

No. 730,874.

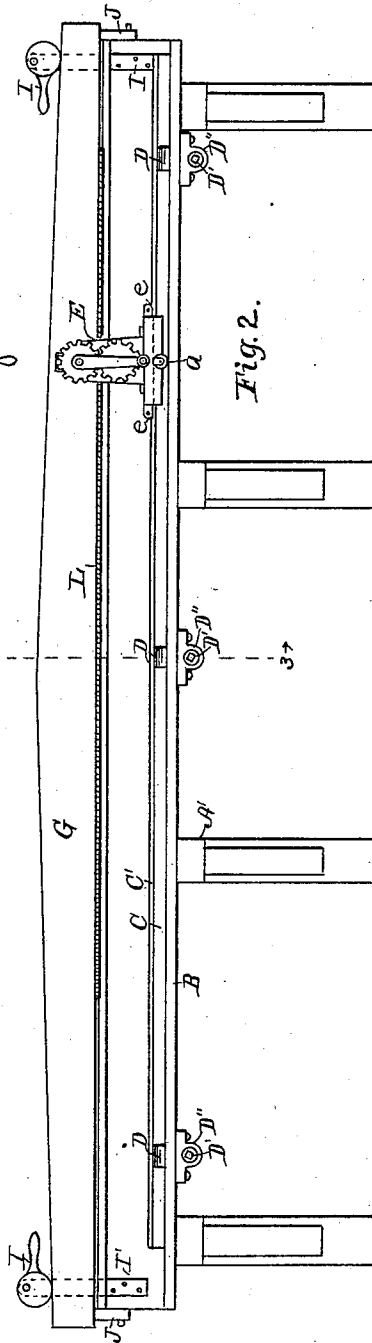
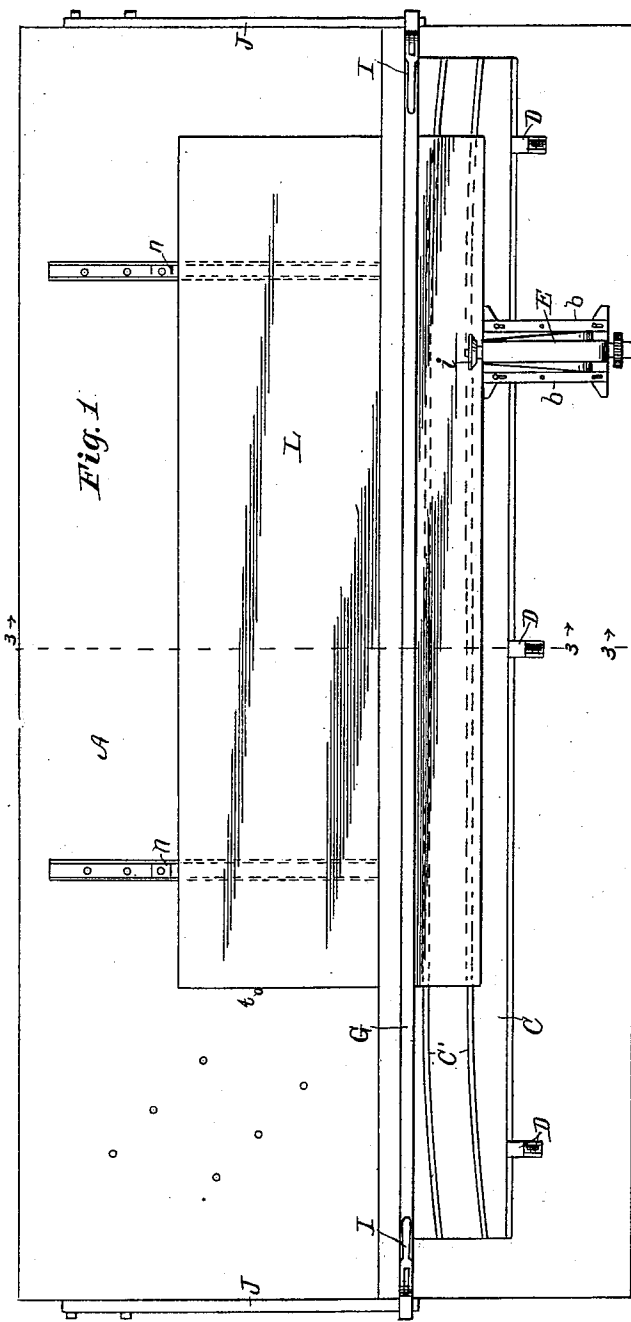
PATENTED JUNE 16, 1903.

