Feb. 6, 1951 S. W. KANAVAL 2,540,169

TUBULAR ASSEMBLY

Filed Nov. 20, 1945 2 Sheets-Sheet 1

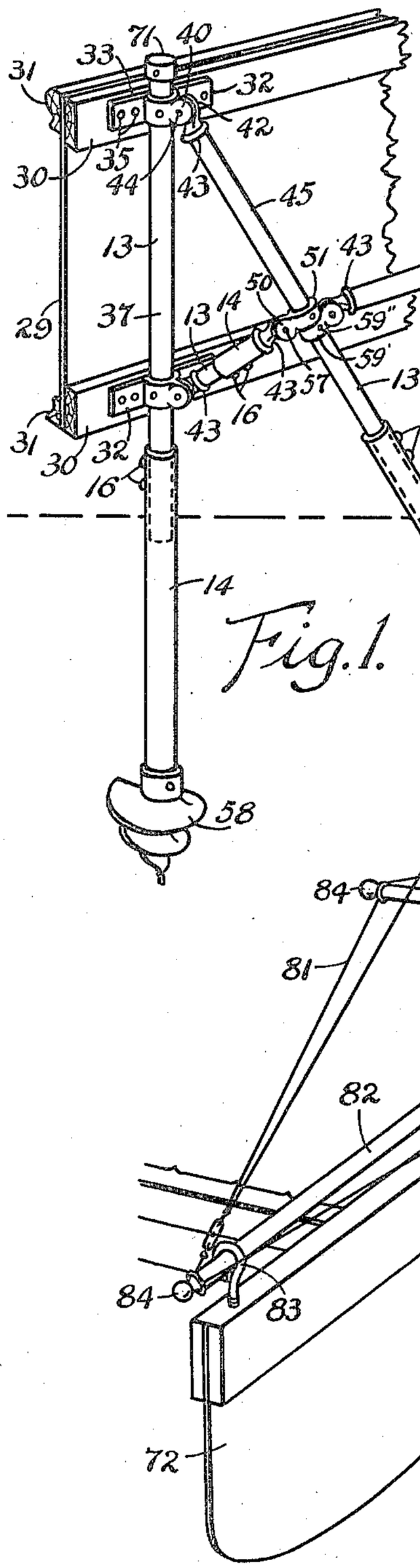

Fig. 1.

