

Oct. 18, 1960

E. C. LISKEY, JR  
ELEVATED FALSE FLOOR

2,956,653

Filed Nov. 14, 1958

3 Sheets-Sheet 1

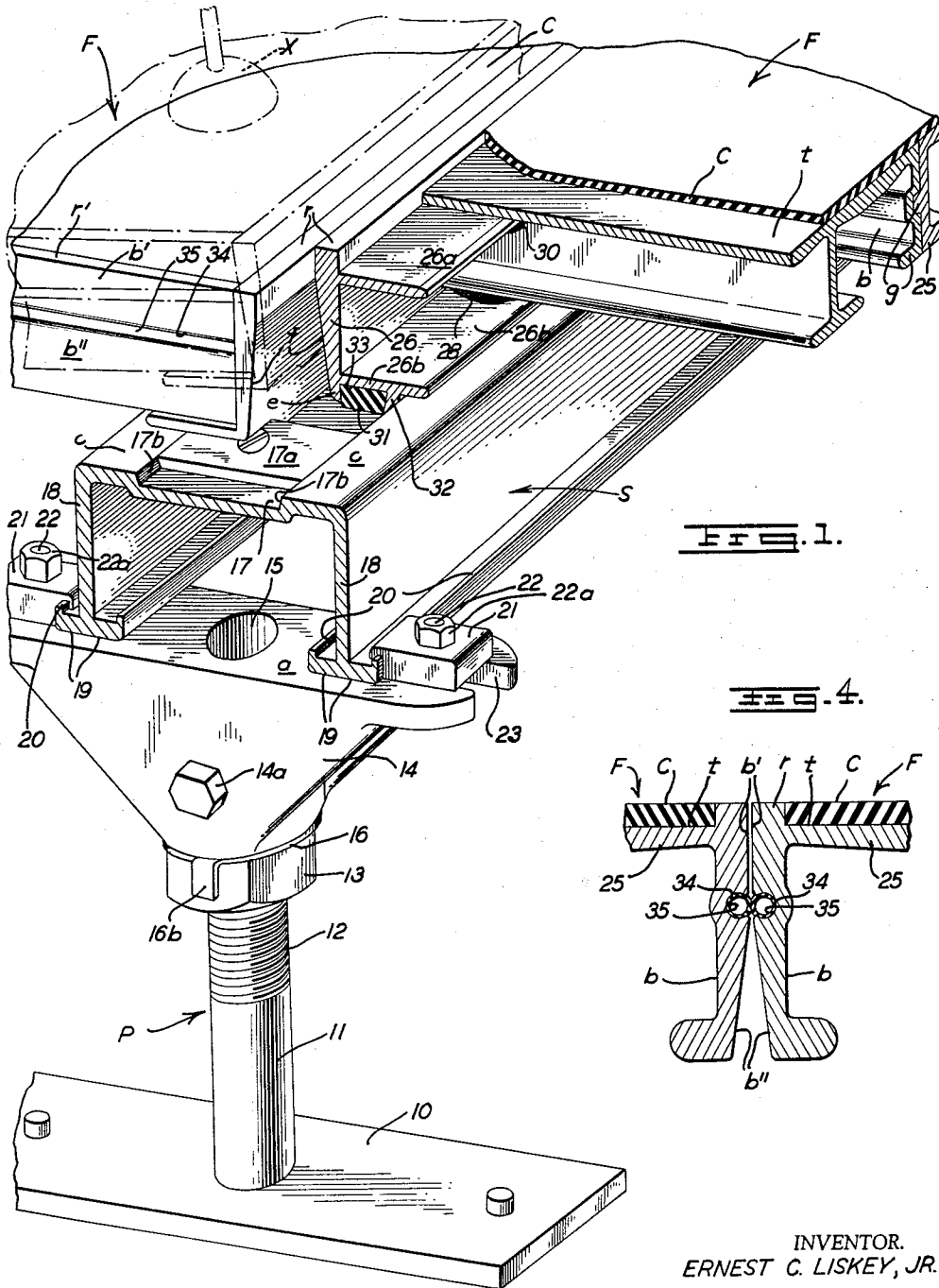


FIG. 1.

