July 14, 1964 W. TROTTER ETAL 3,140,905

CHASSIS LATCH

Filed Aug. 1, 1962

Fig 1

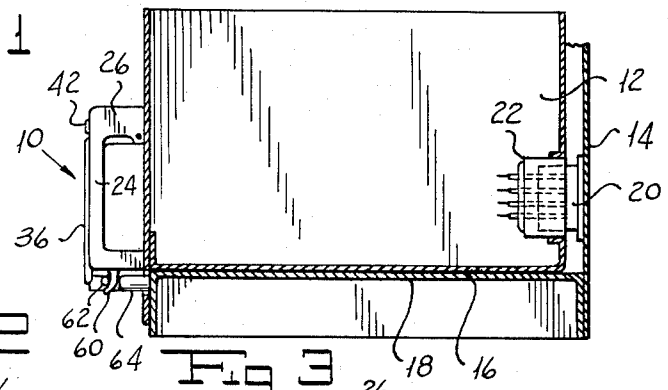


Fig 2

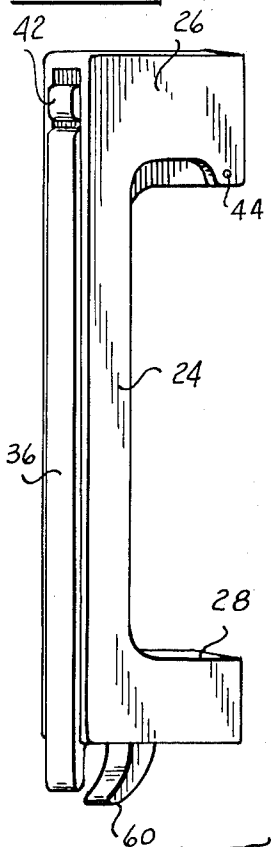


Fig 3

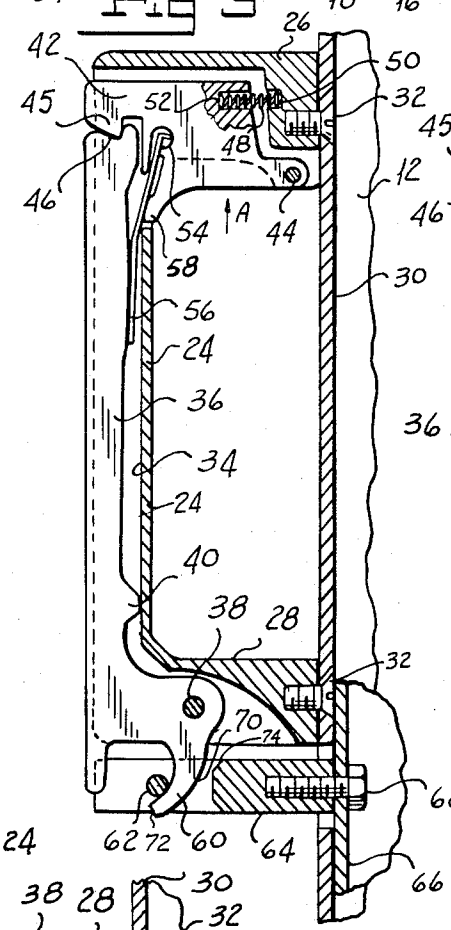


Fig 5

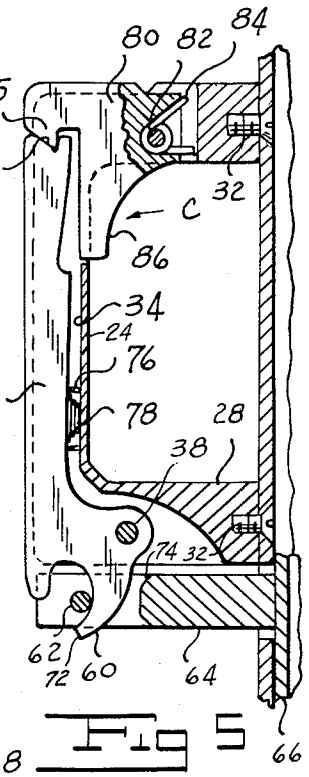
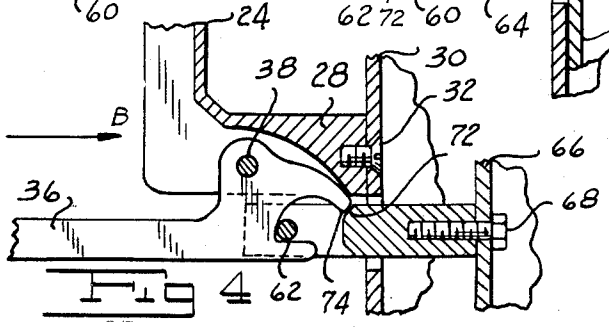


