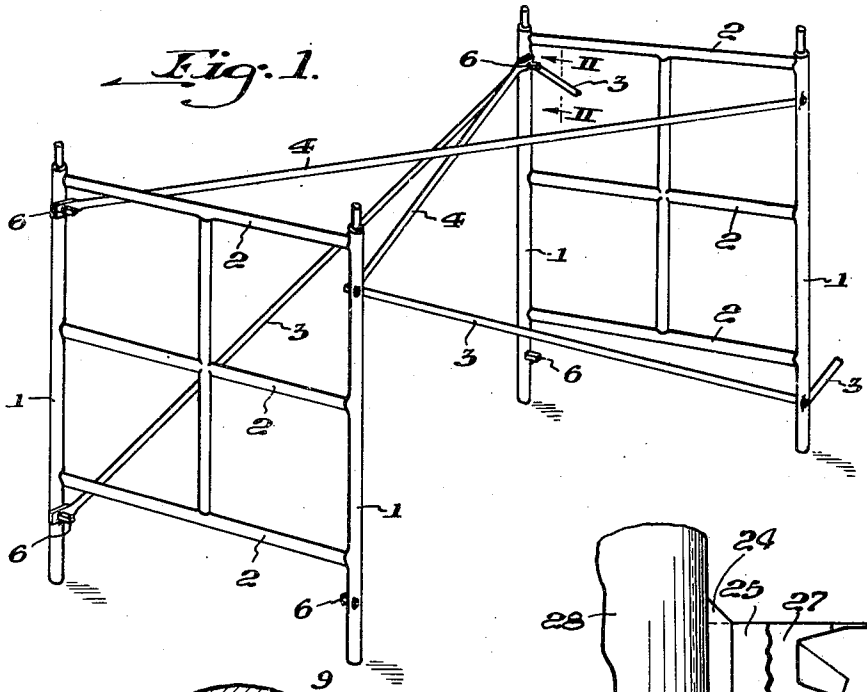
Feb. 1, 1955 J. A. KIRKPATRICK 2,701,167

BRACING FOR SCAFFOLDS AND THE LIKE

Filed Feb. 13, 1951

Fig. 1.



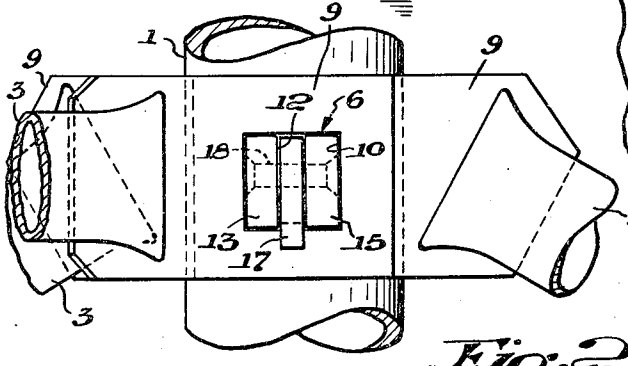


Fig. 2.

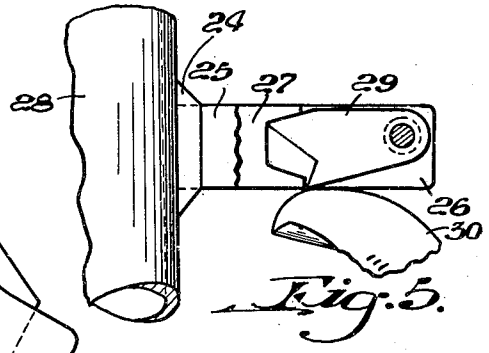


Fig. 5.

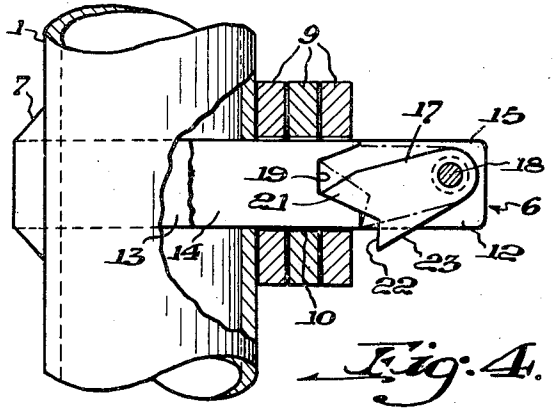


Fig. 4.

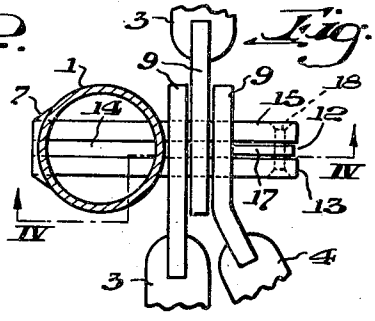


Fig. 3.

