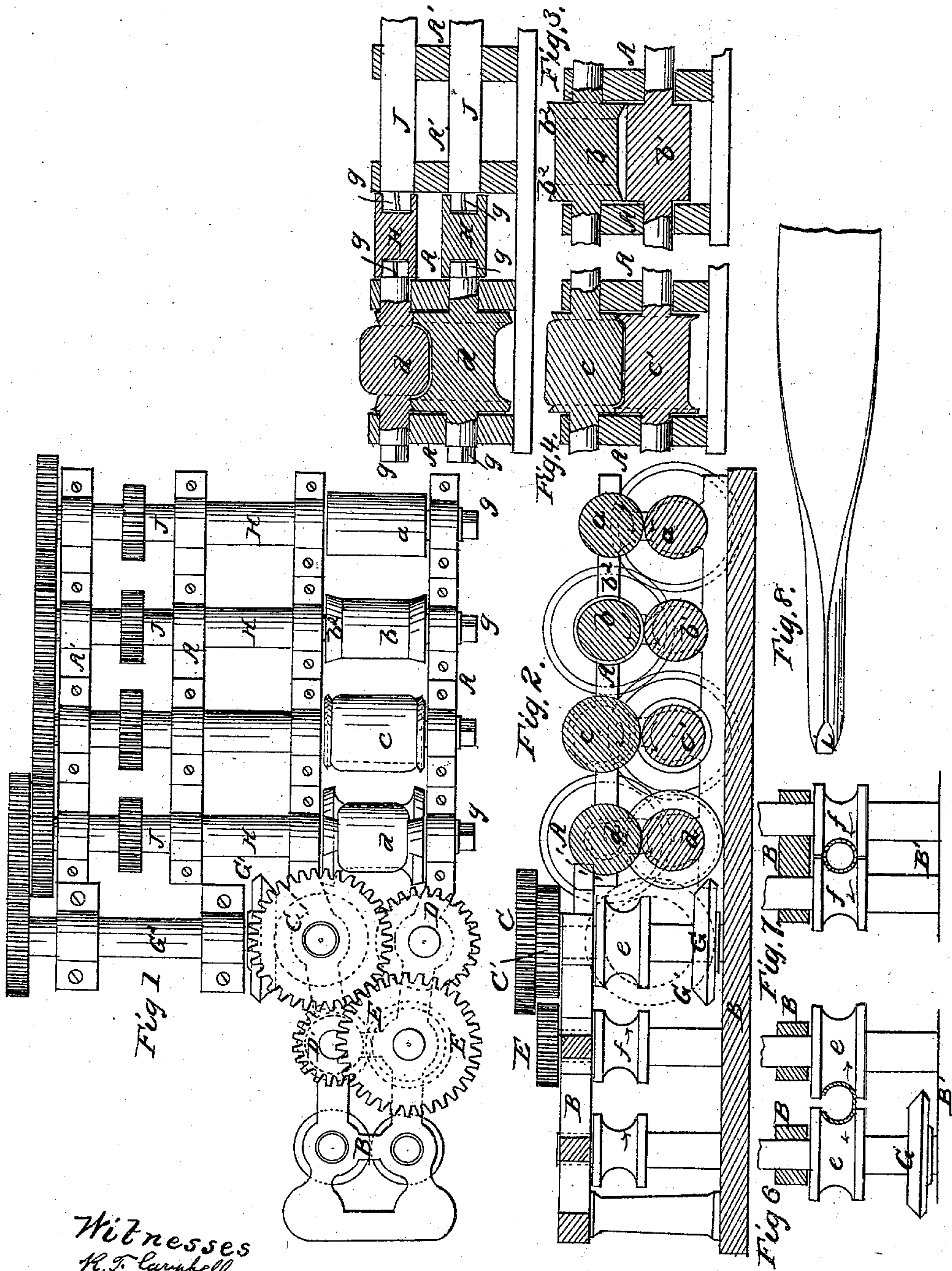


P. L. WEIMER.  
Machine for Making Metal Tubes.

No. 56,152.

Patented July 3, 1866.



Witnesses  
R. F. Campbell  
Edw. Schafer

Inventor:  
P. L. Weimer  
By his atty  
Mason Fennell & Co.



# UNITED STATES PATENT OFFICE.

P. L. WEIMER, OF LEBANON, PENNSYLVANIA, ASSIGNOR TO AURORA IRON COMPANY, OF SAME PLACE.

## IMPROVED MACHINE FOR MAKING METAL TUBES.

Specification forming part of Letters Patent No. 56,152, dated July 3, 1866.

