Jan. 24, 1961 C. J. FOX 2,969,249

FOLDING BRACE FOR CONNECTING HINGED ELEMENTS

Filed July 6, 1959 2 Sheets-Sheet 1

Fig. 1.

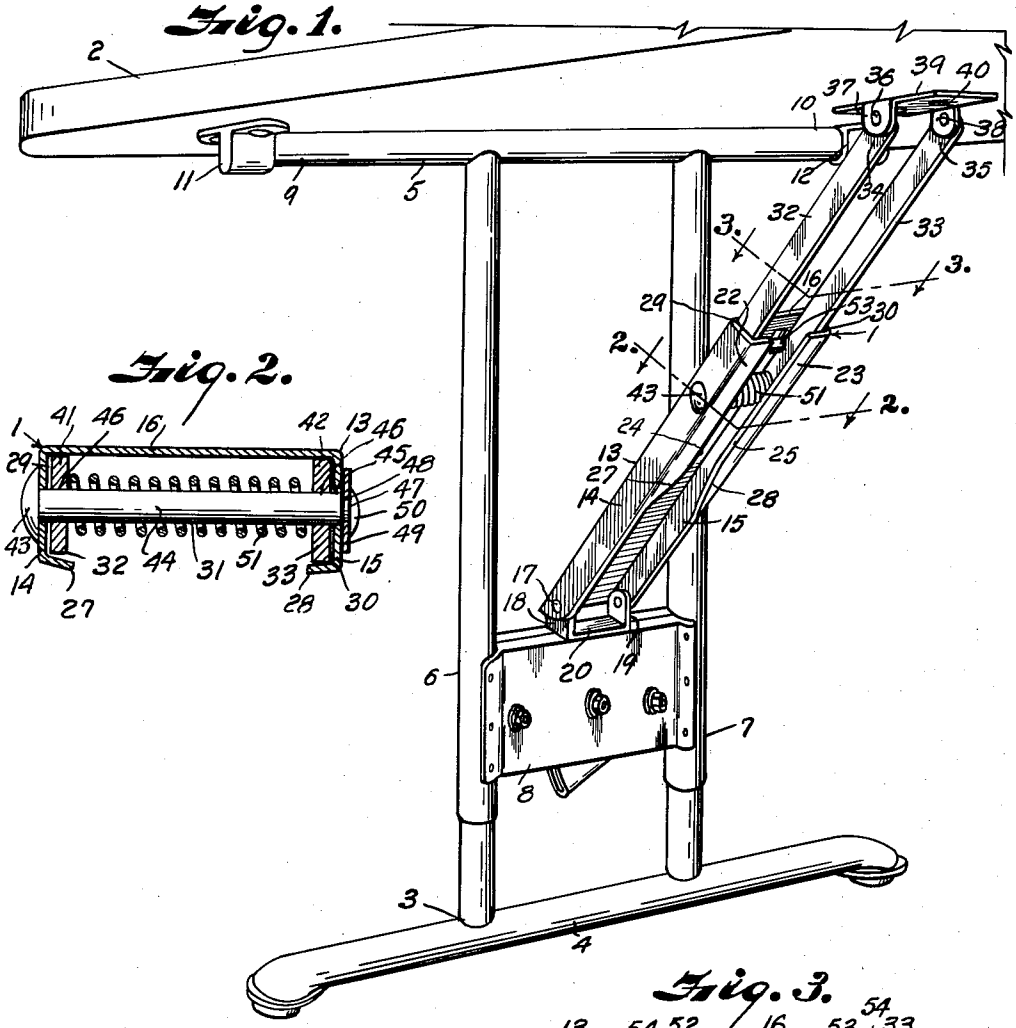


Fig. 2.

Fig. 3.

