Oct. 4, 1966 J. M. RALLIS 3,276,179

CEILING ACCESS OPENING AND BRACKET THEREFOR

Filed May 11, 1964

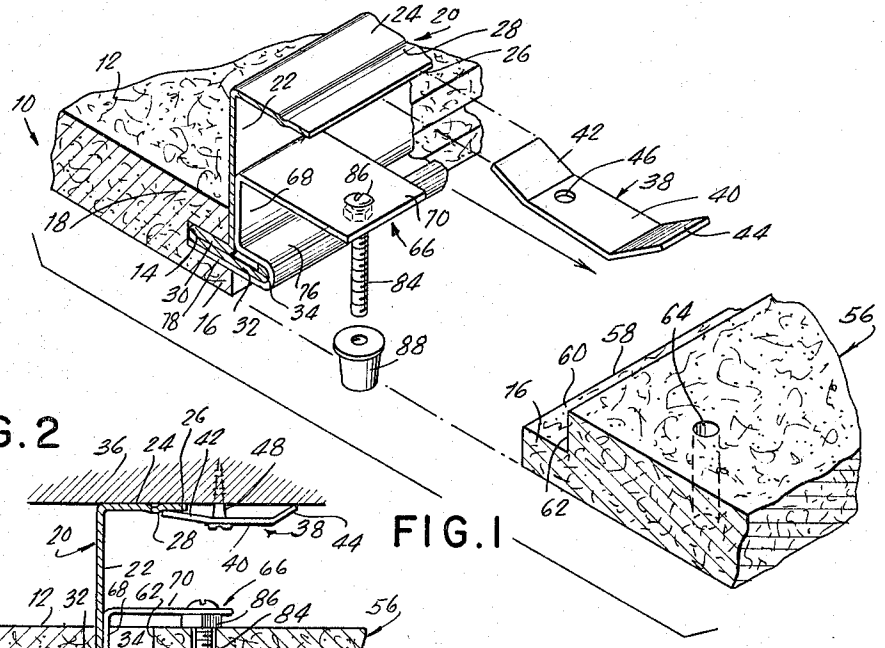


FIG. 1

FIG. 2

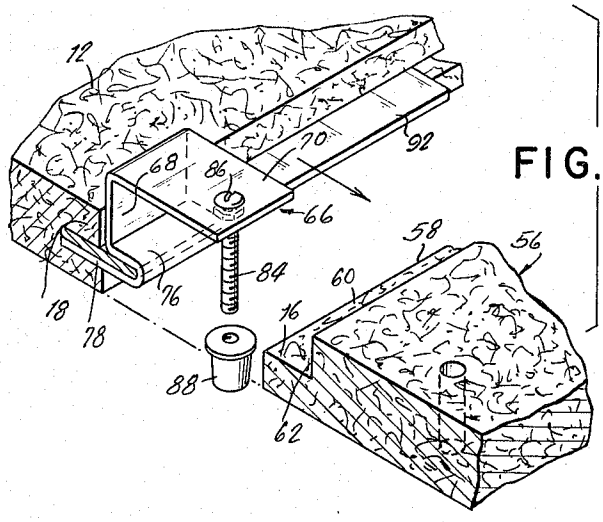


FIG. 3

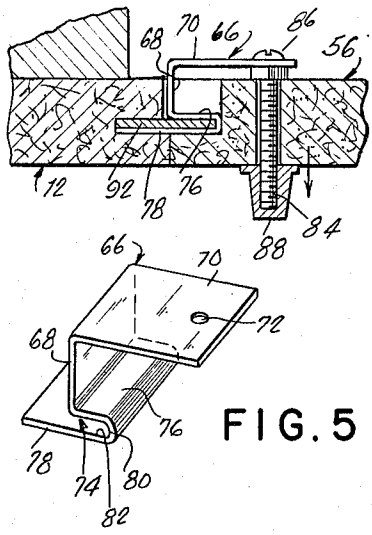


FIG. 4

FIG. 5

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CEILING ACCESS OPENING AND BRACKET THEREFOR

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The present invention relates in general to an auxiliary or suspended ceiling construction and, in particular, to such a ceiling construction having provision for an access opening therein which is provided with a removable closure.

