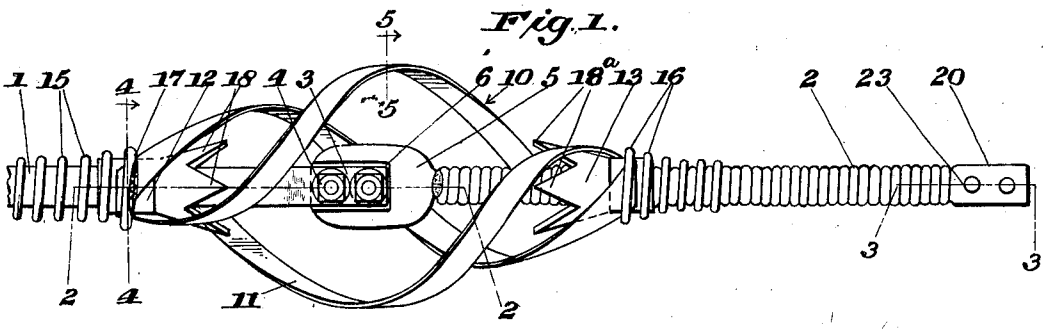
Feb. 27, 1940. A. P. KJERULFF 2,192,086

PIPE SEWER ROD

Filed Feb. 19, 1936

Fig. 1.



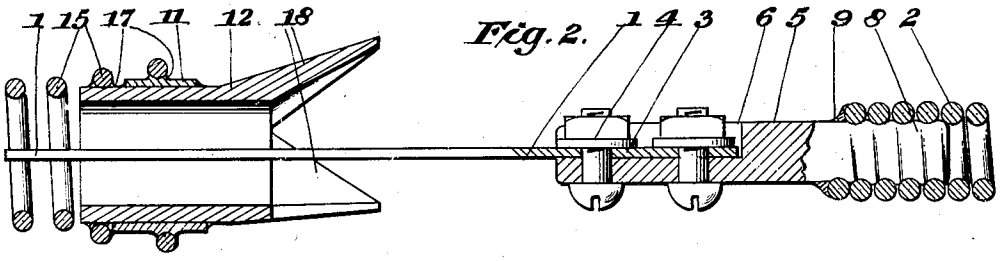


Fig. 2.

Fig. 3.

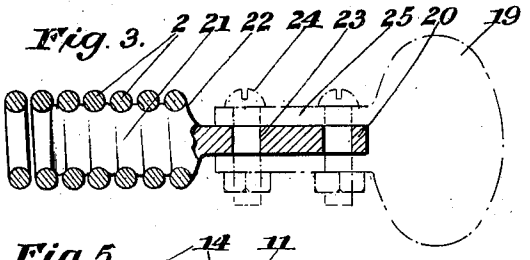


Fig. 4.

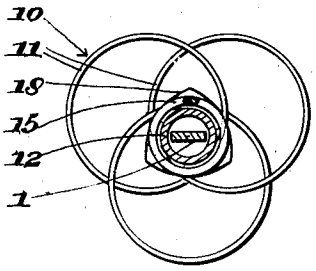


Fig. 5.

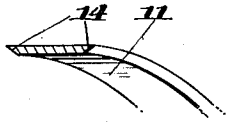


Fig. 6.

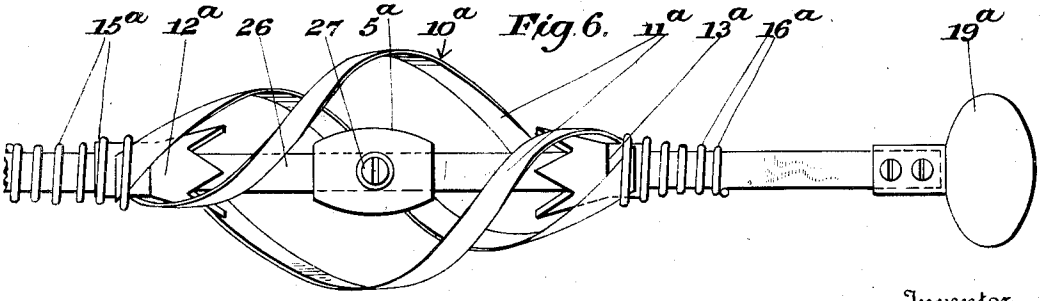
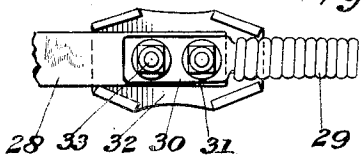


Fig. 7.



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UNITED STATES PATENT OFFICE

2,192,086

PIPE SEWER ROD

Anton P. Kjerulff, Guthrie, Okla.

Application February 19, 1936, Serial No. 64,768

7 Claims. (Cl. 15—104.30)

This invention relates to improvements in pipe and sewer rods, especially on the pipe and sewer rod disclosed in Patent 1,858,509 of May 17, 1932, to Anton P. Kjerulff, and its objects are as follows:

First, to provide a cleaning device which will adapt itself to variations in the pipe more easily than other cleaning devices of a similar nature, particularly in more easily turning bends, and contacting the walls of the pipe more closely so that obstructions are loosened and removed more cleanly and with less trouble.

