

943,323.

J. P. SORENSEN.

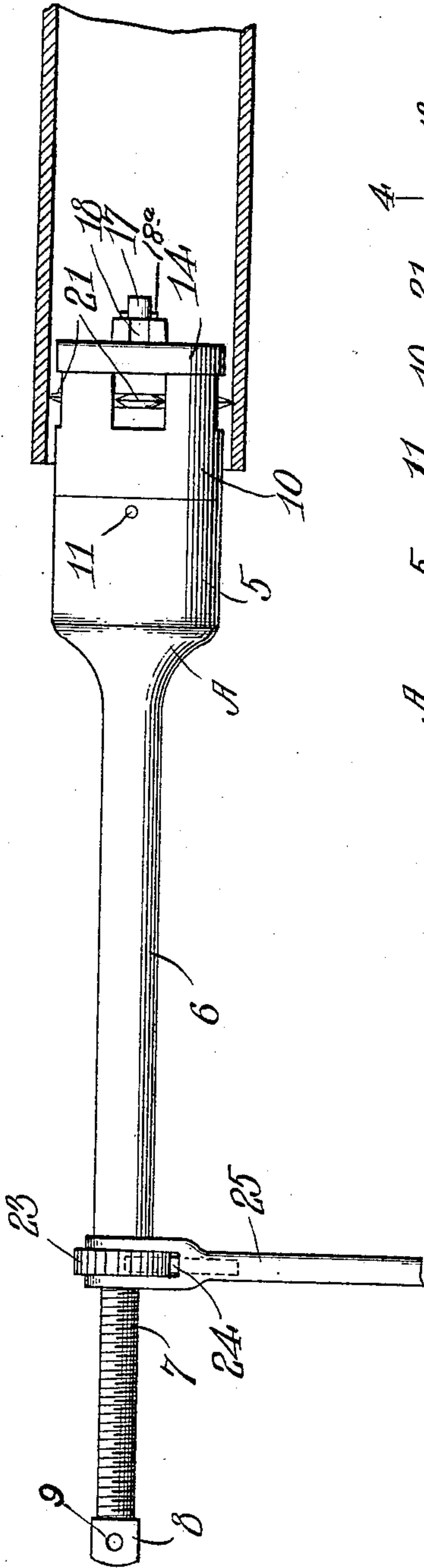
FLUE CUTTER.

APPLICATION FILED APR. 17, 1908.

Patented Dec. 14, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
C. E. Smith,
T. V. Smith, Jr.

