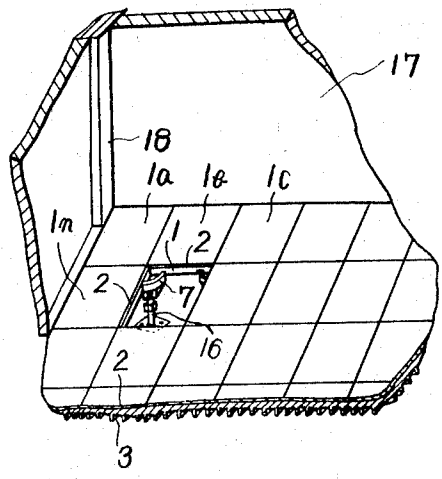
Jan. 3, 1967 TOMONOBU KANNO 3,295,272

RAISED FLOOR CONSTRUCTION

Filed June 1, 1964 3 Sheets-Sheet 1

FIG. 1.



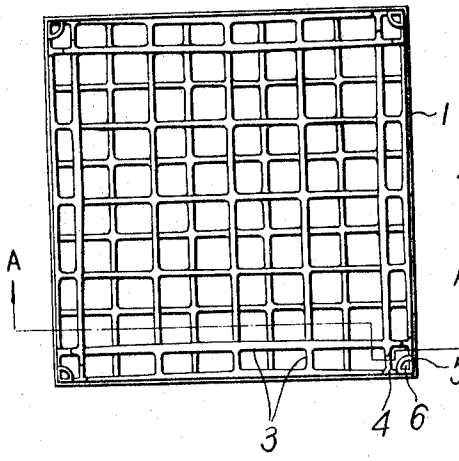


FIG. 3.

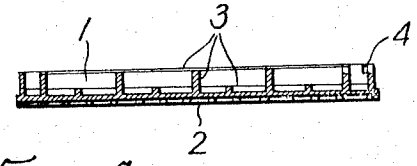


FIG. 4.

