

No. 753,489.

PATENTED MAR. 1, 1904.

A. HEBERER.  
ADJUSTABLE WRENCH.

APPLICATION FILED MAR. 13, 1903. RENEWED JAN. 5, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

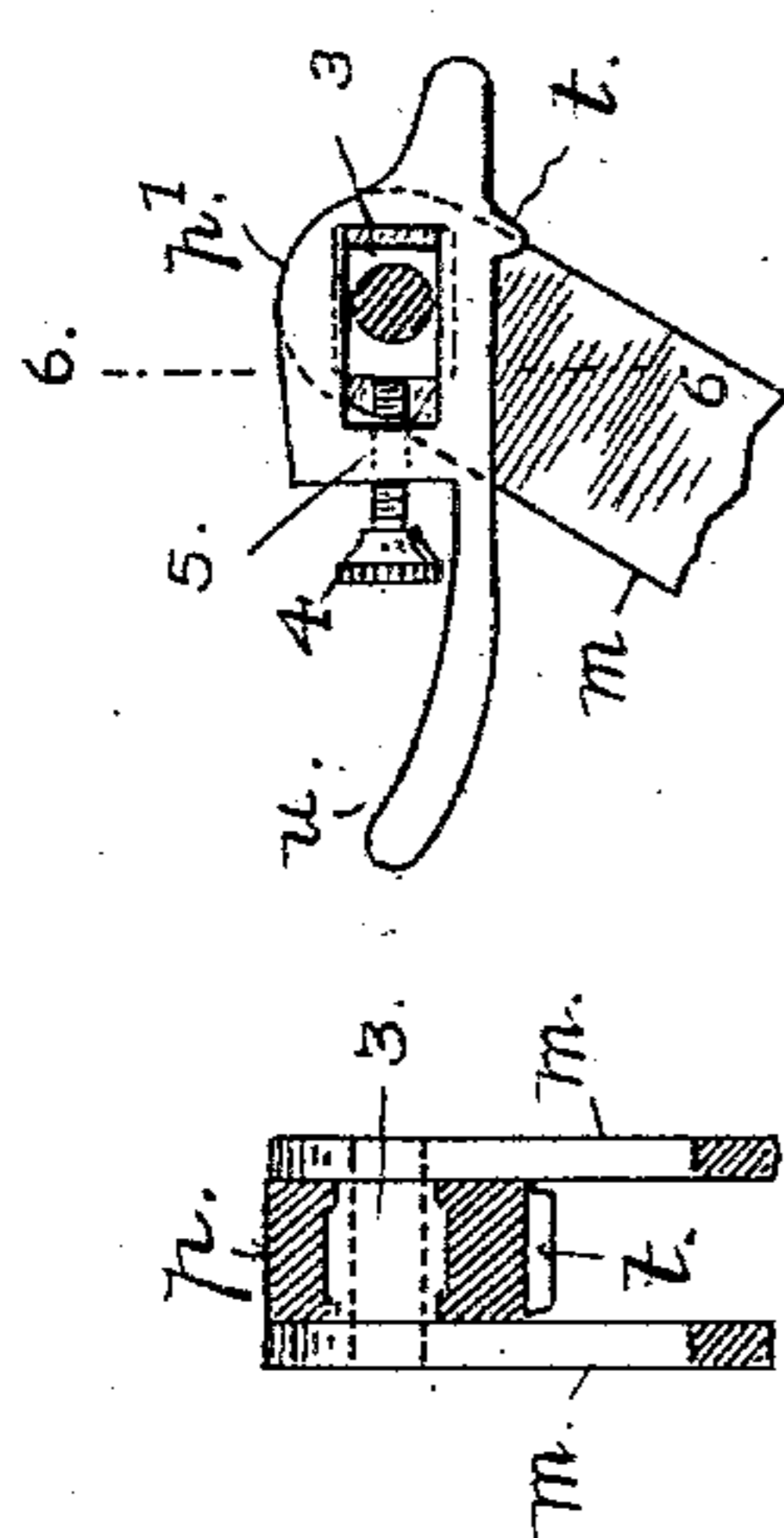
