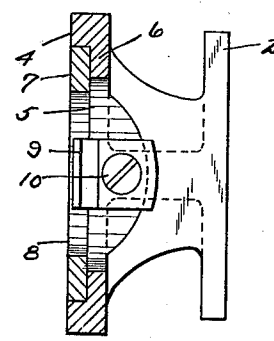
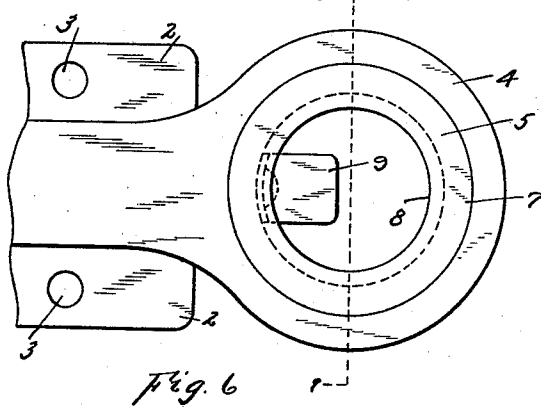
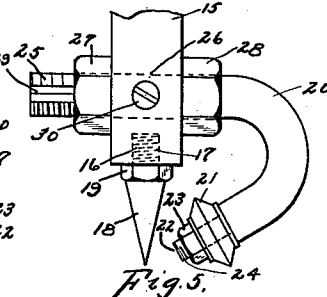
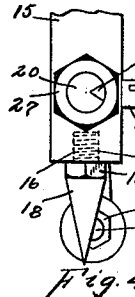
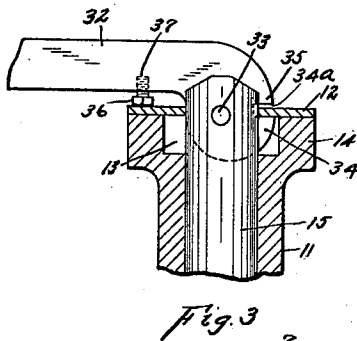
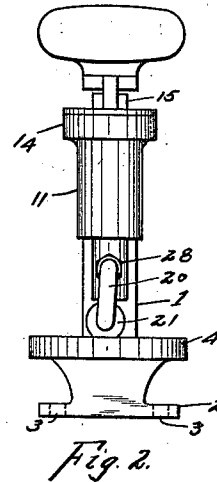
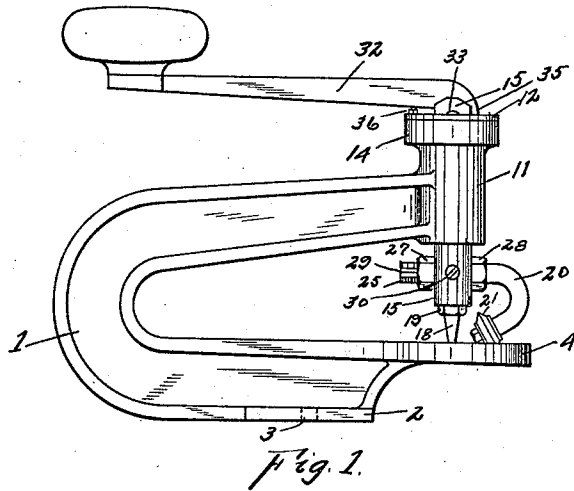


E. L. SCHANCK.
 DEVICE FOR CUTTING HOLES IN SHEET METAL.
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1,034,517.

Patented Aug. 6, 1912.



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DEVICE FOR CUTTING HOLES IN SHEET METAL.

1,034,517.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Application filed December 1, 1911. Serial No. 663,314.

To all whom it may concern:

Be it known that I, EPHRAIM L. SCHANCK, a citizen of the United States, residing at Delaware, in the county of Delaware and State of Ohio, have invented certain new and useful Improvements in Devices for Cutting Holes in Sheet Metal, of which the following is a specification.

