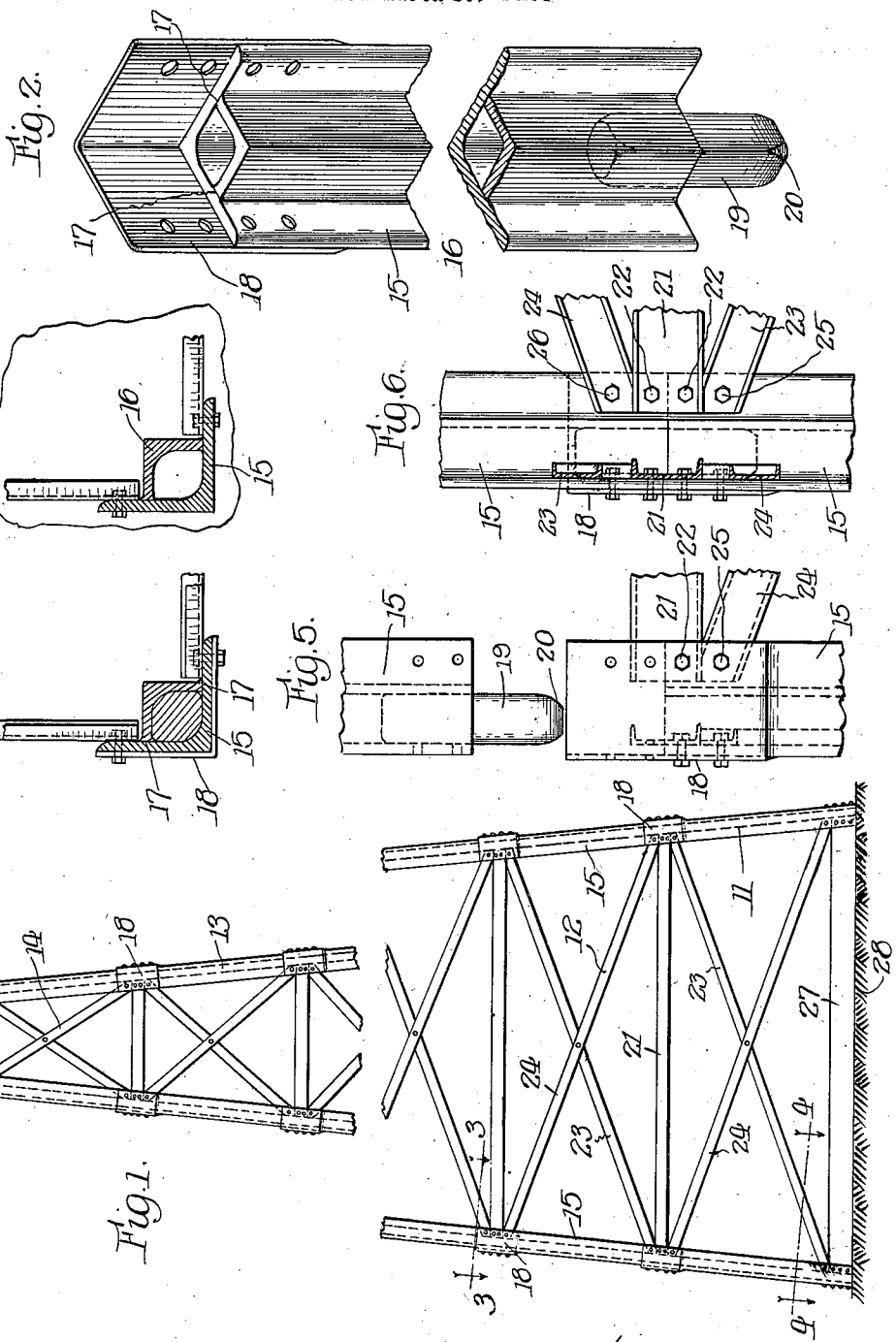
April 26, 1927. 1,626,393

W. H. CATER

FRAME STRUCTURE

Filed March 10, 1924



Witness:
T. J. Sauser.

Inventor:
William H. Cater
By Walter M. Fuller
Atty.

Patented Apr. 26, 1927. 1,626,393

UNITED STATES PATENT OFFICE.

WILLIAM H. CATER, OF CHICAGO, ILLINOIS.

FRAME STRUCTURE.

Application filed March 10, 1924. Serial No. 697,990.

My invention relates to skeleton frame structures, especially those with disconnectable parts or sections, such as are used as derricks for the sinking of wells.

