

[54] **FALSE CEILING SYSTEMS**
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 [22] **Filed: May 7, 1973**
 [21] **Appl. No.: 357,529**

3,352,071 11/1967 Sutter 52/484 X
 3,362,122 1/1968 Julius-Schmitt 52/484
 3,481,088 12/1969 Lickliter et al. 52/484 X
 3,714,753 2/1973 Jahn 52/484
 3,720,432 3/1973 Chudler 52/484 X

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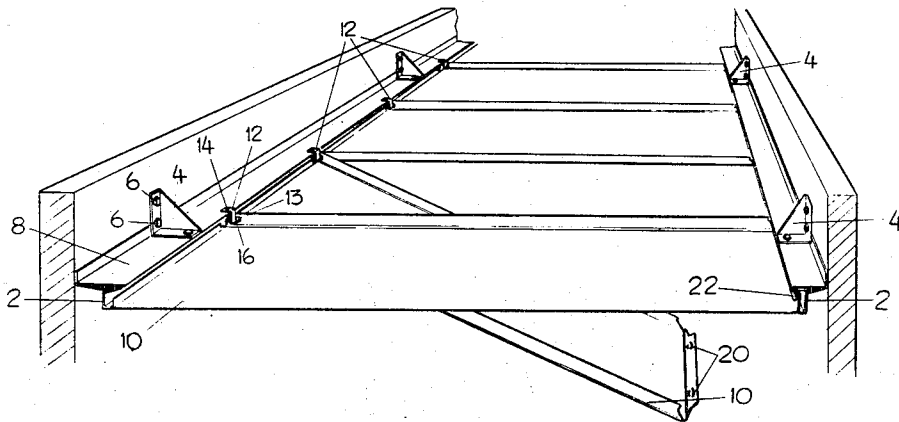
[52] **U.S. Cl.**..... 52/484, 52/489, 52/498
 [51] **Int. Cl.**..... **E04b 5/52**
 [58] **Field of Search** 52/476, 28, 29, 39, 484, 52/488, 489, 497, 498

[57] **ABSTRACT**

False ceiling system has panels which are pivotably supported on one end and releasably supported at the other end. The ends of the panels are supported on longitudinal members which are mounted to the walls of the building with brackets. The false ceiling system may be positioned in corridors of varying width and provides a convenient access to service ducts during construction and maintenance.

[56] **References Cited**
UNITED STATES PATENTS
 2,389,171 11/1945 Urbain 52/489 X
 3,164,230 1/1965 Adams 52/498 X
 3,181,275 5/1965 Schroter et al. 52/498 X

