G. H. WHITE.

Machine for Welding Tubing.

No. 166,668. Patented Aug. 10, 1875.

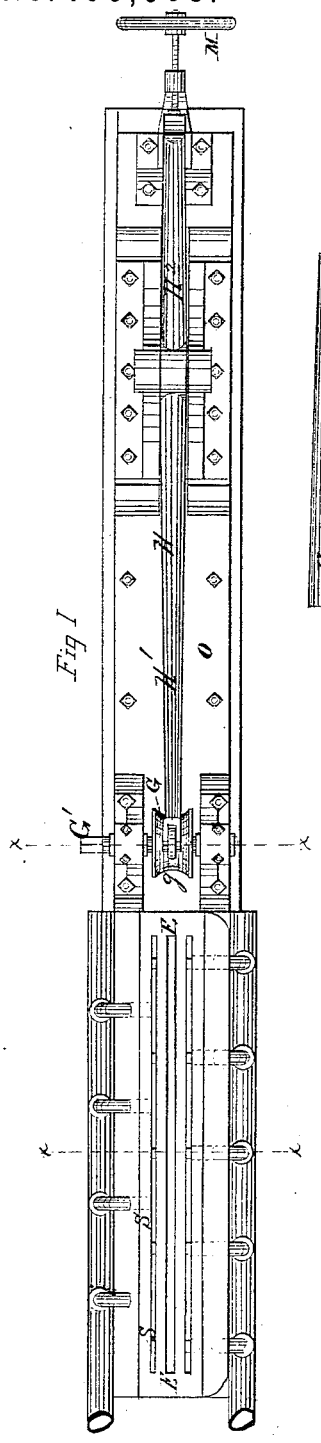

Fig 1

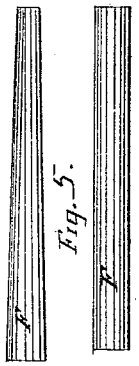

Fig. 5.

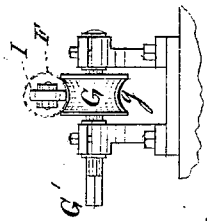

Fig 3

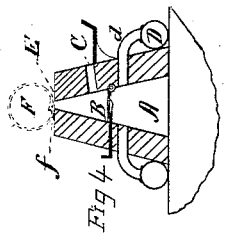

Fig 4

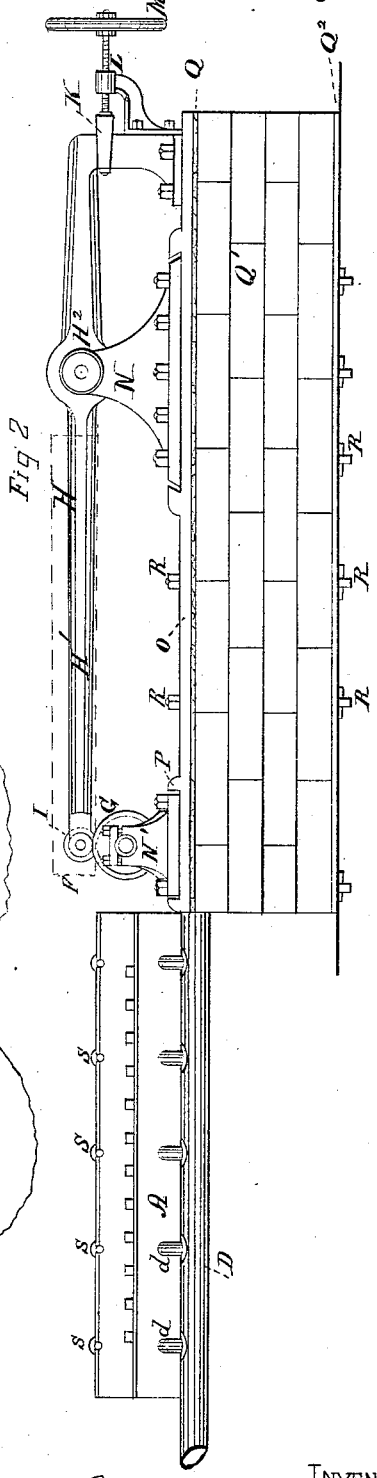

Fig 2

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE H. WHITE, OF CLEVELAND, OHIO.

IMPROVEMENT IN MACHINES FOR WELDING TUBING.

Specification forming part of Letters Patent No. **166,668**, dated August 10, 1875; application filed April 17, 1875.

To all whom it may concern:

Be it known that I, GEORGE H. WHITE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machinery for Manufacturing Lap-Weld 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improved machinery for the manufacture of lap-weld tubes; and consists in mechanism whereby the joint alone is heated, in connection with novel mechanism for forming the weld and imparting pressure, the machinery being adapted equally for making cylindrical or tapering tubes.

