March 28, 1944. K. A. OLSON 2,345,419

FLOOR CLIP

Filed Jan. 31, 1942

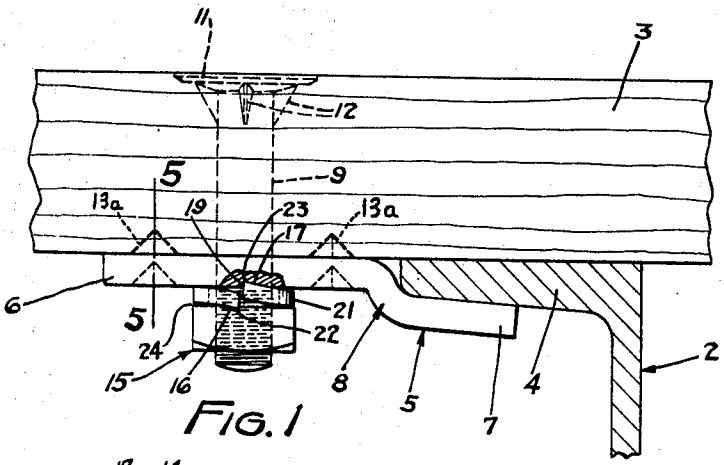


FIG. 1

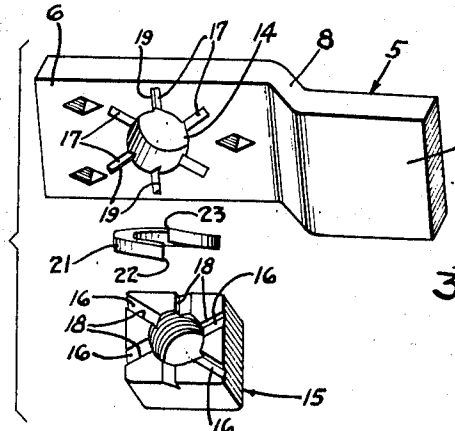


FIG. 4

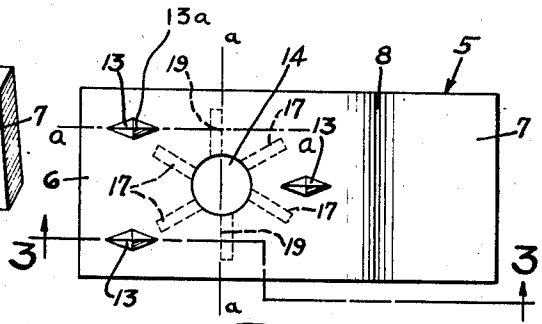


FIG. 2

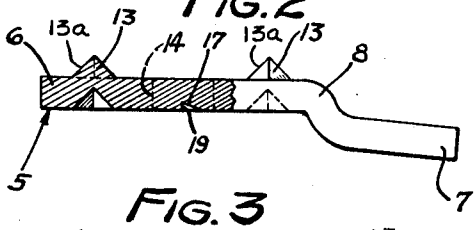


FIG. 3

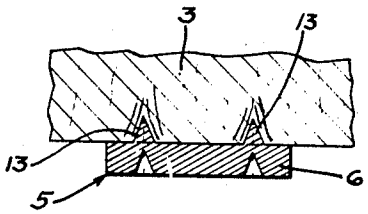


FIG. 5

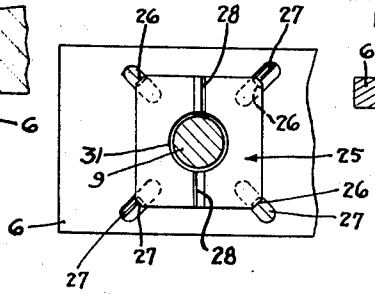


FIG. 7

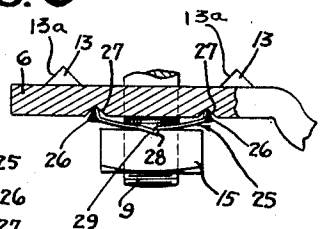


FIG. 6

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Patented Mar. 28, 1944 2,345,419

UNITED STATES PATENT OFFICE

2,345,419

FLOOR CLIP

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Application January 31, 1942, Serial No. 429,062

5 Claims. (Cl. 189—35)

This invention relates to new and useful improvements in floor clips of the type now commonly used for securing floor boards to a supporting beam or sill, as in the construction of railroad cars, although it is to be understood that the invention may be used for other purposes where applicable.

