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L. C. HARDEN

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SEWER CLEANING MECHANISM

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Fig. 1.

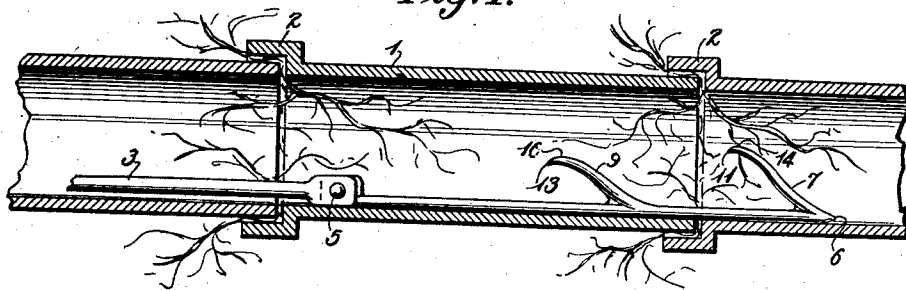


Fig. 2.

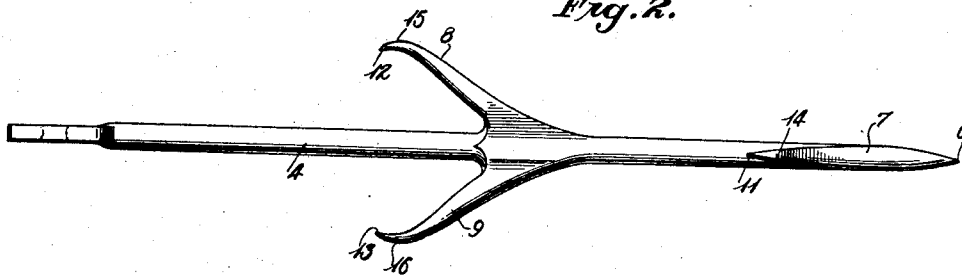


Fig. 3.

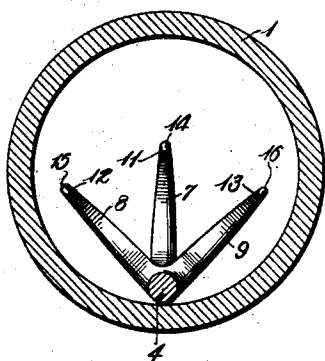
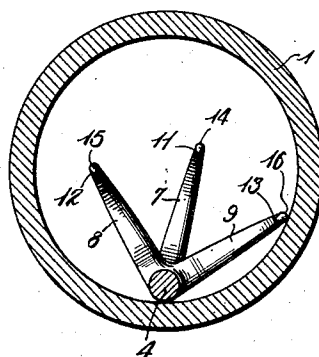


Fig. 4.



Inventor
Leon C. Harden

By

James P. Burns

Attorney

UNITED STATES PATENT OFFICE.

LEON C. HARDEN, OF NICKERSON, KANSAS.

SEWER-CLEANING MECHANISM.

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My invention relates to an improved mechanism of the class designed for cleaning sewer mains and more particularly to an improved device for effectually removing roots which have penetrated the sewer mains through the joints thereof.

It is an object of my invention to provide a sewer cleaning device of practical construction and one which will be economical to manufacture. I am fully aware that many devices of various forms have been designed for the purpose of cleaning water pipes and sewer mains. My experience with the known devices of this general character however has proved them to be impractical in actual operation either because of the extreme difficulty encountered in introducing such devices into the sewer main to be cleaned or because of the tendency of such devices to catch in the sewer main when being removed therefrom.

More specifically my invention contemplates the provision of a multi-pronged hook of such configuration that the prongs of the hook will act as cams causing any root or other obstructions in the sewer main to ride up over the hook prongs as the device is being inserted into the sewer main. A feature of the invention resides in the particular curvature of the several prongs. The arrangement being such that at least two operative prongs will be effective regardless of the position of the device on the bottom of the sewer main. Furthermore, each prong is so curved that the extreme end thereof extends slightly inwardly, thus a rounded shoulder is provided on each prong which shoulders function as guides for the device and prevent catching of the prongs in the joints of the sewer main.

While I have illustrated and described my invention as relating particularly to the removal of roots from sewer mains, it will be understood that the same is readily applicable for opening various forms of conduits which have become obstructed.

In the drawings like reference characters refer to corresponding parts,—

Figure 1 is a vertical sectional view of a portion of a sewer main showing my invention applied thereto.

Figure 2 is a detail view of my improved cleaning hook illustrating the particular arrangement and curvature of the prongs.

Figure 3 is a transverse sectional view of

a sewer main showing my improved cleaning hook in normal position therein and

Figure 4 is a sectional view similar to Figure 3 showing the hook in a tilted position.

