Jan. 16, 1934. H. MAYWEG 1,944,096

APPARATUS FOR MAKING BUTT JOINED TUBES AND PIPES

Original Filed June 1, 1927 4 Sheets-Sheet 1

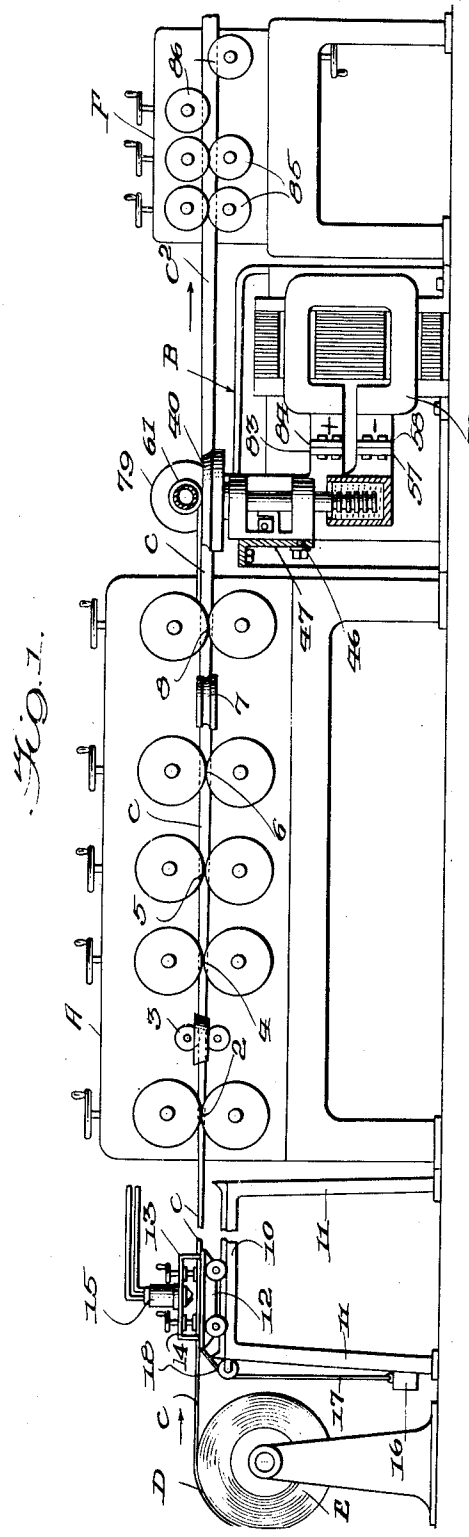


Fig. 1.



Fig. 5.

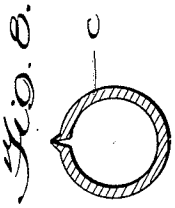


Fig. 8.



Fig. 4.

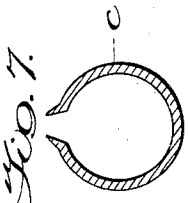


Fig. 7.

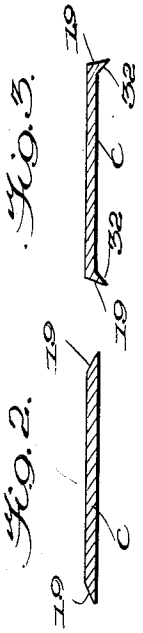


Fig. 3.

Fig. 2.

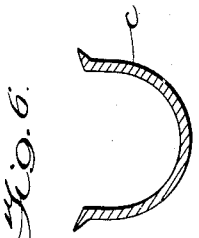


Fig. 6.

Inventor
Hugo Mayweg,
By Howard Howard
his Attorneys

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APPARATUS FOR MAKING BUTT JOINED TUBES AND PIPES

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Fig. 9.

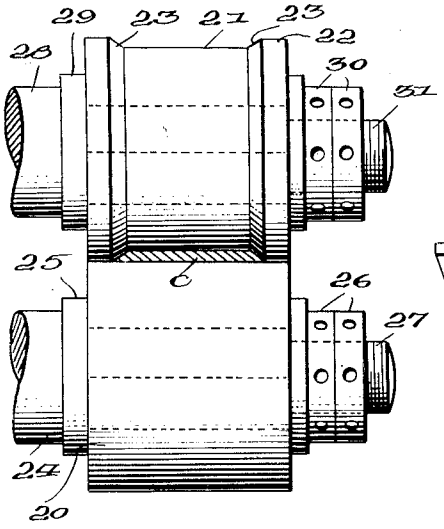


Fig. 10.