FIG. 4.

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FIG. 5.

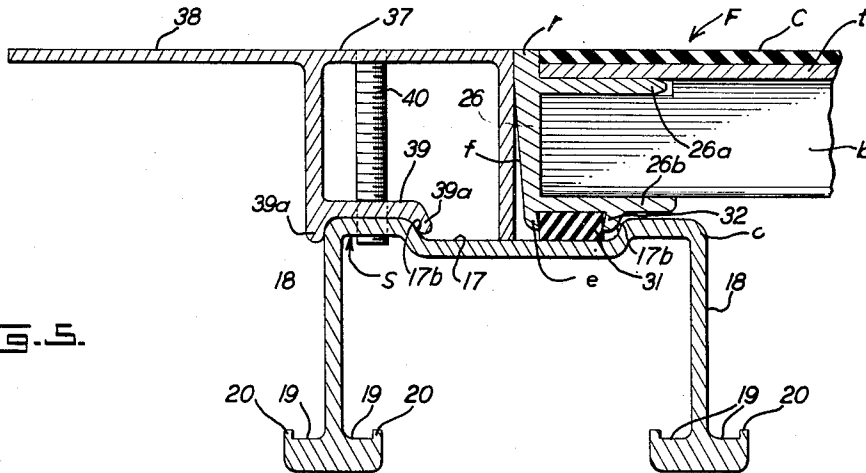


FIG. 6.

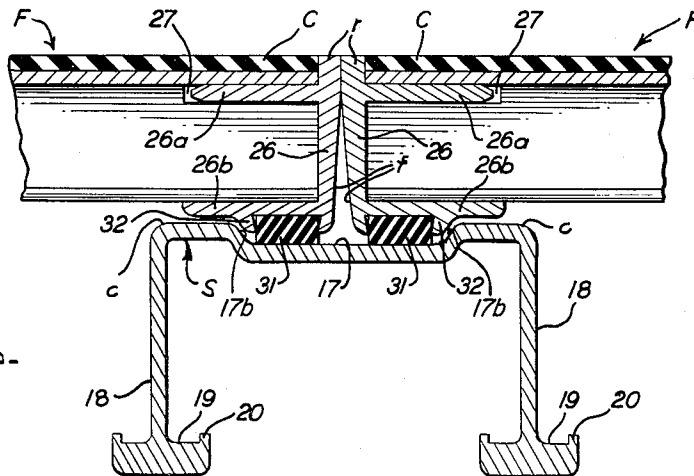
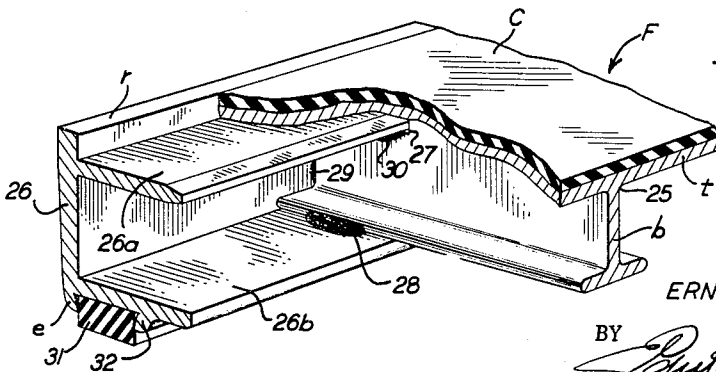


FIG. 7.



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## ELEVATED FALSE FLOOR

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2 Claims. (Cl. 189—34)

The present invention relates to a, so-called, raised or false floor and is an improved variation of the false floor disclosed in my copending application for Letters Patent Serial No. 755,174 of which this application is a continuation-in-part.

