

United States Patent [19]
Harvey

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[45] Feb. 5, 1974

[54] RAISED FLOORING

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[21] Appl. No.: **148,713**

[30] Foreign Application Priority Data

June 8, 1970 Great Britain 27,700/70

[52] U.S. Cl. **52/126, 52/263, 52/539**

[51] Int. Cl. **E04f 13/08**

[58] Field of Search **52/588, 629, 126, 122, 592, 52/593, 263, 541, 595, 585, 586, 390, 391; 292/91, 19, 256, 322**

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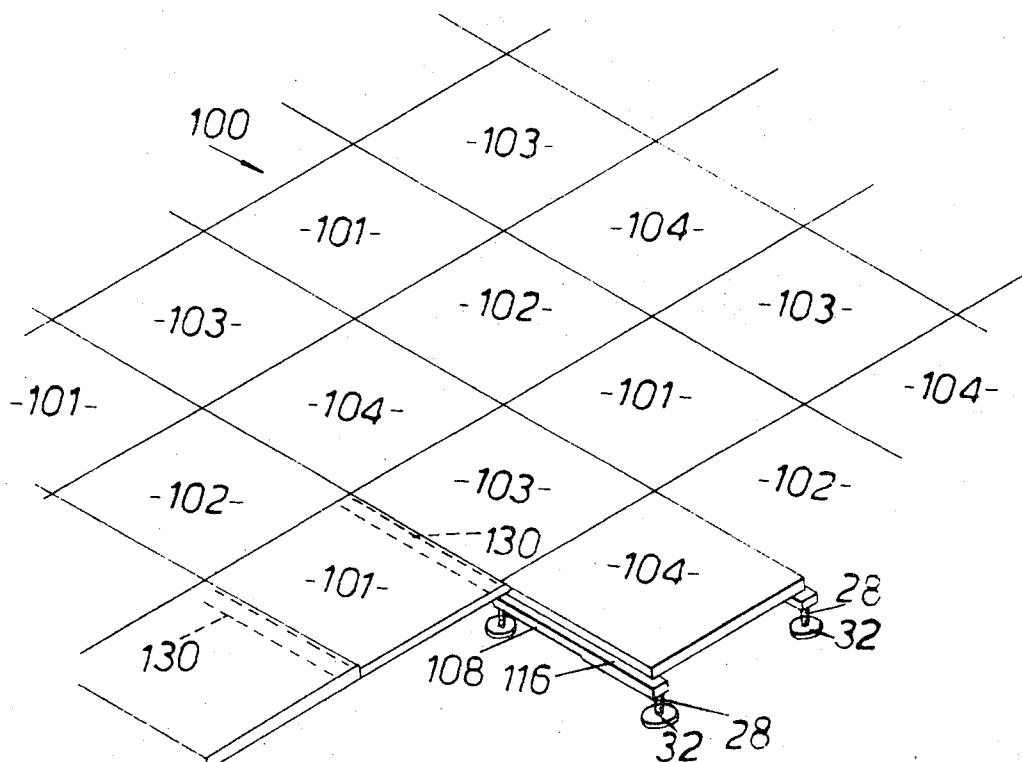
Assistant Examiner—Carl D. Friedman

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[57] ABSTRACT

This invention relates to raised flooring made of a number of flooring panels assembled side by side and to the flooring panels themselves. In the raised flooring according to the invention at least some of the panels are supported on their underfaces by spaced substantially parallel battens, one or more of which have parts which project beyond at least one of the edges of these panels. The battens themselves are supported at these projecting parts on props which are adjustable for length so supporting the panels above the actual floor of the building. The invention also extends to these panels themselves.

19 Claims, 20 Drawing Figures



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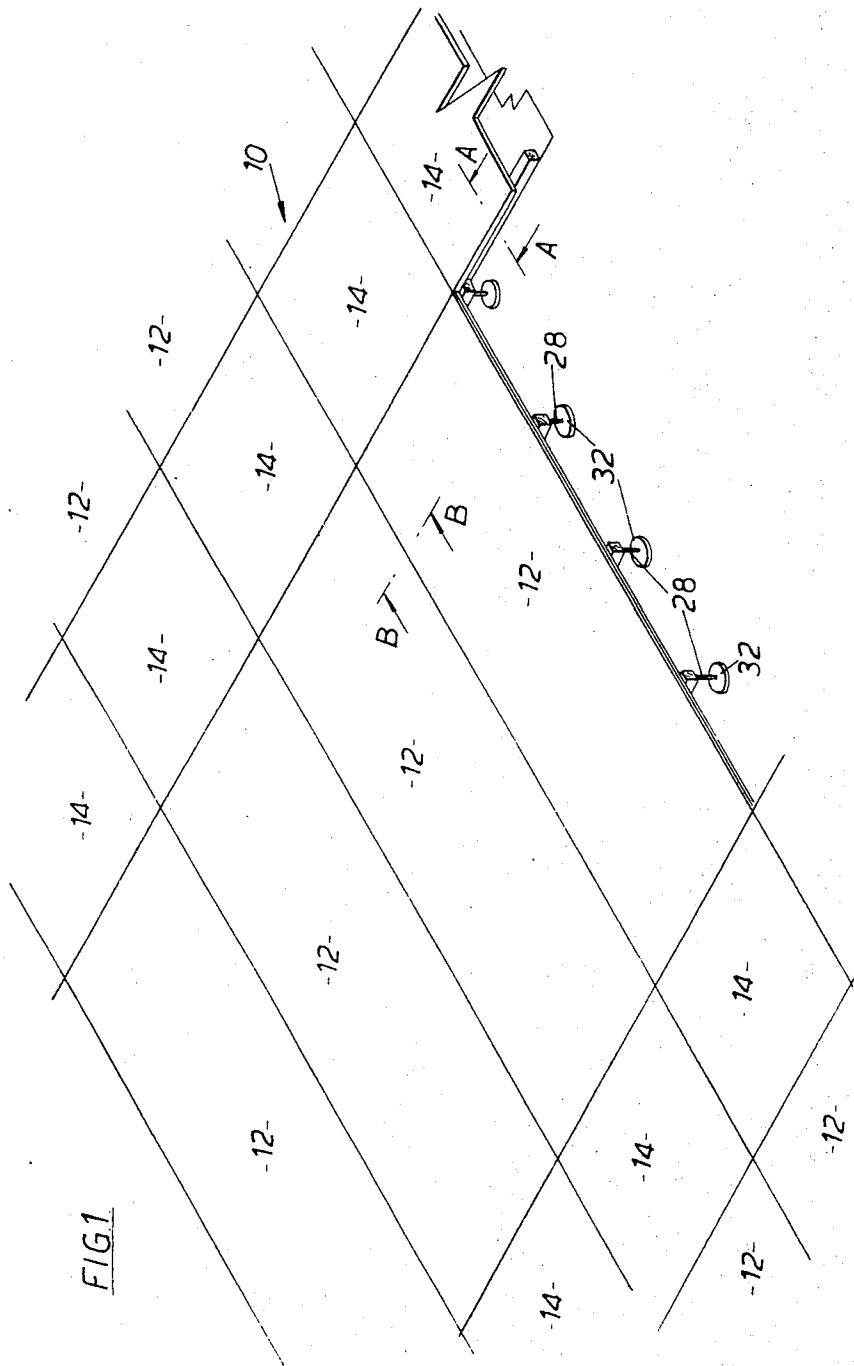


FIG. 1.

