Feb. 17, 1959 E. E. HOGAN ET AL 2,873,529

METHOD OF AND APPARATUS FOR SETTING CONCRETE FORMS TO TRUE LINE AND GRADE

Filed Dec. 17, 1954 2 Sheets-Sheet 1

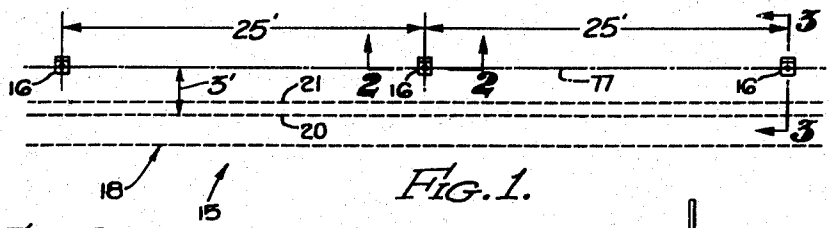

FIG. 1.

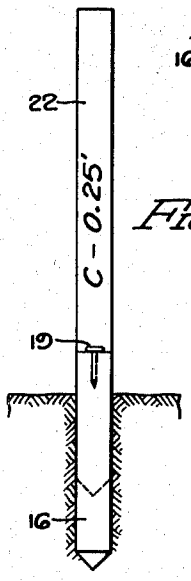

FIG. 2.

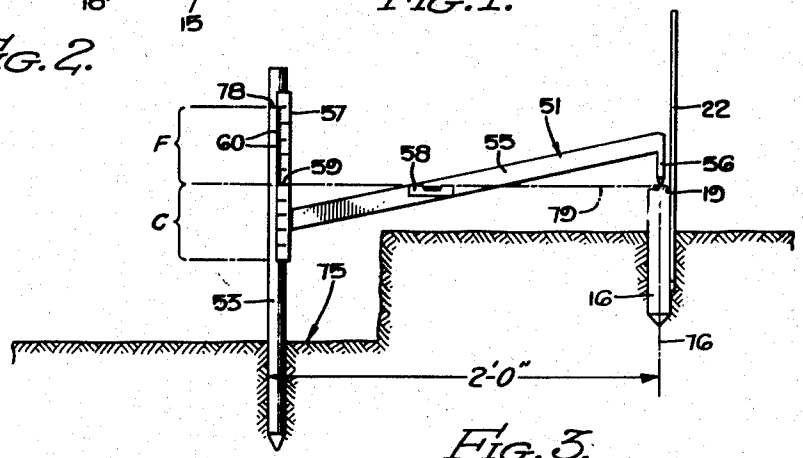

FIG. 3.

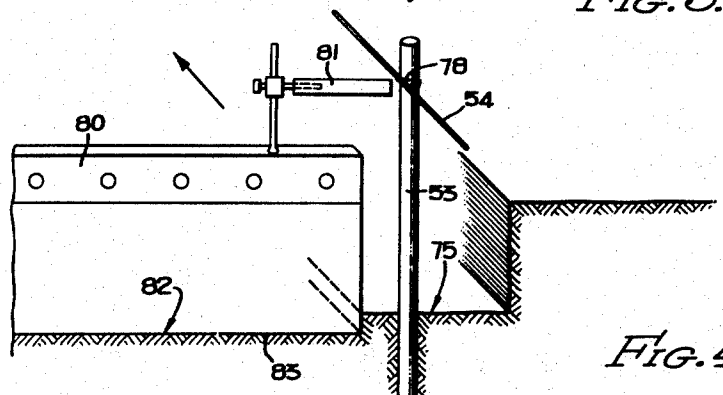

FIG. 4.

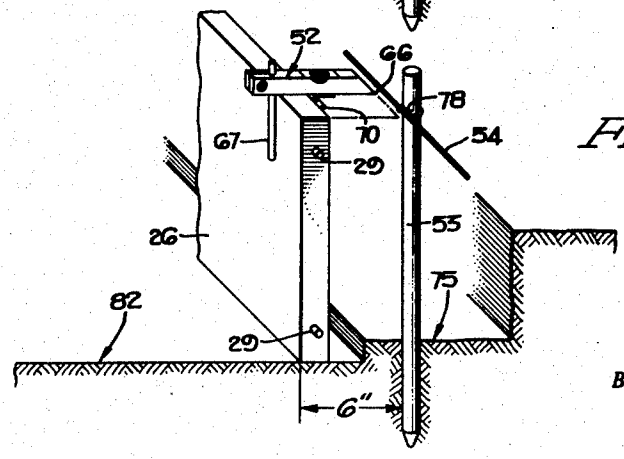

FIG. 5.

