June 6, 1933. C. F. HOTCHKISS, JR 1,912,525

PIPE CLEANING TOOL

Filed Nov. 22, 1930

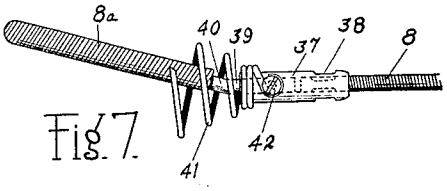



Fig. 7.

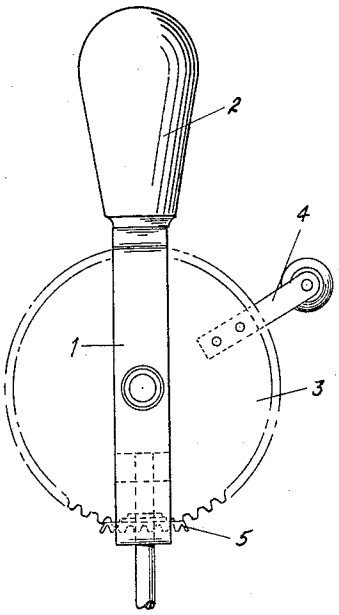



Fig. 1.

Fig. 6.

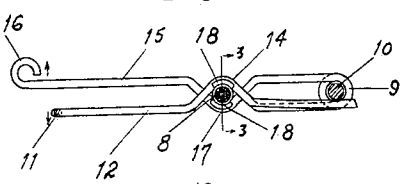



Fig. 2.

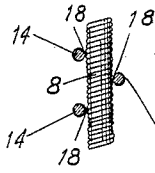



Fig. 3.

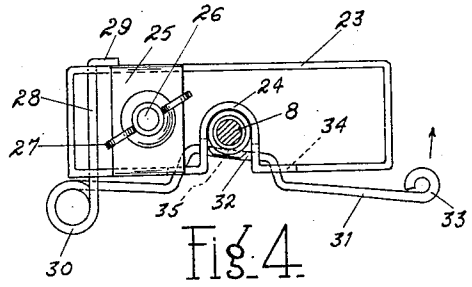



Fig. 4.

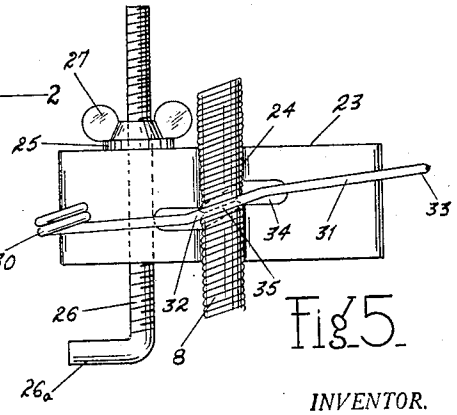



Fig. 5.

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# UNITED STATES PATENT OFFICE

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## PIPE CLEANING TOOL

Application filed November 22, 1930. Serial No. 497,398.

My invention relates to pipe cleaning tools such as are used for removing foreign accumulations from sewage pipes, waste bowls and the like.

The primary object of my invention is to provide a feeding device, which will evenly, positively and cooperatively feed the shaft of said tools through stoppages in pipes and the like.

Another and important object of my invention lies in the provision of means for quickly and easily disengaging said device from feeding engagement with said shaft thereby allowing same to be unrestrictedly and rapidly passed through the normal passages of the pipe until it contacts with the stoppage therein, thus facilitating and reducing the boring operation.

A further object of my invention lies in the provision of a novel tip of relatively greater flexible and resilient qualities than the shaft proper which serves to cleanly wipe the inner surfaces of the pipes entered as it is rotated therein and which because of its extremely flexural qualities, guides or leads and permits the relatively stiffer or less flexible shaft to pass over and beyond the recesses, traps, clean-out openings etc. frequently encountered in the passages of sewage pipes, drains and the like.

