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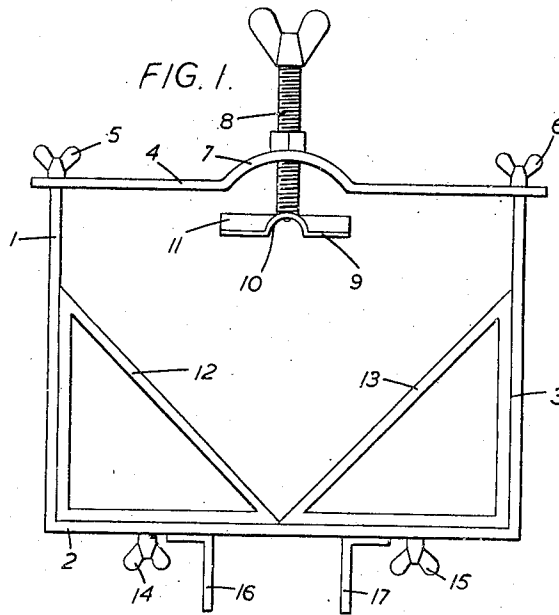
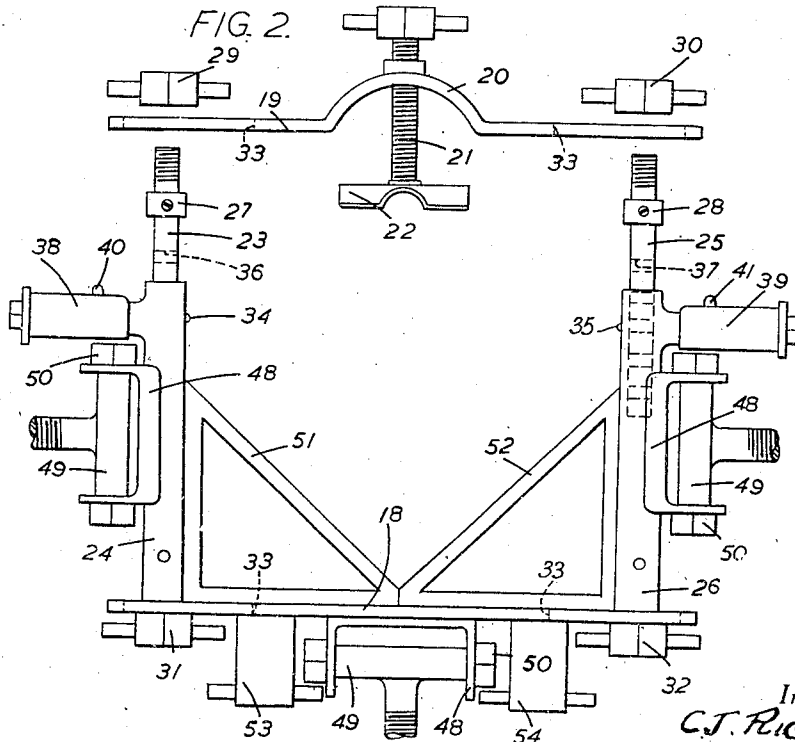
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2,392,549

