No. 784,515. PATENTED MAR. 7, 1905.

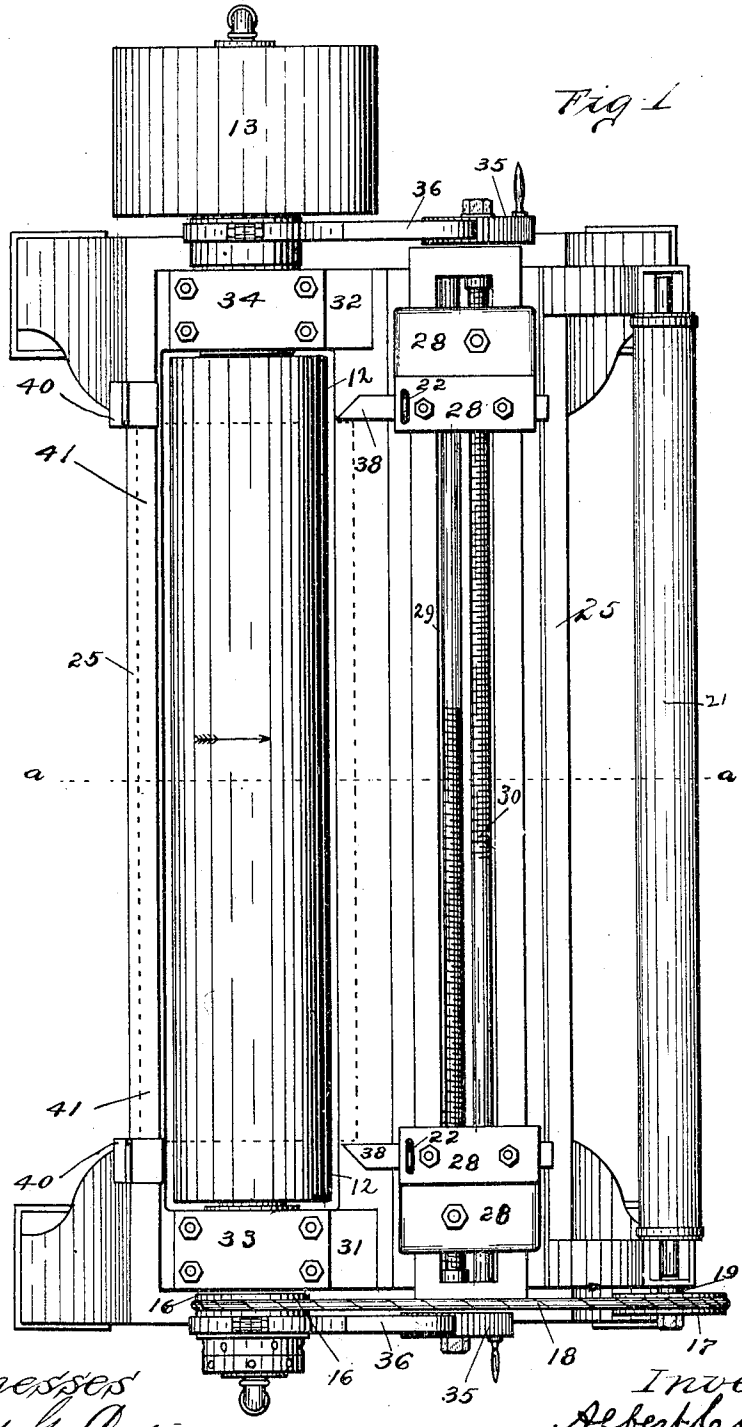
A. C. CALKINS.

METAL CUTTING MACHINE.

APPLICATION FILED JULY 16, 1902. RENEWED SEPT. 3, 1903.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig 2