Floor clips of the general type herein disclosed are now more or less commonly used in the construction of railroad freight cars to secure the usual floor boards thereof to the supporting beams or sills. Such floor clips, however, have not been entirely satisfactory, because the securing means thereof does not always retain the floor clips in firm contact with the floor boards, which is essential to minimize the entrance of moisture into the wood, and further, because the means provided for preventing the clip from relatively rotating on the floor board has been so constructed as to more or less fracture the fibers of the wood, when the securing bolt is tightened to draw the clip into intimate contact with the flooring, whereby moisture may enter between the broken fibers, and thereby cause the wood to rapidly deteriorate or rot.

Other clips now on the market are more or less dependent upon their engagement with the flange of the sill or beam to prevent them from relatively rotating. Such clips are usually so located with respect to the beam that the shoulder provided by the offset in the clip will engage the edge of the sill flange which, of course, necessitates that the bolt for securing the clip in position be located in a definite relation to the sill flange, whereby the offset will so engage the sill as to prevent the clip from relatively rotating when the bolt is tightened. This, therefore, requires that care must be exercised when boring the hole in the flooring for receiving the clip bolt so that the hole will be properly spaced from the sill flange. Other known clips are dependent entirely upon their frictional engagement with the flange of the beam to prevent them from rotating, which obviously is not practical, because if the clip should at all become loose, which might readily occur as a result of wood shrinkage, it could readily rotate out of engagement with the flange of the beam.

Other known clips provide means for positively locking the nut in clip-securing position, but in the application thereof it is necessary to perform some manual operation, such as bending up one or more prongs, which may be a part of the body of the floor clip, or another piece of metal used in the assembly. Besides requiring extra labor to perform such an operation, workmen frequently neglect to bend these locking prongs into locking engagement with the nut, with the result that the nut remains unlocked, and may subsequently work loose. Such a structure is disclosed in the patent to J. A. MacLean, No. 2,030,216.

It is well known that wood will swell or shrink according to atmospheric conditions. Up to the present, no provision has been made in the construction of floor clips for allowing for shrinkage of the floor boards, with the result that in some instances where the floor boards have shrunk the clips have become loose, whereupon the floor clips have failed to function properly.

The novel clip herein disclosed embodies a resilient spring locking element, which automatically takes up shrinkage, and thereby constantly keeps the clip in proper position against the flooring, and at the same time the head of the bolt is maintained in intimate contact with the flooring, whereby it is always kept flush with the top surface thereof. In many instances, "waterproof" bolts are used in connection with floor clips. The waterproof features of these bolts are generally dependent upon the heads being held in close contact with the wood, which, in the present invention, is accomplished by the compensating spring locking washer utilized for securing the nut against working loose, once it has been positioned to secure the clip in proper position against the floor.

It is therefore an object of the present invention to provide a floor clip in which all of the objectionable features present in well-known clips have been eliminated, and which is so constructed that it may be secured in position with a minimum of effort and with the assurance that once it has been secured in position against the flooring and sill, it cannot relatively change its position or become loose on the bolt.

A further object is to provide a floor clip of the class described having an aperture therein for receiving a bolt which passes through the car flooring and through the aperture in the clip body, and has a nut received in threaded engagement therewith, and a resilient locking element being interposed between the body of the clip and said nut, and having opposed terminals offset from the median plane of the locking element, in opposite directions, whereby said locking element constantly exerts opposing forces against the clip body and said nut, and the adjacent faces of the clip body and nut having radially disposed notches formed therein adapted to receive the ter-

minals of the locking element, whereby the nut is positively secured in locking position whereby it cannot work loose, and at the same time the resilient locking element will retain the body of the clip and the head of the bolt in firm water-tight engagement with the opposite faces of the flooring, whereby the danger of the floor deteriorating as a result of moisture entering under the bolt head or clip body is substantially eliminated.

A further object is to provide a floor clip of the class described having means for securing it in position whereby the clip cannot accidentally become loose and which securing means is so constructed that the bolt is constantly maintained under tension, whereby the head of the bolt and the body of the clip are firmly held against the flooring, regardless of shrinkage or contraction of the wood.