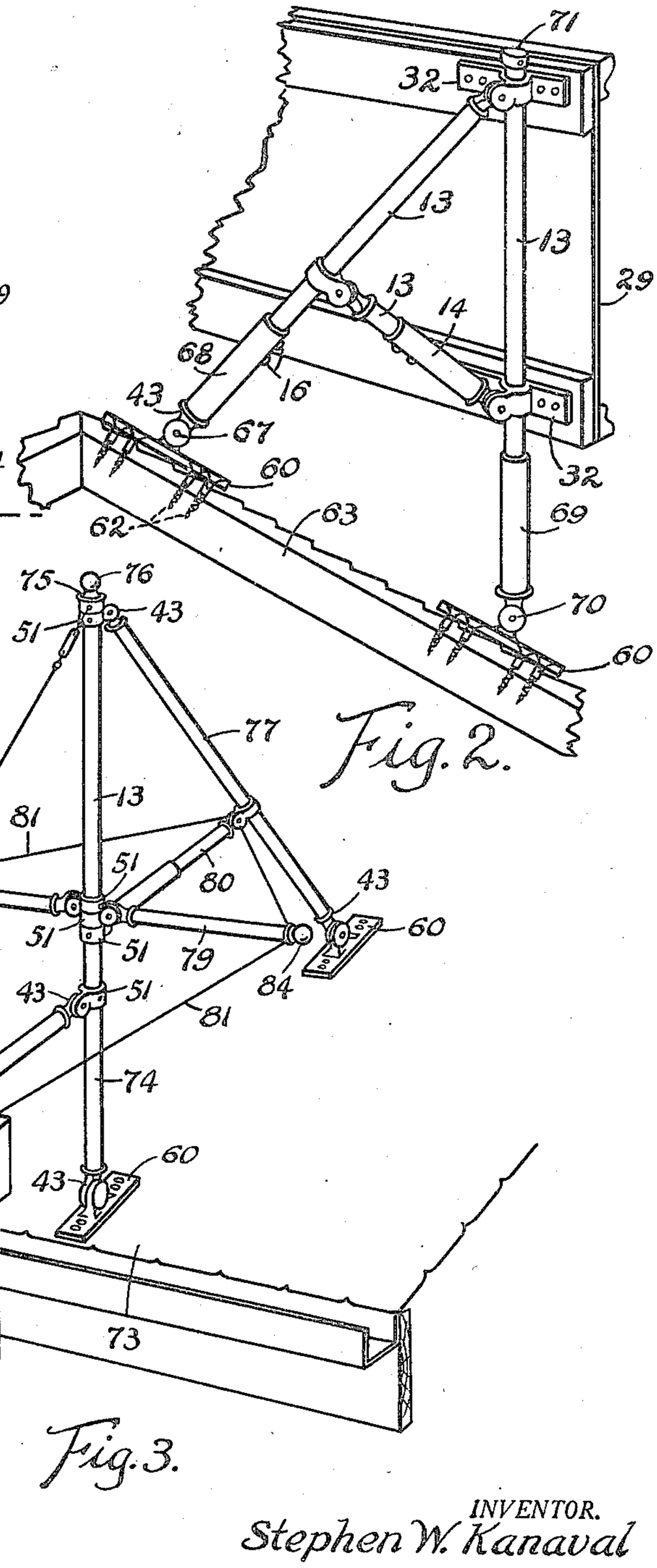

Fig. 2.

Fig. 3.

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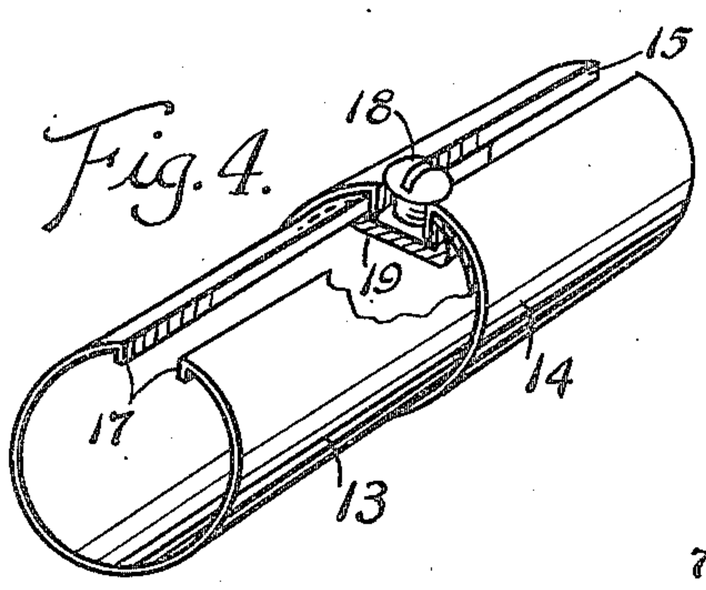

Fig. 4.

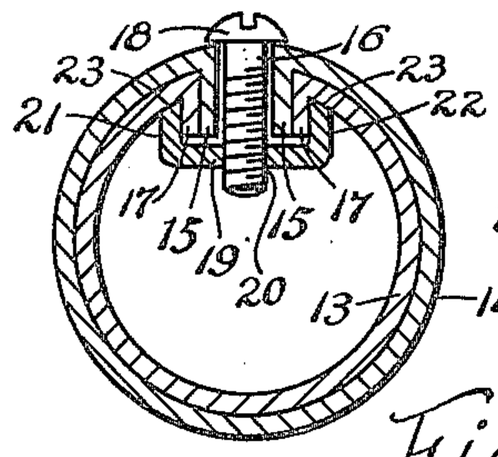

Fig. 5.

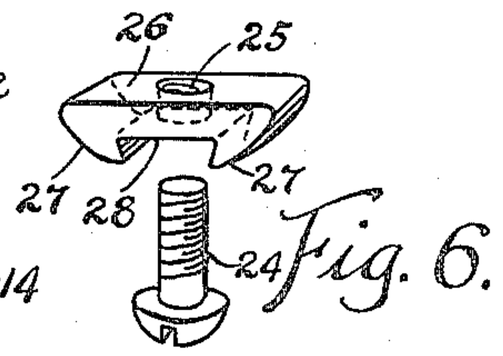

Fig. 6.

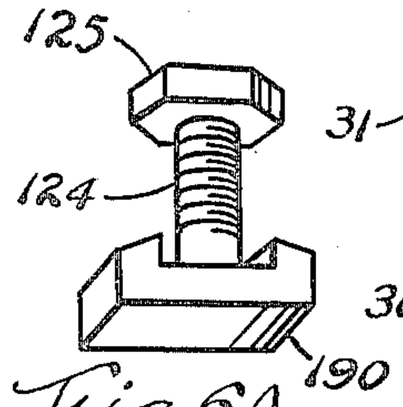

Fig. 6A.