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Filed Dec. 17, 1954 2 Sheets-Sheet 2

FIG. 6.

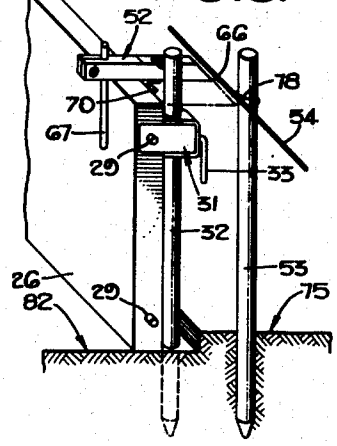


FIG. 7.

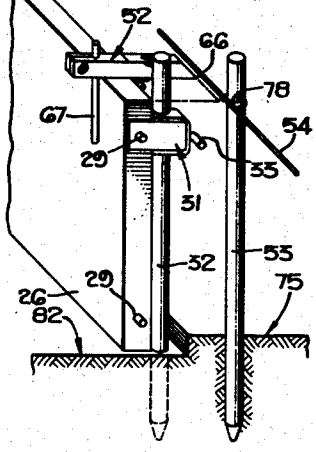


FIG. 8.

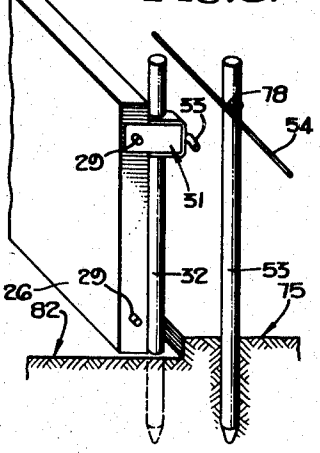
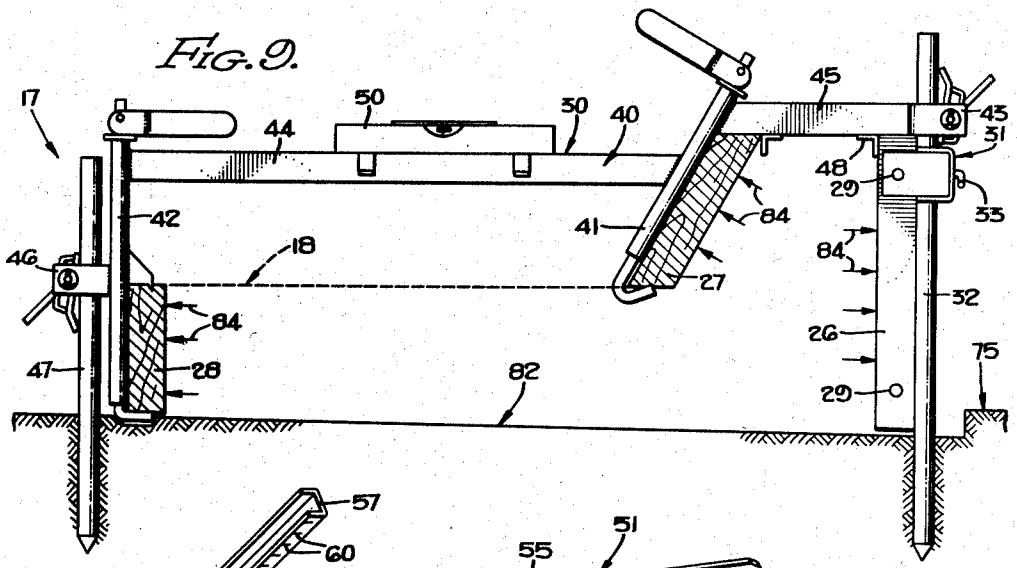


FIG. 9.



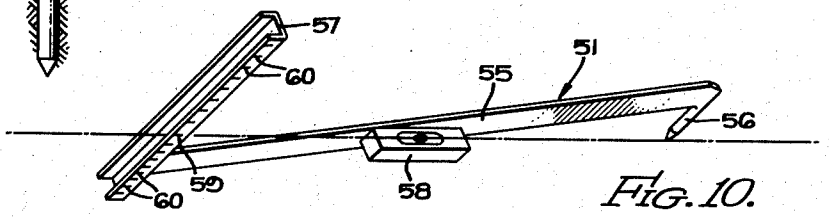


FIG. 10.

