G. LINTHICUM.

PIPE CLEANER.

APPLICATION FILED OCT. 4, 1916.

1,250,195.

Patented Dec. 18, 1917.

2 SHEETS—SHEET 1.

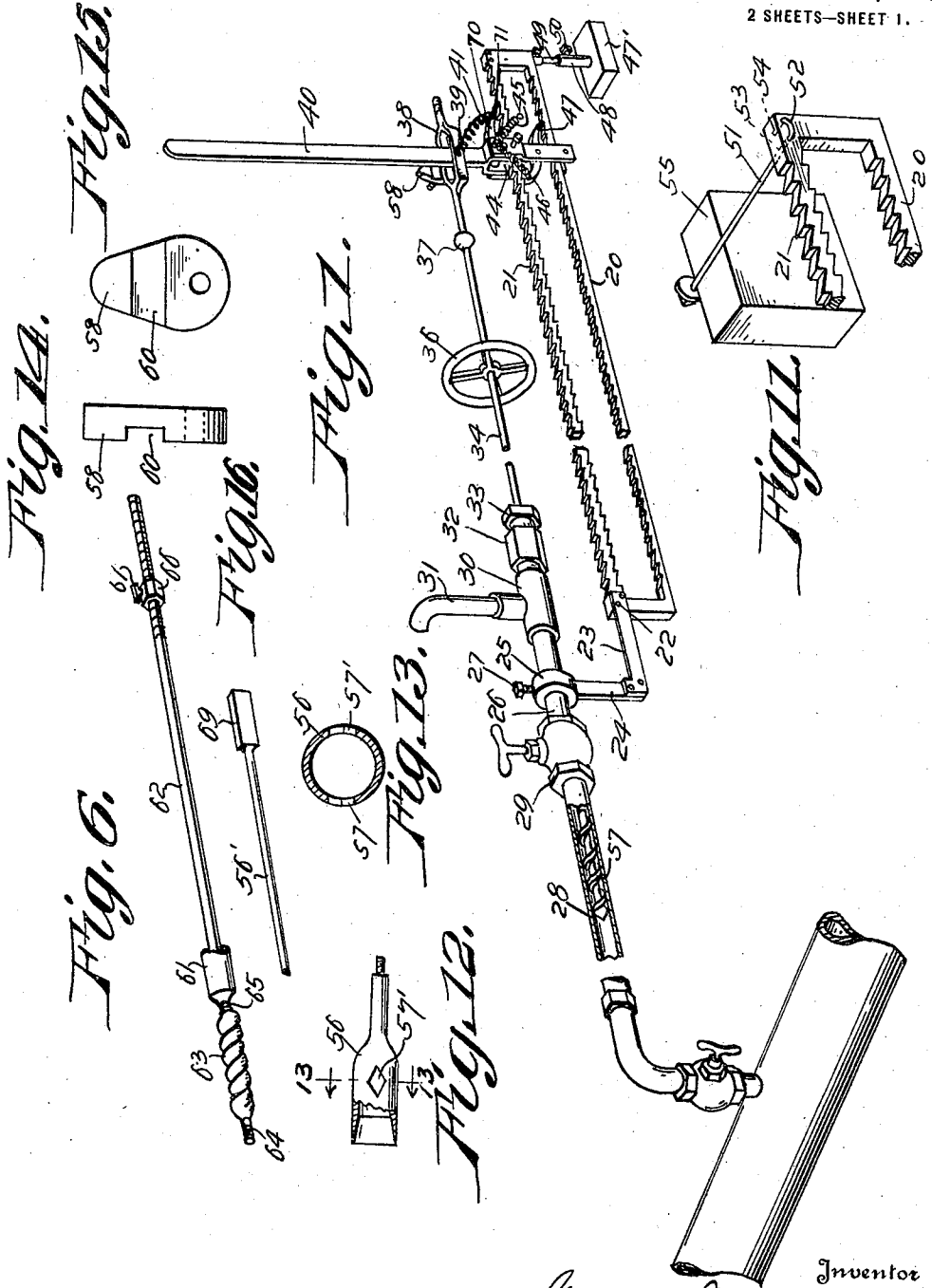


Fig. 1.

Fig. 11.

Fig. 14.

Fig. 15.

Fig. 6.

Fig. 13.

Fig. 12.

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2 SHEETS—SHEET 2.

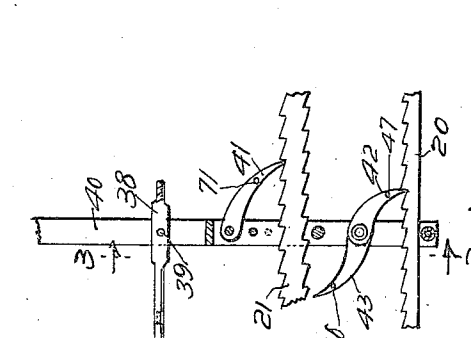


Fig. 3.

