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[54] **NOVEL FASTENER DEVICE**
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Primary Examiner—Werner H. Schroeder

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403/405, 211/176, 248/245

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[58] **Field of Search** 403/106, 110, 187, 188,
403/189, 201, 343, 346, 400, 403, 405;
52/753 G, 753 T, 758 C; 211/176; 248/245

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[57] **ABSTRACT**

A fastener device useful in clamping rail members to support posts is disclosed. The device has a main portion which is slidable into a hollow rail member and a second portion which is attachable to a remote anchor block located within the support post. The resulting assembly has a high degree of versatility and adjustability.

3 Claims, 4 Drawing Figures

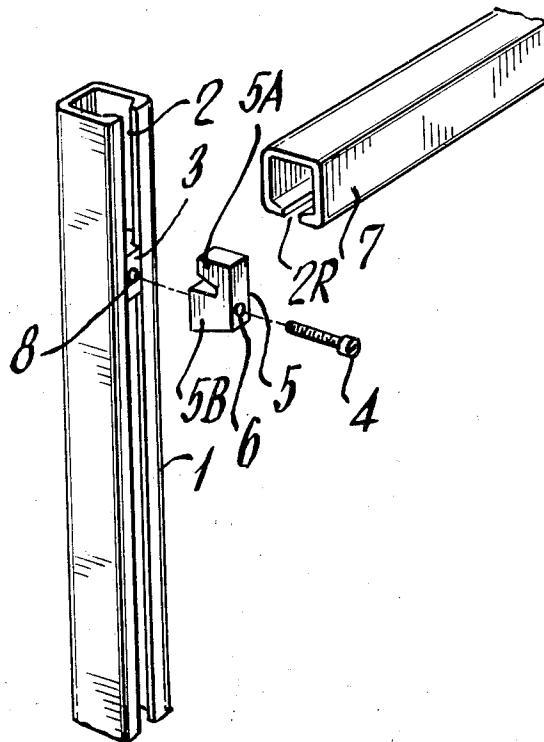


Fig. 1.

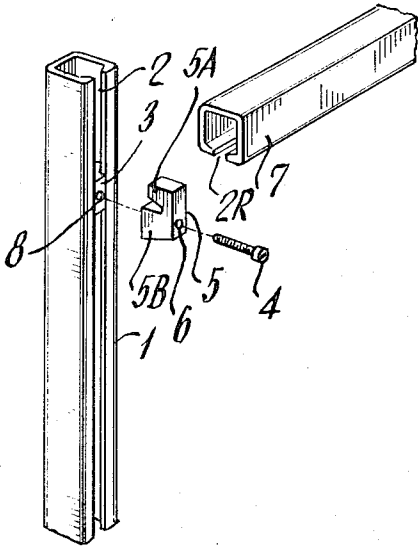


Fig. 2.

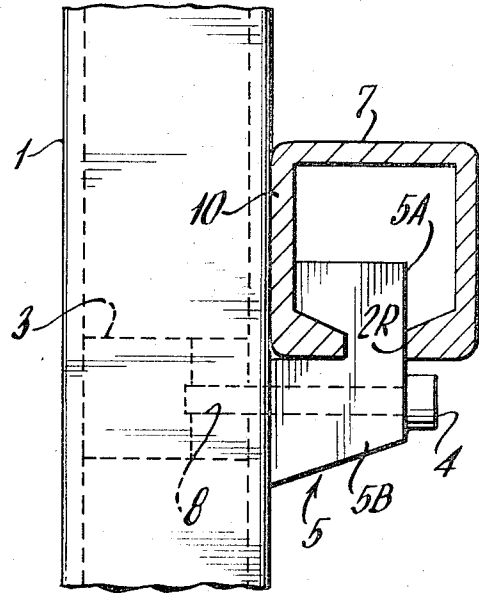


Fig. 4.

