

(No Model.)

2 Sheets—Sheet 1.

J. LACHAUME & J. PASTEYER.
SHEARS.

No. 445,700.

Patented Feb. 3, 1891.

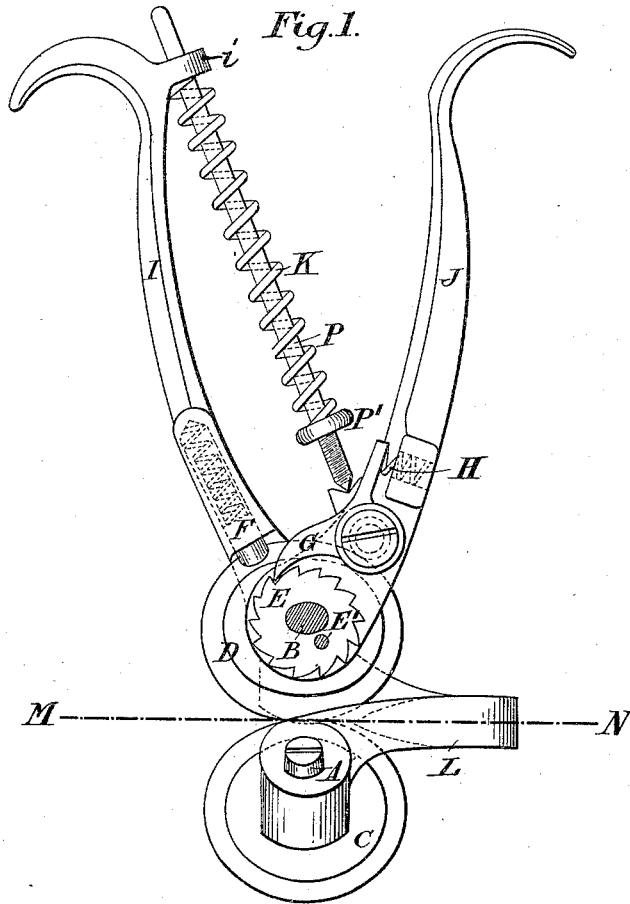
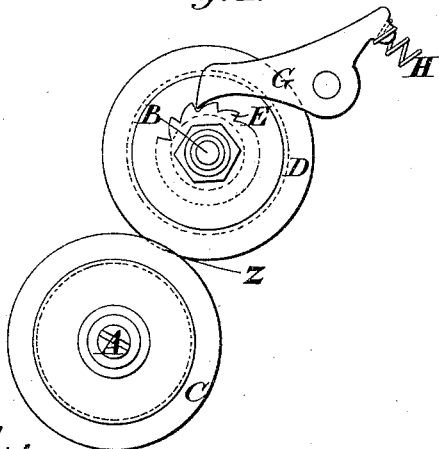
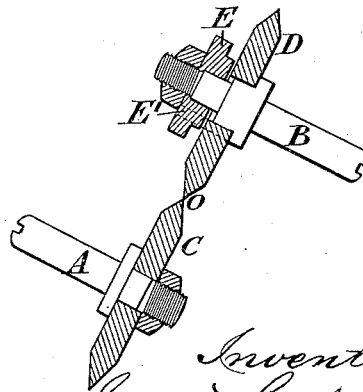


Fig. 4.



Witnesses:
H. E. Walker
A. Northrup

Fig. 5.



Inventors:
Jean Lachaume
Joseph Pastejer,
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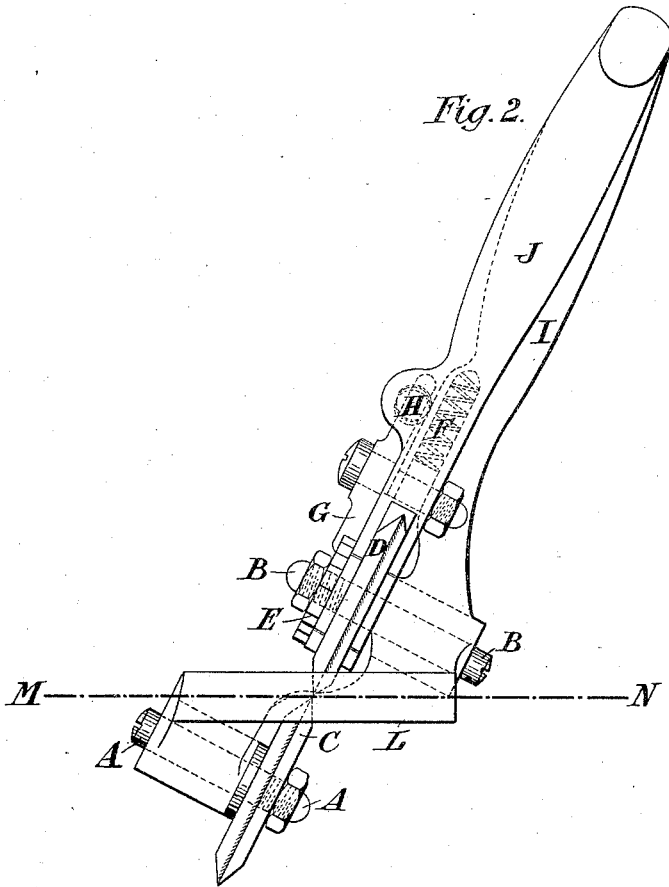
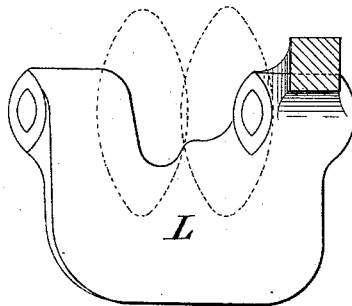