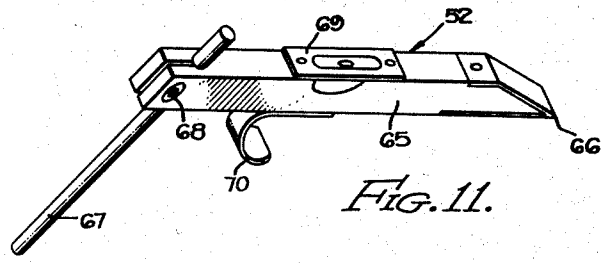


FIG. 11.

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2,873,529

METHOD OF AND APPARATUS FOR SETTING CONCRETE FORMS TO TRUE LINE AND GRADE

Eric E. Hogan and Robert S. Malloch, Riverside, Calif.

Application December 17, 1954, Serial No. 476,040

15 Claims. (Cl. 33—1)

This invention relates to the art of accurately locating the forms for molding concrete structures and is particularly useful in the preparation for casting concrete curbs.

The true line of a curb (the top inside corner edge, viewed in plan) and the true grade level (or vertical location) of the top of the curb are accurately indicated by wooden surveyor's stakes known as "hubs" which are driven into the ground close to said line. These hubs are placed at regular intervals, generally either 25' or 50' apart, and three feet from the vertical plane containing the top inside corner edge of the curb facing the street. The hubs are located out of the street area, i. e. outside of the curb, and on the opposite side of the curb from said top inside corner edge.

The point of reference furnished by each hub is located at the center of the head of a nail driven by the surveyor into the top of the hub. This nail is driven to locate said point three feet outward from the vertical plane which contains the inner top corner edge of the curb. The nail is driven in the hub to place the top face of the nail at a level which is a certain distance above or below the correct level for the top of the curb directly opposite said hub. The surveyor then drives a lath in the ground alongside the hub and writes that distance on this lath. His inscription may read, for instance: "C–0.25'" (meaning "cut a quarter of a foot beneath the level of the nail head") or it may read "F–0.25'" (meaning "fill a quarter of a foot above the level of the nail head").

It is to solve the problems presented to the contractor in availing himself of this accurate survey information so that the curb when cast will conform to the plan line thus indicated and so that the top of the curb will conform consistently to the grade level indicated therefor, that the present invention was evolved.

It is an object of the invention to provide a method and apparatus which will solve these problems so as to greatly increase the degree of accuracy with which curb produced conforms to the plan line and grade levels indicated by the survey data while at the same time substantially reducing the cost of setting up the molds for producing the curb and thus the overall cost of the curb itself.

Many different expedients have heretofore been resorted to for setting up the curb mold in practical conformity with the survey data.

One commonly followed practice is to measure the true grade level on the hub laths and mark this. A rough grade is then run with a power earth grading tool approximately twelve inches below the true grade level for the top of the curb. Backboards for the curb form (which are normally 12" wide) are then set up vertically on a side edge on the graded earth with the face toward the curb approximately 30" from the reference points of the hub nails. Assuming the top curb face to be six inches wide (which is the conventional width) this would place

the inner top curb edge three feet from said points and on the true plan line for the curb.

Flat steel stakes are now placed snugly against opposite sides of the backboards and driven into the ground while holding the backboard vertically. The backboard is now lowered or raised by manually cutting or filling earth therebeneath to bring its upper edge to the correct grade level indicated by the hub lath "cut or fill" data. This operation involves considerable labor as the earth grading has been roughly done so that much earth has to be moved manually to lower or raise the backboard to its correct grade level.

It is an important object of the present invention to provide a method of and apparatus for setting concrete curb forms to true plan line and grade level which will require relatively little if any manual moving of earth incident to this operation.

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a diagrammatic plan view of a ground area surveyed for the casting of a combined concrete curb and gutter thereon.

Fig. 2 is an enlarged vertical sectional view of a surveyor's hub and data lath taken on line 2—2 of Fig. 1.

Fig. 3 is a diagrammatic sectional view taken on the line 3—3 of Fig. 1, and showing the rough grade made by a power earth working tool in the soil of said area preliminary to setting up the mold forms and the first steps of the method of the present invention for accomplishing this, said steps comprising the positioning and driving of a line of string stakes and stretching a string thereon for locating the plan line and grade level of the curb.

Fig. 4 is a view similar to Fig. 3 and illustrates, in perspective, the next step in said method which is to employ a power earth working tool to run a sub-grade in the soil of said form area with constant reference to said string.