MEANS FOR SUPPORTING AND/OR FACILITATING THE ERECTION
OF POSTS, STANCHIONS, PIPES, AND THE LIKE

Filed April 29, 1944

3 Sheets-Sheet 1



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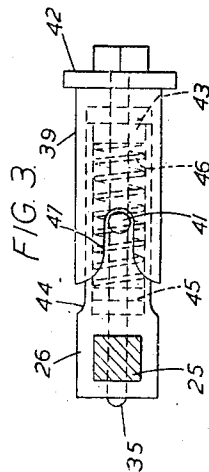
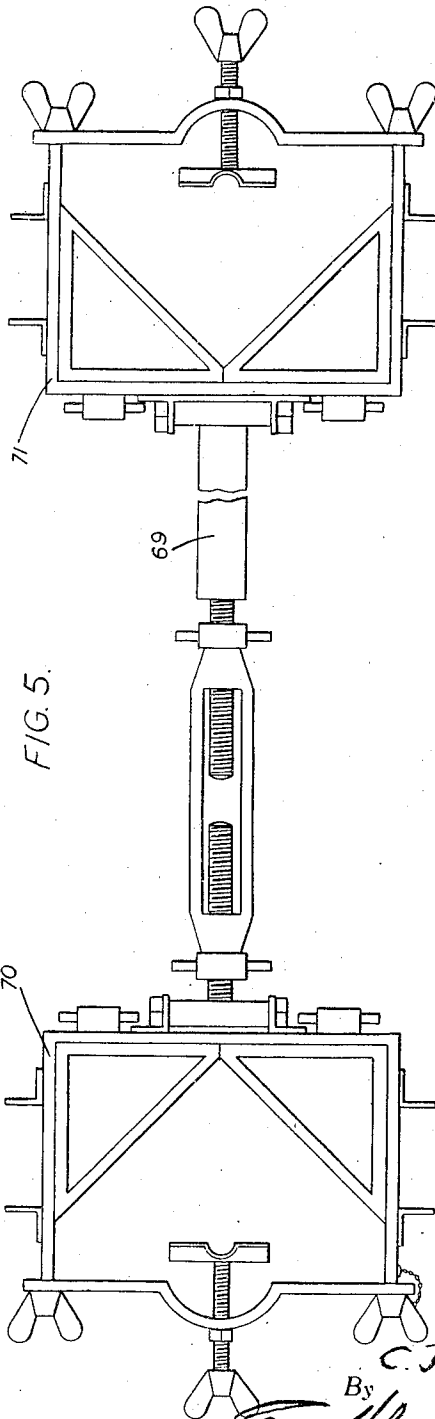
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3 Sheets-Sheet 2



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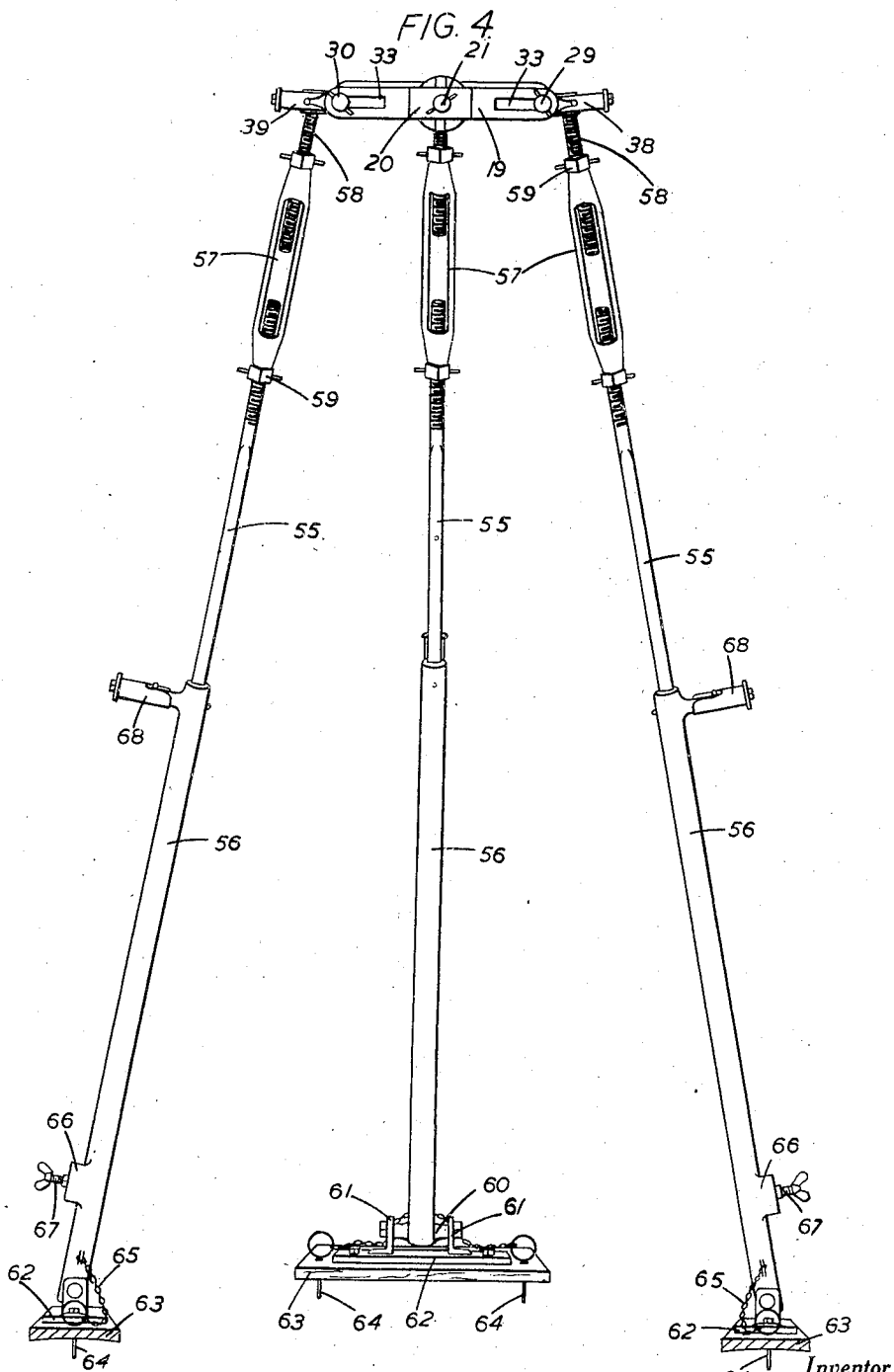
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MEANS FOR SUPPORTING AND/OR FACILITATING THE ERECTION OF POSTS, STANCHIONS, PIPES, AND THE LIKE