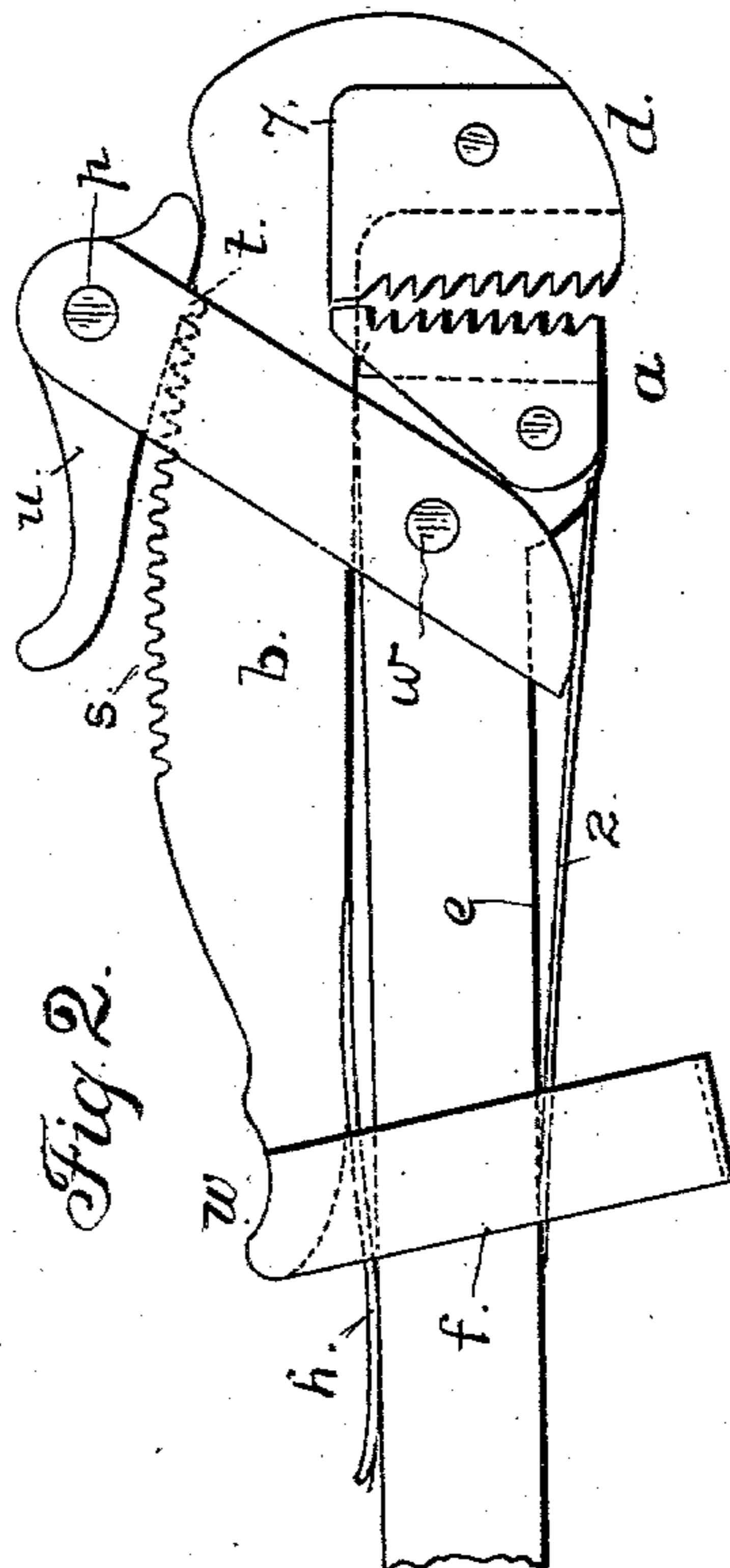
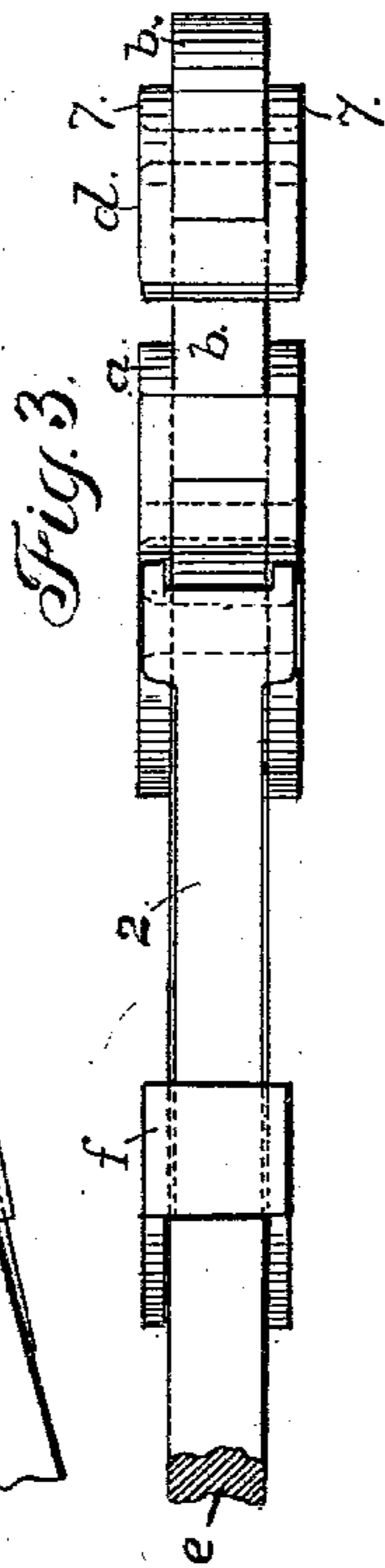
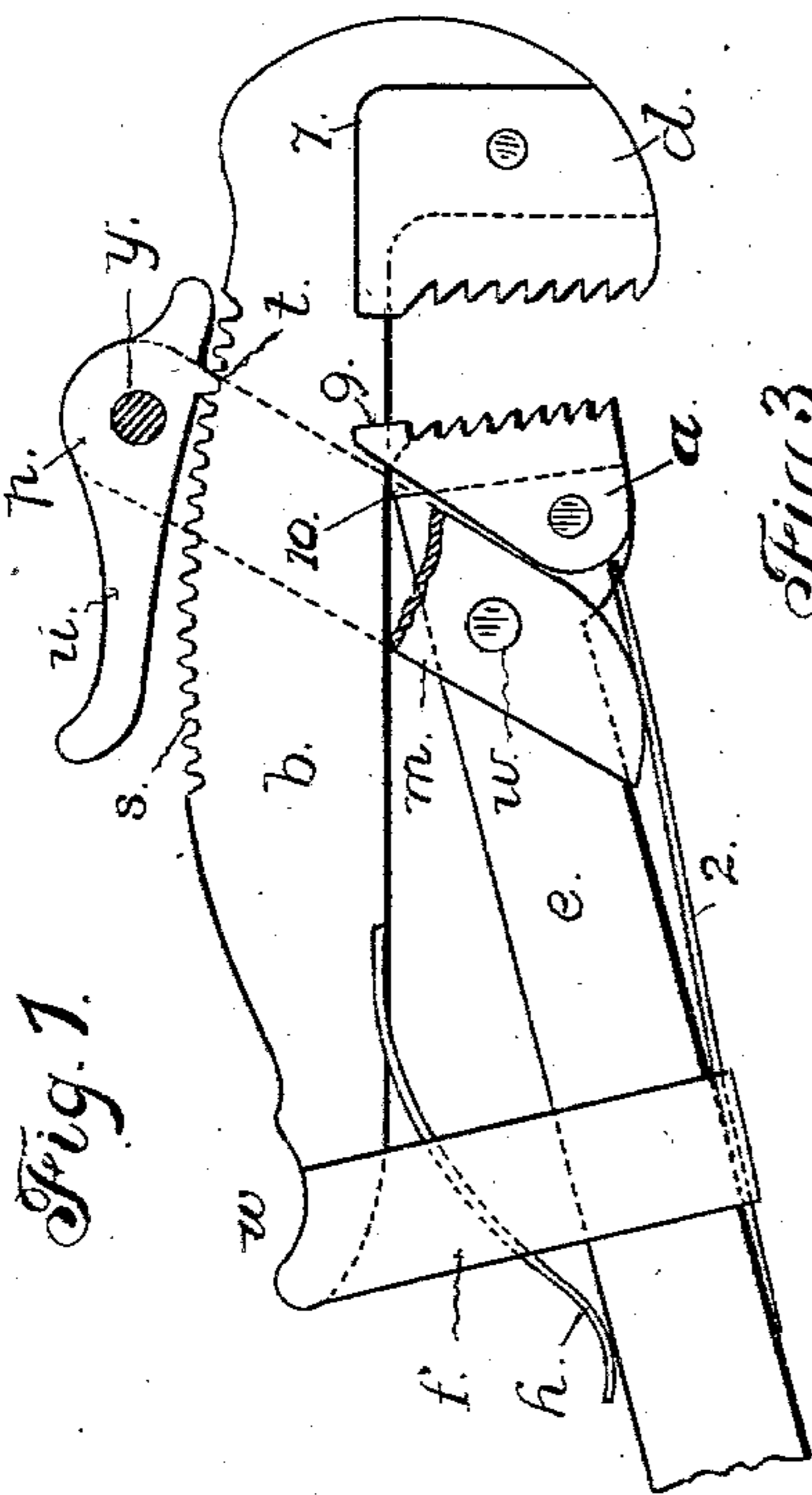


