United States Patent [19]

Ballou

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[54] **SHORING FRAME SYSTEM**

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[21] Appl. No.: **169,173**

[52] **U.S. Cl.** ..... **52/122,** 52/637, 52/646, 52/648, 182/178, 248/188.4, 248/354 S, 248/357

[51] **Int. Cl.** **E04g 25/00**

[58] **Field of Search** ..... 248/188.4, 354 S, 248/357; 249/18, 210; 52/126, 122, 637, 646, 638, 648; 182/178, 179; 251/101

[56] **References Cited**

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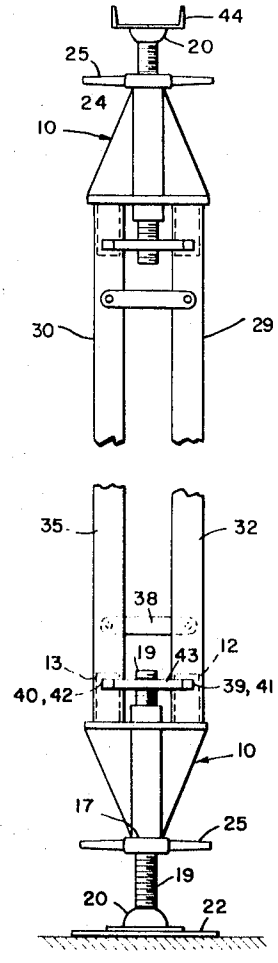
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[57] **ABSTRACT**

A shoring frame system is disclosed whereby a pair of generally planar columns are spaced from each other in tandem with the respective legs of each column interconnected by jack heads at the tops and bottoms thereof. Each jack head includes a jack thereon whereby the overall height of the respective legs of each column can be readily adjusted by adjusting a single jack.

5 Claims, 5 Drawing Figures



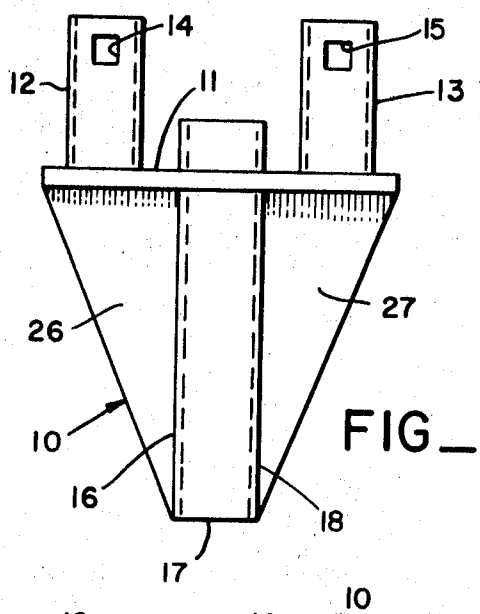


FIG_1

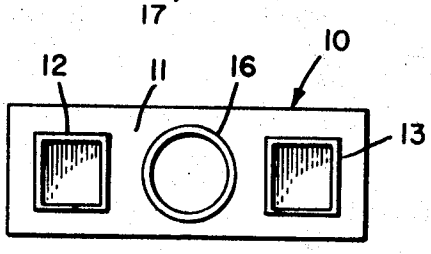


FIG_2

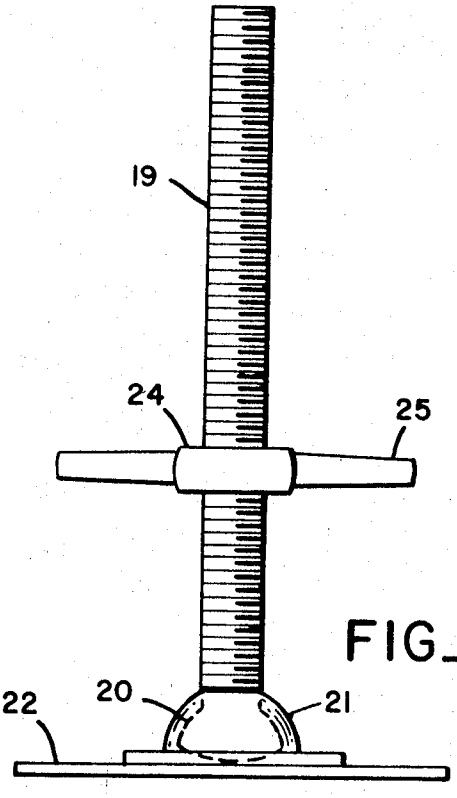
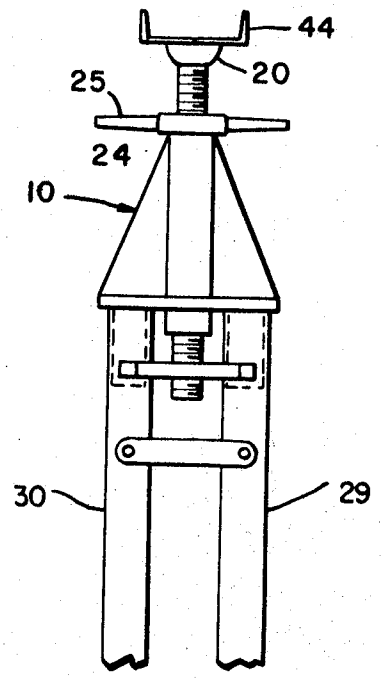


