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G. A. DELF ETAL

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FLOATING FLOOR ANCHOR

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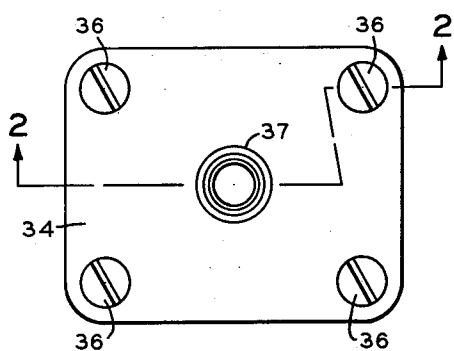


FIG. 1

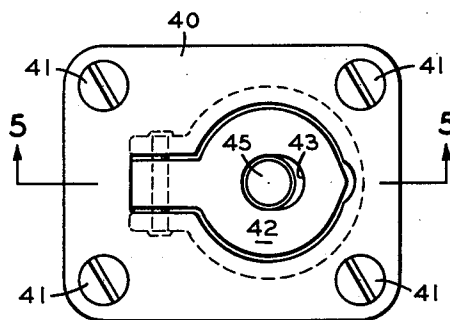


FIG. 4

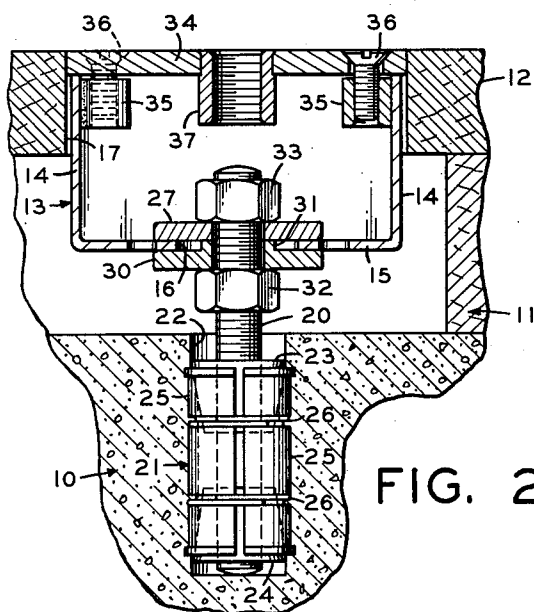


FIG. 2

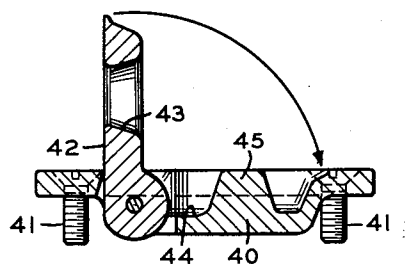


FIG. 5

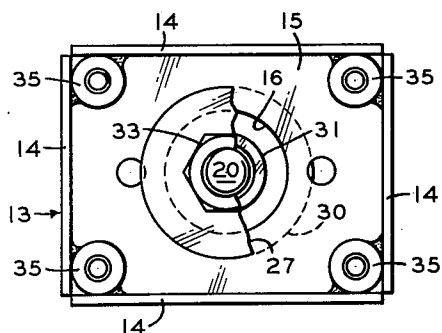


FIG. 3

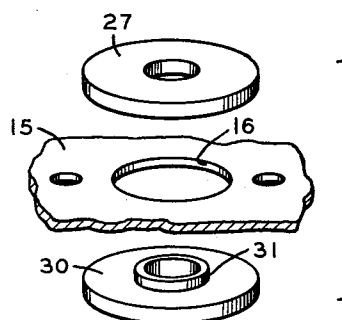


FIG. 6

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FLOATING FLOOR ANCHOR

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5 Claims. (Cl. 20—6)

This invention relates generally to improvements in a floor anchor, and more particularly to an improved anchor of this type adapted for use in a floating floor assembly.

