

July 17, 1923.

H. R. KENNEDY

1,461,853

SHEET METAL ROLLING MACHINE FOR FENDERS AND THE LIKE

Filed Sept. 3, 1921

4 Sheets-Sheet 1

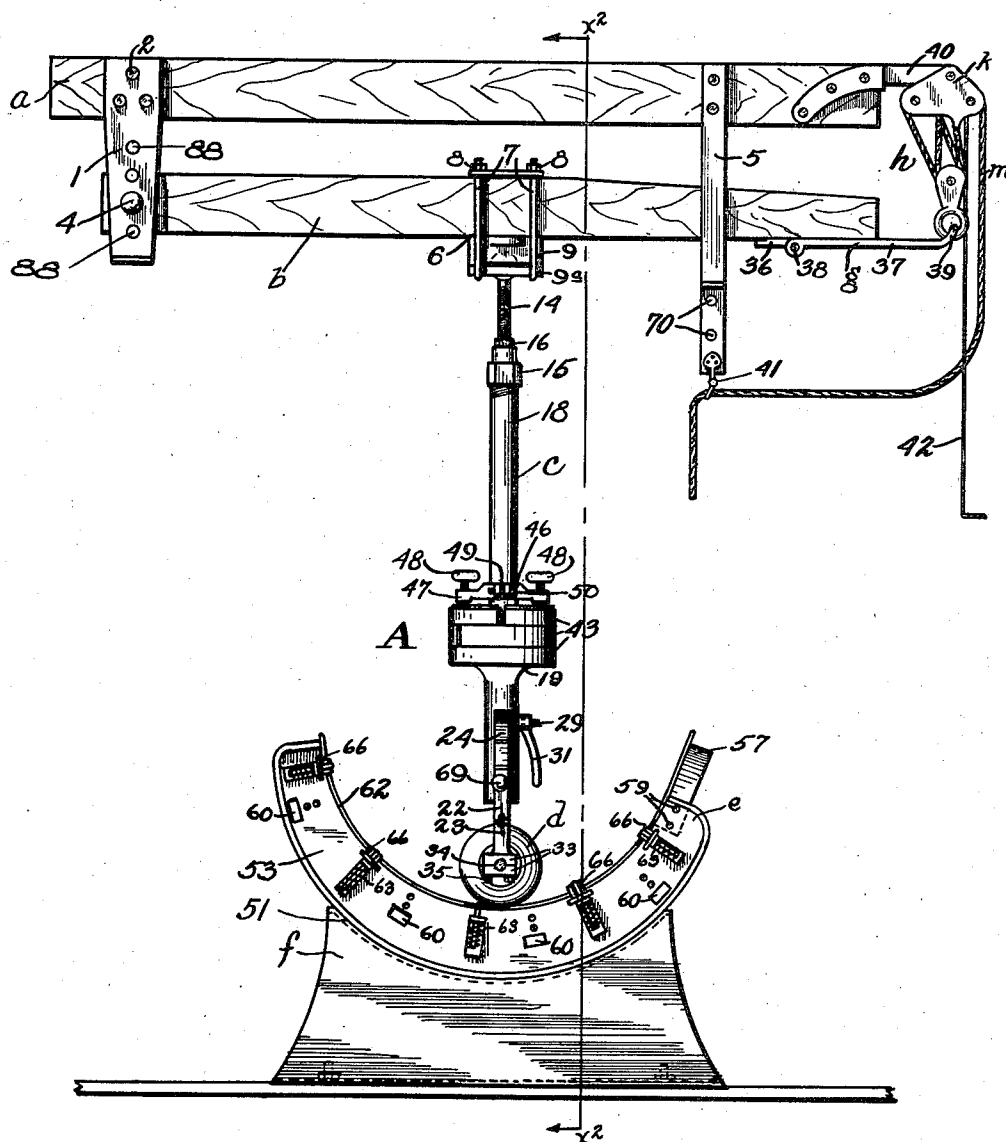


Fig. 1.

INVENTOR,
Homer R. Kennedy;
BY *Raymond H. Hulse*
ATTORNEY.

