May 7, 1968 S. STAMATES 3,381,927

TRACK ATTACHMENT MEANS FOR SEATS AND THE LIKE

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Figure 1

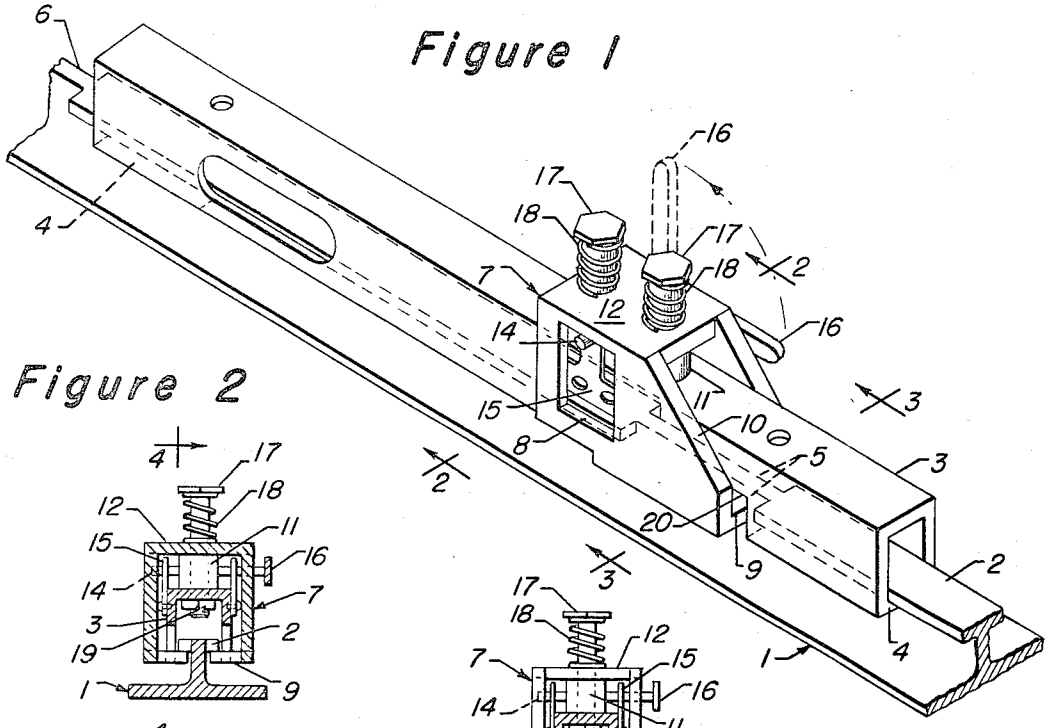
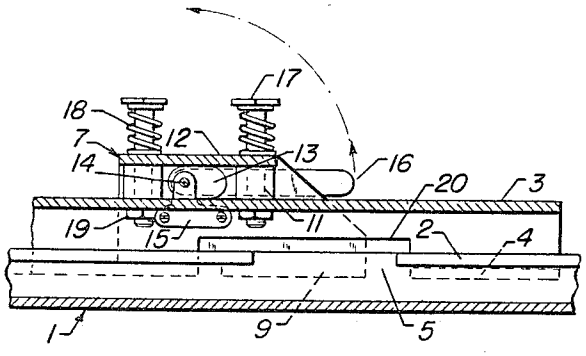


Figure 2

Figure 3

Figure 4



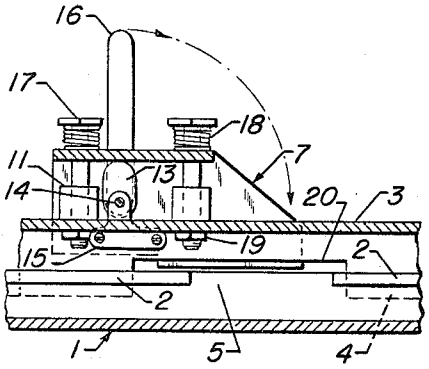


Figure 5

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TRACK ATTACHMENT MEANS FOR SEATS AND THE LIKE

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The present invention relates to track attachment means for seats, or the like, whereby there may be a quick installation or release thereof. More particularly, there is provided an apparatus arrangement which does not require any tools whatsoever in effecting the attachment or removal of a seat, or other unit, to a fixed track.

