

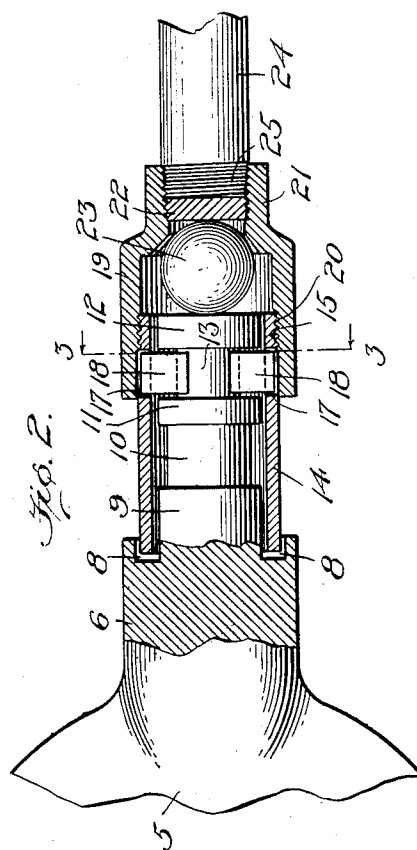
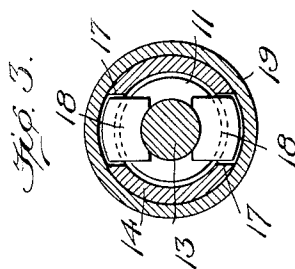
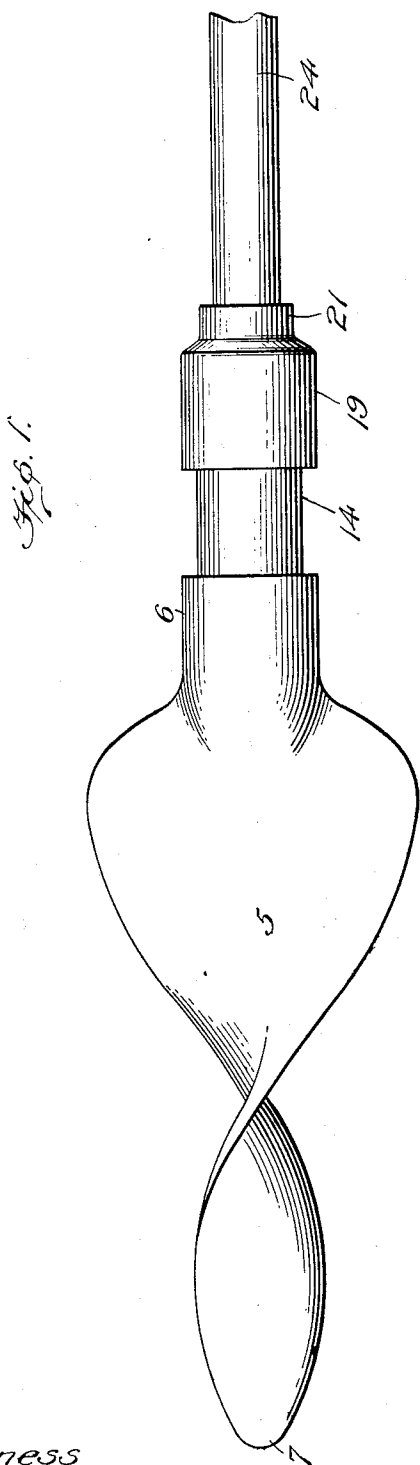
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J. HOKE

ROTARY DRAIN AND SEWER CLEANER

Filed Sept. 23, 1922



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UNITED STATES PATENT OFFICE.

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ROTARY DRAIN AND SEWER CLEANER.

Application filed September 23, 1922. Serial No. 590,119.

To all whom it may concern:

Be it known that I, JOSEPH HOKE, a citizen of the United States, residing at Union City, in the county of Randolph and State of Indiana, have invented certain new and useful Improvements in Rotary Drain and Sewer Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to rotary cutters, and has for an object the production of a boring tool of spiral construction, together with novel means for mounting the same in operative position.

The invention is applicable to a variety of uses wherein rotary cutters are required, but is especially arranged, designed and adapted for use in clearing underground drain pipes, sewers or other conduits, of obstructions, particularly the roots of trees and bushes which so frequently gain entrance through pipe joints, or through cracked or defective tile.