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BRACING FOR SCAFFOLDS AND THE LIKE

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Application February 13, 1951, Serial No. 210,665

1 Claim. (Cl. 304—2)

This invention relates to the bracing of metal scaffolds, bleachers and the like, and more particularly to the braces and the members that detachably connect them to the legs of the structure being braced. For the sake of illustration this invention will be described as applied to metal scaffolds formed from spaced end panels that are connected by removable braces, but it is not limited thereto.

It is among the objects of this invention to provide such bracing in which the braces are moved horizontally into and out of position, in which the ends of the braces can not rotate in a vertical plane against the legs they are bracing, in which the braces are retained in place by gravity-actuated locking members, in which the locking members are positive in action and limited to movement over a very short distance, and in which the supporting members for the braces are simple in construction and inexpensive to make and fasten to the legs.

According to this invention, horizontal pins, preferably of non-circular cross section, are rigidly connected to a pair of spaced vertical legs in such a manner as to project from the sides of the legs. For connecting the legs together a removable brace has end portions provided with openings for receiving the pins. Each of these openings is of substantially the same size and shape as the non-circular pins in cross section so as to keep the brace from rotating on the pins. By preventing the brace from rotating on the pins, the number of braces can be reduced. Thus, in a scaffold formed from end panels, only one brace need be provided at each side of the scaffold between any given pair of end panels. Each brace-supporting pin has a vertical slot in it at the side of the brace opposite to the adjoining leg, and a latch is disposed in the slot with its outer end pivotally mounted therein. The inner end of the latch normally projects below the pin to lock the brace thereon, but the latch is adapted to be swung up manually into the pin slot to permit the brace to pass outward over it. The pin is shaped to limit the distance the latch can swing downward in the slot, and also preferably is shaped to limit the distance the latch can be swung upward in the slot so that the movements of the pin in both directions will be controlled. The pin preferably is formed from three bars disposed side by side, with the center bar shorter than the other two so as to form the latch-receiving slot.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which Fig. 1 is a perspective view of a section of a scaffold provided with my bracing; Fig. 2 is an enlarged fragmentary view taken on the line II—II of Fig. 1, to show the outer end of one of the brace-supporting pins; Fig. 3 is a reduced horizontal section through a leg, showing the pin from above; Fig. 4 is an enlarged combination side view and section of the pin taken on the line IV—IV of Fig. 3; and Fig. 5 is a view similar to Fig. 4, showing a modification of this invention.

Referring to Fig. 1 of the drawings, each of a pair of vertical prefabricated scaffold end frames of any suitable construction has tubular legs **1** that may be rigidly connected by horizontal cross members **2** upon which wooden planking (not shown) may be placed to form a working platform. When the scaffold is assembled, the end frames are held upright by means of inclined side braces **3**, and they may be further braced by crossed horizontal braces **4**.

In order to detachably connect the ends of the braces to the scaffold legs, supporting pins **6** are fastened to each leg near its upper and lower ends. As shown in Fig. 2, each pin is non-circular in cross section, preferably being

rectangular. The legs are provided with holes of the same shape as the pins for snugly receiving them. Each pin is inserted in a pair of holes in a leg with its opposite ends projecting therefrom, as shown in Figs. 3 and 4. The inner end of the pin projects only a short distance and is connected by a weld **7** to the leg to anchor the pin in it. The other or outer end of the pin projects a much greater distance from the leg, most suitably from the inside of the leg, which is the side nearest to the other leg of the same frame. In this position the pins are more protected than if they projected from the outside of the leg.

The braces **3** and **4** that are connected to the pins may be formed from members of any desired shape and cross section, but their ends should be provided with openings of substantially the same size and shape as the pins **6** in cross section. Each of the braces shown in the drawings happens to be formed from a length of pipe provided at its ends with vertical slots in which short metal plates **9** are welded. Each of these plates is provided with a rectangular opening **10** for more or less snugly receiving one of the rectangular pins. That is, the ends of the braces can be slid inward over the pins. This type of connection prevents the brace from rotating around the pins and thereby makes it feasible to use only one brace **3** at each side of the scaffold between each pair of panels. Of course, two or more braces can be used if desired. The pins project far enough from the legs to accommodate at least three braces per pin.

The long projecting portion of each pin **6** is provided with a vertical slot **12** that extends entirely through it from top to bottom and from its outer end inward toward the adjoining leg. It is preferred to form the slot by making the pin from three flat bars **13**, **14** and **15** of such thickness that when disposed side by side their combined cross sectional area will be square. The intermediate or filler bar **14** is shorter than the outside bars and is spaced from their outer ends to form slot **12** between their outer end portions. The three bars are held together by the surrounding leg and by weld **7**.