Jan. 3, 1967 TOMONOBU KANNO 3,295,272

RAISED FLOOR CONSTRUCTION

Filed June 1, 1964 3 Sheets-Sheet 2

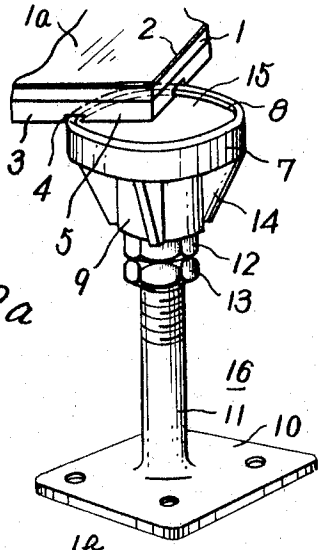


FIG. 2a

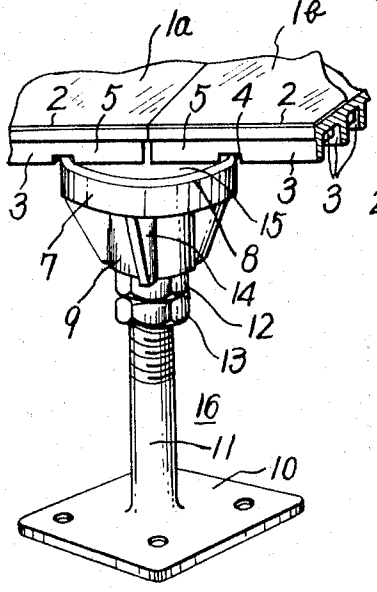


FIG. 2b

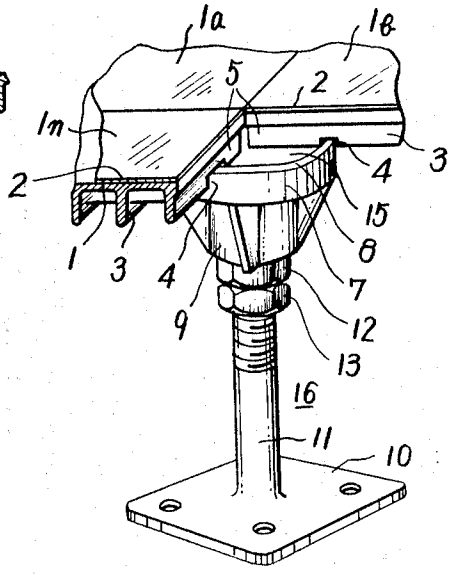


FIG. 2c

Jan. 3, 1967 TOMONOBU KANNO 3,295,272

RAISED FLOOR CONSTRUCTION

Filed June 1, 1964 3 Sheets-Sheet 3

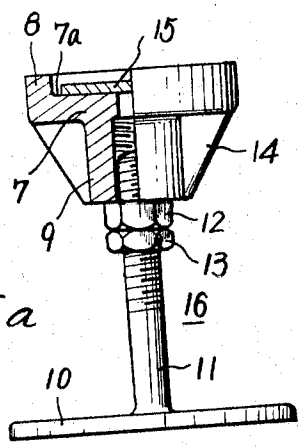


FIG. 6a

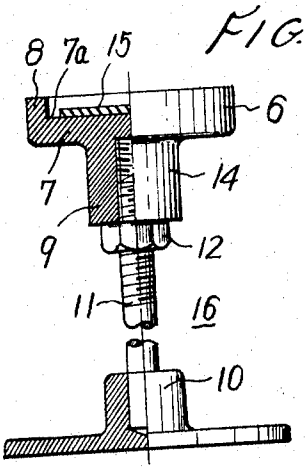


FIG. 6b

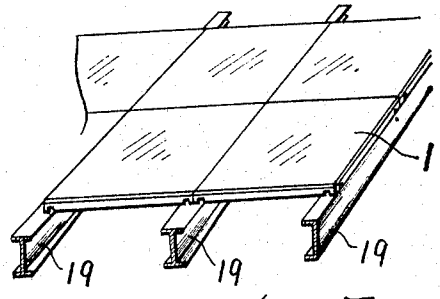


FIG. 7

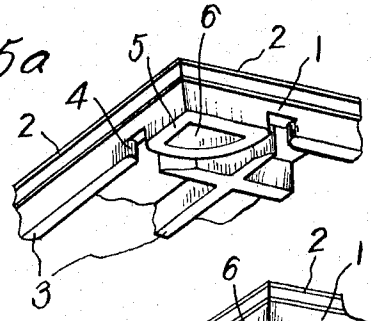


FIG. 5a

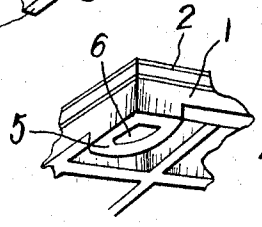


FIG. 5b

United States Patent Office 3,295,272 Patented Jan. 3, 1967

3,295,272

RAISED FLOOR CONSTRUCTION

Tomonobu Kanno, Ota-ku, Tokyo, Japan, assignor to Furukawa Casting Company Limited, Kawasaki, Japan

Filed June 1, 1964, Ser. No. 371,395
Claims priority, application Japan, Aug. 7, 1963, 38/59,046; Dec. 17, 1963, 38/94,028
3 Claims. (Cl. 52—126)

This invention relates to an improved lifted or raised floor panel supporting device, and in particular to a supporting device that affords sound supporting of lifted floor panels.

For making it possible to house various signal and power cables for connecting various electrical apparatus units to each other and to electric power sources in a room, like an electric computer room, wherein the various electrical apparatus units are installed, a lifted or raised floor is constructed by arranging panel shaped layers above an existing floor of a structure, and then underneath the lifted floor, the cables and the like are housed so as to be protected from being damaged and the apparatus room may be put in order. The structure of the lifted floor, any floor panel of which can be removed is called normally a free access type.

This invention relates to a floor panel supporting device that affords supporting of floor panels in the lifted floor of the type as mentioned above.

Heretofore, the lifted floor has been constructed in such a manner that a frame is formed on the existing floor, and this frame is supported by means of a supporting stand which is adapted to be lifted or lowered as desired by using an adjusting screw. Then the frame is paved with square or rectangular floor panels and the lifted floor is arranged to be partially removable. However, such structure of the frame presents difficulty in making and assembling, moreover it is bulky, therefore it has the disadvantage of being not suitable for rearranging the room.