20 Claims, 11 Drawing Figures



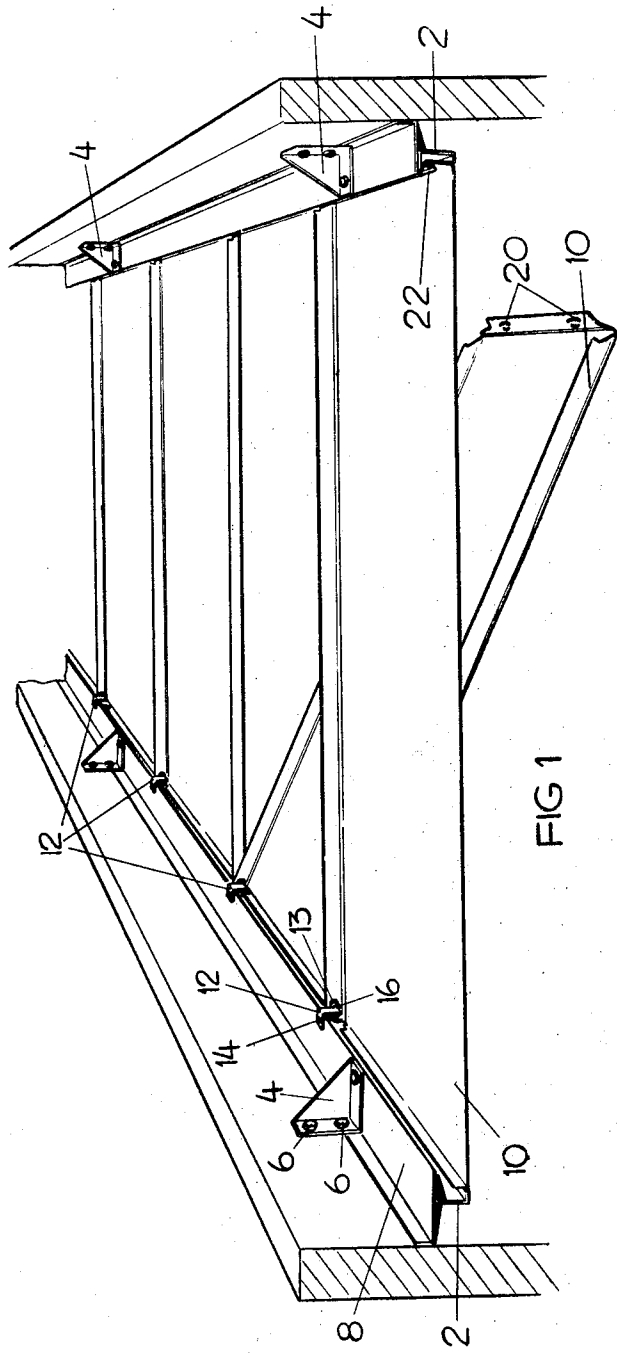
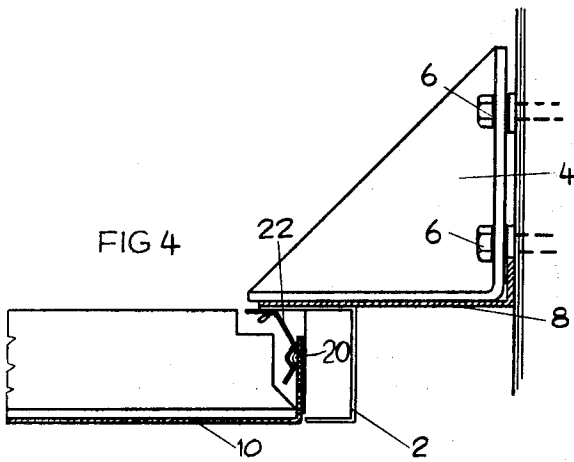
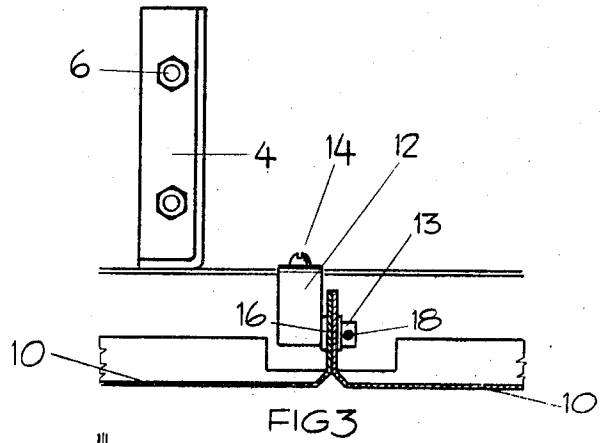
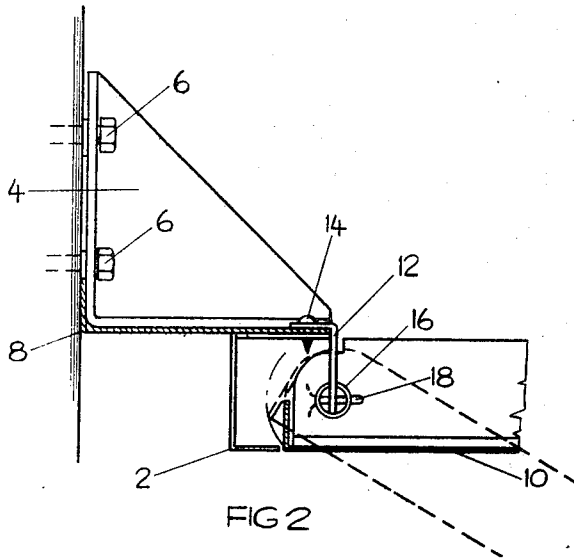
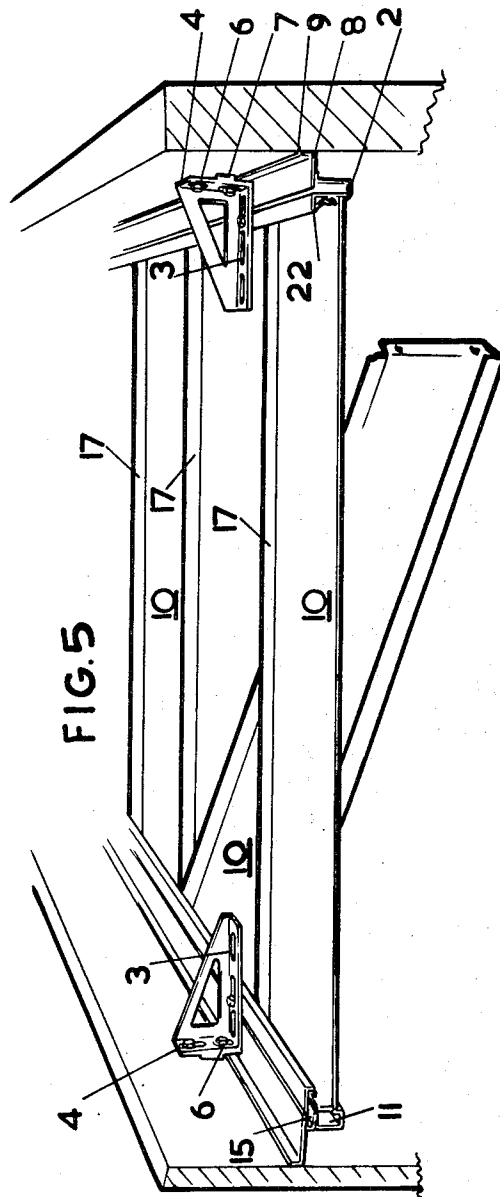