Fig. 5 is a view similar to Fig. 4 showing a twelve inch backboard set up on edge resting directly on the sub-graded soil with a special locator tool comprising a level-square applied to the backboard and by the use of which said board has been manipulated so as to be vertically erect and properly spaced horizontally from and parallel with the true plan line of the inner top edge of the curb to be cast against said backboard.

Fig. 6 is a view similar to Fig. 5 and shows a stake clamp applied to a dowel pin in the near end of said backboard and a stake extended vertically downward through said clamp and lying in contact with said backboard throughout the width of the latter, said stake then being driven into the ground.

Fig. 7 is a view similar to Fig. 6 showing the next steps in setting said backboard which consist in raising the latter until the square-level shows the top edge of the board to be on the same level with said string, and then setting said stake clamp on the stake extending therethrough to support the backboard on said stake as so positioned.

Fig. 8 is a view similar to Fig. 7 showing the backboard as set in its correct position according to the surveyor's data and with the square-level removed therefrom.

Fig. 9 is a diagrammatic vertical sectional view showing a backboard correctly set up (as in Fig. 8) and with a spacer clamp applied to the stake supporting the backboard, and embodying means for positively and correctly relating the face board and the gutterboard of the concrete form with the backboard thereof, whereby

the entire form is now set up in accurate conformity with the surveyor's data for locating the gutter curb to be cast in said form.

Fig. 10 is a perspective view of a preferred form of the string stake locator tool of the invention.

Fig. 11 is a perspective view of a preferred form of the backboard locator tool of the invention.

Referring specifically to the drawings, a ground area **15** is shown in plan in Fig. 1 which area has been surveyed and a line of surveyor's hubs **16** driven into the ground at intervals of 25' for reference purposes in setting up a form **17** (Fig. 9) for the casting of a combined concrete gutter and curb **18** which is indicated by broken lines in Fig. 1.

Each hub **16** has a nail **19** driven vertically therein by the surveyor with the axis of the nail on a vertical line of reference furnished by the hub (Fig. 2), and the nail **19** is driven flush into the hub which will leave the top surface of the nail a certain number of hundredths of a foot above or below a horizontal line of reference furnished by the hub.

The vertical line of reference in the present instance is located exactly three feet from the true plan line of the inner top corner edge **20** of the curb **21** of the curb and gutter **18** (Fig. 1).

The horizontal line of reference furnished by the hub intersects the vertical line of reference, in a plane at right angles with the line of hub stakes **16**, and the point on said horizontal line located three feet inward from said vertical line lies on the true plan line for curb edge **20** at the true grade level therefor.

The distance in hundredths of a foot that said horizontal reference line is located above or below the top face of nail **19** of each hub is written in crayon by the surveyor on a lath **22** which is driven into the earth adjacent that hub. This is called "cut or fill" data, as pointed out hereinabove. If this reads "C–0.25'," it means said horizontal reference line is one quarter of a foot or 3" below the level of the nail **19** and therefore that the soil grade opposite this hub will have to be cut to bring the top of the curb **21** three inches below the level of the nail. If the data on the lath reads "F–0.25'" it means just the reverse, and that the soil grade here must be filled to bring the top of the curb three inches above the level of the nail **19**.

The hubs **16**, and laths **22**, with their cut-or-fill data, comprise the survey data available for use by the present invention in setting concrete form **17** for the casting of gutter and curb **18**.

It is now to be noted that form **17** (see Fig. 9) includes a backboard **26**, a face board **27**, and a gutter board **28**. Each of these boards come in convenient sixteen foot lengths, is metal shod at its opposite ends, and drilled endwise, and provided with dowel pins **29** for interlocking adjacent lengths end to end.

A board spacing apparatus unit **30** is provided at each juncture between adjacent lengths of backboard **26** for precisely relating the three boards of form **17**. This apparatus is no part of the present invention but is covered in copending application for United States Letters Patent Serial No. 475,995, filed December 17, 1954.

Each apparatus unit **30** includes a backboard supporting stake and clamp **31**, the stake **32** of which is preferably of three quarter inch round steel rod and the clamp **33** of which has a thin, apertured metal tongue which fits over the upper pin of a pair of dowel pins **29** of a backboard length and said clamp can be set on its stake **32** to support adjacent ends of backboard lengths, between which said tongue extends, so that said backboard ends are united by said dowel pins and supported by said stake and clamp at a level selected by the form setter.