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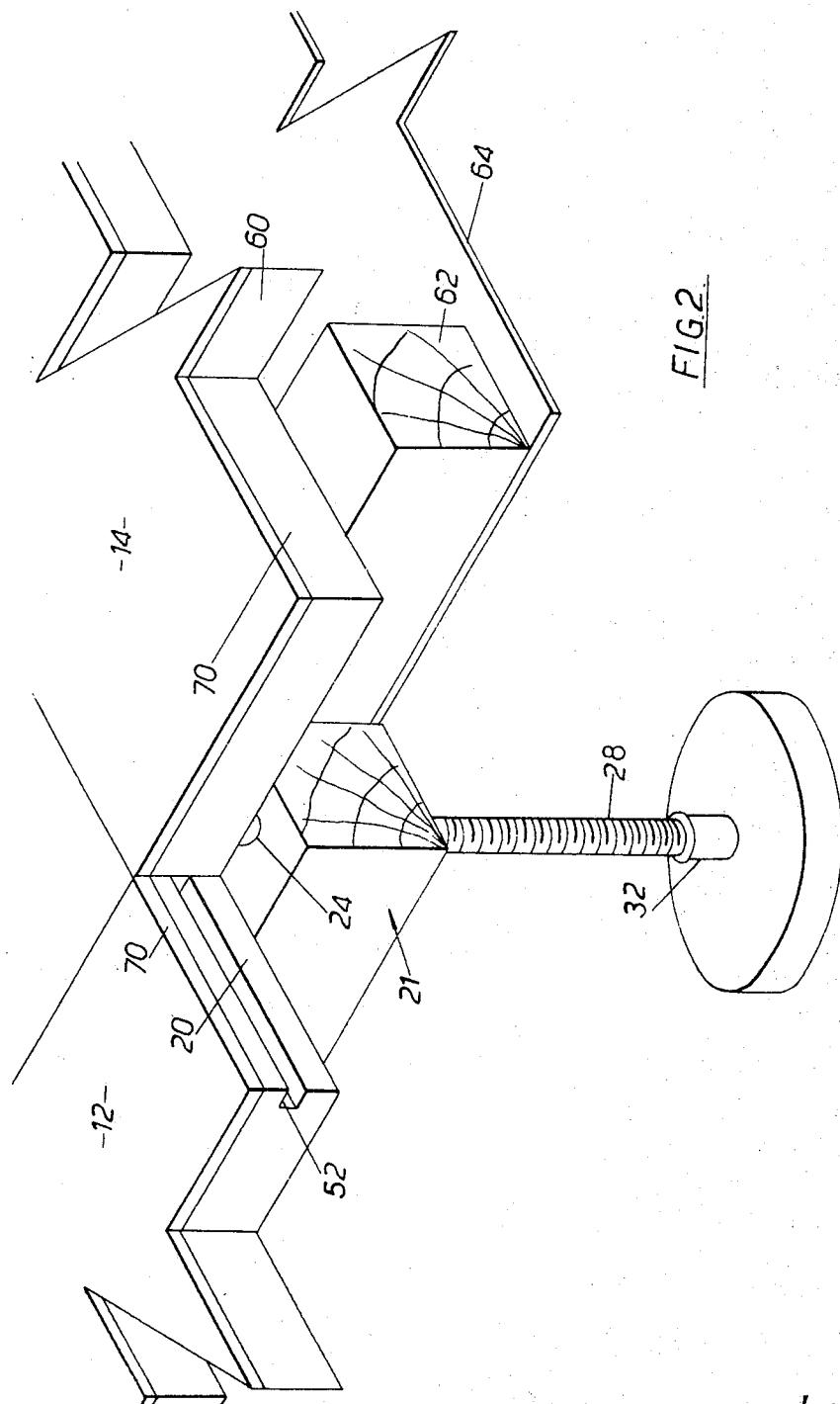
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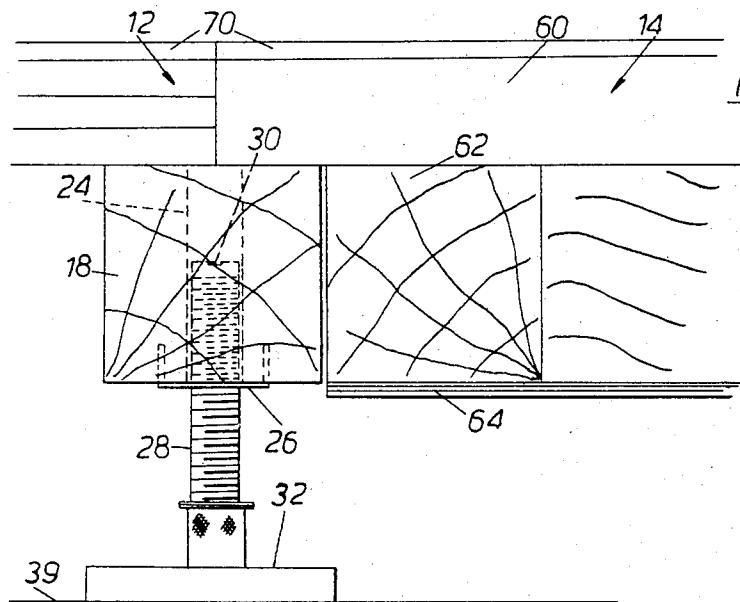


FIG. 3.

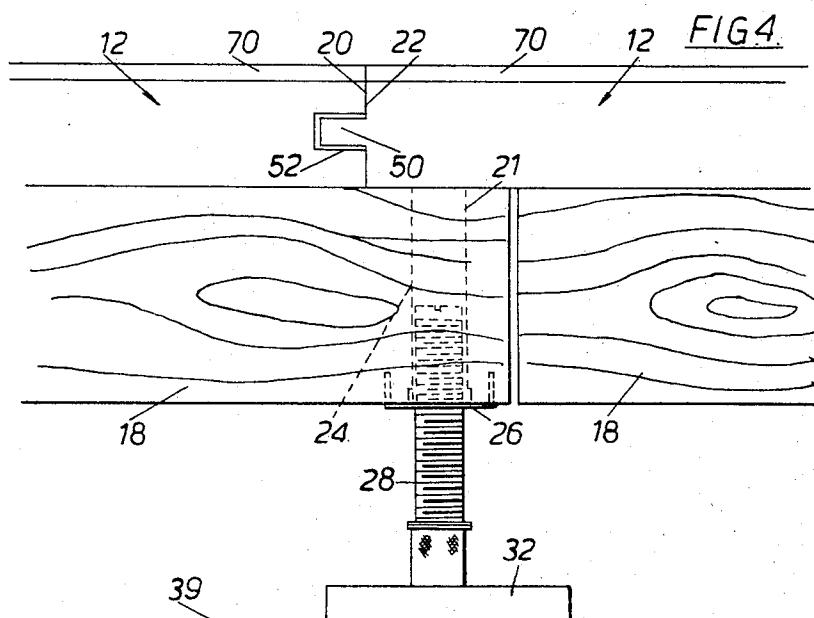


FIG. 4.

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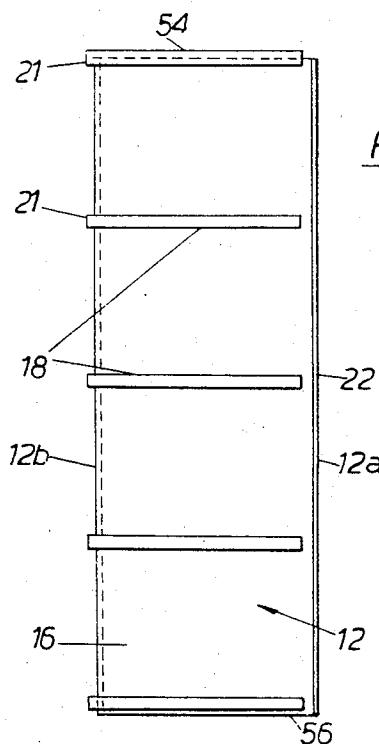


FIG. 5.

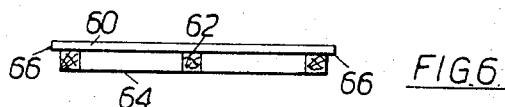
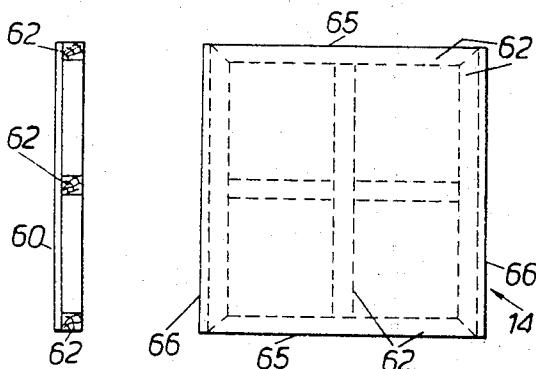


FIG. 6.