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8 Claims. (Cl. 29—284)

This invention relates to improvements in or relating to means for supporting and/or facilitating the erection of posts, stanchions, pipes and the like.

Difficulties are frequently experienced in locating a post, stanchion, pipe or the like in a vertical or other desired position and temporarily maintaining such article in that position whilst it is being connected to another article or otherwise permanently fixed in the desired position. Thus for instance in the erection of posts such as posts of fences or the like it is usual temporarily to support such post in a vertical position by means of a rough timber structure erected on the site. This procedure necessarily takes a long time, it being necessary to hold the post in an approximately vertical position and then to erect the supporting structure and endeavour during such erection to bring the post into a vertical position as indicated by levels, plumb lines or the like. After erection of the supporting structure it is impossible to make any fine adjustments and the accurate positioning of the post is therefore difficult. Moreover the supporting structure has to be dismantled after the post has been secured in position so increasing the time taken in the erecting operation.

One of the objects of the present invention is to provide a device with the aid of which such erecting operations can be carried out very easily and quickly and with the very minimum of labour.

According to the present invention there are provided means for supporting and/or facilitating the erection of posts, stanchions, pipes and the like said means comprising a clamping head and one or more adjustable supporting struts, legs or the like associated with said head.

The aforesaid clamping head may be adapted to engage articles of any desired section and it may be provided if desired with attachments enabling various sections to be accommodated. Thus for instance the main body of the head may be of square or rectangular shape so providing accommodation for articles of square or rectangular form and attachments for example of triangular or substantially triangular form may be adapted for insertion in the corners of the frame opposite to the clamping member so providing accommodation for receiving and securely gripping articles for instance of round, elliptical or even irregular section.

The clamping member of the aforesaid frame may be of any suitable kind and if desired more

than one clamping member may be provided. In general, however, I find that a single clamping member is sufficient and this is preferably located midway or approximately midway along one side of the clamping head. If desired the side to which the clamping member is fitted may be adjustably secured to the rest of the head in such a way as to provide for longitudinal adjustment of said side and consequent adjustment of the clamping member with respect to the article to be clamped.

The clamping face of the aforesaid clamping member preferably consists of a plate having a concaved or recessed centre portion, the side parts thus being adapted for engaging a plane surface and the central portion being adapted to engage an angular or curved surface. Such plate may be carried on an adjusting screw making screw-threaded engagement with the adjacent side of the clamping head and means such for instance as a lock nut may be provided for locking said adjusting screw in a desired position.

The aforesaid clamping head is preferably adapted to surround the article to be clamped and in such cases and in order to enable engagement to be made with articles which cannot be passed longitudinally through such head one of the sides of the head is preferably removably fitted. Thus for instance the side carrying the clamping member may be detachably secured to the rest of the head by wing nuts.

The aforesaid clamping head may be of fixed or adjustable size. Thus for instance in the case of an adjustable rectangular head two of the opposed sides, e. g., the side carrying the clamping member and the opposite side may be of dimensions appropriate to the largest article of the range for which the head is intended and the other two sides may be of adjustable length and consist for example of telescopically interconnected components. In a modified arrangement the first mentioned sides may make slotted engagement with the adjustable sides so enabling the effective length of the former also to be adjusted.

