Dec. 5, 1961 P. H. MALLOG 3,011,587

SUPPORTING DEVICE

Filed Oct. 6, 1958 3 Sheets-Sheet 1

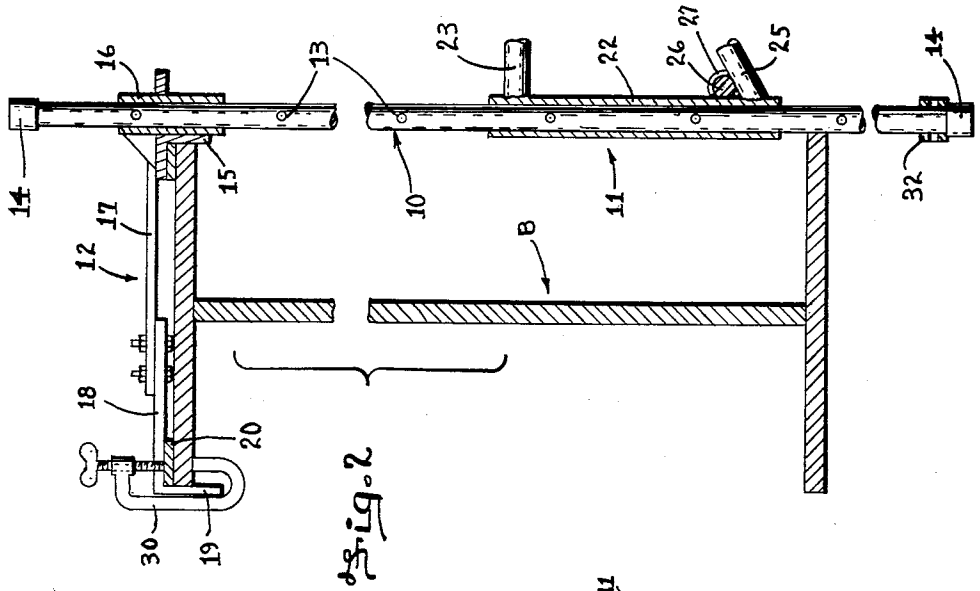


Fig. 2

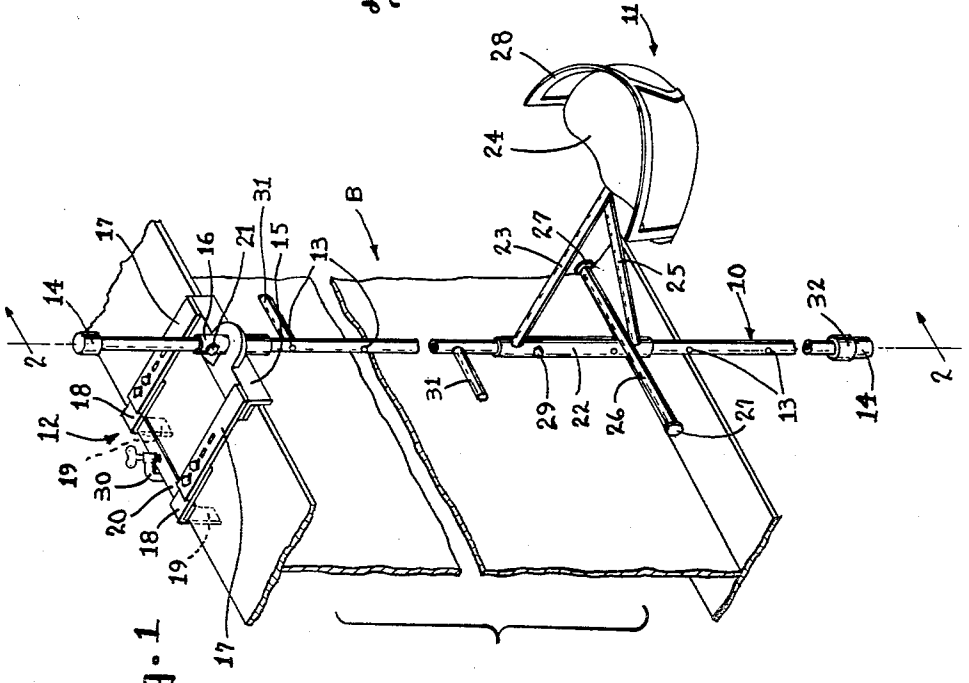


Fig. 1

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Dec. 5, 1961 P. H. MALLOG 3,011,587