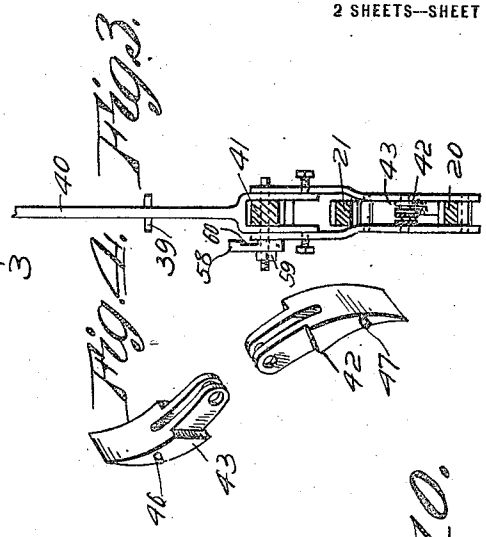


Fig. 4.

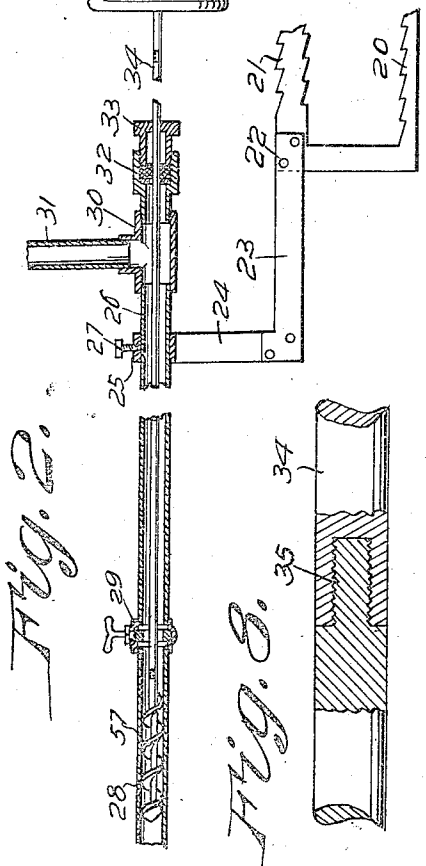


Fig. 2.

Fig. 8.

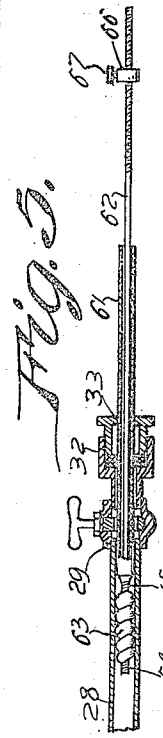


Fig. 5.

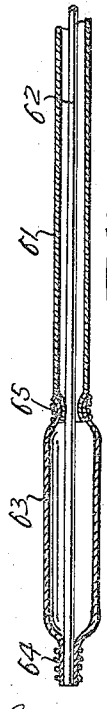


Fig. 7.



Fig. 9.

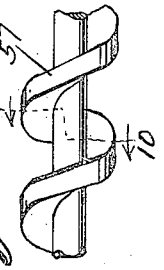


Fig. 10.

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UNITED STATES PATENT OFFICE.

GEORGE LINTHICUM, OF ANNAPOLIS, MARYLAND.

PIPE-CLEANER.

1,250,195. Specification of Letters Patent. Patented Dec. 18, 1917.

Application filed October 4, 1916. Serial No. 123,798.

To all whom it may concern:

Be it known that I, GEORGE LINTHICUM, a citizen of the United States of America, and resident of Annapolis, in the county of Anne Arundel and State of Maryland, have invented certain new and useful Improvements in Pipe-Cleaners, of which the following is a specification.

This invention relates to pipe cleaning implements and particularly to means for boring or removing the deposits commonly found in the pipes of water systems, particularly in the service pipes thereof leading from mains to buildings.

An object of this invention is to provide novel means whereby a rotary member may be inserted in a pipe and advanced or pressed forward as it is being rotated and as it cuts or removes the deposit within the pipe, means being also provided for effecting a step by step movement of the rotating means in advancing or retracting the said implement.

A further object of this invention is to provide means for holding the feeding or advancing mechanism at different positions with respect to the bottom of the trench or wherever the pipe is located.

A still further object of this invention is to provide means for operating the cleaning tool by thrust motion, means being provided for reciprocating the said cleaning tool during the oscillation of a lever constituting a part of the apparatus.

