

922,111.

R. ECK.
PIPE CUTTER.
APPLICATION FILED JULY 17, 1907.

Patented May 18, 1909.

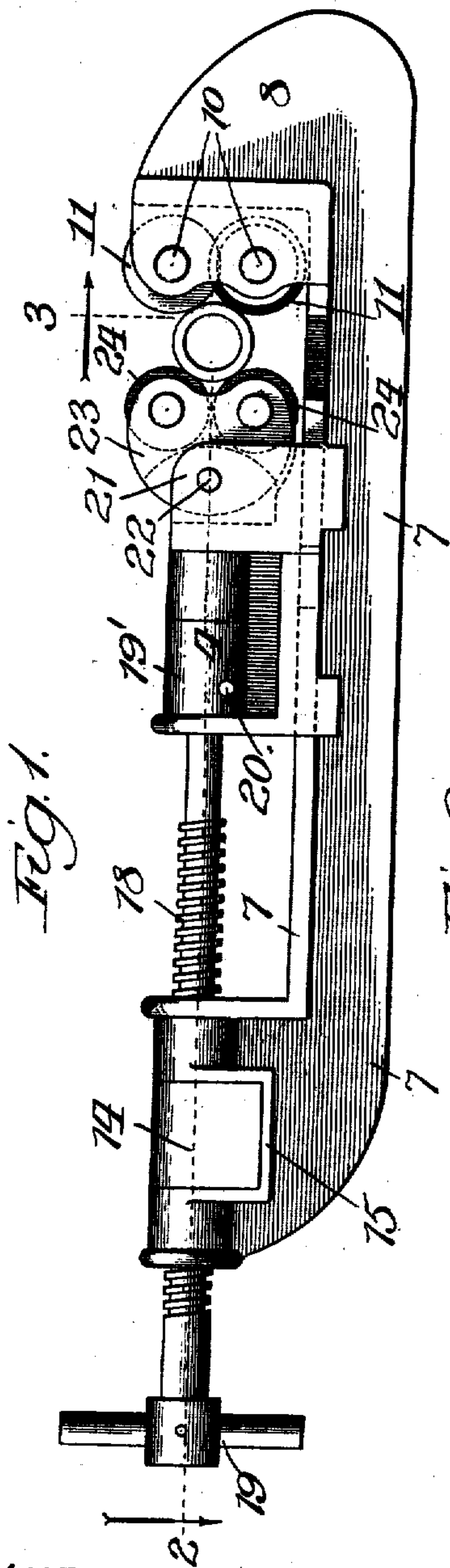


Fig. 1.

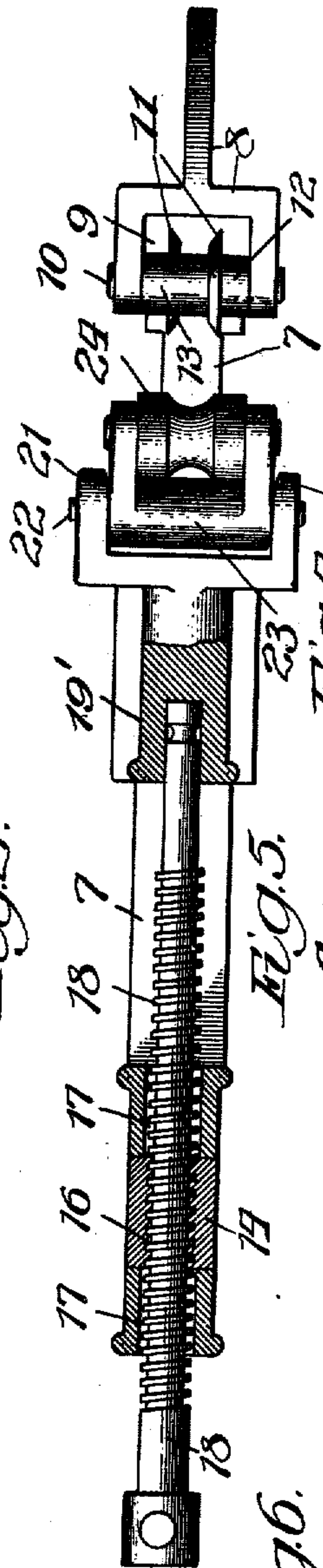


Fig. 2.