At the present time there is a need to have attachment means which can be operated rapidly by any workman with a minimum of tools and preferably with no tools whatever. For example, in certain present-day aircraft it is customary to utilize a track and sliding channel arrangement for the attachment of the crew seats in order to have adjustable positioning of such seats for the benefit of the pilots and various crew members.

Thus, it may be considered a primary object of the present invention to provide an adjustable attachment system which is adapted to effect a quick installation or removal of seats, or other objects, to track means which in turn are attached to a floor or other "fixed" location.

A further object of the present invention is to utilize in combination with a track attachment system, a safety latch arrangement which is readily attached to a sliding channel means to in turn preclude the latter from being detached from the fixed track section.

The floor or "fixed" location for the track means may comprise the floor of a truck, ship or freight car and, as referred to herein, need not be limited to just the floor of an aircraft.

Broadly, the present invention embodies a track attachment apparatus for effecting easy manual connection and removal with respect to a fixed track means, and comprises in combination a track member having outwardly projecting upper flange portions and at least two spaced apart longitudinal cut-out sections in such flange portions, a channel attachment member having longitudinally spaced apart inwardly projecting flange portions adapted to encase the flange portions of said track member and provide therewith a longitudinally slidable member, with said spaced apart inwardly projecting flange lengths of said channel member being spaced longitudinally to be in alignment with said spaced cut-out sections of said track member and, in addition, such inwardly projecting flange portions being of slightly less length than said cut-out sections in the flange portions of said track member whereby there can be engagement therewith, a safety latch unit movably connected with and encompassing said movable channel member at a zone between the flange portions thereof, with said latch unit having lower inwardly projecting flange portions in normal alignment with those of said channel member whereby there will be engagement with said track section and, in addition, guide means with spring bias means between said channel member and said latch unit holding the latter in a normal operating position with respect to said channel member and said track member, such spring bias means and said guide means of the latch unit permitting vertical movement of said latch unit with respect to said channel member whereby the flanged portion of said latch unit can be moved relative to the channel member and passed through the cut-out section of said track member.

A preferred design and arrangement further embodies the use of a small lever and cam means which permits

moving the latch unit with respect to the channel member such that in working the cam against the spring of the latch connecting means there can be a temporary removal of the latch effectiveness and the lifting of the channel member from the track means by suitably aligning the flange portions of the channel to the cut-out sections in the track.

Reference to the accompanying drawing and the following description thereof will serve to illustrate one embodiment of the improved track attachment system as well as point out additional advantageous features in connection therewith.

FIGURE 1 of the drawing illustrates, in an isometric type view, one embodiment of the present track attachment means utilizing a sliding channel arrangement and a vertically movable safety latch unit in combination therewith.

FIGURE 2 of the drawing shows a cross-sectional view through the attachment apparatus, as indicated by the line 2—2 in FIGURE 1.

FIGURE 3 of the drawing is also a sectional view through the apparatus, as indicated by the line 3—3 in FIGURE 1.

FIGURE 4 of the drawing is a partial longitudinal and sectional view through the attachment apparatus system, with such section being in accordance with the line 4—4 in FIGURE 2 of the drawing.

FIGURE 5 indicates a view similar to that of FIGURE 4 except that a movement of the cam on the latch unit provides a different or vertically translated relationship between the flanges thereof with respect to the channel member and the track means.

Referring now particularly to FIGURE 1 of the drawing, there is indicated a portion of an elongated track section **1** which is of a typical configuration with a base section to attach to the floor of an aircraft, or other fixed panel or floor section, and in addition having an upper flanged portion **2** with typical outwardly projecting flanges. Adapted to encase the top flanged section of the track means **1** is a longitudinally movable or slidable channel member **3** which in turn has inwardly projecting flange portions **4** at each end thereof. Although not shown in the drawing, the channel member **3** is adapted to be bolted or otherwise fixedly attached to a seat or other superposed unit which in turn is desired to be adjustably connected to the track means.

It should be particularly noted in FIGURE 1 of the drawing that the flanged portion **2** of track means **1** is notched in two places, i.e. at zones **5** and **6**, such that there is merely an upwardly projecting web section or central leg portion left with respect to the base of the track **1**. Coordinated with the lengths of the notched portions **5** and **6** are the inwardly projecting flange portions **4** on channel member **3**, whereby such flanged portions may be longitudinally aligned with the cut-out track portions and the channel member **3** slipped down therethrough or, alternatively, removed from engagement with the track portion **2**. This of course means that the overall length of channel member **3** is constructed to match the cut-out sections in the flange **2** of track **1** or, conversely, that the cut-out portions of the track flange are spaced to match the length of the channel member **3**. Also, each longitudinal portion of the inwardly projecting flange portions **4** of the channel member **3** shall be somewhat shorter in length than the notched or cut-out portions **5** and **6** such that there may be an easy connection or removal of the channel member **3** from around the flanged portion **2** of the track.