A still further object of my invention lies in the provision of a simple clamping means incorporately assembled therewith.

Still another object of my invention is to provide a device of this character which is durable, of few parts, simple of construction and operation and economic of manufacture.

Other objects and advantages in details of construction and operation will be apparent as the description proceeds, reference now being had to the figures of the accompanying drawing, forming a part of this application and wherein like reference characters indicate like parts.

In the drawing:—

Figure 1 is a side view of my improved pipe cleaning tool.

Figure 2 is a detail sectional view taken on the line 2—2 of Figure 1.

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

Figure 4 is a plan view of a modified form of my invention.

Figure 5 is a side view thereof.

Figure 6 is a diagrammatic sectional view of a drain pipe showing how the novel tip of my device permits the passage of the shaft over cleanout openings, recesses and the like.

Figure 7 is a side view of a modified form of the novel tip.

The reference character 1 indicates a frame, the upper end of which is provided with a handle 2. A driving gear 3 journaled in the frame 1 is adapted to be manually rotated as by means of the crank 4 and meshes with a pinion 5 rigidly secured to the upper end of a vertical shaft 6 which is securely journaled in the lower end of the frame 1. Obviously the rotation of the crank 4 will drive the shaft 6. Removably secured to the lower end of the vertical shaft 6 as at 7 is a flexible shaft 8 preferably formed of spirally and tightly coiled wire of ample resilient and flexible qualities to follow the most exceedingly irregular passages and provided at its extreme lower end with a tip 8*a*. This tip 8*a* is preferably formed of a tightly coiled single strand of resilient spring stock of relatively greater resilient and flexible qualities than the coiled wire of the shaft 8, and is disposed angularly with respect thereto and terminates with a smooth rounded end 8*b*. It should be understood that this tip 8*a* could be made of any suitable extremely flexible stock such as rubber, flexible chain or other suitable material.

Referring to Figure 7 a modified form of the tip, a hollow sleeve 37 is securely fastened to the shaft 8 as at 38 and is adapted to receive a stem or shank 39 having an an-

gular bend at one end as at 40 to which is rigidly secured the flexible tip 8*a*. A spirally coiled boring member 41 of relatively stiffer and heavier stock is secured to the end of the sleeve 37 as by means of the screw 42 which serves also to secure the stem 30 within the sleeve 37 as it is threaded therethrough. The outer coiled end of this member 41 is formed preferably larger than the rear end thereof, and serves to screw or bore its way through stoppages, obstructions and the like, as well as to pick up lint, grease, etc., as it travels through the passages. It will be clear that this form of tip may be used with both of the elements 8*a* and 40 or by removing the screw 42 either of same may be removed and the screw replaced thereby allowing the use of the other independently. An example of where it would be necessary to use only the boring member 41 without the flexible tip 8*a* lies in the case of a straight pipe without bends, curves or traps while on the other hand the flexible tip 8*a* may be used very effectively in smaller pipes independent of the member 41 and will lead the shaft 8 through the most exceedingly irregular curves. The combination of the two elements proves particularly useful in larger pipes where the member 41 not only serves to bore through hard or caked stoppages or obstructions, but also serves to fill up space and thereby increases the efficiency of the flexible tip member 8*a*. Obviously the spirally wound wire of the shaft 8 forms a continuous spiral groove or thread along the entire outer contour of same. This shaft 8 passes through a feeding device positioned transversely with respect thereto which is formed preferably of heavy spring stock coiled as at 9 several times around a threaded bolt 10 which runs parallel to and lies slightly to one side of the shaft. The lower end of the coil 9 extends horizontally in back of and beyond the shaft 8, and is bent or otherwise suitably formed substantially in a U shape as at 11, terminating above the coil 9 and resting against the bolt 10, thus forming the horizontal parallel portions 12 and 13.

