

Sept. 19, 1967

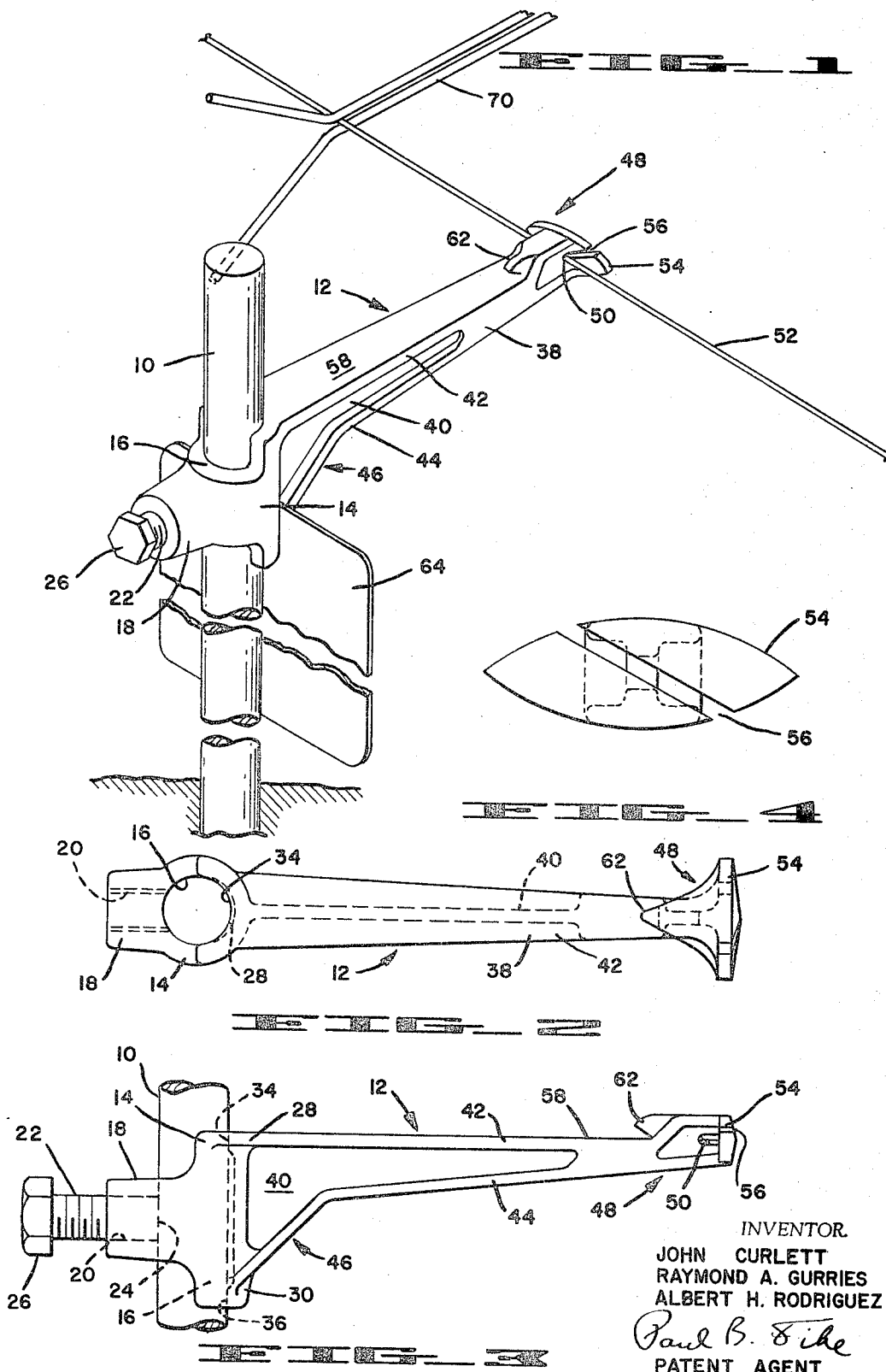
J. CURLETT ET AL

3,342,446

GRADE WIRE SUPPORT

Filed March 29, 1965

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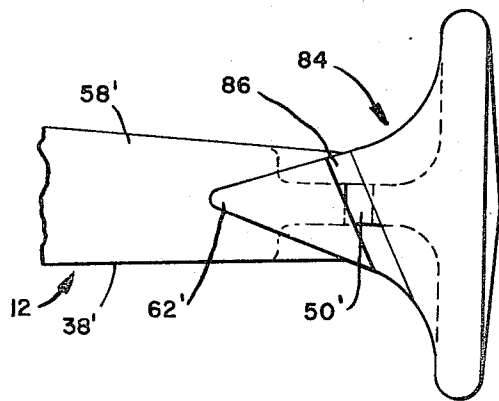


