Feb. 3, 1942. W. E. DIXON 2,271,582

PIPE CUTTER

Filed Sept. 8, 1941 2 Sheets-Sheet 1

Fig. 1.

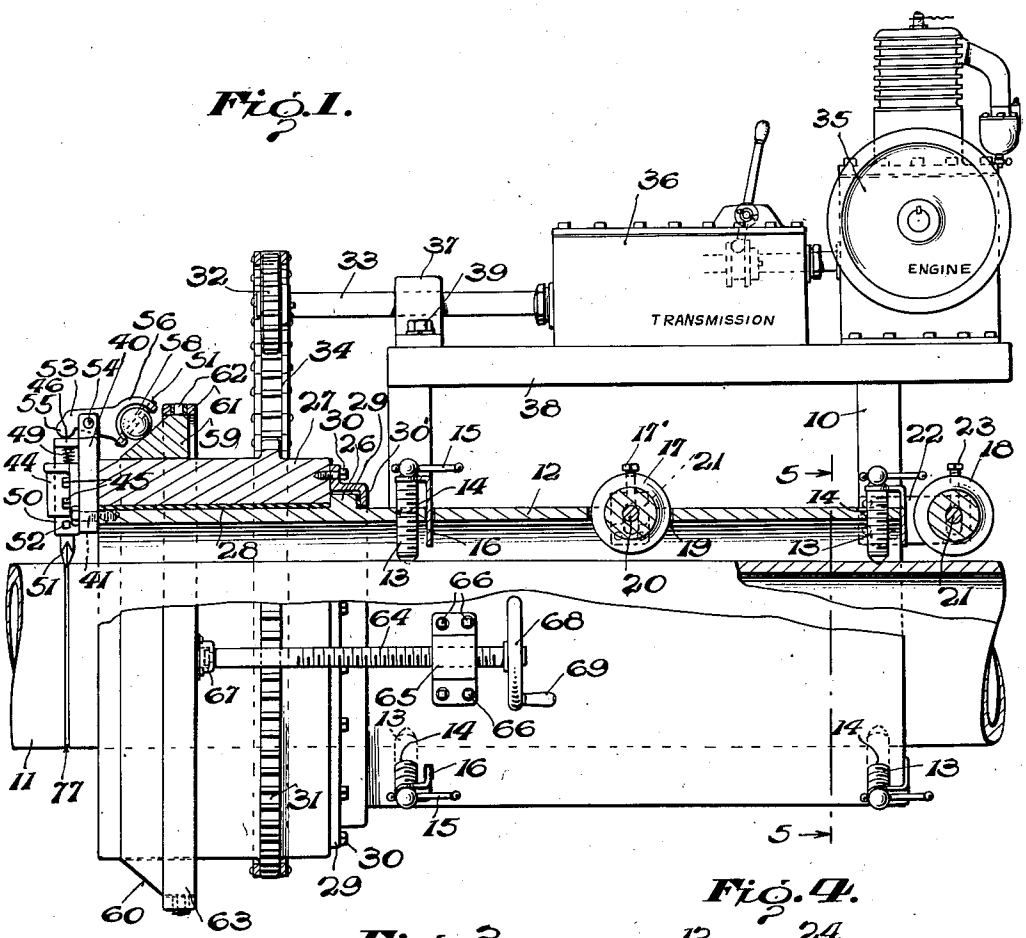


Fig. 2.

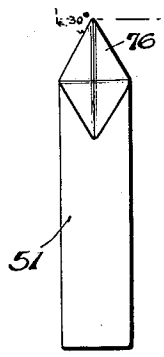


Fig. 3.