Fig 4



INVENTORS
WALTER TROTTER
FRANK WHEELER

BY Shenier & O'Connor
ATTORNEYS

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CHASSIS LATCH

Walter Trotter, Fairlawn, and Frank Wheeler, Little Falls, N.J., assignors to Camloc Fastener Corporation, Paramus, N.J., a corporation of New York

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Our invention relates to a chassis latch and more particularly to a latch for releasably holding an electronic chassis in its installed position and which permits removal and reinstallation of the chassis without danger of damaging electrical connectors.

In the prior art drawer-like chassis carrying heavy electronic equipment are removably installed in the supports containing electrical connectors such as plugs which engage receptacles carried by the chassis to make proper electrical connections of the components on the chassis. There are provided in the prior art means for locking the chassis in their installed positions while permitting them to be removed, as for example, when it becomes necessary to service the components supported by the chassis. One type of latching assembly known in the prior art includes a fixed handle secured to the chassis and provided with a recess adapted to house a pivoted handle in the closed position of the drawer. The pivoted handle portion carries a latch which engages a keeper when the drawer is closed and a catch releasably holds the pivoted handle portion in its housed position.

When the chassis is to be removed the catch is released and the pivoted handle swings to a position at which it is accessible to permit it to be moved to a position at which the latch is out of engagement with the keeper. In this position of the parts the drawer can readily be removed from the recess in which it normally is housed.

When the chassis is to be reinstalled it is slid into the recess and as it slides home the electrical connectors such as pins carried by the support engage with the electrical connector such as a receptacle provided with holes and carried by the chassis. At the same time the pivoted handle swings into the fixed handle recess as the latch engages a portion of the keeper support.

While the latch assembly of the type described is satisfactory in most respects it embodies a number of disadvantages. First, owing to the weight of the components carried by the chassis the unit has a relatively high inertia as it slides home and if the interengageable electrical connectors are not precisely aligned the pins or the like may be bent or broken before they have an opportunity to align themselves with the holes in the plug. An occurrence such as this necessitates relatively extensive repairs. Moreover, as the pivoted handle swings into the fixed handle recess it moves with great force and unless the installer exercises a relatively high degree of care it may slam onto his thumb and cause severe injury. Another disadvantage which has been found with latch assemblies of the prior art is the difficulty of operating the pivoted handle catch to release the pivoted handle.

We have invented an improved chassis latch which overcomes the difficulties which have been encountered in chassis latches of the prior art. Our improved latch prevents the chassis from sliding home with such force as might damage the electrical connectors. At the same time our assembly avoids the possibility of injury to the installer's hand as the pivoted latch swings into its recess. Our improved chassis latch is provided with an easily operated and relatively simple mechanism for releasing the pivoted handle catch. Our latch is so constructed that it is not easily released by accident.

One object of our invention is to provide an improved

chassis latch which prevents damage to the electrical connectors as the chassis slides home.

Another object of our invention is to provide an improved chassis latch which minimizes the danger of injury to the installer's hand as the pivoted handle swings into its recess.

A further object of our invention is to provide an improved chassis latch having a simple and expeditiously operated catch-releasing mechanism.

A still further object of our invention is to provide an improved chassis latch which is not readily released by accident.

Other and further objects of our invention will appear from the following description:

In general our invention contemplates the provision of an improved chassis latch in which a pivoted handle portion normally housed in a fixed handle on the chassis has a latch which engages a keeper on the chassis support when the handle is disposed in the recess. We provide our latch with interengageable means on the latch and the keeper support for preventing movement of the chassis to its fully housed position until the installer intentionally moves the pivoted handle to its position within the recess. We provide our latch with a simple trigger arrangement to permit the pivoted handle catch to be released in an expeditious manner. Our trigger is so constructed that it is not easily struck by an extraneous member so as to be accidentally released.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

FIGURE 1 is a sectional view of an electronic chassis and support provided with our improved chassis latch.

FIGURE 2 is a perspective view of one form of our improved chassis latch removed from its installed position.

