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C. DE W. WAGNER.
SHEET METAL SHEARS.
APPLICATION FILED MAY 4, 1904.

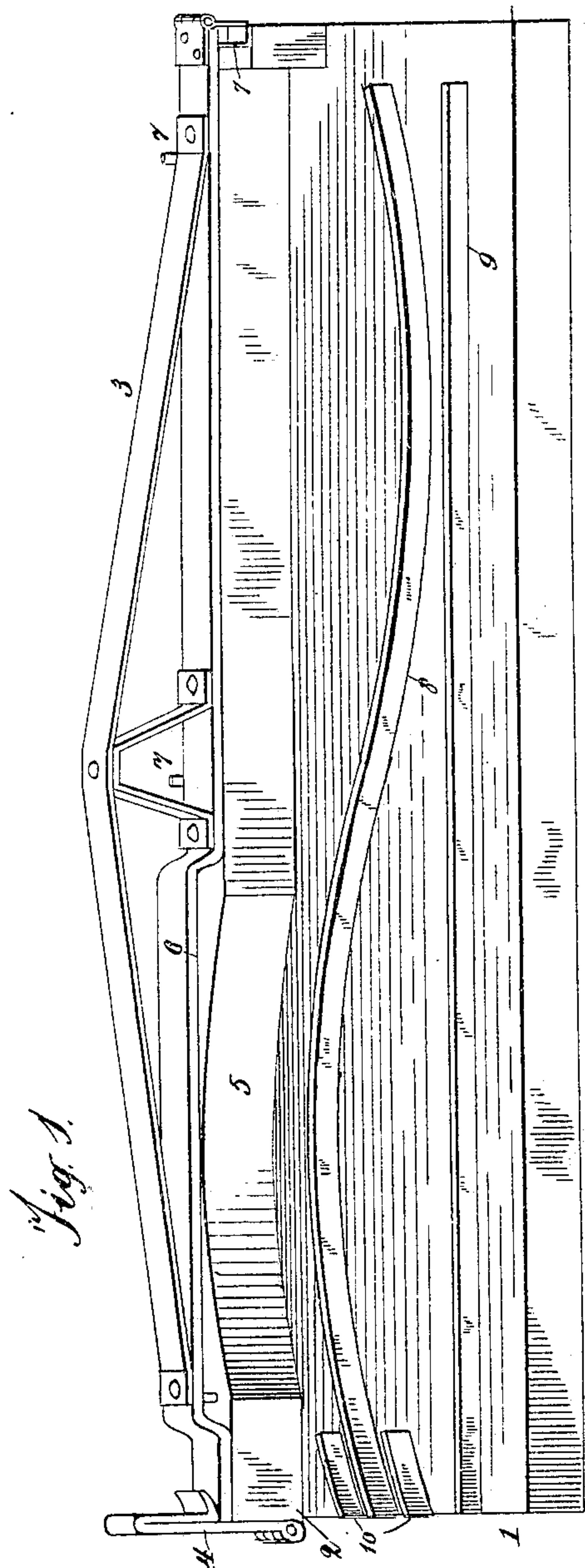


Fig. 1.

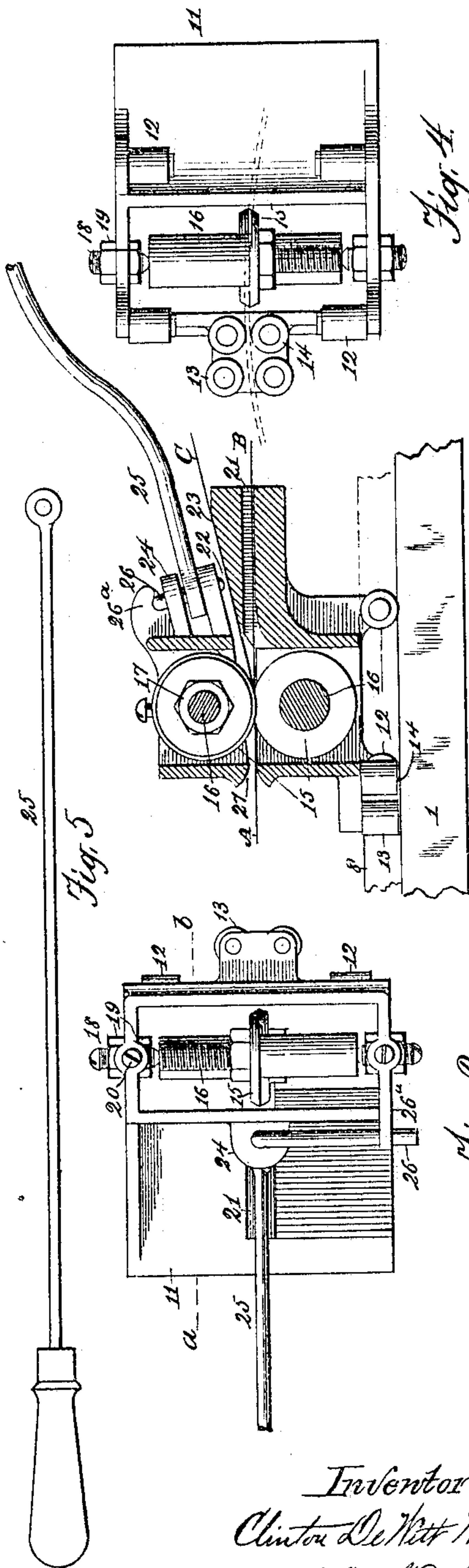


Fig. 2.

Fig. 3.

Fig. 4.

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SHEET-METAL SHEARS.

No. 801,697.

Specification of Letters Patent.

Patented Oct. 10, 1905.

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To all whom it may concern.

