S. P. Ruggles,

Shearing Metal,

No. 7,584, Patented Aug. 20, 1850.

Fig. 1.

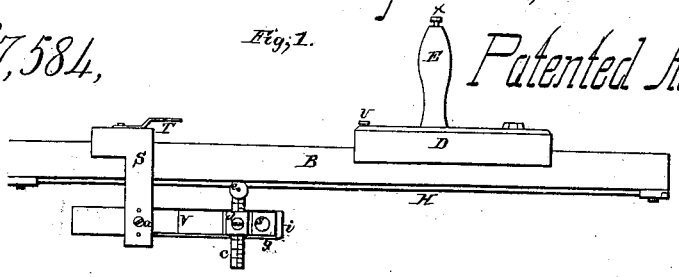


Fig. 2.

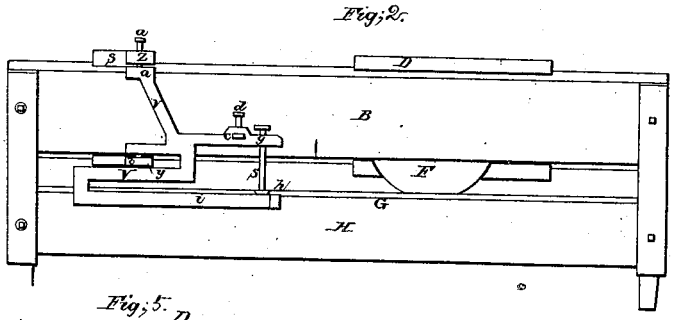


Fig. 5.

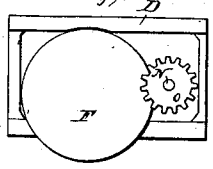


Fig. 4.

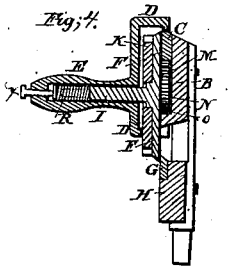


Fig. 6.

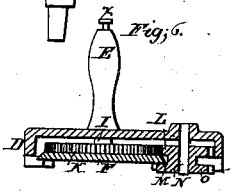


Fig. 7.

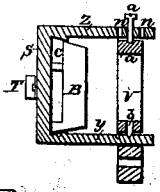
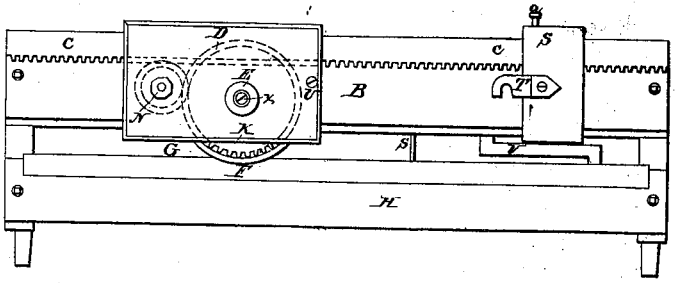


Fig. 3.



UNITED STATES PATENT OFFICE.

STEPHEN P. RUGGLES, OF BOSTON, MASSACHUSETTS.

MACHINE FOR CUTTING SHEET METALS, &c.

Specification of Letters Patent No. 7,584, dated August 20, 1850.

To all whom it may concern:

Be it known that I, STEPHEN P. RUGGLES, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Machinery for Cutting Sheets of Metal or other Material; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of the said drawing Figure 1 denotes a top view of my improved machine. Fig. 2, is an elevation of one side of it. Fig. 3, is an elevation of the other side of it. Fig. 4 is a transverse section of it, as taken through the rotating or circular knife. Fig. 5 is a back view of the circular knife and its supporting frame, and the gearing by which it is moved. Fig. 6 is a horizontal section of said circular knife and gearing.

Over and parallel with a table or flat board or bench and near one side or edge of it, I place and support a long flat metallic bar or frame B on one side of which, and near its top edge is a horizontal rack C of teeth, the said rack being made to extend from one end of the bar to the other end of it. A metallic carriage or slide D is arranged or applied upon the side of the bar, and so adapted to the bar, as to be capable of being slid or moved on it, from one end of it toward the other end of it and vice versa. The slide or carriage has a handle E projecting from its front face, and at right angles thereto. It also carries and supports on a shaft in the handle E a cutter wheel F which stands vertically and has its periphery or circular edge beveled down to an acute angle with that side or edge of the wheel which rests in contact with the front face of a straight knife edge bar G, which is screwed or otherwise properly fastened to a rail or bar H which is placed underneath the bar B as seen in the drawings. The said rotary wheel and the straight knife edge forms together what may be termed rotating shears.

