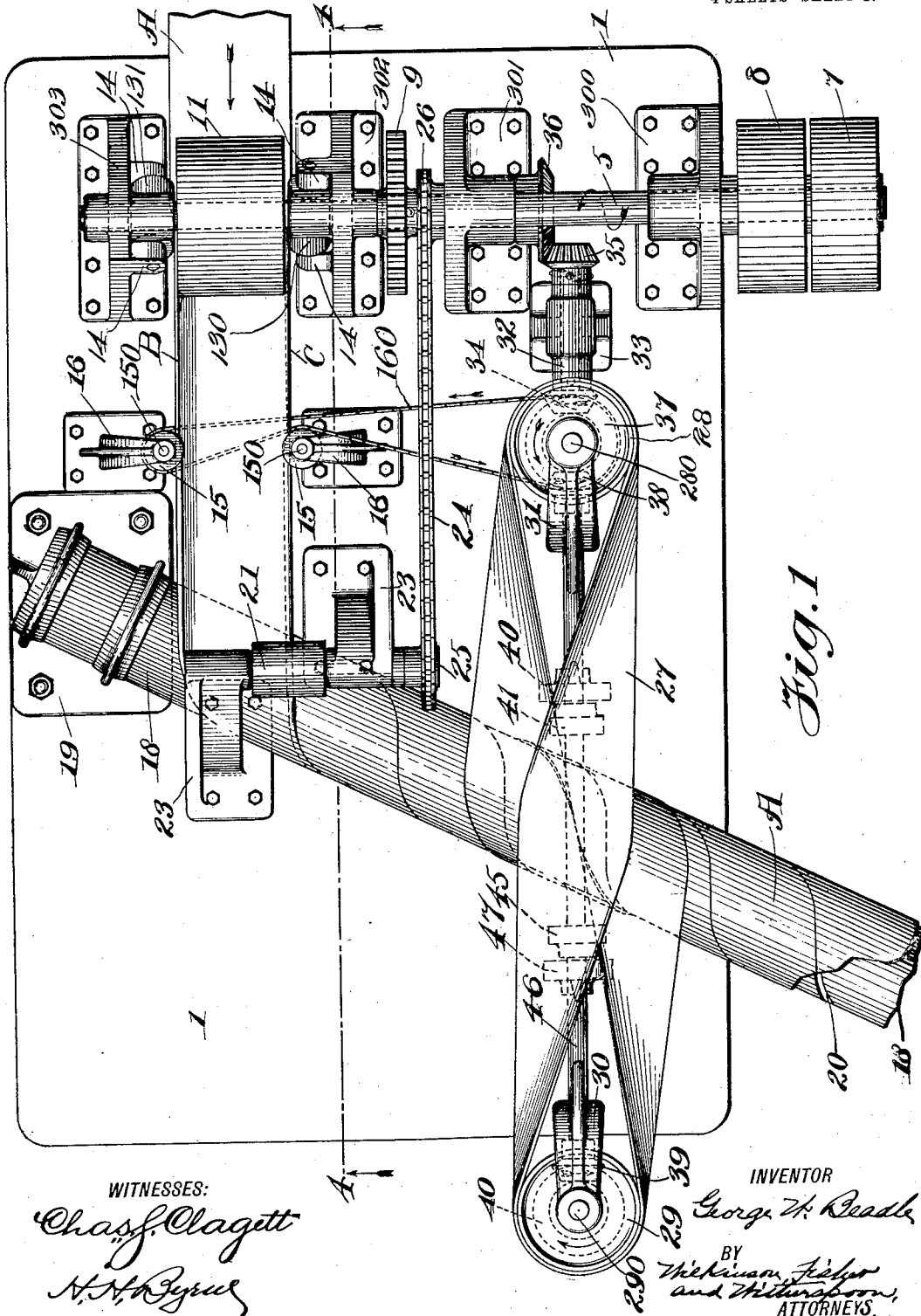


G. W. BEADLE.
MACHINE FOR MAKING METAL TUBES.
APPLICATION FILED MAY 9, 1911.

Patented Feb. 20, 1912.

