

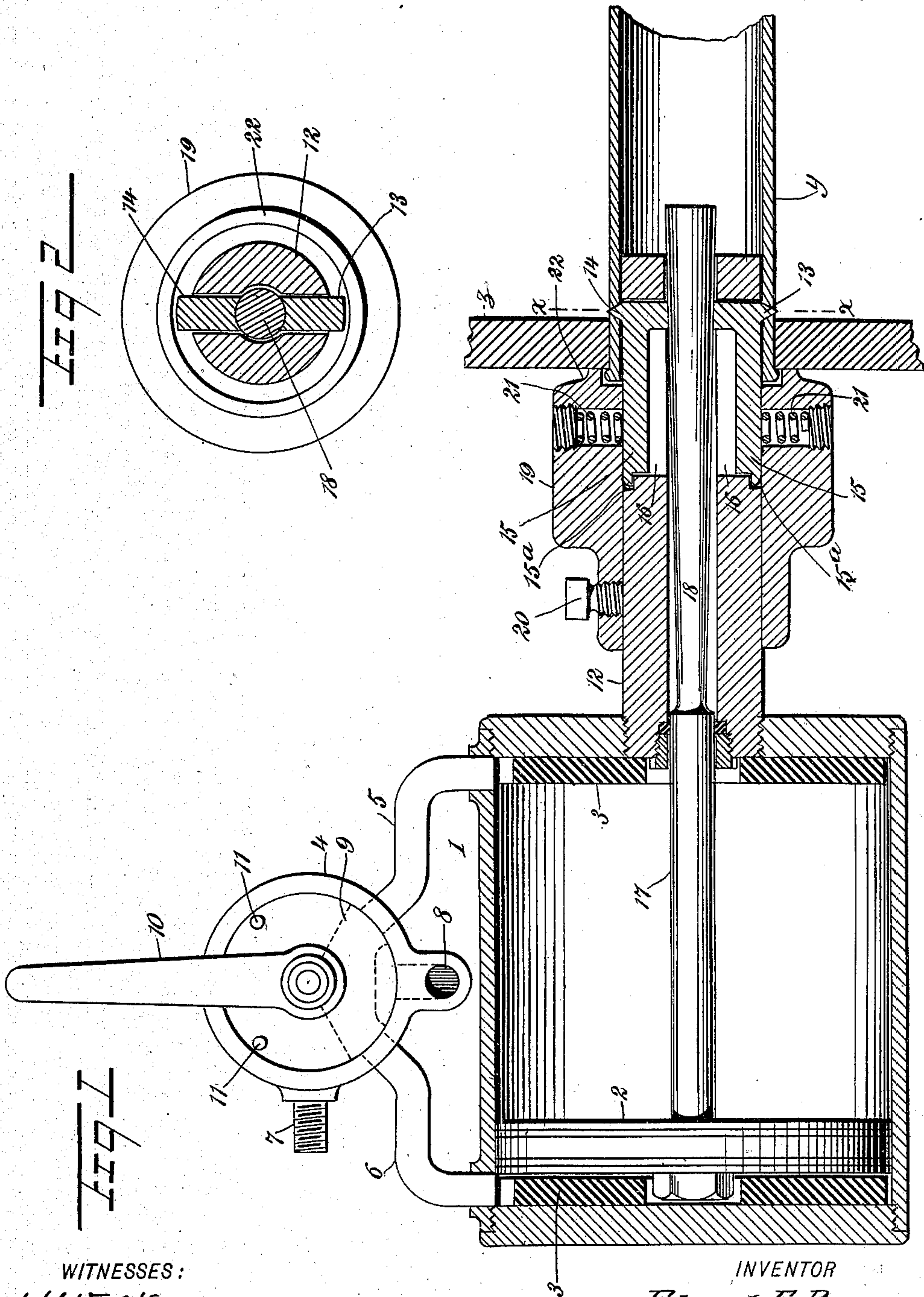
No. 723,025.

PATENTED MAR. 17, 1903.

E. E. RESOR.
FLUE CUTTER.

APPLICATION FILED FEB. 26, 1902.

NO MODEL.



WITNESSES:

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EDWARD E. RESOR, OF VANWERT, OHIO.

FLUE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 723,025, dated March 17, 1903.

Application filed February 26, 1902. Serial No. 95,711. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. RESOR, a citizen of the United States, and a resident of Vanwert, in the county of Vanwert and State of Ohio, have invented a new and Improved Flue-Cutter, of which the following is a full, clear, and exact description.

