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DEVICE USED IN BENDING METAL.

APPLICATION FILED JAN. 18, 1912. RENEWED OCT. 30, 1916.

1,264,249.

Patented Apr. 30, 1918.

2 SHEETS—SHEET 1.

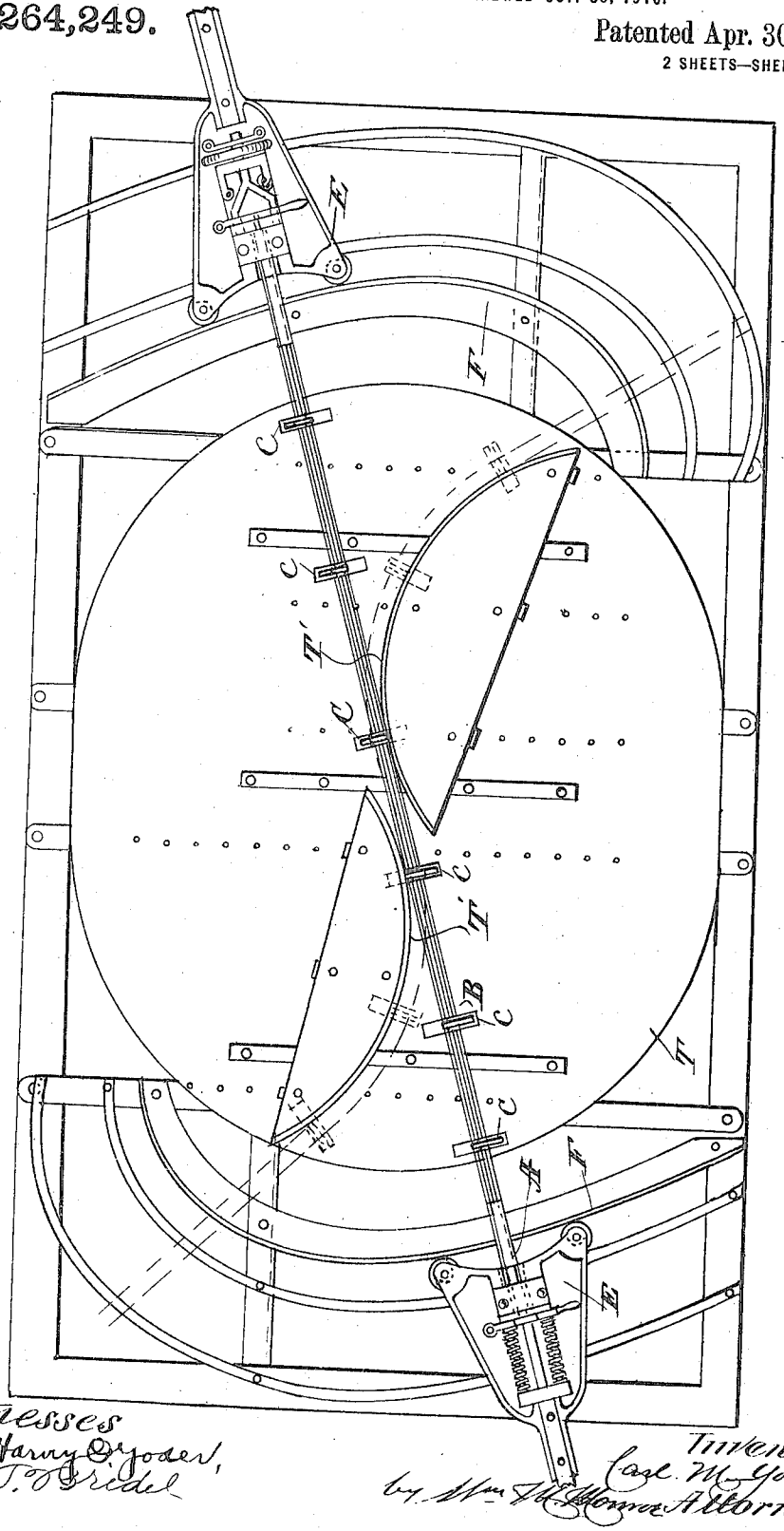


Fig. 1

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2 SHEETS—SHEET 2.

