PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in or relating to Tools for Bending Metal

We, STANLEY EDWARD OPPERMAN, a British Subject, of Greenhill, Ganwick Corner, near Barnet, Hertfordshire, and JOHN HARRISON, A.Mech.E., A.M.I.A.E., a British Subject, of 46, Kent Gardens, Ealing, London, W.13, and JUNEERO LIMITED, a British Company, of 25, White Street, Moorfields, London, E.C.2, do hereby declare the nature of this invention to be as follows:—

This invention relates to tools for bending metal.

In Patent No. 441,157 is described a device by means of which metal strip or rod may be sheared, angularly bent, curved or perforated, and which is intended primarily for the production of the parts required for constructional toys of the type employing perforated metal strips adapted to be bolted or otherwise secured together.

The object of the present invention is to provide an improved tool for bending into curved shape metal strip or rod such as is used with the above mentioned device, the tool being intended chiefly for use in the production of curved shaped parts for constructional toys.

The invention comprises a bending block of metal having curved surfaces of different diameters and a leverage plate attached thereto.

According to one practical form of the present invention the tool comprises a member of semi-circular cross sectional shape consisting preferably of a series of integrally formed short half-cylinders having a common longitudinal axis and of increasing diameter from one end, with a leverage plate internally stepped, to accord to the varying diameters of the half-cylinder and fixed longitudinally to said member such that the steps are spaced a slight distance beyond the outer circumferences of the half-cylinders for the insertion for leverage purposes of the metal parts between the step and the circumference whereby the parts may be bent to any required radius either by pressing the parts completely round the circumference of one of the half-cylinders, thus producing a curvature of known radius or by edging the part between the step and the circumference using only a small portion of the length of said circumference thus producing a curvature of any radius or by turning the part a spiral or any other curved shape may be produced. Preferably means will be provided for fixing the tool on to a bench or the like.

In one way of carrying out the invention one member of the tool, which may be about three inches long, comprises a number of integrally formed half-cylinders, of length about half an inch, having a common longitudinal axis and of increasing diameter, the shape of the member being substantially that which would be obtained by cutting in half along a longitudinal axis the stepped speed cones of a turning lathe. Around the outer periphery of each of the half-cylinders is formed a recess for use in bending metal rods of substantially circular section. Attached longitudinally by screws to the flat side of the semi-circular member is a leverage plate suitably internally stepped so that each step is spaced a slight distance away from an edge of the corresponding half-cylinder for insertion of the metal strip or rod between said edge and said step for leverage purposes when bending the metal.

The leverage plate is preferably extended at one end of its length and shaped to form opposite jaws with a clamping screw in one of said jaws whereby the tool may be fixed to a bench or the like.

Dated this 13th day of February, 1939.

WHEATLEY & MACKENZIE
40, Chancery Lane, London, W.C.2,
Agents.

COMPLETE SPECIFICATION

Improvements in or relating to Tools for Bending Metal

We, STANLEY EDWARD OPPERMAN, a British Subject, of Greenhill, Ganwick Corner, near Barnet, Hertfordshire, and JOHN HARRISON, A.Mech.E.,

[Price]

A.M.I.A.E., a British Subject, of 46, Kent Gardens, Ealing, London, W.13, and JUNEERO LIMITED, a British Company, of 25, White Street, Moorfields, London, E.C.2, do hereby declare the nature of this invention and in what manner the same is to performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to tools for bending metal.

In Patent No. 441,157 is described a device by means of which metal strip or rod may be sheared, angularly bent, curved or perforated, and which is intended primarily for the production of the parts required for constructional toys of the type employing perforated metal strips adapted to be bolted or otherwise secured together.

The object of the present invention is to provide an improved tool for bending into curved shape metal strip or rod such as is used with the above mentioned device, the tool being intended chiefly for use in the production of curved shaped parts for constructional toys.

Known tools for bending metal pipes and rods in the cold state comprise a bending block of metal having one or more curved bending surfaces and a leverage member attached thereto.

According to the present invention the bending block is made substantially in the form of one half of a stepped cone and the leverage member consists of a plate formed internally with steps or stepped slots corresponding and adjacent to the various curved bending surfaces of the block.

