Sept. 25, 1923. 1,468,935

W. W. VOSPER

PIPE CUTTING MACHINE

Filed Dec. 31, 1921

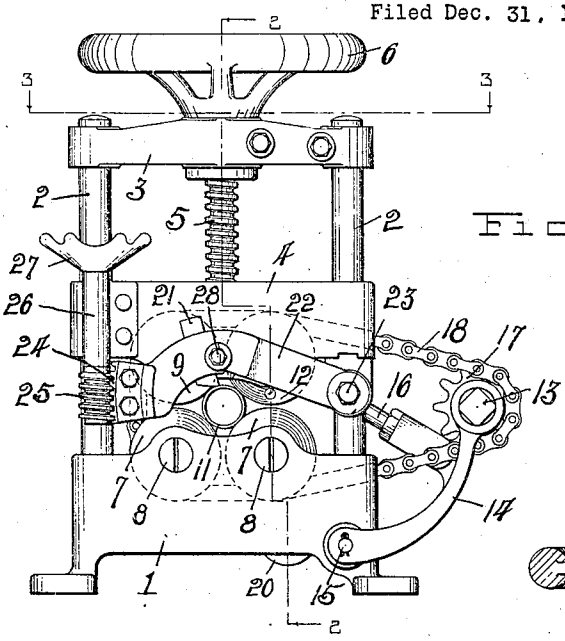


Fig 1.

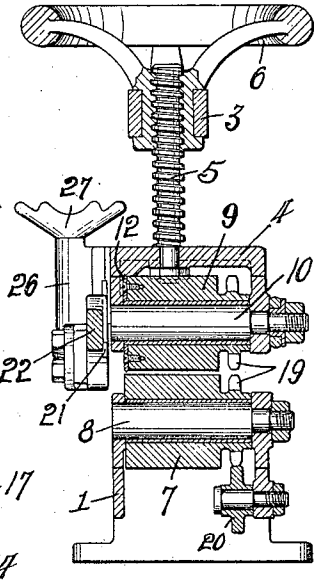


Fig 2.

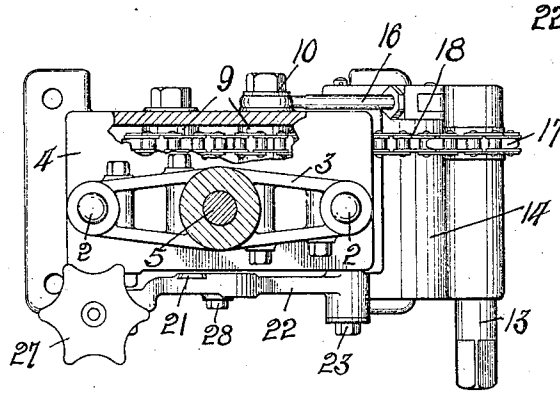


Fig 3.

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UNITED STATES PATENT OFFICE.

WILLIAM W. VOSPER, OF TOLEDO, OHIO, ASSIGNOR TO THE TOLEDO PIPE THREADING MACHINE COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

PIPE-CUTTING MACHINE.

Application filed December 31, 1921. Serial No. 526,131.

To all whom it may concern:

Be it known that I, WILLIAM W. VOSPER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have made an Invention Appertaining to Pipe-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates particularly to pipe cutting machines and has for its object the provision of a simple, strong and inexpensive machine of this character of novel construction and operable to cut a pipe in two in an easy, rapid and efficient manner.

The invention is fully described in the following specification, and while in its broader aspect it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Fig. 1 is a side elevation of a machine embodying the invention with a pipe held in cutting position therein. Fig. 2 is a section on the line 2—2 in Fig. 1, and Fig. 3 is a section on the line 3—3 in Fig. 1, with a portion broken away.

Referring to the drawings, 1 designates the base member of the machine, which member is of hollow form and has a standard 2 rigidly rising from each end thereof. The standards 2 are rigidly connected at their upper ends in spaced relation to the base 1 by a cross-arm or frame-head 3.

