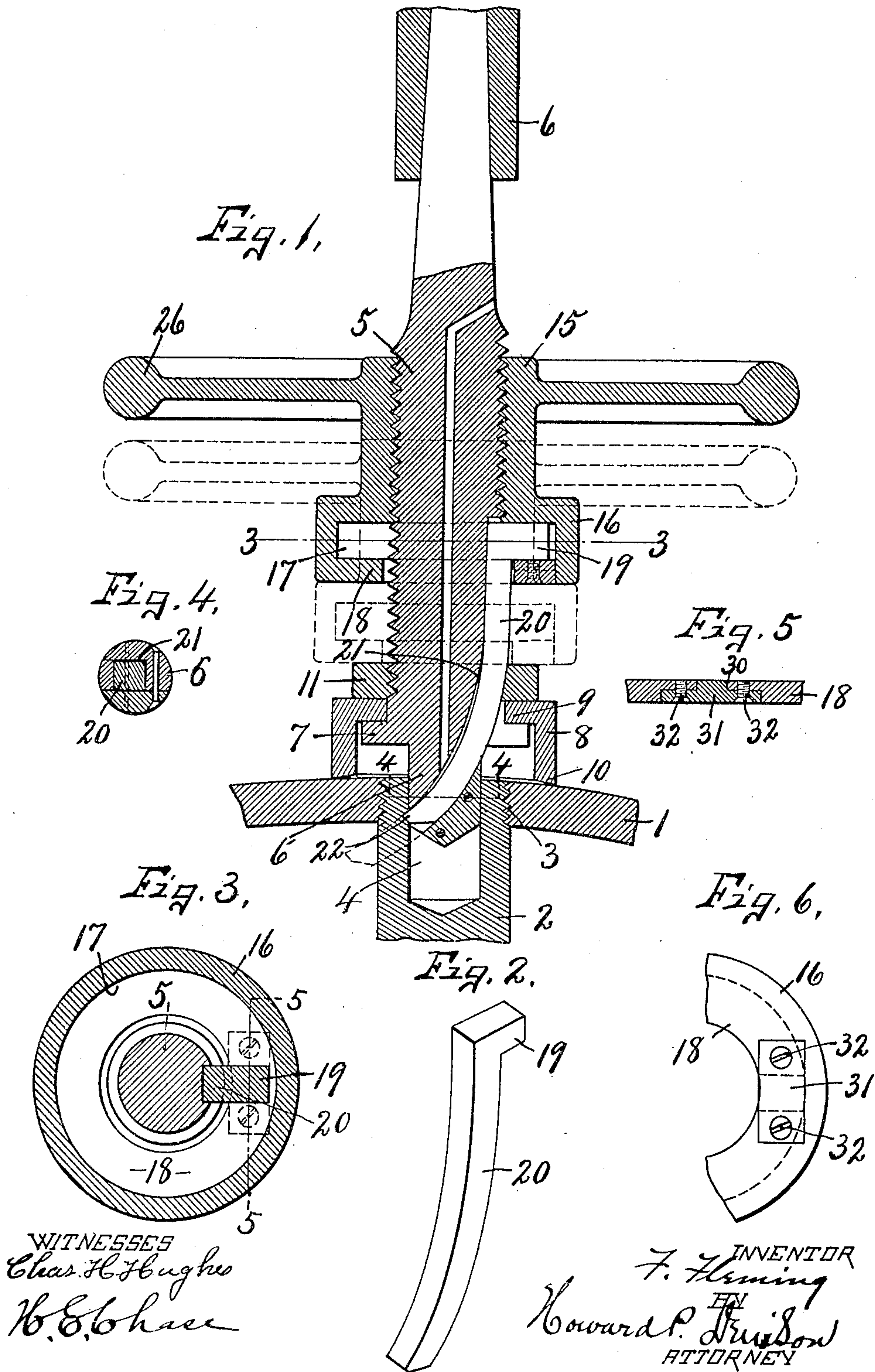


No. 869,628.

PATENTED OCT. 29, 1907.

