

(No Model.)

M. D. LUEHRS.  
BOLT CUTTER.

2 Sheets—Sheet 1

No. 511,441.

Patented Dec. 26, 1893.

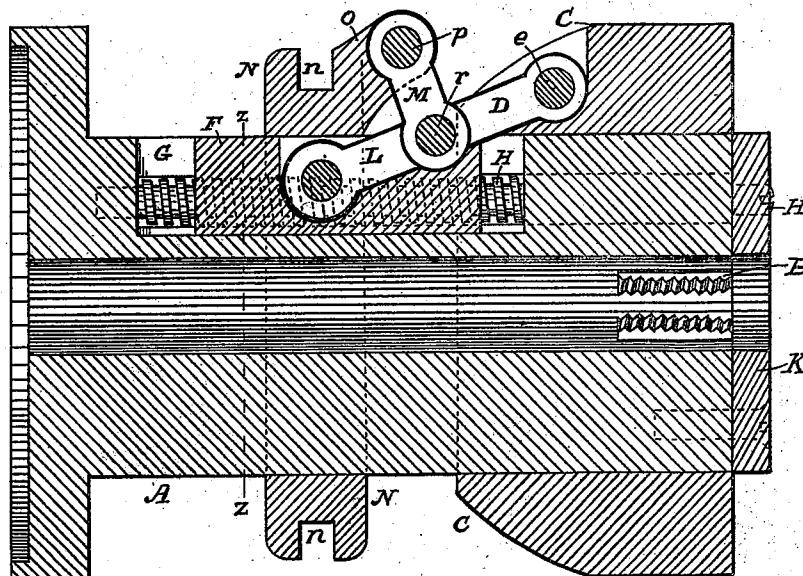


Fig. 1

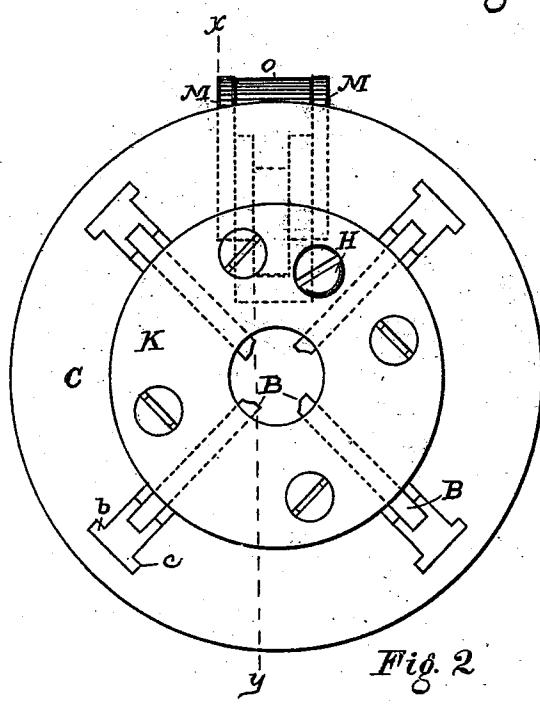


Fig. 2

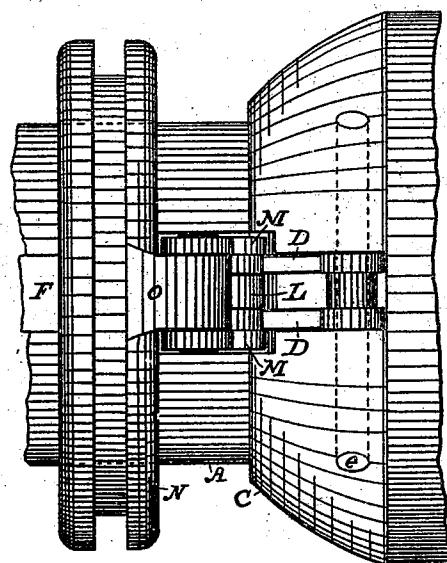


Fig. 3

WITNESSES

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by   
Attorney

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2 Sheets—Sheet 2.