FIG_3



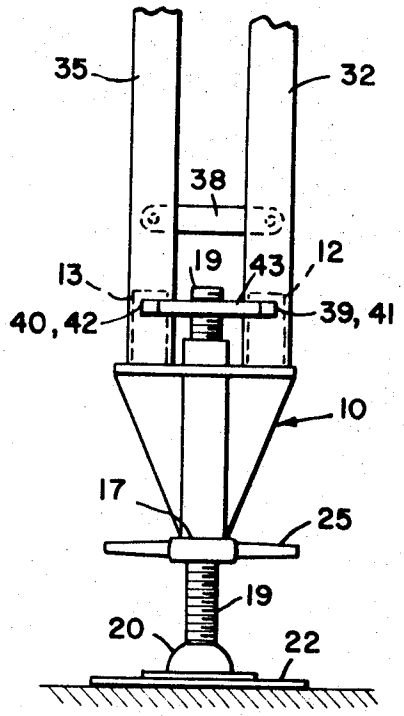
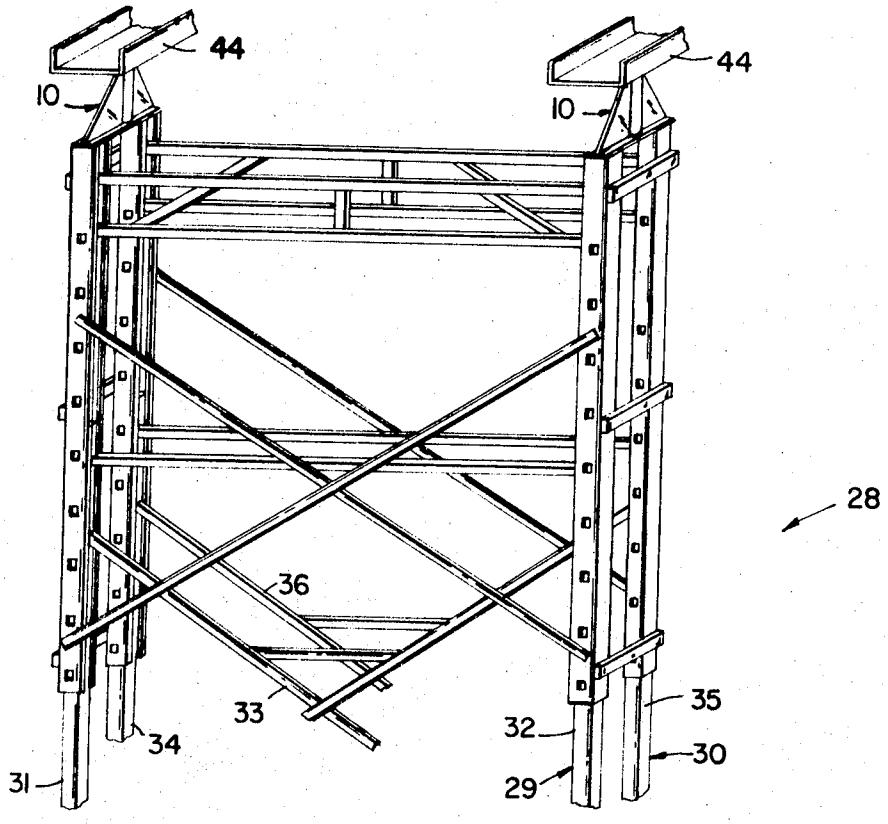


