

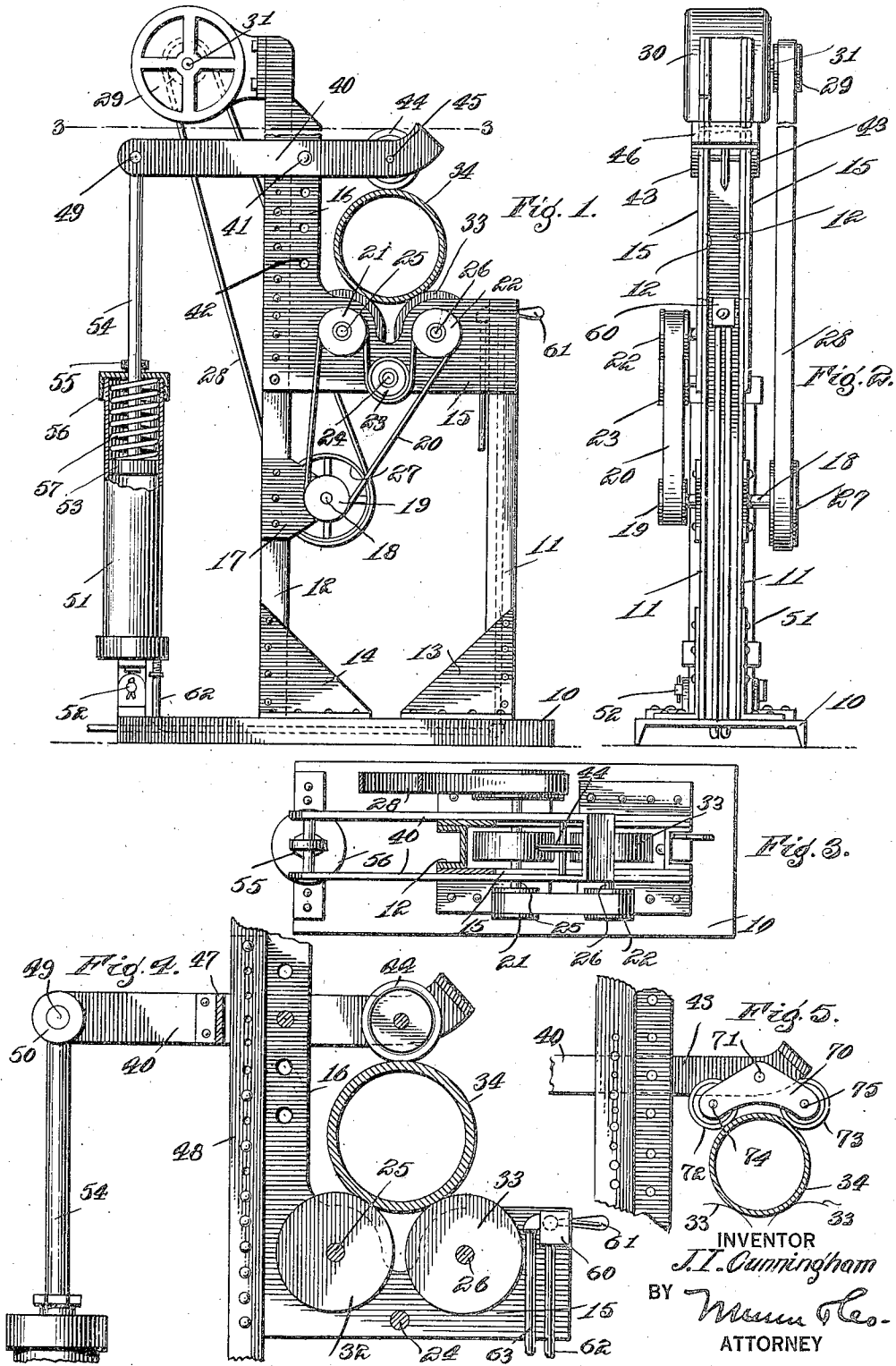
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BOILER FLUE AND PIPE CUTTER

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BOILER FLUE AND PIPE CUTTER

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This invention relates to a device for cutting flues and pipes.