Also included in each apparatus **30** is a board spacer **40** which has a face board jig clamp **41**, a gutter board jig clamp **42**, a stake clamp **43** for attachment to stake **32**, and bars **44** and **45** welded to said clamps to unite them in rigidly fixed relation. The gutter board clamp **42** also has welded thereto a stake clamp **46** for uniting that end of the spacer **40** to a stake **47** which is like stake **32**. A finger **48** extends downward from bar **45** to hold a length of backboard **26** snugly against stake **32** when a unit of apparatus **30** is assembled thereon.

Apparatus units **30** are so dimensioned that when the back board **26** at each of its juncture points is supported in a vertical plane on a stake-and-clamp **31** and the face board **27** and gutter board **28** are gripped by the jig clamps **41** and **42** of said units, and the stake clamps **43** thereof rest on the upper edge of backboard **26** and when stakes **47** of said units are driven vertically through stake clamps **46** thereof and into the ground and clamps **46** are set on stakes **47** to support adjacent ends of board spacers **40** to show bars **44** level (as by a spirit level **50**) the concrete form **17** is assembled so as to cast a curb and gutter **18** to the exact specified dimensions of the latter when concerte is poured into the form to fill the same as shown in Fig. 9.

The location of the form **17** when so assembled will, of course, determine the location on the ground of the gutter and curb cast therein, both as to curb plan line and grade level for the top of the curb. In the method of the present invention, the correct location of the form **17** is attained by first accurately setting the backboard **26** of the form in the true position it must have in the form, in order for a gutter and curb to be cast in the latter in exact accordance with said survey data, and then assembling the rest of the elements of form **17** on the backboard in their exactly proper relation with the latter.

The completion of the form **17** after the backboard has been accurately set is rendered easy by the jig-like character of the board spacing apparatus **30** briefly above described.

The first thing to do is to set the backboard **26** in its correct position with a relatively high degree of accuracy and with a relatively small amount of labor. This is done with the aid of a few special tools, and in the following manner.

The tools used include a string stake and grade level locator **51** (Fig. 10), a backboard locator **52** (Fig. 11), a series of string stakes **53** (Fig. 3) and a string line **54** (Fig. 4).

The locator **51** includes a flat steel bar **55** a little less than two feet long and having a sharp pointer **56** welded on one end thereof to point downward at an angle of about 80° with the bar. A channel **57** is welded to the opposite end of bar **55** so as to be parallel with pointer **56** and face away from this. A spirit level **58** is welded to bar **55** and aligned to show the tool level when the point of pointer **56** is in the same horizontal plane with a mark **59** placed on channel **57**. A scale of indicia **60** is provided on channel **57** by which distance upward or downward from mark **59** may be read in tenths and hundredths of a foot.

The backboard locator **52** is of the nature of a square-level, and includes a wooden bar **65**, metal shod at one end to form a pointer **66**, with its point on a level with the bottom face of bar **65**. The bar is vertically kerfed and drilled at its opposite end to receive a rod **67** at right angles thereto, a bolt **68** extending horizontally through bar **65** and clamping rod **67** thereto. A spirit level **69** is mounted in the upper edge of bar **65**, and a spring clip **70** on its lower edge, the latter being spaced from rod **67** so as to yieldably retain locator **52** on a length of backboard **26** when pressed down thereon with rod **67** being pressed full-length against the adjacent side face of the backboard. The distance between rod **67** and the tip of pointer **66** is six inches.

The string stakes **53** may be round or flat but are shown as of three-quarter inch round steel material.

The first step of the method of the present invention

is to employ a power earth working tool, such as a grader or a bull dozer, to produce what is called a "rough-grade" 75 in the soil of the area 15 which rough-grade includes the ground space over which form 17 is to be set up and a marginal ground space extending about a foot therefrom towards the hubs 16 (Fig. 3).

In the present method, rough-grade 75 can be made without anywhere near the care required in the single soil grading step employed in conventional form setting practices being superseded by the present invention. This is because the rough-grade 75 is not to be used to erect the form 17 on and is purposely cut to lie well above the level at which the bottom edges of backboard 26 and gutterboard 28 must lie when form 17 is properly set up in accordance with the survey data.

The next step of the method of this invention is to locate and drive a string stake 53 in the soil of rough grade 75 with this stake vertical and located in a plane containing the vertical axis 76 of the nail 19 of the hub 16 at one end of area 15, said plane also being at right angles to the line 77 of the hubs 16, and with this stake 53 located with its inner face two feet from said vertical axis.

The location and driving of this string stake 53 is accomplished as shown in Fig. 3. The string stake and grade level locator 51 is held in one hand, and the stake 53 in the other hand. The pointer 56 is rested on the center of the head of nail 19 of the hub 16 with the locator 51 at right angles to the hub line 77 and, with the stake 53 resting in the channel 57, the locator 51 is manipulated until spirit level 58 shows level. This locates stake 53 in its correct vertical position in which the stake is now driven into the ground.

