No. 629,532. Patented July 25, 1899.

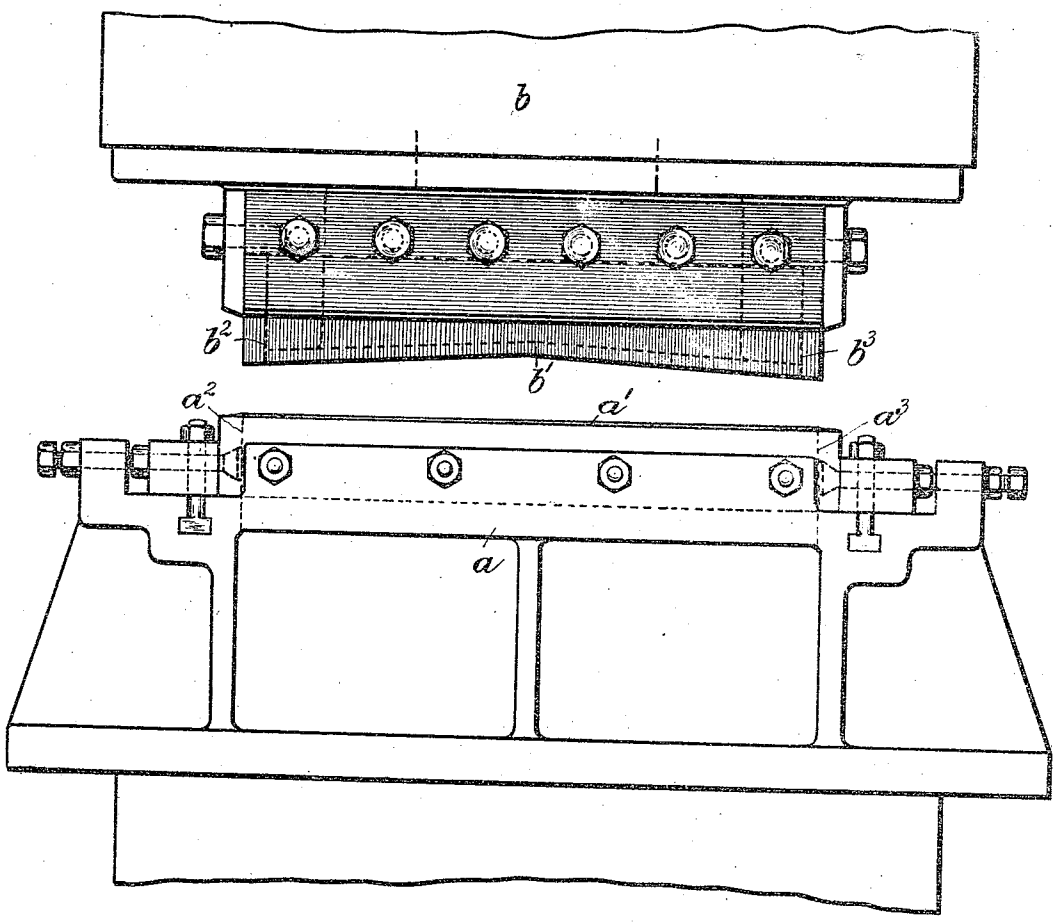
H. S. THOMAS.

MACHINERY FOR SHEARING OR CUTTING METALLIC PLATES OR SHEETS, &c.

(Application filed Aug. 25, 1898.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses;—

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Robert. S. Creed

Inventor;—

Hubert Stevenson Thomas.

No. 629,532. Patented July 25, 1899.