The supporting strut, struts or the like associated with the aforesaid clamping head is or are preferably pivotally secured thereto or connected by means of a swivel or universal joint and it is advantageous that such strut or struts should be detachably mounted. Thus for instances I may provide a bracket on one or more sides of the clamping head and a detachable supporting strut can then be connected to the bracket located on

the side where support is required or struts can be fitted to more than one side, e. g., on two or three sides of a rectangular support.

In order to provide for quickly adjusting the length of the aforesaid strut or each of the aforesaid struts such strut may comprise two or more telescopically interconnected sections and any suitable means may be provided for locking said sections in an adjusted position. For the fine adjustment of such strut or its adjustment under load, it is however sometimes desirable to provide a screw adjustment such for instance as a screw threaded rod making engagement with internally screw-threaded tubular parts of the strut or a screw-threaded socket or stretcher making engagement with externally threaded rod-like sections of the strut. If desired the two forms of adjustment may be incorporated so providing for a coarse and quick adjustment to approximately correct values and a fine adjustment under load.

In some cases it is desirable to provide for angular adjustment of one section of a strut with respect to another section and for this purpose I may incorporate any suitable joint such as a universal joint between two adjacent sections.

In cases where a device according to the present invention is intended for supporting an object from the ground to the lowermost end of the aforesaid strut or the lowermost end of each of the aforesaid struts is preferably provided with a base and the latter is preferably pivotally connected to said strut so that good contact with the ground is attained and opposition to slipping afforded. If desired pins or the like may be provided for insertion through holes in said base and into the ground for the purpose of offering further opposition to slipping for instance on soft ground.

The ends of the aforesaid strut or the ends of each of the aforesaid struts are preferably of similar form in cases where there is provision for such strut being detached from the clamping head and from the base if provided, so adapting both ends of such strut for connection to a clamping head. This enables the device to be used as an adjustable tie or strut between two articles in any desired relative positions, i. e., clamping heads can be applied to each of the articles concerned and said heads can be interconnected and supported in the desired relative positions by means of one or more struts and assuming that the latter are adjustable in length adjustments in the relative positions of such articles can be easily made.

In order that the present invention may be well understood I will now describe, by way of example only, some embodiments thereof with reference to the accompanying drawings in which—

Figure 1 is a plan view of one simple form of clamping head of fixed size.

Figure 2 is a plan view of one form of adjustable clamping head with parts of the associated struts also shown.

Figure 3 is a side view of a detail of the clamping head shown in Figure 2.

Figure 4 is a perspective view of a horizontally disposed clamping head as shown in Figure 2 and associated with adjustable supporting struts, and

Figure 5 is a plan view of an arrangement showing the application of the invention to means for supporting two bodies in the required relative position e. g. for centering one body with respect to another one.

Referring to Figure 1, the clamping head in-

cludes a rectangular frame having integrally formed sides 1, 2 and 3 and a fourth side 4 which is detachable from the sides 2 and 3, said side 4 being for instance detachably secured to the frame by means of butterfly nuts 5 and 6 applied to screw threaded projections extending from the sides 1 and 3 through the side 4.

The aforesaid side 4 is provided with a screw-threaded hole about mid-way therealong and the adjacent part 7 of said side is preferably outwardly bowed as shown. A clamping screw 8 passes through and makes screw-threaded engagement with said hole and to its inner end is fitted a clamping plate 9 extending parallel to the adjacent side of the head. Said clamping plate may be of disc form with concaved channels 10 and 11 extending thereacross at right angles to one another so adapting such plate for gripping a rounded surface or the corner of an angular body although plates of other forms may of course be employed.

The frame of the aforesaid head may be made for instance from mild steel strip material $1\frac{1}{4}$ " wide and $\frac{1}{4}$ " thick and such frame may be about seven inches long and five inches wide but it is to be understood that I do not wish to imply that the invention is limited to any particular dimensions nor to the use of any particular material. The range of adjustment of the clamping screw 8 may be of any desired value but assuming that the frame is of the above mentioned dimensions and the clamping member can be moved through a distance of say two inches then the frame can accommodate rectangular members up to a width of 7" and varying between 3" and 5" in depth.

