No. 839,275. PATENTED DEC. 25, 1906.

J. H. DOUB.

SHEET METAL CUTTING MACHINE.

APPLICATION FILED FEB. 7, 1906.

Fig. 1.

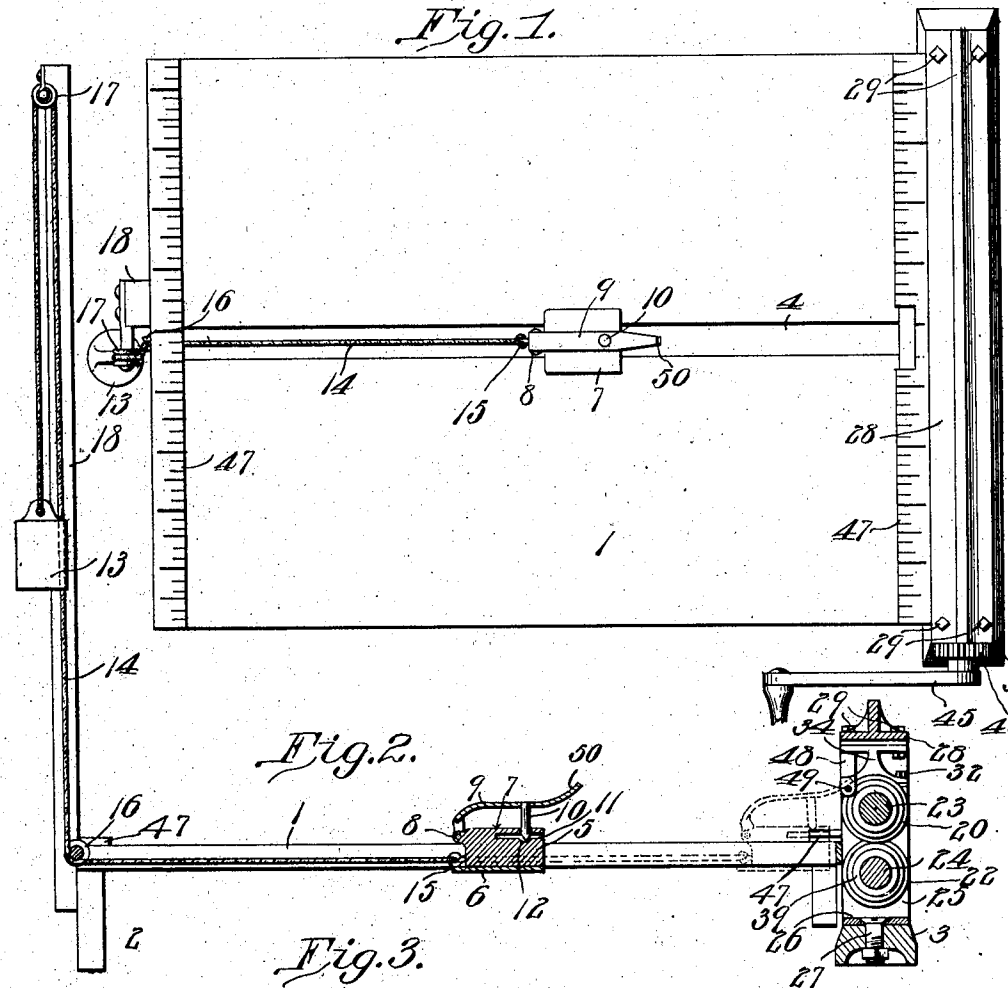


Fig. 2.

Fig. 3.

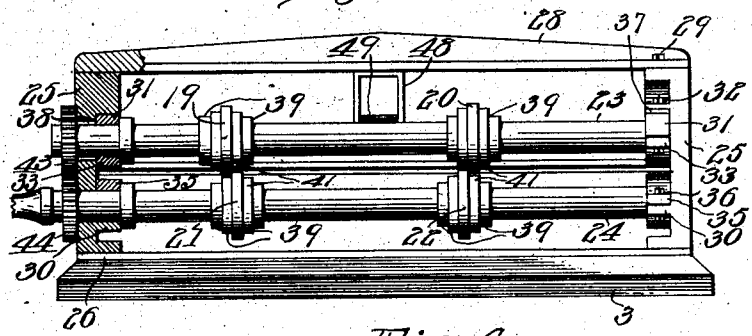


Fig. 5.

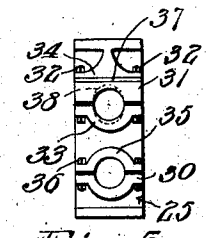
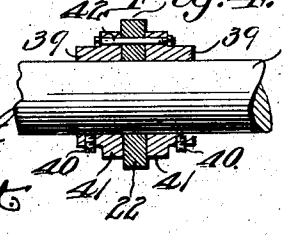


Fig. 4.