The inventor has already invented a lifted floor panel supporting device wherein by arranging sector-shaped engaging parts at the four corners on the back side of the floor panel and assembling the sector-shaped engaging parts of neighboring panels cylindrically in an abutting manner the sector-shaped engaging part at each corner contacts the neighboring panels so as to form an engaging projection. By holding this projection in a recess of a supporting disc having an axial flange and supporting the end surface of the said projection by means of the bottom surface of the recess, and then supporting the disc by means of a nut on a stud-screw of a stand which is so arranged as to be lifted or lowered as desired by a screw, each of the adjacent panels is engaged at the corner thereof to be supported as a whole. Simultaneously the invention eliminates the above said disadvantages of the prior arts.

The present invention is an improvement of the above mentioned device and provides a novel panel structure that is capable of, not only in the case of supporting the floor panels by means of said supporting disc with a flange but in the case of, for example, a heavy mounting load, being placed on the frame structure of known construction without any modification and supporting satisfactorily a large supporting area. Lower surfaces of ribs provided on the back side of the panel are flushed with the rear surface of the sector-shaped engaging part in order to be able to support these surfaces on the frame with a large pressure receiving area, in other words, sector-shaped engaging slot is constituted by forming the sector-shaped slot, which engages with the flange in the axial direction provided at the periphery of the supporting disc,

at the four corners on the back side of the panel with the apex of the corner as a centre respectively.

For a better understanding of the invention reference is taken to the accompanying drawing, in which,

FIG. 1 is a perspective view illustrating the upper floor of the supporting device embodying the invention,

FIGS. 2*a*, 2*b* and 2*c* are perspective views illustrating the engaging structure of the supporting rod and floor panel,

FIG. 3 is a back view of the floor panel,

FIG. 4 is a sectional view on the line A—A of FIG. 3,

FIGS. 5*a* and 5*b* are perspective views illustrating the engaging portions of the panel in two different forms,

FIGS. 6*a* and 6*b* show sectional elevation of the supporting rod, and

FIG. 7 is a perspective view of the upper floor supported by the frame.

Referring now to the drawings, there are shown floor panels **1***a*, **1***b*, **1***c*, . . . **1***n* . . ., each of which is, as shown in FIGS. 3, 4 and 5, made of a light alloy die-case floor panel coated with a sheet of plastics **2** thereon and is reinforced by intersecting ribs **3** provided on the back side thereof, and then these panels are laid out successively so as to form a lifted floor.

At each of the four corners on the back side of floor panels **1***a*, a quadrant arc-shaped engaging slot **4**, as more clearly shown in FIG. 5*a*, is excavated about the vertex of the corner as a centre. **5** designates the sector-shaped engaging part defined by the arc-shaped engaging slot **4**, and at the central part thereof a hole **6** is provided, **7** is the supporting disc having the flange **8** projected axially therefrom for engaging the arc-shaped slot **4**, this flange **8** engages a cylindrical engaging assembly formed by abutting the said arc-shaped slots **4** of neighboring panels, thereby supporting the end surface of the sector-shaped engaging part **5** by the bottom surface **7***a* of the recess of the supporting disc **7** for coupling the adjacent panels together as well as supporting them. If the end surface of the sector-shaped engaging part **5** is projected downwards from the lower surface of the ribs **3**, as shown in FIG. 5*b*, the slots **4** may be dispensed with.

Now referring to FIG. 6*a*, the supporting disc **7** is provided with a bored boss **9** at the lower surface thereof and is so arranged as to be lifted and lowered freely by means of double nuts **12**, **13** engaged by screw threads onto a stud **11** seceured to a stand base **10**, or it may be so arranged that by cutting screw thread at the interior of the boss **9**, as shown in FIG. 6*b*, the stud **11** engages therewith and the other end of the stud **11** is fitted into a boss provided on the base. **14** designates reinforcing ribs for supporting the disc **7** and **15** is a cushion.