Ceilings of the type to which the present invention relates are formed of a plurality of tiles which are mounted in juxtaposed or abutting relation. Such a ceiling is illustrated and described in my prior application Serial No. 269,098, now Patent No. 3,225,503, filed March 29, 1963. In said application, there is illustrated and described such a ceiling construction in which there is provided an access opening in the ceiling. The access opening construction required the utilization of a bracket means which was retained within the channel defined by a Z-member or bar. Due to the fact that different types or dimensions of Z-bars could be used with various different ceiling constructions, there arose the necessity for providing for each type of Z-bar, a companion bracket or holder which would fit precisely within the associated Z-bar. As a result, it became necessary to maintain a relatively large stock of brackets or holders for the various different sizes or types of Z-bars.

Pursuant to the present invention, the necessity for maintaining various different sizes and types of holders or brackets has been eliminated. This constitutes a primary object of the present invention.

In accordance with the foregoing object of the invention, it is another object of the present invention to provide a single bracket or holder for a removable tile which is normally disposed within the access opening of the ceiling, which bracket or holder can be used with Z-bars of various different sizes or types.

It is another object of the present invention to provide a suspended ceiling construction having a highly novel closable access opening means provided therein which is highly efficient in operation and which can be provided in the ceiling at a relatively low cost.

It is a further object of the present invention to provide a suspended or auxiliary ceiling of the described type which is provided with closable access opening defining means which is economical to manufacture, to mount in position and which presents a highly attractive and decorative appearance.

Other and further objects and advantages of the present invention will be readily apparent to those skilled in the art from a consideration of the following specification, taken in connection with the appended drawings which illustrate the best mode presently contemplated for carrying out the invention.

In the drawings:

FIGURE 1 is a fragmentary, exploded view partially in section of a suspended ceiling construction provided with means which define a readily closable access opening therein pursuant to the present invention;

FIGURE 2 is a fragmentary, sectional view through that portion of the suspended ceiling construction which is provided with a closable access opening means pursuant to the present invention;

FIGURE 3 is a view similar to FIGURE 1 and illustrates a modified form of suspended ceiling construction;

FIGURE 4 is a fragmentary view through that portion of the suspended ceiling construction illustrated in FIGURE 3, which is provided with the closable access opening means pursuant to the present invention; and

FIGURE 5 is a perspective view of a bracket or holder for the removable tile which closes the ceiling access opening.

A suspended ceiling construction of the type to which the present invention relates is illustrated and described in my previously identified co-pending application. Such a ceiling construction includes a plurality of square tiles **12** of conventional construction. The tiles **12** are each provided with a continuous peripheral groove **14** which is defined therein. As best shown in FIGURES 1 and 2, the lower peripheral side portions **16** of the tiles **12** extend outwardly for a greater distance than the upper peripheral side portions **18**. As is well known to those skilled in the art, the set-back conformation of the upper portions relative to the lower portions permits the sides of the tiles to be readily mounted on adjacent supporting channels or Z-bars **20**.