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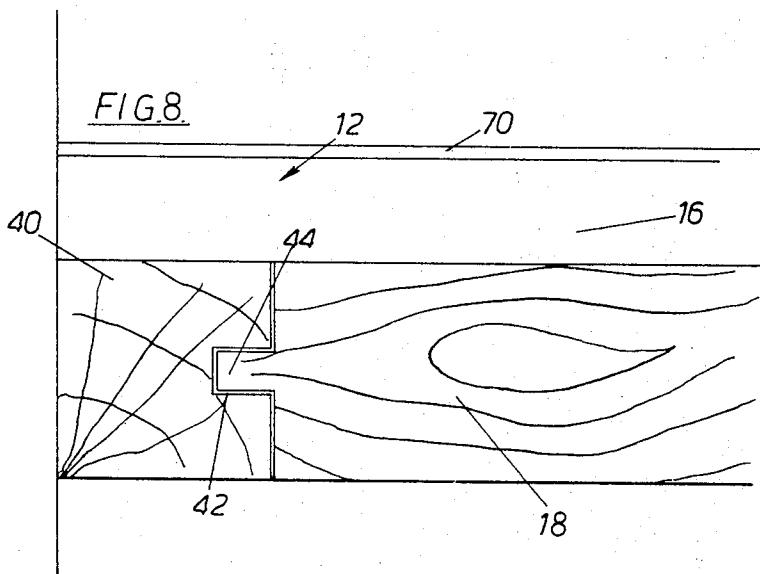
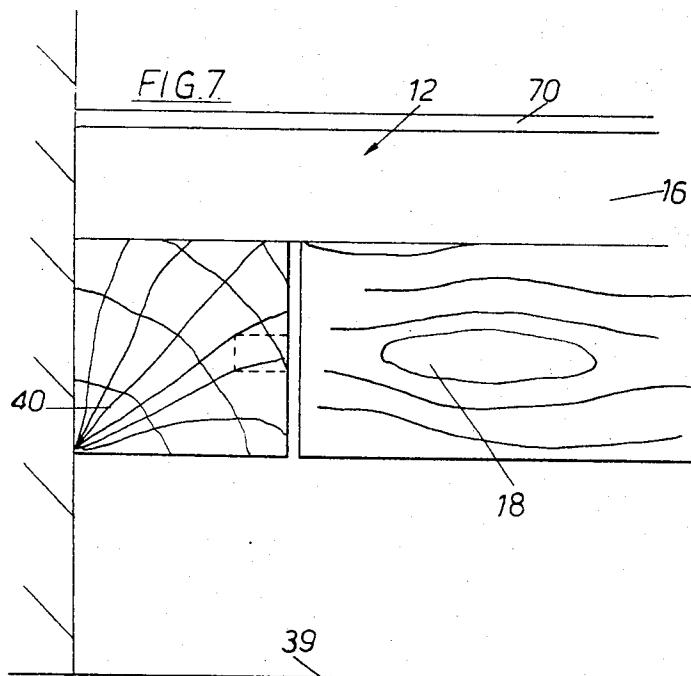
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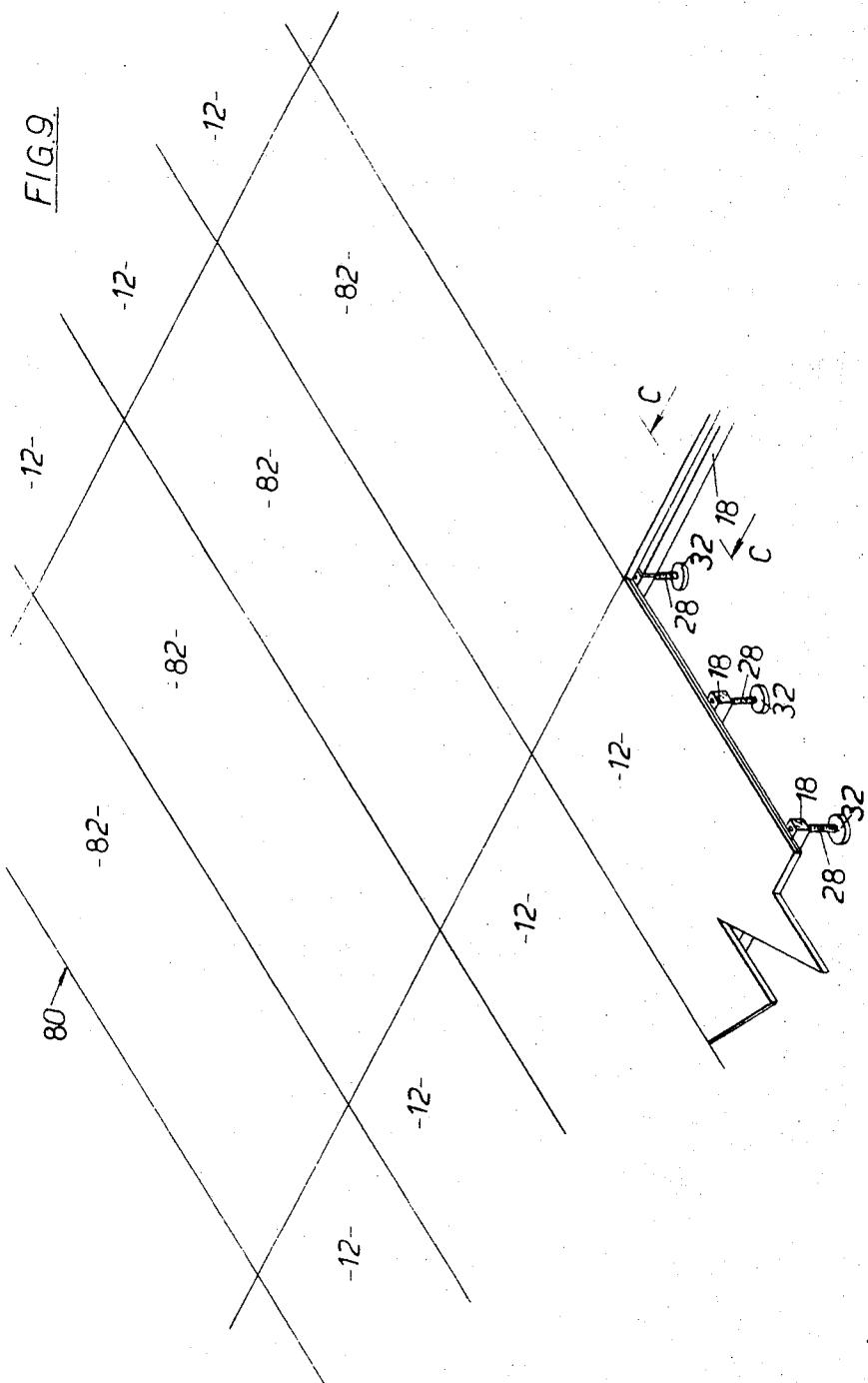
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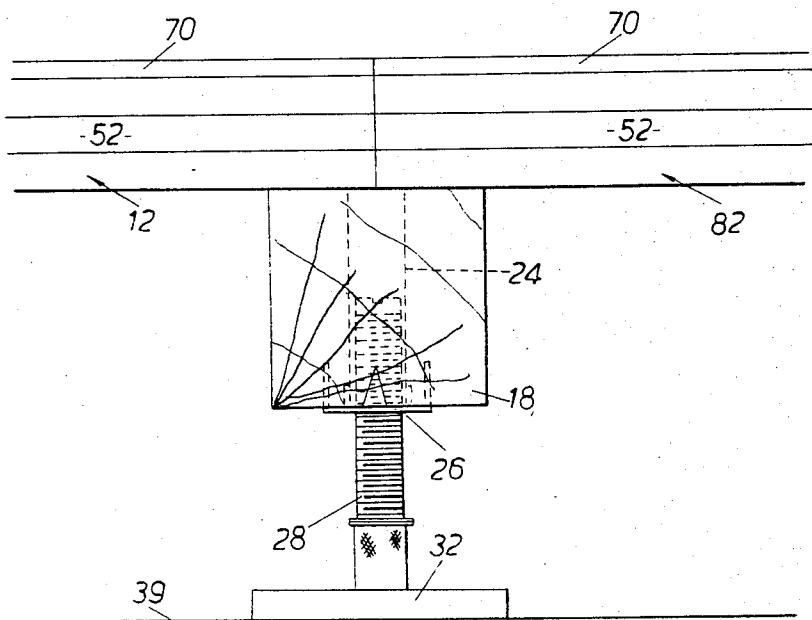
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FIG.10.



