June 18, 1963 A. G. NEWBOLD 3,094,178

GROUND DIGGING AUGER

Filed Oct. 6, 1961

Fig. 1.

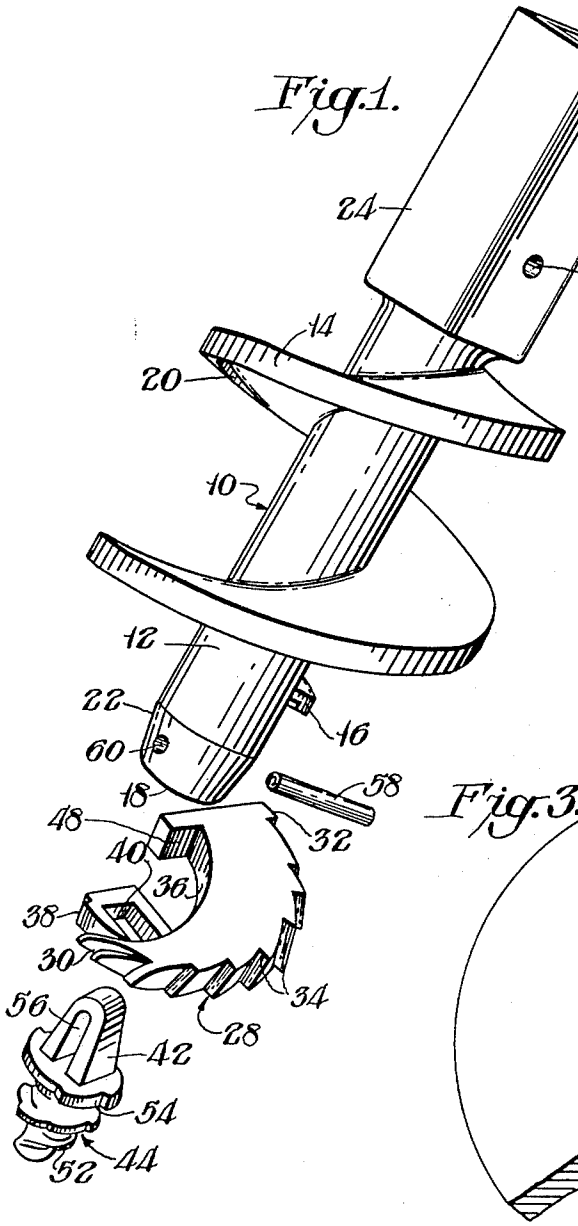


Fig. 2.

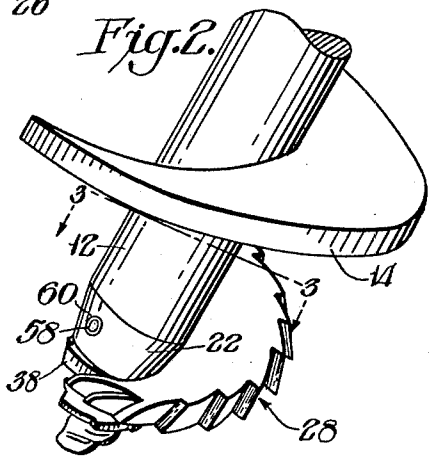
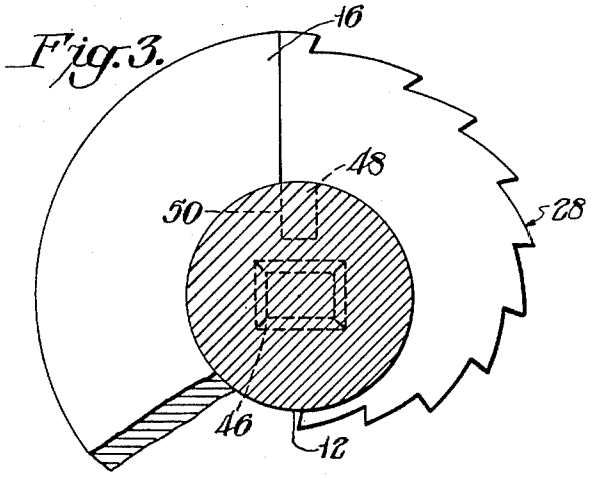


Fig. 3.