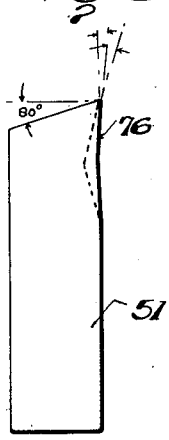
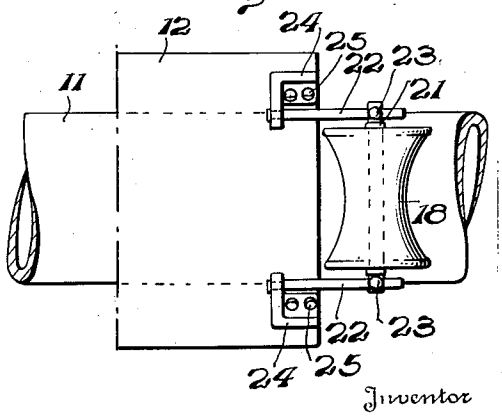


Fig. 4.



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Feb. 3, 1942. W. E. DIXON 2,271,582

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Filed Sept. 8, 1941 2 Sheets-Sheet 2

Fig. 5.

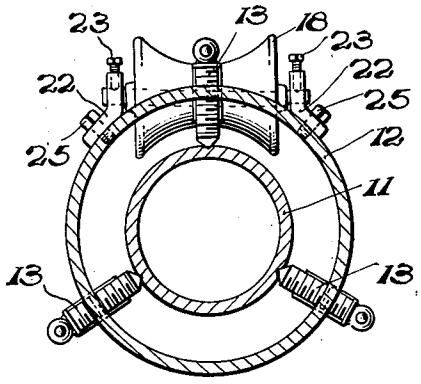


Fig. 6.

