April 27, 1965 E. C. LISKEY, JR 3,180,460

FLOOR PANEL FOR ELEVATED FLOORING

Original Filed Sept. 16, 1960 2 Sheets-Sheet 1

FIG. 1

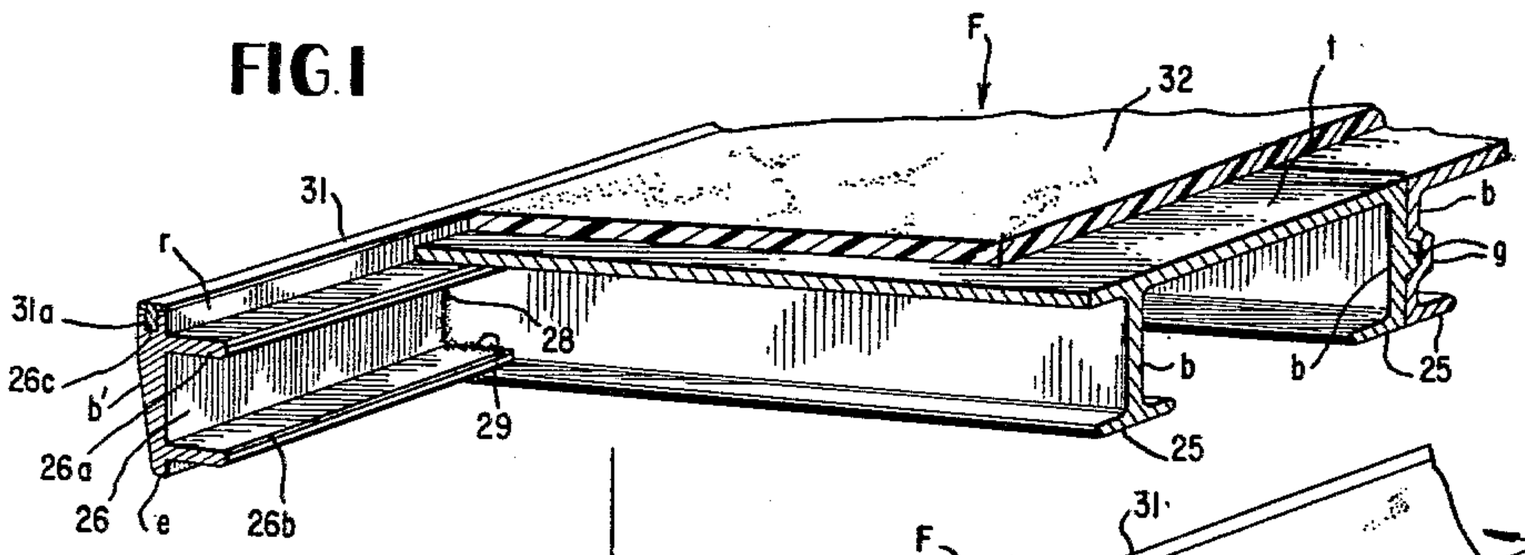

FIG. 2

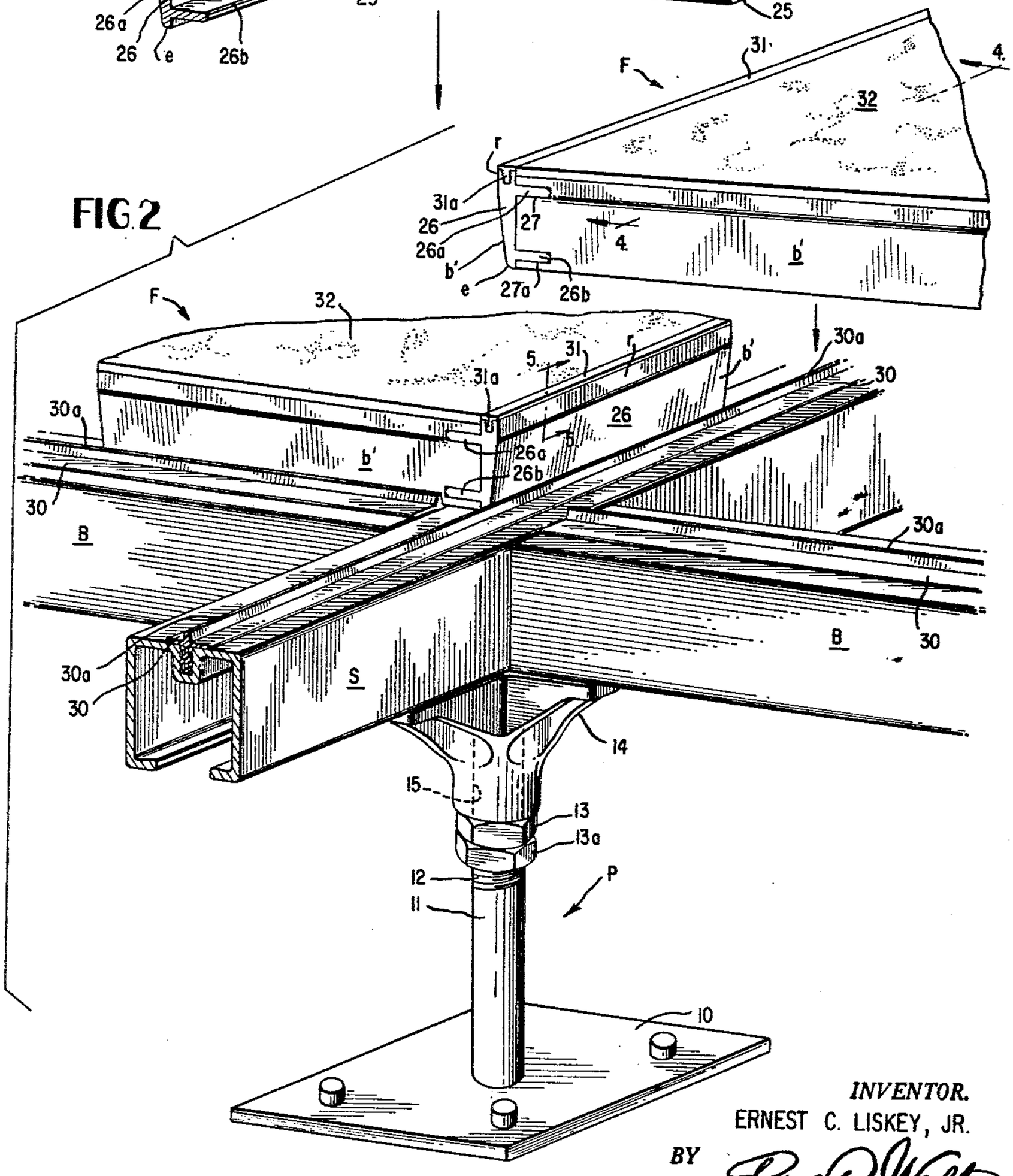

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FIG. 4

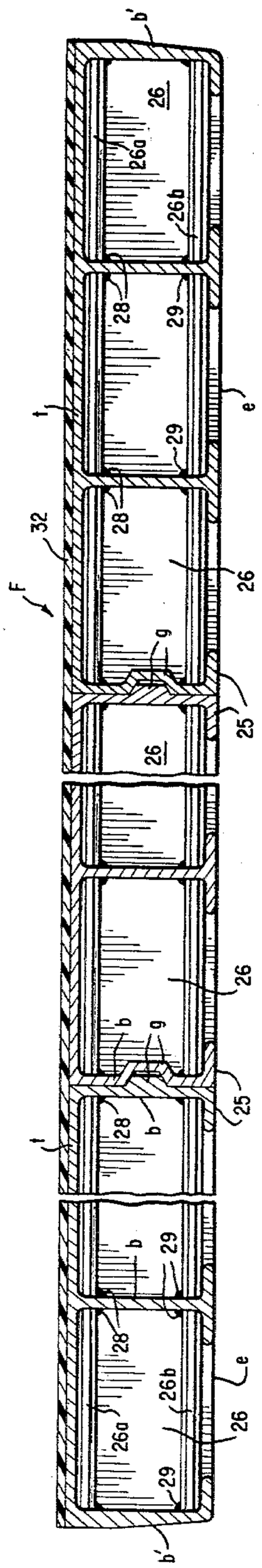

FIG. 5

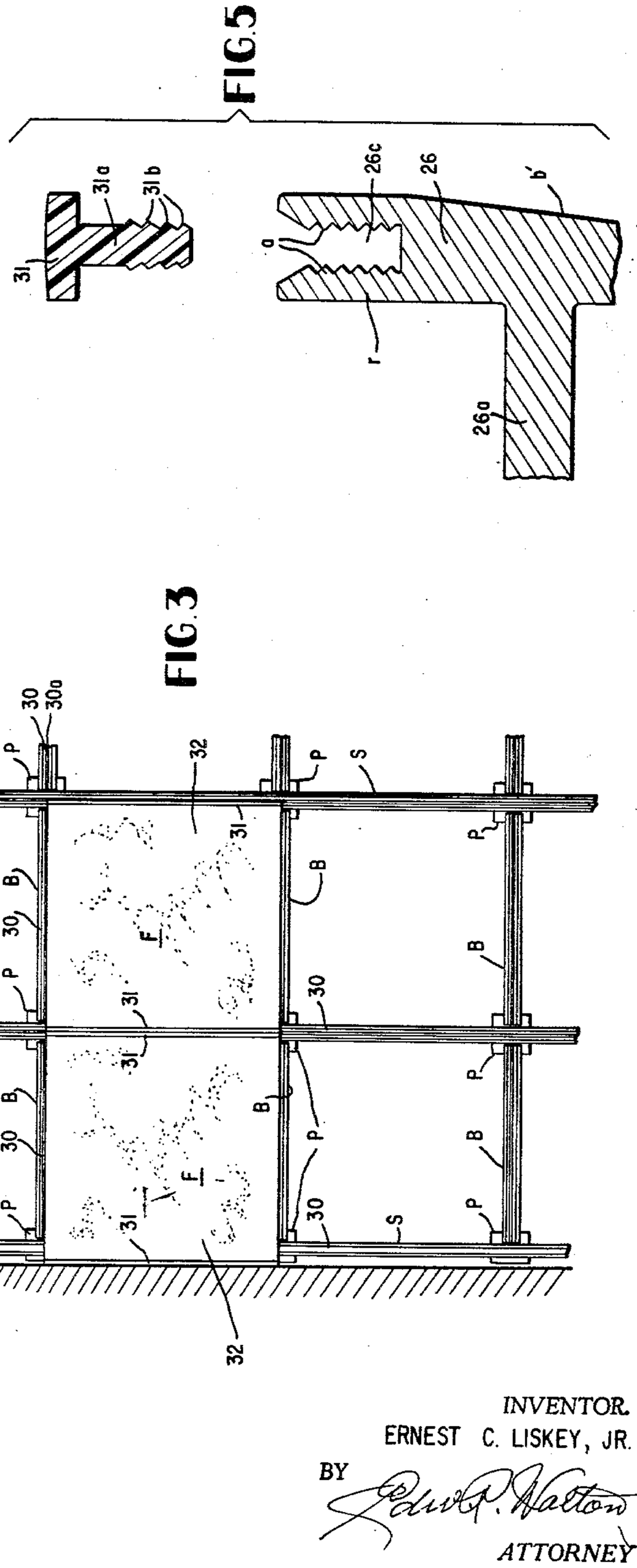

FIG. 3

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FLOOR PANEL FOR ELEVATED FLOORING

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Original application Sept. 16, 1960, Ser. No. 56,530. Divided and this application June 29, 1962, Ser. No. 206,521

4 Claims. (Cl. 189—34)

The invention relates in general to elevated sectional panel-flooring useful particularly with electronic computer installations and is more specifically concerned with the construction of the floor panels, per se, which are arranged in close end-to-end and side-by-side planar position and supported by an underlying supporting means positioned upon a normal or sub-floor and spacing the elevated flooring from the latter, the panels being easily positioned, removed and replaced at will for the inspection, repair and cleaning of instrumentalities underlying the same; and this invention is a division of the invention described in my copending application Serial No. 56,530 filed September 16, 1960 which has matured into Patent No. 3,150,748.