A still further object of this invention is to provide means for choking or closing the pipes between the main and a valve so that in case the passage in the valve is too small for a cleaning tool, another valve may be substituted during the cleaning operation and thereafter the first mentioned valve may be replaced without cutting off the water from the main.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this specification wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a perspective view of a fragment of a main and service pipe with the invention applied thereto;

Fig. 2 illustrates a sectional view of the service pipe with fragments of the cleaning apparatus in elevation, and partly in section;

Fig. 3 illustrates a sectional view on the line 3—3 of Fig. 2;

Fig. 4 illustrates a perspective view of certain dogs disconnected;

Fig. 5 illustrates a detail view of a choking tool showing its application to a pipe;

Fig. 6 illustrates a perspective view of said choking tool;

Fig. 7 illustrates an enlarged detail view in section of the choking tool;

Fig. 8 illustrates a fragment of the sections of the connecting rod and the joint therebetween;

Fig. 9 illustrates a detail view of the drill;

Fig. 10 illustrates a sectional view on the line 10—10 of Fig. 9;

Fig. 11 illustrates a perspective view of a fragment of a rack and means for supporting the same;

Fig. 12 illustrates a view in elevation, partly in section, of the reciprocating cleaner;

Fig. 13 illustrates a sectional view on the line 13—13 of Fig. 12;

Fig. 14 illustrates a side elevation of a clamp;

Fig. 15 illustrates a face view thereof; and

Fig. 16 illustrates a perspective view of a cleaning rod for use in conjunction with the reciprocating cleaner.

In these drawings 20 denotes a rack bar, 21 a rack bar having teeth on its upper and lower surfaces, the shoulders of the said teeth being oppositely faced. The rack bars 20 and 21 are connected at the joint 22 to an arm 23 which arm is connected to an extension 24 of a collar 25, which collar is adjustably secured on the pipe 26 by the set screw 27, so that the said collar may be moved longitudinally of the pipe for the purpose of bringing the rack bars into proper operative relation to the service pipe 28 to be cleaned, there being a valve 29 in-

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terposed between the service pipe 28 and the pipe 26. A coupling 30 is attached to one end of the pipe 26 and the said coupling communicates with a discharge pipe 31 by which water and borings are permitted to escape during the cleaning operation.

A stuffing box 32 and a packing ring 33 are assembled in operative relation to the coupling 30 and a cleaning rod or shaft 34 is rotatable and reciprocatable therein, the said cleaning rod preferably comprising sections having a joint such as shown at 35 in Fig. 8. The cleaning rod 34 has a hand wheel 36 by which it is rotated and the outer end of the said cleaning rod has a universal joint 37 to which a yoke 38 is connected, the said yoke 38 being provided with a pivot 39 for the lever 40 so that the lever may be oscillated for thrusting the rod inwardly or pulling it outwardly.

As a means for causing an advance or withdrawal of the cleaning tool, the lower end of the lever is provided with a dog 41 which engages the upper series of teeth of the rack bar 21 and the said lever is further provided with dogs 42 and 43 the latter of which engages the series of teeth on the under surface of the rack bar 21, and the dog 42 engages the teeth of the rack bar 20. The lever 40 is further supplied with springs 44 and 45, the former of which is adapted to be connected to a stud 46 on the dog 43 and the latter of which is adapted to be connected to a stud 47 of the dog 42 according to the direction of movement to be imparted to the cleaning tool, as will be presently explained.

In order to support the rack bar and the mechanism associated with it in proper relation to the pipe to be cleaned, a base block 47 which is adapted to rest on the ground, has a sleeve 48 rising from it, the said sleeve receiving a post 49 on the under surface of the racks and the said post is held at different positions of adjustment by a set screw 50. A modified construction is shown in Fig. 11 for holding the rack bars and this consists of a rod 51 having a hooked end 52, the said rod being slidable in an aperture 53 and the hooked end thereof being adapted to enter an aperture 54. A base block 55 in this embodiment of the invention supports the rod 51 and it, in turn, supports the rack bar. This latter mentioned form is of utility where the trench is not very deep and where the clearance between the service pipe and the bottom of the trench is not sufficient to use the form shown in Fig. 1.

The inner end of the cleaning rod 34 carries a drill 57 and when the rod 34 is rotated, the drill is likewise rotated. The drill 57 is elliptical in cross section or at least the threads of such drill are elliptical, as this construction conforms to the passages or openings in the valves and facilitates the flow of the borings and liquid from the pipe, it being understood that water from the mains will then find its way through the service pipe, carrying the borings past the drill and out of the discharge pipe 31.

