No. 611,599. Patented Oct. 4, 1898.

G. M. BEATY & F. MAZZEI.

METAL CUTTER AND ROLLER.

(Application filed July 7, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

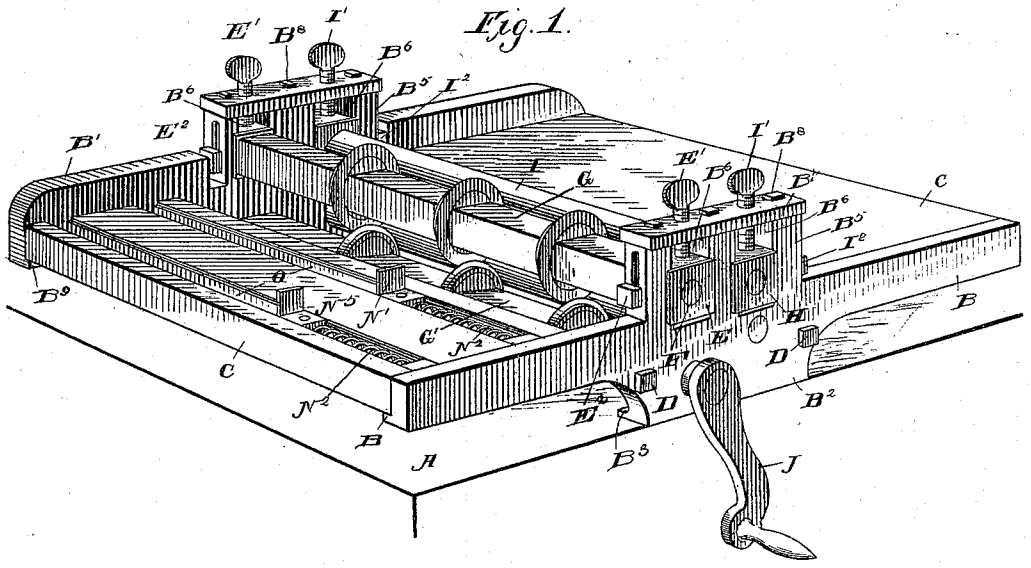


Fig. 2.

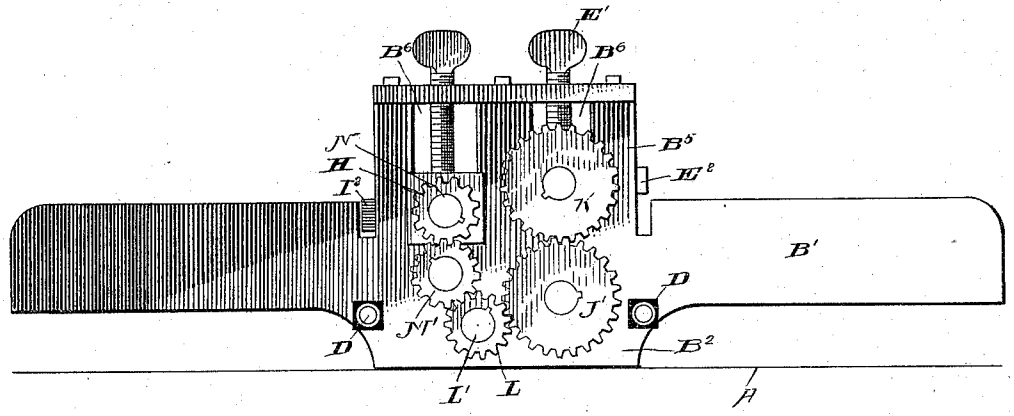
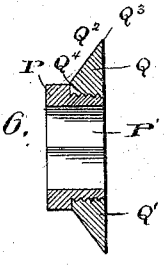


Fig. 6.



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Fig. 3.