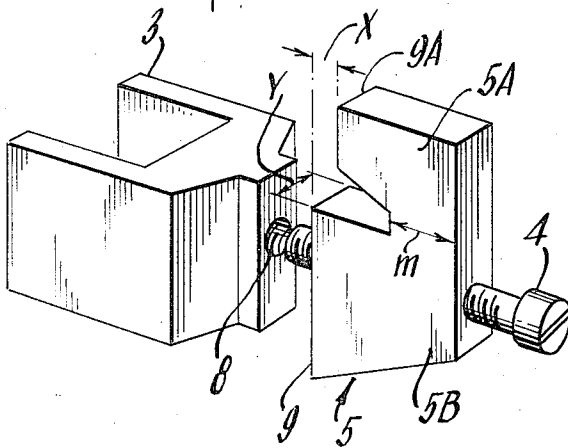
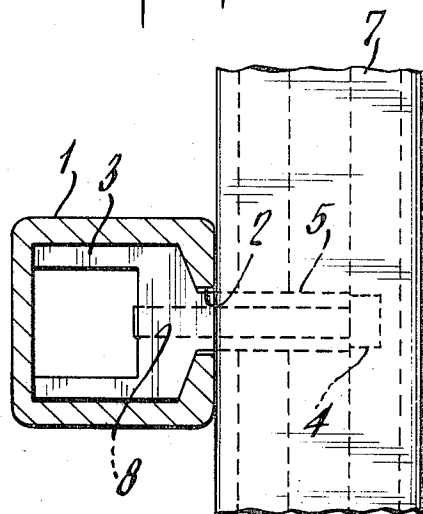


Fig. 3.



NOVEL FASTENER DEVICE

This invention relates to novel fastener devices generally and to fastener devices of eminently suitable utility in the construction of rail assemblies.

As is known in the art, the construction and installation of rail assemblies often presents major difficulties to architects, designers and builders. The problem to a great degree centers around the difficulty encountered in fastening the horizontal rail (or inclined rail when dealing with stair railing) to a support post or wall. When successive lengths of railing are to be installed, it is frequently necessary to weld the rails to the support posts or wall member. This, however, is a very inconvenient, time consuming venture and not at all economically satisfactory.

In an effort to overcome these disadvantages, the art has used a variety of clamping means to fasten the rail to the support member. An extensive array of clamping devices has been evolved involving elaborate screw-type mechanisms. In general, these devices have been specific to the particular rail being positioned and have not afforded any great degree of versatility relative to adjustability of both the support post and the rail. For example, a frequently encountered clamping device is one located on a support post in a fixed position. This does not permit any vertical adjustability. The present invention, in one of its aspects, provides such versatility and in another provides even horizontal adjustability.

The present invention, in its preferred aspects, comprises elements which interact to provide a rail system having a high degree of flexibility and adjustability. The rail system is thus conveniently assembled at the site and because of its flexibility admits of last minute design changes, adjustments and connections.

In general, the system of the invention comprises a support member, a rail member which may be inclined or horizontal and a novel locking device slidably positioned within the rail member and the support member. Reference to the drawings herein will serve to facilitate an understanding of the preferred modes of the invention. In such drawings FIG. 1 shows an exploded view of the system of the invention in use. FIG. 2 shows a partial section view of the assembled device in use and FIG. 3 shows a plan view of FIG. 2. FIG. 4 shows in detail elements of the locking device of the invention.

As seen in FIG. 1, support member 1 is represented as a support post. The post is preferably of extruded aluminum and is fabricated so as to be essentially hollow with a slot 2 providing access from a point within the post to a point without. Communicating with said slot 2 is anchor block 3 is slidably located within the hollow portion of support post 1 and accessible to a point outside of the slot 2.

Anchor block 3 is constructed of such dimensions that it may be freely moved in a vertical direction along post 1 but is not, at least in use, capable of being entirely removed from slot 2. Anchor block 3 is adapted to receive a support screw 4 as by a screw tap 8 (see FIG. 4) via screw tap 6 in lock block 5. The combination of screw 4 and anchor block 3 provides the holding means to secure the lock block 5 in place in use via screw tap 6.

Lock block 5 is the central element of the device of the invention and serves to hold rail member 7 in position. As can be seen from FIG. 1, rail member 7 is a

slotted member similar to, and in fact preferably the same configuration as, support post 3. Additionally it is preferably constructed of aluminum.

