

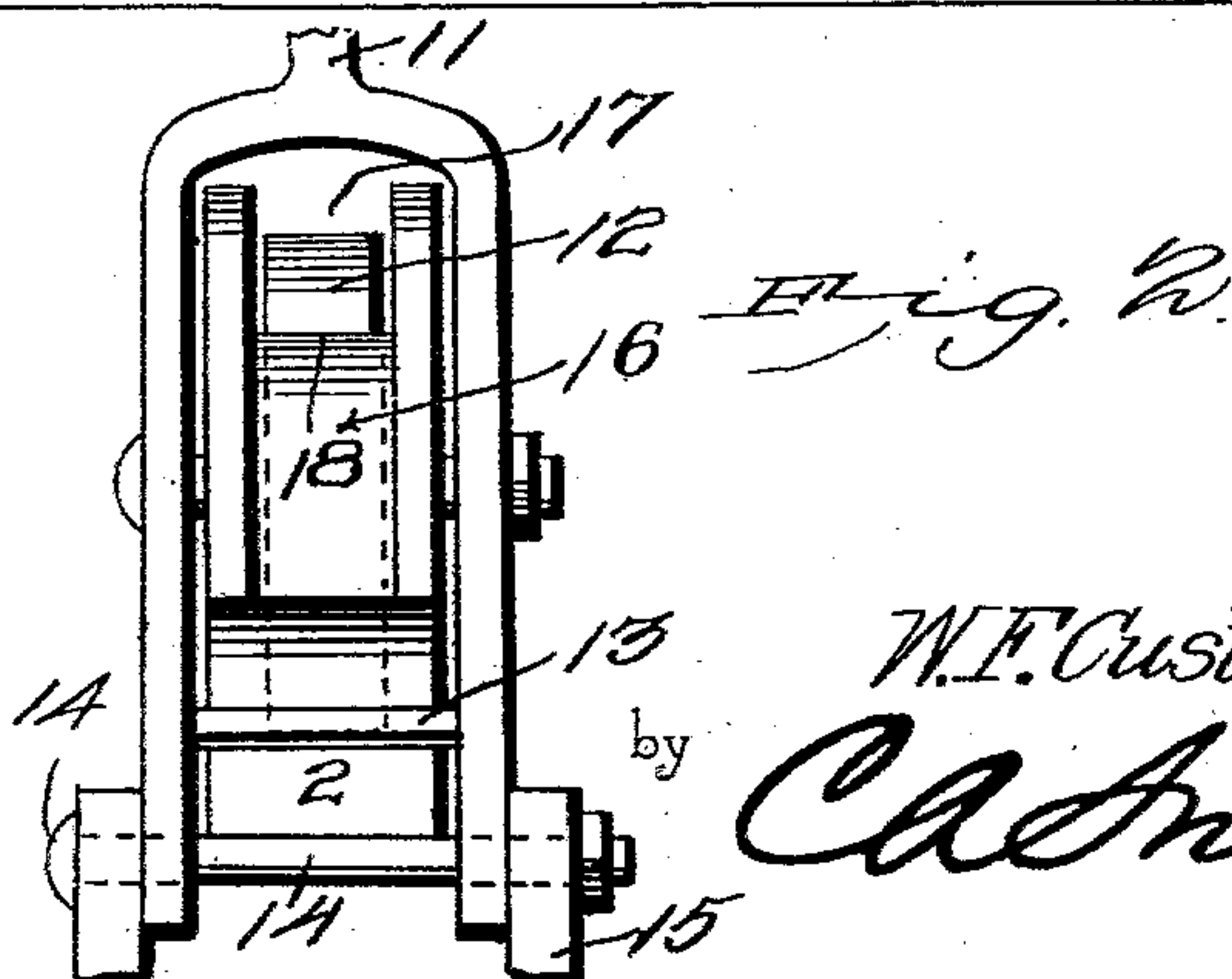