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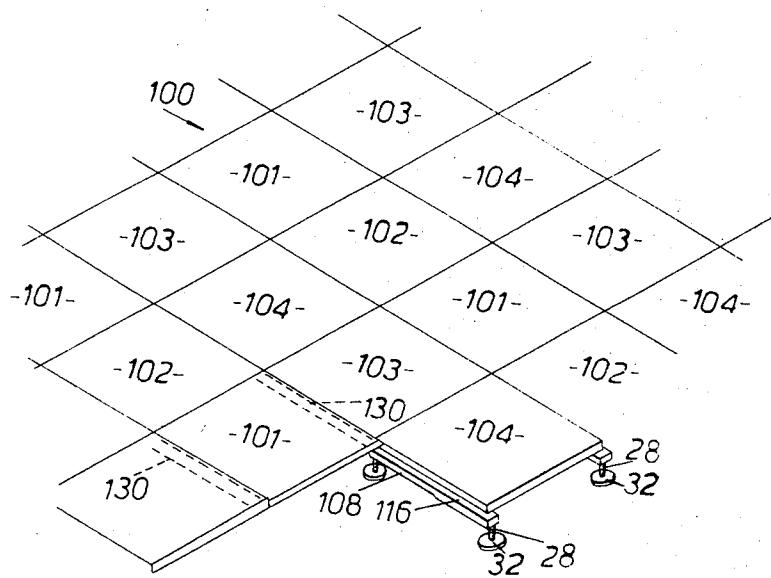
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FIG.11.



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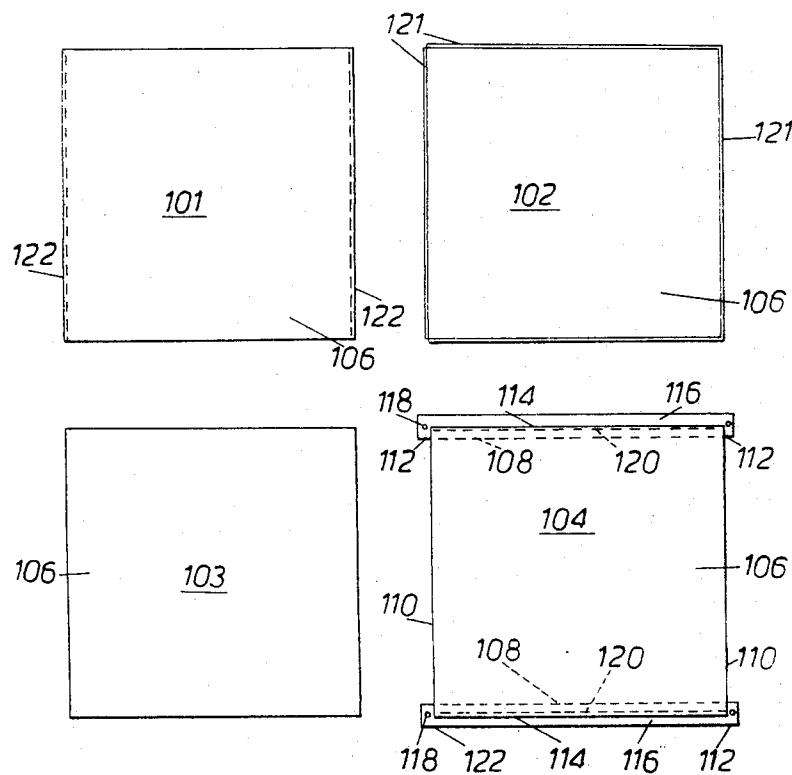
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FIG.12.



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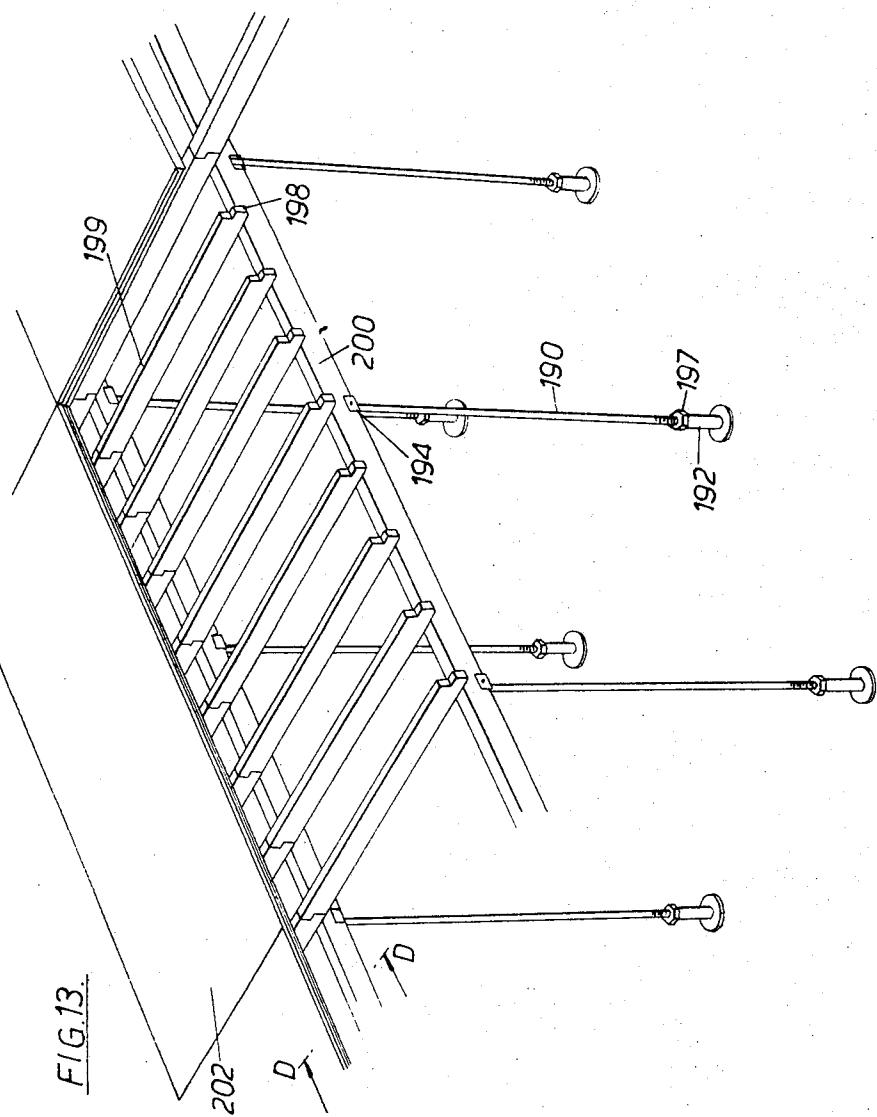
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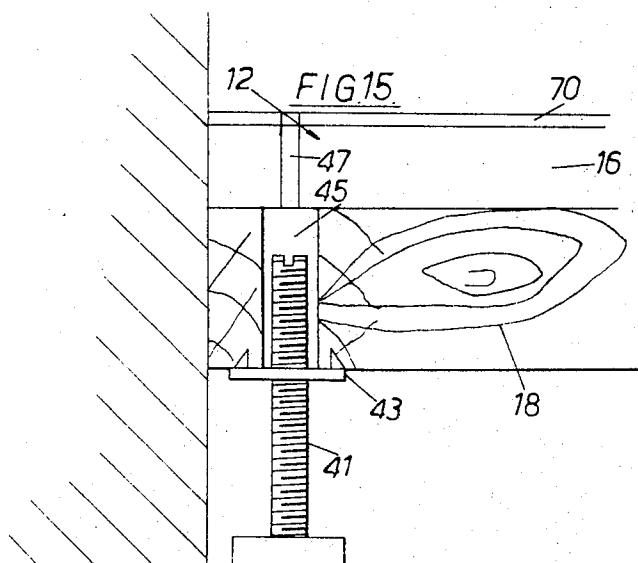
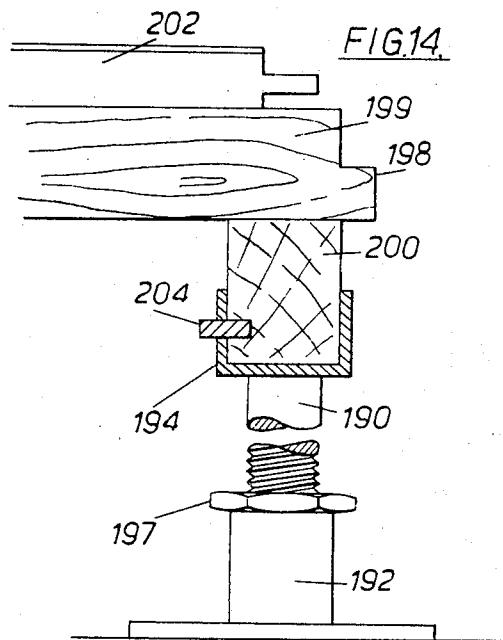
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FIG.16.