Fig. 5.

Fig. 6.

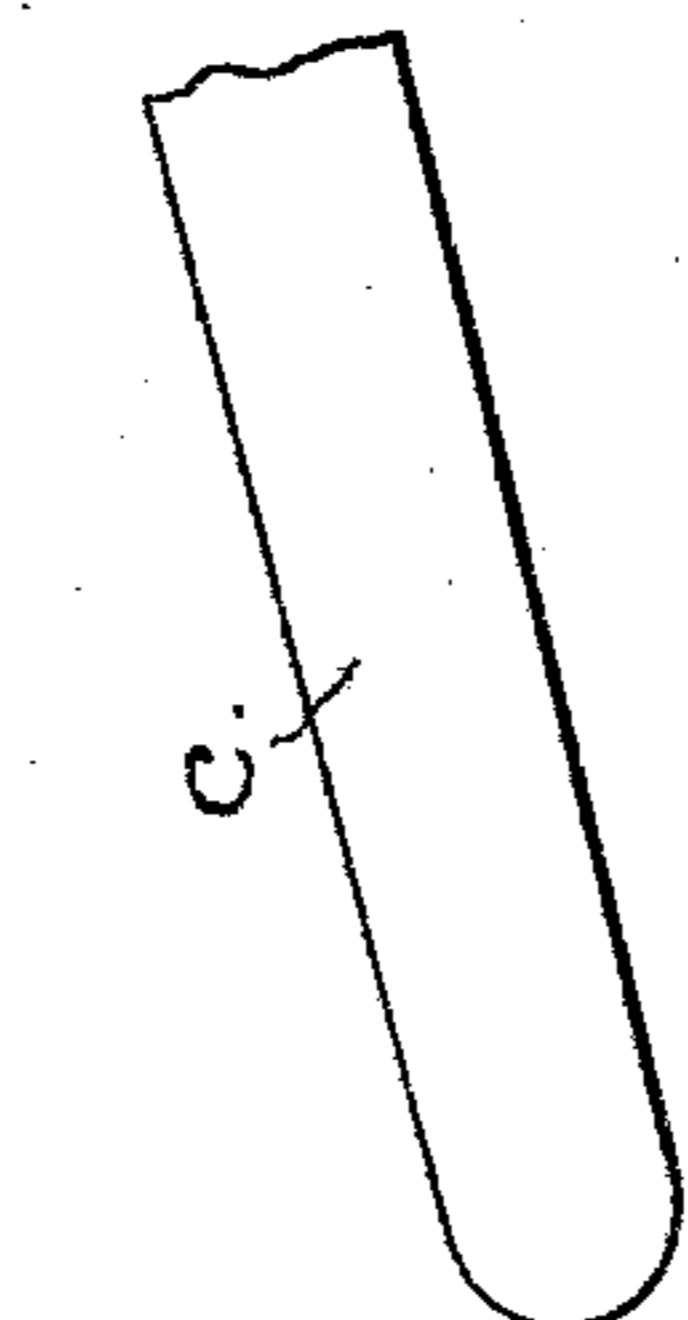


Fig. 4.

