E. WHITNEY.

SUSPENDED SCAFFOLDING.

APPLICATION FILED AUG. 15, 1916.

1,270,906. Patented July 2, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

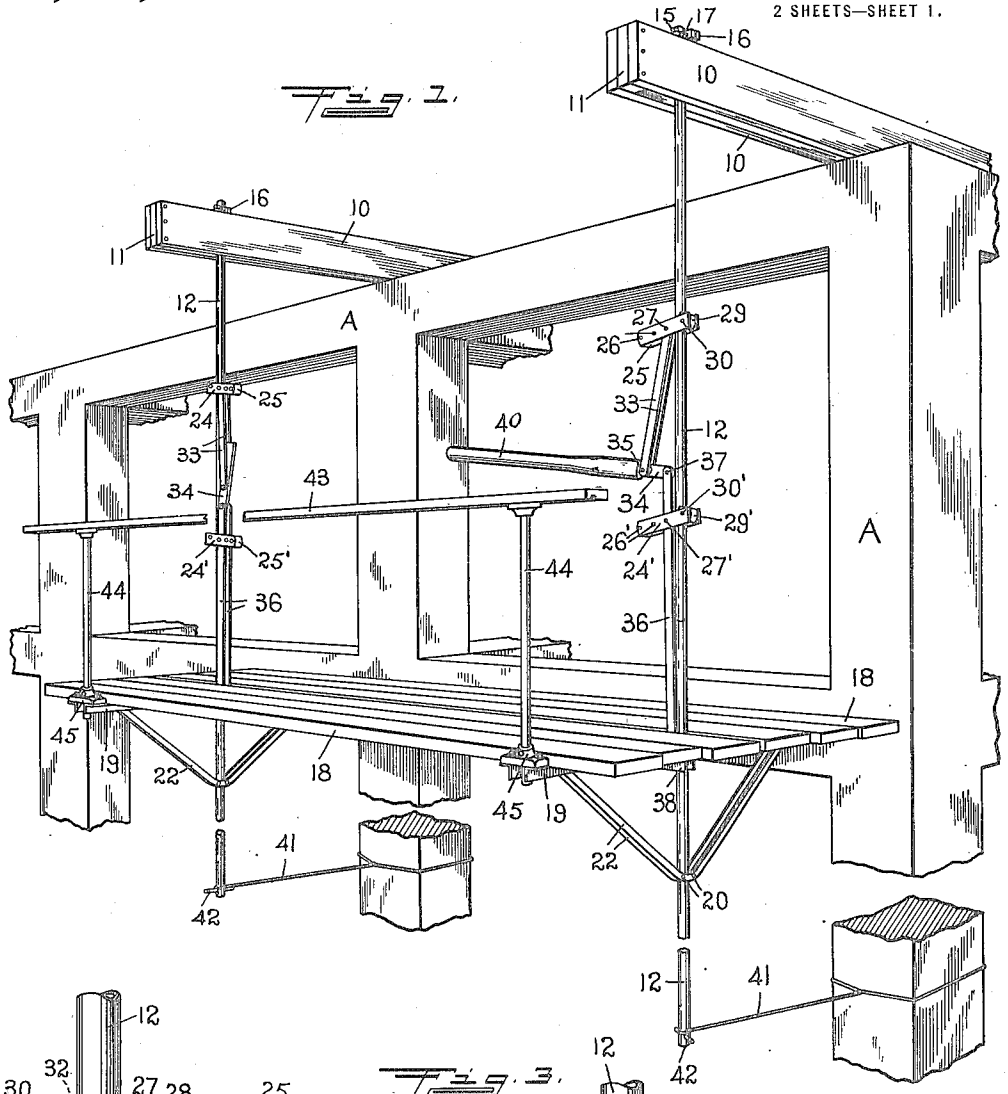


Fig. 2.

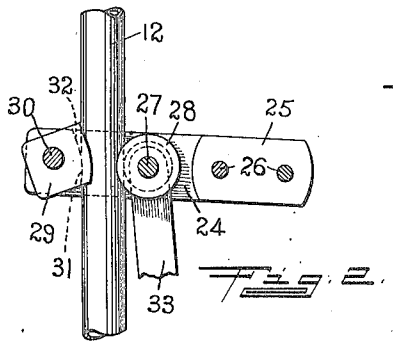
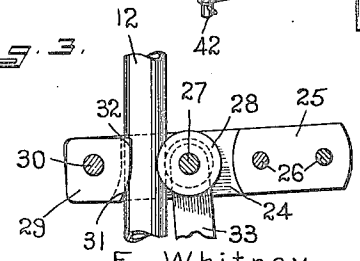


Fig. 3.



