April 1, 1969 R. E. FOLTZ 3,436,047

MOUNTING ASSEMBLY

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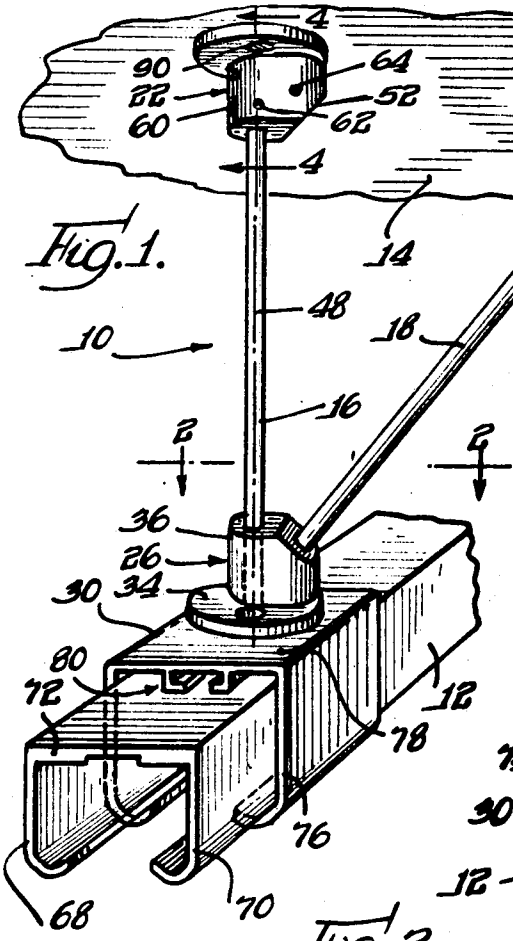
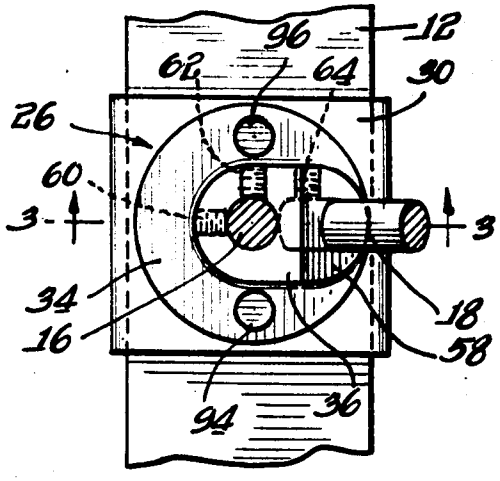


Fig. 1.

Fig. 2.



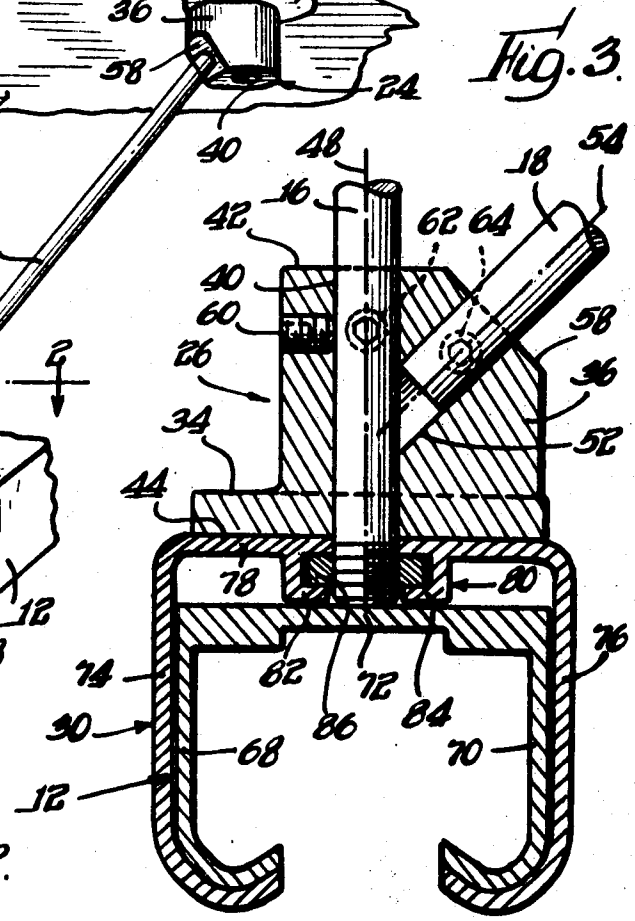


Fig. 3.