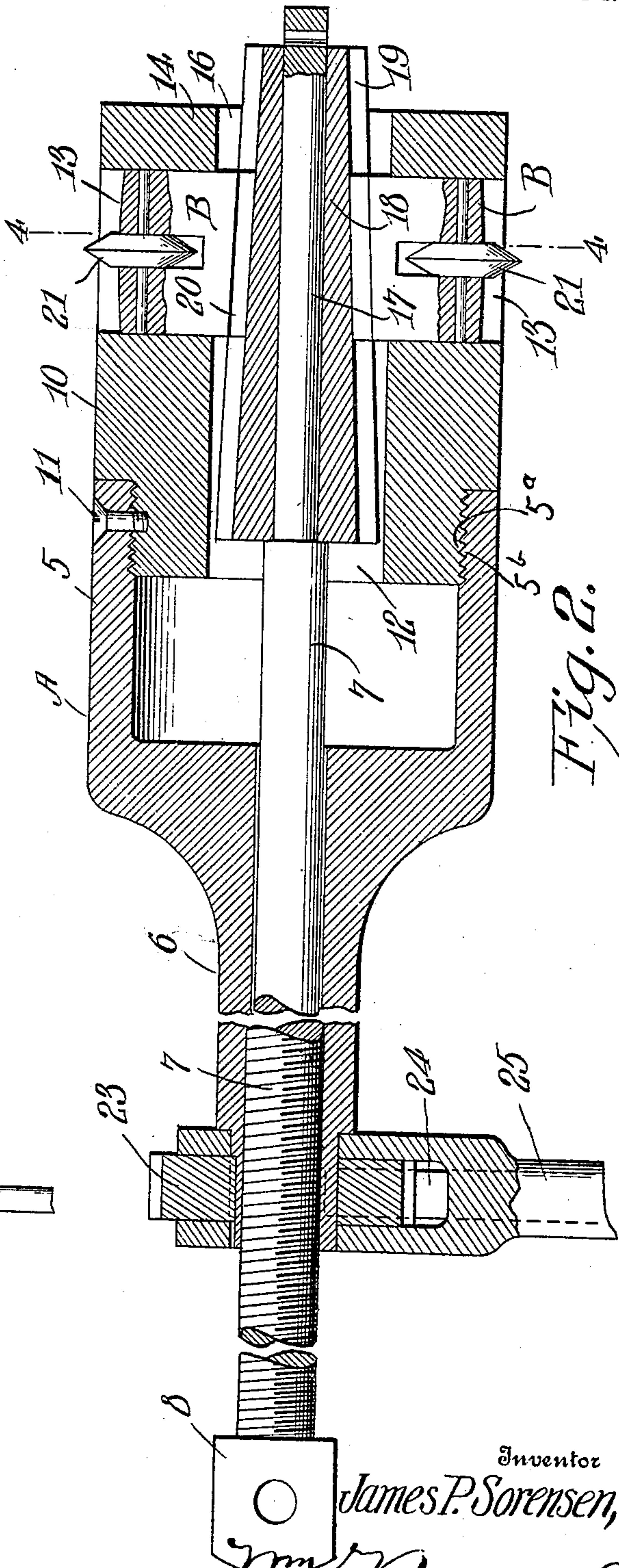


Fig. 2.

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Inventor
James P. Sorensen,
By *Wm. Baggett*
Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