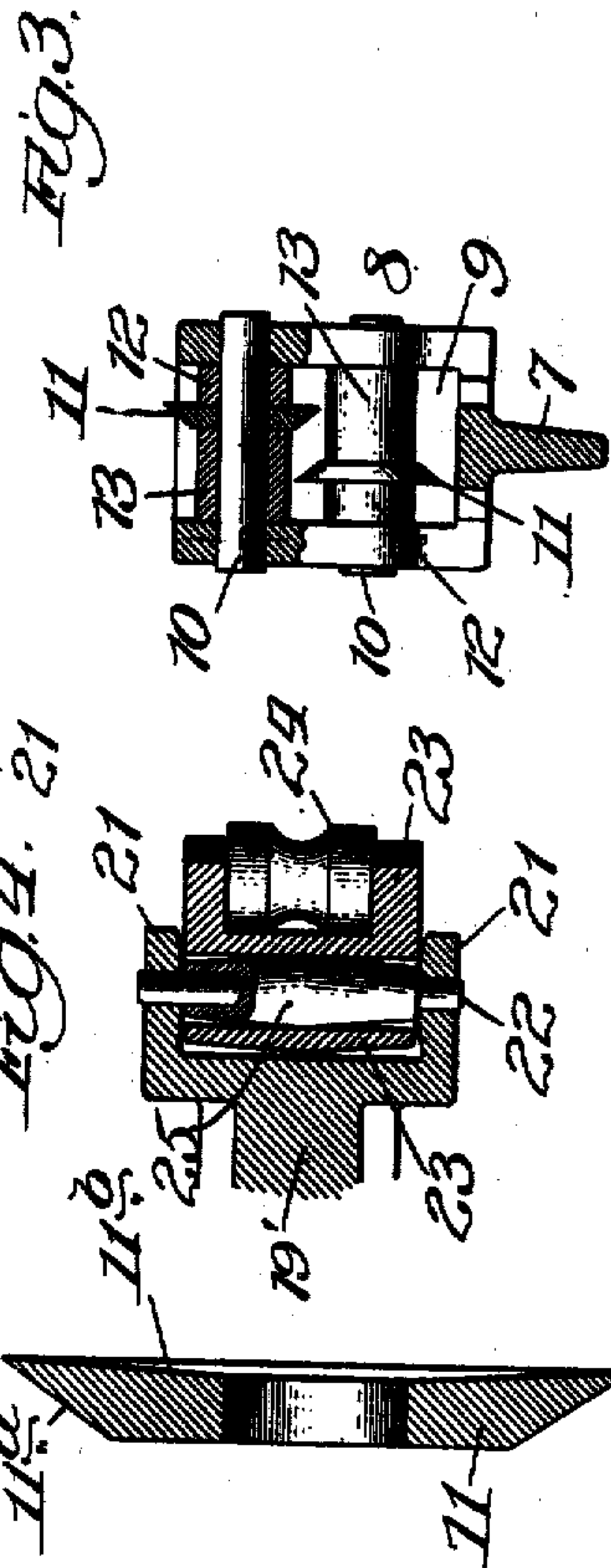


Fig. 3.