A further object is to provide a floor clip comprising a plurality of integral spurs or fins adapted to pierce the surface of the wood in such a manner as to separate the fibers without cutting or breaking them, and whereby a maximum surface is presented to the fibers to prevent the clip from relatively rotating, when the nut or bolt is tightened to secure the clip in position.

A further and more specific object is to provide a floor clip comprising a plurality of spurs or fins which project from one surface thereof, and said spurs or fins being more or less diamond-shaped, in cross section, with their long dimension running lengthwise of the fibers in the wood upon which the clip is to be secured, whereby when said spurs are forced into the surface of the wood, in the operation of securing the clip thereto, the fibers engaged by said spurs are simply pushed apart or separated substantially without severing or breaking any of the fibers, and whereby the spurs will present their widest or greatest surfaces to the fibers to prevent the clip from relatively rotating, when the securing nut is manipulated to secure the clip in position.

A further object is to provide a floor clip comprising an elongated body having a plurality of elongated spurs projecting from a face thereof and extending lengthwise of the clip body, and each spur having a sharp edge extending substantially the full length thereof and up from and down to the surface of the clip body, whereby each spur has a cutting edge which comes to a point at the center of the spur to facilitate forcing the spurs into the surface of a timber.

Other objects of the invention reside in the unique and simple construction of the clip whereby it may be manufactured in quantity production at small cost; in the diamond-shaped contour of the spurs or fins which penetrate the surface of the wood when the clip is secured thereto; in the means provided between the body of the clip and the nut for locking the nut in position so that it cannot accidentally work loose; and in the specific construction of the resilient locking element interposed between the body of the clip and the bolt nut, and the provision of notches or recesses in the adjacent surfaces of the clip and nut, whereby the opposed terminals of the locking element or washer will engage said recesses or notches and thereby positively secure the nut against working loose, even through the wood with which it is engaged may shrink considerably.

Other objects of the invention will appear from the following description and accompanying drawing and will be pointed out in the annexed claims.

In the accompanying drawing there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawing:

Figure 1 is a detail sectional view showing a portion of a supporting beam or sill and the manner of securing the flooring thereto by the use of the clip;

Figure 2 is a bottom view of the clip showing the location of the spurs or fins thereon;

Figure 3 is a detail sectional view substantially on the line 3—3 of Figure 2;

Figure 4 is a perspective view showing the clip, the locking washer and the nut;

Figure 5 is a detail sectional view on the line 5—5 of Figure 1 showing the spur or fins embedded in the surface of the wood, and how the wood fibers are separated, when the fins are pressed into the surface of the wood;

Figure 6 is a view showing another type of spring locking device; and

Figure 7 is a plan view of Figure 6.

In the selected embodiment of the invention here shown, there is illustrated in Figure 1, a portion of a conventional beam or sill, generally designated by the numeral 2, such as are commonly used in the construction of railroad freight cars. The wood flooring 3 is shown supported on the upper flange 4 of the sill, and is secured thereto by the novel clip herein disclosed, and generally designated by the numeral 5.

The clip, as will readily be understood by reference to Figures 2 and 3, may be made from strap metal, and is shown comprising a body portion 6, having a tongue 7 at one end, which may be conveniently and inexpensively formed by providing an offset 8 in the metal, as shown at 8 in Figures 1, 3 and 4. The tongue 7 is thus offset from the median plane of the clip body 6, whereby it will seat against the bottom surface of the flange of the sill 2, as best shown in Figure 1. The main body portion 6 of the clip is adapted to be seated against the bottom surface of the flooring 3. The clip is secured in position by a suitable bolt 9, shown having a flanged head 11, which is seated in a recess in the upper surface of the flooring 3, and is preferably provided with fins 12 to prevent rotation of the bolt, when the clip is being secured in position.

A feature of the invention resides in the construction of the means for preventing the clip from relatively rotating, when in position against the flooring. The means provided for thus preventing the clip from relatively rotating, is best shown in Figures 1, 3 and 5, and comprises a plurality of spurs or fins 13, two such spurs being provided at one end of the clip body 6 and another at the opposite end thereof. The spurs or fins 13 may be struck out of the metal, as shown in Figures 3 and 5, whereby the operation of forming the fins is relatively inexpensive.