A. E. CHAMBERS & L. H. BULLARD.  
MACHINE FOR CUTTING SHEET METAL.

APPLICATION FILED JUNE 6, 1902. RENEWED MAY 9, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES

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INVENTORS

*Lewis H. Bullard*  
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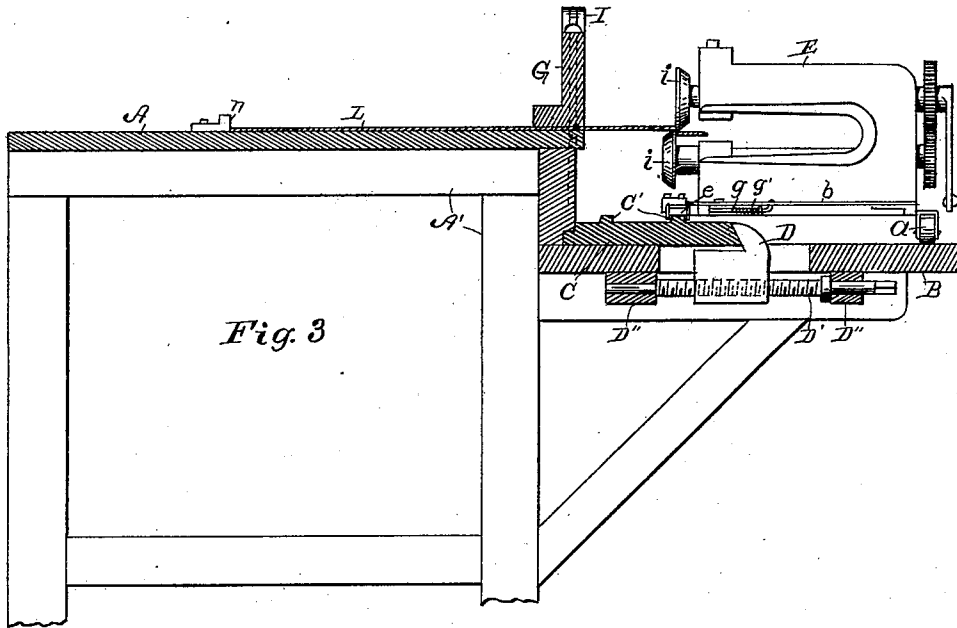


Fig. 3

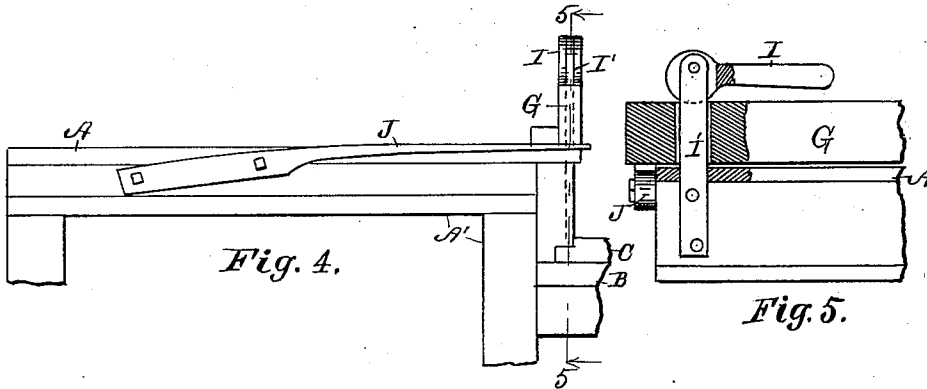


Fig. 4.

Fig. 5.