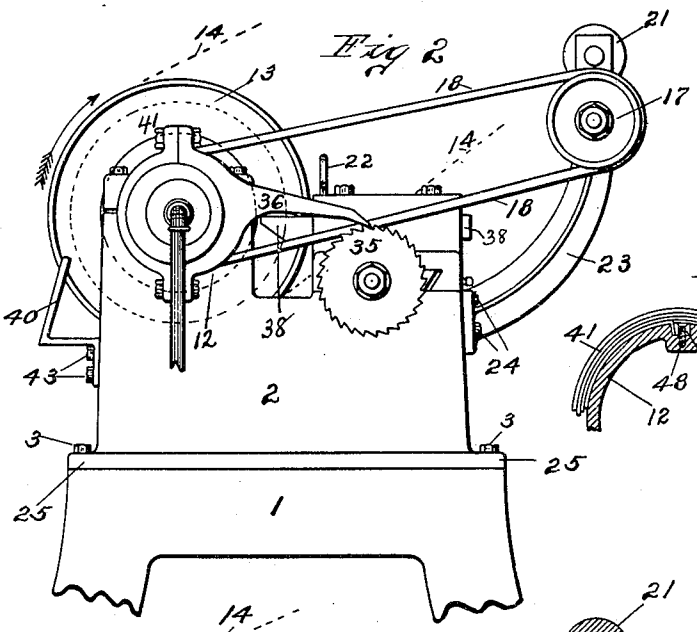


Fig 6

Fig 5

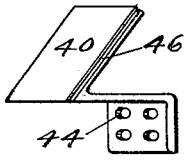


Fig 3

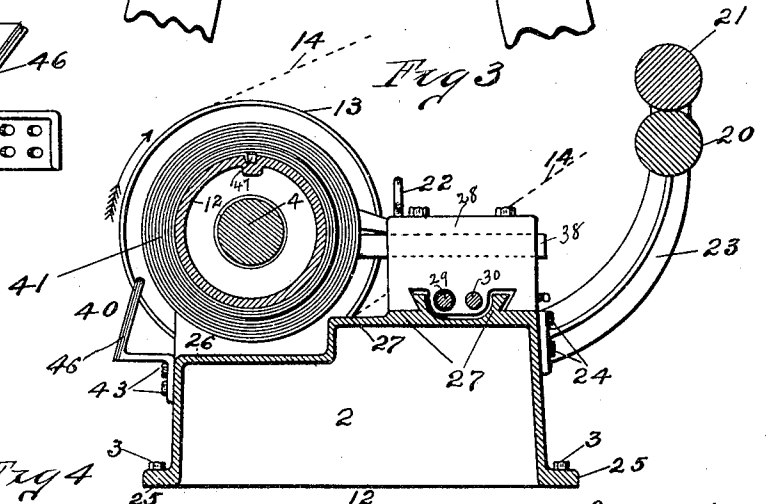
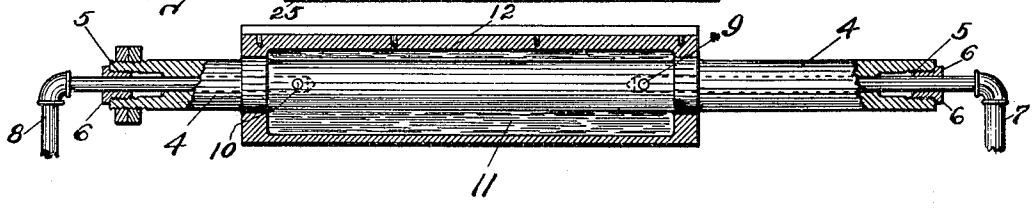


Fig 4



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No. 784,515. Patented March 7, 1905.

UNITED STATES PATENT OFFICE.

ALBERT C. CALKINS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THE CALKINS COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

METAL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 784,515, dated March 7, 1905.

Application filed July 16, 1902. Renewed September 3, 1903. Serial No. 171,782.

To all whom it may concern:

Be it known that I, ALBERT C. CALKINS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, State of California, have invented and discovered a new and useful Improvement in Metal-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in metal-cutting machines; and some of the objects of my improvement are, first, to construct machines for cutting zinc or other metals of greater capacity than those now in use; second, to devise means for cutting the edges of rolled sheets of metal; third, to provide machines for cutting metals that can be continuously operated during all the working hours of the day by reducing the temperature of the roll of metal while being cut; fourth, to manufacture metal-cutting machines in combination with an apparatus for keeping the cutting devices cool during the operation of the machines. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the machine. Fig. 2 is a view in elevation of one end of the same. Fig. 3 is a view in cross-section on the line *a a* of Fig. 1. Fig. 4 is a view, partly in elevation, of the mandrel and parts thereof in section, showing the pipes for conveying the cooling mixture therethrough and the water-jacket secured to the mandrel. Fig. 5 is a detail view illustrating one of the guides for rolling the metal sheets upon the mandrel and water-jacket. Fig. 6 is a detail view showing a portion of the water-jacket with the mandrel removed and a portion of sheet secured to the water-jacket.

