

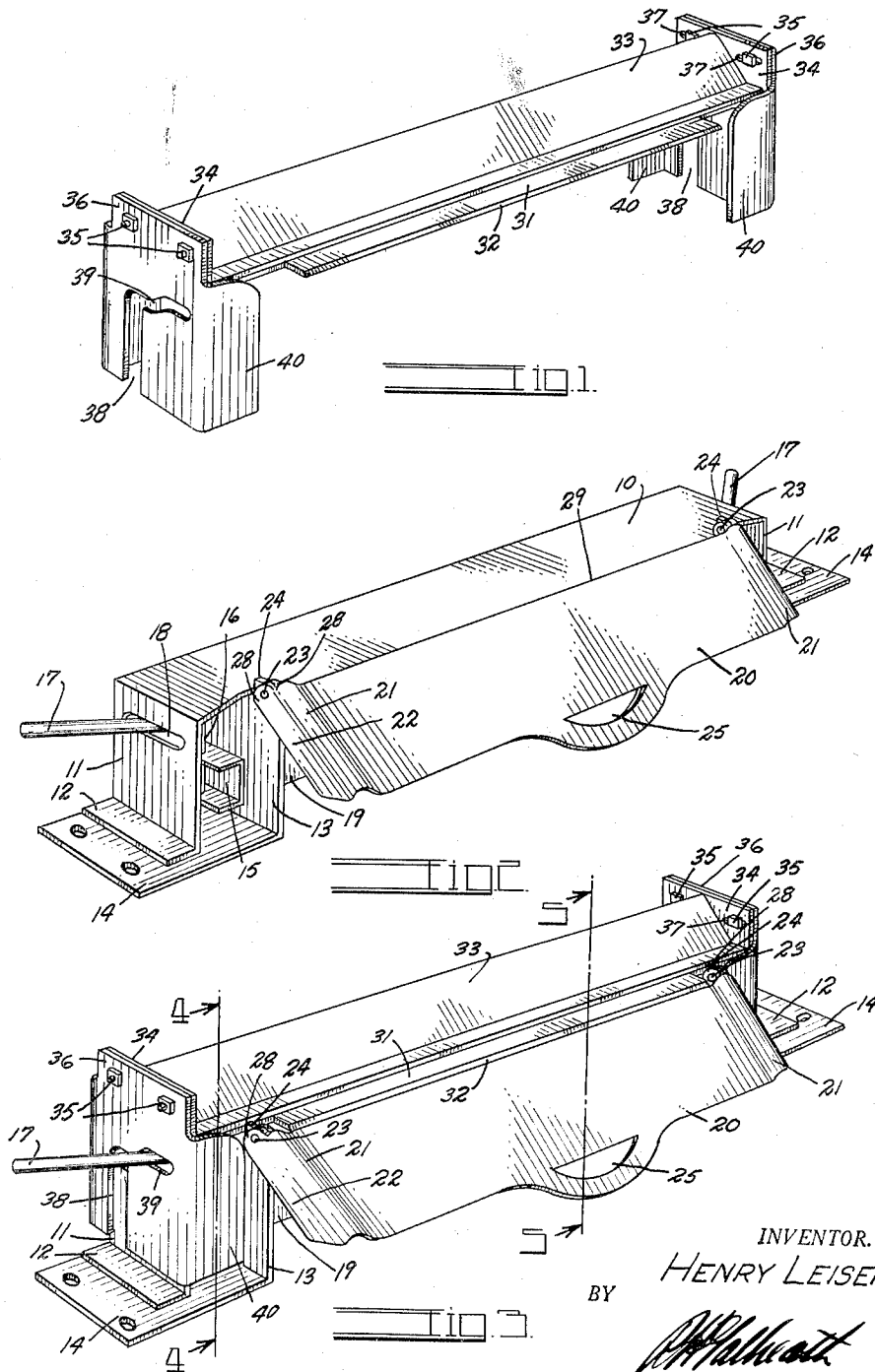
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SHEET METAL BRAKE

