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GRADING MARKER

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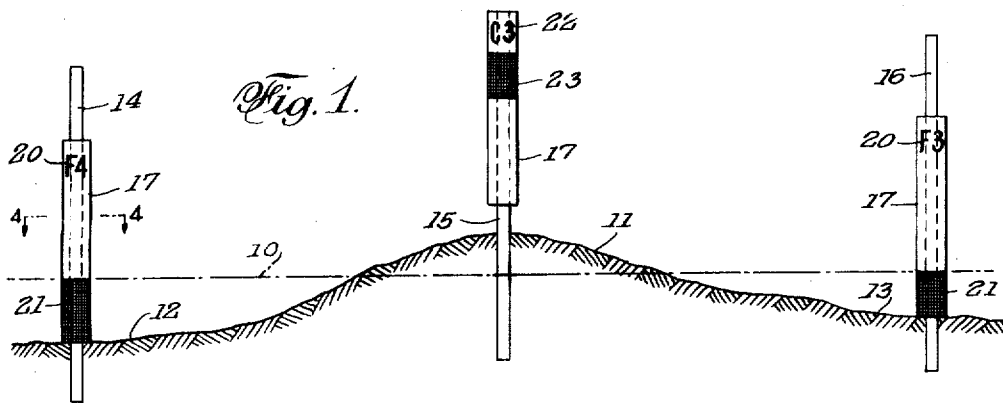


Fig. 2.

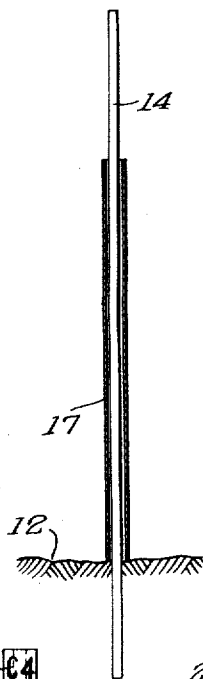


Fig. 3.

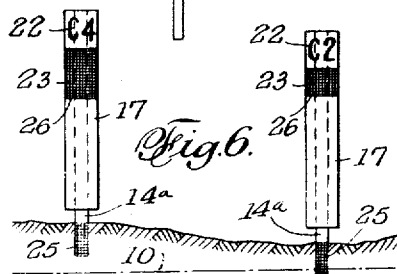
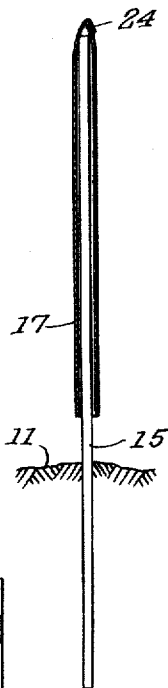
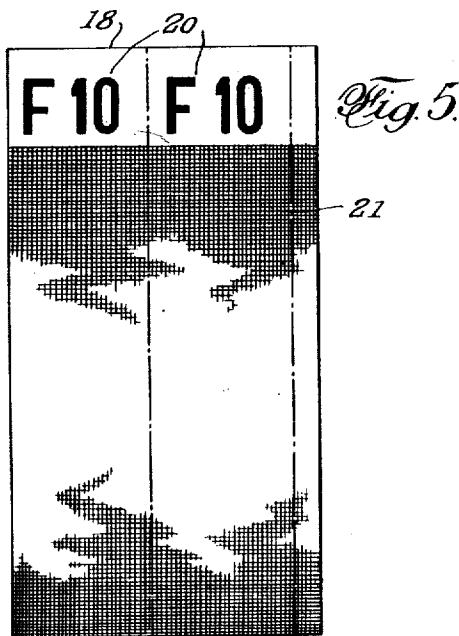
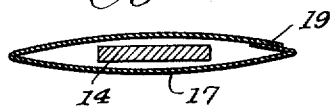


Fig. 4.



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GRADING MARKER

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1 Claim. (Cl. 40—2)

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This invention relates to markers to guide the cut and fill operations entailed in leveling a piece of ground to a desired level or sloping grade line.