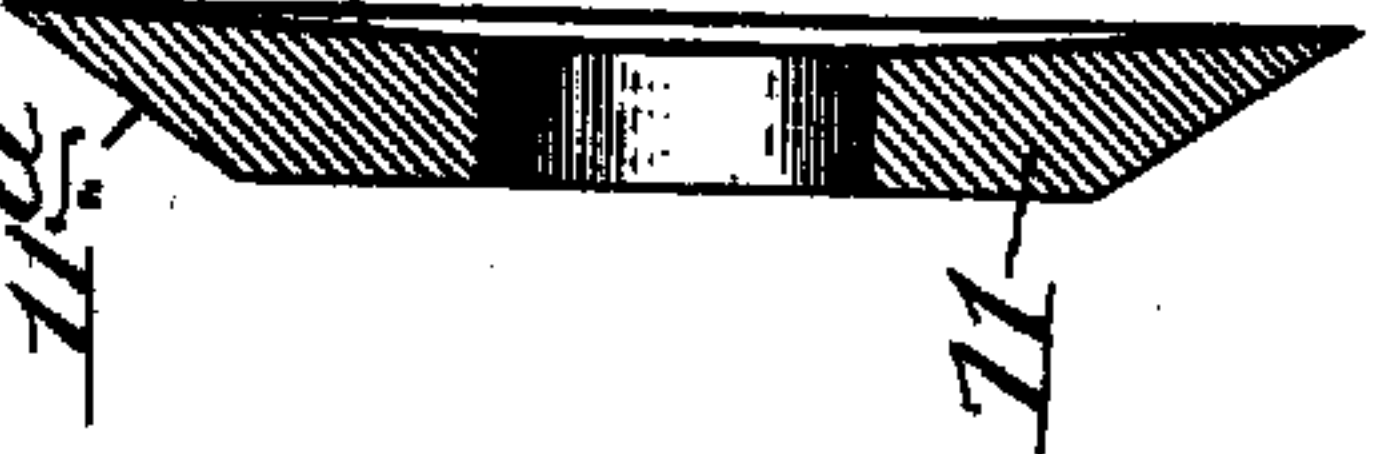


Fig. 4.