A hollow cross-head 4 connects and is guided by the standard for vertical reciprocatory movements between the base and top frame members. A screw 5 is connected at its lower end to the top of the cross-head 4 for free rotary movements relative thereto and extends upward therefrom through a hand-wheel 6, being threaded through the hub of such wheel, which hub is mounted in the frame-head 3 for rotary, but not axial, movements relative thereto, so that a turning of the wheel will impart vertical adjustment to the screw and cross-head.

A pair of rolls 7 is suitably mounted on shafts 8 in transversely spaced relation between the sides of the base member 1, with their axes transverse to such sides, and a similar pair of rolls 9 are suitably mounted on shafts 10, in transversely spaced relation between the sides of the cross-head 4 in parallel relation to the rolls 7 and disposed in position to cooperate with the rolls 7 to grip therebetween a pipe or other circular work-piece 11. One of the rolls of the upper set, in the present instance, is provided with a scoring edge 12 at one end thereof, which is adapted to bite a work-piece to prevent longitudinal movement thereof when rotated. It is evident that an adjustment of the spacing between the upper and lower sets of rolls to accommodate work of different sizes and to facilitate the engaging and releasing of a work-piece is accomplished by a raising and lowering of the cross-heads 4.

A drive shaft 13 is mounted at one end of the machine in a bearing arm 14 which is pivotally connected to the base-frame 1 at 15 for swinging movements in a vertical plane with respect to the frame, whereby the shaft 13 may be moved inward or outward with relation to the rollers 7 and 9. The bearing arm 14 is connected by a link 16 to the cross-head 4, as for instance, to an end of one of the shafts 10 thereof so that a raising of the cross-head with respect to the base 1 will draw the bearing arm inward, and a lowering of the cross-head will force the bearing arm outward. The shaft 13 carries a sprocket-wheel 17 and this is connected by a chain 18 to a sprocket-wheel 19 on the adjacent end of each roll 7 and 9, the chain passing over the sprocket-wheels of the upper set of rolls and down and under the sprocket-wheels of the lower set of rolls. The lower flight of the chain is held in engagement with one of the sprocket-wheels 19 of the lower roll set by an idler wheel 20. One end of the drive shaft 13 is shown as squared to receive a crank for hand turning, or if desired, it may be connected to any suitable motive power. It is evident that if the cross-head 4 is raised the length of projection of the chain 18 laterally from the machine it will be shortened accordingly and it is for this purpose that the bearing arm 14 for the shaft 13 is mounted for swinging movements and is connected by the link 16 to the cross-head, this connection being such that the shaft 13 and its sprocket-wheel 17 are automatically ad-

justed to compensate for any relative adjustment of the upper and lower sets of rolls.

The cutting element of the machine comprises a blade, die or other cutting member 21, which is carried by a vertically adjustable arm 22 in position for the nose of the cutting member to peripherally engage the work in such manner that it will cut therein when the work is turned by the driving action of the rolls 7 and 9. The arm 22 is pivotally mounted at one side of the cross-head 4 on a stud 23 projecting from one end portion of the cross-head so that the arm pivot will have vertical movements with the cross-head. The other end of the arm 22 is provided with a segmental rack 24 which is engaged by a vertically disposed worm 25, the shaft of which is mounted in a bearing 26 secured to a side of the cross-head 4 at the opposite end thereof to the pivot stud 23. The worm shaft has a hand wheel 27 at the upper end thereof and it is evident that a turning of the worm will effect a vertical swinging adjustment of the cutter arm 22. The cutting member 21 is adjustably held to the arm 22 at the inner side thereof by a bolt 28, or in any other suitable manner.