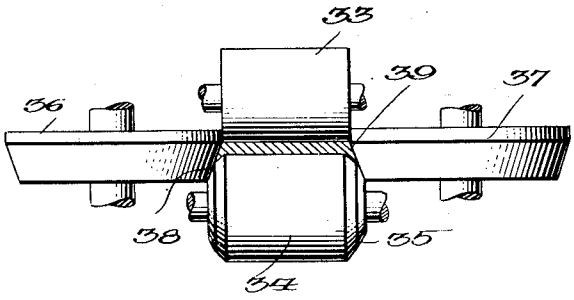
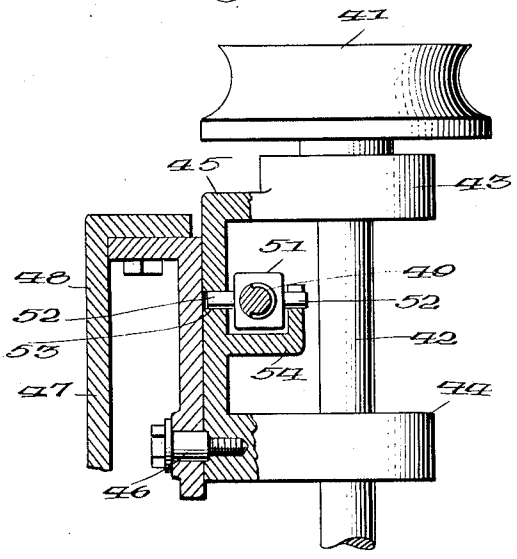


Fig. 16.



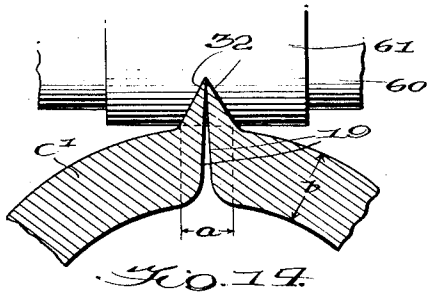
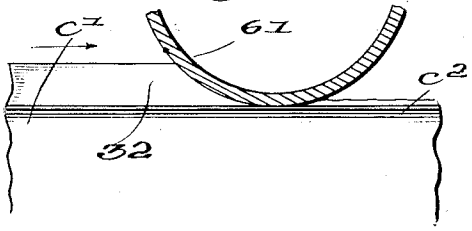


Fig. 14.

Fig. 15.



Inventor
Hugo Mayweg,
By Stubard & Stubard
his Attorneys

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APPARATUS FOR MAKING BUTT JOINED TUBES AND PIPES

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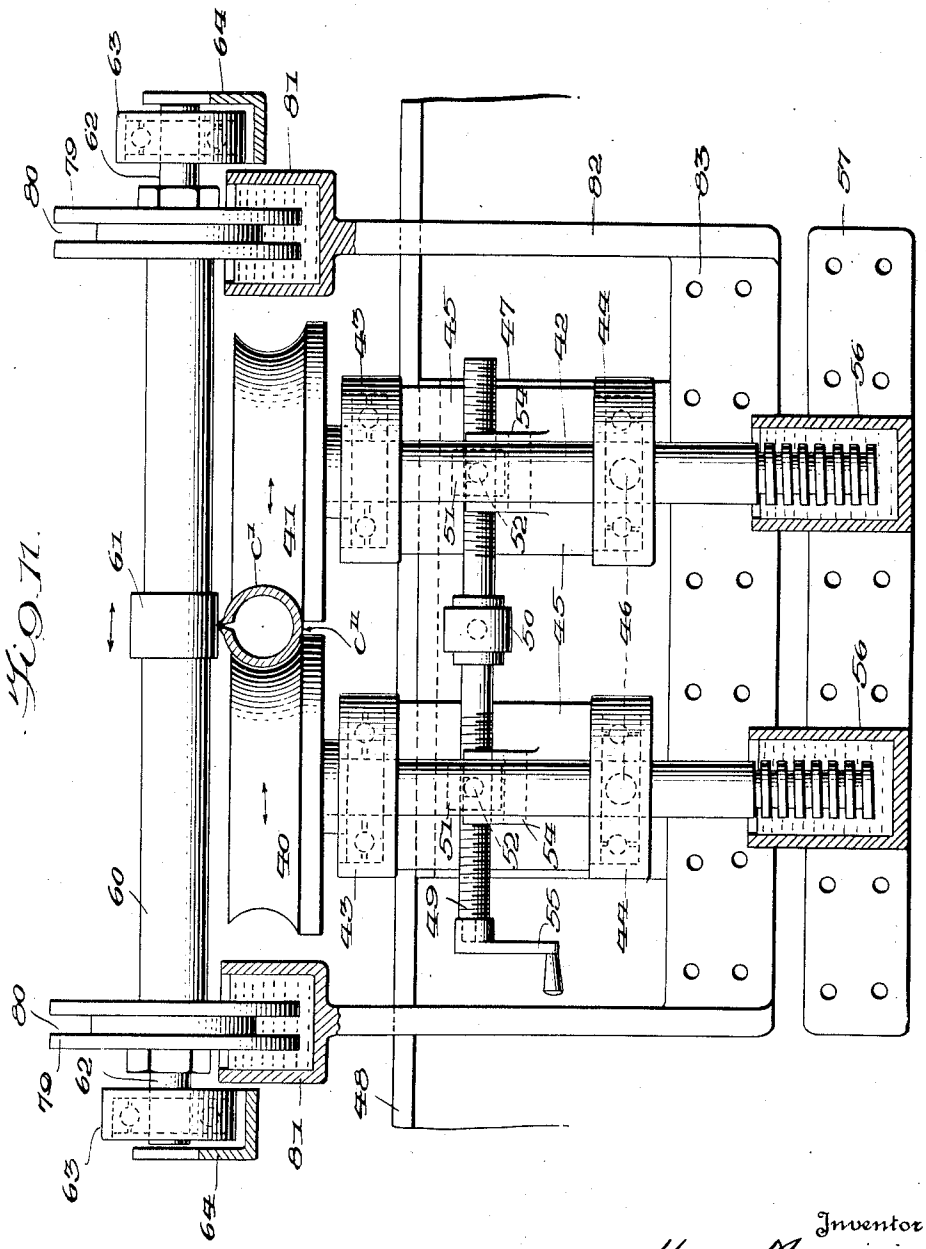


Fig. 7.

