Feb. 22, 1927. 1,618,294

J. OLSON

UNDERREAMER

Filed March 30, 1926 2 Sheets-Sheet 1

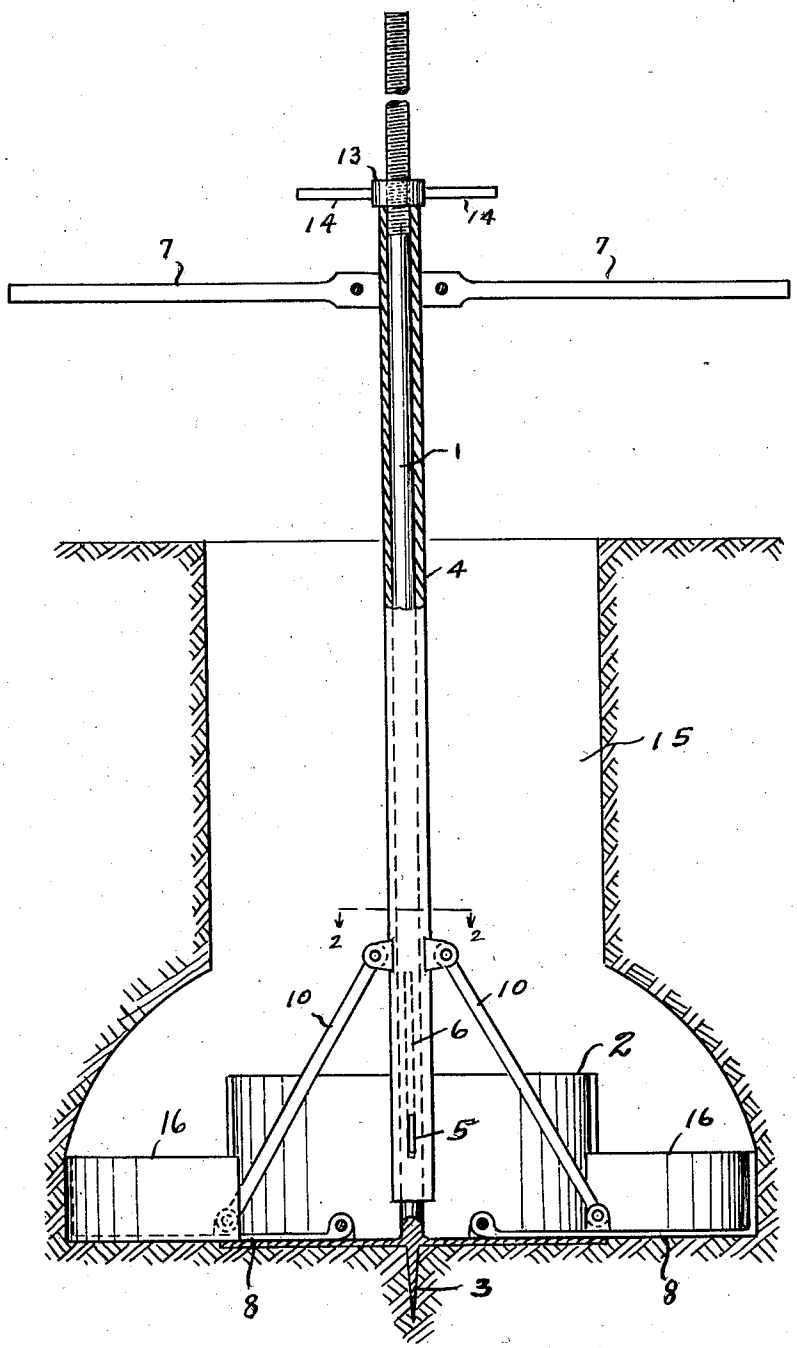


Fig. 1.

