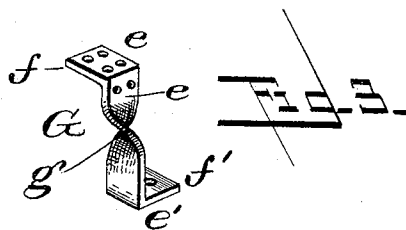
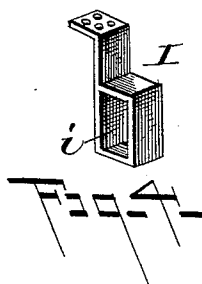
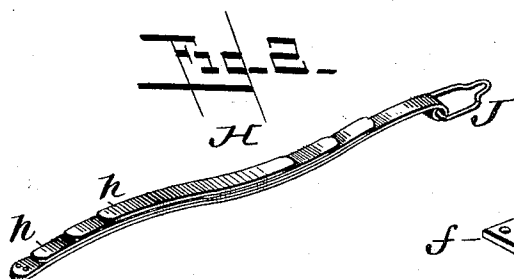
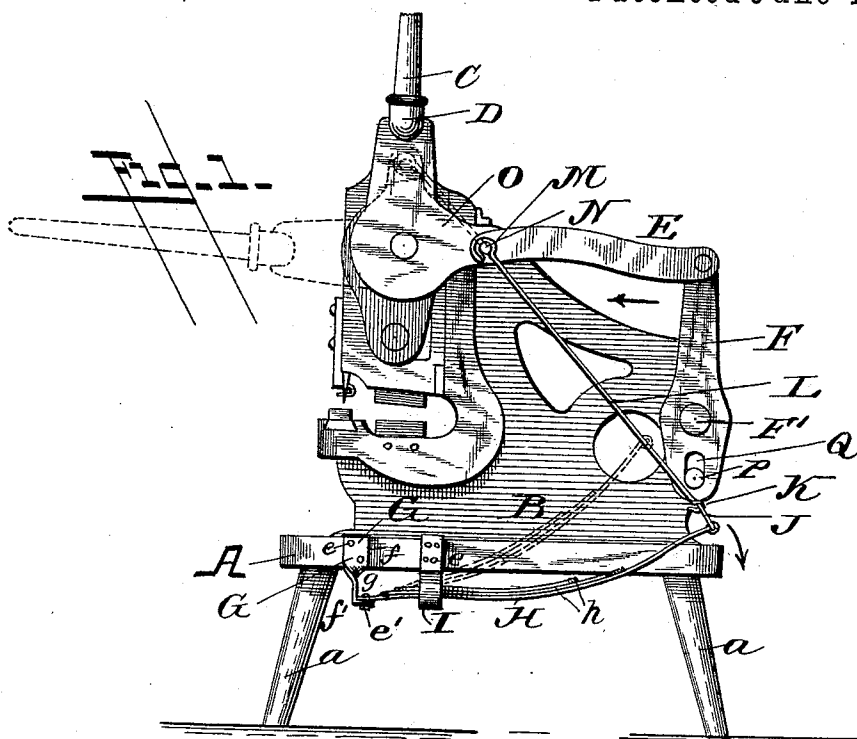


(No Model.)

L. C. HAUBER.
METAL PUNCHING AND SHEARING MACHINE.

No. 499,540.

Patented June 13, 1893.



Witnesses:
F. C. Ouray
James Jones

Inventor:
Louis C. Hauber
Wm. S. Duggan & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

LOUIS C. HAUBER, OF ST. MARY'S, PENNSYLVANIA.

METAL PUNCHING AND SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 499,540, dated June 13, 1893.

Application filed March 25, 1893. Serial No. 467,633. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. HAUBER, a citizen of the United States, and a resident of St. Mary's, in the county of Elk and State of Pennsylvania, have invented certain new and useful Improvements in Metal Punching and Shearing Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side view of a punching and shearing machine equipped with my improvement. Fig. 2 is a detail view of the relief spring (which constitutes the essential feature of my improvement) removed from the machine; and Figs. 3 and 4 are detail views of, respectively, the fastening device and the stirrup used in conjunction with the relief spring.

Like letters of reference denote corresponding parts in all the figures.

This invention relates to metal-working machines, and, more especially, to punching and shearing machines worked by hand, the operation of which requires considerable power, and has for its object to facilitate the manipulation of such machines and reduce the power required to operate them to a minimum.

With this object in view, my improvement consists in the combination with the main working-lever of the machine of a relief spring and certain devices for applying the same to the machine, as will be hereinafter more fully described and claimed.

Referring to the drawings, the letter A denotes the bed or table of the machine, supported upon stout legs, *a*, of suitable height.

B is the iron base and frame of the machine proper (which may be of any approved type or construction capable of being manipulated by a lever handle).