Inventor
Hugo Mayweg,
By Howard & Howard
his Attorneys

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APPARATUS FOR MAKING BUTT JOINED TUBES AND PIPES

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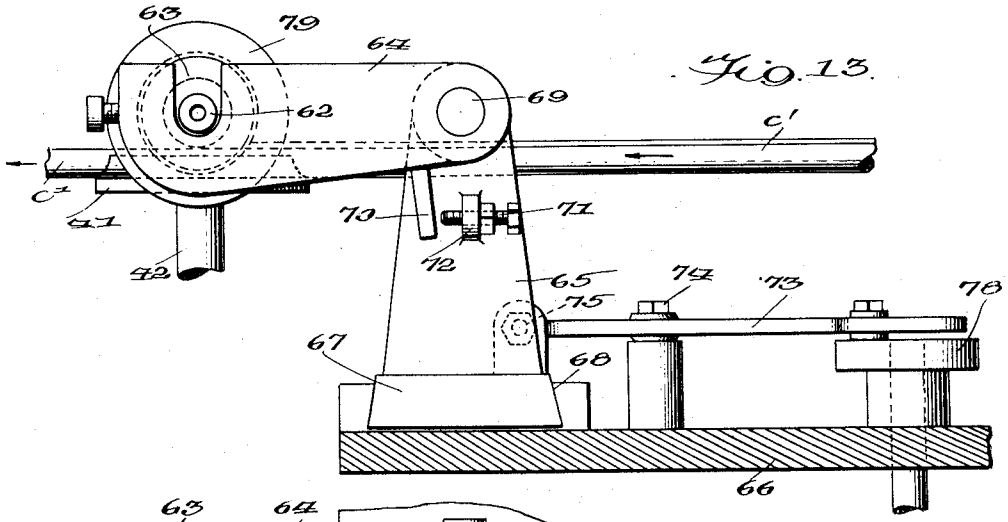


Fig. 13.