INVENTOR

Albert G. Newbold

BY Connolly and Hutz

ATTORNEYS

United States Patent Office 3,094,178 Patented June 18, 1963

3,094,178

GROUND DIGGING AUGER

Albert G. Newbold, Summit, Pa., assignor to Trainer Associates Inc., New Castle, Del., a corporation of Delaware

Filed Oct. 6, 1961, Ser. No. 143,378
11 Claims. (Cl. 175—388)

This invention relates to a ground digging auger for drilling holes through the ground, and it more particularly relates to a simple and uncomplicated structure for such an auger.

Various types of augers have been proposed for drilling holes through the ground. However, most of these augers are quite complicated and include a relatively large number of parts. This makes most existing types of such augers unsuitable for drilling smaller diameter holes ranging from 8 to 12 inches in diameter, such as those suitable for receiving posts and anchors.

In accordance with this invention an auger is composed of three main parts including an axial shaft having a spiral web extending upwardly about it from a predetermined distance above its bottom end. A spiral blade having a series of cutting edges about its periphery is mounted upon the lower end of the axial shaft. A penetrating point locks the spiral blade to the bottom of the shaft by insertion of its key projection through a corresponding opening in the boss of the central blade and into an axial keyseat in the lower end of the axial shaft. A pin may be inserted through the shaft and the key projection inserted within it to detachably secure the assembly together. The upper end of the spiral blade may be secured to the shaft and web assembly by insertion of an inwardly extending lug upon the blade into a corresponding recess in the side of the shaft.

Novel features and advantages of the present invention will become apparent to one skilled in the art from a reading of the following description in conjunction with the accompanying drawings wherein similar reference characters refer to similar parts and in which:

FIG. 1 is an exploded perspective view of one embodiment of this invention;

FIG. 2 is an assembled perspective view of the lower portion of the embodiment shown in FIG. 1; and

FIG. 3 is a cross-sectional view taken through FIG. 2 along the line 3—3.

In FIG. 1 is shown a ground digging auger including an axial shaft **12** with a spiral web **14** extending upwardly from leading end **16** about it from a predetermined distance above its lower end or bottom **18**. Web **14** includes a stiffening flange **20** about its periphery, and it is substantially regular in diameter. This facilitates its transportation of spoil upwardly through the hole that auger **10** is digging. The lower end **22** of shaft **12** is slightly tapered to facilitate its entry into the ground, and a chuck **24** having an axial bore **25** and an outer surface **27** of rectangular cross section in planes perpendicular to the longitudinal axis of shaft **12** is provided upon the upper end of shaft **12** for attaching auger **10** to a rotating source of power to which it is pinned through chuck hole **26**.

Spiral blade **28** has an increasing outer radius from its lower outer edge **30** to the upper portion **32** of its outer edge. The outward spiralling outer edge is serrated to provide a series of cutting edges or teeth **34** about its periphery. The inner arcuate surface **36** of blade **28** is curved to engage the outer periphery of shaft **12**. Spiral blade **28**, as well as the rest of this assembly, is made of high strength cast steel. However, cutting teeth **34** can be effectively provided by casting hard inserts within spiral blade **28** or attaching these inserts to it in any convenient manner to enhance its cutting action.

A central boss **38** is formed at the bottom end of blade **28** and it includes a tapered opening **40** corresponding to tapered key projection **42** formed at the top of penetrating or piercing point **44**. A tapered axial keyseat **46** is formed in the bottom of axial shaft **12** for receiving key projection **42**. A lug **48** extends radially inwardly from inner surface **36** to spiral blade **28**, and it engages within a radial recess **50** in the side of axial shaft **12** as is later described.

Penetrating point **44** includes a serrated spiral web **52** to facilitate its entry into the ground upon rotation, and a serrated flange **54** is formed between the lower penetrating portion of point **44** and key projection **42** for engaging the bottom of boss **38** of blade **28** when the parts are assembled. An aperture **56**, which is slotted to facilitate engagement, is formed in key projection **42**; and pin **58** which is made resilient to facilitate engagement and disengagement, is inserted through hole **60** in an axial shaft **12** into slot **56** for securing the assembly together.

Spiral blade **28**, for example, covers an angle of approximately 180° about axial shaft **12** to provide a substantial cutting edge without interfering with its ease of assembly. Furthermore, all of the illustrated parts are easily manufactured completely by casting or foundry practice without any machining operations being necessary.

