Feb. 16, 1932. V. M. HADDON 1,845,709

GRAVEL TESTER

Filed May 1, 1931

Fig. 1.

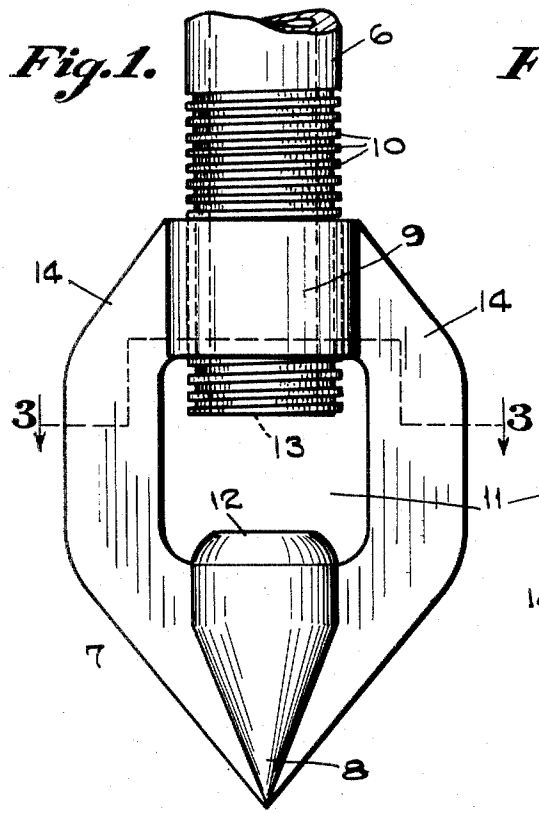


Fig. 2.

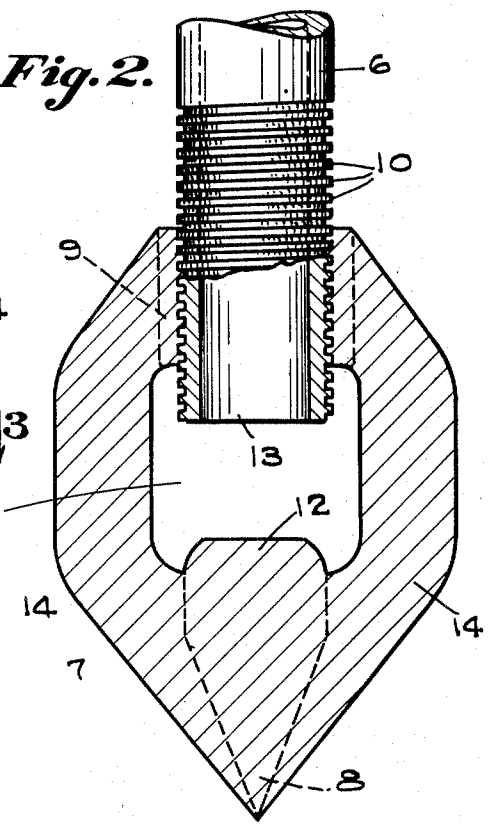


Fig. 3.

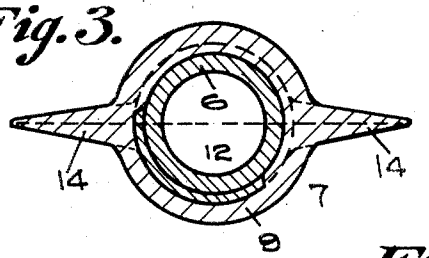


Fig. 4.

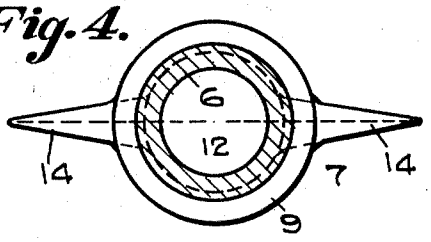


Fig. 5.



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UNITED STATES PATENT OFFICE

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GRAVEL TESTER

Application filed May 1, 1931. Serial No. 534,213.