The next step is to observe the cut-or-fill data on lath 22 adjacent that hub 16 and place a horizontal crayon mark 78 on the stake 53, just driven, marking the level of the horizontal reference line, above mentioned, the location of which is determined by said data. This is done by reapplying the locator 51 to said hub 16 and stake 53 as shown in Fig. 3, reading the distance of the cut-or-fill data down or up, respectively, as the case may be, on the scale 60 from zero mark 59 thereof, and placing mark 78 on said stake 53 at the level so indicated.

Assuming the lath data in the present instance reads "F–0.25'," the mark 78 will be made one-quarter of a foot above the zero level mark 59 on locator 51, which, with this locator positioned as above described and shown in Fig. 3, lies in the same horizontal plane 79 as the top face of nail 19 on which pointer 56 is resting.

Mark 78 thus lies on the true grade level for the top of backboard 26 and the top of the curb 21 to be cast thereagainst.

The step of locating and driving the first string stake 53 and making a mark 78 thereon is now repeated at each of the hubs 16, using at each hub the particular cut-or-fill data marked on the lath 22 adjacent the hub.

String line 54 is now strung between adjacent stakes 53 of the entire series with said line tangent with inner faces of stakes 53 and on the level, at each of said stakes, of the mark 78 applied to said stake. This line is seen to lie two feet horizontally from the vertical plane of hub line 77 and at the true curb grade level.

The method of the invention next provides for use of a power earth working tool such as a grader or bulldozer (not shown), having a mold board 80 equipped with a vertically adjustable rubber indicator arm 81, for cutting a sub-grade 82 in the soil of the rough grade 85 (Fig. 4). The arm 81 is set on the mold board 80 so that the top face of arm 81 is twelve inches above the cutting edge 83 of said mold board. This is because it is twelve inches between the top and bottom edges of the backboard 26 which sub-grade 82 is being cut to accommodate.

The depth of sub-grade 82 is accurately gauged by the tool operator keeping indicator arm 81 just beneath the string line 54 as the power tool travels parallel with said

line in cutting said sub-grade. Sub-grade 82 thus is always slightly beneath a level at which it would support backboard 26 with the upper side edge of the board at true grade level, i. e. on the level of string line 54. In other words, erecting a backboard 26 with one side edge on sub-grade 82 always presents the upper side edge of that board a small fraction of an inch below the string line 54 and the true curb grade level marked thereby.

The next step of the method of this invention is to set up the backboard 26 on sub-grade 82 as shown in Figs. 5, 6, 7 and 8. This step starts with lengths of backboard 26 and face board 27 and gutter board 28 being laid out end-to-end along the area 15 to provide sufficient boards for the entire form 17. An adequate number of units of board spacing apparatus 30 are at the same time laid on the ground at intervals where they will be required.

Starting at one end of area 15, a length of backboard 26 is set on edge on sub-grade 82, a backboard locator 52 is applied to the upper side edge of this board as shown in Fig. 5, and this board is manipulated to where it is in a vertical plane, which is the case when spirit level 69 reads level, and is then shifted to where its inner face is six inches from string line 54, which is indicated by the point of pointer 66 being in vertical alignment with said string line. Normally this places said point a small fraction of an inch directly below said line.

With the first length of backboard 26 thus positioned, a clamp 33 is applied to the upper of the two dowel pins 29 extending from the extreme end edge of that length. A stake 32 is now extended downward through said clamp in close contact with the outer side face of the board and driven into the ground.

This having been done, that end of that length of backboard is lifted with a pick or by direct application of the hands, while snubbing the bottom edge of the board against stake 32 by the form setters shoe, to bring the point of pointer 66 onto the level of string line 54. While holding the backboard thus, clamp 33 is set on stake 32 thereby supporting that end of that length of backboard in its correct position as shown in Fig. 7.

The form setter now repeats this step at the other end of said length of backboard 26 with correspondingly located holes in said end receiving the dowel pins 29 of the second length of backboard, and with the upper of these pins serving to anchor the clamp 33 used here. The form setter then continues thus along the area 15 until the entire backboard 26 is set up in its true position as shown in Fig. 8.

As above noted, the only thing remaining to be done to complete setting up the form 17 in exact accordance with the survey data is to assemble the balance of said form in its correct relation to the backboard 26 of said form.

