(No Model.)

J. H. VINTON.

PIPE CUTTER.

No. 536,554. Patented Mar. 26, 1895.

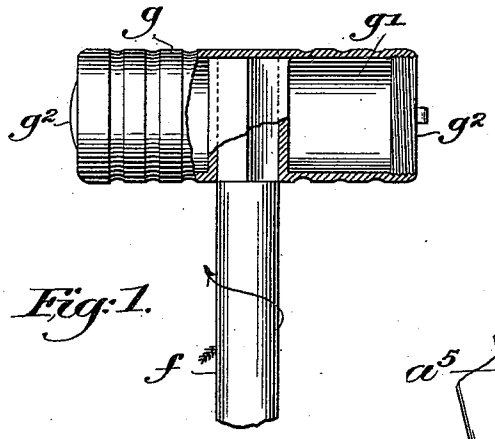


Fig. 1.

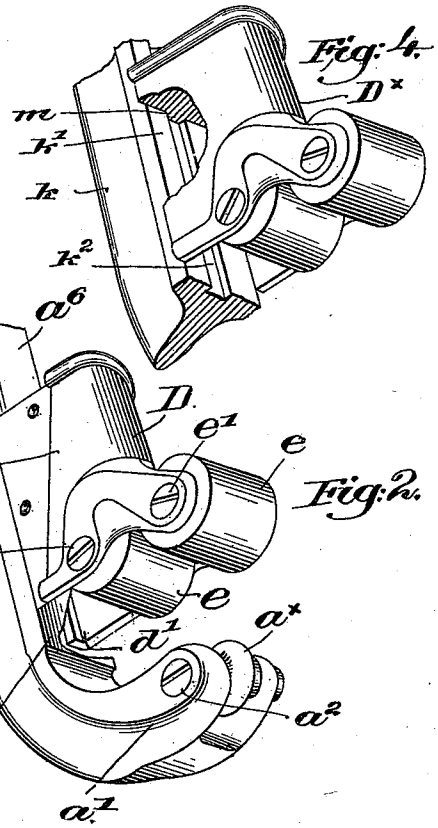
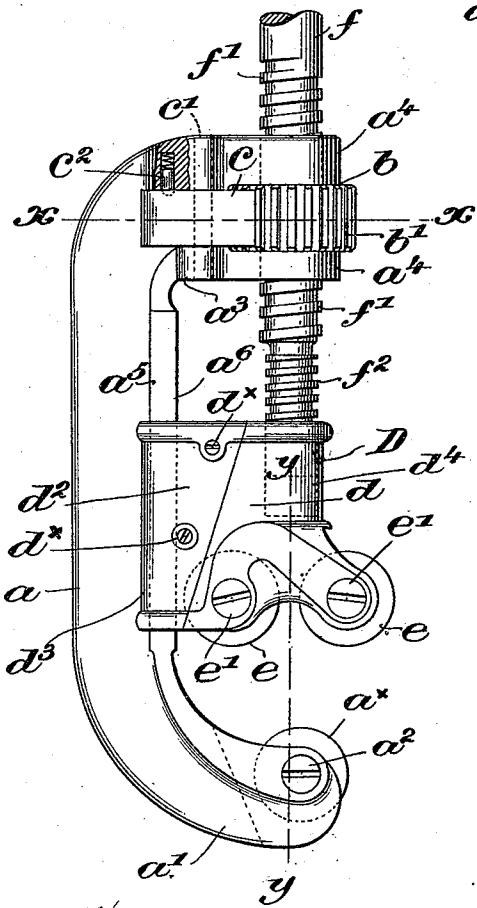


Fig. 4.

Fig. 2.



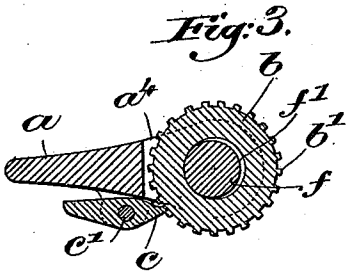


Fig. 3.

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UNITED STATES PATENT OFFICE.