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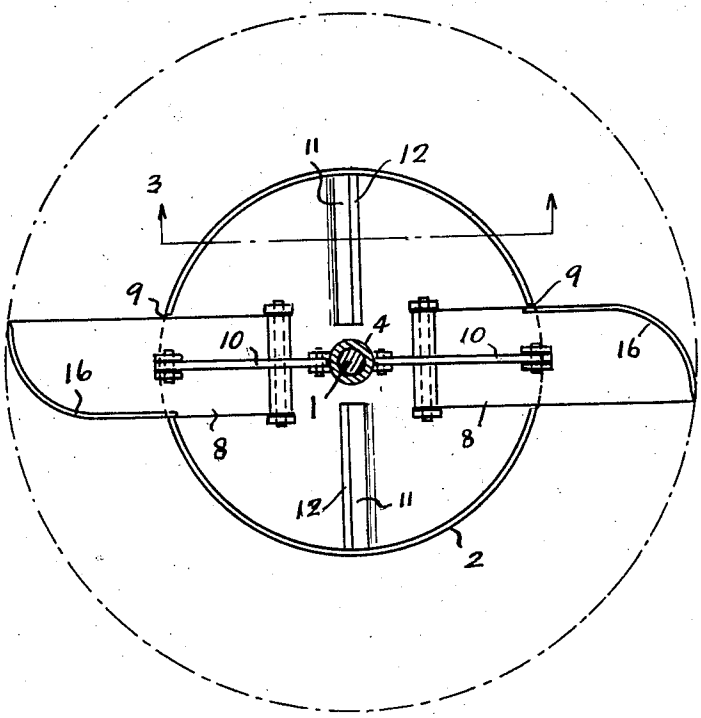


Fig. 2.

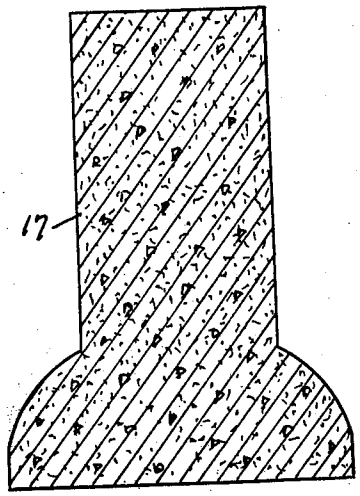


Fig. 4.

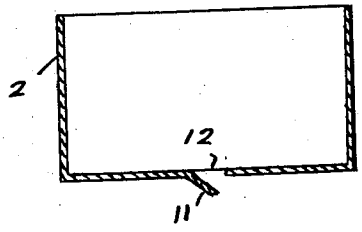


Fig. 3.

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Patented Feb. 22, 1927. 1,618,294

UNITED STATES PATENT OFFICE.

JOSEPH OLSON, OF HOUSTON, TEXAS.

UNDERREAMER.

Application filed March 30, 1926. Serial No. 98,489.

This invention relates to new and useful improvements in an underreamer.

One object of the invention is to provide a device of the character described specially designed for the purpose of underreaming, or enlarging the lower ends of bores excavated to receive concrete footings or pillars in foundation work.

Another object of the invention is to provide an implement of the character described which will enlarge, and form a smooth bottom for the lower end of a bore in the earth for the purpose stated.

A further feature of the invention is to provide an implement of the character described which will work in soft formation and which is also equipped with means which adapt it for use in certain kinds of hard formation.

A still further feature of the invention is to provide an implement of the character described which may be cheaply and easily constructed and easily operated and which is very effective in use.

With the above and other objects in view this 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 drawings, wherein:—

Figure 1 shows a vertical sectional view of the implement partly in section.

Figure 2 shows a cross-sectional view, taken on the line 2—2 of Figure 1.

Figure 3 shows a vertical sectional view of the barrel, taken on the line 3—3 of Figure 2, and

Figure 4 shows a vertical sectional view, showing an outline of the bore formed and the footing therein.

Referring now more particularly to the drawings, wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 designates a driving shaft, attached to the lower end of which is the barrel 2. This barrel is cup-shaped in form and has a flat bottom. The shaft 1 is extended beneath the barrel and formed with a guide point 3. Fitted over, and slidable on the shaft 1, there is a sleeve 4 which carries a key 5 which works in the lengthwise key way 6, in the shaft, to prevent the sleeve from turning on the shaft, but to permit a limited lengthwise movement of the sleeve on the shaft.