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4 Sheets-Sheet 2

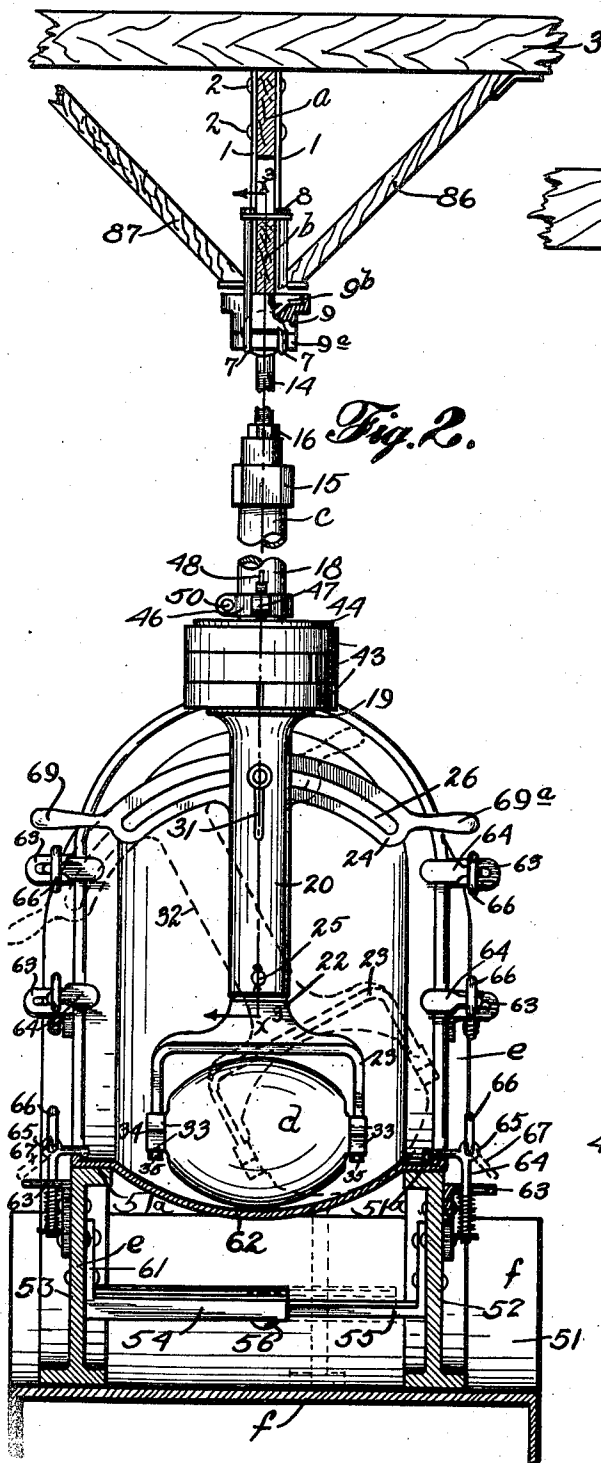


Fig. 2.

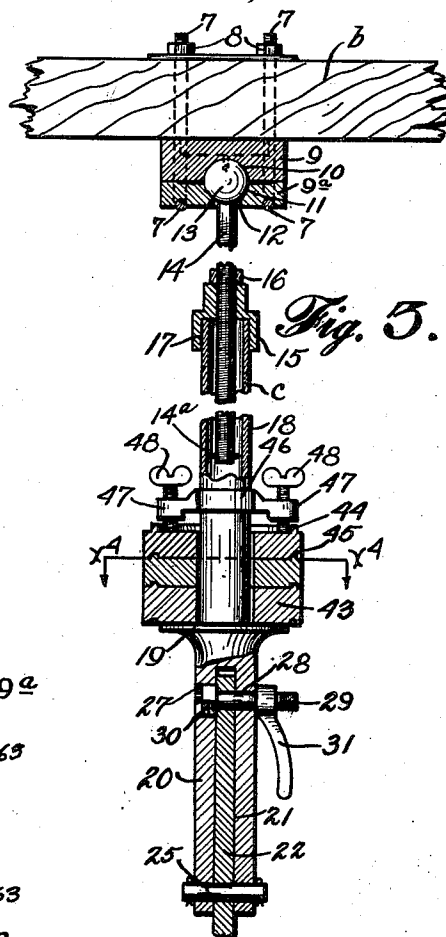


Fig. 3.

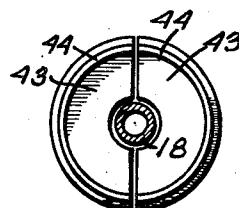


Fig. 4.