The advent of electronic computers, business machines, magnetic files and the like and their use in large batteries or groups has made this type of flooring not only desirable but a necessity as explained in my aforesaid patent application.

The object of the present invention is the provision of an improved elevated false floor supported upon a sub-floor and which is relatively inexpensive and light in weight yet strong and durable and wherein the flooring comprises floor panel members spanning stringers, or other suitable supports, and arranged in close contiguous end-to-end and side-by-side contact without the use of fasteners, thus permitting the panels to be laid quickly in place and to be quickly removed from place to afford easy access to all points of the sub-floor area for inspection, cleaning and repair of electrical connections or other equipment underlying the same.

Another object of the invention is the provision of an elevated false floor comprising floor panel members, as just described, wherein an effective seal is provided at their meeting edges whereby the space between the false flooring and the sub-floor may form an air plenum chamber.

A further object of the invention is provision of a resilient cushioning material at the ends of each panel which rests upon a supporting stringer or the like to give each panel a resiliency under heavy loads and to provide a frictional contact with the underlying support to hold the panel against shifting on its support without the requirement of other fasteners.

Still further objects of the invention are to provide a floor panel having a great transverse rigidity, to provide an improved adjustable pedestal of supporting stringers or the like and to provide a one-piece stringer having an improved shape to locate and hold adjacent panel members thereon against shifting thereon.

Other objects will be apparent from a consideration of the construction of the false floor of this invention illustrated in the accompanying drawings when read in connection with the following detailed specification.

In the drawings which show the preferred embodiment of the invention as now in use—

Figure 1 is a perspective view of the false floor, in accordance with the present invention, illustrating the meeting end of two adjacent panel members supported upon a stringer, which in turn is supported by two or more adjustable pedestals, certain parts being broken away and shown in section to illustrate details of construction;

Figure 2 is a fragmentary vertical sectional view taken through the false flooring of this invention, illustrating arrangement and assembly of parts from one end of the flooring;

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Figure 3 is a transverse sectional view taken substantially on line 3—3 of Figure 2;

Figure 4 is an enlarged vertical sectional view illustrating the sealing contact between the side of adjacent floor panel members as in Figure 3.

Figure 5 is a vertical section on actual scale, through a marginal or boundary portion of a floor panel member and its stringer;

Figure 6 is a vertical sectional view on actual scale through two adjacent floor panel members at their meeting ends overlying a stringer; and

Figure 7 is a fragmentary perspective view of a panel member on actual scale and with portions broken away to show details of construction.

Referring in detail to the drawings in which like character of reference refers to similar and like parts throughout the several views, the false floor of the present invention comprises a plurality of spaced pedestals P of sufficient number and suitably spaced apart to support a plurality of spaced and parallel stringers S, which latter are spanned by a plurality of floor panels F laid in contiguous side-by-side contact and having their opposite ends resting upon and supported by two adjacent stringers S.

Each of the pedestals P comprises a baseplate 10 from the central portion of which extends upwardly a column 11 threaded at its upper portion 12 to threadedly receive a nut 13. A header 14, having a vertical passage 15 therethrough, is supported upon the nut 13 with the portion 12 of the column 11, above the nut, extending into said passage 15 with a close fit. Thus, the header 14 is vertically adjustable by rotating the nut 13 and the upper end of the column 11 maintains the head in centered and aligned position. The header 14 is, preferably, an aluminum casting in the form of an inverted equi-lateral triangle with its apex truncated and of substantial thickness. Hence, the base of the triangle becomes the upper supporting surface a of the header 14 upon which a stringer S rests. Interposed between the nut 13 and the lower end of said header 14 is a lock washer 16 having two tabs or lugs 16a and 16b projecting from its diametrical opposite edges, the tab 16a extending at a right angle to engage the adjacent surface of the header 14 and the tab 16b being bendable to a right-angular position against an adjacent face of the nut 13, after the proper elevation of the header 14 has been obtained by the rotation of the nut 13. The headers 14 may be retained in their proper angular position with respect to the column 13 by set screws 14a threaded in each of the headers and which bear against the column 11.