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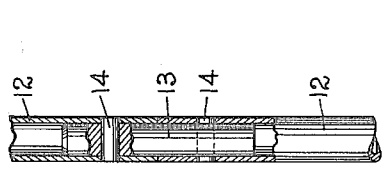


Fig. 3.

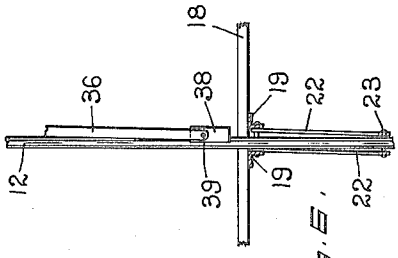


Fig. 6.

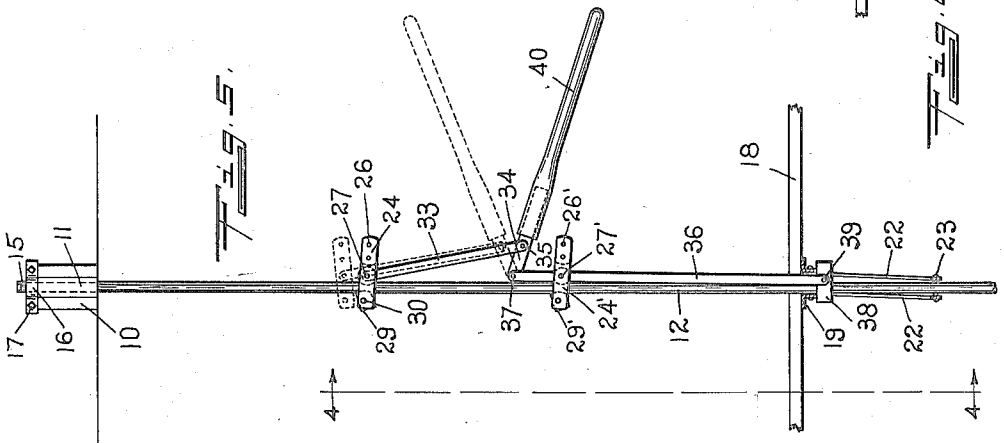


Fig. 5.

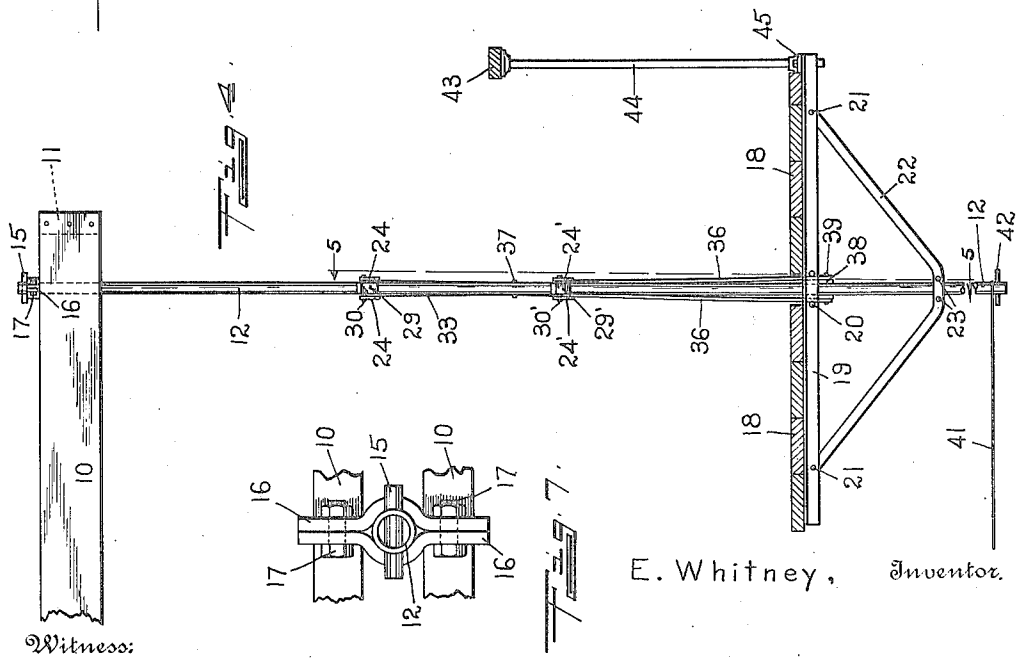


Fig. 4.