After there has been assembly of the channel member **3** with respect to the track means **1**, there is made use of the safety latch unit **7** to preclude an undesired disconnection of channel member **3** with respect to the track

during the normal operation of the attachment system. The present safety latch attachment unit embodies a short, enlarged hollow box like design which has lower inwardly projecting flange portions **9** similar to the flange sections **4** on channel member **3**. The side wall portions **10** of the latch unit **7** shall however be spaced wide enough to encompass the width of channel member **3** as well as have an extended height permitting room for spacer means **11** between the top of channel member **3** and the lower surface of a top section **12** on the latch unit itself. Access openings **8** are provided in the side walls **10** to assist in the assembly of the unit.

As best shown in FIGURES 4 and 5 of the drawing, there is also provided in the space between the top of channel member **3** and the underside of top section **12** a movable cam means **13** connecting to shaft means **14**. The shaft means **14** is indicated in FIGURES 1, 2 and 3 as extending between side plate-type support members **15** which in turn are bolted or otherwise attached to the side of the channel member **3**. The shaft **14** also connects with an external lever arm means **16** positioned along one side of the safety latch **7**.

In the assembly of the safety latch unit **7** to channel member **3** there are provided two guide pins or bolts **17** which are of an extended length above the top portion **12** and adapted to hold compression spring means **18** also mounted above the top plate portion **12**. In order to effect a movable engagement of the latch unit **7** with the channel member **3**, the bolt means **17** continue down through spacer means **11** into the top portion of channel member **3** to suitable cap nut means **19** on the interior of the channel member **3**. Alternatively, the top of the channel **3** can be tapped to engage the threaded ends of bolt means **17**. It will be noted in FIGURE 1, as well as in FIGURE 4, that side wall portions **20** of the channel member **3** are longitudinally notched to accommodate the inwardly projecting flange means **9** on the safety latch **7** and that the length of such flange portions **9** shall have an equivalent length to those flange portions **4** on channel member **3** itself whereby the former may be raised and lowered through a notched-out portion **5** or **6** in the track **1**.

In the normal operation of the channel member on track section **1**, the safety latch **7** is mounted and attached to the channel member **3** such that the cam member **13** is lying in a substantially flat orientation between the top of the channel and below the top section **12** of latch unit **7**, in accordance with FIGURES 3 and 4 of the drawing. Thus, the flanged sections **9** are in substantial alignment with the flanged portions **4** of channel member **3** and will serve to engage the underside of the flanged portion **2** of track section **1**. However, during any seat adjustment period or at any time whenever the flanged portion **4** of channel member **3** is in alignment with a cut-out portion of the track, then the flanges **9** will hold the assembly in engagement. At the time of the actual installation of the latch unit **7**, the channel member **3** is aligned with the track section **1** such that the side wall cut-out portion **20** of channel member **3** will be in alignment with a cut-out portion of flange **2** in track **1**, thereby permitting the latch unit **7** to encompass the channel member **3** and at the same time permit flange sections **9** to come to a level below the outwardly projecting flange portion **2** of track section **1**. Guide bolts **17**, spring means **18**, spacer means **11** and lock nuts **19** are all assembled and connected, as hereinbefore set forth, such that there is a vertically movable relationship between the channel member **3** and the latch member **7**.

