

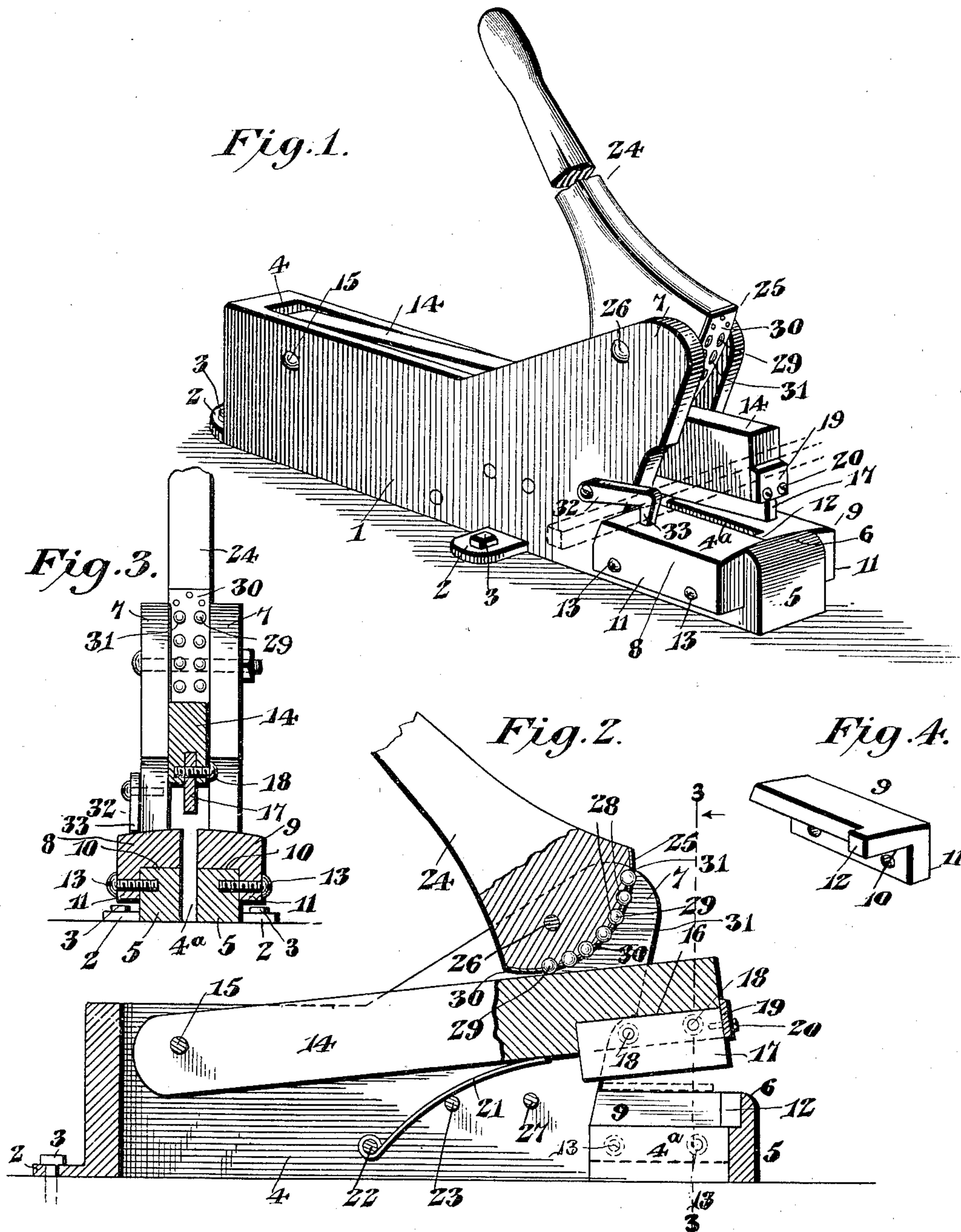
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C. McDONNER.  
METAL SHEARING MACHINE.

APPLICATION FILED DEC. 28, 1901.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## METAL-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 736,536, dated August 18, 1903.