4 SHEETS—SHEET 1.

1,018,291.



WITNESSES:
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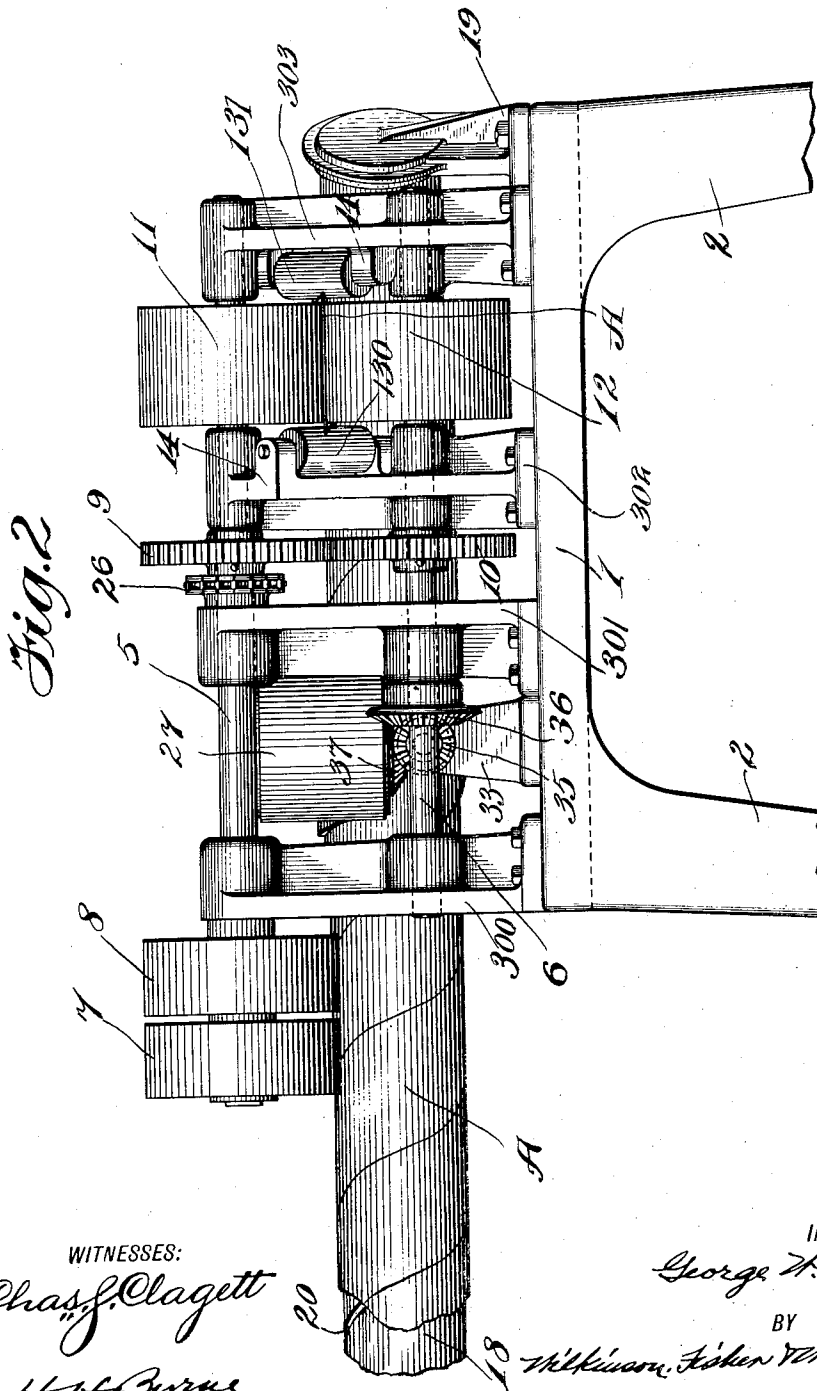
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Fig. 3