In one practical form of the invention the tool comprises a member of semi-circular cross sectional shape, preferably consisting of a series of integrally formed short half-cylinders having a common longitudinal axis and the diameter of successive half-cylinders being larger than the preceding half-cylinders from one end, with a leverage plate, internally stepped according to the diameters of the various half-cylinders and fixed longitudinally to said member such that the steps are spaced a slight distance beyond the outer circumferences of the half cylinders, for the insertion of the metal parts between the step and the circumference for leverage purposes whereby the parts may be bent to any required radius, either by pressing the parts completely round the circumference of one of the half-cylinders, thus producing a curvature of known radius, or by edging the part between the step and the circumference using only a small portion of the length of said circumference thus producing a curvature of any radius, or, by turning the part, a spiral or any other curved shape may be produced. Means are preferably provided for fixing the tool onto a bench or the like.

According to one embodiment, one member of the tool, which may be about three inches long, comprises a number of integrally formed half-cylinders, of length about half an inch, having a common longitudinal axis, the diameter of each successive half-cylinder being larger than the preceding half-cylinder from one end, and the shape of the member being substantially that which would be obtained by cutting in half the stepped speed cones of a turning lathe. The diameters of the half-cylinders may, for instance, extend from one inch to two inches, proceeding in successive $\frac{1}{4}$ inch steps. Around the outer periphery of each of the half-cylinders a recess is formed for use in bending metal rods of substantially circular section. Attached longitudinally by screws to the flat side of the semi-circular member a leverage plate is provided, the said plate being suitably internally stepped so that each step is spaced a slight distance away from an edge of the corresponding half-cylinder for insertion of the metal strip or rod between said edge and said step for leverage purposes when bending the metal.

The leverage plate is preferably extended at one end of its length and shaped to form opposite jaws with a clamping screw in one of said jaws whereby the tool may be fixed to a bench or the like.

In another form of the invention, one tool consists of a number of unlike curved surfaces of similar dimensions, so that metal strips or rods may be bent to various different forms.

In the accompanying illustrative drawings: —

Figure 1 is a side view of an embodiment of the invention,

Figure 2 is a side view of the embodiment of Figure 1 from the opposite side to Figure 1.

Figure 3 is an end view of the embodiment of Figures 1 and 2.

Figure 4 is an end view of the embodiment of Figures 1, 2 and 3 from the opposite end to Figure 3.

The embodiment of the invention as illustrated comprises a member 1, preferably a hollow metal casting, comprising a series of integrally formed half-cylinders 2, 3, 4, 5 and 6, the diameters of the half-cylinders being progressively larger from 2 to 5. Recesses

7, 8, 9, 10, 11 are provided around the outer periphery of the half-cylinders 2, 3, 4, 5 and 6 respectively for use in bending metal rods or wire. Attached to one edge of the flat side of the member 1, by means of bolts 12, 13 is a flat leverage plate 14 provided with internal steps 15, 16, 17, 18 and 19 corresponding to the half-cylinders 2, 3, 4, 5 and 6 respectively. The plate 14 is preferably extended in the form of an arm 20 which is curved round as at 21 and provided with a thread for receiving a clamping bolt 22 for clamping the tool to a bench or the like between the jaw 23 and the end surface 24 of the member 1, provided with a projection 25 for gripping purposes.

When it is desired to bend a metal strip to the diameter of the half-cylinder 2, for instance, the metal strip is inserted in the slot between the half-cylinder 2 and the step 15 of the plate 14 so that the said step abuts against that point in the metal strip where the curve is to commence. The metal strip is then bent round the half-cylinder 2 to the desired extent and removed. If a metal rod is to be bent to the same diameter, the said rod is inserted in the same slot and in the recess or groove 7 and is bent round in the same manner as the metal strip.