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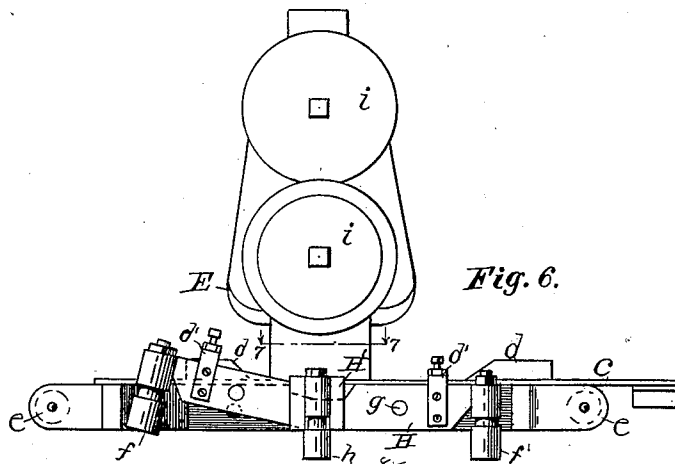


Fig. 6.

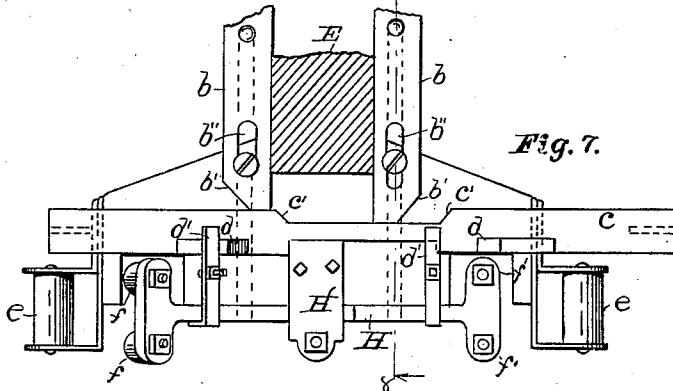


Fig. 7.

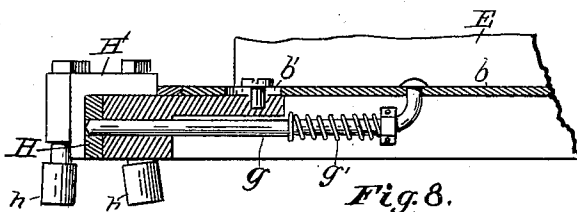


Fig. 8.

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# UNITED STATES PATENT OFFICE.

ARTHUR E. CHAMBERS AND LEWIS H. BULLARD, OF DETROIT, MICHIGAN, ASSIGNORS TO MICHIGAN STEEL BOAT COMPANY, OF DETROIT, MICHIGAN.

## MACHINE FOR CUTTING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 730,874, dated June 16, 1903.

Application filed June 6, 1902. Renewed May 9, 1903. Serial No. 156,499. (No model.)

*To all whom it may concern:*

Be it known that we, ARTHUR E. CHAMBERS and LEWIS H. BULLARD, citizens of the United States, residing at the city of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Machines for Cutting Sheet Metal, of which the following is a specification.

This invention relates to improvements in machines for cutting sheet metal.

The objects of the invention are, first, to provide a machine for cutting sheet metal which may be quickly and easily adjusted to cut sheet metal into strips of varying shape and one with which when adjusted any number of strips of a given shape may be cut without any variation; second, to provide a machine for cutting sheet metal which is simple in its parts and operation and economical to construct and use; third, to provide an improved guiding means for rotary shears that will effectively guide the same without any tendency to draw the metal out of shape or displace the shears; fourth, to provide means for automatically reversing the cutting-machine, so that it may be operated in both directions.

