Sept. 8, 1964 M. W. RAUEN ETAL 3,147,791

BRAKE FOR BENDING SHEET METAL

Filed May 31, 1961 2 Sheets-Sheet 1

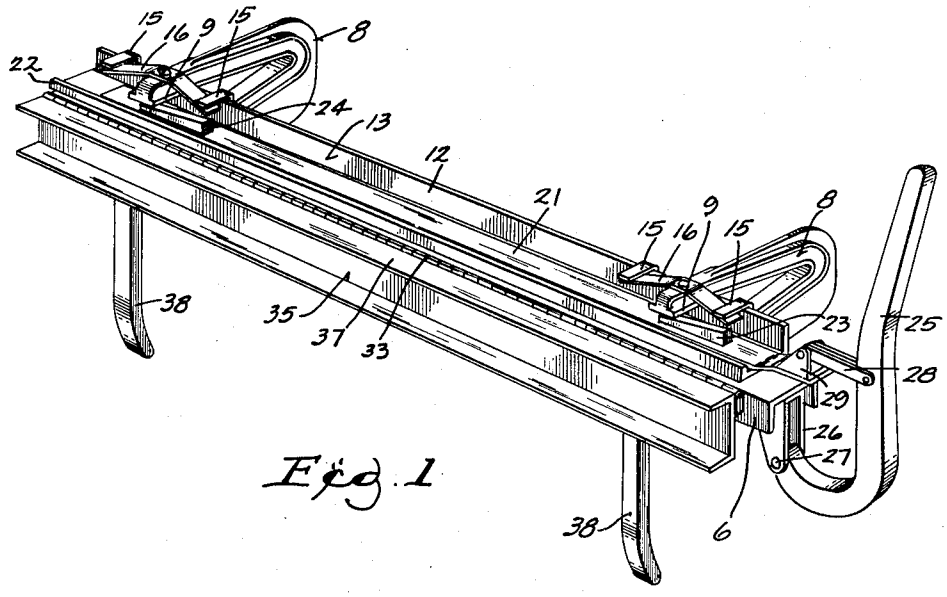

Fig. 1

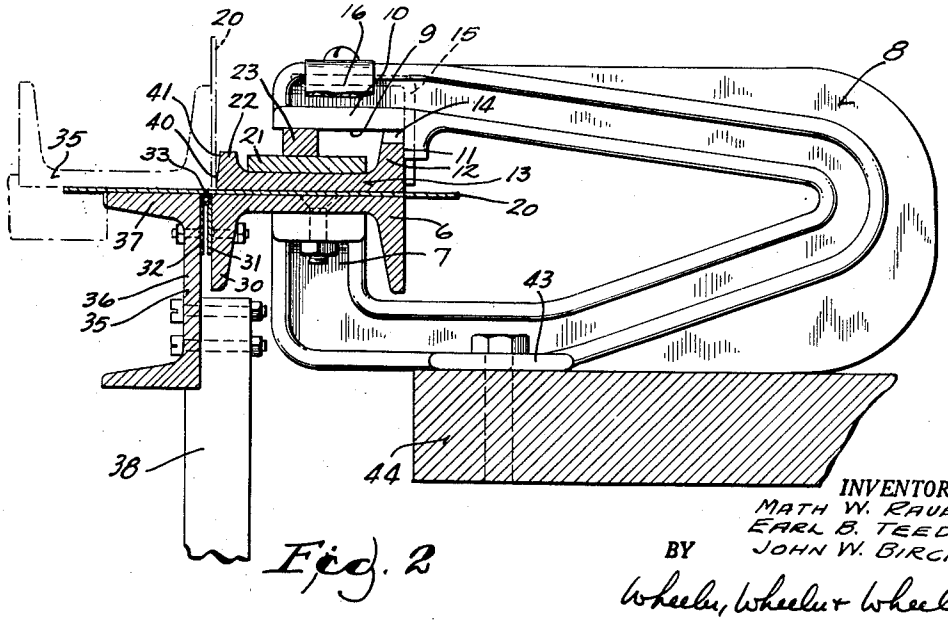

Fig. 2

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Fig. 3

