

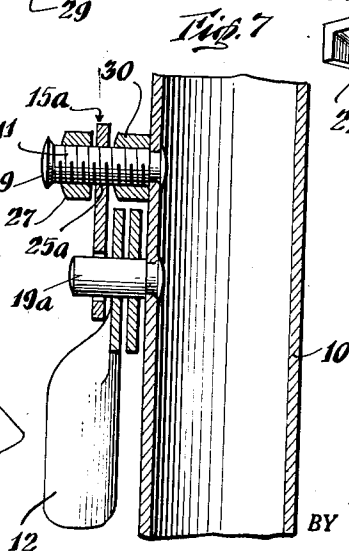
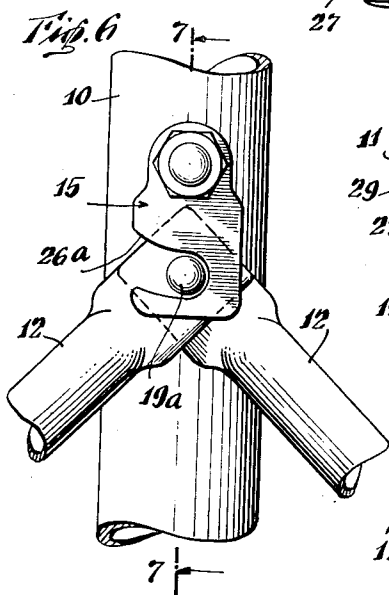
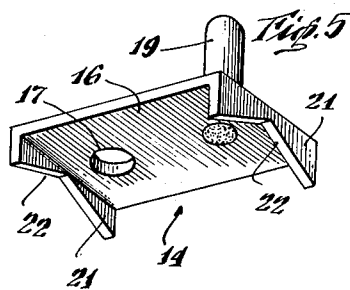
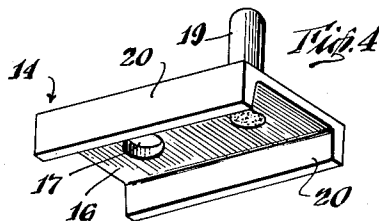
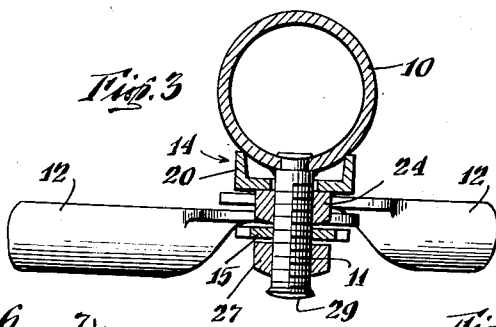
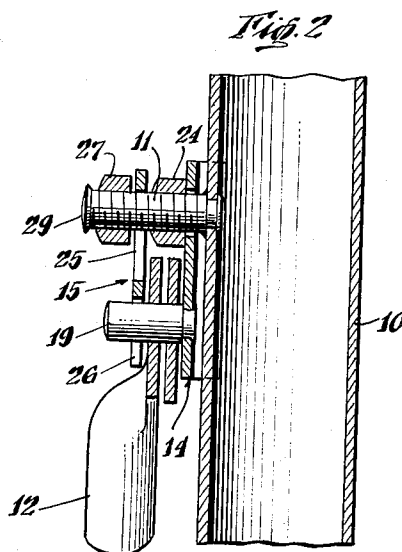
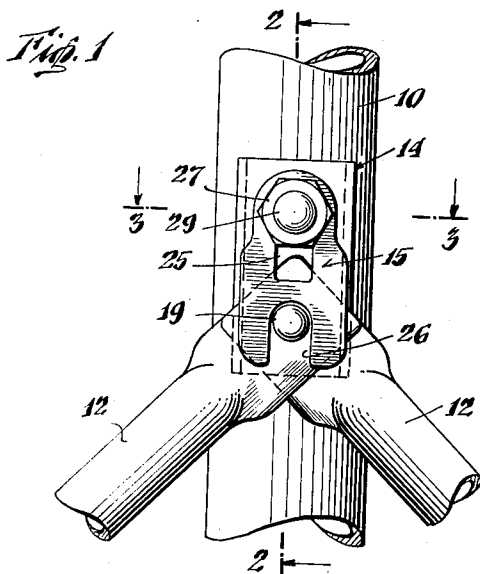
Aug. 10, 1954