Said Z-bars are of the type illustrated and described in my previously identified application and, as best shown in FIGURES 1 and 2, each channel or Z-bar **20**, which is preferably formed from suitable sheet metal, comprises a vertical wall **22** which is provided at the upper end thereof with a lateral flange **24** which extends from one side of the wall **22**. Inwardly from the free longitudinal marginal ledge **26** thereof, the flange **24** is provided with a depressed portion **28** which extends parallel to the adjacent marginal edge **26**. It will be understood that each channel member **20** is preferably formed of a single strip of sheet metal and, in addition to the flange **24** which is provided preferably by bending at the upper end of the vertical wall **22**, is provided also with a flange **30** which is formed by bending and doubling the strip upon itself at the lower end of the vertical wall **22**, so that the double-layer flange **30** extends from the wall **22** in a direction opposite the direction of the upper flange **24**. The material of the strip from which the channel member **20** is formed continues laterally of the wall **22** in the same direction as the upper flange **24** so as to define a single layer flange **32** which underlies and is spaced from the upper flange **24**. The free longitudinal marginal edge of the flange **32** is bent upon itself to define a bead **34** which is spaced laterally from the wall **22**. It will be readily apparent that the vertical wall **22** provided with an upper flange **24** and a lower flange **32** both extending in the same direction therefrom defines a channel construction. The flanges **30** and **32** respectively define a spline and fit in opposed grooves **14** of the abutting sides of adjacent tiles **12** which define the suspended ceiling, as illustrated in my co-pending application and as is well known in the art.

In order to mount the suspended ceiling construction from an overlying permanent ceiling **36**, the Z-bars **20** are mounted on the lower surface of the ceiling by means of leaf springs **38**. Each leaf spring **38** is provided with a central body portion **40** and with opposite end portions **42** and **44** which are bent upwardly from the body portion **40**. An aperture **46** is defined in the body portion **40**. The leaf spring **38** is secured on the lower surface of the main ceiling **36** by means of a screw or bolt **48** which passes through the aperture **46** and is threaded in the main ceiling **36**. In order to mount the Z-bars **20** on the lower surface of the ceiling **36**, the upwardly-bent end **42** of the spring **38** is engaged under the upper flange **24** in abutment with depressed portion **28** thereof, as best shown in FIGURE 2, so that the depression **28** defines a detent for the free marginal edge of the end portion **42**. It will be readily apparent that as the screw **48** is threaded into the ceiling **36**, the spring **38** will be stressed so as to retain the Z-members or bars **20** in engagement with the main ceiling **36**. It will be understood that a sufficient number of springs **38** are mounted in spaced relation longitudinally of each member **20** to provide for the adequate

securement of the latter to the under-surface of the main ceiling **36**.

From the foregoing, and as illustrated and described in my prior application, it will be apparent that a suspended ceiling is defined by means of a plurality of tiles **12** which are mounted by the lower flanges **30** and **32** of the Z-bars **20**, the latter being engaged against the undersurface of the ceiling **36** by the engagement of the leaf springs **38** with the upper flange **24** of the Z-bar. The distance between the upper ceiling **36** and the suspended ceiling depends upon the longitudinal dimension of the wall **22**. In order to secure the suspended ceiling to the walls of the building, the latter are provided with suitable channels secured thereto as illustrated and described in my prior application. Such channels engage the outer sides of the end tiles **12** which define the suspended ceiling so as to support the end tiles of such ceiling in position.

Pursuant to the basic inventive concept of the present invention, provision is made for obtaining access to the area between the suspended ceiling, which is generally indicated by the reference numeral **10** and the main ceiling **36**. For this purpose, provision is made for modified tiles **56**. The tiles **56** are in all respects similar to the tiles **12** except that the upper peripheral portion **18** along one marginal side edge thereof is broken away or removed so that along one marginal edge thereof the tile **56** has only the lower peripheral portion or kerf of the tile **12**, which remaining portion is also designated by the reference numeral **16**. The removal of the upper portion **18** provides a right angular step **58** at the marginal edge from which that portion **18** has been removed. Said right angular step **58** is defined by the upper surface **60** of the underlying kerf or lower peripheral portion **16** and by the adjacent vertical surface **62** which rises upwardly from the surface **60** and which was defined by the removal of the upper peripheral portion **18**. In addition to the removal of said one upper peripheral portion **18** from the tile **12** to form a modified tile **56**, there is also provided in the latter an aperture **64** adjacent or inwardly of the right angular step **58** which extends completely through the modified tile **56**. Consequently, it will be understood that except for the removal of the one of the upper peripheral portions **18** and the formation of an aperture **64**, the tile **56** is in all other respects similar to the tile **12**. In addition, it will be understood that along its marginal side edge in opposition to the marginal side edge in which there is defined the right angular step **58**, the tile **56** is mounted in the same manner as previously described in connection with the tiles **12**, namely by the insertion of the double-layer flange **30** of the Z-bar **20** into the peripheral groove **14** in the opposing side marginal edge, as illustrated in my prior application.