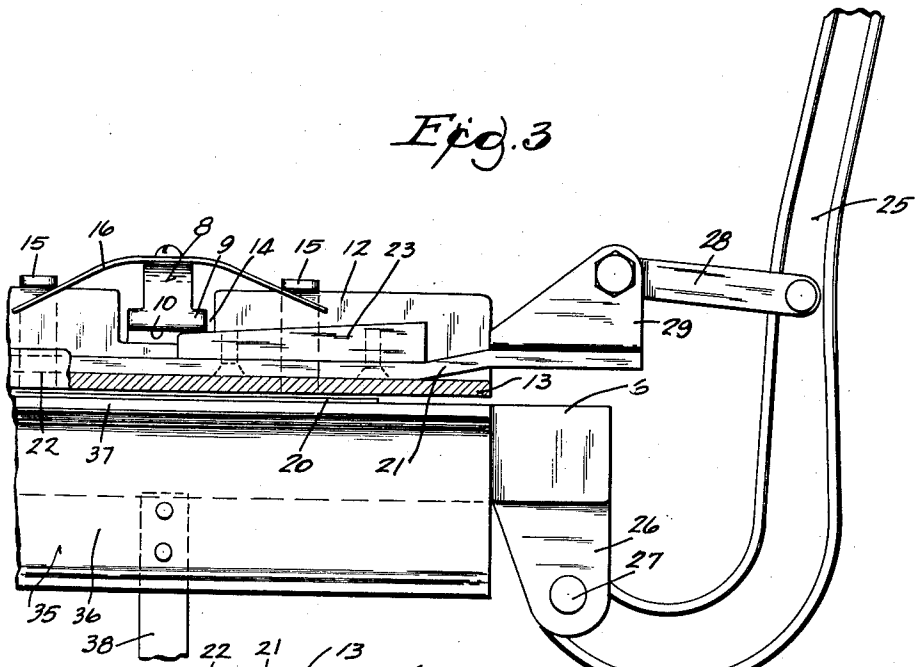

Fig. 5

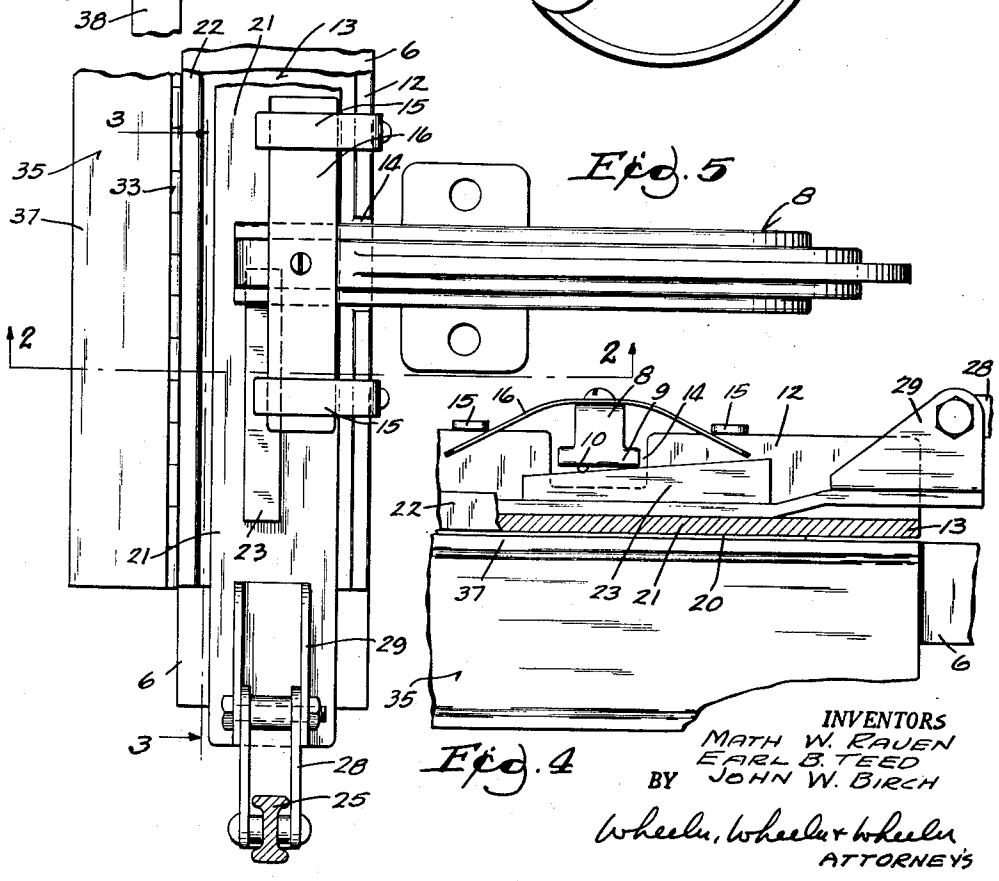

Fig. 4

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BRAKE FOR BENDING SHEET METAL

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This invention relates to a brake for bending sheet metal.