Corner frames 12 and 13 are provided for insertion in the corners of the above described clamping head for instance for the purpose of making the head suitable for application to a round object, e. g., a pipe or post of circular cross-section. These triangular frames may be made from material similar to that employed for making the clamping head itself and they are preferably of such a size that their adjacent apices meet at the centre of the side 2 of the head.

The aforesaid frames 12 and 13 may be detachably secured to the head in any convenient way for instance by studs projecting therefrom through the side 2 and cooperating with winged or other suitable nuts 14, 15.

Angle brackets 16 and 17 secured to the side 2 of the above described head are adapted to receive the end of an adjustable supporting strut which strut may be of any suitable kind but it is preferably of the kind hereinafter described.

If desired brackets similar to the brackets 16 and 17 may be fitted to the side 1 and/or to the side 3 of the clamping head so enabling struts to be applied to a selected side or to more than one side if desired.

Referring now to Figure 2 of the drawings the clamping head is again of rectangular form but it is of adjustable size. In this embodiment the side 18 of the head consists of a strip for instance of mild steel say $1\frac{1}{4}$ " wide and $\frac{1}{4}$ " thick and the opposite side 19, which may for instance be made from similar material, resembles the corresponding side of the earlier described construction in that it has an outwardly curved central part 20 through which a screw threaded clamping screw 21 passes, said screw carrying at its inner end a clamping plate 22 which may be similar to the above described clamping plate.

The sides uniting the sides 18 and 19 of the head are of a telescopic nature, one consisting of a rod-like part 23 and a tubular part 24 and the other consisting of a rod-like part 25 and a tubular part 26. The rod-like parts 23 and 25 are preferably of square section and the tubular parts 24 and 26 are provided with bores of corresponding cross-section.

The side 19 is provided with apertures through which the rod-like parts 23 and 25 can pass and collars 27 and 28 are fitted to said rod-like parts so as to form abutments for the side 19 of the frame. The ends of said rod-like parts are screw-threaded for cooperation with nuts 29 and 30 and the side 19 can accordingly be easily removed from the frame or securely fitted thereto at will.

The side 18 of the clamping head is preferably fitted to the adjacent sides in a manner similar to that in which the side 19 is fitted, i. e., screw-threaded projections on the tubular parts 24 and 25 extend through apertures in the side 18 and nuts 31 and 32 are provided for cooperation therewith.

The apertures provided in the sides 18 and 19 of the head for receiving the ends of the adjacent sides are preferably in the form of slots as indicated by reference numeral 33 so enabling the telescopic sides of the head to be spaced apart by a variable distance and also enabling adjustments to be made in the position occupied by the clamping plate 22 with respect to the said telescopic sides. Assuming for instance that the said slots are $1\frac{1}{2}$ " long the distance between the telescopic sides can be varied through a range of three inches.

The telescopic sides of the above-described head may be adjustable through any desired distance, the distance of separation between the sides 18 and 19 being for instance variable between $7\frac{1}{4}$ " and $5\frac{1}{4}$ ". The means provided in the arrangement shown in Figure 4 for locking the telescopic sides in any desired positions of adjustment comprise pins 34 and 35 adapted to make engagement with the appropriate holes of the series of holes 36 and 37 provided in the rod-like parts 23 and 25 respectively, such holes being spaced apart for instance by a distance of about half an inch.

The pins 34 and 35 can be withdrawn from the associated holes by pulling the cups 38 and 39 outwardly against the action of a spring and they may be locked in their freed positions by rotating them so that slots therein are moved out of alignment with stop members 40 and 41 respectively.

Figure 3 of the accompanying drawings is a detailed side view of the locking device 35, 39, 41 and as the other locking device is similar further description of the latter is necessary. As shown in Figure 3 the pin 35 extends from the head 42 of the cup 39 and passes through a nut 43 fitted to the hub portion 44 which projects from the part 26 of the clamping head. A plunger 45 is fitted to a medial part of the pin 35 and a compression spring 46 is located between said nut 43 and plunger 45, said spring tending to urge the pin inwardly through one aligned opening in the member 25 of the clamping head.

