

UNITED STATES PATENT OFFICE.

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS.

MACHINE FOR ROLLING SPHERICAL AND CYLINDRICAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 350,906, dated October 12, 1886.

Application filed July 20, 1886. Serial No. 208,534. (No model.)

To all whom it may concern:

Be it known that I, HORACE WYMAN, of Worcester, county of Worcester, and State of Massachusetts, have invented an Improvement in Mechanism for Rolling Spherical and Cylindrical Articles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a mechanism by which to readily roll into shape from a bar or blank an article cylindrical in cross-section, the shape of the said article in longitudinal section depending altogether on the shape of the forming and diverging reducing and spreading surfaces of the two rolls employed.

In another application, Serial No. 208,050, I have shown one roll co-operating with a concaved die, both the roll and the die being provided with forming-surfaces and with diverging reducing and spreading surfaces.

Prior to my invention bars or blanks of metal have been rolled between plane surfaces having forming-surfaces and diverging reducing and spreading surfaces, the said surfaces moving in opposite directions.

To increase the speed of operation of the mechanism for doing the class of work referred to, I have provided two rotating rolls, the adjacent surfaces of which are made movable in opposite directions at the same speed by means of suitable gearing, the metal being acted upon by the rolls being rotated in the space between the contiguous surfaces thereof, a suitable rest supporting the metal during its rotation and while being acted upon by the said rolls.

My invention consists, essentially, in the combination of two rolls provided with forming and with diverging reducing and spreading surfaces, the said rolls having their axes of rotation parallel with gearing to rotate the said rolls in the same direction at the same surface-speed.

Other features of my invention will be set forth in the claims at the end of this specification.

Figure 1, in front elevation, represents a machine embodying my invention; Fig. 2, a top or plan view of Fig. 1; and Fig. 3 shows one of the said rolls cut and spread out as a plane

surface, in order to show the configuration of the same.

The apparatus herein shown is adapted to make an article representing a cylinder or rod at its center, with a cone at each end having a base of a larger diameter than the diameter of the rod between the cones, the shape of the article being represented nearly by the shape of the space between the two rolls in Fig. 2.

In the drawings, A represents the frame-work, upon which is placed journal boxes A¹, A², each of the said journal-boxes having attached to it a cap, A³, held in place by bolts *a*, the said journal-boxes and caps receiving between them the shafts *b c* of the die-rolls C D, (shown by breaking out the caps in Fig. 2,) the said journal-boxes being made adjustable horizontally by bolts *a'*, extended through ears *a''* of the frame A, and acting against the outer ends of the journal-boxes, the latter being confined in adjusted position by strong bolts *a'''*, having usual heads and nuts. The shaft *b* has attached to it a toothed gear, *b'*, and the shaft *c* a toothed gear, *c'*, the said gears being driven by a pinion, *e*, on the stud *e'*, extended from the frame-work, the said pinion having attached to its hub a handle, or in practice a belt-wheel or gear, by which to rotate the pinion by power to drive the shafts *b c* and the attached die-rolls C D. The die-rolls C and D are just alike, and, as herein shown, each die has forming-surfaces *f* and *f'* and diverging reducing and spreading surfaces *f'' f'''*, the said rolls each having like surfaces being so secured to the shafts carrying them, and the shafts being so geared together that the apex 3 of the diverging reducing and spreading surfaces of the die roll C will in the rotation of the rolls meet the corresponding apex, 5, of the die-roll D, the adjacent surfaces of the said rolls moving in opposite directions just about as the said apices meet the heated rod *r*, (shown by dotted lines, Fig. 1,) to commence the reducing and spreading of the same from its center outward.

The metal rod or blank to be placed between the die-rolls to be operated upon by them will in practice be supported by a rest, *h*, in the space between the dies at a point below a horizontal line intersecting the axes of the shafts *b c*. The apices 7 of the die-rolls

cut into and reduce and spread the rod at a point somewhat distant from that point of the rod where the apices 3 and 5 of the die-rolls first strike the rod, the diverging surfaces following the apices 7, gradually spreading the rod and forming conical ends for the article being rolled between them. By varying the shape of the forming-surfaces and of the diverging reducing and spreading surfaces it is possible by two rolls running in the same direction to give to a rod or bar any desired shape in longitudinal section, provided the said rod or bar when finished is circular in cross-section. So I do not desire to limit my invention to any particular shape for the said forming-surfaces or the diverging reducing and spreading surfaces, for they will be varied to correspond with the shape of the article to be produced by rolling. The scored or milled sides of the diverging reducing and spreading surfaces materially aid in the uniform rotation of the bar or blank. Each forming-surface terminates with a heel, as at 8, the rod or blank to be reduced being inserted between the two die-rolls when the heels 8 and the apices 3 and 5 are substantially in the position Fig. 1.

I claim—

1. Two die rolls provided with forming and diverging reducing and spreading surfaces, and two parallel shafts carrying the said die-

rolls, combined with each other and with gearing to rotate the said die-rolls in the same direction, to operate substantially as described.

2. Two die-rolls provided with forming and diverging reducing and spreading surfaces, and two parallel shafts carrying the said die-rolls, combined with each other and with gearing to rotate the said die-rolls in the same direction, and with an intermediate rest to support the bar or blank being acted upon by the die-rolls, the said die-rolls rotating the said rod, substantially as described.

3. Two rotating die-rolls mounted on shafts parallel each to the other, and provided with forming-surfaces and with diverging reducing and spreading surfaces scored or milled to aid in rotating the rod or blank being acted upon, combined with each other and with gearing to drive the said die-rolls in the same direction at the same surface-speed, the like apices of the diverging reducing and spreading surfaces meeting the rod or blank at opposite sides at substantially the same time.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE WYMAN.

Witnesses:

G. W. GREGORY,
F. CUTTER.