Witnesses:

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E. L. Gay

Inventor:

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By E. C. Osborn  
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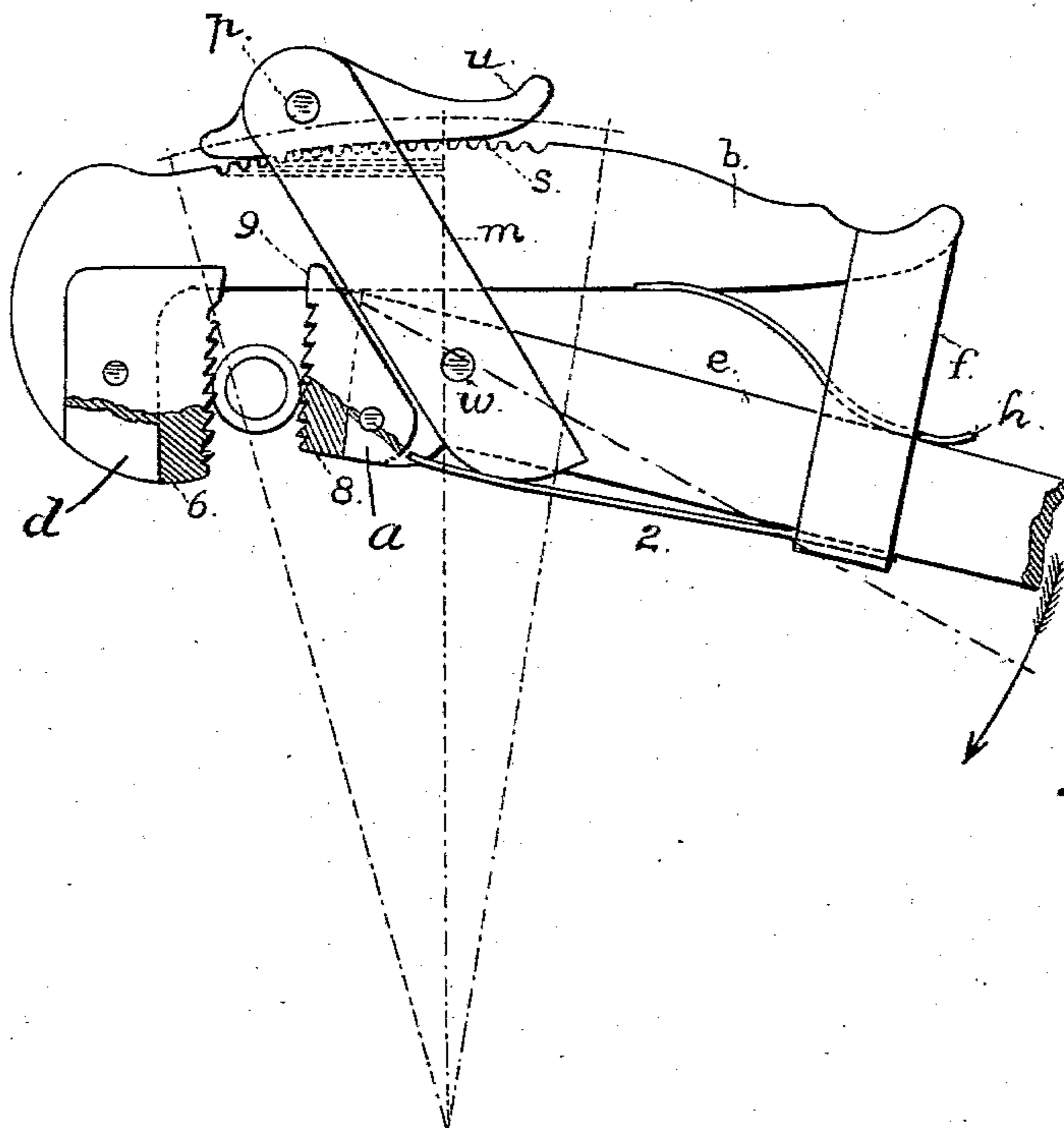
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2 SHEETS—SHEET 2.