INVENTOR,
Homer R. Kennedy,
BY *Raymond H. H. H. H.*
ATTORNEY.

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4 Sheets-Sheet 3

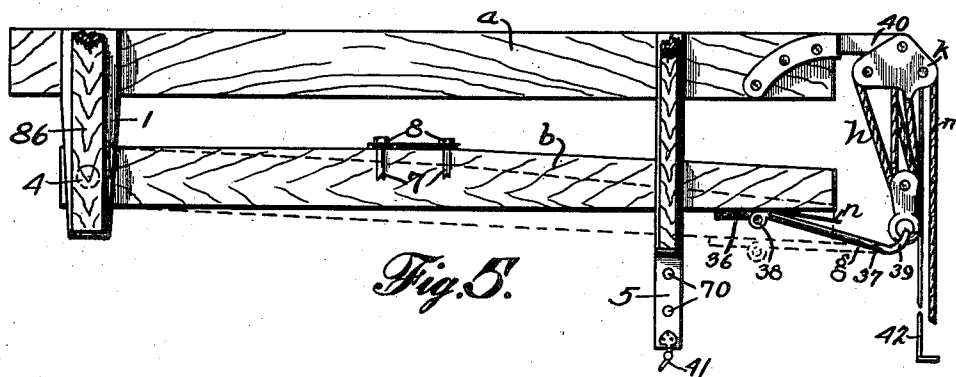


Fig. 5.

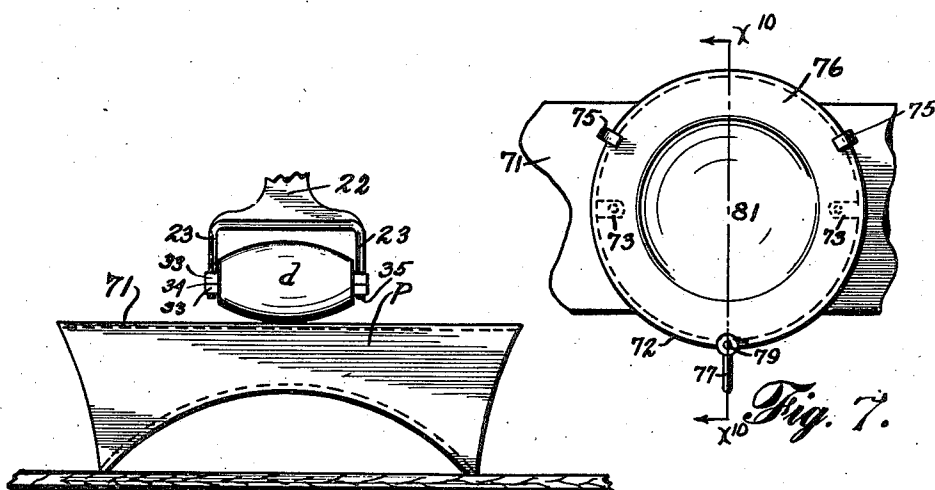


Fig. 6.

INVENTOR,
Homer R. Kennedy;
BY *Reginald H. H. H. H. H.*
ATTORNEY.

July 17, 1923.

