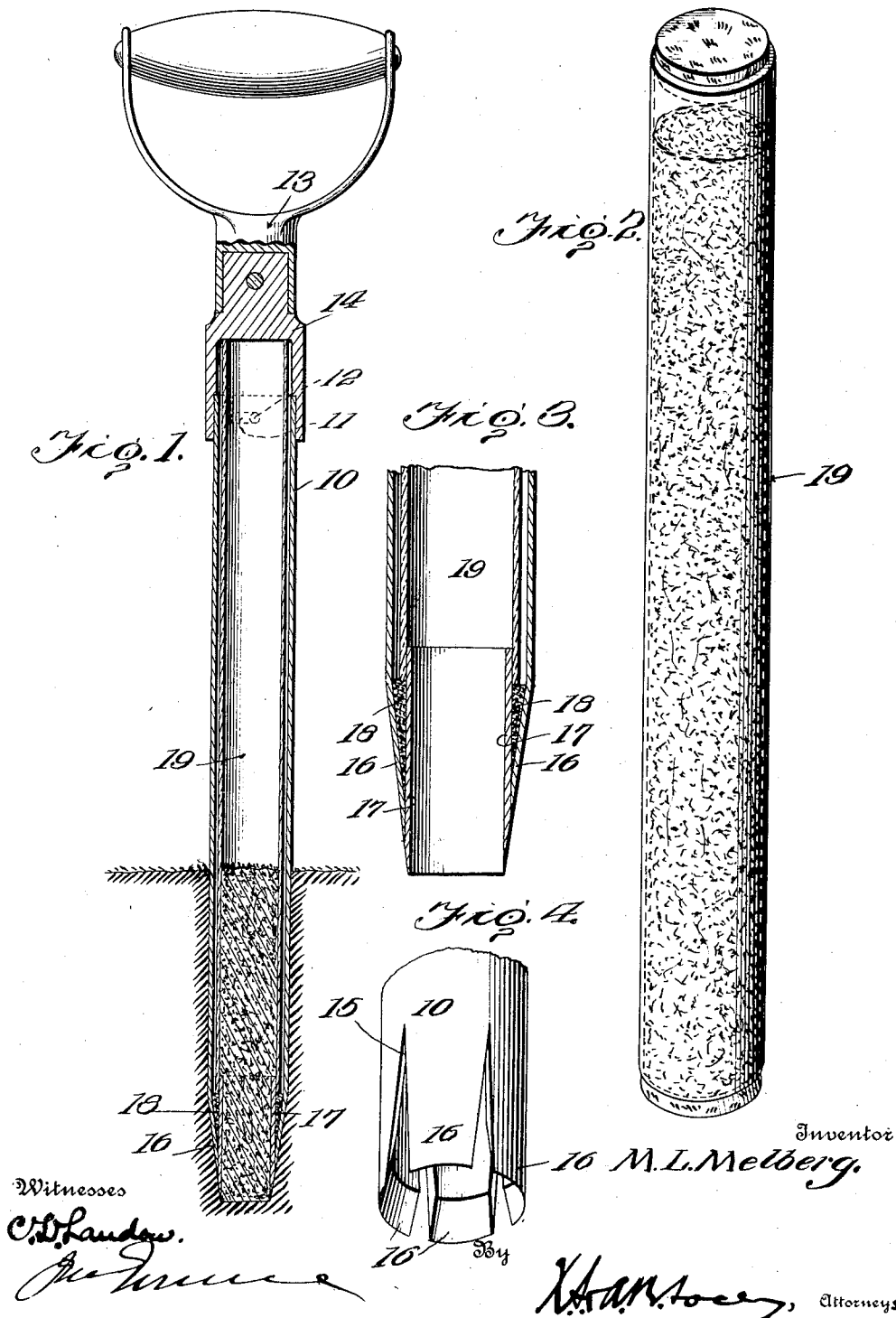


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SOIL TESTER.  
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1,109,446.

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# UNITED STATES PATENT OFFICE.

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SOIL-TESTER.

1,109,446.

Specification of Letters Patent.

Patented Sept. 1, 1914.

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*To all whom it may concern:*

Be it known that I, MILLER L. MELBERG, citizen of the United States, residing at Bloomer, in the county of Chippewa and State of Wisconsin, have invented certain new and useful Improvements in Soil-Testers, of which the following is a specification.