The assembled auger **10** is shown in FIG. 2 with pin **58** inserted through hole **60** to lock tapered key projection **42** within corresponding tapered aperture **46** in the bottom of axial shaft **12**. This automatically locks boss **38** of spiral blade **28** against axial or longitudinal movement, and the engagement of lug **48** at the upper end of blade **28** within radial recess **50** in axial shaft **12** securely locks the upper end of blade **28** to shaft **12** in a manner sufficient to resist the most severe stresses imposed during a digging operation.

Assembled auger **10** is remarkably effective for digging relatively small diameter holes ranging from 8 inches to 12 inches, and it cuts smoothly through the ground with a clear path for the spiral web being cut by the teeth upon the spiral blade. Should the blade and penetrating blade become worn, they can easily be replaced by the use of a hammer and drift pin which facilitates their replacement with ease in a remarkably short time. This also facilitates the interchanging of blades of different character to suit changing conditions of ground compositions.

What is claimed is:

1. A ground digging auger comprising an axial shaft, a spiral web extending upwardly about said shaft and commencing a predetermined distance above the bottom end of said shaft, a spiral blade mounted upon the lower end of said axial shaft and extending about the bottom of said shaft up to join said spiral web, said spiral blade having a series of cutting edges about its periphery, the bottom of the periphery of said spiral blade being disposed substantially close to said axial shaft and the upper portion of said spiral blade joining said spiral web to provide a substantially continuous spiral from said blade to said web, an axial keyseat within said axial shaft, a penetrating point having a key projection upon its upper end which engages within said keyseat, the bottom of said spiral blade having a central boss which is disposed under said lower end of said axial shaft, said boss having an opening corresponding to said key projection, and said key projection being inserted through said aperture in said boss into said axial keyseat and a securing means connecting said key projection to said axial shaft for maintaining said spiral blade and said penetrating point secured to the lower end of said axial shaft.

2. An auger as set forth in claim 1 wherein said spiral blade covers an angle of approximately 180° about said axial shaft.

3. An auger as set forth in claim 1 wherein the lower end of said axial shaft is tapered to provide a smooth transition from said boss to the full width of said axial shaft.

4. An auger as set forth in claim 1 wherein said penetrating point includes a serrated spiral cutting edge.

5. An auger as set forth in claim 4 wherein said penetrating point includes a serrated flange which engages the bottom of said boss of said spiral blade.

6. An auger as set forth in claim 1 wherein angular securing means connects the upper portion of said spiral blade to the axial shaft and spiral web assembly.

7. An auger as set forth in claim 6 wherein said angular securing means includes a lug extending inwardly from the inside upper surface of said spiral blade, a recess being formed in said axial shaft in line with said lug when said spiral blade is mounted upon said axial shaft, and said lug being engaged in said recess for locking the upper portion of said blade to said shaft.

8. An auger as set forth in claim 1 wherein said key projection and keyseat are correspondingly tapered to facilitate their engagement and disengagement.

9. An auger as set forth in claim 8 wherein said opening in said boss is also tapered.

10. A ground digging auger comprising an axial shaft, a spiral web extending upwardly about said shaft and commencing a predetermined distance above the bottom end of said shaft, a spiral blade mounted upon the lower end of said axial shaft and extending about the bottom of said shaft up to join said spiral web, said spiral blade having a series of cutting edges about its periphery, the bottom of the periphery of said spiral blade being disposed substantially close to said axial shaft and the upper portion of said spiral blade joining said spiral web to provide a substantially continuous spiral from said blade to said web, an axial keyseat within said axial shaft, a penetrating point having a key projection upon its upper end which engages within said keyseat, the bottom of said spiral blade having a central boss which is disposed under said lower end of said axial shaft, said boss having an opening corresponding to said key projection, said key projection being inserted through said aperture in said boss into said axial keyseat for maintaining said spiral blade secured to the lower end of said axial shaft, an axial aperture being formed in said key projection, a hole extending through the bottom of said axial shaft in line with said aperture in said key projection when it is inserted within said keyseat, and a pin being inserted through said hole and said aperture to secure said penetrating point and spiral blade to said axial shaft.

11. An auger as set forth in claim 10 wherein said aperture is slotted, and said pin is resilient to facilitate its removal and retention.

References Cited in the file of this patent

UNITED STATES PATENTS

2,594,261	Henning	Apr. 22, 1952
2,846,192	Ostling	Aug. 5, 1958
3,024,856	Henning	Mar. 13, 1962