

(No Model.)

2 Sheets—Sheet 1.

C. C. GERLACH.  
TUBE CUTTER.

No. 422,341.

Patented Feb. 25, 1890.

Fig. 1.

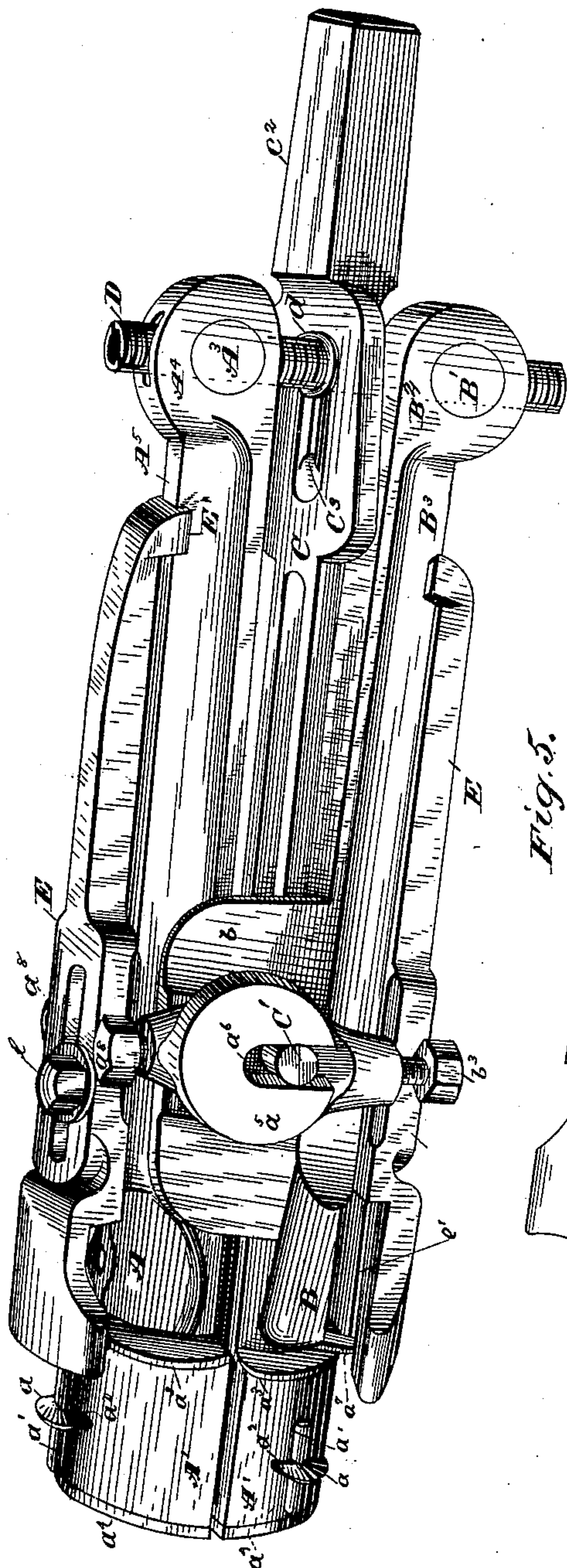


Fig. 5.