H. S. THOMAS.

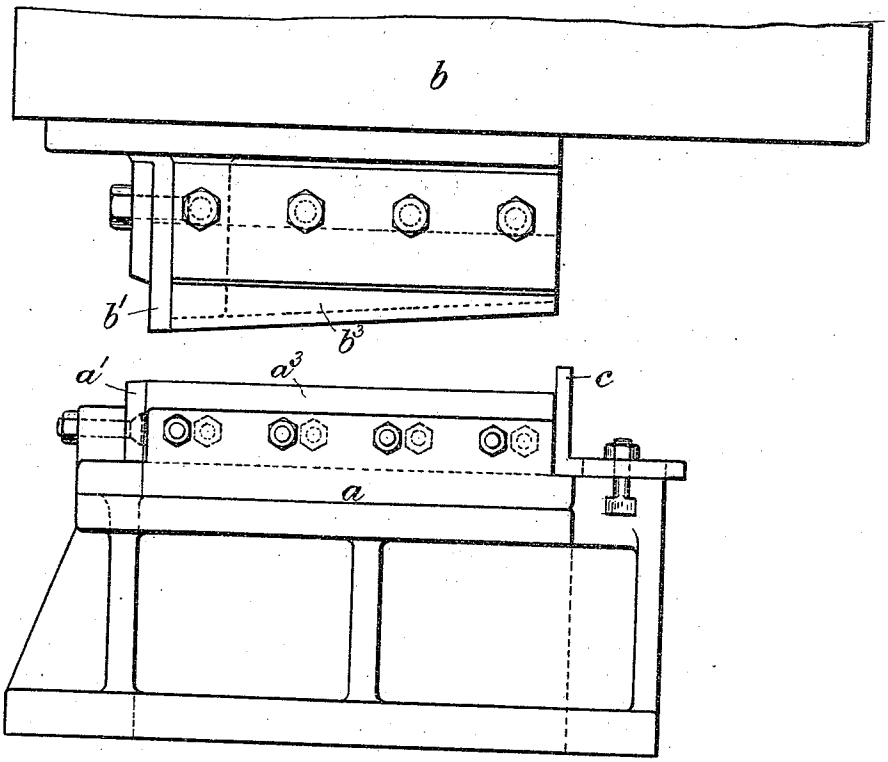
MACHINERY FOR SHEARING OR CUTTING METALLIC PLATES OR SHEETS, &c.

(Application filed Aug. 25, 1898.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 2.



Witnesses;—

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Robert. L. Read

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No. 629,532. Patented July 25, 1899.

H. S. THOMAS.

MACHINERY FOR SHEARING OR CUTTING METALLIC PLATES OR SHEETS, &c.

(Application filed Aug. 25, 1898.)

No Model.

4 Sheets—Sheet 3.

Fig. 3.