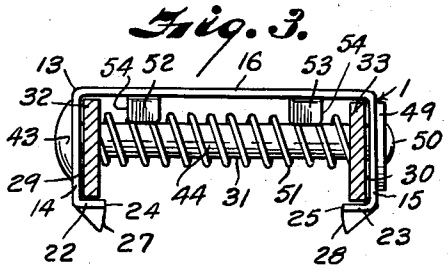
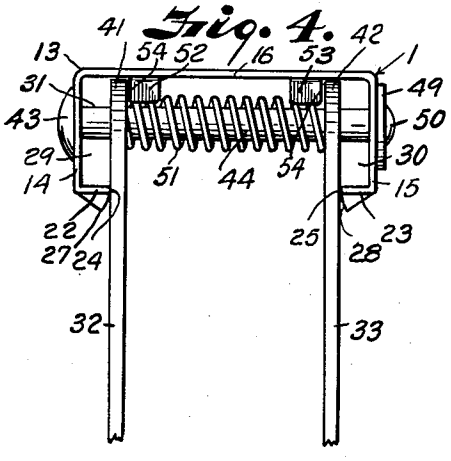


Fig. 4.



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Fig. 5.

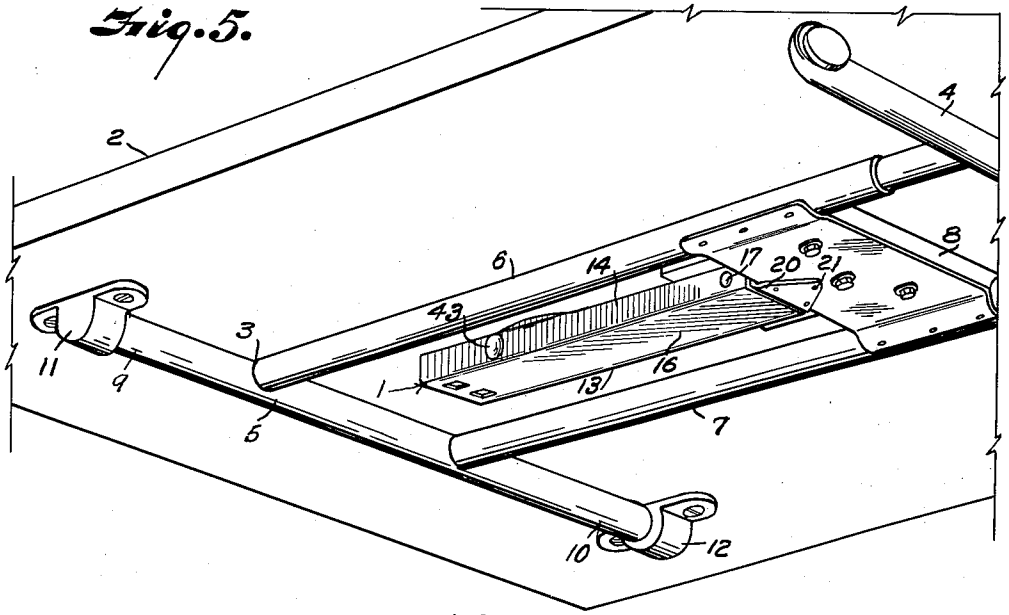


Fig. 6.

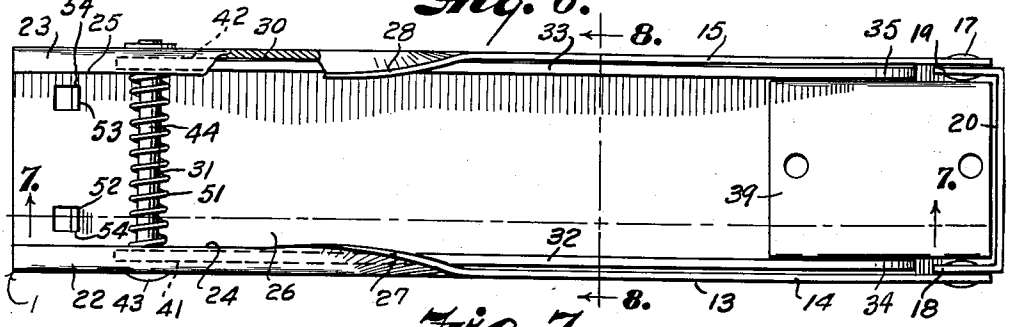


Fig. 7.