C marks the lever or handle for operating the machine; D the socket into which the handle is inserted; and E, F are the compound levers, or jointed arms, common to many punching and shearing machines of this type.

As I do not, however, claim anything in the construction of the machine *per se*, a brief reference to these parts (the function of which is well understood by all persons familiar with metal-working machines) is all that will be necessary.

To the under side of the table, A, I fasten, by a bearing or holder G, one end of a leaf-spring, H, built up of a suitable number of overlaid leaves, *h h*, of spring steel, as usual in the construction of such springs, for wagons, for example; the spring being of an attenuated or elongated S-shape, as shown in the drawings. The fastening device G is composed of a strap of steel, twisted at its middle, as shown at *g*, so as to bring its two parts or ends at right angles to each other, each part being bent at right angles, as shown at *f* and *f'*. The upper part or section is securely fastened to one side of table A by strong screws or bolts, *e*, inserted through holes punched in the two right-angled parts of the strap, and the inner end of spring H is fastened in the lower part, or bearing part, of the strap by rivets *e'*, inserted through the right angled bearing *f'* and through the inner end of the spring resting upon it. Instead of riveting, other means of fastening the spring to its bearing may, of course, be adopted, if desired.

The free end of the spring H is inserted through a stirrup, I, the shape of which is fully illustrated in Fig. 4, and which is fastened to the table A in the same manner as the bearing-strap G. This stirrup is formed by bending a strap of steel so as to form a rectangular opening, *i*, through which the spring is inserted so as to take a loose bearing upon or against the under side of, and have some up-and-down play within, this stirrup. The free end of the spring projects a considerable distance, approximately to the end of the table, and has hinged to its outer end a stirrup, J, which engages an eye, K, at the lower end of the connecting-rod L, so that the rod L may be unhooked or disengaged from the spring if desired. The other end of rod L also has a hook M, which is hooked upon a headed stud or pin, N, projecting from one side of lever-arm E, at the point or fulcrum where said arm is articulated to the elbow O

of the main working-lever C D, so that the rod L may also be unhooked at that point if it is desired to remove it.

From the foregoing description, taken in connection with the drawings, the function and operation of the relief spring H will be readily understood. The tension or pressure of said spring being downward at its free end, as indicated by the arrow shown at that point, will assist—commensurately with the stiffness of the spring—to pull down upon rod L and the lever-fulcrum N, when lever C is swung back into its normal or upright position after punching or cutting a plate of metal, thereby greatly relieving the reinstatement or replacing of the lever from its horizontal position shown in dotted lines to the approximately vertical position shown in full lines. During the motions of the elbow-lever C D O, either when swung down or up, these movements will, in a measure, be guided by the compound levers E F, one of which (E) forms a continuation of the elbow O at the lower end of the main operating lever C D, which carries the fulcrum N, while the other (F) forms a movable support for the other end of said elbow-extension or lever E, swinging upon a fulcrum-stud or bearing, F', fastened in one side of the frame; besides which this lever F serves to operate certain other working-parts of the machine (which, however, form no part of my invention) to which a reciprocating motion is given by means of a stud P which plays in a slot, Q, in the lower end of the lever, below its fulcrum. But as I have already stated at the beginning of my specification, these connecting-levers are common (in combination with the main elbow-lever C D O) to very many metal-punching and shearing machines of the same general type; one of the functions of lever F being, as aforesaid, to operate certain parts of the machine simultaneously with the punching or shearing operation performed by depressing the handle C of the main operating lever. In doing this, the upper end of lever F moves to the left, as indicated by the arrow at that point, while by again raising the lever-handle, it returns to

its normal position shown in the drawings. At the same time, the downward pressure on the lever or handle for punching or shearing is not augmented in any appreciable degree by the spring which may be disconnected (by unhooking rod L) when the machine is to be used for cutting a heavy plate.

As I have already pointed out, this improvement may be advantageously applied to all metal-working machines of the type heretofore referred to, in which the punch or shears is (or are) operated by a lever, by connecting the main-operating lever, on one side of its main fulcrum, to a rod, L, the other end of which is connected to a relief-spring operating to reinstate the lever in its normal upright position arranged substantially as described.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In metal punching and shearing machines of the described type, the combination with the main-operating lever C D, having an elbow when arranged and operating substantially as shown, of the relief-spring H fastened at one end to the bed of the machine, connected at its free end to a rod, L, connecting it to the elbow of the lever and inserted loosely through a keeper or stirrup, I, intermediate its point of attachment to the bed of the machine and connection to rod L; substantially as and for the purpose herein shown and set forth.

2. The combination, in a metal-punching and shearing machine of the described type, of the main-operating elbow lever C D, removable connecting-rod L, and relief spring H, when constructed and combined to operate substantially in the manner and for the purpose herein shown and described.

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

LOUIS C. HAUBER.

Witnesses:

FRANK KRAFT,
GEORGE HOEHN.