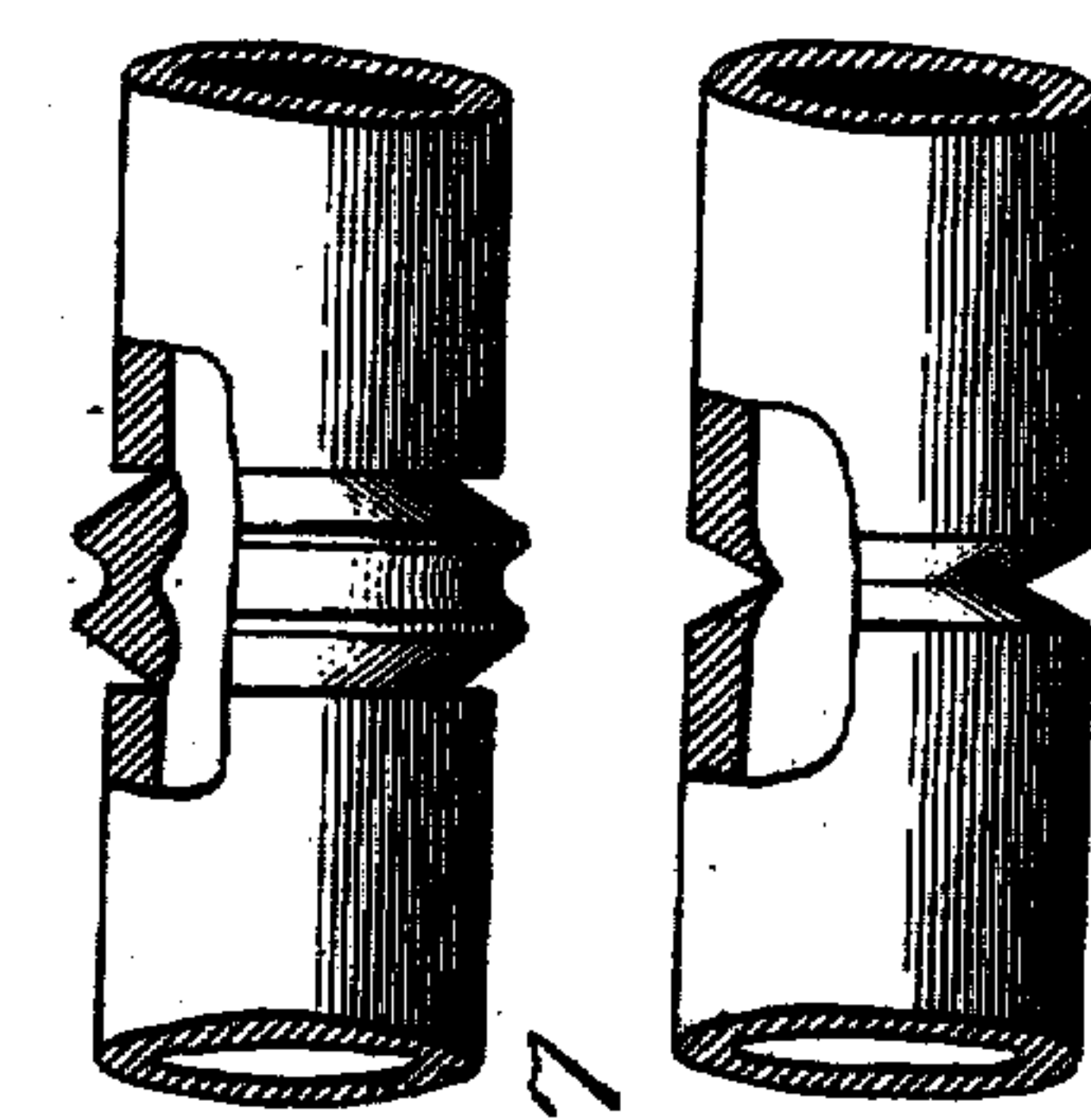


Fig. 5.

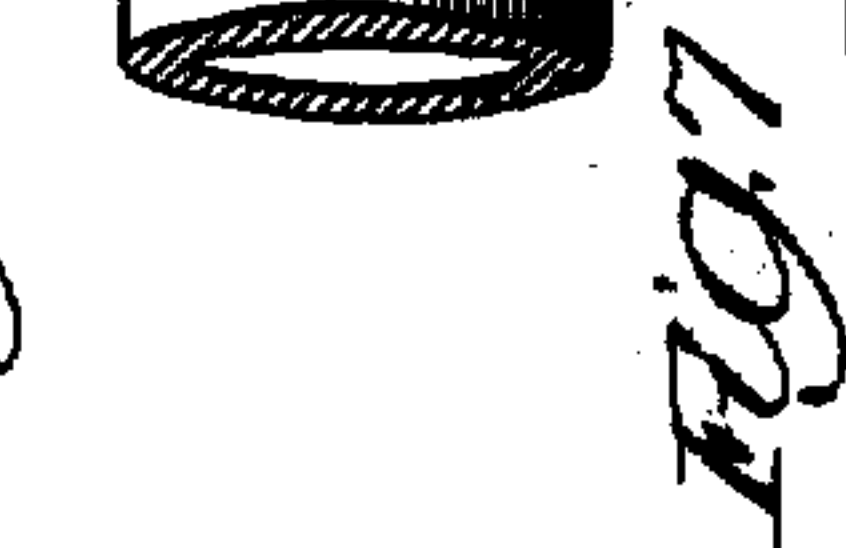


Fig. 6.

