

Feb. 9, 1937.

S. O. BLANC

2,069,871

CUTTER MEMBER FOR CLEANING DRAIN PIPES

Filed Oct. 21, 1935

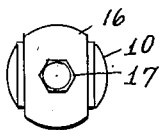


Fig. 4.

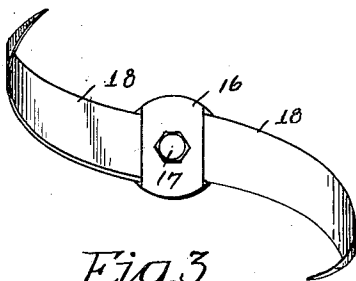


Fig. 3.

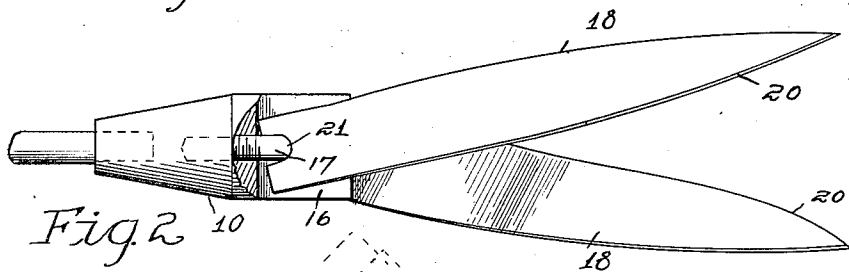


Fig. 2.

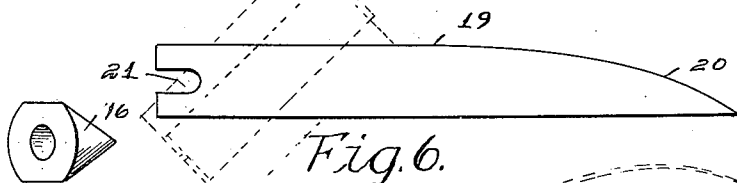


Fig. 6.

Fig. 5.

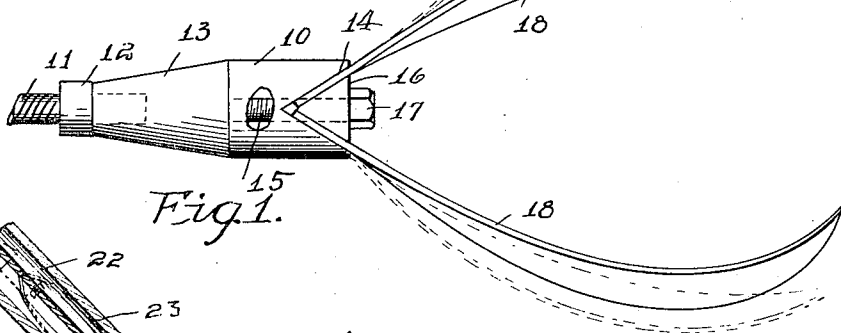


Fig. 1.

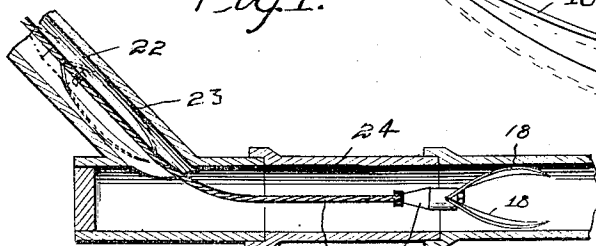


Fig. 7.

Inventor
Samuel O. Blanc
by Onig & Hagen, Attys

UNITED STATES PATENT OFFICE

2,069,871

CUTTER MEMBER FOR CLEANING DRAIN
PIPES

Samuel O. Blanc, Des Moines, Iowa

Application October 21, 1935, Serial No. 45,993

6 Claims. (Cl. 15—104.30)

This invention relates to improvements in mechanism for cleaning drain pipes and the like, and more particularly to improvements in the rotatable cutter member designed to enter the drain pipe and be driven by a flexible shaft. Cutter devices of this kind are actuated by means of a flexible shaft which, together with the cutter member, is inserted into the drain pipe through the ordinary inlet openings, such as clean-out openings or floor traps, which are usually smaller than the drain pipe to be cleaned. By thus inserting the flexible shaft and cutter element it is unnecessary to provide an additional opening which could only be accomplished by digging up part of the drain pipe.