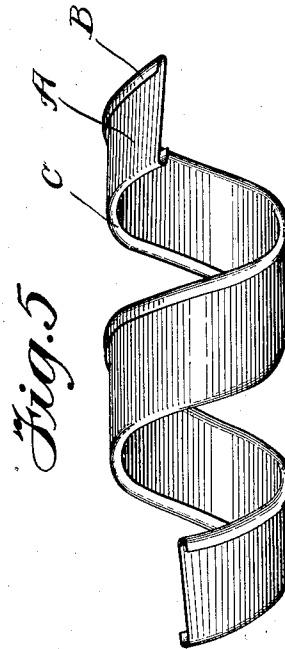
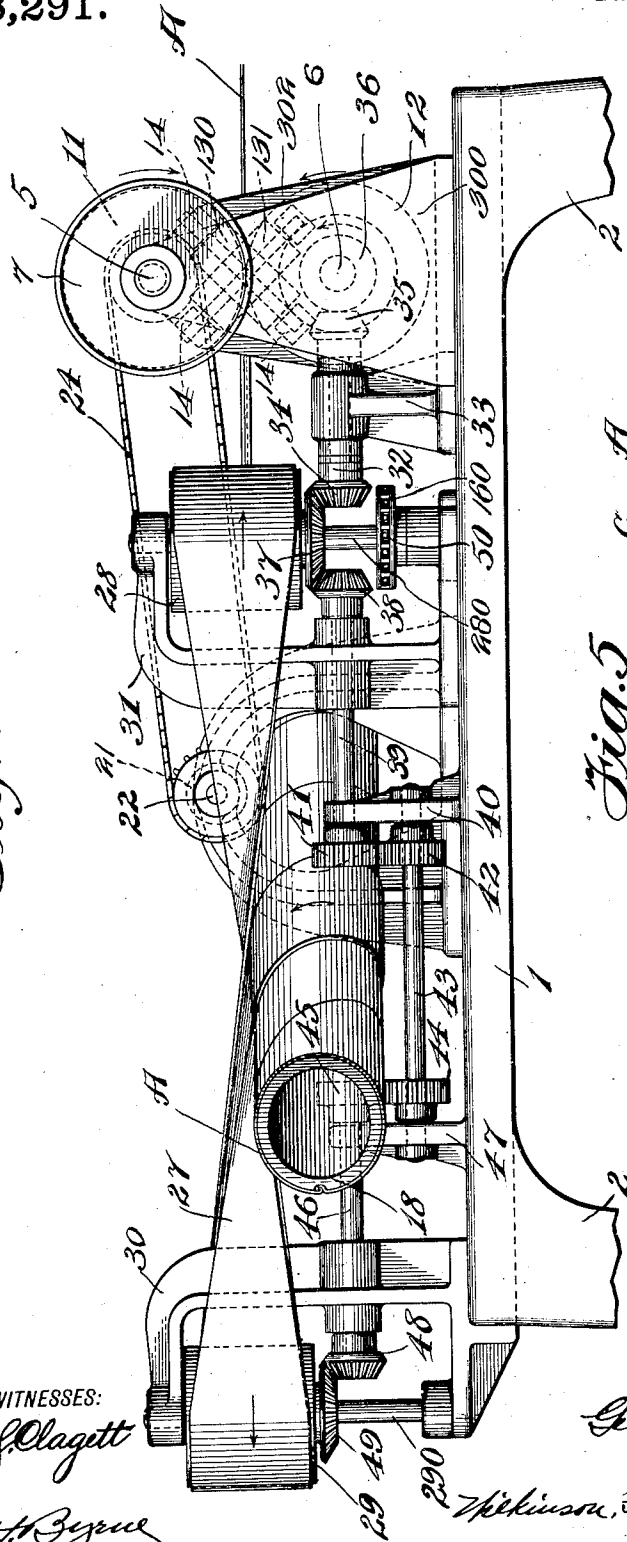