FIG_5

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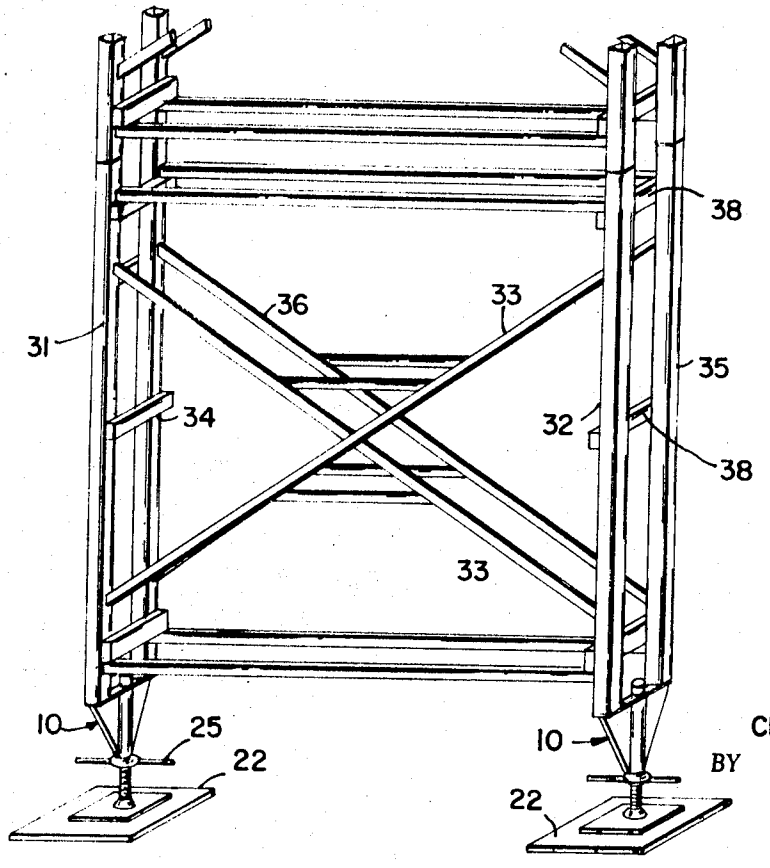


FIG_4

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SHORING FRAME SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to shoring structures; and, more particularly, to a shoring frame system capable of supporting a greatly increased load-bearing capacity.

2. Description of the Prior Art

In the shoring of, for example, overpass roads or the like, it is well known to provide a series of shoring structures during the building of such roads. For example, a typical shoring structure is shown in U. S. Pat. No. 3,190,405 to Squire. In this patent, it can be seen that a conventional type of shoring system involves a plurality of columns such as the two illustrated in FIG. 1 of Squire, mounted in tandem and interconnected by suitable cross-bracing. Such bracing as shown results in relatively wide spacing between the columns of the shoring structure. This is due to the fact that the bases of the leg members forming the columns of the shoring structure generally include commercially made jack members or the like for adjusting the overall height of the columns. These jack members generally include load-supporting nuts coupled to handles which require a particular amount of spacing between the leg members for clearance. This relatively wide spacing between columns results in a structure which can take a lesser amount of loading and is generally aesthetically unappealing.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a more stable shoring structure capable of bearing relatively heavy loading.

It is a further object of this invention to provide an improved shoring structure which is more aesthetically pleasing than prior art structures.

It is a still further object of this invention to provide an improved jack arrangement for interconnecting columns of such shoring structures.

These and other objects are preferably accomplished by providing a pair of generally planar columns spaced from each other in tandem with the respective legs of each column interconnected by jack heads at the tops and bottoms thereof. Each jack head includes a jack thereon whereby the overall height of the respective legs of each column can be readily adjusted by adjusting a single jack.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a vertical view of a jack head prior to installation on the shoring frame system of my invention;

FIG. 2 is a bottom plan view of the jack head of FIG. 1;

FIG. 3 is a vertical view of a jack to be installed on the jack head of FIGS. 1 and 2;

FIG. 4 is a vertical view of the shoring frame system of my invention having the jacks and jack heads of FIGS. 1 through 3 installed thereon; and

FIG. 5 is a side view of a portion of the shoring frame system of FIG. 4 with portions omitted for convenience of illustration.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1 of the drawings, a jack head 10 is shown oriented in the direction for installation at

the bottom of the columns of a shoring structure as will be explained further hereinbelow (the orientation of jack head 10 in its upsidedown position, i.e., 180°, would orient it in the direction for installation at the top of these columns). Jack head 10 is generally trapezoidal, as shown, and is adapted to receive the legs of the columns on which it is to be installed at the wide base member 11 thereof. Thus, at base member 11, jack head 10 includes a pair of spaced leg insert members 12 and 13. Leg insert members 12 and 13 are generally square in cross section as shown in FIG. 2 since the legs of the columns into which leg insert members 12 and 13 are to be extended are generally square in cross section. Of course, if desired, leg insert members 12 and 13 may be of any suitable cross section depending upon the configuration of the aforementioned legs.