Similar reference-numerals refer to like parts throughout the several views.

The reference-numeral 1 refers to the frame of the machine; 2 2, the end supports, one secured to each end of the frame 1 by means of bolts or screws 3.

The mandrel 4 is journaled at each end in the supports 2 2 and is made hollow for a portion of its length at each end thereof and is provided at each end with internal screw-threads 5 to receive the external screw-threaded stuffing-boxes 6 6, through which the inlet and exit pipes 7 and 8, respectively, pass, which conduct a refrigerating fluid of any desired constituents, such as ammonia, solution of chlorid of sodium or other temperature-reducing mixture. These pipes 7 and 8 extend for a short distance into the mandrel 4, and at about the points where the said inlet and exit pipes 7 and 8 terminate the mandrel 4 is provided with perforations 9 and 10 in order to allow the refrigerating mixture conveyed into the mandrel 4 through the inlet-pipe 7 to pass through the inlet-perforation 9 into the space 11 between the outer surface of the mandrel 4 and the water-jacket 12, which is shrunk or otherwise secured water-tight upon the mandrel to freely circulate around the mandrel, thereby reducing the temperature caused by the friction of the tools in cutting the edges of the sheets of metal wound upon the jacket 12.

The pulley 13 for revolving the mandrel 4 and the water-jacket 12 is secured upon one end thereof and is driven by the belt 14, (shown in dotted lines upon Figs. 2 and 3 of the drawings,) which belt 14 passes over a pulley (not shown) connected with any desired form of motor, which is not necessary to be illustrated upon the drawings. Upon the opposite end of the mandrel from that upon which the pulley 13 is fastened I spline or otherwise secure the pulley 16, over which the belt 18 passes and also passes over the pulley 17, fastened upon the projecting end 19 of the lower roller 20, which by contact or other known means revolves the upper roller 21, so as to withdraw the thinly-cut shavings or shreds from the ends of the roll of metal through rings 22, and thereby convey them from the cutting-tools and prevent the accummulation of the said cut shavings or shreds upon the bed of the machine.

The two rollers 20 and 21 are journaled in

the upper ends of a pair of the upwardly-curved brackets 23, which at their lower ends are fastened to the supports 2 2 of the frame of the machine by means of bolts, rivets, or screws 24.

The two end supports 2 2, in which the two ends of the mandrel 4 have their bearings 31 and 32, provided with caps 33 and 34, are cast or made integral with the bed-plate 25, which is bolted to the frame 1 of the machine. The front portion 26 of the bed-plate 25 is lower than the rear portion 27 of the bed-plate, upon which the two cutting-holders travel and over which the shavings or shreds cut from the sheet-metal roll pass and through the rings 12 12 upward between the rollers 20 and 21 from the machine. Upon the said rear and higher portion 27 of the bed-plate the two tool-holders 28 28 travel in opposite directions by means of the right and left screw-threaded rods 29 and 30.

Each end of the rods 29 and 30 pass laterally and horizontally through each of the two tool-holders 28 28, and one end, respectively, of each of said rods 29 and 30 projects through one of the supports 2 2 of the bed-plate 25 of the machine, and upon said projecting ends of the said rods 29 and 30 ratchet-wheels 35 are keyed or otherwise secured, so that when the said ratchet-wheels 35 are caused to revolve by means of the cam-strap pawls 36 upon each of the cam ends of the mandrel 4 the said rods 29 and 30 are caused to revolve in screw-threads in the two holders upon the free ends of said rods, thereby causing the tool-holders to approach each other, each carrying therein a cutting-tool 38, which cuts simultaneously the two ends 41 41 of the sheet-metal roll wound upon the mandrel 4 when the same is revolved.

The guide 40 (shown upon Fig. 5 of the drawings) is secured to the bed-plate 25 of the machine by means of screws 43 43 or other devices which pass through elongated perforations 44 44 in the vertical portion of the guide. By means of the elongated perforation 44 44 in the guide 40 and the screws 43 43 different widths of sheet metal can be guided upon the water-jacketed mandrel, the edges of said sheets passing through the slot 46 in the edge of the incline portion of the guide.