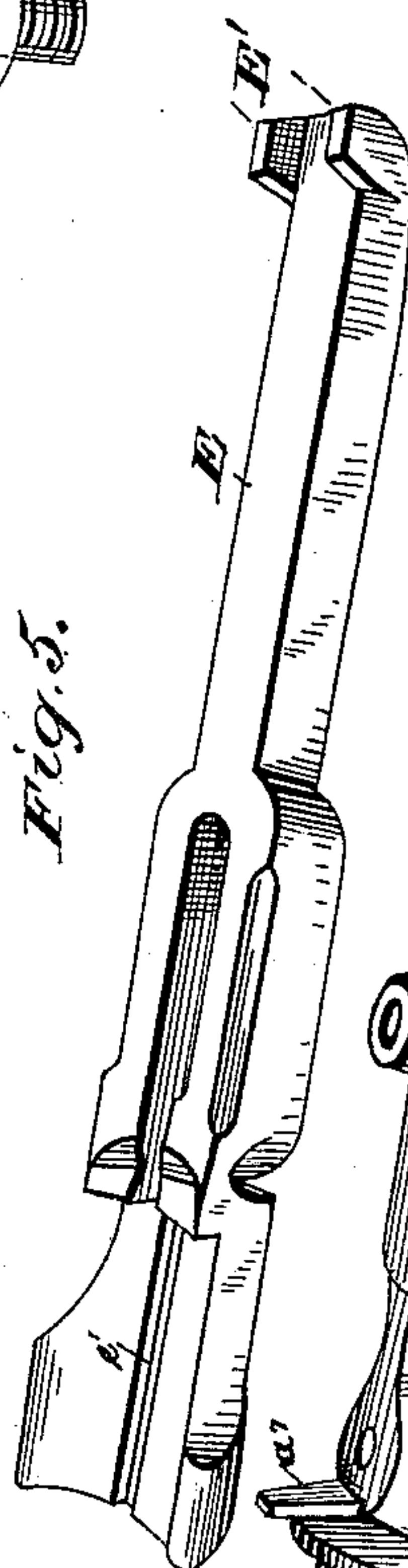
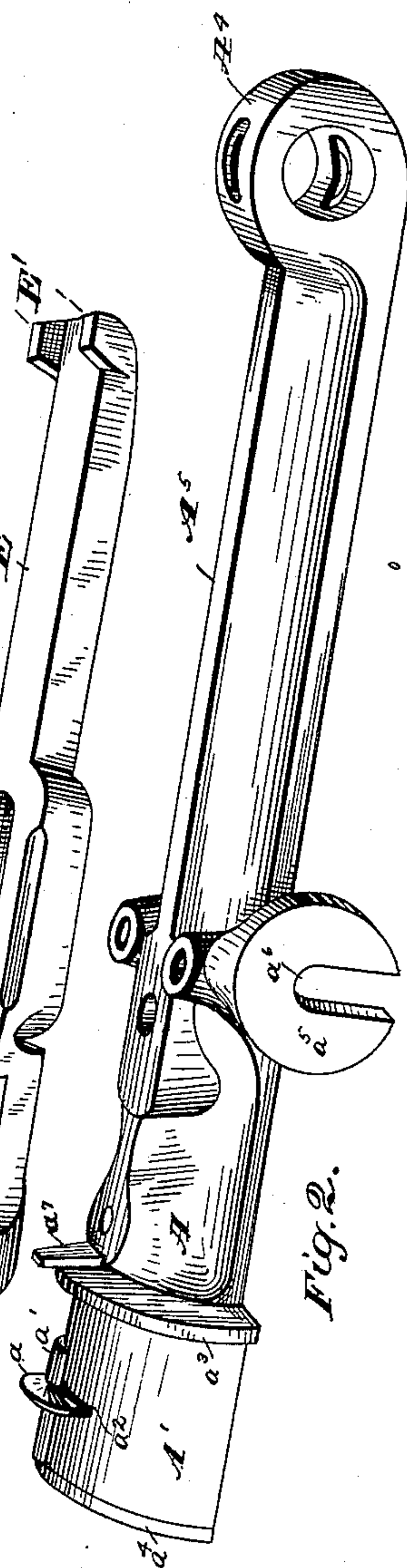


Fig. 2.