FIG. 6

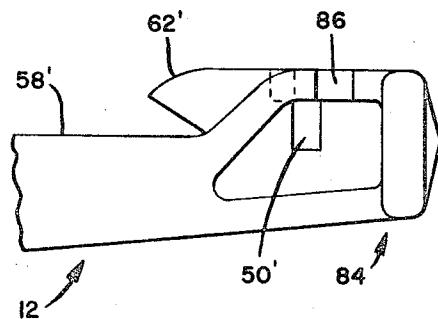


FIG. 7

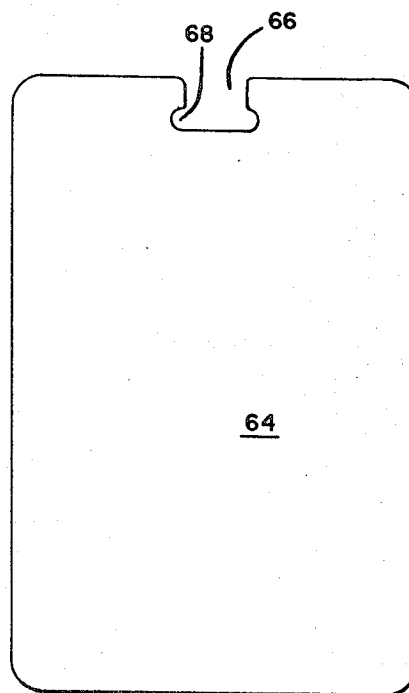


FIG. 8

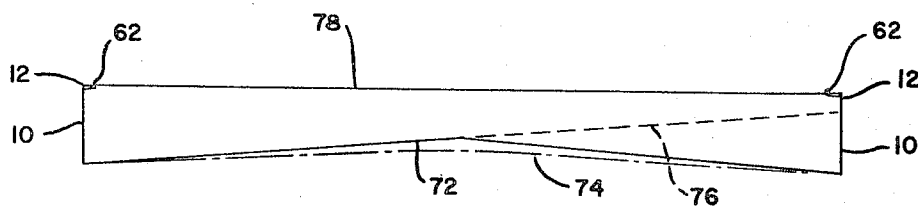


FIG. 9

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3,342,446

GRADE WIRE SUPPORT

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8 Claims. (Cl. 248—221)

This invention relates to a grade-wire support and more particularly to a wire hanger used in connection with leveling control systems for road building machines.

Leveling control systems for road building machines have been developed which sense an external reference in the form of a grade-wire stretched along the side of and parallel to a road under construction for regulating the vertical position of the working implement of the road building machine, a typical example being disclosed in the patent of Raymond A. Gurries et al., Patent No. 3,155,020, dated Nov. 3, 1964.

A general object of the present invention is to provide an improved wire hanger for supporting a grade-wire used for leveling control of road building machines.

A feature of the invention is to provide a wire hanger which is economical to manufacture.

A further feature of the invention is to provide a wire hanger which may be readily aligned to support a grade-wire in a precise position.

An additional feature of the invention is to provide a wire-hanger having means for supporting a line extending transversely to the grade-wire.

Still another feature of the invention is to provide a wire-hanger in combination with a data tag for indicating the necessary station number, slopes and any other necessary information at a given roadway section.

Other objects and features of the invention will be apparent from the following detailed description, reference being made to the annexed drawing, in which:

FIGURE 1 is a perspective view of a wire hanger embodying the present invention mounted upon a stake and supporting a grade-wire,

FIGURE 2 is a top plan view of the wire hanger shown in FIG. 1,

FIGURE 3 is a side elevation view of the wire hanger shown in FIG. 1,

FIGURE 4 is an end view of the wire hanger shown in FIG. 1,

FIGURE 5 is a front elevation view of a data card which fits on the wire hanger as shown in FIG. 1,

FIGURE 6 is a partial top plan view of a modified form of wire hanger,

FIGURE 7 is a side elevation view of the modified form of wire hanger shown in FIG. 6, and

FIGURE 8 is a transverse roadway sectional view illustrating a line extended between opposed wire hangers for establishing transverse roadway slope due to superelevation, crown or drainage.