Between the coil 9 and the U shaped formation 11, the parallel portions 12 and 13 respectively are bent laterally in a V shape as at 14 thus forming a recess for the shaft 8. The opposite end 15 of the coil 9 extends slightly downwardly at an angle in front of the shaft 8, between the parallel portions 12 and 13 and terminates slightly beyond and in back of the U shaped formation 11 with a finger piece as at 16. This end 15 of the coil 9 is likewise provided between the coil 9 and the finger piece 16 with a cooperating V shaped recess 17. Obviously because of the inherent resilient character of the material used and the coil 9, the V shaped recesses 14 of the portions 12 and 13 in back of the shaft 8 will normally be forced toward the corresponding V shaped recess 17 of the portion 15 in front of the shaft 8 and thereby rigidly embrace the same. The inner surfaces of the V shaped recesses 14 and 17 are preferably stamped, filed or otherwise suitably formed or provided with sharp, threadlike edges 18 running parallel and securely engaging with the spiral groove of the shaft 8 as clearly shown in Figures 2 and 3.

The threaded bolt 10 around which the coil 9 is wound serves to securely clamp the device to the waste pipe or drain opening and is provided with a right angular hook 19. Washers 20 and 21 are placed above and below the coil 9 on the bolt 10 to provide a firm clamping surface as the wing nut 22 is screwed down.

The operation of my invention is as follows:—

The user adjusts the feeding device a short distance (approximately 6 inches) from the angularly disposed tip 8*a* on the shaft 8 by compressing the finger piece 16 thereof toward the U-shaped portion 11 thereof against the tension of the coil 9, thus disengaging the recesses 14 and 17 from the shaft 8 and thereby allowing the feeding device to be freely adjusted to such a position, whereupon the user releases the compression, thus allowing the recesses 14 and 17 and the threadlike edges 18 thereof to securely and threadably engage the spiral groove of the shaft 8. After such adjustment is made, the user introduces the tip 8*a* into the pipe or drain and clamps the feeding device as previously described to the waste pipe or drain opening. Grasping the handle 2 in one hand and turning the crank 4 with the other hand, the operator rotates the shaft 8 carrying the tip 8*a* and thereby by virtue of the spiral groove feeds same continuously and downwardly through the feeding device into the pipe. It will be clear that the angular disposition of the tip 8*a* to the shaft 8 will cause the end 8*b* thereof to engage against the inner surface of the pipe, thereby loosening any lint, grease or other foreign accumulations therefrom and allowing such substances to be carried off by water. Obviously, if the tip 8*a* contacts with a hard or packed stoppage or other stubborn obstruction, which resists the tip 8*a*, the member 41 will readily bore through and loosen the same and thus cleanly open the passages of the pipe or drain.

Referring now to Figure 6, it is obvious that should the tip 8*a* engage with a clean out opening or other recess indicated at 36 throughout the operation, this tip 8*a* because of its superresiliency will bend over as clearly shown and thereby allow the shaft 8 to pass over and beyond such recesses whereupon the tip 8*a* will snap back into normal position. It will be clear, that as the shaft is advanced through the pipe, because of its

relatively slow feeding progress and the extremely resilient qualities of the tip 8*a*, it will readily adapt itself to any bends, curvatures or other irregular formations of the pipe entered and thus lead or guide the shaft 8 through such passages.

Referring now to Figures 4 and 5 illustrating a modified form of my invention, the reference character 23 indicates a rectangular frame, centrally and on one side of which, there is depressed a semi-circular, right angularly disposed channel 24 of approximately the diameter of the shaft 8 for receiving same. Spanning and integrally formed with the upper edges of the two longer sides of the frame 23 and to one side of the channel 24, is a flat strip of metal 25 adapted to receive and support the clamping bolt 26 which passes downwardly therethrough. The bolt 26 is provided at its extreme lower end with the right angular bend 26*a* and at its upper end with a wing-nut 27 thereby forming a clamping means for the frame 23. A piece of heavy spring stock 28 is anchored as at 29 at one end to one side of the frame 23 and passes through the opposite channeled side of said frame where it is coiled as at 30 to normally urge the opposite end 31 thereof extending along said side, inwardly toward same. This free end 31 of the spring stock 28 is bent inwardly and upwardly at an angle at a point where it engages with the shaft 8 in the channel 24 as at 32 and terminates with a finger piece 33.