It is important that the spurs be so fashioned as to avoid fracturing or tearing the fibers of the flooring or timber, when the spurs are forced into the surface thereof in the operation of securing the flooring to the rails 2. To thus prevent the spurs from fracturing or tearing the fibers, each spur is formed with a cutting edge 13—a which extends lengthwise of the clip body and is substantially parallel to the longitudinal axis of the

clip body, as indicated by the line *a*—*a* in Figure 2, and, that the cutting edge 13—*a* of each spur extends up from the surface of the clip to the point of the spur and then down to the surface of the clip body, as best shown in Figure 3. The base of each spur is also made relatively wider at its center portion, as shown in Figures 2 and 5, whereby the side faces of each spur taper to a point at each end of the spur to provide in effect, a diamond shaped spur, when looking at the clip body as illustrated in Figure 2.

The body of the clip has an aperture 14 adapted to receive the bolt 9, as shown in Figure 1. The lower end of the bolt is threaded to receive a nut 15, having notches 16 in one surface, as best shown in Figure 4. The bottom surface of the body 6 of the clip is similarly provided with V-shaped notches 17. The walls 18 and 19 of the notches 16 and 17, respectively, are preferably radially disposed, as will be understood by reference to Figure 1, and as shown by the line *a*—*a* in Figure 2.

Another feature of the invention resides in the means provided for locking the nut 15 in clip-securing position, and whereby the flooring may contract without danger of the clip and bolt becoming sufficiently loose to permit moisture or water to enter between the clip body and the flooring and between the head of the bolt and the flooring. The means provided for thus locking the nut in position and compensating for shrinkage or contraction of the flooring, is best shown in Figures 1 and 4, and comprises a suitable spring locking element or washer 21, which is adapted to be interposed between the nut 15 and body 6 of the clip. The washer 21 is provided with oppositely disposed terminals 22 and 23, which are offset from the median plane of the washer, in opposite directions, and are adapted to be received in the notches 16 and 17, respectively, when the lock washer and nut are in position on the bolt, as shown in Figure 1.

The terminals 22 and 23 of the lock ring or washer 21 are offset to such an extent from the median plane of the washer, that when the nut is tightened to secure the clip against the floor boards 3 sufficiently to drive or force the spurs or fins 13 into the surface of the wood, as shown in Figures 1 and 5, the body of the washer may or may not be tightly clamped between the clip and the nut. In some instances, it may only be partially tightly clamped therebetween, as shown at 24 in Figure 1. The spring tension in the lock washer is sufficient, however, to maintain the clip and bolt head in intimate contact with the flooring, even though the washer may not be clamped rigidly between the clip and nut. This is important in that the washer, in addition to locking the nut in position, also serves to prevent moisture from entering the wood under the clip body or bolt head, with the result that deterioration or rotting of the wood at these places is substantially eliminated.

The spurs or fins 13, it will be noted, have their long dimension disposed in parallel relation to the length of the clip, whereby the spurs or fins may readily be pressed into the surface of the floor boards without breaking or cutting the fibers thereof, it being understood that the fibers of the wood usually run in a direction lengthwise of the clip. It will also be noted that the spurs are disposed at opposite sides of the bolt hole 14 of the clip, whereby maximum resistance to turning of the clip is afforded, as will be understood. By reference to Figure 2, it will be noted that the size or width of the spurs or fins 13 cross-wise of the clip, is comparatively small, whereby the fins may readily separate the fibers of the wood, when they are pressed thereinto, as indicated in Figure 5. This, as hereinbefore stated, is of great importance in that the fibers are not cut or broken by the spurs, whereby moisture is not so likely to enter the wood and cause rotting thereof. The spurs or fins may also be pressed into the wood with less effort, when fashioned as shown in Figure 2.

In actual manufacture, it has been found that the spurs or fins 13 may readily be struck out of the metal in such a manner as to leave the spurs with relatively sharp points and edges. The notches 16 and 17 provided in the nut and clip, respectively, may also readily be formed without any cutting operations, whereby such operation is very inexpensive. The construction of the clip thus readily lends itself to manufacture in quantity production at small cost, which is highly desirable in devices of this general type.