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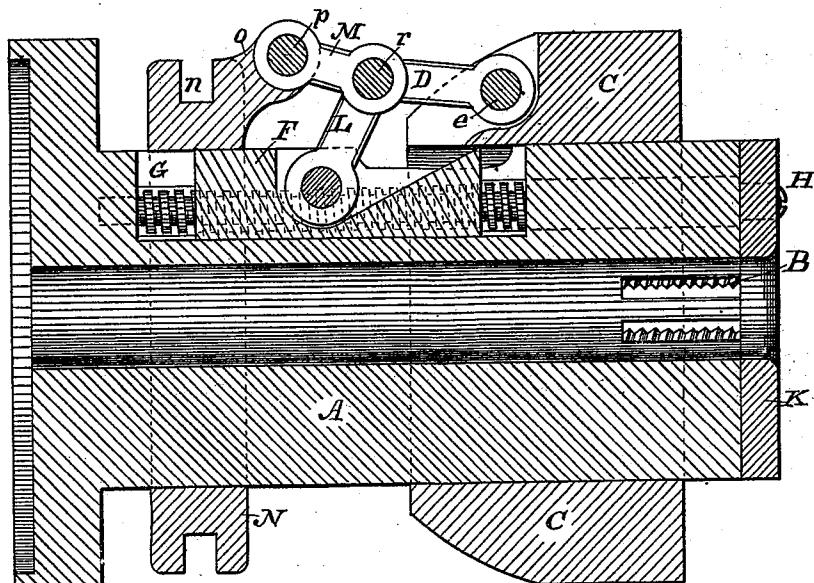


Fig. 4

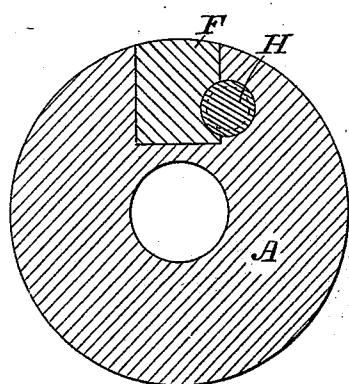


Fig. 5

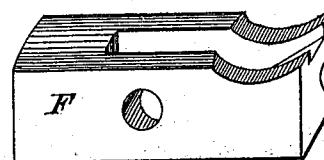


Fig. 6

WITNESSES:

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

MICHEL D. LUEHRS, OF CLEVELAND, OHIO.

## BOLT-CUTTER.

SPECIFICATION forming part of Letters Patent No. 511,441, dated December 26, 1893.

Application filed August 16, 1893. Serial No. 483,278. (No model.)

*To all whom it may concern:*

Be it known that I, MICHEL D. LUEHRS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State 5 of Ohio, have invented certain new and useful Improvements in Bolt-Cutters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it 10 appertains to make and use the same.

My invention relates to improvements in bolt cutters of the class wherein radial movement of the dies is effected by the sliding on the barrel of a die ring having inclined grooves 15 or ribs with which the dies engage; an example of which class of bolt cutters is shown in the patent to myself, No. 268,508, dated December 5, 1882.

The object of the invention is to increase 20 the efficiency of the apparatus and the ease of operating the same, and it consists in the construction, arrangement and combination of parts to accomplish those objects.

In the drawings Figure 1 represents a longitudinal section through a bolt cutting head embracing my invention; Fig. 2 is a front end elevation of the same, in which the broken line  $x-y$  indicates the plane of section shown in Fig. 1. Fig. 3 is a plan view of the clutch- 25 ring and toggle connection thereof to the die-ring. Fig. 4 is a longitudinal section in the same plane as Fig. 1, showing the position of the parts when the dies are retracted to clear the bolt and permit its withdrawal. Fig. 5 is 30 a transverse section on the line  $z-z$  of Fig. 1. Fig. 6 is a detached view of the sliding adjusting-block F, by means of which the depth of cut is regulated and varied at will.

A represents the barrel or body of the head, 35 having at its front end radial slots in which the dies B move, being held therein by the face-plate K secured to the front end of the barrel.

C is the die-ring, sliding on the barrel which 40 it smoothly fits, and having internal rearwardly inclined grooves c in which slide the similarly inclined shoulders b formed on the dies or die-caps.

N is the clutch-ring, operated in the usual 45 manner by a handle (not shown) which engages the groove n in the clutch-ring, the latter sliding smoothly on the barrel A, and actu-

ating the die-ring C in the manner presently to be described.