The channeled side of the frame 23 being slotted as at 34 to receive and allow this inwardly and upwardly extending portion 32 of the spring 28 to engage with the shaft 8. At this point of engagement 32 the upward angle of the spring 28 coincides with the angle of the spiral groove in the flexible shaft 8 and thereby allows same by virtue of the thread-like edge 35 stamped, filed or otherwise suitably formed on the inner surface of same to engage with said groove and thus feed the shaft 9 upwardly and downwardly in channed as it is rotated therein.

The operation of this modified form of my invention is substantially the same as the previously described form, the only change being that user adjusts the feeding member on the shaft 8 by pulling outwardly on the finger piece 33 of the spring 28, thus allowing free movement of the shaft in the channel 24. When the desired adjustment is made, the user releases the spring 28 into feeding engagement with the shaft. From here on, the operation of modified form is a repetition of the previously described form.

Of course, many changes in details of construction and arrangement of parts may be made without departing from the spirit and scope of my invention. I do not limit myself therefore, other than by the appended claims.

I claim:

1. A pipe cleaning tool comprising a flexible shaft provided at one end with a tip and at the opposite end with means for rotating the shaft, a wire clamp through which said shaft passes, and a bent portion of said wire engageable with said shaft for causing the shaft to be fed therethrough upon rotation of the same.

2. A pipe cleaning tool comprising a flexable shaft provided at one end with a tip and at the opposite end with means for rotating the shaft, a wire clamp through which said shaft passes, and means on said clamp engageable with said shaft for causing the shaft to be fed therethrough upon rotation of the same, said means comprising an edge formed on said wire clamp engageable with the windings on said shaft.

3. A pipe cleaning tool comprising a flexible wire wound shaft having a tip at one end and a means at its opposite end for rotating the shaft, a clamp of a single bent wire so formed as to provide a resilient grip for said shaft passing therethrough, said clamp being provided with an edge at its point of engagement with said shaft for following the windings of the shaft whereby the same may be fed therethrough.

4. A pipe cleaning tool comprising a flexible shaft having a tip at one end and a means at its opposite end for rotating the shaft, a clamp of a single bent wire so formed as to provide a resilient grip for said shaft passing therethrough, said clamp being provided with a coil at one side to insure resiliency.

5. A pipe cleaning tool comprising a flexible shaft having a tip at one end and a means at its opposite end for rotating the shaft, a clamp of a single bent wire so formed as to provide a resilient grip for said shaft passing therethrough, said clamp being provided with a coil at one side to insure resiliency, and said coil forming an opening adapted to receive a threaded bolt member having a hook at its lower end and a wing-nut at its opposite end for securing said clamp in operating position.

6. A pipe cleaning tool comprising a resilient clamping member having an anchoring means assembled therewith, a flexible shaft passing through said clamp, said shaft having a rotating means at one end and a tip removably secured to its opposite end and means on said opposite end for removably securing a boring member in cooperative relation to said tip.

7. A pipe cleaning tool comprising a flexible shaft having means for rotating the same at one end and a flexible tip removably secured to its opposite end, a spirally coiled wire member of relatively heavier material than said tip removably secured in cooperative relative thereto.

8. A pipe cleaning tool comprising a flexi-

ble shaft having means for rotating same at one end and a socket at its opposite end, an angular stem having a flexible tip removably secured within said socket, a spirally coiled member removably secured to the periphery of said socket by said securing means in co-operative relation with said angularly disposed tip.

In testimony whereof, I affix my signature.

CLARENCE F. HOTCHKISS, JR.