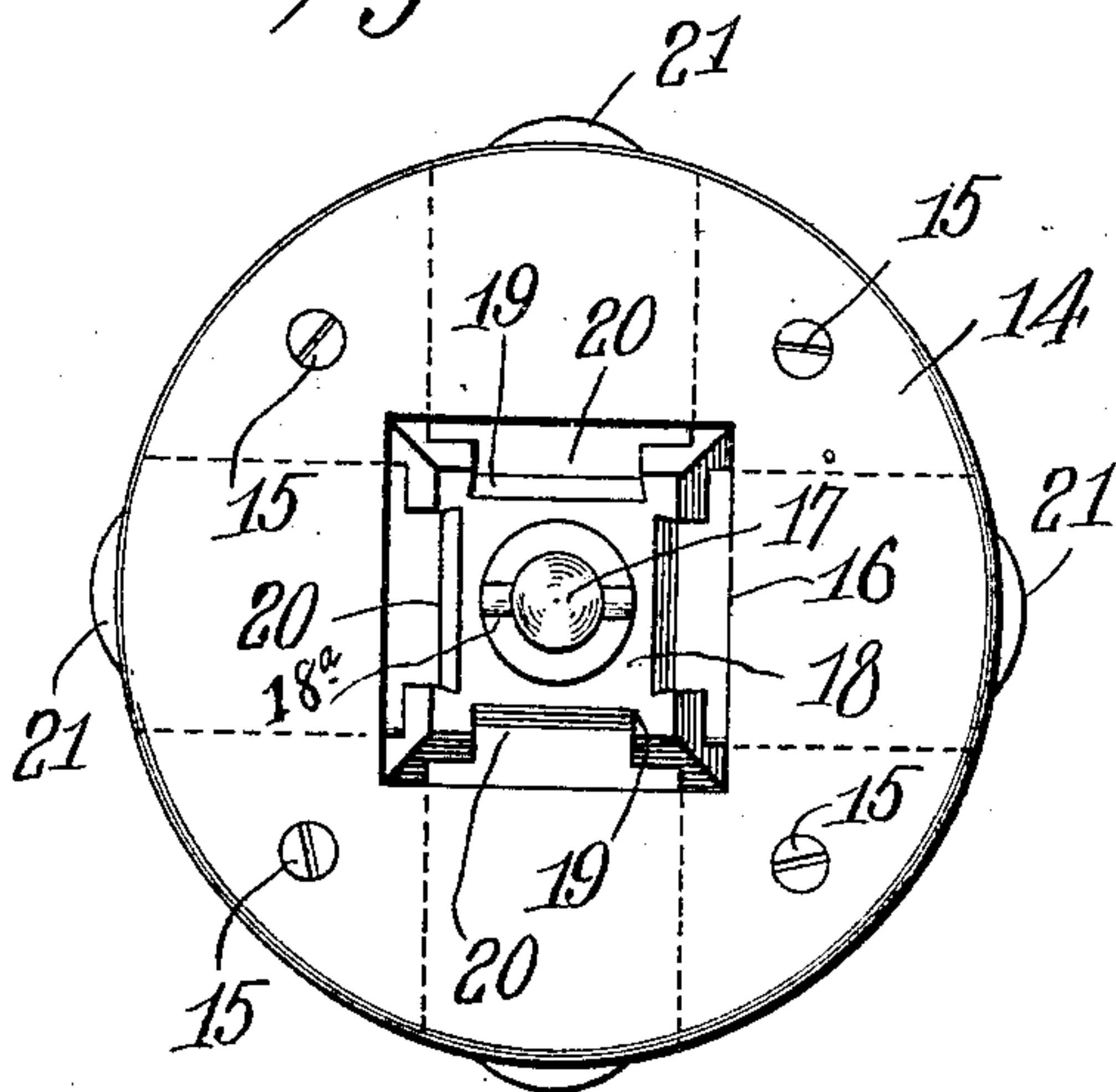


Fig. 4.

