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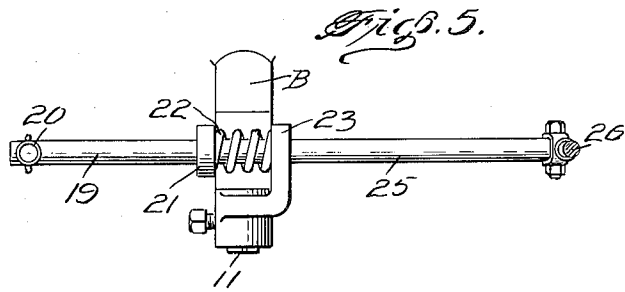
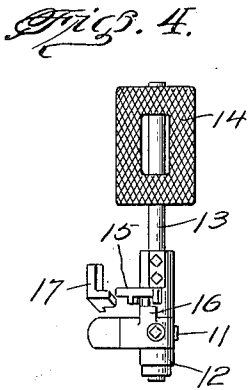
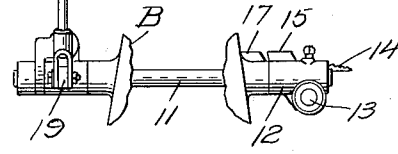
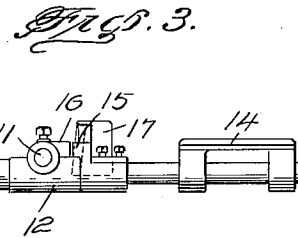
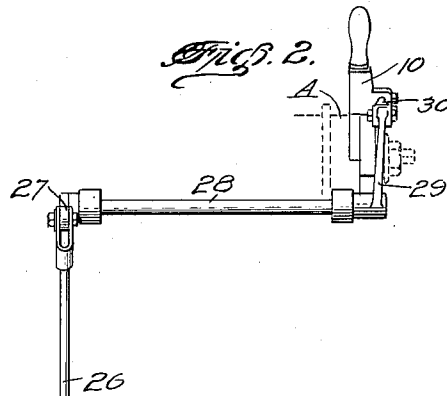
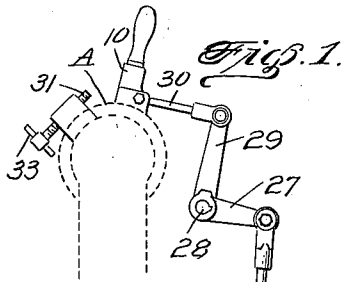
A. J. LIBERT