SUPPORTING DEVICE

Filed Oct. 6, 1958 3 Sheets-Sheet 2

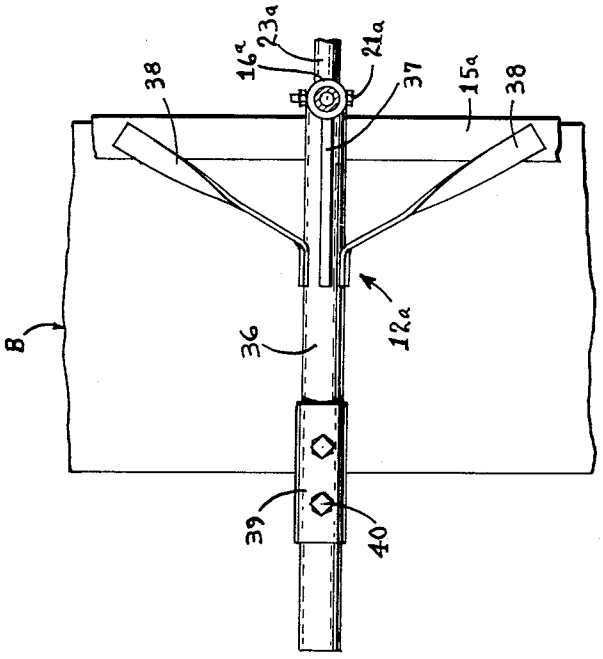


Fig. 5

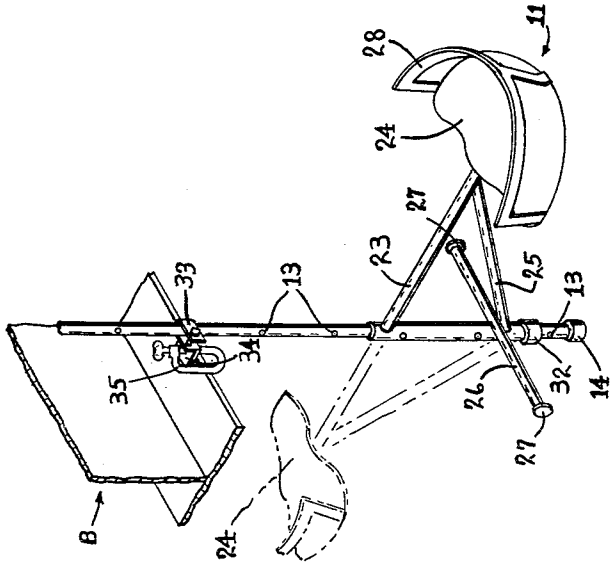


Fig. 3

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Dec. 5, 1961 P. H. MALLOG 3,011,587