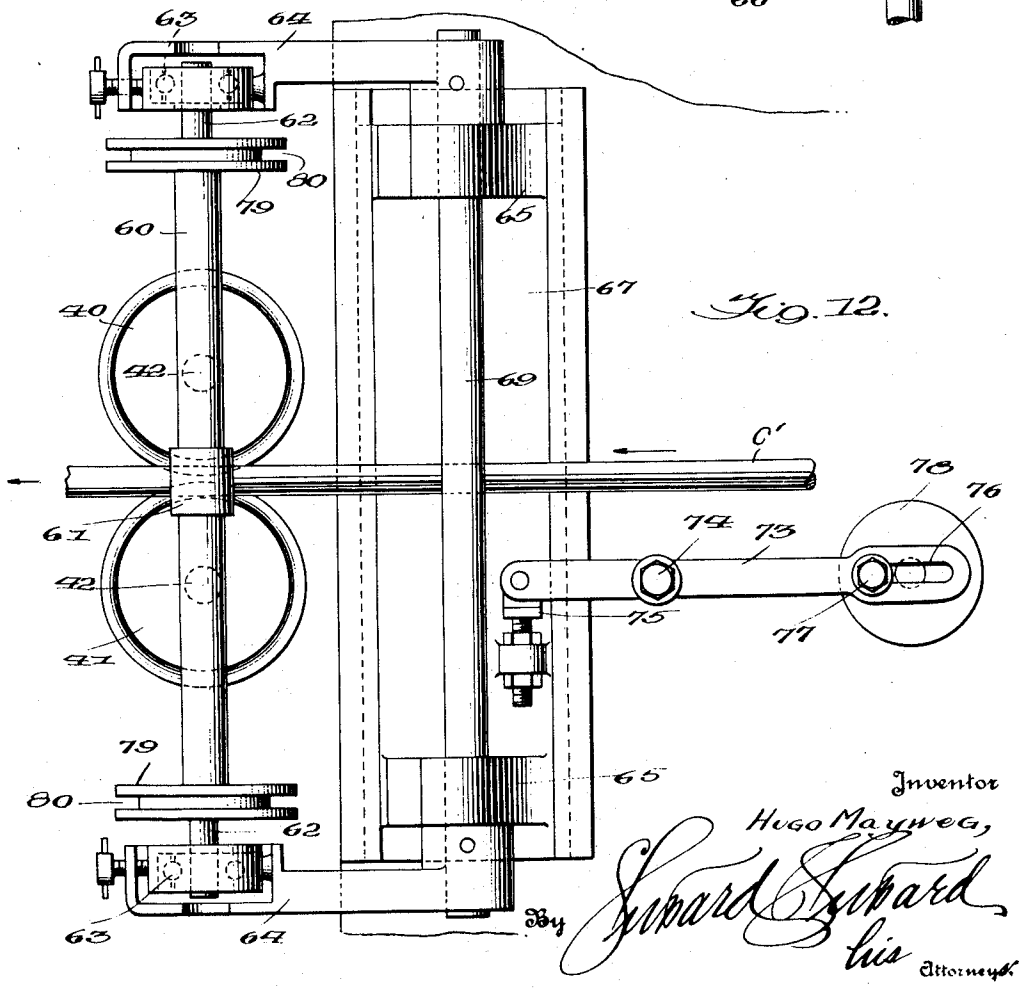


Fig. 12.

Inventor
Hugo Mayweg,
By Howard & Howard
his Attorneys.

UNITED STATES PATENT OFFICE

1,944,096

APPARATUS FOR MAKING BUTT JOINED TUBES AND PIPES

Hugo Mayweg, Holzwickede, Germany, assignor, by mesne assignments, to Laura S. Stevenson, Wheeling, W. Va.

Original application June 1, 1927, Serial No. 195,689. Divided and this application May 29, 1929, Serial No. 366,976. Renewed December 3, 1932

13 Claims. (Cl. 219—6)

This invention relates to the making of butt joined tubes and pipes, and has for its prime object to provide an improved apparatus for the continuous production of a tubular shape from a cold metal strip or blank which is first subjected to a series of operations and thereby formed into a tube with the edges of the blank in abutted relation, immediately after which the abutted edges of the blank are electrically joined, the finished tube being subsequently straightened and cut into lengths. The tube is fed to and through the electric apparatus by means of the traveling movement imparted to the tube by the action of the rolls employed in shaping the blank into tubular form, and the capacity of the electric apparatus is such as to produce an efficient joint at the rate of speed imparted to the tube by the rolls of the tube forming machine or apparatus.

This application is a division of my copending application filed June 1, 1927, Serial No. 195,689.

The invention has been illustrated in the accompanying drawings wherein,

Figure 1 is a side elevation, more or less diagrammatic and partly in section, of a tube shaping and joint forming apparatus embodying the features of the present invention;

Figure 2 is a cross sectional view of a tube blank having its longitudinal edges bevelled by the first pass of the tube forming machine;

Figure 3 is a similar view showing the plate having its bevelled edges bent into flanges projecting at that side of the blank which is to be the exterior of the tube;

Figures 4, 5, 6, 7 and 8 are views of the blank in its successive stages of formation;

Figure 9 is an enlarged fragmentary detail view of the rolls employed for bevelling the edges of the blank;

Figure 10 is an enlarged detail fragmentary view showing the arrangement of the rolls for bending the flanged edges of the blank;

Figure 11 is an enlarged cross sectional view of a portion of the electric apparatus;

Figure 12 is a detail fragmentary plan view of Figure 11;

Figure 13 is a side elevation of Figure 12; and

Figures 14 and 15 are enlarged fragmentary views showing the cooperative relation between the seam of the tube and one of the electrodes of the electric apparatus.

Figure 16 is a fragmentary side elevation, partly in section, showing the bracket mounting for the shaft of one of the electrode rolls.

The apparatus of the present invention includes a tube shaping or forming apparatus designated in general by the reference character A, and an electric apparatus designated in general by the reference character B, the two machines being arranged in close proximity to one another so that the electric machine may receive the tubular shape immediately as it is fed from the tube shaping machine. The tube making machine is provided with pairs or sets of cooperating rolls for performing the successive bending or shaping operations upon the blank, and said rolls are arranged to produce the successive passes which have been designated 2, 3, 4, 5, 6, 7 and 8, through which the blank is continuously fed and shaped to the final product.

In order that the operation may be a continuous one, it is proposed to have the cold blank C put up in a roll or coil D which is mounted upon a suitably supported reel E. Located between the reel E and the feed-in end of the tube shaping machine A, there is a suitable track 10 supported in a horizontal position in any suitable manner as upon leg standards 11. The track 10 is below the horizontal line of the passes of the tube shaping machine and supports a carriage 12 mounted to travel back and forth on the track and beneath the horizontal line of the passes. Suitable clamping devices 13 and 14 are provided upon the carriage so as to clamp thereupon the rear end of one tube blank and the front end of another tube blank with said ends in abutted relation so that they may be welded by any suitable means, as for instance by a gas torch 15 carried by a carriage. It will of course be understood that any form of welding means may be employed, as the form of the welding means constitutes no part of the present invention. The clamps 13 and 14 are hand operated, and are manually released just before the carriage reaches the end of the track adjacent the tube forming machine, and the carriage is returned to its original position by a weight 16 and a cord 17 connected to the carriage and travelling over a guide pulley 18.