The sheet of zinc or other metal is wound on the water-jacket in one continuous sheet, and one end of said sheet is keyed to the water-jacket, and then the edges of the roll at each end are shaved off simultaneously. Before commencing to shave or cut the edges of the roll of zinc wound tightly upon the jacket the cutters are adjusted in their holders closely to the periphery of the jacket, as will clearly appear in Fig. 1 of the drawings, the dotted line showing the roll of zinc upon the jacket and the jacket shown in full lines, with the point of the cutters approaching the jacket at the ends of the roll of zinc. The machine is used for cutting zinc shavings, which are employed for precipitating gold, silver, and other metals from solutions containing cyanid of potassium.

In Fig. 6 of the drawings I have shown means whereby the first sheet of metal wound upon the jacketed mandrel is fastened to the outer face of the jacket. The key 47 and the screw 48 or other equivalent devices are used for the purpose.

I do not desire to be confined to the precise construction hereinabove described and shown upon the drawings as my invention; but I do desire to secure as my invention all features of construction that come within the scope of my improvement as hereinabove described, and illustrated upon the drawings appended hereto.

Having described my invention, what I desire to secure by Letters Patent is—

1. In a sheet-metal-cutting machine a hollow mandrel constructed to receive sheet material, means for circulating a refrigerating fluid therethrough, mechanism for revolving the mandrel, cutting devices and instrumentalities for simultaneously progressing said devices against the ends of the material upon said mandrel.

2. In a sheet-metal-cutting machine a mandrel constructed to receive sheet material, mechanism for operating said mandrel, means for cooling said mandrel, adjustable cutting devices and instrumentalities for progressing said devices simultaneously against the ends of the material upon said mandrel.

3. In a sheet-metal-cutting machine, a hollow mandrel, means for revolving the mandrel, devices for retaining the sheets of metal upon the mandrel, means for conveying a refrigerating fluid through the mandrel, cutting-tools, mechanism for simultaneously moving each of the cutting-tools in opposite directions against the edges of the sheets of metal wound upon the mandrel.

4. In sheet-metal-cutting machine, a hollow mandrel having a water-tight jacket shrunk thereon, means for revolving the mandrel, longitudinally-adjustable cutting-tools, mechanism for moving the cutting-tools simultaneously against the edges of sheets of metal wound upon the water-jacket, and means for conveying a refrigerating mixture to and from the mandrel.

5. In metal-cutting machines, the bed-plate having journal-bearings, the revolving mandrel provided with a jacket, slotted guides secured to the bed-plate and means for revolving the mandrel and jacket.

6. In metal-cutting machines, the bed-plate with journal-bearings made integral therewith, the revolving mandrel having a jacket shrunk thereon, the adjustable guides secured

to the bed-plate, and having longitudinal slots upon the inner edges thereof for guiding sheets of metal of different widths upon the jackets, and means for revolving the mandrel and jacket secured thereon.

7. A machine provided with means for supporting material, mechanism for rotating said means, threaded rods, a cutter-holder having a nut in engagement with each rod and means for relatively rotating the nuts and rods whereby said cutters are automatically progressed against both ends of said material simultaneously.

8. A hollow mandrel, a water-tight jacket secured thereto, means for revolving the mandrel and water-jacket secured thereon, devices for holding sheets of metal rolled upon the jacket thereto, means for conveying a refrigerating fluid through the mandrel and jacket, adjustable cutting-tools, mechanism for moving the said cutting-tools in opposite direction against the edges of the sheets of metal rolled upon the jacket.

9. A hollow mandrel, a jacket secured thereto, means for revolving the mandrel and jackets secured thereon, adjustable cutting-tools and mechanism for moving the cutting-tools simultaneously and in opposite directions against the edges of the sheets of metal wound upon the jackets.

10. In a machine for shaving sheet metal, a hollow mandrel, means for revolving the mandrel, means for conveying a cooling agent therethrough and devices for securing the material upon the mandrel.

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

ALBERT C. CALKINS.

Witnesses:

AMELIA GUEST,

I. B. MARLIN.