2,059,644

COMPENSATING LEVER MECHANISM FOR SHEARS

Filed Oct. 22, 1930

3 Sheets-Sheet 1



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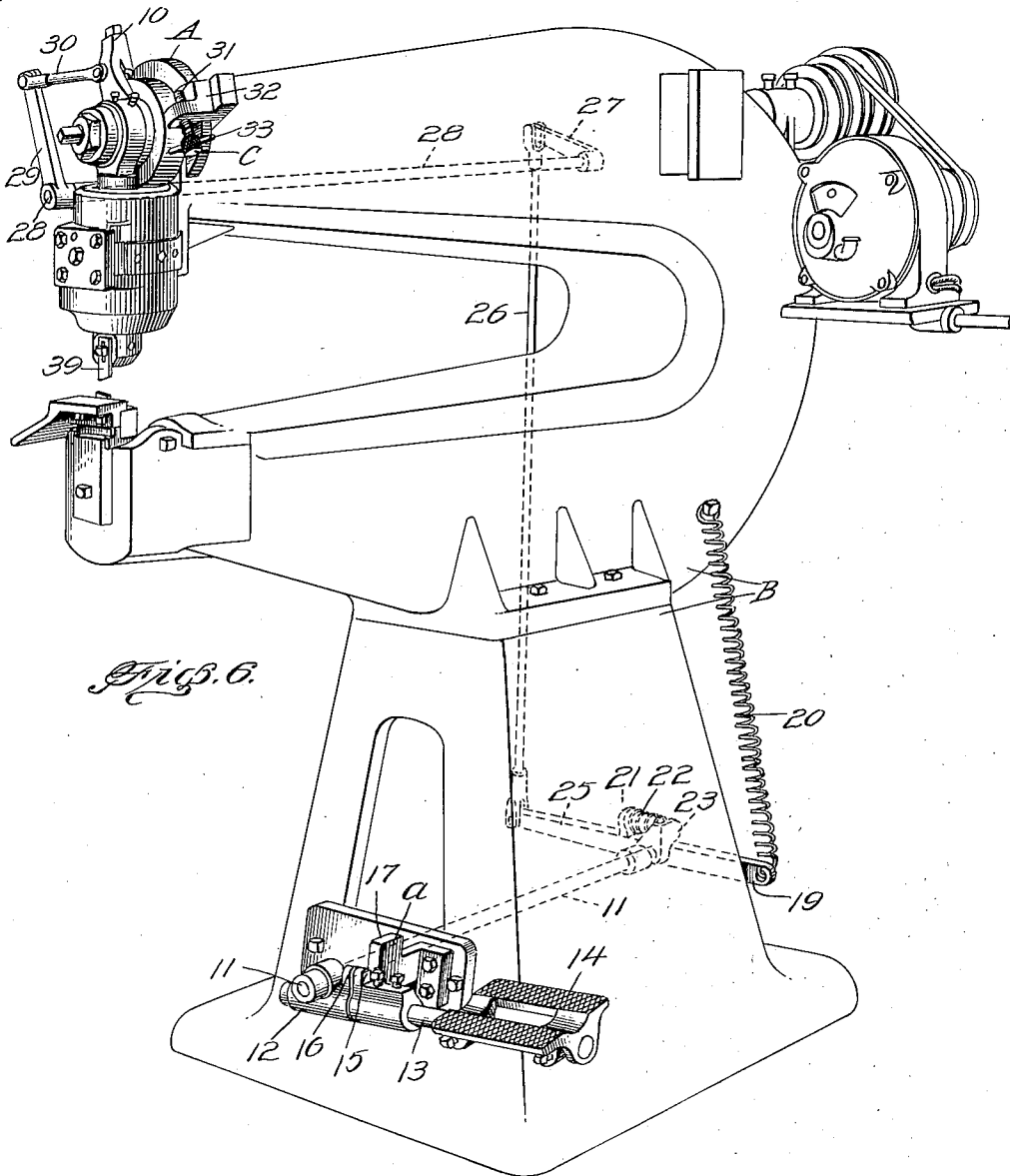
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COMPENSATING LEVER MECHANISM FOR SHEARS

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3 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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COMPENSATING LEVER MECHANISM FOR
SHEARS

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Application October 22, 1930, Serial No. 490,518

1 Claim. (Cl. 164—47)

The invention relates to compensating lever mechanism for automatic sheet metal shears, and more particularly to treadle control for the movable cutter of the shears to regulate the throw and depth of penetration of said cutter and constitutes improvements over the subject-matter of an application for United States Letters Patent filed on or about December 26, 1928 and serially numbered 328,594.

The primary aim of the present invention is the provision of mechanism of this character, wherein the movable cutter of the shears can be shifted by a foot treadle to regulate the length of the stroke or vertical travel of the said cutter and the depth of penetration of the latter in the work in the operation of the shears.

Another aim of the invention is the provision of mechanism of this character, wherein there are involved novel connections between a foot treadle and an adjusting element for a movable cutter of the shears to regulate the throw or stroke of the blade for compensation of the adjustment of the setting means for depth of penetration of the movable cutter and also stop penetration at the proper shearing point during the operation of the machine.

A further object of the invention is the provision of mechanism of this character, wherein the cutting blades of the shears can be maintained open and the weight of the foot treadle counterweighted, while the movable cutter of the shears can be regulated for its throw and accurate adjustment had for depth of penetration in the work, as well as to stop penetration at proper shearing point.

Other objects will be in part obvious and in part hereinafter pointed out.

With the above and other objects in view the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which show the preferred embodiment of the invention, and pointed out in the claim hereunto appended.

In the accompanying drawings:—

Figure 1 is an elevation of the compensating lever mechanism constructed in accordance with the invention with adjunct parts of the sheet metal shears associated therewith, these being partly in full lines and partly in dotted lines and said mechanism being viewed on line 1—1 of Figure 2, looking in the direction of the arrows.

Figure 2 is a side elevation of the mechanism, only a portion of the base of the shears being shown therewith.

Figure 3 is an elevation viewed on the line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a top plan view of Figure 3, viewed on the line 4—4 of Figure 2, looking in the direction of the arrows.

Figure 5 is a sectional view taken on the line 5—5 of Figure 1 looking in the direction of the arrows.

Figure 6 is a perspective view of the automatic shears with the compensating lever mechanism associated therewith.

Figure 7 is a fragmentary sectional view through the head of the shears.