As previously explained, it will be understood that in connection with a normal tile **12** the single thickness flange **32** of the Z-bar **20** is insertable into the peripheral groove **14** thereof while the double thickness flange **30** of the Z-bar is inserted into the adjacent groove **14** of an adjacent tile **12**. However, with the removal of the upper peripheral extension **18** from one marginal edge of the modified tile **56**, it will be apparent that the tile **56** can no longer be supported along its modified marginal edge by means of the single flange **32** or by means of the double flange **30** since the groove **14** is no longer present at said modified edge. For this purpose, and pursuant to a highly novel feature of the present invention, there is provided a bracket or holder **66** for mounting a tile **56** along the marginal edge thereof which is provided with a right angular step **58**. As best shown in FIGURE 5, the bracket or holder **66** is a substantially S-shaped member preferably formed of sheet metal. As here shown, the bracket **66** comprises a vertical center or body portion **68** provided at the upper end thereof with the laterally-extending flange **70**. Flange **70** is provided with an aperture **72** defined therein for the purpose hereinafter described in detail. At the lower end thereof, the body portion **68** is provided with a generally U-shaped flange **74**. The U-shaped flange **74** is defined by an arm **76** which extends from the body portion **68** in the same direction as the flange **70** and by an opposing arm **78** which extends in an opposite direction, said arms being interconnected by the integral bight **80**.

In order to mount the access opening closure tile **56** in position in a suspended ceiling construction, the holder **66** is engaged on a Z-bar **20**. More specifically, the U-shaped flange **74** of the holder **66** is engaged over the bead **34** and the flange **32** of the Z-bar **20** so that the bead and the flange **32** are seated within the recess **82** defined by the opposing arms **76** and **78**. As best shown in FIGURES 1 and 2, when the bead and flange **34** and **32**, respectively, are engaged within the recess **82**, the arm **78** of the bracket **66** underlies both flanges **30** and **32** of the Z-bar, the arm **76** overlies the bead **34** which fits within the bight **80** and the body portion **68** of the bracket **66** abuts the vertically-extending body portion **22** of the Z-bar **20**. As a result, the bracket **66** is frictionally engaged with the Z-bar **20**, the lower flanges of which are seated within the recessed portion **82** of the bracket **66** and the vertical wall **68** of the bracket being in abutting engagement with the vertical wall **22** of the Z-bar. Consequently, it will be apparent that the holder **66** need not be precisely dimensioned to fit within the channel of the Z-bar **20** defined by the opposing flanges **32** and **24** thereof, and as a result, the distance between said flanges is not critical in so far as the construction of the holder **66** is concerned. Consequently, the bracket or holder **66** need not be designed pursuant to the present invention to fit specifically in firm engagement between the opposing flanges **24** and **32** of the Z-bar. With the bracket **66** so engaged on the Z-bar **20**, a bolt **84** is then utilized to secure or mount the tile **56** in position. More specifically, the step portion **58** of the tile **56** is engaged with the U-shaped flange **74** of the bracket **66** in the manner illustrated in FIGURE 2. The bolt is inserted through the aperture **72** of the flange **70** of the bracket **66** and a nut **86** is disposed immediately underneath the flange **70**. The bolt **84** extends through the aperture **64** defined in the tile **56** and extends below the latter. A threaded cap **88** is threaded onto the exposed portion of the bolt **84** so as to securely seat and mount the tile **56** in position to the bracket **66** which, in turn, is frictionally engaged or seated on the Z-bar **20**. When it is desired to obtain access to the opening in the ceiling **10**, it is necessary only to disengage the cap **88** from the bolt **84**. The tile **56** may thereupon be removed from the bracket **66** by moving the tile downwardly, as indicated by the arrow **90** in FIGURE 2.

