

Oct. 10, 1967

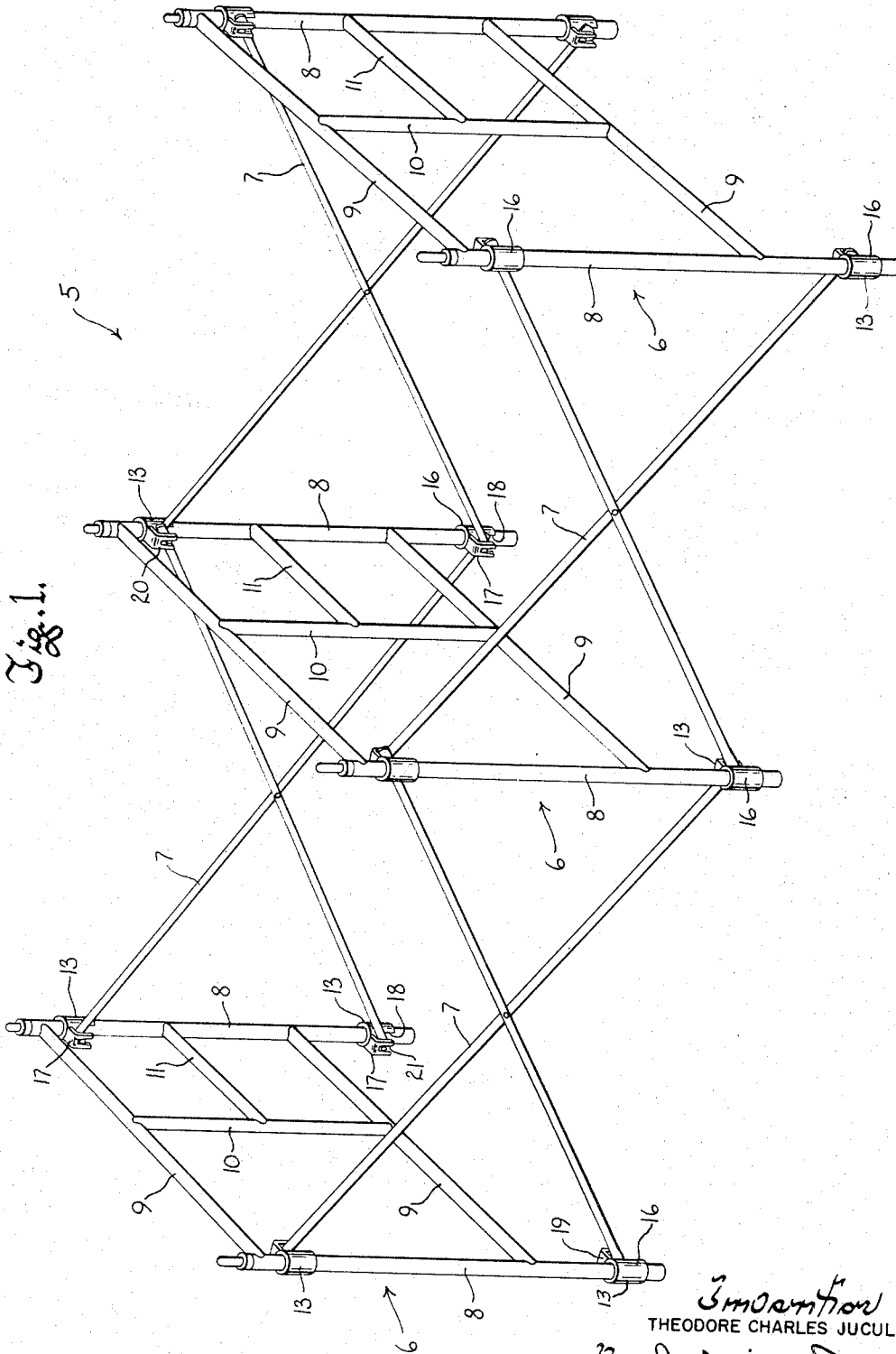
T. C. JUCULANO

3,345,655

RELEASABLE METAL SCAFFOLDING CONNECTOR

Filed June 30, 1965

4 Sheets-Sheet 1



*Invention*  
THEODORE CHARLES JUCULANO

*334* *Donaldson Jones*  
*Attorney*

Oct. 10, 1967

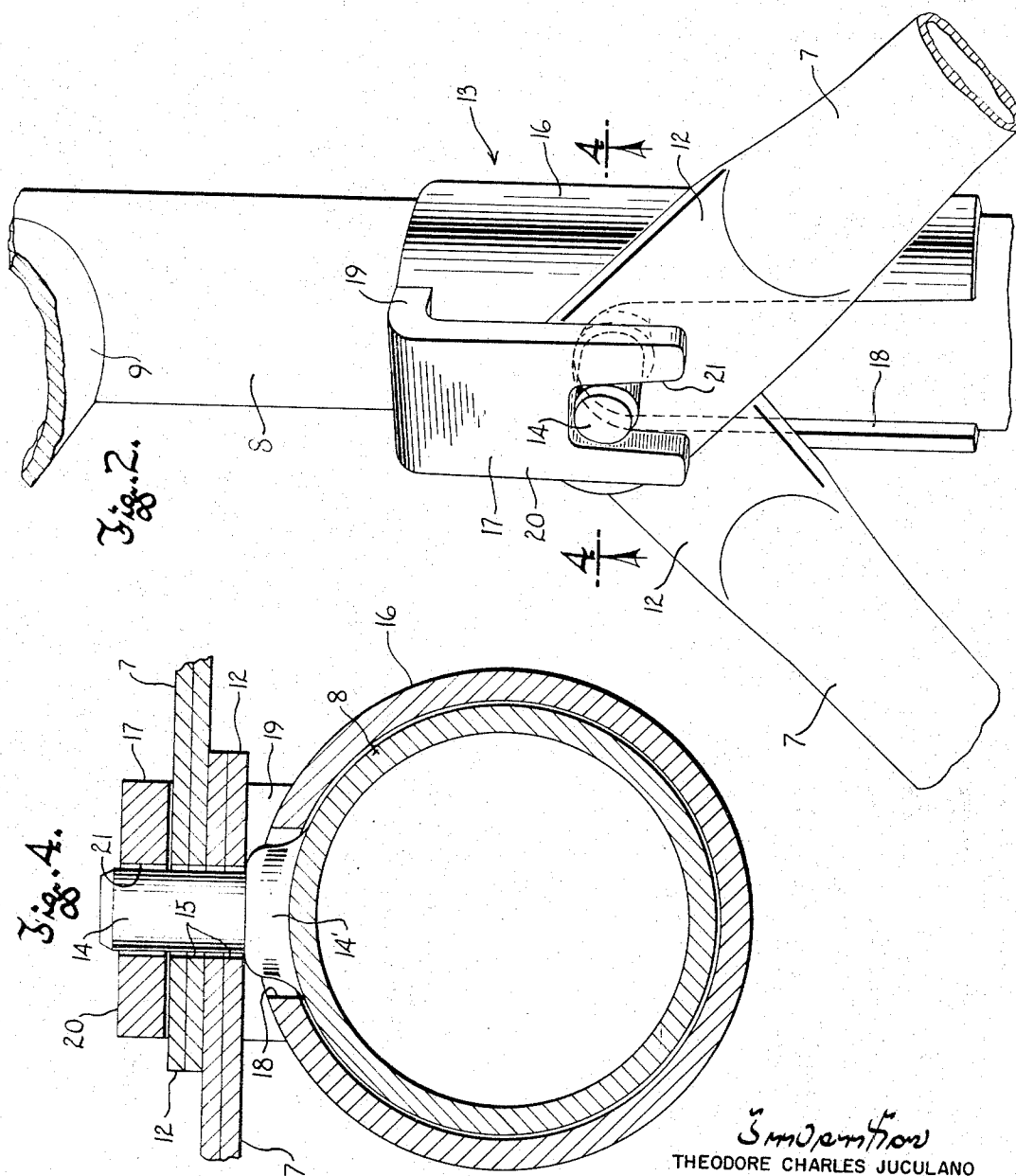
T. C. JUCULANO

3,345,655

RELEASABLE METAL SCAFFOLDING CONNECTOR

Filed June 30, 1965

4 Sheets-Sheet 2



*Invention*  
THEODORE CHARLES JUCULANO  
*By* *Dr. Milton Jones*  
*Attorney*

Oct. 10, 1967

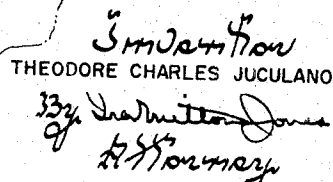
T. C. JUCULANO

**3,345,655**

RELEASABLE METAL SCAFFOLDING CONNECTOR

Filed June 30, 1965

4 Sheets-Sheet 3





1

3,345,655

## RELEASABLE METAL SCAFFOLDING CONNECTOR

Theodore Charles Juculano, Oshkosh, Wis., assignor to Marvel Equipment Corporation, Oshkosh, Wis., a corporation of Wisconsin

Filed June 30, 1965, Ser. No. 458,367

2 Claims. (Cl. 5—327)

### ABSTRACT OF THE DISCLOSURE

A tubular sleeve encircling and freely slideably mounted on the upright of a dismantlable metal scaffold has a longitudinal slot opening to its lower end to embrace a pin projecting from the side of the upright, and a bifurcated arm fixed to the sleeve above the inner end of the slot and overlying the slotted portion of the sleeve with its end spaced above the bottom of the sleeve, also embraces the pin to hold the apertured end of a brace impaled upon the pin against disassembly therefrom until the sleeve is lifted.