The first step in doing this is to lift a board spacer 40 from the ground, at each junction between backboard lengths, and place the clamp 43 thereof down over the adjacent stake 32 until bar 45 rests on top of backboard 26 and the gutter board jig clamp 42 rests on the ground. Gutter board lengths are now assembled into a continuous gutter board 28 and locked in place in jig clamps 42 provided on board spacers 40.

A stake 47 is now extended down vertically through the clamp 46 of each board spacer 40 and driven into the ground. The gutter board end of that spacer is now lifted until spirit level 50 reads level whereupon clamp 46 is set on stake 47. Clamp 43 is now set on stake 32.

The face board 27 is now lifted and locked in place in jig clamps 41 on spacers 40.

The setting of form 17 for the casting of gutter and curb 18, in strict accordance with the survey data supplied, has been completed.

To render the form 17 adequately resistant to deformation from pressure of the concrete thereagainst as indicated by arrows 84 in Fig. 9, it is good practice to employ board spacers 40 at eight foot intervals along the

form 17 and half spacers (not shown) but which are disclosed in said copending application midway between each adjacent pair of spacers 40. The latter are used for merely spacing the face board 27 from the backboard 26. This means that two board spacers 40 and two of such half spacers are used for each sixteen foot length of form 17.

From the foregoing disclosure, it is believed apparent that the present invention fully attains the objects set forth in the preamble. The setting up of a string line which is relatively close to the backboard 26 and which reflects the survey data in its actual position, and the making of a power tooled sub-grade guided by this line, eliminates practically all necessity for moving dirt by hand labor in practising this method. It also makes the setting up of the backboard on the sub-grade a simple, easily performed operation while facilitating the doing of this with a high degree of accuracy without requiring highly skilled labor to do the same.

Finally the step of assembling the form 17 on the backboard 26 after the latter is thus accurately set in its true location, transmits to the entire form the accuracy of location attained in the setting of the backboard.

By this method the cost of casting concrete curb and gutters has been greatly reduced while the product itself is of a high quality not hitherto practically attainable.

The claims are:

1. A method of setting the backboard of a concrete form in conformity with the survey data contained in a row of surveyor's hubs and cut-or-fill notes relative thereto, which comprises: power grading the soil adjacent said row of hubs along a path parallel thereto, to produce a rough grade of said soil inclusive of the area to be occupied by said form; positioning a string line stake vertically over said rough graded soil opposite each of said hubs, with the line of said stakes uniformly spaced from the line of said hubs and outside the area to be occupied by said form; driving said stakes vertically into the soil as so positioned; stretching a string between said stakes the level of which thereon is determined by reference to said survey data so as to be parallel with the correct plan line for the upper inner edge of said backboard and in a given vertical relation with the predetermined true grade level for said upper inner edge of said backboard; power grading the soil of said form area by constant visual reference to the relation of the level of the soil grade being produced and the level of said string to produce a sub-grade in said soil uniformly slightly lower than necessary to support said backboard vertically with its upper inner edge at said true grade level; erecting said backboard to lie in a vertical plane on its side edge on said sub-graded soil and spaced from said string to bring its inner face in the vertical plane of its true plan line; driving stakes vertically into the soil in supporting contact with the outer face of said backboard; elevating said backboard by reference to said string to bring the top edge of said backboard into conformity with the true grade level therefor while maintaining said board positioned vertically; and providing support for said board, so as to set said board in the true position indicated therefor by said survey data.

2. A method as defined in claim 1 in which said string is stretched between said string stakes substantially at said true grade level for the top of said backboard.

3. A method as defined in claim 2 in which the location of said string on said string stakes is determined by finding a point on each such stake on the same level as the top of the adjacent hub, and measuring up or down on said stake from said point as instructed in the cut-or-fill data associated with said hub.

4. A method as defined in claim 1 in which said backboard is a part of a form for casting a combined concrete gutter and curb; and rigidly assembling the balance of said form in predetermined relation with said backboard after the latter is accurately set in position in accordance with said survey data as aforesaid.

5. A method as defined in claim 1 in which the final step of supporting said backboard in its true position, as elevated above said subgrade, is accomplished by clamping said backboard to the stakes driven in supporting relation with said backboard.

6. A tool for locating a string stake with reference to a surveyor's hub plus cut-or-fill data associated therewith, said tool comprising: a bar; a spirit level thereon; a pointer fixed on one end of said bar and extending vertically downward therefrom when said spirit level indicates level; a stake positioning channel fixed on the opposite end of said bar parallel with said pointer and facing longitudinally away from said bar; and indicia means on said channel marking the location of a horizontal plane containing the point of said pointer when said spirit level indicates level.

