

(No Model.)

2 Sheets—Sheet 1.

E. T. HORNER.
METAL SHEARS.

No. 484,370.

Patented Oct. 11, 1892.

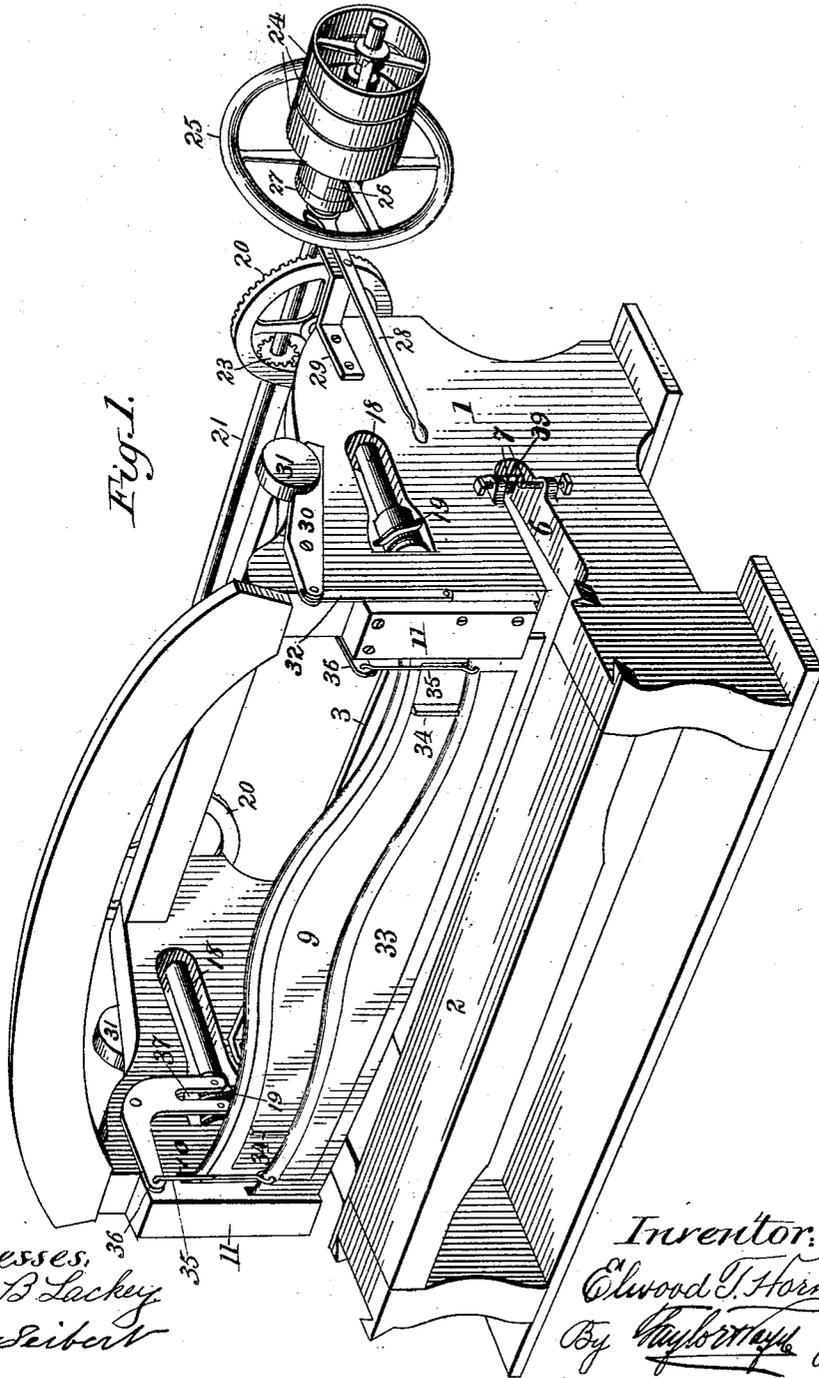


Fig. 1.