SUPPORTING DEVICE

Filed Oct. 6, 1958 3 Sheets-Sheet 3

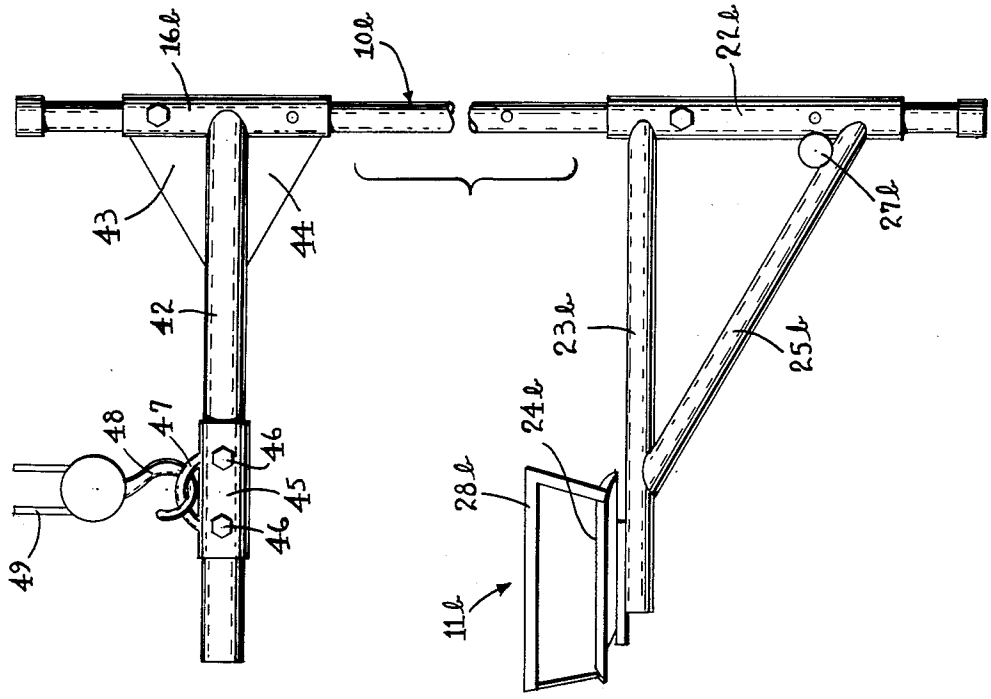


Fig. 6

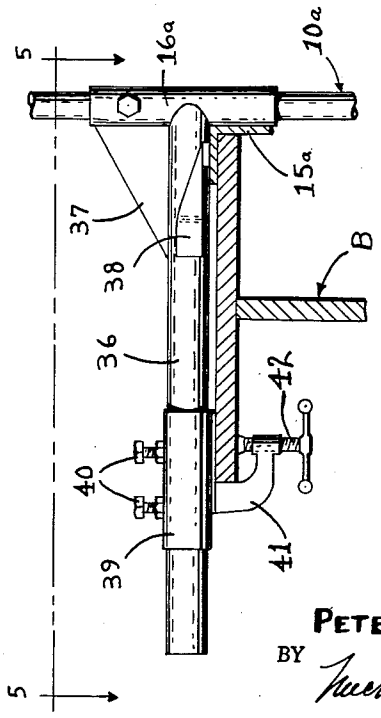


Fig. 4

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3,011,587

SUPPORTING DEVICE

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6 Claims. (Cl. 182—150)

The present invention relates to a device for supporting a workman on an elevated structure and the principal object of the invention is to provide new and improved devices of such character.

The device in most frequent use today for supporting a workman on an elevated structure comprises a platform which is suspended from the structure by means of two or more ropes. This arrangement, however, possesses several serious disadvantages. Firstly, a device of this type usually requires the combined efforts of two men to either adjust the platform vertically or to shift it horizontally to another portion of the structure. Accordingly, although the work being done may require but one man, a second man must be provided to assist in adjusting the platform when such becomes necessary. This is extremely wasteful of manpower as will be apparent.

Secondly, not only is the prior art platform inherently unsafe because it tends to swing, supported as it is by means of the flexible ropes, it also encourages unsafe practices, such as encouraging a workman to stand on a box or the like to increase his reach, simply because of the difficulty of changing the vertical height of the platform as hereinbefore mentioned. The danger of standing upon a box or the like which is supported by the inherently unstable platform will readily be apparent; however, many construction workers are injured or killed by falls each year simply because they attempt to postpone the troublesome operation of moving the platform.

The present invention provides a device for safely supporting a workman on an elevated structure in a comfortable working position. It further provides a device which may readily be shifted either vertically or horizontally by the workman himself in but a few moments time. Other advantages of the present invention will readily become apparent from a study of the following description and from the drawings appended hereto.

In the drawings accompanying this specification and forming a part of this application there are shown, for purpose of illustration, embodiments which the invention may assume, and in these drawings:

FIGURE 1 is a perspective view of a preferred embodiment of a device constructed in accordance with the present invention attached to a beam, such as are employed as structural members in bridges and the like, for supporting a workman who may perform welding, painting, or other operations thereon,

FIGURE 2 is an enlarged, broken, fragmentary sectional view generally corresponding to the line 2—2 of FIGURE 1,

FIGURE 3 is a fragmentary view similar to FIGURE 1 but showing certain parts in another position,

FIGURE 4 is a fragmentary, side elevational view of another embodiment of the invention,

FIGURE 5 is a broken, top plan view of this embodiment, and

FIGURE 6 is a side elevational view of still another embodiment of the invention.

It should be noted at the onset that while the hereinafter to be disclosed embodiment of the invention is shown and described as being supported by a large I-beam of the type employed in bridges, such use of the device is illustrative only and is not to be considered as a limitation.