The stringers S are essentially channels of extruded aluminum and are cut to required lengths. The channels are placed upon the headers 14 in inverted position, as shown, that is with their channel face downward; and the upper surface c of each inverted channel stringer is formed with a longitudinally depressed portion 17 medially disposed along the length of said upper surface c, as shown more particularly in Figs. 1, 2, 5 and 6. The free edge portions of the flanges or legs 18 of each stringer are provided with lateral flanges 19 which have their outer edges upturned, as at 20, to form upwardly facing grooves on opposite sides of the legs 18 for the reception of similarly grooved portions of clamping cleats 21. These cleats 21 are bolted to the top surface a of the header 14 by suitable fastening means such as bolts 22 and nuts 22a, which bolts pass through and are longitudinally slidable in elongated slots 23 formed in the end portions of the header 14 so as to clamp the stringer in its adjusted position on the header. The pedestals P in adjacent rows may be braced laterally, where necessary, by horizontal brace bars 14b each of a length to extend between opposite headers 14 in

adjacent rows of said pedestals and having openings in their ends to receive a bolt of the fasteners 22—22a, as shown in Figs. 2 and 3.

The floor panels F may be of any convenient size but it has been found that, in most cases, panels 2' x 2', more or less, better fill the requirements in most installations. Each floor panel F is fabricated of several sections 25 of extruded aluminum. Each of these sections comprises a plurality of substantially equi-spaced I-beams *b* arranged in the same horizontal plane, the upper flange portions of the beams being extended laterally to join the flanges of adjacent beams to form a smooth upper tread surface *t*. 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 to 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 complementary rib and grooves *g* extending longitudinally on their web portions to interlock one with the other, as shown particularly in Figs. 1 and 3.

When the required number of sections 25 are 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 and are formed channel or U-shaped, on what is their inner face, with two outwardly projecting spaced and substantially parallel flanges 26a and 26b of substantial width, as shown, and extending longitudinally of the length of the bar 26. The upper of these flanges 26a is spaced from the upper edge *r* of the end-bar 26 and is received in slots 27 in the web portions of the I-beams *b* immediately underlying the tread surface *t* of the assembled sections 25; and, the lower flange 26b is spaced from the lower longitudinal edge *e* of the end-bar 26 and extends under the end portions of the assembled sections 25, forming the panel, in underlapping engagement with the lower flanges of the beams *b* of said panel, as shown more particularly in Figs. 1, 6 and 7, so that the ends of the sections abut against the end-bar 26 and the flanges 26a and 26b extend inwardly of the beams *b* of the panel sections 25 for a substantial distance from the ends of the beams *b*. Weldments 28, 29 and 30 secure the end-bar 26 and its flanges 26a and 26b to adjacent parts of the beams thus holding the tongues and grooves *g* of the adjacent section 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 face of the flange 26b of each end-bar 26 carries a resilient yieldable strip 31 along its entire length and rests in the depression groove 17 in a stringer S and is of sufficient thickness to support its end of the floor panel above the surface *c* of the stringer. These strips 31 may be of rubber or rubber-like material and serve three purposes—(1) to cushion the floor panels on the stringers, thus giving the flooring a degree of yieldability, (2) afford a frictional anti-slip contact with the surface of the stringers S and (3) form air seals between the stringers and the panels. Since the end-bars are preferably extrusions, an additional rib 32 is formed on the under face of each flange 26b for the full length of the flange and is positioned in spaced cooperative relation with the lower edge portion *e* of the end-bar 26 to form a retaining channel or groove 33 for the cushion strip 31. The opposing faces of the rib 32 and of the edge portion *e* may, and preferably do, converge to form a dove-tail groove to better retain the cushion strip 31 which is of considerably greater thickness than the depth of the groove 33 so as to protrude therefrom. The depression 17 in the stringers S are so dimensioned as to receive the cushion strips 31 of the adjacent ends of two panels F and provide a guide stop 17b to locate said ends in abutting relation, as