FIGURE 3 is a sectional view of the form of our improved chassis latch shown in FIGURE 1.

FIGURE 4 is a fragmentary sectional view of our improved chassis latch illustrating the operation thereof in overcoming defects of latch assemblies of the prior art.

FIGURE 5 is a sectional view of an alternate form of our improved chassis latch having a modified triggering arrangement.

Referring now to FIGURES 1 to 4 of the drawings our improved chassis latch indicated generally by the reference character **10** is adapted to hold a chassis **12** in its installed position within a recess formed in part by a wall **14** and a support **18** on which the base **16** of chassis **12** normally rests. It will readily be understood that a number of supports **18** and associated structure can be provided so that the chassis **12** is completely housed when in its installed position.

As is known in the art, the wall **14** carries an electrical connector such, for example, as a plug **20** having a plurality of pins while the chassis **12** supports a connector such as a receptacle **22** having holes adapted to receive the pins of the plug **20**. It will further be understood that when the chassis **12** slides into its housing the pins of the plug **20** should be generally aligned with the holes of the receptacle **22** so that the pins readily slide into the holes as the chassis **12** slides home. Owing to the great weight of the chassis **12** and the components supported thereby in the prior art the chassis has so great an inertia as it goes to its fully housed position some of the pins of the plug **20** may be bent or broken if they are not precisely aligned with the holes in receptacle **22**.

Our improved chassis latch **10** includes a fixed handle **24** the ends **26** and **28** of which are secured to the front **30** of the chassis **12** by any suitable means such as screws **32**. We provide the handle **12** with a recess **34** which is

adapted to house a pivoted handle 36 supported for movement on a pin 38. A stop 40 on the handle 36 is adapted to engage the base of the recess 34 to limit movement of the handle into the recess.

We provide our latch with a catch 42 pivotally supported on a pin 44 on the handle end 26. A hook 45 on the catch 42 is adapted to engage a notch 46 in the upper end of the pivoted handle 36. A coil spring 48 having one end disposed in a recess 50 in end 26 and having its other end disposed in a recess 52 in the catch 42 normally urges the catch to move in a direction at which the hook 45 is in engagement with recess 46. An opening 54 in the catch supports a spring 56 which engages the pivoted handle 36. From the position of the parts shown in FIGURE 3 when a force is exerted on the catch 42 in the direction of the arrow A the catch pivots in a clockwise direction against the action of spring 48 to move hook 45 out of engagement with the pivoted handle. At the same time a foot 58 on the catch moves the spring 56 to kick the pivoted handle out to a position at which it is accessible.

We form the lower end of handle 36 with a latch 60 which normally engages a keeper pin 62 supported in a bracket 64 secured to a flange 66 on the support 18 by a screw 68.

After the pivoted handle 36 has been released in the manner described above so as to be accessible to the installer he grasps the handle 36 and moves it in a counterclockwise direction as viewed in FIGURE 3 to cause a surface 70 on the latch 60 to engage the base of bracket 64 to cam the chassis 12 outwardly thus disengaging the electrical connectors 20 and 22 against the action of the frictional force tending to hold the connectors in engagement. When this has been accomplished the chassis 12 can readily be drawn out of its housing and carried away from the installation.

When the chassis 12 is to be reinstalled it is inserted in the housing with the base 16 resting on support 18. In this condition of the parts the pivoted handle 36 extends in a generally horizontal direction as shown in FIGURE 4. From this position the chassis 12 is slid inwardly along the support 18 in a direction to move the connectors 20 and 22 into engagement with each other. We form the base of bracket 64 with a surface 74 and we form the end of the latch 60 with a surface 72 so that as the chassis 12 moves in the direction of the arrow B in FIGURE 4 toward the position at which the connectors 20 and 22 are about to engage each other surfaces 72 and 74 come into contact to arrest movement of the chassis 12 to its completely housed position. This operation produces two highly desirable results. First, it prevents the interengageable members of connectors 20 and 22 from coming into contact under the high inertia force of the chassis as its slides home. Thus it prevents damage to the pins of plug 20. Secondly, it prevents the pivoted handle 36 from swinging rapidly into its housed position as occurs in assemblies of the prior art. Thus it minimizes the danger of injury to the hand of the installer. With the parts of this position the installer moves the chassis home by pivoting handle 36 to bring latch 60 into engagement with keeper pin 62 thus moving the connectors 20 and 22 slowly into engagement to permit the pins to align.