Fig. 3.



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UNITED STATES PATENT OFFICE.

JEAN LACHAUME AND JOSEPH PASTEYER, OF PARIS, FRANCE.

SHEARS.

SPECIFICATION forming part of Letters Patent No. 445,700, dated February 3, 1891.

Application filed May 21, 1890. Serial No. 352,680. (No model.) Patented in France May 14, 1889, No. 198,193.

To all whom it may concern:

Be it known that we, JEAN LACHAUME and JOSEPH PASTEYER, citizens of the French Republic, and residents of Paris, France, have invented a new and useful Improvement in Shears for Cutting Metal or Pasteboard Sheets, &c., in Any Straight or Curved Lines (for which applications for Letters Patent have been made in Great Britain, No. 7,032, dated May 6, 1890, and in France, dated May 14, 1889, No. 198,193,) of which the following is a specification.

This invention will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a side view; Fig. 2, an edge view. Fig. 3 is a plan view showing a portion of the supporting-frame, the cutting-blades being shown in dotted lines. Fig. 4 shows the position of the two blades provided with a ratchet-wheel and a plug or brake. In Fig. 5 these two blades are seen in edge view as they come in contact at O.

A is the axle of the lower blade.
B is the axle of the upper blade.
C is the lower blade.
D is the upper blade.
E is the ratchet-wheel, secured to the blade D by means of a pin E'.
F is a spring-controlled brake.
G is a pawl operating the ratchet-wheel.
H is a spiral spring controlling the pawl G.
I is the main-frame lever.
J is the pawl-lever.
K is the spiral spring which, pressing upon the collar P' of the spindle P and the ear i of arm or lever I, tends to keep the two arms I J apart.

In Fig. 1 the arms I J, spindle P, and spring P' are shown broken away intermediate their lengths.

L is the supporting-frame, having the general shape shown of the shears.

M N is the imaginary line of the sheet to be cut, and O the point of contact of the two blades.

The principle of our shears or cutters mainly consists in the displacement of the axis of the ratchet-wheel operating the upper blade D. The axle B of the side blade forms, also, the axis of the pawl or driving-lever J. Thus there is practically only one single-arm lever in the

device. The brake controlled by the spiral spring F is located within the thickness of the lever and acts upon the upper blade, Fig. 1. In order to prevent the said blade from rotating too freely, this brake may be made of bronze or any other suitable metal. The ratchet-pawl is held in engagement with the teeth of the ratchet E by reason of the stress of the spring H. The blade-carrying axles A and B are arranged in an oblique plane in relation to the point of contact O of the blades C and D, Fig. 4, in such a manner that the axle B is situated to the right and the axle A to the left of such point of contact O. The position of the two cutting-blades (which must be corrugated or milled at the edge, so as to carry along the material to be cut) is such that they slightly overlap at Z—that is to say, the distance between the two axles is less than the diameter of each blade. The advantage resulting from this arrangement will be readily realized.

The operation of the device may be briefly described as follows: The sheet of material to be cut is held by one hand in a horizontal position and the edge of said sheet presented between the edges of the cutting-blades, the shears being held by the fingers of the other hand in the ordinary manner and in the oblique position shown in Fig. 2. The person then by closing his fingers causes the lever J to be moved toward the main-frame lever I, whereby the spring K is caused to be compressed, and whereby the pawl G, which is in engagement with the teeth of ratchet-wheel E, causes the latter to rotate a distance of one or more teeth, and causing the blade D to rotate the same distance, and thereby cutting the material. Upon opening the fingers the lever J, by means of spring K, will be forced away from the lever I, and the pawl G rides backward over the teeth of the ratchet-wheel and engages the said teeth, whereby upon the next operation of the lever J a further rotation will be given to said ratchet-wheel and consequently to the blade D.