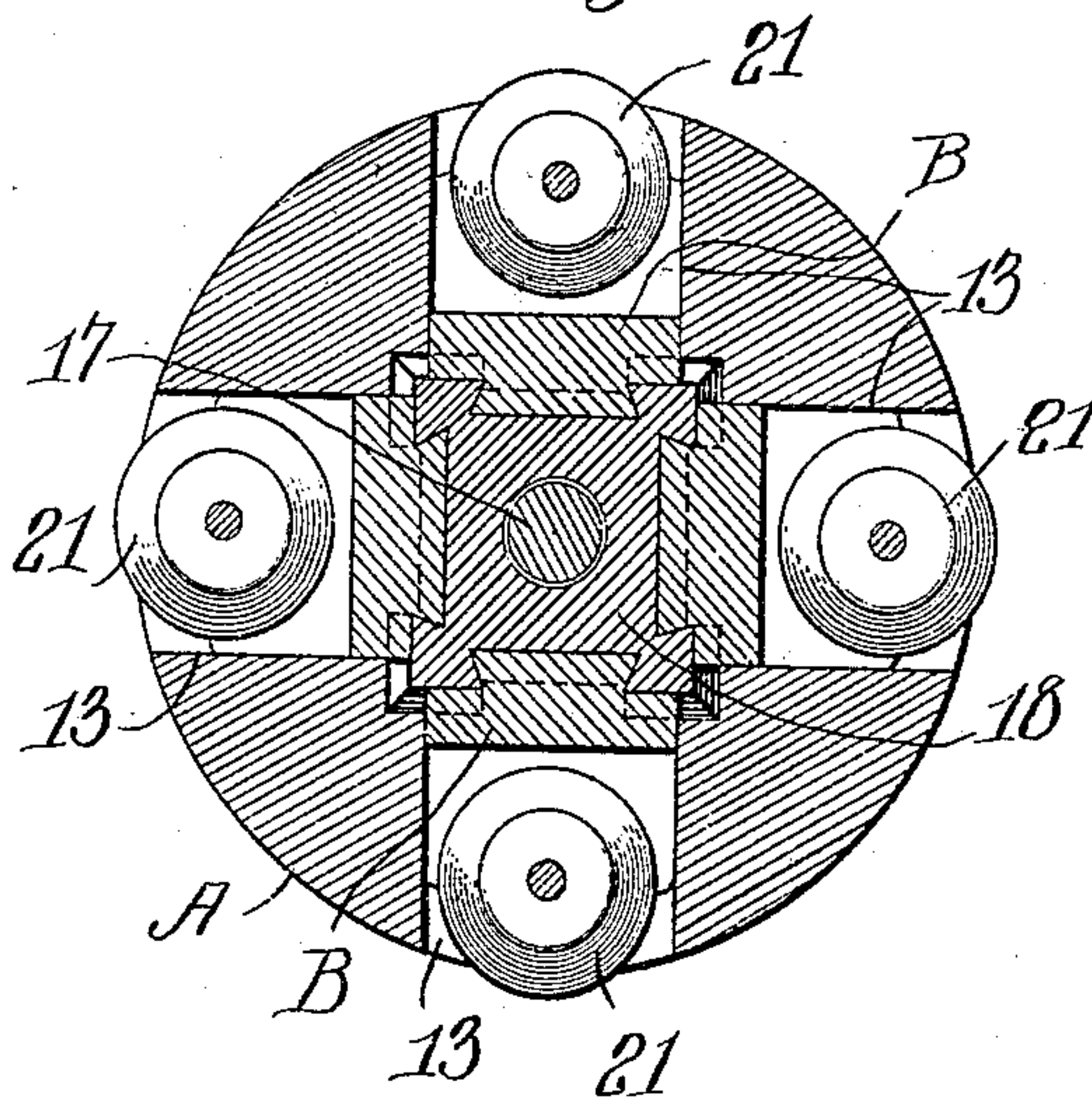


Fig. 5.