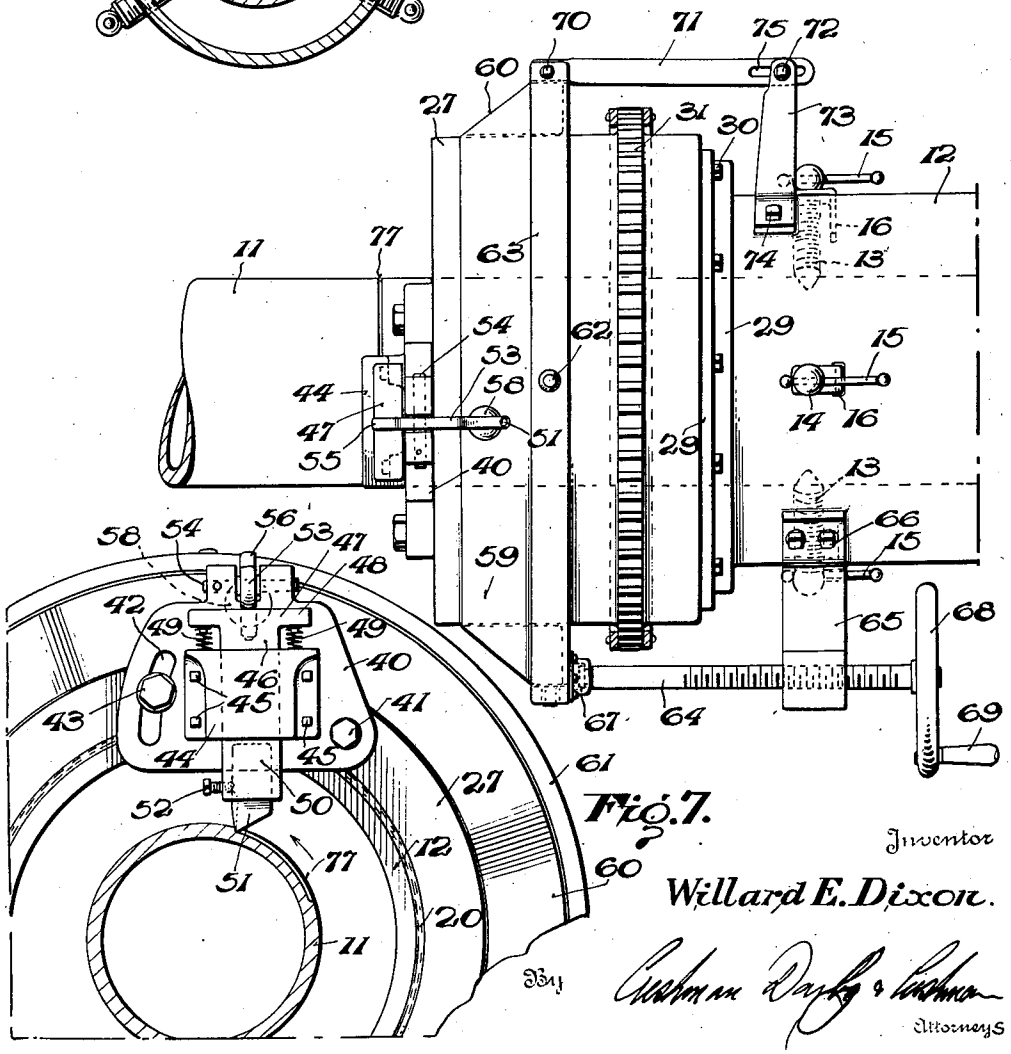


Fig. 7.

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Patented Feb. 3, 1942 2,271,582

UNITED STATES PATENT OFFICE

2,271,582

PIPE CUTTER

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Application September 8, 1941, Serial No. 410,076

11 Claims. (Cl. 30—97)

The present invention relates to pipe cutters and more particularly to a cutter of the traveling type arranged to be releasably mounted on a pipe so as to cut and bevel the same.

An important feature of the invention consists in providing improved means for automatically feeding the cutter to the pipe or the work during the rotation of the cutter. This means essentially includes an axially slidable member having a cam surface operatively connected to a control member for actuating the latter so as to move the cutter into engagement with the pipe during the operation of the machine.

A further object comprehends the provision of an annular pipe embracing frame or carriage having means for concentrically clamping the same to the pipe and which also includes means for engaging the pipe when the clamping means is released so as to facilitate the movement of the carriage along the pipe at a minimum expenditure of time and effort.

Another object of the invention consists in operatively connecting the cam member and its associating parts to a manually operable member for feeding the cutter to the pipe, thus providing hand control means for actuating the cutting tool which not only lessens the time required for cutting the work as contrasted to mechanical operating means, but also insures a proper degree of cut and bevel under the direct control of the operator.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with accompanying claims and drawings.

Referring to the drawings in which is shown a preferred embodiment of the invention:

Figure 1 is a side elevation of the cutter clamped to a pipe and with parts in section for clearness of illustration;

Figure 2 is a detail side view of a double-rake cutter arranged to be used with the machine;

Figure 3 is a view taken at right angles to Figure 2 of the cutter;

Figure 4 is a plan view of one end of the carriage showing the end supporting roller thereon;

Figure 5 is a sectional view taken substantially along the line 5—5 of Figure 1;

Figure 6 is a plan view of the front end of the carriage; and

Figure 7 is an end view of Figure 6 with parts removed.

Referring to the drawings in which like numerals indicate like parts in the several views, 10 designates an annular frame or carriage arranged to embrace the pipe or work 11 to be cut. The frame 10 includes a fixed tubular member or housing 12 into which axially extends the metal pipe or work 11. The frame 10 and its associated parts are concentrically mounted on the pipe through the instrumentality of the spaced circumferentially disposed clamping or centering screws 13 which extend into suitable threaded openings 14 adjacent opposite ends of the casing. The outer ends of the screws 13 preferably are provided with handles 15 for controlling the movement thereof. Each of the screws 13 may have associated therewith a graduated slide or scale 16 so as to insure the proper centering of the carriage on the pipe. When the screws 13 are released from clamping engagement, the carriage may be supported on the pipe so as to be moved thereon by means of the spaced horizontally aligned rollers 17 and 18. The roller 17 extends through an opening 19 in the top of the housing 12 intermediate the ends thereof, and is journaled on a shaft 20 adjustably mounted in bearing blocks 21 on opposite sides of the opening 19 by the thread bolts 17'. The roller 18 extends outwardly from the rear end of the carriage and is revoluble on a shaft 21 which is adjustably mounted in the arms 22 by the screws 23. The inner ends of the arms 22 are connected to brackets 24 secured to the housing by the bolts 25. It will be seen that through the adjustment of both the clamping screws 13 and the rollers 17 and 18, the cutter may readily accommodate itself for use with pipes of varying sizes and diameters.

