(No Model.) 2 Sheets—Sheet 1.

E. BOEHME.

HYDRAULIC SHEARS.

No. 345,358. Patented July 13, 1886.

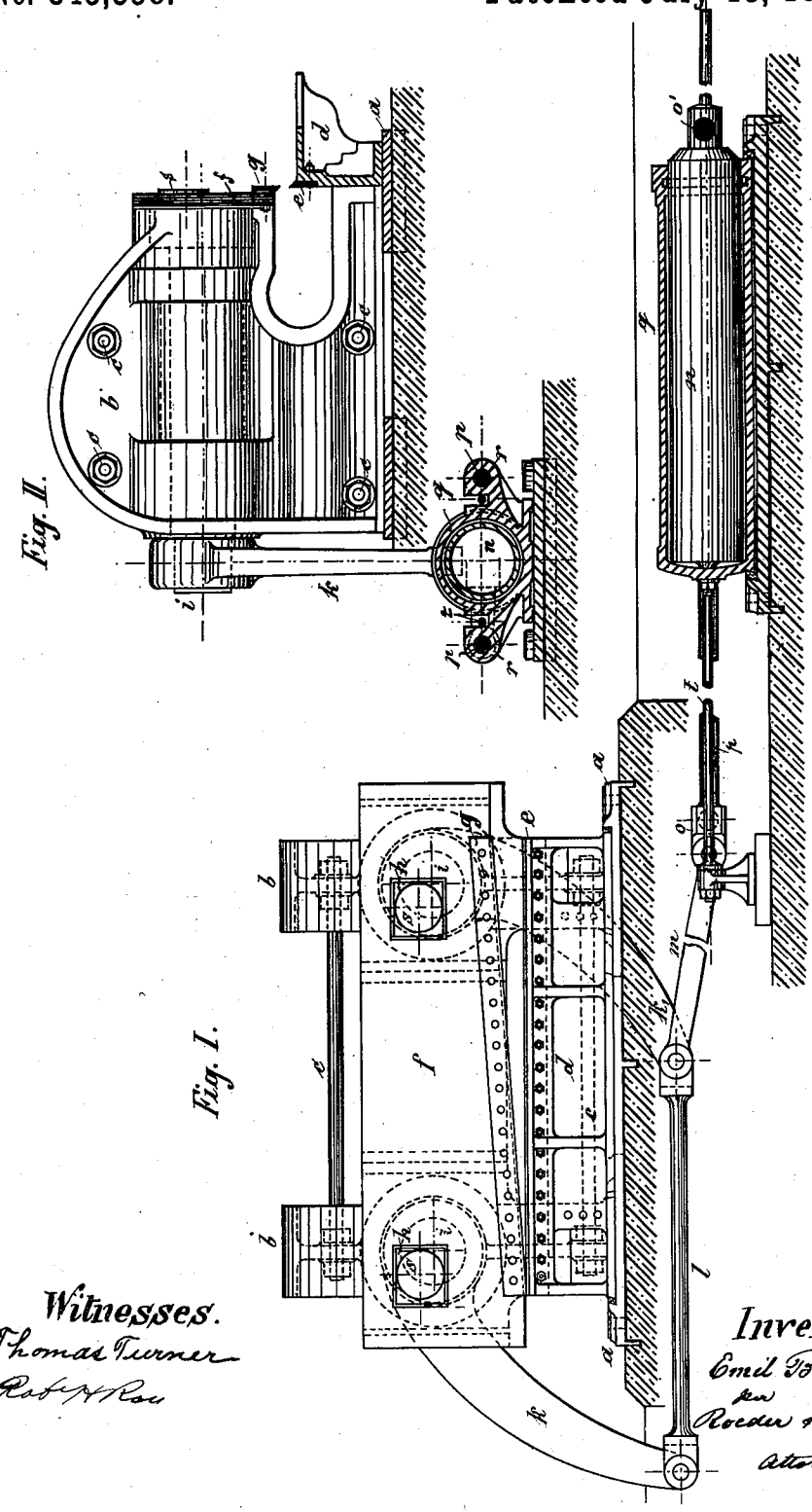


Fig. II.

Fig. I.

Witnesses.
Thomas Turner
Robt. H. Rose

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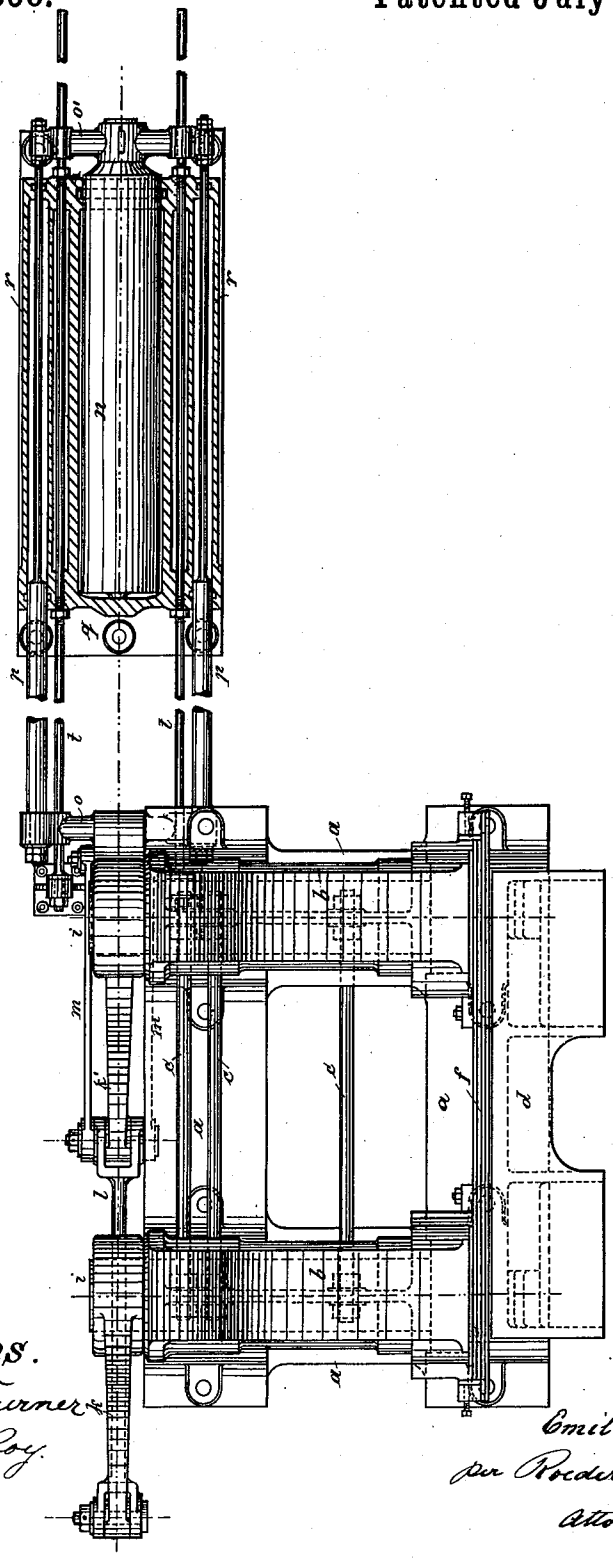
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Fig. III.