M. P. FRENCH

2,686,086

CROSS BRACE ATTACHMENT FOR SCAFFOLDING STRUCTURES

Filed March 29, 1952



INVENTOR.
Merle P. French
BY
Leo C. Krazinski
ATTORNEY

UNITED STATES PATENT OFFICE

2,686,086

CROSS BRACE ATTACHMENT FOR SCAFFOLDING STRUCTURES

Merle P. French, New Rochelle, N. Y.

Application March 29, 1952, Serial No. 279,306

3 Claims. (Cl. 304-40)

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The present invention relates to scaffolding structure of the type comprising vertical and horizontal frame members adapted to be assembled to provide a scaffold and to be taken apart when the scaffold has served its purpose, and is more particularly concerned with improvements utilized in the attachment of cross braces to the frame members which serve to rigidify the scaffold.

A widely used scaffolding structure of the foregoing type comprises frame members having threaded studs thereon at suitable locations adapted to extend through apertures formed at the ends of the cross braces, and a nut, such as a wing nut, which is threadably secured to the studs to attach the cross braces to the frame members.

The difficulty with such structures is that, in taking the same apart, the nuts must be completely separated from the studs and thus are frequently dropped by careless workmen and are lost. The loss of the nuts is an annoyance to the owner or operator of the scaffolding structure because of the cost of frequently replacing the lost nuts and because of the loss of time that may occur upon discovering a shortage of nuts in the course of erecting the structure.

It has been proposed to overcome these objections by providing an attachment to take the place of nuts which comprises a yoke pivoted on a frame member adjacent a stud thereof having an eyelet adapted to pass over the stud to retain a cross brace and having a cam surface thereon, and a toggle element having means thereon adapted to cooperate with the cam surface to lock the yoke over the stud.

The difficulty with such a toggle lock is that it is relatively complicated and expensive to manufacture, that it cannot be readily adapted to scaffolding structure now in the field and that it is not as safe as a threaded connection because excessive vibrations may cause the toggle to be released.

Accordingly, an object of the present invention is to provide for the attachment of cross braces to scaffold frame members in a safe, simple and economical manner which overcomes the foregoing objections, difficulties and disadvantages.

Another object is to provide an attachment which can be operated at least as rapidly and conveniently as a wing nut but eliminates the loss of any elements thereof.

A further object is to accomplish the foregoing connection with both scaffolding structure

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now in use and newly manufactured scaffolding structure.

Other and further objects will be obvious upon an understanding of the illustrative embodiments about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description as is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a fragmentary elevational view of a scaffolding structure illustrating an attachment in accordance with the invention for applying cross braces to a frame member, particularly adapted for structures now in the field.

Fig. 2 is a sectional view taken along the line 2-2 on Fig. 1.

Fig. 3 is a sectional view taken along the line 3-3 on Fig. 1.

Fig. 4 is a perspective view illustrating one form of a base utilized in connection with the attachment shown in Figs. 1 to 3.

Fig. 5 is a perspective view of another form of base.

Fig. 6 is a view similar to Fig. 1 illustrating an attachment particularly adapted for newly manufactured structures.

Fig. 7 is a sectional view taken along the line 7-7 on Fig. 6.

Referring to the drawing in detail and more particularly to Figs. 1, 2, and 3, thereof, there is shown a tubular cylindrical scaffolding frame member 10 of the type commonly used having a threaded stud 11 permanently secured thereto and extending radially outwardly therefrom, perpendicularly with respect to the longitudinal axis of the frame member. The frame member and stud are of standard construction, and heretofore the stud received an apertured end of one or more cross braces 12 and a wing nut was threaded on the stud to attach the cross braces thereto.