As the tube blank C travels through pass 2, its longitudinal edges are provided with the bevels 19 as shown in Figures 2 and 9. The pass designated 2 is defined by a lower horizontally disposed plain faced roll 20, and an upper composite roll consists of a cylindrical plain faced roll 21 and end roll sections 22 of greater diameter than the intermediate roll section 21 and provided with inner bevelled end portions 23. The lower roll 20 embraces a noncircular portion of a shaft 24 having a fixed annular collar or shoulder 25 against which one end of the roll 20 is

held by means of nuts 26 provided upon the screw threaded portion 27 of the shaft 24. Similarly the upper roll sections embrace a non-circular portion of a shaft 28 having a collar 29 against which one end of the composite roll is held by means of nuts 30 fitting the screw threaded portion 31 of the shaft. By this construction, the roll parts may be replaced when worn and may be substituted by different sizes of parts in accordance with the thickness and width of the tube blank and the character of the bevel to be produced upon the blank.

Immediately upon being fed out of the pass designated 2, the bevelled tube blank is fed into the pass designated 3 and its bevelled edges bent into flanges 32, as shown in Figures 3 and 10, said flanges being projected at the lower side of the blank which is to be the exterior of the finished tube in its final form. The pass designated 3, as shown in Figure 10, is made up of an upper plain faced cylindrical roll 33 mounted on a horizontal axis, a lower plain faced cylindrical roll 34 having its ends bevelled as at 35 and mounted upon a horizontal axis below and in alignment with the roll 33, and a pair of opposite rolls 36 and 37 mounted upon vertical axis in the same plane with the axis of the roll 33 and 34, and provided with the bevelled faced portions 38 and 39, which, together with the bevelled end portion 35 of the lower roll 34 bend and shape the bevelled edges of the blank C into the flange 32.

The succeeding passes 4, 5, 6, 7 and 8 shape the blank progressively in accordance with Figures 4, 5, 6, 7 and 8 of the drawings. It will therefore be understood that as the blank emerges from the last pass designated 8 it will have been bent into the tubular shape C′ shown in Figures 8 and 14 with its bevelled edges 19 in partially abutted relation and the flanges 32 disposed longitudinally of the tube on the exterior thereof. The bevelled or inclined edges 19 of the blank do not abut throughout their widths, but come together at their outer edge portions only, thereby leaving a substantially V-shaped space between the abutted edges of the blank at the inner side of the tube. The two flanges 32 constitute an external rib extending longitudinally of the tube and of V-shape in cross section. It will here be noted, as best shown in Figure 14 of the drawings, that the widest dimension *a* of the combined ribs or flanges 32 at the exterior of the tube is less than the thickness *b* of the blank for an important purpose as will be hereinafter explained.

Immediately after the tubular shaped blank emerges from the last pass 8, it is subjected to the action of the electric welding machine for the purpose of fusing the external rib, so that fused portions thereof may flow downwardly and fill the gap between the lower portions of the spaced edges 19 of the blank and thereby join such edges in a welded joint in a simple and efficient manner. The tubular shape is fed to the electric welding apparatus by reason of the travel of the blank through the tube forming machine, whereby the tube forming machine and the electric machine operate successively and continuously upon a single blank as it is travelling through the apparatus under the feeding effect of the driven rolls of the tube forming machine.

The tubular shape C′, in the cross sectional shape shown in Figure 8, travels from the last pass 8 of the tube forming machine into the electric machine and between the cooperating idle-rolls 40 and 41, Figures 11, 12 and 16, which have concaved peripheries so as to define a seat or pass for receiving, guiding and supporting the tube C′. The mountings for the rolls 40 and 41 are duplicates, and therefore a description of one of the mountings is deemed sufficient. Each of these rolls is carried by an upstanding rotatable spindle 42 mounted in upper and lower bearings 43 and 44 carried by a bracket 45, pivoted at its lower end as at 46 upon a hanger 47 secured to and depending from a part 48 of the frame of the machine. By the pivotal mounting of the bracket 45, the rolls 40 and 41 may be adjusted towards and away from one another to vary the size of the pass or gap between the rolls for the purpose of accommodating tubes of different diameters. For convenience in adjusting the positions of the rolls 40 and 41, there is provided a horizontal and rotatable adjusting member 49 which is mounted between its ends in a suitable bearing 50 carried by the hanger 47 and located between the pivotally adjustable brackets 45. The respective end portions of the rotatable bar 49 are reversely screw threaded, and each end portion is received within a nut 51, best shown in Figure 16 of the drawings, said nut having trunnions 52, received respectively in a bearing opening 53 in the pivoted bracket 45 and the substantially L-shaped bracket 54 provided upon the front face of the pivotal bracket 45, whereby the nuts 51 will remain in a horizontal position with the adjusting rod 49 and thereby accommodate themselves to the tilting adjustments of the pivotal brackets 45. A detachable crank handle 55, or other suitable means, may be employed for rotating the rod 49 to adjust the positions of the pivotal bracket members 45.