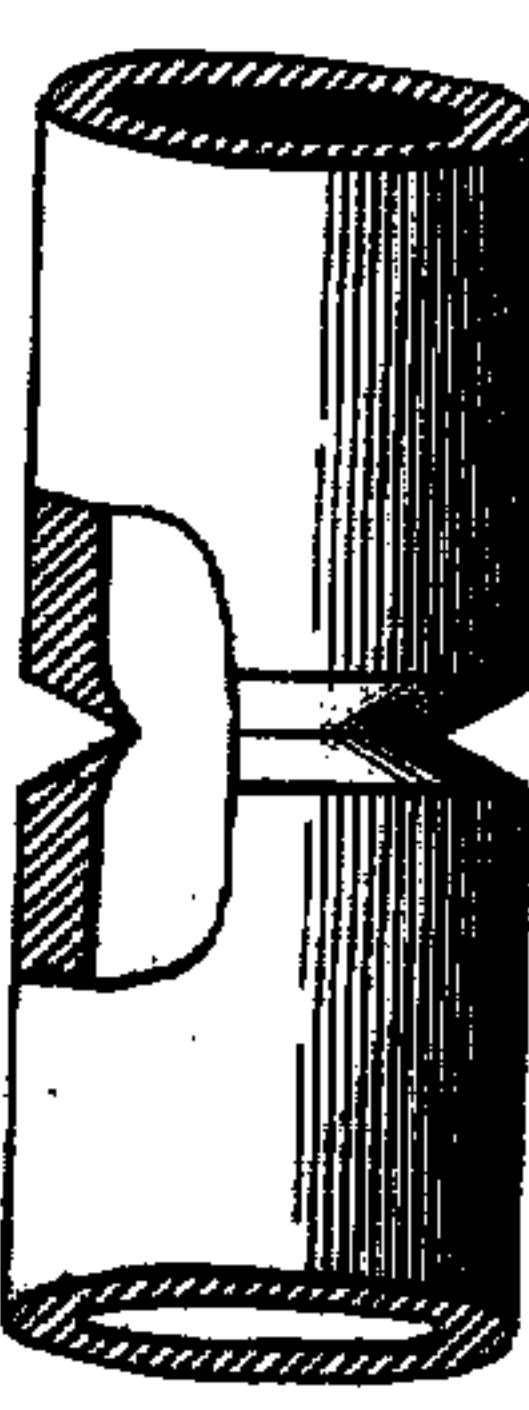


Fig. 7.

Witnesses:
Ed. Chyford.
John Enders.

Inventor:
Ragnvald Eck,
By Dymenforth, Lee, Chilton & Wills,
Attys.

UNITED STATES PATENT OFFICE.

RAGNVALD ECK, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO WILLIAM P. CROCKETT, OF CHICAGO, ILLINOIS, AND ONE-HALF TO THE ECK TOOL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PIPE-CUTTER.

No. 922,111.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed July 17, 1907. Serial No. 384,187.

To all whom it may concern:

Be it known that I, RAGNVALD ECK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pipe-Cutters, of which the following is a specification.

My invention relates to that class of pipe-cutters which is intended for use in cutting metallic pipes. In the use of pipe-cutters of this class heretofore constructed, each of the several ends of a pipe is necessarily beveled at the time, and by the act of cutting, and an inturned annular flange or feather-edge is then formed which reduces, to a greater or less extent, the diameter of the bore of the pipe at such ends, according to the degree of hardness of the metal of the pipe and the condition of the cutter. Whenever it is desired to have a bore of uniform diameter throughout the pipe and to have the same free from all obstructions as well as to have the end square (rather than beveling) it is necessary to "finish" the end of the pipe usually by filing and reaming. This requires a second operation and materially adds to the cost of the product.

The object of my invention is to overcome these objections and to provide a pipe-cutter which, in operation, so cuts the pipe that each of the severed ends is square and left free from feather-edges at its bore.

Referring to the accompanying drawings: Figure 1 is a side elevation of my improved pipe-cutter with a pipe in position for cutting; Fig. 2, a broken plan section taken at the line 2 on Fig. 1; Fig. 3, a transverse sectional view taken at the line 3 on Fig. 1; Fig. 4, a plan section taken at the line 4 on Fig. 1; Fig. 5, an enlarged sectional view of one of the cutting-disks; Fig. 6, a broken section of a pipe illustrating the cut made with my improved pipe-cutter; and Fig. 7, a similar view to that presented by Fig. 5 illustrating the cut made with other cutters.