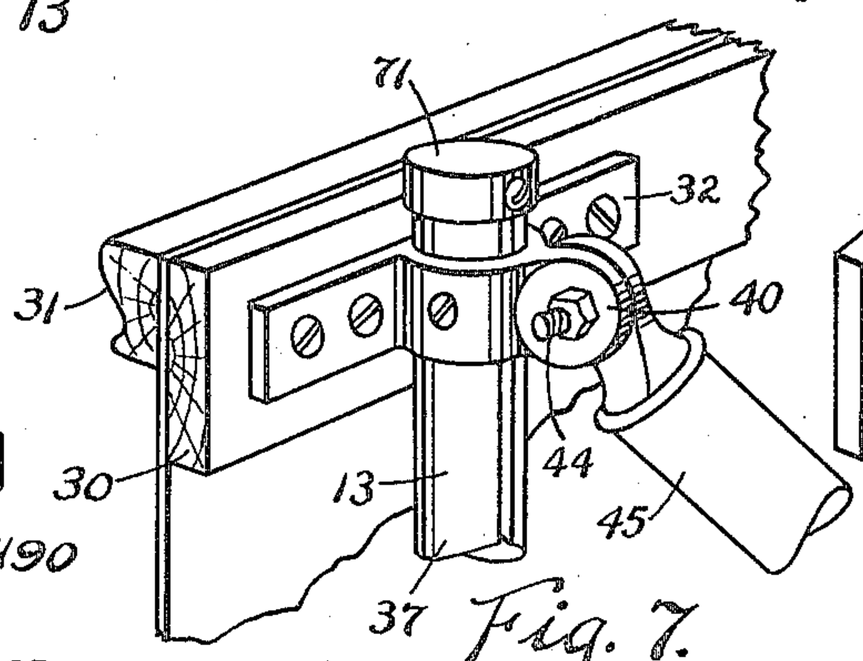

Fig. 7.

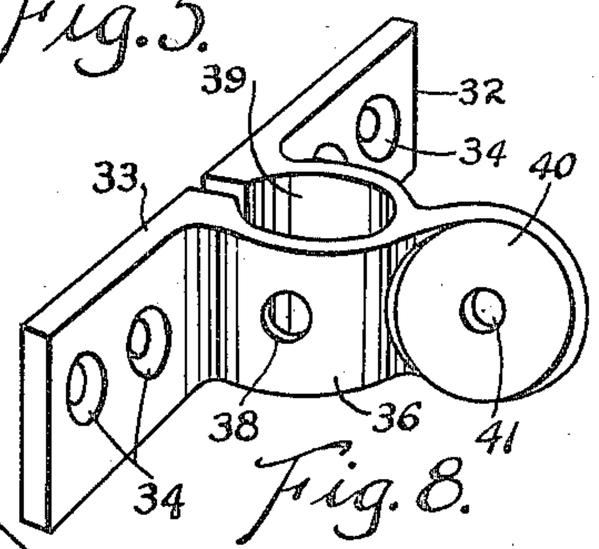

Fig. 8.

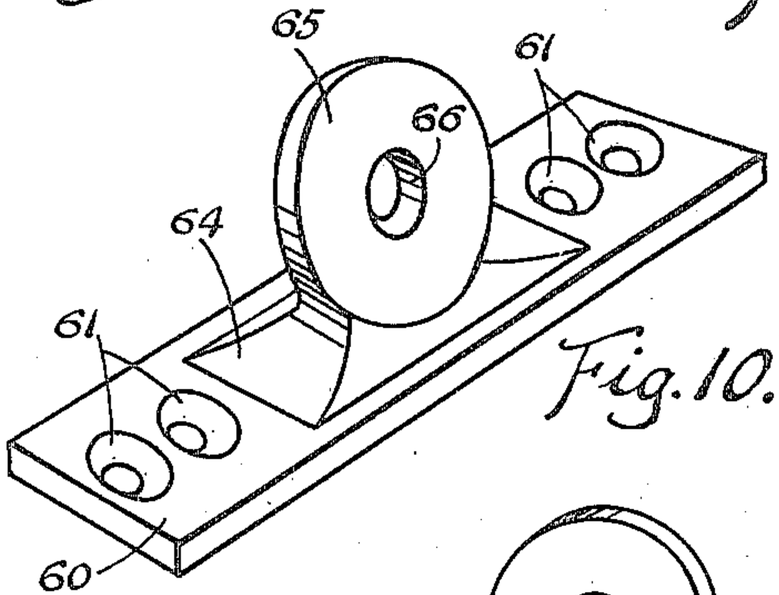

Fig. 10.