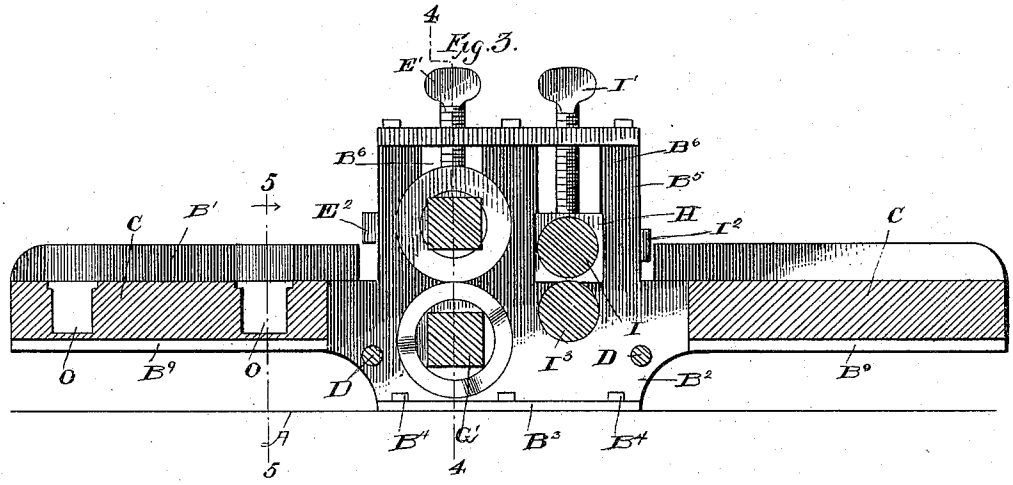


Fig. 4.

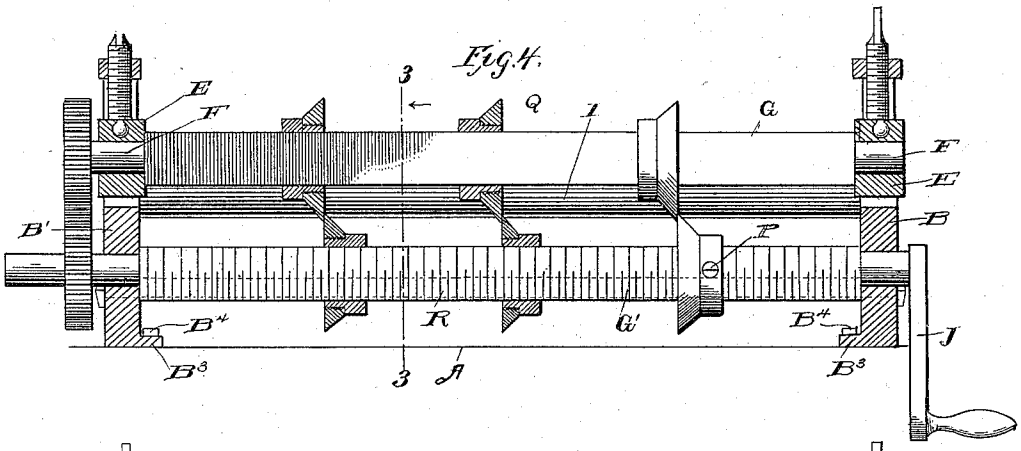
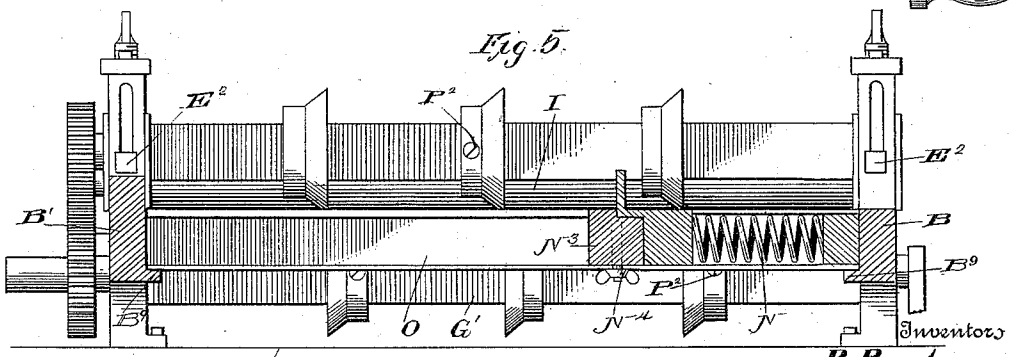


Fig. 5.



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UNITED STATES PATENT OFFICE.

GILBERT M. BEATY AND FRANK MAZZEI, OF DENISON, TEXAS.