The housing 12 is preferably provided with an annular shoulder or flange 26 (Figure 1) between which and the adjacent end of the carriage is revolubly mounted a collar or sleeve 27. A bronze bushing 28 interposed between the housing 12 and the collar 27 acts to constitute a bearing surface for the collar. An annular flanged member 29 is secured at one end to the inner face or side of the collar 27 by the bolts 30 and at its opposite end is bent inwardly to overlap the shoulder 26 to provide means for retaining and guiding the collar 27 on the housing 12. A washer 30' may be positioned between the adjacent walls of the flange 26 and the member 29 so as to insure free rotation of the collar 27 on the housing. A gear 31 is secured to the outer periphery of the collar 27 and is connected to a sprocket wheel 32 on the drive shaft 33, by an endless chain 34. The shaft 33 in turn may be driven by any suitable source of power and is shown operably connected to an engine 35

through the transmission 36 so as selectively to control the rotation of the collar 27 and its associated parts during the operation of the machine. The shaft 33 is supported in a bearing block 37 fastened to a base 38 by the bolts 39. The engine 35 and the transmission mechanism may also be supported on the base 38.

A plate 40 is attached to the outer face of the collar 27 on one side by the bolt 41 (Figure 7) and on its opposite side has an arcuate slot 42 which receives the bolt 43 to permit vertical adjustment or movement of the plate prior to the tightening up of the bolts 41 and 43. A saddle member 44 is secured by the bolts 45 to the outer face of the plate 40 and is shaped to provide an opening therewith through which loosely extends the tool holder 46. The holder 46 has a head 47 provided with spaced flanges 48 between which and the saddle 44 are positioned coil springs 49 for yieldably maintaining the holder in its outer or inoperative position. The holder 46 is provided with a socket 50 into which extends the cutter 51. A set screw 52 acts to releasably maintain the cutter within the holder.

A control member in the form of a lever 53 is pivoted as at 54 to the plate 40 (Figure 1) and is provided at one end with a knob portion 55 which engages the head 47 of the holder 46. The opposite end of the lever 53 has a bifurcated portion 56 in which is mounted a shaft 57 that carries a roller 58. A member 59 axially slidable on the collar 27 is provided with a cam surface 60 which contacts with the roller 58. The member 59 also has an annular flat portion 61 on which is pivotally mounted as at 62 a strip or ring 63. The cam member 59 is preferably moved towards and away from the tool holder by a threaded shaft 64 mounted in a bracket 65 secured as at 66 to one side of the housing 12. The shaft 64 abuts or is connected at its inner end as at 67 to the strap or ring 63. A wheel 68 fastened to the opposite end of the shaft 64 has a handle 69 for the purpose of manually actuating the shaft 64. To the band 63 on the side opposite to the shaft 64, is pivotally connected as at 70, one end of a link 71 which has an elongated slot 75 slidably connected as at 72 to a fixed arm 73 secured by the bolt 74 to the housing 12 (Figure 6).

The machine may be used with various types of cutters to provide any desired degree of cut and bevel to a metal pipe or the like. For the purpose of illustration, the cutter 51 is shown in Figures 2 and 3 as having a double-rake cutting surface 76 which when applied to the holder 47 forms a cutting and beveled surface 77 as shown in Figure 1 on the pipe. Thus means are provided which not only cuts the pipe but which, at the same time forms a perfect bevel so as to facilitate the re-welding of the pipe without the expense and delay of sending the pipe to a machine shop to be beveled as heretofore required.

