Dec. 7, 1965 W. J. THORPE 3,222,030

FLOOR STRUCTURE ELEVATING DEVICE

Filed June 22, 1964

FIG. 1

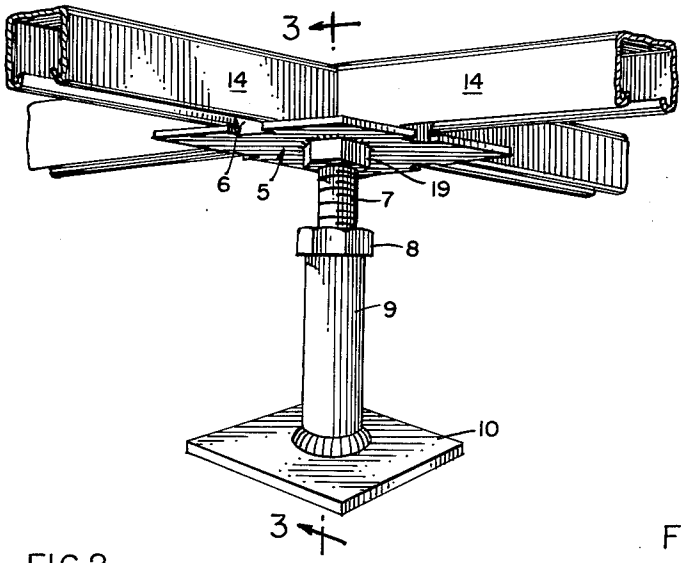


FIG. 2

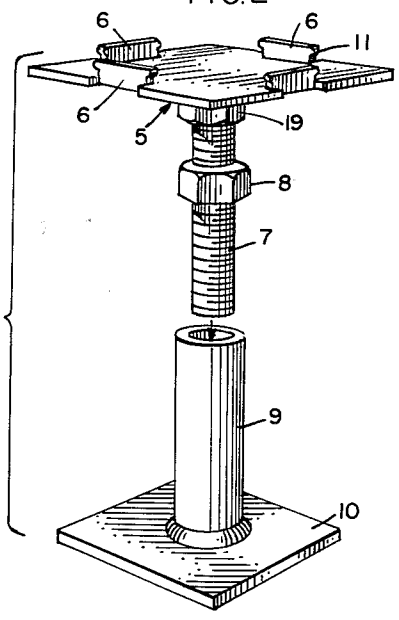


FIG. 3

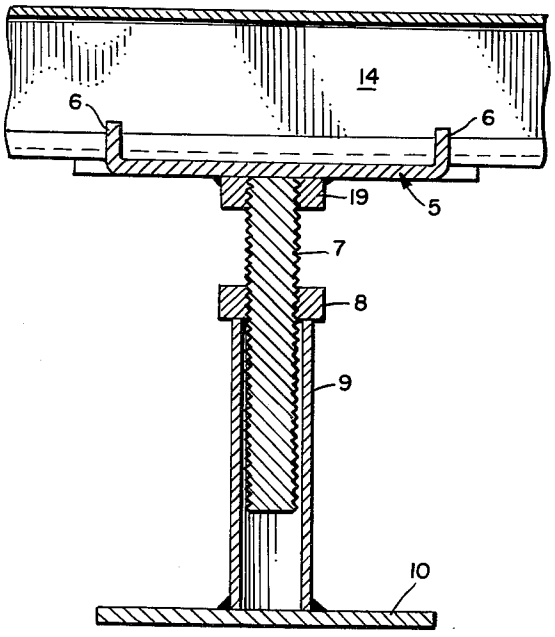
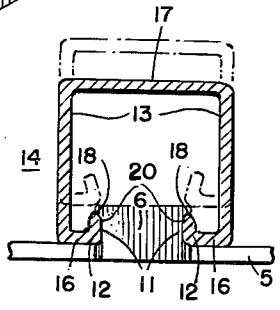


FIG. 4



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FLOOR STRUCTURE ELEVATING DEVICE

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3 Claims. (Cl. 254—100)

The present application is a continuation-in-part of my co-pending application Ser. No. 187,389 filed April 13, 1962 and now abandoned.

