United States Patent

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[72] Inventor **Stephen S. Koziski**
872 Upper Sherman Ave., Hamilton, Ontario, Canada

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[54] **EARTH AUGER**
4 Claims, 1 Drawing Fig.

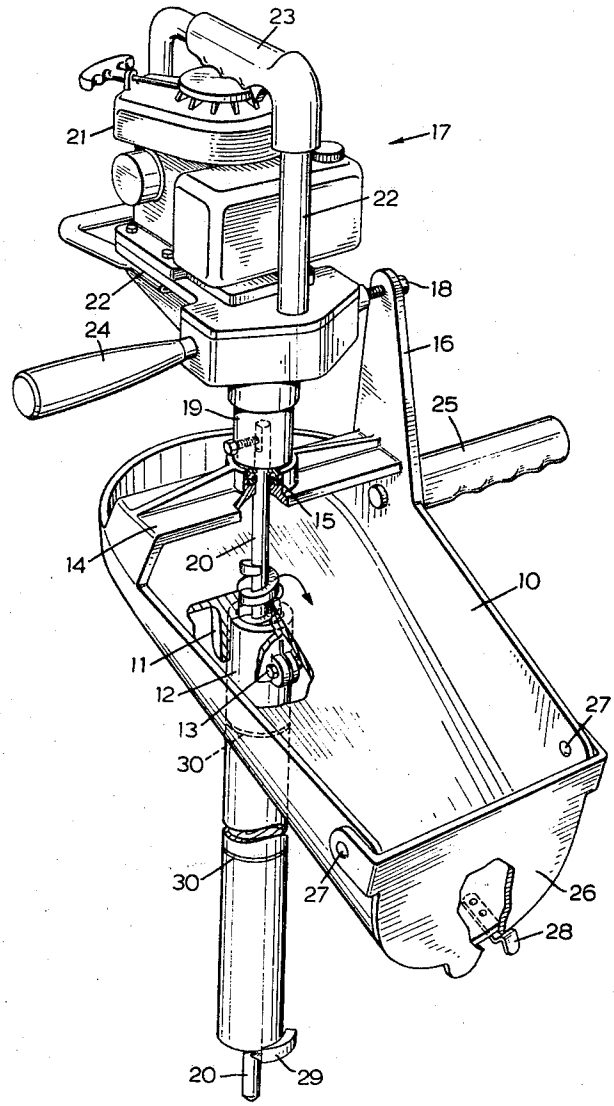
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[50] **Field of Search** 175/88, 207

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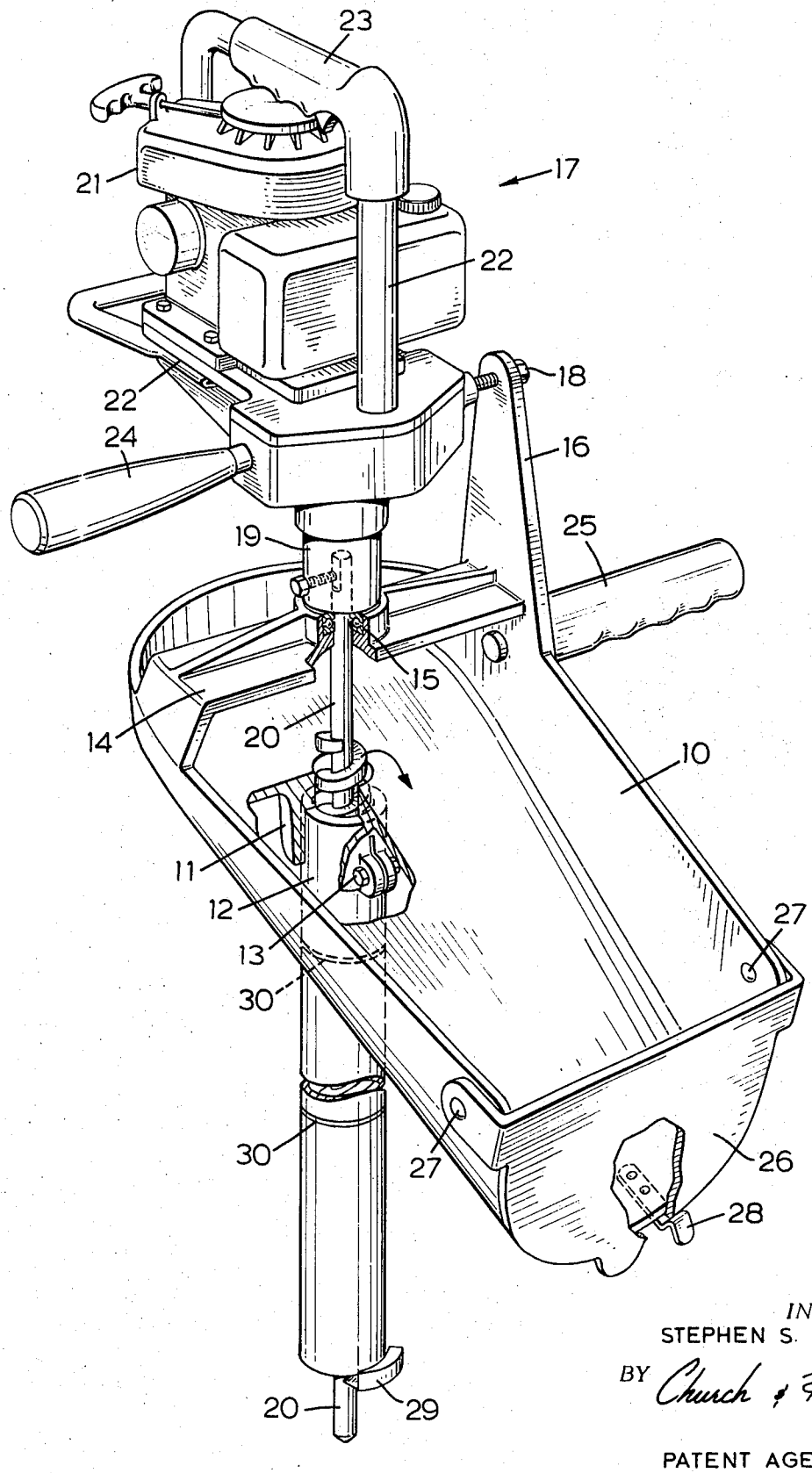
Primary Examiner—Nile C. Byers, Jr.
Attorney—Church and Rogers

