

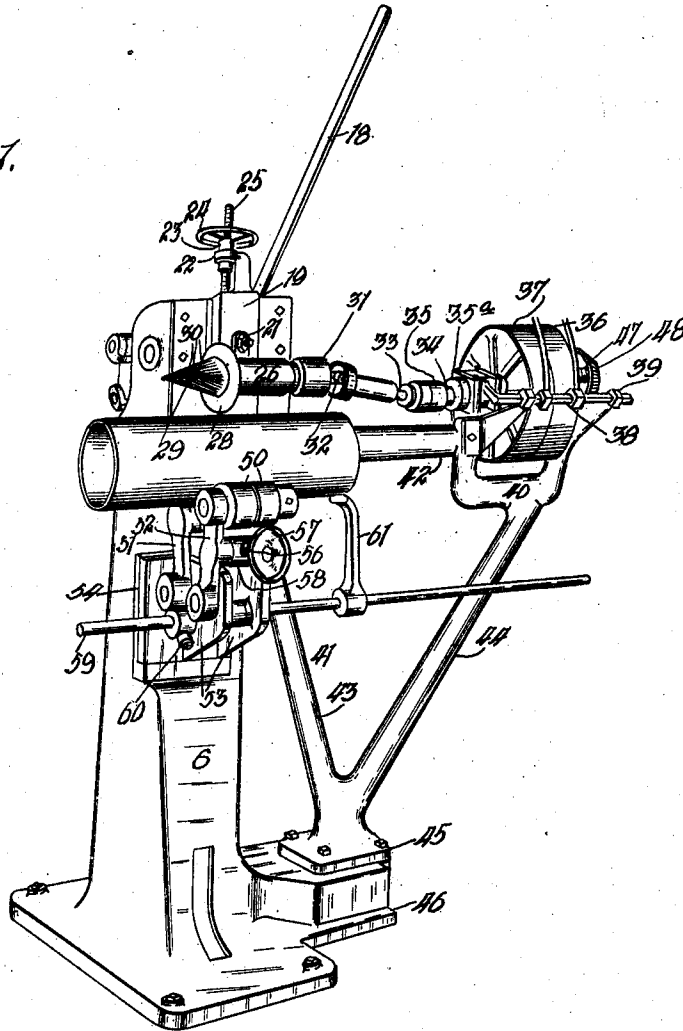
K. MATHEUS.
TUBE CUTTER AND BEAMER.
APPLICATION FILED MAY 25, 1909.

