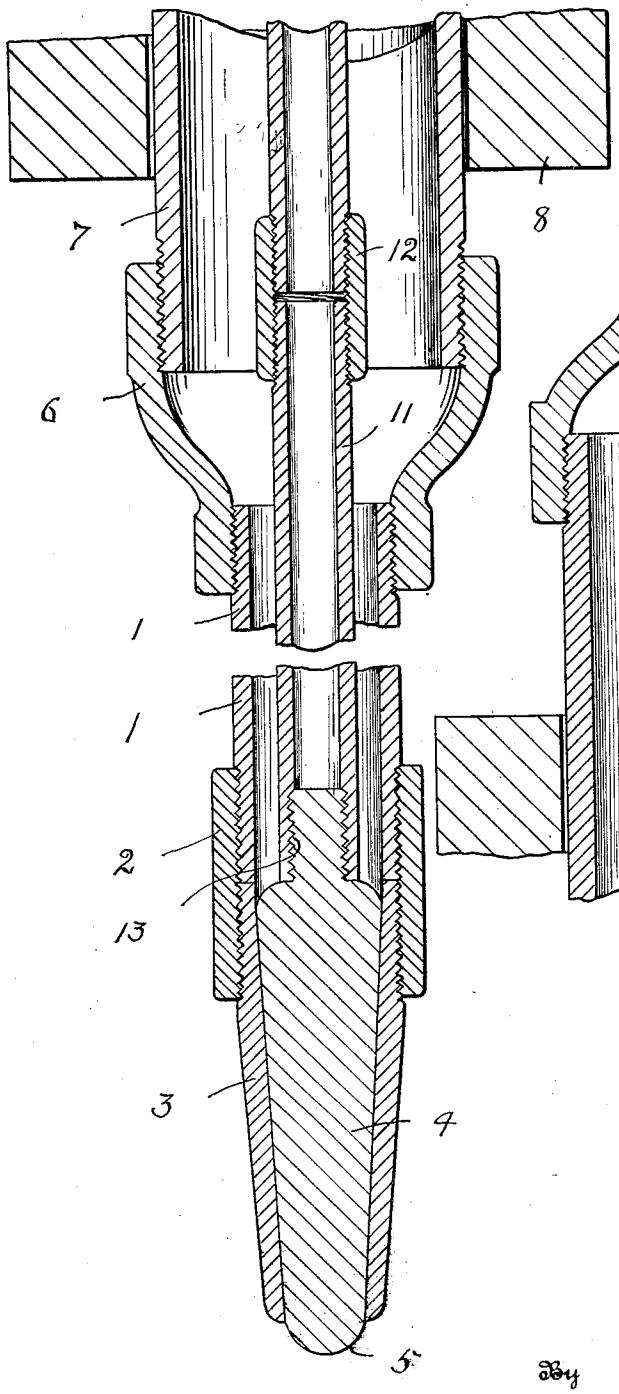
June 7, 1932. J. H. HIGHMARK 1,862,339

EARTH TESTING INSTRUMENT

Filed Feb. 12, 1932

Fig. 1.



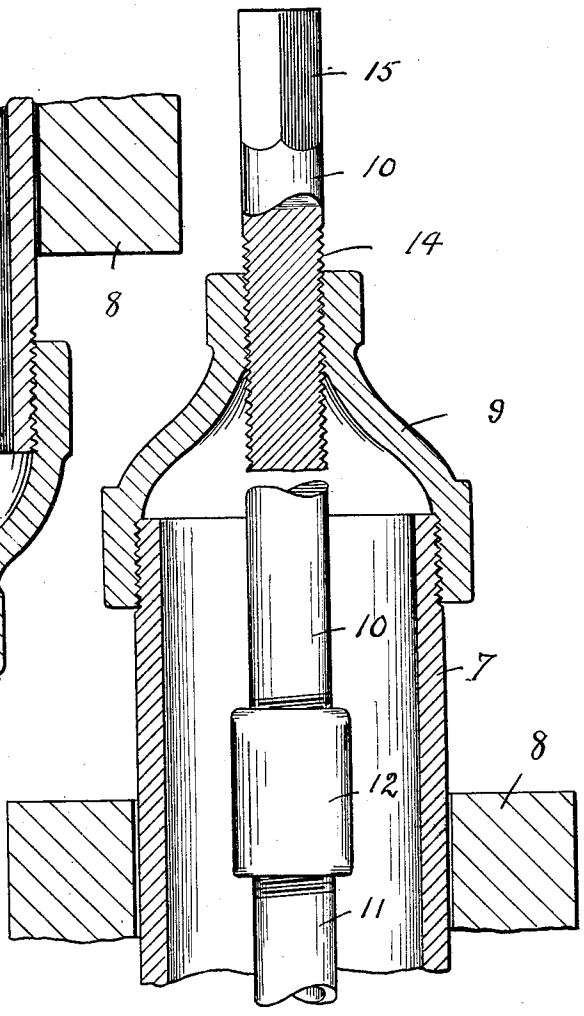




Fig. 2.

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# UNITED STATES PATENT OFFICE

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## EARTH TESTING INSTRUMENT

Application filed February 12, 1932. Serial No. 592,528.

This invention relates to testing instruments and has special reference to one designed for the purpose of removing samples or specimens of earth from time to time as the instrument is forced thereinto.