*Fig. 7.*



Witnesses:

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# UNITED STATES PATENT OFFICE.

ADAM HEBERER, OF ALAMEDA, CALIFORNIA.

## ADJUSTABLE WRENCH.

SPECIFICATION forming part of Letters Patent No. 753,489, dated March 1, 1904.

Application filed March 13, 1903. Renewed January 5, 1904. Serial No. 187,847. (No model.)

*To all whom it may concern:*

Be it known that I, ADAM HEBERER, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented a new and useful Improvement in Adjustable Wrenches, of which the following is a specification.

This invention relates to improvements made in wrenches of that class or description having a stationary jaw on the end of a relatively long shank that constitutes the handle of the tool and a movable jaw on a second and relatively short shank which by adjustment longitudinally on the longer shank separates the jaws and allows them to grasp and hold objects and parts of different sizes or dimensions. The shank or part carrying one jaw being arranged to slide longitudinally on the part carrying the other jaw is also held from displacement while the tool is being operated through the medium of a locking device of some kind that secures the two shanks together for the time being. Wrenches of this character are designed more particularly for grasping and turning cylindrical or circular objects and parts—such as pipes, tubes, rods, and couplings—for which purpose they are generally furnished with serrated or notched jaws; but they are also rendered capable of working on angular surfaces by providing flat or smooth faces.

The present invention has for its object chiefly to improve the several parts or members of a tool of this class or description, more especially with respect to the means by which the distance between the two jaws is varied and regulated to suit the work, whereby the operation of setting and locking the movable jaw is rendered more nearly automatic; also, to give the tool a large scope or range of adjustment and especially the quality of accommodating itself to any variations in or departures from standard sizes or dimensions of parts and objects, and, finally, to provide a tool capable of being placed and adjusted by the workman with one hand to grasp and hold any size or dimension of work within its range and one that is specially adapted for use on overhead work and in other situations where the part

to be seized and operated on is difficult of access.

To these ends and objects mainly my said improvements consist in certain novel parts and combination of parts producing an improved wrench of the character described, all as hereinafter fully explained, and set forth in the claims at the end of this specification.

In the following description explaining the manner in which I proceed to construct, apply, and carry out my said invention reference is had to the accompanying drawings, that form part thereof.

Figure 1 is an elevation on a vertical longitudinal plane of a wrench for pipes and other circular work embodying my invention, the handle being reduced in length to bring the figure within the limits of the sheet. Fig. 2 is a similar elevation showing the jaws closed. Fig. 3 is an edge view looking at the front of the jaws, or that edge which is turned to the right in Fig. 1. Fig. 4 shows details in perspective of the detachable gripping-faces on the jaws. Fig. 5 illustrates an additional means sometimes applied to the locking-dog for obtaining a finer adjustment of the movable jaw. Fig. 6 is a transverse vertical section on the line 6 6, Fig. 5. Fig. 7 illustrates the relative position of the parts after the piece to be turned is seized in the jaws and the force is applied to the handle of the wrench.

For the purpose of distinguishing between the two jaws *a* *d* and also between the shanks that carry them the jaw *a* is herein termed the "stationary" jaw, and its shank is designated as the "main" shank, while the other jaw, *d*, is called the "movable" jaw and its shank the "secondary" shank. The main shank *e* is provided with a handle portion *c* on one end and the jaw *a* on the opposite end, the face of the latter being serrated or notched in the usual manner of forming the gripping-surfaces in an implement of this kind. The movable jaw *d* on the end of the secondary shank *b* is also serrated, and both jaws stand approximately at right angles to their respective shanks. A stirrup *f*, rigidly secured to the secondary shank *b* on the end opposite the jaw *d*, embraces the main shank, and that member is