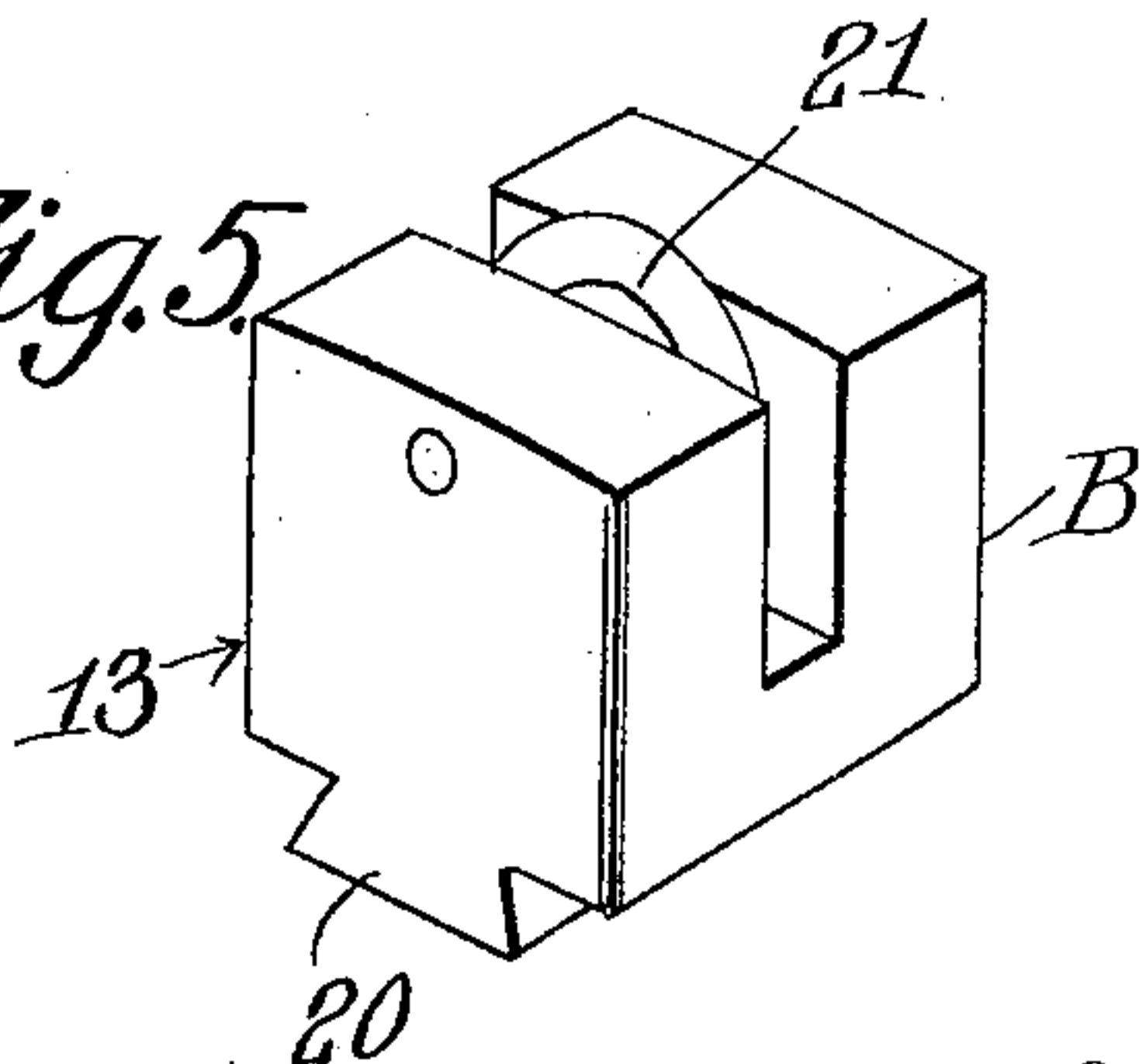


Fig. 6.