In boiler shops it is necessary to cut off that portion of the boiler flue which has become thin due to repeated rollings when an end of the flue is being enlarged. The enlarged portion of the flue is adapted to be inserted through openings in the flue sheet of the boiler in order to provide for a leak proof connection. When it is found that one of the sections is too thin for use, it is removed and a section of the same length is welded to the flue pipe in order to reclaim that portion of the pipe which is capable of further use.

In the present method of cutting off the thin sections of the flue pipes circular knives are employed for not only cutting the pipe but for rotating the same. The contact of the knife with the flue in this instance is of such a slight character that the knife slips during several revolutions before it secures sufficient traction to cause rotation of the flue thereby causing unnecessary delay in the work and requiring the continual replacement of the knives.

An object of the present invention is the provision of a device for cutting flue pipes in which the knives are brought into contact with the pipe when being revolved by means which is positively rotated while the knives are revolved by the rotating pipe or flue.

Another object of the invention is the provision of a pipe cutter in which the pipes are supported by revolving rollers which cause rotation of the pipe and in which a plurality of rotatable knives are carried by an equalizer mounted in a yoke, said yoke being reciprocated for causing the knives to be moved in contact with the revolving pipe.

A further object of the invention is the provision of a pipe cutter in which a circular knife is moved into contact with a revolving pipe adapted to be cut, a motor being employed for causing operation of a rotating means for the pipe, revolving means being manually actuated for causing the cutter to operatively engage the pipe.

This invention will be best understood from a consideration of the following de-

tailed description in connection with the accompanying drawings; nevertheless, it is to be understood that the invention is not confined to the disclosure being susceptible of such changes and modifications as shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 is a side view in elevation of a pipe and flue cutter constructed according to the principles of my invention,

Figure 2 is an end view of the same,

Figure 3 is a horizontal section taken along the line 3—3 of Fig. 1,

Figure 4 is an enlarged fragmentary vertical section of a detail of a pivoted support for cutters,

Figure 5 is a fragmentary vertical section of a pipe and flue cutter showing a modified form of the support for the cutters.

Referring more particularly to the drawings, 10 designates a base member from which rises a pair of standards 11 and a pair of standards 12 in line with the pair of standards 11. Reinforcing plates 13 and 14, respectively, are secured to the lower ends of the standards 11 and 12, and also to the base member 10. A pair of plates 15 are secured to the upper ends of the standards, and each plate has a portion 16 rising above the body of the plates 15.

Brackets 17 are secured to the side faces of the standards 12 and provided with bearings which support a shaft 18. A pulley 19 is secured to the shaft 18 around which is trained a belt 20. This belt is trained around pulleys 21, 22 and 23. The pulley 23 is rigid with a shaft 24 mounted in bearings which are supported by the plates 15. Pulleys 21 and 22 are respectively fixed to shafts 25 and 26. The shaft 18 is driven by means of a pulley 27, a belt 28, a pulley 29, and a motor 30. A shaft 31 driven by the motor 30, drives the pulley 29.

A roller 32 is secured to the shaft 25 in any approved manner and is normally located between the plate to support, in connection with a roller 33, a pipe or flue 34.

The roller 33 is secured to the shaft 26 in any approved manner.

Lever 40 is pivotally mounted on a pin 41 which may be placed in any one of a plurality of perforations 42 formed in the extensions 16 of the plates 15. The lever 40 is U-shaped, thereby having a pair of arms 43 between which are adapted to be received a rotary cutter 44 mounted on a shaft 45 which is carried by the arms 43 of the lever 40. The ends of the arms adjacent the cutter 40 are connected together by a bridging member 46. One end of the arms is provided with a stop 47 which is adapted to engage the rear edge 48 of one of the standards 12 to limit the upward and downward movement of the lever 40. The outer end of the lever 40 is provided with a pin 49 upon which is mounted a sleeve 50.

An air cylinder 51 is pivotally supported at 52 on the base member 10, and in which is adapted to be reciprocated a piston 53 connected with a piston rod 54 moving through a stuffing box 55 of the head 56 of the cylinder. The outer end of the piston rod is secured to the sleeve 50. A coil spring 57 is located in the cylinder 51 and between the piston 53 and the head 56 which will move the piston to the lower end of the cylinder when air has been released, as will be presently explained.