Due to the fact that the opening through which the cutter and flexible shaft are inserted into the drain pipe is smaller than the drain pipe, difficulty has heretofore been experienced in providing a suitable cutter capable of entering the small opening and at the same time being capable of properly functioning inside of the enlarged drain pipe after it has been inserted therein. It is, therefore, the object of my invention to provide a cutter head having flexible cutter blades which may be sprung together in such a manner as to enter a comparatively small opening, and after being inserted in said opening and into the enlarged drain pipe, capable of being sprung outwardly by the resiliency of the material to fit the inner surface of the drain, or to be further moved outwardly by centrifugal force as the cutter is rotated.

A further object of my invention is to provide in a cutter device of the class above described, improved means whereby the cutter blades may be adjusted at various angles relative to their rotative line of movement, and also capable of being quickly and easily detached from the cutter head.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawing, in which:

Figure 1 is a side elevation of my improved cutter head showing the blades sprung outwardly in dotted lines.

Figure 2 is a top view of the same, a portion of the cutter head being broken away.

Figure 3 is an end elevation of the cutter head and blades.

Figure 4 is an end elevation of the cutter head with the blades removed.

Figure 5 is a perspective view of the cutter head wedge.

Figure 6 illustrates one of the blades in blank form.

Figure 7 is a longitudinal sectional view of a section of drain pipe showing the manner in which the flexible shaft for operating the cutter head and the cutter head are mounted therein.

My improved device comprises a cutter head 10 designed to be secured to one end of a flexible shaft 11 by means of a screw threaded union 12, the cutter head 10 being preferably of a cylindrical formation having a tapered portion 13 at one end in which the union 12 is mounted. The opposite end of the cutter head 10 is provided with a V-shaped notch 14 and a screw threaded opening 15. A wedge 16 is provided which is mounted in position within the notch 14 by means of a bolt 17 entering the opening 15.

Supported in the notch 14 between the inclined faces of the wedge 16 and the inclined faces of the notch 14 I have provided a pair of cutter blades 18, each of the blades 18 being cut out in the form as illustrated in Figure 6, said blades being formed of comparatively flexible material such as spring steel, having the outer end of the cutting edge 19 curved outwardly and rearwardly of their line of advance, to form a curved cutting edge 20, the inner end of each of the blades 18 being preferably provided with a notch 21 through which the bolt 17 extends when the said blades are mounted in the head 10 in the manner illustrated in Figure 2. Each of the blades 18 is first formed from a flat piece of steel, after which the said blades are moved between suitable forming rollers, illustrated in dotted lines in Figure 6, said rollers being inclined relative to the longitudinal axis of the blades, as indicated, so as to produce a somewhat helical blade. The blades are then placed in position in the notch 14 and set at an angle relative to the longitudinal axis of the head 10, in the manner illustrated in Figure 2, so that the cutting edges of the blades will produce a sort of draw-cut effect as the blades are rotated, the blades being curved in the manner as illustrated in Figure 1, with their convex surfaces outermost. The bolt 17 is then tightened causing the blades to be firmly fixed in the head. The cutter then may be inserted through a clean-out opening of the drain pipe 22, which is of comparatively small diameter, the blades being sprung together as indicated at 23 in dotted lines. The cutter is then rotated and moved inwardly into the main drain pipe 24, which is of larger diameter. The blades will

then spring outwardly until they engage the inner surface of said drain pipe, if the drain pipe is of a diameter substantially the same as the normal distance between the two blades at their widest points.