Each roll spindle 42 extends below the lower bearing bracket 44 and dips into a mercury bath contained in a cup or receptacle 56 which is carried by a cross head 57 bolted or otherwise secured to one of the pole terminals 58 of the secondary 59 of any suitable form of electric transformer. The lower end portion of the spindle which is within the bath is grooved, either circumferentially, as shown, or longitudinally, so as to expose a large surface area to the mercury contained in the cup or receptacle 56. The internal diameter of the cup or receptacle 56 is such as to permit of the necessary tilting of the spindle 42 in the adjustments thereof. It will now be understood that the rolls 40 and 41 are electrically connected to the pole piece 58 through their spindles 42 and the mercury contents of the cups or receptacles 56, and therefore the rolls 40 and 41 constitute one of the pole members of the welding machine.

Disposed horizontally and diametrically across the tops of the rolls 40 and 41 is the other pole member 60 of the electric machine, said pole member being in the form of a cylindrical roll or bar provided at its middle with a band or collar 61 preferably of copper and disposed so as to come into proper cooperative relation with the rib on the exterior of the tubular shape C′. Each end of the member 60 is provided with a journal 62 rotatable within an anti-friction bearing 63 carried by and insulated from a substantially horizontal link or arm 64 pivoted upon an upstanding bracket arm 65 rising from a frame portion 66 of the machine. As best shown in Figure 12, it will be seen that the brackets 65 are connected by a base member 67 mounted to slide endwise in a guideway 68 provided upon the top of the frame portion 66. The opposite arms or links 64 are connected by a rod or bar 69 rotatably mounted in the bracket 65 so that the two arms

64 are connected for simultaneous up and down movements. Downward movement of each arm 64 is limited by means of a shoulder 70 depending from the arm and disposed for engagement with a set screw 71 carried in a screw threaded boss 72 provided upon the outer face of the adjacent post or bracket 65. Under operating conditions, and as well shown in Figures 14 and 15 of the drawings, it will be seen that the pole member 61 rests upon the tubular shape C' and against the rib 32 and supports the arms 64 in the position indicated in Figure 13 with the part 70 slightly in advance of the set screw 71. When there is no work in the machine, the part 70 engages the forward end of the set screw 71 so as to maintain the pole piece 61 in proper position for engagement with the external rib of a tubular shape which is being entered into the welding machine.

It is proposed to longitudinally reciprocate the pole member 60 so as to work the pole piece 61 transversely across the rib on the tube and thereby prevent the wearing of a groove in the periphery of the pole piece 61. To accomplish this result, the base member 67 is reciprocated endwise through the medium of an oscillating arm 73 fulcrumed as at 74 upon the frame part 66 and connected at one end by means of a pivotal link 75 with the base member 67. The other end of the arm 73 is slotted at 76 to receive a wrist pin 77 carried by an eccentric 78 mounted upon the frame part 66 and suitably driven from some operating part of the general apparatus.

As best shown in Figure 11 of the drawings, it will be seen that each end of the pole member 60 is provided with a circular head 79, grooved peripherally as at 80, and having its lower portion dipped into a mercury bath in a mercury cup or container 81 carried by the upper end of an arm standard 82 rising from the cross head 83 suitably secured to the other pole piece 84 of the secondary 59, whereby the electric circuit will be completed from the tubular shape C' through the pole member 60, the heads 79, the standards 82 and the cross head 83.

After passing from the electric machine, the welded tube C^2 passes through a finishing and straightening machine F of any ordinary or preferred form. As shown in Figure 1 of the drawings, the machine F includes finishing rolls 85 for smoothing the exterior of the pipe, and bending rolls 86 for straightening the tube or pipe. After passing from the finishing and straightening machine F, the tube or pipe is run into any desired form of tube cutting machine, not shown, for the purpose of cutting the finished tube into lengths.

The action of the electric machine will be best understood by reference to Figures 11, 12, 14 and 15 of the drawings. In the beginning of the operation, as well shown in Figure 11, the pole piece 61 rests upon the apex of the pointed external rib 32 on the tubular shape C', whereby the tip edge of the rib becomes fused and the pole piece sinks down into the rib to about the position shown in Figures 14 and 15 of the drawings, whereby the rib will be fused throughout substantially its entire depth as the tubular shape is fed through the machine under the feeding influence of the driven rolls of the tube shaping machine A. Under operating conditions, the weight of the pole piece 60 and its associated parts is supported upon the tubular shape C', as shown in Figures 14 and 15, and as the latter is supported in the seat defined by the rolls 40 and 41 there is no pressure exerted to force the spaced edges of the blank together such as is commonly employed in welding operations. The pole member 60 will be rotated by reason of the frictional engagement between the tubular shape C' and the pole piece 61, while at the same time the pole member 60 will reciprocate transversely across the rib under the action of the oscillating arm 73. It will of course be understood that the size of the mercury cups 81 is sufficient to permit of the necessary lateral play of the contact head 79 in the mercury baths. As the rib 32 is fused, the molten metal runs down and fills the gap between the spaced edge portions 19 of the blank which produces a strong and durable joint without producing any internal rib on the completed tube while at the same time filling the gap between the edges of the blank without leaving a groove at the interior of the tube.

It will here be explained that there is no welding of the joint in the sense of softening metal members and then applying pressure thereto sufficient to unite the softened parts into a welded joint, for the reason that the fused parts of the flanges gravitate into the gap which is filled by the fused metal, and such fused metal when it hardens unites the edges of the blank in a strong and durable seam or joint.