7. A combination as in claim 6 having measuring indicia on said channel measuring cut-or-fill distances below and above said horizontal plane.

8. A tool for locating a concrete form backboard with said board resting on its side edge, with the inside face of said board disposed in a vertical plane which is parallel with a string line spaced from the opposite side of said board a substantial fixed distance from said plane, and with corresponding portions of said string and the upper edge of said board at the same level, the combination of: a square comprising a primary arm which is placed, when said tool is in use, in upright position against said face, and a secondary arm fixed to the upper end of said primary arm at a right angle therewith to rest on and cross said edge of said board and extend horizontally from said edge towards said string line; a pointer provided on the extremity of said secondary arm with the point thereof located at said fixed distance from said primary arm and in the plane of the lower edge of said secondary arm; spring means on said square which yieldably engages the outside face of said backboard to hold said square arms in engagement, respectively, with said inside face and upper edge of said backboard; and a spirit level on said secondary arm which indicates level when said secondary arm is disposed horizontally.

9. A method of setting the backboard of a concrete form in conformity with the survey data contained in a row of surveyor's hubs and cut-or-fill notes relative thereto, which comprises: vertically positioning a string line stake over the soil opposite each of said hubs with the line of said stakes disposed in between and parallel with, and spaced both from the line of said hubs and the area to be occupied by said form; driving said stakes into the soil as so positioned; stretching a string between said stakes the level of which thereon is determined by reference to said survey data so as to be parallel with the correct plan line for the upper inner edge of said backboard and in a given vertical relation with the true grade level for said upper inner edge of said backboard as indicated by said survey data; grading the soil of said form area with reference to said string to a soil level uniformly slightly lower than necessary to support said backboard vertically with its upper inner edge at said true grade level; erecting said backboard to lie in a vertical plane on its side edge on said graded soil and spaced from said string to bring the inner face of said backboard in the vertical plane of its true plan line; driving stakes vertically into the soil in supporting contact with the outer face of said backboard; elevating said backboard by reference to said string to bring the top edge of said backboard into conformity with the true grade level therefor while maintaining said board positioned vertically; and providing support for said board, so as to set said board in the true position indicated therefor by said survey data.

10. A method as defined in claim 9 in which said string is stretched between said string stakes substantially at said true grade level for the top of said backboard.

11. A method as defined in claim 10 in which the location of said string on said string stakes is determined by applying a level to said stakes and said hubs to find a point on each such stake on the same level as the top of the adjacent hub, and measuring up or down on said stake from said point as instructed in the cut-or-fill data associated with said hub.

12. A method as defined in claim 9 in which said backboard is a part of a form for casting a combined concrete gutter and curb; and rigidly assembling the balance of said form in predetermined relation with said backboard after the latter is accurately set in position in accordance with said survey data as aforesaid.

13. A method as defined in claim 9 in which the final step of supporting said backboard in its true position, as elevated above said graded soil, is accomplished by clamping said backboard to stakes driven in supporting proximity with said backboard.

14. A method of setting the backboard of a concrete curb form on its side edge in the assembly of said form over a given soil area, which comprises: setting a row of surveyor's hubs in the soil parallel to and a substantial distance to one side of said area, said hubs being uniformly spaced from a vertical plane in which it is desired the inner face of said backboard be disposed when said form is so assembled, providing cut-or-fill data indicating the vertical relation between each hub and the true level of the adjacent portion of the upper edge of said board, establishing a string line, by reference to said hubs and data, said line being located between said row and said plane and away from over said area, which line lies at said level and is uniformly spaced a relatively short distance from said plane, grading said area with a power tool guided by said string to produce a soil grade in said area which is below said level a distance uniformly slightly greater than the vertical breadth of said backboard, setting said backboard on its side edge on said graded soil with its inner face vertical and spaced from said line said short distance, driving stakes in said soil in outward vertical guiding relation with said backboard, lifting said backboard in guided relation with said

stakes to bring the upper edge of said board to said level, and securing said backboard to said stakes to suspend said board on said stakes as so positioned.

15. A method as defined in claim 14 in which said form also includes a curb faceboard and a gutterboard and in which said method has the added steps of rigidly fixing the relationship in space of said entire faceboard to said entire gutterboard whereby they are movable in space as a unit, jig-relating said unit to the upper edge of said backboard at one side of said form, and supporting said gutterboard at the opposite side of said form on said graded soil to bring all three boards of said form into proper relationship with each other and with said row of hubs in accordance with said cut-and-fill data.

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