There are times when a rigid drill rod or cleaning device cannot be employed in removal of deposits from pipes, as where there is a bend or elbow in a service pipe. For the purpose of adapting the apparatus for use in connection with implements for cleaning pipes having such curves, the clamp 58 is applied to the pivot 39 and said pivot has a nut 59 for forcing the said clamp inwardly and if an end 69 of a rod 56′ were seated in the recess 60 of the said clamping block, it could be held so that during the reciprocation of the lever 40, the rod 56′ and cleaning tool 56 would be reciprocated and forced longitudinally of the service pipe for the removal of deposits. The cleaning tool 56 has apertures such as 57′ for permitting the escape of cuttings.

In practice, it has been found that the valves such as 29 of service pipes have restricted openings which will not permit the passage of the cleaning tools. In carrying out my invention, the said valve to which the pipe 26 is connected may be removed when such obstacles are encountered and valves having larger openings substituted so as to permit the cleaning tools to enter the service pipe without cutting off the water at the main by choking the service pipe and removing the small valve, placing the larger valve thereon and then removing the choking device while the operation of cleaning the pipes is performed after which the pipe will then be choked and the original valve restored. To effect the result just stated, a choking implement is provided which consists of a tubular member 61 in which a rod 62 is rotatable, one end of the said rod having a flexible member 63 secured to it by wire or other wrapping 64. The said flexible member is secured at its opposite end to the pipe 61 by the fastenings 65 and hence as the rod 62 is rotated, the flexible material 63 is twisted and forms a choke such as is shown in Fig. 5 of the drawing where the flexible material 63 is shown as twisted, as stated. The outer end of the rod 62 is threaded and a nut 66 is threaded on it, the said nut having a set screw 67 by which it is held at different positions of adjustment and it may bear against the end of the pipe 61 to hold the choke operating rod.

From the foregoing description of the elements and the functions of the elements, one skilled in the art will understand the use of the choke or manner of substituting valves and the operation of the device, it be-

ing apparent it is thought that after the parts have been assembled in the relation shown in Fig. 1, a reciprocation of the lever 40 will cause the cleaning tool to be moved into the service pipe, although when the tool is to be advanced, the spring should be disconnected from the stud of the dog 43 and it should hang loose and out of engagement with the teeth of the rack bar 21. When the parts are thus arranged, an oscillation of the lever 40 will result in advancing the dogs 41 and 42 alternately and when the implement is being advanced, the wheel should be rotated so that the cutting tool will be rotated to remove deposits from the service pipe.

When the tool is being advanced the dogs 41 and 42 engage the respective rack bars and when the upper end of the lever is being pushed forward, the dog 41 advances and when the lever is oscillated in the opposite direction, the dog 41 bears against one of the shoulders of the rack bar and the dog 42 moves over a tooth or more and engages the shoulder to retain the lever in the advanced position, while it is being oscillated in the opposite direction. This would be apparent from an inspection of Fig. 2 of the drawing.

When the cleaning tool is to be withdrawn, the dogs 41 and 42 are held out of engagement with the teeth of the rack 20 and the rod is drawn out of the pipe. Provision is made for disconnecting the springs from the dogs so that the dogs may be held in or out of engagement with the racks according to the direction of movement to be imparted to the reciprocating rods.

I claim:

1. In a pipe cleaning apparatus, a double rack, a lever, dogs carried by the lever for engaging the rack for advancing the lever, a cleaning rod connected to the lever whereby the said cleaning rod is reciprocated, means for rotating the cleaning rod, a drill elliptical in cross section on the inner end of the cleaning rod adapted to enter a service pipe, a drain pipe for carrying off the dislodged material within the pipe, and means for connecting the rack bar to the pipe.

2. In a pipe cleaning apparatus, an oscillating lever, a clamp secured thereto, a cleaning rod adapted to be held by the clamp, said cleaning rod being flexible, a cleaning tool adapted to be connected to the said cleaning rod, and means for holding the lever in operative relation to a pipe to be cleaned.

3. In a pipe cleaning apparatus, a rack, an adjustable support therefor, means for connecting the rack to a pipe, a lever oscillatable with relation to the rack and movable longitudinally thereof, a cleaning tool carried by the rod, and a stuffing box through which the rod projects.

4. In an apparatus for cleaning pipes, means for closing a passage in a pipe, a valve adapted to be secured to the said pipe when the closure is operating, said valve having a passage therein to permit the withdrawal of the closure when the valve is in operative position, a rod for operating the closure, a stuffing box through which the rod operates, and means for holding the closure in adjusted position.

5. In a pipe cleaning apparatus, a rack bar having teeth on two faces, a second rack bar connected thereto, means for holding the rack bars in place, means for holding the rack bars in operative relation to a pipe, a lever, means carried by the lever adapted to engage the teeth of the rack bars whereby oscillatory motion of the lever results in imparting movement to the lever longitudinally of the rack bars, a cleaning rod, means for connecting the cleaning rod to the lever, and a cleaning tool on the rod adapted to enter a service pipe.

GEORGE LINTHICUM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."