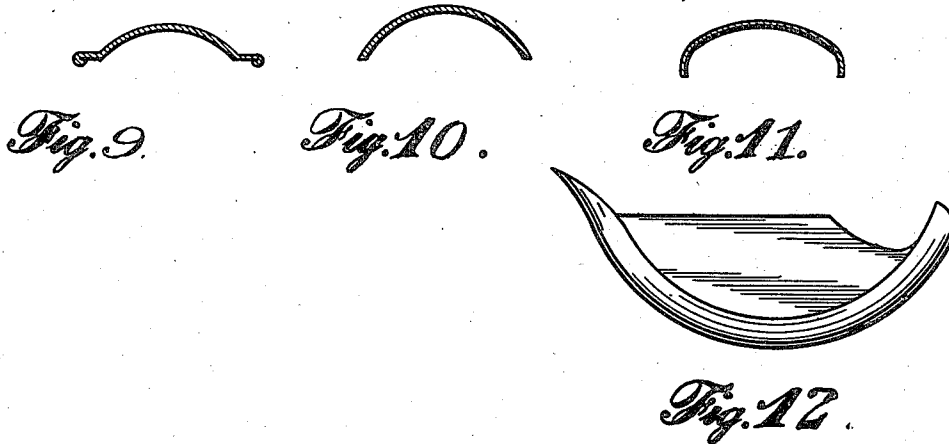
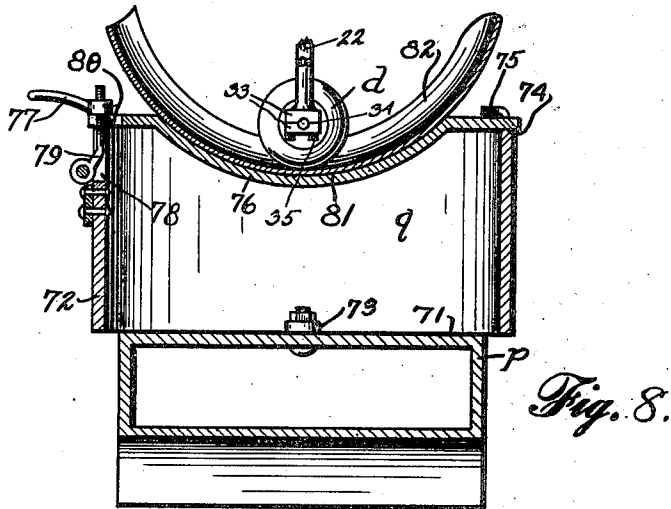
H. R. KENNEDY

1,461,853

SHEET METAL ROLLING MACHINE FOR FENDERS AND THE LIKE

Filed Sept. 3, 1921

4 Sheets-Sheet 4



INVENTOR,
Homer R. Kennedy;
BY *Raymond H. H. H. H.*
ATTORNEY.

Patented July 17, 1923.

1,461,853

UNITED STATES PATENT OFFICE.

HOMER R. KENNEDY, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO JOSEPH J. MATHE,
OF LOS ANGELES, CALIFORNIA.

SHEET-METAL-ROLLING MACHINE FOR FENDERS AND THE LIKE.

Application filed September 3, 1921. Serial No. 498,354.

To all whom it may concern:

Be it known that I, HOMER R. KENNEDY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Sheet-Metal-Rolling Machines for Fenders and the like, of which the following is a specification.

This invention relates to sheet metal tools, and particularly to a sheet metal tool adapted to crown or form fenders or other sheet metal objects.

The invention has for an object the provision of a device which will form sheet metal into various shapes with a minimum of time and labor expended, and which will perform its work in a superior manner.

This invention is an improvement upon and a departure from the invention of Robert W. Carter for improvements in sheet metal working machines for fenders and the like, U. S. Letters Patent No. 1,244,422, issued October 23, 1917.

In practicing the invention I provide a sheet metal rolling machine which incorporates in its simplest embodiment a template member or a forming member and a member co-operating therewith. The template member carries the sheet metal to be formed, while the second member rolls over the sheet metal and the template and presses or forms the sheet metal into the desired shape. It is customary to hand-peen or to strike out at one blow automobile fenders. When metal is treated in this manner, however, it is subjected to great stress at certain parts thereof, which weakens the entire structure. In accordance with my invention, the metal is stretched gradually and formed without weakening it, such as would occur when the metal is stamped. When metal is stamped it is impossible for it to "follow," due to the quickness of the stamping operation. My device does not crystallize, abrade, or harden the metal, as is the case with hand-peening or hammering. A device of this character performs a neat job upon the metal to be formed and the finished product does not require buffing or finishing of any kind, but the sheet metal is immediately ready for enameling.

The invention has for further objects the provision of an improved sheet metal machine of the character described which will

be superior in point of relative simplicity and inexpensiveness, taken in conjunction with utility, durability and general efficiency and serviceability.

With the above mentioned and other objects in view, the invention consists in the novel and useful provision, formation, construction, combination, association and interrelation of parts, members and features, as illustrated in some of its embodiments in the accompanying drawings, described in the following detailed statement, and finally pointed out in claims.