If the cutter is inserted in a larger drain pipe, then the blades will swing outwardly by centrifugal force, as illustrated in dotted lines in Figure 1, until they engage the inner surfaces of the drain pipe. The centrifugal action of the blades, in any event, tend to hold the blade against the inner surfaces of the drain pipe so that the cutting edge of the blade engages the inner surfaces of the pipe so as to produce a better cutting effect when roots and similar substances are extending inwardly within the drain pipe. By causing the blades to engage the inner surfaces of the drain pipe a better cleaning operation also takes place.

The free ends of the blade 18 are curved inwardly toward each other so as to prevent the ends of the blades from engaging offset portions of the drain pipe, the curved ends of the blades serving as runners to cause the blades to ride over the inwardly projecting portion of the drain pipe rather than to butt against it. By this arrangement the cutter blades may be fed into drain pipes having offset portions, such as the abutting end of the pipe. The curved ends of the cutters also assist in fitting the cutter around corners and curved portions of the drain pipe.

It will readily be seen that by clamping the blades detachably in the head 10 different sized and shaped blades may be used in said head at the will of the operator. The clamping device also provides means for adjusting the angle of the blades, when so desired. Thus it will be seen I have provided an improved cutter device particularly adapted to be used on one end of a flexible shaft and to be fed into drain pipes wherein the cutter may be easily moved into the pipe, or withdrawn, without becoming locked in the tile against either inward or outward movement, and at the same time capable of being adjusted to drains of various diameters.

Furthermore, it will readily be seen that the cutter blades are of very simple formation, and may be easily and cheaply constructed, the blades being easily removed for sharpening or repair or the substitution of one set of blades for another.

I claim as my invention:

1. A cutter for drain cleaners comprising a cutter head having one end adapted to be attached to a flexible shaft, the opposite end of said head being provided with a V-shaped notch for receiving cutter blades, a wedge for said notch, a pair of cutter blades adapted to have one set of corresponding ends clamped between the inclined faces of said wedge and the inclined faces of said V-shaped notch, and a bolt for forcing

said wedge into clamping position between said blades.

2. A cutter for drain cleaners comprising a cutter head having one end adapted to be attached to a flexible shaft, the opposite end of said head being provided with a notch having inwardly inclined side walls, a wedge for said notch, a pair of cutter blades adapted to have one set of corresponding ends clamped between the inclined faces of said notch and said wedge, and means for forcing said wedge into clamping position between said blades.

3. The combination of a rotatable cutter head, a pair of oppositely curved cutter blades formed of thin and flexible material having one set of corresponding ends fixed to said head in a diverging manner with the opposite ends spaced apart, the outer ends of said blades being inclined rearwardly relative to their direction of rotation, the outer ends of the cutting edges of said blades being further inclined rearwardly relative to their direction of rotation.

4. A cutter for drain cleaners comprising a cutter head having one end adapted to be attached to a flexible shaft, the opposite end of said head being provided with a recess having inwardly inclined side walls, a wedge for said recess, a plurality of cutter blades adapted to have one set of corresponding ends clamped between the inclined faces of said recess and said wedge, and means for forcing and retaining the wedge into clamping position between said blades.

5. A cutter for drain cleaners comprising a cutter head having one end adapted to be attached to a flexible shaft, the opposite end of said head being provided with a recess having inwardly inclined side walls, a wedge for said recess, one or more cutter blades adapted to have one or one set of corresponding ends clamped between the inclined faces of said recess and said wedge, and means for forcing said wedge and retaining the same in clamping position between said blades.

6. A cutter for drain cleaners comprising a head having one end adapted to be attached to a flexible shaft, a plurality of cutter blades formed of thin and flexible material having one set of corresponding ends fixed to said head in a diverging manner, said blades being inclined from said head and rearwardly relative to their direction of rotation, having their free ends inclined inwardly towards the axis of rotation of said cutters, whereby a draw cutting effect will be produced by the cutting edges of said blades as they engage inwardly extending roots within the drain in which the cutter is operated, the inclined ends of said blades, being adapted to guide the cutter through drains having offset portions to prevent the cutting edges of said blades engaging the said offset portions, said blades being flexible to permit the cutter to be operated in drains of various diameters.

SAMUEL O. BLANC.