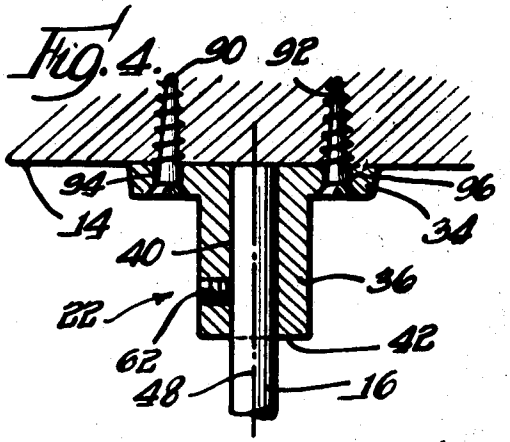


Fig. 4.

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MOUNTING ASSEMBLY

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U.S. Cl. 248—317 7 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to a mounting assembly including a plurality of mutually interchangeable mounting brackets for suspending a track from a support surface and bracing the track against movement relative to the support surface.

Tracks and other members are often suspended from a ceiling of a building to movably support objects such as curtains, screens, or tools and parts on an assembly or conveyor line. A first group of rods commonly extend vertically between the track and the ceiling to support the track from the ceiling. A second group of rods, extending at an acute angle to the first group of rods, are usually provided between the track and the ceiling to brace the track against sway or sidewise movement relative to the ceiling.

The tracks and support rods are usually connected to the ceiling with a plurality of sets of brackets. Each set of brackets generally includes at least three different types of bracket. A first type of bracket is required for connecting the support rod to the ceiling. A second type of bracket is required for connecting the brace rod to the ceiling. A third type of bracket is provided for interconnecting the support rods and brace rod. Since these three types of brackets serve different purposes, they have different shapes. The installation of a suspended track requires large numbers of each type of bracket. The obtaining of requisite materials for installing a track is complicated by the necessity of "specifying" and order detailing" the number of each kind of bracket required. The track installation is complicated by the necessity of locating and positioning the different types of brackets in their proper relationship with each other and the associated support and brace rods. Of course, the production of three different types of brackets increases the inventory requirements of both a manufacturer and a distributor.

Therefore, it is an object of this invention to provide a mounting assembly which overcomes the aforementioned limitations of prior art constructions. Specifically, it is an object of this invention to provide a mounting assembly which uses mutually interchangeable mounting brackets for supporting and bracing a track to simplify "specifying," "order detailing" and installing the track.

Another object of this invention is to provide an inexpensive mounting bracket for a suspended track installation.

Another object of this invention is to provide a mounting bracket which enables a suspended track to be readily adjusted vertically relative to a support surface or ceiling.

These and other objects and features of the invention will become more apparent upon a consideration of the accompanying drawings wherein:

FIG. 1 is a perspective view of a mounting assembly for a suspended track installation;

FIG. 2 is a plan view, taken along the line 2—2, illustrating the interrelationship of a brace rod, a support rod and a mounting bracket for interconnecting the brace and support rods;

FIG. 3 is an elevational view, taken along the line 3—3 of FIG. 2, showing the interrelationship of the brace and support rod, the mounting bracket, the track, and a track support bracket for connecting the support rod to the track; and

FIG. 4 is a sectional view, taken along the line 4—4 of FIG. 1, illustrating the interrelationship of a support rod mounting bracket and a support surface from which the track is suspended.

