(No Model.) 2 Sheets—Sheet 1.

B. WESSELMANN.

METAL SHEARING MACHINE.

No. 606,106. Patented June 21, 1898.

Fig. 1.

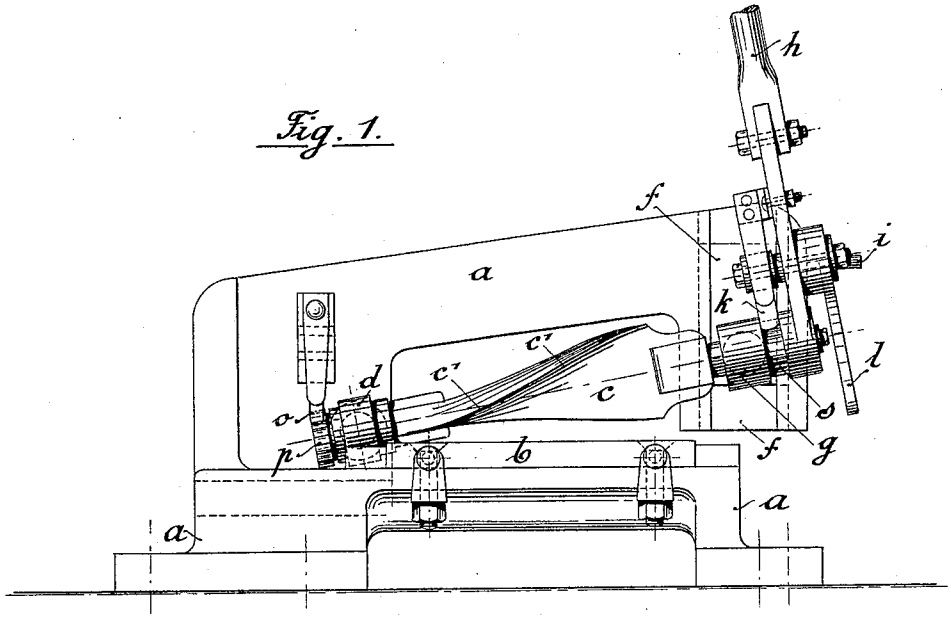
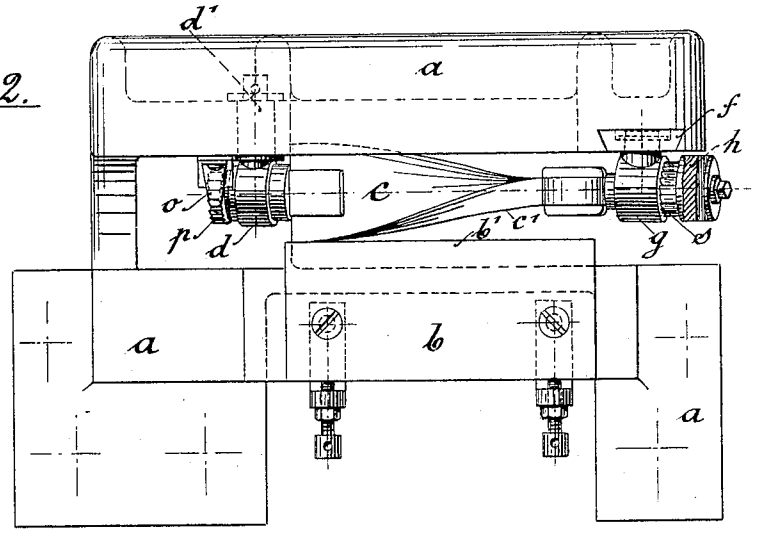


Fig. 2.



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Inventor:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

B. WESSELMANN.

METAL SHEARING MACHINE.

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Fig. 3.

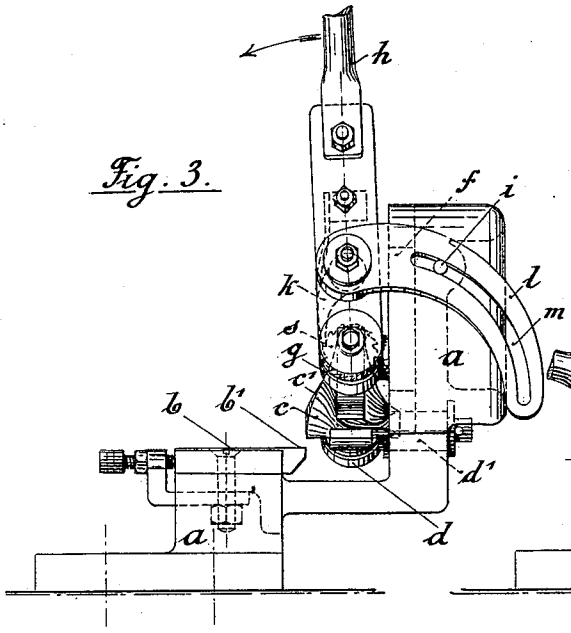


Fig. 4.

