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J. R. RICH

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FOUNDATION AUGER

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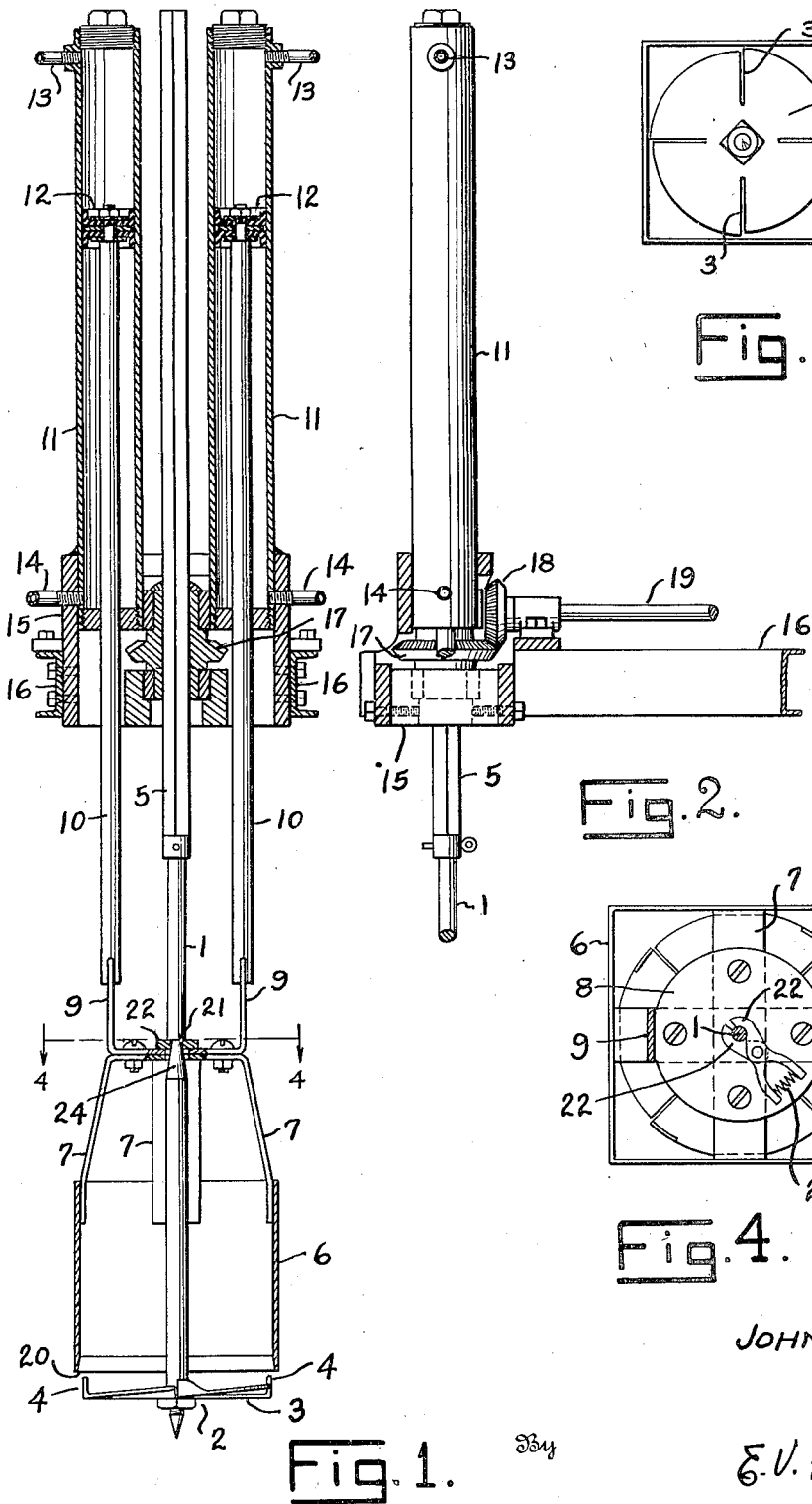


Fig. 3.

Fig. 2.

Fig. 4.

Inventor
JOHN R. RICH

By
E. V. Handwerker,
Attorney

UNITED STATES PATENT OFFICE

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FOUNDATION AUGER

John R. Rich, Houston, Tex.

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5 Claims. (Cl. 255—22)

This invention relates to a foundation auger and embodies also a bucket arranged to cooperate with the auger in order to produce a square excavation for foundation work in building construction.

In making excavations for foundation footings it is often desirable, and sometimes required, that the excavations for receiving the plastic concrete for the footing be formed substantially square. It is an object of the present invention to provide a combination auger and wall shaper which will produce a square hole or excavation for the footings.

It is another object of the invention to provide novel means for driving the auger and advancing the wall shaper in harmony therewith so that the round hole formed by the auger will be converted into a square hole, said auger and wall shaper forming a retainer for the loose earth so that said earth may be from time to time lifted out and disposed of as the work proceeds.

The invention also embodies novel means for driving the auger as well as novel means for advancing the wall shaper.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawing, wherein:

Figure 1 shows a vertical, sectional view of the apparatus.

Figure 2 shows a fragmentary, side elevation, partly in section.

Figure 3 shows a bottom end view of the auger and wall shaper, and

Figure 4 shows a cross-sectional view taken on the line 4—4 of Figure 1.

Referring now more particularly to the drawing wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates a drive shaft to the lower end of which the disc-like auger is attached.

As illustrated in Figure 3 this auger is slitted radially as shown in Figure 2, the rear sides of the slits forming the radial blades as 3 which are pitched forwardly and downwardly so as to feed into the earth as the auger is rotated and whose forward outer margins are formed with the upturned side cutters 4, 4 to sharply define the outer wall of the bore.