In many floor structures, as for example, in gymnasiums, a wood floor is supported on a subjacent solid concrete subfloor or slab. Equipment utilized in gymnasiums is retained or fixed to the floor structure by guy wires attached to anchors mounted flush in the upper wood floor. Such anchors heretofore used for this purpose include a box secured to the top wood floor, and a stud fixed to the box and embedded in the bottom concrete subfloor. Upon warping of the wood floor or for other reasons, there is a tendency of the top wood floor to shift laterally in position relative to the concrete subfloor. Because of the rigid connection of the heretofore conventional type of anchor it is possible for the stud to be bent, pulled or sheared from the concrete floor when an excessive strain is exerted on the anchor by reason of shifting movement of the floating top floor relative to the bottom concrete floor.

It is an important object of the present invention to provide an anchor that is interconnected to the stationary concrete subfloor and associated with the floating wood floor in a manner to avoid the previously discussed disadvantages and difficulties.

An important objective is achieved by the provision of a box extending through a hole in the floating floor and a stud fixed in the concrete subfloor which enables relative lateral movement of the box and stud within limits, and hence permits relative shifting of the floors without adversely affecting the anchorage.

Another important objective is realized by providing an aperture in the bottom box wall through which the anchor stud projects, and a pair of washers fixed axially on the stud and engaging opposite sides of the box wall. The washers are spaced sufficiently to allow lateral shifting movement of the box wall between the washers, yet maintain effective attachment to transmit a tensional force applied to the box directly to the stud. This structural arrangement permits a translatory movement of the floating floor and yet maintain the same positive connection of the anchor stud to the concrete subfloor.

Still another important object is to provide a floor anchor that is simple and durable in construction, economical to manufacture, efficient in operation, and which can be readily installed in a floating floor assembly.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawing, in which:

FIG. 1 is a top plan view of the floor anchor;

FIG. 2 is a cross-sectional view of the floor anchor and part of the floor assembly, as seen along line 2—2 of FIG. 1;

FIG. 3 is a top plan view of the floor anchor illustrated in FIG. 2 with a top plate removed, the upper washer and nut being partially broken away in order to more clearly illustrate the structure;

FIG. 4 is a top plan view of the modified structure of the top plate for the box in the floor anchor;

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FIG. 5 is a cross-sectional view of this modified top plate as seen along line 5—5 of FIG. 5, and

FIG. 6 is an exploded, perspective view of the pair of washers and the bottom wall of the box located there-between.

Referring now by characters of reference to the drawing, and first to FIG. 2, it is seen that the particular anchor is adapted for use in a floating floor assembly. A stationary concrete subfloor indicated at 10 supports a plurality of furring strips indicated at 11 to which is attached a superjacent wood floor referred to at 12. The upper wood floor and furring strips 11 constitute a floating floor that is capable of being laterally shifted relative to the stationary concrete subfloor 10 under some conditions, as for example upon warping.

The anchor includes a box 13 that is usually open at the top, such box 13 having opposed side walls 14 and a bottom wall 15. Formed centrally through the bottom wall 15 is a circular aperture 16. In assembly, the box 13 is fitted within a suitable recess 17 formed in the floating floor 12 so as to be laterally shiftable therewith. In the preferred embodiment, the upper margin or rim of box 13 is spaced below the upper surface of floating floor 12.

A threaded stud 20 extends upwardly through aperture 16 and into the box 13. Threadedly connected on the lower end of stud 20 is an expansible means 21 adapted to fix the stud 20 securely to the concrete subfloor 10. More particularly, the expansible means 21 and the lower end of stud 20 is disposed in a preformed bore 22 drilled or otherwise formed in the concrete subfloor 10.

The expansible means 21 includes a tapered sleeve 23 mounted on stud 20 and an opposing opposing tapered nut 24 threadedly connected to such stud 20. Extending between and substantially embracing the opposed sleeve 23 and nut 24 are a pair of side plates 25. These plates 25 are retained in place by encircling lock wires 26 before expansion into frictional engagement with the concrete wall defining bore 22.