This standard construction is adapted to be converted into an attachment in accordance with the present invention wherein the necessity for a separable wing nut is eliminated. As about to be described, this is accomplished by providing an adapter 14 (Figs. 4 and 5) arranged to be permanently or removably secured to the frame member 10, and a fastening link 15 for attaching the cross braces to the adapter arranged to

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be releasably secured to the other elements of the attachment structure.

The adapter 14 comprises a generally rectangular base 16 having an aperture 17 adjacent one end thereof through which the stud 11 extends (Figs. 2 and 3), and a stud 19 permanently secured to one side of the base adjacent its other end and in longitudinal alignment with the aperture. The stud 19 is adjacently spaced apart from the aperture 17 and is adapted to be rigidly positioned in parallel relation with respect to the stud 11.

In order to align the longitudinal axis of the adapter 14 with the longitudinal axis of the frame member 10 and retain the adapter in such alignment to prevent shifting thereof with respect to the frame member, the base 16 of the adapter may have means at the side opposite from which the stud 19 extends for receiving a portion of the outer wall of the frame member. Such means may be provided by constructing the adapter from a channel member having side flanges 20 (Fig. 4) between which the wall portion of the frame member 10 is adapted to fit, or by forming the adapter base 16 with end flanges 21 having V-shaped recesses 22 (Fig. 5) for receiving the wall portion of the frame member. By constructing the aligning means in the foregoing manner, the adapter is capable of being used in cooperating relationship with frame members of various diameters, but it will be understood that the adapter base or the recesses 22 could have an arcuate frame member engaging surface conforming to the shape of the frame member.

As shown in Figs. 2 and 3, the adapter 14 is secured to the frame member 10 by a nut 24 which is threaded onto the stud 11 to engage the outer face of the adapter base in a manner to rigidly mount the adapter on the frame member, whereby the studs 11 and 19 are rigidly positioned with respect to each other.

The link 15 illustrated in Figs. 1 to 3 is a generally rectangular plate having an elongate aperture 25 therein adjacent one end thereof through which the stud 11 extends and having an open slot 26 at the opposite end thereof in longitudinal alignment with the aperture 25 for receiving the stud 19. The link 15 is retained on the stud 11 in a pendant position with respect to the stud 19 by a nut 27 which is threaded onto the stud adjacent the outer face of the link.

In using the attachment so far described herein, the adapter 14 is secured to the frame member 10 in the manner already indicated, the cross braces 12 are so positioned that the stud 19 extends through their respective apertures, the link 15 is applied with the stud 11 at the upper portion of the aperture 25 and with the stud 19 at the upper end of the slot 27 (Fig. 2) and the nut 27 is threaded onto the stud 11 to hold the link loosely in such a position whereby the lower portion of the link extends over the apertured ends of the cross braces to prevent removal thereof from the stud 19.

When it is desired to disassemble the cross braces, the link 15, being freely mounted, is merely moved upwardly, so that the stud 11 is at the lower portion of the aperture 25 (the aperture 25 and the slot 26 being so dimensioned that the stud 19 is now completely out of the slot 26), and the link is then pivoted about the stud 11 to clear the ends of the cross braces, whereby the latter may be removed from the stud 19.

In order to prevent untrained workmen from unnecessarily separating the nut 27 from the stud

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11 and consequently losing the nut 27, the free end of the stud 11 may be provided with means for retaining the nut immediately after the nut is first applied to the stud. Such means may be provided by peening over the free end of the stud to form an enlarged portion 29 which prevents removal of the nut or in any other conventional manner. For example, the threads at the end of the stud may be burred to make unthreading difficult or the stud may be formed with a diametrically extending bore adjacent its free end through which a fixed or a removal pin is adapted to extend. Since such nut retaining means are well known, illustration of alternative structures for accomplishing this purpose is deemed unnecessary.