To reinstall the chassis 12 its base 16 is placed on the support 18 and with handle 36 extending generally horizontally the chassis is pushed in the direction of the arrow B in FIGURE 4 until the end 72 of latch 70 engages the surface 74 to stop the chassis 12. Now the operator can swing handle 36 toward its housed position to move latch 60 into engagement with keeper pin 62 to move the connectors 20 and 22 slowly into engagement to permit the broken pins to align themselves with the receptacle holes. As the handle 36 moves to its fully housed position catch hook 45 engages recess 46 to lock the pivoted handle in the position at which it engages the keeper.

The operation of the form of our invention shown in FIGURE 5 is substantially the same as that of the form of our invention shown in FIGURES 2 to 4 with the exception that the handle 36 is released in response to pressure of the operator's index finger on the trigger 86 in the direction of the arrow C.

It will be seen that we have accomplished the objects of our invention. We have provided an improved chassis latch which substantially eliminates the possibility of damage to the connector parts as the chassis 12 slides home. Our improved chassis latch minimizes the danger of injury to the installer's hand as the chassis slides home. Our latch is provided with means for releasing the pivoted handle portion in a simple and expeditious manner so as to lessen the possibility of the equipment being dropped as it is removed.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is, therefore, to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, what we claim is:

1. A latching assembly for holding a first member in a home position on a mounting member on which said first member can be moved along a predetermined path into and out of said home position including in combination a keeper, means mounting said keeper on one of said members, a latch, means mounting said latch for movement on the other of said members, said latch being adapted to be moved into engagement with said keeper to restrain said first member against movement when said first member moves into its home position and means for restraining said latch against movement to said latching position as said first member approaches its home position in its movement along said path.

2. A latching assembly for holding a first member in a home position on a mounting member along which said first member can be moved into and out of said home position including in combination a keeper, means mounting said keeper on one of said members, a latch, means mounting said latch on the other of said members for movement from a released position to a latching position at which said latch engages said keeper in the home position of said first member and means for preventing the arrival of said first member at its home position until said latch is moved toward its latching position.

3. A latching assembly for holding a first member in a home position on a mounting member along which said first member can be moved into and out of said home position including in combination a keeper, means mounting said keeper on one of said members, a latch, means mounting said latch on the other of said members for movement from a released position to a latching position at which said latch engages said keeper in the home position of said first member and interengageable means on said latch and said keeper mounting means for preventing the arrival of said first member in its home position until said latch is moved toward its latching position.

4. A latching assembly for holding a first member in a home position on a mounting member along which said first member can be moved into and out of said home position including in combination a keeper, means mounting said keeper on one of said members, a latch, means mounting said latch on the other of said members for movement from a released position to a latching position at which said latch engages said keeper in the home position of said first member, means for preventing the

arrival of said first member in its home position until said latch is moved toward its latching position and a catch for locking said latch in its latching position.

5. A latching assembly for holding a first member in a home position on a mounting member along which said first member can be moved into and out of said home position including in combination a keeper, means mounting said keeper on one of said members, a latch, means mounting said latch on the other of said members for movement from a released position to a latching position at which said latch engages said keeper in the home position of said first member, means for preventing the arrival of said first member in its home position until said latch is moved toward its latching position, a catch, means movably mounting said catch on said one member, means normally urging said catch for movement to a position at which it engages said latch to hold said latch in its latching position and a trigger for actuating said catch to release said latch.

6. A latching assembly for holding a first member in a home position on a mounting member on which said first member can be moved into and out of said home position including in combination a keeper pin, means comprising a bracket for mounting said pin on one of said members, a handle, means mounting said handle for movement on the other member, a latch formed on said movable handle, said handle being adapted to be moved from a first position at which said latch is free of said keeper pin to a second position at which said latch engages said keeper pin in the home position of said one member and means for restraining said movable handle against movement to said second position as said one member approaches its home position.

7. A latch assembly for holding a first member in a home position on a mounting member along which said first member can be moved from a location out of said home position into said home position to cause the engagement of interengageable electrical connectors carried by the respective members including in combination a keeper, means mounting said keeper on one of said members, a latch, means mounting said latch for movement on the other of said members for movement from a first position at which said latch is free of said keeper to a second position at which said latch engages said keeper to hold said electrical connectors in engagement and means for restraining said one member against movement into said home position as it moves toward said home position to prevent said electrical connectors from being brought together with excessive force.

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