loosely fitted in the stirrup, so that the latter is free to slide on the main shank under the longitudinal movement of the secondary shank, while the main shank is also movable in the stirrup longitudinally or from end to end of the stirrup. A spring *h*, placed between the main shank and the secondary shank at the stirrup *f*, holds the end of the stirrup against the main shank, with the effect to press the rear end of the secondary shank away from the main shank, and thereby throw the points of the jaws toward each other. This is the normal position of the shank and jaws both before the tool is adjusted to grasp the piece to be turned and also while it is in operation. The principal function of the stirrup is to maintain the jaws in proper alinement and to permit an angular movement of the secondary shank, whereby the points of the jaws are thrown toward each other after the jaws are brought up to the piece placed between them. The two shanks are connected together by two side straps *m*, pivotally attached to the main shank and on opposite sides thereof at a point behind the stationary jaw; but at the opposite ends the straps are connected to the secondary shank through the medium of a latch-piece *p* and a row of grooves or open slots *s* in the back of the secondary shank. The part *p* is a block of the same thickness as the secondary shank, with a tooth or projection *t* on the under face fitting any one of the grooves in the adjacent edge of the shank and also provided with a tailpiece *u*, terminating in an outwardly-turned part for a finger-rest. The block *p* and the ends of the straps *m* between which it is placed are attached together by a pin *y*, that forms a pivot for the block and the straps. A spring 2, attached at one end to the shank and extending from that point toward the head of the tool, bears against the ends of the straps beyond the pivot *w*, the ends of the straps being so curved that the tendency of the spring bearing against the curved end is to hold the block *p* down against the back of the shank *b* with a degree of pressure sufficient to make the projection on the block engage the grooves in the shank and also hold the straps in an angular position across the shank. By virtue of this angular position the block will ride over the back of the shank and the tooth or projection will slip from groove to groove as the shank *b* is drawn back on the shank *e* to close the jaws until the jaw *d* is arrested by coming in contact with the piece placed between the jaws. The tooth thereupon slipping into the nearest groove prevents a retrograde movement of the block. By reason of this construction the shank carrying the jaw *b* can be set backward by a longitudinal movement along the shank *e* either by the weight of the secondary shank and the parts it carries when the tool is held in a vertical position or else by seizing the tail of the shank *b* where the stirrup is attached

and drawing the shank toward the handle-bearing end of the tool. No movement of the shank *b* can take place in the contrary direction upon the shank *e* without disengaging the tooth *t* of the block *p* from the grooves in the back of the shank *e*. The tailpiece of the block *p* is turned outwardly to form a finger-rest *u*, by which that end can be seized to draw back the straps and bring them to the proper angle to throw the tooth *t* clear of the grooves in the shank.

Variations in the width of the opening between the jaws are effected by shifting the tooth of the bearing-block *p* from one groove to the next, and the range of such adjustment of the jaws provided in the tool will be found to depend on the number and the fineness of the grooves. Such limitations, while rendering impracticable the use of closely-spaced grooves for the locking device where the grooves are arranged in a straight line, especially on wrenches of the smaller sizes, are overcome in the present improvement by disposing the grooves on a curved instead of a straight line, and arranging the grooves on a curve, as seen in Figs. 1 and 2, I am able to obtain a small variation or increase in the width of the opening between the jaws by shifting the block from one groove to the next with a relatively coarse or wide spacing of the grooves. By this means I provide a fine adjustment of the movable jaw on the stationary jaw and at the same time give ample amount or thickness of metal between the grooves for strength and durability. The bottom line of the grooves is laid on a curve struck from a point below the stationary jaw, as illustrated in Fig. 7, and the grooves are spaced and laid off on lines radiating from such point. The tooth or projection on the block *p*, that engages these grooves, holds the block on the shank *b* at whatever position it may be set; but the strain upon the straps as the power is applied to the handle to work the wrench is taken from the projection *t* and is thrown entirely on the back of the shank *b*, by the peculiar form and arrangement of the bearing-block, so that the projection and the groove in which it rests are not required to sustain the working strain. These results are secured by providing the bearing-block with a tailpiece extending behind the pivot a greater or less distance and having a curved bottom face to rest on the back of the shank. When the power to work the wrench is applied to the handle, the entire strain sustained by the straps *m* is thrown upon the back of the shank *b*, at which time the block *p* is drawn down to a solid bearing on the back of the shank, as shown in Fig. 7.

The tooth *t* is set eccentrically or in front of the line of the pivot *y*, so that the outer end of the tailpiece of the block will set away from the grooves when the tool is being adjusted.