This invention relates to a gravel tester, and has for its object, broadly, to provide a tool or apparatus for ascertaining the character and quality of alluvial deposits from the surface of the ground to any desired or practical depth.

The invention has particular reference to a tool adapted to be driven into the ground to a required depth for disclosing the various kinds of earth deposits and their distances below the surface, and has been used to great advantage for examining and testing coarse sand and gravel as to its quality, and especially to ascertain the depth of gravel beds below the surface to determine the cost of its removal.

The invention includes the use of a rotatable tube consisting of detachable pipe sections, the lowermost pipe section operating as a valve and provided with a head-piece or pointed valve casing to facilitate operation when the tube is driven into the ground, said valve casing also being provided with anchor-fins for resisting a rotary movement thereof and having a valve seat adapted to be engaged by the open, lower end of said pipe section.

It is an object of the invention to provide a device for the purpose mentioned which may be manufactured at a limited cost, and will be convenient in use.

With the foregoing objects in view and others to be mentioned, the invention presents a new and useful construction, combination and arrangement of parts as described herein and claimed, and as illustrated in the drawings, it being understood that changes may be made in form, size, proportion of parts and minor details, said changes being within the scope of the invention as claimed.

In the drawings, which illustrate one embodiment of the invention, Fig. 1 is a side view of a convergent head-piece or valve casing, and a part of a pipe section threaded therein to operate as a valve.

Fig. 2 is a view showing the pipe section threaded in the stem of the valve casing, the latter being in section.

Fig. 3 is a transverse section on line 3—3 of Fig. 1, and Fig. 4 is a plan view of the device. Fig. 5 is a broken away plan or side view showing a plurality of connected pipe sections.

Referring now to the drawings for a more particular description, the invention consists, in part, of any required number of tubular sections 6 (Fig. 5.) adapted to have threaded connections end to end, to provide a tube of any desired length, and adapted to be separated one from the other.

I provide a combined head-piece and valve casing 7 having a convergent terminal 8 and a threaded sleeve 9 adapted to be mounted on the threaded end-portion 10 of the pipe section 6.

Numeral 11 indicates an aperture or intake port formed in the valve housing 7 for receiving sand, gravel, silt or other material therein for moving into the lower open end of the pipe section 6.

The valve housing or casing 7 is provided with a valve-seat 12 adapted to be engaged by the lower end of the pipe 6 for preventing any movement of gravel or other material from entering said pipe 6, the open end of said pipe operating as an intake therefor and indicated at 13.

Numerals 14 indicate a pair of opposed anchor-fins which tend to prevent any rotatable movement of the valve housing while disposed in the ground.

As thus described it will be seen that when the valve housing 7 is maintained in a stationary position the pipe section 6 may be rotated to cause the lower end to engage the seat 12 for retaining material in said tube and preventing entrance into said tube of any additional material.

Members 6 generally consist of comparatively short lengths of pipe so that their contents, after removal from the ground, may be conveniently inspected, but in some instances longer pipe-sections may be used.

In operation, for securing specimens of earth deposits and in search for a gravel bed beneath the surface of the ground, an adjustment is first made of parts so that the port 11 will be unobstructed, the pipe-section 6 being disposed with its port 13 outwardly of said port 11.

The pipe-section 6 is then driven vertically into the ground, any suitable means being employed for this purpose. Since the ports 11 and 13, last mentioned, will be open, the pipe-section 6, while moving into the ground, will become filled with earth.

A second pipe-section is then mounted on the upper end of the first named pipe-section and the work of driving is continued. It is obvious that other pipe-sections may be added.

The connected pipe-sections are then rotated to cause the end of the lowermost pipe to engage the valve seat to prevent loss of any of the contents of material from the pipe-sections, and the device may then be removed from the ground and the contents of each pipe-section examined to determine the exact depth where a gravel bed or other desired material may be found, it being understood that the anchor-fins 14 will prevent any rotatable movement of the valve housing 7 while the pipe-sections 6 rotate.