This invention relates to new and useful improvements in soil testers; and has particular reference to that type of such devices which are provided with soil receiving receptacles such as permit the samples of the earth or soil to be hermetically sealed and placed in storage until such time as it is desired to analyze the samples.

As its principal object, the present invention aims to provide a soil tester consisting essentially in a cylindrical body tube which is tapered at its lower terminal and carries thereat a sharpened mouth-piece which may be bored into the ground so that a cylindrical filler of earth will be projected upwardly into the body tube and into a glass tube or magazine which is removably placed in the body tube.

A further object is to construct the soil tester of the present invention with such regard to proportion, number and arrangement of parts that it may be cheaply manufactured, will be durable and efficient in its action, and will permit the operator to obtain the sample of soil with a minimum expenditure of time and labor.

A still further object is to construct the body tube of the tester in such manner that a soil receiving magazine or tube may be quickly inserted or withdrawn, thus making it possible to collect a relatively large number of samples in a comparatively short time.

The above and additional objects are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification and then more particularly pointed out in the claims which are appended hereto and form a part of this application.

With reference to the drawings, wherein there has been illustrated the preferred embodiment of this invention as it is reduced to practice, and throughout the several views of which similar reference numerals designate corresponding parts, Figure 1 is a longitudinal section taken through the device, illustrating the various elements in

complete assembled relation; Fig. 2 is a detail view illustrating a magazine which has been filled with soil and is corked at each end; Fig. 3 is a detail view showing an enlarged sectional view of the lower terminal of the instrument. This figure discloses particularly the manner in which the cutting element is secured to the body tube; and Fig. 4 is an enlarged perspective view illustrating in detail the manner in which the lower terminal of the body tube is formed.

Proceeding now to the description of the drawings, the preferred embodiment of this invention, as best illustrated in Fig. 1, includes a metallic body shell or cylinder, a removable handle, a removable magazine arranged within the body shell, and a soil cutting member carried by the body cylinder. The body cylinder, as illustrated in Fig. 1, is preferably cylindrical in shape, being formed in the nature of an elongated tube which may be of any suitable diameter or length, although in practice it has been found expedient to employ a tube approximately twelve (12) inches in length and one and one-eighth ( $1\frac{1}{8}$ ) inches in diameter. This body member 10 is preferably constructed from a drawn nicked brass tube, although, if so desired, relatively thin steel tubing or any other metal may be employed without departing from the spirit of this invention, it being perfectly obvious that the material from which the member 10 is constructed is a purely arbitrary matter, and one to be governed solely by the conditions under which the device is manufactured.

The upper terminal of the member 10 is formed with diametrically opposed bayonet slots 11 which are designed to receive the studs 12 of the handle 13. In passing it may be well to mention the fact that the handle 13 in the preferred embodiment is greatly similar to an ordinary shovel or spade handle and carries a tubular extension 14 interiorly of which at diametrically opposed points are disposed the studs 12 above mentioned. The purpose for which the handle 13 is detachable from the body member 10 will be hereinafter more fully disclosed in that portion of the specification devoted to the description of the operation of the device.

The lower terminal of the body member 10 is incised a number of places, as at 15. These incisions extend longitudinally of the body member and are V-shaped so that

the four tongues 16 which are produced by making the incisions may be bent inwardly so as to engage at their lower ends against a cutting tube 17. This cutting tube 17 extends into the body tube 10 a considerable distance and also projects exteriorly of the tongues 16. As will be observed upon reference to Fig. 1, a filler of solder is poured between the tongues 16 and the inwardly projecting portion of the cutting member 17, as indicated at 18. This solder filling 18 terminates a slight distance short of the inner edge of the member 17 and is adapted to serve as a supporting base for the glass cylinder or soil magazine which is placed in the body member 10 when a sample of soil is to be collected, as will be hereinafter explained. It will be noted upon reference to Fig. 1 that an annular chamber is formed between the inner end of the cutting tube 17 and the body tube 10, a solder filler constituting the bottom wall of this chamber. It has been found necessary in practice to sharpen the lower edge of the cutting tube 17 so that the tester may be quickly inserted in the ground. The soil magazine, indicated at 19, is, as previously set forth, preferably formed from a length of glass tubing. If desired, however, a metallic tube may, of course, be employed.