Briefly, and with reference to FIGURE 1, the presently disclosed embodiment of the invention comprises a rigid elongated mast member 10 which is secured to

and depends from a beam B (or other elevated structure). Suitable support means 11 is carried by and extends transversely of the elongated member 10 for supporting a workman adjacent the beam. Means 12 is provided for removably securing an upper portion of member 10 to the beam and the arrangement of parts is such that the support means 11 is readily adjustable toward and away from the securing means 12 so as to bring various vertically spaced beam portions within the reach of the workman supported on the support means 11.

More specifically, member 10 is preferably formed of a length of high tensile steel tubing having a series of transverse apertures 13 which extend therethrough and which are spaced-apart longitudinally thereof for a purpose to appear. Also for a purpose to appear, a radial enlargement is preferably provided at each end of member 10 by securing respective cap members 14 thereto.

Means 12 comprises a bracket structure adapted to overlie the upper flange of the beam. This bracket structure presently comprises a length of angle member 15 to one leg of which a sleeve 16 is welded or the like (see especially FIGURE 2) so that it extends transversely of the angle. Suitable strengthening ribs will preferably also be welded between the sleeve and the angle to increase the strength of the assembly.

In the embodiment seen in FIGURES 1 and 2, a pair of strap members 17 are secured by welding or the like in spaced-apart, side-by-side relation to the other leg of the angle 15 to extend transversely thereof. Secured beneath strap members 17 at their free ends are respective extension members 18 each having a downwardly turned foot portion 19 for engagement behind the beam. A cross strip 20 preferably underlies extension members 18 as shown and is welded thereto to maintain such members properly spaced for alignment with the strap members and for another purpose later to be disclosed.

The connection between the strap members 17 and the extension members 18 preferably provides for adjustment of the spacing between respective feet 19 of the extension members and the vertically disposed leg of the angle 15 so as to make the securing means 12 readily usable with beams of various widths. To this end, respective members 17 and 18 may be connected together by means of suitable bolts or the like which pass through apertures in respective members. Either one or both of the members 17, 18 will have its apertures elongated in a direction longitudinally of the members to provide the foregoing adjustment.

Returning to sleeve 16 which forms a part of the securing means 12, it is to be understood that this sleeve is of a size to slidably pass the elongated member 10. A transverse aperture in the sleeve permits a suitable pin or a bolt 21 to be passed through the sleeve and through one of the apertures 13 in the elongated member 10 to secure the latter to the sleeve. Obviously, by selecting the proper aperture in the member 10 through which bolt 21 will be passed, vertical adjustment of the member 10 relative to the securing means 12 is provided.

Turning now to the support means 11, the latter comprises a sleeve 22 which is slidable along the elongated member 10. Welded to this sleeve and extending transversely thereof is an arm 23 carrying a seat 24 at its free end. A suitable strut 25 will preferably be welded between the sleeve 22 and the arm 23 to brace the latter. Although not shown, seat 24 may be secured to arm 23 by means of bolts or the like which may pass through slotted holes to permit the seat to be adjusted toward and away from the elongated member 10 in accordance with the preference of the workman using the device.

Welded to the sleeve 22 and the strut 25 is a bar 26

which extends transversely of the sleeve, as shown, to provide a foot rest for the workman seated upon the seat **24**. Abutments **27** will be provided at each end of the bar **26** to insure that the workman's feet will not slip off respective bar ends. A suitable guard rail **28** is secured to the seat to extend about its back and sides for safety purposes and as a further safety feature, a safety belt or the like (not shown) may be fastened across the front of the seat after the workman is seated therein.

As before mentioned, sleeve **22** is slidable along member **10** and, to retain the sleeve (together with the parts associated therewith and comprising the support **11**) in a predetermined position along such member, a bolt **29** or the like may be passed through either one of two longitudinally spaced, transverse apertures in the sleeve and through one of the apertures **13** in the elongated member **10**. The purpose of having two apertures in the sleeve is to provide smaller increments of adjustment of the support means along the member **10**.

For example, if the apertures **13** in the member **10** are spaced-apart a distance of, say, six inches, the support means could only be positioned at six inch intervals along the elongated member if the sleeve **22** had only one transverse aperture. However, by providing the sleeve with two apertures spaced apart a distance of, say, either three or nine inches, the support means may be adjusted at three inch intervals along the elongated member by a proper choice of apertures through which bolt **29** will be inserted.