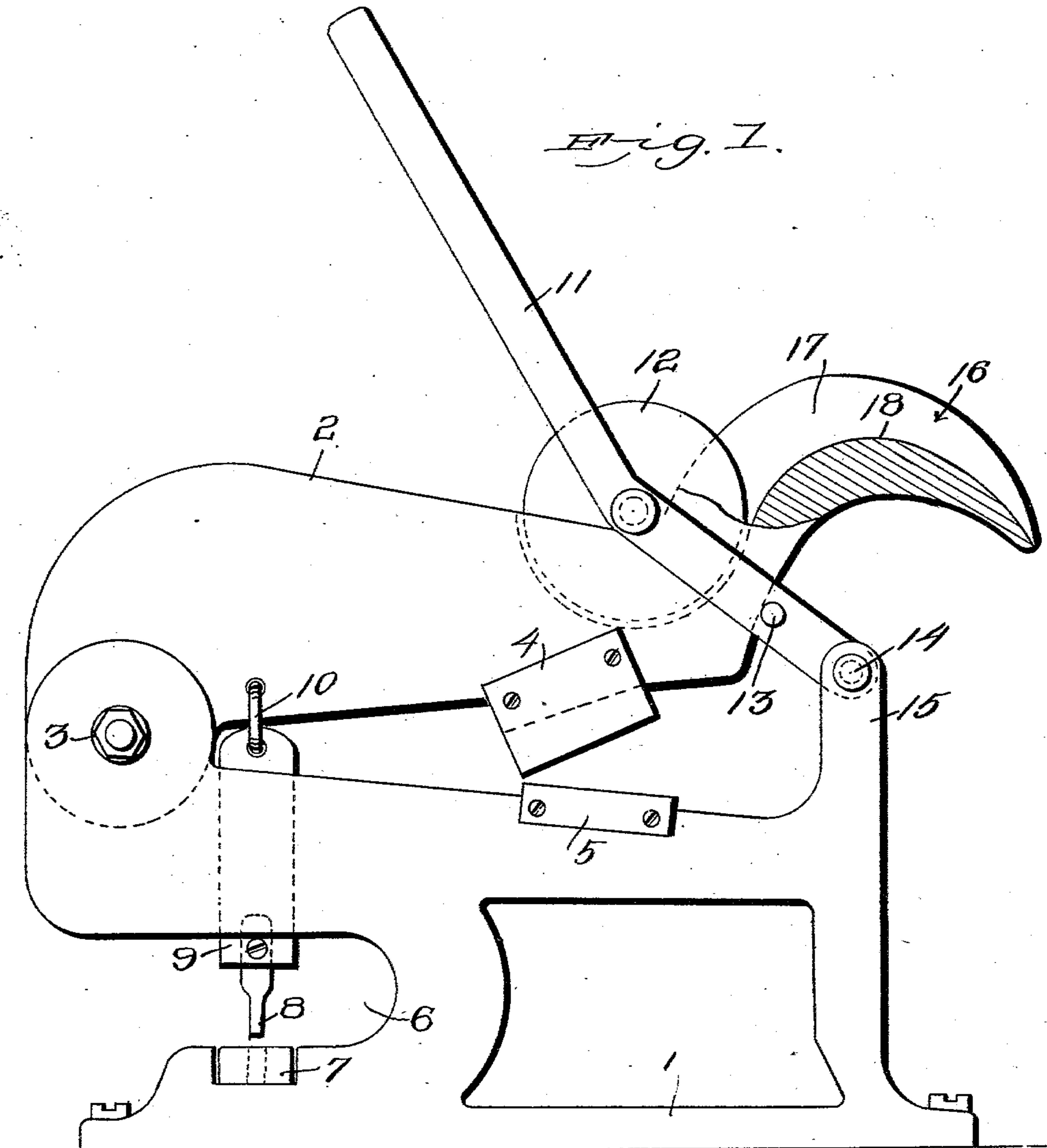
No. 715,459.