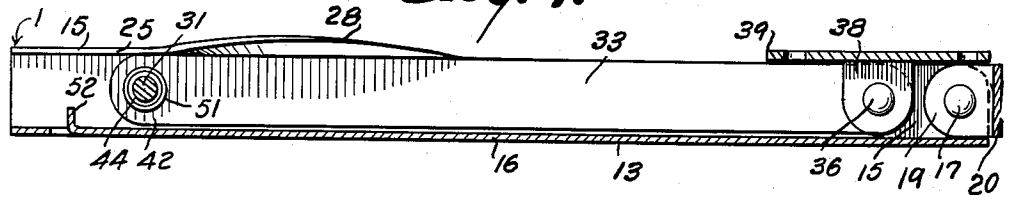
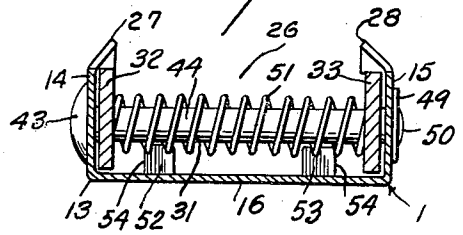


Fig. 8.



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FOLDING BRACE FOR CONNECTING HINGED ELEMENTS

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5 Claims. (Cl. 287—99)

This invention relates to a folding brace for connecting hinged elements, for example, a brace for connecting a folding leg to a table top supported thereby.

The principal objects of the invention are to provide a brace of this character with lock means incorporated into the construction thereof for holding the leg firmly in position when supporting the table top, and to retain the leg in folded position under the table top when the brace is hinged, whereby the table can be carried about without dropping of the leg away from the table top; to provide a brace which automatically releases the lock means incidental to movement of the leg from folded to supporting position; to provide a brace that requires simultaneous squeezing pressure from opposite sides thereof to release the lock means, thereby providing a safety factor; to provide a brace with means for independently stopping one latch when in released position, so that the squeezing pressure is effective from the opposite side to assure release of the other lock means; and to provide a brace that is of simple and inexpensive construction and easily manufactured.

In accomplishing these and other objects of the invention as hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a portion of a table equipped with a folding brace constructed in accordance with the present invention.

Fig. 2 is a cross section through the brace on the line 2—2 of Fig. 1.

Fig. 3 is a similar section on the line 3—3 of Fig. 1.

Fig. 4 is an end view of one of the hinge members of the brace, showing the bars composing the other member under automatic release, as when the leg of the table is moved downwardly from under the table top to extend and lock the brace.

Fig. 5 is a similar view, but showing the leg and brace in folded position.

Fig. 6 is an enlarged plan view of the brace in folded or collapsed position.

Fig. 7 is a longitudinal section through the folded brace on the line 7—7 of Fig. 6.

Fig. 8 is a cross section on the line 8—8 of Fig. 6.

Referring more in detail to the drawings:

1 designates a folding or hinging brace constructed in accordance with the present invention for connecting hinged elements, for example, in the illustrated instance, one of the elements constitutes a table top 2 and the other one of the leg units 3 therefor. While the leg unit 3 may be of various structures, the one illustrated includes a foot bar 4 connected with an upper bar 5 by telescoping standards 6 and 7, the outer tubular sections of which are connected by a transverse member 8. The bar 5 has ends 9 and 10 that are journaled within brackets 11 and 12 whereby the entire leg unit is adapted to be swung from a folded or collapsed position under the table top as shown in Fig. 5 to an extended or upright position as shown in Fig. 1, in which the leg is supporting

the table top and retained by the brace 1, as now to be described.

The brace 1 includes a channel member 13 having side flanges 14 and 15 connected by a web 16. One end of the flanges 14 and 15 are connected by pivot devices such as rivets 17 with ears 18 and 19 on an attaching member 20 which is suitably attached to the member 8 as by spot welding 21 (Figs. 1 and 5). The opposite end of the channel member 13 has inturned flanges 22 and 23 having edges 24 and 25 spaced apart to provide a passageway 26 therebetween, for a purpose later described. The ends of the inturned flanges in the direction of the attaching member 20 curve outwardly away from the web 16 and terminate intermediate the length of the channel member in plane with the side flanges 22 and 23 to provide cam tracks 27 and 28 forming continuations of the side edges 24 and 25, as shown in Figs. 1, 6 and 7. The inturned flanges 22 and 23 cooperate with the side flanges 14 and 15 and with the web 16 to provide facing recesses 29 and 30. Carried by the side flanges 14 and 15 of the channel member 13 at points intermediate the length of the recesses 29 and 30 is a hinge pin 31 for hingedly connecting bars 32 and 33 with the channel member. The other ends 34 and 35 of the bars 32 and 33 are pivotally connected by pivot devices such as rivets 36 with ears 37 and 38 on an attaching member 39 that is adapted to be secured to the under side of the table top by fastening devices, such as screws 40. The ends of the bars that hinge on the hinge pin 31 are designated 41 and 42. The ends 41 and 42 also have laterally sliding movement upon the pin 31 (Fig. 4) to move into and out of the recesses 29 and 30 for locking and unlocking the hinge action of the channel member 13 and bars 32—33, as later to be described.