FIG 1





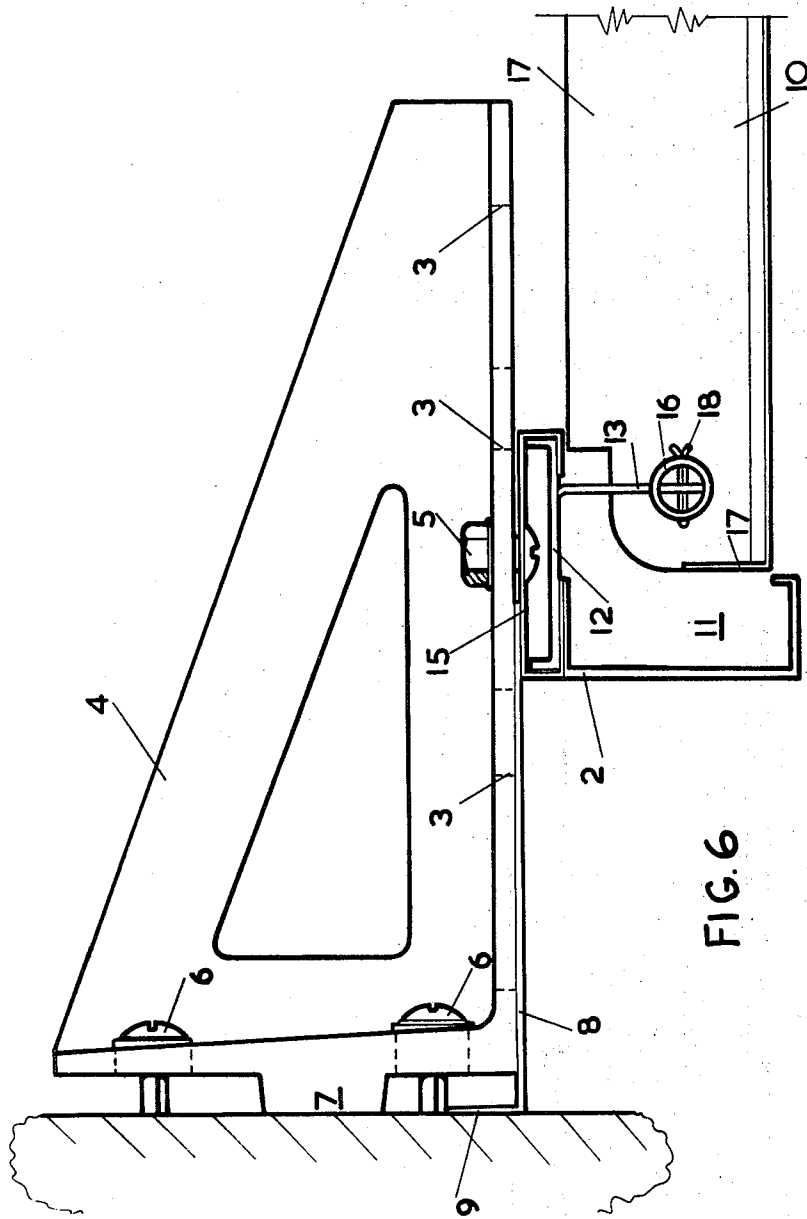
