(No Model.)

E. LITTLE.

MACHINE FOR ROLLING TUBES.

No. 343,325. Patented June 8, 1886.

Fig. 1.

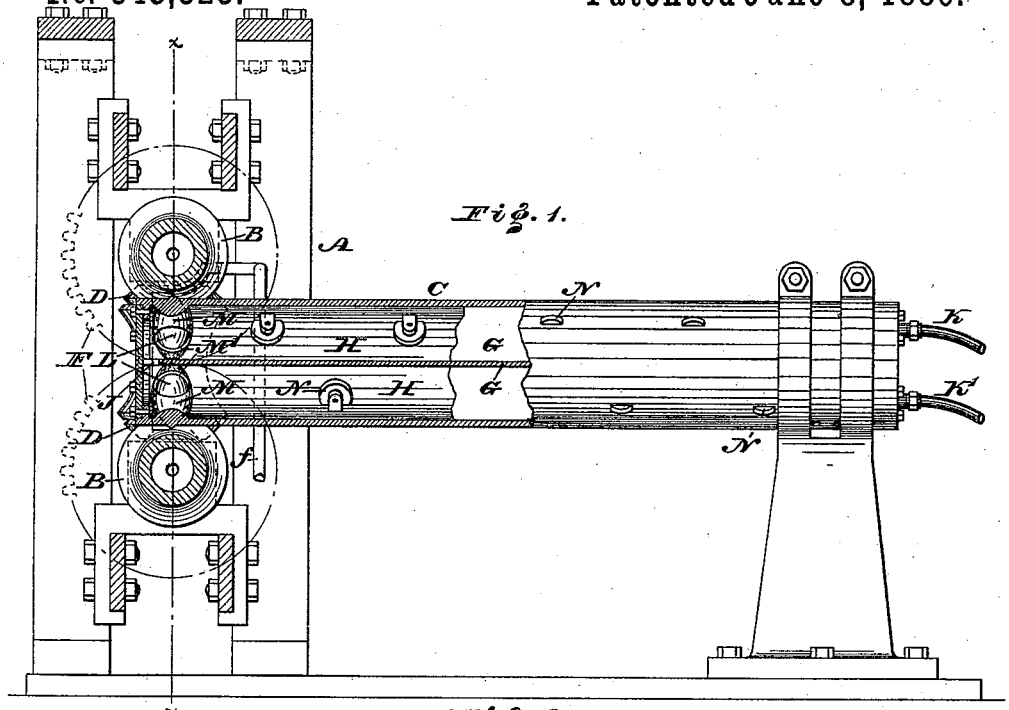


Fig. 2.

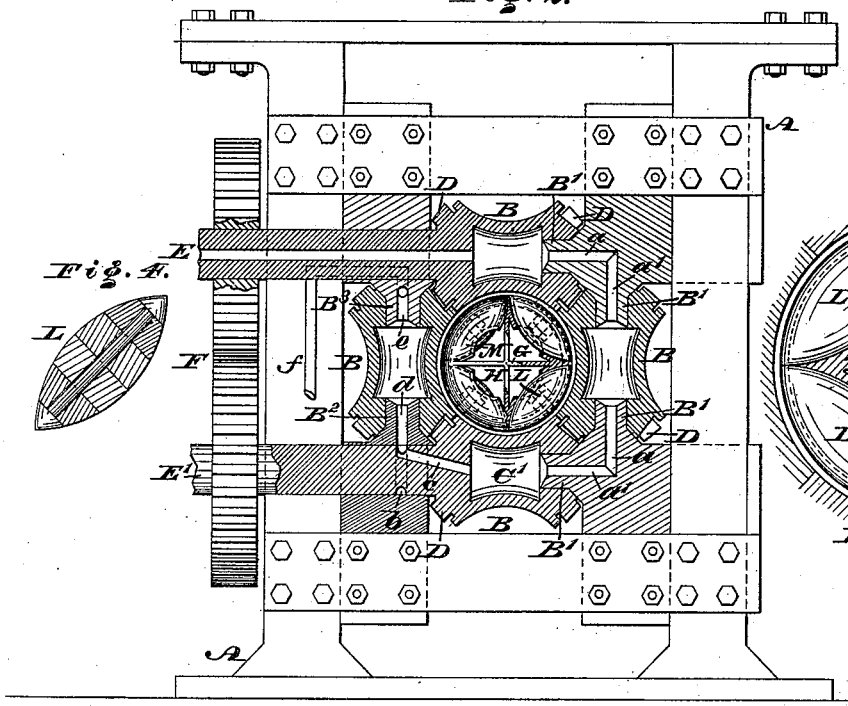
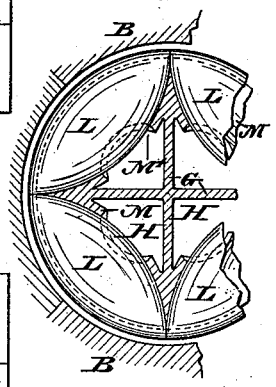


Fig. 4.