2,587,865

Filed May 16, 1950

2 SHEETS—SHEET 1



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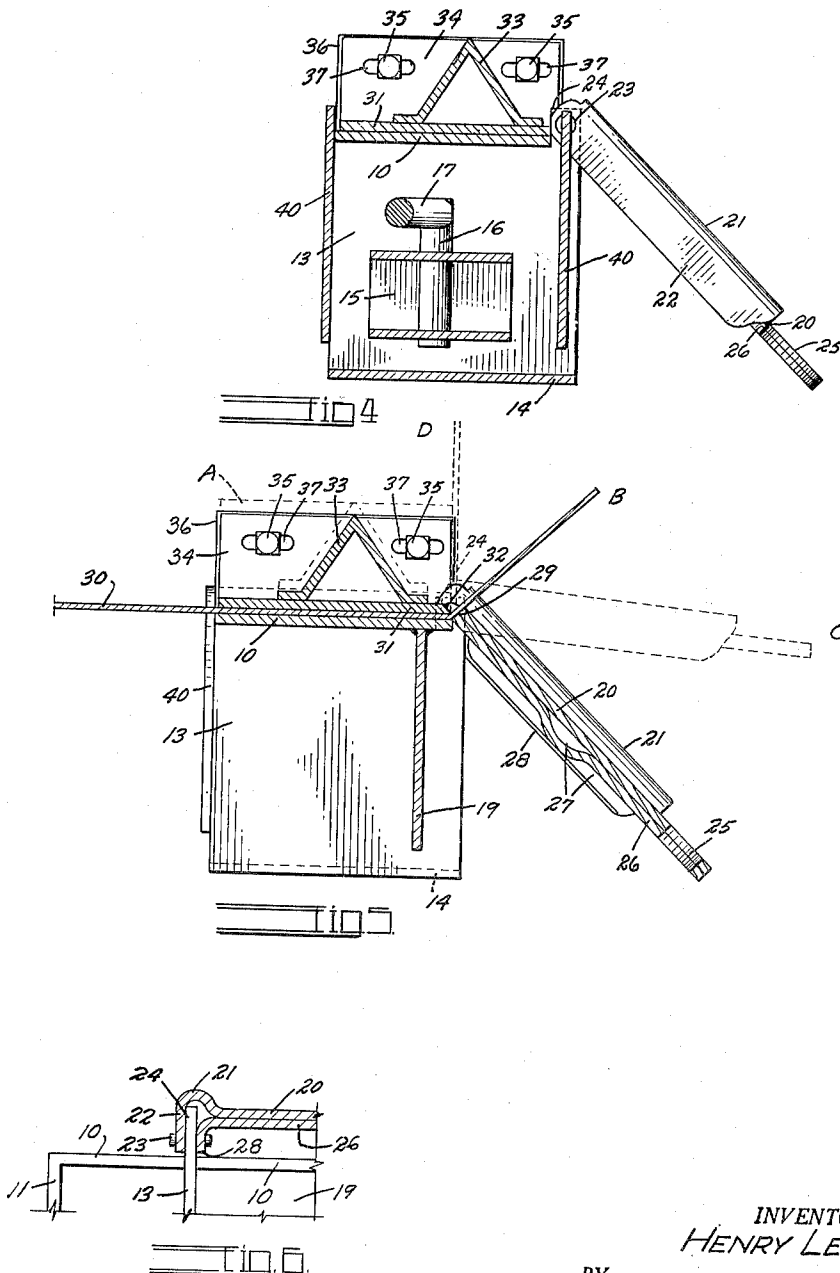
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2 SHEETS—SHEET 2



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## UNITED STATES PATENT OFFICE

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## SHEET METAL BRAKE

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4 Claims. (Cl. 153-16)

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This invention relates to a sheet metal brake, and has for its principal object the provision of a relatively small device which can be used on any convenient work-bench or table, and which will quickly and easily form straight, accurate, angular bends in metal sheets.

