

(No Model.)

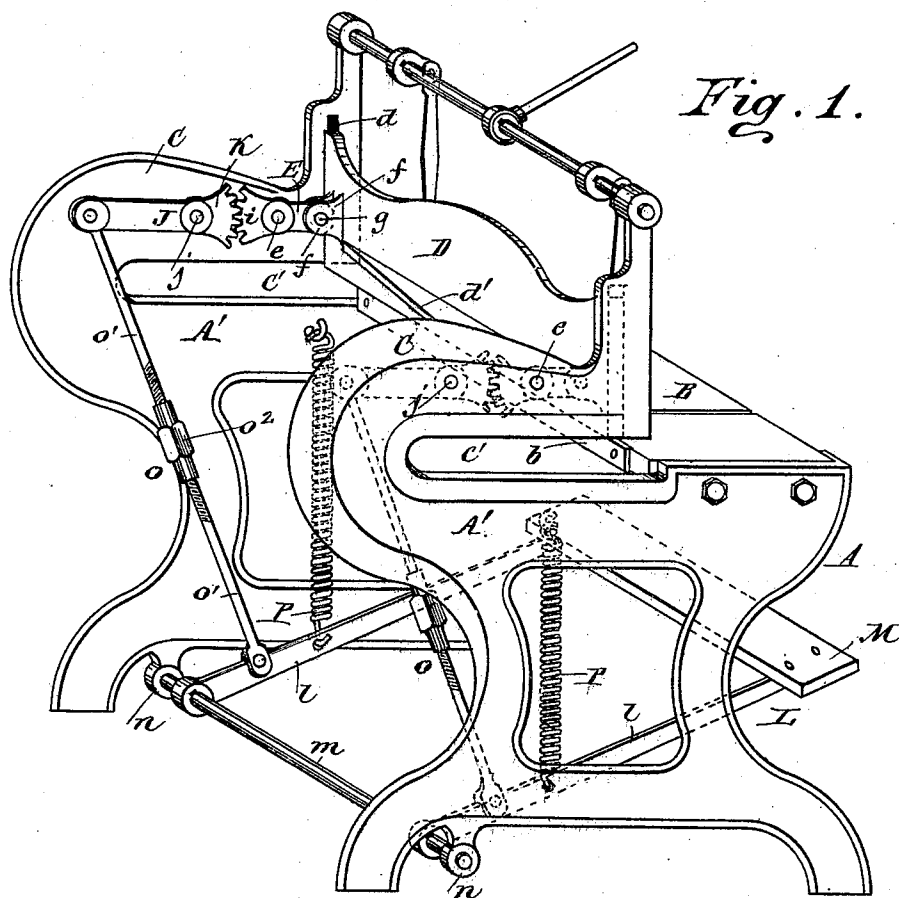
2 Sheets—Sheet 1.

H. L. EDGE.

SHEARS FOR CUTTING SHEET METAL.

No. 464,652.

Patented Dec. 8, 1891.