Fig. 3.



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MACHINE FOR ROLLING TUBES.

SPECIFICATION forming part of Letters Patent No. 343,325, dated June 8, 1886.

Application filed February 11, 1886. Serial No. 191,532. (No model.)

To all whom it may concern:

Be it known that I, EDGAR LITTLE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Rolling-Mills, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a partial side elevation and partial longitudinal section of a rolling-mill embodying my invention. Fig. 2 represents a vertical section in line *x x*, Fig. 1. Fig. 3 represents an end view of a portion thereof on an enlarged scale. Fig. 4 represents a sectional view of a detached portion of a modification.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of certain improvements in rolling-mills adapted for rolling tubes or pipes, whereby the exterior rolls and interior mandrel may be kept cool, and the rolling is uniformly and expeditiously accomplished, as will be hereinafter fully set forth.

Referring to the drawings, A represents the housing of a mill adapted for rolling tubes or pipes.

B represents the exterior rolls, and C a cylindrical mandrel which is encircled at one end by the rolls B, it being noticed that a space exists between the rolls and mandrel for the insertion and passage of the tube or pipe to be rolled. The rolls B are formed with bevel-gear D, whereby the adjacent rolls are geared together, and motion is thus communicated to the several rolls, the shafts E E′ of the two rolls (four in number in the present case) being geared together, as at F, and power applied to either of said shafts.

The mandrel C is hollow and divided interiorily by a diaphragm, G, which extends longitudinally and forms chambers H within the mandrel, which chambers are in communication at one end by a port, J, in said diaphragm, said mandrel being adapted to receive water, which is admitted into one chamber or one set of chambers, and, running the length thereof, enters the port J, and so reaches the other chamber or other set of chambers, and after running through the same escapes at the end corresponding to the inlet end of the first-named chamber, for which purpose said ends are provided with pipes K K′.

The rolls B and the shaft E are hollow, and the bearings B′ of certain rolls have bores *a a′*, which, it will be seen, are in communication with the openings of the rolls. The shaft E′ has a circumferential groove, *b*, and a bore, *c*, which leads to said groove, and also to the bore or opening C′ of the roll with which the shaft E′ is connected, said groove *b* being also in communication with the bore *d* in the bearing B^2 of the adjacent roll, the opposite bearing, B^3, of the latter roll having a bore, *e*, which leads to a discharge-pipe, *f*. By this provision a continuous stream of water may be supplied to the rolls, the same entering the shaft E and passing through the rolls, the bearings B′, the groove *b* of the shaft E′, and the bearings B^2 B^3, and finally discharging at the bore *e*, the rolls and bearings being cooled in a uniform and reliable manner.

Within the mandrel C are rollers L, which are circular spindles, and disposed point to point at the periphery of the mandrel, so as to project slightly thereat and form a continuous curve around the mandrel, said rollers being sustained on bearings M, which in the present case are formed with or secured to the diaphragm G, whereby said rollers are permitted to rotate with freedom, and thus roll the inner periphery of the tube or pipe, the exterior whereof is rolled by the rolls B. The rollers L are cooled by the water passing through the mandrel, openings M′ existing in the bearings M to permit such passage.

After a tube or pipe has made its forward motion the rolls B are reversed and the tube or pipe thus returned.

The exterior of the mandrel is provided with rollers N, to assist the tube or pipe in its motions on said mandrel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The mandrel C, in combination with the rolls B, each of the latter having bevel-gearing attached thereto, all of said gearing meshing together, substantially as and for the purpose set forth.

2. In a rolling-mill, a hollow mandrel having a diaphragm with a port therein, substantially as and for the purpose set forth.

3. Hollow or chambered rolls B, the hollow shaft E, bearings B′, with bores *a a′*, the shaft E′, with groove *b* and bore *c*, the bearing B^2, with bore *d*, and bearing B^3, with the discharge-bore *e*, substantially as described.

4. The mandrel C, provided with exterior rollers, N, substantially as and for the purpose set forth.

5. The hollow mandrel C, having communicating compartments H, in combination with rollers L, slightly projecting at the periphery of said mandrel, rolls B, and rollers N, substantially as described.

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