By reason of the milled or corrugated edges of the cutting-blades the material will be caused to be fed forward as the blade D is rotated, whereby the cutting of said material is facilitated.

The greater the strain sustained by the

blades during the cutting operation the greater will their tendency be to draw closer to each other, and thus to produce a neat cut. In the circular shears such as have been
5 hitherto devised the symmetrical arrangements of the blade-axles produced exactly the reverse effect—viz., the greater the strain the greater the tendency of the blades to move farther apart, the result being a jagged and unsightly cut.

The results obtained by this improved arrangement of shears or cutters with circular and independent blades may be summed up as follows:

15 First. The strain that has been necessary hitherto to cut sheets of metal direct by means of shears with straight blades is here avoided.

20 Second. The shears cut with the same facility along straight or curved lines, no matter what the outline of the piece to be cut out may be, the cut being at all times neat and without any jags.

25 Third. The gradually-increasing resistance opposed by the straight blades of the shears hitherto known, as they are brought closer together, owing to the initial angle formed by such straight blades at the beginning of the cut becoming gradually smaller, is also avoided.
30 It is well known that to overcome this resistance an effort increasing in the same proportion is necessary as the point to which force is applied is more and more removed from the axis, and therefore diminishes the length of the operating-lever. This, it will be
35 seen, is a most important advantage of our circular blades, in which the angle of operation is invariable and the distance from the axis of each of the blades constantly remains
40 the same.

Fourth. The blades are easily kept in repair and adjusted, and they require but little expense, since they can be sharpened in a slow-turning lathe without being removed
45 from their axles and without it being necessary to soften them.

Fifth. Another advantage lies in the fact that whereas in straight-bladed shears the resistance of the blades to the force applied by
50 the user constantly tends to move them farther apart from each other in a lateral direction, thus producing a jagged cut, the contrary effect is obtained by means of the circular blades—that is, the greater the resistance the greater the tendency of the blades
55 to draw closer to each other, the result being a perfectly neat cut in the metal sheet, or even in paper, the blades being, as it were, automatically sharpened, owing to their friction
60 against each other, which is due to the angle of their axes.

We claim—

1. In rotary shears, the combination, with a suitable supporting-frame and two rotary
65 cutting blades or disks carried by said frame and adapted to coact in the manner described, of a lever pivoted to the frame and means

for imparting a step-by-step rotation to one of the said blades when the lever is operated, in the manner described. 70

2. In rotary shears, the combination, with the supporting-frame, of the rotary cutting-blade carried by said frame, the operating-lever carrying the spring-controlled pawl, the
75 second rotary cutting-blade carried by the frame, and the ratchet-wheel carried by said second cutting-blade, with which ratchet-wheel said pawl engages, all arranged for co-operation substantially as and for the purpose set forth. 80

3. In rotary shears, the combination, with the supporting-frame, of a rotary cutting-blade carried thereby, the operating-levers, one of which carries a spring-controlled pawl, a second rotary cutting-blade carried by the
85 frame, a spring-brake carried by the other lever and acting upon the edge of the second cutting-blade, and the ratchet-wheel carried by the latter, with which ratchet-wheel the pawl engages, all said parts being arranged
90 for co-operation substantially as and for the purpose set forth.

4. In rotary shears, the combination, with a suitable supporting-frame and two rotary cutting-blades carried by said frame, said
95 blades having their edges milled or corrugated and adapted to coact in the manner described, of a lever pivoted to the frame, and means for imparting a step-by-step rotation to one of said blades when the lever is oper-
100 ated in the manner described.

5. In rotary shears, the combination, with a suitable supporting-frame and two rotary cutting-blades carried by said frame and adapted to coact in the manner described, of a
105 lever pivoted to the frame, means for imparting a step-by-step rotation to the second blade, and a spring-actuated brake adapted to bear upon the latter blade, for the purpose specified.

6. In rotary shears, the combination, with a
110 supporting-frame, an arm or lever rigidly connected with said frame, and a second arm or lever pivoted to the frame, of a rotary cutting blade or disk pivoted to the frame below the pivotal point of the latter lever, a second rotary cutting blade or disk pivoted to the
115 frame above the other blade and adapted to coact therewith in the manner described, a ratchet-wheel mounted rigidly upon the shaft or pivot of said second cutting-blade, a spring-actuated pawl pivoted to the pivoted lever
120 and engaging the teeth of the ratchet-wheel, and a spring arranged intermediate the levers and adapted to normally press said levers apart, as described. 125

In testimony that we claim the foregoing as our invention we have signed our names, in presence of two witnesses, this 5th day of April, 1890.

JEAN LACHAUME.
JOSEPH PASTEYER.

Witnesses:

R. J. PRESTON,
C. MIOFONTAIN.