On object of the invention is to provide an improved floor panel of extruded aluminum sections held together in a unitary structure by end-bars in a manner imparting greater transverse rigidity to the panel than heretofore in similarly constructed floor panels, such as in U.S. Patents No. 2,956,652 and No. 2,956,653.

Another object is to provide each panel with strips of electrically insulative material mounted in fixed position on and forming a raised edging at and along opposite top marginal edges of the panel so as to provide boundary edges within which a floor covering is fitted flush with said insulative strips, thus electrically insulating the top surface of the completed panel from electrical charges and preventing the edges of the floor-covering becoming loosened or detached from the panel by repeated removal and replacement of the panel to and from position in the flooring.

Other objects and features of the invention will be apparent from the following detailed specification when read in connection with the accompanying drawings in which:

FIGURE 1 is a fragmental perspective view of the floor panel, according to the present invention, with parts being broken away to illustrate details of construction;

FIGURE 2 is a fragmental perspective view illustrating the manner the panels are preferably supported in position;

FIGURE 3 is a fragmentary plan view of elevated flooring of this invention with two panels in place on the underlying supporting means;

FIGURE 4 is a sectional view taken substantially on line 4—4 in FIGURE 2, illustrating detailed construction of the panel; and

FIGURE 5 is an enlarged exposed vertical sectional view taken substantially on line 5—5 of FIGURE 2, illustrating the details of the top-edging-strip and the means for anchoring it to the end-bars of the panel.

The elevated floor comprises a plurality of adjustable pedestals P of sufficient number spaced apart to support a plurality of spaced and parallel elongated stringers S, and a plurality of brace-stringers B interposed between the stringers S and extending substantially at right-angles thereto, and a plurality of floor panels F laid in contiguous side-by-side and end-to-end contact and having their opposite marginal end portions resting upon and supported by two adjacent stringers S and their opposite side marginal end portions resting upon and supported by two adjacent brace stringers B.

Each of the pedestals P comprises a base plate 10 from the central portion of which extends upwardly a column

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11 threaded at its upper portion 12 to receive a pair of nuts 13 and 13*a*. A header cap 14, formed with a vertical passage 15, is supported upon the nut 13 with the portion 12 of the column 11, above the nut extending into the passage 15 with a close fit.

The stringers S and B are essentially identical channels of extruded lengths of aluminum and are cut transversely to required lengths for their respective uses. The channels are placed upon the caps 14 in inverted position, as shown, that is with their channel faces downward and are suitably secured to the caps 14.

The top face of each stringer S and B has a cushion strip 30 secured thereto along its longitudinal center so that the bottom edges of the adjacent floor panels F rest upon the strips 30, which cushion the panels and seal the marginal portions of the panels against leakage of air or the seepage of dust therebetween. The cushion strips 30 may be formed of an extruded resinous material with an upstanding rib 30*a* extending along its longitudinal center to act as a locating guide or curbing to center the panels F on the supporting means. The cushion strips 30 may be of a rubber composition, of nylon or vinyl plastic material. At present, nylon is being used with most satisfactory results.

The floor panels F may be of any convenient size, but it has been found that, in most cases, panels of approximately 2 feet by 2 feet (square) better fill the requirements in most installations. Hence, the pedestals P should be arranged on the normal or sub-floor in rows two feet apart (centre to centre) and the pedestals in each row should be two feet apart (centre to centre) as indicated in FIGURE 3, in order that the pedestal caps 14 may properly receive and support the stringers S and the brace-stringers B.

Each floor panel F is fabricated of several sections 25 of extruded aluminum and each section comprises a plurality of substantially equi-spaced beams *b* arranged in the same horizontal plane with at least their upper edges connected to join adjacent beams and form a smooth upper tread surface *t*. The lower edges of said beams may be similarly joined to form a lower surface, particularly should it be desired to fill the voids between said beams with a material, such as insulation for example. Since it is desirable for these sections 25 to be in modules of 2 inches, it is most practical for extrusion purposes that these sections be 6 inches in width and approximately 24 inches in length, that is in the direction of the beams *b*. Adjacent side beams *b* of adjacent sections of the floor panel F are formed respectively with complemental ribs and grooves *g* extending along a longitudinally medial portion thereof to interlock one with the other, as shown particularly in FIGURE 4.