Use of the embodiment thus far disclosed will be as follows:

Securing means **12** will first be adjusted to fit over the top flange of the beam from which the device is to be suspended. The device will then be suspended from the beam as shown in FIGURES 1 and 2. A suitable C clamp or the like **30** may be employed to clamp cross strip **20** of the securing means **12** to the beam upper flange to lock the securing means to the flange.

Either before or after the securing means is hung over the beam, the elongated member will be positioned to depend from the securing means the desired amount and will be retained in position by passing bolt **21** through the securing means sleeve **16** and through the desired aperture **13** in the elongated member. The support means **11** will also be positioned as desired along the elongated member and retained in position by means of the bolt **29** as hereinbefore described. Note that the caps **14** at respective ends of the elongated member **10** will prevent undesirable disassembly of the parts **10, 11** and **12** even before the bolts **21, 29** are employed to secure them in position.

With the device thus positioned as shown in FIGURE 1 a workman may lower himself into the seat **24**. To assist the workman in descending from the top of the beam to his seat and to facilitate his return, elongated bolt-like members **31** may be secured to the member **10** in spaced-apart staggered relation to provide steps. Members **31** will be passed through any convenient aperture **13** in member **10** as will be evident.

When the workman desires to change his vertical working position, he need only stand on the bottom flange of the beam and adjust the support means **11** vertically as hereinabove described. Alternatively, he may, if desired, ascend to the top of the beam and adjust the elongated member vertically as hereinbefore mentioned. Movement of the device longitudinally of the beam may readily be accomplished by removing the clamp **30**, repositioning the device at the desired place on the beam, and replacing the clamp once again.

Under certain circumstances, it may be desirable to retain the support means **11** at a desired vertical position along the elongated member **10** without restraining it against swinging movement radially about the member. Accordingly, a small collar **32** is positioned about member **10** beneath the support means. When desired, this collar may be slid up the member **10** to the desired position and retained with a bolt in a manner similar to that heretofore described as employed in retaining sleeve **22** in position along the member. The support means may then be lowered to rest upon the collar **32**.

FIGURE 3 illustrates the position of parts when work is to be done on the underside of the beam's lower flange. For such purpose, the support means is lowered to a point beneath the lower flange and is preferably supported by means of the collar **32** for swinging movement radially about the member from the full line position shown to the phantom line position. Since with the support means swung to the phantom line position there would be a tendency for the lower end of the elongated member **10** to swing away from the beam, means are preferably provided to retain the lower end of the member thereagainst.

As seen in FIGURE 3, such means may comprise a U shaped member **33** which straddles the member **10**. A suitable bolt may pass through apertures formed in the legs of the member **33** to clamp the latter in position on the member **10**. Extending from member **33** is a plate **34** which is adapted to overlie the beam's lower flange. This plate **34** may be securely locked to the lower flange by means of a C clamp **35** which engages both the plate and the beam lower flange.

The embodiment of the invention illustrated in FIGURES 4 and 5 is similar to that heretofore disclosed; accordingly, similar parts are identified with the same reference characters but with the suffix "*a*" added. In this embodiment, securing means **12***a* is modified in that strap members **17** have been eliminated and their place taken by a solitary arm **36** which is welded or otherwise secured to the sleeve **16***a* and to the angle member **15***a* to extend transversely therefrom as shown. A suitable web **37** and bracing struts **38** insure ample rigidity between the parts. At the present time, it is preferable to form arm **36** of a length of tubing similar to that of the sleeve **16***a*.

Shiftable along arm **36** is a slide **39** formed of a length of tubing having sliding fit with the arm. A pair of setscrews **40** are threadably carried by the slide and bear against the arm for a purpose to be seen. Welded or otherwise secured to the underside of slide **39** is an L shaped leg **41**. The free end of the leg extends toward the angle **15***a* and its terminal portion is apertured to threadably pass a clamping screw **42** whose axis extends transversely of arm **36**.

In the use of this embodiment, arm **36** will be positioned to overlie the beam with the angle member **15***a* extending along one margin of the beam's upper flange. Slide **39** will then be slid along arm **36** from left to right (in the position of parts shown) until the upper end of screw **42** underlies the beam upper flange. Setscrews **49** will then be tightened to lock the slide in position on the arm and the screw **42** tightened to cause its upper end to bear underneath the beam upper flange as shown to thus clamp this flange to the slide. This will securely lock the device to the beam as will readily be apparent. Obviously, adjustment for various widths of beam flanges is readily provided by loosening setscrews **40** and by moving the slide **39** along the arm **36** to the required position.