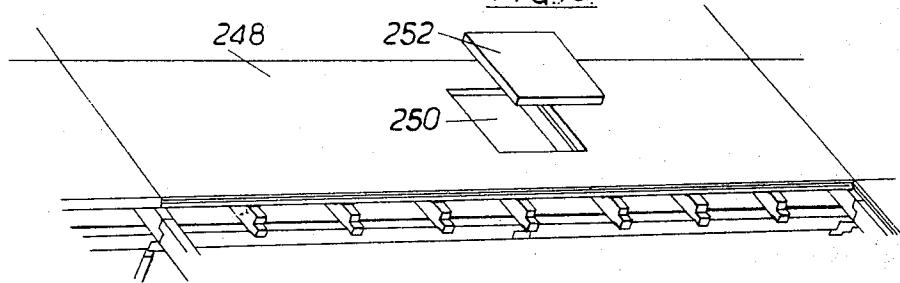


FIG.17.

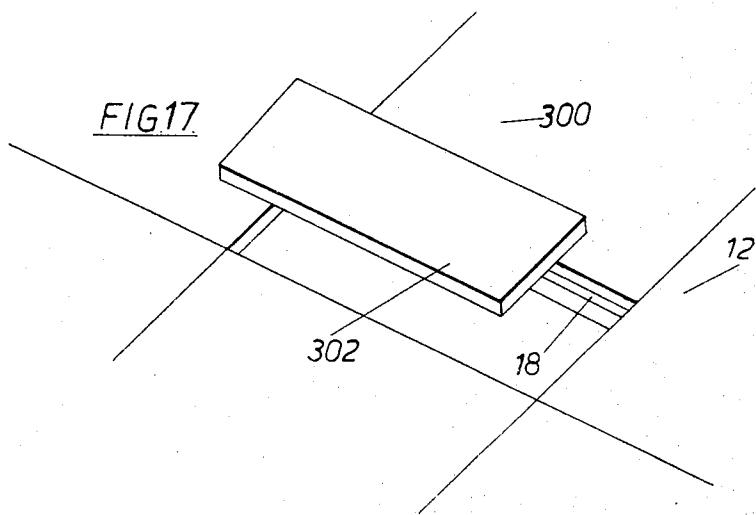
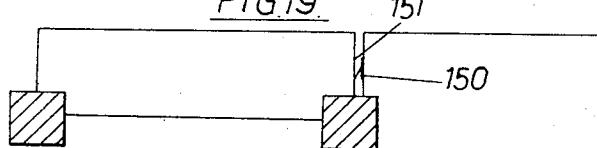


FIG.19.



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FIG.18.

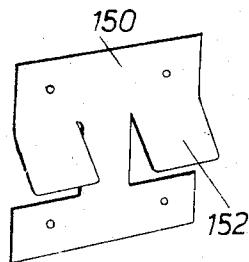
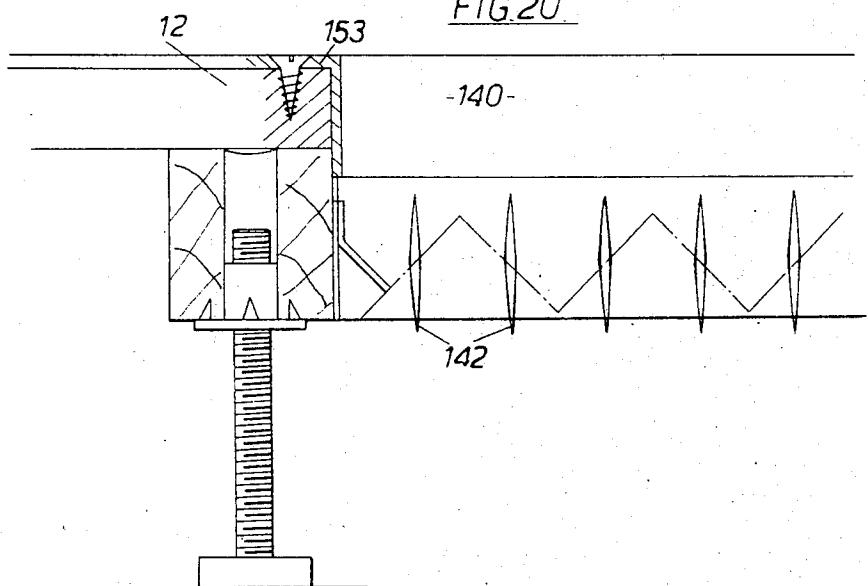


FIG.20.



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RAISED FLOORING

This invention relates to the construction of raised flooring and is particularly concerned with flooring made of a number of flooring panels.

BACKGROUND TO THE INVENTION

In certain cases it is often desirable to provide a raised flooring which is elevated above the actual floor intermediate the actual floor and the ceiling of a room. Particular cases are, for example, offices, gymnasiums, assembly rooms, telephone exchanges and computer rooms, the raised flooring supporting the interior furnishings of the room while in the cavity defined beneath the raised flooring, wiring pipes, air ducts, and other services can be laid where they are hidden from view and do not obstruct passage across the raised flooring.

The invention relates to such raised flooring.

BRIEF DESCRIPTION OF THE INVENTION

According to the invention there is provided a raised flooring which is composed of flooring panels laid side by side with their adjacent edges abutting one another, at least some of the panels being supported on their underfaces by spaced substantially parallel battens, one or more of which have parts which project beyond at least one of the edges of those panels, the battens being supported at their projecting parts on props which are adjustable for length so supporting the panels above the actual floor of the building.

In such a floor the abutting sides of one or more adjacent panels can rest on, and be supported by, the projecting parts of the battens.

Also according to the invention there is provided a flooring panel having attached to its underface a number of spaced battens substantially parallel to one another and to one opposed pair of edges of the panel, one or more of the battens having parts which project beyond at least one of the edges of the panel to provide a support for the side of an adjacent abutting panel, the battens being capable of being supported by props to support the panel above the actual floor of a building.

Such raised flooring is quick and simple to erect and can be relatively inexpensive because the individual flooring panels can be quite cheap. For example they can be manufactured wood composition sheets such as for example, chipboard, blockboard or plywood strengthened by means of the wooden battens. In addition, the raised floor can be made perfectly level irrespective of the inclination or surface finish of the actual floor of the room.

The battens can be supported by props in the region where those battens project beyond the edges of the panels. In addition a suitable support such as a wooden bearer fixed to the wall of the building can be used to support the ends of each line of adjacent abutting panels. Alternatively, the battens can rest on a prop arrangement consisting of beams which are transverse to the battens and which are in turn supported by suitable adjustable height props. These transverse beams can extend beyond the ends of the panels and can stretch right across the room.

The advantage of providing the props supporting the battens in the regions where the battens project beyond the panels is that ready access can be gained to the props during the laying of each panel for adjustment so

as to ensure that each panel as it is laid is perfectly horizontal.

One simple form of prop which has been found to give simple and accurate adjustment comprises a threaded stem which engages a screwed portion in the batten so that rotation of the stem provides adjustment of the length of the stem projecting from the batten and accordingly adjusts the height at which the panel is supported above the actual floor of the building.

Therefore, according to another aspect of the invention there is provided a prop arrangement for a raised flooring comprising a threaded stem screwed into a threaded bush in alignment with a hole extending completely through the batten and the end of the threaded stem is provided with means for engagement with a screw-driver or the like. In this way, the length of the prop can be quickly and simply adjusted by obtaining access from above the batten.

The free end of the threaded stem is desirably provided with an end cap or foot place of a size to suit the particular point load.

In another case the hole through the batten need not extend completely through the batten, if the threaded stem is provided with a head at its lower end, e.g. a hexagonal head so that the stem is in effect a bolt. The head can then act as the foot which rests on the actual floor of the building.