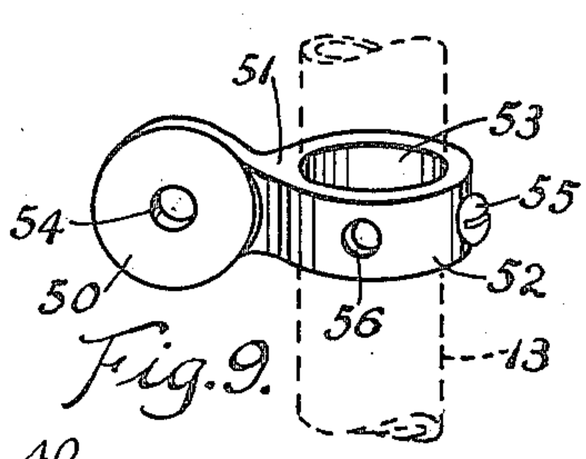

Fig. 9.

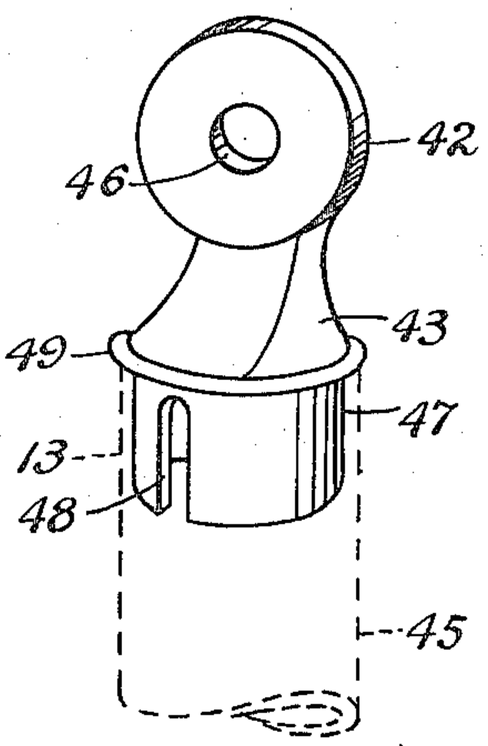

Fig. 11.

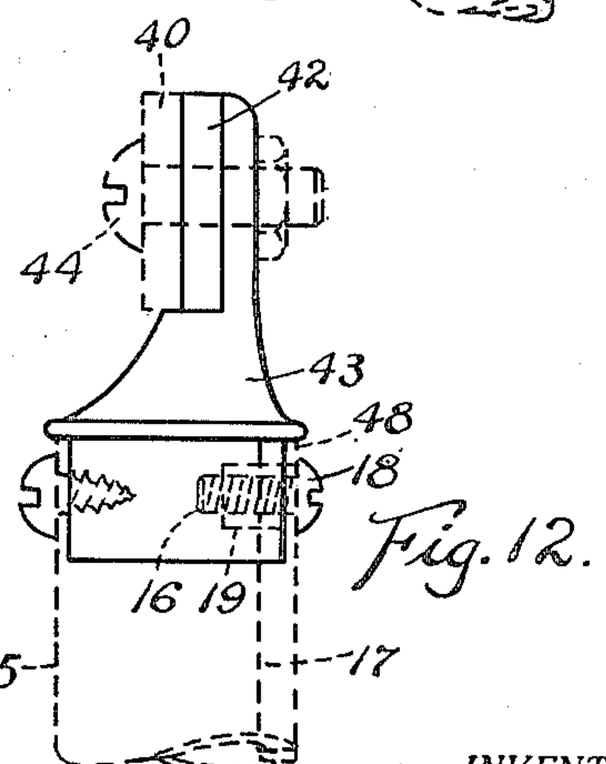

Fig. 12.

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UNITED STATES PATENT OFFICE

2,540,169

TUBULAR ASSEMBLY

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Application November 20, 1945, Serial No. 629,836

2 Claims. (Cl. 287—58)

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This invention relates to a tubular assembly to be employed in the erection of signs.

An object of the invention is to provide simple and inexpensive means for the erection of signs upon buildings, or roof slabs, or upon the earth, with the use of simple tools and prefabricated telescopic sections of metallic tubing which may easily be transported to any erection site.

Another object is to enable relatively unskilled workmen to perform a highly satisfactory job of sign erection, without waste of time and effort, so that the work of erecting signs of all kinds may be performed at minimum expense and without professional supervision.