It is evident that I have provided a simple and efficient cutting-off means for pipes or other cylindrical objects; that it may be easily and quickly adjusted to engage work of different diameters; that the driving chain for the work engaging and rotating rolls is automatically adjusted during an adjustment of the rolls for different sizes of work so as to compensate for the relative adjustment of the rolls with respect to the driving means, and that the cutting element is easily adjustable to vary the depth of cut and to suit the size of the work.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and change without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is,—

1. In a machine of the class described, a stationary set of rolls, a second set of rolls for cooperating with the first set to grip a work piece therebetween and to rotate it when the rolls are driven, the second set of rolls being movable toward and away from the first set, means for driving all of the rolls in unison, means connecting the driving means and second set of rolls to automatically adjust the driving means to suit the relation of the two sets of rolls when relatively adjusted, and adjustable cutting means for engaging and cutting a work piece when rotated by the rolls.

2. In a machine of the class described, a stationary frame part, a set of rolls carried by said part, a movable frame part adjustable toward and away from the stationary frame part, a second set of rolls carried by the movable frame part to cooperate with the first set of rolls to hold and rotate a work piece therebetween, means operable to adjust the movable frame part, a drive shaft, chain and sprocket driving connection between the drive shaft and all of said rolls operable to drive the rolls in unison to rotate a work piece engaged thereby, means carrying the drive shaft and automatically adjustable by movements of the movable frame part to adjust the drive shaft to compensate for a relative adjustment of the sets of rolls, and means for engaging and cutting a work piece when rotated.

3. In a machine of the class described, a stationary frame part, guide standards rising therefrom, a cross-head guided by the standards for movement toward and away from the frame part, means operable to adjust the cross-head, separate sets of rolls carried by the frame part and cross-head and adapted to cooperate to hold a work piece and rotate it when the rolls are rotated, means for driving the rolls and automatically adjustable to remain in operative engagement therewith during a relative adjustment of the roll sets, and means for engaging and severing a work piece when rotated by the rolls.

4. In a machine of the class described, two relatively movable frame parts, a set of work gripping rolls carried by each frame part, means for causing relative movement between the frame parts to relatively adjust the roll sets to engage and release and hold work pieces of different diameter, a drive shaft, chain and sprocket driving connection between the shaft and all of the rolls to drive the rolls in the same direction, means carrying the shaft and automatically adjustable by a relative adjustment of the frame parts to take up or let out the chain to suit a relative adjustment of the rolls, and cutting means adjustably carried by one of the frame parts and adapted to sever a work piece when rotated by the rolls.

5. In a machine of the class described, a stationary frame part, guide standards rising therefrom, a cross-head guided by the standards for movements toward and away from the frame part, two sets of cooperating work holding and rotating rolls, one set carried by the frame part and the other by the cross-head, means for adjusting the cross-head, an arm swingingly carried by the cross head in position to extend across a work piece engaged by the rolls, a work cutting element carried by the arm, means for swingingly adjusting the arm to vary its cutting relation to a work piece, and means operable to drive the rolls in unison.

6. In a machine of the class described, a

stationary frame part, guide standards rising therefrom, a cross-head guided by the standards for movements toward and away from the frame part, two sets of cooperating work holding and rotating rolls, one set carried by the frame part and the other by the cross-head, means for adjusting the cross-head, an arm swingingly carried by the cross-head in position to extend across a work piece engaged by the rolls, a work cutting element carried by the arm, means for swingingly adjusting the arm to vary its cutting relation to a work piece, a drive shaft, chain and sprocket driving connection between the shaft and each of the rolls, and means connecting the drive shaft and cross-head to transversely adjust the shaft a predetermined extent for any adjustment of the cross-head.

7. In a machine of the class described, a stationary frame part, guide standards rising therefrom, a cross-head guided by the standards for movement toward and away from the frame part, two sets of work holding and rotating rolls, one set carried by the frame part and the other by the cross-head, means for adjusting the cross-head, adjustable means for engaging and severing a work-piece when rotated by the rolls, a bearing arm swingingly carried by the frame part for movements toward and away from the rolls transversely thereof, a drive shaft carried by said bearing arm, chain and sprocket connection between the drive shaft and several rolls to drive the rolls in unison and in the same direction from the drive shaft and connection between the cross head and bearing arm to move inward an extent proportional to any outward movement of the cross-head, and vice versa.

In testimony whereof I have hereunto subscribed my name to this specification.

WILLIAM W. VOSPER.