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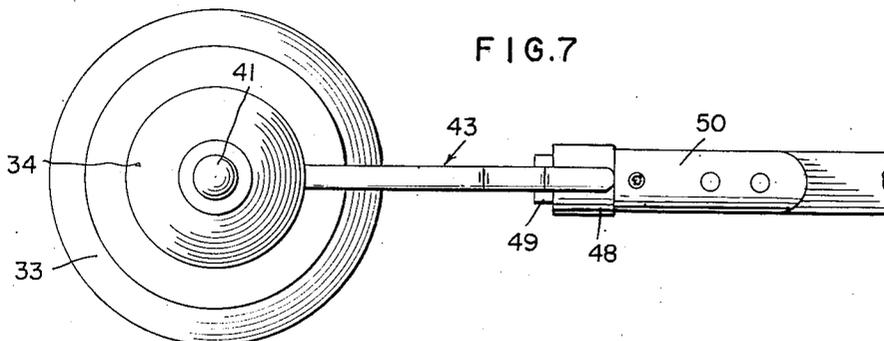
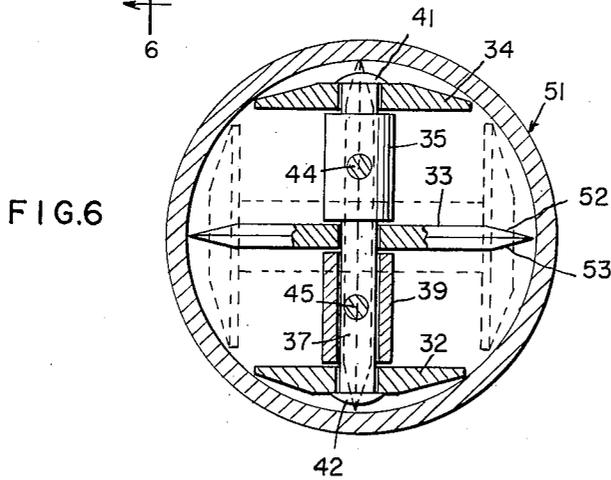
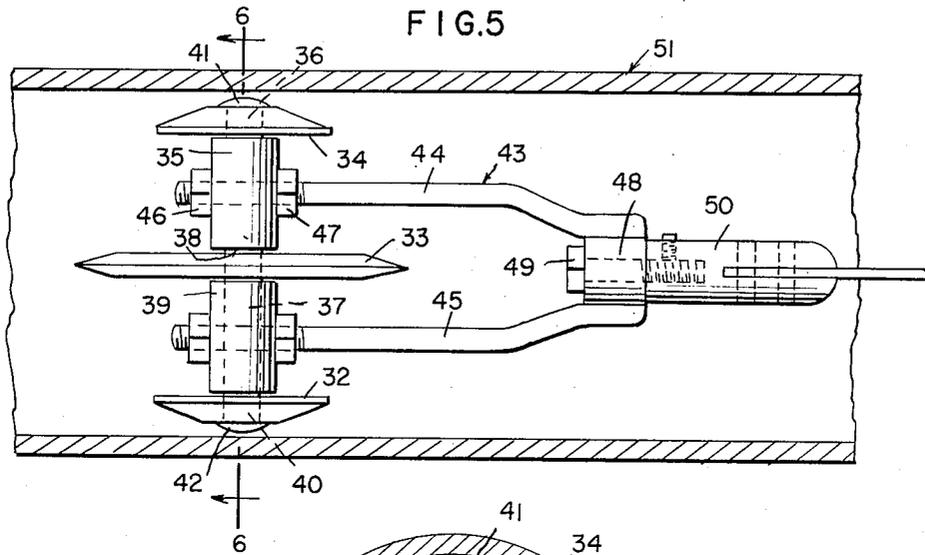
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SEWER CLEAN-OUT CUTTER

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2 Sheets-Sheet 2



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1

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SEWER CLEAN-OUT CUTTER

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8 Claims. (Cl. 15—104.3)

This invention relates generally to clean-out tools and pertains more particularly to a tool specifically adapted for use in cleaning out sewer lines and the like.