In operation, assuming it is desired to cut and bevel the pipe 11, the frame 10 is mounted to embrace the pipe and the set screws 13 are adjusted in order to properly center and maintain the machine in a fixed position at the point where the pipe is to be cut. The cutter 51 is inserted in the socket 50 of the holder 46 and is releasably maintained therein by the set screw 52. The plate 40 is then moved and maintained in proper position by the set screw 43 in accordance with the diameter of the pipe to be cut. It will be seen that due to the adjustment of the plate 40, cutting tools of various types may be used with the machine to cut and bevel varying sizes of pipes without requiring any substantial changes to be made to the machine. The shaft 33 is then rotated through the engine 35 and the transmission 36 at the desired speed. The operation of the shaft 33 in turn rotates the collar 27 through the endless chain 34. The shaft 64 is manually actuated to move the cam surface 60 into contact with the roller 58 which causes the opposite end of the lever 53 to be lowered; thus depressing the holder 47 against the tension of the springs 49, and moving the cutter 51 into engagement with the outer peripheral surface of the pipe 11. As the shaft 64 is conveniently positioned to one side of the machine, and acts not only to advance the cutter but also to maintain the same in proper cutting position, the operator may readily control the degree of cut and bevel as the cutter rotates in the direction of the arrow as shown in Figure 7. The slidable connection of the strap 63 to the link 71 with the arm 73, insures the strap being maintained and guided in proper position when it is actuated by the screw 64.

Upon completion of the cutting operation at one point, the clamping screws 13 are withdrawn so as to allow the rollers 17 and 18 to contact with the pipe and the machine may then be moved axially along with the pipe to complete another cutting operation at a minimum expenditure of time and effort.

Due to the adjustability of the various parts, the machine may be used for cutting and beveling pipes of various kinds and sizes. Moreover, the manual control of the cutter will reduce to a minimum the time required for each cutting operation and will also insure the pipe being severed at the proper degree of cut and bevel, thus dispensing with expensive and complicated mechanical operating means.

It will be understood that the form of the invention shown and described is merely illustrative and that such changes may be made as fall within the purview of one skilled in the art.

I claim:

1. A cutter of the class described including a carriage arranged to be mounted on a pipe, means for clamping the carriage to the pipe, a collar rotatably mounted on the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut the same, a cam member axially slidable on the collar, means operable by the cam member and connected to said holder for moving the cutter into engagement with the pipe, means for rotating the collar and the cutter relative to the carriage, and means operatively connected to the cam member for actuating the same to control the operation of the cutter.

2. A cutter of the class described including a carriage arranged to be mounted on a pipe, means for clamping the carriage to the pipe, a collar rotatably mounted on the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut the same, a cam member axially slidable on the collar, means operable by the cam member and connected to said holder for moving the cutter into engagement with the pipe, means for rotating the collar and the cutter relative to the carriage, and manually operable means for actuating the cam member to move and maintain the cutter in contact with the pipe.

3. A cutter of the class described including a movable carriage arranged to be mounted on a pipe, means for clamping the carriage to the pipe, a collar rotatably mounted on one end of the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved in engagement with the pipe to be cut, a cam member axially slidable on the collar, a control member pivotally mounted on the collar and engaging at one end said holder, said control member having means contacting with said cam member for controlling the movement of the cutter, and manually operable means connected to the carriage and engaging the cam member for advancing the latter towards the holder to control the operation of the cutter.

4. A cutter of the class described including a movable carriage arranged to be mounted on a pipe, means for clamping the carriage to the pipe, revoluble means on the carriage arranged to engage the pipe when the clamping means is released to support the carriage, a collar rotatably mounted on one end of the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut and bevel the same, a member axially slidable on the collar, said member having a cam surface, a control lever pivotally mounted on the collar and having one end engaging said holder, the opposite end of the lever having revoluble means mounted thereon and engaging said cam surface, means for rotating the collar and cutter relative to the pipe, a band pivoted to said slidable member, and manually operable means connected to said band for actuating the slidable member to control the operation of the cutter.