F. FLEMING.  
TUBE CUTTER.

APPLICATION FILED MAY 23, 1907.





# UNITED STATES PATENT OFFICE.

FRANK FLEMING, OF ROME, NEW YORK.

## TUBE-CUTTER.

No. 869,628.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed May 23, 1907. Serial No. 375,274.

*To all whom it may concern:*

Be it known that I, FRANK FLEMING, of Rome, in the county of Oneida, in the State of New York, have invented new and useful Improvements in Tube-Cut-

ters, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in stay-bolt cutters, the object of which is to cut off the stay-bolt close to the inner side of the boiler shell after the stay-bolt has been properly drilled for the reception of the cutting implement, although the device is equally applicable for cutting tubes of boilers and other shells where it is impossible to gain access to the part of the flue to cut off, except from the outside of the shell.

My main object, therefore, is to provide a simple device adapted to be operated by any available power, or by hand, for feeding the cutting tool laterally through the side of the tube or stay-bolt to be cut so as to permit the removal of the stay-bolt or separation of the outer shell from the inner shell which are tied together by such stay-bolt.

Other objects and uses relating to the specific parts of the invention will be brought out in the following description.

In the drawings—Figure 1 is a sectional view of my improved stay-bolt cutter as applied to the cutting of a stay-bolt of a boiler or similar shell. Fig. 2 is a perspective view of the detached cutter. Figs. 3, 4, and 5, are sectional views taken respectively on lines 3—3, and 4—4, Fig. 1, and 5—5, Fig. 3. Fig. 6 is an inverted plan of a portion of a grooved collar or nut.

In Fig. 1 I have shown a portion of a boiler-shell—1— and a stay-bolt—2— as secured in a threaded aperture—3—in the shell—1—and which has been drilled from its outer end inwardly forming a socket—4— extending some distance inwardly beyond the inner face of the shell—1— preparatory to the use of my improved stay-bolt or flue-cutter. This cutter comprises essentially a threaded spindle—5— having one end tapered and adapted to fit into a revolving chuck 6— forming a part of a drill-press and which may be rotated by any suitable mechanism, not necessary to herein illustrate or describe.

The inner end of the threaded spindle—5— is preferably reduced in diameter to fit easily within the socket—4—, but is free to rotate therein and is simply fitted for the purpose of holding the spindle against undue radial movement during the cutting operation, as will be presently described.

The portion of the spindle—5— at its junction with the reduced end, as—6'—, is formed with an annular flange—7— forming a stop shoulder for a non-rotatable collar—8—, which is loosely fitted around and projects some distance inwardly from the flange—7— and is

provided with an inner annular flange—9— which also forms a limiting stop to engage the flange—7— and limit the inward movement of the collar—8— relatively to the spindle—5—.

The inner end of the collar—8— is provided with an annular bearing—10— adapted to rest upon the outer surface of the boiler shell—1—, while the outer end of the collar, or rather the flange—9—, is adapted to be engaged by a lock nut or adjustable stop—11—; that is, the flange—9— is held between the flange—7— and lock-nut—11— and is preferably left a trifle loose so that the spindle—5— with the flange—7— and lock-nut—11— may be rotated independently of the collar—8—, which is frictionally engaged with the outer face of the boiler-shell—1— to limit the inward movement of the spindle—5—, said collar being held stationary by friction with the boiler shell, and thereby prevents cutting or undue abrasion of the shell.

A rotating nut 15— is screwed upon a threaded portion of the spindle—5— and is provided with an integral collar 16— having an annular groove 17— and flange 18— within which is fitted a lateral offset or shoulder 19— of a curved cutting tool—20—. This cutting tool is mounted in a lengthwise curved guide or groove—21— in one side of the spindle 5—, such groove being of substantially the same cross sectional size and form as the cutter—20—, which in this instance, is rectangular. The groove—21— extends in a lengthwise curved line from one side of the spindle—5— some distance inwardly and laterally through the diametrically opposite side and is slightly longer than the tool—20— which is adjustable by means of the grooved collar—16— so as to throw the point or cutting edge—22— of the tool inwardly through the inner end of the guide—21—. This lengthwise and lateral movement of the groove—20— is effected by rotating the nut 15— upon the threaded spindle—5—, said nut being provided with a suitable hand-piece—26— whereby the rotation of the nut may be easily effected by hand.

