

J. M. REID.

MACHINES FOR BENDING METALLIC TUBES.

No. 170,300.

Patented Nov. 23, 1875.

Fig. 2.

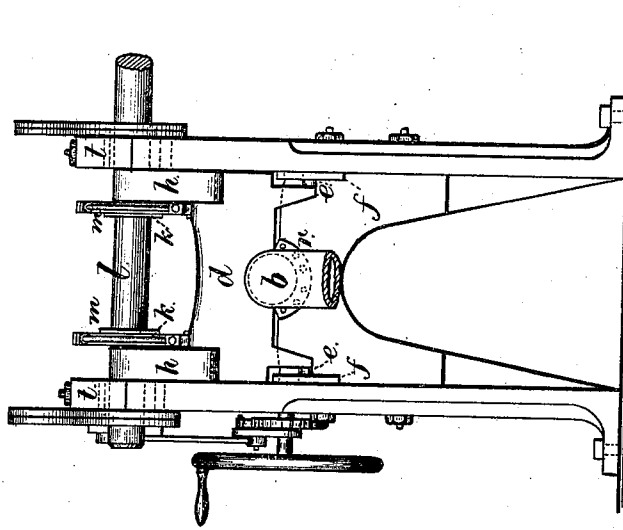
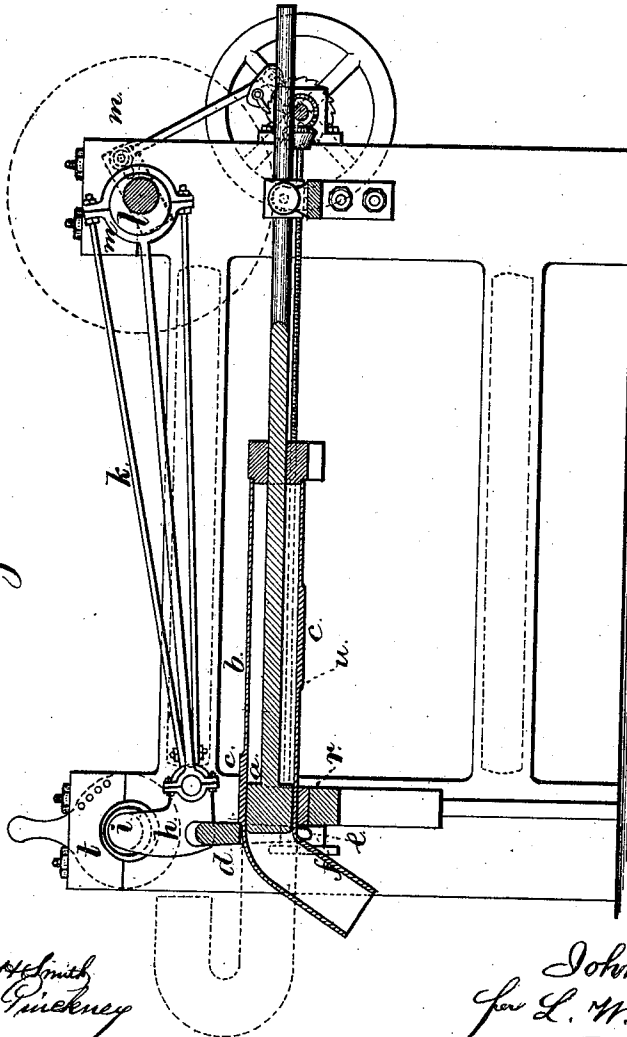


Fig. 1.



Witnesses,

Chas. H. Smith
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Inventor

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UNITED STATES PATENT OFFICE.

JOHN M. REID, OF MONTREAL, CANADA.

IMPROVEMENT IN MACHINES FOR BENDING METALLIC TUBES.

Specification forming part of Letters Patent No. **170,300**, dated November 23, 1875; application filed May 19, 1875.

To all whom it may concern:

Be it known that I, JOHN M. REID, of Montreal, Dominion of Canada, have invented an Improvement in Machinery for Compressing and Bending Metallic Tubes, of which the following is a specification:

Metallic tubes have been cast in lead and alloys, with sections at one or more sides thicker than the pipe is to be when finished, and this increased thickness has been reduced and extended in the act of bending the pipe to form traps and bends employed in drain-pipes.

My machine is made for the purpose of compressing the pipe where the extra thickness occurs, and at the same time giving to the die a swinging motion in the direction of the bend of the pipe, thereby insuring greater uniformity in the bends, and making such bends of a shorter radius than heretofore usual, so as to occupy less space, and the mechanism employed is very powerful and adapted to reducing and bending metal that is comparatively hard, such as alloys of tin and lead or zinc.

In the drawing, Figure 1 is a longitudinal section of the improved machine, and Fig. 2 is an end view of the same.

The mandrel *a* is of a size corresponding to the interior of the pipe to be bent, and the pipe *b* is made of increased thickness in sections, as seen at *c*. The compressing-die *d* is made as a half circle, corresponding to the external diameter of the finished pipe. There are two legs extending down at the sides to the gudgeons or trunnions *e*, that are within the sliding-boxes *f*. At the upper portions of the compressing-die there are joints connecting the toggle-bars *h* and actuating-links *k*. These toggle-bars *h* swing on the journals or centers *i*, and the links *k* are moved by the shaft *l* and eccentrics or cranks *m*.

The operation is as follows: The pipe *b* is passed upon the mandrel when the die *d* is raised, and the thicker portion goes beneath the compressing-die, and back behind the same. The operator sets the machine in motion, and slides the tube toward the compressing-die until the thicker portion of the said tube comes beneath the same. The links *k* move the toggle *h* and die nearly into a straight line, and cause the die *d* to compress

the extra thickness of the metal to the standard thickness, and in so doing elongate this side of the pipe. At the same time the die *d*, swinging upon the trunnions *e*, describes the arc of a circle corresponding, or nearly so, to the bend of the pipe, and the metal is polished or burnished upon its surface, as well as consolidated and bent into the proper curve or arc, so that a quarter or half circle bend is produced in consequence of the increased thickness of metal provided at one side of the straight cast tube. The bent end of the tube turns in beneath the arched support or bearing *r*, upon which the under side of the pipe rests while under compression, and when the tube *b* is to be bent into a complete **S** form the first bend will be brought back above the compressing-die *d*, as represented by dotted lines, and the second bend will be made by compressing the metal at *u*.

It may sometimes be important to accurately adjust the downward movement of the compressing-die. For this purpose the boxes or bearings *t* of the journals *i* may be provided with adjusting-screws, or there may be either single eccentric sleeves in the journals, or double eccentric sleeves, as shown, with lever-arms by which to rotate such sleeves and move the journals *i* up or down.

To allow for using the machine with bends of varying diameters the core *a* is removable, and the die *d* and bearing *r* are each made with recesses receiving removable die-blocks that can be changed to suit different external diameters of pipes. The die *d* may be lifted off the pipe upon the return movement by a spring or otherwise.

I claim as my invention—

A compressing-die, swinging upon trunnions or centers corresponding, or nearly so, with the center from which the bend of the pipe is described, in combination with a mandrel to support the tube while being compressed and bent, and mechanism substantially as set forth for actuating the swinging compressing-die, as specified.

Signed by me this 17th day of May, A. D. 1875.

JOHN M. REID.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.