In either case, no special care need be exercised in laying this floor and it can conveniently be a roughly finished concrete floor, while the surface of the raised flooring can be made so as to be very accurately horizontal and level. This advantage is particularly important where the raised flooring is used in a gymnasium and provides a simple way of achieving the required level floor.

In the case where the battens are supported on transverse beams, props are provided whose upper ends can be provided with stirrups in which the beams nest, the props consisting of a stem threaded into a foot resting on the floor of the building thus enabling the height of the props and so that of the floor to be varied to ensure that the raised flooring can be set level. One can, for example use a prop as described in our copending Patent Application No. 61816/69.

In order to keep adjacent abutting edges of the panels aligned with one another a tongue and groove arrangement is preferably provided for at least some of the panels, so that one edge of the panel has a tongue while the opposite edge has a groove so that the tongue of the abutting edge of one panel can project into the groove of the abutting edge of the adjacent panel.

To provide the battens with a good location, the ends of the battens can be suitably shaped, e.g. in the form of half-housings, tongue and grooves, tenons or dovetails, so that the end of one batten is actually engaged with and possibly resting on the end of another.

The raised flooring of the invention can consist completely of a number of rows of identical panels or some panels may be smaller and could serve to provide access to beneath the raised flooring. For example, one could provide alternate rows of abutting panels according to the invention, each of which is identical and comparatively large in area, and alternate rows of abutting identical smaller panels supported by the larger panels. Access panels can also be formed in larger panels.

In the case where all of the panels of the raised flooring are of identical size, one of the battens can extend along one side edge of each panel and so as to project slightly beyond that side edge and provide a ledge onto which the adjacent side edge of the adjacent panel of the next row of panels can rest. Raised flooring of this type is extremely useful in gymnasiums and meeting halls where a level floor is required and frequent access to beneath the flooring is not required. Alternatively if access to beneath the raised flooring is required fairly frequently, the panels of alternate rows of panels can have battens extending along each side edge so as to project slightly beyond those side edges and provide ledges onto which the adjacent side edges of the panels of the two adjacent rows can rest. In this case, the panels of the adjacent rows will not have battens extending along their opposite side edges.

In the case where the panels of adjacent rows are of differing sizes, the larger panels can suitably have battens extending along each side edge so as to project slightly beyond those side edges and provide ledges onto which the adjacent side edges of the smaller panels of the adjacent rows can rest. The smaller panels need not be provided with battens, supporting props or tongued edges and can consist of an upper sheet reinforced by suitable wooden stringers if necessary, the panels being completed by a thin lower sheet of, for example, plywood. Preferably, the panels consist of a sheet of solid plywood, since such panels do not warp. The advantage of this raised flooring, is that quick access can be obtained to beneath the raised flooring by lifting the smaller panels. Accordingly, telephone cables, electrical wires and the like can be hidden beneath the flooring and outlet points provided as required through the flooring. This is very convenient in offices where a rearrangement is required.

In another embodiment of the invention, the panels are all of the same size and are preferably relatively small in area. One in four of the panels is provided according to the invention with the battens and these project beyond all four sides of each of the panels. The remaining panels are then supported on the projecting parts of the battens of the panel provided with them. Some of the edges of the panels are desirably provided with tongue and groove arrangements so as to assist in holding the panels together. Preferably, however, one in four of the panels is plain and is capable of removal from the finished floor to obtain access to beneath the raised floor. If the panels are quite small in area, this embodiment provides ready access to beneath any part of the raised floor and so is extremely useful in say, offices, where telephone points and electrical points need to be moved from time to time.

Naturally raised flooring according to the invention can be made by combining panels as required by any particular circumstances.

The exposed surface of the raised flooring can be covered or finished as required by the particular circumstances. Thus each panel can have a polished, carpeted or tiled upper surface or alternatively the finished complete flooring can be carpeted in conventional fashion.

An air grille with associated dampers can be provided in the panels at desired intervals along the flooring. The grille sits in a hole in the panel and has edges which extend onto the upper surface of the abutting panel being

arranged so that the grille is flush with the panel or with carpeting or tiles covering the panels.

The damper is attached below the grille and can consist of vanes which can be opened or closed so as to regulate the passage of air from the cavity below the raised flooring, through the damper and grille, into the room above.

A fire sheet, preferably made of steel or an aluminum foil can be applied to the underside of the battens and is provided with holes through which the props pass.

Any panels which are to be removable for access to beneath the flooring can be retained in position by one or more spring clips, each of which consists of a small metal plate suitably attached to the edge of an adjacent holed panel and having resilient flaps which bite into and retain the access panels until a flat plate or the like is inserted to bend them clear of the access.

20 BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

25 FIG. 1 is a perspective view of one arrangement of raised flooring according to the invention;

FIG. 2 is an enlarged perspective detail of the flooring showing FIG. 1;

FIG. 3 is an enlarged cross-sectional detail taken on the line A—A of FIG. 1;

FIG. 4 is an enlarged cross-sectional detail taken on the line B—B of FIG. 1;

30 FIG. 5 is an underplan view of one of the panels used in the flooring shown in FIG. 1;

FIG. 6 is a plan, end and side elevation showing the construction of another of the panels used in the flooring shown in FIG. 1;

35 FIGS. 7 and 8 are enlarged sectional details showing two different ways of attaching the flooring to the wall of a building;

FIG. 9 is a perspective view similar to FIG. 1 of another arrangement of raised flooring according to the invention;

40 FIG. 10 is an enlarged sectional detail taken on the line C—C of FIG. 9;

FIG. 11 is a perspective view similar to FIG. 1 of a further arrangement of raised flooring according to the invention;

50 FIG. 12 shows in plan the four different types of panel used in the flooring shown in FIG. 11;

FIG. 13 is a perspective view of another arrangement of raised flooring according to the invention;

FIG. 14 is a detailed cross-section taken on the line 55 D—D of FIG. 13;

FIG. 15 is an enlarged sectional detail shown a way of support the flooring adjacent a wall of a building;

FIG. 16 is a perspective view of another type of access panel for use in the raised flooring of the invention;

FIG. 17 is a perspective view of yet another type of access panel for use in the raised flooring of the invention;

60 FIG. 18 is a perspective view of a spring clip for use in the raised flooring of the invention;

FIG. 19 is a detailed cross-sectional view showing the spring clip positioned to hold an access panel in place;

FIG. 20 is a cross-sectional view of an air grill and associated damper for use in the raised flooring of the invention;

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The raised flooring 10 shown in FIG. 1 to 4 comprises large panels 12 and smaller panels 14. The larger panels 12 are, for example 8 feet \times 2 feet in size and are laid in a row side by side with their long edges abutting. The smaller panels 14 are, for example, 2 feet \times 2 feet in size and are laid in abutting rows which alternate with the rows of panels 12.

As best shown in FIG. 5, each panel 12 comprises a sheet 16 of, for example, chipboard, blockboard or plywood. Wooden battens 18 are fixed, for example, by pinning to the underface. The battens 18 are spaced and parallel to one another and to the shorter edges of the sheet 16. They project past one edge 20 of the sheet 16 by a small projecting length 21 and they extend towards, but stop short of, the opposite side edge 22 of the sheet.

Through the small projecting lengths 21 are provided holes 24. In alignment with these holes and in the under-side of the battens are positioned pronged T-nuts 26. Threaded into the latter are threaded stems 28 having a slot 30 in their end for the reception of a screwdriver to adjust the extent by which they extend from the battens. Alternatively, in place of the slot 30, the stem can have a suitably shaped head which can be engaged with a spanner, Allen key or the like. The free ends of the screws 28 are fixed to foot plates 32.

To assemble the panels 12 one initially attaches a horizontal timber bearer 40 to the wall of the building in any convenient fashion (FIG. 7). Then the edge 22 of the panel 12 is laid on and supported by the bearer 40 and fixed in place by for example nails. Alternatively one could provide a groove 42 in the bearer 40 and corresponding tongues 44 on the battens 18 to fix the panels 12 in place as shown in FIG. 8. Instead of providing the bearers 40, the panels 12 abutting the wall can be as shown in FIG. 15 with the battens 18 flush with the edge of the sheet 16. Suitably threaded stems 41 are threaded into nuts 43 fixed in alignment with holes 45 through the battens 18. In addition, a small hole 47 is provided through the sheet 16 to enable a screwdriver to engage the slot in the stem 41 to adjust the height of the panel. The opposite edge 20 of the panel 12 is supported by the stems 28.