The present invention relates to elevated floor structures and more particularly to an improved means of providing a gridwork of framing members in an elevated position. The recent increase in the use of computer and data processing equipment as well as similar heavy electronic equipment has greatly increased the use of elevated and supplemental floor structures. The primary purpose of such a supplemental floor is to provide space between the floors for the complex power and transmission cables necessary for such equipment. Such a supplemental floor structure must meet at least three major requirements. It must be capable of supporting heavy, unequally distributed weight loads. It must maintain absolute level floor conditions to insure proper equipment operation. And it must permit ready accessibility for servicing and rearrangement of the equipment. Provision for such a supplemental floor structure generally is made by providing an auxiliary gridwork of framing members supported on leveling jacks above the normal building floor and by the provision of rigidly structured, removable panels carried by the gridwork.

It is apparent that to meet the first two of these requirements it is necessary to provide a means for securely locking the framing members making up the gridwork to the leveling jacks so that the supplemental flooring cannot be pulled away from the leveling jacks by remotely positioning heavy equipment to produce an unlevel floor. In addition to these requirements it is desirable that the means for securing the framing members to the leveling jacks be such that only a minimum of tools and skills are required to erect the flooring structure.

The present invention provides an improved elevated floor structure combination which includes leveling jacks and channel shaped structural members which form a supporting gridwork for carrying the removable panel members. The leveling jack is provided with a supporting plate having a plurality of upwardly extending ears or lugs. The channel shaped struts are arranged and supported on the supporting plate in a level, abutting relationship. The ears or lugs of the floor leveling jacks extend upwardly into the channels provided in the framing members and engage above inturned flanges provided in the framing members to securely lock the framing members against the face of the supporting plate.

It is an object then of the present invention to improve elevated floor structures by providing an improved floor leveling jack and structural framing member combination assembled to provide a panel carrying gridwork to support heavy, unequally distributed weight loads and to maintain absolute level floor conditions.

It is another object of the present invention to prevent heavy unequally distributed weight loads on an elevated floor structure from pulling the gridwork forming framing members from the floor leveling jacks of such a structure by providing an improved means for securely locking the framing members to the supporting plate of the floor leveling jack.

It is still another object of the present invention to facilitate the erection and assembly of elevated floor structures by providing a floor leveling jack and framing structure gridwork combination in which a minimum of tools and skills are required to securely lock the jacks to the framing structure.

Still further objects and advantages of the present invention will readily occur to one skilled in the art to which the invention pertains upon reference to the following drawings in which like reference characters refer to like parts throughout the several views and in which,

FIG. 1 is a perspective view of an improved floor leveling jack and framing structure gridwork combination of the present invention,

FIG. 2 is an exploded perspective view of the floor leveling jack illustrated in FIG. 1 and with the framing members removed,

FIG. 3 is an enlarged vertical sectional view taken substantially on line 3—3 of FIG. 1, and

FIG. 4 is a fragmentary detailed showing in dashed lines how a framing member first is set on the floor leveling jack of the present invention and in solid lines how it is locked thereto.

Now referring to the drawing for a more detailed description of the present invention a preferred floor leveling jack is therein illustrated as comprising a framing member supporting plate **5** having perimetrically-integrated, locking lugs or ears **6**. The plate **5** is preferably secured to a bolt **7** mounting a nut **8** for telescopical adjustment on a post **9** fixed to a position base plate **10**.

The supporting plate **5** is preferably provided with a planar horizontally extending supporting surface and is preferably constructed of a square section of heavy gage steel, perimetrical portions of which are struck up from the supporting surface to form the lugs or ears **6**. The lugs or ears **6** are preferably located substantially medially of each plate edge and extend above the supporting surface of the plate approximately one-half of an inch. The opposite lateral edges of the lugs or ears **6** are formed with recesses **11** as best seen in FIG. 4.

The framing members **14** are each preferably in the form of elongated channel members having a pair of elongated parallel walls **13** joined by an elongated connecting section **17**. The free longitudinal edge of each of the walls **14** is bent inwardly to form short sections **16** substantially normal to the respective parallel walls **13** and substantially parallel to the section **17**. The free edges of the section **16** are preferably bent inwardly as at **12** to define flange portions **18**. The flange portions **18** are substantially parallel with the walls **13**.

As best illustrated in FIG. 4 the framing members **14** are adapted to be carried on the supporting plate **5** with the surface of the sections **16** in engagement with and supported by the plate **5**. The ears or lugs **6** are dimensioned such that upon movement of the framing members **14** from the position shown in dashed lines in FIG. 4 to the position shown in solid lines the flange portions **18** of the framing members **14** engage beneath the outwardly extending portions of the lugs or ears **6** formed by the recesses **11** so that the framing members are securely locked to the supporting plate **5** of the floor-leveling jack. In this way, as illustrated in FIG. 1, a plurality of framing members **14** are securely locked to the supporting plate **5** in abutting relationship to provide a planar gridwork for supporting removable panels (not shown).