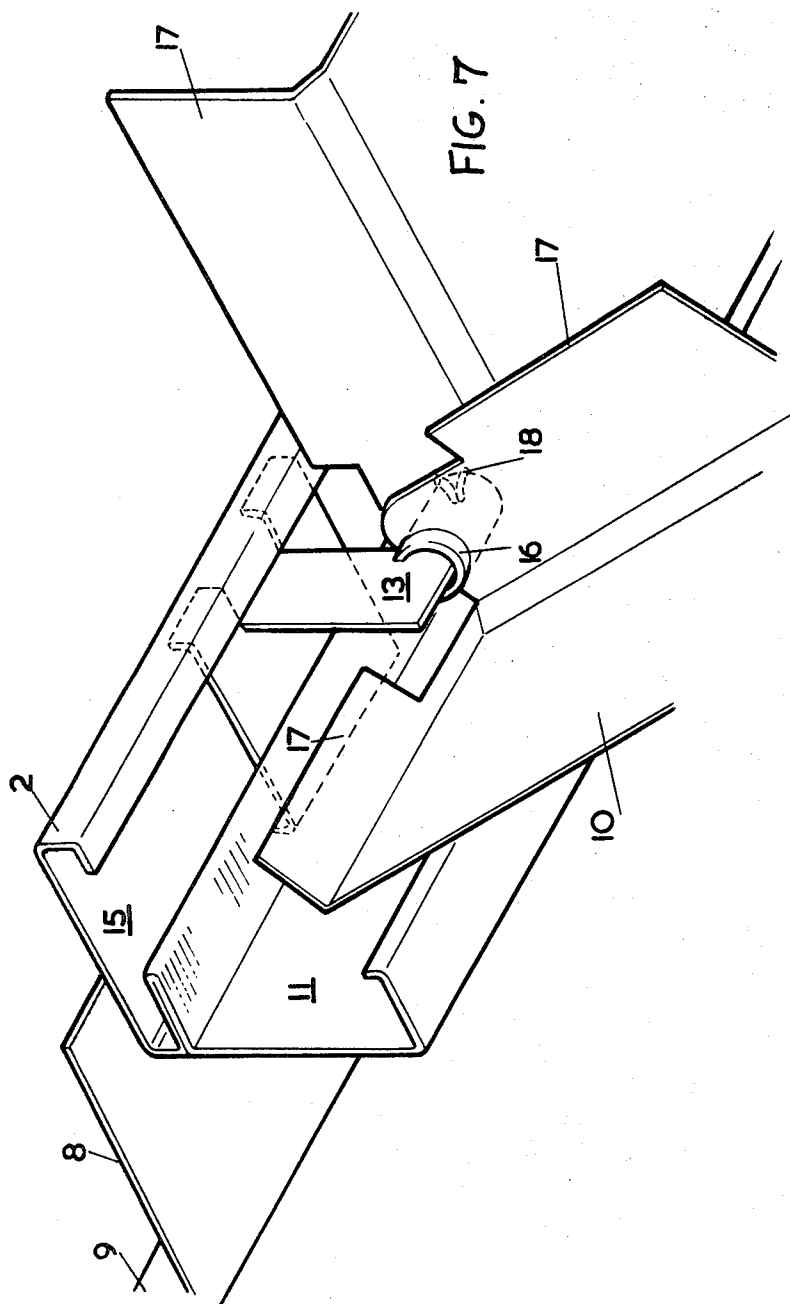
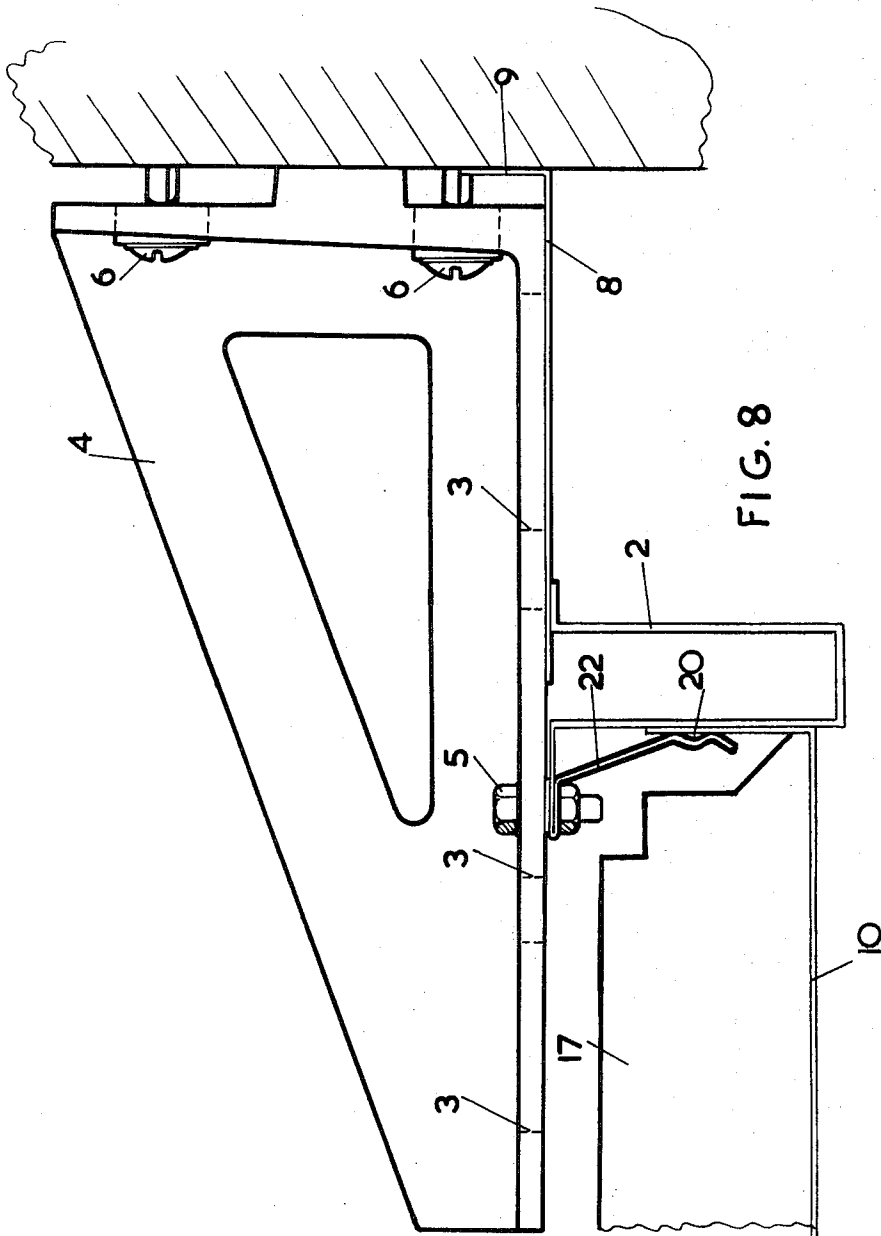