In the embodiment seen in FIGURE 6, parts similar to those heretofore seen in FIGURES 1, 2 and 3 are identified by the same reference characters as before but with the suffix "*b*" added. In this embodiment, sleeve **16***b* has a transversely extending arm **42** which is similar to arm **36** heretofore described with reference to FIGURES 4 and 5. In this embodiment, however, the angle member is eliminated and the arm is braced by means of suitable webs **43, 44**. Furthermore, arm **42** extends from sleeve **16***b* (and from member **10***b* to which the sleeve is secured) in the same direction as the arm **23***b* of the support means **11***b* for a purpose to be seen.

Shiftable along arm **42** is a slide **45** which may be locked at various positions along the arm by means of setscrews **46** which are threadably carried by the slide for engagement with the arm. As will be evident, slide **45** may be similar to slide **39** in that it may be formed of a length of tubing of a size to slide over the arm.

Carried by slide **45** is an eye **47** through which a hook or the like **48** may be inserted. Hook **48** may be carried by a suitable cable **49** by means of which cable the entire assembly may be suspended. Although not shown, that end of cable **49** which is pulled in or payed out to respectively raise and lower the hook **48** may, if desired, be controlled by the workman using the present device. Under such circumstances, such cable end could be "tied off" to the arm **23***b* or the like. Then, when the workman desires to raise or lower his working position, he will untie such cable end and either pull on such end or pay it out until the desired vertical working position is attained whereupon the cable may be once again tied off to the arm **23***b*.

In order to provide for the suspension of member **10***b* in a generally vertical position, slide **45** will be adjusted along arm **42** so as to center the eye **47** over the center of gravity of the workman using the device. Such adjustment may also be used to tilt member **10***b* to the left or right (in the position of parts viewed) to thus shift the workman toward and away from the structure being worked upon.

In view of the foregoing, it will be apparent to those skilled in the art that I have accomplished at least the principal object 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 appreciated that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim:

1. A device for supporting a workman from an elevated structure, comprising a support member adapted to engage an elevated portion of said structure, a vertically extending sleeve carried by said support member, a tube of considerable length slidable through said sleeve, connection means between said tube and said sleeve for connecting the two against relative sliding movement in any one of a plurality of vertically adjusted positions to dispose said tube at selected vertical relationship with said support member, a second sleeve slidable along said tube below said support member and carrying a support for a workman, and connection means between said tube and said second sleeve for connecting the two against relative sliding movement in any one of a plurality of vertically adjusted positions.

2. A device for supporting a workman on an elevated structure, comprising a support member adapted to horizontally overlie an elevated portion of said structure and adjustable in length horizontally so that spaced vertically

extending portions may be adjusted to engage against side parts of said elevated portion, a vertically extending sleeve carried by said support member, a tube of considerable length slidable through said sleeve, connection means between said tube and said sleeve for connecting the two against relative sliding movement in any one of a plurality of vertically adjusted positions to dispose said tube at selected vertical relationship with said support member, a second sleeve slidable along said tube independently of the first mentioned sleeve and carrying the support for the workman, and further connection means between said tube and said second sleeve for connecting the two against relative sliding movement in any one of a plurality of vertically adjusted positions.

3. The construction according to claim 2 wherein a horizontal tube has one end connected to said second sleeve and its other end carrying the support for the workman.

4. The construction according to claim 2 wherein a collar is slidable along said tube and held in any one of a plurality of positions therealong, and wherein said collar underlies and abuts the lower end of said second sleeve to hold the latter against downward sliding movement while permitting rotation of said second sleeve about said tube.

5. A device for supporting a workman on an elevated structure, comprising a support member adapted to engage an elevated portion of said structure, a vertically extending sleeve carried by said support member, a tube of considerable length slidable through said sleeve and having a plurality of openings spaced longitudinally therealong, a pin adapted to extend into any one of said openings and engageable with said sleeve to dispose said tube at selected vertical relationship with said support member, a second sleeve slidably adjustable along said tube and carrying the support for the workman, and a second pin adapted to extend into any one of the tube openings below said support member and engageable with said second sleeve to dispose the latter at selected vertical positions along said tube.

6. The construction according to claim 5 and including further pins adapted to extend into the spaced tube openings to provide hand and foot supports for the workman.

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