My invention relates to devices for cutting holes in sheet metal and is particularly designed to take the place of the commonly used punch and in taking the place of these punches, to provide a structure of cutting device which will attain results without in any way mutilating or distorting the body of sheet metal in which the holes are being cut.

It contemplates the provision of a rotatory member carrying a centering pin and having a cutter blade desirably in the form of a rotatable wheel. This cutter blade is constructed to operate in conjunction with a ring-shaped seat of comparatively hard metal and removable in form. The cutter blade is desirably radially adjustable to vary the diameter of the holes being cut and in conjunction therewith, the structure of my device is desirably such that the ring-shaped seat may be removed and replaced by a seat of a diameter corresponding with the diameter of the hole being cut.

In addition to the results attained in the direction indicated, I desirably provide an adjustable means for determining the elevation of the cutting element. This is desirably effected by the provision of a cam-like formation upon the end of the operating handle for such element which is pivoted thereto, such cam formation having a slot therein at a predetermined point which is effective to give a leverage in one direction only and serve as a positive check against movement in the opposite direction.

The preferred embodiment of my invention is shown in the accompanying drawings, in which similar characters of reference designate corresponding parts, and in which—

Figure 1 is a side elevation of my device, Fig. 2 is an end elevation thereof, Fig. 3 is a detail view showing the cam formation

upon the handle and the means for regulating the elevation of the cutting element, Fig. 4 is a detail view of the cutter element showing the relative position of the centering pin and the cutter blade, Fig. 5 is a detail in elevation of the structure shown in Fig. 4 and looking from a point at right angles thereto, Fig. 6 is a detail plan of the seat for my device, and Fig. 7 is a transverse section taken on line 7—7 of Fig. 6.

My invention discloses a U-shaped structure 1 having a base 2 apertured as at 3 for the securing of said base to any suitable stand. This base desirably terminates at its lower extremity in a substantially circular formation 4 having a circular cut-out portion 5. This circular cut-out portion is bounded by a wall having an annular shelf 6 formed integral therewith and constructed to receive and receiving a washer-like ring 7 of comparatively hard metal with an abrupt inner periphery 8. This ring 7 in reality serves as the seat for the metal being cut and is supplemented in its action by an L-shaped flange member 9 secured to the interior periphery of the shelf formation by means of a screw or other fastening medium 10. This L-shaped flange desirably extends to a point just short of the center of the circle and serves a purpose which will be hereinafter described.

The upper extremity of the U-shaped structure 1 terminates in a vertical bearing structure 11 having a washer formation 12 secured upon its upper end and having a concentric cut-away portion 13 in the upper enlarged end 14 thereof. Vertically slidable within the housing 11 is a shaft 15 constituting the rotary member of the cutting element. This shaft 15 is provided in its lower end with a threaded depression 16 for the reception of the threaded reduced portion 17 of a tapered centering pin 18 which is desirably formed with a hexagonal or other polygonal formation 19. It will be understood that this tapered pin constitutes the centering point of my cutting element and is desirably removable and replaceable at will for purposes to be hereinafter set forth. Extending at right angles to this tapered pin 18 and passing radially through

the shaft 15 is an arm 20 having one end bent to a substantially U-shaped form and provided upon this extremity with a rotatable cutting wheel 21 mounted upon the reduced portion 22 thereof and maintained in place by a nut 23 carried by threads 24 on such reduced extension. The other end of this member is likewise threaded as at 25 and is locked in position in the opening 26 radially formed through the shaft 15 by lock nuts 27 and 28. For further guarding against accidental radial movement of the cutter blade carrier, it is provided with a V-shaped slot 29 into which extends a locking set screw 30.