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PIPE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 536,554, dated March 26, 1895.

Application filed July 13, 1894. Serial No. 517,433. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. VINTON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Pipe-Cutters, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a novel pipe cutter of great strength, durability and simplicity, and adapted to be rapidly adjusted for use.

My improved pipe-cutter comprises a cutter-carrying frame, a cutter, a roll carrier supporting preferably smoothing rolls opposed to the cutter, and a rotatable threaded shank to co-operate with, and by its rotation cause said frame and roll carrier to be moved toward or from each other, whereby the rolls bear upon and force the pipe against the cutter; and by the employment of a preferably differentially threaded shank the frame and roll carrier are moved in the same direction but at different speeds, the rapidity with which the rolls and cutter approach or move from each other being equal to the difference between the speeds referred to. By such construction I am enabled to cause the cutter to enter the pipe slowly but with great power, while, by means to be hereinafter described, the tool is rapidly adjusted to the diameter of the pipe to be cut, such adjustment requiring but little power.

The specific features comprised in my invention will be hereinafter more fully described in the specification, and particularly designated in the claims at the end thereof.

Figure 1, in side elevation and partially broken out, represents a pipe cutter in which my invention is embodied. Fig. 2 is a perspective view of a portion of the pipe-cutter, with a part of the roll carrier removed. Fig. 3 is a transverse sectional detail taken on the line x—x, Fig. 1, and Fig. 4 is a detail of a modification to be described.

Referring to Figs. 1 and 2, the pipe cutter as therein shown is composed of a cutter carrying frame a having at its outer end an overhanging jaw a', suitably shaped to receive a rotary cutter a^x, journaled upon a pin or stud a^2, and preferably threaded to facilitate the removal of the cutter when desired. The other end of the frame is inturned at a^3, Fig. 1, and preferably it is transversely slotted to form lugs a^4, having a shank opening therethrough.

An interiorly threaded nut b, herein shown as having ratchet teeth b' thereon, is loosely mounted on the inturned portion of the frame a, between the lugs a^4 and held from longitudinal movement thereby, the said nut constituting a bearing for and controlling the movement of the shank, to be described.

A pawl c is pivoted to the frame at c', see Fig. 3, adjacent the bearing, to engage its teeth b' and thereby prevent rotation of said bearing when desired, the pawl being held in operative position by a spring catch c^2 entering a depression therein, as clearly seen in Fig. 1.

The inner side of the frame a forms a longitudinal bearing surface a^6 for a sliding roll carrier D, and in Figs. 1 and 2, said bearing surface is shown as laterally extended to present a guide rib a^5 at each side thereof.

As shown in Figs. 1 and 2, the roll carrier is made separable, the main portion d thereof being recessed or cut away to receive two rolls e, mounted to rotate on removable pins or studs e', and opposed to the cutter a^x. These rolls e act as smoothing rolls, to bear against and smooth down the burr formed by the cutter as the pipe is being cut, and the rolls are shown as quite long to form a firm, substantial seat for the pipe, centering it accurately, and presenting its surface exactly at right angles to the plane of the cutter.

Should the pipe be improperly centered the cutter will make a spiral cut or thread in the pipe, instead of a single annular cut, and this is obviated by the construction of the rolls as herein shown.

To prevent lateral displacement of the roll carrier, and to assist in retaining it upon the bearing surface a^6 at all times, the back of the main portion is grooved at d', Fig. 2, to embrace one of the guide ribs a^5, and a locking plate d^2 having an overturned lip d^3 is secured to the main part of the carrier, after the latter has been put in position, by suitable screws d^x, shown in Fig. 1.

It is necessary to construct the roll carrier

as described when two guide ribs are employed, as shown in Figs. 1 and 2, in order to enable the carrier to be put in place on the frame *a*.

The longitudinal axis of the tool is coincident with the longitudinal axis of the shank *f*, and the rolls *e* are preferably arranged equidistant therefrom on each side, while the rotary cutter $a^{\times}$ has its center offset beyond the said tool axis, as shown in Fig. 1, the broken line *y*—*y* representing the tool axis.

