(No Model.)

C. O. THIEME.

DEVICE FOR CUTTING BOILER TUBES.

No. 516,459. Patented Mar. 13, 1894.

Fig. 1

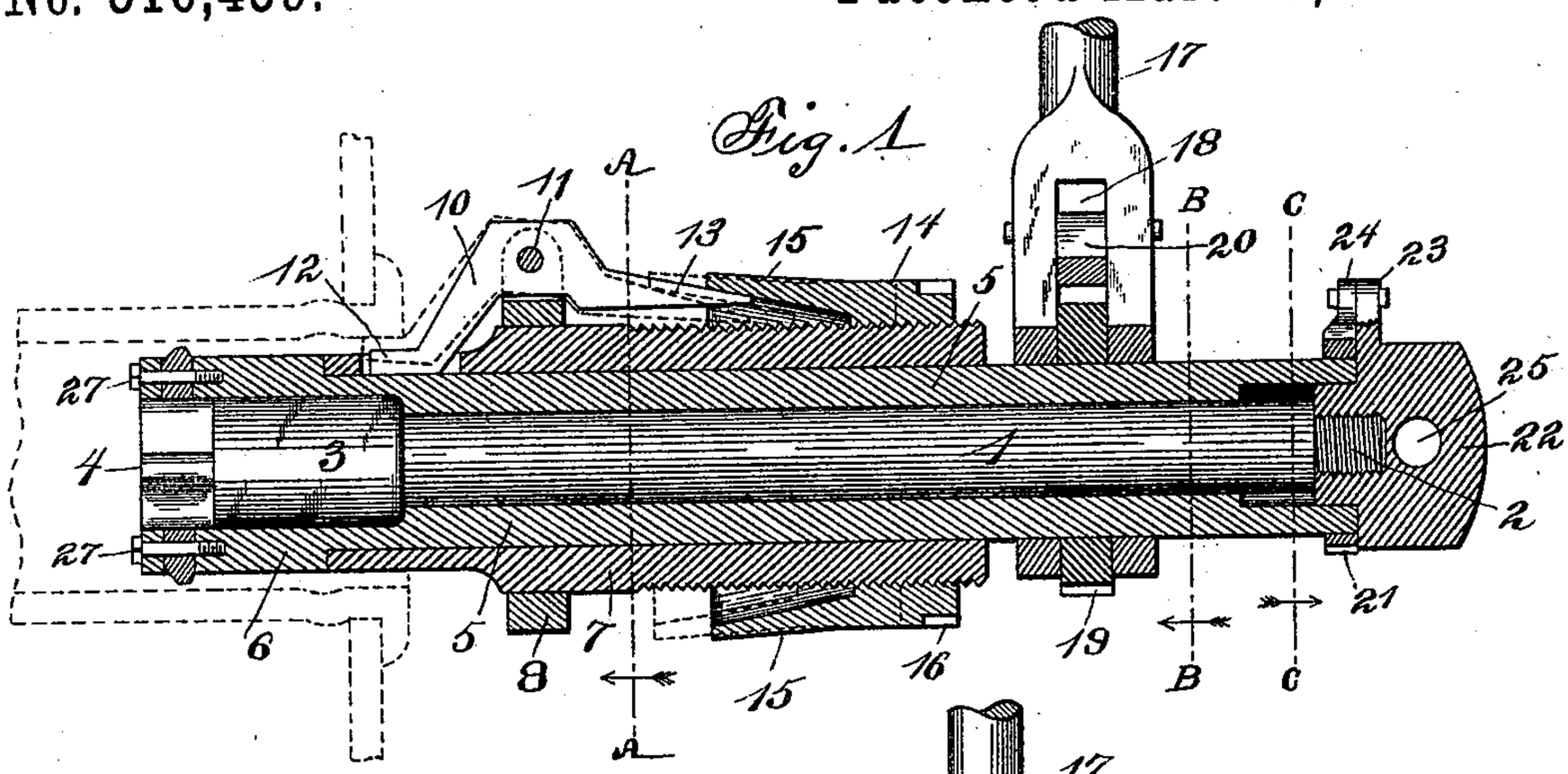


Fig. 2

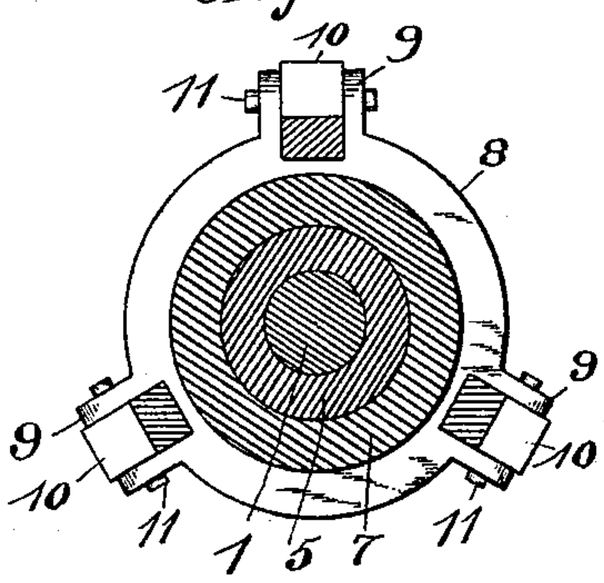


Fig. 3

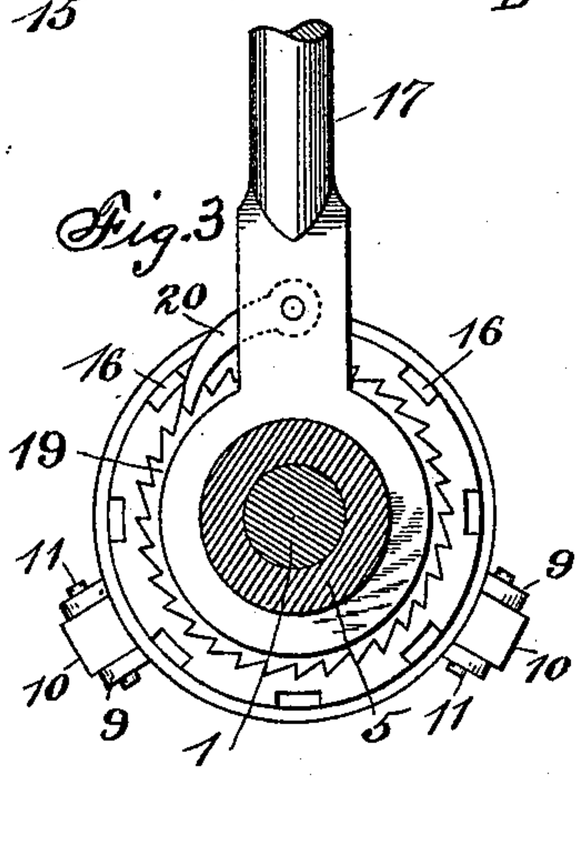


Fig. 4

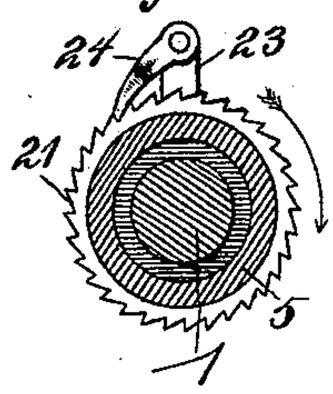


Fig. 5

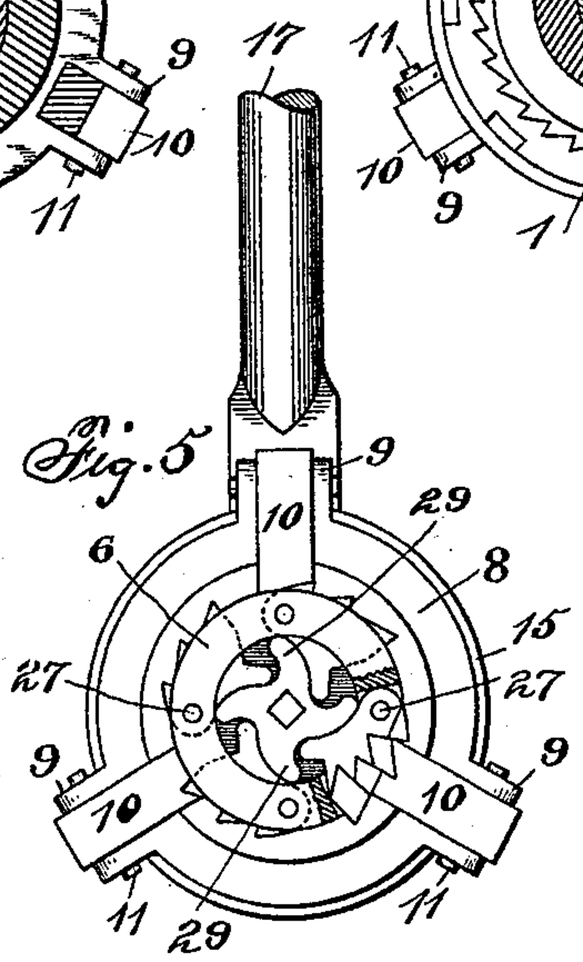
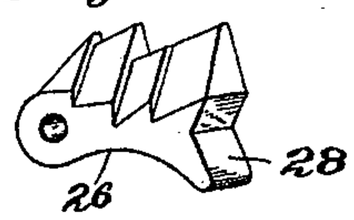


Fig. 6.



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CARL OTTO THIEME, OF ST. LOUIS, MISSOURI.

DEVICE FOR CUTTING BOILER-TUBES.

SPECIFICATION forming part of Letters Patent No. 516,459, dated March 13, 1894.

Application filed July 24, 1893. Serial No. 481,307. (No model.)

To all whom it may concern:

Be it known that I, CARL OTTO THIEME, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Devices for Cutting Boiler-Tubes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improvement in a "device for cutting boiler tubes" and consists in the novel arrangement, combination and construction of parts as will be more fully hereinafter described and designated in the claims.

The object of my invention is to provide an improved device for cutting off the tubes of steam boilers while they are in position in the boiler, whereby worn, or otherwise defective tubes may be readily cut at each end closely adjacent each head of the boiler and quickly removed.