Another object is to reduce to a minimum the quantity and kinds of materials to be transported to the erection site in placing various kinds and types of signs, the structures in all instances being so standardized as to ensure achievement of this objective without in any manner complicating the procedure, but rather simplifying it to great advantage.

Another object of the invention is to facilitate and expedite the erection of signs, gaining the advantages of substantial uniformity in construction, cost, strength and durability thereof so that their permanency may be depended upon and guaranteed irrespective of conditions found at the place of erection.

The foregoing and other objects are attained by the means described herein and illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmental perspective view of an earth supported sign embodying the means of the invention.

Fig. 2 is a fragmental perspective view of a similar sign structure mounted upon a sloping roof or supporting slab.

Fig. 3 is a perspective view of a roof mast for supporting an overhanging suspended type of sign.

Fig. 4 is a perspective view, part being broken away, showing the telescopic tubular sections employed in practicing the invention, and indicating a method of joining and locking the sections together.

Fig. 5 is a cross-sectional view of the tubular sections telescopically arranged, and locked together by the securing means of Fig. 4.

Figs. 6 and 6A are detail views in perspective, showing the securing means in modified form.

Fig. 7 is a perspective view showing a detail of assembly illustrated by Figs. 1 and 2.

Fig. 8 is a perspective view of a panel supporting bracket.

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Fig. 9 is a perspective view of a brace coupler.

Fig. 10 is a perspective view of an anchor member.

Fig. 11 is a perspective view of a plug-type end connector.

Fig. 12 is a side view of the connector shown in Fig. 11, and indicating connection thereof with another structural element.

As previously stated herein, one of the primary objects of the invention is to facilitate and expedite the erection of signs at low cost in labor and materials, while at the same time enhancing the strength, appearance, and serviceability of the structure. In the past, it was customary to proceed with the erection of signs, by first inspecting the site of installation and then estimating the type and the amount of the various construction materials necessary to complete the installation at the site selected. This mode of procedure invariably resulted in carrying to the job a variety of materials in excessive amounts to allow for waste, damage and mistakes, and it was customary to include skilled tradesmen in the work crew, to perform or supervise the necessary carpenter work. Depending upon conditions encountered upon the job, more or less skilled labor was involved in fitting and joining the structural elements of the sign, and this type of work often was aggravated by lack of uniformity in the size or quality of timbers and other materials utilized in making the installation. Conditions such as this, being unforeseen in many instances, resulted in delays and loss of efficiency, which invariably increased the cost of sign erection.

By means of the present invention, there has been established a uniformity of materials so fabricated as to be interfitting, with emphasis upon flexibility of use in assembly, so that the installation may be advanced to completion without loss of time, labor and materials. To this end, the invention contemplates the provision of two sizes of tubular structural members adapted for telescopic engagement, along with various fittings, fixtures, and fasteners, all of which readily may be assembled rapidly and with precision, to result in the production of highly durable, safe, and attractive signs. The only tools required are a common screw driver, wrench, and hammer, with the possible addition of means to cut the tubular members to length, as the particular installation may require. It will be apparent as the description proceeds, that the sign installation may be accomplished without the need for skilled labor.

In the drawings, the inner and outer tube

members or sections are indicated by the characters 13 and 14, respectively. The sections may be of any convenient length, as they will ordinarily require cutting to a length as required by the peculiarities of the sign structure to be erected. As herein illustrated, the tube sections may be substantially cylindrical in cross-sectional shape, the inner tube section being slightly smaller in diameter than the outer tube section, so that the sections may be telescoped together for establishing a given overall length.

As illustrated by Figs. 4 and 5, the outer tube section 14 is provided with a straight longitudinal way or opening extending from end to end thereof, the opening being bounded by inwardly turned substantially parallel flanges 15—15 spaced apart sufficiently to receive a screw or other fastener indicated at 16. In like manner, the inner tube section 13 is furnished with spaced substantially parallel flanges 17—17 turned inwardly at an angle such that these flanges will rest substantially flatwise against the sides of the outer tube flanges 15. The flanges 15 and 17 preferably are substantially parallel to the axis of fastener 16, and as indicated upon Fig. 5, the flanges of the outer tube section may be made slightly wider than the flanges 17, so that when the tube sections are telescoped one within the other, all of the flanges will extend approximately the same distance inwardly of the tube sections. A screw or fastener 16 may have a head 18 of any desired shape, to be engageable with a suitable tool for rotating the fastener. The size of the head should exceed the space between flanges 15—15, so that the head may not enter the longitudinal slot or way between the flanges. The character 19 indicates a clamping member substantially U-shaped in cross section, said clamping member being bored and internally threaded at 20 to threadedly engage the shank of the screw or fastener 16. The clamping member includes the substantially parallel upstanding legs 21 and 22 which are spaced apart a distance sufficiently so that they may embrace the outer faces of the inner tube flanges 17—17. The height of the legs 21 and 22 should slightly exceed the width of flanges 17—17, so that the inner edges of said flanges will not rest upon the base of the clamping member when it is tightened in position by means of the screw or fastener 16.