FIG. 6





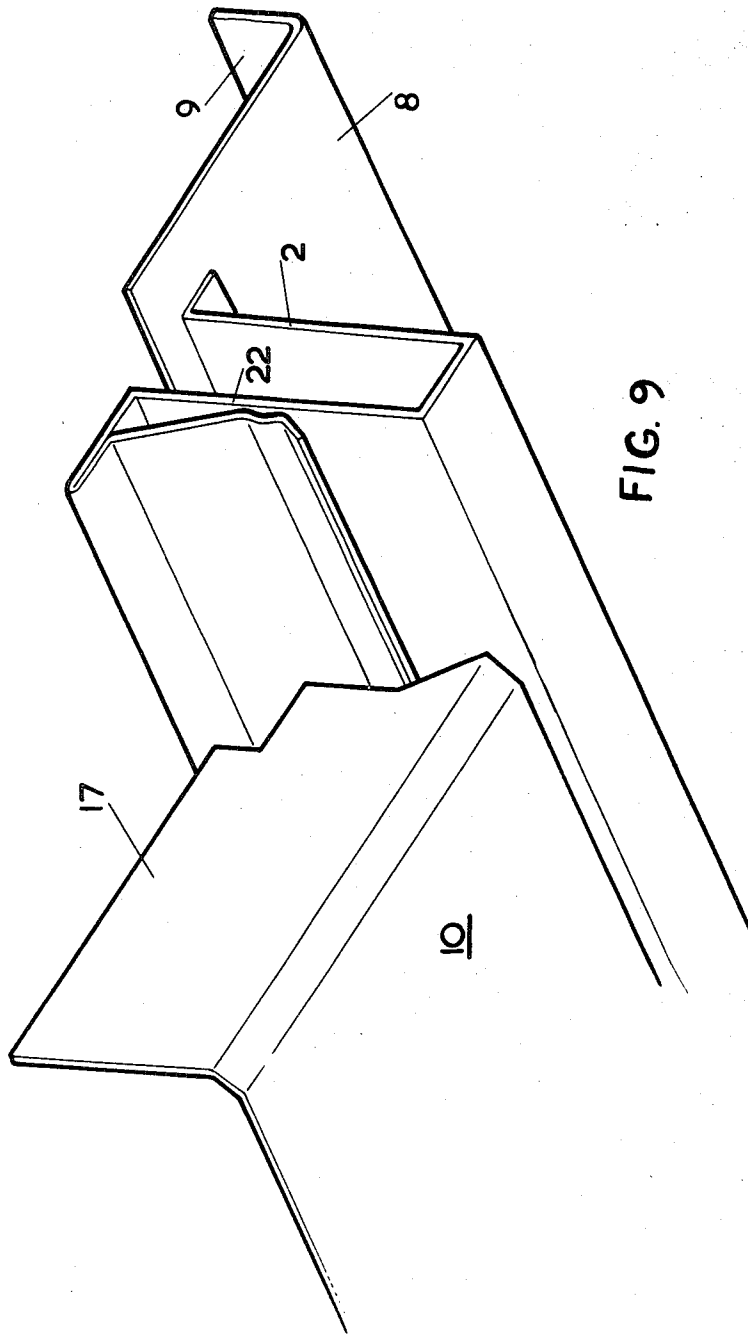
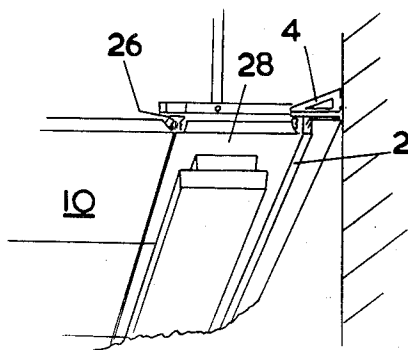
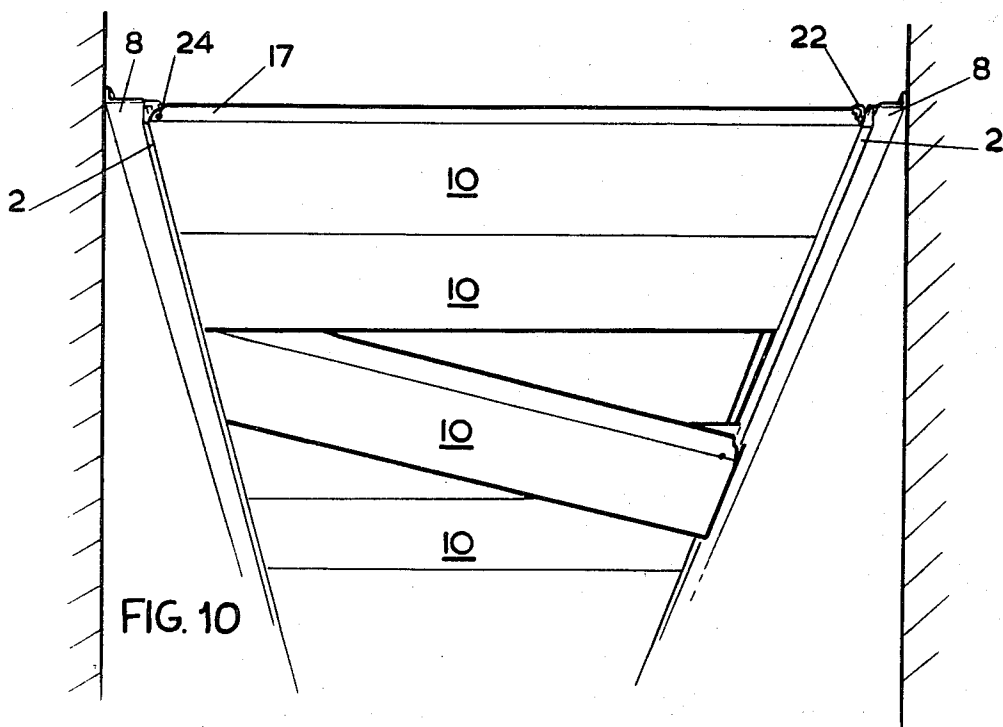


FIG. 9



FALSE CEILING SYSTEMS

The invention relates to false ceiling systems which are capable of concealing services ducts below a structural ceiling, which are readily displaceable for maintenance purposes, and which take up only little dead space. False ceiling systems according to this invention are particularly suitable for spanning corridors in public buildings such as hospitals.

In concrete structures false ceilings are commonly employed which are supported by a grid anchored in the concrete. False ceilings are made-up of panels. Each panel is individually supported, often on all four sides. The space above the panels is also used to house the components of a heating or ventilation system. In certain types of buildings such as hospitals many different types of ducting have to be accommodated above the false ceiling. Thus especially in corridors the space below the concrete ceiling and the panels may be taken up to a substantial extent by ducting which prevent the panels being supported from an overhead grid. The ducting must be easily accessible both during the construction of the building and for maintenance purpose. Nevertheless the false ceiling must cover the whole of the ceiling surface without interruption. All the components of a false ceiling must be capable ideally of being assembled on site and the assembled structure occupies a large surface area.

In the past this problem has been solved by using ceiling panels having a considerable structural strength which were mounted between a pair of ledges one secured to each side of a corridor. The ceiling panel was merely rested on the ledges. To remove the panels one end was raised and pushed to the side so that the other end cleared the ledge on the other side. The panel could then be lowered. This system has a number of disadvantages. Considerable clearance is required above the panels. In view of the size of the panels and their weight a pair of workmen are required to remove the panels. Once the panels are removed they are placed on the ground and may easily be damaged. This is especially so when construction is still in progress. Also in fires the panels may buckle and fall out of their own accord. Apart from the dangers to the people using the corridor, it might also assist the propagation of the fire.