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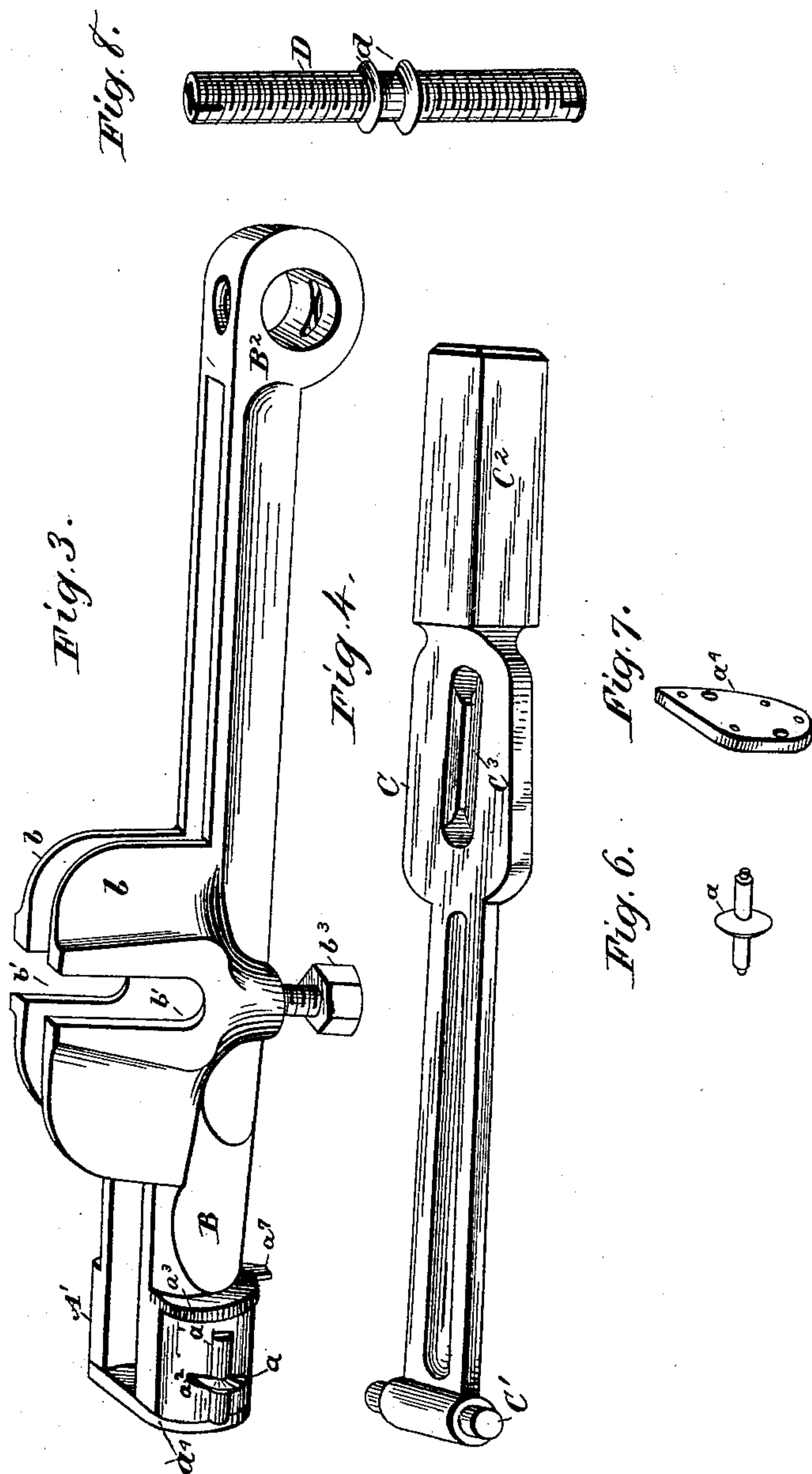
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

CARL C. GERLACH, OF CLEVELAND, OHIO.

## TUBE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 422,341, dated February 25, 1890.

Application filed February 4, 1889. Serial No. 298,676. (No model.)

*To all whom it may concern:*

Be it known that I, CARL C. GERLACH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Boiler-Tube Cutters; and I do hereby declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide an improved boiler-tube cutter that has great power and durability, is simple in construction, and adapted to cutting any size of boiler-tubes, either upon the inside or the outside of the tube-sheet.

My improvements are fully described herein and shown in the accompanying drawings, and the matter constituting my invention is defined in the claims forming part of this specification.

In the drawings, Figure 1 is a perspective view of my complete invention. Fig. 2 is a view of the upper portion of the cutter. Fig. 3 is a view of the corresponding lower portion. Fig. 4 is an independent central portion provided at one end with the fulcrum upon which the upper and lower portions are pivoted, and with a square head at the other end for turning the device. Fig. 5 is one of the stops or gages attached to the upper and lower portions of the cutter. Fig. 6 is one of the roller-cutters, and Fig. 7 one of the end plates for securing the same. Fig. 8 is the right-and-left-hand screw.