To simplify the connection between the ends 41 and 42 of the bars 32 and 33, the hinge pin 31 is preferably a rivet having a head 43 (Fig. 1) and an elongated shank 44 which is of sufficient length to extend through registering openings 45 and 46 in the side flanges 14 and 15 and bars 32 and 33, respectively, when the head 43 is engaging the outer face of the side flange 14 (Fig. 2). The opposite end of the shank has a reduced terminal 47 to provide an annular shoulder 48 in registry with the outer face of the side flange 15. Inserted over the terminal 47 is a washer 49 that is retained in contact with the shoulder 48 by riveting over the end of the terminal, as indicated at 50, whereby the washer 49 cooperates with the head 43 in securing the hinge pin 31 to the channel member 13. The shank 44 of the rivet between the head 43 and annular shoulder 48 is of uniform diameter, whereby the ends 41 and 42 of the bars 32 and 33 have the free sliding and rotatable support thereon as previously mentioned. The ends 34—35 and 41—42 of the bars 32 and 33 are preferably rounded to provide free swinging movement of the bars on the shank 44 of the hinge pin 31 and pivots 36.

Also preferably mounted on the shank 44 of the hinge pin 31 between the bars 32 and 33 is a coil spring 51 having its ends engaging against the inner side faces of the bars, as best shown in Figs. 2, 3, 4 and 8, to urge the bars into contact with the cam tracks 27 and 28 and to urge the bars into the recesses 29 and 30 for latching the bars to hold the brace in the extended position shown in Fig. 1 on one side of the hinge pin 31, and in folded position on the opposite side of the hinge pin 31, as shown in Figs. 6 and 7.

In order to limit inner movement of the bars 32 and 33 on the hinge pin 31, the web 16 has ears 52 and 53 that are struck inwardly from the web with their outer edges 54 spaced inwardly relatively to the edges 24 and 25 of the tracks slightly more than the thickness of the bars 32 and 33, as best illustrated in Fig. 4, whereby the

bars may be released from engagement with the longitudinal recesses 29 and 30 when the brace is moved to and from its respective positions.

In assembling the brace 1 of parts constructed as described, the ends 41 and 42 of the bars 32 and 33 having the apertures 46 are inserted in the longitudinal recesses 29 and 30 so that the apertures 46 register with the openings 45 of the side flanges 14 and 15 of the channel member 13, after which the coil spring 51 is inserted between the bars with the ends in encircling relation with the apertures 46. The shank 44 of the hinge pin 31 is then passed through the openings 45 and 46 at one side, coil spring 50, and openings 45 and 46 at the other side, to seat the head 43 against the outer face of the side flange 14. The washer 49 is then applied over the reduced terminal 47 and the projecting end of the terminal is riveted as at 50 over the outer face of the washer 49 to retain the inner face of the washer in contact with the shoulder 48. The attaching member 20 is fixed to the outer ends of the flanges 14 and 15 by the rivets 17 and the outer ends 34 and 35 of the bars 32 and 33 are connected with the attaching member 39 by means of the rivets 36. The projecting portions of the bars 32 and 33 may be squeezed together to bring the inner faces thereof into contact with the stops 52 and 53, in which position the outer faces of the bars clear the edges 24 and 25 of the inturned flanges 22 and 23, whereby the bars 32 and 33 can then be hinged on the hinge pin 31 from the position shown in Fig. 1 until the bars 32 and 33 are stopped by contact with the inner face of the web 16 on the opposite side of the hinge pin as shown in Fig. 6. During the hinging movement, the outer faces of the bars ride along the tracks and against the outwardly curved portions 27 and 28 as the squeezing pressure on the bars is released, and the coil spring 51 expands to again urge the hinged ends 41 and 42 of the bars into the recesses 29 and 30 on the opposite side of the hinge pin 31, as shown in Fig. 6, whereby the bars 32—33 and channel member 13 are latched in folded position. In folded position, the attaching member 20 extends across the end of the attaching member 39 when the attaching member is pivoted on the rivets 36 to bring the plate portion thereof in parallel relation with the web 16 at that end of the channel member (see Figs. 6 and 7).