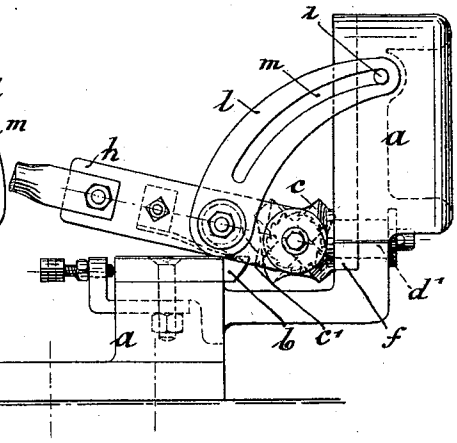
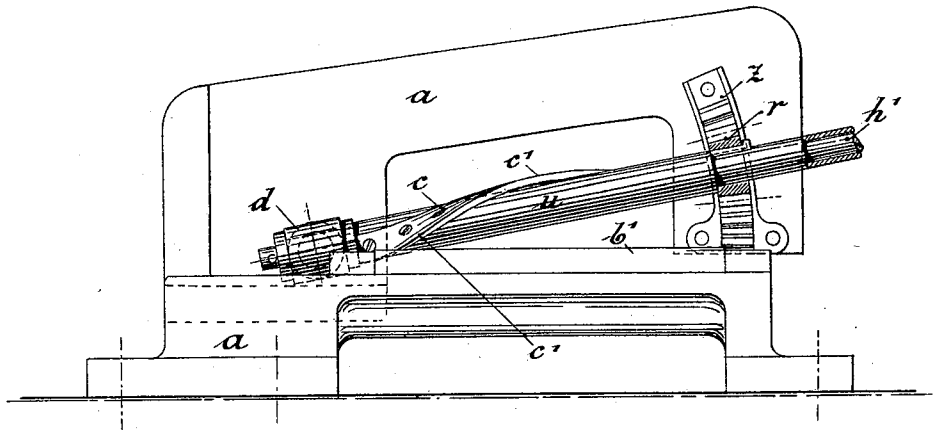


Fig. 5.



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UNITED STATES PATENT OFFICE.

BRUNO WESSELMANN, OF GÖTTINGEN, GERMANY.

METAL-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 606,106, dated June 21, 1898.

Application filed October 7, 1897. Serial No. 654,443. (No model.) Patented in Germany May 19, 1897, No. 96,141; in France September 27, 1897, No. 270,785; in England September 28, 1897, No. 22,163, and in Austria October 22, 1897, No. 47/4,214.

To all whom it may concern:

Be it known that I, BRUNO WESSELMANN, a subject of the King of Prussia, German Emperor, residing at 54 Friedländer Weg, Göttingen, in the Province of Hanover, Kingdom of Prussia, Germany, have invented new and useful Improvements in Metal-Shearing Machines with Spiral Blades, (patented in England, No. 22,163, September 28, 1897; in Austria, No. 47/4,214, October 22, 1897; in Germany, No. 96,141, May 19, 1897, and in France, No. 270,785, September 27, 1897,) of which the following is a specification.

The subject of the present invention is a metal-shearing machine in which a better shearing effect is obtained by a spiral form being given to the blade of the movable limb and a rotative motion on its longitudinal axis imparted to this movable shearing-blade simultaneously as it passes the cutting edge of the stationary blade. By reason of the spirally-running course of the movable blade the latter in all its phases of shearing lies at approximately the same angle of cut to the stationary blade, whereby an equal cutting efficiency is attained at all points of the blade, while on account of the rotation the cut at the same time acts in a drawing manner, the spiral cutting edge being in a certain sense drawn past the cutting edge of the fixed blade to that extent that the spiral cutting edge is longer than the edge of the stationary blade.

On the accompanying drawings, Figure 1 shows a front view, and Fig. 2 a plan, of the metal-shearing machine. Fig. 3 is an end view, the movable blade being in its raised position. Fig. 4 is an end view showing the movable blade in its lowest position. Fig. 5 is a front view of the shearing-machine having a blade of higher pitch and another arrangement for rotating the same.

