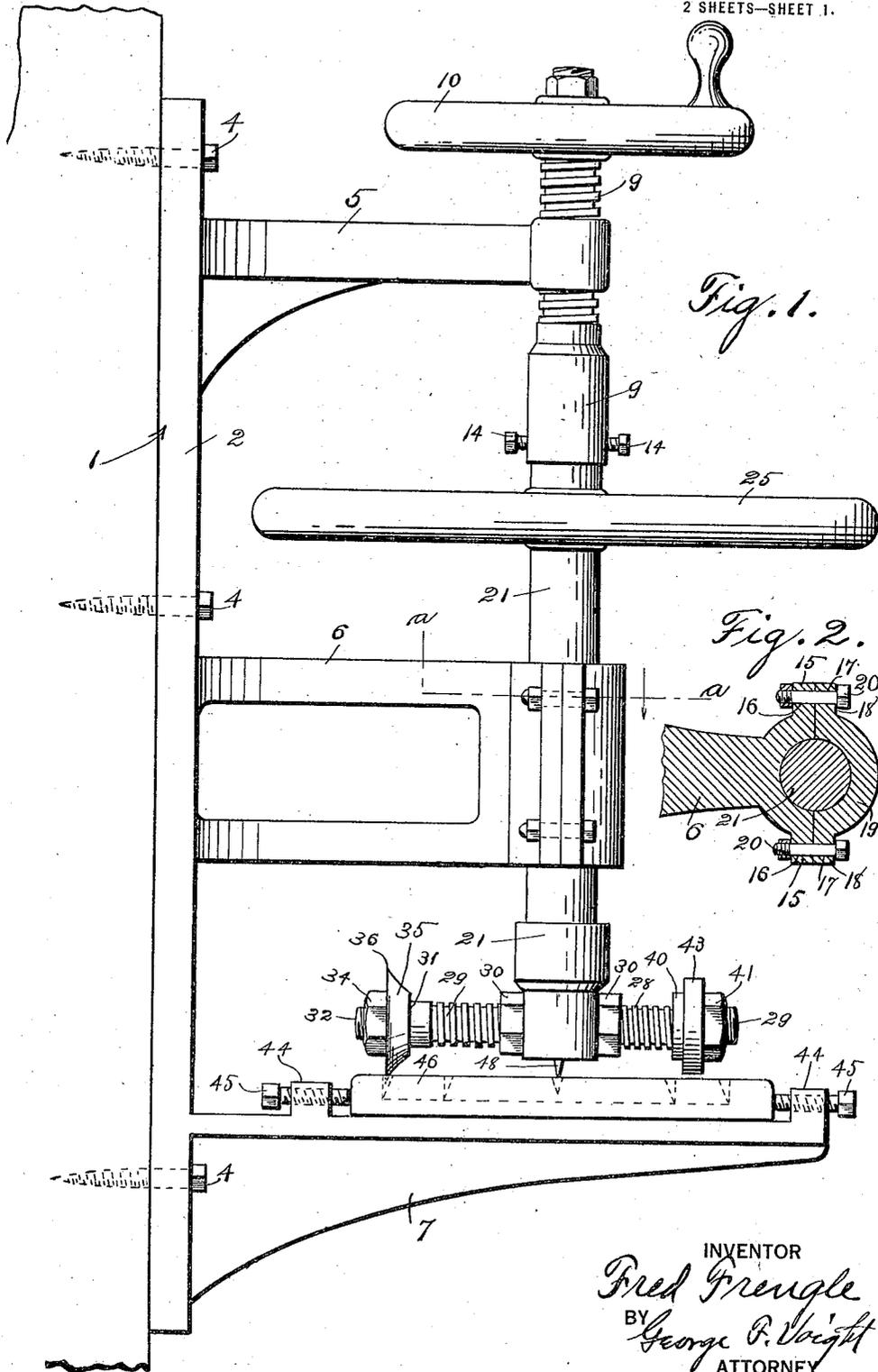


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APPLICATION FILED FEB. 17, 1920.

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2 SHEETS—SHEET 1.