Fig. 2

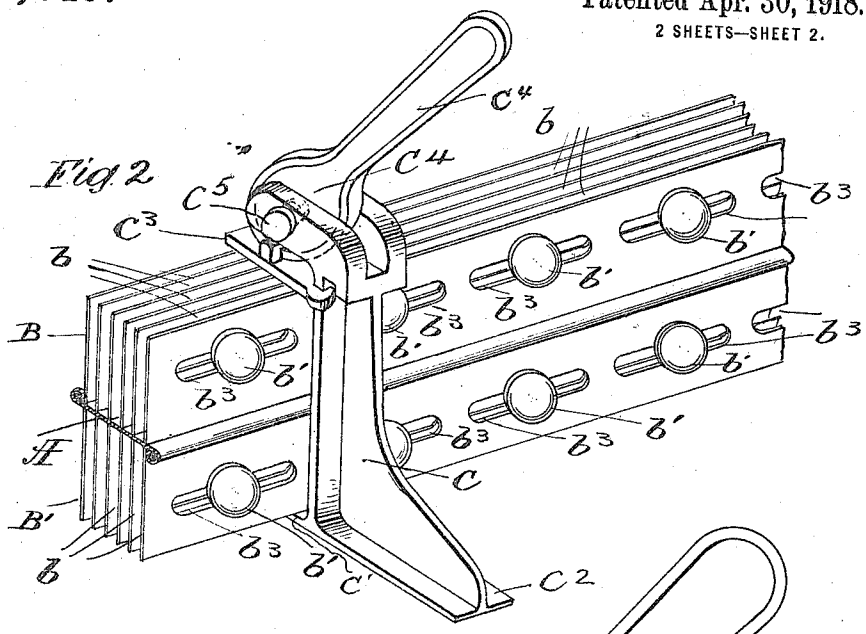
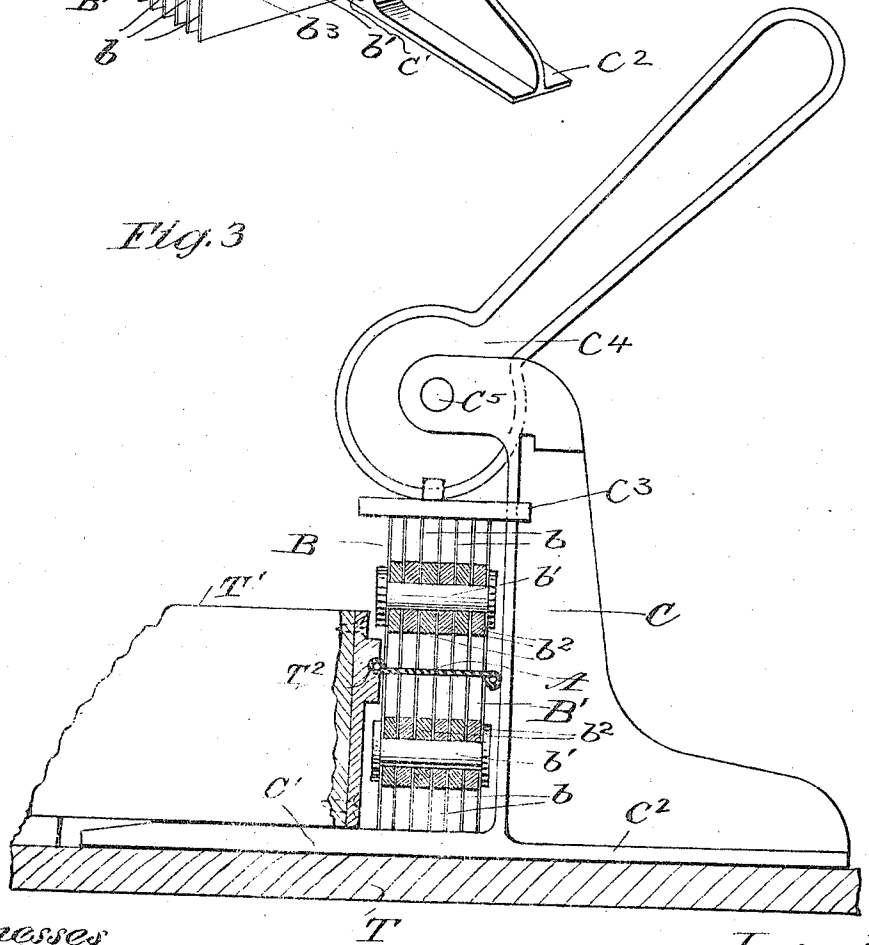


Fig. 3



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UNITED STATES PATENT OFFICE.

CARL M. YODER, OF CLEVELAND, OHIO.

DEVICE USED IN BENDING METAL.