The brace 1 may be supplied to the table manufacturer in folded position for attachment to the table. Attachment of the brace may best be effected by attaching the member 20 to the transverse member 8 of the leg unit. With the leg unit in position to support the table top 2, the bars 32 and 33 are hinged between the side flanges 14 and 15 of the channel member 16, with the ends 41 and 42 thereof turning on the hinge pin 31, during which time the outer faces of the bars engage and ride inwardly along the cam tracks, which act to squeeze the bars toward each other in opposition to the action of the coil spring 57, so that the bars travel in their swinging movement through the passageway 26. As soon as the bars slide over the outer ends of the flanges 22 and 23, the coil spring 51 again becomes effective to seat the hinged ends of the bars within the recesses 29 and 30. The plate portion of the attaching member 39 may then be secured to the under face of the table top by inserting the fastening devices 40 and screwing them into the table top 2.

With the brace thus applied, the hinged ends of the bars are securely latched in the recesses 29 and 30 by the action of the spring 51, and the leg unit is rigidly supported relatively to the table top.

When the leg unit is to be folded under the table top 2, the bars 32 and 33 are squeezed together to apply simultaneous pressure to the outer sides thereof for bringing the bars into contact with the stops 52 and 53. At this time, the bars have cleared the facing edges 24 and 25 of the inturned flanges 22 and 23, whereupon the hinged ends 41 and 42 of the bars 32 and 33 and corresponding end of the channel member 13 may pivot relatively to each other as the leg unit 3 is being turned or folded against the under side of the table top 2. As soon as the bars 32 and 33 ride downwardly over the curved ends 27 and 28 of the cam tracks, the spring 51 expands to bring the outer faces of the bars into contact with the inner faces of the side flanges 14 and 15, whereupon the bars 32 and 33 are located in the longitudinal recesses 29 and 30 and under the inturned flanges 22 and 23, so that the brace locks to hold the leg in its folded position under the table top. When the table is to be set up, the leg unit is pulled away from the table top to hinge the brace. During this movement, the bars 32 and 33 swing along the inner edges 27 and 28 and are cammed inwardly thereby to swing through the passageway 26 until the bars 32 and 33 are again in position to enter the recesses under the inturned flanges 22 and 23 and web 16, whereupon the spring 51 is effective in urging the hinged ends of the bars into the recesses 29 and 30 on the opposite side of the hinge pin, in which position the bars extend in alignment with the channel member 13 so as to hold the leg unit in rigid position.

It is to be noted that when the leg is to be folded against the table top, the stops 52 and 53 facilitate the application of the squeezing pressure necessary to bring both pivoted ends of the bars 32 and 33 out of the recesses 29 and 30. For example, should one of the bars be first to contact its stop, continued pressure applied to the other bar while holding the first bar against its stop assures that the other bar is also brought against its stop, whereby both bars are in position to hinge. Independent locking of both bars is important, particularly in the instance of banquet tables, since foot or knee pressure against one side of the brace will not release the opposite side.

From the foregoing, it is obvious that I have provided a brace which is of simple and reliable construction and easy to operate.

While I have particularly illustrated and described the brace for use in connection with tables, it is obvious that it is well adapted for use in bracing other types of hingedly connected elements.

What I claim and desire to secure by Letters Patent is:

1. A folding brace, including a channel member having side flanges interconnected by a web portion, said channel member having inturned side flanges extending along ends of said flanges of the channel member and cooperating with the web portion to provide longitudinally facing recesses, a pair of bars having apertured ends engaged in said recesses, a hinge pin extending through said flanges at points intermediate the length of the recesses and through said apertures for hinging the bars to the channel member, a coil spring having ends bearing against the apertured ends of the bars to yieldingly retain the said ends of the bars in said recesses in both extended and folded positions of the brace, and said spring being adapted to be compressed when a gripping pressure is applied to said bars to move the bars out of said recesses for folding of the brace, and cams providing continuations of said side flanges for moving the bars out of portions of the recesses on one side of the hinge pin when the brace is hinged on said hinge pin from folded to extended position whereby the spring snaps the ends of the bars into the portions of the recesses on the opposite side of the hinge pin.