It is thus a main purpose of the invention to provide a false ceiling system where the position of the panels is positively controlled and where the panels are firmly secured to the structure on the walls of the building. The panels further can be placed close to any overhead ducting or tubes. Further improvements of the basic concept of the invention serve to ensure that the false ceilings have an esthetic appearance and that the system is adaptable to a variety of building dimensions. During construction of a building, the false ceiling system of the invention can be installed at the same time as the ducting above the ceiling panels. All work in installing the false ceiling is done close to the wall leaving central room in the corridor for the installing of the ducting. After installing the false ceiling system the panels hang along the wall if they are not fastened in place and are not easily damaged.

The invention provides a false ceiling which comprises two elongate members each provided with a number of mounting brackets, and ceiling panels pivotable at one end with respect to one of the elongate

members and fastenable at the other end with respect to the other elongate member. The invention also provides a kit parts for assembly into a false ceiling comprising two elongate members, a plurality of mounting brackets for securing to the elongate members, and ceiling panels adapted on one end for providing a hinged connection to one elongate member and adapted on the other end for fastening by clipping with respect to the other elongate member. Preferably the elongate members are of channel section and the mounting brackets are angle brackets adapted for securing to the elongate members on one side and for securing to a wall or vertical surface on the other side. Additionally there may be provided closure strips extending sideways from the elongate members for passing underneath the mounting brackets and between the elongate members and the walls on which the elongate members are mounted. The closure strips are preferably provided to improve the appearance and reduce the fire risk and dust penetration. Lighting and like fittings can well be suspended from the longitudinal members so as to hang below the panels.

All or any of the components of the system may be made of mild steel or possibly aluminium or an alloy to meet special requirements. The ceiling panels are generally made of pressed or rolled metal sheet which is perforated. The ceiling panels may include a cover membrane over the outer surface of the metal sheet of sheet material. The ceiling panels may be combined with a material having a sound absorbent or heat insulating effect. Like other components of the system they may be pre-finished, for example by painting, a plastics coating or nylon dipping. Conveniently pivot brackets are provided for securing at one end to said one elongate member and forming at the other end a pivot for pivotably supporting the ceiling panels and the ceiling panels are provided with protuberances and the other elongate member is provided with spring fasteners for engaging the protuberances.

Ceiling panels used according to this invention can well be up to 8 feet long. Thus they can well span a corridor and enable one man to perform a maintenance operation on the services ducts above by unfastening the panels in sequence from the (other) longitudinal member and allowing them to pivot and hang down from the first longitudinal member. Wider expanses can be covered with a ceiling system according to this invention by mounting the brackets on spaced ceiling members or joists. A similar arrangement can be made at the corners of corridors where the use of the longitudinal members facilitates design.

The invention is illustrated by way of example in the drawings in which:

FIG. 1 is a perspective view of a false ceiling according to the invention mounted in a corridor with one panel unfastened at one end;

FIG. 2 is a section of the left hand end mounting of FIG. 1;

FIG. 3 is a section perpendicular to the section of FIG. 2;

FIG. 4 is a section of the right hand end of FIG. 1;

FIG. 5 is a perspective view of an improved false ceiling system according to the invention mounted in a corridor with one panel unfastened at one end;

FIG. 6 is an end view of the left hand end mounting of FIG. 5;

FIG. 7 is a perspective view of the left hand end mounting of FIG. 5;

FIG. 8 is an end view of the right hand end mounting of FIG. 5;

FIG. 9 is a perspective view of the right hand end mounting of FIG. 5;

FIG. 10 is a perspective view of the assembled false ceiling system of FIG. 5 from below; and

FIG. 11 is a perspective view from below a light fitting incorporated in the false ceiling system of FIG. 5.

With particular reference to FIGS. 1 to 4 a false ceiling system comprises two elongate members 2 each secured to a number of mounting brackets 4. Ceiling panels 10 are pivotably mounted at the left hand end with respect to one of the elongate members 2 and fastenably mounted at the right hand end with respect to the other elongate member 2. The elongate members are odd-leg channel section members. The lower leg forms a visually continuous surface with the fastened panel 10 and prevents dust from passing. The mounting brackets 4 are secured to a wall with bolts 6. Closure strips 8 are held between the elongate members 2 and the brackets 4. The ceiling panels 10 are attached to the elongate member 2 at the left hand end by pivot brackets 12. With particular reference to FIGS. 2 and 3 each pivot bracket 12 is secured to the left hand elongate member 2 by a screw 14 which in an alternative construction may be fastenable from below or which may be secured by spot-welding. A pivot 13 protrudes from each pivot bracket 12 through holes in two adjacent panels 10. Around each pivot 13 a collar 16 is secured which provides a bearing surface for the panels 10. Each panel 10 is secured to a pivot 13 by a split pin 18 passing through the pivot 13. With particular reference to FIG. 4 the panel 10 is fastened to the right hand elongate member 2 by means of two protuberances 20 which extend inward from the panel and are shown in FIG. 1 but omitted from FIG. 4 for the sake of clarity. The protuberances 20 engage a split-stem T member 22 to secure the panel. The T member 22 is fixed to the elongate member 2.

A false ceiling system according to this invention can be manufactured in the factory to fit a particular corridor or structural ceiling, the elongate members being secured to the mounting brackets and closure strips. The mounting brackets are then secured to the walls on site. The ceiling panels are then mounted on the pivots in sequence in a hanging position and fastened by means of split pins. Finally the ceiling panels are rotated about the pivots and sprung in position at their other ends. A hole or a slit may be provided on the right hand side in the panel through which a tool can be inserted, so that the panel can be pulled down. A false ceiling system according to this invention does not need supplementary supports which reduce accessibility of the service ducts. One man can remove a large panel. During maintenance the danger of damage to the panels is slight because of the ease with which the panels can be displaced.