Figures 6 and 7 illustrate another form of locking device for the nut 15, which comprises a metallic plate, generally designated by the numeral 25, which is curved or slightly arched-shape, as shown in Figure 6. The locking plate 25 is shown substantially square in configuration, although it may be otherwise shaped, if desired. The four corners 26 of the plate 25 are downwardly bent, as best shown in Figure 6, adapted to be received in suitable recesses 27 provided in the adjacent or bottom surface of the clip 6, when viewed as shown in Figure 6. As a result of the corners 26 of the locking plate 25 thus engaging the recesses 27, the locking plate is prevented from relatively rotating with respect to the clip 6.

The locking plate 25 is also shown provided with oppositely disposed ridges or ribs 28, which may readily be formed therein, as shown in Figure 6. These ribs or ridges are received in correspondingly shaped recesses 29 provided in the face of the nut 15.

The ribs 28 in the locking plate 25 are preferably so formed that the nut may readily be rotated in a direction to tighten the clip against the timber or flooring 3, but whereby the nut cannot readily be rotated in a direction to loosen the clip 6. This will readily be understood by reference to Figure 6. The lock plate 25 has a suitable aperture 31 for receiving the bolt 9.

The locking device shown in Figure 6 functions in a manner similar to the spring locking washer 21, shown in the previous figures, in that it positively locks the nut 15 against accidental rotation in a direction to loosen the clip, and at the same time it serves to hold the clip against the surface of the flooring under spring tension, whereby the clip and the bolt head will constantly be retained in intimate contact with the surface of the flooring, regardless of expansion and contraction thereof.

In the drawing I have shown the clip as used for securing floor boards to a flanged beam or sill. It is to be understood that it may be used for other purposes, where applicable, without departing from the scope of the invention.

It will be apparent to those skilled in the art that I have accomplished at least the principal objects of my invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be ap-

preciated that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim as my invention:

1. A floor clip of the class described comprising an elongated body having a plurality of elongated spurs thereon extending lengthwise af the clip body, each spur having a cutting edge extending substantially the full length thereof and up from and then down to the surface of the clip body and parallel to the longitudinal axis of the clip body, and the base of each spur being of substantial width at its center portion, as compared with the opposite ends thereof.

2. A floor clip of the class described comprising an elongated body having a plurality of elongated spurs thereon extending lengthwise of the clip body, each spur having a relatively sharp edge extending substantially the full length thereof and up from and then down to the surface of the clip body and parallel to the longitudinal axis of the clip body, and the base of each spur being of substantial width at its center portion and tapering to a point at each end.

3. A floor clip of the class described comprising an elongated body having a plurality of elongated spurs thereon extending lengthwise of the clip body, each spur having a relatively sharp edge extending substantially the full length thereof and up from and then down to the surface of the clip body and parallel to the longitudinal axis of the clip body, the base of each spur being of substantial width at its center portion and tapering to a point at each end, and the sides of each spur extending upwardly and inwardly from the base of the spur and terminating at the sharp edge of the spur the length thereof and whereby each spur is provided at its center with a relatively sharp point.

4. A floor clip of the class described comprising an elongated body formed with a tongue at one end offset from the median plane of the clip body, a plurality of elongated spurs on the clip body extending lengthwise thereof and each having a cutting edge extending substantially the full length of the spur and up from and then down to the surface of the clip body and parallel to the longitudinal axis of the clip body, the base of each spur being of substantial width at its center portion as compared with the opposite ends thereof and the opposed side wall of each spur extending upwardly and inwardly to said cutting edge.

5. A floor clip for securing wooden flooring to a flanged supporting beam, said clip comprising an elongated body having a tongue at one end offset from the median plane of the clip body, a plurality of elongated spurs on the clip body extending lengthwise thereof and each spur having a cutting edge extending substantially the full length thereof and up from and then down to the surface of the clip body and parallel to the longitudinal axis of the clip body, the base of each spur being of substantial width at its center portion and tapering to a point at each end, a bolt and nut for securing the clip body in position against the surface of the flooring with the tongue engaging the beam, and compensating means associated with the nut and clip body for permitting free expansion or contraction of the flooring without loosening the nut and whereby the clip body is always held in firm contact with the surface of the flooring.

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