*To all whom it may concern:*

Be it known that I, P. L. WEIMER, of Lebanon, in the county of Lebanon and State of Pennsylvania, have invented a new and useful Improvement in Machines for Making Metal Tubing; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the machine. Fig. 2 is a longitudinal section taken in a vertical plane through the center of the bending-rollers. Fig. 3 is a longitudinal section through the scarfing-rollers. Fig. 4 is a longitudinal section through the first pair of bending-rollers. Fig. 5 is a longitudinal section through the second pair of bending-rollers. Figs. 6 and 7 are views of the first and second pairs of tubing-rollers. Fig. 8 is a view of a strip of metal as it would appear when subjected to the bending and tubing rollers.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my improvement is to simplify the means for, and facilitate the operation of, bending metal into the form of cylindric tubes or pipes (dispensing entirely with the use of a mandrel in the bending operation) by machinery, preparatory to the operation of welding the seams of the pipes thus produced, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A A' represent two frames, which are arranged in planes parallel to each other and supported upon a firm foundation. These frames are adapted to serve as bearings for the horizontal bending and feeding rollers, which prepare the pipe-metal strips to be received between the rollers which give a cylindrical form to them.

The cylindrical rollers *a a* first receive the strips of metal which are to be bent in the form of pipes, and feed the strips up to and between the scarfing-rollers *b b'*, which scarf the edges of the strips so that these edges may be lapped and welded in the welding operation. The roller *b* has flaring or beveled surfaces

*b<sup>2</sup> b<sup>2</sup>* at its ends, which press upon the edges of the strip of pipe-metal that passes between it and the cylindrical roller *b'*, and scarf or bevel said edges, so that they will leave a smooth seam or joint when welded together. After leaving these scarfing-rollers the flat strip of metal is caught and acted upon by the first pair of bending-rollers, *c c'*. (Clearly shown in Fig. 4.) These rollers merely turn up the edges of the strip, leaving the intermediate portion flat. The second pair of bending-rollers, *d d'*, turn up the edges of the strip still more, and prepare the strip to be received between the first pair of tubing-rollers, *e e'*, which turn over the outer edges of the strip, as shown in Fig. 6, and give the first tubular bend to it. The second pair of tubing-rollers contract the metal and form the cylinder or tube shown in Fig. 7. These rollers *f f* may be succeeded by a third or even a fourth pair, corresponding in shape and size to them.

The tubing-rollers are secured to vertical shafts which have their bearings in a frame, B, and a foundation, B'.

The shafts of the rollers *e e'* carry horizontal spur-wheels C C' D upon their upper ends, the teeth of which engage with spur-wheels D' E E', on upper ends of the shafts of the rollers *f f*. The rollers which succeed these latter are rotated by the friction which is caused by the passage of the pipe between them.

The shaft of the tubing-roller *e'* has a bevel-spur wheel, G, keyed on it, which wheel engages with a bevel-spur wheel, G', on a horizontal shaft, G<sup>2</sup>, which is the main driving-shaft for communicating motion to the feeding, scarfing, bending, and tubing rollers.

The rollers are all turned in the direction indicated by the arrows in the drawings by means of a train of wheels, (shown in Fig. 1,) which are applied on shafts that have their bearings in frames A' A'. The inner ends of the shafts J of said wheels, as well as the inner ends of the shafts of the rollers which feed in the strips, scarf and bend them, have toothed tenons *g* formed on them for receiving the corresponding mortises which are formed in the ends of coupling-shafts H H. By thus coupling the feed, scarfing, and bending roll-



ers with their respective driving shafts these rollers can be readily removed from their frames and others of a larger or smaller size substituted in their stead when it is desired to make larger or smaller pipes.

Previously to introducing the strips of pipe-metal between the feed-rollers I shear off the corners of one end of each strip, so as to form a narrow entering lip, *i*. (Shown in Fig. 8.) This lip will enter between the several pairs of rollers, and allow each pair to bite the end of the strip firmly and draw it onward before the bending takes place. This lip *i* not only facilitates the entrance of the strip between each pair of bending-rollers, but it prevents any liability of the strips being turned out of their proper course or becoming buckled or crimped up between the pairs of rollers.

Previously to introducing the skelps or strips of metal of which the pipes are formed into the machine they should be heated in a suitable furnace, and the lips *i* formed on them, either before or after they are heated.

I am aware that in the years 1846 and 1847 M. Brocard obtained French patents on machinery for making tubes or pipes. I therefore do not claim, broadly, a machine which will perform such work; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the bending-rollers *d d*, *e e*, and *f f*, in a machine which is constructed and operates substantially as and for the purpose described.

2. While not claiming broadly the scarfing-rollers *b b* and the bending-rollers *e e'*, I do claim these rollers in combination with the bending-rollers *d* and the rollers *e e'* or *f f*, all arranged and operating substantially in the manner described, and for the purpose set forth.

P. L. WEIMER.

Witnesses:

ANTHONY S. ELY,  
L. E. WEIMER.