to one another two separable panels **20** and **22**. These panels **20** and **22** may comprise parts of the body and cover respectively of a packing case or the like, but it should be noted that the catch of this invention is equally well adapted to secure to one another panels and parts other than the body and cover portions of a packing case.

The catch **24** includes a base **82**, suitably adapted for attachment to the panel **20**, and an operating lever **84**. It further includes a drawbar **86** which is pivotally connected to the rear or lower end of the operating lever **84** by a transversely extending pin **88** and which cooperates with a strike **30** attached to the panel **22** above the base **26**. The drawbar **86** is adjustable in length and is comprised basically of two parts. These two parts are a strike engageable claw **92** and an inner part **36**. The strike engageable claw **92** includes a wide upper portion **39**, preferably made of sheet metal, and a threaded shank **38**. The inner part **36** is preferably made from formed sheet metal, as shown, and in addition to defining a transversely extending opening for receiving the pivot pin **88** also defines a longitudinally extending centrally arranged opening into which the shank **38** of the claw **92** is threaded.

The base **82** of the catch **80** is adapted to rest flatly against the surface of the panel **20** and may be secured thereto in any convenient manner, as for example by screws or rivets or the like. Two transversely spaced flanges **91, 91** extend outwardly from the portion of the base engaging the panel **20** and include laterally aligned longitudinally extending openings or slots which respectively receive associated end portions of the pin **88**. That is, the pin **88** extends laterally outwardly through the elongated openings or slots **90, 90** formed in the side flanges **91, 91** of the base **82** and restrains the rear end of the operating lever to pivotal and longitudinal sliding movement relative to the base. As shown in FIG. 3, these openings **90, 90** are elongated along a line passing generally from the base to the strike so that as the pin **88** slides in the openings, the drawbar is moved toward or away from the strike.

In addition to being connected at its rear end to the base by the pin **88** and slots **90, 90**, the operating lever is also connected thereto through two similar laterally spaced short links **94, 94**. At the rear ends of the links **94, 94** the operating lever **84** is pivotally connected to the links by a pair of transversely aligned short pivot pins **96, 96**. The links **94, 94** are in turn pivotally connected at their forward ends to the base flanges **91, 91** by a second pair of transversely aligned short pivot pins **98, 98**. Each link **94** also has an undercut portion, as indicated at **100**, so as not to interfere with the sliding pin **88** as the operating lever **84** is moved between its open and closed positions.

FIG. 1 shows the catch **80** in its closed condition. In this position, the links **94, 94** are generally parallel with the operating lever and drawbar. The sliding pin **88** is located at the rear or lower ends of the openings **90, 90** to cause the drawbar to be firmly engaged with the strike. Also, the axis of the pivot pin **88** is located "over-center" with respect to the axis of the pivot pins **96, 96** and the point of engagement of the claw with the strike so that the force exerted by the strike on the claw tends to retain the catch in the closed condition. In the closed condition of the catch, the axis of the pivot pin **88** is also

located behind, or further from the strike than, the axis of the pivot pins **96, 96**. As the operating lever is moved clockwise from its closed position of FIG. 1, the rear or lower ends of the links **94, 94** first move away from the panel **20** until the operating lever reaches generally the position of FIG. 3. At this position, the pivot pin **88** passes under the pivot pins **96, 96**, and upon further clockwise rotation of the operating lever the lower ends of the links **94, 94** return toward the panel **20**. It will also be noted that as the operating lever moves clockwise from its closed position the pin **88** moves toward the strike by sliding along the openings **90, 90** and thereby removes the drawbar from the strike to allow the panel **22** to be separated from the panel **20**. From the position shown in FIG. 3 the drawbar **86** may also be pivoted counterclockwise about the axis of its pivot pin **88** to move the claw **92** outwardly away from the strike **30**, thereby allowing the panel **22** to be moved upwardly relative to the panel **20** without danger of catching the strike on the claw.

Means are also preferably provided in the catch **80** for releasably holding the operating lever in its closed position. Such means may constitute a positive latch. However, in the illustrated case, the holding means constitutes the two pivot pins **98, 98** which are provided with rounded heads **101, 101**, on their inboard ends, which engage cooperating detents, such as shown at **102** in FIG. 2, formed in the side flanges of the operating lever when the operating lever is in its closed position. The natural resiliency of the operating lever side flanges therefore tends to retain the detents aligned with the rounded heads **101, 101** and must be overcome by some substantial degree of manual force when opening or closing the catch. The operating lever is therefore frictionally held in its closed position and is not susceptible to inadvertent opening as a result of shock loads or the like.