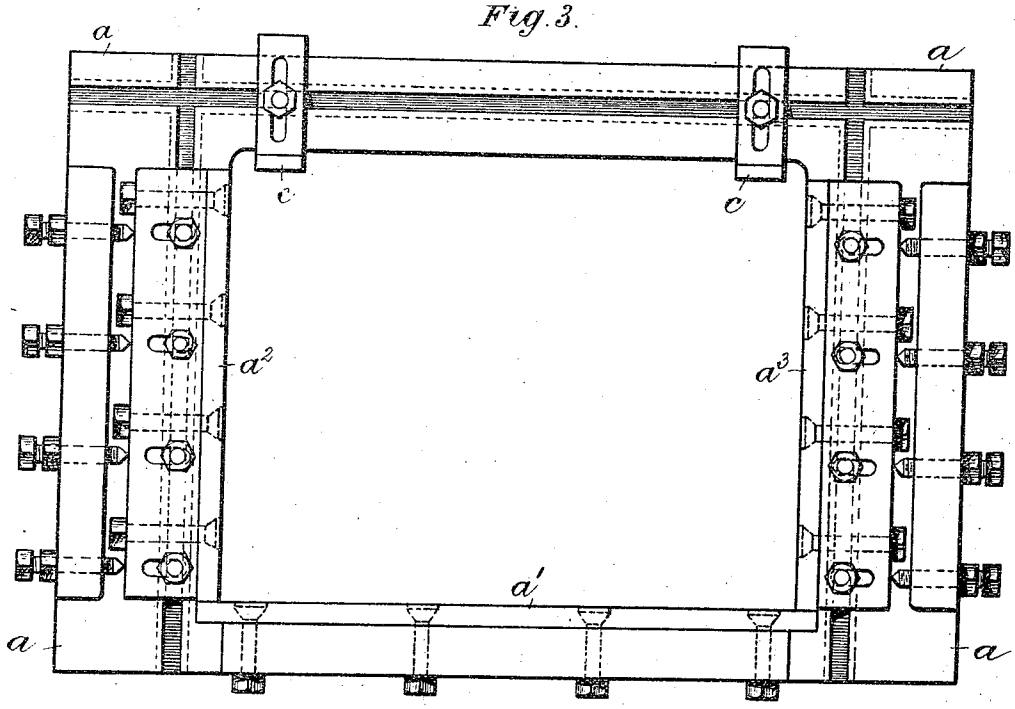
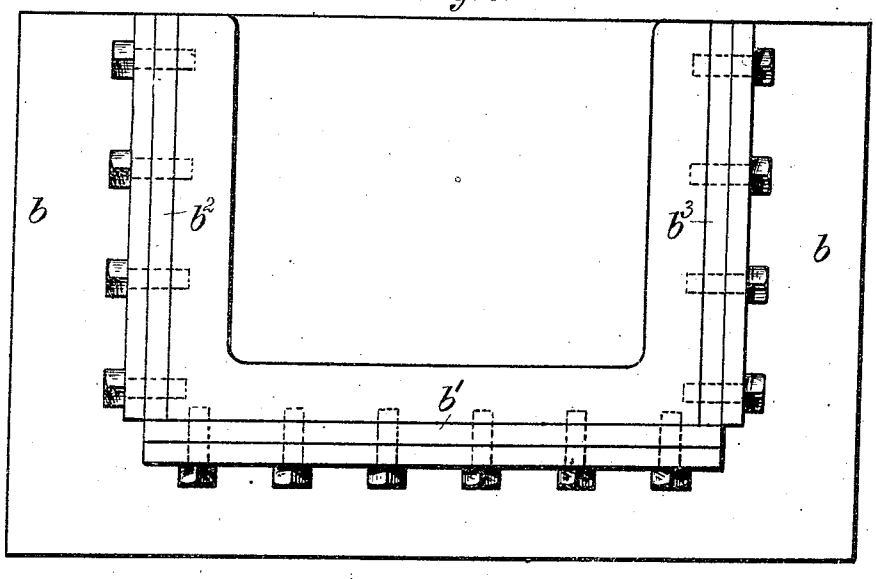


Fig. 4.



Witnesses;—

H. B. Jones

Robert S. Reed

Inventor;—

Hubert Spencer Thomas

No. 629,532. Patented July 25, 1899.

H. S. THOMAS.

MACHINERY FOR SHEARING OR CUTTING METALLIC PLATES OR SHEETS, &c.

(Application filed Aug. 25, 1898.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 5.