Patented Dec. 9, 1902.

W. F. CUSTER.
COMBINED SHEARS AND PUNCH.

(Application filed June 16, 1902.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM F. CUSTER, OF SUMMITVILLE, INDIANA.

COMBINED SHEARS AND PUNCH.

SPECIFICATION forming part of Letters Patent No. 715,459, dated December 9, 1902.

Application filed June 16, 1902. Serial No. 111,980. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. CUSTER, a citizen of the United States, residing at Summitville, in the county of Madison and State of Indiana, have invented a new and useful Combined Shears and Punch, of which the following is a specification.

This invention relates to metal punching and shearing machines.

The object of the invention is to simplify the construction of the jaw-operating mechanism and to render it capable, with the output of a minimum of energy, to secure the highest possible leverage.

With these and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a combined metal punching and shearing machine, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in side elevation, partly in section, of a combined punch and shears characterizing this invention. Fig. 2 is a view in front elevation of the jaw looking in the direction of the arrow in Fig. 1.

Referring to the drawings, 1 designates the bed of the machine, and 2 the jaw, the two parts being connected by a hinge 3 of the usual or any preferred construction. Associated with the jaw, near its forward end, is a knife 4 and with the base a shearing-block 5, with which the knife coacts, as usual. The rear portion of the bed is provided with a recess 6, and in the lower wall of the recess is disposed a punch-block 7 to coact with a punch 8, carried by a plunger 9, working in a vertical guide in the bed, the punch being associated with the jaw through the medium of a link 10, thus to permit vertical movement of the plunger while the jaw is moving through

the arc of a circle. It will be observed that the plunger is disposed as close as possible to the hinge, so that a powerful leverage may be exerted thereon when the jaw is moved.

The jaw-operating mechanism comprises a lever 11, carrying a roller 12 and a jaw-lifting bar 13, the lower end of the lever being fulcrumed at 14 to an upstanding extension 15 at the front of the bed. The front end of the jaw is formed into a curved arm 16, provided with a longitudinal recess 17, the bottom wall 18 of which is formed into a compound curve, constituting a cam to be engaged by the roller 12, the said roller being guided for movement by the opposed walls of the recess. The jaw is normally held raised by the lifting-bar 13, as shown in Fig. 1, and when the lever is moved to the position shown in dotted lines in Fig. 1 to bring the knife-elements to operative position to shear a piece of metal and also to bring the punch into engagement with the socket of the punch-block the lifting-bar will be inoperative for performing any function; but as soon as the direction of movement of the lever is reversed to return to the position shown in full lines in Fig. 1 the lifting-bar will ride against the under side of the curved arm 16, and thus lift the jaw. By reason of the rolling contact between the roller and the cam heavy pressure may be imparted to the arm 16 with the output of the minimum of energy, so that the machine may be operated for doing effective work by a person of ordinary strength. As shown in Fig. 2, the lever is formed with a yoke at that portion between which the arm 16 works, and thence merges into the handle of the lever. This form of operating-lever will be found thoroughly effective for the purpose designed; but it is to be understood that the invention is not to be limited to the precise construction shown. A further advantage in the employment of the cam-carrying arm 16 over the ordinary form of cam employed for actuating the jaw is that as it projects beyond the bed the leverage will progressively increase as the roller approaches the outer terminal of the arm, so that if the metal to be sheared presents such resistance to the knife as to prevent shearing when the roller is upon an intermediate portion of the cam this obstacle

will be overcome if the roller is brought to bear upon the outer portion of the cam or that projected above the bed, it being seen, as above pointed out, that the leverage will progressively increase in proportion as the roller approaches the terminal of the arm.

While the machine of this invention is exceedingly simple of construction, it will be found thoroughly efficient and durable in use and may be cheaply and readily manufactured. Furthermore, there being no intricate parts connected with it danger of derangement in use will be reduced to a minimum.

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

1. A metal punching and shearing machine having the upper face of its jaw provided with a cam-surface, and an operating-lever carrying a roller to traverse the surface.

2. A metal punching and shearing machine having the upper face of the free end of its jaw provided with a cam-surface, and an operating-lever carrying a roller to traverse the said surface.

3. A metal punching and shearing machine having the upper face of the free end of its jaw provided with a cam-surface the terminal of which projects beyond the bed of the machine, and an operating-lever carrying a roller to traverse the surface.

4. A metal punching and shearing machine

having the upper face of the free end of its jaw formed into a curved arm provided with a longitudinal recess, the bottom wall of which constitutes a cam-surface, and an operating-lever fulcrumed on the bed of the machine and carrying a roller to engage the cam-surface.

5. In a metal punching and shearing machine, the combination with the jaw provided on its upper side with a cam-surface, of a lever carrying a roller to engage the said surface to depress the jaw, and means carried by the lever for lifting the jaw.

6. In a metal punching and shearing machine, the combination with the bed, of a jaw having the upper face of its free end provided with a longitudinal recess the bottom wall of which constitutes a cam, a plunger disposed in a guide arranged adjacent to the hinge of the jaw, a punch carried by the plunger, knife elements carried respectively by the jaw and the bed, and an operating-lever having a roller to work in the recess and engage the cam to depress the jaw, and a part to engage the under side of the jaw to lift it.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM F. CUSTER.

Witnesses:

JAS. M. WOOD,
SUSIE TRICE.