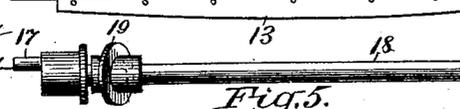
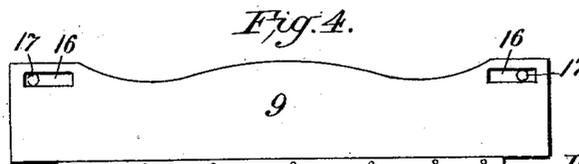
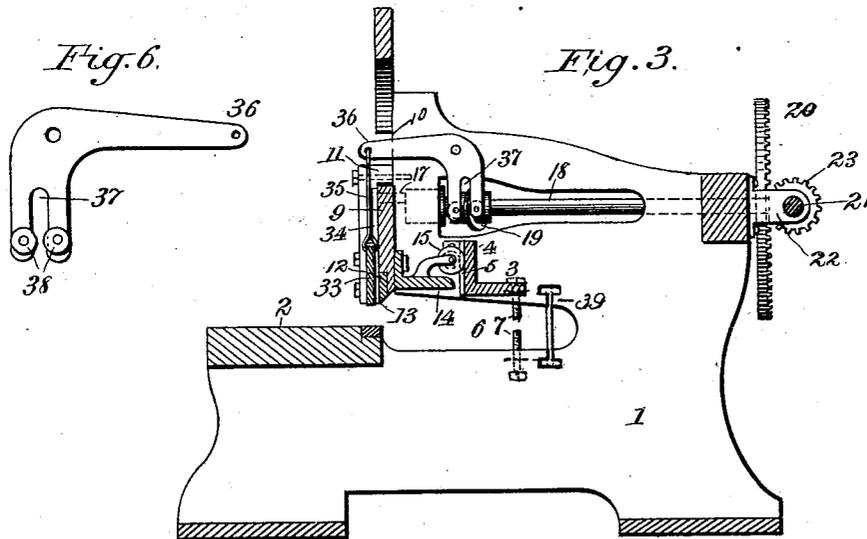
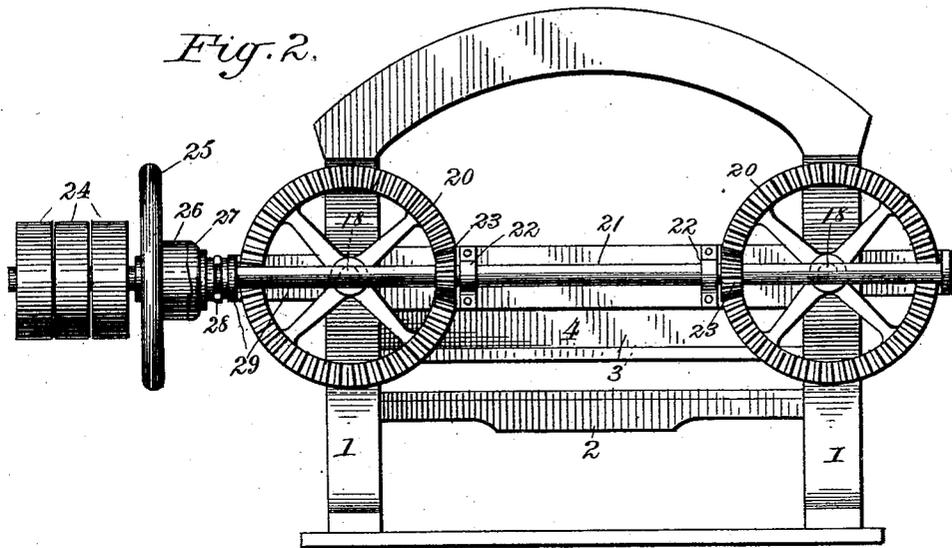
Witnesses:
Jas. B. Lackey
S. R. Seibert

Inventor:
Elwood T. Horner
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S. R. Seibert

Inventor:
Etwood T. Horner
 By *Hubert J. Attye*

UNITED STATES PATENT OFFICE.