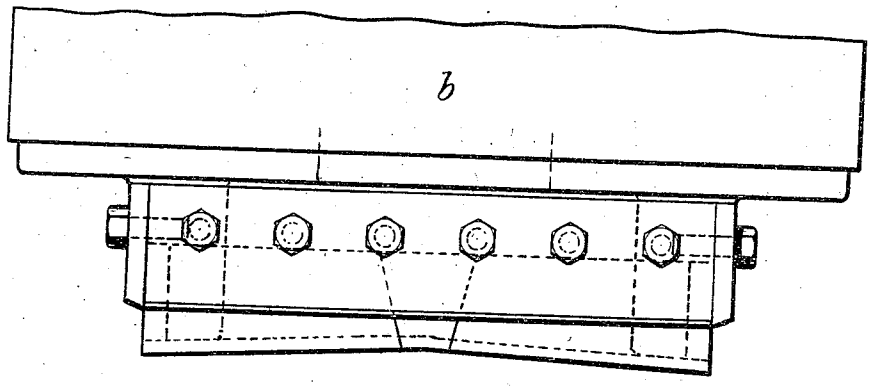
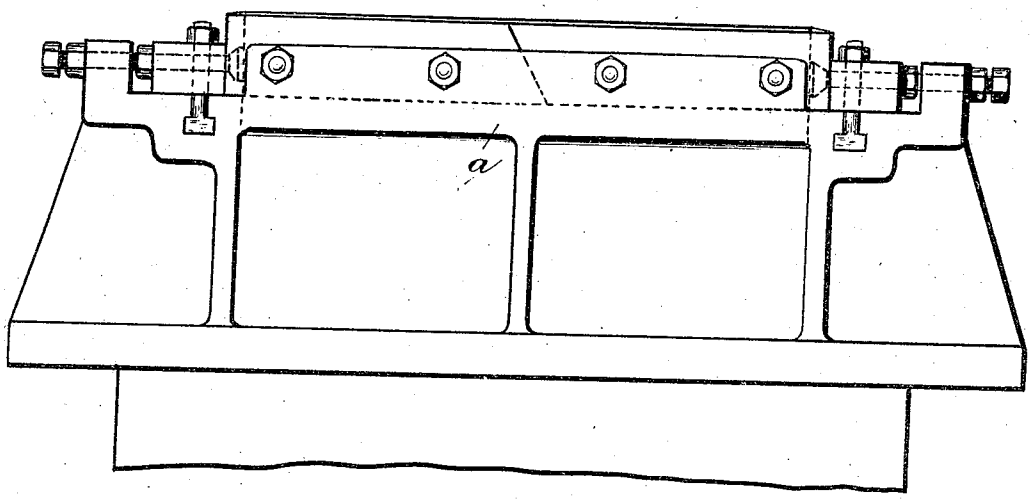


Fig. 6.



Witnesses;—

W. R. Jones

Robert S. Reed

Inventor;—

Hubert Spencer Thomas.

UNITED STATES PATENT OFFICE.

HUBERT SPENCE THOMAS, OF LYDBROOK, ENGLAND.

MACHINERY FOR SHEARING OR CUTTING METALLIC PLATES OR SHEETS, &c.

SPECIFICATION forming part of Letters Patent No. 629,532, dated July 25, 1899.

Application filed August 25, 1898. Serial No. 689,506. (No model.)

To all whom it may concern:

Be it known that I, HUBERT SPENCE THOMAS, a subject of the Queen of Great Britain, residing at Lydbrook, in the county of Gloucester, England, have invented new and useful Improvements in Machinery for Shearing or Cutting Metallic Plates or Sheets and for other Like Purposes, of which the following is a specification.

My invention consists of the improvements hereinafter described in machinery for shearing or cutting rolled black plates and other like metallic plates into sheets or pieces and for other like purposes; and my said invention has for its object to effect the cutting of all the sides but one of the sheets or pieces at one operation.

I wish it to be understood that by "shearing or cutting" I include the cutting operation commonly called "punching."

My invention is especially useful in the dividing of black plates into sheets or pieces to be used in the manufacture of tin plates and other like metal-coated plates.

I will describe my invention in connection with the shearing or cutting of a black-plate into rectangular sheets or plates.

In constructing a shearing-machine according to my invention I arrange and fix on the bed or table of the machine a series of three knives or shearing-blades, the cutting edges of which are upturned and presented inward. One of the said knives, which I will hereinafter call the "front" knife, is preferably parallel with the front of the machine, and the other or side knives are arranged at the rear of the said front knife and preferably at right angles thereto. The side parallel knives are adjustable on the bed or table of the machine, so as to fit them to cut sheets of varying width. I employ in conjunction with the said fixed knives three upper movable knives having their cutting edges downward and turned outward and adjusted so as to fit and work against the cutting edges of the lower or fixed knives. The junction of the upper side knives with the upper front knife may be beveled or inclined, so that by adjusting the upper side knives with respect to the upper front knife the adjustment of the width or distance apart of the side knives is effected, or the upper front knife may be made in two or more parts having inclined meeting faces, by the sliding of which on one another the length of the upper front knife and consequent width of the sheet to be cut may be adjusted.