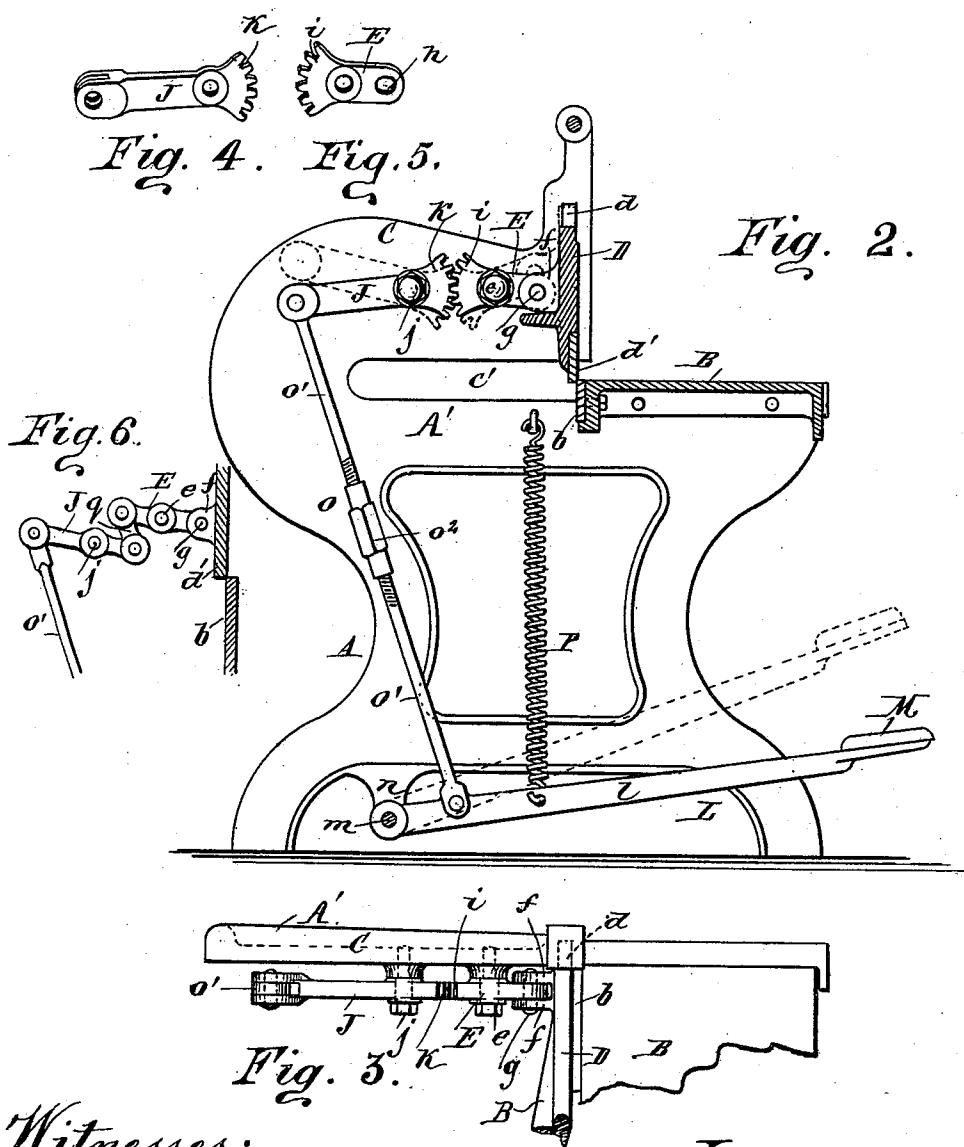
Witnesses:
John Aspdin.
 W. H. Davis.

Inventor :
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UNITED STATES PATENT OFFICE.

HORACE L. EDGE, OF BUFFALO, NEW YORK, ASSIGNOR TO THE NIAGARA STAMPING AND TOOL COMPANY, OF SAME PLACE.

SHEARS FOR CUTTING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 464,652, dated December 8, 1891.

Application filed March 30, 1891. Serial No. 386,908. (No model.)

To all whom it may concern:

Be it known that I, HORACE L. EDGE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Shears for Cutting Sheet Metal, of which the following is a specification.

This invention relates to that class of machines for cutting sheet metal which are commonly known as "gap-shears." Heretofore the movable shearing-knife in these machines was connected with the treadle by means of a U-shaped yoke, which passed around the gap in the shears, so as not to obstruct the gap. This yoke was necessarily extremely heavy, owing to the strain placed upon it, and required a very heavy counterbalancing-spring to raise the same and the movable knife.

The object of my invention is to provide a connecting mechanism between the treadle and the movable knife, which is very light and durable and which can be operated with less power.

In the accompanying drawings, Figure 1 is a perspective view of a shearing-machine provided with my improvement. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a top plan view of one side of the shearing-machine. Figs. 4 and 5 are perspective views of the intermediate levers interposed between the treadle and the movable knife. Fig. 6 is a fragmentary elevation showing a modified connection between the intermediate levers.

Like letters of reference refer to like parts in the several figures.

A represents the main frame of the shearing-machine, which consists, essentially, of side frames A' A' and a table B, connecting the upper front portions of the side frames. The table B is provided on its rear transverse edge with a stationary shearing-knife b.