The present invention aims to provide a structure of this type which is strong and rigid, which may be easily erected, and which may also be readily taken apart so that it will occupy but small space during shipment or storage.

A further purpose of the invention is to supply an appliance of this general style some of the parts of which interlock with one another in such a manner as to facilitate the erection of the framework.

An added aim of the invention is the provision of an appliance of this character which is simple in structure, which is economical to manufacture, and which performs its functions effectively and efficiently.

To enable those skilled in this art to have a full and complete understanding of the invention, both from its structural and functional standpoints, I have illustrated a desirable and preferred embodiment of the invention in the accompanying drawing forming a part of this specification, and throughout the several views of which like reference characters have been used to designate the same parts.

In this drawing,—

Fig. 1 is a fragmentary side elevation of the completely erected structure;

Fig. 2 is a perspective view of one of the corner-post units broken away in its middle section to more clearly illustrate the construction;

Fig. 3 is an enlarged horizontal section on line 3—3 of Fig. 1;

Fig. 4 is a similar horizontal section on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary detail view showing the lower end of one of the corner posts about to be assembled with that portion of the framework just below it; and

Fig. 6 is a view at right angles to that of Fig. 5, with the parts assembled and with the diagonal brace bars in position.

Referring to these drawings, it will be seen that the improved and novel structure includes, when fully erected, a plurality of superposed sections of gradually, upwardly, decreasing size, which unitedly or conjointly comprise the complete framework or derrick.

In Fig. 1 a portion of such frame units or sections has been shown, the two lower ones being characterized 11 and 12, and the two upper ones denominated 13 and 14.

With the exception of the uppermost and lowermost units or sections, each part or section of the framework comprises four upright, slightly-inclined, metal corner posts 15 of angle-bar cross-section, and inside of each such post or standard unit, for stiffening and strengthening purposes, I employ a smaller, reversely-arranged angle-bar 16, the margins of the flanges of which along the lines 17, 17 are welded to the inner faces of the two flanges of the corresponding outer or main angle-bar post unit.

This forms a hollow standard or post section of great strength having longitudinal or lengthwise disposed flanges outstanding therefrom and in planes at right angles to one another.

The upper end of each of such post units or bar sections has an angle-plate 18 welded or otherwise secured against its outer faces with the plate extended upwardly beyond the top end of the part 15 whereby to be overlapped and bolted to the lower end of the next post unit 15, such lower end bearing or resting on the top end of the particular part 15 under consideration, with the ends of the smaller angle-bars 16, 16 bearing directly on one another.

In order to facilitate the fitting together of the superposed post sections 15, 15, and to strengthen the structure at these joints, the lower end of each is provided with a plug 19 accommodated and fixed permanently in part only in the cavity formed by the united larger and smaller angle-bars 15 and 16, with a substantial portion of the plug projecting downwardly beyond the bottom end of the particular post section 15 under consideration, and adapted to fit telescopically in the registering cavity in the upper end of the next lower post section.

To aid in the introduction of this plug into the recess or pocket in the next lower section, its bottom part is desirably beveled or chamfered as at 20.

The top ends of the post sections and the bottom ends of the post sections next above and resting upon them are connected together by horizontal tie bars 21, 21 conveniently, but not necessarily, of channel cross-section, the end portions of whose outer faces bear against and overlap the inner faces of the top ends of the post sections and the bottom ends of the adjacent superposed

post sections, all of which is perhaps most clearly illustrated in Fig. 6.

By means of bolts 22, 22 and suitable registering holes in the structural elements involved, the corresponding short, outer angle-plate 18, the outstanding flanges of the two post sections directly above one another, and the end part of the channel bar 21 are rigidly but detachably bolted or secured together.

In somewhat similar manner, each pair of posts of the same unit of the frame are tied and secured together by a pair of crossed, diagonal or inclined channel-braces 23 and 24, each of which at its upper end is demountably fastened to the frame by a bolt 25 extended through alined apertures in the diagonal brace, the flange of the angle-bar post section 15, and the outer angle-plate 18, and each of which at its lower end is rigidly but detachably held in place by a bolt 26 in registering holes in the inclined brace, the flange of the angle-bar post unit 15 and the upper part of the next lower angle-bar plate 18.

Thus the structure, which is the same on all four sides, is adequately and securely held and tied together and properly braced to withstand all ordinary strains.