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UNITED STATES PATENT OFFICE.

EMIL BOEHME, OF BRESLAU, PRUSSIA, GERMANY.

HYDRAULIC SHEARS.

SPECIFICATION forming part of Letters Patent No. 345,358, dated July 13, 1886.

Application filed April 8, 1886. Serial No. 198,305. (No model.)

To all whom it may concern:

Be it known that I, EMIL BOEHME, a subject of the King of Prussia, residing at Breslau, in the Kingdom of Prussia, Germany, have invented new and useful Improvements in Hydraulic Shears for Cutting Steel and Iron Plates, of which the following is a specification.

This invention has reference to shears fit for cutting steel and iron plates; and it consists in the elements of improvement hereinafter more fully pointed out.

In the accompanying drawings, Figure I is a front view of the machine. Fig. II is a side view, and Fig. III a plan view, of the same.

The machine consists of the bed-plate *a*, upon which are mounted the two cast-iron principal pillars *b b*. These pillars are connected together by strong stays *c c c*, and by the table *d*, carrying on its inside the lower shear-blade, *e*. On the front side of the two pillars moves up and down in a guide the head *f* of the shears, which is composed of several plates of ductile iron connected by means of steel bolts. The head *f*, carrying the upper shear-blade, *g*, is provided with two openings, *h h*, lined with hardened-steel plates, into which catch the eccentric taps *s s* of the two driving-shafts, *i i*. The two shafts carry on the opposite ends the two steel levers, *k k'*, which are somewhat curved in order to give a free passage to long plates. By the turning of the shafts *i i* the eccentric taps *s s*, working in the openings *h h*, an up-and-down motion will be communicated to this head *f*. These two levers are connected on their lower ends by the rod *l*, while the drawing-rods *m m* are connected with the fore lever, *k'*. The rods *m m* are in connection with the hydraulic pump-piston *n* by the cross-heads *o o'*, conducted in a straight direction by the rods *t t*, and by the differential pistons *p p*, working at the same time as drawing-rods.

The hydraulic cylinder consists of the main cylinder *q* and the two secondary cylinders *r r*. When the water, being under a sufficiently strong pressure, enters into the principal cylinder *q*, it acts against the piston *n*, forcing the same outward, moving the cross-head *o'*, with pistons *p p* and cross-head *o* in the same direction, and as the latter cross-head is, by the rod *m*, connected with the levers *k k'*, motion will thereby be given to the same, and, consequently, a rotary motion to the shafts *i i*, so as to move the head *f* with the knife *g* downward. As soon as the strip is cut off the water is introduced under the same pressure by a suitable valve into the two small cylinders *r r*, when the pistons *p p* will be moved in the opposite direction, thereby reversing the motion of the levers *k k'* and shafts *i i*, so as to move the head *f*, with its knife *g*, upward again. By means of the valve the head of the shears can, of course, be stopped at any point by letting the water escape. It results that it is not necessary to move the blades of the shears in each case the whole way downward and upward, as is the case with the ordinary shears; but the attendant can regulate the motion of the blades, and move the exact distance required by the size of the piece to be cut off.

I claim as my invention—

1. The combination, in hydraulic shears, of head *f*, consisting of several plates of ductile iron connected together by means of steel bolts, and carrying upper shear-blade, *g*, with table *d*, carrying lower shear-blade, *e*, substantially as specified.

2. The combination of two driving-shafts, *i i*, provided with eccentric taps *s s* on one side, and with levers *k k'* on the other side, with head *f*, carrying upper shear-blade, *g*, and with table *d*, carrying lower shear-blade, *e*, substantially as specified.

3. The combination of hydraulic cylinders *q r r*, provided with pistons *n p p*, with the levers *k k'*, cross-heads *o o'*, and drawing-rods *m m*, and with head *f*, carrying upper shear-blade, *g*, and table *d*, carrying lower shear-blade, *e*, substantially as specified.

4. The combination of hydraulic cylinders *q r r*, with the pistons *n* and *p p*, the pistons *p p* serving at the same time as guiding-rods for piston *n*, and to produce the back motion of levers *k k'*, that operate the head *f* of the shears, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMIL BOEHME.

Witnesses:
PAUL KRAUSE,
EDUARD KLEINERT.