In most bolt-cutters now in use the movement of the die-ring is effected by a rocking lever or "dog" pivoted in the barrel and either connected to or bearing directly or indirectly upon the die-ring. A structure of this type is shown in my former patent above mentioned.

In practice it is found that in time the clutch-ring, as well as the lever or dog, wears by use, causing some lost motion; furthermore the friction of the clutch-ring on the lever or dog increases the power required to operate the bolt cutter, and especially in that form of bolt-cutter in which the rocking lever, connected by a link to the die-ring, is arranged to have its forward end forced down to or below a line joining the pivots, so as to effect what is called a toggle lock of the die ring in the closed position, in which case the power required to be exerted upon the back end of the lever or dog to open the toggle lock is considerable, and is exerted at a disadvantage, as it is resisted at first by the greatest friction as well as by the greatest power of the toggle. By my present invention I retain the toggle lock but dispense with the lever and thus avoid entirely the friction of the clutch-ring on the lever, and I apply the power to open the toggle lock in the most effective direction, viz: at a right angle to the line joining the pivots of the toggle. In this manner I almost entirely obviate friction and greatly reduce the power required to operate the cutter, thereby facilitating the work and increasing the output in a given time, and I accomplish this by the means which I will now proceed to describe.

To the die-ring C are pivoted one or more links D by a pin e, and a link or links L, pivotally secured to the barrel, are pivoted to the links D, forming a toggle which, when the three pivots are brought into line, 95 as shown in Fig. 1, locks the die-ring in the closed position. The clutch-ring N is connected to the toggle by a link or links M, pivoted at their upper ends to the ring, preferably to a forward extending lug o thereon, by the pivot p, and at their lower ends pivoted on the common pivot r which joins all the links together. It will be seen that moving the clutch-ring forward will extend the toggle and force

forward the die-ring, thus closing the dies and locking the die-ring in position, while moving the clutch ring backward will cause the link M to pull directly in the line of least resistance, and will open the toggle and bring the parts into the open position shown in Fig. 4 with the least possible expenditure of power, and hence with a saving of time.

As it is desirable to have the extent of movement of the die-ring, and consequently of the dies, adjustable, I provide one or both ends of the toggle with a movable bearing whereby the relation of the pivotal points at the extremities of the toggle to the barrel or die-ring, or both, may be varied. This is preferably accomplished by pivoting the link L to a block F, fitting in a recess G in which it has longitudinal movement in the barrel A, and threading into the block F a screw H having bearing in the barrel and extending through the face plate K, so as to be readily accessible. Obviously by turning the screw H the block F will be moved longitudinally in the barrel, and will thus govern the extent of forward movement of the die-ring and the depth of the cut.

Two, three, or any desired number of the toggle connections of the die-ring to the barrel may be used, according to the power required for the work to be done; in nearly all cases two, diametrically opposite each other, will be sufficient.

What I claim as my invention, and desire to secure by Letters Patent, is—

35 1. In a bolt-cutter head the combination with the barrel and the die-ring sliding thereon, of a toggle connecting the barrel and die-

ring, a clutch-ring sliding on the barrel, and a link pivoted at one end to the clutch-ring and at the other to the center joint of the toggle, substantially as described.

2. In a bolt-cutter head the combination with the barrel and the die-ring sliding thereon, of a toggle adjustably connecting the barrel and die-ring, a clutch-ring sliding on the barrel, and a link pivoted at one end to the clutch-ring and at the other to the center joint of the toggle, substantially as described.

3. In a bolt-cutter head the combination with the barrel and the die-ring sliding thereon, of a toggle having immovable pivotal connection to the die-ring and movable pivotal connection to the barrel, a clutch-ring sliding on the barrel, and a link pivoted at one end to the clutch-ring and at the other to the center joint of the toggle, substantially as described.

4. In a bolt-cutter head the combination with the barrel and the die-ring sliding thereon, of the link D pivoted to the die-ring, the link L pivoted to a block sliding in the barrel, an adjusting screw engaging said sliding block and having bearing in the barrel, a clutch-ring sliding on the barrel, and a link pivoted at one end to the clutch-ring and at the other by a common pivot to the links D and L, substantially as described.

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

MICHEL D. LUEHRS.

Witnesses:

DANIEL M. LUEHRS,  
WM. G. TAYLOR.