Fig. 5

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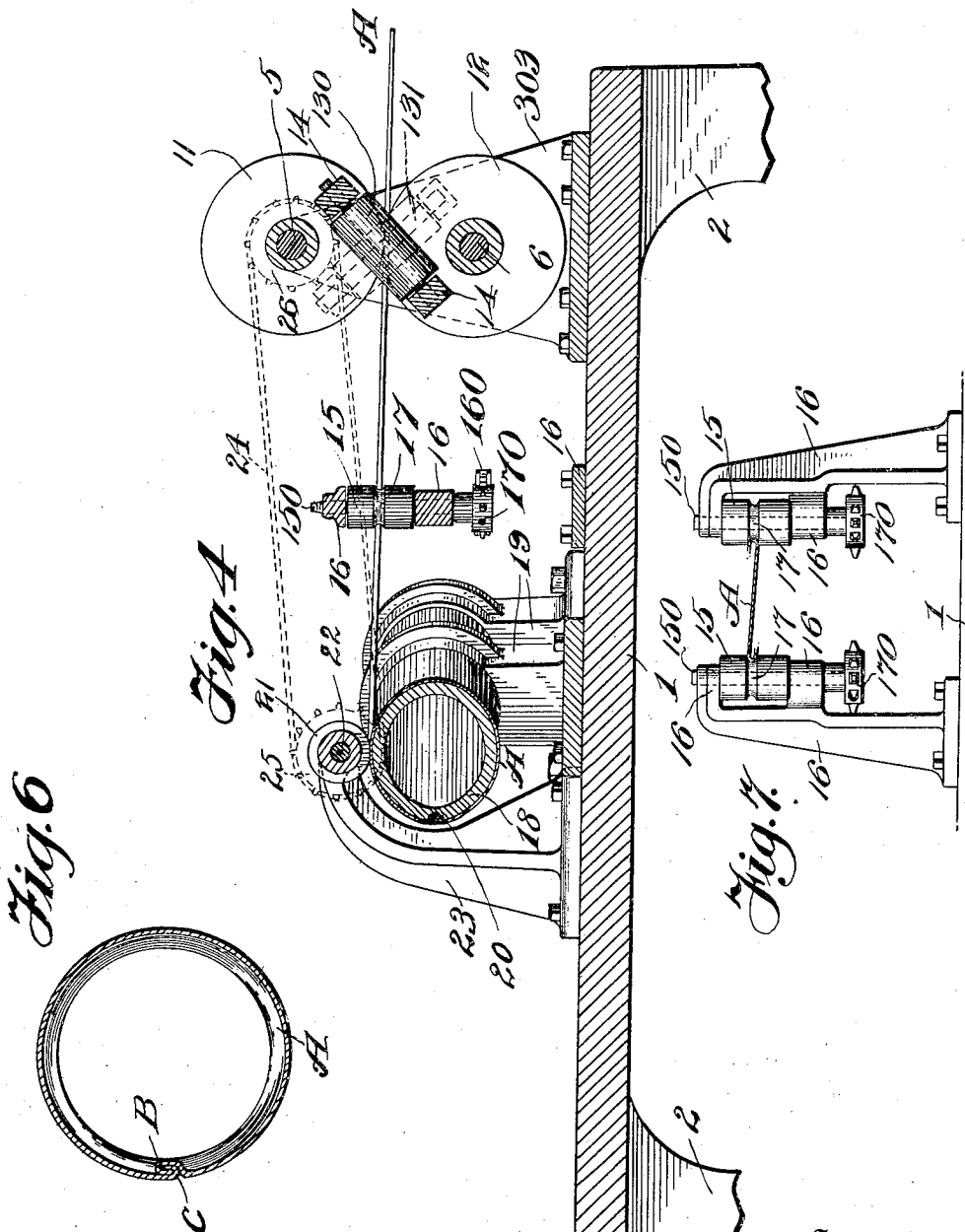
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING METAL TUBES.

1,018,291.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed May 9, 1911. Serial No. 626,104.