With reference to the drawings, FIG. 1 shows a stake 10 which may be made of steel having a circular cross section and is adapted to be driven into the ground in a vertical position adjacent one side of a roadway. A wire hanger 12 is mounted on the stake 10 generally to project inwardly toward the roadway. With additional reference to FIGS. 2, 3 and 4, the wire hanger 12 includes a boss 14 at one end with an opening 16 which is dimensioned for sliding engagement about the stake 10. An end boss 18 projects laterally from the boss 14 and includes a threaded hole 20 adapted to accommodate a threaded set screw 22. A contact face 24 is provided at one end of the set screw which projects into the opening 16 for releasable engagement with the stake 10 and a hexagonal head

26 is provided at the opposite end of the set screw. A pair of projections 28 and 30 extend inwardly into the stake-receiving opening 16 diametrically opposite the threaded hole 20 but at positions above and below the opening to form vertically-aligned stake contact faces 34 and 36. Upon tightening the set screw, the stake 10 is firmly gripped between the contact face 24 of the set screw 22 and the contact faces 34 and 36, thus securing the wire hanger 12 in place upon the stake 10, as shown in FIG. 1. Since the contact faces 34 and 36 are vertically aligned, the wire hanger 12 is positioned automatically in perpendicular relation to the stake 10 when the set screw 22 is tightened. Since the stake opening 16 is formed with the projections 28 and 30, the wire hanger 12 may be cast from a metal such as aluminum and no expensive boring or machining is required.

The main body portion of the wire hanger 12 constitutes a support arm 38 which projects laterally from the boss 14 opposite the end boss 18. The support arm includes a web section 40 which joins horizontal flange 42 and a lower angular flange 44, and varies in depth from a maximum adjacent the boss 14 to a minimum located outwardly on the support arm. Both flanges 42 and 44 also decrease in width toward the unsupported outer end of the arm 38. The extremity of the support arm 38 is enlarged to provide a fork-spreading plate 54 having vertically-opposed concave surfaces which allow a control fork as shown at 70 in FIG. 1 to pass thereover. A diagonally-extending slot 56 is formed in the fork spreading plate 54 so that a grade-wire may be passed therethrough into a communicating short wire-retaining slot 50. As shown best in FIG. 3, the upper surface of the upper horizontal flange 42 is aligned in elevation with the centerline of the wire-retaining slot 50, and thus the slot can be positioned at a required elevation by setting the upper surface of the wire hanger flange 42 at the elevation desired. An integral transverse-line support hook 62 projects upwardly from the upper surface of the upper horizontal flange 42 so as to support a line extending transversely of the roadway, as shown in FIG. 8, and for a function which will be described more fully hereinafter.

A grading data tag 64, as shown in FIGS. 1 and 5, preferably made of flexible plastic sheet material is formed with a vertical slot 66 and an adjacent elongated horizontal slot 68 which are adapted to interfit with the web section 40 and the lower angular flange 44 of the support arm 38. As shown in FIG. 1, the grading data tag 64 is suspended from the wire hanger 12 near the boss 14 and grading data information may be marked on the tag to indicate the necessary cuts, fills and slopes at the specific roadway section. For removal, the tag 64 is moved outwardly along the flange 44 until the reduced dimensions of the flange becomes less than the width of the vertical slot 66. For attachment of the tag 64, the process is reversed; the tag is placed over the flange 44 at its outer reduced dimension end and is then slipped inwardly until it is wedged on the flange adjacent its inner end, as shown in FIG. 1.

In operation, the stake 10 is driven into the ground in a vertical disposition and the wire hanger 12 is positioned thereon. A level rod may be placed upon the upper surface 58 of the wire hanger 12 and a level reading can be taken. The wire hanger is then moved up or down so that the desired rod reading can be obtained. At this point, the wire-retaining slot 50 is automatically positioned at the desired level and the wire hanger is locked in position by aligned contact faces 34 and 36 and the contact face 24 of the set screw so that the support arm 38 extends outwardly in the desired and assured perpendicular relationship.

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A grade-wire 52 is inserted through the diagonally extending slot 56 into the wire-retaining slot 50 of each of a plurality of wire hangers 12 spaced along a roadway under construction. The grading data at the particular roadway section is marked on the tag 64. As shown in FIG. 1, a wire fork 70 engages the grade-wire to control the level of the working implement of a road building machine, as explained in detail in the mentioned patent, Patent No. 3,155,020. When the wire fork 70 reaches a wire hanger 12, the fork is spread apart by the fork-spreading plate 54 and thus passes about the support arm 38 without interference.