Further objects will definitely appear in the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in this specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of our invention is fully illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a structure embodying the features of our invention. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged detail cross-sectional view of a structure embodying the features of our invention, taken on lines 3 3 of Figs. 1 and 2. Fig. 4 is an enlarged detail end elevation of a structure embodying the features of our invention, showing the clamping mechanism for holding the sheet metal in position to be cut. Fig. 5 is a detail longitudinal sectional view of the same, taken on line 5 5 of Fig. 4. Fig. 6 is an enlarged side elevation view of the cutting

mechanism removed from the machine. Fig. 7 is an enlarged detail sectional view taken on line 7 7 of Fig. 6, showing the arrangement of parts. Fig. 8 is an enlarged detailed cross-sectional view taken on line 8 8 of Fig. 7.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the lettered parts of the drawings, A is a table supported on a suitable framework A'. A shelf or second table B is supported by suitable brackets in front of the table A. The reason for the arrangement of the tables in this manner will clearly appear from the description to follow.

C is a movable pattern-plate having the tracks or guides C', forming the pattern. It is clamped in position on the table B by clamps D, which project from below through the slots in the table, which are controlled by the threaded rods D', supported on the under side of the table B by the blocks or bearings D''. The pattern or guides C' are arranged in relation to each other to outline the shape of the strips of sheet metal which it is desired to cut.

It is apparent that the track-plate C may be removed and others having differently-related tracks or guides substituted in its place when desired.

The cutting-machine E is provided with rotary cutters *i i* and with suitable means for revolving the same.

The cutting-machine E is supported on the wheel or roller *a* on the outside, adapted to travel on the table B, and the rollers *e*, adapted to travel on a guide or track C'.

Supported on the ends of the pivoted bar H are guide-rollers *f f* and *f' f'*. Supported on a bracket H' in line with the cutting-shears is a guide-roller *h*. One set of guide-rollers, either *f f* or *f' f'*, and the guide-roller *h* engage a guide-track C' at the same time and guide and hold the cutting-machine in such position while it is being operated that it operates easily and does not have any tendency to bind on the track or to displace the cutting-shears or draw the metal operated upon.

That the cutting-machine may be easily op-

erated in either or both directions we provide means for automatically reversing the same. On the sliding bar *c* are beveled blocks *d d*, carried by the pivoted bar *H* to operate the same to cause the guide-rollers *f f* and *f' f'* to alternately engage with the guide-tracks as the trip-bar *c* is moved back and forth. The pivoted bar *H* is locked in position by pins *g*, arranged to engage suitable perforations therein. The pins *g* are carried by blocks *b*, which are secured to the frame of the machine by set-screws or the like through slots *b''*, so that they are free to slide back and forth. The inner ends of the blocks *b* are beveled at *b'*, and the trip-bar *c* is cut away or beveled, so that as it moves back and forth it will engage the blocks and force them back to disengage the pins *g*. Springs *g'* hold them normally inward. Suitable stops are provided toward the ends of the table, against which the ends of the trip-bar *c* strike to shift the position of the same. In its movement the bar first engages the block *b* and withdraws the locking-pins *g*. It then engages the brackets *d'* and reverses the position of the bar *H*, when the opposite locking-pin engages the same and locks it in that position, when the machine may be operated in the opposite direction.

Supported toward the front of the table *A* by guides *I'* on either end of the framework is a clamping-plate *G*. This plate is clamped to the surface of the table *A* by the eccentric levers *I* and is held normally upward by the spring-levers *J* at each end.

On the surface of the table *A* are the adjustable guides *n*, which aid in holding the sheet of metal which it is desired to operate upon. Holes *t* are also made in the table-top *A* to receive pins to assist in holding the same.

Having described our invention in detail, we will now describe it in operation. A sheet of metal, as *L*, is inserted in under the clamping-plate *G*, and the guides on the surface of the table are arranged to retain it in the desired position and the clamping-plate *G* clamped upon the same. The sheet is thus clamped to the table along its entire length, the outer edge of the sheet of metal from which the strip is to be cut projecting out over the table *B*. The track or guide plate *C*, having guides on its surface of suitable pattern, having first been clamped in position, the cutter *E* is placed upon the outer track or guide and operated to trim the outer edge of the sheet. The machine automatically reverses itself, as before described. It is then placed upon the inner track or guide and again operated, and the desired strip is cut. It is apparent that this operation may be repeated as many times as desired and that the strips cut will all be of identical size and shape.