In the drawings:

Figure 1 is an elevation of my improved sheet metal working machine;

Figure 2 is a fragmentary front elevation of the machine shown in Figure 1, taken on the line x^2-x^2 , Figure 1, and looking in the direction of the appended arrows;

Figure 3 is a fragmentary cross sectional view taken on the line x^3-x^3 , Figure 2, and looking in the direction of the appended arrows;

Figure 4 is a plan view of weight members used in practicing the invention, said view being taken on the line x^4-x^4 , Figure 3, and looking in the direction of the appended arrows;

Figure 5 is a detail of certain elements used in practicing the invention;

Figure 6 is a fragmentary elevation showing a base member in conjunction with a roller member used in practicing the invention;

Figure 7 is a fragmentary top plan view of certain forming members used in practicing the invention;

Figure 8 is a cross sectional view taken on the line x^8-x^8 , Figure 7, looking in the direction of the appended arrows;

Figures 9, 10, 11 and 12 illustrate sheet metal objects after being formed into various shapes by the device.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawings, I have designated the sheet metal working machine in its entirety as A, of which *a* is a structure, *b* a fulcrumed lever arm, *c* an oscillating or working arm, *d* a roller member, *e* a mold or template, and *f* a base or seat member,—all of which elements are used in practicing one embodi-

ment of my invention. The elements shown from *a* to *d* inclusive, are more or less standardized, while the elements *e* and *f* may assume a variety of shapes and forms as will more fully appear in the body of the specification.

The structure *a* may be the beam of a building or may be a separate piece joined to some structure, so that the same may be supported above the template or mold *e* and the base *f* in order that the roller *d* may operate upon the template *e* and material carried by the template. The structure has pendent therefrom two cheek or fulcrum plate members 1, the said cheeks being held on opposite sides of the structure *a*, as by means of bolts 2. As stated, the structure *a* may be joined with a further structure as 3. The lever arm is fulcrumed at any one of several points between the cheek members 1, as shown at 4. Said lever arm is further confined between two brackets 5 to prevent the lever arm from having lateral play. Joined to said lever arm as at 6 is the oscillating arm *c*. To hold the arm *c* I provide U-bolts 7 straddling opposite faces of said lever arm and held by means of nuts 8. The means for holding the arm *c* also includes a block 9 provided with a curved seat 10, and a further block 9^a likewise formed with a curved seat 11 and with an opening 12 communicating with said curved seat. The two blocks are held together beneath the arm *b* by means of the U-bolts 7. Normally confined within the curved seats at 10 and 11 is a ball 13 which ball has a screw threaded stem 14 joined therewith and passing through the opening 12. A hexagonal reducing coupling 15 with a lock nut 16 receives the stem 14. Said member 15 is screw-threaded as at 17 for reception of a member 18, which is annular in form for a certain distance to where it forms an annular flange 19. The remaining portion as shown at 20 of said member 18 is slotted as shown at 21. A shank 22 is provided at one end with a yoke 23, and at the other end with a quadrant member 24. The shank 22 and the quadrant member 24 are adapted to be received within the slot 21. Both the portion 20 of the member 18, and the shank 22 are perforated for reception of a bolt 25. Thus the shank 22 may be oscillated back and forth within the slot 21. Said quadrant member 24 is provided with a curved slot 26. The portion 20 of the member 18 is provided with an enlarged transverse opening 27 and a smaller transverse opening 28. A bolt member 29 is adapted to be passed through said openings 27 and 28 and the opening 27 is large enough to receive the head, as 30, of said bolt. Said bolt 29 likewise passes through the curved slot 26 of the quadrant member 24. The bolt 29 carries

a tail nut 31. Thus by turning the tail nut upon the threads of the bolt 29 the head 30 of said bolt will be drawn against the shank 22 locking the shank in any one of a plurality of positions, one of which positions is illustrated by dotted lines 32 in Figure 2. The yoke 23 is provided with two journaled portions 33 which are adapted to receive the gudgeons carried by the roller *d*. The roller *d* is oval in shape; that is to say, it is circular in transverse section and oval in longitudinal section. The journaled portions 33 are split as indicated at 34, the split portions being held together by screws or the like 35, so that the roller *d* may be changed and other rollers of various shapes substituted therefor.