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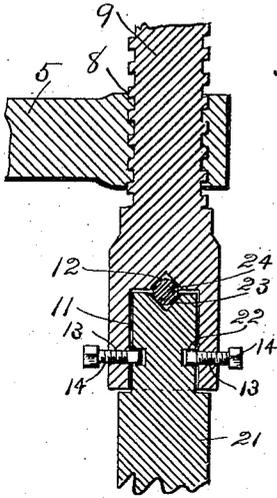


Fig. 3.

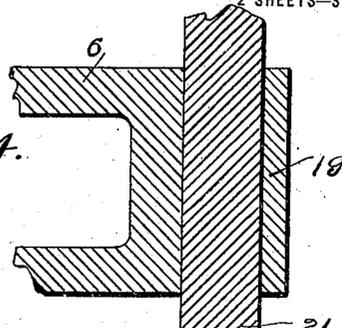


Fig. 4.

Fig. 5.

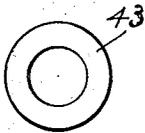
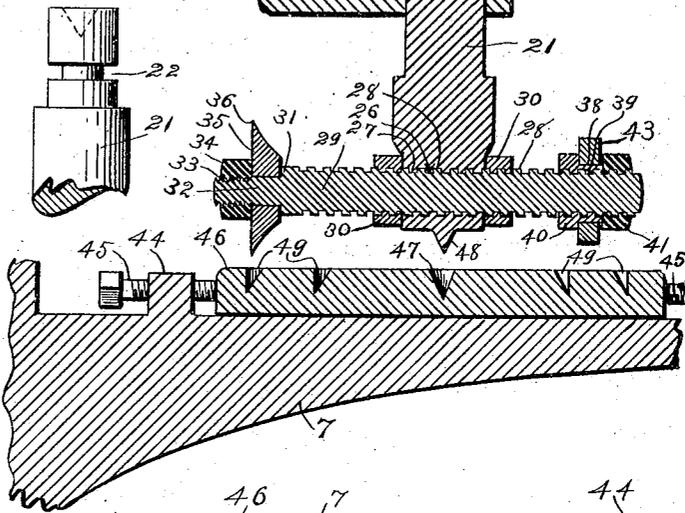


Fig. 6.

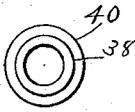


Fig. 7.

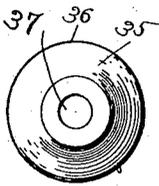


Fig. 8.

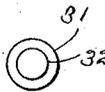


Fig. 9.

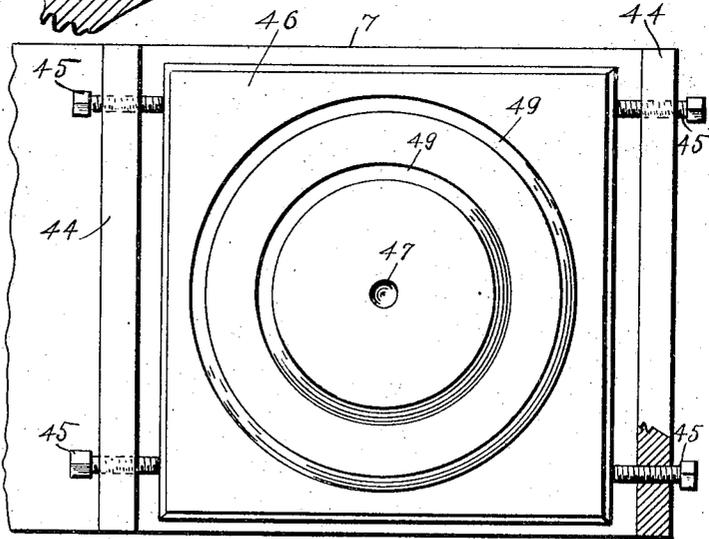


Fig. 10.

INVENTOR  
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# UNITED STATES PATENT OFFICE.

FRED FREngle, OF COTATI, CALIFORNIA.

ROTARY SHEET-METAL CUTTER.

1,353,526.

Specification of Letters Patent. Patented Sept. 21, 1920.

Application filed February 17, 1920. Serial No. 359,321.

*To all whom it may concern:*

Be it known that I, FRED FREngle, a citizen of the United States, residing at Cotati, in the county of Sonoma and State of California, have invented new and useful Improvements in Rotary Sheet-Metal Cutters, of which the following is a specification.