It will be seen from my drawings that my improved cutting-tool is constructed to enter the outer ends of the boiler-tubes, and is divided substantially into longitudinal halves A and B. The end A', designed to enter the tubes, is cylindrical in section and bears one or more of the disk-shaped cutters *a* upon the periphery of each section of the cutting-tool. Grooves *a'* and *a''* are cut longitudinally and transversely of the cylindrical surface A' to receive the cutting-disks *a* and their axes, which are pivoted between the flanges *a'''* and plates *a''''* at the outer end of the tool to hold them in position. The two portions of the tool are nearly straight from

the inner end to near the center of their length, whence they diverge gradually outward to their extremities, where they are connected by a right-and-left-hand screw D, playing in the swivels A<sup>s</sup> and B' in the enlarged extremities A and B. The separate portions A and B are provided with the overlapping extensions *a<sup>s</sup>* and *b*, having open slots *a<sup>b</sup>* and *b'*. These extensions are placed at about one-third the length of the tool from the inner or cutting end and receive in the slots the end of the fulcrum C', upon which the separate portions A and B revolve.

It will be seen that each of the longitudinal portions of the cutter is provided with the overhanging extensions containing slots, those of the upper portion lapping over those of the lower and having slots somewhat narrower, the ends of the fulcrum-shaft being correspondingly reduced, giving an improved appearance to the cutter, the advantages of the double set of slots being to secure perfect alignment of the cutting-disks, which otherwise would cut a spiral upon the inner face of the boiler-tube. Adjusting-screws *a<sup>s</sup>* and *b<sup>s</sup>* are inserted in the inner end of the slots, by which the parts of the tool may be separated in cutting larger tubes. The fulcrum-shaft C' is integral with a central plate C, extending longitudinally beyond the extremities of the parts A and B and terminating in the square end C<sup>2</sup>. A key-hole slot C<sup>3</sup> is shown in this plate, through which the screw D passes, shoulders *d* supporting the plate C and allowing some movement as the portions A and B are separated.

It will be observed that when the parts are put in position and the cylindrical end A', armed with the cutters *a*, is inserted in the end of a tube great pressure may be brought to bear upon the cutters by means of the fulcrum C' and right-and-left-hand screw D.

When it is designed to cut off a tube within the tube-sheet, the adjustable stops E on the exterior of the tool may be used to gage the depth of the cutters in the tube, set-screws *e* being used to secure the stops in position when the cutters *a* are at the required depth.

The advantages of this variety of stop are that when the portions of the cylindrical end A' are separated the stops E become loose-



ened, so as to be removed readily, and the cutters run in the groove formed in the tube.

Lugs  $a^7$  on the portions of the cutter resting in the slots  $e'$  on the gages, and the outer 5 extremities  $E'$  of the gages riding over the ridges  $A^5$  and  $B^3$  on the cutter, serve to keep the gages in line.

The advantages of my construction are obvious, combining great strength and power 10 of leverage with simplicity and economy of design.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

15 1. In a tube-cutter, a main body in two longitudinal sections, each section provided with overhanging slotted lugs, a fulcrum-shaft embraced within these slots, and a right-and-left-hand screw connecting the outer ends of 20 the longitudinal section, substantially as described.

2. In a tube-cutter, a main body divided longitudinally into two sections, a cylindrical inner end composed of both sections and 25 bearing cutters, a central plate bearing a fulcrum-shaft supported in slots in overlapping lugs on the aforesaid sections, and a right-and-left-hand screw supporting said plate and connecting the outer extremities of the 30 sections, substantially as set forth.

3. In a tube-cutter, a main body in two lon-

gitudinal sections, each section provided with overhanging slotted lugs, a fulcrum-shaft inclosed within the slots in the lugs, set-screws 35 in the slots resting against the shaft, and a right-and-left-hand screw connecting the outer extremities of the sections, substantially as described.

4. In a tube-cutter, the combination of two opposite levers provided with a fulcrum be- 40 tween them, cutting-disks upon one end of the levers, and a right-and-left-hand screw at the other end for operating the levers upon the fulcrum, substantially as described.

5. In a tube-cutter, the adjustable stops  $E$ , 45 provided with the slot  $e'$  and overhanging lugs  $E'$ , and the set-screw  $e$ , substantially as shown.

6. In a tube-cutter, the main body in longitudinal sections, each section provided with 50 overhanging slotted lugs, a fulcrum-shaft embraced within said slots, a right-and-left-hand screw connecting the outer ends of the longitudinal sections, and the stops  $E$ , adjustably secured to said longitudinal sec- 55 tions, substantially as shown.

In testimony whereof I hereunto set my hand this 23d day of January, A. D. 1889.

CARL C. GERLACH.

Witnesses:

JOSEPH A. OSBORNE,  
WM. M. MONROE.