The large dimension *a* of the combined flanges 32 is less than the thickness *b* of the blank or the wall of the tube, whereby the electric current is concentrated in the combined flanges or rib and fusion is limited thereto, so that burning of the walls of the tube adjacent the butt weld is effectually prevented.

In the practice of the invention, and in order that it may be continuous, the tube blank C is in the form of a long strip of the desired thickness and width. For convenience in handling; the cold strip is wound into a coil, as indicated at D, Figure 1, and mounted on the reel E. The end of the strip or blank is fed to the roll forming machine A and entered by hand into the bite of the driven rolls constituting the first pass designated 2, and thereafter the blank is fed automatically through the entire apparatus under the feeding action of the driven rolls of the tube forming machine A. It will of course be understood that the tube forming machine is driven in any suitable manner, as by an electric motor which is of course regulable as to speed. As the blank passes through the tube forming machine, it is successively given the shapes shown in Figures 2 to 8 inclusive, and is fed directly from the last pass 8 into the electric machine and passes between the rolls 40 and 41 with the external rib 32 in frictional engagement with the pole piece 61 as best shown in Figure 11 of the drawings. Fusion and union of the edges of the blank takes place in the electric machine, as hereinbefore described, and thereafter the completed tube C^2 passes on to the finishing and straightening machine F and thence to a tube cutting machine, not shown, for the purpose of cutting the completed tubes into lengths.

From the foregoing explanation of the practice of the present invention, it will be understood that the tube shaping and the joint forming operations are performed successively and continuously upon the same strip of metal, and that the work emerges from the finishing and straightening machine in a smooth finished condition and is afterwards cut into lengths. The finished tube has neither external projections

nor internal grooves. The manual labor expended is reduced to the minimum.

By reason of the contact of the pole member 61 with the thin apex of the external rib 32, immediate and effective fusion of the relatively thin edge of the rib is obtained, which permits of the formation of the seam as rapidly as the shape C' can be formed by the tube forming machine A and fed thereby to the electric machine. This rapid formation of the seam permits of the said operation following immediately upon the completion of the final step of the tube shaping operations, and therefore permits the operation of the tube shaping machine at its normal rate of speed. In actual practice, tubes have been made in accordance with the present invention at the rate of twenty feet per minute.

As hereinbefore explained overheating is prevented because of the triangular shape of the external rib 32, together with the fact that the width of the base of the rib is less than the thickness of the blank, so that the electric current is concentrated in said rib and therefore burning of the blank adjacent the joint is impossible. Actual practice has shown that even great irregularities in the thickness of the blank or metal strip have no undesirable influence on the formation of the joint, and therefore it is possible to use crude, or so called hot or cold rolled metal strips which are seldom uniform in their dimensions. Moreover the electric current consumption is low, as the heat is concentrated at the fusion zone.

What is claimed is:

1. In an apparatus for the continuous formation of tubing, the combination of means for continuously and progressively shaping a blank into tubular form and feeding it endwise, and an electric device disposed to receive the tubular shape as it emerges from the tube shaping means, said electric device having a pair of idle electrode rolls of the same polarity disposed to form a pass to receive guide and support the tubular work piece, another idle electrode roll of the other polarity disposed for engagement by the moving tubular work piece, and means for reciprocating said other electrode roll transversely across the work piece, said tube shaping means also constituting feeding means for feeding the tubular shape through the electric device each of said electrode rolls being adapted for rotation by frictional contact with the moving work piece.

2. In an apparatus for the continuous formation of tubing, the combination of means for continuously and progressively shaping a blank into tubular form and feeding it endwise with the edges of the blank disposed as flanges projecting at the top of the tubular shape, and an electric device disposed to receive the tubular shaping as it emerges from the tube shaping means, said electric device having a pair of idle electrode rolls of the same polarity mounted upon upright axes and disposed to define a pass to receive guide and support the tubular shape therebetween and in engagement therewith, and another idle electrode roll of the opposite polarity disposed above the first mentioned rolls in position to engage the top edges of the flanges, and means to reciprocate said other electrode said tube shaping means also constituting feeding means for feeding the tube through the electric device roll transversely of the pass defined by the first mentioned rolls, each of said rolls being mounted for rotation by frictional contact with the moving work piece.

3. In an electric device, the combination of a pair of idle electrode rolls of the same polarity mounted upon vertical axes and disposed to define a pass for the reception of a work piece, another electrode roll of the opposite polarity disposed transversely of the pass defined by the first mentioned rolls and in position for engagement with a work piece in the pass, and means for reciprocating said other electrode roll transversely of said pass.

4. In an electric device, the combination of a pair of idle electrode rolls of the same polarity mounted upon vertical axes and disposed to define a pass for the reception of a work piece, another idle electrode roll of the opposite polarity disposed for engagement with a shape in said pass, means for reciprocating said other electrode roll transversely of the pass, mercury cups of the same polarity, and contact heads carried by the reciprocatory electrode and working in the respective mercury cups.

5. In an electric device, the combination of a pair of idle electrode rolls of the same polarity mounted upon vertical spindles and disposed to define a pass to receive a work piece, mercury cups of the same polarity and receiving the spindles of the electrode rolls, means for simultaneously adjusting the spindles in the mercury cups and another idle electrode roll of the opposite polarity mounted for engagement with a work piece in the said pass.