Referring now to the drawings in greater detail, a mounting assembly **10** for suspending a track **12** from a ceiling or support surface **14** is illustrated in FIG. 1. The mounting assembly **10** includes a vertically extending steel riser or support rod or shaft **16** and a steel brace or side rod or shaft **18**. The support rod or shaft **16** transfers a load applied to the track **12** by a carriage or trolley (not shown) to the ceiling **14**. The brace rod **18** steadies or holds the track **12** against swaying or sidewise movement relative to the ceiling **14**. The support rod **16** is connected by a support rod mounting bracket or fixture **22** to the ceiling or support surface **14**. The brace rod **18** is connected to the ceiling by a brace rod mounting bracket or fixture **24**. The support rod **16** and brace rod **18** are interconnected by a connector mounting bracket or fixture **26** which is mounted adjacent to a track support bracket **30**. The mounting brackets **22** through **26** are substantially identical in structure, so that the mounting brackets are mutually interchangeable. Thus, any one mounting bracket can be substituted for any other mounting bracket, that is the mounting bracket **22** can be substituted for either the mounting bracket **24** or the mounting bracket **26** and the mounting brackets **24** and **26** can be substituted for any other mounting bracket in the mounting assembly **10**.

The interrelationship of the mounting bracket **26**, the track support bracket **30**, the support rod **16** and the brace rod **18** is shown in greater detail in FIGS. 2 and 3. The mounting bracket **26** is cast as an integral structure of aluminum in a preferred embodiment of the invention. However, the bracket **26** can be machined or forged from other metals. The bracket **26** includes a cylindrical radially outwardly projecting base flange **34** and an axially projecting body section **36**. A cylindrical vertical support rod channel or passage **40** extends through the body section **36** and base flange **34** from an outer end surface **42** of the body section **36** to a flat circular outer surface **44** of the base flange **34** (see FIG. 3). The support rod passage **40** is positioned centrally of the base flange **34** so that a longitudinal central axis **48** of the support rod **16** extends through the center of the flange **34**. A second passage **52** is formed in the body section **36** of the bracket **26**. The second passage **52** has a longitudinal axis **54** which extends at an angle of approximately 45 degrees with the central axis **48** of the support rod **16** and passage **40**. The passage **52** intersects the passage **40**, as is perhaps best seen in FIG. 3, so that an end portion of the brace rod **18** engages an end portion of the support rod **16**. To facilitate the formation of the passage **52**, a side surface **58** is formed on the body section **36** and extends perpendicularly to the central axis **54** of the passage **52**.

A plurality of set screws **60**, **62** and **64** are mounted in the body section **36** for engagement with the support rod **16** and brace rod **18** to fixedly interconnect the mounting bracket **30** and the support rod **16** and brace rod **18**. It should be noted that a pair of set screws **60** and **62**, spaced apart 90° from each other, are provided for interconnecting the support rod **16** and the mounting bracket **26**, since the support rod **16** transmits a relatively large load from the track **12** to the mounting bracket **22** on the ceiling **14**.

The track **12** is formed of aluminum, or other suitable

material, and includes a pair of opposite inwardly facing J-shaped leg sections **68** and **70** which are interconnected by a horizontally extending connector section **72**. The bracket **30** is also formed of aluminum and has a cross sectional configuration which is somewhat similar to the cross sectional configuration of the track **12**. The support bracket **30** includes a pair of opposite inwardly facing J-shaped leg sections **74** and **76** whose inner surfaces engage outer surfaces of the J-shaped leg sections **68** and **70** of the track **12**. The J-shaped leg sections **74** and **76** of the support bracket **30** are interconnected by a transversely extending connector section or wall **78**. The bracket **30** also includes a rail assembly **80** having a pair of oppositely facing generally L-shaped guide or mounting tracks **82** and **84** which position a connector support nut **86** for engagement with an outermost threaded end portion of the support rod **16**. The nut **86** and the support rod **16** are advantageously made of steel which has a relatively high tensile strength to prevent deformation or stripping of the threads between the nut and support rod when a relatively large load is applied to the track **12**. The support rod **16** extends through the support bracket **30** into engagement with the connector section **72** of the track **12** so that when the support rod is screwed or tightened into the nut **86** an end surface of the support rod **16** presses the leg sections **68** and **70** of the track **12** against the leg sections **74** and **76** of the support bracket **30**. The rail assembly **80** engages side surfaces of the nut **86** to hold the nut against rotation during the tightening of the support rod **16** against the connector section **72** of the track. For those who are interested, the construction of the support bracket **30** and track **12** are set forth in considerable detail in my copending application Ser. No. 618,791, filed Feb. 27, 1967, entitled "Track Supports."