A hinged arm or compensating arm *g* is joined with the lever arm *b*. A portion of said arm *g* is fixed to the lever arm, as indicated at 36, while the remaining portion, as 37, is hinged to the portion 36, as shown at 38. The free end of the portion 37 is formed with an eye 39 and tackle means *h* is joined with said eye member. Said tackle means includes a tackle block *k* provided with a differential clutch and with the usual operating rope *m*. Thus by pulling on the operating rope *m* it is possible to lift the lever arm *b* in any one of several positions. Beneath the arm *b* is a spring *n* which is adapted to contact with the portion 37 of the means *g* and to keep said portion *g* normally away from the arm *b*. The tackle block *k* is held to the structure *a* by means of an arm 40. The operating rope *m* after passing through the tackle block may extend over to where it is carried by a rope hook 41 on the members 5. The tackle block likewise has a clutch release 42 so that after the operating rope has been pulled so as to adjust the lever arm for a certain height the lever arm will not slip until the differential clutch is released by the means 42. The flange 19 acts as a seat for receiving any one of a number of split weight blocks 43, which blocks are provided with ring flanges 44 on one surface thereof and a corresponding curved groove 45 on the other surface, the ring flange of one block fitting within the curved groove of the next adjacent block. This arrangement allows for securely locking the blocks. A member 46 has a portion thereof slidable upon the member 18 and said member 46 is provided with two arms 47 carrying wing bolts 48 passing through said arms 47 and adapted to contact with a surface of the weight blocks 43. Said member 46 is split at a portion thereof as at 49 and provided with two outstanding spaced lugs. A bolt 50 passes through threaded perforations in said lugs so that by turning the bolt member 50 it is possible to securely clamp the

member 46 to the member 18. The elements just described are standard for all functions to be performed by this machine. The remaining devices to be described may vary in accordance with the work to be performed.

Referring to Figure 1 I have shown a base member *f* having a curved seat 51 upon which seat the plate or template *e* may be received.

Referring to Figure 1, the template sides *e* are adjusted to a pre-determined width and a head 57 is connected therewith and the metal to be worked or formed into a given shape is then locked upon said template *e* by means of the clamps 64. We will assume that the sheet metal to be worked is that indicated at 62 in Figure 2. The template *e* is placed upon the base *f*, and the differential clutch is released through the medium of the arm 42 and by grasping the operating rope the lever arm *b* is slowly lowered so that the roller member *d* may come in contact with the sheet metal 62. After this is done and the necessary weights 43 have been placed upon the oscillating arm *c* an operator grasps the handle members 69 and 69^a of the quadrant member 24 and imparts universal oscillation to the roller *d* so as to pass the same uniformly over the sheet metal 62 and form it to the template *e*, producing, in the instance under discussion, an automobile fender. It is to be particularly noted that as the arm *c* is oscillated the arm *b* oscillates up and down freely, inasmuch as the arm *g* is at all times kept away from the arm *b* through the medium of the spring *n*. This is very important, as it allows the arm and the roller carried by said arm to assume any one of several positions without in any manner binding the arm *b*. In other words, the spring *n* acts as a compensating medium between the arm *b* and the arm *g*. If for any reason the arm *b* should suddenly drop, due to a slippage of the clutch in the tackle block *k*, I prevent an excessive drop by placing a pin through any one of a number of pairs of perforations 70 in the guide arms 5.

In Figure 6 I have shown a template base *p* having a flat upper surface 71. A piece of metal can be slightly crowned by placing the same on the flat surface of the base and moving the roller member *d* over the same. It is best to place some form of flexible or yieldable board over the upper surface 71, rather than place the metal to be formed on the surface 71, as the board may be compressed giving aid in crowning the material.

In Figures 7 and 8 I have shown a further form of a template or forming member designated in its entirety as *q*, which template includes a ring member 72 provided with inwardly directed lugs 73 which are formed with transverse perforations,

and a bolt is adapted to be passed through transverse perforations in the top member of the base *p* and through the perforation in the lugs 73, whereupon a nut carried by the bolt may securely lock the ring member to the base *p*. The marginal edge 74 of the ring member 72 is provided with a plurality of spaced inwardly directed brackets 75. The ring member is adapted to carry a bowl 76. Said bowl is received between the bracket 75 and clamped in position upon the ring member by means of a tail nut 77. To accomplish this clamping I slot a portion of the ring member 72 as shown at 78 and a pivoted bolt 79 is carried by the ring member and adapted to be received within the slot 78. The bowl 76 is likewise slotted as at 80 and the bolt 79 when swung upon its pivot will pass within the slot 78 and the slot 80, whereupon by turning the tail nut 77 said nut will bear against the top surface of the bowl 76. The bowls are made in various shapes and forms and of varying depths. As before stated, the metal to be worked is placed within a curved or depressed portion 81 of the bowl 76 and the roller *d* brought to bear upon said metal, as 82, so as to form it to the desired shape. These bowl members 76 are particularly adapted to form fully crowned fenders or the ends of gas tanks, etc. Obviously bowls of varying depths may be provided so as to form various crowning depths in the metal.