The principal object of the instant invention is to provide an improved and somewhat modified form of similar instrument patented to me December 29th, 1931, No. 1,839,153.

Other objects and advantages of the invention will appear in the following description thereof.

Referring now to the accompanying drawing, forming part of this application, and wherein like reference characters indicate like parts:

Figure 1 is a central vertical section of the point and bit, and a broken away portion of the operating casing for same; and

Figure 2 is a similar view partly in perspective of the upper end of the casing.

The preferred form of tubing for penetrating the ground upon which the device is particularly adapted is a piece of inch gas pipe illustrated at 1, which may be of any desired length, though preference is given to the initial length being of ten feet, and subsequent lengths of approximately six feet.

To the lower end of this pipe is ordinarily attached a common coupling 2 into which is threadedly fitted the point or bit sheath 3, it being of smooth and tapered construction, both internally and externally, though it may be straight, if preferred.

Into the tapered bore of the sheath 3 is fitted the core 4, being of suitable metal and of such a size as to snugly fit within the sheath with its lowermost rounded end 5 slightly protruding therefrom, forming the smallest area possible consistent with the utility of the device, and the lower end of the sheath for such a bit should be such as to permit of a ⅜″ gas pipe being manipulated therethrough for sampling purposes.

Upon the upper end of the casing is attached a common reducing coupling illustrated at 6 providing convenient attachment of a length of larger casing, preferably a length of 2″ pipe, indicated at 7. This larger pipe or casing section is for the purpose of manipulating the instrument as well as supporting the vertically reciprocable hammer 8 which surrounds same, and is operated in any desired manner common to those versed in the art. In the manipulation of the hammer thus mounted it is found expedient to permit of same to impinge or impart its downward thrust to the uppermost end of the reducing coupling 6, so that the instrument may be driven from time to time into the ground as desired.

Upon the upper end of this length of hammer casing 7 is mounted another reduction coupling 9, though oppositely disposed to the coupling 6 and sufficiently small at its upper end to threadedly support the upper end 10 of the plug stem. Now this latter is composed of preferably sections of ⅜″ gas pipe as illustrated at 11, they being of convenient lengths to be adjusted from time to time with the adjustment of the sectional portion of the casing 1, said sections of the stem being united as by common couplings 12. The lowermost section of the stem is shown as being screw threadedly mounted at 13 upon the shank of the core 4. It is obvious that this stem of the core 4 may be of a solid rod if preferred but for lightness of construction and convenience in handling a pipe is shown as well as utilized in practice, except that the section 10 thereof is solid and externally screw threaded as at 14 sufficiently for longitudinal adjustment in the event of different lengths of casing being used. This is sometimes the case where, for example, lengths of the casing have become broken or the threads spoiled, so that cutting of the casing is required. The upper end 10 of the solid portion of the stem is square as at 15 for convenient application of a wrench in turning same.

From the foregoing it is apparent that I have devised a structure obviating the necessity of screw-threading the plug within the bit or point of the sampling instrument; the adjustment and holding of same being wholly manipulated from the upper end of the casing.

The operation of the device is as follows:

After being equipped with the necessary power and other instruments for conducting the operation which may take place in swampy land where a fill already exists, and, as before stated, a ten foot length of casing is first employed, the hammer supporting length of casing is attached, the plug inserted with the reducer 9 attached, when the latter is screwed down upon the hammer section of casing, thus securely holding the plug in position within the sheath 3. This structure permits of ultimate adjustment to a nicety of the plug within the sheath by cooperatively adjusting the reducer 9 and the plug stem. For example if the reducer 9 has not been screwed down home as desired by slacking of the plug stem in unscrewing same, the reducer 9 may be firmly and ultimately fitted so that as the instrument is driven into the ground as little thrust as possible comes upon the plug but at the same time the latter is well adapted to receive the thrust on account of its firm connection to the upper end of the casing as previously described.

Now when the instrument has been driven down the desired distance in the ground, for taking the sample it is quite obvious that all that is necessary is to unscrew the reducer 9, which in this instance, has acted as a lock nut to the holding of the plug stem, and removing the plug ready for the insertion of the sampling rod, not shown, and which does not form part of my present invention. Then when further penetration of the ground is desired, the plug is refitted as before described and the driving and further sampling continued.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A testing instrument of the class described comprising a pipe, a hollow tapering point removably attached to the lowermost end of the pipe, a smooth core snugly fitted within the point and projecting slightly therethrough, a smaller pipe or rod axially disposed within the first mentioned pipe and to which the core is attached, a larger pipe attached to the upper end of the first pipe, reciprocable driving means about the larger pipe, and means upon the upper end of the larger pipe for adjustment of the core in the point.

2. A testing instrument of the class described comprising a bit consisting of a hollow tapered sheath, a core removably fitted within the sheath, a tubular sectional casing for support and operation of the bit, a sectional stem within the casing for support and operation of the core, and means upon the upper end of the casing for holding the stem and adjustment of the core of the bit.

3. A testing instrument of the class described comprising a hollow sheath, a casing removably attached to the sheath, means for driving the casing, a core filling the sheath and removable therefrom, a stem attached to the core, a reducing coupling upon the upper ends of the casing and stem whereby the core may be forcibly engaged within the sheath.

In testimony whereof I affix my signature.

JOSEPH H. HIGHMARK.