In the drawings: Figure 1 is a central longitudinal sectional view of my invention. Fig. 2 is a section on the line A—A of Fig. 1, looking in the direction indicated by the arrow. Fig. 3 is a sectional view taken on the line B—B of Fig. 1 looking in the direction indicated by the arrow. Fig. 4 is a sectional view taken on the line C—C of Fig. 1 and looking in the direction indicated by the arrow. Fig. 5 is a front end elevation of my invention, showing the inner end thereof a portion being broken away to more clearly exhibit the parts thereof. Fig. 6 is a perspective view of a cutter which I use in carrying out my invention.

1 indicates a shaft upon the outer end of which is formed a lug or projection 2 which is screw threaded on its outer periphery. Formed on the other or inner end of said shaft is an enlarged portion 3. Formed on or connected to the enlarged portion 3 is a star-wheel 4 for the purpose hereinafter mentioned.

5 indicates a cylindrical casting with an enlarged portion 6 formed on its inner end. Mounted on the cylindrical casting 5 is another cylindrical casting 7. A portion of the outer surface of said casting is screw-threaded. The inner end of the casting 7 is somewhat smaller than the screw-threaded portion to conform with the enlarged portion 6 of the casting 5. Fixed to the casting 7 adjacent to its small inner end is a ring 8 and located in pairs in a relatively triangular position, and formed on the ring 8 are ears 9.

10 indicates three locking devices preferably made of cast iron pivoted at about their centers to the ears 9 by means of pins 11. The inner ends of the locking devices 10 project downward at an angle of about thirty degrees and inwardly to form a nose 12 for the purpose hereinafter stated. The other or outer end of the locking devices 10 projects downward and outward from its bearings a suitable distance to form an arm or lever 13, the end of which engages the interior of the conical portion 15. The collar 14 is screw-threaded on its inner periphery to engage the screw threads on the cylindrical casting 7. Formed on the collar 14 adjacent its inner end is a conical portion 15 for the purpose of engaging the arms or levers 13 of the locking devices 10. Formed on the outer periphery of the collar 14 adjacent to its outer end are notches 16 for the purpose of allowing the wrench to be applied to turn the collar and the conical portion.

