J. L. PIPER.

Machine for Capping the Joint-Flanges of Hollow Columns and Cylinders.

No. 167,117. Patented Aug. 24, 1875.

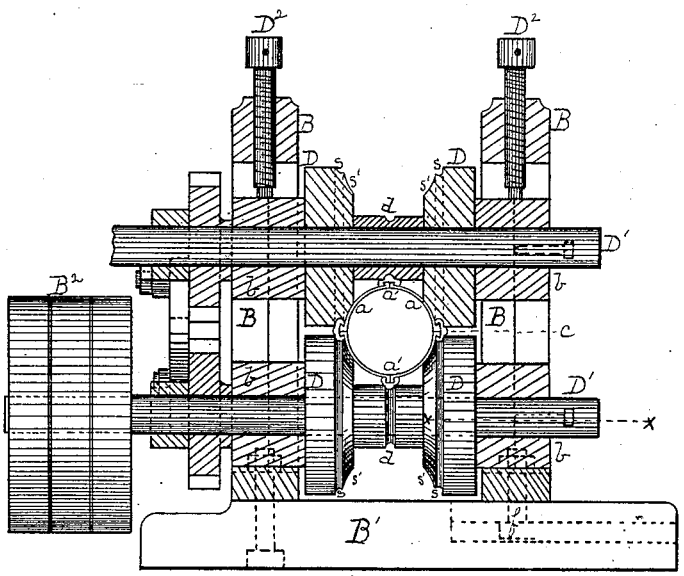

Fig. 1.

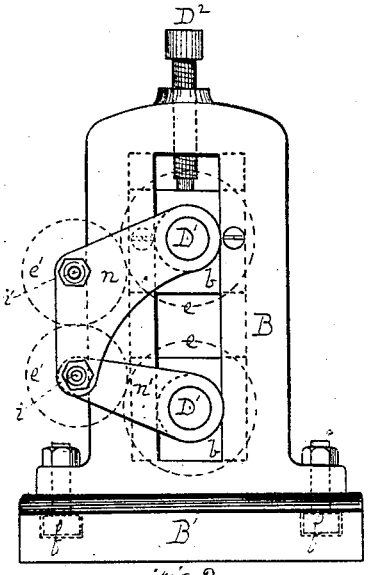

Fig. 2.

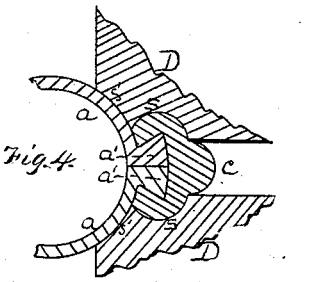

Fig. 4.

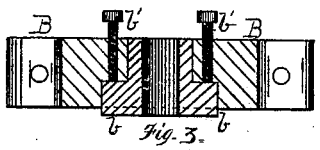

Fig. 3.

WITNESSES.

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JOHN L. PIPER, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR CAPPING THE JOINT-FLANGES OF HOLLOW COLUMNS AND CYLINDERS.

Specification forming part of Letters Patent No. **167,117**, dated August 24, 1875; application filed June 10, 1875.

To all whom it may concern:

Be it known that I, JOHN L. PIPER, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Metal-Rolling Machine; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a view, partly in side elevation and partly in sectional elevation, of my improved machine. Fig. 2 is an end elevation thereof. Fig. 3 illustrates, by a sectional view through the housing and bearing or box in the line *x x*, Fig. 1, one means of adjusting the rolls; and Fig. 4 is an enlarged detached view, showing the joint to be operated on, and how the same is griped by the roller-dies.

My present improvement relates to the manufacture of the class of hollow posts, columns, girders, &c., described in Letters Patent granted to me May 13, 1873, No. 138,817, in which each edge of the concave plates which go to form the column has a rib, which constitutes the one-half of the male part of a dovetail joint. Such plates and dovetail flanges are represented at *a a'* in the drawing hereunto annexed. These plates are secured together edge to edge by means of bars *c c*, each having a groove correspondingly shaped, so as to make the other or female part of a dovetail joint. These bars are of any desired length, either as long as the column to which they are applied, or of a shorter length, and applied in sections at intervals, or one abutting against another. These parts being shaped by known operations in rolling to the shapes shown in the drawing, they are united by slipping the male parts *a'* of the plates *a* endwise along and into the grooves of the bars *c*. This gives a joint somewhat loose, and on that account objectionable. My present machine is designed for completing and perfecting the joint thus formed, and, if need be, straightening the post. The frame or foundation B^1 and housings B, and the loose and driving pulleys B^2, are of any suitable construction.

