(No Model.)

W. GREGG, J. F. DONAGHY & J. HUMPHREY.

TUBE MAKING MACHINE.

No. 595,810. Patented Dec. 21, 1897.

Fig. 1.

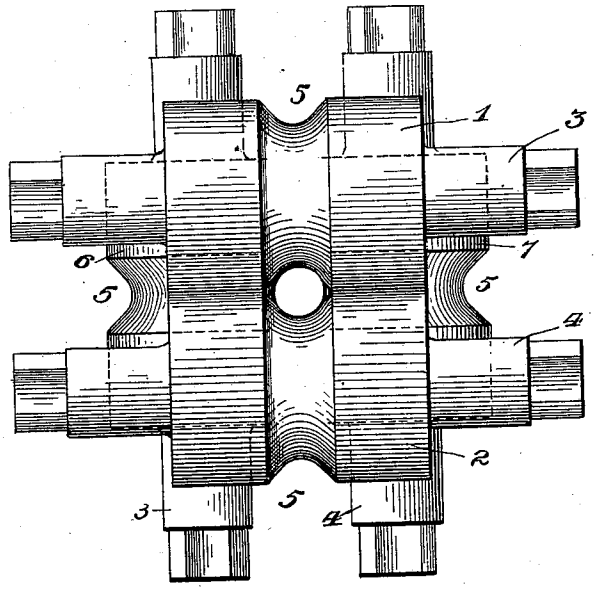


Fig. 2.

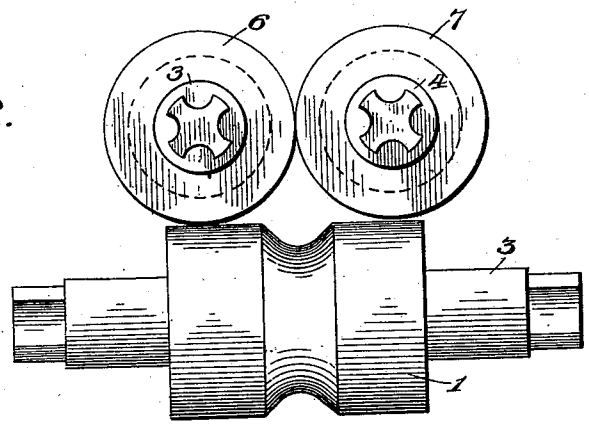
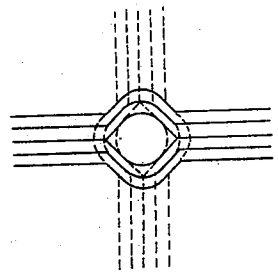


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

WALTER GREGG, JOSEPH FRANK DONAGHY, AND JOHN HUMPHREY, OF ELLWOOD CITY, PENNSYLVANIA.

TUBE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 595,810, dated December 21, 1897.

Application filed January 20, 1897. Serial No. 619,853. (No model.)

To all whom it may concern:

Be it known that we, WALTER GREGG, JOSEPH FRANK DONAGHY, and JOHN HUMPHREY, citizens of the United States, residing at Ellwood City, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Tube-Making Machines; and we 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.

The object of our invention is the production of a novel and efficient metal-working device of the general class known as "tube-making rolls," by the employment of which the manufacture of metallic pipes or tubes will be facilitated and by which the objectionable fins or beads usually incident to their manufacture will be eliminated. To the accomplishment of this object our invention consists in employing oppositely-disposed double rolls having correlative grooves of a novel configuration hereinafter described in detail.

Referring to the drawings, Figure 1 is an elevation of our rolls complete. Fig. 2 is a bottom plan view thereof. Fig. 3 is a diagrammatic view showing the relation of the rollers and their grooves at stated intervals between the "rough" and the "finish" of the tube operated upon.

Referring to the numerals on the drawings, 1 and 2 indicate a pair of horizontally-disposed rolls provided with suitable journals 3 and 4, carried in suitable bearings, (not illustrated,) and provided, further, with annular grooves or channels 5.

6 and 7 indicate a pair of rolls similar in all respects to the rolls 1 and 2, but disposed vertically or, in other words, at right angles to said rolls.

We are aware that metal-working rolls have been employed, arranged in pairs and oppositely disposed, but the gist of our invention lies not in such arrangement but in the particular form of grooves the efficiency of which is incidental to such arrangement. In the ordinary manufacture of metal tubing—as, for instance, pipes and the like—a thin fin or bead of metal extending the entire length of the tube has been an almost invariable and equally objectionable accompaniment. In order to make the four coöperating grooves of the rolls form a complete circle in a gradual manner as the rolls are drawn together in a manner well known in the art during the course of manufacture, we form the grooves 5 with a curvilinear base extending exactly one-quarter of a circle. The remainder of the groove, extending from the curvilinear base to the edge, is a straight line tangential to the curve of the bottom of the groove, the straight portions of the groove on its opposite sides being disposed at right angles to each other. Thus when the rolls are separated the interior configuration of the four coöperating grooves is of a general circular form, and as the rolls are drawn together the aperture is gradually restricted or contracted until a perfect circle or cylinder of the desired size is produced, as illustrated in Fig. 1. The contiguous straight sides of the opposing grooves approach each other with a wedge action; but when they have reached a point at which a fin would be formed the opposing curve of the other set of rolls is presented to such angular portion of the tube and all tendency to bead is obviated.

The curved portions of the grooves are ninety degrees in extent, or quadra-circular in form, so that, as stated, when the four opposing surfaces are brought together an exact circle or cylindrical die will be formed, and the entire device differs in every essential particular from the ordinary Mannesman rolls, well known in the art, and the objections to which it has been our object to obviate.

We do not desire to limit ourselves to the details of construction herein shown and described, but reserve to ourselves the right to change, modify, or vary them at will within the scope of our invention.

Having thus described the invention, what is claimed as new is—

In a tube-rolling machine, the combination with a pair of rollers having circumferential grooves each formed with a curvilinear base and straight sides disposed at right angles to each other and tangential to the base, of another pair of similar rollers arranged at right angles to the first-mentioned rollers, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

WALTER GREGG.
JOSEPH FRANK DONAGHY.
JOHN HUMPHREY.

Witnesses:
OSCAR T. ADAMS,
J. M. RUMBERGER.