2. A folding brace, including a pair of attaching members, a channel member having side flanges interconnected by a web portion, means having side flanges interconnected by a web portion, means pivotally connecting the flanges at one end of the channel member with one of the attaching members, inturned side flanges extending along opposite ends of said flanges of the channel member and cooperating with the web portion to provide longitudinally facing recesses, a pair of bars having one of their ends pivotally connected with the other attaching member and having apertured opposite ends engaged in said recesses, a hinge pin extending through said flanges at points intermediate the length of the recesses and through said apertures for hinging the bars to the channel member, a coil

spring having ends bearing against the apertured ends of the bars to yielding retain the said ends of the bars in said recesses in both extended and folded positions of the brace, and said spring being adapted to be compressed when a gripping pressure is applied to said bars to move the bars out of said recesses for folding of the brace, said inturned flanges having cams for moving the bars out of portions of the recesses on one side of the hinge pin when the brace is hinged on said hinge pin from folded to extended position whereby the spring snaps the ends of the bars into the portions of the recesses on opposite sides of the hinge pin, and stop means carried by the web portion of the channel member at outer ends thereof to limit inward movement of the bars under said gripping pressure when the bars have cleared the inturned flanges on folding of said brace.

3. A folding brace including a pair of attaching members each having ears, a channel member having side flanges interconnected by a web portion, means pivotally connecting the flanges at one end of the channel member with the ears of one attaching member, inturned side flanges extending along opposite ends of said flanges of the channel member and cooperating with the web portion to provide therebetween longitudinally facing recesses, a pair of bars each having one of their ends pivotally connected with a respective ear of the other attaching member and having apertured opposite ends engaged in said recesses, a hinge pin extending through said flanges at points midway the length of the recesses and through said apertures for hingedly connecting the bars to the channel member and providing a support on which the bars are slidable laterally to and from each other, a coil spring having ends bearing against the apertured ends of the bars for yieldingly retaining the said ends of the bars in said recess on one side of the hinge pin when the brace is in extended position and in the recess on the other side of the hinge pin when the brace is in folded position and said spring being adapted to be compressed when the bars are squeezed toward each other to move the bars out of said recesses, and stop means forming a part of the channel member for limiting sliding movement of the bars on said hinge pin when the bars have cleared the inturned flanges.

4. A folding brace, including a channel member having side flanges interconnected by a web portion, inturned flanges extending along said side flanges at one end of the channel member and cooperating with the web portion to provide therebetween inwardly facing longitudinal recesses, a pair of bars each having one apertured end engaged in one of said inwardly facing recesses, a hinge pin extending through said side flanges and through said apertures in said ends of the bars for hinging the bars to the channel member and providing a support on which the bars are adapted to move laterally into and out of said recesses, and a coil spring having ends bearing against the apertured ends of the bars for yieldingly retaining the said ends of the bars in said recesses in both an extended and a folded position of the brace, said spring being adapted to be compressed when a gripping pressure is applied to said bars to move the bars out of said recesses for hinging the brace to said folded position.

5. A folding brace, including a channel member having side flanges interconnected by a web portion, inturned flanges extending along said side flanges at one end of the channel member and cooperating with the web portion to provide therebetween inwardly facing longitudinal recesses, a pair of bars each having one apertured end engaged in one of said inwardly facing recesses, a hinge pin extending through said side flanges and through said apertures in said ends of the bars for hinging the bars to the channel member and providing a support on which the bars are adapted to move laterally into and out of said recesses, a coil spring having ends bearing against the apertured ends of the bars for yieldingly retaining the said ends of the bars in said recesses in both an extended and folded position of the brace, said spring being adapted to be compressed when a gripping pressure is applied to said bars to move the bars out of said recesses for hinging the brace to said folded position, and means on a part of the channel member for limiting lateral sliding movement of the bars on said hinge pin when the bars have cleared the inturned flanges.

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