With reference to FIGS. 5 to 11 a false ceiling system comprises a pair of elongate members 2 each secured to a number of mounting brackets 4. The elongate members 2 are shaped as required from a single piece of metal. The members 2 are secured to the mounting brackets 4 by bolts and nuts 5. Ceiling panels 10 are pivotably mounted at the left hand end with respect to

one of the elongate members 2 and clipped at the right hand end to fasten them with respect to the other elongate member 2. The elongate members 2 are odd-leg channel section members. The lower leg forms a visually continuous surface with the fastened panel 10 and prevents dust passing.

The mounting bracket 4 has a number of longitudinal slits 3 for receiving screws 6 for securing it to a wall and the bolts 5 for fastening the elongate member. In this way the elongate member 2 can be fastened in a number of alternative positions to the mounting bracket 4 so that the overall width of the complete false ceiling is easily varied. The mounting bracket has a raised portion 7 on one side which actually lies against the wall. By appropriate tightening of the screws 6 the angle of mounting bracket 4 with the wall can be adjusted so as to have the lower side in a horizontal position even if the wall is not strictly vertical.

Closure strips 8 are held between the elongate members 2 and the brackets. The closure strips 8 has an upstanding flange 9 which is receivable underneath the raised portion 7 of the mounting bracket 4. The closure strip 8 serves to obstruct the view of the mounting brackets 4 from underneath the false ceiling and is clamped between the mounting brackets 4 and the elongate member by bolts and nuts 5.

The ceiling panels 10 are attached to the elongate member 2 at the left hand end by pivot brackets 12. The pivot brackets 12 comprise a body portion having a slider part with upturned lips from which depends an L-shaped part 13 and circular collar 16 received on the horizontal leg of the L-shaped part 13 and retained thereon by a split pin 18. The elongate member 2 has in section an upper channel 15 defined by an inverted U-shaped part of the member 2 with inwardly turned flanges. The slider part of the pivot brackets is received in the channel 15 with the L-shaped part 13 protruding through the longitudinally extending opening of the channel 15. The elongate member 2 has in section further a lower channel 11 which is defined by L-shaped part of the member 2 connected to the inverted U-shaped part. The channel 11 is on a similar level as the circular collar 16 of the bracket 12 and the edge of the L-shaped part terminates close to the side of the panel 10 in a horizontal position. Thus the channel 11 allows the side of the panel 10 to pivot freely upwardly. The panels 10 have upstanding flanges 17 and the collar 16 is fitted in holes in flanges 17 of adjacent panels 10. The split pin 18 holds the panels 10 in position. The flange 17 above the side of the panel 10 adjacent the elongate member 2, is recessed to clear the depending L-shaped part 13 of the bracket 12.

The panel 10 is fastened to the right hand elongate member 2 by means of two protuberances 20 which extend inward from the panel flanges. The protuberances 20 engage a split-stem T-member 22 to hold the panels 10 in a horizontal position. The T-member 22 is fixed to the elongate member by a bolt and nut 5. Holes 24 may be provided in the panel to enable a quick and convenient lowering of the right hand end of the panels 10.

With reference to FIG. 11, the false ceiling system can be easily modified to enable light fittings to be incorporated. To this end a T-member 26 is suspended from the ceiling closely adjacent the wall. The T-member 26 cooperates with the T-member 22 to enable suitably modified panels 28 to be dipped in the

false ceiling. The pivotable panels 10 can then be fastened to the T-member 26 as previously described for the T-member 22.

The advantage of the improved false ceiling is the freedom in position the panels both side ways with respect to the walls of the corridor and lengthwise whilst retaining complete control of the panels 10 when they are lowered.

I claim:

1. False ceiling which comprises a first elongate member, a plurality of mounting brackets secured to walls surrounding the false ceiling and supporting the first elongate member, a plurality of pivot brackets mounted on the first elongate member and forming a pivotal axis substantially parallel to the first elongate member, a plurality of false ceiling panels pivotably mounted at one end on the pivot brackets for pivoting on said pivotal axis, the pivot brackets each comprising a horizontally extending pivot part and a body part from which the pivot part is supported at one end, and the ceiling panels each comprising upwardly turned flanges having an aperture for receiving the other end of the pivot part, the pivot part being passed through apertures of adjacent ceiling panels; a second elongate member supported by further mounting brackets in a position spaced from and parallel to the first elongate member and a resilient member on the second elongate member to engage and retain the other end of the false ceiling panels when pivoted upward to bridge the space between the first and second elongate members.

2. False ceiling as claimed in claim 1 in which the first and second elongate members are mounted underneath their respective mounting brackets and the pivotal axis is positioned aside of the first elongate member.

3. False ceiling as claimed in claim 2 in which the first elongate member has a downwardly extending flange to the side of said one end of the ceiling panel which is formed with a longitudinal recess to allow the said one end to pivot during pivotal movement of the ceiling panel.

4. False ceiling as claimed in claim 1 in which the resilient member is a longitudinally extending split-stem T-member having a longitudinally extending recess and in which the other end of the ceiling panel is formed with protuberances for engaging the split-stem T-member in the recess.

5. False ceiling as claimed in claim 1 in which a closure strip is provided mounted underneath the mounting brackets and held between the mounting brackets and the elongate members.