This invention relates to readily releasable connectors for fastening two or more structural members together, and refers particularly to connectors for securely but readily releasably attaching the ends of diagonal braces to the posts or uprights of conventional metal scaffolding.

As is well known, metal scaffolding is made up of so-called panels or frames, each of which comprises a pair of tubular posts or uprights connected and held in parallel spaced apart relation by transverse members which are securely welded thereto. When such scaffolding is erected, the panels or frames are held upright and in uniformly spaced apart alignment by means of pivotally connected diagonal braces detachably anchored to the posts of each panel near their upper and lower ends. Each diagonal brace usually has its end portions flattened and apertured so that it may be impaled upon a pin or stud which projects from the side of the post to which the brace is to be secured. Obviously, the connectors by which the diagonal braces are secured to the posts of the panels or frames are a critically important element in the scaffolding. In fact the entire safety of the structure depends upon the security and reliability with which they hold the ends of the diagonal braces to the posts. However, unless the connectors are also capable of being quickly and easily activated or manipulated, they constitute an economic disadvantage, since the time required for the erection and dismantling of metal scaffolding is a significant factor in its commercial acceptability.

Heretofore, the simplest form of connector employed in metal scaffolding consisted simply of a threaded stud projecting from the side of the post or upright to be engageable in a closely fitting hole in the end of the diagonal brace, and a wing nut threaded on the stud to clamp the apertured end portion of the brace against the post. This type of connector, although simple and inexpensive, had serious disadvantages, in addition to lacking the desired quickness of assembly. For one thing, the nut which held the brace to the upright was not an inseparable part of the securement means and could easily become lost. More seriously, though, the repeated engagement of the apertured end of the brace upon the threaded stud deformed the threads on the stud and soon rendered the connector useless.

To eliminate the need for removing the wing nut from the threaded stud whenever the apertured end of the brace was applied thereto or removed therefrom, various forms of connectors were devised, some of which have gained

2

acceptance in the trade—as, for instance, the connector of Patent No. Re. 25,053, issued Oct. 17, 1961, to the present applicant's assignee. However, all connectors heretofore proposed for metal scaffolding to secure the diagonal braces to the uprights, lacked the desired convenience of assembly and disassembly.