This invention relates to improvements in devices for cutting boiler flues or tubes at the inner side of the flue-sheets; and the object is to provide a device of this character by means of which a flue may be quickly cut with very little exertion on the part of the operator and by means of which shock incident to hammer-actuated cutters is avoided.

I will describe a flue-cutter embodying my invention and then point out the novel features in the appended claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both figures.

Figure 1 is a longitudinal section of a flue-cutter embodying my invention, and Fig. 2 is a section on the line *x x* of Fig. 1.

This cutter is operated or forced through the metal of the tube by the action of air-pressure, and it therefore comprises a cylinder 1, in which a piston 2 operates; and to prevent damage to the piston at the ends of its stroke or to the cylinder-heads I place against the inner surface of each head a cushion 3, of rubber or the like. From a valve-casing 4 port-tubes 5 6 lead into opposite ends of the cylinder. The valve-casing 4 has an inlet 7 for compressed air and an exhaust 8. A valve 9 is arranged to have rocking movement in the casing, so as to direct air into one of the ports, while the exhaust is through the other port and through the exhaust or outlet 8. The stem of the valve extends outward through a wall of the casing and has attached to it an operating-lever 10, which is limited in its movement in opposite directions by means of pins 11. Extended from the cylinder is a tube 12, the end of which is designed to be inserted in the flue to be cut, and movable radially with relation to this tube 12 are the cutters 13 14. These cutters have stem portions 15, which extend into outwardly-opening slots 16, formed in the opposite sides of the tube 12.

It may be here stated, however, that while I have shown but two cutters a greater number may be employed. The cutters have a swinging motion, caused by the lips 15^a engaging loosely in recesses in the tube 12. The valve-stem 17 has a tapered portion 18, the larger diameter being at the outer end, and this tapered portion is designed, by engaging against the inner ends of the cutters, to force said cutters outward when the piston is moved in one direction. After placing the cutters in position in the tube 12 they are held or prevented from dislodgment by means of a collar 19, extending around the tube 12 and secured by any suitable means. I have here shown a set-screw 20 for this purpose. Springs 21, arranged in openings in the collar 19, bear against the shank portions 15 of the cutters and are designed to move the said cutters inward, as will be hereinafter described. The end of the collar 19 is provided with an annular flange 22 for engaging around the flange at the outer end of the flue *y* and for engaging or forming an abutment against the sheet *z*.

In operation when the valve-stem is in its outermost position the cutters will be moved inward by means of the springs 21, so that their cutting edges are flush with the outer surface of the tube 12. Then by inserting the end of the tube 12 into the flue to a point to bring the cutters against the flue at the inner side of the flue-sheet the motive agent is admitted through the tube or port 5. This of course will force the piston 2 rearward, and the tapered portion 18 of the valve-stem will force the cutters outward, quickly cutting through the pipe at opposite sides. Then upon reversing the valve-9 air will be admitted through the tube or port 6, forcing the piston in the opposite direction, the exhaust taking place through the port 5 and the exhaust 8. During this movement the springs 21 will force the cutters inward or toward each other, so that the tool can be rotated slightly to bring the cutters into new position adjacent to the holes or openings to be made. Then the valve is again turned to cause an operation of the piston to force the cutters outward.

It is obvious that with a tool embodying my invention the cutters are steadily moved

outward with continuous motion, resulting in an even and clean cut, while with tools in which the tapered pin is forced inward by hammer - blows the cutting is intermittent
5 and the cutters are forced lengthwise of the tube, making a ragged cut. It will be noted that the lesser diameter of the stem 18 is toward the piston, and therefore the cutters are moved outward by a drawing movement
10 of the stem, which holds the end of the collar 19 tightly against the flue-sheet, so that the machine practically holds itself in place while operating.

Having thus described my invention, I
15 claim as new and desire to secure by Letters Patent--

In a flue-cutter, the combination with a cylinder for receiving a motive agent, a piston

and a tapered piston-stem, of a tube extended from one end of the cylinder and in which the
20 stem operates, the said tube having outwardly-opening slots and recesses, cutters having shank portions arranged in said slots and engaged by the piston-stem, lips on said
25 shanks for engaging in the recesses, a collar around the tube, and springs in the collar engaging with the shanks, substantially as specified.

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

EDWARD E. RESOR.

Witnesses:

E. S. MATTHIAS,
GEORGE RICE.