Another object of the invention is to provide a sheet metal brake in which the clamping vise portion will be quickly and easily removable so that sheets bent in closed or U-shaped forms may be easily removed from the brake.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a perspective view of the upper removable portion of the improved brake;

Fig. 2 is a similar view of the brake with the upper portion of Fig. 1 removed;

Fig. 3 is a similar view illustrating the complete brake with the upper portion in place;

Fig. 4 is a cross-section taken on the line 4-4, Fig. 3;

Fig. 5 is a similar cross-section taken on the line 5-5, Fig. 3; and

Fig. 6 is a detail view of the hinge.

The improved brake employs an elongated table plate 10 which is bent downwardly at its extremities to form vertical end members 11, thence outwardly to form end flanges 12. The horizontal plate 10 is supported at its extremities on the end members 11 and upon angle plates, each extending downwardly from plate 10 and having an upturned side or plate 13 and a base portion or plate 14.

The flanges 12 and the end members 11 are welded to the base portions 14, and the upper edges of the upturned sides 13 are welded to the bottom of the plate 10 so as to form an open-sided, box-like lever compartment at each extremity of the brake. The upturned sides 13 at the opposite extremity of the plate 10 are held in rigid, spaced relation by means of an elongated plate 19, which is welded at its extremities to the upturned sides 13 and along its top to the plate 10. One edge of each of the plates 13 is extended upwardly to form a hinge ear 24 supporting a hinge pin 23.

A channel member 15 is welded horizontally to the upturned sides 13 in each of the compartments. The horizontal side flanges of each channel member 15 are drilled to receive a vertical leg 16 of an L-shaped swinging lever 17. Each of the levers 17 extends outwardly through an elongated horizontal slot 18 in each of the end members 11.

The bending of a metal sheet, such as shown at 30, is accomplished by means of a swinging plate 20, which is first rolled upwardly at its extremities to form terminal ridges 21, thence is rolled downwardly to form terminal flanges 22. The flanges 22 extend to one side of the plate 20 and are hingedly mounted on the hinge pins 23. The plate 20 is provided with a suitable hand grip 25 and is stiffened by means of a back plate 26 having an outline similar to the plate 20, which is welded or otherwise secured to the latter over its entire undersurface. Stiffening ridges 27 are stamped into the backing plate 26 to stiffen the entire structure of the two plates 20 and 26. The extremities of the backing plate 26 are flanged downwardly, and the flanges terminate in downwardly turned hinge flanges 28 through which the hinge pins 23 pass.

The upper inner edges of the two plates 20 and 26 are accurately aligned and machined to form a flat, narrow bending edge 29. The axes of the pins 23 are placed in axial alignment with the lower edge of the bending edge 29 and the upper surface of the plate 10, as shown in Fig. 5.

The sheet metal 30 is gripped against the plate 10 by means of a gripping plate 31, the forward edge of which is beveled back to form a relatively sharp edge 32 at the intersection of the edge 29 and the top of the plate 10. The gripping plate 31 is stiffened throughout its length by means of an inverted V-shaped stiffening member 33 extending the entire length thereof. The extremities of the plate 31 and the extremities of the member 33 are welded to terminal plates 34, which are in turn bolted by means of clamp bolts 35 to the terminal or end cap plates 36. The bolts 35 extend through slotted openings 37 in the terminal plates 34 to allow forward and back adjustment of the beveled edge 32. The two vertical edges of each of the end cap plates 36 are rolled inwardly to form covering flanges 40, which cover the lever compartments at each extremity of the plate 10, as shown in Fig. 3.

The cap plates 36 are slotted to provide an upwardly extending slot 38 joining an inclined, sidewardly-extending side slot 39. When the

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brake is assembled, the vertical slots 38 slide downwardly over the levers 17 until the latter rest in the side slots 39. The levers 37 are then swung sidewardly into the side slots 39 so as to travel up the inclines thereof to pull the plates 36 downwardly over the end members 11.

In use, the two levers 17 are swung to the lower extremities of the side slots 39 so as to lift the gripping plate 31, as shown in broken line at A, in Fig. 5. The sheet 30 is then inserted beneath the plate 31 until the bend line thereon aligns with the beveled edge 32. The levers 17 are then swung forwardly into the upper extremities of the side slots 39. As they swing, they act to pull the plate 31 downwardly against the sheet metal 30, causing the projecting portion of the latter to bend upwardly, as indicated at B, Fig. 5.

