

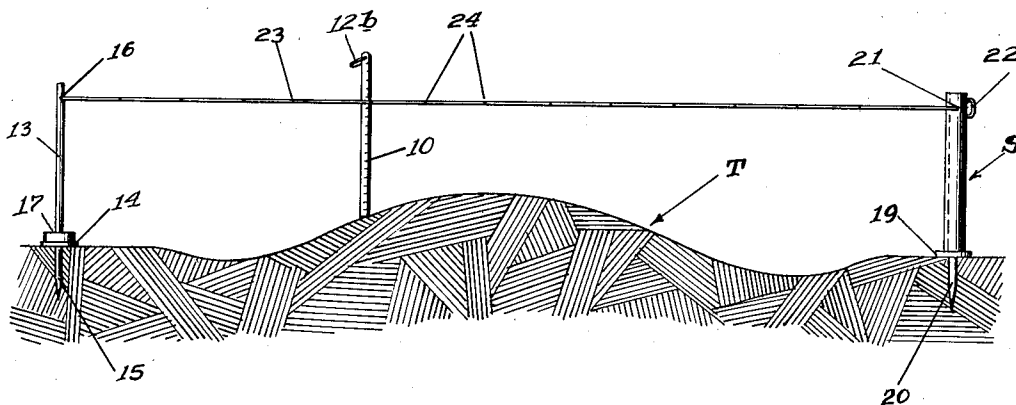
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B. R. COLEMAN
SURVEYING INSTRUMENT

Filed Feb. 2, 1948

2,523,255

Fig 1



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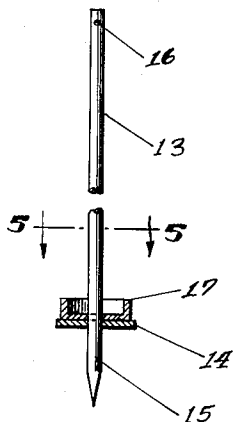
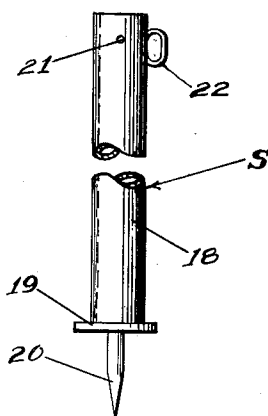


Fig 3



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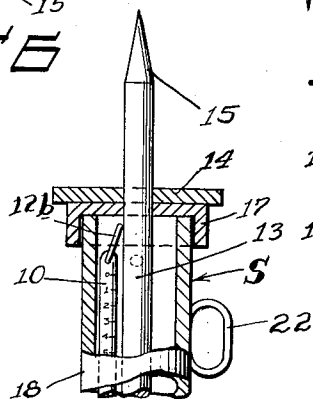
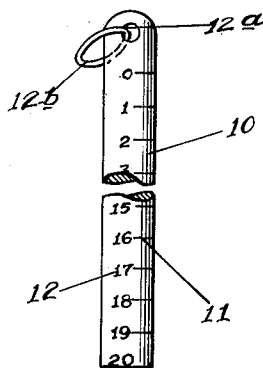
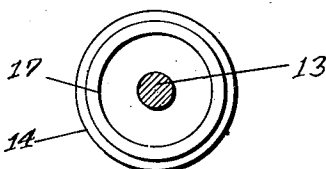


FIG 5



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SURVEYING INSTRUMENT

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2 Claims. (Cl. 33—86)

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My invention relates to surveying instruments and more especially to equipment for the purpose of defining the cross-section of a standard terrace and for checking the height thereof.

The object of my invention is to provide surveying apparatus of the character indicated above which is adapted to be used by one man and which eliminates the use of engineering instruments such as tripods, contractor levels, etc.

A further object of my invention is to provide a surveying apparatus of the character indicated above, the use of which does not require engineering knowledge or any special skill and eliminates practically all figuring and plotting.

Another object of my invention is to provide a surveying apparatus of the character indicated above, which may be placed on the market at a price any one could afford to pay and which may be successfully used by any person that can add and multiply by two.

A further object of my invention is to provide a surveying apparatus of the character described above adapted to enable any farmer or contractor to ascertain that he has the amount of dirt in a terrace required by the U. S. Government to entitle him to payment by the Government.

Other objects of my invention not specifically mentioned may appear in the following specification describing my invention with reference to the accompanying drawing illustrating a preferred embodiment of my invention. It is, however, to be understood that my invention is not to be limited or restricted to the exact construction and combination of parts described in the specification and shown in the drawing, but that such changes and modifications may be made which fall within the scope of the claims appended hereto.

In the several figures of the drawing, similar parts are designated by similar reference characters and

Figure 1 is a diagrammatic view partly in elevation and partly in section illustrating an apparatus for surveying embodying the invention;

Figure 2 is a view partly in section and partly in elevation of the small stake as herein comprised;

Figure 3 is a fragmentary elevational view on an enlarged scale of the large stake as embodied herein;

Figure 4 is an enlarged fragmentary elevational view of the ruler as herein employed;

Figure 5 is a sectional view taken on the line 5—5 of Figure 5; and

Figure 6 is a fragmentary view partly in sec-

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tion and partly in elevation showing the several parts in nested assembly.