963,610.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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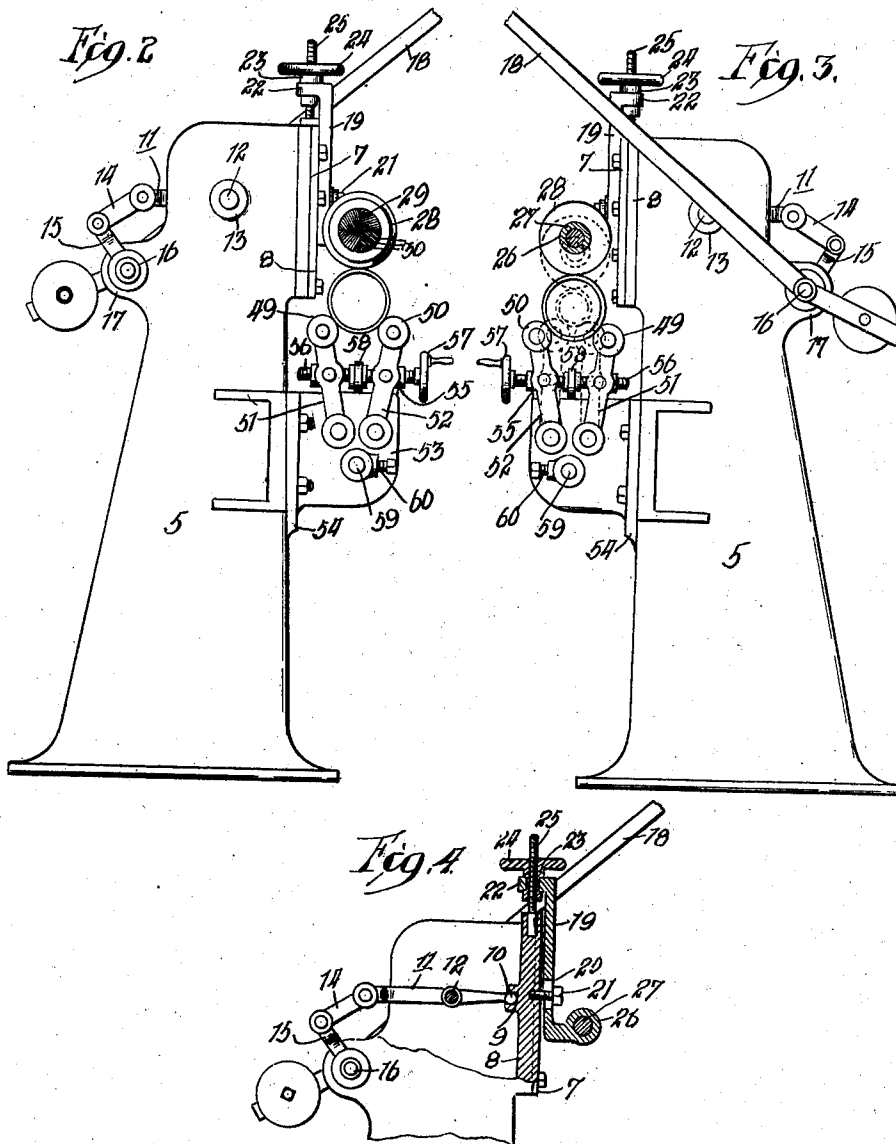
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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

KARL MATHEUS, OF CHICAGO, ILLINOIS.

TUBE CUTTER AND REAMER.

963,610.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed May 25, 1909. Serial No. 498,265.

To all whom it may concern:

Be it known that I, KARL MATHEUS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tube Cutters and Reamers, of which the following is a specification.

This invention relates to a tube cutter of the type ordinarily employed in cutting off and thereafter reaming out sections of tubes or pipes; and the object of the invention is to so mount and arrange the cutter shaft and the supporting rollers that they may be adjusted to act upon tubes or pipes of widely different sizes, without difficulty in making the adjustments necessary, thereby increasing the adaptability of the machine for use under different conditions.

The invention further relates to the means provided for raising and lowering the cutter, without interfering with its continuous rotation; to the means for adjusting the supporting rollers; to the formation and arrangement of the reamer; and to the machine as a whole and the individual parts thereof.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of the machine as a whole; Fig. 2 a side elevation of one side of the machine; Fig. 3 a side elevation of the other side of the machine; and Fig. 4 a sectional elevation of the upper portion of the machine, showing the lever mechanism for operating the slide plate.

The machine is built into a frame of square column formation, comprising side walls 5 and a front cross wall 6. The front cross wall is provided, near its upper end, on each side, with guideways 7, between which is mounted a vertically movable slide plate 8 provided, on its rear side, with a socket boss 9, recessed to afford a mounting for the rounded forward end 10 of a shifting lever 11, the arrangement being in the form of a ball and socket joint. The shifting lever is fulcrumed on a transversely extending fixed shaft 12, the ends of which are supported within bosses 13 in the side walls of the frame. The rear end of the shaft has pivoted thereto a link 14, which in

turn is pivoted to the end of a crank arm 15 which outwardly projects from a rock shaft 16, the ends of which are journaled through ears 17 rearwardly projecting from the side walls 5, at a point slightly below the plane of the fixed shaft 12. The rock shaft 16 is operated by means of a counterweighted hand lever 18, which is keyed or otherwise rigidly secured to one end of the shaft and projects diagonally forward and upward in position to be easily engaged by the hand of the operator.