When the tool is in position on a pipe to cut it, such offset of the cutter $a^{\times}$ acts to constantly press the pipe into its seat on the rolls *e*, *e*, and thereby the roll carrier D is firmly held down on the bearing surface a^6, to take up the strain.

A threaded shank *f* is extended through the nut *b* and into co-operative engagement with the roll carrier D, rotation of the said shank causing relative movement of the frame and roll carrier, to adjust the tool to the pipe and thereafter operate the feed.

The adjustment of the tool for the pipe to be cut requires but little power, while quick movement is desirable, and consequently I preferably make the thread *f'*, which engages the threaded nut or bearing *b*, of a steep pitch, so that rotation of the said bearing will cause rapid longitudinal movement of the shank therethrough, and an equal movement of the roll carrier, the shank *f* extending loosely through the lugs a^4 of the frame *a*, after which the pawl *c* is put into engagement with the nut *b* to prevent its rotation. When the tool is thus adjusted the pipe is centered by the rolls *e* and the tool is then turned around it in the usual manner, and the cutter begins to enter and score the pipe, the cutter being fed to the pipe as it deepens the cut by rotating the shank in the direction of the arrow, Fig. 1. Such rotation will cause the roll carrier and its rolls *e* to move toward the cutter $a^{\times}$, but the steep pitch of the thread *f'* would give too rapid a feed and would require great power to make the cutter enter the pipe. I overcome this by providing the shank with a second thread f^2, of finer pitch, and entering a correspondingly threaded opening d^4, shown in dotted lines Fig. 1, in the roll carrier. By referring to said figure, it will be seen that the rotation of the shank *f* as described, will, by means of the threads *f'*, cause its longitudinal advancement at a certain speed, but such rotation also causes it to enter and draw the roll carrier D in the opposite direction, at a slower speed. The said roll carrier will accordingly be moved toward the cutter at a rate equal to the difference between the two speeds referred to, and by the finer thread f^2, or thread of less pitch, the carrier is moved with great power to feed the cutter into the pipe. The rolls *e* thus press against the pipe, forcing the cutter into the pipe, and they extend laterally from each side of the plane of the cut sufficiently to get an extended bearing on and to maintain the pipe at right angles to the cutter. In addition the rolls turn down or smooth the burr formed by the rotary cutter, so that the severed ends of the pipe are left smooth and obviate subsequent filing.

I have shown a modification in Fig. 4 of the means to prevent lateral displacement of the roll carrier $D^{\times}$, which is shown as a single piece of metal. The frame *k* is provided with a longitudinal bearing surface *k'*, shown as having a shallow longitudinal groove k^2 therein, to be engaged by a projecting portion of the roll carrier $D^{\times}$, said portion being shown as a rib *m* on the back of the carrier. It will be obvious that a rib or projection could be formed on the bearing surface *k'* to engage a groove in the back of the roll carrier $D^{\times}$, such mere reversal of parts needing no illustration and it is also obvious that the threaded shank which enters the roll carrier $D^{\times}$, but which is not shown in Fig. 4, will hold the carrier on the frame *k*, the said threaded shank passing through a bearing in the latter.

It is sometimes desirable to use cutters in place of the rolls *e*, when only a limited movement can be had for the tool in cutting a pipe, owing to the position of the latter, as for instance, in a corner or in close proximity to a wall, and for this purpose the pins or studs *e'* are withdrawn, the rolls *e* removed and cutters similar to the cutter $a^{\times}$ are substituted therefor. The pipe is then subjected to cutting at three points of its circumference simultaneously, so that with a small throw of the tool the cut will be completed.

To provide a convenient storage place for such cutters, so that they will be at hand when wanted, I have hollowed out each end of the shank handle *g*, Fig. 1, at *g'*, shown by the broken-out-portion in said Fig. 1, and threaded it at the outer ends to receive screw caps or closures g^3, the hollowed out portions being each of sufficient size to receive and hold one of the smoothing rolls as *e*, or one or more cutters.

