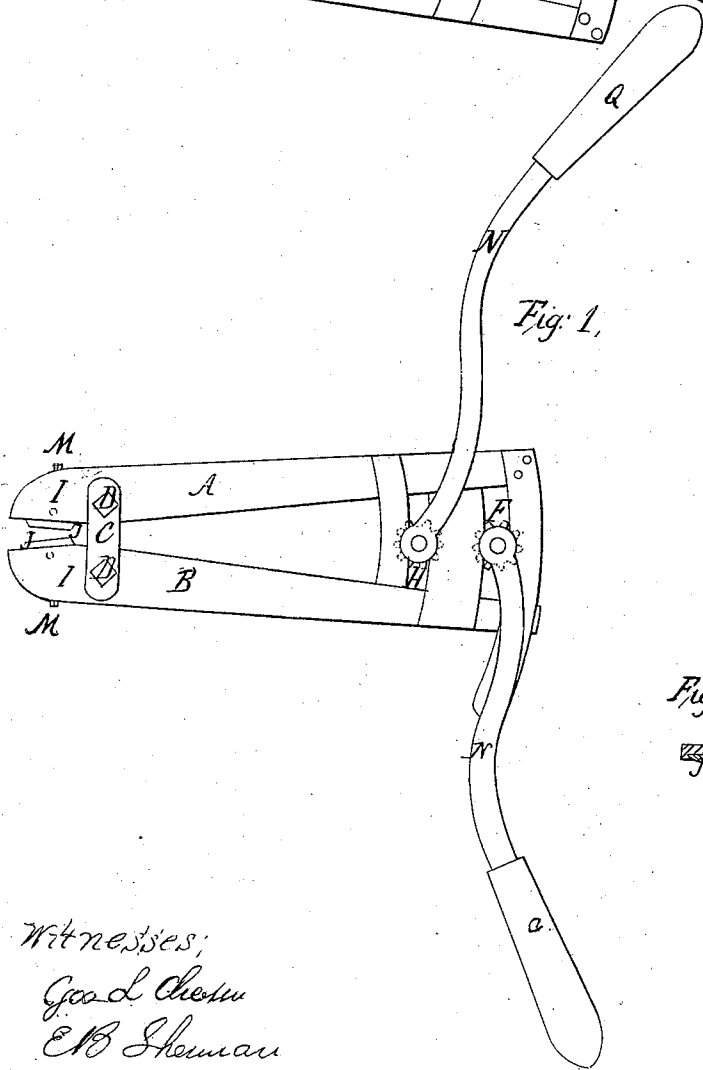
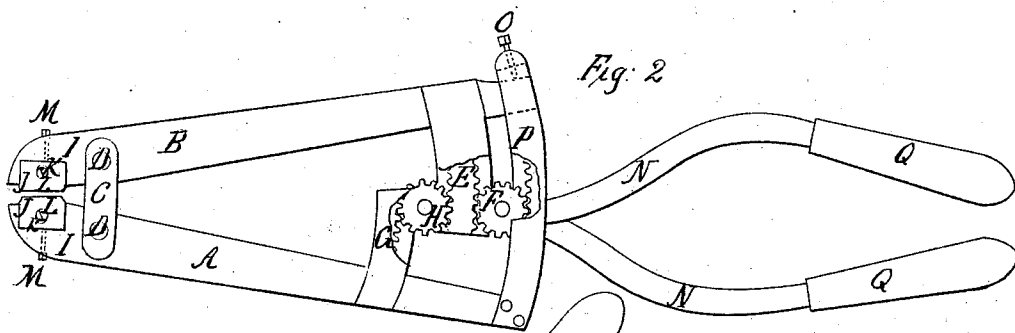


*J. E. Heath,  
Cutting Metal,*

*No. 65,745,*

*Patented June 11, 1867.*



*Fig. 3,*



*Witnesses;  
Geo. L. Chas. M.  
E. B. Sherman*

*Inventor  
J. E. Heath*

# United States Patent Office.

JOHN E. HEATH, OF NILES, MICHIGAN.

Letters Patent No. 65,745, dated June 11, 1867.

## IMPROVED DEVICE FOR SHEARING METALS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN E. HEATH, of Niles, in the county of Berrien, and State of Michigan, have invented a new and useful improvement in Ratchet-Shears for Cutting Metal; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, and letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is an elevation of my invention with the jaws of the shears open.

Figure 2 is an elevation with the jaws shut.

Figure 3 is a section of the knife and one of the jaws taken through the line  $x x$ , fig. 2.

The nature of my invention consists, first, in operating the shears by means of two pinions moving between racks, so that the pressure of the hand upon each of the two handles will have a positive effect upon said shear-blades. By this mechanical arrangement two levers can be attached to the shafts of the ratchet-pinions, by which means much more power can be applied to the jaws or shears; consequently a much larger piece of iron can be cut.

Improvement second consists in fitting a set-screw into the end of the up-lever guide, for the purpose of adjusting the distance that the edges of the cutters should be from each other.

Improvement third consists in dove-tailing the cutters into the jaws of the levers, and holding the cutters in place by means of screws passing through slots made in the cutters and into the jaws; and further, in putting set-screws into the jaws, in order that the cutters may be set closer together at any time desired, after they shall have become worn by use. By this arrangement and construction provision is made for keeping the cutters in the proper condition for severing iron or other metal.

A shows the lower and B the upper levers, connected by the straps C, having the bolts D passing through the parts so as to form a joint. E is a double rack projecting from the arm B, and located between the racks G and P, and equidistant from each other, so that the pinions H F will lie between and properly mesh with the cogs of the racks. The levers N N are attached, one to each of the pinions H F, and it is apparent that though either of said levers would operate both jaws of the shears, yet the duplication of the racks and pinions enables both of the operators' hands to act positively to the same result, and thus greatly increases the power which he is enabled to exert, and therefore he will be enabled to sever a much thicker sheet of metal than would otherwise be the case. The cutters J J, as seen at fig. 3, are dove-tailed into the jaws I, and have slots,  $k$ , made through them, as seen at fig. 2, for the purpose of admitting the screws L to pass through the cutters J and into the jaws I, and hold said cutters firmly in position, yet allow the screws to be loosened, and the cutters to be forced together by means of the set-screws M, when the edges of the cutters become worn by use. O is the set-screw against which the arm B strikes when the jaws open, and is adjustable in the end of the guide P for the purpose of regulating the distance the lever B shall move when made to shut the jaws I.

Operation: When my device has been constructed as set forth, it can be operated by placing the knives or cutters J on the opposite sides of the metal to be cut, as seen at fig. 1, after which the handles  $a$  of the levers M must be forced together, as seen at fig. 2. The cutters J can be adjusted, as desired, by means of set-screws M and O.

The ledge on each side of each rack, as shown in the drawings, prevents the pinions from becoming displaced, and they, therefore, require no journals, but roll freely between the two opposite racks when the jaws are moved.

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

1. The racks E G P and pinions F H, provided with the handles N N, constructed and combined substantially as set forth.
2. The set-screw O, in combination with the arms A B, provided with racks E G P and pinions H F, for the purpose of limiting the movement of the arms away from each other and the movement of the operative lever.
3. The slotted cutters J J, in combination with the screws L L and set-screws M M and jaws A B, substantially as and for the purpose set forth.

J. E. HEATH.

Witnesses:

GEO. L. CHAPIN,

E. B. SHERMAN.