METAL CUTTER AND ROLLER.

SPECIFICATION forming part of Letters Patent No. 611,599, dated October 4, 1898.

Application filed July 7, 1897. Serial No. 643,724. (No model.)

To all whom it may concern:

Be it known that we, GILBERT M. BEATY and FRANK MAZZEI, citizens of the United States, residing at Denison, in the county of Grayson and State of Texas, have invented a new and useful Metal Cutter and Roller, of which the following is a specification.

Our invention is in the nature of a machine for cutting and rolling sheet metal, and has for its object to simplify and cheapen the construction of this class of machines and render them more reliable and effective in operation.

With this object in view our invention consists in the improved construction, arrangement, and combination of parts hereinafter fully described, and afterward specifically pointed out in the appended claims.

In order to enable others skilled in the art to which our invention most nearly appertains to make and use the same, we will now proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a machine constructed in accordance with our invention. Fig. 2 is a side elevation of the gearing end thereof. Fig. 3 is a longitudinal section on the line 3 3 of Fig. 4, looking in the direction of the arrow. Fig. 4 is a transverse vertical section on the line 4 4 of Fig. 3. Fig. 5 is a transverse vertical section on the line 5 5 of Fig. 3. Fig. 6 is a vertical section through one of the knife-supporting blocks or hubs removed from its square shaft, showing the manner of threading the knife thereon.

Like letters of reference mark the same parts wherever they occur in the various figures of the drawings.

Referring to the drawings by letters, A is a table, stand, or counter which forms the base upon which our machine is mounted. The main body of our machine consists of two side frames B B′, preferably made of cast metal, being extended downward in the central portion thereof at B^2 and having inwardly-projecting flanges B^3, which form feet to rest upon the table A and to be secured thereto by means of bolts B^4. The central portions of the side pieces are also extended upward at B^5 and provided with vertical notches or openings B^6 and covered by a cap B^7, secured by bolts B^8. A horizontal flange B^9 extends along the inside of the side pieces from the center toward each end, upon which rest wooden blocks C, which form the work-table of our machine, being held in position between the side pieces by bolts and nuts D, which connect the two side pieces together.

E are bearings to receive the journals F of the square shaft G. These bearings are provided at each end of the machine and are slidably arranged in the opening B^6 in the side frames, being adjustable vertically by means of set-screws E′ and held at any adjustment by means of set-bolts E^2, passing through the side pieces and engaging the side of the bearing.

A guideway similar to B^6 and parallel thereto is arranged in the side frame B to receive the bearing H, in which a roller I is journaled, said bearing being adjustable vertically by means of a set-screw I′ and held in proper adjustment by means of a bolt I^2, the guideway-bearing and set-screw being duplicated at the two sides of the machine.

Below the square shaft G is mounted a parallel square shaft G′, provided on one end with a crank-handle J, by means of which it may be turned, or a pulley may be secured on the opposite end for power-driving.

A roller I^3, below and parallel with the roller I, is also mounted in the side of the frame, as shown. A train of gearing, consisting of a gear-wheel K, mounted on the end of the square shaft G, a gear-wheel J′, meshing therewith and mounted on the end of the square shaft G′, a gear-wheel L, mounted on a short shaft L′ and engaging the gear-wheel J′, a gear-wheel M′, mounted on the end of the roller I^3 and engaging the gear-wheel L, and a gear-wheel N, mounted on the end of the roller I and engaging the gear-wheel M′, serves to cause the square shafts and the rollers to rotate in unison in their bearings.

Guides N^5 and N′ are mounted in transverse guideways O, formed in the table C in front of the cutters, extending entirely across the woodwork and arranged to be adjustable therein lengthwise of said guideways, said guides projecting vertically and longitudi-

nally above the table and being backed up by springs N^2, located behind them in the guideways.

Blocks N^3 are mounted in the guideways in advance of the guides, upon which the guides rest and which are secured in any position by screws and thumb-nuts N^4.

P are hubs or blocks preferably made of steel and having a central opening P′ of a size and shape to accurately fit upon the square shafts G and G′.