When it is desired to effect the removal of the channel member **3** and any superimposed seat or other assembly thereon, with respect to track means **1**, it is first necessary to effect a moval of the lever arm **16** to an upright position, as best shown in FIGURE 5, such that cam means **13** is in turn rotated to bear against the underside of top plate **12** of the latch unit **7** and cause the compression of springs **18** as well as effect the principally desired

upward lifting of flange sections **9** through the slotted zone **5** to a level above the top of track flange portion **2**, in accordance with the relationship shown in FIGURE 5 of the drawing. Once the flange portion **9** has been lifted above the level of the top of the track section **1**, then the channel member **3** may be longitudinally moved with respect to the track to in turn effect the alignment of the inwardly projecting flange portions **4** to the notched-out sections **5** and **6** whereby the total channel member **3** may be lifted from the track section **1** together with a seat or whatever unit may be attached to the channel member **3**. At any time when it is desired to reinstall the channel member **3** with respect to the track means **1**, then the adjustment of the latch unit **7**, with the lever arm **16** and cam means **13** moved to the raised positioning will readily permit insertion of the channel into the zones **5** and **6**. A subsequent longitudinal movement of the unit and channel member will provide an alignment of flange means **9** with a notched section, such as in FIGURE 5, at which time lever arm **16** may be lowered and cam means **13** moved to a retracked position permitting such flange means **9** to fall to a level below that of the underside of track flange portion **2**. The attachment apparatus is then ready for normal operation whereby there may be longitudinal adjustment between the channel member **3** and the track section **1**, without fear of the channel member being disengaged from the track.

It will be noted that it is a particular feature of the present improved construction to use a small lever arm, and cam means **13** to permit operation of the safety latch unit **7** whereby there are no tools required during a typical installation, or removal, of the channel member with respect to the track unit. Also it will be noted that the compression spring means **18** on the guide pins **17** maintain a normal biasing of the latch unit into an operating position on the track section **1**. Thus, it takes a lever arm action working against the spring biasing means **18** to temporarily lift the latch means and its flange portion from the safety holding position with respect to the track flanged portion **2**.

In a modified, less detailed type of design, there can be an elimination of the cam movement means. In other words, by manually lifting against the spring biasing means and utilizing any insertable type wedging member between the latch unit and the channel member, there can be a temporarily held translation between the two sections of the apparatus while the channel member is being removed or attached to the track section.

While the present track attachment system has been particularly adapted for use with seats, it is not intended to limit the present invention to any one use since other adjustable type installations may be desired. For example, machinery, shipping cartons, and the like, might well make use of the present type of system such that there is both a safe and rapid attachment to track means on any given floor or panel section.

I claim as my invention:

1. Track attachment apparatus for effecting easy manual connection and removal with respect to fixed track means, which comprises in combination; a track member having outwardly projecting upper flange portions and at least two spaced apart longitudinal cut-out sections in such flange portions, a channel attachment member having longitudinally spaced apart inwardly projecting flange portions adapted to encase the flange portions of said track member and provide therewith a longitudinally slidable member, with said spaced apart inwardly projecting flange lengths of said channel member being spaced longitudinally to be in alignment with said spaced out sections of said track member and, in addition, such inwardly projecting flange portions being of slightly less length than said cut-out sections in the flange portions of said track member whereby there can be engagement therewith, a safety latch unit movably connected with and encompassing said movable channel member at a

zone between the flange portions thereof, with said latch unit having lower inwardly projecting flange portions in normal alignment with those of said channel member, whereby there will be engagement with said track section and, in addition, guide means with spring bias means between said channel member and said latch unit are attached in a manner holding the latter in a normal operating position with respect to said channel member and said track member, such spring bias means and said guide means of the latch unit permitting vertical movement of said latch unit with respect to said channel member whereby the flanged portion of said latch unit can be moved relatvie to the channel member and passed through the cut-out section of said track member.

2. The track attachment apparatus of claim **1** further characterized in that vertically positioned guide pin means extend between the top of said channel member and through the top portion of said latch unit for a spaced distance as said guide means and thereby provide a unidirectional movement between the latter and said channel member.

3. The apparatus of claim **2** still further characterized in that spacer means between said channel member and said latch unit as well as compression spring means between the top portion of said guide pins and the top portion of said latch unit provide spring biasing holding said latch unit in a normal operating position with its flange portions therefrom in alignment with the flange portions of said channel member.

4. The track attachment apparatus of claim **1** further characterized in that movable cam means is positioned between said channel member and said latch unit provide for raising the latter with respect to said channel member whereby the flange portions of the latch unit may be translated with respect to those of said channel member.

5. The apparatus of claim **4** still further characterized in that lever arm means externally positioned with respect to said latch unit connects with said cam means and permits manual adjustment of the latter.

6. The apparatus of claim **4** still further characterized in that said cam means is positioned between said latch unit and said channel member in a manner providing its least width for a normal positioning between the latch unit and the channel member, and said compression spring biasing means on top of said latch unit works against the larger width of said cam means.

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