The brake is bench-mounted and is designed to be readily portable. A pair of laterally spaced C-frames support an inverted channel which serves as a table to receive the sheet metal that is to be bent. Cooperating therewith is a platen which desirably is also a channel extending longitudinally of the table and having between its flanges a slideable pressure plate equipped with wedge blocks engageable with the C-frame to exert clamping pressure through the platen upon the work. There is a lever pivoted to the table channel and linked to the slide plate for moving such blocks to and from operative clamping position. Springs connected with the respective C-frames yieldably support the platen channel free of the table except when the wedge members are operative.

The bending is done by a third channel connected by means of a piano hinge with the table channel and provided with hand levers which normally hang downwardly, the bending channel having one of its flanges substantially flush with the table to immediately underlie the work. When the bending channel is oscillated about the pintle of the piano hinge by manipulation of the hand levers, the work is bent upwardly against the forward flange of the platen.

The C-frames are respectively provided with apertured ears to enable the device to be bolted to a table or other support. For convenience of transportation, it is not provided with legs. It can be used on the job without physical anchorage to any support.

The fact that the several component parts which engage the work are all channel-shaped makes it possible to employ relatively light metal such as aluminum or magnesium alloy for these parts. The C-frames against which the clamping pressure is developed can likewise be cast of light metal.

In the drawings:

FIG. 1 is a view in perspective of a brake embodying the invention.

FIG. 2 is an enlarged detail view taken in transverse section on the line 2—2 of FIG. 5, a fragment of a suggested support being illustrated in section.

FIG. 3 is a fragmentary front elevational view of the brake as compared with FIG. 1, portions of the platen being broken away to the section indicated at 3—3 in FIG. 5.

FIG. 4 is a fragmentary detail view showing portions of the same section illustrated in FIG. 3 with the parts in clamping position.

FIG. 5 is a fragmentary plan view of the device on an enlarged scale as compared with FIG. 1.

The brake is organized with reference to a bed or table 6 in the form of an inverted channel, this being bolted to the upstanding ends 7 of two identical C-frames generically designated by reference character 8. The upper jaw portion 9 of each C-frame has a downwardly exposed flat surface 10 with which cooperates one of the wedge blocks hereafter to be described. Rearwardly of the surface 10 there is a generally vertical finished bearing surface 11 engaged by the rear flange 12 of the pressure platen 13. The rear flange 12 of platen 13 has notches 14 accommodating the jaws 9 of the respective C-frames 8. The

width of the notch only slightly exceeds the width of the jaw 9, whereby substantial displacement of flange 13 with respect to the C-frames 8 is precluded.

Mounted on the rear flange 12 of the channel-shaped platen 13 are the arms 15 which project forwardly to engage the ends of leaf springs 16, these being centrally connected across the respective C-frames 8 as clearly shown, for example, in FIG. 3 and FIG. 4. These springs normally support the platen 13 in a position spaced sufficiently above the bed 6 to receive the work sheet as shown at 20 in FIG. 3.

The work sheet is clamped to the bed by a wedge arrangement which forces the platen 13 toward the bed as shown in FIG. 4. A slide plate 21 is reciprocable longitudinally of the channel-shaped platen 13 in a guideway defined between the rear flange 12 and the forward flange 22 thereof. It carries wedge blocks 23, 24 which, in their retracted positions, are substantially free of the bearing surface 10 above referred to as shown in FIG. 3. When the slide 21 is advanced to the left as viewed in FIGS. 1, 3 and 4, the wedges 23 are driven beneath the fixed surfaces 10 on the under sides of the jaw portion 9 of the C-frames 8, thereby forcing the slide 21 and platen 13 downwardly against the bias of the springs 16 so that the work sheet 20 will now be clamped between the platen 13 and the bed 6 as shown in FIGS. 2 and 4.

For reciprocating this slide 21 to effect work-clamping and work-releasing movement, a hand lever 25 is preferably employed. Connected to the under side of the inverted channel which provides the bed or table 6 are ears 26, which support a pintle 27 on which the lever 25 is pivoted. A link 28 pivoted to the lever and to the upstanding ears 29 on slide 21 communicates motion from the hand lever 25 to the slide.

Connected to the forward flange 30 of the table channel 6 is the leaf 31 of a piano hinge which desirably extends the full length of a brake channel 35. The leaf 32 of the piano hinge generically designated by reference character 33 is connected to the web portion 36 of the brake channel 35. The actual bending is done by the flange 37 of brake channel 35. When the work sheet 20 is clamped as above described, the handles 38 attached to the brake channel 35 are used to oscillate the channel upon the piano hinge from the full line position of FIG. 2 to the dotted line position shown in that view whereby the work is folded up across the front margin 40 of the platen channel 13. In order to give clearance for movement slightly in excess of 90°, the external surface 41 of the forward flange 22 of the platen 13 is desirably beveled obliquely to the rear as clearly shown in FIG. 2. Thus, if the work sheet 20 is somewhat resilient, it can be folded slightly beyond 90° if desired.