The machinery constituting my invention is used as follows: The rolled black-plate to be cut or sheared into sheets or pieces is advanced between the upper and lower front knives, so that on the descent of the upper knives the front irregular edge of the black-plate is removed, leaving two horns at the opposite sides of the front edge of the black-plate. The black-plate, with its front edge thus trimmed, is advanced farther into the machine against fixed or movable stops, which determine the length of the sheet to be cut. On the descent of the upper or movable knives a sheet is obtained from the black-plate having its edges trimmed and its sides true or at right angles to each other. The black-plate is further and similarly operated upon, so as to obtain a second and third sheet, until the whole or nearly the whole of the black-plate is divided into sheets.

Although I have only described my invention in connection with the obtaining of rectangular sheets, I wish it to be understood that it may be used for the obtaining of polygonal or other shaped sheets, and by the use of curved—that is, concave, convex, or corrugated—knives it may be used in the obtaining of sheets with curved sides and ends, provided in all cases the front and back edges of the cut pieces are parallel.

Figures 1 and 2 of the accompanying drawings represent in front and side elevation, respectively, machinery for shearing or cutting metallic plates or sheets constructed according to my invention. Fig. 3 is a plan of the table of the machine, showing the lower knives in position thereon; and Fig. 4 is a plan of under side of the upper shear-block and knives carried by the same. Fig. 5 illustrates a method by which the length of the front knives may be adjusted applied to the upper front knife, and Fig. 6 illustrates another or modified method by which the length of the front knives may be adjusted applied to the lower front knife.

The same letters of reference indicate the same parts in the several figures of the drawings.

a is the table or bed of the machine, and b is the upper movable shear-block. To the table a three knives or shear-blades a' a^2 a^3 are bolted, the inner or cutting edges of the said knives or blades having in plan the outline of three sides of the rectangular plates or sheets to be cut. The front knife a' is fixed to and is situated, preferably, parallel with the front of the table a, and the side knives a^2 a^3 are adjustably fixed at right angles to the front knife a', the cutting edges of the three knives a' a^2 a^3 being presented inward. At the back of the table a of the machine are adjustable stops c c.

The upper or movable shear-block b carries three knives or shear-blades b' b^2 b^3, the cutting edges of which are turned outward and work on the descent of the shear-block b against the inwardly-turned cutting edges of the lower knives a' a^2 a^3. It will be seen by an examination of Figs. 1 and 2 that the cutting edges of the upper knives b' b^2 b^3 are inclined in the direction of their length to the lower knives, so as to effect on the descent of the said upper knives a shearing action, the angle of inclination of each of the said upper knives being preferably the same as that of the bevel or rake necessary to be put on the edge of the adjacent knife to form the cutting edge of the said adjacent knife. In other words, the cutting edge of each knife is preferably in the plane of the bevel or rake of the knife at right angles to it. The front corners of the upper knives are preferably lowest.

The action of the machine is as follows: The long rolled plate to be divided into smaller plates or sheets has the irregular edge first introduced into the machine trimmed—that is, made straight—in the following manner: The said irregular edge is passed only so far into the machine that on the descent of the upper movable shear-block b and its knives b' b^2 b^3 a strip is removed from the plate extending nearly from side to side of the said plate, a pair of horns being left at the opposite sides of the front straight edge thus produced. The plate is advanced into the machine until the said front straight edge bears against the stops c c, when by the descent of the upper movable shear-block b a plate or sheet of the required size is cut by the pairs of shearing-blades a' b' a^2 b^2 a^3 b^3 from the long rolled plate, the three sides of the sheet constituting, with the straight edge first produced, the rectangular sheet, being cut at one operation. The long rolled plate is again advanced into the machine until the edge last produced by the pair of front knives a' b' bears against the stops c c, when by the descent of the upper knives again a second sheet or plate is cut, the operation being repeated until the whole of the long rolled plate has been divided into smaller plates or sheets.