The swinging plate 20 is now swung upwardly to the broken-line position C of Fig. 5, causing the bending edge 29 to bend the sheet 30 upwardly about the beveled edge 32 of the position D of Fig. 5. For ordinary single bends, the gripping plate 31 need not be removed from the brake. For double bends, however, which form bends in the sheet at both sides of the brake, the levers 17 can be swung to positions over the vertical slots 38 and the entire upper portion of the brake, shown in Fig. 1, can be lifted from the lower portion thereof, shown in Fig. 2.

It will be noted that it is not necessary to lock the levers 16 in the channel members 15, since the horizontal slots 18 prevent upward movement of the levers.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A brake for bending sheet metal sheets comprising: a flat table plate; a flat gripping plate adapted to grip the sheet metal sheet against said table plate, one edge of each plate being in alignment with one edge of the other plate; a swinging plate; means hinging said swinging plate along an axis in alignment with the aligned edges of the first plates; an outwardly extending lever hingedly secured to said table plate at each extremity thereof; means guiding the swinging movement of said levers in a plane parallel to the plane of said table plate and angularly turned end members on said gripping plate extending at right angles to the latter and over and beyond the extremities of said table plate, said end members being slotted to receive said levers, the slots in the end members being inclined from the plane of said table plate so that when said levers are swung, they will act against said inclined slots to move said gripping plate toward said table plate.

2. A brake for bending sheet metal sheets comprising: a flat table plate; a flat gripping plate adapted to grip the sheet metal sheet against said table plate, one edge of each plate being in alignment with one edge of the other plate; a swinging plate; means hinging said swinging plate along an axis in alignment with the aligned edges of the first plates; an outwardly extending lever hingedly secured to said table plate at each extremity thereof on an axis perpendicular to the plane of said table plate; angularly turned end members on said gripping plate extending at

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right angles to the latter and over and beyond the extremities of said table plate, said end members being slotted to receive said levers, the slots in the end members being inclined from the plane of said table plate so that when said levers are swung, they will act against said inclined slots to move said gripping plate toward said table plate, and being open to the lower edges of said end members for the passage of said levers so as to allow said gripping plate to be lifted from said table plate; and means for guiding the swinging movement of said levers in a plane parallel to the plane of said table plate.

3. A sheet metal bending brake comprising: a horizontal table plate; angle plates extending downwardly from and supporting each extremity of said table plate; a lever hinged upon a fixed vertical axis upon each angle plate and extending outwardly therefrom so as to swing sidewardly in a horizontal plane; a gripping plate adapted to lie on said table plate; end members on said gripping plate extending downwardly in parallel relation to said angle plates at the ends of said table plate, said end members having vertical open ended slots arranged to pass downwardly over said levers and side slots extending sidewardly from said vertical slots, said side slots being inclined relative to the plane of said table plate so that sideward movement of said levers in said side slots will cause a vertical movement of said gripping plate; and means for bending sheet metal upwardly over the edge of said gripping plate.

4. A sheet metal brake comprising: an elongated, horizontal table plate; a vertical end member formed on, and extending downwardly from, each extremity of said table plate; an angle plate secured to and extending downwardly from said table plate adjacent each extremity thereof within and parallel to said end members; a base plate joining the bottoms of the end member and the angle plate at each extremity of said table plate to form open-sided, box-like lever compartments at the extremities of said brake; a hinge ear formed on each angle plate and extending above said table plate at one side thereof; a swinging plate hingedly mounted on said hinge ears so as to swing about a horizontal axis at one side of said table plate; a lever hinged on a vertical axis on each angle plate and extending outwardly through a horizontal slot in the adjacent end member; a horizontal gripping plate positioned over said table plate; and a terminal plate secured to and extending downwardly from each extremity of said gripping plate parallel to said end plates, said terminal plates having substantially vertical slots for the passage of said levers, and inclined side slots extending from said vertical slots into which said levers may be swung to exert a clamping action on said gripping plate.

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