When surveying for grading streets, building foundations, railway tracks, etc., it has been the practice to set stakes at suitably spaced intervals and to mark upon said stakes with crayon or chalk the amount of cut or fill necessary to bring the areas intimate to said stakes on grade. While such markings may be initially accurate, they lack visibility from remote points. For instance, the operator of a grading machine is frequently so distant from a pertinent stake that, from his position on the machine, he is unable to read the marking on said stake. Frequently such markings become obliterated making the ground-leveling process so unreliable that much additional work may result from too much fill or cut, as the case may be.

Also, the stakes employed in other prior marking methods were graduated and, therefore, expensive elements that had to be driven into the ground to a predetermined depth and then employed to locate markers or targets along an assumed grade or line. Great care was thus needed to both set the stakes and locate the targets thereon accurately.

According to the present invention, the length of the stakes and the depth of their penetration into the ground is immaterial provided that their length is sufficient to support the contemplated markers. Thus, said stakes may be set out with great facility over the area or along the line that is to be graded. Usual surveying methods can readily determine the distance above or below grade of the ground intimate to each stake.

It is, therefore, an object of the present invention to provide a novel set of grading markers from which the rodman of a surveying party selects a marker, as determined by the levelman of said party, and places the same on the stake adjacent which the leveling rod has been held.

Another object of the invention is to provide a set of grading markers that are visible for considerable distances and are resistant to the deleterious effects of the elements although the same are relatively inexpensive and are, therefore, expendable.

Another object of the invention is to provide a set of grading markers of which a selected marker is adapted to be strung on the stake being surveyed as a clear guide to the amount of cut or fill necessary in the area surrounding said stake.

The invention also has for its objects to provide

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such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes one embodiment of the present invention, which is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a cross-sectional view of a piece of ground showing markers according to the present invention and the manner of their use.

Fig. 2 is an enlarged vertical sectional view, showing a stake provided with a fill-indicating marker.

Fig. 3 is a similar view, showing a stake provided with a cut-indicating marker.

Fig. 4 is a further enlarged cross-sectional view as taken on line 4—4 of Fig. 1.

Fig. 5 is a flat pattern view of one of the markers and before the same has been formed ready for use.

Fig. 6 is a view similar to Fig. 1 showing how an alternate form of cut-indicating marking means is employed.

In Fig. 1 the line 10 represents an assumed grade which may be level, as shown, or sloping as is often the case. It will be seen that the ground line typically shows a portion 11 that requires to be cut away or removed to bring the same to the level of the grade line, and also shows portions 12 and 13, on either side of portion 11 that require to be filled in to bring said portions to the level of said grade line. As hereinbefore indicated, a plurality of stakes are set out, the same being driven into the ground. Of the stakes required, three are shown and designated 14, 15 and 16. For clearer illustration, said stakes are shown much closer spaced than is usual, the spacing being usually greater and often as much as fifty to one hundred or more feet depending on the character of the terrain. The stakes are generally conventional and can be set out quickly since no great care is needed to drive them.

The markers according to the present invention, each comprises a flattened and elongated tubular paper member 17 that is formed from a flat blank 18 to have a cemented seam 19, as

shown in Fig. 4. Before the blank is formed into a tube, the same is imprinted with indicia 20 near the top edge and with a solid pigmented area 21. The indicia 20 is provided in two places so that both sides of the flattened tube bear said indicia and the area 21 extends across blank 18 to cover both sides of said tube.

A set of these markers is provided and the same is made of two types of markers, one to designate fill areas and the other cut areas. On the fill markers, the indicia 20 comprises an F followed by a number designating tenths of feet. Thus, F3 indicates fill three tenths of a foot; F10, fill ten-tenths or one foot; F17, fill one and seven-tenths feet; etc. Each marker so designated is provided with an area 21 that extends upward from the bottom edge of the tube a distance commensurate to number of the indicia. Consequently, an F3 marker has an area 21 that is three-tenths of a foot high; an F17 marker, an area that is one and seven-tenths feet high; etc. It is preferred that the markers between F1 and F10 be made of a minimum height of say, one foot plus an additional three or four inches for indicia 20. The markers from F11 through the range of the set, will be longer accordingly.