It will be understood that the several connected pipe-sections will rotate as a unit since they have threaded connections end to end.

In instances when it is desired to test the character of gravel beds or earth deposits at a predetermined distance below the surface of the ground, the valve is closed, and the device is then driven into the ground to dispose the head-piece or valve housing 7 at said predetermined depth. The pipe-sections are then rotated in a direction to cause the valve to open. The device is then driven further into the ground to cause the gravel or other material to enter one or more pipe-sections, and after the valve has been closed in the manner above described, the device may be removed to permit inspection of the contents.

Since the valve seat 12 is of convex form and corresponds to the bore of the pipe-section, a complete closure of the valve may be made by rotating the pipe-sections in one direction, and since the surface of the bore moves into engagement and disengagement with the convex surface of the valve seat the interior of the pipe-section at its terminal will become scoured and maintained in a condition free from adhesions.

It will be noted that the anchor-fins converge outwardly to a knife edge so that they will not operate to unduly resist a downward movement of the device when the latter is driven into the ground. Also the anchor-fins have an adequate thickness at their bases so that they will adequately resist stresses when the device is driven into the ground.

I claim as my invention:—

1. A gravel tester comprising a pipe having an intake port and adapted to be driven into the ground, a head-piece threaded on the pipe and having a convergent end-portion and provided with anchor-fins for resisting a rotary movement thereof while engaging in the ground, said head-piece being provided with an intake port normally in communication with the intake port of said pipe and having a valve seat for closing the intake port of the pipe when said pipe has been rotated.

2. A gravel tester comprising a pipe having an intake port and adapted to be driven into the ground, a head-piece having a sleeve threaded on the pipe and provided with anchor-fins for resisting a rotary movement when disposed in the ground, said head-piece being provided with an intake port normally in communication with the intake port of said pipe and having a valve seat for closing the intake port of the pipe when said pipe has been rotated.

3. A gravel tester comprising a pipe adapted to be driven into the ground and having an intake port and consisting of detachably connected tubular sections, a head-piece threaded on said pipe and provided with a valve seat and having an intake port normally in communication with the intake port of the pipe, said pipe being adapted to have a rotary movement to cause it to engage said valve seat, said head-piece being provided with outwardly projecting fins to cause it to resist a rotary movement while in the ground and while said pipe is performing said rotary movement.

4. A gravel tester comprising a pipe consisting of a plurality of detachably connected tubular sections provided with an intake port and adapted to be driven into the ground, a head-piece provided with a valve seat and having a sleeve threaded on said pipe, said head-piece having a convergent terminal to facilitate a movement of the pipe while it is driven, a plurality of anchor-fins to resist a rotary movement while in the ground and provided with an intake port normally in communication with the intake port of the pipe, said pipe being adapted to have a rotary movement to cause it to engage the valve seat.

5. A gravel tester comprising a pipe consisting of detachably connected tubular sections provided with an intake port, a head-piece having a valve seat, a plurality of outwardly convergent anchor-fins, an outwardly convergent terminal part, an intake port normally in communication with the intake port of the pipe, and having a sleeve threaded on said pipe, said pipe with its head-piece being adapted to be driven into the ground, and said pipe being adapted to have a rotary movement to cause it to engage said valve seat.

6. A gravel tester comprising a pipe having an intake port, a head-piece threaded on said pipe and having an intake port normally communicating with the intake port of said pipe and provided with a valve seat, said pipe with its head-piece being adapted to be driven into the ground, said pipe being adapted

to be rotated to cause it to engage the valve seat, the head-piece being provided with fins for resisting rotation.

7. A gravel tester comprising a pipe having an intake port and consisting of detachably connected pipe sections, a head-piece threaded on said pipe and having a valve seat and an intake port normally communicating with the intake port of said pipe and provided with outwardly projecting fins for resisting a rotatable movement while engaging in the ground, said pipe being adapted to be rotated to cause it to engage the valve seat.

In testimony whereof, I affix my signature.

VIRGIL M. HADDON.