6. False ceiling which comprises a first elongate member, a plurality of mounting brackets secured to walls surrounding the false ceiling and supporting underneath them the first elongate member, a longitudinally extending flat channel formed in the elongate member having a longitudinal opening at the bottom of the channel, a plurality of pivot brackets each having horizontal portions and downwardly extending L-shaped portions which horizontal portions are slidably received in the channel and which downwardly extending L-shaped portions depend through the longitudinal opening, said L-shaped portion forming a pivotal axis substantially parallel to the first elongate member, a plurality of ceiling panels pivotably mounted at one end on the pivot brackets for pivoting on said pivotal axis, a second elongate member supported by further mounting brackets in a position spaced from and paral-

lel to the first elongate member and a resilient member on the second elongate member to engage and retain the other end of the false ceiling panels when pivoted upward to bridge the space between the first and second elongate members.

7. False ceiling as claimed in claim 6 in which bolts are provided engaging the elongate members and the mounting brackets and in which the bolts pass through slits in the mounting brackets to enable the relative position of the elongate member and the mounting bracket to be adjusted.

8. False ceiling as claimed in claim 6 in which a projection is provided on the mounting bracket between two screw apertures to enable the tilt of the mounting bracket to be adjusted.

9. False ceiling as claimed in claim 6 in which the first elongate member has a downwardly extending flange to the side of said one end of the ceiling panel which is formed with a longitudinal recess to allow the said one end to pivot during pivotal movement of the ceiling panel.

10. False ceiling as claimed in claim 6 in which the ceiling panels comprise upwardly turned flanges having an aperture for receiving the L-shaped portion, the lower leg of the L-shaped portion being passed through apertures of adjacent ceiling panels.

11. False ceiling as claimed in claim 6 in which the resilient member is a longitudinally extending split-stem T-member having a longitudinally extending recess and in which the other end of the ceiling panel is formed with protuberances for engaging the split-stem T-member in the recess.

12. False ceiling as claimed in claim 6 in which a closure strip is provided mounted underneath the mounting brackets and held between the mounting brackets and the elongate members.

13. Kit of parts for assembly into a false ceiling comprising a first elongate member for mounting along a wall, a longitudinally extending flat channel formed in the first elongate member having a longitudinal opening in the bottom of the channel and a longitudinal extending recess formed in the first elongate member underneath the channel, a plurality of pivot brackets, each pivot bracket having a flat slider portion for mounting in said flat channel and at an angle thereto an L-shaped portion for projecting through said longitudinal opening to form a pivot axis substantially parallel to said first elongate member, a second elongate member having a longitudinally extending resilient, split-stem T-member and a longitudinal recess on said split-stem T-member, a plurality of mounting brackets for securing the first and second elongate members to building walls, and a plurality of ceiling panels with upturned flanges which upturned flanges are formed adjacent one end with holes for pivotally engaging said L-shaped portions and adjacent the other end with protuberances for clipping into the longitudinal recess of the split-stem T-member.

14. False ceiling which comprises a first elongate member, a plurality of mounting brackets secured to a wall adjacent the false ceiling and supporting the first elongate member, a plurality of pivot brackets mounted on the first elongate member and having pivot shafts extending substantially parallel to the first elongate member, a plurality of false ceiling panels each having a lower surface for defining part of a false ceiling surface and pivotably mounted adjacent one end on

the pivot shafts, the pivot brackets and panels being pivotable relative to one another on a pivot axis defined by said shafts, said pivot axis lying above the lower surface of each panel to thereby conceal the pivot brackets from view from below the panel and off-set from said first elongate member so as to permit the panels to be pivoted to an attitude parallel to the walls; a second elongate member supported by further mounting brackets in a position spaced from and parallel to the first elongate member, and a resilient member on the second elongate member to engage and retain the other ends of the false ceiling panels when pivoted upward to bridge the space between the first and second elongate members.

15 15. False ceiling as claimed in claim 14 in which the first and second elongate members are mounted underneath their respective mounting brackets and the pivotal axis is off-set laterally from the first elongate member.

20 16. False ceiling as claimed in claim 15 in which the first elongate member has a downwardly extending flange to the side of said one end of the ceiling panel, which flange is formed with a longitudinal recess to allow the said one end to pivot during pivotal movement of the ceiling panel.

25 17. False ceiling as claimed in claim 14 in which the pivot brackets each comprise a horizontally extending pivot shaft and a body part from which the pivot shaft is supported at one end, and in which the ceiling panels comprise upwardly turned flanges each having an aperture for receiving the other end of the pivot shaft, the pivot shaft being passed through apertures of adjacent ceiling panels.

30 18. False ceiling as claimed in claim 14 in which the resilient member is a longitudinal extending split-stem

T-member having a longitudinally extending recess and in which the other end of the ceiling panel is formed with protuberance for engaging the split-stem T-member in the recess.

5 19. False ceiling as claimed in claim 14 in which a closure strip is provided mounted underneath the mounting brackets and held between the mounting brackets and the elongate members.

10 20. Apparatus for assembly to form a false ceiling, comprising a first elongate member, a plurality of mounting brackets for supporting said first elongate member along a wall, a plurality of pivot brackets having pivot shafts and means for mounting said pivot brackets on said first elongate member with said pivot shafts extending substantially parallel to said first elongate member, a plurality of false ceiling panels each having a lower surface for defining part of a false ceiling surface and having means for pivotably mounting the panel adjacent one end on the pivot shafts such that the pivot brackets and panels are pivotable relative to one another on a pivot axis defined by said pivot shafts, with the pivot axis lying above the lower surface of each panel and off-set from said first elongate member to thereby conceal the pivot brackets from view from below the panels and to permit the panels to be pivoted to an attitude parallel to the walls; a second elongate member, a plurality of mounting brackets for supporting said second elongate member in a position spaced from and parallel to the first elongate member, and a resilient member on the second elongate member for engaging and retaining the other ends of the false ceiling panels when pivoted to bridge the space between the first and second elongate members.

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