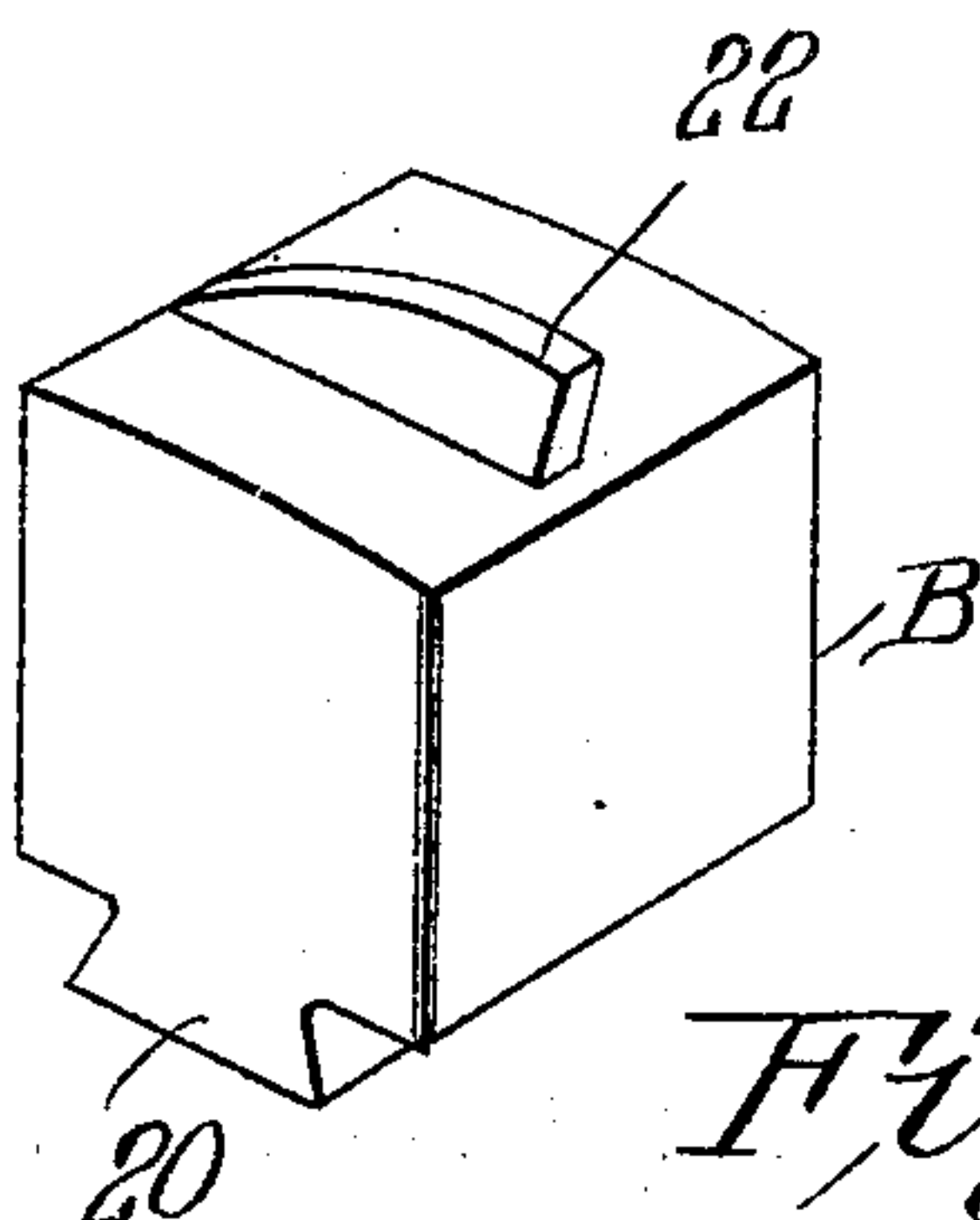
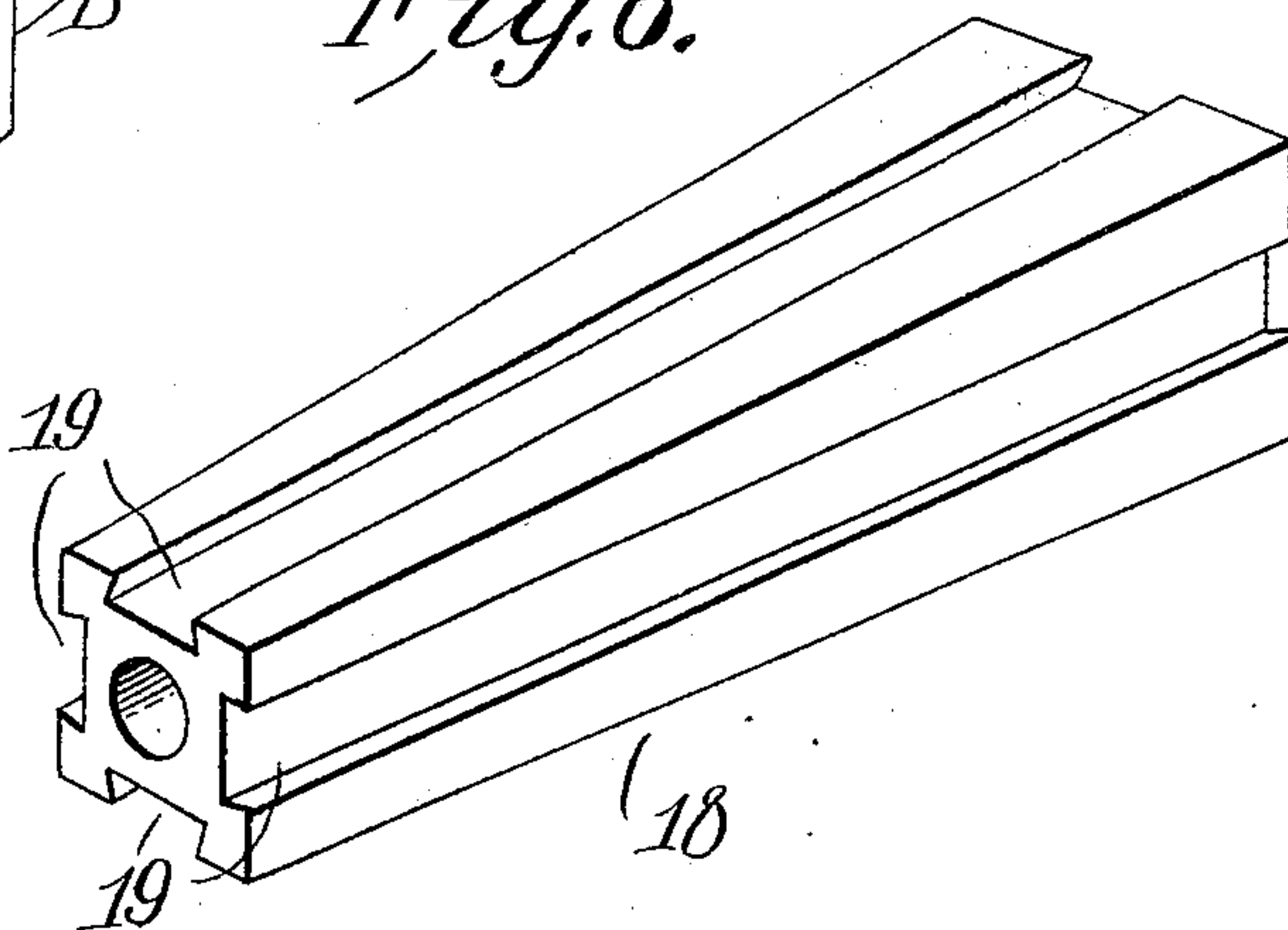