It is, therefore, the purpose and object of this invention to provide a connector for readily detachably securing the end of a diagonal brace to a post or upright of metal scaffolding, which has no separable parts and no threaded portions which can become damaged by repeated erection and dismantling of the scaffolding, but which, most of all, can be more easily and quickly manipulated than any connector heretofore available for this purpose.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate two complete examples of the physical embodiments of the invention, constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is a perspective view of part of an erected metal scaffold equipped with connectors constructed in accordance with this invention;

FIGURE 2 is a perspective view on an enlarged scale of one of the connections, illustrating the same in its operative condition securing two diagonal braces to a post or upright of the scaffold;

FIGURE 3 is a perspective view similar to FIGURE 2, but illustrating the simplicity of the manner in which the connector of this invention is manipulated during erection and/or dismantling of the scaffold;

FIGURE 4 is a cross sectional view through FIGURE 2 on the plane of the line 4—4;

FIGURE 5 is a perspective view similar to FIGURE 2, but illustrating a modified embodiment of the invention; and

FIGURE 6 is a cross sectional view through FIGURE 5 on the plane of the line 6—6.

Referring now more particularly to the accompanying drawings, the numeral 5 designates generally an erected metal scaffold which comprises, in general, a plurality of panels or frames 6 held upright and in spaced apart alignment by pairs of pivotally connected diagonal braces 7.

Each panel or frame 6 comprises a pair of tubular posts or uprights 8, held in spaced apart parallel relationship by transverse members 9 that are welded or otherwise rigidly secured thereto. Customarily, also, the panels or frames have their transverse members 9 connected, intermediate their ends, by a vertical member 10 which cooperates with one of the uprights 8 to provide a ladder, the rungs of which are the adjacent portions of the transverse members 9 and a shorter intermediate cross bar 11.

The panels or frames are all alike and hence comprise modular units which can be built up vertically and connected horizontally.

The pivotally joined diagonal braces 7 by which the panels or frames are connected horizontally and by which the panels or frames are held upright and properly spaced, are usually formed of tubular stock, but have flattened and apertured end portions 12 to cooperate with the connectors 13 of this invention, one of which is located near the top and near the bottom of each post or upright.

Although the connector 13 of this invention is especially adapted to, and was specifically devised for metal scaffolding, and hence is described herein with particular reference to such scaffolding, it will be understood that the connector may be used in any device or structure in which an apertured end portion of a strut must be detachably secured to a post.

Each connector consists simply of an unthreaded pin or stud 14 fixed to and projecting from the side of the post or upright 8 and preferably the side thereof which faces inwardly with respect to the panel of which the post or upright constitutes a part. The base of the pin or stud 14 is enlarged, as at 14', to provide a shoulder against which the flattened end portion 12 of a diagonal brace engages when the brace is attached to the post with the pin passing through the hole 15 in the brace. The pin is long enough to not only project through the overlying flattened ends of two braces, but a substantial distance therebeyond.

The means by which the apertured ends of the diagonal braces are held on the pin or stud 14 in accordance with this invention, comprises a sleeve 16 with an overhanging arm 17. The sleeve is simply a short length of steel tubing slipped onto the post 8 before fabrication of the panel or frame of which the post is a part. The sleeve is freely lengthwise slideable on the post and has a longitudinal slot 18 extending up from its lower end to a point somewhat short of its upper end, to accommodate the pin or stud 14. Hence the sleeve may occupy a position in which the pin or stud is between the upper and lower ends of the sleeve, and when free and unrestrained, the sleeve automatically drops by gravity to this position, which of course is defined by the engagement of the base portion of the pin with the upper closed end of the slot 18, the slot being wide enough to accept the base portion.

The arm 17 is a right-angularly shaped member having a short flange 19 which is welded or otherwise suitably secured to the unslotted upper end portion of the sleeve, and an elongated flat bifurcated portion 20 which overlies the slotted portion of the sleeve, with its bifurcation 21 in line with the slot to straddle or embrace the pin when the sleeve is permitted to drop to its aforesaid defined position. For this to occur, it is of course necessary that the bifurcation 21 be long enough to prevent its upper closed end 22 from contacting the pin 14 before the closed end of the slot seats upon the base of the pin.