Located closely about stud 20 are a pair of washers 27 and 30. The bottom wall 15 of box 13 is located between the washers 27 and 30. One of the washers 30 includes an integral upstanding collar 31 that extends upwardly through the aperture 16 and engages the opposite washer 27. The collar 31 holds the washers 27 and 30 in sufficiently spaced relation so as to permit lateral movement of the bottom wall 15 between the pair of washers and hence permit lateral movement of the box 13 relative to stud 20 upon lateral shifting of the floating floor 12 with respect to the subjacent concrete floor 10. Yet, the spacing of washers 27 and 30 as determined by the length of collar 31 is such as to preclude any substantial vertical movement of the washers with respect to the intervening bottom box wall 15 when the pair of washers are fixed axially on stud 20.

The width of collar 31 is smaller than the aperture 16 and the collar 31 is spaced inwardly from the bottom box wall 15 defining such apertures 16 so as to enable lateral movement of the box 13 relative to stud 20 as previously described.

A nut 32 is threadedly attached to stud 20 and engages the underside of washer 30. A similar coacting nut 33 is threadedly attached to stud 20 and engages the top side of washer 27. The nuts 32 and 33 clamp the pair of washers 27 and 30 together and lock such washers axially in place on stud 20, as is shown best in FIG. 2.

Disposed over the top of box 13 is a closure plate 34 that lies substantially flush with the top surface of floating floor 12. Welded internally of box 13 at each of its corners is a threaded socket member 35. A plurality of screws 36 are utilized to attach the top closure plate 34

to box 13, such screws 36 threadedly interfitting the socket members 35.

In the embodiment disclosed in FIGS. 1 and 2, the closure plate 34 includes a depending center socket member 37 provided with internal threads. When utilized as an anchorage, a post (not shown) is threadedly attached in the center socket member 37 and a guy wire (not shown) is attached to such post.

A modified closure plate 40 is illustrated in FIGS. 4 and 5. This plate 40 is attached to the box 13 in a similar manner by a plurality of screws 41. However, this embodiment includes a hinged eye member 42 that is provided with a center opening 43. The closure plate 40 includes a center dish portion 44 into which the eye member 42 is hingedly movable. An upstanding tapered shoulder 45 formed integrally with closure plate 40 is adapted to interfit the opening 43 in the eye member 42 when such eye member 42 is hingedly closed. When closed, the eye member 42 lies substantially flush with the top surface of closure plate 40 and hence flush with the top surface of floating floor 12. When raised, the guy wire (not shown) can be attached to the eye member 42 through the opening 43.

It is thought that the installation and function of the floor anchor has become fully apparent from the foregoing detailed description of parts, but for completeness of disclosure, it will be assumed that a suitable recess 17 has been formed in the floating floor 12 and that a bore 22 has been formed in the concrete subfloor 10.

First, the bottom end of stud 20 with its expansible means 21 is located within the bore 22. The position of nut 32 is adjusted axially on stud 20 so as to locate the bottom washer 30 in position so that the box 13 is arranged at a proper height relative to the floating floor 12, i.e., so that the closure plate 34 when connected will lie flush with the top surface of floating floor 12. Then, the nut 33 is tightened on top of washer 27 to clamp such washers 27 and 30 together.

Upon continued turning of nut 33, the stud 20 will rotate and automatically cause expansion of side plates 25 against the concrete wall defining bore 22, and hence securely fix the stud in the stationary concrete subfloor 10. After the stud 20 has been securely fixed, the closure plate 34 is attached to the top of box 13. The anchor is now conditioned for use.

If for any reason, the top floating floor 12 shifts laterally relative to the stationary concrete subfloor 10, the box 13 will move with the top floating floor 12. Because the bottom wall 15 can shift laterally between the washers 27 and 30 within limits defined by the abutment of the wall of aperture 16 with the collar 31, such translatable movement will not be transmitted to the stud 20. Consequently, it is seen that the stud 20 is not pulled, bent or otherwise moved from its firm anchorage within the concrete subfloor 10 by reason of any lateral translatable movement of the floating floor 12. Yet, it will be apparent that any tensional force exerted outwardly on box 13 by a pulling guy wire will be transmitted directly to the stud 20 by the interengagement of the washers 27 and 30 with the bottom wall 15, and is effectively opposed by the firm anchorage of stud 20 in the concrete subfloor 10.