Application filed December 28, 1901. Serial No. 87,602. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLEY McDONNER, a citizen of the United States, residing at Wausauke, in the county of Marinette and State of Wisconsin, have invented a new and useful Metal-Shearing Machine, of which the following is a specification.

This invention relates to metal-shearing machines, and has for its object to provide an improved device of this character which may be conveniently manipulated by hand to easily and effectively cut or shear metal plates, bolts, rods, and the like.

It is furthermore designed to apply for detachably mounting the die upon the fixed jaw of the device, so that the die may be replaced when worn, and also knives of different sizes and shapes may be conveniently fitted to the device whenever desired, and also to guard against lateral displacement or expansion of the die under the pressure of the shearing-blade.

Another object is to provide for the convenient application and removal of the shearing-blade to the knife-bar and also to prevent looseness of the blade thereof.

Another object is to provide an improved construction between the operating-handle and the knife-bar, so as to reduce the friction therebetween to the minimum, and thereby to materially facilitate the operation of the machine.

Another object is to provide for conveniently holding bolts, rods, and the like upon the die of the machine, so as to obviate displacement thereof under the action of the shearing-blade, and thereby to obviate the necessity for holding the work by hand upon the die of the machine.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a perspective

view of a metal-shearing machine embodying the present invention. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a cross-sectional view taken on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of one of the members or sections of the die.

Like characters of reference designate corresponding parts in all the figures of the drawings.

In carrying out the present invention there is provided a body or casing 1, which is provided with opposite side and rear laterally-projected perforate ears 2 for the reception of suitable fastenings 3, whereby the device may be firmly secured to a bench or other suitable support. Throughout the greater portion of the body there is provided a longitudinal slot or opening 4, which opens out through the top and bottom of the body and terminates adjacent to the opposite ends thereof. The front of the body has its upper portion cut away, so as to form a fixed jaw 5, above which the front end of the body projects, so as to provide an upstanding ledge or shoulder 6, and at the rear of the jaw the sides of the body are extended upwardly a suitable distance, so as to form bearing ears or portions 7, between which the handle of the machine is to be mounted. That portion of the slot or opening 4 which extends into the fixed jaw 5 is reduced in width, as indicated at 4<sup>a</sup>, so as to increase the width of the opposite portions of the jaw, and thereby strengthen the same.

The die of the machine is formed in two separate longitudinal sections 8 and 9, each of which is of inverted-L shape in cross-section, thereby presenting a flat base 10, having a pendent longitudinal flange 11 at the outer edge of said base. The die-sections are applied to the fixed jaw from the opposite sides thereof, so that the base and flange portions may snugly embrace the top and outer sides of the jaw, and the sections are of a length to fit snugly between the ledge or shoulders 6 and the front ends of the respective ears 7, said front ends being inclined upwardly and outwardly, so as to overhang the die-sections, and the rear ends of the latter being beveled to correspond to the inclination of the ears, whereby the latter serve to



prevent accidental upward displacement of the sections. As indicated in Fig. 3 of the drawings, it will be noted that each die-section is of a width to have its inner edge lie  
 5 flush with the adjacent edge of the slot or opening in the fixed jaw, and one of these sections is provided at its forward end and upon its inner edge with a spacing-block 12 to lie against the inner edge of the other die-  
 10 section. Suitable screw fastenings 13 are set through the flanges of the die-sections and into the fixed jaw, so as to detachably hold the die to the machine, and thereby permit of replacement of the die when worn or when  
 15 it is desired to use a different character of die.