In Figs. 6 and 7, attachment structure is illustrated for practicing the present invention in connection with newly manufactured scaffolding members or such members in prior use which are available to be taken out of service for reconversion. This structure eliminates the adapter 14 to further simplify the same and to thereby make its construction even more economical than that of the structure shown in Figs. 1 to 3.

This modified structure generally comprises a frame member 10 and a stud 11 as previously described, a stud 19a for receiving the apertured ends of the cross braces 12 which is adjacently spaced and rigidly positioned with respect to the stud 11 in parallel relation by securing the same to the frame member in the same manner as the stud 11 may be secured thereto, and a link 15a for fastening the cross braces to the stud 19a.

The link 15a, as shown in Figs. 6 and 7, is a hook-shaped element which may be in the form of a plate having a circular aperture 25a adjacent its upper end through which the stud 11 extends to pivotally mount the link and having an open arcuate side slot 26a adjacent its lower end for receiving the stud 19a. The link 15a is so dimensioned that the weight of the bottom portion thereof will by gravity immediately rotate to its locking position upon release thereof.

In applying the attachment just described, a spacer nut 30 is threaded over the stud 11, the cross braces are positioned with the stud 19a extending through their respective apertures, the link 15a is positioned with the stud extending through its aperture 25a and is then pivoted about the stud 11 to cause the stud 19a to enter the slot 26a, and a nut 27 is threaded on the stud 11 to loosely position the link in a manner whereby the cross braces are retained on the stud 19a.

When it is desired to disassemble the cross braces 12, the link 15a is merely pivoted counterclockwise, as viewed in Fig. 6, to clear the slot 26a of the stud 19a whereby the cross braces are freed for removal from the stud 19a.

As previously described, the stud 11 may be provided with suitable nut retaining means 29.

While the link 15 has been illustrated and described in connection with Figs. 1 to 3 and the link 15a has been illustrated and described in connection with Figs. 6 and 7, it will be understood that they can be interchanged and that the links were so illustrated to minimize the number of views which would be otherwise required to illustrate modifications of the present invention.

From the foregoing description, it will be seen that the present invention provides a simple, safe, foolproof, practical, reliable and economical attachment for connecting cross braces and the like to scaffolding frame members. The attach-

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ment is rugged in construction and does not include any parts or surfaces subject to damage or wear, and thereby is fully adapted to withstand such rough usage to which it may be subjected in its normal use.

As various changes may be made in the form, construction and arrangements of the parts herein, without departing from the spirit and scope of the invention, and without sacrificing any of its advantages, it is to be understood that all matters are to be interpreted as illustrative and not in any limiting sense.

What is claimed is:

1. An attachment for connecting a pair of cross braces to scaffolding frame members each member having a stud thereon, said attachment comprising a base having an aperture for receiving the stud of a frame member, a stud secured to said base adjacently spaced with respect to said aperture and positioned to extend from one side of said base in parallel relation with respect to and below the frame member stud when the frame member stud is received by said aperture, and a link having an elongate aperture therein through which the frame member stud is adapted to extend and having an open slot for receiving said base stud, said link being loosely suspended upon said first stud and being adapted to remain in a cross brace retaining position by its own weight.

2. Structure according to claim 1, wherein said base is a channel-shaped element having flanges

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at the side opposite from which said base stud extends adapted to cooperate with a portion of the frame member.

3. In scaffolding structure, the combination of a frame member having a stud thereon, a base having an aperture for receiving said stud, a second stud for mounting a cross bar, said second stud being secured to said base adjacently spaced with respect to said aperture and positioned to extend from one side of said base in parallel relation with respect to said frame member stud, a link having an elongate aperture therein through which said frame member stud extends and having an open slot for receiving said base stud to position said link to retain the cross brace on said base stud, means cooperating with said frame member stud for rigidly securing said base to said frame member and for spacing said link free of said cross bar, and means cooperating with said frame member stud for loosely securing said link with respect to said studs, said link being loosely suspended from said first stud and being adapted to retain said cross brace by its own weight.

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