ELWOOD T. HORNER, OF CAMBRIDGE CITY, INDIANA, ASSIGNOR OF ONE-HALF TO JOHN A. SPENCE, OF SAME PLACE.

METAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 484,370, dated October 11, 1892.

Application filed March 1, 1892. Serial No. 423,375. (No model.)

To all whom it may concern:

Be it known that I, ELWOOD T. HORNER, a citizen of the United States, residing at Cambridge City, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Metal-Shears; 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 figures of reference marked thereon, which form a part of this specification.

My present invention aims to provide a simple and efficient machine by the use of which heavy metal plates may be easily cut. I accomplish the object thus sought to be attained by the use of the mechanism illustrated in the accompanying drawings; and the invention consists in certain novel features of the same, which will be hereinafter described and claimed.

In the drawings thus referred to, Figure 1 is a perspective view of my improved machine. Fig. 2 is a rear elevation of the same, and Fig. 3 is a central transverse section thereof. Fig. 4 is a detail view of the reciprocating jaw. Fig. 5 is a detail view of the shaft which imparts motion to the reciprocating jaw and the presser-bar, and Fig. 6 is a detail view of one of the rocking arms which support the presser-bar and assist in operating the same.

The supporting-frame of my machine consists of the standards or housings 1 1, a bed-plate 2, secured to and extending between the front portions of the standards, and a brace 3, secured to and extending between the standards, near the center of the same. This brace 3 is provided with a vertical front portion 4, on the front face of which I form the ribs 5, the purpose of which will be hereinafter set forth. The standards or housings are provided with the slots or recesses 6 to receive the rear edge of the plate, and on the standards, at the rear ends of the said recesses or notches, I mount the binding-screws 7, which are adapted to be turned up against the plate, and thereby hold the rear portion of the same steady while being operated upon.

In order to secure the housings against all strain while the machine is cutting, the anchor-bolts 39, situated in the rear ends of the slots or recesses 6 and having a T-head at each end, are cast in the mold. The standards are further provided on their outer sides, at their front edges, with the dovetailed lugs 8 to permit the ready attachment of an extension of the bed-plate.

The reciprocating jaw 9 is mounted between the bearing-surfaces 10 of the standards and the caps 11 secured thereto.

The bed-plate 2 forms the lower or stationary jaw of the machine, and the under knife is firmly secured to the said bed-plate or jaw, while the upper knife 12 is secured to the lower edge of the reciprocating jaw. The cutting-edge 13 of the upper knife is slightly convex, as clearly shown, in order that when a rocking motion is imparted to the said jaw the knife will move over the metallic plate with a perfect shearing motion, and thus easily cut the plate. On the rear side of the reciprocating jaw I provide a strengthening-rib 14, and on the upper side of the said rib I mount the rollers 15, which engage and ride upon the ribs or guides 5 of the brace 3, so that the jaw will move easily and steadily when in operation. In the upper corners of the reciprocating jaw I form the slotted bearings 16, which are engaged by wrist-pins 17 on the front ends of shafts 18, which are mounted in the upper portions of the standards or housings. The standards or housings are provided with suitable slots and openings to receive the shafts 18 and double cams 19, secured thereon, and the rear ends of the said shafts project through the rear portions of the standards and are provided with the crown-wheels 20, as shown.