6. In an electric device, the combination of a pair of idle electrode rolls disposed to form a pass to receive a work piece, vertical spindles for the rolls, mercury cups of the same polarity and receiving the spindles, another idle electrode roll mounted for engagement with a work piece in the said pass, contact heads upon the said other electrode roll, mercury cups of the opposite polarity receiving the contact heads, and means for reciprocating the said other contact roll.

7. An apparatus for the continuous formation of tubing, comprising means for continuously and progressively feeding and shaping a blank into tubular form having external edge flanges, electrodes of the same polarity disposed to form a pass to receive a tubular form as it is discharged from the tube forming means and guide and support the form as it is fed along by the forming means, said pass being substantially of the same diameter as that of the tubular form to permit the pushing of the form through the pass by the feeding action of the tube forming means without exerting welding pressure on the tubular form, and an electrode of the opposite polarity disposed for contact with the flanges of the tubular form to fuse the flanges as said form is fed through the pass.

8. An apparatus for the continuous formation of tubing, comprising electrodes of the same polarity disposed to form a pass for receiving and supporting the tubular form which is being fed through the apparatus, positively driven sets of forming rolls for shaping a blank into tubular form and providing the same with external edge flanges and for feeding the flanged form to and through the said pass, and an electrode of the opposite polarity disposed for contact with the flanges of the tubular form to fuse the flanges as the form is fed through the pass, the electrode members being spaced to define a pass of a shape and size to receive and permit passage therethrough of the tubular form without exerting welding pressure thereon.

9. An apparatus for the continuous formation

of tubing, comprising means for continuously and progressively feeding and shaping a blank into tubular form having external edge flanges, electrodes of the same polarity disposed to form a pass to receive a tubular form as it is discharged from the tube forming means and guide and support the form as it is fed along by the forming means, said pass being substantially of the same diameter as that of the tubular form to permit the pushing of the form through the pass by the feeding action of the tube forming means without exerting welding pressure on the tubular form, said pass also being open longitudinally along one side to permit the outward projection therethrough of the flanges of the tubular form, and an electrode of the opposite polarity disposed for contact with the flanges of the tubular form to fuse the flanges as said form is fed through the pass.

10. An apparatus for the continuous formation of tubing, comprising electrodes of the same polarity disposed to form a pass for receiving and supporting the tubular form which is being fed through the apparatus, said pass being open longitudinally throughout the top thereof, positively driven sets of forming rolls for shaping a blank into tubular form and providing the same with external edge flanges and for feeding the flanged form to and through the said pass with the flanges projecting upwardly through the open top of the pass, and an electrode of the opposite polarity disposed above the open top of the pass and in position for contact with the flanges of the tubular form to fuse the flanges as the form is fed through the pass, the electrode members being spaced to define a pass of a shape and size to receive and permit passage therethrough of the tubular form without exerting welding pressure thereon.

11. An apparatus for the continuous formation of tubing, comprising means for continuously and progressively feeding and shaping a blank into tubular form having external edge flanges, electrodes of the same polarity disposed to form a pass to receive a tubular form as it is discharged from the tube forming means and guide and support the form as it is fed along by the forming means, said pass being substantially of the same diameter as that of the tubular form to permit the pushing of the form through the pass by the feeding action of the tube forming means without exerting welding pressure on the tubular form, an electrode of the opposite polarity disposed for contact with the flanges of the tubular form to fuse the flanges as said form is fed through the pass, and means for reciprocating the last mentioned electrode transversely of the pass.

12. An apparatus for the formation of tubing without exerting welding pressure, comprising electrodes of the same polarity disposed to form a pass for receiving and supporting the tubular form which is being fed through the apparatus, said pass being open longitudinally throughout the top thereof, and an electrode of the opposite polarity disposed above the open top of the pass and in position for contact with that portion of the tubular form which projects through the opening in the top of the pass, the electrode members being spaced to define a pass of a shape and size to receive and permit passage therethrough of the tubular form without exerting welding pressure thereon.

13. In an electric device for joining parts without exerting welding pressure, the combination of a pair of idle electrode rolls each mounted upon a vertical axis with their peripheries in cooperative relation to form a pass to receive a work piece and mutually spaced to define a longitudinal opening in the top of the pass, and another idle electrode roll mounted upon a horizontal axis extending transversely across the opening in the top of the pass for engagement by gravitation with that portion of a work piece in said pass which projects upwardly through the longitudinal opening, the said pair of electrode rolls being spaced to define a pass of a shape and size to receive and permit passage therethrough of the tubular form without exerting welding pressure thereon.

HUGO MAYWEG.

CERTIFICATE OF CORRECTION.

Patent No. 1,944,096. **January 16, 1934.**

HUGO MAYWEG.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, lines 69 to 71, claim 2, strike out the words "said tube shaping means also constituting feeding means for feeding the tube through the electric device" and insert the same after "rolls," in line 72, of said claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of February, A. D. 1934.

F. M. Hopkins

(Seal) Acting Commissioner of Patents.