The panel is next adjusted to make its top surface exactly level by rotating the stems 28 by means of a screwdriver spanner or the like inserted through the holes 24 or by rotating the foot plate 32.

Once the first panel has been accurately set up, the next one is laid alongside with its edge 22 adjacent to the edge 20 of the first panel. The edge 22 rests on the projecting lengths 21 of the battens 18 and is supported by them. This panel is then made level in the same way as the first panel. This procedure is, of course, then repeated right the way across the room.

As can be seen, flooring assembled this way can be quickly and easily built. In addition it is cheap because the panels are simple and can be constructed of relatively cheap materials. It will be seen, however, that the flooring can be made very accurately horizontal irrespective of the nature of the actual floor 39, of the building. The cavity defined beneath the floor can be

used for a number of purposes included amongst which are space for electrical and telephone wiring, water pipes and ventilation air ducts.

In order to keep the panels positively butted together 5 the edges 22 may be provided with tongues 50 which are inserted into corresponding grooves 52 in the edges 20 of adjacent panels. For the panel 12 shown in FIG. 5 the opposite edges 12a and 12b are tongued and grooved, respectively. One could, however, in addition 10 provide the shorter edges 54 one with a tongue and the other with a groove.

The raised flooring 10 can be completed in this way by arranging a number of rows of panels 12 side by side in the fashion described. If this is the case, it is preferred that one of the battens 18 should extend past one of the shorter edges 54 (FIG. 5) of each panel. This will then form a ledge on which the opposite edge 56 (FIG. 5) can rest. Alternatively the flooring 10 can be completed as shown in FIG. 1 with alternate rows of panels 12 and smaller panels 14 in which case battens must extend past both edges 54 and 56.

Each panel 14 (FIG. 6) consists of a top sheet 60 of, for example, the same material as the sheet 16. To this sheet 60 are fixed reinforcing battens 62, and beneath them are provided a thin plywood sheet 64 to close the panel.

As best seen in FIG. 6, two opposed battens 62 extend right to the opposite edges 65 of the sheet 60 while 30 the other two opposed battens 62 are spaced a short distance of the opposite edges 66 of the sheet. In addition, in each panel 12, the end battens 18 extend past the edges 54 and 56 (FIG. 5) to provide ledges onto which the edges 66 of the sheet 60 can rest.

The flooring shown in FIG. 1 is made up by assembly 35 rows of the panels 12 in the way described above, leaving spaces between the rows equal to the width of the panels 14. The flooring is then completed by laying the panels 14 on the ledges provided by the end battens 18 of the panels 12.

Such a flooring has the advantage that wires, pipes and the like can be laid beneath the rows of panels 14 and ready access can be obtained by simply raising the 45 small panels 14 and not disturbing the panels 12 whose, horizontal alignment has been accurately set up. Even if wiring is provided beneath the rows of panels 12 and say an electric point is needed in the middle of a panel 12 it is not too difficult to do this without disturbing the panels 12 because access can be gained via the panels 14. This is particularly advantageous when the flooring is used in office accomodation.

Each panel 12 and 14 may have its own floor covering 50 finish 70 i.e. each may have a polished, carpeted or tiled upper surface.

The modified form of flooring 80 shown in FIGS. 9 and 10, is made up of alternate rows of panels 12 which are identical with the panels 12 previously described and shown in FIG. 5, and rows of panels 82. These are 60 of the same size as the panels 12 but have fewer battens 18. In fact, the end pair of battens 18 are omitted from the panel 12 shown in FIG. 5 to give a panel 82 and these panels rest on and are supported by the panels 12 in the same way as the panels 14. In addition, however, 65 they have intermediate battens 18 with the supporting stems 28 which act in the same way as with the panels 12.

This raised flooring 80 is useful in, for example, gymnasiums and meeting halls where access to beneath the flooring is not required after assembly.

The raised flooring 100 shown in FIGS. 11 and 12 is composed of four different types of panel, 101 to 104. Each panel is of the same overall size and is comparatively small, say 2 feet \times 2 feet.

The panels 104 are basically similar to the panels 12 described in connection with FIG. 1. Each panel comprises a sheet 106 of, for example, chipboard, blockboard or plywood. To the rear of this are fixed, for example, by pinning, two spaced parallel wooden battens 108. As best seen in FIG. 12, each batten projects past the opposed edges 110 of the sheet 106 by small lengths 112. In addition each batten extends beyond the other edges 114 of the sheet 106 to provide ledges 116. In the lengths 112 are provided holes 118 and threaded stems 18 identical with those previously described. The stems 28 are, of course, supported on pads 38 and can be adjusted as described previous to make the panels 101 level. The edges 114 are provided with grooves 120.

The other panels 101 to 103 consist solely of sheets 106 with the exception that certain of their edges are tongued and grooved. All of the edges of the panels 102 are provided with tongues 121, none of the edges of the panel 103, which is to be an access panel, are tongued or grooved, while the opposed edges 122 of the panel 101 are provided with grooves 124.

To assemble the flooring 100, the panels 104 are positioned and levelled in the way described in connection with the panels 12. Next the rows containing the panels 101 and 102 are completed by correctly engaging in the grooves 124 of the panels 101 the tongues 121 of the panels 102 and engaging the remaining tongues 121 of the panels 102 in the grooves 120 of the panels 104. In addition, of course, the panels 102 are supported on the ledges 116 while the panels 101 rest at their four corners on parts of the lengths 112. Finally, the flooring 100 is completed by inserting the plain access panels 103 into the remaining spaces and these panels 103 rest at their four corners on the remaining parts of the lengths 112. If desired, additional support can be given to the panels 103 by provided battens 130 on the panels 101 which project beyond the sides of the panels 101 to provide ledges onto which the panels 103 rest.

As will be seen the flooring 100 has the advantages of giving a level even floor and cheapness and simplicity of assembly as described in connection with the flooring 10 and 80. In addition, however, the flooring 100 has the advantage that quick and simple access can be obtained to beneath the flooring 100 by removing the panels 103. If the size of the panels is 2 feet \times 2 feet, then by removal of the appropriate panel 103, one has to reach at a maximum no more than about 1 foot under the flooring 100 to obtain access to any point under the floor. Because of this, the flooring 100 is particularly useful in situations, e.g. offices where fairly frequent access to beneath the flooring 100 is required, for example, to change the position of telephone or wiring points.

Naturally the panels 101 to 104 can be provided with suitable finishes 70 as described previously.

The positions of the tongues 121 and grooves 120 and 124 can be changed around from the positions described provided tongues and grooves mate correctly in

the finished floor and one of the panels is left free for removal as an access panel.

The flooring shown in FIGS. 13 and 14 consists of rows of panels 202 which can be identical to the panels 12 previously described in the flooring of FIG. 1. These panels rest on spaced parallel battens 199 the ends of which are shaped in the form of half-housings 198. This enables one end of each batten to rest on the end of an adjacent batten whilst the other end of the first is supported by parallel beams 200 extending transversely of the battens 199.

The beams 200 themselves are supported in position by props 190 which are spaced at regular intervals along the beams, and suitably one prop is provided at every half-length of the panel.

The upper ends of each prop 190 has a stirrup 194 in which the beam nests, the beam being secured in the stirrup by a small dowel 204, screw or the like. The lower end of each prop is threaded and screws into a foot 192. By changing the extent to which the threaded prop protrudes from the foot, the length of the prop can be varied and the set height can be fixed by a lock-nut 197.

The panels 202 can be attached to the battens 199 either during manufacture or during the construction of the raised flooring.

The thickness of the beams 200 is chosen to suit the loading requirements of the raised flooring and other factors such as the distance between the beams.

In each of the embodiments described in connection with the flooring of FIGS. 1 to 12, the ends of the battens 18 can be shaped in the form of half-housings as shown for the battens 199 described in connection with the flooring shown in FIGS. 13 and 14. This gives the battens an improved location and thus increases the stability of the raised flooring.

In the embodiments shown in FIG. 1 to 12 the flooring need not be supported by the threaded stems 28 screwed into T-nuts in the battens, but can be supported by props such as the props 190 shown in FIGS. 13 and 14.

It is desirable to provide for access to beneath the raising flooring. In all embodiments described this can be achieved in a number of ways.