Fig. 7.

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UNITED STATES PATENT OFFICE.

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SUSPENDED SCAFFOLDING.

1,270,906. Specification of Letters Patent. Patented July 2, 1918.

Application filed August 15, 1916. Serial No. 115,104.

To all whom it may concern:

Be it known that I, EGBERT WHITNEY, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Suspended Scaffolding, of which the following is a specification.

My invention relates to suspended scaffolding for use in completing the exterior of buildings of such height that scaffolding therefor cannot be conveniently erected and supported from the ground. It is the object of my invention to provide a safe, durable and comparatively inexpensive scaffolding for use on buildings of the class above mentioned; to provide an improved climbing device by which the scaffold platform may be readily raised or lowered to any desired level; to provide rigid suspension members for supporting the platform; to provide an improved working platform such that it is substantially unobstructed by the hoisting and supporting devices therefor, and may be of a width suitable for the use of masons yet have but a single supporting member at each end; to provide means for maintaining the level of the working platform; and to provide certain other desirable constructions and combinations which will be hereinafter fully set forth.

In the accompanying drawings Figure 1 is a perspective view of a section of scaffolding embodying my invention. Figs. 2 and 3 are detail longitudinal sectional views of one of the automatic clutches or clamp-members of the climbing device, showing the same, respectively, in clamped and released positions. Fig. 4 is a transverse vertical sectional view of the mechanism on the plane of the line 4—4 of Fig. 5. Fig. 5 is a longitudinal sectional view thereof on the plane of the line 5—5 of Fig. 4. Fig. 6 is a detail of certain parts viewed the same as in Fig. 5, and showing the method of detaching or disconnecting the climbing device from the platform. Fig. 7 is a detail plan view of the connection between an outrigger and one of the suspension-tubes. Fig. 8 is a detail sectional view showing the means employed for connecting the sections of suspension-tubes.

In carrying out my invention I employ a plurality of outriggers which are secured to the frame A of the building, being disposed at a suitable height and projecting out horizontally beyond the sides of the building at equally-spaced intervals. In the illustrated construction the outriggers each consist of two rectangular beams 10 spaced apart laterally by a block 11 secured between them at their outer ends. From each of the outriggers there depends a vertically-extending rigid suspension member 12, consisting of one or more lengths or sections of metal pipe. I preferably employ for this purpose ordinary wrought-iron gas or water pipe, having a nominal diameter of one inch, and being actually about 1¼ inches in diameter, such pipe having all the qualifications ordinarily required for the said purpose. When several lengths or sections of the pipe are used, the same are connected serially by the means shown in Fig. 8, a cylindrical plug 13 being placed within the abutting ends of the connected sections, and pins 14 extending transversely through holes made in the pipe and plug, as shown. By the described means a strong and inflexible connection is formed between the pipe-sections, and the exterior parts of the joints are left smooth and of uniform diameter with the intermediate portions of the tubular suspension-member. The upper end-portions of the suspension-members extend between the beams 10 of the outriggers, and above the same have transverse pins 15 extending through them. The ends of said pins 15 rest on a pair of metal bars 16 of which the central parts fit around the pipe and are clamped thereon by bolts 17, the ends of the bars resting on the upper edges of the beams 10, as shown in Fig. 7.

The working platform of the scaffold comprises a series of floor planks 18, extending parallel with the side of the building, and laid on cross-frames extending parallel with the outriggers. Each of said cross-frames comprises a pair of metal angle-bars 19, having horizontal and vertical flanges, the vertical flanges being adjacent to each other but spaced apart, and the horizontal flanges extending oppositely therefrom. The central parts of the pairs of angle-bars 19 are con-

nected to each other by a pair of rivets 20, and the suspension-members 12 extend slidably through the rectangular space between said rivets and the bars. Near the outer ends of the angle-bars, rivets 21 connect thereto the ends of pairs of brace-bars 22, which extend therefrom diagonally down toward the suspension-member, the central parts of the brace-bars passing on opposite sides of the suspension-member and being connected to each other by a pair of rivets 23, the latter extending on opposite sides of the pipe 12. The brace-members thus fit slidably on the suspension-member, but retain the bars 19 at right angles thereto so that the platform cannot be tilted out of a horizontal position should the same be loaded more heavily at one side than at the other. The platform is connected adjustably with the suspension-members by means of climbing devices, which will now be described in detail.