In the base of the shearing-machine framing *a* is secured the horizontally-lying blade *b*, against the cutting edge *b'* of which the blade *c*, with cutting edge *c'*, is actuated in such manner that it performs simultaneously a descending and a rotative movement. In order to effect this, each end of the longitudinal axis of the blade is rotatively mounted in head-bearings *d g*. The head *d* turns on its bolt *d'*, while the head *g* turns in the slide *f* during the up-and-down motion of the blade *c*. The operation of the blade is effected, according to the arrangement of the shears shown in Fig. 4, by the agency of the lever *h*, which, moved in the direction of the arrow Fig. 3, rotates the blade *c* by means of the pawl *k* engaging in a ratchet-wheel *s*, fixed on the axis of the blade. The simultaneous downward motion of the blade on turning the lever in the direction of the arrow is effected by a curved link *l*, which is guided by a pin *i*, fixed in the framing and lying in a slot *m* in the link. The slot runs eccentrically relatively to the center of the axis of the movable blade. Hence the slide *f*, with blade *c*, will be pressed downward until it reaches its lowest position, as shown in Fig. 4. In this position the cutting effected by means of the double movement of the blade is completed. On reversing the motion of the lever *h* the pawl *k* in the ratchet-wheel *s* is also drawn back. During this return stroke of pawl *k* the blade *c* is prevented from rotating backward by pawl *o*, mounted on the framing and engaging the ratchet-wheel *p*, secured to an end of the axis of the blade, and which pawl *o* prevents backward rotation of the blade. The upward movement of the blade is effected on reversing the motion of the lever by the eccentric slot *m*. Corresponding to the rotation imparted to the blade *c* the cutting edge *c'* receives a spiral motion, so that during the downward motion of the blade it maintains the same angle of cut relatively to the cutting edge *b'* of the fixed blade. The shearing force during the whole shearing operation is thus uniform, and the efficiency itself, by reason of the drawing action of the cut due to the double movement of the blade, is essentially raised.

The blade *c* can also, as shown in Fig. 5, be arranged spirally about an axis *u*, the lower end of which is rotatively mounted in the bearing-head *d*, the outward extension of the axis forming the lever *h'* for raising and depressing the axis. To attain such rotation of the axis or blade *c* that on the descent the cutting edge *c'* comes against the cutting edge *b'* of the fixed blade, a toothed wheel *r* is

keyed to the axis u, engaging in the curved rack z, secured to the framing a of the machine. The center of the curve of the rack lies at the point of rotation of the head d, and the rack r is constructed of such proportion that on downward movement of the lever h' rotation of the axis u is effected to such extent as is required for the continual action of the spirally-formed cutting edge c' against the cutting edge b'. On raising the lever h' or axis u the toothed wheel r, engaging in the stationary curved rack z, effects a reverse motion of the spiral blade c, so that this receives the appropriate position for commencing the next shearing operation. The lever h' is provided with a bushing which is grasped by the hand, permitting of free rotation of the axis u within it.

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

1. A metal-shearing machine comprising a stationary blade and a swiveled rotary blade substantially as described.

2. A metal-shearing machine comprising a stationary blade and a swiveled rotary spiral blade substantially as described.

3. A metal-shearing machine comprising a stationary blade, a spiral blade, and a swiveled rotary shaft for the spiral blade substantially as described.

4. A metal-shearing machine comprising a stationary blade, a spiral blade, a swiveled rotary shaft for the spiral blade, and means substantially as described for causing the shaft to rotate during the cutting stroke and to remain stationary during the return stroke substantially as described.

5. A metal-shearing machine comprising a stationary blade, a spiral blade, a rotary shaft for the spiral blade, a ratchet and pawl carrying lever for rotating the shaft in one direction and a ratchet and pawl for holding the shaft against rotation in the opposite direction substantially as described.

6. A metal-shearing machine comprising a stationary blade, a spiral blade, a rotary shaft for the spiral blade, an actuating-lever for rotating the spiral blade, and an eccentric for moving the spiral blade toward and from the other blade substantially as described.

7. A metal-shearing machine comprising a stationary blade, a spiral blade, a rotary shaft for the spiral blade, and an actuating-lever for the spiral blade, said lever having an eccentric guide-arm substantially as described.

8. A metal-shearing machine comprising a stationary blade for supporting the material operated on in the plane of the cut, a swiveled rotary blade, and actuating means substantially as described for the rotary blade.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BRUNO WESSELMANN.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.