To all whom it may concern:

Be it known that I, GEORGE W. BEADLE, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Machines for Making Metal Tubes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for making spirally wound tubing, and has for its object to produce a mechanism for manufacturing such tubing out of a single strip of material and at the same time effectually closing the seams between contiguous edges of the strip.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which one form of my invention is illustrated, and in which like numerals designate like parts in all the views:—Figure 1 is a plan view of a complete machine for making spiral metal tubing; Fig. 2 is an end elevation of the parts shown in Fig. 1 looking in the direction of movement of the arrow on the strip; Fig. 3 is a side elevation of the machine, showing the mandrel in section; Fig. 4 is a longitudinal sectional view on the line 4—4 of Fig. 1; Fig. 5 is a detail perspective view of the tube strip partially wound; Fig. 6 is a transverse sectional view of the finished tubing; and Fig. 7 is a detail view of the crimping rollers and their supports.

1 designates a base suitably supported by the legs 2, and on said base are mounted four standards 300, 301, 302 and 303 and which have suitably journaled therein a driving shaft 5 and a driven shaft 6 as best shown in Fig. 2. The shaft 5 has at one end a fixed pulley 7 and a loose pulley 8 adapted to be driven by a belt in the usual manner, and the driving connection between the shafts consists of a pair of meshing pinions 9 and 10 mounted respectively on said shafts. A roller 11 mounted on the shaft 5 between the standards 302 and 303 co-acting with a

like roller 12 on the shaft 6 constitutes a means for feeding the strip A; and coöperating with said feeding rollers are two diagonally disposed flanging rollers 130 and 131 journaled in arms 14 on said standards, and which in connection with the feeding rollers form flanges B and C upon the side edges of the moving strip A. The purpose of disposing the flanging rollers 130 and 131 in opposed diagonal relation is to turn the flanges to opposite sides of the strip, see Fig. 5, in order to form the interlocking seams shown in Fig. 6. After its treatment by the flanging rollers the moving strip is next subjected to the action of a pair of crimping or finishing rollers 15 mounted vertically on spindles 150 journaled within the yokes 16 supported upon the base 1. The rollers 15 are each formed with a medially disposed groove 17 that engages with and gives the final shape to the edges or flanges B and C, and in operation said rollers are rotated in the direction reverse to that of the strip A. The driving means for the rollers 15 consists of a chain 160 riding on sprockets 170 that are carried by the lower ends of the roller spindles 150 (see Fig. 7).

After having been subjected to the action of the spinning rollers 15 the strip A passes forward to and is wound on a mandrel 18, which is mounted diagonally with respect to the machine in suitable standards 19, only one of which is shown. Said mandrel is also provided with a spiral groove or channel 20 for the reception of the crimped edges of the strip which, as illustrated, are formed internally of the tube. In passing to the mandrel 18 the finished crimped edges B and C are united and the joint sealed through the action of an ironing or pressing roller 21 which is mounted on a shaft 22 journaled within suitable bearings on the standards 23. The rotation of the roller 21 is effected through a gearing connection with the shaft 5 comprising a sprocket chain 24, traveling over sprockets 25 and 26 mounted on said shafts 22 and 5 respectively. A belt 27 running on pulleys 28 and 29, fixed on spindles 280 and 290 journaled in the yoke frames 30 and 31 passes around the formed tube and feeds it along the length of the mandrel.

The means for imparting movement to the belt supporting pulleys 28 and 29 consists of a relatively short shaft 32 journaled in

the standard 33 and having cone pinions 34 and 35, the latter of which meshes with and is driven by a cone pinion 36 carried by the shaft 6 (see Fig. 2). The cone pinion 34 meshes with a bevel gear 37 that is fixed to the pulley spindle 280. From the gear wheel 37 there is a positive drive between the two belt pulleys (see Fig. 3) consisting of a bevel gear 38 fixed to a shaft 39 which is journaled within the supporting frame 31 and a standard 40. The shaft 39 has a pinion 41 in mesh with a like pinion 42 on a counter-shaft 43, carrying a pinion 44 meshing with a pinion 45 on the shaft 46. The shaft 46 is journaled in the upright 47 and frame 30 and has a bevel pinion 48 meshing with a bevel pinion 49 on the belt pulley shaft 290. The driven shaft 32 also effects the driving of the crimping rollers 15 through the medium of the chain 160 that runs on a sprocket 50 on the shaft 280, (see Fig. 3).