For each climbing device there is an upper clutch or clamping member having two parallel side-plates 24 spaced apart by a block 25 secured between them at one end by transverse rivets 26. Near the center of the plates 24 there is a cross-pin 27 on which is revolubly mounted a small roller 28 having a concave grooved periphery adapted to fit against and extend partially around one side of the suspension-pipe 12. Between the ends of the plates 24 opposite the block 25 there is a cam 29 mounted pivotally on a cross-pin 30. Said cam has at one side a grooved or concave surface of which the transverse curvature is such that it will fit partially around the suspension-pipe, the lower portion 31 of the concave surface being curved longitudinally, and the upper portion 32 of the concave surface being straight and extending tangentially to the corresponding surface elements of the portion 31. The curved portion 31 of the cam is slightly eccentric to the pin 30, and the point nearest to the pin is at the juncture of the surfaces 31 and 32. The roller 28 and cam 29 are so spaced by the pins 27 and 30 that when the side-plates 24 are at right angles to the suspension-pipe 12, as shown in Fig. 3, there is sufficient space between the cam and roller for the pipe to slide freely therein. The block 25 forms a weight which tends to move downwardly the ends of the plates 24 opposite the cam, and when the plates assume an angular position, such as shown in Fig. 2, the suspension-pipe is clamped between the cam and roller, and any downward pull upon the clutch-member tends to rotate the cam so as to bring the eccentric concave cam-surface 31 into closer engagement with the pipe and thus increase the clamping action thereon. The clamp or clutch-member is easily released from the pipe by pushing upwardly upon the weighted end thereof, and when so moved the cam tends to turn so that the face 32 extends parallel with the side of the pipe, as shown in Fig. 3.

The climbing device has a lower clamping or clutch-member identical in construction with the described upper clutch-member, and the several parts thereof are designated by the same reference numerals as the corresponding parts of the upper clutch, but with prime indices (′) added thereto. To the cross-pin 27 of the upper clutch there are pivotally connected the ends of a pair of bars 33, the same lying between the side-plates 24 and the ends of the roller 28. The lower ends of the bars 33 are pivotally connected with the central part of a lever 34, by means of a pin 35. A pair of bars 36 are connected with the lower clutch-member by the pin 27′, said bars passing between the side-plates 24′ and the ends of the roller 28′, and extending both above and below the side-plates 24′, as shown. To the upper ends of the bars 36 the lever 34 is pivotally connected by means of a pin 37. The lower portions of the bars 36 extend down alongside the suspension-pipe 12, passing between the angle-bars 19 of the cross-frame, and at the lower ends thereof short bars 38 are pivotally connected therewith by a pin 39. The bars 38 normally extend horizontally beneath the lower edges of the angle-bars 19 to support the cross-frame, as shown in Fig. 5, but said bars 38 may be turned to vertical positions as shown in Fig. 6, to permit them to pass up between the angle-bars when disassembling the mechanism. A handle 40 is provided, having at one end a socket adapted to fit detachably upon the end of the lever 34, so that said handle may form an extension of said lever for use in actuating the climbing device.

By working the handle 40 up and down, the climbing device is caused to ascend the suspension-pipe, the upper and lower clutch-members alternately engaging the pipe to support the mechanism, while the other clutch-member is released and moved upwardly along the pipe. Thus, referring to Fig. 5, when the handle is moved up to the position shown by dotted lines, the upper clutch is first released and then slides up along the pipe to such a position as indicated. Then, upon downward movement of the lever-handle, the latter moves pivotally about the pin 35, the bars 36 are pulled upwardly, and the lower clutch is released and pulled upwardly along the pipe, the upper clutch meanwhile engaging the pipe and supporting the mechanism. For lowering the climbing device relatively to the suspension-pipe, the lever handle is pushed downward slightly so as to release the lower clutch, the weighted end of the latter is then held up to keep the same in released position, and while said clutch is kept in release position the handle is raised to move

the clutch downwardly along the pipe. As the handle approaches the upper position thereof the lower clutch is permitted to engage and clamp the pipe, the handle is raised slightly further to release the upper clutch, the weighted end of the latter then held up to keep the same in release position, and the handle then moved downwardly while the clutch is kept released.