The upper end of the shaft 15 is desirably bifurcated and receives the end of a handle 32 being pivotally connected through and by a pivot pin 33. This handle 32 at its point of connection of the shaft 15 is of a peculiar formation. This formation is in the nature of a cam 34 interrupted by a slot 34^a. In normal position, this slot 34 embraces the washer 12 and prevents upward movement of the shaft 15 under downward pressure upon the handle 32. However, the formation is such that upward pressure upon the handle 32 causes the point 35 to fulcrum upon the upper surface of the washer and elevate the shaft 15 carrying the centering pin and cutter element. Continued upward movement of the handle 32 causes the portion 35 to move toward the center and the cam formation to be in a position somewhere below the pivot pin 33, until finally, the portion 35 comes entirely out of engagement with the washer 12, and, by an upward pull, the shaft 15 may be raised vertically until the nuts 27 and 28 contact with the lower portion of the bearing structure 11. If now the handle 32 is allowed to assume a horizontal position, the cam formation 34 is placed in a position to contact with the washer 12 and thus maintain the shaft 15, the pivot pin 18 and the cutter element in elevated position, giving a free access to any sheet metal that is to be placed upon the circular formation 4, preparatory to cutting. In its return to normal position, the shaft 15 may be limited in its downward movement by means of a set screw 36 threaded into an internally threaded socket 37 upon the under surface of the handle and in a position to contact with and slide upon the washer 12 in the rotary movement of the handle.

The operation of my invention is as follows: It being desired to cut holes in sheet metal without desiring to save the material cut from such holes or utilize it for any particularly fine work in its entirety, the handle is forced down until the centering pin clamps the metal in position. The importance of the bracket 9 becomes apparent at this point, for the reason that this bracket 9 serves to prevent distortion of the metal be-

ing cut by the pressure of the centering pin. The next operation is the rotation of the shaft 15 by means of the handle. Such rotation will cause the cutter wheel to travel in the path of a circle, it being maintained at the proper angle to produce the most effective cutting action by means of its supporting element 20. The diameter of the circle cut may be regulated by the radial adjustment of the member 20, by first loosening the set screw 30 and one of the lock nuts 27 or 28. In varying the diameter of the circle being cut, it is advisable that a ring 7 of a suitable size be placed upon the shelf formation of the base. If it is desired to utilize the disks cut from the metal and therefore retain them free of mutilation, the centering pin 18 may be readily removed and the operation carried into effect by some other means of maintaining the sheet metal in proper position. The elevation of the centering pin and cutter wheel and consequently the regulation of the cut and the holding force of the cutting element, may be effected through the set screw 36 in the handle. When the operation is completed, it is simply necessary to lift the handle 32 causing it to fulcrum upon the corner 35 of the slot wall.

It will be observed that I have produced a comparatively simple machine which is effective through various alterations to produce a wide range of cutting actions.

What I claim, is—

1. A device for cutting holes in sheet metal comprising a rotary cutting element, a support for said element, and a handle for said element capable of rotation to render said element effective and constructed to provide a leverage bearing on said support for raising said element out of normal position.

2. A device for cutting holes in sheet metal comprising a rotary cutting element, a support for said element and a handle pivoted to said element capable of rotation to render said element effective and having a formation for coöperation with said support to elevate said element.

3. A device for cutting holes in sheet metal comprising a rotary cutting element, a support for said element, a pivoted handle for said element and capable by rotation to render said element effective having a leverage bearing on said support, and a means for altering the normal elevation of said element.

4. A device for cutting holes in sheet metal comprising a rotary cutting element, a centering pin, means coöperatively mounted with respect to said centering pin to support the material being cut, and a seat for said cutting element having an opening to correspond to the size of hole being cut.

5. A device for cutting holes in sheet

metal comprising a rotary cutting element, a centering pin carried by said element, means coöperatively mounted with respect to said centering pin to support the material being
5 cut, and a removable ring shaped seat for said cutting element having an opening to correspond to the size of hole being cut.

In testimony whereof I affix my signature in presence of two witnesses.

EPHRAIM L. SCHANCK.

Witnesses:

W. A. HALL,
L. C. CHAPMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