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SHEET-METAL-CUTTING MACHINE.

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Application filed February 7, 1906. Serial No. 299,961.

To all whom it may concern:

Be it known that I, JOHN H. DOUB, a citizen of the United States, residing at Walnut, in the county of Crawford and State of Kansas, have invented a new and useful Sheet-Metal-Cutting Machine, of which the following is a specification.

This invention relates to sheet-metal-cutting machines.

The object of the invention is to provide a machine which will with the maximum of accuracy and minimum of labor cut sheet metal either into rectangular pieces or tapered pieces, as may be desired, the latter effect being secured without the necessity of any cutter attachments for the purpose.

A further object is to provide a novel form of combined scale and metal smoothing attachment which will not only secure accurate measurements as to the width of the metal to be cut, but will operate to press or smooth out any kinks or bulges in the metal, thereby to prevent an extra treatment of the metal which will be necessary to remove such kinks or bends.

A further object is to provide a novel form of guiding means for the metal being cut and also a novel form of releasing mechanism for the cutting means whereby when the metal has been cut a predetermined length it will automatically be detached from the guiding means, which will then resume automatically its normal position.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a sheet-metal-cutting machine, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in plan, taken from the top of the machine. Fig. 2 is a view in vertical longitudinal section. Fig. 3 is a view in end elevation, partly in section. Fig. 4 is a detail view showing the manner in which the cutters are constructed. Fig. 5 is a view in elevation, displaying the construction of one of the shaft-bearings.

Referring to the drawings, 1 designates a work-table, which may be of any size and supported upon suitable legs or standards 2 and 3. The table is provided with a longitudinal slot or guideway 4, which extends practically throughout its entire length and the walls of which are exactly parallel with the edge of the table. Mounted within the slot is a guide-block 5, which consists of a piece of metal of the appropriate shape and size and having secured to its under side a plate 6, which prevents it from working upward out of the slot, downward movement through the slot being prevented by a similar plate 7. Pivotally connected with an ear or extension 8 on the block is a lever 9, carrying a pin or spur 10, which projects downward through the plate 7 and intersects a slot or seat 11 in the block, the lower end of the spur being pointed and being disposed within a depression 12 in the lower wall of the slot. The outer or free end of the lever is upwardly curved for a purpose that will presently appear. The guide-block is adapted to be moved to and fro in the slot 4, its forward movement being secured by the plate of metal being cut and its rearward movement by a weight 13, with which connects one end of a rope or chain 14, the other end of which is secured in an eye 15, carried by the block. This flexible connection between the weight and the guide-block passes around a sheave 16, supported in suitable bearings on the table and over a sheave 17, carried by an upright supported by the table.

The cutting mechanism comprises in this instance four cutters 19, 20, 21, and 22, the cutters 19 and 20 being carried by a shaft 23 and the cutters 21 and 22 by a shaft 24. These shafts are journaled in boxes formed by preference integral with standards 25, which are carried by a base-plate 26, the latter being secured to the leg 3 by bolts 27, as clearly shown in Fig. 2. The standards are connected at their upper ends by a frame-bar 28, which is held combined with the standard by bolts 29. The shaft-bearing referred to consists of two half-bearings 30 and 31, the former being integral with the standards 25 and the latter being held combined with the standard by bolts 32, that combine one of the remaining half-bearings 33 with the standard, the bolts 32 passing through flanges 34, formed on the standard. The remaining half-bearing 35 is secured to the half-bearing 30 by bolts 36. Between the bearings 30 and 32 are interposed liners 37, which will permit proper adjustment of the shaft 23 relatively to the shaft 24 to take up any lost motion and also to permit the adjustment of the cutters so as to secure proper depth, to effect which the standards back of

the bearings 31 and 33 are provided with elongated orifices 38, as indicated by dotted lines in Fig. 5 and by full lines in Fig. 3. By this form of shaft-bearing accuracy of adjustment may be secured and any lost motion may readily be taken up.

Each cutter 22 is composed of a circular disk, the cutter being loosely mounted upon the shaft. To hold the cutter against movement relatively to the shaft and also to prevent the formation of burs, two collars 39 are employed, which are held combined with the shaft by set-screws or bolts 40. Each of these collars has a flange 41, which is of such diameter as effectually to prevent the formation of any burs at the edges of the metal being severed. To prevent the cutters from having any movement, a bolt 42 is employed which passes through the flanges of the collars and through the cutter, as clearly shown in Fig. 4.