Second, to include in the flexible rod member a stiff pilot spring which serves to lead the cutter member around bends, said pilot spring also carrying a coupling member to which a conventional sewer rod head is attached when desired.

Third, to make the cutter member in a tapered blade formation, the tubular end pieces or sleeves to which the ends of the blades are secured being provided with prongs for catching roots and other obstructions.

Fourth, to provide the cleaning device with short buffer springs to cushion the shocks in the operation of the cutter member.

In the drawing:

Figure 1 is a side elevation of the improved pipe and sewer rod.

Figure 2 is a longitudinal section taken on the line 2—2 of Fig. 1.

Figure 3 is a longitudinal section taken on the line 3—3 of Fig. 1.

Figure 4 is a cross section section taken on the line 4—4 of Fig. 1.

Figure 5 is a detailed cross section taken on the line 5—5 of Fig. 1.

Figure 6 is a side elevation of a modified construction.

Figure 7 is a detail view of a modified form of connecting means for the sewer rod and spring pilot.

In the drawing, 1 designates a flexible sewer rod of a conventional type. This rod has a pilot extension 2 composed of a stiff coil spring. The rod 1 and pivot 2 are cellectively known as the rod member. The end 3 of the rod 1 is secured at 4 (Fig. 2) to a sleeve or casting 5, which is recessed at 6 to contain the end 3.

A threaded nipple 8 made integral with the casting 5 (Fig. 2) is screwed into one end of the pilot 2, the convolutions of the latter providing complementary threads. After the two parts are screwed together they are permanently secured as by welds 9. The casting 5 is thus rigidly held in place intermediately of the rod 1 and pilot 2 of the flexible rod member, serving as connecting means for the rod and pilot.

A cutter member 10 is slidably mounted on the rod member. It is composed of a plurality of blades 11 which are attached at their ends to tubular end pieces or sleeves 12, 13 constituting two spaced bearing points for said member, in such a manner that the cutter member is generally elongated and has a tapered blade formation. Each blade is of a helical shape, making one complete turn around the flexible rod member, beginning at the sleeve 12 and ending at the sleeve 13 or vice versa. The opposite edges of each blade 11 are sharpened as at 14 (Fig. 5) so as to more effectively cut through obstructions in a pipe (not shown).

Buffer springs 15, 16 are partly wrapped around the remote spring blade ends and around the sleeves 12, 13 whence they extend in opposite directions, and have loose contact with the rod 1 and pilot 2. The sleeves 12, 13 are also loose on the rod member. Those parts of the springs 15, 16 that are wrapped around the spring blade ends aid in securing said ends, but welds 17 (Fig. 2) serve to permanently connect the parts mentioned.

The foregoing casting 5 constitutes the means for transmitting motion from the rod member to the cutter member 10 by engaging one or the other of the sleeves 12, 13 as the implement is wielded in the pipe. These sleeves, further, are used to enable the operator to pull cut roots and other obstructions out, and for this purpose they have points or prongs 18, 18a. The pilot 2 is capable of use as a mount for a conventional sewer rod head 19 shown in broken lines in Fig. 3. A coupling member 20 has a threaded nipple 21 (Fig. 3) that is screwed into the convolutions of the pilot spring 2. The connection is made permanent by welds 22. The coupling member 20 has holes 23 through which the securing bolts 24 are passed, the latter also passing through the sleeve end 25 of the head 19.

Figure 6 illustrates a modification which is almost identical with Fig. 1. The cutter member 10a has sharpened blades 11a as before, the opposite ends of these being secured to pronged sleeves 12a, 13a, which are loosely and slidably mounted on a flexible rod member 26 which now comprises a single element instead of including the spring pilot 2 (Fig. 1). The sewer rod head 19a is secured to the extremity of said rod member. Buffer springs 15a, 16a are employed as before, but instead of the casting 5a being of the type shown in Fig. 2, it is now made in the form

of a sleeve which is slid upon the rod member to the desired position and secured there by a set screw 27. The casting 5a may be positioned wherever desired along the flexible rod member, and the cutter member 10a will be positioned accordingly, the casting being centered with respect to the cutter member just as in Fig. 1.

Fig. 7 illustrates a further modification which chiefly concerns the connecting means between the sewer rod 28 and spring pilot 29. The latter is to be considered substantially the same as the pilot 2 in Fig. 1, and now both ends are made alike. There will be a coupling member like 20 on the right end (not shown) of the spring 29, and at the left end it has a similar element 30 which is nested with the end 31 of the rod 28 in a flat, steel center piece abutment 32. Said center piece is of relatively large girth as compared with the girth of the rod and pilot thereby to have the necessary oversize to constitute it the abutment for the cutter member. This center piece together with the securing bolts and nuts 33 complete the aforesaid connecting means. The corners of the center piece are curled in at 34 to fit the cone shaped ends of the cutter member (as in Fig. 1), and to the better make engagement with the sleeves 12, 13 when functioning as an abutment.