The three way valve box 60 is supported by standards 11 and a valve handle 61 projects laterally therefrom for controlling the valve in the box. An inlet pipe 62 connects the valve box with the bottom of the cylinder 51. An exhaust pipe 63 connects said box with the atmosphere. A pipe 34 is connected with a source of compressed air or is connected with the box 60.

In the modified form shown in Fig. 5, an equalizing bracket 70 is pivotally mounted at 71 between the arms 43 of the lever 40. The bracket has oppositely disposed extensions for rotatably supporting cutters 72 and 73, respectively mounted on axles 74 and 75.

The operation of my device is as follows:

The pipe 34 is placed on the rollers 32 and 33 and the motor is placed in circuit with the usual house current, whereby it will drive the rollers 32 and 33 through the various instrumentalities previously described. When the speed of rotation of the pipe 34 is sufficient, the lever 61 is operated to a position where the compressed air will be supplied to the cylinder 51 whereby the piston 53 will be elevated against the tension of the spring 57. The lever 40 is then rocked moving the cutter 44 into operative engagement with the revolving pipe 34.

In the case of the construction shown in Fig. 5, the lever 40 moves the cutters 72 and 73 into engagement with the pipe 34, while

the bracket 70 will cause said cutters to be applied with equal pressure to several points on the pipe.

When the operation has been completed the lever 61 is moved to an inoperative position, whereby the compressed air from the cylinder 51 will be exhausted through the pipe 63.

The equalizing member 70 will cause both blades 72 and 73 to exert an even pressure on the pipe 34 so that the cutting action will be properly distributed. The rollers 32 and 33 engage the pipe 34 at a point where the pipe is being cut so that the rough edges caused by the cutting may be displaced or removed during the cutting action.

Where different sizes of pipes or flues are to be cut, the horizontal position of the lever 40 may be varied by removing the pin 41 and placing it in that perforation 42 which will cause the cutter 44 or cutters 72 and 73 to properly engage the pipe when the lever 40 is in substantially horizontal position. Where compressed air is not available, a foot pedal may be employed and connected in such a manner to the lever 40 that it will oscillate said lever for causing the cutter blade or blades to be moved into engagement with the pipe.

I claim:—

1. A pipe cutter comprising a frame, a cutter arm pivotally and adjustably mounted on the frame, a bracket swingably mounted from the arm, a pair of spaced cutters rotatably supported at the free end of the bracket, rollers for supporting a pipe to be cut, means for rotating the rollers, and means for causing oscillation of the cutter arm for forcing the cutter into operative relation with a pipe.

2. A pipe cutter comprising a frame, a cutter arm pivotally and adjustably mounted on the frame, a bracket swingably mounted from the arm, a pair of spaced cutters rotatably supported at the free end of the bracket, rollers for supporting a pipe to be cut, means for rotating the rollers, a cylinder, a piston movable in the cylinder, a spring tending to move the piston in one direction, a source of compressed air in communication with one end of the cylinder, a valve for controlling the supply of compressed air to the cylinder, a rod connected between the piston and the other free end of the cutter arm.

3. A pipe cutter comprising a base member, pairs of standards secured to the base member, one pair of standards having greater length than the other pair, plates secured to the adjacent sides of the standards, said plates being provided with aligned perforations, a pin received by aligned perforations in the plates, a lever pivotally mounted on the pin, a roller cutter mounted for rotation at one end of the lever, and

means for oscillating the other end of said lever, rollers located adjacent the cutter and adapted to support a pipe to be cut, means carried by the frame for causing rotation of the rollers, said lever being U-shaped and including a pair of arms located adjacent the outer faces of the plates.

4. A pipe cutter comprising a frame, a cutter arm pivotally mounted on the frame, an equalizing means swingably depending from one end of the cutter arm, cutters rotatably mounted on the equalizing means in spaced relation, rollers located adjacent the equalizing means for supporting a pipe to be cut, means for rotating the rollers, and means for causing reciprocation of the lever for forcing the cutters into operative relation with a pipe.

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