Each of the shafts 23 and 24 carries a gear-wheel 43 and 44, which mesh, as shown in Fig. 3, and in addition the shaft 24 carries a crank 45 by which to effect turning of the two shafts. As will be obvious, a pulley or sprocket-wheel may be substituted for the crank, and as this will be readily understood illustration thereof is omitted.

Secured transversely of each end of the table is a scale 47, the scale 47 at the forward end of the table being spaced a sufficient distance above the table to permit the passage of a sheet of metal therebetween, and in addition to serving as a scale the bar carrying the scale 47 operates to smooth out and relieve the sheet metal of any bends, buckles, or dents that it may contain, so that when the cut article leaves the machine it is in the best possible condition for use.

Depending from the frame-bar is a yoke 48, with which is connected a bar 49, which operates as a tripping device to throw the spur 10 out of engagement with the metal when the curved end 50 of the lever 7 contacts with the bar 49, and this is effected when the sheet metal has been severed throughout practically its entire length.

In the use of the device the metal is laid upon the table and its edge is brought to the appropriate position on the scale 47 to determine the amount to be cut off, and the other edge of the plate is seated in the slot 11, after which the spur 10 is forced through the metal, and thus holds it firmly combined with the guide-block. As soon as the shaft 24 is turned the metal is fed over the table and between the cutters, moving the head-block with it and raising the weight 13. By reason of the coaction between the walls of the guideway and the guide-block the metal will be caused to travel in the right line and will be held from turning either to the right or left, whereby the severed edges will be in exact parallelism if such be desired. When the sheet is drawn through the machine a sufficient distance to bring the end of the lever into engagement with the throw-off or trip-bar 49, the lever is raised, thereby moving the spur out of engagement with the sheet metal, whereupon the latter will be free to pass from the machine and the weight 13 will then perform its function and move the guide-block back to the rear end of the machine.

Should it be desired to cut a piece of sheet metal tapering, say, two inches wider at one end than the other, one corner of the front end of the sheet metal will be brought opposite the inch-mark "1" on the forward scale and the other corner of the opposite end on the opposite end of the sheet on the same side will be brought opposite the inch-mark "3" on the rear scale, and when the metal is cut it will be found to be two inches wider at one end than the other.

The improvements herein defined while simple in character will be found of the highest efficiency and durability in use and will effect a saving of time and labor in the cutting of the sheet metal.

It will be observed that the block 5 serves as a combined guide and retarding device, which is locked or secured to the rear end of the metal sheet and is drawn forward thereby. The retarding action, which is due to the counterweight 13, serves to stretch the sheet metal so as to flatten the same down on the table and prevent any buckling or creasing thereof. When the guiding device is automatically unlocked from the metal by the trip 49 engaging the handle 50, the counterweight 13 acts automatically to move the guide 5 backward into its retracted position.

Having thus described the invention, what is claimed is—

1. In a machine of the class described, metal-feeding means guiding means including a locking device adapted to be secured to and moved by the metal and means for releasing the locking device at a predetermined point in the operation of the machine.

2. In a machine of the class described, the combination with cutting mechanism of metal-feeding means guiding means including a locking device adapted to be secured to and moved by the metal, and means for releasing the locking device at a predetermined point in the operation of the machine.

3. In a machine of the class described, the combination with metal-feeding means cutting mechanism and a trip-bar located adjacent thereto, of a metal-guide including a holding device adapted to be secured to the rear end of the metal and moved thereby, and means combined with the holding device to engage with the tripping-bar at a predetermined point in the operation of the machine.

4. In a metal-cutting machine, the combination with a table provided with a longitu-

dinal slot, and cutting mechanism supported by the table, of a guide-block working within the slot, a metal-locking device carried by the block, a counterweight coöperatively connected with the guide, and a device for releasing the metal-locking means at a predetermined point.

5. In a machine of the class described, the combination with a table provided with a longitudinal slot, and cutting mechanism supported by the table, of a guide-block working within the slot, and provided with a transverse seat, a lever pivotally connected with the block and having a spur intersecting the seat, counterweighting mechanism connected with the guide-block, and means disposed adjacent to the cutting mechanism for throwing the spur out of operative relation relatively to the seat.

6. In a metal-cutting machine, a feed-table, a scale mounted at the rear end thereof, a combined scale and metal-smoothing device extending across the forward end thereof and being raised slightly thereabove, and metal feeding and cutting means.

7. In a metal-cutting machine, means for moving and cutting the metal, and gravity-actuated guiding and retarding means adapted to be moved by the metal.

8. In a metal-cutting machine, means for moving and cutting the metal, a combined guide and retarding device adapted to be secured to and moved by the metal, automatic means for releasing the guide from the metal, and means for automatically retracting the guide.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN H. DOUB.

Witnesses:
GEO. GOFF,
W. M. HOLMAN.