In the drawings, Figure 1 is a plan, and Fig. 2 a side elevation, of my improved machinery. Fig. 3 is an end view of the feed-roller and welding-wheel, representing a tube in position in dotted lines. Fig. 4 is a cross-section through the furnace, indicating, in dotted lines, a tube in position upon it. Fig. 5 represents a cylindrical tube and a tapering tube, both forms of which can be readily made by the said machinery.

A is a suitable furnace for heating the said pipe. B is a grate for receiving the fuel through feed-ports C. D are pipes, through which air is forced or permitted to enter beneath the grate through smaller pipes *d*. The furnace is made large at the bottom, but diminishing in size at the top, so as to leave but a narrow opening at the top at E. F is a tube placed in position upon the top of the said furnace over the said opening E, its edges *f* having been scarfed and lapped previous to placing the tube in position. In this position the tube at the joint or lap will be rapidly brought to a welding heat. G is a feed-roll. It is, preferably, provided with a channel or groove, *g*, having somewhat the curve of the tube that is to be formed. H is a lever, with its long arm H^1 and its short arm H^2. At the free end of the arm H^1 is the pressure or welding wheel I, whereby pressure is imparted to the lap sufficient to form the weld. Beneath the free end of the short arm H^2 is a wedge, K. This wedge is driven forward or brought back by means of a screw, L, and a hand-wheel, M. By forcing the wedge K forward greater pressure is transmitted by the wheel I. By drawing the wedge K backward the pressure at I is relieved. By properly manipulating the wedge K by the hand-wheel M and the screw L the proper degree of pressure may be obtained that is required for any particular style of tube. N is a fulcrum, upon which the lever tilts. O is a bed-plate, provided with suitable shoes P for receiving the fulcrum N and the standard N′ of the feed-roll.

It will be understood that the formation of the standards N′ and fulcrum N in respect to the bed-plate O, as well as the bed-plate itself, are not material elements of my invention. The form and adaptation of the parts here shown is simple and effective, and admits of readily removing the parts and replacing with others, either for the purpose of repair, or, if required, change in the size of the tube to be made. Q is a cushion of timber beneath the bed-plate O. Q^1 is a suitable masonry or other foundation. Q^2 is a metallic plate, which I prefer to place beneath the masonry, whereby the whole structure may be readily and securely bound together by bolts R. The formation of the structure beneath the bed-plate O, as above described, is likewise not an essential element of my invention, though it forms a good foundation for the operative parts of the mechanism. S are rolls, upon which the tube, or the frame bearing the tube, may rest, and whereby the tube can be readily carried forward to the roller G. Instead of employing the rollers there may be instead of them a railway, upon which a suitable car for the purpose may traverse, or any other suitable device may be employed, whereby the tube, when properly heated, can be properly and readily carried forward, and brought accurately to its position for welding. G′ is the shaft, to which power is applied for feeding the tube forward.

The operation of the device is as follows: A piece of metal is properly bent around to form a tube of any desired size, provided only that it is of sufficient size to admit of passing over the welding-wheel I, and the arm H^1 of the lever. The edges of the tube are properly prepared for welding, either by scarfing or otherwise, and are made to lap over each other. The material thus prepared is placed in its proper

position over the narrow opening E in the top of the furnace, so that the lap shall rest immediately over the said opening. In this way it is soon brought to a welding heat without materially heating the other parts. It is then immediately carried forward to the feed-roller G, which is made to revolve in the direction of the arrow. The tube is fed forward by the feed-roller G, causing it to draw up like a sleeve over the arm H^1 of the lever. As it is being carried forward the wheel I exerts pressure upon the lap sufficient to form a perfect weld, the pressure sufficient for the purpose being regulated by the wedge K and the hand-wheel M. After the tube has passed forward its whole length beneath the welding-wheel the feed-roll G is reversed; and the tube is run back off of the lever H complete.

It is evident that it is just as easy by this mechanism to weld a taper tube as it is to weld a cylindrical tube, and the machine is adapted to weld tubes of any size whatever that are larger than the diameter of the welding-wheel I. The fuel-ports C are, preferably, distributed along the furnace, so that a uniform heat may be insured. I prefer to employ the welding-wheel I, but an inferior result might be produced without using the wheel, but instead thereof a simple smooth surface.

Heretofore in forming lap-weld tubes it has been difficult to preserve the proper shape and proper degree of lap while welding. So also the same difficulty has been experienced in preserving the shape, form, and thickness of the tube during the operation of welding. All these difficulties are obviated by my invention.

What I claim is—

1. In a machine for making lap-weld tubes, the furnace A, provided with a narrow opening, E, in combination with the feed-roller G, welder I, and lever H, all substantially as and for the purpose described.

2. The combination, with the feed-roller G and the lever H, of the wedge K, and hand-wheel M, substantially as and for the purpose described.

3. The combination of the lever H, provided with welding-roller I, fulcrum N, and standard N′, with the bed-plate O and shoes P, substantially as and for the purpose described.

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

GEORGE H. WHITE.

Witnesses:
FRANCIS TOUMEY,
S. J. P. BISHOP.