There are available many types of sewer line cleaners utilizing a flexible steel tape which is used to push the cleaning cutters through the sewer line and in its progress cut the sediment and obstruction therefrom. Usually, the conventional cleaners employ a plurality of cutting heads or discs which scrape or cut sediment and the like from the inner surface of the lines. Usually, however, the cutter heads or discs of conventional cleaner assemblies are of the same diameter and certain difficulties arise from the use of such cleaners that the herein disclosed invention is particularly adapted to obviate. For example, it is not uncommon to find that with conventional cleaners, although the obstructions in the line will be successfully cut thereby, when the cleaner is removed or withdrawn from the pipe, the very action of removal will tend to cause the line to close up with the material removed and a clogged or partially clogged condition will result. In fact, it is often the case that the line, though initially apparently cleared, will replug itself after a very short period of use and then the entire operation must be repeated again and perhaps still another time until the line is successfully cleaned. Still another difficulty is the fact that conventional cleaning assemblies cannot be forced through a line having sharp bends therein.

It is, therefore, of primary concern in connection with this invention to provide an improved type of sewer line cleaner employing cleaning or cutting discs of different diameters and so related to each other in size as to more effectively provide a cleaning action and to obviate the difficulty of closing off the line when the cleaner is withdrawn from the same.

Still another object of this invention is to provide an improved form of sewer line cleaner which will readily pass through a line having sharp bends or turns therein and which employs for this purpose a large diameter cutting disc of substantially the same or slightly less than the inside diameter of the line and in conjunction therewith a smaller cutting disc, with the two discs cooperatively interacting to more effectively clean the line, permit the assembly to easily pass through sharp bends and to prevent closing of the line with sediment and the like when the cleaner is withdrawn from the sewer line.

Another object of this invention is to provide an improved form of sewer line cleaner employing a pair of substantially similar cutting discs presented on opposite sides of the tool and with there being a substantially larger cutting disc disposed intermediate the two smaller discs and being of substantially the same or slightly less diameter than the inside diameter of the sewer line in which the tool is to be used.

With the above and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various

2

changes in the form, proportions, and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

5 In the drawings:

Fig. 1 is a sectional view through a portion of a sewer line showing one form of the improved tool operatively disposed therein;

10 Fig. 2 is a transverse sectional view taken substantially along the plane of section line 2—2 in Fig. 1 and showing details of the tool;

Fig. 3 is a plan view of the tool shown in Figs. 1 and 2;

Fig. 4 is a horizontal sectional view taken through a sewer line having a bend therein and illustrating the manner in which the tool passes through the bend;

Fig. 5 is a view similar to Fig. 1 but showing a modified form of cleaning tool;

15 Fig. 6 is a transverse sectional view taken substantially along the plane of section 6—6 in Fig. 5 and illustrating details of the tool assembly; and

Fig. 7 is a plan view of the tool illustrated in Figs. 5 and 6.

Referring at this time more particularly to Figs. 1 and 2, the reference numeral 10 indicates, in general, a section of sewer line and the numeral 11 generally indicates a tool constructed in accordance with this invention which is utilized for the purpose of cleaning out sewer lines and functioning primarily to cut or scour accumulations of grease and sediment from the inside surface of the line. The tool itself consists essentially of a centrally disposed hub 12 having oppositely but co-axially projecting axles 13 and 14 receiving and journaling thereon a pair of cutter elements 15 and 16, as is shown most clearly in Fig. 2. Each of the discs 15 and 16 is symmetrical about its center and is provided thereat with an opening rotatably receiving its respective axle 13 or 14 and the free ends of the axle portions are headed over as is indicated by the reference characters 17 and 18 to retain the discs in place.

The disc 15 is provided with a flat inner surface 19 and is beveled on its outer surface 20 so that the periphery of the disc tapers to a sharp edge, substantially as is shown. Each disc is of circular configuration, see particularly Fig. 3, and the disc 15 is of a diameter which is substantially the same as but preferably slightly less than the inside diameter of the pipe or sewer line 10 so that when the tool is in place within the line, the cutter 15 will engage the inside surface of the pipe 10 at points lying on a line slightly offset from the diameter of the pipe.

The other disc 16, is substantially smaller than the disc 15 but is so related in diameter thereto and with respect to the spacing between the two discs such that the disc 16 will also engage the inside surface of the pipe 10 at points lying on a line parallel to the line of contact between the large disc 15 and the pipe. The disc 16 is provided with a flat inner surface 21 in opposed relationship to the aforementioned flat inner surface 19 of the disc 15 and its outer surface 22 is also beveled to taper to a somewhat blunted peripheral edge, substantially as is shown in Figs. 1 and 2.