The operation is as follows:

The cleaning device, whether of the form in Figs. 1, 6 or 7, is projected into the pipe to be cleaned, whereupon the rod 1 is pushed or pulled with a hammer or battering ram action when the obstruction is reached. The abutment means which the castings 5, 5a, or the center piece 32 afford will engage or be gripped by one or the other of the sleeves, and in doing so will tend to elongate the blades of the cutter member, reducing the diameter of the cutter member so that it can be worked into and through the obstruction. In this respect emphasis is laid on the special shape of the cutter blades. As shown in the drawing and as previously stated, each blade makes one complete turn from end to end. When rounding a curve, for instance in an elbow, the inside blade will be compressed and elongated, thereby tilting the sleeves 12, 13 to which the blade ends are attached and thus setting said sleeves to conform to the curve.

The frictional contact of the cutter member 10, 10a either with the walls of the pipe or with the encountered obstruction will cause the cutter member to turn automatically by virtue of its tapered and helical formation thereby cutting into the obstruction. After the obstructions have been loosened the prongs 18, 18a will catch them and enable the operator to pull them out of the pipe. The flexible pilot 2 (Fig. 1) feels out the obstruction and guides the cutter member into the working position. Special emphasis is laid on the automatic screw action of the cutter member which is obtained by the sharp angle of the blades. However, there are times when the cutter member 10 can be held fixed upon the rod member 1, 2, and this function is achieved by pulling or pushing hard enough upon the tool at the operator's end. At such a time the socket (Fig. 2) which the flaring prongs 18 (or 18a) forms, cups the abutment member 5 or the equivalents, and exercises a grip thereupon as explained. The buffer springs 15, 16 both cushion the shocks when working the cutter member 10 back and forth, and also prevent the tube from hanging up in the sewer, said buffer springs slipping off of any sharp edges that might be struck in going around bends in the pipe, or at a place where a small pipe enters a larger one. In the last instance there is bound to be a large obstruction which, virtually, is a solid wall against which a tool, made otherwise than herein shown, can easily be locked. But by having the buffer springs 15, 16 in advance of the sleeves 12, 13 the free end of one or the other of these springs will strike the foregoing obstructions, the convolutions nearest to said obstruction bending and tilting until the entire spring slips off.

I claim:

1. A pipe cleaning device comprising a sewer rod, a stiff coil spring pilot, a cutter commonly and slidably mounted on the sewer rod and coil spring pilot, and means joining said rod and pilot within the confines of the cutter to limit the sliding motion of said cutter on the rod and pilot.

2. A pipe celaning device comprising a flexible rod member, a cutter member loosely carried thereon, said cutter member consisting of a plurality of helical blades around the rod member and sleeves rotatably and slidably mounted on the rod member to which the ends of the blades are secured, single abutment means carried by the rod member medially of said sleeves to transmit motion from the rod member to the cutter member, and means on the sleeves to grip the abutment means upon the application of a sudden thrust in either direction of the rod member to hold the cutter member stationary on the rod member.

3. A pipe cleaning device comprising an elongated cutter member having two spaced bearing points, a rod member on which the cutter member is slidably mounted, means on the rod member situated medially of said bearing points by which to abut and transmit motion to the cutter member, and a buffer spring secured to each end of the cutter member and surrounding the rod member, the remote convolutions of said springs being exposed to pipe obstruction to absorb shocks in operating the cleaning device.

4. A pipe cleaning device comprising a cutter member, a rod member on which the cutter member is slidably mounted, said rod member including a spring pilot and a flexible rod, abutment means mounted on the rod member, and sleeves forming parts of said cutter member, said sleeves constituting spaced bearing points for the cutter member on said rod member, the abutment means being situated medially of said points, with one of which sleeves the abutment means is engageable to hold the cutter member in stationary relationship to the rod member.

5. A pipe cleaning device comprising a flexible rod member, a sleeve on the rod member with means to fix the sleeve in position on said rod member, a cutter member which has a plurality of blades each being helically disposed around the rod member and including pronged sleeves to which the ends of the blades are attached, said pronged sleeves being slidable on the rod member and engageable by the first sleeve, and buffer means carried by the pronged sleeves also serving to secure the blade ends to the pronged sleeves.

6. In a pipe cleaning device comprising a cutter member, a sewer rod and a spring pilot upon which the cutter member is commonly and slidably mounted and having ends meeting within the confines of said cutter member, said spring pilot carrying an element which overlaps the end of the sewer rod, a center piece of relatively

large girth as compared with the girth of the rod and pilot, thereby adapted to function as an abutment, and means commonly driven through the center piece and the overlapping element and sewer rod to secure said parts together.

7. A pipe cleaning device comprising a flexible rod member, a sleeve on the rod member with means to fix the sleeve in position on said rod member, a cutter member which has a plurality of cutting elements each helically disposed around the rod member and including pronged sleeves to which the ends of the cutting elements are attached, said pronged sleeves being slidable on the rod member and engageable by the first sleeve, and buffer means carried by the pronged sleeves.

ANTON P. KJERULFF.