shown in Figs. 1, 3 and 6, and maintain them against horizontal endwise movement relative to the stringers yet permits a yielding resilient movement of the panel vertically relative to the stringers. Lateral shifting movement of the panel is prevented by a block-stop 17a positioned in the depression 17 under the corners of four adjacent panels F, said meeting corners of the panel F being notched to accommodate these stops. However, in most cases these stops 17a are not necessary and can be omitted.

The outer faces *f* of the end-bars 26 are smooth with their upper portions normal to the tread surface *t* and the major portion of their lower portion declined inwardly, as shown particularly in Figs. 3 and 6, so that the adjacent ends of two floor panels may be laid with the upper portions of the face *f* in abutting contact and the lower portions of said faces *f* diverging, thus providing the necessary clearance which permits the ready and easy insertion and removal of any one panel with respect to its adjacent panels F.

The I-beams *b*, occurring at the outer sides of each floor panel F, thus assembled, are formed with their outer faces smooth and without lateral flanges but with a circular-like groove 34 extending longitudinally of and substantially medial of said face of said beam, as shown more in detail in Figs. 1 and 4, and in which groove is disposed a sealing member 35, preferably in the form of a flexible or rubber tube, partially protruding beyond the groove. The portions *b'* of said surfaces above the groove 34 are perpendicular to the tread surface *t* and extend upwardly from the tread surface *t* to form a rib *r'*, while the portion *b''* of said surfaces below the groove 34 is slanted downwardly and inwardly of the panel. Consequently, when two or more adjacent panels are positioned in place side-by-side, the portion of the sealing member 35 projecting from the slot is brought in tight contact with the opposite sealing member 35 of an adjacent panel F and the declined surfaces *b''* of adjacent panels diverge one from the other, thus allowing the easy insertion and removal of one panel with respect to its adjacent panels. The rib *r* on the end-bar 26 and the rib *r'* extend about  $\frac{3}{32}$  of an inch above the tread surface *t* of each floor panel F or the equivalent of the thickness of a rubber tile or other floor covering 36, which is bonded to the upper tread surface *t*, to provide a protecting border rib for such covering.

It is desirable that the "boundary" stringers, at the ends of the false flooring, be finished with an end border panel 37 as illustrated in Figs. 2 and 5. To this end, the border panel 37 is essentially a channel bar in cross section with a lateral flange 38 extending therefrom as an extension of the bottom of the channel and is employed in an inverted position as shown. That which may be termed the inner leg of the border panel 37 (i.e. nearest the extension 38) is formed at its free end with inwardly extending flange 39 having downwardly turned lips 39a along its longitudinal edges to form a saddle, the width of the saddle being such as to embrace and rest upon the surface *c* of a stringer S on one side of the depression 17 therein; and the other or outer leg of the border panel 37 extending into and resting upon the surface of the depression 17 and abutting tightly against the end-bar 26 of an adjacent floor panel F. The border panel 37 is secured in position by spaced screws 40, extending through its upper surface between its legs, which screws thread into openings in the stringers S.

The border panel 37 is so dimensioned that its top or tread surface will lie flush with the covered tread surface *t* of the adjacent floor panels F which it borders and, since their extensions 38 are of aluminum, the extensions 38 may be readily cut or severed with a suitable tool, during the installation of the false floor, to

have the extension 38 brought to fit nicely against a wall or abut a column or the like.