The abovementioned stop 41 extends radially from the hub portion 44 of the locking device and cooperates with a slot 47 formed in the skirt portion of the cup 39, said slot being flared and curved at its outer end so that any necessity for accurate setting between the slot and the stop

is rendered unnecessary. Thus assuming that the cup has been withdrawn to allow of adjustment between the parts 25 and 26 it is only necessary to move such parts to the approximate positions then rotate the cup 39 so that some part of the flared entrance of the slot 47 is in alignment with the stop 41. If the pin 35 is then in alignment with a hole in the member 25 the pin will be urged therethrough and during this process the cup 39 will be automatically turned into a position bringing the root of the slot 47 into exact alignment. If on the other hand the pin is not exactly in alignment with a hole in the member 25 it is only necessary to move the member 25 with respect to the member 26 until registration is attained whereupon the pin will automatically move into its locking position and the cup 39 will also move automatically into its appropriate position.

Brackets 48 are fitted to the side members 24, 18 and 26 of the clamping head and these are adapted to receive the heads 49 of struts, the said heads being pivotally connected to said brackets by bolts 50 and the struts themselves being constructed in a manner hereinafter described.

Triangular frames 51 and 52 are detachably fitted to the above described clamping head, such frames being secured for instance by screwed studs extending from said frame through the side 18 of the clamping head and having nuts 53 and 54 applied thereto. As explained in the earlier described example these frames are of assistance when cylindrical bodies are to be gripped although they would not be used when the bodies to be gripped are of rectangular cross-section.

Referring now to Figure 4 of the drawings there is shown a clamping head which is similar to that described with reference to Figures 2 and 3 and similar reference numerals are accordingly applied to corresponding parts. Such head is however shown in a position suitable for instance for supporting a post in a vertical position and the struts associated with said head are shown in detail, that is to say the three struts, parts only of which are shown in Figure 2, are shown in full and since these struts are all similar to one another corresponding parts thereof are designated by corresponding reference numerals.

Each of the aforesaid struts includes two telescopically interconnected portions 55 and 56, the part 56 being of tubular form and the part 55 preferably being of square section and being guided by a suitably contoured bore in the part 56 or by suitably apertured bushes located therein.

The upper end of the rod-like portion 55 of each strut is screw-threaded and makes engagement with one end of a stretcher device 57 and the upper end of such stretcher device makes screw-threaded engagement with a rod 58 extending from the above mentioned head 49 which is pivotally mounted in the bracket 48 of the clamping head. The aforesaid stretcher 57 makes right-handed screw-threaded engagement with the rod at one end and left-hand screw-threaded engagement with the rod at the other end so that the rods 55 and 56 can be moved towards or away from one another by rotating such stretcher in the appropriate direction.

If desired lock nuts 59 may be provided for locking each of the stretchers 57 in its properly adjusted position.

The lower end of the part 56 of each of the aforesaid struts is provided with a T-head 60 and the latter is pivotally mounted in brackets 61 secured to the base 62. If desired each of the

said bases 62 may be secured to a subsidiary base 63 of an area and shape appropriate for use on the particular ground concerned, thus for instance said bases 63 may be slightly concaved on their lower surfaces as shown in Figure 4.

In order to afford additional opposition to any slipping of the bases 63 pins 64 may be passed through holes in said bases and into the ground, such pins preferably having heads in the form of rings to facilitate their manipulation. Such ring pins are preferably anchored to the struts by means of chains 65 so as to prevent their being lost and a box 66 may be provided for normally housing said pins, said box having an opening into which the pins can be inserted and a clamping screw 67 being provided for gripping said pins and preventing their inadvertently falling from said box.

The aforesaid parts 55 and 56 of each of the struts are secured in their desired relative positions by a spring operated plunger device 68 co-operating with holes spaced for instance at $\frac{1}{2}$ " intervals along the part 55, device 68 being identical with the above described plunger devices 38 and 39 associated with the clamping head and further description is accordingly unnecessary.

When the above described apparatus is employed for instance for supporting a post in a vertical position during erection of such post, the clamping head is passed over the post or alternatively the side 19 is removed so enabling the head to be applied laterally and the side 19 is then re-applied. The head is adjusted so that it approximately conforms to the size of the post and the clamping screw 21 is then tightened so securing the head to the post. The struts are then adjusted to approximately the right lengths for supporting the post and their bases are rested on the ground, the securing pins 64 being applied if the nature of the ground makes this desirable. The struts are then finely adjusted by adjusting the stretchers so as to bring the post into the exact position required and it is firmly held in that position during subsequent work thereon such for instance as during the operation of concreting in or otherwise securing the foot of the post.