In the bearings or plumber-blocks *b* I mount the roller-shafts D^1, and adjust them vertically by means of set-screws D^2 or other like known means. Each roller-shaft carries two roller-dies, D, which on the two shafts work opposite to each other in pairs, and their peripheries are so shaped, as shown at *s*, as that each shall take a bite on the opposite edges of the bars *c*, whereby the lips that form the female part of the dovetail shall be compressed down onto the ribs *a'*, that form the male part, and this may be done while the material is either hot or cold. The ribs *a'* are thus firmly and securely griped by the lips of the bars *c*, and are also made to bear tightly one against the other; and to guard against all liability in the post, while undergoing this operation, to twist or otherwise become distorted, I insert on each roller-shaft, and between the roller-dies D, a buttress-roll, *d*, with a groove therein, or other shaped operative face, such that it shall bear firmly against the bars *c*, which are intermediate between the bars which are being acted on by the roller-dies D, or against some part of the post midway or about midway between point of bite of the roller-dies D; and for the same purpose, when necessary or desirable, the inner ends of the roller-dies D are extended, so as, by curved faces, as shown at *s'*, to bear on plates *a*, composing the post or column for a little distance, greater or less, as may be preferred, from the joint which is being perfected.

Should there be a slight warp, twist, or bend in any part of the post, or in any of the parts of which it is composed, such part or parts may be straightened by increasing or lessening the pressure on the distorted part or parts, in accordance with well-known rules, by the use of the set-screws D^2, or such other means of easy adjustment as may be employed.

The roller-dies D are held up to their work by means of any suitable device which will prevent them from moving endwise of the shafts while at work, one such being shown in Fig. 3, where set-screws *b'* are passed through the housings, with an end bearing against the plumber-blocks *b*, the latter abutting against the rear faces of the roller-dies.

To adapt the machine for operating on posts of different diameters the roller-dies and buttress-rolls are made independent of the roller-shafts, and are secured thereto by keys, feathers, or other like means, but so as to be both adjustable on and removable from their roller-shafts, so as to be set at any desired distances apart, and so that other dies and rolls of different sizes may be substituted. But when removability is not desired, only one pair of roller-dies need be adjustable; and for the same reasons the roller-shafts may be adjusted vertically, as already stated. But in order that the driving gear-wheels may always be in position for use, without being affected by such vertical adjustment, I employ a construction shown in Fig. 2, where *e e* represent, by dotted lines, the gear-wheels on the roller-shafts D^1; and *e' e'*, two other gear-wheels, which gear into each other, and one of which gears into one wheel, *e*, and the other into the other. A bent arm, *n* is slipped onto one roller-shaft, and a straight arm, *n'*, onto the other, and the two arms, at their outer ends, are jointed together by a pivot or hinge pin, *i*, which is also the bearing of one of the gear-wheels *e'*. The other gear-wheel *e'* is pivoted to the bent arm *n* by a pin, *i'*. Then, as the upper roller-shaft is raised or lowered, the arms *n n'* will turn on the joint formed by the pin *i*, so as to throw the line joining the pins *i i'* to a greater or less distance from the line joining the centers of the roller-shafts D^1; but the distances from the center of each gear-wheel to the center of its gear-wheel *e'*, and from center to center of the two latter, will always remain the same, so that the wheels will be always meshing, and will always impart the desired motions in the right direction at every point of vertical adjustment.

The better to facilitate adjustment and interchangeability of roller-dies and buttress-rolls, one of the housings may be made adjustable or removable by means of T-head bolts working in correspondingly-shaped grooves, as illustrated at *f f*.

The machine thus described is adapted to the work set forth on posts of any desired number of sides.

It will be observed that each pair of roller-dies D, operating on the same joint, perform not only the function designated, but also guide the post while the opposite joint is passing through between the opposite pair of roller-dies. Hence each pair of roller-dies acts as a guide to guide the post in the proper relation to the other pair, and for this purpose any suitable known form or construction of U-shaped guiding device may take the place of one pair of the roller-dies, the construction and function of the other pair remaining substantially the same.

I claim as my invention—

1. In a machine for compressing dovetail joints on hollow posts, a pair of roller-dies, D, having each a griping-face, *s*, for engaging the lips or sides of the female part of the dovetail, in combination with suitable guides, arranged to operate on the opposite side of the hollow post, and above and below the flanges thereof, substantially as set forth.

2. A pair of roller-dies, D, having each a griping-face, *s*, for perfecting the joint, and an extension, *s'*, which shall bear on the hollow post outside the joint, substantially as and for the purposes set forth.

3. The roller-dies D, having each a griping-face, *s*, arranged in pairs, to be operative simultaneously on joints on the opposite sides of a hollow post passing through between them, substantially as set forth.

4. The roller-dies D, having each a griping-face, *s*, arranged in pairs, to be operative simultaneously on joints on the opposite sides of a hollow post passing between them, such dies being movable vertically, and also longitudinally, on their shafts, substantially as set forth.

5. The combination of roller-dies and intermediate buttress-rolls, arranged for engaging simultaneously the different sides of a hollow post, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand.

JOHN L. PIPER.

Witnesses:
JAMES M. CHRISTY,
CLAUDIUS L. PARKER.