A nut **19** is secured to the underface of the plate **5**. The bolt **7** is screwed into the nut **19** and mounts the nut **8** for contactive positioning on the post **9** with the bolt **7** telescoped into the post **9**. The post **9** is preferably a short section of fairly heavy gage steel tubing bonded at the one end to the base plate **10** substantially centrally thereof. The inside diameter of post **9** is enough larger than the outside diameter of the bolt **7** to permit the latter to easily telescope into the post **9**.

In assembling and erecting the gridwork for the elevated floor structure of the present invention the framing members **14** of the kind herein illustrated and described are preferably laid out on a building floor where the electronic equipment is to be installed for operation. The floor leveling jacks then are assembled and set in place and the nut **8** adjusted to so dispose the plates **5** that when the framing members **14** are secured in place the framework for the supplemental floor will be spaced the desired distance from the building floor. The leveling jacks generally will be approximately 2 or 3 feet apart to accommodate the gridwork to the conventional panels especially structured for supplemental floors of this kind.

Once the jacks have been properly located, the longer framing members **14** will be set along a series of jacks with the inwardly turned flange portions **18** of the framing members **14** resting on the top rounded end of diametrically opposed lugs or ears **6** on the respective plates **5** as shown in dashed outline in FIG. 4. A blow of a mallet on the framing member **14**, directly over each plate **5**, will spread the framing member walls **13** to displace the flange portions **18** at the point of contact with the corner of the lugs or ears **6**, just enough to force the flange portions **18** down into the lug recesses **11** as shown in full outline in FIG. 4.

The longer runs of the framing members **14** being secured in place on the plates **5** of a series of jacks, the short cross framing members **14** then may be set on one of the free lugs **6** of adjacent jacks and forced into locking engagement with the supporting plate **5** as was done with the longest framing members **14**.

In due course, the nut **8** on the respective jacks will be turned to bring the framework into perfect level for the subsequent setting of the floor panels and eventual installation of the electronic equipment.

It is apparent that an elevated floor structure has been provided which can be readily assembled with a minimum of tools and skills. Because the framing members **14** are securely locked to the support plate **5** by the lugs or ears **6**, unequally distributed equipment cannot pull the framing members **14** upwardly away from the support plate **5** and thereby produce an unlevel floor condition. Further, since the framing members **14** are carried in a planar abutting relationship on the upper surface of the support plate **5** the provision of floor panels above the gridwork formed by the framing members **14** will provide a planar floor which can be readily adjusted by the leveling jacks to produce absolute level conditions.

It is also apparent that although I have described but a single embodiment of my invention many changes and modifications can be made therein without departing from the spirit of the invention as expressed by the appended claims.

I claim:

1. In combination

(a) a pair of channel shaped framing members each having a pair of longitudinally extending coplanar inturned flanges, the free edges of said inturned flanges being turned inwardly at substantially right angles to said inturned flanges to define a longitudinal recess therebetween,

(b) a plate having a planar surface for supporting said framing members in abutting and substantially coplanar position,

(c) said plate having a plurality of lugs formed of portions struck upwardly from said plate and extending upwardly from said surface and into said recess, each of said lugs being provided with upper lateral outwardly extending portions dimensioned to embracively engage said free edges of said inturned flanges and to urge said inturned flanges against said surface of said plate,

(d) a positioning base plate, and

(e) a threaded bolt and nut connection interposed between said plates to affect their vertical relationship.

2. A floor leveling jack and framing member combination comprising

(a) a framing member supporting plate having a planar surface for supporting at least two of said framing members in a coplanar and abutting positioning,

(b) said framing members each having a pair of longitudinally extending coplanar inturned flanges, the free edges of said inturned flanges being turned inwardly at substantially right angles to said inturned flanges to define a longitudinal recess therebetween,

(c) means formed of portions struck upwardly from said plate and extending upwardly from said surface and into said recess, said struck upwardly portions being provided with upper lateral outwardly extending portions dimensioned to embracively engage said free edges of said inturned flanges and to urge said inturned flanges against said surface of said plate, and

(d) means for adjusting the vertical position of said plate.

3. The combination as defined in claim **2** and in which said last mentioned means comprises

(a) a positioning base plate, and

(b) a threaded bolt and nut connection interposed between said plates to effect their vertical spaced relationship.

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