The attachment illustrated in Figs. 5 and 6 is applied to the wrench when a finer adjustment is required than the grooves will furnish. The bearing-block  $p'$  carries an adjustable box 3 for the pin  $y$ , and a screw 4, with a milled head, working in a stationary nut 5 on the block, furnishes the means for shifting the pin in one direction or the other. Shifting the point  $y$  in this manner while the tooth on the block is resting in a groove will have the effect to produce a slight increase or decrease in the width of the opening between the jaws beyond the adjustment that would result from the position of the block alone.

The jaws are separable from the shanks for the purpose of replacing them when worn or broken, and they are formed with the view to give ample strength and a solid bearing on the shanks. The sides of the jaws extend beyond the shank to which the jaw is secured, so as to embrace the sides of the opposite shank, as shown in Figs. 2, 4, and 7, both for the purpose of keeping the jaws in line and for increasing the stiffness of the tool at the point where the shanks are subject to angular strain under careless handling of the tool.

The detachable jaw 8 is formed with a rounded heel 9, on which as a fulcrum the shank  $b$  has a limited rocking movement, the effect of which is to throw the points of the jaws toward each other when they are first placed on the piece to be turned.

The operation of the tool is as follows: The tool being in the position shown in Fig. 1, place the thumb on the rest on the tail of the block and grasping the handle on the main shank draw the head of the strap and the block to the rear. This causes the tooth on the block to clear the grooves and allows the movable jaw to be pushed forward with the palm of the hand or with the other hand as far as required. Then, shifting the thumb to the thumb-rest on the rear end of the secondary shank, squeeze the shanks of the movable jaw and stationary jaw together, thereby compressing the spring  $h$ , as shown in Fig. 2. This brings the faces of the toothed portions parallel and at their widest separation. The pipe then being entered between the toothed surfaces and set against the stationary jaws, the secondary shank is drawn to the rear along the main shank until the movable jaw comes in contact with the pipe between the jaws. In this position the tooth on the block will slide over the grooves until on releasing the secondary shank the tooth on the block will drop into the groove directly beneath it and hold the straps at that point.

Having thus fully described my invention,

what I claim as new therein, and desire to secure by Letters Patent, is—

1. In an adjustable wrench the combination, with a main shank having a gripping-jaw on one end and provided with a handle, of a secondary shank having a gripping-jaw on one end and a stirrup on the opposite end and loosely embracing the main shank; spaced grooves on the back of the shank having their bottoms arranged on a curved line, straps pivotally attached to the main shank and embracing the secondary shank, a bearing-block to which the straps are connected at their opposite ends, the bearing-block being adapted to ride on the back of the shank and having a projection to engage the grooves, and a tail-piece extending rearwardly of the point of attachment between the bearing-block and the straps.

2. In an adjustable wrench the combination, with a main shank having a gripping-jaw on one end and provided with a handle; of a secondary shank having a gripping-jaw on one end and a stirrup on the opposite end loosely embracing the main shank, and means adjustably connecting the main shank and the secondary shank together consisting of the straps pivotally attached to the main shank at the rear of the gripping-jaw, a bearing-block to which the opposite ends of the straps are pivotally connected, the bearing-block having a curved inner face adapted to bear on the back of the secondary shank; a series of grooves on the back of the secondary shank arranged on a curved line the center of which is situated below the point of attachment of the straps to the main shank, and a projection on the bearing-block engaging said grooves.

3. In a wrench of the character described the combination, with the main shank having a gripping-jaw on one end and provided with a handle, and the secondary shank having a gripping-jaw on one end and a stirrup loosely embracing the main shank; of the straps pivotally attached to the main shank and embracing the secondary shank, a bearing-block adapted to ride on the back of the secondary shank, a pin pivotally connecting the bearing-block and the straps, a slidable box on the bearing-block adapted to carry the said pin, and means for adjusting the said box; said bearing-block having a projection arranged to engage grooves on the secondary shank.

In witness whereof I have signed my name in the presence of two subscribing witnesses.

ADAM HEBERER.

Witnesses:

EDWARD E. OSBORN,

M. REGNER.