The pipe-cutter is provided with a cutter-carrying frame 7, having at one end a stationary jaw 8 recessed at its inner side, and within the recess 9 are two rotary cutting-disks 11 mounted upon pins or shafts 10. These cutting-disks are spaced apart as to be equidistant from the vertical longitudinal center of the device, and are confined to ro-

tate freely upon their respective shafts, by washers or spacers 12 and 13 surrounding the shafts and interposed between the disks and the sides of the recess 9. The cutting-disks are beveled as shown at 11^a to a knife-edge, upon their adjacent or inner faces, while their opposite, or outer faces, are made very slightly concave or dish-shaped as shown at 11^b represented in Fig. 5 of the drawing, wherein this concavity is shown of somewhat exaggerated form. The opposite end of the frame 7 terminates in a stationary head bifurcated transversely to form a socket within which is confined a nut 14 held against turning by its engagement with the web 15. This nut is provided with a longitudinal screw-threaded opening 16 in alinement with openings or holes 17 in the furcations of the head. A screw-threaded rod 18 provided with a handle 19 passes through the holes 17, in which it has a bearing, and also through the nut 14 with which it has a threaded engagement, and enters a sliding head 19' to which it is held by a pin 20 against withdrawal, but permitted to rotate freely therein. The sliding head is provided at one end with ears 21 forming between them a recess within which is pivotally secured by means of a pin 22, a jaw 23 carrying rolls 24. A sleeve 25 surrounds the pin 22 and is made conical or tapering from a larger diameter at its center to a smaller diameter at each of its ends, whereby the jaw 23 is allowed to swing slightly to either side of the longitudinal center in a horizontal plane, and at the same time to rotate slightly upon the pivot-pin 22, for the purpose hereinafter explained. The sliding head is mounted upon the frame 7 to slide freely thereon, upon the manipulation of the screw 18 as is common in devices of this class.

The operation of my improved pipe-cutter is practically the same as that of others which are in general use; the pipe is clamped between the cutting-disks 11 and rolls 24 through the medium of the screw 18, as is shown in Fig. 1, until sufficient pressure is exerted upon the pipe by the rolls and cutting-disks, whereupon the operator rotates the cutter around the pipe. This action causes the cutting-disks to cut into the pipe, and after one or two revolutions of the device the screw is again turned to again exert pres-

sure of the rolls and cutting-disks upon the pipe when the device is rotated as before. This process is repeated until the pipe has been completely severed. As before stated, the cutting-disks are mounted equidistant from the vertical longitudinal center of the device with their inner faces beveled, as shown in Figs. 2 and 3, and with their outer faces slightly concave or dish-shaped. The cutting-disks being thus positioned, it is obvious that in operation two cuts will be made simultaneously around the pipe, and the cutting-disks being thus formed, the severed ends of the pipe adjacent to the perpendicular face of each cutting-disk will be square, that is, the end of the pipe will be at right-angles to the longitudinal axis of the same. And in cutting a pipe with my device the bore of the pipe at the severed end is left free of all obstructions, such as the inturned annular flange or feather-edge which is always present when a pipe is cut with a cutting-disk having a V-shaped cutting-edge, thus obviating the necessity of "finishing" the end of the pipe after it has been cut. The metal which is displaced by the cutting-disks as they advance in making the cuts is forced by the bevel-edge of each cutting-disk longitudinally of the pipe toward the center of that part of the pipe between the cuts in the manner shown in Fig. 6, instead of being forced toward the center of the pipe, as shown in Fig. 7, as is the case when the cut is made with a V-shaped cutting-disk. The section of pipe between the cuts is waste and may be disposed of as such. The face (perpendicular to the axis) of each cutting-disk is preferably made concave, or dish-shape, to afford clearance between that face of the disk and the metal of the pipe to thereby reduce the friction between the two surfaces, which otherwise would be occasioned, but this is not absolutely essential.

Where two cutting-disks are used in a device of this class, it is desirable to prevent a torsional movement of the device around the pipe during the process of cutting, as such movement tends to injure the cutting-disks. This strain may occur if the pipe is forced against the cutting-disks by a stationary roll or rolls bearing against the pipe, because then imperfections and irregularities in the surface of the pipe may be encountered by the roll or rolls in the rotation of the device around the pipe so as to produce irregular motion. To prevent this torsional strain, I prefer to mount the rolls 24 in a jaw, which is pivoted to the sliding head in such a manner as to permit a limited universal movement, whereby the rolls may oscillate when they encounter uneven surfaces in rolling about the pipe.

