June 27, 1961 H. Y. MAGEOCH 2,990,458

ELECTRIC CONDUCTOR-HANGER ALINING MEANS

Filed Jan. 22, 1957

Fig. 1

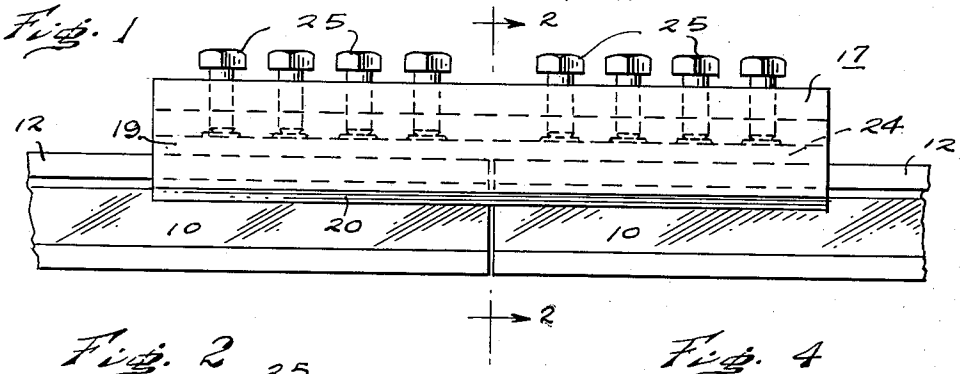


Fig. 2

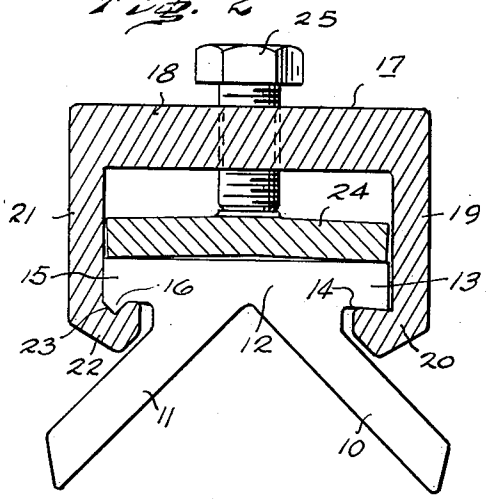


Fig. 4

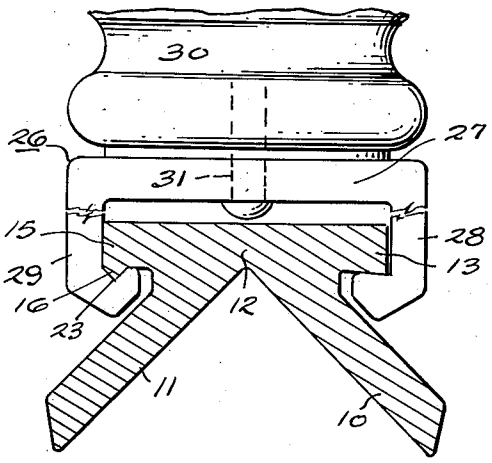


Fig. 3

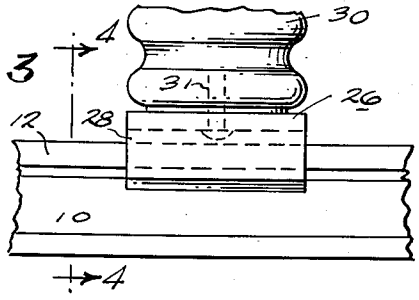
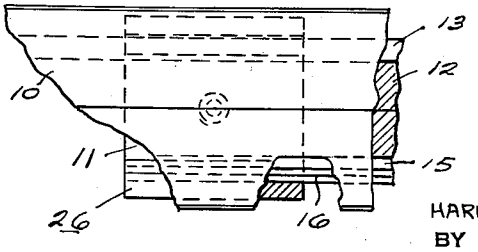


Fig. 5



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ELECTRIC CONDUCTOR-HANGER ALINING MEANS

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This invention relates generally to electric power conductor systems and more particularly to improvements in the construction of rails for conducting electric power to a mobile unit.

Commonly, rails for conducting electric power to a mobile unit have a pair of longitudinally extending legs that diverge downwardly and outwardly from the center and on opposite sides of the rail, and normally each rail comprises a multiplicity of rail sections aligned in end to end relation. For drawing electric power from the conductor rail, the mobile unit is provided with current collectors that are fitted with shoes which move along the rail in frictional contact with the undersurface thereof. If the undersurfaces of adjacent rail sections are not in exact alignment, a transversely extending step is formed at the meeting ends thereof, and the current collector shoes must pass under this step in moving from one rail section to the other, in consequence of which, whenever a shoe passes under misaligned meeting ends of adjacent rail sections, the entire conductor system receives a severe shock, operation is unduly noisy, and the current collector shoe is subjected to excessive wear.