When the required number of sections 25 is arranged in contiguous side-by-side relation to form a floor panel F, they are connected and held together in this relationship at each end by an end-bar 26 extending transversely across each end of a panel F. The end-bars 26 are preferably extruded lengths of aluminum which are of a length corresponding to the width of said panel and of a width slightly less than the thickness of said panel, and each is formed, on its inner face, with two outwardly projecting spaced and substantially parallel flanges 26*a* and 26*b* of substantial width and extending longitudinally of the length of the bar 26. The upper 26*a* of these flanges is spaced from the upper edge *r* of the end-bars 26 and is received in slots 27 in the web portions of the beams *b* immediately underlying the tread surface *t* of the assembled sections 25. The lower flange 26*b* is spaced from the lower longitudinal edge *e* of the end-bar 26 and is received in similar slots 27*a* in the lower portions of the beams of the assembled sections 25, forming the panel, in overlapping engagement with the upper surfaces of the

lower flanges of the beams *b* of the panel, as shown more particularly in FIGURES 1, 2 and 4. The ends of the sections abut against the end bars **26** and the flanges **26***a* and **26***b* extend inwardly of the beams *b* of the panel sections **25** for a substantial distance from the ends of the beams *b*. Weldments **28** and **29** secure the end-bar **26** and its flanges **26***a* and **26***b* to adjacent parts of the beams, thus holding the tongues and grooves of the adjacent sections **25** in interlocking position and providing a very rigid floor panel F in the directions of its beams *b* and transversely of its beams *b*.

The lower edge *e* of each end-bar **26** extends below the flange **26***b* to be flush with the bottom of the beams *b* while its upper edge *r* extends upwardly for a distance above the tread surface *t* of the floor panels F. The upper edges *r* of the end-bars **26** are formed, during their extrusion, with a holding slot **26***c* (see FIGURE 5), to receive and anchor therein an extruded rim edging-strip **31** of plastic and rubber material.

As shown in FIGURES 1, 2 and 5, the side walls of the groove **26***c* are, preferably, formed with inwardly projecting ribs *a* and running the length of the groove, and which are produced during the extrusion of the end-bars **26**. The above edging-strip **31** is formed, by extruding a resinous plastic material (such as rubber, vinyl or nylon plastics or the like), to have a body portion rectangular in cross-section with a depending rib **31***a* extending along its longitudinal center and dimensioned to be received in the grooves **26***c*. The rib **31***a* is formed on its opposite side faces with a plurality of ribs or serrations **31***b* which are complemental to the ribs or serrations *a* of the groove **26***c* to cooperate therewith (when the rib **31***a* is forced, under pressure, into said groove **26***c*), to assure an interengaging relation and firmly lock or anchor the top-edging-strip **31** in position to cover the top edges *r* of the end-bars. The edging strip **31** is, of course, of a thickness to lie flush with the top surface of the floor-covering **32** on each panel F.

The material of the edging-strip **31** is electrically insulating and of the same kind, and if desired, of the same color as, or contrasting to, the floor covering **32**, which is fitted to and carried on and bonded to the upper tread surface *t* between the edging-strips **31** of each panel. This floor covering **32** may be rubber or plastic tile and other suitable electrical insulative material. The edging-strips **31**, being firmly anchored to the panel, protect the edges of the covering material from becoming loosened or detached at its edges from the tread surface *t* of the panel as a result of repeated removal from and replacement into position in the floor assembly or from other scuffing, and, together with the floor-covering **32**, electrically insulates to to top surface of the completed panel.