The operation will be clear from the foregoing, but may be briefly summarized as follows:—A suitable strip A of sheet material, preferably tinned iron is fed by the rollers 11 and 12 between the rollers 130 and 131 which serve to turn over the edges B C of said strip in opposite directions. These edges are next passed between the finishing rollers 15 which serve to properly shape them so as to enable them later to form an interlocking seam, and the strip A is further fed between the compressing roller 21 and the mandrel 18. The mandrel 18 is provided with a groove 20 which receives the seam formed on the interior of the finished tube and as it revolves the strip A is spirally wound on said mandrel while the upturned edge B of one winding interlocks with the downwardly turned edge C of a succeeding winding. The compressing roller 21 in the meantime firmly presses the flanges B and C of succeeding windings together and thereby forms a sealed seam in the finished tube. The belt 27 serves to feed the tube along the mandrel, and after it passes off the same the said tube may be cut into suitable lengths by mechanism not shown, preparatory to the manufacture of containing vessels out of the same.

It is obvious that those skilled in the art may vary the details of construction and arrangement of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claims.

What I claim is:—

1. In a tube forming machine the combination of means for feeding a strip out of which the tube is to be formed; means for turning over the edges of said strip; additional means for crimping and finishing said turned over edges; a mandrel around

which said strip may be spirally wound; and a roller for pressing down said turned over edges, substantially as described.

2. In a tube forming machine the combination of means for feeding a strip out of which the tube is to be made; means for turning over the edges of said strip in opposite directions; grooved crimping rollers between which said turned over edges are forced; means for rotating said rollers; a mandrel around which said strip is wound; and means for pressing down said turned over edges on said mandrel, substantially as described.

3. In a tube forming machine the combination of means comprising a pair of rollers for feeding a strip out of which the tube is to be made; means comprising diagonally disposed rollers for turning over the edges of said strip in opposite directions; grooved crimping rollers between which said turned over edges are forced; means for rotating said rollers; a mandrel around which said strip is wound; and means comprising a roller for pressing down said turned over edges on said mandrel, substantially as described.

4. In a tube forming machine the combination of means for feeding a strip out of which the tube is to be formed; means for turning over the edges of said strip; a mandrel around which said strip may be spirally wound; a roller for pressing down said turned over edges, interlocking the same, and thereby forming the tube out of a single strip of material; and a belt encircling said mandrel for feeding said tube relatively to said mandrel, substantially as described.

5. In a tube forming machine the combination of means for feeding a strip out of which the tube is to be made; means for turning over the edges of said strip in opposite directions; grooved crimping rollers between which said turned over edges are forced; means for rotating said rollers; a mandrel around which said strip is wound; means for pressing down said turned over edges on said mandrel; and a belt encircling said mandrel for moving the finished tube, substantially as described.

6. In a tube forming machine the combination of a pair of strip feeding rollers; a pair of strip flanging rollers; a pair of flange finishing rollers; means for rotating said finishing rollers in a direction opposite to that in which the strip is fed; a mandrel around which said strip may be wound and provided with a groove; a pressing roller coaxing with said mandrel to cause the finished flanges of the strip to interlock to form a seam; and a belt encircling said mandrel adapted to move the finished tube along the axis thereof, substantially as described.

7. In a tube forming machine the combi-

nation of a pair of strip feeding rollers; a pair of diagonally disposed strip flanging rollers; a pair of flange finishing rollers; means comprising a chain and sprocket for
5 rotating said finishing rollers in a direction opposite to that in which the strip is fed; a mandrel around which said strip may be wound and provided with a groove; a pressing roller coacting with said mandrel to
10 cause the finished flanges of the strip to interlock to form a seam; a chain and sprocket

for rotating said pressing roller; and a belt encircling said mandrel adapted to move the finished tube along the axis thereof, substantially as described. 15

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

GEORGE W. BEADLE.

Witnesses:

J. H. GEWECKE,

F. F. EDWARDS.