Obviously the tool may be of any desired dimensions and each of the curved surfaces may be of any desired shape. For instance, one tool may include a number of like curved surfaces of different dimensions or it may include a number of unlike curved surfaces of similar dimensions.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1.) A tool for bending metal strip or rod into curved shape comprising a bending block of metal provided with different curved bending surfaces and a leverage member attached thereto wherein the bending block is made substantially in the form of one half of a stepped cone and the leverage member consists of a plate formed internally with steps or stepped slots corresponding to the various curved bending surfaces and adjacent thereto.

2.) A tool according to claim 1 wherein the curved surfaces are of the same shape but are of different dimensions.

3.) A tool according to claim 2 wherein each of the curved surfaces is semi-circular.

4.) A tool according to claim 1 wherein the curved surfaces are of different shapes.

5.) A tool according to any of the preceding claims wherein a groove or recess is provided in the outer periphery of each of the curved surfaces for the specific purpose of bending metal rods or wire.

6.) A tool according to any of the preceding claims wherein the leverage plate is provided with an extension which carries a clamping screw and jaw for clamping the tool to another tool or to a bench or the like.

7.) A tool for bending metal strip or rod into curved shape substantially as herein described and illustrated in the accompanying drawing.

Dated this 26th day of October, 1939.
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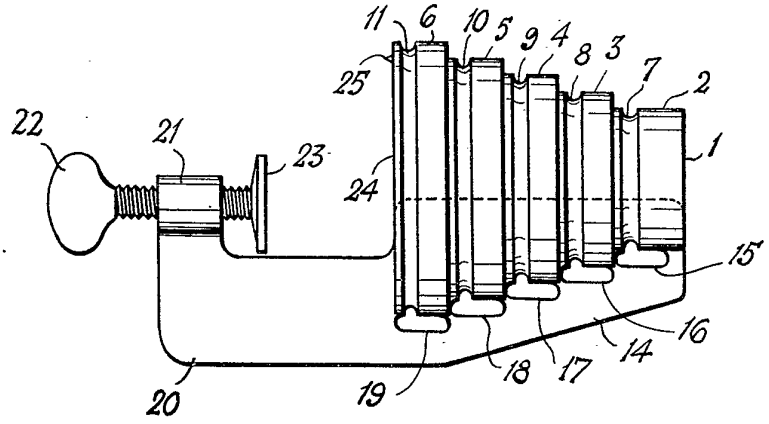


FIG. 1.

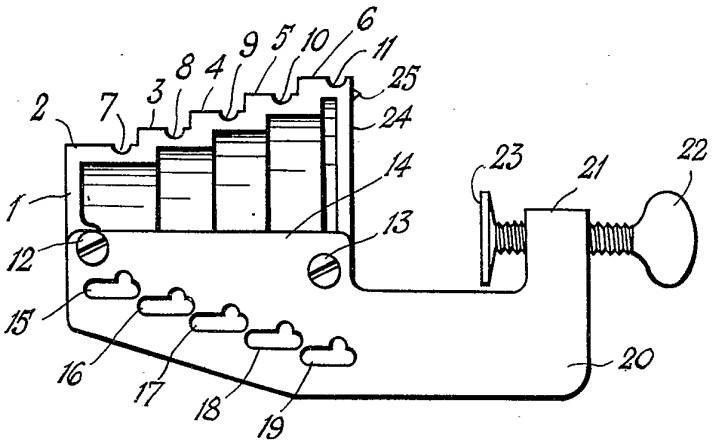


FIG. 2.

FIG. 3.

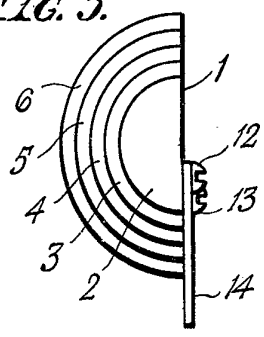
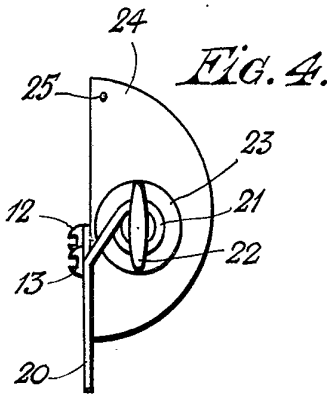


FIG. 4.



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