Within the slot or opening of the body is mounted a vertically-swinging knife-bar 14, which has its rear end supported upon a suitable pivot-pin 15, passing through the opposite sides of the body, while its forward end is projected in front of the upstanding ear portions 7, so as to overhang the slot or opening in the die. In the under edge of the outer free end of the knife-bar there is provided a longitudinal groove 16, which opens  
 25 outwardly through the outer end of the bar and into which is fitted a knife-blade 17, which is held in place by means of screws or suitable fastenings 18, set through one side  
 30 of the knife-bar and into the blade. It is preferred to have the knife-receiving groove open through the outer end of the bar in order that the knife-blade may be thrust longitudinally into the groove, as this manner  
 35 of inserting the blade is very convenient and expeditious. After the blade has been fitted in place a stop-plate or cross-bar 19 is placed over the open or outer end of the groove and connected to the knife-bar by means of fastenings 20, it of course being understood that  
 40 the rear end of the blade abuts the rear end of the groove, and therefore the blade is effectually held against endwise movement, and thereby maintained rigidly upon the  
 45 knife-bar. The free end of the knife-bar is normally and yieldably held in an elevated position by means of a spring-tongue 21, which lies within the longitudinal opening of the body and has its lower end connected to a pin  
 50 or cross-bar 22, set through the opposite sides of the body near the bottom thereof. The intermediate portion of the spring passes over another pin or cross-bar 23, so as to hold the spring inclined upwardly and outwardly with  
 55 its upper free end bearing against the under side of the knife-bar. For the purpose of forcing the knife-bar downwardly, so as to thrust the blade through the opening in the die, there is provided an operating-handle 24,  
 60 having a cam or segmental head 25, which is pivoted between the upper end portions of the ears 7, as indicated at 26, whereby its rounded lower end is disposed in frictional engagement with the upper edge of the knife-  
 65 bar, and by rocking the handle in either direction from the upright position of the handle the knife-bar will be moved downwardly

with a powerful force. To limit the downward movement of the knife-bar and to prevent the same from striking the die, there is  
 70 provided a stop therefor in the nature of a pin or cross-bar 27, piercing the opposite sides of the body and located above and in rear of the die, so that the under side of the knife-bar will strike against this pin, and there-  
 75 by be limited in its downward movement. To reduce the friction between the operating-handle and the knife, the cam-surface thereof is provided with a plurality of concaved sockets or seats 28, in which are loosely fitted  
 80 antifriction-balls 29, which latter are held in place by means of a metallic plate or ball-retaining device 30, which is fastened to the cam edge of the handle and provided with  
 85 perforations 31, corresponding to the sockets and slightly less in diameter than the diameter of the respective balls, whereby the latter are adapted to project through the perforations and bear upon the upper edge of the  
 90 knife-bar, thereby materially reducing the friction of the bar and the handle. Although not shown in the drawings, it will of course be understood that antifriction-rollers may be employed instead of balls.

In the operation of the device it will be un-  
 95 derstood that the work to be cut is placed upon the die so as to lie across the opening therein and beneath the shear or knife blade, as indicated in dotted lines in Fig. 2 of the  
 100 drawings, so that when the knife-bar is forced downwardly the blade will be forced against the work, so as to cooperate with the edges of the opening or slot in the die, and thereby sever the work with a shear cut. It will here be noted, as best shown in Fig.  
 105 3 of the drawings, that the upper face of the die is rounding transversely or beveled inwardly and upwardly from its opposite sides for the purpose of securing the maximum shearing effect of the edges of the opening in  
 110 the die. By fitting the die between the upstanding ledge or shoulder 6 and the front ends of the sides of the body of the machine any tendency of the die to move or extend in an endwise direction under the pressure of  
 115 the knife-blade is effectively overcome. By making the die in opposite longitudinal sections it is possible to apply and remove the same laterally without first removing the handle and knife-bar.  
 120

For convenience in holding a metal bar upon the die during the cutting operation there is provided a hook-shaped work-holder comprising a shank 32, pivoted externally to one  
 125 side of the body and having its forward free end projected in front of the bearing-ears 7 and provided at its outer free end with a pendent bill or hooked portion 33, which is adapted to be swung downwardly over a rod and into engagement with the top of the die,  
 130 thereby to snugly hold the rod between the hooked portion 33 and the front ends of the ears, whereby the rod or bar is prevented from being pushed laterally outward by, and



thereby escape the cutting action of, the knife-blade. It is thus obvious that after this work-holder has been engaged with the work it is not necessary to hold the latter by hand, whereby both hands of the operator are free for manipulating the handle of the machine.