C C represent overhanging arms formed on the upper rear portions of the side frames and extending forwardly to the table B, so as to form a gap C' between the upper end of each side frame and the overhanging arm.

D represents a vertically-movable knife-frame, which is guided with its ends in vertical grooves or ways d, formed in the inner sides of the front ends of the overhanging arms. The lower edge of the movable knife-

frame is provided with a shearing-knife d', arranged parallel with the lower stationary shearing-knife and working in conjunction therewith in the usual manner.

EE represent primary rock-levers whereby a vertically-reciprocating movement is imparted to the movable knife-frame. These rock-levers are arranged in rear of the movable knife-frame and are pivoted near their central portions to the inner sides of the overhanging arms by means of pivot-bolts e e. Each of these primary rock-levers is arranged with its front end between two lugs f f, formed on the rear side of the movable knife-frame, and loosely secured thereto by a pin g, passing through perforations in the lugs, and an elongated opening h, formed in the front end of the rock-lever. The rear ends of the primary rock-levers are provided with gear-segments i.

J J represent secondary rock-levers whereby a rocking movement is imparted to the primary rock-levers. These secondary rock-levers are arranged in rear of the primary rock-levers and are pivoted near their middle portions to the inner sides of the overhanging arms by means of pivot-bolts j j. The front end of each secondary rock-lever is provided with a gear-segment k, which meshes with the gear-segment i of the adjacent primary rock-lever E.

L represents a treadle whereby the rock-levers and the knife-frame are actuated. This treadle consists of two arms l l, connected at their front ends by a foot-board M, while their rear ends are secured to a transverse rock-shaft m, journaled in bearings n n, formed on the lower portions of the side frames.

O O represent connecting-rods pivoted with their upper ends to the rear ends of the secondary rock-levers, while their lower ends are pivotally secured to the arms of the treadle. Each of these connecting-rods is preferably made in two sections o' o', having their opposing ends screw-threaded and connected by a screw-threaded coupling-sleeve o². The rear ends of the secondary rock-levers extend backwardly so far that the connecting-rods clear the gaps underneath the overhanging arms, and thereby avoid interfering with the sheet of metal which is being cut.

P P represent spiral springs arranged vertically and secured with their ends to the treadle-arms and the side frames, whereby the treadle and knife-frame are normally held in an elevated position.

Upon depressing the treadle the connecting-rods depress the rear ends of the secondary rock-levers, thereby causing the segments of these rock-levers and the segments of the primary rock-levers meshing therewith to move upwardly. The front arms of the primary rock-levers descend when their segments ascend, thereby depressing the knife-frame attached thereto. Upon releasing the treadle the latter is raised by the springs, thereby raising the knife-frame by the reverse movement of the intermediate connecting mechanism.

The rear arms of the primary rock-levers may be connected with the front ends of the secondary rock-levers by links *q*, as represented in Fig. 6.

My improved mechanism for operating the movable shearing-knife is very light and simple in construction and enables the shears to be operated with less power than was heretofore required.

I claim as my invention—

1. In a gap shearing-machine, the combination, with the frame, the stationary knife secured thereto, and the movable knife and frame, of a primary rock-lever arranged in

rear of the movable knife-frame and connected with its front arm to the movable knife-frame, a secondary rock-lever arranged in rear of the primary rock-lever and connected with its front arm to the rear arm of the primary rock-lever, a treadle pivoted to the lower portion of the main frame, and a rod connecting the rear end of the secondary rock-levers with the treadle, substantially as set forth.

2. In a gap shearing-machine, the combination, with the main frame, the stationary knife secured thereto, and the movable knife and frame, of primary rock-levers pivoted to the main frame in rear of the knife-frame and having their front arms loosely attached to the knife-frame and their rear arms provided with gear-segments, secondary rock-levers pivoted to the main frame in rear of the primary rock-levers and having their front arms provided with gear-segments which mesh with the segments of the primary rock-levers, a treadle pivoted on the lower portion of the main frame, and rods connecting the rear arms of the secondary rock-levers with the treadle, substantially as set forth.

Witness my hand this 25th day of March, 1891.

HORACE L. EDGE.

Witnesses:

THEO. L. POPP,
FRED. C. GEYER.