5. A cutter of the class described including a movable carriage arranged to be mounted on a pipe, means for releasably clamping the carriage to the pipe, revoluble means on the carriage arranged to engage the pipe when the clamping means is released to support the carriage and permit movement of the same along the pipe, a collar rotatably mounted on the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut and bevel the same, a cam member axially slidable on the collar, means operatively connecting the cam member to the cutter, and manually operable means for actuating the cam member to move and maintain the cutter in contact with the pipe.

6. A cutter of the class described having in combination, a movable carriage arranged to be mounted on a pipe, means for releasably securing the carriage to the pipe, a collar rotatably mounted on one end of the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut the same, an annular member slidable on the collar, said member having a cam surface and a substantially flat peripheral portion, a control lever pivotally mounted on the collar and having one end engaging said holder, the opposite end of the lever having a roller journaled thereon and engaging said cam surface, means for rotating the collar and cutter relative to the carriage and pipe, a band encircling said slidable member, means pivotally connecting the band to the flat portion of said slidable member, means on one side of said pivotal connection for movably connecting the band to the carriage, and means on the opposite side of said pivotal connection for actuating the band and the cam member to move and maintain the cutter in contact with the pipe.

7. A cutter of the class described having in combination, a movable carriage arranged to be mounted on a pipe, means for releasably securing the carriage to the pipe, a collar rotatably mounted on one end of the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut the same, an annular member slidable on the collar, said member having a cam surface and a substantially flat peripheral portion, a control lever pivotally mounted on the collar and having one end engaging said holder, the opposite end of the lever having a roller journaled thereon and engaging said cam surface, means for rotating the collar and cutter relative to the carriage and pipe, a band encircling said slidable member, means pivotally connecting the band to the flat portion of said slidable member, said band having a link extending rearwardly therefrom, means movably connecting the link to the carriage, and manually operable means connected to the band on the opposite side of said link for actuating the cam to move and maintain the cutter in cutting contact with the pipe.

8. In combination with a cutter of the class described, a pipe embracing frame including an annular housing through which the pipe axially extends, means for releasably clamping the housing to the pipe, revolubly spaced means on the carriage arranged to engage the pipe when the clamping means is released so as to support the carriage and allow movement thereof on the pipe, a collar rotatably mounted on one end of the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut the same, a cam member axially slidable on the collar, a control lever pivotally mounted on the collar and engaging at one end said holder, means at the opposite end of the lever for feeding the cutter into engagement with the pipe when the cam member is advanced towards the cutter, and manually operable means for actuating the cam member to move and maintain the cutter in cutting contact with the pipe.

9. In combination with a cutter of the class described, a pipe embracing frame including an annular housing through which the pipe axially extends, means for releasably clamping the housing to the pipe, revolubly spaced means on the carriage arranged to engage the pipe when the clamping means is released so as to support the carriage and permit movement thereof on the pipe, a collar rotatably mounted on one end of the carriage, a tool holder movably connected to the collar, a cutter carried by the holder and arranged to be moved into engagement with the pipe to cut the same, a cam member axially slidable on the collar, a control lever pivotally mounted on the collar and engaging at one end said holder, means at the opposite end of the lever for feeding the cutter into engagement with the pipe when the cam member is advanced towards the cutter, and manually operable means connected to one side of the housing for actuating the cam member to control the operation of the cutter.

10. A pipe cutter of the class described having a longitudinally disposed housing into which the pipe to be cut axially extends, releasable clamping means for maintaining the pipe centered

within the housing, and spaced revoluble means mounted on the housing and extending therein to contact with the pipe when the clamping means is released so that the cutter may be moved on the pipe longitudinally thereof.

11. A pipe cutter of the class described having a longitudinally disposed fixed housing into which the pipe to be cut axially extends, a releasable clamping means for maintaining the pipe centered within the housing, said housing having spaced openings extending longitudinally thereof, a roller extending into each of said openings and arranged to contact with the pipe, means for adjustably mounting the roller on the housing, said rollers being arranged to engage the pipe when the clamping means is released so that the cutter may be moved on the pipe longitudinally thereof.

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