Referring now to FIGURES 3 and 4 in detail, there is shown a modified construction. In the construction illustrated in FIGURES 3 and 4, it will be understood that the various parts and components illustrated in FIGURES 3 and 4 are exactly the same as those shown in FIGURES 1 and 2 execpt for the fact that in FIGURES 3 and 4 the Z-bars **20** are not shown. More specifically and as best shown in FIGURE 3, the tiles **12** are provided in the four corners thereof with splines **92** which are used to interengage in conventional manner tiles **12**. More specifically, and as well known in the art, the splines **92** extend into the opposing groove **14** of abutting tiles **12** in conventional fashion. Consequently, in order to mount the tile **56** to close an access opening defined in a ceiling having tiles **12** provided with splines **92**, the bracket **56** is engaged on the exposed portion of the spline **92**. More specifically, the exposed portion of the spline **92** is engaged or seated within the recess **82** defined in the U-shaped flange of the holder, as best shown in FIGURES 3 and 4. More specifically, it will be noted that the lower arm **78** of the U-shaped flange **74** extends and underlies the lower surface of the spline **92** and that the upper arm **76** overlies the exposed portion of the spline **92**. It will be understood that when the spline

92 is seated within the recess 82, The bracket 66 is in firm frictional engagement therewith. With the bracket 66 so engaged on the spline 92, the tile 56 is engaged with the bracket 66 in the same manner as previously described in connection with the construction illustrated in FIGURES 1 and 2. Consequently, and as best shown in FIGURE 4, it will be apparent that the tile 56 is engaged in position on the holder 66 by means of the bolt 84 and cap 88, the holder being, in turn, frictionally engaged on the spline 92 which is engaged in the groove 14 defined in the tile 12, it being noted that the spline and the lower flange arm 78 substantially fill the groove so as to provide for the firm frictional engagement of the holder 66 in position relative to the tile 12.

In view of the foregoing, it will be apparent that pursuant to the present invention there has been provided a highly novel and efficient arrangement for providing a removable access opening closure in a dropped ceiling of the type which is described. It will be understood that various changes and modifications may be made therein without, however, departing from the inventive concept thereof, as set forth in the appended claims.

I claim:

1. A suspended tile ceiling construction comprising a plurality of tiles mounted in spaced relation below a main ceiling, said tiles being interconnected along their edges by means of splines and a closure tile provided with closure bracket means, said bracket means comprising an S shaped bracket having a recessed portion formed at its bottom end below the top surface of said closure tile wherein a portion of a spline is received and a flange at its top end overlying said closure tile, said flange being provided with a bolt secured thereto, said bolt extending downwardly through an opening in said closure tile and being provided with a fastening means on the bolt portion projecting below said closure tile.

2. In a suspended tile ceiling construction comprising a plurality of tiles mounted in spaced relation below a main ceiling adjacent tiles being interconnected along their abutting edges by means of splines, said tiles including at least one closure tile provided with closure bracket means said bracket means comprising an S shaped bracket having a recessed portion formed at its bottom end disposed below the top surface of the closure tile and receiving a portion of a spline and a flange at its top

end overlying said closure tile, said flange having a bolt secured thereto, said bolt extending downwardly through an aperture in the closure tile and being provided with fastening means on the bolt portion extending through the aperture in the closure tile.

3. Bracket means for supporting a closure tile in a suspended ceiling tile construction wherein adjacent tiles are provided with interconnecting means, said bracket means comprising a substantially S shaped member comprised of a vertical body portion which is provided at the upper end thereof wtih a horizontaly extending first flange, said flange being provided with a bolt attached thereto, the lower end of said body portion being provided with a generally U shaped flange defined by an arm which extends in the same direction as said first named flange and an opposing arm which extends from the body portion in the opposite direction, said arms being interconnected by a bight portion, said U shaped flange defining a recess adapted to receive a complementary portion of a tile interconnecting means in frictional engagement therewith.

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