I claim:

1. A catch for use in releasably connecting two separable panels or the like one of which carries a strike, said catch comprising a base adapted for attachment to other of said panels in alignment with said strike, an operating lever, means connecting said operating lever at its rear end to said base for pivotal movement relative to said base between open and closed positions about a first transverse pivot axis fixed relative to said operating lever and limited to sliding movement longitudinally of said base, an intermediate link pivotally connected at one of its ends to said operating lever for pivotal movement relative to said operating lever about a second transverse pivot axis fixed relative to said lever and located forwardly of said first pivot axis when said lever is in its closed position and pivotally connected at its other end to said base for pivotal movement relative to said base about a third transverse pivot axis fixed relative to said base and located forwardly of said first and second pivot axes when said operating lever is in its closed position, and a drawbar having one end thereof adapted for engagement with said strike and said drawbar so that said drawbar axis is said operating lever for pivotal movement about a transverse drawbar pivot axis fixed relative to said operating lever and located rearwardly of said second pivot axis, said pivot axes being so arranged that when said operating lever is in its closed position said drawbar axis is in an over-center condition with respect to a line drawn between said second axis and the point of contact between said strike and said drawbar so that said drawbar axis is moved between said second axis and said other panel as said operating lever is moved from its closed to its open position.

2. A catch as defined in claim **1** further characterized by said drawbar axis being coincident with said first axis.

3. A catch as defined in claim **1** further characterized by means for adjusting the length of said drawbar.

4. A catch as defined in claim **1** further characterized by said drawbar being connected to said operating lever solely by said pivotal connecting means and being unconnected to any other part of said catch so as to be pivotally movable about said first axis toward and away from said strike.

5. A catch for use in releasably connecting two separable panels or the like one of which carries a strike, said catch comprising a base adapted for attachment to the other of said panels in alignment with said strike and including two laterally spaced side flanges, an operating lever having two side flanges each located adjacent a respective one of said base flanges, two intermediate links each located between one of said base flanges and the associated operating lever side flange, each of said links being connected at one end to the associated base flange for pivotal movement about a first axis fixed relative to said base and being connected at its other end to the associated operating lever side flange for pivotal movement about a second axis fixed relative to said operating lever, and located beyond said first axis in the direction away from said strike when said operating lever is in its closed position, a drawbar actuated by said operating lever, said drawbar having one end thereof adapted for engagement with said strike and having its other end pivotally connected to said operating lever for movement about a drawbar axis fixed relative to said operating lever and spaced from said second axis, and means restraining said drawbar axis to movement relative to said base in a path located generally in a plane passing from said base to said strike, said operating lever when in its closed position overlying said drawbar and causing said drawbar axis to be located beyond said second axis in the direction away from said strike, said axes being further so arranged that when said operating lever is in its closed position said drawbar axis is in an over-center condition with respect to said second axis and the point of contact between said strike and said drawbar and so that said drawbar axis is moved between said second axis and said other panel as said operating lever is moved from its closed to its open position.

6. A catch as defined in claim **5** further characterized by at least one of said links being connected to the associated base flange by means of a pivot pin having a rounded head located in the path of movement of the associated operating lever side flange, and said associated lever side flange having a detent for receiving said rounded head to frictionally retain said operating lever in its closed position.

7. The combination as defined in claim **5** further characterized by said drawbar being pivotally connected to said operating lever by means of a pivot pin, and said means for restraining said drawbar axis to movement relative to said base in a path located generally in a plane passing from said base to said strike comprising two elongated openings each located in a respective one of said base flanges and end portions of said pivot pin which end portions are received in and guided by said elongated openings.

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U.S. Cl. X.R.

292—247

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(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,534,992 Dated October 20, 1970

Inventor(s) Gunnar E. Swanson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 3, line 58, delete "said drawbar so that said drawbar axis is" and substitute --having its other end pivotally connected to-- .

SIGNED AND
SEALED
DEC 22 1970

(SEAL)
Attest:

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