We have described our structure in detail in the form we believe to be the most simple and effective. However, we are aware that it is capable of considerable variation without departing from our invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for cutting sheet metal, the combination of a table *A*; means for clamping a sheet of metal thereto; a table *B* having guides thereon; a cutting-machine provided with rotary shears and with wheels or rollers *a, e, e*; a guide-roller *h* supported in line with said shears adapted to engage the guides on said table; guide-rollers *f, f*, supported on the pivoted bar *H* adapted to alternately engage the said guide; locking-pins *g* for said pivoted bar; and a sliding bar *c* adapted to act upon said locking-pins alternately to release said bar *H* and to act upon said bar to shift the same; all coacting for the purpose specified.

2. In a machine for cutting sheet metal, the combination of a table *A*; means for clamping a sheet of metal thereto; a table *B* having guides thereon; a cutting-machine provided with rotary shears and with wheels or rollers *a, e, e*; guide-rollers *f, f*, supported on the pivoted bar *H* adapted to alternately engage the said guide; locking-pins *g* for said pivoted bar; and a sliding bar *c* adapted to act upon said locking-pins alternately to release said bar *H* and to act upon said bar to shift the same; all coacting for the purpose specified.

3. In a machine for cutting sheet metal, the combination of a table *A*; means for clamping a sheet of metal thereto; a table *B* having guides thereon; a cutting-machine having rotary shears; a guide supported in line with said shears adapted to engage the guides on said table; guides supported on a pivoted bar adapted to alternately engage the guides on the said table; and means for automatically shifting said last-named guides, for the purpose specified.

4. In a machine for cutting sheet metal, the combination of a table *A*; means for clamping a sheet of metal thereto; a table *B* having guides thereon; a cutting-machine having rotary shears; a guide supported in line with said shears adapted to engage the guides on said table; guides supported on a pivoted bar adapted to alternately engage the guides on said table; for the purpose specified.

5. In a machine for cutting sheet metal, the combination of a table *A*; means for clamping a sheet of metal thereto; a table *B* having guides thereon; a cutting-machine having rotary shears; guides on said cutting-machine adapted to alternately engage the guides on said table; and means for automatically shifting the same, for the purpose specified.

6. In a machine for cutting sheet metal, the combination of a table *A* having guides *n* on its surface; a clamp consisting of the clamping-plate *G* controlled by the eccentric levers *I I*, arranged above said table; a second table *B* supported to the front of said table *A*; a plate *C* having tracks or guides *C'* thereon, arranged to form a pattern; and a rotary cutting-machine *E* adapted to reciprocate on said table *B*, having a part to engage said

tracks or guides alternately, for the purpose specified.

5 7. In a machine for cutting sheet metal, the combination of a table A having guides and stops on its upper surface; suitable means for clamping a sheet of metal to the same; a table B supported to the front of said table A; a plate C having tracks or guides C' thereon, arranged to form a pattern, secured in position on said table B; and a rotary cutter adapted to reciprocate on said table B, having a part to engage said tracks or guides alternately, for the purpose specified.

10 8. In a machine for cutting sheet metal, the combination of a table A; suitable means for clamping a sheet of metal thereto; a second table B supported to the front and below the plane of said table A; a plate C having suitable tracks or guides thereon, arranged  
20 to form a pattern supported by the said table

B; and a rotary cutting-machine adapted to reciprocate on said table B, and to be guided in such movement by said guides, for the purpose specified.

9. In a machine for cutting sheet metal, the combination of a table; means for clamping a sheet of metal thereto; a table having guides thereon, arranged to form a pattern; and a cutting-machine adapted to be moved across said table and to be guided in said movement by said guides, whereby the metal is cut into the desired pattern, as specified.

In witness whereof we have hereunto set our hands and seals in the presence of two witnesses.

ARTHUR E. CHAMBERS. [L. S.]

LEWIS H. BULLARD. [L. S.]

Witnesses:

C. G. BULLARD,

J. E. TISCHNER.