The reference numeral 1 indicates a sewer main formed of ordinary sections joined together by the usual telescopic joints 2. The end of a sewer chain 3 is shown extending into the sewer main 1 in Figure 1. It will be understood that any conventional form of sewer chain may be employed with my invention. These chains being characterized by the fact that the joints will break to permit their insertion and removal from the sewer main but which form a rigid construction when being forced longitudinally through the sewer main. My improved hook is indicated generally by the reference character 4 and is connected to the sewer chain 3 by any suitable connection 5. The hook 4 is provided at its forward end with a sharp slightly upturned penetrating point 6 adapted to ride along the bottom of the sewer main and to pass under any roots or obstructions therein. Slightly to the rear of the penetrating point 6 is the upwardly curved rearwardly extending prong 7. At a substantial distance back of the prong 7, usually at a point substantially intermediate the length of the hook 4, are provided a pair of divergent prongs 8 and 9. Each of these prongs 8 and 9 is curved outwardly and upwardly from the hook 4. The arrangement is such that the prongs 7, 8 and 9 will penetrate and clean a substantial cross-sectional area of the sewer main.

It is to be particularly noted that the extreme points of the prongs 7, 8 and 9 which points are indicated at 11, 12 and 13 respectively are very slightly curved inwardly. The inward curvature of the point 11 forming the oval shoulder 14, while the inward curvature of the points 12 and 13 form the shoulders 15 and 16 respectively. These oval shoulders 14, 15, and 16 perform a very important function in my invention in that they act as guides for the device and because they provide a surface which will freely ride over the joints of the sewer main and prevent catching of the hook in the sewer main. The slight curvature of the ends of the prongs 7, 8 and 9 does not impair the efficiency of these prongs as engaging elements for the removal of accumulated roots

in the sewer main. Should the hook become tilted for any reason the outward curvature of the prongs 8 and 9 is such that the lowermost prong, when the hook has been tilted, will form a runner upon which the hook will ride. When in such a tilted position the prong 7 as well as at least one of the prongs 8 and 9 will still extend upwardly into the sewer main and be effective to catch any roots or obstructions and to remove the same upon a reverse pull of the hook.

In operation my improved cleaning hook 4 is attached to the end of any desired form of sewer chain 3 and is then forced into the sewer main. The sewer chain being effective as a plunger when moving longitudinally of the sewer main. The cleaning hook 4 will ride along the bottom of the sewer main causing any accumulated roots which have penetrated the sewer main to ride up over the cam surfaces of the prongs 7, 8 and 9. After the hook has been forced into the sewer main for a substantial distance it is withdrawn from the sewer main through the medium of the sewer chain 3, bringing with it masses of entangled roots which have been torn from the interior of the main. The hook can be successively introduced to and removed from the sewer main until the same has been opened and substantially all of the roots removed therefrom. Due to the particular curvature of the prongs of my hook a substantial portion of the cross-sectional area of the sewer main can be cleared of penetrating roots without fear of any ill effects resulting from the catching of a prong of the hook in a joint of the sewer main. Furthermore, the hook will always present two operative prongs regardless of the tilted position of the hook.

While I have been specific in the description and illustration of my invention it is to be understood that the same is applicable to many uses and that in the practice of my invention I am to be limited only by the scope of the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the class described, comprising a hook having an elongated body portion, said body portion having a smooth lower side and being provided at its rear end with means for attaching the hook to a sewer chain and terminating at its forward end in a sharpened point, said body portion being provided at spaced points with upwardly and rearwardly extending prongs,

the arrangement of said prongs being such that at least two of said prongs will be maintained in operative position regardless of the tilting of the hook.

2. A cleaning hook for sewer mains comprising an elongated body portion having means at one end thereof for attaching the hook to a sewer chain and provided at its opposite end with a sharp penetrating point, the lower side of said body portion being free from projections and adapted when in operative position to lie upon the lower side of the sewer main, a plurality of upwardly and rearwardly extending prongs carried by said body portion to the rear of said penetrating point, each of said prongs having formed thereon adjacent its end an oval shoulder, the end of each of said prongs being curved inwardly beyond said shoulder, said shoulders forming guides for the hook when introduced to and removed from a sewer main.

3. A cleaning hook for sewer mains comprising an elongated body portion having means at one end thereof for attaching the hook to a sewer chain and provided at its opposite end with a sharp penetrating point, a single upwardly and rearwardly extending prong carried by said body portion slightly to the rear of said penetrating point, said body portion being provided at a point substantially intermediate its length with a pair of diverging upwardly and rearwardly extending prongs, said single prong and said pair of diverging prongs being of such length and curvature as to penetrate a substantial portion of the cross-sectional area of the sewer main to be cleaned.

4. A cleaning hook for sewer mains comprising an elongated body portion of rod-like form having means at one end thereof for attaching the hook to a sewer chain and provided at its opposite end with a sharp penetrating point, a pair of diverging upwardly and rearwardly extending prongs carried by said body portion to the rear of said penetrating point, said prongs being provided adjacent their ends with oval shoulders adapted to form guides for the hook and prevent catching of the prongs in the joints of the sewer main, the degree of divergence of said prongs being such that at least one of said diverging prongs will extend upwardly into the sewer main regardless of whatever tilted position the hook may assume.

LEON C. HARDEN.