The structure of the support rod mounting bracket **22** and the brace rod mounting bracket **24** is identical to the structure of the connector bracket **26**. Therefore, components and passages of the mounting brackets **22** and **24** will be referred to by the same numerals previously used to designate the components of the mounting bracket **26**.

As is perhaps best seen in FIG. 4, taken in connection with FIG. 1, the support rod **16** extends into the central passage **40** of the mounting bracket **22**. The support rod is fixedly connected to the mounting bracket **22** by the set screws **60** and **62**. The mounting bracket **22** is in turn connected to the ceiling or support surface **14** by suitable connector elements such as screws **90** and **92** which extend through holes or apertures **94** and **96** in the base flange **34**. The track **12** can be readily adjusted vertically relative to the ceiling **14** by loosening the set screws **60** and **62** and sliding the support rod **16** in the passage **40** of the mounting bracket **22**. When the track is positioned at the desired height, the set screws are again tightened to fixedly interconnect the mounting bracket **22** and the support rod **16**.

The brace rod **18** extends into the passage **52** in the brace rod mounting bracket **24** in much the same manner as in which the brace rod extends into the passage **52** in the connector mounting bracket **26**. Of course, the brace rod mounting bracket **24** is connected to the ceiling **14** with suitable connection means, similar to the screws **90** and **92**. The mounting bracket **26** has been shown in abutting engagement with the support bracket **30** (see FIG. 3) to transmit sway or side forces to the brace rod **28** and mounting bracket **24** from a relatively large surface area of the connector section **78** of the support bracket **30**. However, the connector bracket **26** could, if a shorter brace rod **18** or longer support rod **16** were used, be positioned in a spaced apart relationship relative to the support bracket **30**, that is in a position on a central or intermediate portion of the support rod **16**. When the bracket **26** is positioned in a spaced apart relationship with the support bracket **30**, sway or side forces are transmitted to the brace rod **18** by the bracket **26**. This transmission of sway forces to the brace rod is facilitated by the abutting engagement of an end of the brace rod **18** with the side of the support rod **16**, as shown in FIG. 3. When the mounting bracket **26** is spaced apart from the support bracket **30**, a lock nut can be advantageously provided on the support rod **16** in abutting engagement with an outer surface of the connector section **78** of the bracket **30**.

The operation of the mounting assembly **10** constructed as illustrated in FIGS. 1 through 4, will be apparent from the foregoing description. However, it should be noted that the mounting assembly **10** includes a plurality of mutually interchangeable mounting brackets **22** through **26** of similar structure to facilitate installation of the mounting assembly. Each of the mounting brackets **22** through **26** includes a first passage **40** having a longitudinal axis which extends vertically relative to the ceiling **14** and a second passage **52** having a longitudinal axis which extends at an angle of approximately 45° to both the ceiling **14** and the longitudinal axis of the first passage **40**.