Q is a ring-cutter threaded upon the hub P, having its front face Q′ flush with one end of the hub, while its rear face Q^2 is inclined from the extreme edge Q^3 at about an angle of forty-five degrees to the point Q^4, where it joins the periphery of the hub. The knives being fitted upon these hubs, the hubs are placed in position upon the shafts G and G′ and secured in any adjusted position thereon by means of set-screws P^2, as clearly shown.

The adjustment of the knives on the shafts is greatly facilitated by the provision of a graduated scale R on one face of either of the shafts G or G′, whereby the knives may be accurately set at proper distances apart for the work being performed. In placing the hubs upon the shafts they are so arranged that the flush faces of the knives on the shaft G are opposite to those on the shaft G′, their edges slightly overlapping and when properly adjusted bear against and run in contact with each other.

The guides N^5 and N′ are for the purpose of laterally guiding the run of metal to be cut through the machine and are not necessary except in front of the cutters.

The knives having been properly adjusted with relation to each other and to the thickness of the metal to be cut, and the rollers having also been adjusted with relation to the metal to be passed through them, a sheet of metal to be cut longitudinally is entered between the knives, with one edge resting against the guides N^5 and N′ and started through the machine. When it reaches the rollers, it will be seized by them and drawn through in a direct line, the rollers rolling and smoothing down all raised or burred surfaces and all indentations that may have been produced by the cutters, thus in one operation cutting the sheet metal into strips and rolling it, thus saving the time and labor required to pass the sheet metal through the knives and then through separate rollers, which has heretofore been done.

The set bolts or screws which hold the bearing-blocks of the cutter-shafts in their adjusted positions move up and down in slots in the side frames as the adjusting-screws at the top move the bearings up and down.

We have found it absolutely necessary upon practical trial to provide a guide for the sheet in front of the knives, as shown at N^5 and N′, as no other expedient has been found producing the satisfactory result of cutting absolutely straight.

The particular bevel given to the back edge of our cutter is the result of long study and repeated experiment, in which we found that a sharper cutter was not sufficiently strong, and a cutter with less inclination on its rear side is too broad and does not make a proper shear clear cut without unnecessary pressure.

Our cutters are of such shape that they shear as they feed the material along, the rolling being simultaneous and leaving no bur. This is a valuable feature for sheet-metal workers, especially cornice-makers, as when burs are formed they have to smooth their edges on iron mandrels before they can possibly manipulate the metal.

This cutter is made in two separate parts, the cutter itself being made of fine tool-steel tempered and threaded to screw onto the collar of the hub, which is made of machine-steel or cast-iron. This provision results in the saving of considerable expense over the custom of making the cutter and hub of one piece of all-tempered steel, which is very difficult to manufacture. Our plan permits of the replacement of a small portion—namely, the knife itself—the hub not being easily broken or worn.

The making of our cutter-shaft square is of considerable advantage in the adjustment of the knives. A round shaft with the best of fastenings will permit of slight vibration and separation of the knives, which causes a bur on the edges of the iron when cut by knives mounted on such shafts. On a square shaft the cutter is bound and held on all four sides and cannot possibly give under any pressure. The square shaft also permits of the graduating-scale, whereby the operator can immediately set the knives to any desired width by moving the cutters to any portion of the scale.

Our machine can be made any width desired, but will usually be made to accommodate the regulation width of sheet-iron used in the United States, which is thirty inches or less. We have found by practical operation that as much metal can be cut into strips in fifteen minutes as will take two days by hand, the metal being also rolled in this machine with the same operation.

This machine will cut No. 16 steel and iron very easily and smoothly and can be made heavy enough to cut No. 12 or lighter iron.

While we have illustrated and described the best means now known to us for carrying out our invention, we do not wish to be understood as restricting ourselves to the exact details of construction shown, but hold that any slight changes or variations such as might suggest themselves to the ordinary mechanic would properly fall within the limit and scope of our invention.

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

1. The combination of a table having guideways formed across it, blocks slidable in said

guideways, means for securing them, guides resting on said blocks, and springs in the guideways backing up the guides, all substantially as set forth.

2. The combination with a table having suitable bearings and guideways across it, of the cutter-shafts and the rolls, mounted in the bearings and suitably geared together, the blocks slidable in the guideways, means for securing the blocks, guides resting on the blocks, and springs in the guideways backing up the guides, substantially as described.

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