In either case, each leg insert member preferably includes an aperture extending therethrough, such as apertures 14 and 15, for receiving a locking pin or the like, as will also be explained further hereinbelow. Obviously, leg insert members 12 and 13, to extend into the aforementioned legs, must be of a smaller cross section than the interior diameter of the legs. Of course, the legs could telescope into members 12 and 13 but the first-mentioned arrangement is preferred for reasons of strength, stability, etc.

As shown in FIG. 1, jack head 10 includes a centrally located jack-receiving member 16 which extends from the narrow base portion 17 of jack member 10 a short distance past wide base portion 11. Member 16 is threaded internally as at threads 18 for receiving therein a threaded jack rod 19 (FIG. 3). Rod 19 includes a knob 20 welded or the like thereon, which is adapted to fit into a hemispherical socket-type member 21 secured to a base plate 22 to permit some rotational movement thereof as is well known in the art. Of course, any suitable means may be provided for limiting the pivotal movement of knob 20 with member 21 while retaining the knob 20 therein. Finally, a load-supporting nut 24 having an operating handle 25 thereon is threaded on rod 19, as is well known in the art.

Referring once again to FIG. 1, a pair of generally triangular flange plates 26 and 27 are secured to both base member 11 and jack-receiving member 16 for strengthening the jack head 10. Referring now to FIG. 4, a shoring structure 28 is shown comprised of a pair of columns 29 and 30 mounted in tandem. That is, columns 29 and 30 are generally planar and so spaced from one another that their respective legs lie in generally the same vertical plane normal to the plane of the columns. Thus, column 29 includes a pair of legs 31 and 32 interconnected by suitable bracing 33. The general configuration of legs 31 and 32 forms no particular part of my invention; however, such legs are generally square in cross section and may include one or more telescoping sections as shown, as for example, the legs disclosed in my copending application Ser. No. 846,759, filed Aug. 1, 1969.

The legs 34 and 35 of column 30 are similar and also interconnected by suitable bracing 36. As shown, columns 29 and 30 are further interconnected by suitable cross-bracing such as tie rods 38. This cross-bracing 37 is of a lesser extent than is usual in structures of this type and may be generally horizontal members as shown. That is, the distance between columns 29 and 30 may be on the order of only about 3.625 inches,

whereas the prior art distance might be about ten inches. Such bracing is less expensive and more aesthetically pleasing in structures of this type and also increases their load-bearing capacity.

This relatively short distance between columns **29** and **30** is accomplished using the jacks and jack heads of FIGS. **1** through **3**. Thus, as shown more particularly in FIG. **5**, jack head **10** is connected to the lower ends of legs **32** and **35** of columns **30** and **29**, respectively. As can be seen in dotted lines, leg insert members **12** and **13** telescope or extend up into the lowermost ends of legs **32** and **35**, respectively. A tie rod **38** or the like may be connected to each leg **32** and **35** to provide bracing for columns **29** and **32**. Threaded jack rod **19** is threaded within jack-receiving member **16** while knob **20** of rod **19** is snap-fitted onto base plate **22**, as discussed hereinabove with respect to FIG. **3**. Load-supporting nut **24** is moved along rod **19** by means of handle **25** to abut against the bottom or narrow base portion **17** of jack head **10** as is well known in the art.

A pair of pins **39** and **40** are preferably inserted in suitable apertures **41** and **42**, respectively, in legs **32** and **35**, which apertures are aligned with the apertures **14** and **15**, respectively, of leg insert members **12** and **13** (see FIG. **1**). These pins **39** and **40** are preferably secured to a connecting member, such as a mild steel strap **43**, and have a cross section related to the apertures into which they are inserted (in this instance, generally square in cross section).