Lock block 5, preferably also of aluminum, is constructed of such dimensions as will permit its entry into rail 7 through slot 2R in close communication therewith such that a holding neck 5A of block 5 is within the hollow portion of rail 7 and the lock portion 5B of the block is outside the rail. When the parts communicate in this fashion screw 4 can be passed through hole 6 and tightened into anchor block 3 thereby to form an integral, firmly bound rail assembly.

The versatility of this assembly is at once apparent. If it is desired to raise or lower the rail member 7 all one need do is loosen the assembly and adjust anchor block 3 within its slot 2 until the desired level is attained. Similarly the degree of extension of rail 7 beyond the support post can be altered and adjusted at will through the simple expedient of the interactions of screw 4 and lock block 5.

In FIG. 2 a locked, assembled rail system is depicted with rail 7 being viewed from the end and support post 1 being shown in a vertical position. Lock block 5 is shown in locking engagement with rail 7 and with anchor block 3 via screw 4, the securing action being transmitted to neck 5A, the upper portion of lock block 5. The action of screw 4 through slot 2 (not shown) with anchor block 3 exerts a pressure on lock block 5 resulting in a secure clamping action on rail 7.

While the shape of anchor block 3 is not critical, it is preferred that it conform somewhat to the internal configuration of post 1. FIG. 3 is meant to show a plan view of support post 1 in engagement with rail 7 via lock block 5 (not shown). Screw 4, shown only as a dotted line, communicates with anchor block 3 through slot 2 via tap hole 8. Locking engagement between the post 1 and rail 7 is effected by turning screw 4 in an advancing direction through tap hole 8. Anchor 3 could as well be shaped differently as long as some configuration is used which permits anchoring action of post 1 against rail 7; that is, as long as over some dimension, anchor block 3 is too large to pass entirely through slot 2.

In FIG. 4 there is shown a detail of the locking assembly of the invention without the support post or rail member in place. The locking faces 9 and 9A of lock block 5 will be displaced a finite distance x which in general will correspond within manufacturing tolerances to the thickness of wall 10 (see FIG. 2) of rail member 7. Similarly, the width of block 5, i.e., dimension y will exceed the width of slot 2 (FIGS. 1 and 3). The thickness of the lock block between 5A and 5B, i.e., dimension m , need not be produced in close tolerance with slot 2R although it is shown as such in FIG. 2.

While the invention has been described with particularity regarding a preferred mode, it will at once be appreciated by skilled in the art that many modifications may be made depending on particular preferences of the user. For example, while rail 7 and post 1 may be of the same configuration, as is preferred, and therefore interchangeable even just prior to installation, they need not be. Anchor block 3 may be of any configuration such as a flat bar with the caveat above mentioned. Lock block 5 may as well be longer or shorter and of varied configuration depending on personal preferences. Additionally, while rail member 7 and support

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member 1 have been shown in a particular "squared cee" (□) configuration it should be clear that any generally hollow elongated tube-like structure may be employed. Thus, cylindrical tubes, elliptical tubes, rectangular tubes, square tubes, triangular tubes and the like may be employed provided the requisite configuration is present for reception of the anchor block and the lock block.

In short, though many modifications may be made, the present invention provides a means by which rails may be secured to supports, which is simple, direct, economical and versatile.

What is claimed is:

1. A locking device for clamping a rail member to a support member comprising an anchor block and a lock block, said anchor block being adapted to be inserted into a hollow slotted support member and including means on said anchor block for receiving said lock block through said slot, said lock block having a portion thereof adapted to be insertable into a hollow slotted rail member and comprising two main portions, one of said portions being a neck portion having a lock-

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ing surface and adapted to being disposed within said rail member and the other portion being a lock portion having a locking surface and adapted to be disposed outside of said rail member, fastener means on said lock portion of said lock block communicating with said anchor block, said two locking surfaces being disposed from one another a distance which corresponds substantially to the thickness of the portion of said rail member being clamped to said support member.

2. The device of claim 1 wherein said means on the anchor block is a threaded tap hole and said fastener means on said lock block is a screw threaded correspondingly with said tap hole and inserted through a hole in said lock block.

3. The device of claim 2 wherein the anchor block and lock block are adapted to be inserted into a rail member and a support member which are generally hollow elongated tube-like structures having a slot present in each of said rail and support member to receive said anchor block and said lock block.

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