The upper end of the sleeve has the fixed handles 7, 7, by means of which the implement may be turned.

Pivoted at their inner ends to the bottom of the barrel, on opposite sides of the shaft 1, are the scoop-like cutters 8, 8, and the aligned portions 9, 9, of the upstanding rim of the barrel 2 are cut away, forming openings through which said cutters may work. Links 10, 10, are pivoted, at their upper ends, to the sleeve 4, and at their lower ends, to the respective cutters 8.

The bottom, of the barrel 2 has the radial blades 11, 11, and in front of them the radial slits 12, 12, for a purpose hereinafter to be described.

The upper end of the shaft 1 may be threaded and in some cases, when hard strata must be excavated, a jamb nut 13 will be threaded thereon. This nut has the handles 14, 14, and its purpose, and mode of operation will be hereinafter explained.

In use the hole, as 15, to be underreamed, or enlarged, is first formed by the use of any ordinary implement provided for the purpose. The nut 13 is then either removed, or run up to the upper end of the shaft 1. The implement herein described is then picked up by the handles 7 and the sleeve will move upwardly on the shaft as far as permitted by the key 5 and this will carry the cutters 8 into upright position, parallel with said shaft.

The implement is then lowered into the bore until it rests on the bottom and the weight of the sleeve will force the outer, or free ends of the cutters 8 out against the walls of the bore. The implement is then turned by the handles 7 and a downward pressure, at the same time exerted against them and this will gradually force the cutters out into, and they will cut away the walls at the bottom of the bore.

It is to be noted that the outer ends of these cutters, at the rear, have the upstanding arcuate guides 16, 16, which engage the loose earth cut away, and force it through the openings 9, 9, into the barrel. While this work is in progress the blades 11 will cut away the material at the bottom of the bore which will pass up through the slots 12 into the barrel. As the barrel is filled from time to time the implement may be lifted out of the excavation and the barrel emptied.

If very hard strata be encountered the nut 13 may be threaded onto the upper end

of the shaft 1 and run down against the upper end of the sleeve 4 and from time to time during the progress of the work may be forced down against the upper end of the sleeve 4 so as to hold the cutters 8 out firmly against the work.

By the use of the implement herein described the lower end of a bore may be gradually enlarged and at the same time the walls and bottom of the bore kept smooth so as to provide a perfect form for a footing of concrete, as 17.

What I claim:—

1. A device of the character described including a driving shaft, a barrel fixed thereto and having inlet openings, cutters pivoted at one end to the bottom of the barrel and whose other ends are adapted to work vertically through said openings and project beyond the barrel, a sleeve keyed to the shaft and slidable thereon, links pivoted to the sleeve at one end and whose other ends are pivoted to said respective cutters.

2. A device of the character described including a driving shaft, a barrel fixed thereto and having inlet openings, cutters pivoted at one end within the barrel and whose other ends are adapted to work vertically through said openings and project beyond the barrel, a sleeve keyed to the shaft and slidable thereon, links pivoted to the sleeve at one end and whose other ends are pivoted to said respective cutters and guides on the outer ends of the cutters adapted to guide the cuttings through said openings and into the barrel.

3. A device of the character described including a driving shaft, a barrel fixed thereto and having inlet openings, cutters pivoted at one end to the bottom of the barrel and whose other ends are adapted to work vertically through said openings and project beyond the barrel, a sleeve non-rotatable relative to the shaft and slidable thereon, links pivoted to the sleeve at one end and whose other ends are pivoted to said respective cutters, and a nut threaded onto the upper end of the shaft and adapted to abut the corresponding end of said sleeve.

4. A device of the character described including a driving shaft; a barrel fixed thereto and having inlet openings, cutters pivoted at one end within the barrel and whose other ends are adapted to work in vertical planes through said openings and project beyond the barrel, a sleeve keyed to the shaft and slidable thereon, links pivoted to the sleeve at one end and whose other ends are pivoted to said respective cutters, radial blades carried by the bottom of the barrel, said bottom having inlets for the blade cuttings in front of the respective blades.

In testimony whereof I have signed my name to this specification.

JOSEPH OLSON.