I realize that considerable variation is possible in the construction of my improved device without departing from the spirit of

my invention, and I do not intend, therefore, to limit myself to the particular form herein shown and described.

I claim as new, and desire to secure by Letters Patent:

1. In a pipe-cutter, a frusto-conical disk provided with a cutting edge and having its base concave, means for pressing said disk against the pipe to be operated upon with the base of said disk substantially at right-angles to the axis of the pipe, and means whereby a relative movement of revolution can be imparted to the disk and pipe.

2. In a pipe-cutter, the combination with a frame having a stationary jaw, and a sliding head adapted to be moved upon the frame, of a cutting disk mounted upon one of said members having one of its faces concave and its opposite face beveled to form a knife-edge, and means for advancing and retracting the sliding head, for the purpose set forth.

3. In a pipe-cutter, the combination with a frame having a stationary jaw, and a sliding head adapted to be moved upon the frame, of cutting disks mounted upon one of said members, each disk having its outer face substantially perpendicular to its axis and its inner face beveled to form a knife-edge, a pair of rolls mounted upon the other of said members to have a universal movement thereon, and means for advancing and retracting the sliding head, for the purpose set forth.

4. In a pipe-cutter, the combination with a frame having a stationary jaw, and a sliding head adapted to be moved upon the frame, of cutting disks mounted upon one of said members, each disk having its outer face substantially perpendicular to its axis and its inner face beveled to form a knife-edge, a pair of rolls mounted within a swinging jaw and pivoted to the other of said members to oscillate in one direction around the pivot, a sleeve tapering from a large diameter at its center to a smaller diameter at each of its ends and interposed between said pivot and swinging jaw whereby said rolls can swing at right-angles to said oscillations, and means for advancing and retracting said sliding head, for the purpose set forth.

5. In a pipe-cutter, the combination with a frame having a stationary jaw, and a sliding head adapted to be moved upon the frame, of cutting disks spaced apart and mounted upon said jaw, each disk having an outer concave face substantially perpendicular to its axis and its inner face beveled to form a knife-edge, a pair of rolls mounted within a swinging jaw and pivoted to the sliding head to oscillate in one direction, a sleeve having its sides converging from a larger diameter to a smaller diameter at each end and interposed between said pivot and swing-

ing jaw whereby said rolls can swing at right-angles to said oscillations, and means for advancing and retracting said sliding head, for the purpose set forth.

5 6. In a pipe-cutter, the combination with a frame having a stationary jaw at one end, a bifurcated head at the other end, the furcations provided with holes through their ends, a nut confined against rotation and
10 longitudinal movement by contact with the frame at one of its sides and with said furcations at its ends, a sliding head mounted upon the frame between its ends and adapted to be moved thereon, cutting disks mounted
15 upon said stationary jaw and to rotate thereon, a pair of rollers mounted upon the sliding head to have universal movement thereon, a screw-threaded rod provided with a handle and passing through said nut and the holes
20 in the furcations and having one end rotatably confined within said sliding head and adapted to advance and retract said head, for the purpose set forth.

25 7. In a pipe-cutter, two frusto-conical disks spaced apart each having a cutting

edge, the base of each being concave and facing outward and substantially at right-angles to the axis of the pipe, and with their conical surfaces facing inward whereby the distorted metal is thereby forced longitudi- 30 nally of the pipe toward a central parallel plane between said disks, interchangeable spacing-washers adapted to vary the relative spacing apart of said disks, means for pressing said cutting disks against the pipe to be
35 operated upon, and means whereby a relative movement of revolution can be imparted to the disks and pipe.

8. In a pipe-cutter, two frusto-conical disks adjustably spaced apart, each having 40 a cutting edge and the base of each being concave, means for pressing said cutting disks against the pipe to be operated upon, and means whereby a relative movement of revolution can be imparted to the disks and
45 pipe.

RAGNVALD ECK.

In presence of—

RALPH SCHAEFER,
J. H. LANDES.