Fig. 7.

Witnesses

C. C. Smith.
T. V. Smith, Jr.

Inventor

James P. Sorensen,

By

Wm. Baggett & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

JAMES PETER SORESENSEN, OF SALT LAKE CITY, UTAH.

FLUE-CUTTER.

943,323.

Specification of Letters Patent.

Patented Dec. 14, 1909.

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To all whom it may concern:

Be it known that I, JAMES P. SORESENSEN, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Flue-Cutters, of which the following is a specification.

This invention relates to flue cutters for cutting out boiler flues and tubes of various kinds; and it has for its objects to simplify and improve the construction and operation of this class of devices and to provide a tool which may be easily and efficiently operated without requiring special skill in the use thereof.

With these and other ends in view which will readily appear as the nature of the invention is better understood; the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claim.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications within the scope of the invention may be resorted to when desired.

In the drawings—Figure 1 is a side elevation of the improved flue cutter showing the same applied in operative position with relation to the tube, which latter is shown in section. Fig. 2 is a longitudinal sectional view, enlarged, of the improved flue cutter. Fig. 3 is an end view. Fig. 4 is a transverse sectional view taken on the plane indicated by the line 4—4 in Fig. 2. Fig. 5 is a perspective view showing one of the cutting tools detached. Fig. 6 is a perspective view showing the expanding member detached. Fig. 7 is a perspective view showing a modified form of cutting tool adapted to be used in connection with the invention.

Corresponding parts in the several figures are denoted by like characters of reference.

The improved flue cutter comprises a casing, an expanding member movable longitudinally in the casing, a feed-screw for actuating the expanding member, a plurality of cutting members movable radially in the casing and actuated by the expanding member, and means for rotating the casing to actuate the cutters.

The casing, which as a whole is designated

by A, comprises a cylindrical socket 5 having an axial tubular shank 6 through which extends the feed-screw 7, which is in threaded engagement with the correspondingly threaded interior of the tubular shank; the outer extremity of the feed-screw being provided with a head 8 affording a wrench-seat; said head being also provided with a transverse aperture 9 for the passage of a pin or key to constitute a handle whereby the feed-screw may be rotated. The forward end of the socket 5 is internally threaded at 5^a for the reception of a cylindrical head 10 having a reduced externally threaded rear portion 5^b engaging the internally threaded portion of the socket 5, wherein it is firmly secured by means of a set screw, as shown at 11. The head 10 has a longitudinal aperture 12, which is of polygonal cross-section to correspond with that of the expanding member which is guided therethrough, as will be presently described. and it is provided with a plurality of radial slots or recesses 13 for the accommodation of the cutting members B which are fitted slidably in said recesses, where they are securely retained by means of a face plate 14 securely fastened upon the head member 10 by means of screws 15, or other suitable fastening members; said face plate 14 being provided with an aperture 16, registering with the longitudinal aperture 12 of the head member.

The feed-screw 7 has an unthreaded portion that extends through the head and the face plate and it is provided with a terminal or end portion 17, of reduced diameter, said end portion extending through the entire length of the expanding member 18, which latter may be retained by means of a pin or key 18^a in such a manner that the reduced end of the feed-screw will turn or rotate freely in said expanding member; the latter being capable of longitudinal adjustment in the head of the device by manipulating the feed-screw. By extending the reduced unthreaded portion of the feed-screw through a bore extending through the entire length of the expanding member the parts will be mutually braced and guided without the necessity of providing guides or tracks for the expanding member. The expanding member consists of a wedge-shaped or tapering body of regular polygonal cross-section and having a number of sides corresponding to the number of radial recesses in the head of the device wherein the cutting tools are