It will be seen that normally the cross-frames and working platform are supported by the lower clutch-members of the climbing devices, but that should said lower clutch-members slip upon the suspension pipes the levers 34 will move to an approximately vertical position, as shown at the left of Fig. 1, and the downward pull will then be transmitted through the connecting bars 33 to the upper clutch, which will then assist in supporting the load.

If the working-platform be heavily loaded at the inner side, adjacent to the building, while positioned at moderate distances below the outriggers, there will be a tendency to swing the lower ends of the suspension-pipes outwardly, the latter moving pivotally about the points at which the same are connected with the outriggers. Such outward swinging of the suspension-pipes is prevented by tying the lower portions of the pipes to the building-frame by means of tension-wires 41 or the like, as shown in Fig. 1, the lower ends of the pipes being provided with cross-pins 42 to prevent the wires slipping off said ends.

The working platform is preferably provided at the outer side with a guard-rail 43, extending parallel with and at a suitable distance above the floor-planks 18. For supporting the guard-rail, vertical standards 44 are secured to the outer ends of the angle-bars 19 of the cross-frame, by means of suitable foot-pieces 45 bolted to the horizontal flanges of the angle-bars as shown.

For a single section or unit of the working platform, there are required two each of the outriggers, suspension-members, climbing devices, and cross-frames, as represented in Fig. 1. It will be understood, however, that when a plurality of the platform sections are disposed continuously along the side of a building, there is needed but one more of the outriggers, and accompanying elements of the supporting mechanism, than the number of platform-sections, since each of the intermediate sets of supporting devices will serve to carry the adjoining ends of two of the platform-sections.

It is to be particularly noted that the working platform provided by my invention is substantially unobstructed by the supporting mechanism, there being only the single rigid suspension-pipes extending up at intervals from the center thereof, the side adjacent to the building being entirely open, and free movement of the workmen along the platform being permitted at both the inner and outer sides thereof.

Now, having described my invention, what I claim and desire to secure by Letters Patent is:

1. Suspended scaffolding including a cross frame composed of spaced horizontal frame-members provided between their ends with spaced connecting means forming an upper guide and spaced continuous pendent bracing means secured at their ends to the horizontal frame-members and having intermediate portions spaced from the said frame-members and provided with spaced connecting means forming a lower guide, said guides being disposed in vertical alinement, a rigid vertical member passing through the said guides and a climbing device connected with the cross-frame and provided with means for engaging the vertical member.

2. Suspended scaffolding including a cross-frame composed of spaced horizontal angle bars having vertical and horizontal flanges, spaced fastening devices passing through the vertical flanges and forming an upper guide, pendent approximately V-shaped bracing members spaced apart and secured at their terminals to the angle bars and provided intermediate of their ends with connecting fastening devices spaced apart to form a lower guide, a rigid vertical member passing through the upper and lower guides and a climbing device associated with the vertical member and connected with the cross-frame.

3. Suspended scaffolding including a cross-frame comprising spaced horizontal frame members provided between their ends with spaced connecting means forming an upper guide and spaced continuous pendent bracing members secured at their ends to the horizontal frame-members and having intermediate portions spaced therefrom and provided with connecting means spaced apart to form a lower guide, a rigid vertical member passing through the upper and lower guides, horizontal bars located beneath the frame-members at opposite sides of the vertical member and a climbing device associated with the vertical member and provided at opposite sides of the same with substantially vertical bars extending downwardly to the said horizontal bars and connected therewith and a platform supported by the frame members and located above the said horizontal bars.

4. Suspended scaffolding comprising spaced outriggers, a single rigid suspension member depending from each outrigger, a climbing device associated with each suspension member and provided with means for engaging the same and a working platform slidable on each suspension member and carried by the climbing devices.

5. Suspended scaffolding comprising spaced outriggers, a single rigid suspension member depending from each outrigger, a climbing device associated with each suspension member and provided with means for engaging the same and a working platform slidable on each suspension member and carried by the climbing devices, and bracing means depending from the platform and slidably engaging the suspension member at points spaced from the said platform to prevent the latter from tilting or rocking.

EGBERT WHITNEY.