When it is desired to cut a stay-bolt the outer end of the latter is previously drilled by any form of drill, not shown, to form the socket—4— of substantially the same or slightly greater diameter than the reduced end—6'— of the spindle—5—, whereupon by adjusting the cutting tool—20— to bring its cutting point within the periphery of the reduced portion—6—, said reduced portion is inserted in the socket—4— a sufficient distance to bring the cutting edge of the tool just inside of the boiler shell—1— where it is desired to cut the stay-bolt—2—, the collar—8— determining the position of the cutting edge of the tool—20—. When the device is thus positioned the spindle—5 is rotated by any suitable driving mechanism, not shown, and by rotating the nut 15— in one direction relatively to the spindle—5— the tool—20—



- may be forced inwardly gradually as often as it is capable of cutting through the stock of the stay-bolt —2—, the feeding of the cutter —20— and rotation of the spindle —5— being continued until the cutting point —22— has entirely cut through the side of said stay-bolt, thereby separating the boiler shell —1— from the part to which it is tied by the stay-bolt —2— and allowing the parts of the stay-bolt to be more easily driven out or removed through the socket —3—.
- 10 In order that the collar —16— may be placed over the lateral projection —19— of the tool —20— a portion of the flange —18— is cut away forming a slot —30— of sufficient size to permit the offset 19— to be inserted therethrough into the groove —17— and this
- 15 slot is afterward closed by a plate —31— which is fastened in place by screws —32— and may be removed at any time when it is desired to disconnect the tool —20— and the collar —16—.

What I claim is:

- 20 1. A tube cutter comprising a rotary threaded spindle having one end adapted to be inserted into the tube to be cut, said spindle being provided with a lengthwise curved slot extending therethrough from side to side, a curved cutting tool riding in said slot, and means for feeding the
- 25 cutting tool endwise.
2. A tube cutter comprising a rotatable threaded spindle having one end adapted to be inserted in the tube to be cut; said spindle being provided with a lengthwise slot extending from one side inwardly in curved lines through
- 30 the opposite side, a curved cutter movable lengthwise in said slot, and a nut adjustable on the threaded portion of the spindle and engaged with the cutter for feeding the latter endwise.

3. A tube cutter comprising a rotatable threaded spindle having one end adapted to be inserted in the tube to be cut, said spindle being provided with a lengthwise slot extending from one side inwardly in curved lines through the opposite side, a curved cutter movable lengthwise in said slot, and a nut adjustable on the threaded portion of the spindle and engaged with the cutter for feeding the latter endwise, and an adjustable stop on the spindle for engaging the outer face of the part to which the tube is attached.

4. A tube cutter comprising a rotatable threaded spindle having one end adapted to be inserted in the tube to be cut, said spindle being provided with a lengthwise slot extending from one side inwardly in curved lines through the opposite side, a curved cutter movable lengthwise in said slot and a nut adjustable on the threaded portion of the spindle and engaged with the cutter for feeding the latter endwise, and a non-rotatable stop mounted on the spindle to limit its endwise inward movement during the cutting operation.

5. A tube cutter comprising a threaded spindle having a reduced inner end adapted to be inserted in the tube to be cut, said spindle having a lengthwise curved slot extending therethrough from side to side, a cutter movable endwise in said slot and provided at its outer end with a lateral offset, a nut engaged with the threaded portion of the spindle and provided with a grooved collar engaging said offset for moving the tool lengthwise as the nut is rotated upon the spindle, and an adjustable limiting stop loosely mounted upon the spindle to limit its inward movement during the cutting operation.

In witness whereof I have hereunto set my hand this 16 day of May 1907.

FRANK FLEMING.

Witnesses:

H. E. CHASE,  
C. M. McCORMACK.