The outer face of each end-bar **26** and of the outerside beams *b'* of each panel F are smooth with their upper portion normal to the tread surface *t* and their major lower portion declining inwardly, as at **34** (see FIGURE 2), so that the adjacent ends and/or sides of the two floor panels may be laid with the upper portions of their outer ends and side faces closely adjacent and with the lower portions of said faces diverging downwardly, thus providing the necessary clearance to accommodate the upstanding rib **30***a* of the seal-cushion-strip **30** and to permit the ready and easy insertion or removal of one panel from the laid floor with respect to its adjacent panels F. Further, this clearance between adjacent panels, together with the upstanding rib **30***a*, affords a means for centering each panel exactly in place during the installation of the elevated floor and for preventing slippage or creeping in any direction of its plane, when so installed.

Any one of the panels may be removed with facility and celerity by the application of a suction-cup to its tread surface.

Having thus described the invention and the manner in which it is to be performed, it is to be understood that certain changes and variations may be made in the exact details shown and described herein without departing from the spirit of the invention; and that all changes and/or modifications as fall within the scope of the appended claims are contemplated as part of this invention.

That which is claimed, as new and to be secured by Letters Patent, is:

1. A floor panel, including a floor-covering material thereon for use with an elevated sectional flooring, said panel comprising a metallic structural unit including a flat planar tread surface adapted to have a floor-covering material secured to its upper surface and having a plurality of underlying and spaced substantially parallel reinforcing beams integrally connected therewith and extending in the same direction coextensively with the tread surface and flanged laterally at their bottom edges, one of said beams depending from each side edge, respectively, of the tread and forming a side-edge wall devoid of an outwardly projecting bottom edge flange; the improvement comprising facing end bars of a length corresponding to the width of the panel and of a width slightly less than the thickness of said panel, one of said end bars extending across each end, respectively, of the panel to form end walls therefor and arranged to have its upper edge below the upper surface of the floor covering material having its lower edge substantially flush with the bottom edges of all said beams so that the bottom end edges of the beams may rest directly upon an underlying planar supporting surface, the inner face of each end bar having a pair of spaced flanges projecting laterally therefrom and extending along its length and spaced from the top and bottom edges of said end bar, respectively; said flanges on the end bars extending for a considerable distance inwardly relative to and into and in contact with the walls of complementary slots in the ends of the vertical webs of said beams; one of said flanges on the end bars lying immediately below the tread surface and the other flange lying immediately above the bottom flanged edges of said beams; weldments rigidly securing the end bars and their flanges to said beams; the top edge portion of each facing end bar having a groove along its length; an edging-strip of electrical insulative material on and coextensive with said top-edge of each of said end bars and having a plug member projecting therefrom into and anchored in said groove, and said floor-covering being of an electrical insulative material fitted in and bonded to the area of the tread surface of the panel between said edging strips thereof and substantially flush therewith.

2. In an elevated floor structure including rectangular floor panel members of electrical conductive material having a tread-surface and in a contiguous planar arrangement relative to one another upon an underlying elevated supporting means to form a continuous floor surface with the panel members being individually and independently removable from and replaceable onto the supporting means; strips of electrically insulative material fixedly anchored to each panel member respectively and positioned and extending at and along opposite marginal edges of said tread surface within the confines of its panel to form a raised electrical insulating and protective floor-covering edge-rim thereon; and an electrically insulative floor-covering disposed on the tread surface of each panel member between said insulative and protecting strips thereon, the upper surfaces of the covering and of the strips being substantially flush.

3. An elevated floor structure as claimed in claim 2, wherein the anchoring of said insulative and protective strips comprises a groove provided in the tread surface of the panel at and along two opposite marginal edge portions thereof, a portion of said strips being complementary to said grooves and fittedly projecting into its respective groove with a binding fit for anchoring said strips in position on the panel.

4. An elevated floor structure as claimed in claim 2, wherein the panel members are fabricated from metallic

material with a groove along each of two opposite marginal edges of the tread surface of the panel members, the side walls of said grooves being serrated, and wherein said insulating and protecting strips each have a head portion rectangular in cross-section and formed with a downwardly extending and coextensive serrated rib slightly larger than the width of their respective groove and adapted to effect a press-fit therewith, said head being dimensioned to extend only to the adjacent outer edge of the panel, whereby each strip covers the underlying edge portion of its respective panel member without necessarily contacting the head portion of similar strips on adjacent panel members, when laid in position.

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