It will of course be appreciated that if desired a plurality of clamping heads and associated supports may be applied to a single article and that such heads and struts can be employed for supporting an article in various positions. Moreover the apparatus may be used as a centering bar for supporting one article in a desired position with respect to another one by removing the base from the strut and substituting therefor a second clamping head. Thus for instance in the arrangement shown in Figure 5 a strut 69 extends between two clamping heads 70 and 71 so providing equipment with which one post or other article may be properly centered with respect to another post or other article. The strut 69 is identical with the struts described with reference to Figure 4 in that it includes telescopically interconnected parts for making coarse adjustments in length and a screw-threaded stretcher for making fine adjustments therein and further description is therefore unnecessary. The clamping heads shown in Figure 5 are very similar to those shown in Figure 1 and they will not therefore be again described in detail.

It will of course be understood that if desired further adjustable struts may be coupled to the clamping heads shown in Figure 5 for instance for the purpose of giving support from the ground or for making adjustable connection with other

bodies. It will also be understood that instead of employing fixed clamping heads as shown in Figure 5 adjustable clamping heads for instance of a kind similar to that shown in Figure 2 may be employed.

If desired stops may be provided for limiting the extent to which the above-described telescopically interconnected parts can be separated from one another so as to ensure that the desired rigidity will be maintained even when such parts are fully extended.

Whilst I have hereinbefore described some embodiments of the present invention, I wish it to be understood that the specific details may be varied or modified without departing from the scope of such invention. Thus for instance the clamping head may include more than one clamping member and the strut or struts employed may include more than two telescopically interconnected parts. Moreover, in cases where an adjustable head having sides comprising telescopically interconnected parts is provided each of the sides concerned may include more than two telescopically interconnected parts. It is also to be understood that the clamping head or heads and the strut or struts may be made of any desired dimensions and from any suitable material.

I claim:

1. Supporting means comprising a clamping head for gripping the object to be supported and at least one strut of adjustable length associated therewith and angularly adjustable with respect thereto, said head being in the form of a frame having two opposed sides each of which comprises telescopically interconnected sections, the outer telescopic sections having spring urged plungers adapted to make selective engagement with series of holes in the inner telescopic sections and so enable said sides to be adjusted in length and locked in an adjusted position.

2. Supporting means as claimed in claim 1 wherein said plungers are carried by cups which are slidable radially with respect to said sides of the frame and slots are provided in said cups for cooperation with stops, the arrangement being such that by withdrawing said cups and rotating them so that their slots are out of alignment with said stops the spring-urged plungers are locked in their released positions but when said cups are turned so that the slots register with the stops the plungers move into their locked positions as soon as they register with a hole in the inner telescopic sections.

3. Supporting means as claimed in claim 1 wherein the inner telescopic sections are of square cross-section.

4. Supporting means as claimed in claim 1, wherein said strut includes at least two telescopically interconnected sections allowing the length of the strut to be adjusted and means comprising a spring operated plunger mounted on the outer telescopic section and a series of cooperating holes in the inner telescopic section being provided for locking said sections in desired positions of adjustment.

5. Supporting means as claimed in claim 1, wherein said head also includes two opposed sides making slotted engagement with the said telescopic sides, thereby allowing the last-mentioned sides to be moved towards and away from one another.

6. Supporting means as claimed in claim 1, wherein removable corner units are provided in said frame for modifying the contour thereof,

and so adapting it for gripping objects of various cross-sections.

7. Supporting means comprising a clamping head for gripping the object to be supported and at least one strut associated therewith in an angularly adjustable manner, said strut comprising at least two telescopically interconnected sections allowing the length of the strut to be adjusted, means comprising a spring-operated plunger mounted on the outer telescopic section and a series of cooperating holes in the inner telescopic section being provided for locking said sections in desired positions of adjustment, said plunger being carried by a cup which is mounted for

radial movement with respect to the outer telescopic section, a slot being provided in said cup for cooperation with a stop, whereby the cup may be withdrawn and rotated to a position in which the slot is out of registration with the stop to lock the plunger in its freed position.

8. Supporting means as claimed in claim 1, wherein said strut includes at least two telescopically interconnected parts enabling coarse adjustments to be made in its length, and at least two parts interconnected by screw threaded means for enabling fine adjustments to be made in its length.

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