For example, as shown in FIG. 16 some panels can be similar to the panel 248 for access to beneath the flooring shown in that figure. That panel 248 is similar to the panel 12 shown in FIG. 5 but has an access hole 250 within which is normally filled an access panel 252 having dimensions much smaller than any of the dimensions of the fixed panel 248. This access panel is preferably made of a piece of plywood to prevent warping.

Alternatively, some of the panels preferably smaller in size than the other panels of the floor, can constitute access panels. For example, as shown in FIG. 17, the flooring can consist of normal panels 12 (FIG. 12) together with slightly shorter panels 300 which are similar to the panels 12, and a plain access panel 302 consisting preferably of a sheet of plywood. The panel 302 will of course be supported by the projecting edge of the battens 18 of the panels 12 and 300.

Any panels which are to be removable for access to beneath the flooring can be temporarily secured in position by spring clips 151 as shown in FIG. 18. Each clip, as shown in FIG. 19 consists of a flat metal plate 150 having resilient metal flaps 152. As shown in FIG. 18, the clips are fixed to the edges of the fixed panel

and when the panel is put in place the metal flap 152 is resiliently deformed by the edge of the access panel but the access panel is allowed to slide into place. The access panel is, however, retained by the metal flap 152 which bites into the edges of the access panel and holds it in place. In the event that an access is to be removed, a flat blade is inserted between the access panel and the flap thus forcing the flap 152 flat and so enabling the panel to be withdrawn.

A fire sheet can be provided which is attached to the lower surface of the battens or floor panel. This sheet is preferably made of a non-combustible material such as steel or aluminium foil, and can be provided with holes through which the props pass. This improves the fire resistance of the flooring.

The flooring according to the invention forms a good seal with the wall of the building and so one has an enclosed sealed region beneath the flooring. This can be used with advantage to provide ventilation and heating by positioning air grills as shown in FIG. 20 in various panels. The air grill consists of a duct 140 which fits within a hole in a panel 12. Across the duct are dampers 142. The duct has edges 153 which are screwed to the panels 12 to fix the grills in place, flush with the flooring.

The dampers 142 can be rotated on axes parallel to the panels. To vary the amount of air passing through the grill the dampers can be rotated between completely open positions when the dampers are vertical, and closed positions when the edges of the vanes touch one another and thus prevent the passage of any air as shown by broken lines in FIG. 20.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

I claim:

1. A raised flooring which is composed of flooring panels laid with adjacent edges of adjacent panels abutting one another, each of said panels having a top face, an underface and opposed pairs of edges extending between said top face and said underface, at least some of said panels being composed of one piece lengthwise and widthwise of said panel, and said panels having on their undersides spaced substantially parallel battens which have been attached to said panels prior to assembly of said raised flooring, at least one of said battens having a portion which projects beyond at least one of the edges of said panels to a region along the underside of an adjacent abutting panel to provide support for the edge of said adjacent abutting panel, said battens being directly supported by props which are adjustable in height to support said panels above the actual floor of a building, the props supporting said battens at the projecting portions of said battens.

2. A raised flooring according to claims 1 in which said props comprise a threaded stem screwed into a threaded bush or nut in alignment with a hole in said batten.

3. A raised flooring according to claim 2 in which said hole extends through said batten and the end of said stem is provided with a slot for engagement with a screwdriver for adjustment of the height of said prop.

4. A raised flooring according to claim 2 in which said hole extends through the batten and the end of said stem is provided with a shaped head which can be engaged with a spanner, Allen key or the like.

5. A raised flooring according to claim 1 which is supported by a prop arrangement consisting of transverse beams on which said battens rest, said beams being in turn supported by props.

6. A raised flooring according to claim 1 further comprising removable access panels provided in on at least one of said flooring panels.

7. A raised flooring according to claim 6 further comprising at least one spring clip which temporarily retains said access panel in position, each of said spring

15 clips consisting of a small metal plate attached to an adjacent edge and having resilient flaps which bite into and retain said access panel until a flat plate or the like is inserted to bend them clear of said access panel.

8. A raised flooring according to claim 1 in which at 20 least one panel is free for removal so constituting an access panel.

9. A raised flooring comprising flooring panels laid side by side with adjacent edges abutting one another, and height-adjustable props supporting said panels 25 above the actual floor of the building, in which in one direction across said floor there are identical adjacent repeating rectangular panels composed of one piece lengthwise and widthwise of said panel, said panels having top faces and underfaces and having on their under-

30 faces spaced substantially parallel battens which are parallel to said one direction across said floor and which are attached to said panels prior to assembly of said raised flooring, one end of each batten projecting past one edge of each of said panels while the other end of each batten stops short of the opposite edge of each of said panels by an amount equal to that by which one end of each batten projects past said one edge of said panel, so that one edge of one panel rests on and is supported by said parts of said battens projecting past said 35 opposite edge of an adjacent panel, each panel further comprising a ledge on which an adjacent panel can rest, said ledge being defined by a part of a batten which overlaps one edge of said panel which is parallel to said batten, and in which in a transverse direction across

40 said floor at right angles to said one direction said flooring consists of alternating panels of the type having said battens and other panels which rest on and are supported by said ledges, said props directly supporting said battens at said projecting parts and in turn supporting said raised flooring.

10. A raised flooring comprising a number of identical flooring panels laid side by side and end to end to complete the surface of said flooring, and height-adjustable props for supporting said panels above the 45 actual floor of the building, in which said panels are composed of one piece lengthwise and widthwise of said panel, said panels having top faces and underfaces and having on their underfaces spaced substantially parallel battens which are attached to said panels prior

50 to assembly of said raised flooring, one end of each batten projecting past one edge of each of said panels, while the other end of each batten stops short of the opposite edge of each of said panels by an amount equal to that by which said one end of said batten projects past said one edge of said panels, so that the edge of each panel rests on and is supported by said parts of said batten projecting past said opposite edge of an ad-

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jaçent panel and in which each panel further comprises a ledge on which an adjacent panel rests, said ledge being defined by a part of a batten which overlaps one edge of said panel which is parallel to said batten, said props directly supporting said battens at said projecting parts and in turn supporting said raised flooring.

11. A substantially flat flooring panel for use with raised flooring of the type supported by props having vertically extending threaded stems, said panel having a top face, an underface, a number of substantially parallel spaced battens attached to said underface, said panel being composed of one piece lengthwise and widthwise of the panel, said battens being substantially parallel to one opposed pair of edges of said panel and extending uninterruptedly over a major part of one dimension of said panel so as to strengthen said panel, at least one of said battens having projecting parts which project beyond at least one edge of said panel to a region along the underside of an adjacent abutting panel to provide a support for said adjacent abutting panel, said at least one of said battens having threaded attachment means at said projecting parts for engaging said threaded stems of said props to support said panel above the actual floor of a building.

12. A flooring panel according to claim 11 in which said screwed portion comprises a threaded bush in alignment with a hole extending completely through said batten.

13. A flooring panel according to claim 12 in which at least one of said battens has a projecting part which projects beyond an edge of the panel to provide a support for an adjacent abutting panel while the other end of each batten stops short of the opposite edge of said panel by an amount equal to that by which the other

end projects past said opposite edge of said panel.

14. A flooring panel according to claim 11 in which one edge of said opposed pairs of edges has a tongue and said other edge of said opposed pair of edges has a corresponding groove, so that when identical panels are laid side by side, said tongue of one panel projects into said groove of an adjacent panel so as to keep said top faces of adjacent panels in the same plane.

15. A flooring panel according to claim 11 in which one edge of each of said opposed pairs of edges has a tongue and said other edge of each of said opposed pairs of edges has a corresponding groove.

16. A panel according to claim 11 further comprising a ledge on which an adjacent panel can rest, said ledge being defined by a part of a batten which overlaps one edge of said panel parallel to said batten.

17. A flooring panel according to claim 16 in which one edge of said opposed pairs of edges has a tongue and said other edge of said opposed pair of edges has a corresponding groove, so that when identical panels are laid side by side, said tongue of one panel projects into said groove of an adjacent panel so as to keep said top faces of adjacent panels in the same plane.

18. A flooring panel according to claim 16 in which one edge of each of said opposed pairs of edges has a tongue and said other edge of each of said opposed pairs of edges has a corresponding groove.

19. A flooring panel according to claim 16 in which one end of each of said battens projects past one edge of said panel while the other end of each batten stops short of the opposite edge of said panel by an amount equal to that by which the other end projects past said opposite edge of said panel.

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