Figure 8 is a fragmentary end elevation thereof.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates a portion of the upper stretch of the frame head of the shears and B a portion of the stand or base thereof, the shears constituting the subject matter of an application for U. S. patent, filed December 26, 1928 and serially numbered 328,594. This head A has mounted therein for free rotation an eccentric sleeve C fitted with bearings D for the journal E of a crank F, the latter being projected beyond the free end of the head A as shown in Figure 7 of the drawings. The inner end of the journal E is joined through the medium of a flexible coupling G with a driven shaft H operated by a power unit. The eccentric sleeve C has a lever or handle 10 for turning it to regulate the displacement of the upper cutter 39 of the shears. This lever or handle 10 carries a spring pressed friction ball J located in the overhang K of the said lever or handle and this ball frictionally rides upon the head A.

In the stand or base B of the shears is journaled a horizontal rocker shaft 11 having its bearing therein and extends from front to rear of the stand or base. On the front end of the shaft 11 is fixed a treadle coupling 12, in which is rotatably mounted the shank or stem 13 of a treadle or pedal 14. This shank or stem 13 is fitted with an adjustable latching device 15 which can be adjusted thereon to engage with a keeper 16 integral with the coupling 12 to prevent rotation of the shank or stem therein and corresponding tilting of the treadle or pedal 14 or to engage a keeper 17 on the stand or base B when the shank or stem is turned in the coupling 12 after depressing the same and tilting the treadle or pedal 14 for locking the rocking shaft 11 and

said treadle or pedal in this position for a purpose presently described.

In some cases the operator does not wish to keep the cutter in set position, but to change it during the operation. For this reason the operator does not wish to latch the treadle, so before starting the operation he sets the latching device 15 that it will engage the keeper 16 and not the keeper 17. On the other hand, if the operator wishes to hold the cutter in adjusted position, he first sets the latching device 15 so that it will not engage the keeper 16 but the keeper 17 when the treadle 14 is tilted.

On the rear end of the shaft 11 is loosely journaled a cradle lever 18 having its short arm 19 connected with the lower end of a coiled retractile spring 20 forming a counterweight spring, the upper end of which being fixed or connected to the stand or base B at the proper elevation thereon.

In the cradle 21 of this lever 18 is a compensation spring 22 of the compressible type which coacts with an abutment 23 formed on and rising from a hub 24 adjustably fixed to the shaft 11, which latter is rocked by the treadle or pedal 14.

Connected with the long arm 25 of the lever 18 is a rod 26 which extends upwardly at the rear of the shears and connects with an arm 27 of a bell-crank lever 23, the other arm 29 of the same being linked at 30 with the throw handle 10 of the shears for regulating the upper movable cutter thereof.

On the frame A of the shears in the path of movement of the throw handle 10 is an adjustable setting device including a set screw 31 supported in a stationary bearing 32 formed on the frame and this screw 31 is provided with a hand hold 33, the said screw serving as a stop for the handle 10 when actuated to limit the throw of the handle when depressing pedal 14 to allow the correct penetration of the cutter 39 for cutting the different gauge metals.

It is to be understood that the shaft 11 is limited in its rocking movement and likewise the shank or stem 13 carrying the treadle or pedal 14 has a corresponding determined movement, so the compressible spring 22 which is of such stiffness that it will not compress until the lever

or handle 10 engages set screw 31, compensates for the setting of the throw handle and adjustment of the screw 31 without disturbance of or interference by the rocker shaft 11, while the spring 20 acts to maintain the upper and lower cutters of the shears open and counterweights the treadle or pedal 14.

In the operation of the mechanism hereinbefore described when it is desired to regulate the throw of the upper movable cutter of the shears an operator depresses the treadle or pedal 14 causing the shifting of the throw handle 10 to the determined degree whereupon the said treadle or pedal 14 is tilted to bring the keeper latch 15 into engagement with the keeper 17 on the stand or base B, so that the said throw handle will now be maintained in its set position, to regulate the throw of the cutter which is automatically operated.

The screw 31 can be set in its bearing 32 to coact with the throw handle 10 to determine the depth of cutting action or penetration of the cutter and also to stop the penetration at the proper shearing point during the working of the shears.

The treadle or pedal 14 is released by reversely tilting the same or turning it forwardly of the shears by the foot of the operator as will be clearly apparent.

What is claimed is:

The combination of a control device for a movable element, adjustable means for regulating the throw of the control device, a horizontal rocker shaft, a treadle coupling on the shaft, a treadle stem rotatably fitted in the coupling, a treadle carried by the stem, a latching device on the stem, means including a keeper on the coupling and engageable by the latching device for releasably holding the stem against rotation, a locking member on a stand of the control device for engagement by the latching device for maintaining the shaft locked after depression and subsequent rotation of the treadle, said treadle having a movement greater than the control device, and means for compensating the difference in movements of the control device and treadle.

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