My invention relates to improvements in rotary sheet metal cutters for cutting circular openings in sheet metal, and in which a rotating shaft carries at one end a cross-bar provided with a cutting disk adapted to operate in conjunction with a die.

An object of the invention is to provide a cross-bar that can be adjusted relative to the shaft so that openings of different dimensions may be cut.

A further object of the invention is to provide interchangeable dies to work in conjunction with the cutting means.

A still further object is to provide dies with a plurality of grooves.

Still further objects will appear as the description proceeds, it being understood that changes may be made in the exact embodiment of my improvements from those shown in the accompanying drawings, described in the specification or as pointed out in the claims.

In the drawings, throughout which like reference characters represent like parts:

Figure 1 is a side elevation of the cutter and a portion of a post or standard to which the cutter is secured.

Fig. 2 is a sectional view on line *a-a*, Fig. 1.

Fig. 3 is a vertical sectional view of a portion of the device.

Fig. 4 is a vertical sectional view of another portion thereof.

Figs. 5, 6, 7, 8 and 9 are views of portions of the invention.

Fig. 10 is a plan view of the frame, showing one of the dies disposed thereon.

Referring to the drawings in detail—

The numeral 1 designates a frame, comprising a vertical member 2 secured to a standard or post 3 by means of fastening devices 4, an upper bracket 5, an intermediate bracket 6 and a lower bracket or die table 7.

In the free end of the bracket 5 is a threaded vertical opening 8, in which is operatively disposed a screw 9, to the upper end of which is rigidly secured an operating wheel 10. The lower end of the screw 9 is

larger, diametrically, than its threaded portion and is provided with a socket 11, at the base of which is a ball seat 12.

Adjacent the free end of said enlarged portion of the screw 9, are two oppositely disposed threaded openings 13, 13, which connect with the socket 11 and are fitted with screws 14, 14. The free ends of the shanks of the screws 14, 14, project a distance into the socket 11.

The free end of the bracket 6 is provided with oppositely disposed flanges 15, 15, having horizontally disposed openings 16 registering with openings 17 extending horizontally through flanges 18, 18, of a cap 19 removably secured to said free end of the bracket 6, by means of bolts 20 fitted in said openings 16, 17. The construction and arrangement of the cap 19 and the free end of the bracket 6 is such so as to form a vertical opening 20 in which is fitted for longitudinal as well as for rotarial movement the intermediate section of a shaft 21.

The upper end of the shaft 21 is diametrically reduced and fitted, rotatably, into the socket 11, and has an annular groove 22 adapted to receive the free ends of the retaining screws 14, 14. The upper end of said reduced portion is provided with a ball seat 23 registering with the ball seat 12 in the screw 9. Said ball seats carry a bearing ball 24, which is adapted to receive any end thrust between the screw 9 and the shaft 21.

The retaining screws 14, 14, are intended to engage the groove 22 and thereby normally support the shaft 21 when that member is not being supported by the die table 7.

25 designates an operating wheel rigidly secured to the shaft 21 adjacent its upper end and is adapted to be engaged by the operator for rotating the shaft in either direction.

Extending laterally through the shaft 21, adjacent its lower end, is an opening 26 provided with screw threads 27 adapted to engage threads 28 of a cross-bar 29, the cross-bar 29 being movable longitudinally in either direction by rotating it in the proper direction in the opening 26.

30 are nuts on the cross-bar 29, which are adapted to screw up tightly against opposite sides of the shaft 21 to prevent said cross-bar from turning when the machine is in operation.

One end of the cross-bar 29 is diametrically reduced thereby forming an offset 31 and a bearing pintle 32, the latter disposed in axial alinement with the cross-bar and provided at its free end with threads 33 engaged by a nut 34.

35 designates a cutting disk having on its periphery an annular cutting edge 36 and a central opening 37 through which extends the pintle 32, the arrangement being such that the disk 35 may freely rotate upon said pintle, between the nut 34 and the offset 31.

Upon the cross-bar 29, on opposite sides of the shaft 21 from the disk 35, is disposed a sleeve 38 having threads 39 engaging the threads 28, and an annular flange 40. The sleeve 38 may be moved either outwardly or inwardly upon the cross-bar 29 by rotating it in the proper direction.

41 is a jam-nut engaging the threads 28 and adapted to be screwed up tightly against the free end of the sleeve 38 to prevent said sleeve from turning upon the cross-bar 29.