While the assembly can be used anywhere, and mounted on a bench or saw horses or the like without being physically connected thereto, ears 43 are desirably provided on each of the C-frame 8 whereby the C-frames may be bolted to a bench such as that fragmentarily illustrated at 44 in FIG. 2.

The device is highly portable as compared with any brake of comparable capacity. The two C-frames are entirely responsible for resisting the clamping thrust exerted by the wedges and they are connected solely by the table. Thus, the working parts of the brake perform functions for which extensive framing has been required in previously known apparatus.

We claim:

1. In a brake for bending sheet metal, the combination comprising a pair of C-frames having spaced upper and lower jaw portions, a table member connected with corresponding lower jaw portions of said C-frames and spanning the space therebetween, a channel-shaped platen

movably connected with upper jaw portions of the C-frames and having a web confronting the table member and spaced, upwardly extending flanges constituting a guideway, a slide plate reciprocable longitudinally of the platen in said guideway and having means coacting with the C-frame jaws last mentioned for urging the platen toward the table, the platen being normally biased away from the table to receive a work sheet between the platen and table, and means connected with the table and the slide plate and manually operable for effecting reciprocation of the slide plate respecting the platen for effecting advance of the platen toward the table.

2. The device of claim 1 in which the means for effecting movement of the platen toward the table comprises wedges mounted on the slide plate and engaged with complementary bearing surfaces provided by the C-frames.

3. A brake for bending sheet metal comprising the combination with an elongated table having the form of an inverted channel, of a bending brake of elongated channel-shaped form, the bending brake and table having flanges connected by a piano hinge having leaves attached to the respective flanges, handle means on the brake channel for moving the brake channel about said hinge respecting the table channel, a third channel constituting a clamp for clamping work to the table channel and having upstanding flanges providing a guideway, C-frames having lower jaws connected with the table channel, and upper jaws overlying the third channel, and spring and cam means reacting between the third channel and the upper jaws for moving the third channel from and to the table channel.

4. The device of claim 3 in which said spring and cam means includes a slide plate guided for reciprocation longitudinally of said third channel within said guideway, wedge members mounted on the slide plate at longitudinally spaced points, means for reciprocating the slide plate, and means on said upper jaws providing fixed bearing surfaces with which said wedge members react to urge the third channel toward the table channel.

5. The device of claim 4 in which the means for supporting the platen free of the table comprises a pair of leaf springs, arms carried by the platen and engaged with respective springs, and supports for the respective springs providing the aforesaid surfaces with which the wedge members react.

6. The device of claim 5 in combination with frame members connected with the table substantially at right angles thereto and having portions overlying the platen and providing said surfaces and supporting said springs.

7. A brake for bending sheet metal comprising a pair of C-frames laterally spaced and having vertically spaced jaws, an elongated table channel mounted on corresponding jaws of said frames and providing substantially the sole connection between said frames, said table channel having an upwardly disposed web and depending flanges, a platen channel having a downwardly exposed web and upwardly extending flanges, the platen being disposed between the table and the corresponding upper jaws of the respective C-frames, springs spanning the upper jaws of the C-frames, the platen channel having arms overlying the springs to receive resilient support therefrom for biasing the platen to a retracted position in which it is normally spaced from the table channel to receive sheet metal to be bent, a slide reciprocable longitudinally of the platen channel, wedges mounted on the slide, the jaws of the C-frames having bearing surfaces engageable by the wedges in the reciprocation of the slide plate to force the platen downwardly toward the table upon an intervening piece of sheet metal in opposition to the bias of said spring, means for reciprocating the slide plate, and a brake channel in hinged connection with the table channel and having handle means for oscillating it upwardly into operative bending engagement with the sheet metal clamped between the platen and the table, the platen channel having an edge adjacent said connection and shaped to provide an acute angle for refining the line upon which the sheet metal will be folded.

8. A brake for bending sheet metal comprising a pair of spaced C-frames each including base mounting means and upper and lower jaws, a first channel member spanning said C-frames and mounted in inverted position on the lower jaws of said C-frames, a second channel member providing a bending brake, means connecting said first and second channel members at adjacent edges thereof for providing pivotal movement of said second member relative to said first member, and a third channel member spanning said C-frames and disposed for movement toward and away from the web of said first channel member for clamping therebetween a work piece, and means interposed between the upper jaws of said C-frames and said third channel member for biasing and camming said third channel member toward and away from said first channel member.

9. A brake in accordance with claim 8 wherein said lower jaw on each of said C-frames is connected to the web of said first channel member and extends between the depending flanges thereof.

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