The bottom ends of the lowermost post sections 15 are directly secured together by stronger, horizontal channel-bars 27 designed to rest on a suitable base or foundation 28, and in like manner the upper ends of the topmost post sections are connected together by appropriate channel-bars 29, the outer angle-plates being omitted at these two points.

Some of the special advantages inherent in this novel frame structure reside in the manner in which the framework may be put together with rapidity, ease and dispatch.

Assume, for example, that the frame structure has been partly erected and that the next horizontal section is to be put or erected in place element by element.

Each of the four corner-post sections is placed in position by inserting its downwardly-extended plug or filler 19 in the hole at the top of the corresponding corner of the partially erected structure, its flanges sliding down in the spaces designed to accommodate them between the outer angle-plate member 18 and the upper halves of the end portions of the horizontal channel-bars 21 which are arranged at right angles to one another.

When the bottom end of such erected post-section is fully home in position, the lower face of its inner angle-bar 16 will bear directly on and be supported on the upper face of the corresponding inner angle-bar 16 of the post section to which it is being fitted.

It will be perceived therefore that the plugs are not depended upon alone or solely for maintaining the alinement of the several members when they are being asembled and secured together, but the exterior angle-plate and the interior, horizontal channel-bars assist in this work.

As soon as the angle-post section has been fitted in place as described, it may be fastened in position by introducing and tightening those of the bolts 22 which pass through the corresponding holes in its lower end.

Then the diagonal braces may be placed and fastened in position by their bolts 26, and then the upper, horizontal channel-bars 21, it being understood that the outer angle-plates 18 are already desirably permanently fastened to the upper ends of such post units.

The horizontal channel-bars 21 may be used as supports for planks for the workmen to stand on as the frame members are positioned and bolted in place, and as each horizontal section of the framework is completed the planks are moved up to the next set of such horizontal bars.

In taking down the derrick or framework a substantial reversal of the specified operations is performed, all as will be readily understood.

In some instances it may be perferred to defer the installation of the horizontal channel-bars 21 at the top of any section of the framework until after the next series of upright post sections have been put in place, in which case the plugs and the upwardly-projecting flanges of the outer angle-plates 18 are relied upon for alining the post sections and holding them in position until the parts are bolted together.

In still other instances it may be convenient not to have the outer angle-plates welded or otherwise permanently secured to the post sections, and, of course, in such cases these exterior members would be merely bolted in place.

In other cases these outer angle-plates may be dispensed with entirely.

In this specification I have presented only one desirable embodiment of the invention, but it is to be understood that it is susceptible of a variety of embodiments and that many minor changes may be made in the structure illustrated and described without departure from the heart and essence of the invention and without the sacrifice of any of its substantial benefits and advantages.

I claim:

1. In a demountable framework of the character described comprising a plurality of superposed sections, the combination in each such section of corner-post units each of angle-bar cross-section having internally a reversely-disposed smaller angle-bar with the margins of its flanges secured to the inner

faces of the flanges of the main angle-bar of the corner-post unit, and a plug secured in the aperture at one end of each such post unit between its component angle-bars and projecting beyond the end of the post unit into the corresponding aperture at the end of the next adjacent post unit, the smaller angle bars of the post units of each section resting on the ends of the corresponding angle-bars of the next lower section.

2. In a demountable framework of the character described comprising a plurality of superposed sections, the combination in each such section of corner-post units each of angle-bar cross-section having internally a reversely-disposed smaller angle-bar with the margins of its flanges secured to the inner faces of the flanges of the main angle-bar of the corner-post unit, a plug secured on the aperture at one end of each such post unit between its component angle-bars and projecting beyond the end of the post unit into the corresponding aperture at the end of the next adjacent post unit, the smaller angle-bars of the post units of each section resting on the ends of the corresponding angle-bars of the next lower section, an outer angle-bar plate secured to and projecting beyond the end of such post unit, and means detachably fastening the projecting part of said angle plate to the next adjacent corner post unit of another section.

3. In the demountable framework of the character described comprising a plurality of superposed sections, the combination in each said section of corner-post units each of angle-bar cross-section having internally a reversely-disposed smaller angle-bar with the margins of its flanges secured to the inner faces of the flanges of the main angle-bar of the corner-post unit, such smaller angle-bars of the post units of each section resting on the ends of the corresponding angle-bars of the next lower section, and means to hold said sections together in the relation specified.

In witness whereof I have hereunto set my hand.

WILLIAM H. CATER.