On and fixed to the axle I of the cutting wheel, I place a gear K which gear wheel I make of a diameter less than that of the cutter wheel and I cause it to engage with a pinion L placed upon a short shaft M, which revolves freely upon a pin or stud N, projecting from and within the sliding carriage. On the shaft M is another and similar pinion O which is made to engage with the rack of teeth C. Consequently when the slide or carriage is moved on its bar, the cutter wheel will be rotated and with a velocity such as will make any point in its cutting periphery move around a greater distance than the wheel is moved horizontally. The pinion O may be made of a diameter either greater or less than that of the pinion L and so as when revolved by the rack to impart to the cutter wheel a less or greater velocity, or such a one as will enable us to obtain the exact degree of drawing stroke required. The cutter wheel in moving horizontally and acting in connection with the knife edge, has a drawing stroke imparted to it which drawing stroke causes it, to cut through a sheet of pasteboard, metal or any other substance that it would not cut at all had it not the drawing stroke imparted to it much better and with more facility than it would if its periphery moved only at the rate of the horizontal motion of the wheel. The cutter wheel is borne against the knife edge by means of a helical spring R fixed upon its axle, and introduced within the handle of the sliding carriage, the pressure of which spring may be regulated by a set screw *x* properly adapted to it, and the end of the handle. In connection with the said sliding carriage I use another sliding carriage S, which is adapted to the bar B and made to slide freely upon it, in the same manner as is the carriage D.

A latch T is applied to one carriage and made to latch or hook upon a screw pin or stud *u* projecting from the carriage, and so not only to connect the two carriages together, but to enable a person to disconnect them when the sliding carriage S is not to be used. To the side of the said sliding carriage S, I apply a vertical frame V, one end of which I so hinge or joint to the carriage as to admit of the said frame being turned horizontally through a sector of a circle, the center or points of motion of said frame being at *a*, *b*. Through the frame I insert a bar *c* which I fix in position by means of a set screw *d* and I place upon the inner end of the said bar, a friction roller *e*, to bear and run against the bar B. The purpose of the said bar and its friction roller together with its set screw is to regulate the distance of the unjointed end of the swinging frame from the bar B or in other words, to enable a person to adapt the center of motion of a plate of metal (to be cut circular) to its

rue or proper distance from the cutting shears. The said frame is made or provided with a suitable contrivance for holding the plate of metal or pasteboard at the central post thereof, and allowing said plate to freely revolve when brought under the operation of the rotating cutter wheel and the knife edge with which said cutter wheel acts. The contrivance for holding the said plate should be so made as to hold it at a level with the top of the knife edge. This contrivance consists of a set screw S, (extending through the bar *g*) and a small bearing *h*, applied to the lower bar *i* of the swinging frame, the upper surface of the bearing being slightly countersunk. Now if a plate of metal is placed in the swinging frame, and the distance of the center of the plate from the cutting edge of the cutting wheel, is properly regulated by means of the gage bar and set screw before described, (such diameter being the radius of the circle to be cut) and the two carriages are connected and put in motion on the slide bar B, the metallic plate will be cut by the action of the cutter wheel and will revolve and be reduced to a circular shape. This shape however may be varied by simply placing a suitable moving or curved surface on the bar B, and in such position as that the friction roller of the gage bar may slide against it instead of against a straight surface, and thus by modifying the shape of such moving surface or using such a shaped surface in lieu thereof, as circumstances may require, the plate may be cast into an elliptical or any other desirable form of perimeter. The turning points or bearings of the swinging frame should be made capable of adjustment or of being moved toward or away from the bar B, and confined in any position and thus to enable a person to make the frame parallel or about parallel, to the frame of the cutter wheel, and so as to cause the cutttr wheel to operate to the best advantage on the sheet to be cut by it. In the drawings I have represented the swinging frame as connected to the sliding carriage S, by two parallel bars *y*, *z*, extended from the carriage. The lower pivot *b* of the frame is stepped into the bar *y*, while the upper one, viz, *a* is a screw, which is screwed through one of a series of screw holes *n*, *n*, *n*, made through the bar, each of the same having a corresponding step or socket made in the bar *y* and for the support of the pivot *b*, the same being shown in section in Fig. 7. By unlatching the two sliding carriages and using the carriage B only, the plate of metal may be cut in a straight line when subjected to the operation of the rotating cutter wheel and its stationary knife edge, or we may cut it generally speaking, in any manner in which it may be cut by ordinary shears, although I have described the frame B as attached to a base board, it may be constructed so as to be capable of being attached or detached from a bench at pleasure, the same as the ordinary shears used by tinmen.

What I claim as my invention is—

1. The toothed rack or its equivalent, (applied to the bar B,) and a system of one or more gears or the mechanical equivalents therefor (applied to the cutter wheel and made to engage with the said rack or equivalents therefor) in combination with the said bar B, the cutter wheel and its sliding carriage; the same being substantially in the manner as above described, and for the purpose of causing the cutting periphery of the rotary knife to travel around faster than the knife moves horizontally and to thereby make said knife cut with a drawing stroke.

2. I also claim the combination of the swinging frame and gage contrivance or equivalents therefor, with a sliding carriage, its cutter wheel and the slide bar and straight cutting edge as substantially specified, the same being for the purpose of enabling me to cut either circular or curved work as described, and of any diameter or dimensions capable of being produced by the machine of whatever size it may be made.

In testimony whereof I have hereto set my signature this twentieth day of July, A. D. 1850.

STEPHEN P. RUGGLES.

Witnesses:

R. H. Early,

F. Gould.