Although the invention has been described by making detailed reference to a single preferred embodiment, and a modification thereof, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

We claim as our invention:

1. In a floor structure of the character described:

- (a) a stationary floor,
- (b) an upper floor mounted for lateral movement on the stationary floor, the upper floor being provided with a hole therethrough,

- (c) a stud secured to the stationary floor below the hole,
 - (d) means attached to said stud and providing a slot spaced axially relative to the stud, and
 - (e) a wall provided with an aperture, the wall having the peripheral portion adjacent the aperture engaged in said slot, the aperture being larger than the diameter of the stud, the wall having side portions extending upwardly into the hole in the upper floor and located closely adjacent the sides of said hole, whereby the wall is held against movement axially on the stud but is free for limited lateral movement upon relative lateral shifting of the said floors.
2. In a floor structure of the character described:
- (a) a stationary floor,
 - (b) an upper floor mounted for lateral movement on the stationary floor, said upper floor being provided with a hole,
 - (c) a stud secured to the stationary floor below the hole,
 - (d) a pair of washers on said stud,
 - (e) means fixing the washers axially on said stud, said washers being spaced axially relative to the stud to provide a slot, and
 - (f) a box having a wall provided with an aperture, the wall having the peripheral portion adjacent the aperture engaged in said slot, the aperture being larger than the diameter of the stud, said box having side portions extending upwardly into the hole in the upper floor and located closely adjacent the sides of said hole, whereby the wall is held against movement axially on the stud but is free for limited lateral movement upon relative lateral shifting of said floors.
3. In a floor structure of the character described:
- (a) a stationary floor,
 - (b) an upper floor mounted for lateral movement on the stationary floor, the upper floor being provided with a hole,
 - (c) a stud secured to the stationary floor below the hole,
 - (d) a pair of washers on said stud,
 - (e) means on said stud fixing the washers axially on said stud,
 - (f) means holding the washers apart to provide a slot spaced axially relative to the stud, and
 - (g) a box having a wall provided with an aperture, the wall having the peripheral portion adjacent the aperture engaged in said slot, the aperture being larger than the diameter of said means holding the washers apart, the box having side portions extending upwardly into the hold in the upper floor and located closely adjacent the sides of said hole, whereby the wall is held against movement axially on the stud but is free for limited lateral movement upon relative lateral shifting of said floors.
4. In a floor structure of the character described:
- (a) a stationary floor,
 - (b) an upper floor mounted for lateral movement on the stationary floor, the upper floor being provided with a hole,
 - (c) a stud secured to the stationary floor below the hole,
 - (d) a pair of washers closely embracing the stud, one of said washers including a collar engaging the other said washer to hold the washers apart to provide a slot spaced axially relative to the stud, and
 - (e) a box having a wall provided with an aperture, the wall having the peripheral portion adjacent the aperture engaged in said slot, the aperture being larger than the diameter of said stud and collar, the box having side portions extending upwardly into the hole in the upper floor and located closely adjacent the sides of said hole, whereby the wall is held against movement axially on the stud that is free

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for limited lateral movement upon relative lateral shifting of said floors.

5. In a floor structure of the character described:

- (a) a stationary floor,
- (b) an upper floor mounted for lateral movement on the stationary floor, the upper floor being provided with a hole,
- (c) a stud secured to the stationary floor below the hole,
- (d) a pair of washers closely embracing the stud, an integral collar on one of said washers engaging the other said washer to hold the washers apart to provide a slot spaced axially relative to the stud,
- (e) nuts threadedly connected to said stud and engaging opposite sides of the pair of washers to fix the washers axially on the stud, and
- (f) a box having a wall provided with an aperture, the wall having the peripheral portion adjacent the aperture engaged in said slot between said washers, the aperture being larger than the diameter of said stud and collar, the box having side portions ex-

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tending upwardly into the hole in the upper floor and located closely adjacent the sides of said hole, whereby the wall is held against movement axially on the stud but is free for limited lateral movement upon relative lateral shifting of said floor.

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