ABSTRACT: An earth auger comprises an open topped frame having a downwardly sloping floor leading to a discharge end opening having a pivoted closure door. A boss at the bottom of the tray mounts a downwardly extending hollow auger tube. Brackets above the tray mouth a motor unit and a thrust bearing. The motor unit engages the thrust bearing and drives a screw auger that extends downwardly through the tube; the screw auger has an enlarged lower end so that the hole it cuts is larger than the auger tube.



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INVENTOR.
STEPHEN S. KOZISKI
BY Church & Rogers
PATENT AGENTS

EARTH AUGER

FIELD OF THE INVENTION

This invention is concerned with improvements in or relating to earth augers of the type intended to provide a sample of the soil through which they pass.

DESCRIPTION OF THE PRIOR ART

It is now a common practice to take earth samples at a number of spaced points over an area to be cultivated, the samples being analyzed to determine the specific requirements of the area for fertilizer etc., to suit the particular soil, climate and the crop that is to be grown. Modern techniques in this field require that a large number of samples be provided at different depths, usually to a total depth of about 3 feet, and the production of numerous samples by hand equipment is a laborious and tiring operation. The motorised equipment proposed hitherto for producing such samples has generally been of an expensive and complicated nature.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a motorised earth auger of new form.

It is a specific object of the invention to provide a motorised earth auger of simple form that is particularly suited for the collection of separate samples of the earth withdrawn by the auger at different depths in the soil.

In accordance with the present invention there is provided an earth auger comprising an auger tube having an operative upper end and an operative lower end and having an earth discharge opening adjacent the said upper end, means mounting an auger member in the tube for operative rotational movement therein to draw earth into the bottom end of the tube and to discharge it through the said opening, means for mounting a driving motor adjacent the said tube upper end for operative driving engagement with the said auger member, and means providing a tray member adjacent the said tube upper end to receive earth discharged through the said opening.

DESCRIPTION OF THE DRAWING

A particular preferred embodiment of the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawing, the single FIG. of which is a general perspective view taken from above and to one side to show the general structure of the earth auger, parts thereof being shown broken away as necessary for clarity of illustration.

DESCRIPTION OF THE PREFERRED EMBODIMENT

An earth auger in accordance with the present invention comprises a deep open-topped tray member **10**, which also constitutes a main frame for the device, the frame member preferably being a casting of a suitable metal. The bottom of the member is provided with a downwardly extending, vertically split boss **11** which receives the operative upper end of a straight hollow auger tube **12**, the tube being clamped firmly in the boss by means of a clamp bolt **13**. With the auger tube mounted in the frame member the open upper end thereof constitutes an earth discharge opening through which earth that passes upwards in the auger tube will enter the tray member **10**.

A generally horizontal cross bracket **14** that is formed integral with the member **10** extends over the open top thereof, and constitutes means mounting a thrust bearing **15** disposed centrally on the bracket with its axis of rotation generally vertical and coaxial with the longitudinal axis of the auger tube. A vertically extending bracket member **16**, also integral with the frame member **10**, serves to mount a driving motor indicated generally herein by the reference **17**, the motor being fastened thereto by a bolt **18**. An output shaft of the driving motor carries a chuck **19** which is engaged with the thrust bearing **15** and grasps the upper end of an auger member **20** that extends through the auger tube and is rotatable therein.