What I claim is—

1. In a metal-working machine, the combination with a body having a fixed jaw, of a vertically-swinging knife-blade, and a removable die supported upon the jaw and having opposite substantially vertical flanges snugly embracing the opposite sides of the fixed jaw and detachably secured thereto, the die also having a longitudinal slot which is open at the inner end thereof for the reception of the knife-blade.

2. In a metal-working machine, the combination with a body having transversely-aligned upstanding spaced side portions, a fixed jaw projected in front of and at the bottom of said portions and provided at its outer end with an upstanding transverse ledge or flange, of a removable die supported upon the jaw and fitted snugly between the ledge or flange and the upstanding side portions of the body, and provided with pendent flanges snugly embracing the opposite sides of the jaw, the die also having a longitudinal slot, detachable fastenings connecting the flanges of the die to the jaw, and a vertically-swinging knife-blade mounted between the upstanding side portions of the body and in cooperative relation with the slot of the die.

3. In a metal-working machine, the combination with a fixed jaw or base having an upstanding transverse ledge or shoulder at the outer edge thereof, of a removable die made in separate longitudinal sections which are of inverted substantially L shape in cross-section and snugly embrace the top and respective side edges of the jaw and also abut against the inner side of the flange or shoulder, and independent detachable connections between the respective die-sections and the jaw.

4. In a metal-working machine, the combination with a body having a fixed jaw which is provided at its outer end with an upstanding transverse ledge or flange, of a vertically-swinging knife-blade in cooperative relation with the jaw, a removable die made in separate longitudinal sections which are of inverted substantially L shape in cross-section and snugly embrace the top and respective side edges of the jaw and also abut against the inner side of the flange or shoulder, the inner edges of the die-sections being separated by a longitudinal interspace forming a slot for the reception of the knife-blade, and independent detachable connections between the respective die-sections and the jaw.

5. In a metal-working machine, the combination with a fixed base or jaw and a swing-

ing knife-blade, of a die made in separate opposite sections which are fitted to the top of the base or jaw, and a spacing-block carried by the forward end of the inner edge of one of the die-sections to bear against the other section and space the two sections to form a longitudinal slot to receive the knife-blade.

6. In a metal-working machine, the combination with a body having a die, of a vertically-movable knife-bar having its underside provided with a longitudinal groove which opens through one end of the bar, a knife-blade fitted snugly in the groove, and a plate or cross-bar removably secured across and closing the open outer end of the groove to prevent endwise movement of the blade.

7. In a metal-working machine, the combination with a vertically-swinging knife-bar, of an operating device therefor embodying a vertically-swinging pivoted cam in frictional engagement with the top of the knife-bar, the lower active surface of the cam being provided with a plurality of concaved sockets or seats, antifriction-balls loosely mounted in the seats, and a retaining-plate secured to the active surface of the cam and provided with perforations corresponding to and slightly less in diameter than the antifriction-balls, whereby the latter are retained in their seats and project through the perforations into frictional engagement with the knife-bar.

8. In a metal-working machine, the combination with a base or body having a longitudinal slot, a fixed jaw projected at the forward end thereof and provided with a longitudinal slot, a ledge or shoulder rising from the outer end of the jaw, opposite upstanding side portions rising at the rear end of the jaw, inverted substantially L-shaped die members embracing opposite sides of the jaw and fitted snugly between the ledge or shoulder and the upstanding side portions of the body, detachable fastenings piercing the sides of the die members and engaging the fixed jaw, a knife-bar pivoted within the slotted portion of the body and having its outer free end working over the slotted portion of the die, the under side of the free end of the bar being provided with a groove opening through its outer end, a knife-blade fitted endwise into the groove, a stop-plate detachably secured across the open outer end of the groove, a spring held within the body and bearing upwardly against the knife-bar to yieldably elevate the same, and a handled operating-cam pivoted between the upstanding portions of the body and in frictional operative engagement with the upper side of the knife-bar.

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

CHARLEY McDONNER.

Witnesses:

H. G. LAUN,  
GERTRUDE RILEY.