fitted; the number of the latter may be varied, but four will probably be the number preferably employed, as shown in the accompanying drawings. Each side of the expanding member is provided with a longitudinal dovetailed groove 19, and each of the guiding members B comprises a block provided on its inner face with a dovetailed rib or tenon 20, adapted for engagement with one of the grooves 19 in the expanding member. The blocks B of the cutting members may be equipped with rotary cutters 21, as shown in Figs. 1, 2, 3, 4 and 5 of the drawings; or they may be formed or equipped with suitably constructed stationary cutters, as shown at 22 in Fig. 7.

Suitably secured upon the tubular shank 6, is a ratchet-wheel 23, engaged by a spring pawl 24 secured upon a handle 25, which is mounted for rotation upon the tubular shank; it will be seen that by manipulating the handle 25 the shank 6 and related parts may be slowly and forcibly rotated.

In assembling the improved tool or device, the dovetailed ribs or tenons 20 of the blocks B are placed in engagement with the dovetailed grooves 19 of the expanding member, which latter is swiveled upon the end of the feed-screw which projects through the head of the device; the face-plate 14, when secured in position, serves to retain the cutting members in position without interfering with their movement radially in the slots or recesses 13, and the radial movement of said cutting members is regulated and controlled by the wedge-shaped expanding member with which they are connected by the dovetailed ribs 20 engaging the correspondingly dovetailed grooves in said expanding member. For operation, the head of the tool is inserted into the end of the flue or tube which is to be cut, and the feed-screw is operated to actuate the expanding member until the cutters engage the inner walls of the tube; the tool is then rotated by means of the ratchet handle, and the feed screw is operated at intervals, thus causing the cutters to sever the tube as will be readily understood.

As will be seen from the foregoing description, the improved flue cutter is simple in construction, easily operated, and it will be found thoroughly efficient for the purposes for which it is provided.

A particular advantage resulting from the improved construction resides in the facility with which the cutting members B may be reached, by simply removing the face-plate 14, thus enabling said cutting members to be removed and replaced by others of a different construction or of different dimensions. Said face-plate, which is retained in position by means of the screws 15, also serves to connect and to re-

inforce the end of the cylindrical head 10, at the point where the latter is weakened by the radial slots or recesses 13; it being obvious that by simply removing the face-plate the cutting members B may be removed by sliding them lengthwise from the slots 13. The aperture 16 in the face plate 14 provides for the passage of the reduced end of the feed-screw carrying the expanding member, so that the movement and efficiency of said expanding member is not interfered with by the presence of the face-plate.

It is obvious that the cylindrical head 10, having threaded connection with the socket 5, may be readily detached from the latter, thus enabling a cylindrical head of different dimensions and carrying a corresponding face-plate, as well as cutting members of different dimensions, to be readily substituted when tubes of different dimensions are to be operated upon; this enables the retention of the greater and more expensive portion of the tool, and its utilization for the purpose of cutting tubes of different sizes.

Having thus described the invention, what is claimed is—

A flue-cutter comprising a cylindrical socket having a rearwardly-extending tubular shank internally threaded at its forward end, a feed screw extending through and having a threaded engagement with the shank and provided at its front end with a reduced portion defining a shoulder, a longitudinally-dovetailed mortised and tapered expanding member having a bore extending longitudinally therethrough for the passage of the reduced portion of the feed screw with which the expanding member is freely connected for rotation, the member being in engagement with the shoulder, a head member having a reduced externally-threaded rear portion engaging the internally-threaded front end of the socket, means for securing together the socket and the head member, the latter member being provided with a longitudinal aperture of a cross section corresponding with that of the expanding member which latter is guided therethrough and with a plurality of radial slots at its outer end, cutting members fitted for radial movement in the slots and having dovetailed tenons engaging the mortises of the expanding member, a face plate detachably secured upon the head member, and retaining the cutting members in place and means for rotating the tubular shank and parts connected therewith.

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

JAMES PETER SORENSEN.

Witnesses:

ANDREW A. BIORN,
THORVALD L. LARSEN.