When the mounting assembly **10** is installed, the support rod **16** is connected to the track **12** by the support bracket **30**. The mounting bracket **26** is then slid onto the support rod **16** with the support rod extending through the central passage **40** of the mounting bracket. Next, the outer upper end of the support rod **16** is positioned in the central passage **40** of the mounting bracket **22** which has been connected to the ceiling **14**. The vertical position of the track relative to the ceiling **14** is then adjusted and the set screws **60** and **62** tightened to fixedly interconnect the support rod **16** and mounting bracket **22**. The brace rod **18** is then positioned loosely in the passage **52** of the mounting bracket **26** and the passage **52** in the mounting bracket **24**. The mounting bracket **24** is connected to the ceiling and the set screw **64** tightened to fixedly interconnect the mounting bracket **24** and the brace rod **18**. The set screws **60** through **64** in the mounting bracket **26** are then tightened to fixedly interconnect the mounting bracket **26** and the brace rod **18** and support rod **16**. It will be apparent to those skilled in the art that since the mounting brackets **22** through **26** are mutually interchangeable, it is unnecessary to install a particular mounting bracket at a particular place in the mounting assembly **10**. It will also be apparent to those skilled in the art that the order of steps for installing the track **12** can be varied from the particular order set forth above.

While particular embodiments of the invention have been shown, it should be understood, of course, that the invention is not limited thereto since many modifications may be made.

What is claimed is:

1. An assembly for suspending a track in a spaced apart relationship with a support surface, said assembly comprising: a plurality of mutually interchangeable mounting brackets of similar structure, each of said mounting brackets including a first passage having a longitudinal axis extending in a substantially perpendicular relationship with the support surface, said passage having a length substantially greater than the diameter of the rod to be accommodated thereby so as to provide an elongated rod supporting surface, and a second passage extending at an acute angle to the longitudinal axis of said first passage, said second passage having a length substantially greater than the diameter of the rod to be accommodated thereby so as to provide an elongated rod supporting surface; a support rod extending through a first passage in a first mounting bracket of said plurality of mounting brackets to interconnect the track and a second mounting bracket of said plurality of mounting brackets, said second mounting bracket being connected to the support surface with an upper end of the support rod positioned in the first passage in said second mounting bracket to suspend the track from the support surface; a brace rod having a first end portion extending into the

second passage of said first mounting bracket and a second end portion extending into the second passage of a third mounting bracket of said plurality of mounting brackets, said third mounting bracket being connected to the support surface to hold the suspended track against movement relative to the support surface, and a plurality of set screw members for securing said rods against displacement with respect to their complementary mounting bracket.

2. An assembly as set forth in claim 1 wherein: each mounting bracket of said plurality of mounting brackets is an integral structure including a base flange adapted to be positioned in abutting engagement with the support surface and an outwardly projecting body portion, said first passage extending through both said base flange and said body portion, said second passage intersecting said first passage in said body portion to enable said brace rod to abuttingly engage said support rod in the body portion of said first mounting bracket.

3. An assembly as set forth in claim 1 wherein one of said support brackets is mounted on the track for interconnecting the track and said support rod, said support rod having a lower end portion extending through the support bracket into engagement with the upper surface of the track to urge the track into a predetermined relationship with said support bracket.

4. A mounting bracket comprising: a base mounting flange having a flat outer surface for abutting engagement with and attachment to a support surface; an integral body portion extending laterally outwardly from said base flange; a first passage extending through said body portion and the center of said base flange for receiving a support rod, said passage having a length substantially greater than the diameter of the rod to be accommodated thereby so as to provide an elongated rod supporting wall surface; a second passage extending into said body portion and intersecting said first passage at an acute angle for receiving a brace rod, said second passage having a length substantially greater than the diameter of the rod to be accommodated thereby so as to provide an elongated rod supporting wall surface; and a plurality of setscrews extending into said first and second passages to secure the support rod and brace rod against movement relative to the body portion of the mounting bracket.

5. An assembly as set forth in claim 3 wherein the support bracket which is mounted on the track includes a channel and a nut within said channel for accommodating the lower extremity of a vertical support rod.

6. A mounting bracket as set forth in claim 4 wherein the passages in the support brackets are defined by unthreaded walls of a bore for slidably receiving a complementary support rod.

7. A mounting bracket as set forth in claim 4 wherein the body portion of the bracket extending laterally outwardly from said base flange is substantially less in cross sectional area than the area defined by said base flange.

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U.S. Cl. X.R.

104—111; 287—20; 16—94