Such rails commonly are suspended from hangers that are provided with fittings of channel shape in transverse section. The base walls of the fittings overlie a generally flat head that is formed integral with and which overlies the rail legs aforesaid, and the side walls of the fittings extend downwardly on opposite sides of the rail head and hook under the same. Preferredly, the rail head is slidably received by the channel fittings for movement of the rail relative to the fittings when the rail shifts under the influence of expansion or contraction due to temperature changes. Known constructions are not entirely satisfactory because when the rail shifts relative to a hanger, the fitting turns slightly about the vertical axis of the hanger and locks with the rail head, in the same way that a washer locks on a rod when the washer is thin in comparison with the size of the rod and a force is applied to one side of the washer to cant the same relative to the longitudinal axis of and in an attempt to move it along the rod. When the fitting and the rail head are interlocked in the manner aforesaid and the rail shifts, the hanger is moved to an undesirable inclined position. In view of the foregoing, therefore, it is a principal object of the present invention to provide an improved construction of conductor rail and conductor rail fittings.

Another principal object of the present invention is to provide improved conductor rail and conductor rail fittings having indexing means for conveniently aligning accurately sections of the rail, to thereby eliminate transversely extending steps at misaligned meeting ends of adjoining rail sections.

And another principal object of the present invention is to provide improved conductor rail and conductor rail hanger fittings wherein the tendency for the latter to lock on the head of the rail in the manner aforesaid is eliminated.

Other objects and advantages of the present invention will appear more fully hereinafter, it being understood that the invention consists substantially in the combination, construction, location and relative arrangement of parts, all as described in detail hereinafter, as shown in the

accompanying drawings and as finally pointed out in the appended claims.

In the accompanying drawings:

FIGURE 1 is a side elevation at a splice between a pair of conductor rail sections constructed in accordance with and embodying the principles of the present invention.

FIGURE 2 is an enlarged transverse section taken on line 2—2 of FIGURE 1.

FIGURE 3 is a side elevation showing the conductor rail and the lower end of a hanger carrying the same.

FIGURE 4 is an enlarged transverse section taken on line 4—4 of FIGURE 3.

FIGURE 5 is a bottom view of the conductor rail and conductor rail hanger assembly shown in FIGURE 3, part being broken away and sectioned for the sake of clarity.

Referring to the drawing, the conductor rail constructed in accordance with and embodying the principles of the present invention comprises a pair of longitudinally extending opposite side legs **10** and **11** that diverge at right angles to one another downwardly and outwardly from the center of the rail. Formed integral with and overlying these rail legs is a rail head **12** that is of a width sufficient for overlying the rail legs **10** and **11**. The portion of the rail head that overhangs the rail leg **10**, designated **13**, is provided with an undersurface **14** that slopes upwardly and inwardly from the side of the rail head, and the portion of the rail head that overhangs the rail leg **11**, designated **15**, is provided with an underlying longitudinally extending integral bead **16**. This bead, of V-shape in transverse section, extends throughout the full length of the rail and is disposed immediately adjacent the side of the rail head, as shown.

Referring particularly to FIGURES 1 and 2, the means for splicing rail sections comprises an elongated fitting **17** of channel shape in transverse section. The base wall of this fitting, designated **18**, is disposed in parallel overlying spaced relation to the rail head **12**, and the side walls extend downwardly on opposite sides of the rail head. One of these side walls, designated **19**, terminates at its lower end in a longitudinally extending portion **20** that extends laterally inwardly therefrom and hooks under the side portion **13** of the rail head. The other side wall, designated **21**, terminates at its lower end in a longitudinally extending portion **22** that extends laterally inwardly therefrom and hooks under the side portion **15** of the rail head. The hook forming portion **22** is provided with a groove **23** that is shaped complementally to and which registers with the overlying bead **16** depending from the side portion **15** of the rail head.

The means for splicing rail sections also comprises an elongated spring metal plate **24** that is slightly arcuate in transverse section. This plate extends over the opposed rail head portions and under the base wall **18** of the fitting **17**. For securing the several parts against displacement relative to one another, a set of studs **25** are threaded through the base wall **18** of the fitting **17** and brought to bear upon the spring plate **24** to clamp the opposed rail head portions between the spring plate **24** and the hook forming portions **20** and **22** respectively of the fitting side walls **19** and **21**.

It will be appreciated that due to manufacturing tolerances, the clear distance between the side walls **19** and **21** of the fitting **17** may be greater than the overall width of the rail head. In this event, the beading underlying the opposed end portions of the rail sections, and the groove **23** that is formed in the side wall portion **22** of the fitting **17** coact to secure the opposed end portions of the rail sections against any lateral offset relative to one another.