The space between the flat bifurcated portion 20 of the arm and the adjacent side of the sleeve is sufficient to snugly, though relatively easily accommodate the overlapped end portions of two diagonal braces when the inner one thereof is seated upon the enlarged base of the pin. Accordingly, when the diagonal braces have been impaled upon or attached to the pin—in the manner shown in FIGURE 3 which, of course, requires holding the sleeve in a raised position exposing the pin—the sleeve will drop to its operative position when released. In this operative position of the sleeve the bifurcated arm embraces the outer end portion of the pin and thereby prevents detachment of the braces from the post.

As shown in FIGURE 1, the movable element of each connector 13 is permanently held assembled with the post 8 on which it is mounted, by being confined between the pin or stud 14 with which it coacts and the transverse member 9 immediately above it, it being understood that each post has two connectors thereon, one near its upper end beneath the top transverse member 9 and the other near its lower end beneath the bottom transverse member 9.

Although gravity can be relied upon to keep the sleeve in its operative position, clamping means 25 may be pro-

vided to releasably secure the sleeve in this position, as in the modified form of the invention illustrated in FIGURES 5 and 6. This clamping device consists of a bridging member 26 extending across the lower end of the slot 18, in which position it is welded to the sleeve while the pin is in the slot. A thumb screw 27 is threaded into a tapped hole in this bridging member to have its inner end bear against the adjacent side of the post when the screw is tightened, and to preclude detachment of the screw its end is upset, as at 28.

From the foregoing description taken in connection with the accompanying drawings, it will be apparent to those skilled in this art that this invention provides a connector for securing the ends of diagonal braces to the posts or uprights of metal scaffolding, which is considerably more convenient and quicker to use than any device heretofore devised for this purpose.

What is claimed as my invention is:

1. A connector for readily detachably securing an apertured end portion of a brace to a post, comprising:

(A) a pin fixed to the side of the post and projecting substantially perpendicularly therefrom to enter and pass through the hole in the apertured end of the brace;

(B) a sleeve completely encircling the post and freely slideable axially thereon;

(C) a bifurcated arm fixed to the sleeve with its bifurcated end portion substantially parallel to the adjacent side of the post and spaced therefrom a distance to accommodate the apertured end portion of the brace when the latter is impaled upon the pin, so that upon movement of the sleeve into a position at which the bifurcated end portion of the arm embraces the pin, the brace is secured to the post,

the sleeve having a longitudinally extending slot opening to one end thereof to receive the pin and thereby hold the sleeve against rotation about the post,

said slot being in line with the bifurcated end portion of the arm and the sleeve being axially longer than the bifurcated arm and having its slotted end portion projecting a substantial distance beyond the bifurcated end of said arm,

so that reception of the pin in any portion of the slot in the sleeve, properly aligns the bifurcation in the arm with the pin.

2. The connector of claim 7, further characterized by a bridging member secured to the sleeve across the open end of its slot, and

a clamping screw threaded in said bridging member to bear against the adjacent side of the post,

whereby the sleeve may be releasably held against axial movement on the post.

#### References Cited

##### UNITED STATES PATENTS

|           |         |          |          |
|-----------|---------|----------|----------|
| 884,772   | 4/1908  | Sorensen | 5—282    |
| 2,813,759 | 11/1957 | Braun    | 287—53.5 |
| 2,814,535 | 11/1957 | Jagiel   | 287—53.5 |
| 2,823,959 | 2/1958  | Pimm     | 287—53.5 |
| 3,027,181 | 3/1962  | Tardif   | 287—53.5 |
| 3,028,928 | 4/1962  | Juculano | 182—178  |

DAVID J. WILLIAMOWSKY, *Primary Examiner.*

R. D. KRAUS, *Assistant Examiner.*