A similar jacking arrangement is provided at the top of legs **32** and **35**. However, in addition to the orientation of the jack and jack head, the knob **20** of threaded rod **19** is connected to a generally U-shaped bracket **44** (see also FIG. **4**) which is adapted to receive thereon a suitable supporting member (not shown), such as an elongated steel beam or the like. Load-supporting nut **24** on the jack rod **19** at the top of legs **32** and **35** abuts against the top of the legs **32** and **35**.

of course, a similar jack and jack head arrangement is provided at the top and bottom of legs **31** and **34** of FIG. **4**, as shown. Thus, in all cases, the overall height of the legs of two columns mounted in tandem may be adjusted by means of only a single jacking arrangement, whereas in the past individual jacks must have been provided for each leg. Also, the elimination of such individual jacks, as discussed hereinabove, brings the columns closer together, resulting in a more stable shoring structure while eliminating complicated and expensive cross-bracing between such columns.

In prior art arrangements, when one leg of a column is adjusted through means of a single jack, there is increased pressure on the other jack. In the case of my arrangement, this increased pressure is eliminated. Also, as discussed hereinabove, the loading capacity on the shoring structure is substantially increased, while a lesser amount of space is required.

Such spacing between columns may be as little as 3.625 inches (i.e., the inner spacing from the outside of one leg to another — the distance between centerlines of such legs may be on the order of 10 inches or so). The outer diameter of jack rod **19** may be preselected (and of course the threads of jack-receiving member **16**) to provide a suitable shoring capacity, depending upon the safety factor desired. For example, a jack rod of 1-½-inch diameter may have a minimum shoring capacity of about 10 tons; a 2-inch diameter jack rod may have a minimum capacity of about 20 tons and a 2-½-inch diameter jack rod may have a minimum capacity of about 40 tons. The length of such jack rod may be about 18 inches, whereas the distance between centerlines of leg insert members **12** and **13** may be about 7 inches or so. The overall height of jack head **10** (from base member **11** to base portion **17**) may be about 9.5 inches or so. The apertures **14** and **15** may be 1 inch square in cross section.

Of course, all such dimensions may vary, depending upon the loading capacity desired, engineering economics, manufacturing techniques, etc. However, the closer the columns are to each other, the more stable such shoring structure is.

I claim as my invention:

1. A shoring frame system comprising:

a pair of columns spaced in tandem wherein each of said columns includes at least a pair of elongated vertically extending leg members of generally the same length interconnected by a plurality of brace members, each column being generally planar and parallel to the other with the respective spaced leg members lying in generally a vertical plane, which plane is generally normal to the plane of said columns;

a pair of jack heads removably interconnecting the bottom of each pair of said respective spaced leg members, respectively, and adapted to support said columns on a supporting surface;

a second pair of jack heads removably interconnecting the top of each pair of said respective leg members, respectively, and adapted to support a member thereon; and

each of said jack heads including a generally horizontally disposed base member, a pair of leg member receiving members fixedly secured to opposite ends of each of said base members, the leg member receiving members of said first pair of jack heads extending generally upwardly for removably receiving the lower ends of said respective leg members and the leg member receiving members of said second pair of jack heads extending generally downwardly for removably receiving the upper ends of said respective leg members, a single generally centrally located jack-receiving member having internal threads extending therealong fixedly secured to each of said base members and extending generally downwardly from the base member associated with the first pair of jack heads and extending generally upwardly from the second pair of jack heads, a pair of generally right triangular bracing plates fixedly secured to each of said jack heads, said bracing plates having their hypotenuses extending from the outer extremities of their respective base members to the outer ends of said jack-receiving members, their bases fixedly secured to their respective base members on the side thereof from which said jack-receiving member extends, and their remaining sides extending along and fixedly secured to said jack-receiving members, and

jack means having an elongated threaded shaft threaded into each of said jack-receiving members for selectively varying the height of each pair of said respective leg members with respect to said jack heads, each of said threaded shafts further including a base plate at the free ends thereof and a load-supporting nut threadably mounted on each

of said threaded shafts and bearing against each of said jack-receiving members.

2. The system of claim 1 wherein said leg member receiving members are of a cross section less than the internal diameter of said leg members whereby said leg member receiving members are insertable into said leg members.

3. The system of claim 1 wherein means are associated with each of said leg member receiving members and said leg members for securing said leg members from relative movement with respect to said leg member receiving members.

4. The system of claim 3 wherein said means associated with said leg member receiving members and said leg members include a pair of interconnected pin members, said leg members and said leg member receiving members including apertures therein for receiving said pin members when the apertures in said leg member receiving members are aligned with the apertures in said leg members.

5. The system of claim 4 wherein each of said threaded shafts further includes a knob on one end thereof and said base plate is pivotally connected to said knob.

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