Upon the sleeve 38, intermediate the flange 40 and the nut 41, is rotatably mounted a roller 43, the functions of which will hereinafter be fully described.

The die table 7 is provided upon its upper side with two spaced apart ribs 44, which extend transversely relative to the table and carry set screws 45, which engage opposite sides of a die 46 seated on said table between the ribs 44. The width of said die 46 is less than the distance between the ribs, thereby permitting the die to be shifted upon the table so that it may be brought into proper alinement with the shaft 21 which it underlies.

After the die 46 has been placed in proper position on the die table 7, the screws 45 are intended to be turned up until they bear equally tight against its sides. By loosening the screws 45, the die may be removed from the table 7 and another die substituted.

Upon the upper or face side of the die 46 is cut a central conical recess 47, which during operation of the cutter, receives a conical projection 48 at the lower end of the shaft 21, which is intended to assist in alining the die relative to the shaft 21 and the cutting disk 35 before the screws 44 are tightened. The die 46 is further provided upon its upper side with annular grooves 49, in either of which grooves the disk may be made to travel when the cutter is in operation.

While the device illustrated shows a die provided with two grooves, it is to be understood that the die is not limited to any particular number of grooves, and that, if desired, it may be constructed with only one groove, or it may have more than two grooves.

By loosening the nuts 30, the cross-bar 29

may be rotated to shift it longitudinally of itself until the disk 35 registers with the desired groove.

To operate the cutter, after adjusting the cross-bar so that the disk 35 will register with the proper groove, the wheel 10 is rotated to turn the screw 9 in the proper direction to lift the shaft 21 and the cross-bar 29 above the die 46 so as to permit the sheet metal intended to be cut to be inserted between the die and the disk 35. The wheel 10 and screw 9 are then rotated in the opposite direction to lower the shaft 21 and its cross-bar 29, until the disk 35 engages the said sheet metal, when by rotating the wheel 25 the shaft 21 will be made to rotate in the opening 20, causing the cross-bar 29 to move over the grooves 49 and the disk to rotate and cut into said sheet metal along a circular line corresponding with the groove over which said disk is traveling. As the screw 9 is turned farther downwardly the disk 35 will be made to cut deeper into the metal.

When the shaft 21 is rotated and the disk 35 made to cut into the sheet metal, it may at times cause said metal to buckle up, and in order to prevent or limit said upward buckling of the metal, I have provided the roller 43, which is intended to roll along on the metal as the shaft 21 revolves, or it may be so constructed and arranged as to normally travel a slight distance above the metal and to engage the same only when it bends or buckles up.

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

1. A rotary sheet metal cutter comprising a frame having a pair of spaced apart outstanding brackets disposed in the same vertical plane, a vertically disposed screw carried by the upper one of said brackets, a vertically disposed shaft rotatably and slidably carried by the other of said brackets, said screw and shaft being disposed in axial alinement with each other and having one end pivotally connected together, a screw-threaded cross-bar carried by the free end of said shaft and having its ends extending at substantially right angles from opposite sides of the shaft, said cross-bar movable longitudinally in either direction by rotating it relative to the shaft, nuts on said cross-bar engageable with opposite sides of the shaft for normally preventing movement thereof relative to said shaft, a rotary cutting disk on one end of the cross-bar, a roller on the other end thereof, a die underlying said cross-bar and cooperating therewith for cutting circular openings in sheet metal, and means for supporting said die.

2. A rotary sheet metal cutter comprising, a frame provided with a pair of brackets disposed one about the other, a vertically disposed screw carried by the free end of the

upper one of said brackets, the screw being movable longitudinally in either direction relative to the bracket by rotating it, a vertical opening extending through the free end of the lower one of said brackets, said opening carrying a shaft disposed in axial alignment with said screw and having its upper end movably connected to the lower end thereof, said shaft being movable both longitudinally and rotatably relative to its bracket, a screw threaded opening extending horizontally through the lower end of said shaft, a screw disposed in said opening and having its free ends projecting outwardly a distance from either side thereof, a cutting disk rotatably mounted on one end of said last named screw, and means cooperating with said disk for cutting circular openings in sheet metal.

In testimony whereof, I have hereunto set my hand this 31st day of January, 1920.

FRED FRENGLÉ.