The slide plate 8 carries an adjustable journal plate 19 provided, in its center, with a slot 20 which receives a headed bolt 21 entered into the outer face of the slide plate; and the upper end of the adjustable journal plate is provided with an inturned lug 22, which journals the hub 23 of a hand wheel 24 threaded onto a fixed screw 25 which upwardly projects from the top of the slide plate. The arrangement is one which permits the journal plate to be vertically adjusted by the rotation of the hand wheel to regulate its position with respect to the slide plate upon which it is carried. The journal plate serves as a mounting for a transversely extending journal sleeve 26, through which extends a cutter shaft 27 having, on its forward end, a disk cutter 28, and mounting, on its extreme end, a cone-shaped reamer 29, the teeth 30 of which are arranged in four segments, as best shown in Fig. 2. A single tooth only of each segment extends to the apex of the cone, and the remaining teeth are arranged at an angle with and merge into the radially extending tooth of the next adjacent set of teeth. The opposite end of the cutter shaft carries a tubular shaft section 31, which is connected with the cutter shaft by means of a universal joint 32, which tubular shaft section receives the end of a driving shaft section 33, which is telescoped and splined into the tubular shaft section and is connected with a power shaft 34 by means of a universal joint or coupling 35—the arrangement being one which permits the slide plate to be raised and lowered and the shaft sections 31 and 33 to be shifted to different degrees of angularity with respect to the power shaft, without loss of rotative effort. The power shaft is mounted within journal boxes 35 and carries fast and loose pulleys 36 and 37, respectively, adapted to receive a belt which can be shifted by means of a belt shifter 38,

which is slidably mounted through ears 39 on a bracket head 40 which forms parts of a triangular bracket 41, comprising a horizontal bar 42 and inner and outer supporting bars 43 and 44, respectively, which merge together into a plate 45 supported upon the base 46 of the main frame. The outer end 47 of the shaft 34 is threaded to receive a reamer 48, which is in the form of a truncated cone and is adapted to bevel out the end of a section of tubing in form to receive the end of another section in preparation for a welding of the two sections together.

15 The cutting disk coöperates with inner and outer supporting rollers 49 and 50, respectively, which rollers are journaled between a pair of inner bracket arms 51 and a pair of outer bracket arms 52, the lower ends of which arms are pivoted to the sides of bracket plates 53 which unite in a base plate 54, bolted or otherwise secured to the front face of the machine frame at a suitable distance below the mounting for the slide plate.

20 The upper ends of the bracket arms extend above the bracket plates 53, and between each pair of arms is swiveled a screw block 55, through which blocks is entered a right and left screw 56 provided with a hand wheel 57, and the screw is entered through a lug 58 located intermediate the front and rear bracket arms, which lug serves as a journal mounting for the right and left screw and serves to prevent longitudinal movement thereof. Below the bracket arms is located a transversely adjustable rod 59, which passes through the bracket plates 53, and is adapted to be held in adjustable position by means of a set screw 60, which rod carries a supporting arm 61 adapted to serve as a gage for the end of the pipe or tube being acted upon.

In use, the end of the pipe or tube to be cut is laid upon the rollers 49 and 50, which are thereafter adjusted by means of a hand wheel to bring the surface of the pipe or tube into close proximity or actual contact with the disk cutter, the normal vertical elevation of which can be likewise adjusted by means of the hand wheel 23. Thereafter, when the parts are adjusted to the best position to act upon a pipe or tube of a given diameter, the cutting operation will be performed by depressing the hand lever, which operates the slide plate, in order to apply the necessary pressure to enable the disk cutter to perform its cutting operation. When the hand lever is thereafter released, it will be returned to its normal position, and the disk cutter thrown out of contact with the pipe or tube by the action of the counterweight. The toggle and lever arrangement is one which enables a very heavy pressure to be put upon the disk cutter. This is true by reason of the length of the long