From Fig. 1 it will be seen that when the levelman determines that stake 14 is located in an area four-tenths below grade, the rodman will slip an F4 marker on said stake and the top edge of area 21 will fall on the grade line 10. Similarly, stake 16, being located in an area three-tenths below grade, said stake will be provided with an F3 marker. All the stakes in fill areas will be similarly provided with fill markers and all of the top edges of the areas 21 of said markers will fall on the grade line.

Since the indicia 20 is quite large and the area 21 is heavily pigmented in a color that may be seen for considerable distances, the men that are filling the ground can easily see the markers so that said men can fill to the grade line 10 as measured by the areas 21.

On the cut markers, indicia 22 comprising a C and a number, and a pigmented area 23, in tenths of feet according to said number, are provided as for the fill markers. In this case, however, the areas 23 are located immediately below the indicia 22 so as to be relatively high on the tube 17. Also, in this case, the upper end of the tube is closed as by bending the same over as shown at 24 in Fig. 3. The markers are thus suspended from the tops of the stakes located in cut areas. There is thus available to the men performing the soil cutting operations a measuring device that is used for determining whether the cut has been properly made. By removing the cut marker from the stake and using the area 23 as a measuring device, the men have available a guide that cannot be misread to guide the depth of cut in the vicinity of stake 15. All stakes located in cut areas are similarly provided with markers according to the various heights of said areas above grade.

As will be seen in Fig. 1, the areas 21 of all fill markers terminate, at their upper edges, on the assumed grade line 10. Thus, the accuracy of the markers can be easily checked by sighting with the eye along said upper edges and an error will be revealed should one said edge appear to be above or below that of the other fill markers. Such eye checking cannot be made with the above described cut markers. However, as shown in Fig. 6, a modified cut marking means is provided that, with stakes of uniform length and

uniformly tipped, may provide for the mentioned facility of checking as above.

The stakes 14^a are of uniform length and one end thereof is pigmented as at 25 providing all of said stakes with tips of the same length. Said pigmented tips guide the depth of penetration of the stakes into the ground.

Each marker 17 is similar to the cut marker shown in Fig. 1 in that the same comprises a top closed envelope bearing a pigment area 23 and indicia 22. Since the difference in elevation of any two stakes is the same as the difference in height of their pigmented areas 23, the lower edges 26 of said areas will fall on a line parallel to grade line 10, as will be seen from Fig. 6. The mentioned eye-sighting facility is, therefore, afforded.

While not illustrated in the drawing, zero markers may also be provided, the same comprising paper tubes, as before, on which the indicia comprises a zero. No pigmented areas are provided on these zero markers which are used on stakes located in areas that are on grade.

By means of the present invention, much time is saved since field work entailed in the individual marking of stakes may now be performed as office work. The surveyor's notebook, bearing the data for each stake, may be used to make up a complement of markers in the office and the same successively and quickly applied to the stakes. Thus, both the surveying and marking operations are shortened by the herein-described novel marking method.

While not illustrated, the markers 17, instead of the pigmented areas 21 or 23 and indicia 22 or 24, may be imprinted along the entire length thereof with a scale graduated in twentieths of a foot arranged as alternate pigmented and unpigmented rectangles that are suitably numbered from the bottom of the marker upward. Alongside these graduations may be provided hundredths graduations. Since the surveyor's data, as herein contemplated, is transferred from the field to the office, it is a simple matter to mark a set of this form of marker according to the cut or fill adjacent the various stakes that are set out. Such marking may be made with a permanent ink that will not wash away nor fade out and may comprise indicia comparable to indicia 20 or 22, as the case may be. After completion of such a set of markers, the same is set on the stakes as hereinabove described.

While the invention that has been illustrated and described is now regarded as the preferred embodiment, the construction is, of course, subject to modifications without departing from the spirit and scope of the invention. It is, therefore, not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claim.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

Apparatus for indicating necessary localized fill with reference to a grade line, comprising a stake having a ground-penetrating tip portion and an upwardly extending portion, a tubular marker positioned over the lower part of the upwardly extending portion of said stake, said marker having a lower end comprising a ground-engaging member and a pigmented band completely encircling the marker and extending upwardly from said lower end of the marker and having a critically determined width for indi-

cating the vertical distance of the grade line from the ground level when said ground engaging member is in contact with the surface to be graded and whereby the upper edge of the band will be located on the grade line.

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