1,264,249. Specification of Letters Patent. Patented Apr. 30, 1918.

Original application filed December 17, 1910, Serial No. 597,769. Divided and this application filed January 18, 1912, Serial No. 672,023. Renewed October 30, 1916. Serial No. 128,633.

To all whom it may concern:

Be it known that I, CARL M. YODER, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Devices Used in Bending Metal, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to metal bending apparatus, more especially an apparatus of the type capable of bending a section, band or strip of sheet metal edgewise or in its own plane. The present invention particularly relates to the means which support the band or strip and prevent it or portions thereof from twisting, bending, springing or becoming distorted while the strip is being bent.

This application is a division of my application Ser. No. 597,769, filed December 17, 1910.

The object of the invention is to provide improved means for supporting and holding the section, band or strip of sheet metal while being bent.

With this and other objects in view, the invention consists of the parts or combinations of parts hereinafter described and referred to in the appended claims.

For the purpose of illustration I have, in the accompanying drawings, shown and herein described one form of apparatus embodying my invention.

Figure 1 is a plan view of a metal bending apparatus having band supporting and holding means embodying my invention.

Fig. 2 is a fragmentary perspective view, enlarged, of the band support and holding means.

Fig. 3 is a transverse sectional view of the parts shown in Fig. 2.

In these figures, A is the metal band shown as the mud rim of an automobile wheel fender which may be provided with reinforcing marginal wires.

This band is extremely difficult to bend edgewise or in its own plane, owing to the tendency of the flat band to flex, spring, buckle and bend in all directions relative to the plane in which the band is disposed. To prevent flexure in any direction the clamping or holding members B, B′ are applied to the opposite faces of the band, they being preferably clamped together and against the band by means of a series of spaced clamps C, C.

Each clamping or holding member comprises a series of relatively thin parallel flexible metal plates b, b engaging on their edges the adjacent face of the metal band. These plates b, b, are rigid in the direction of their edges, but preferably extremely flexible at right angles thereto.

The plates in each member may be connected together by means of bolts b', b', and are preferably spaced apart by means of washers b^2, b^2. The members B, B′, are preferably formed from the same number of plates b; and each plate b of one member B or B′ is preferably disposed in the same plane as one of the plates b of the other member, so that plates of one member will be opposed to the plates of the other member when the members are clamped together. The bolts b' and washers b^2, in addition to their connecting and spacing functions, serve to strengthen the plates b between their upper and lower edges, without affecting the flexibility thereof.

The bolts b' pass through elongated slots b^3, b^3, in the plates, thus permitting the plates to bend in either direction in unison with the metal band A, but will absolutely prevent flexing or bending of the metal band in any direction except edgewise.

Each clamp C comprises a standard, the base portions C′, C^2 of which rest on the table T of the bending machine and extend in opposite directions from the band to prevent the clamp from turning while the band is being bent. The clamping member B′ preferably rests on the base portions C′ of the clamps and supports the band A on its upper surface, while the clamping member B rests on the band A so that the clamping members, when clamped together, will securely hold the band A between them. The clamping device of each clamp C preferably comprises a plate C^3 arranged to engage the upper clamp member B, as shown in Fig. 3, and a cam lever C^4, which engages with and forces the plate C^3 downwardly against the clamp member B. The lever C^4 is pivoted at C^5 on the standard and is provided with a handle, whereby it may be operated to clamp and unclamp the plate C^3.

In Fig. 1 curved formers T′, T′, are shown mounted upon a flat table T. The face of

the former is preferably provided with a groove T^2 to receive the reinforced edge of the band. The formers T' are preferably supported above the table T to permit the base portions C' of the standards to slide therebelow, as shown in Fig. 3. By this construction the lower surface of the former T' and the upper face of the table T coöperate to prevent turning or up-setting of the standard.

When it is desired to bend a band A, it is first positioned and clamped between the clamping members B, B'; one end of the band is then fixed to a suitable support while that end which is to be bent is secured to a movable member, such as the carrier E which may be mounted on a track F. The carrier is then moved laterally carrying with it the band A to bend it around the former T', as shown in Fig. 1. When both ends of the bands are to be bent, then two movable carriers E are provided, the opposite ends of the band being secured to the carriers which may be moved separately or simultaneously as desired.