In the preferred form of the invention, the free upper ends of the clamping member legs are slightly tapered as at 23, so as to fit snugly within the crotches formed between the flanges and the adjacent body portion of the inner tube section 13. Thus, when the screw or fastener 16 is tightened to elevate the clamping member 19 to the home position of fixation within the tube sections, the tapered free ends 23—23 bear firmly against the flanges 17 and the inner face of the inner tube section wall. At the crotches the flanges meet the tube wall. The clamping action resulting from tightening the screw or fastener 16 thereby results in drawing the tubes together at the longitudinal openings so that the tube sections will be firmly joined and precluded from relative shifting movement both longitudinally and rotationally. If desired, a washer may be placed on the screw or fastener underneath the head 18, this not being illustrated as it will ordinarily not be required unless the head 18 is of reduced diameter. The clamping member 19, including the legs 21 and 22 thereof, may be of any desired length, and in certain instances might be furnished with a plurality of threaded

bores 20 to receive screws or fasteners as previously explained. When exceptionally tight joints between the tube sections are required, the clamping member may be sufficiently long to embody two or more internally threaded bores 20 arranged in a straight line midway between the upstanding legs 21 and 22.

The securing means for the tube sections have proven highly effective for maintaining a fixed condition of the tube sections, with the further advantage that assembly is greatly facilitated and expedited by the use thereof.

An alternative form of securing means is illustrated by Fig. 6, wherein 24 indicates a common screw to be threaded into the internally threaded bore 25 of the clamping element 26. The clamping element of Fig. 6 differs from that of Fig. 5, in that it is a casting or a forging shaped to furnish spaced shoulders 27—27 curved in correspondency with the radius of the inner tube section so as to have a substantial bearing upon the inner wall surface of said tube section. The channel 28 between the shoulders is of a width approximating the overall distance across the flanges 17—17 of the inner tube section, so that the inner edges of the flanges may rest within the channel as the screw is tightened in fixing the tube sections against relative movement. The clamp means of Figs. 5 and 6 obviously will suggest other forms, of which Fig. 6A is an example, which might be adopted for fixing the tube sections relative to one another in the telescopic relationship. In accordance with Fig. 6A, the clamping member 190 corresponds with member 19, or member 26, but instead of being bored and threaded, it carries a fixed upstanding stud 124 onto which may be threaded a common nut 125 to be applied exteriorly of the tube sections after part 190 has been positioned to embrace the flanges 17—17.

Reference is now made to Fig. 1, which illustrates a representative assembly for an earth supported sign. The sign in this instance comprises a panel 29 mounted upon a pair of spaced parallel frame members or timbers 30 located at the rear of the panel. Finish moldings 31 may be applied to the outer face of the panel, if desired. The character 32 indicates a panel supporting bracket, which is shown in detail by Fig. 8, said bracket comprising a base 33 provided with a series of apertures 34 to receive screws or other fasteners 35 entering the frame or timber member 30. The base of the panel supporting bracket may carry an integral sleeve 36 of proper internal dimension to receive snugly an inner tube section 13 which constitutes a part of the upright standard 37 for the sign structure. The sleeve may be furnished with a lateral aperture 38, if desired, for reception of a self-threading screw or other fastener adapted to penetrate the material of the upright standard and thereby preclude gravitation of the panel supporting bracket along the length of the standard.

The smooth bore 39 of the sleeve extends transversely of the base 33, and from the periphery of the sleeve extends a substantially flat head 40 which is apertured as at 41 to receive a bolt or other fastener. Head 40 preferably is located in a plane which is at right angles to the plane of base 33. The plane of head 40 may include the axis of bore 39, if desired. The opposite flat faces of the head preferably should be parallel to one another, so that either face may provide a seat against which a fitting may be bolted or otherwise secured.