The driving-shaft 21 is mounted in suitable bearings on the rear of the supporting-frame and in a suitable standard 22, arranged to one side of the same, and said shaft is provided with the pinions 23, which mesh with the crown-wheels 20, so that when the driving-shaft is set in motion the shafts 18 will be rotated and the wrist-pins 17 at the front ends of the same will play in the slotted bearings 16, so as to lower the reciprocating jaw with a rocking motion. The driving-shaft is fur-

ther provided with a series of pulleys 24, so that motion may be imparted to the said shaft from any suitable motor. A fly-wheel 25 is mounted loosely on the shaft adjacent to the said pulleys and is provided with a half-clutch 26, which is adapted to be engaged by a half-clutch 27, keyed on the driving-shaft and manipulated by a lever 28, which is fulcrumed on a bracket 29, projecting from the supporting-standards.

In order that the reciprocating jaw may be held normally in its raised position, I pivot on the outer sides of the standards the levers 30, the rear ends of which are provided with the weights 31 and the front ends of which are connected with the ends of the reciprocating jaw by the links 32, as shown. When the machine is not in use, the weights 31 serve to raise the reciprocating jaw. When the machine is set in motion, however, the wrist-pins 17 overcome the action of the said weights and lower the jaw. In front of the reciprocating jaw I arrange the presser-bar 33, which moves between the caps 11 and is guided by ribs 34 on the jaw engaging grooves in the rear side of the presser-bar. The presser-bar is suspended by means of connecting-bars 35 from the front ends of the rocking arms or angle-levers 36, which are fulcrumed on the inner sides of the standards. The lower ends of the rocking arms are provided with open-ended slots 37, through which the double cams 19 play, whereby a vibratory motion will be imparted to the said arms or levers, and the presser-bar consequently operated. In order to reduce the friction between the parts, rollers 38 are mounted in the ends of these rocking arms and project slightly from the walls of the slots 37.

In practice the plate to be cut is arranged on the bed-plate and under the reciprocating jaw and its rear edge is clamped in position by the anchor-screws 7. The machine is then set in motion and the shafts 18 consequently rotated. It will be observed that the wrist-pins 17 are so arranged relative to each other that one of the said pins is at its highest position while the other is at its lowest position, and consequently when the machine is set in motion the said pins will cause the reciprocating jaw to descend with a rocking motion. The knife carried thereby will be thus made to act with a perfect shearing motion on the metal and cut the same evenly and easily. The motion of the shafts 18 will also cause the cams 19 to act on the rocking arms 36, so that

they will be vibrated and force the presser-bar down onto the metal, and the parts are so arranged that the presser-bar will clamp the plate to the stationary jaw before the cutting is commenced. As the rotation of the shafts 18 continues the presser-bar and the reciprocating jaw will be elevated and the parts thus arranged automatically to act on another metal plate.

It will be readily seen from the foregoing description, taken in connection with the accompanying drawings, that I have provided a machine which is composed of very few parts and which is adapted to easily and readily cut heavy metal plates. My machine is practically automatic in its operation, and its advantages are thought to be obvious.

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

1. The combination of a reciprocating jaw, a vertically-movable presser-bar arranged in advance of the said reciprocating jaw, a pair of transverse shafts arranged in the supporting-frame in the rear of the jaw, independent connections between the said shafts and the jaw and between the shafts and the presser-bar, and means for rotating the said shafts.

2. The combination of a reciprocating jaw having guiding-ribs on its front face, a presser-bar having grooves on its rear side, engaging said ribs, and means for operating the said bar and jaw.

3. The combination, with the shearing mechanism, of the presser-bar, rocking arms connected with said presser-bar and having open-ended slots in their lower ends, and operating-shafts provided with double cams playing through the said slots.

4. The combination of the frame, the reciprocating jaw, the presser-bar arranged in advance of said jaw, transverse shafts mounted in the frame, provided with double cams, and having crank-pins at their front ends, engaging elongated bearings in the jaw, means for rotating said shafts, and angle-levers mounted on the frame and having their upper ends connected with the presser-bar and their lower ends provided with notches engaging the double cams.

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

ELWOOD T. HORNER.

Witnesses:

H. B. BOYD,
C. H. TABKE.