hand lever as compared with the crank member 15 and the character of the toggle connection which transmits a movement to the operating lever 11. With the cutter adjusted to the proper position, it will only be necessary to impart a slight degree of movement to the cutter in order to perform the cutting operation. After the cutting operation, any bur which may be formed around the cut end of a pipe or tube can be removed by the action of the reamer 29, the teeth of which are so arranged as to quickly and smoothly remove the bur from the freshly cut end of the pipe or tube. Where it is desired to bevel the cut end of a pipe or tube, this operation can be performed by the reamer 48 which is designed for heavy work, especially on tube sections of large diameter, and is so mounted on the driving shaft that it will receive the direct impetus of the fast pulley thereon, without transmission through jointed bearings. By locating the reamer at the point indicated, the universal jointed transmission shaft sections are relieved from the strain of a heavy operation, and at the same time provision is made for the class of work specified.

It will be seen from the foregoing description that the machine is one which is well adapted for performing reaming and cutting operations of the class described, and that the machine is so constructed and arranged that it can be readily adjusted to meet widely varying conditions.

What I regard as new and desire to secure by Letters Patent is:

1. In a machine of the class described, the combination of a slide plate, a cutter journaled to the slide plate, a main driving shaft, a universal connection between the cutter and the main driving shaft, means for moving the slide plate toward and from the work, and a support for the work having an oscillating adjusting movement toward and from each other and toward and from the cutter.

2. In a machine of the class described, the combination of a slide plate, a cutter journaled to the slide plate, a main driving shaft, a universal connection between the cutter and the main driving shaft, means for moving the slide plate toward and from the work, a support for the work, in the form of a pair of rollers, each journaled on a swinging bracket, and means for moving the brackets in unison toward and from one another, for adjusting the position of the work.

3. In a machine of the class described, the combination of a slide plate, a cutter journaled to the slide plate, a main driving shaft, a universal connection between the cutter and the main driving shaft, means for moving the slide plate toward and from the work, a support for the work, in the form of a pair of rollers, each journaled on a swing-

ing bracket, and means for moving the brackets in unison toward and from one another, for adjusting the position of the work, said means being in the form of a right and left hand screw, substantially as described.

4. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, means for rotating the cutter, and a support for the work having an oscillating adjusting movement toward and from each other and toward and from the cutter, substantially as described.

5. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, a main driving shaft, a universal connection between the cutter and the main driving shaft, and a support for the work, substantially as described.

6. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, means for rotating the cutter, a support for the work, in the form of a pair of rollers, each journaled on a swinging bracket, and means for moving the brackets in unison toward and from one another, for adjusting the position of the work.

7. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, a main driving shaft, a universal connection between the cutter and the main driving shaft, a support for the work, in the form of a pair of rollers, each journaled on a swinging bracket, and means for moving the bracket in unison toward and from one another, for adjusting the position of the work, said means being in the form of a right and left hand screw, substantially as described.

8. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, means

for rotating the cutter, a support for the work having an oscillating adjusting movement toward and from each other and toward and from the cutter, a hand lever, and a toggle connection between the slide plate and the hand lever, for raising and lowering the former, substantially as described.

9. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, a main driving shaft, a universal connection between the cutter and the main driving shaft, a support for the work, a hand lever, and a toggle connection between the slide plate and the hand lever, for raising and lowering the former, substantially as described.

10. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, means for rotating the cutter, a support for the work, in the form of a pair of rollers, each journaled on a swinging bracket, means for moving the brackets in unison toward and from one another, for adjusting the position of the work, a hand lever, and a toggle connection between the slide plate and the hand lever, for raising and lowering the former.

11. In a machine of the class described, the combination of a slide plate, a journal sleeve adjustably mounted on the slide plate, means for raising and lowering the slide plate, a cutter journaled in the sleeve, a main driving shaft, a universal connection between the cutter and the main driving shaft, a support for the work, in the form of a pair of rollers, each journaled on a swinging bracket, means for moving the brackets in unison toward and from one another, for adjusting the position of the work, said means being in the form of a right and left hand screw, a hand lever, and a toggle connection between the slide plate and the hand lever, for raising and lowering the former, substantially as described.

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Witnesses:

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