In this particular embodiment the driving motor **17** comprises a self-contained, portable gasoline engine **21** with an integral gear box and mounted in an enclosing frame **22** provided with handles **23** and **24**. Such units are readily available commercially and render the earth auger completely independent of any external source of power. However, it will be understood by those skilled in the art that other types of motor can be used, such as a suitably geared electric motor, or the power takeoff via a flexible shaft from an adjacent tractor. The tray member **10** is itself provided with a horizontally extending operator's handle **25** which can be used in cases where the motor unit itself does not have such a handle.

With the auger tube **12** in its operative upright position, wherein its longitudinal axis of rotation and that of the auger are vertical, the bottom of the tray member **10** is inclined downward at a relatively steep angle, so that the earth which is drawn into the auger tube and discharged from the said earth discharge opening will upon entering the tray member tend to slide under gravity towards the lowermost end portion thereof. This lowermost end portion is provided with a closure door **26** pivoted to the tray member **10** at **27**, and normally held in the closed position by a retaining clip **28**.

The lower end of the auger member **20** is provided with an enlarged tip **29** of greater radius than that of the auger tube exterior, so that the hole which is formed thereby is somewhat larger than that of the auger tube, and there is therefore no tendency for the surrounding earth to bind around the tube and hinder its withdrawal at the conclusion of the sampling operation.

In a particularly advantageous method of operation of my new device a large number of successive samples can be obtained at different depths from the same hole without cross contamination between the samples. In this method the driving motor is started and the auger pressed by the operator into the earth until it has penetrated the distance required for a first sample, usually 6 inches. The exterior of the auger tube is provided with suitable markings, such as circumferential bands **30**, so as to indicate clearly to the operator when this particular depth is reached. At this point the auger is stopped in its downward travel and held stationary in the earth, while the motor rotates the auger member and thereby feeds the earth in the tube upwards until it is expelled into the tray member. The earth sample will usually slide down to the lowermost end, but if too sticky it can be made to do so by a gentle tapping of the tray, or even by moving the fingers. The closure door **26** is then opened and the sample discharged into a suitable container. The door is again closed and the downward movement of the auger continued for the distance required for the second sample, and so on until the required maximum depth has been reached and all of the required separate samples have been taken. The auger is quickly and easily removed from the earth because of the enlarged hole that has been drilled by the oversized tip **29**, as described above.

It will be apparent to those skilled in the art that a particular construction only has been described, and variations and modifications are possible within the scope of the appended claims.

I claim:

1. An earth auger comprising an auger tube having an operative upper end and an operative lower end and having an earth discharge opening adjacent the said upper end, means mounting an auger member in the tube for operative rotational movement therein to draw earth into the bottom end of the tube and to discharge it through the said opening, means for mounting a driving motor adjacent the said tube upper end for operative driving engagement with the said auger member, and a tray member mounted adjacent the said tube upper end to receive earth discharged through the said opening, wherein with the auger tube in an operative position the bottom of the

tray member is inclined downwardly for the earth received therein to tend to collect at the lowermost portion thereof, and the said lowermost portion of the tray member is provided with an openable closure door and releasable means for retaining the door in the closed position.

2. An earth auger as claimed in claim 1, wherein said means mounting the auger tube and the auger member and providing a tray member comprise an open-topped frame member constituting the said tray, a boss in the bottom of the frame member receiving the said auger tube with the upper end of the tube opening to the interior of the tray member and constituting the said earth discharge opening, and bracket means integral with the frame member and extending above the frame member for mounting the driving motor and the auger member.

3. An earth auger as claimed in claim 2, and comprising handle means extending generally horizontally from the said frame member for manual handling of the auger by an operator.

4. An earth auger comprising an auger tube having an operative upper end and an operative lower end and having an earth discharge opening adjacent the said upper end, means mounting an auger member in the tube for operative rotational movement therein to draw earth into the operative end of the tube and to discharge it through the said opening, means for mounting a driving motor adjacent the said tube upper end for operative driving engagement with the said auger member, a tray member mounted adjacent the said tube upper end to receive earth discharged through the said opening, the said tray member in operative position having the bottom thereof inclined downwardly for the received earth to collect at the lowermost portion thereof, an openable closure door at the said lowermost portion of the tray member, a boss in the bottom of the tray member receiving the said auger tube with the upper end of the tube opening to the interior of the tray member and constituting the said earth discharge opening, a bracket extending above the tray member, a thrust bearing mounted by said bracket to receive an auger member which extends through the auger tube and the thrust bearing, and means for mounting the driving motor in operative engagement with the auger member and the said thrust bearing.