The hub 12 is provided with a transverse bore 23 which receives therethrough a securing bolt 24 upon which the driver head 25 is threadingly engaged, as is shown most clearly in Fig. 1. A set screw 26 may be provided to prevent the driver head from working loose from the hub 12.

The head 25 is provided with one or more transverse bores 27 and 28 and is slotted as indicated by the reference character 29 to receive one end of the driving tape or band 30, the band being apertured to register

3

with the openings 27 and 28 and associated therewith are suitable rivet members such as the rivet 31 shown in Fig. 3 to hold the head upon the tape. The tape itself is formed of flexible material, such as relatively spring-like steel, and is fed from a suitable tool to push the cleaner assembly 11 through the sewer line. The tool is withdrawn by means of the tape also.

Fig. 4 illustrates the operation of the tool in passing around a bend, in this particular instance a right angular bend in the sewer line 10. This operation may be performed very easily by virtue of the fact that movement of the cleaner is primarily controlled through the contact between the larger disc 15 and the inner surface of the line 10 and the cleaner, when engaging a bend such as that shown in Fig. 4, is easily pushed therethrough and the large disc will naturally ride around the bend without substantially any increased effort or push being exerted on the tape 30. This action is also permitted even when the bend is very sharp as is shown in Fig. 4 by virtue of the fact that the driver head 25, being substantially wholly disposed inwardly of the periphery of the larger disc, presents no great extension of the assembly which could swing around and strike the inner surface of the pipe or sewer line and thus prevent the assembly from negotiating a sharp bend.

It is to be understood that the cleaner assembly may be disposed within the line and pushed through the line in any desired position whatsoever, the tendency being that the tool will remain in substantially the same position as when it was originally inserted. That is to say, the cleaner assembly may be inverted with respect to the position shown in Figs. 1 and 2 or it may be turned on its side either way or in any intermediate position within the sewer line.

The operation of the tool is such that the main support therefor within the pipe or sewer line is achieved by virtue of the engagement between the larger disc 15 and the inner surface of the line and the primary cleaning action is achieved by the smaller disc. The taper or bevel 22 of the smaller disc corresponds roughly to the curvature of the opposed section of the pipe and any obstructions will be cut or cleaned not only by the action of the smaller disc 16 but also by the cutting action incurred by the larger disc 15. When the cleaner assembly is withdrawn, there is no tendency for the sediment and the like which has been removed or cut away to be closed up to clog off the pipe opening as so commonly occurs in the conventional type of cleaners.

Figs. 5-7 inclusive illustrate a modified form of cleaning assembly, which in this case, employs three separate cutting discs 32, 33 and 34 disposed for rotation on the tool head about a common axis.

The tool or cleaner embodies a hub portion 35 having a short axle extension 36 at one end and a relatively long axle extension 37 projecting oppositely from the other end. The centrally disposed disc 33 is journalled on the longer axle extension immediately adjacent the shoulder 38 between the portion 37 and the enlarged hub portion 35 and a spacer sleeve 39 is disposed over the reduced portion 37 to confine the centrally disposed cleaner disc 33 so as to leave a portion 40 on the longer extension 37 which is of substantially equal length as compared with the shorter axle extension 36, each of which portions receives the corresponding cutter elements 32 and 34, substantially as shown. Similar to the cleaner previously described, the opposite ends 41 and 42 of the axle portions are headed over to retain the outer discs 32 and 34 in place. The cleaner is driven by a head assembly indicated generally by the reference character 43 which is of generally yoke-like configuration presenting two leg portions 44 and 45, each of which terminates in a threaded end portion projecting through the hub 35 and the sleeve 39 and axle extension 37 respectively. Each leg has associated therewith a pair of retaining nuts 46 and 47 to hold the yoke in place

4

and the two legs 44 and 45 are joined by a stem portion 48 having a bore therethrough receiving the retaining bolt 49 by means of which the driver head 50 is joined to the yoke.

The centrally disposed disc 33 is of largest diameter and is substantially the same as or preferably slightly less in diameter than the inside diameter of the sewer line 51, see particularly Fig. 6, and its periphery is provided with a double bevel as indicated by the reference characters 52 and 53 to present a sharp peripheral edge for contacting the inner surface of the pipe 51. The other two cutting discs 32 and 34, on the other hand, are of substantially equal diameter and each is considerably smaller than the centrally located disc 33 and is so related thereto in diameter and in spacing with respect thereto, so as to be disposed in closely spaced relationship to or in engagement with the inner surface of the pipe 51 and provide a cleaning action thereagainst.