17 indicates a handle which has a slot or opening 18 formed in its lower end. Placed in said opening and connected to the casting 5 is a ratchet wheel 19. Placed in the upper end of the slot or opening 18 and pivoted to the handle is a pawl 20 for the purpose of engaging the ratchet wheel 19. Formed on or fixed to the outer end of the cylindrical casting 5 is another ratchet wheel 21.

22 indicates a cap which is connected to the shaft 1 by being screwed to the lug or projection 2 of said shaft. Formed on the cap 22 is an ear 23 for the purpose of supporting a pawl 24, said pawl being constructed to engage the ratchet wheel 21 for the purpose hereinafter mentioned. Formed in the cap 22 is a hole or aperture 25 to allow a handle or rod to be inserted to turn said cap, the handle not being shown.

26 indicates a series of cutters located in the enlarged portion 6 of the casting 5 and held in position by screws 27. Formed on each lower edge of the cutter 26 at the opposite end from its pivotal point is a projection 28 for the purpose of engaging the points 29 of the star wheel 4.

The operation is as follows: To apply my invention to a boiler-flue, the end which carries the cutters is inserted in the flue as shown in Fig. 1, the flue being in dotted lines. The operator applies a wrench to the notches 16 in the collar 14 and screws the collar up as shown in dotted lines in Fig. 1. The conical portion 15 being integral with the collar also moves up; by so doing it pushes down simultaneously on all the arms or levers 13 which raises the opposite end thereof and brings the nose in engagement with the interior of the flue as shown in dotted lines in Fig. 1, thus forming a bearing for the cylindrical casting 5. Then the operator inserts a handle in the opening 25 of the cap 22 and turns it in the direction shown by the arrow in Fig. 4. The pawl 24 being connected to said cap and in engagement with the ratchet wheel 22 prevents it from moving back and holds it in the required position. By the cap 22 being connected to the outer end of the shaft 1 and the star wheel being connected to the inner end of said shaft the star wheel will also turn. The points 29 of the star wheel being in engagement with the projections 28 on the cutters 26 will cause them to move upon their pivotal points, thus engaging the inner surface of the boiler flue. By the operator oscillating the handle it will rotate the ratchet wheel 19 in the required direction. The ratchet wheel 19 being connected to the cylindrical casting 5 it will also be rotated, thus causing the cutters to turn and their being held against the flue by the star wheel will cause them to cut said flue. When they cease to cut the operator turns the cap a little farther which turns the star wheel and presses the knives up firmly against the flue again and so on till the flue is separated.

It will be observed that the noses 12 of the locking devices, located as they are in a relatively triangular position, each acts as an abutment for the others when clamped in position in a tube.

What I claim is—

1. An improved device for cutting off boiler tubes, comprising a revoluble shaft, means for turning said shaft, a cylinder mounted on said shaft, means for turning said cylinder separate from the means used in turning said shaft, a series of locking devices in the form of levers, pivotally located upon said cylinder in a relatively triangular position, so that their adjacent ends may be simultaneously moved outward to engage the interior of a boiler tube, means for simultaneously throwing out said ends, a series of cutters pivotally mounted upon the end of said cylinder adjacent to said locking devices, and a star-wheel fixed upon the end of said shaft adjacent to said cutters to simultaneously project all the cutters of the series when said shaft is turned in its bearings, substantially as herein specified.

2. A device for cutting boiler tubes, constructed with a cylindrical casting 7 having a portion of its outer periphery screw-threaded, a collar 14 having its inner periphery screw-threaded to engage with the screw threaded portion of the cylindrical casting 7, a conical shaped portion 15 formed on said collar, a ring 8 connected to the outer periphery of the casting 7, ears 9 formed on said ring, locking-devices 10 mounted in said ears, arms or levers 13 formed on said locking-devices and noses 12 formed on said locking devices, substantially as set forth.

3. A device for cutting boiler tubes, constructed with a cutter one end of which is mounted in pivotal bearings, a projection formed on said cutter, a star-wheel constructed to engage said projection, and means for rotating said star-wheel, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CARL OTTO THIEME.

Witnesses:
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