It will also be appreciated that one of the rail legs **10** or **11** may be slightly thinner than the other. In this

event, the beading and the groove 23 aforesaid insure that the conductor rail will be assembled with the thinner legs of the rail sections on the same side of the conductor rail and the thicker legs on the opposite side.

It will further be appreciated that the leg 10 of the rail may be disposed at one angle relative to the longitudinal median plane of the rail, while the rail leg 11 is disposed at a different angle. In this event, the beading and the groove 23 aforesaid insure that the rail leg sections on the same side of the conductor rail will be disposed at the same angle relative to the median plane aforesaid.

It should be obvious that the portions of the bead 16 associated wtih the opposed end portions of the rail sections and the groove 23 that is formed in the underlying side wall portion 22 of the fitting 17 and in which the bead portions aforesaid are seated are effective indexing means for exactly aligning the rail sections, and particularly the undersurfaces thereof to thereby eliminate any transversely extending step that would otherwise be formed at the meeting ends of the rail sections.

Now referring particularly to FIGURES 3, 4 and 5, the hanger means for suspending the conductor rail constructed in accordance with and embodying the principles of the present invention comprises an elongated fitting 26 that is the same in transverse section as the fitting 17, being provided with a base wall 27 and a pair of side walls 28 and 29 that extend about and engage the rail head in the same manner as the fitting 17. The latter is secured to the lower end of an insulator unit 30 by a rivet 31 that extends through the base wall 27 of the fitting 26.

It will be appreciated that the conductor rail should slide freely in the hanger fitting 26 when the conductor rail shifts in the direction of its length. However, when such shifting of the rail occurs, there is a tendency for the hanger fitting 26 to turn about the axis of the rivet 31 and lock with the rail head. This tendency to lock depends upon the ratio of the effective width of the rail head to the length of the hanger fitting 26. The greater the ratio the greater the tendency to lock. In the absence of the bead 16, the effective width of the rail head corresponds to the actual width thereof. However, when the bead 16 is provided, the effective width of the rail head corresponds to the width of the bead 16. Therefore, the ratio aforesaid is smaller, and the tendency to lock is reduced to a minimum when the bead 16 is provided.

It will be understood, of course, that the present invention as hereinbefore described and as shown in the accompanying drawings is susceptible of various changes and modifications which may be made from time to time without departing from the general principles of real spirit of the invention, and accordingly it is intended to claim the same broadly, as well as specifically, as indicated by the appended claims.

What is claimed as new and useful is:

1. In apparatus of the character described, the combination comprising a longitudinally extending conductor rail having a main body portion of inverted V shape in transverse cross section to provide a pair of downwardly diverging side wall parts and a flat topped head portion integral with and extending transversely across the top ridge of said body portion to provide the latter with a pair of opposite projecting wing parts, one of said wing parts having a longitudinally extending bead formed integrally therewith and depending therefrom at the outer

undersurface thereof, an elongated rail-securing member of C-shape in transverse cross-section extending parallel to said rail including a base wall disposed in superposed spaced relation to said rail head and a pair of opposite side walls embracing therebetween said rail head, the bottom edges of said rail-head-embracing side walls being inwardly and upwardly turned to provide hook-like portions respectively underlying in face to face engagement with the opposite wing parts of the rail head and closely overlying the downwardly diverging side wall parts of said conductor rail of inverted V shape, the one of said hook-like portions underlyingly engaging the beaded wing part of the rail head being provided with a groove shaped complementally to that of the overlying bead to furnish a close-fitting seat for the latter, an elongated transversely slightly-bowed flat plate member extending parallel to said rail and interposed between the flat topped rail head and the overlying base wall of said rail-securing member, said plate member being of a width approximately equal to that of the rail head with the transverse bowing being effective to provide a pair of longitudinally extending opposite side portions downwardly inclined relatively to its central portion, the longitudinally extending marginal edge portions of said plate member being respective seated upon the opposite wing parts of the rail head, said slightly-bowed plate member having an inherent bias tending to urge the central portion thereof to normally assume a position raised above the rail head, and means operatively interposed between said rail-securing member and said plate member for pressing the central portion of the plate member toward said rail head against the inherent bias of the plate member to securely clamp together the rail and its securing member with the opposite side portions of the plate member respectively in substantial flat-wise engagement with the wing parts of the rail head and with the rail head depending wing bead seated firmly in the complementally shaped groove formed in the underlying hook-like portion of the rail-securing member.

2. The apparatus according to claim 1 wherein said rail head wing part depending bead is V-shaped with one side of the V sloping outwardly upward to terminating intersection with the outer side edge of the rail head, and wherein the underlying complementally shaped groove in the hook-like portion of the rail-securing member is located relative to the inside surface of its associated side wall so that the outer side edge of the above-lying rail head substantially abuts the said inside surface of the side wall, whereby relative lateral shift between the rail head and rail securing member is positively precluded.

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