Each disc 32 and 34 is formed identically to the previously described cutter 16. The cleaner may be disposed in any position within the line 51, two such possibilities being illustrated respectively in full and dotted lines in Fig. 6, and it is to be noted that the same driver head may be employed for operating each of the specifically disclosed cleaner assemblies.

In the operation of the cleaner shown in Figs. 5-7, the primary support therefor within the pipe is once again accomplished through the medium of the centrally disposed or larger cutter disc 33, whereas the two side cutters 32 and 34 perform top and bottom or opposite side cleaning, as the case may be with respect to the positioning of the cleaner in the pipe.

I claim:

1. A sewer line cleaner comprising an enlarged hub having axle extensions projecting from opposite sides thereof, a cutter disc journalled on each of said extensions, one of said discs being of a diameter substantially equal to the inside diameter of a sewer line in which the cleaner is to be used, and the other cutter disc being of substantially smaller diameter than the first mentioned disc and spaced therefrom a predetermined distance to place said other disc within a sewer line so as to engage the inside surface thereof, and a flexible member secured to said hub for imparting longitudinal movement to said cleaner.

2. The cleaner as defined in and by claim 1 wherein said discs are provided with beveled peripheral portions presenting marginal cutting edges thereon.

3. The cleaner as defined in and by claim 1 wherein said discs are provided with flat, opposed inner faces, the other face of each disc being beveled to present a marginal cutting edge for engagement with the inner surface of a sewer line.

4. A sewer line cleaner comprising an enlarged hub having axle extensions projecting coaxially from opposite sides thereof, a cutter disc journalled on each axle extension, said hub being provided with a transverse bore, a driving member secured to said hub and fixed thereto through said bore, a flexible tape secured to said driving member for imparting longitudinal movement to said cleaner, one of said discs being of a diameter substantially equal to the inside diameter of a sewer line in which the cleaner is to be used, and the other disc being of materially smaller diameter than the first mentioned disc.

5. The cleaner as defined in and by claim 4 wherein said discs are provided with beveled peripheral portions presenting marginal cutting edges thereon.

6. The cleaner as defined in and by claim 4 wherein said discs are provided with flat, opposed inner faces, the other face of each disc being beveled to present a marginal cutting edge for engagement with the inner surface of a sewer line.

7. A sewer line cleaner comprising a pair of spaced, parallel cutter discs, a journal support extending between

5

and rotatably supporting said discs, one of said discs being of substantially the same diameter as the inside diameter of a sewer line in which the cleaner is to be used, and the other disc being of materially smaller diameter than the first mentioned disc, each disc being marginally engageable with the inner surface of a sewer line, and a flexible member secured to said journal support for imparting longitudinal movement to said cleaner.

8. A sewer line cleaner comprising an enlarged hub having a relatively short axle extension on one side thereof and a relatively long axle extension on the opposite side thereof with such extensions being coaxially disposed and projecting in opposite directions, a centrally disposed cutter disc journaled on the longer axle extension adjacent the corresponding side of said hub, a sleeve receiving said longer extension and having an end portion disposed adjacent said centrally disposed cutter disc and terminating at its opposite end short of the corresponding end of the longer extension, a secondary cutter disc journaled on the remaining exposed portion of said longer extension, a further secondary cutter journaled on said shorter extension, the centrally disposed cutter disc hav-

6

ing a beveled periphery presenting a marginal cutting edge and being of a diameter substantially the same as the inside diameter of a sewer line in which the cleaner is to be used, each of said secondary cutters being of materially smaller diameter than the centrally disposed cutter and being spaced equidistantly on opposite sides thereof with the diameters of the secondary cutters being such as to engage inner surface portions of a sewer line, a bifurcated yoke having end portions straddling said centrally disposed cutter and fixed to said hub and sleeve, and a driver head fixed to said yoke for moving the cleaner longitudinally through a sewer line.

References Cited in the file of this patent

UNITED STATES PATENTS

1,042,841	Thorsen -----	Oct. 29, 1912
1,151,357	Grosvold -----	Aug. 24, 1915
1,867,545	Akeyson -----	July 19, 1932
2,560,882	McCauley -----	July 17, 1951
2,589,556	Kjerulf -----	Mar. 18, 1952