No. 646,203. Patented Mar. 27, 1900.

J. C. BURGESS.

METAL SHEARS.

(Application filed Dec. 29, 1899.)

(No Model.)

Fig. 1.

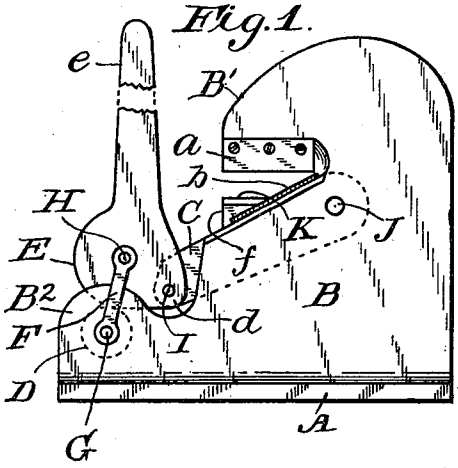


Fig. 2.

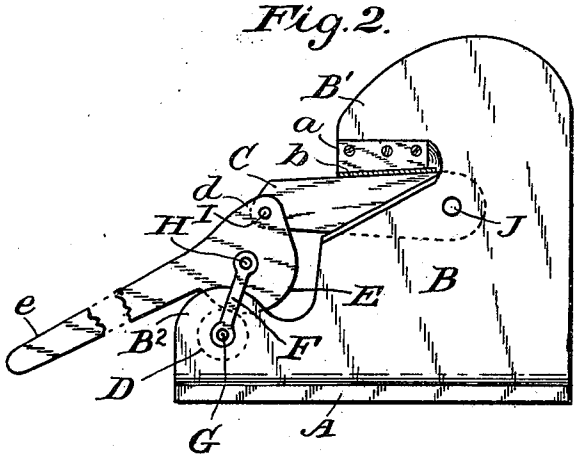


Fig. 3.

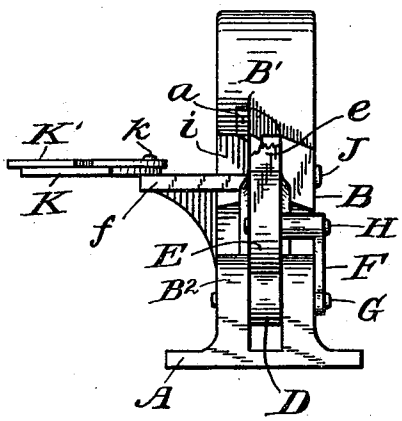


Fig. 4.

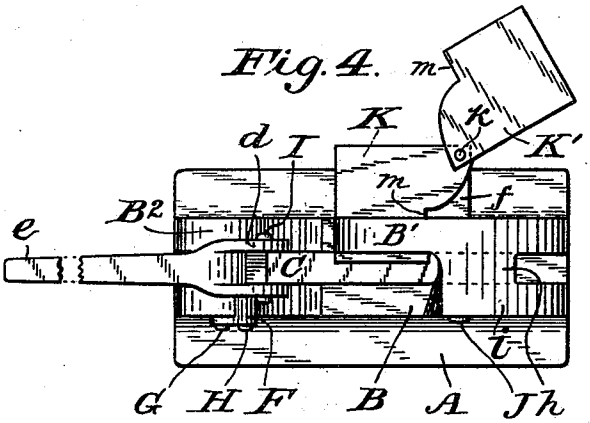
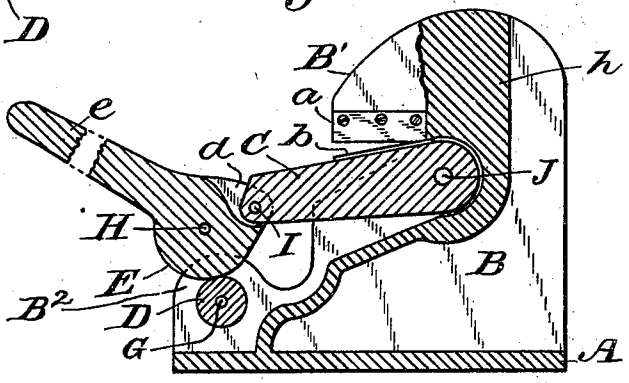


Fig. 5.



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METAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 646,203, dated March 27, 1900.

Application filed December 29, 1899. Serial No. 741,899. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. BURGESS, a citizen of the United States, residing at Columbus, in the county of Bartholomew and State of Indiana, have invented certain new and useful Improvements in Shears for Cutting Metals; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to the class of shears usually designated as "cold-iron" shears, operated manually and designed more particularly for cutting bar-iron into shorter lengths; and the object is to provide such a tool of simple and inexpensive design adapted to be cheaply constructed and which shall be capable of operation with the minimum amount of force applied thereto, an object being to eliminate the weaknesses of shears of this character, especially of those having gear-teeth. These are attained in my invention, which is of great utility and is durable in use.

The invention consists in providing a new and novel form of operating-lever and rolling fulcrum whereby the arm to which one of the shear-blades is attached is actuated, and it consists also in the parts and in the combination and arrangement of parts hereinafter more fully described and claimed.