The supporting stand **16** is comprised of the said supporting disc **7**, the said stand base **10**, the said stud **11** and the said nuts **12** and **13**.

According to the invention, the floor panels **1** and supporting stands **16** are prepared as above described and a first floor panel **1***a* is supported by means of the supporting disc **7** and leveling it, as shown in FIG. 2*a* crowning the arc-shaped engaging slot **4** over the flange **8**, then placing an adjacent second floor panel **1***b* next to the first floor panel in such a manner as shown in FIG. 2*b*, engaging the arc-shaped engaging slot **4** thereof with the flange **8**, hence supporting the neighboring panels **1***a*, **1***b* and coupling them together.

In the same manner, laying the floor panels **1** out laterally in order, then after completing the layout of the first line, the next line is started to be laid out with floor panel **1***n*, as shown in FIG. 2*c*, along side the line of **1***a*, and thereby engaging the arc-shaped engaging slot **4** with the flange **8**, then the engaging slot **4** of an adjacent panel is engaged with the remaining part of the flange **8**, hence by repeating this kind of work the lifted floor can

be constructed. FIG. 1 shows the structure of the lifted floor by removing one floor panel, wherein **17** represents a wall and **18** a corner pillar. In the case of utilizing floor panels of the type having no engaging slots **4**, the sector-shaped engaging part **5** is fitted into the recess defined by the flange **8** respectively.

In the case of forming a lifted floor on an existing frame **19**, as shown in FIG. 7, it is enough by laying merely the panels **1** shown in FIG. *5a* out on the frame, since the supporting stands **16** are not necessary in this case, and thereby since the load supporting ribs on the back side of the panels are in flush with the engaging projection **5**, the pressure receiving area will be increased to enable to support heavy load easily.

The invention, constructed as above described, enables easy removal of any one of the panels **1** as desired and it has the advantages of the free access type lifted floor. Further, since the floor panels are coupled and supported directly by means of the supporting stands, the assembling operation becomes extremely simple. Moreover, it has advantage that it is possible to make rearrangement in any room easy. Still further, since each floor panel is supported by contacting the bottom surface *7a* of the engaging recess of the supporting disc with the end surface of the quadrant sector-shaped engaging part **5** defined by the arc-shaped engaging slot **4** at the corners of the floor panel and providing sound coupling by the engagement of the arc-shaped slot **4** with the flange **8** of the supporting disc, the floor panels can be held regardless of rotatable relative position between the supporting disc of the supporting stands and the cylindrical engaging parts and the attaching operation thereof is very easy. Yet further, the production of the supporting stand including the supporting disc is quite simple, and in addition to this, the coupling and the locking of the floor panels are very positive.

What I claim is:

1. A raised floor construction comprising a plurality

of floor panels each of which is provided with at least three sides, an upper surface and a lower surface, a plurality of reinforcing ribs depending from said lower surface and a sector-shaped projection depending from said lower surface of said panel at each corner thereof with the apex of each sector located at the point of intersection of two adjacent sides of said panel and the lower surface of each projection disposed in the same plane as the lower surfaces of said ribs; and a support pedestal having a base, a flat support plate having an upstanding circular flange secured thereto and projecting upwardly therefrom and means adjustably supporting said plate at a desired distance above said base; arcuate groove means formed in said ribs about the arcuate surface of said sector-shaped projections, the radius of said circular flange and the radius of said groove means being substantially equal whereby upon placing a plurality of panels in contiguous planar relation about a central point, said arcuate groove means defines a circular groove adapted to receive said circular flange to support and lock said panels in the proper relative relationship.

2. A raised floor construction as set forth in claim **1** wherein the depth of said groove means and the height of said flange are so related that the lower surfaces of said sector-shaped projections rest upon said flat support plate.

3. A raised floor construction according to claim **2** wherein a plurality of said pedestals are provided one at each point of intersection of a plurality of said panels.

References Cited by the Examiner

UNITED STATES PATENTS

2,867,301	1/1959	Benton	52—263
3,180,460	4/1965	Liskey	52—126
3,236,485	2/1966	Staples	248—188.1

REINALDO P. MACHADO, *Primary Examiner.*