Detachably secured to the upper end of the driving shaft 1 there is the grief stem 5 preferably square in cross-section.

Following the auger 2 there is the wall shaper 6 open at its upper and lower ends and preferably square in cross-section. Its minimum inside diameter is approximately the same as the maximum outside diameter of the auger as shown in Figures 3 and 4.

Secured to the sides of the wall shaper, at its upper end, are the upstanding brackets 7 whose upper ends are inwardly turned and bolted on said inwardly turned ends there is a disc 8. This disc has oppositely arranged upstanding arms 9, 9 to which the lower ends of the plunger rods 10, 10 are secured. These rods extend up into the cylinders 11, 11 and attached to their upper ends are the pistons 12, 12 which work in said cylinders. The upper and lower ends of the cylinders are closed and leading into said upper and lower ends above and beneath the pistons are the upper and lower lines 13, 13 and 14, 14 for the inlet and relief of an operating fluid. The cylinders are mounted on a suitable frame as 15 which may be supported by a boom as 16 extending out radially from a suitable transporting vehicle such as a tractor.

Rotatably mounted in the frame 15 there is a beveled gear wheel 17 through which the grief stem 5 slides, said beveled gear wheel having a square bearing to receive said grief stem. Upon rotation of the beveled gear wheel the grief stem, the drive shaft 1 and the auger will be rotated. The gear wheel 17 may be driven by a similar gear wheel 18 which is in mesh therewith and which in turn is driven by the shaft 19 on which it is fixed.

Upon rotation of the auger it will penetrate into the earth and will form a round hole and as the work progresses an operating fluid such as compressed air may be introduced into the cylinders through the pipes 13 to force the pistons and the wall shaper 6 downwardly. The loose earth produced by the cutters 3, 4 will collect above the disc 2 and the loose earth displaced from the walls of the bore by the lower cutting edges 20 of the wall shaper will fall onto said disc until the bucket is filled with the earth.

The shaft 1 has an external, downwardly facing, annular shoulder 21 and pivoted on the disc 8 are the latches 22, 22 which engage underneath said shoulder and which are held in such engagement by the pressure spring 23 between the outer ends of the latches. Beneath the shoulder 21 the shaft 1 has the downwardly flared portion 24.

When the shaper 6 is filled an operating fluid may be introduced through the lines 14 into the cylinders to elevate the shaper. The engage-

ment of the latches 22 with the shoulder 21 will cause the auger to be lifted with the shaper. The boom may then be swung around to the point where the shaper is to be dumped and the latches 22 released from the shaft 1 thus permitting the auger and the contents of the shaper 6 to move downwardly thus causing a discharge of the loose earth from the shaper. The auger resting on the ground or other support the shaper 6 may then be lowered and the latches engaged underneath the shoulder 21 and the auger and bucket may then be again lowered into the bore and the boring operation proceeded with as before until the required depth has been reached.

The lines 13, 14 are valve controlled so that when the operating fluid is being introduced through the lines 13 the fluid beneath the pistons will be relieved through the lines 14 and vice versa.

The drawing and description are illustrative merely, while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In combination a square tubular wall shaper which is open at its ends and of uniform diameter and terminating at its lower end in downwardly directed cutting edges, supporting means for raising and lowering the shaper, an auger positioned to move longitudinally in the shaper, a stem to which the auger is connected, means to rotate the stem, the stem being freely movable longitudinally relative to said rotating means, releasable means connecting the stem and shaper.

2. In combination a square tubular shaper which is open at its ends, supporting means for raising and lowering the shaper, an auger arranged to move longitudinally in the shaper, a stem to which the auger is connected, means to rotate the stem, the stem being freely movable longitudinally relative to said rotating means, releasable means connecting the stem to the shaper to support the stem and auger, said connecting means being arranged to allow limited free downward movement of the stem and auger relative to the shaper.

3. In combination, a tubular member open at both ends, of uniform inside diameter, and polygonal in cross section, supporting means for raising and lowering said member, an auger

within, and normally located adjacent the bottom of, said member, a stem extended axially through said member to the lower end of which the auger is attached, means to rotate the stem, said stem being freely movable downwardly relative to the rotating means, said supporting means including means to force said member to follow the auger downwardly as the auger penetrates the earth, releasable means connecting said member to the stem to elevate the auger with said member and when released to permit the auger to move downwardly relative to said member.

4. In combination, a tubular cutter open at its lower end of uniform diameter and square in cross section, an auger within, and normally located adjacent the bottom of, the cutter, a stem extended axially through the cutter to the lower end of which the auger is attached, supporting means for raising and lowering the cutter and auger, means to rotate the stem and auger, said stem being freely movable downwardly relative to the rotating means, said supporting means including means to force the cutter to follow the auger downwardly as the auger penetrates the earth, releasable means connecting the cutter to the stem and formed to allow a downward movement of the cutter relative to the auger and to engage with the stem to elevate the auger with the cutter and when released to permit the auger to move downwardly relative to the cutter.

5. In combination a tubular wall shaper square in cross section and of uniform diameter and open at its ends, said shaper terminating at its lower end in downwardly directed cutting edges, brackets upstanding from the upper end of said shaper whose upper ends are inwardly turned, a disc secured to said inwardly turned ends, supporting means connected to the disc for raising and lowering the shaper, an auger positioned to move longitudinally within the shaper, a stem movable axially through the disc to which the auger is connected, means for rotating the stem, said stem being freely movable longitudinally relative to said rotating means, releasable means connecting the stem to the disc to support the stem and auger, said connecting means being arranged to allow limited free downward movement of the stem and auger relative to the shaper.

JOHN R. RICH.