Referring to the drawings, Figure 1 represents a side elevation of a shearing-tool constructed in conformity to my invention in which the shear-blades are shown in open positions; Fig. 2, a similar view showing the blades closed, as after having taken a cut; Fig. 3, a front view showing the lever in the same position as in Fig. 1, but with the extremity of the lever removed; Fig. 4, a top plan view, in which the lever is down, as in Fig. 2; and Fig. 5, a central vertical sectional view showing the lever and movable blade as in the act of making a cut.

In the drawings similar letters of reference in the several figures designate similar parts.

In construction I combine in one piece of cast-iron or steel the whole stationary framework, comprising a base A, an upright trunk or body portion B, a head B′, to which is attached the stationary shear-blade *a*, and a short bifurcated branch B^2.

The design shown is adapted for cutting very heavy bar-iron and has a powerful head, the trunk being cored out, where strength is not so much required, at the back of and below the movable shear-arm, while the upper part *h* of the web is heavy to afford ample strength of neck. When designed for slitting sheet metal, the part *h* of the web above the shear-arm C and also the side part *i* of the head are cut away in casting to afford clearance for the plate, and also the lever *e* may be offset laterally. The shear-arm C is a powerful forging having one end of greater depth than the other end, as is usual, and at its heaviest end is pivoted to the body portion or trunk by means of an axial journal pin or bolt J, fitted solidly into the trunk, and on which the arm may move without play. The movable blade *b* is attached to the arm C, so as to shear with the fixed blade *a*.

In the bifurcated branch B^2 is a roller D, journaled on an axle secured in the casting, and upon the roller the heel of the operating-lever finds its fulcrum.

The operating-lever *e* has its connected end formed so as to provide a convex surface E to bear upon the roller D as a variable fulcrum, this bearing-surface or "heel" being virtually a segment of a circle struck oppositely to that of the roller, but of greater radius. At the upper side of the lever or part opposite the heel is a bifurcated nose *d*, to which is pivoted the free end of the arm C by means of a pin or bolt I, so that in operation the heel E as the lever is moved up or down rolls upon the roller D as the peripheries of two wheels working face to face. In order to prevent the heel E from rising from the roller D when suddenly raising the lever *e*, I provide a link F, which is pivoted to a pin H, situated at the point from which the circle of the heel is struck and also pivoted to the projecting end of the axle G. These latter-described parts are preferably forgings of either steel or iron, as will be obvious.

At one side of the body portion of the framework is a table *f* upon which to rest the iron

when cutting it, and in order to render this readily adjustable in a cheap manner for differing dimensions of iron I provide false tops of suitable number, as at K K′, pivoted at one corner by a bolt or pin *k* to the table *f*, so as to swing horizontally across the top of the table, each having a gage edge *m* to stop against the neck *i* of the head when in use. When not required, these are swung back out of the way, as K′ in Fig. 4, K being in operative position in Figs. 1 and 4.

In designing very powerful shears the arm C may be extended and the radius of the roller D, as well as that of the heel E, increased accordingly, as may be required. Such a tool operates smoothly with but little friction and is nearly noiseless and is particularly useful for blacksmith jobbing-shops and like industries where hand-power is used. Nevertheless, my invention may be readily adapted to be operated by other power transmitted from shafting, as will be obvious.

The manner in which this invention is used is similar to the manner in which other lever-shears are operated, which is well understood and will be apparent to the mechanic upon examination of the tool, the operation consisting merely in placing the metal to be cut between the shear-blades and forcing the operating-lever down until the cut is accomplished, when the lever is raised in preparing for another cut.

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

1. A shearing-tool provided with a lever having a convex fulcrum-bearing and pivoted to the free end of the movable shear-blade arm, and a rolling fulcrum engaged by the convex fulcrum-bearing of the lever.

2. A shearing-tool having a pivoted arm supporting a shear-blade, a journaled roller situated near the end of the pivoted arm when in its open position, an operating-lever having a nose engaging the free end of the pivoted arm and provided with a convex fulcrum-bearing face engaging the journaled roller.

3. In a shears, the combination of the frame having a shear-blade head and provided with the bifurcated frame branch extending forwardly of the head, the roller journaled in the bifurcated branch, the stationary shear-blade, the arm pivoted at one end thereof in the frame, the shear-blade mounted on the arm, and the lever provided with the convex fulcrum-bearing surface working upon the journaled roller and having the nose engaging the free end of the pivoted arm.

4. In a shears, the combination of the frame, the stationary shear-blade, the pivoted arm, the shear-blade on the pivoted arm, the journaled roller, the lever provided with the convex fulcrum-bearing surface working upon the journaled roller and provided also with the bifurcated nose pivoted to the free end of the pivoted arm, and the link pivoted to the lever and also to the end of the roller-axle or equivalently, substantially as set forth.

5. In a shears, the combination with the frame having the table and the stationary and movable shear-blades, of the false tops for such table pivoted thereto and having each the stop-gage, substantially as set forth.

6. In a shears, the combination with the frame and the pivoted arm, of the bifurcated frame branch extending beyond the pivoted arm, the journaled roller in the bifurcated branch, the lever provided with the convex fulcrum-bearing surface and working upon the journaled roller and provided also with the bifurcated nose pivoted to the free end of such pivoted arm, and the link pivoted to the bifurcated branch and to the lever whereby the convex fulcrum-bearing surface is permitted to roll upon the roller and maintained in contact therewith, substantially as set forth.

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

JAMES C. BURGESS.

Witnesses:
H. W. COOK,
W. C. LA RUE.