To remove obstructions of the character indicated, it is frequently necessary according to present methods, to tear up and disfigure lawns or sidewalks in an effort to locate and remove such obstructions, but my present invention makes it possible to operate at either or both ends of a line of drain tile for example, without in the leastwise disturbing the earth above. Likewise the present rotary spiral cutter may be introduced into a line of sewer pipe from an ordinary manhole, at the mouth of a drain, or at its opposite end from within the walls of a cellar. This accomplished, it is a further object of the invention to then advance said rotary cutter by means of sectional flexible push rods, or by other means, thereby cutting its course through the objectionable obstructions as will later appear.

With the foregoing and other objects in view the invention will now be particularly described and then pointed out in the claims following.

In the accompanying drawings which form part of this application for Letters Patent, and whereon like characters indicate corresponding parts in the several views:

Figure 1 is a side elevation of my invention;

Figure 2 is a fragmentary longitudinal

sectional view on a relatively enlarged scale; and

Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 2.

Reference being had to the drawings and numerals thereon, 5 indicates a duplex spiral cutter which tapers from its shank 6 to its outer advance end 7 as shown by Figure 1. The said shank 7 is grooved circumferentially as at 8, and is formed with an integral concentric projection or shaft 9 reduced as at 10, and having formed thereon two annular integral shoulders or enlargements 11 and 12, spaced apart as shown, thus forming an intermediate key-groove 13, for purposes which will later appear.

Surrounding said shaft 9 and its integral spaced shoulders 11 and 12 aforesaid, is a cylindrical sleeve 14, which, at one end, is seated in the circumferential groove 8 at end of the shank 6, and at its opposite end is threaded as at 15. Just above the threads 15 this sleeve 14 is broken by oppositely disposed rectangular openings 17, through each of which corresponding retaining keys 18, 18, are introduced into the key-groove 13. These keys 18 are of rectangular cross sectional form, but are curved upon their inner and outer edges to conform to the shaft 9 upon which they loosely rest, as also with the curvature of the outer circumference of the sleeve 14, and are of a depth to snugly fill the openings 17 in said sleeve when in operative position.

Over the elements last described there is secured a key-cover and reducing coupling 19 of tubular form. This latter member is threaded interiorly as at 20 for engagement with the exterior threads 15 of the sleeve 14, and when in the working position shown by Figure 2, it not only covers the retaining keys 18, 18, but, by agency thereof, securely locks the rotary cutter 5 to its relatively fixed shank 6.

Within neck 21, of the cover-coupling 19 there is fixed a ball race 22, and interposed between this fixed ball race and the rotary end of the cutter shaft 9 is a ball bearing 23 upon which the rotary cutter may freely turn. And as a means of advancing the entire cutter a drive-shaft 24 is threaded into the neck of coupling 19 at 25.

In operation my improved rotary spiral cutter 5 may be introduced into an underground open drain-pipe for example, and

advanced by pressure applied to the drive shaft 24, which may be of flexible material, or made up of short articulating sections.

Upon meeting an obstruction of roots, or other foreign matter, a thrust of said shaft causes the duplex blade 5 to cut its way through said obstruction by a shearing movement either forward or backward, or both forward and backward, according to the necessities of the case.

During such shearing and clearing action the duplex-cutter 5 rotates with relation to sleeve 14, keys 18, coupling 19, and drive shaft 24, upon the thrust-bearing at the end of cutter shaft 9, upon ball 23, affording a freedom of action which contributes materially to the general efficiency of the invention.

Having thus described my invention, its use and operation in one form of embodiment, what I now claim and desire to secure by Letters Patent is:

1. In a drain and sewer cleaner the combination with a duplex rotary cutter gradually tapering in form from its shank to its cutting extremity, of a centrally positioned unitary bearing ball upon which said cutter freely rotates, a drive shaft, and a suitable coupling for connecting said shaft and cutter.

2. In a drain and sewer cleaner the combination with a rotary cutter, a shaft integral with said cutter, a key-way in said shaft, a sleeve surrounding the cutter shaft, keys interposed between said sleeve and key-way, and a drive shaft for operatively advancing the structure.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

JOSEPH HOKE.

Witnesses:

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