To those skilled in the art of making apparatus of the class described, many alterations in construction and widely differing embodiments and applications of my invention will suggest themselves, without departing from the spirit and scope thereof. My disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

Having described the invention what I claim as new and desire to secure by Letters Patent is:

1. A device for bending a section of metal comprising a member flexible in a direction parallel to the plane of the metal section and engaging one side of and movable with said metal section during bending thereof, a similar member engaging the other side of and movable with said metal section during bending thereof, and a series of spaced clamping devices movable with said members and arranged to clamp them against the opposite faces of the metal section.

2. A device for bending a section of metal comprising a series of flexible metal plates extending longitudinally of the metal section with corresponding longitudinal edges engaging one flat side thereof, a similar series of flexible metal plates having their longitudinal edges engaging the other side of the metal section, means for slidably attaching the plates of each series together, and means for clamping each said series of plates against the adjacent side of the metal section.

3. A device for bending a section of metal comprising a member engaging each side of the metal section, each said member comprising a series of slidably connected together plates having their edges engaging the adjacent side of the metal section, a series of clamps, and means acting on said clamps to press said members against the opposite sides of the section.

4. In apparatus for bending a section of metal, the combination of a series of parallel plates having their edges engaging one side of the metal section, a similar series of metal plates having their edges engaging the other side of said metal section, said plates being provided with longitudinal slots, connectors passing through said slots, spacers upon said connectors, and means for securely clamping said series of plates upon said metal section.

5. In a device for bending a section of metal, series of plates upon opposite sides of the metal section, the edges of each said series of plates engaging the adjacent side of the metal section, means for slidably securing said plates together, a series of clamp bases on which the metal section and the lower series of plates rest, clamp standards, plates for engaging said upper series of plates, and cam devices mounted in said standards for operating said engaging plates.

6. In apparatus for bending a section of metal, the combination with a support, of a pair of flexible members engaging the opposite sides of and movable with the metal section, and means for clamping said members against the opposite sides of the metal section, said clamping means being movable on said support with said members.

7. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite sides of the metal section, and means for clamping said members against the opposite sides of the metal section, the said clamping means being movable with said flexible members as the metal section is bent.

8. In apparatus for bending a section of metal, a pair of members disposed at right angles to and extending longitudinally of the metal section, whereby they can flex and move with the metal section as it is bent, and spaced devices for clamping said members against the opposite sides of the metal section, said clamping devices being movable with said members as the metal section is bent.

9. In apparatus for bending a section of metal, series of flexible plates extending longitudinally and engaging the opposite sides of the metal section, the plates of each series being arranged side by side and disposed at right angles to the metal section, and means for clamping the series of plates against the opposite faces of the metal section, said clamping means being movable with said plates as the metal section is bent.

10. In apparatus for bending a section of metal, a pair of plates extending longitudinally of the metal section and arranged upon opposite sides thereof, said plates being disposed in the same plane and at right

angles to the metal section with their inner longitudinal edges in engagement therewith, and means engaging the outer longitudinal edges of the plates to clamp their inner longitudinal edges against the opposite faces of the metal section.

11. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite sides of and movable with the metal section, and means for clamping said members thereto, said clamping means being movable with said flexible members while the section of metal is being bent, each of said members comprising a series of plates disposed at right angles to the metal section and engaging the latter along their longitudinal edges, each plate of one member being in the plane of a plate of the other member.

12. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite sides of and movable with the metal section, and means for clamping said members thereto, said clamping means being movable with said flexible members while the section of metal is being bent, each of said members comprising a series of spaced parallel plates disposed at right angles to the metal section and engaging the latter along their longitudinal edges.

13. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite sides of and movable with the metal section, and means for clamping said members thereto, said clamping means being movable with said flexible members while the section of metal is being bent, each of said members comprising a series of uniformly spaced, parallel plates disposed at right angles to the metal section and engaging the latter along their longitudinal edges.

14. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite sides of the metal section, means for clamping said members thereto, each of said members comprising a series of spaced parallel plates extending longitudinally of the metal section, and means for connecting said plates together, but permitting relative longitudinal movement between them.

15. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite sides of the metal section, means for clamping said members thereto, each of said members comprising a series of spaced parallel plates extending longitudinally of the metal section, and a series of devices spaced along said plates for connecting said plates together, but permitting relative longitudinal movement between them.

16. In apparatus for bending a section of metal, a pair of flexible members engaging the opposite faces of the metal section, and means for clamping said members thereto, each of said members comprising a series of spaced parallel plates and means for slidably connecting said plates together.

In testimony whereof, I hereunto set my hand this 13th day of January 1912.

CARL M. YODER.

In presence of—
WM. M. MONROE,
HARVEY O. YODER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."