Loosely disposed in slot **12** is a latch **17**, the outer end of which is pivotally mounted on a rivet **18** extending across the outer end of the slot with its heads countersunk in the opopsite sides of the pin so that the rivet will not project beyond the surface of the pin. At no point is the vertical dimension of the latch greater than the height of the slot. It will be seen that with this construction the inner end of the latch normally will swing down by gravity. It is spaced from the leg far enough to permit the ends of braces to be located between the latch and leg.

To limit the distance that the latch can project below the pin, the inner end of the pin slot is positioned to be engaged by a portion of the inner end of the latch after it has swung downward a predetermined amount. Preferably, this is accomplished by providing the inner end of the latch and the inner end of the slot with cooperating projections that will engage each other when the latch has swung downward the desired distance and stop further movement of the latch. Most suitably, the end of filler bar **14** at the inner end of the slot has a recess **19** in it extending toward the adjoining leg, and the inner end of the latch has a projection or point **21** that projects loosely into the recess and normally is supported by its lower wall. The same latch point will engage the upper wall of the recess, when the latch is swung manually upward in the slot to the broken line position shown in Fig. 4, before the latch can project from the top of the slot and interfere with sliding the braces outward along the pin. Consequently, the cooperating point and recess lock the latch in the pin slot by limiting vertical swinging of the latch in both directions. Latch point **21** preferably is formed by providing the inner end of the latch with a two-sided notch which receives the portion of the pin below its recess. The side **22** of this notch that normally extends below the pin is vertical and forms an abutment that holds the braces on the pin. The lower surface **23** of the latch is inclined from the lower end of this vertical side outward and upward into the pin for a purpose about to be described.

When the opening **10** in the end of a brace is lined up with one of the pins **6** and then the brace is pushed inward along the pin, the lower inclined surface **23** of the latch is engaged by the bottom of the brace opening and is forced upward, thereby swinging the latch up into the pin. As soon as the end of the brace passes the lower inner corner of the latch, the latch will swing down again by gravity and the downwardly projecting portion, bounded by surfaces **22** and **23**, will form a lock that will hold the brace on the pin. The vertical locking surface **22** usually is spaced far enough from the leg to permit at least three braces to be locked on the pin. Any movement of the braces outward along the pin and against the locking surface of the latch will tend to swing the latch downward, whereby the latch will positively lock the braces on the pin. When it is desired to remove the braces from the pins, the inner end of the latch is raised manually to the broken line position of Fig. 4 so that the braces can be pulled out along the latch and off the end of the pin.

It will be seen that in this bracing the braces are held on the pins by latches that automatically swing down by gravity into locking position as soon as the braces are slid inward over them. The braces then can not be removed from the pins until the latches have been swung upward by hand into the pin slots. This locking mechanism is of simple construction and there is nothing about it to get out of order or to cause it to fail to operate automatically. Each latch is locked in the supporting pin by means of the recess **19** which receives the inner point **21** of the latch. The latch therefore must always be either entirely within the slot or project a limited distance below it. The pin slot and the latch-retaining recess are easily formed by making the pin from three bars placed side by side, the middle bar having previously been notched at one end to form the recess. No vertical movement of the braces is required in order to mount them on the pins or to remove them therefrom. Consequently, if desired, the pins can be located close to the overlying horizontal cross members **2** of the end panels. A major advantage of this bracing is that it prevents relative rotation or tilting between the braces and legs in a vertical plane.

In the modification shown in Fig. 5, the pin again is formed from two side bars **25** and **26** spaced apart by a filler bar **27**, but all three bars are shorter than those forming pin **6**, because the inner end of the modified pin is welded directly to the leg **28** without extending through it. The weld is shown at **24** in the drawings. The latch

29 is shown in its uppermost position, where it is being held by the thumb **30** of a workman. This particular pin is only long enough to support two braces, but of course it could be made longer if desired.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claim, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

The combination with a pair of spaced vertical legs, of bracing comprising pins of rectangular cross section projecting from the sides of the legs, a removable brace for connecting the legs together and having end portions provided with rectangular openings therethrough for receiving said pins, each pin being formed from a pair of side bars spaced apart by an intermediate bar, the intermediate bar terminating between the adjoining leg and the outer ends of the side bars to form a vertical slot through the pin between the outer portions of the side bars, a latch disposed in the slot, and a pivot connecting the outer end of the latch to the outer ends of said side bars, the inner end of the latch normally projecting below the pin to lock the brace thereon, the latch being adapted to be swung up manually into the slot to permit the brace to pass outward over it, and said intermediate bar being provided at the inner end of said slot with a recess extending toward the adjoining leg, and the inner end of the latch having a portion projecting loosely into said recess to limit the distance the latch can swing downward in the slot.

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