Coming now to the description of the manner in which the tester of this invention is employed: The operator first inserts the glass tube 19 in the body member 10. When the tube has been inserted, its lower terminal will be disposed between the body member 10 and the inner terminal of the cutting tube 17, its lower edge being supported on the solder filler. A cork is then placed in the upper terminal of the glass tube, and the handle 13 is applied by inserting the studs in the bayonet slots and giving the handle a quarter turn. The device is then ready for use. The cutting tube 17 is inserted in the ground and the body tube 10 rotated during the insertion of the cutting member, that is, if such manipulation be necessary, as when the ground is hard and packed. After the body tube 10 has been inserted in the ground the desired distance, the operator pulls the tube out of the ground and in inverting it forces the earth from the cutting member 17 into the magazine. The handle is then removed and the magazine withdrawn. It then remains to insert a cork or a similar sealing device in the open end of the glass tube, and the soil may then be stored away for any desired length of time.

Relative to the many advantages obtained by employing the novel form of structure hereinbefore described, it is desired to first direct particular attention to the formation of the lower terminal of the body tube 10. By bending the tongues 16 inwardly and

soldering them to the cutting member 17, as in Fig. 1, there is produced a substantially conical tip for the body member 10 which obviously makes it comparatively easy to insert the device into the ground. Then again, by extending the upper terminal of the member 17 a considerable distance into the body member 10, there is formed a guard for the lower terminal of the glass tube or magazine so that this member will not be injured by the passing of gravel and the like into the tube such as might result were this lower edge unprotected.

In reduction to practice, it has been found that the form of this invention illustrated in the drawings, and referred to in the above description as the preferred embodiment, is the most efficient and practical; yet realizing that the conditions concurrent with the adoption of this device will necessarily vary, it is desired to emphasize the fact that various minor changes in details of construction, proportion and arrangement of parts may be resorted to, when required, without sacrificing any of the advantages of this invention, as defined in the appended claims.

What is claimed is:—

1. In a device of the character described, a tubular body member having an open lower end, a removable magazine mountable in the body member, and a cutting element secured to the lower terminal of the body member and feeding into the magazine.

2. In a device of the character described, a tubular body member, a cutting element secured to the lower terminal of the tubular body member, and forming in connection therewith a substantially conical tip, a magazine removably mounted in the body member and having an open lower end, and a detachable handle for the upper terminal of the body member.

3. In a device of the character described, a tubular body member, a detachable handle carried by one terminal of the body member, a cylindrical cutting element secured to the other terminal of the body member, and a removable magazine adapted to be arranged in the body member and adapted to receive the material which passes through the cutting element into the body member.

4. In a device of the character described, a tubular body member, a removable handle for one terminal thereof, said body member being formed at its other terminal with a number of longitudinally extending V-shaped incisions, a cylindrical cutting member having its lower terminal sharpened, said cutting member being arranged in the incised terminal of the body member, the tongues produced by incising the body member being bent inwardly to produce a conical portion and having their lower edges in en-

gagement with the cutting member at a point intermediate the length thereof, a binder interposed between the outerwall of the cutting member and the inner walls of the said tongues, said binder terminating at a point short of the inner terminal of the cutting member, and a cylindrical magazine removably mounted in the body-member and disposed with its lower terminal in the annular chamber defined by the binder and adjacent portions of the cutting member and body member.

5. In a device of the character described, a body member open at its lower end, a removable handle forming a closure for the upper terminal of the body member, a cutting element carried by the lower terminal of the body member, and a removable magazine insertible in the body member through the upper terminal thereof, said magazine being adapted to receive material which is fed into the body member through the cutting element.

6. In a device of the character described, a tubular body member, an annular cutting element carried by the lower terminal thereof, the upper terminal of the cutting element extending into the body member and being spaced from the inner wall thereof to form an annular chamber, and a material receiving magazine removably positioned within the body member and arranged with

its lower terminal in the said annular chamber.

7. In a device of the character described, a tubular body member having a conical lower terminal, an annular cutting element having its upper terminal inserted within the lower terminal of the body member and spaced from the inner wall thereof to form an annular chamber, a filling element arranged in the lower portion of the annular chamber, and a tubular magazine removably mounted in the body member and positioned with its lower terminal seated within the annular chamber and resting on the filling element.

8. In a device of the character described, an open-ended body member, a removable open-ended magazine positioned within the body member, and a cutting element carried at the lower edge of the body member for feeding material into the magazine.

9. In a device of the character described, a body member, a removable magazine, and a cutting element arranged at the base of the body member and adapted to feed material upwardly into the magazine.

In testimony whereof I affix my signature in presence of two witnesses.

MILLER L. MELBERG. [L. s.]

Witnesses:

J. G. PRUEHER,  
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