Figures 10 and 11 show completed fenders formed by a bowl such as that illustrated at 76. The fender shown in Figure 11 is formed by the template *e*, while the fender illustrated in Figure 12 is formed by the template *e* acting in conjunction with the base *p* after the fender has received a sufficient crown. It is thus seen that very complicated shapes of metal objects may be readily formed, such metal objects having a deep crown at one point, a straight portion, a reverse curve at another portion, and then a further crown. All of this is easy of accomplishment with this machine.

The ball 13 allows the arm *c* to have a universal swing. Bracket members 86 and 87 may be joined to the cheeks 1 and with the supporting structures 3 so as to securely brace the cheeks 1. Perforations 88 in the cheeks 1 allow for adjustment of the lever arm *b*.

The member 9 is provided with an oil cup 9^b for lubricating the bearing so that the ball member may move easily. Attention is also drawn to the fact that the member 14 carries a stop pin 14^a so as to limit its movement.

It is obvious that many changes and variations and modifications may be made in departure from the particular description and showing of the accompanying drawings, in adapting the invention to varying condi-

tions of use and service, without departing from the true spirit of the invention.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

5 1. A sheet metal working machine, including a structure, a lever arm fulcrumed to said structure, an oscillating arm joined with said lever arm, a roller member carried by the free end of said oscillating arm,
10 a template adapted to receive work, the said roller member and said template co-acting in the forming of said work; said lever arm being provided with means allowing free movement at an end of said lever arm upon
15 moving said oscillating arm; said means including a compensating lift arm joined to the free end of said lever arm and means joined to said compensating lift arm for supporting said compensating lift arm.

20 2. A sheet metal working machine, including a structure, a lever arm fulcrumed to said structure, an oscillating arm joined with said lever arm, a roller member carried by the free end of said oscillating arm,
25 a template adapted to receive work, the said roller member and said template co-acting in the forming of said work; said lever arm being provided with means allowing free movement at an end of said lever
30 arm upon moving said oscillating arm; said means including a compensating lift arm joined to the free end of said lever arm and means joined to said compensating lift arm for supporting said compensating arm; there
35 being means between said compensating lift arm and the lever arm for resiliently separating said compensating lift arm and said lever arm from each other.

40 3. In a sheet metal working machine, including a structure, cheek members joined to said structure, a lever arm fulcrumed between said cheek members, guide members joined to said structure and adjacent opposite faces of said lever arm at its free end, a
45 hoisting block joined to said structure, a compensating lift arm hingedly connected at the free end of said lever arm, said hoisting block likewise being joined to said compensating lift arm whereby the lever arm
50 may be raised or lowered.

4. In a sheet metal working machine, including a structure, cheek members joined to said structure, a lever arm fulcrumed between said cheek members, guide members
55 joined to said structure and adjacent opposite faces of said lever arm at its free end, a hoisting block joined to said structure, a compensating lift arm hingedly connected at the free end of said lever arm, said hoisting
60 block likewise being joined to said compensating lift arm whereby the lift arm may be raised or lowered; said cheek members being formed with a plurality of perforations arranged in pairs, a pin passing
65 through certain of said perforations and

engaging the lever arm and whereby the lever arm may be adjusted as to height.

5. In a sheet metal working machine, including a structure, cheek members joined to said structure, a lever arm fulcrumed between said cheek members, guide members joined to said structure and adjacent opposite faces of said lever arm at its free end, a
70 hoisting block joined to said structure, a compensating lift arm hingedly connected at the free end of said lever arm, said hoisting block likewise being joined to said compensating lift arm whereby the lever arm and compensating lift arm may be raised or
75 lowered; there being an oscillating arm joined to said lever arm.

6. In a sheet metal working machine, including a structure, cheek members joined to said structure, a lever arm fulcrumed between said cheek members, guide members joined to said structure and adjacent opposite faces of said lever arm at its free end, a
85 hoisting block joined to said structure, a compensating lift arm hingedly connected at the free end of said lever arm, said hoisting block likewise being joined to said compensating lift arm whereby the lever arm may be raised or lowered; said cheek members being formed with a plurality of perforations arranged in pairs, a pin passing
90 through certain of said perforations and engaging the lever arm and whereby the lever arm may be adjusted as to height; there being an arm pendent from said lever arm; said arm including a threaded stem provided with a ball at an end thereof, a journaled plate carried by the lever arm and
95 said ball being received therein, a reducing coupling carried by said stem and a tubular extension carried by the reducing coupling, and means for locking said stem to said reducing coupling.