Reverting to Fig. 1, it will be noted that the head 40 of bracket 32 is affixed to a similar head 42 of a plug-type end connector 43 mounted upon one end of a sign structure brace 45, the connection being effected by means of a bolt or other fastener 44. The plug-type end connector is illustrated in detail by Fig. 11, and will be seen to include an aperture 46 for reception of the fastener 44, formed centrally of the head. At the end of the connector opposite the head, a plug 47 is provided for entry within one end of the inner tube section 13 which constitutes the brace 45. The plug end may be slotted as at 48 to receive a fastener inserted through the way of the tube section. An annular shoulder 49 on this fitting may limit the distance to which the plug may be inserted into the tube section. The width of slot 48 is sufficient to accommodate the flanges 17—17 of the inner tube section, and it is intended that an ordinary bolt and nut, or the device of Fig. 6A, may be utilized in perfecting the connection between the tube section and the plug end 47 of the connector 43. Alternatively, however, the attachment of connector 43 to the end of the tube section may be effected by means of the securing devices illustrated at 16—19 of Fig. 5, or at 24—26 of Fig. 6.

As indicated upon Fig. 1, a second panel supporting bracket 32 may be applied to the lower frame member 30 of the sign in substantially the manner above explained. When necessary, a connecting strut may be placed in spanning relationship to the upright standard 37 and the brace 45, said strut being constituted of two plug-type end connectors 43, one of which is fixed to an inner tube section 13, and the other of which is fixed to an outer tube section 14 telescopically joined together by means of the fasteners 16. The connector 43 adjacent to the standard 37 has its head bolted to the head of bracket 32, whereas at some point between the ends of the strut there is a brace coupler 51 which has its head bolted to the corresponding head 50 of a connector 43, which is illustrated in detail by Fig. 9. This brace coupler includes an annular sleeve 52, the bore 53 of which is transverse to the aperture 54 of the head 50, and dimensioned to snugly receive an inner tube section 13. A screw or other fastener 55 may be inserted through an opening in the sleeve, with the shank of the screw entering the longitudinal way of the tube section and adapted to receive interiorly thereof a clamping element such as 19 or 26. An additional opening 56 may be provided in the sleeve to receive a self-threading screw which will penetrate the wall of the tube section and thereby furnish an additional anchorage for the brace coupler upon the tube section. A bolt or other fastener 57 may be utilized in clamping together the head of the brace coupler 51 and the adjacent end connector 43.

When the sign structure is to be earth supported, as in Fig. 1, the lower ends of the upright standard 37 and the brace 45 may be inserted into outer tube sections 14, and fastened thereto telescopically by means of screws or the like 16, in the manner illustrated by Fig. 5. The lower ends of the embedded tube sections 14 may be furnished with augers 58 or other anchorage means to render secure the foundation of the sign structure. In some instances, the auger members may be discarded in favor of concrete anchorages, or anchorages in other forms.

Where the sign structure of Fig. 1 is quite long in the horizontal direction, or for any other reason requires added strength, a truss 59 may be interposed between braces such as 45 to impart the necessary rigidity. Truss 59 may comprise a pair of telescopic members such as 13 and 14, each furnished at its free end with a plug-type end connector 43 joined to a brace coupler 59′ (similar in construction to the coupler 51) affixed to a brace 45 in the same manner as was explained in describing the strut which spans the upright standard 37 and the brace 45. The coupler 59′ may be fixed to the tubular brace 45 by means of a self-threading screw or other fastener inserted through the opening 59″ to penetrate the material of the brace tube.

The roof installation illustrated by Fig. 2 corresponds with that of Fig. 1 except for the fact that the anchors are different. In Fig. 2, the anchors are in the form of plates 60, one of which is illustrated by Fig. 10. Plate 60 may be furnished with a series of apertures 61 to receive screws or other fasteners 62 adapted to penetrate the roof slab and anchor themselves in the roof truss members 63. A neck 64 upstanding upon the plate 60, carries a circular head 65 apertured centrally as at 66 to receive a bolt or other fastener 67 whereby the plug-type connector 43 on the end of brace element 68 may be joined to the anchor member. Similarly, the upright standard 69 of the Fig. 2 sign structure may be joined as at 70, to the anchor member 60 which supports the upright standard. As in Fig. 1, the upright standard and the brace of Fig. 2 are constituted of telescopic tubular sections 13 and 14 joined together by means of the fasteners 16. If desired, the upper end of the standard in any assembly may be closed by means of an end cap 71.