So far as I am aware it is broadly new to actuate the parts of a pipe cutter by means of a differentially threaded shank co-operating therewith, whereby the tool may be rapidly adjusted, and thereafter the cutter fed slowly and powerfully into the pipes and accordingly my invention is not restricted to the exact construction and arrangement of parts herein shown.

I claim—

1. In a pipe cutter, a frame, a rotary cutter carried thereby, a roll carrier longitudinally movable on said frame and having rolls opposed to the cutter, to bear upon the pipe to be cut, a differentially threaded shank to co-operate with said frame and roll carrier, a fixed bearing in the latter, a rotatable bearing in the frame in engagement with the steeper thread of the shank, and a locking device therefor, rotation of the bearing moving the roll car-

rier and shank in unison at the same speed, to rapidly adjust the tool, substantially as described.

2. In a pipe cutter, a frame having an overhanging jaw, a rotary cutter carried thereby, a roll carrier longitudinally movable on the frame and having laterally extended smoothing rolls opposed to the cutter and adapted to seat the pipe at right angles to the axis of the tool, connections between said frame and roll carrier to prevent relative lateral movement, and a shank having two threads thereon of different pitch, to engage bearings in the frame and roll carrier, whereby rotation of said shank in the proper direction will cause the rolls to act upon the pipe and force the cutter thereinto with great power and at a speed proportional to the difference of pitch of the threads on the shank, the rolls smoothing out the burr raised by the cutter, substantially as described.

3. A pipe cutter composed of a cutter-carrying frame having a threaded bearing rotatably mounted thereon in the longitudinal axis of the tool, means to prevent its rotation at times, a roll carrier adapted to travel on the frame and supporting two rolls, and a shank having a thread thereon in engagement with the rotatable bearing and a second thread of less pitch adapted to enter a bearing in the roll carrier, rotation of the shank moving the roll carrier at a speed dependent upon the difference of pitch of the shank threads, said shank and roll carrier being moved in unison by rotation of the rotatable bearing at a faster speed, substantially as described.

4. In a pipe cutter, a cutter carrying frame having a longitudinal bearing surface, a roll carrier adapted to slide on the said bearing surface, a projecting portion of one adapted to enter a groove in the other preventing lateral movement of the frame and roll carrier, rolls supported in the carrier and opposed to the cutter, a rotary cutter having its center offset beyond the longitudinal axis of the tool, to force the roll carrier against the bearing surface when a pipe is being cut, and a threaded shank to co-operate with said frame and roll carrier and move one relatively to the other, whereby rotation of the shank will cause the rolls to center the pipe and force the cutter into it, substantially as described.

5. A pipe cutter comprising a cutter carrying frame provided with a longitudinal bearing surface and laterally extended guide ribs, a roll carrier grooved to engage one of said ribs and adapted to slide on the bearing, a removable locking plate for the carrier, having an overturned lip to engage the other rib, a cutter, rolls supported in the said carrier and opposed to the cutter, and a threaded shank co-operating with said frame and roll carrier and adapted to be rotated, whereby rotation of the said shank will move the roll carrier relatively to the frame and cause the rolls to force the cutter into the pipe, in the operation of cutting a pipe, substantially as described.

6. A pipe cutter comprising a cutter carrying frame, a rotary cutter carried thereby and having its center offset beyond the longitudinal axis of the tool, a roll carrier movable on the frame, rolls carried thereby having their longitudinal axis equi-distant from and on opposite sides of said axis to form a seat for the pipe, whereby in the operation of cutting a pipe the cutter acts to hold the pipe in its seat between the rolls and independent of the frame to thereby press the roll carrier against the frame, and an actuating shank to move the roll carrier, substantially as described.

7. In a pipe cutter, a cutter-carrying frame, a roll carrier movable on the frame, a threaded shank co-operating with and to cause relative movement of the frame and roll carrier when rotated, and a hollow cylindrical handle for the shank threaded at its ends, and a screw cap or closure for each end, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. VINTON.

Witnesses:

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JOHN C. EDWARDS.