7. In a sheet metal working machine, including a structure, cheek members joined to said structure, a lever arm fulcrumed between said cheek members, guide members joined to said structure and adjacent opposite faces of said lever arm at its free end, a
110 hoisting block joined to said structure, a compensating lift arm hingedly connected at the free end of said lever arm, said hoisting block likewise being joined to said compensating lift arm whereby the lever arm may be raised or lowered; said cheek members being formed with a plurality of perforations arranged in pairs, a pin passing
115 through certain of said perforations and engaging the lever arm and whereby the lever arm may be adjusted as to height; there being an arm pendent from said lever arm; said arm including a threaded stem provided with a ball at an end thereof, a journaled plate carried by the lever arm and said ball being received therein, a reducing coupling carried by said stem and a tubular extension
120
125
130

sion carried by the reducing coupling, and means for locking said stem to said reducing coupling; said tubular extension being formed with a flanged portion, there being weight members adapted to be carried by said flanged portion.

8. A sheet metal working machine, including an oscillating arm provided with a ball member at an end thereof, and a template member adapted to carry work to be formed by co-action of the template and ball resultant upon oscillation of said arm; said arm member being formed with a flanged portion, there being weight members carried on said flanged portion, and means for detachably maintaining said weight members on said flange.

9. A sheet metal working machine, including an oscillating arm provided with a ball member at an end thereof, and a template member adapted to carry work to be formed by co-action of the template and ball resultant upon oscillation of said arm; said arm member being formed with a flanged portion, there being weight members carried on said flanged portion, and means for detachably maintaining said weight members on said flanged portion; each of said weight members comprising a split annular member having one surface thereof formed with a curved groove, and its opposite surface formed with an upstanding curved flange, the curved flange of one weight member being received within the curved groove of the next adjacent weight member for maintaining the same in position.

10. A sheet metal working machine, including an oscillating arm, formed with a slot therein, a shank member received within the slot of said arm, said shank member being pivotally joined to the said arm; a locking quadrant carried by an end of said shank member and a yoke member carried at the opposite end of said shank member; a roller member journaled within said yoke member; there being means for adjusting said shank member at an angle with relation to said oscillating arm.

11. A sheet metal working machine, including an oscillating arm formed with a slot therein, a shank member received within the slot of said arm, said shank member being pivotally joined to the said arm; a locking quadrant carried by an end of said shank member and a yoke member carried at the opposite end of said shank member; a roller member journaled within said yoke member; there being means for adjusting said shank member at an angle with relation to said oscillating arm; said locking quadrant comprising an arcuate arm member formed with a slot therein, and said means for locking the shank member in various positions comprising a lock bolt passing through said

arm and slot in the quadrant member and adapted to have a portion bear against said quadrant member.

12. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the interaction of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus.

13. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the interaction of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto.

14. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the interaction of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto, said means comprising a plurality of bracket members, one of which is adjustable.

15. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the interaction of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto; there being a base member adapted to carry said annulus.

16. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the interaction of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto; there being a base member adapted to carry said annulus; said base member and said annulus being formed with means whereby the annulus may be secured to said base member.

17. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for

being formed into various shapes by the inter-action of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto; there being a base member adapted to carry said annulus; said base member and said annulus being formed with means whereby the annulus may be secured to said base member; said base member being formed with a flat upper face.

18. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the inter-action of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto, said means comprising a plurality of bracket members, one of which is adjust-

able; said bowl member being slotted at a portion thereof and adapted to receive said adjustable bracket.

19. A sheet metal working machine, comprising an oscillating arm, a roller member carried by said oscillating arm and a template upon which work may be placed for being formed into various shapes by the inter-action of the template and roller on the work; said template including an annulus and a bowl member carried by said annulus; said annulus being provided with means adapted to secure said bowl member thereto, said means comprising a plurality of bracket members, one of which is adjustable; said bowl member being formed with depressed portions.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

HOMER R. KENNEDY.

Witnesses:

J. SHUTT,

J. CALVIN BROWN.