The apparatus forming the subject matter of the present invention for defining the cross section of and for checking the height of a standard terrace, comprises a ruler 10 preferably made from round metal of one quarter of an inch diameter. The rule is two feet long and is graduated in tenths of an inch, graduation marks 11 and corresponding numerals 12 being stamped in the ruler on two diametrically opposite sides thereof. The numerals from zero to twenty are arranged in rotation beginning at the upper end of the ruler. A small hole 12a is provided in the upper end portion of the ruler to receive a leather loop 12b or the like for carrying the ruler.

A small stake 13 is preferably made from round metal of seven sixteenths of an inch diameter. The overall length of this small stake 13 is thirty-two inches and a stop 14 is permanently and firmly secured to said stake exactly seven and three-quarters of an inch from the lower end of the stake 13. The end portion 15 of the stake 13 is pointed so that it can be driven easily into the ground to hold the stake 13 firmly in upright position. The stop 14 may consist of a washer or the like of approximately three inch diameter with a centrally located hole of a diameter of seven sixteenths of an inch. The thickness of the stop 14 is preferably three sixteenths of an inch. Two feet above the stop 14, a hole 16 of one eighth of an inch in diameter extends diametrically through the stake 13, for a purpose to be described later. An inverted cap 17 is secured permanently on the small stake 13. The cap 17 is preferably made from metal and has preferably an outside diameter of two inches, an inside diameter a little larger than one and one half of one inch and a depth of one and one quarter of an inch. The small stake 13 extends centrally through the cap 17, which is located so that it abuts the top surface of the stop 14. The inverted cap serves a purpose to be described later.

A large stake S consists of a tubular upper portion 18 closed at its bottom end by a stop disk 19. A lower pointed stake portion 20 is secured centrally to the stop disk and extends downwardly therefrom. The lower stake portion 20 is preferably made from round metal, seven sixteenths of an inch in diameter and eight inches long and is adapted to be driven easily into the ground to support the large stake S securely in upright position. The tubular upper stake portion 18 has preferably an outside di-

iameter of one and one half inches, an inside diameter of one and one quarter of an inch. It measures preferably two feet and two inches from the bottom surface of the stop disk 19 and is provided exactly two feet above that surface with a diametrically extending hole 21. At a convenient distance below the upper end of the tubular upper portion 18 of the large stake S, a metal handle 22 or the like is secured to facilitate the carrying of this stake S or to enable it to be hung on a tractor (not shown) or the like, when the apparatus is not in use.

A strong light string 23 is provided which is preferably twenty four to thirty feet long and must be strong enough to be stretched taut. It is preferably made from nylon or the like and is marked off in sections 24 of two feet length by coloring adjacent sections in alternating colors. The thickness of the string is such that it can be pushed through the holes 16 and 21 in the small and the large stake respectively.

When it is desired to define the cross section and the height of a standard terrace T, the two stakes 13 and S are arranged in upright position at opposite sides of said terrace by forcing them into the ground until the stop 14 and the stop disk 19 is located flatly on the ground so that the stakes extend upwardly in as near as possible vertical position. The string 23 is fastened in the holes 16 and 21 in the stakes 13 and S respectively so that it is stretched taut between the two stakes and parallel to the natural level of the ground. The distance between the string 23 and the ground is then measured by means of the ruler 10. This is held as nearly as possible in vertical position and the measurements are taken every two feet as marked off on the string. In the case illustrated in Figure 1, the first two readings will give zero, the next reading minus, proving that no earth has been placed to above the ground level at these points. The next measurement indicates that the ground was raised four tenths of a foot, the next one shows one foot of piled up ground. Continue taking these measurements and write them down until no more ground above the ground level, which is two feet below the string 23, is found. Add all the positive readings and multiply the total by two and the answer is the amount of dirt used in the terrace. To determine the height of the terrace T, multiply the largest reading, multiply it by twelve and divide it by ten and the result gives the height of the terrace in inches.

When the work is done, the string 23 is taken off the stakes, and the stakes are pulled out of the ground. The ruler 10 and the string 23 are placed in the tubular portion 18 of the large stake S and the upper portion of the small stake 10 is inserted also in said tubular portion. The cap 17 is placed in position over the upper open

end of the tubular portion 18, so that the combined stakes form a convenient carrying case.

I claim:

1. Apparatus of the character described, comprising a long tubular body closed at one end, means extending longitudinally from the said closed end of the body for penetrating the ground whereby the tubular body may be set up as a stake, a rod member having a pointed end for facilitating the penetration of the ground whereby the rod may be set up as a stake in cooperation with the tubular body, means carried by said rod adjacent to the pointed end for limiting the penetration of the rod into the ground, the rod being adapted to be introduced from the other end thereof into the open end of the tubular body, the said means carried by the rod being adapted to engage and close the said open end of the tubular body, a cord for connecting the tubular body and the stake together, means for connecting the ends of the cord to the tubular body and stake, and a measuring device adapted to be housed within the tubular body and maintained therein by said stake carried means.

2. An apparatus for determining the cross section and the height of a terrace above the natural ground level including a pair of stakes adapted to be pushed into the ground on opposite sides of the terrace, a string adapted to be secured to and extended tautly parallel to the ground level between the two stakes at a certain distance above said level, a ruler for measuring the distance between the string and the top of the terrace at certain places along the string, one of said stakes comprising a tubular upper main portion closed on its lower end by a stop disk and a pointed rod like lower portion adapted to be pushed into the ground, the other stake being formed by a rod having a pointed lower end, and an inverted cup surrounding the rod adjacent to said pointed lower end, the upper rod portion being adapted to be inserted into the tubular stake portion and the cup being adapted to close the upper end of said tubular portion.

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