Alternate structures embodying the present invention can be readily visualized. One such alternate includes a modified end portion 84 of a wire hanger 12' as shown in FIGS. 6 and 7. A short wire-retaining slot 50' is provided in the end portion 84 and a diagonal slot 86 extends upwardly therefrom on a skew thereto. The upper surface 58' of the support arm 38' is located to coincide in elevation with the centerline of the short slot 50' and a solid fork-spreading plate 54' is located outwardly therefrom. A grade-wire 52, as shown in FIG. 1, may be inserted into the short slot 50' by twisting slightly and forcing downward through the diagonal slot 86. Upon releasing the grade-wire within the short slot 50', the wire will align itself with the short slot and thereby be interlocked within. A transverse line support hook 62', similar to that shown at the end portion 48 of the previously described wire hanger 12, may be provided for supporting a transverse line. Since the fork-spreading plate 54' is a solid member enclosing the short slot in an outwardly direction, a transverse line could also be inserted into the short slot and retained therein.

FIG. 8 illustrates an additional function of the grade-wire supports which may be used to check grade transversely of the roadway. Stakes 10 are positioned at opposite sides of a roadway and wire hangers 12 are secured thereon. A line 78 is then stretched between the transverse line support hooks 62 on each wire hanger. The adaptation of transverse roadway alignment for three different roadway sections is shown. The first section is illustrated by the line 72 and represents a common triangular crown. A line 74 represents a roadway section having a parabolic crown while the line 76 represents a roadway section having superelevation. The line 78 extending between opposite wire hangers is level and may be used to check the transverse grade a roadway section having a common triangular crown, a parabolic crown, or superelevation by relatively simple but accurate measurement.

It will be understood that further modifications and/or variations of the embodiments of the grade-wide support disclosed herein may be resorted to without departing from the spirit of the invention and the foregoing description is to be considered as purely exemplary and not in the limiting sense; the scope of the invention being indicated by reference to the appended claims.

What is claimed is:

1. A support for a grade-wire adapted to be extended along the path of movement of a road building machine so that the grade-wire may be engaged by a wire fork mounted to said road building machine, said support comprising:

a vertical stake and
a wire hanger having

one end portion thereof adjustably connected to said stake, the other end portion of said wire hanger including a short slot adapted to support and retain the grade wire and

an intermediate portion linking each end portion and having a level upper surface aligned at an elevation the same as that of the short slot so as to coincide with the elevation of a supported grade-wire.

2. A support for a grade-wire according to claim 1 wherein the other end portion of said wire hanger has a

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diagonally positioned slot in communication with said short slot and projecting upwardly therefrom.

3. A support for a grade-wire adapted to be extended along the path of movement of a road building machine so that the grade-wire may be engaged by a wire fork mounted to said road building machine, said support comprising:

a vertical stake and

a wire hanger having

one end portion thereof adjustably connected to said stake,

the other end portion of said wire hanger having a short slot in which the grade-wire is adapted to be supported and retained and

a hook member aligned transversely with the grade-wire slot and adapted to support at substantially an equal elevation a line extending perpendicular thereto.

4. An indicating support for a grade-wire adapted to be extended along the path of movement of a road building machine so that the grade-wire may be engaged by a wire fork mounted to said road building machine, said support comprising in combination:

a stake,

a wire hanger including

a boss with a stake opening dimensioned for sliding engagement about said stake,

means for adjustably connecting said boss to said stake,

an arm extending outwardly from said boss to an end portion having a short slot in which the grade-wire is adapted to be supported and retained,

said arm having

a web section which varies in depth from a minimum at the end portion to a maximum adjacent the boss and

a longitudinally tapering flange projecting outwardly from said web section so as to provide greater stiffness and

a grading data tag interfitted about said flange and web section and upon which information can be marked to indicate station numbers, cuts, fills and slopes removable by longitudinal motion along said tapered flange.

5. A support for a grade-wire adapted to be extended along the path of movement of a road building machine which support comprises:

an arm

means supporting said arm in a laterally projecting disposition with the upper surface thereof defining a predetermined plane and

means forming a wire-retaining slot in said arm with its center in the predetermined plane.

6. A support for a grade-wire according to claim 5 which comprises:

a hook formed on said arm adjacent said upper surface thereof.

7. An indicating support for a grade-wire adapted to be extended along the path of movement of a road building machine which support comprises in combination:

an arm,

means for holding a grade-wire at one position on said arm,

said arm having a longitudinally tapered flange, and a data tag having a slot arranged to interfit about said flange at a predetermined longitudinal position thereof and being removable by longitudinal motion therealong.

8. A support for a grade-wire adapted to be extended along the path of movement of a road building machine so that the grade-wire may be engaged by a wire fork

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mounted to said road building machine, said support comprising:

a stake,

a wire hanger including

a boss with a stake opening dimension for sliding engagement about said stake, 5

means for adjustably connecting said boss to said stake, and

an arm extending outwardly from said boss to an end portion having a short slot in which the grade-wire is adapted to be supported and retained, 10

said arm having

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an upper surface portion aligned to coincide in elevation with the grade-wire slot.

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