M. L. ORUM.

Mandrels for Bending Metallic Tubing.

No. 166,294. Patented Aug. 3, 1875.

Fig. 1.

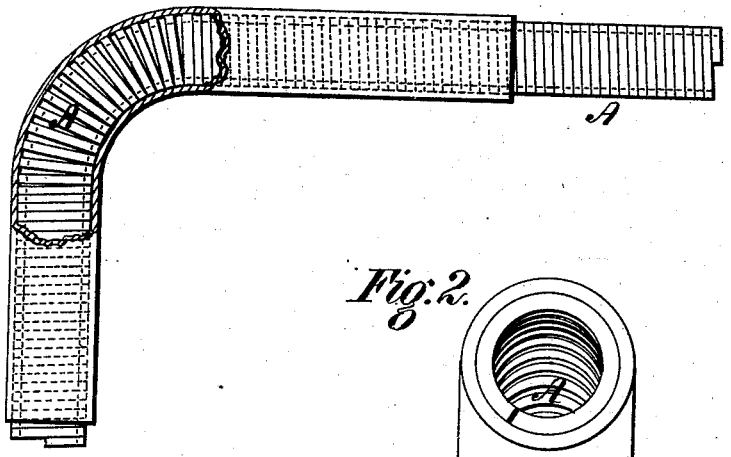


Fig. 2.

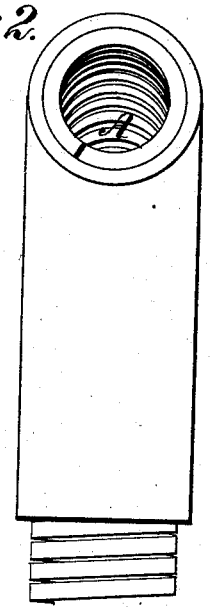
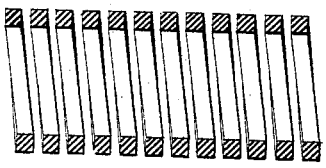


Fig. 3.



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MORRIS L. ORUM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MANDRELS FOR BENDING METALLIC TUBING.

Specification forming part of Letters Patent No. **166,294**, dated August 3, 1875; application filed March 30, 1875.

To all whom it may concern:

Be it known that I, MORRIS L. ORUM, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Device for Bending Metal Pipe, of which the following is a specification:

In the process of bending metal pipes or tubes, as heretofore practiced, it has been difficult to form a bend of regular circular section, by reason of the tendency of the pipe to flatten at the bend in the operation, and various expedients have been resorted to for the purpose of obviating this difficulty. A process which has been extensively practiced consists in filling the pipe with rosin or analogous material, and removing the same by melting after the pipe has been bent. This process is, for obvious reasons, inconvenient, and, further, while involving the expenditure of considerable time, does not, in all cases, prevent the flattening of the pipe before mentioned.

My improvement is designed to provide a simple and convenient device by the use of which pipes can be bent to any desired curvature without flattening or perceptible marking at the bend, as well as, so far as practicable, to guard against breakage of the pipe in the operation; to which ends my improvement consists in a flexible metallic mandrel, consisting of a spiral coil of wire, the section of which is such as to present a flattened surface on the exterior of the spiral, and which is of sufficient pliability to be readily bent into any curve desired, while at the same time possessing sufficient strength to act as an internal support to the pipe, and prevent its deformation by the action of the bending implement. This mandrel is introduced into the pipe, which is then bent by the ordinary means into the required curve, and the flexible mandrel withdrawn at the conclusion of the operation.

In the accompanying drawings, Figure 1 is a side view of a section of pipe with my improved mandrel applied thereto; Fig. 2, a view, on an enlarged scale, of the same, taken at right angles to Fig. 1; and Fig. 3, a section, on an enlarged scale, of a portion of the flexible mandrel.

To carry out the objects of my invention, I provide a flexible mandrel, A, which is formed of a spiral coil of stout wire, the diameter of the coil being such that the mandrel may fit easily within the pipe.

The wire used to form the mandrel should be either of a square, rectangular, or triangular section, or more or less flattened upon the exterior surface of the spiral, so as to afford as much bearing-surface as possible to the pipe, and the spiral should be coiled as closely as practicable for the same reason.

To bend a metal pipe, I select a flexible mandrel of suitable diameter, and introduce it into the pipe before commencing to bend it. I then bend the pipe to the curvature required by the ordinary implements used for the purpose, and afterward withdraw the mandrel from the pipe, which I have found, in practice, is not perceptibly marked or injured in the operation, and the mandrel is ready for use with another pipe.

The mandrel can be readily withdrawn, after bending the pipe, by attaching one of its ends to a lathe-spindle, and revolving it in such direction as to reduce its diameter by screwing up its coils.

It is obvious that in some cases, where additional strength is to be imparted to a pipe, the mandrel might be allowed to remain in the pipe after bending, if so desired; but, in general, it would be more desirable to withdraw it after bending, as stated.

I have found in practice that by the use of my device I am enabled to bend metal pipes with ease and celerity, and am satisfied that its introduction will economize time, labor, and material.

I do not desire to claim either a spiral coil of wire, or the combination of the same with a pipe, as I am aware that flexible tubes for gas, &c., have been provided with an internal coil of wire, the purpose thereof being to prevent the closing or collapsing of the pipe without impairing its flexibility.

I claim as my invention—

A flexible mandrel for bending metallic pipe, consisting of a spiral coil of wire, the exterior surface of which is flattened, substantially as set forth.

MORRIS L. ORUM.

Witnesses:

J. SNOWDEN BELL,

GEO. H. FOX.