In Fig. 3 is illustrated a roof mast constructed of the various fittings and elements previously described herein, for the support of a suspended sign 72. The mast comprises a pair of plate-type anchor members 60 applied to the roof 73, the forward one of which supports an upright standard 74 constituted of a length of tube section 13. Member 74 may be fixed to the anchor member by means of a plug-type end connector 43, and at its upper end the standard 74 may carry a brace coupler 51 upon which is superposed a capping plug 75. This plug may be similar to the cap 71 previously mentioned, with a decorative knob 76 added thereto. The uppermost fitting 51 provides support for a brace 77 which reaches rearwardly to the anchor member 60 at the foot end thereof, where a connection is made by means of an end connector 43. A similar end connector 43 furnishes a mount for the brace at the top of the upright standard 74.

Intermediate the ends of the upright standard, a series of brace couplers 51 may be applied and fastened thereto for the purpose of supporting the series of radial arms 78, 79 and 80 which anchor the various guys of wire, cable, or the like indicated generally by the character 81. The guys extend to the forward end of a suspension arm 82 which supports the sign 72 in any suitable manner, as by means of the hooks 83. The suspension element may be constituted of a single tube section, or in the event that it is necessary, it may comprise an inner tube section and an outer tube section telescoped and joined together in the manner illustrated by Fig. 5. Likewise, the radial arms 78, 79 and 80 may be similarly constituted, if necessary or desirable. Decorative end caps 84, similar to that indicated at 75, may be applied to the outer ends of arms 78, 79

and 82. Suspension arm 82 may be connected to the upright standard 74 by means of fittings 43 and 51.

Although the description illustrates only the three specific forms of sign structures as exemplified by Figs. 1, 2 and 3, it is to be understood that these structures are merely illustrative in character, and might therefore be altered to suit varying circumstances and conditions under which the sign structures are to be erected. For example, the mast construction illustrated by Fig. 3 may vary considerably depending upon the size of the sign panel, the slope of the roof which supports it, and the height at which the sign panel is to be suspended. For the same reasons and possibly others, the sign structures illustrated by Figs. 1 and 2 might require alterations and modifications, but in every instance it will be possible to erect the proposed sign structure by means of the tubular sections and the series of fittings herein described. The tube sections may be supplied in any length, and may be cut at the site of erection to furnish the necessary length of any uprights, braces, struts or trusses that may be required in making any particular installation. Thus, it will be understood that the work crew may quickly and expertly erect any desired type of sign structure using the means provided as herein specified, without carrying to the job a variety of timbers and other structural elements not actually needed for completion of the installation. Other advantages of the invention have been previously referred to herein, and still others will become manifest to those skilled in the art to which the invention relates. In most instances the clamping devices of Figs. 5, 6 and 6A are applicable as alternatives; however it may be found convenient under certain circumstances to select and use one form of clamping device in preference to another, particularly as concerns accessibility in the application of tightening tools. The device of Fig. 6A may properly be considered a T-bolt type of fastener, and as may readily be appreciated, the head of the T-bolt is of such limited width that it may be inserted into the slot of an outer tube section anywhere along its length, and rotated 90 degrees to clamping position before application of the nut. The width of the head is slightly less than the distance between flanges 15—15.

It is to be understood that various modifications and changes in the structural details may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. Structural means for the erection of advertising signs and the like, comprising an outer tube section and an inner tube section telescopically related, each of said tube sections including a longitudinally extending way bounded by a pair of inwardly directed flanges spaced apart, the flanges of the outer tube section abutting the flanges of the inner tube section in substantial flatwise contact, means for clamping the tube sections together at the flanges, for precluding the relative shifting movement of the sections, said clamping means comprising a headed screw extending transversely through the way between the flanges of the outer tube section, and a cooperative clamping member substantially U-shaped in cross section, including substantially parallel upstanding legs spaced apart sufficiently to abut flatwise the flanges of the inner tube section, the legs having free longitudinal edges contacting the inside face of the inner tube section and the flanges of the inner tube section adjacent thereto.

2. Structural means for the erection of advertising signs and the like, comprising an outer tube section and an inner tube section telescopically related, each of said tube sections including a longitudinally extending way bounded by a pair of inwardly directed flanges spaced apart, the flanges of the outer tube section abutting the flanges of the inner tube section in substantial flatwise contact, means for clamping the tube sections together at the flanges, for precluding the relative shifting movement of the sections, said clamping means comprising a headed screw extending transversely through the way between the flanges of the outer tube section, and a cooperative clamping member substantially U-shaped in cross section, including substantially parallel upstanding legs spaced apart sufficiently to embrace the flanges of both tube sections, the legs having free longitudinal edges contacting the inside face of the inner tube section and the flanges of the inner tube section adjacent thereto, the height of the legs slightly exceeding the width of the inner tube flanges, so that the inner edges of the flanges are spaced from the clamping member when tightened in position by means of the headed screw.

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