The side knives a^2 a^3 are adjustable—that is, are capable of being moved from or toward one another—so as to fit the machine to cut sheets of varying width, the front knife a' being replaced by a knife of the length desired. The said adjustment of the side knives also permits of compensation for wear due to regrinding of the said knives, which is necessary from time to time. Instead of replacing the front knife with a knife of greater length the said front knife may be divided—that is, made in two or more parts, as illustrated in Figs. 5 and 6—so as to be adjustable in length.

In Fig. 5 the knife is made in three parts, the middle part having a wedge shape and filling the space between the two end parts. When it is desired to slightly lengthen the knife, the middle wedge-piece is set down, so as to force outward the two end parts to the desired extent. The protruding part of the middle wedge-piece is ground off, so that its cutting edge forms a continuation of the cutting edges of the end parts, or the middle wedge-piece may be removed and replaced by a wedge-piece of a greater or smaller size.

In Fig. 6 the front knife a' is divided by an inclined division at or about its middle. By the sliding of the inclines of the two parts on one another the lengthening or shortening of the knife is effected, the protruding part of one being ground off, so as to bring the cutting edges of both parts on the same level.

Where the sheets to be cut are to have a polygonal figure—say, for example, a hexagonal figure—five knives are employed on the table of the machine and on the shear-block in place of the three represented in the drawings—that is to say, each series of knives or shear-blades is of a number one less than the number of sides of the polygonal figure of the sheet to be cut, the said series of knives having an open-sided figure in plan.

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

1. A machine for cutting plates or sheets into smaller plates or sheets, consisting of a bed or table, a vertically-movable block, two series of knives fixed respectively to the bed or table and the block and a stop or stops on the bed or table for limiting the distance to which the plate or sheet to be sheared or cut into smaller plates or sheets can be fed into the machine, the cutting edges of the said two series of knives having in plan a figure corresponding to that of the plate or sheet to be cut excepting that one of the sides of the said figure, namely that side at which the stop or stops are situated, is knifeless or unprovided with a knife, substantially as described and shown.

2. A machine for shearing or cutting metallic and other plates or sheets into smaller plates or sheets consisting essentially of a table and a rising-and-falling shear-block situated above the said table the said table and shear-block each carrying three knives or

shear-blades so arranged that the cutting edges have a figure in plan corresponding to the front and side edges of the sheet to be cut and a stop or stops at the back of the table for limiting the distance to which the plate to be cut can be fed into the machine substantially as herein set forth and shown.

3. A machine for shearing or cutting metallic and other plates or sheets into smaller plates or sheets consisting essentially of a pair of shearing or punching blocks each having three knives or shear-blades so arranged that on the descent of the upper knives or shear-blades three sides of the rectangular sheet are simultaneously cut the two side or parallel knives being adjustable substantially as and for the purposes herein set forth and shown.

4. A machine, for cutting or shearing metallic and other plates or sheets into smaller plates or sheets, consisting essentially of a fixed block and a movable block each carrying three or a series of knives the cutting edges of which work against each other on the motion of the movable block the cutting edges of the knives of the movable block being inclined lengthwise to the cutting edges of the knives of the fixed block the angle of inclination of each knife of the movable block being the same as that of the bevel or rake necessary to be put on the adjoining knife to give to the said adjoining knife a cutting edge substantially as herein set forth and shown.

5. In a machine for cutting or shearing plates or sheets into smaller plates or sheets, the lengthwise extensible and contractible knives or shear-blades, each composed of a series of separate rigid sections adjustable relatively to one another to lengthen or shorten the knife or blade, substantially as described.

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

HUBERT SPENCE THOMAS.

Witnesses:
W. R. JONES,
ROBERT I. CREED.