To install the false flooring of this invention, it is only necessary to space a plurality of pedestals P in a row according to the length of the stringer S or according to the support required for a given installation, there being a number of these rows of pedestals in spaced substantially parallel relation according to the length of the floor panels to be employed and the area of the false flooring desired. A stringer S is then placed upon the headers 14 of each row of pedestals in the manner shown in Figs. 1, 2 and 3. The stringers of the entire false flooring are then brought to the required level by adjustment of the nuts 13 on the individual pedestals P. After this adjustment has been obtained and the stringers are at proper level, the tabs 16b of the lock washers 16 are bent in position, as shown in Fig. 1, and the set-screws 14a are tightened to lock the header in position on the pedestal column 11. The stringers S are then positioned on the headers in order to properly receive the ends of the floor panels F in the depressions 17 and, then, locked in position by the cleats 21 with the bolt and nut fasteners 22—22a; and, if required or desired, the lateral brace bars 14b may be set in place and held by the fasteners 22—22a. The floor panels are, then, laid side-by-side and end-to-end in position to produce the arrangement shown in Figs. 1, 2 and 3 without the requirement of any securing means for the panels. Should it be desired to remove or lift a panel for any purpose, this may be readily accomplished by the use of a suction cup X, as illustrated in dotted lines in Fig. 1 so that the panel may be removed and replaced with facility and celerity.

From the above, it will be noted that a very simple organization of elements is provided with a minimum of parts, that the panels do not require any fastening means for holding them in place, that the panels abut each other firmly in end-to-end and side-by-side position, that means are provided for sealing the ends and sides of adjacent panels to provide dust seals and so that the false flooring may provide a plenum chamber, when required, from which there will be a minimum of leakage and that any such leakage will only be in an amount that would aid in the normal air ventilation of the room or area, and that the cushion strips 31 are so positioned that, if weight is placed upon the end of a panel, the other end of the panel will not rise out of position. Obviously, all the objects of the invention, previously stated, are attained by the device herein described and shown with its numerous attendant advantages.

Having thus described the invention and the manner in which the same is to be performed, it is to be understood that the invention is not limited to the exact details of construction herein shown, as the same may be modified or varied within the scope of the appended claims.

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

1. In a false floor, the combination of a stringer having an upwardly opening recess extending along its upper face and at least a pair of panels having their ends removably supported in abutting relation on said string-

er, each panel comprising a substantially planar tread member and a series of beams rigidly secured thereto and depending therefrom and extending for substantially the length thereof, said beams being spaced away from said tread member at an end thereof to provide a series of aligned narrow recesses, a U-shaped end-bar for each of said panels having an upper leg fitting in the recesses of its respective panel and a lower leg extending inwardly along and secured to the lower portions of the beams of its panel and having a downwardly opening recess extending substantially the length of the bar, an elongated strip of resilient cushioning material fitting in said downwardly opening recess and bearing on the bottom of said upwardly opening recess, and a prolonged rigid part of the lower portion of said end-bar being disposed in said upwardly opening recess in the stringer and engageable with an adjacent side wall thereof to limit endwise movement of the panels.

2. In a false floor, the combination of a stringer, a pair of floor-panel means each supported at one end of its ends on said stringer, in abutting relation, each of said means having a recess therein and including an end bar said bar having means engaged in said recess to attach said bar to its panel means, said bar extending along the underside of the end portion of its panel means and having a downwardly opening recess extending substantially the length of said bar, an elongated strip of resilient cushioning material fitted in and projecting downwardly from said recess and bearing on the stringer, opposing guide-stops extending upwardly from the panel supporting surface of said stringer and terminating at a distance spaced from said panel means and spaced apart along the length of said surface for a distance to receive therebetween the cushioning strips on the end portions of said pair of abutting panel means, and a prolonged portion on said bar on each panel means being disposed between the adjacent guide-stop and the cushion strip carried by said panel means and engageable with the adjacent guide-stop to center the abutting ends of the panel means on said stringer and to limit endwise movement of said panel means.

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