Be it known that I, CLINTON DE WITT WAGNER, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Sheet-Metal Shears, of which the following is a specification.

The object of this invention is to produce a tool for the rapid and accurate cutting of sheet metal in either straight or curved lines.

The nature of the invention will clearly appear from the description and claims following, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the guide and clamp. Fig. 2 is a top view of the shear. Fig. 3 is a vertical section of the same in the line *a b* looking from above Fig. 2. Fig. 4 is a bottom view of the same. Fig. 5 is a view of the handle detached.

In the making of hot-air-pipe elbows and many other tin-smiths' operations it is necessary to cut metal in curves, single or compound, and this must ordinarily be done with the hand-shears—a slow and laborious operation. The same is also true in cutting metal in straight lines when the sheet is too long for the squaring-shear.

My invention is designed to greatly expedite such work and with great ease and nicety.

In place of the usual sheet-metal pattern with which the workman marks out the desired figures I provide a guide-pattern, the construction of which is shown in Fig. 1. The base 1 may be a board, to one side of which is attached a riser 2 as high as the middle of the shear, or, to be exact, the cutting-line of the shear, to be described presently. To one end of the riser is hinged a clamp 3, suitably trussed for stiffness and held at the other end by a suitable latch or like fastener 4. To admit of the cut being as close to one side as necessary during a part of the course, the riser is hollowed at 5 to make room for the shear. For the same reason a corresponding part of the clamp is offset at 6, so that one side of the shear may pass under it. Gage-stops 7 determine the location of the sheet to be cut.

The base is provided with one or more guide-tracks 8 or 9, curved and straight, respectively, and formed of narrow band-iron, suitably attached to the base. At the starting end short auxiliary tracks 10 may be provided, but are not absolutely necessary. Their purpose is to guide the shear accurately just at starting; but they may be dispensed

with if the workman is careful or if great speed is not essential, as the operator by the exercise of a little care can start the shear nicely without the extra guides.

Referring now to the other figures of the drawings, the shear will be described.

11 is a frame, preferably mounted on rollers 12 to run on the upper surface of the guide-base. At the front of the frame are four guide-rollers 13 and 14, the former being the forward pair, separated a little farther apart than the thickness of the guide-rail or track 8. The rear pair are but slightly farther apart than the thickness of said track, the position of the rollers being such as to take a guide-rail with as short a curve as may be required in practice and as indicated in Fig. 4. Back of these guide-rollers in a rectangular part of the frame is mounted a pair of rotary cutters 15 on suitable arbors 16 by nuts 17 on the threaded parts of the arbors. The arbors are preferably pivoted on conical-pointed screws 18, attached to the sides of the frame by nuts 19. Set-screws 20 secure a limited vertical adjustment of the arbors to compensate for wear on the cutting-disks.

At one side, preferably the left as regards the operator, the frame has a horizontal throat 21 extending to a line a little past the cutting-line. This of course allows for the shear-frame to pass along the sheet on the secured side thereof. The cut-off portion of the sheet passes out through a throat 22 on the opposite side of the frame and up an inclined portion 23 at the back thereof. In suitable lugs 24 at the back of the upper portion of the frame is attached a handle 25, as by a pin 26. This may be provided with a right-angled stem, as shown, to slip under a notched lug 26", thus holding the pin securely but detachably in place. The attachment of the handle to the frame is purposely loose and free, so that the shear may take its own course regardless of the position of the operator's hand.

In Fig. 3, A designates the metal sheet, B the part thereof that remains attached to the pattern-form after cutting, and C the part that is cut off. 27 is the general throat of the shear, extending entirely across the frame and leading to the other throats above described.

The sheet being clamped in position on the pattern-form, the operator starts the shear by setting it at the edge nearest him, with the guide-rollers straddling the guide-rail, and by

means of the handle pushes the shear before him. In practice the cutting may be done with great rapidity—as fast, indeed, as a man can push the shear across the sheet. In the operation the cutters trail behind the guide-rollers and follow the sinuosities of the track with the utmost nicety, in so much that if the track is accurate the stock as cut is perfectly duplicated.

10 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

15 1. The combination with a guide-track and holder for the sheet, of a sheet-metal shear, comprising a pair of rotary cutters, a frame to carry them, having divergent throats for the parent sheet and cut-off portion to pass through, guides for said frame to follow said guide-track, and a handle by which the shear
20 is pushed across the sheet.

2. The combination with a guide-track and holder for the sheet, of a sheet-metal shear, comprising a frame, with divergent throats for the parent sheet and cut-off portion to
25 pass through, a pair of rotary shear cutters mounted to turn in said frame, guide-rollers on the frame to take the guide-track, and suitable means for pushing the shear across the sheet.

30 3. The combination with a curved track therefor, of a sheet-metal shear, comprising

a frame with throats to allow the cut sheet to pass through it, rotary shear cutters mounted in said frame, and two pairs of guide-rollers to engage said track relatively forward of the cutters, the rearmost pair being separated but slightly more than the thickness of the track, and the forward pair enough more to allow for the maximum of curvature in said track.

4. Combined with a suitable guide-track therefor, a sheet-metal shear, comprising a frame with throats to permit the cut portion and parent sheet of any width to pass bodily through it, a pair of rotary cutters mounted in said frame, guide-rollers to engage the guide-track, and antifriction-rollers to carry the shear.

5. The described sheet-metal shear, comprising a frame, with throats to allow the cut metal of any width to pass through it, a pair of rotary shear cutters mounted in said frame, means for adjusting one of them vertically, antifriction-rollers for the shear-frame, and a detachable handle by which it may be pushed across the sheet.

In testimony whereof I affix my signature in presence of two witnesses.

CLINTON DE WITT WAGNER.

Witnesses:

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