

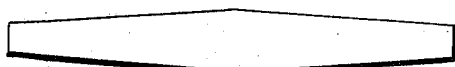
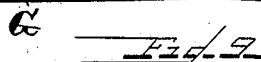
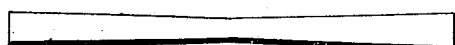
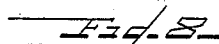
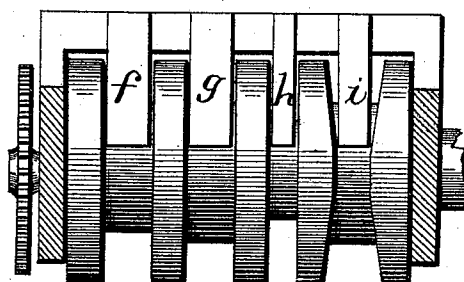
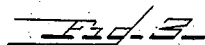
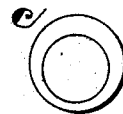
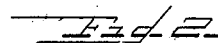
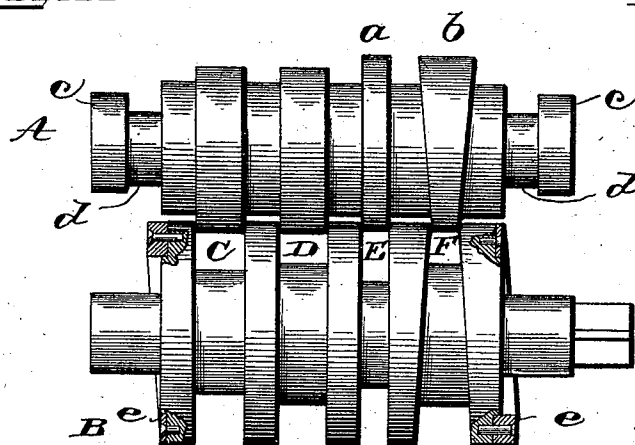
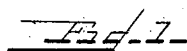
(No Model.)

2 Sheets—Sheet 1.

G. E. RHOADS.
MILL FOR ROLLING FANTAIL AXLES.

No. 576,741.

Patented Feb. 9, 1897.

 $\alpha \quad b'$

Witnesses.

G. A. Pauerschmidt,
D. Meiner Reinohl

Inventor_____

George E. Rhoads.
By D. C. Reinohl
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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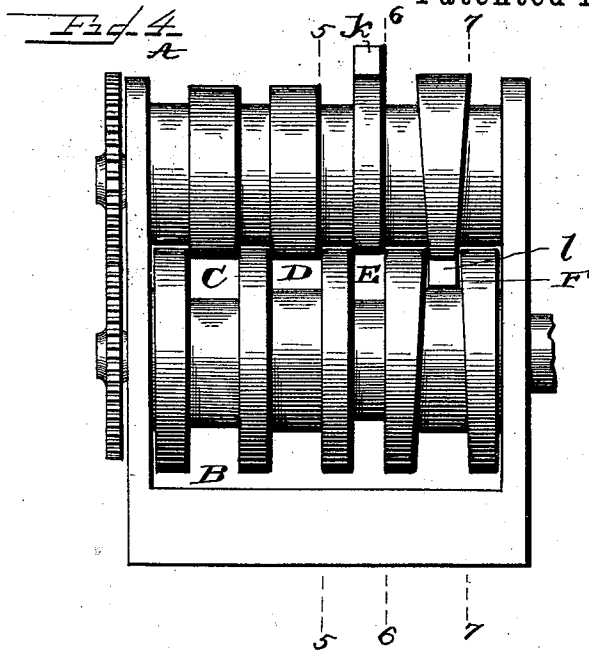
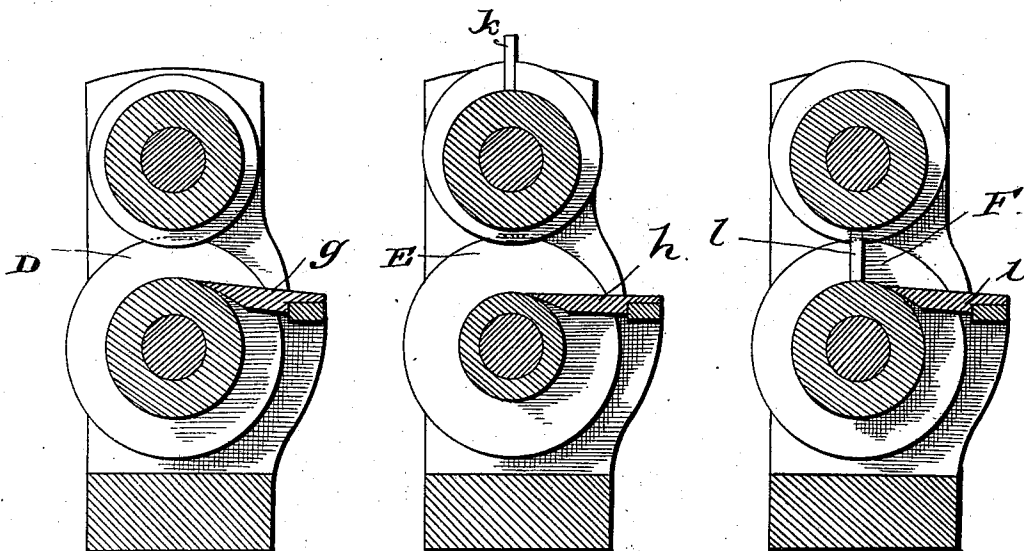


Fig. 5.

Fig. 6.

Fig. 7.



Witnesses—

G. A. Pauerschmidt,
D. Wimmer Reinohl

Inventor—

George E. Rhoads.
By D. L. Reinohl,
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE E. RHOADS, OF LEBANON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO A. B. GLONINGER.

MILL FOR ROLLING FANTAIL AXLES.

SPECIFICATION forming part of Letters Patent No. 576,741, dated February 9, 1897.

Application filed June 17, 1896. Serial No. 595,894. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. RHOADS, a citizen of the United States, residing at Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Mills for Rolling Fantail Axles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to mills or rolls for rolling metal, has especial reference to mills for rolling fantail axles, and has for its object certain improvements in construction which will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a front elevation, partly in section, of the rolls provided with cams to effect the turning of the eccentric collars on the upper roll and the lateral tapering of the last groove in the lower roll; Fig. 2, an end view of the cam of the upper roll detached; Fig. 3, a top plan view of the bottom roll; Fig. 4, a front elevation of the pair of rolls; Fig. 5, a vertical section on the lines 5 5 in two passes on Fig. 4; Fig. 6, a like view on line 6 6; Fig. 7, a like view on line 7 7; Fig. 8, a side view of the rolled axle, and Fig. 9 a top plan view of the same.

Reference being had to the drawings and the letters thereon, A indicates the upper roll, and B the lower roll, which rolls are mounted in suitable housings and geared to revolve together by gearing common to rolling-mills.

In the rolls are formed passes C, D, E, and F. The passes C and D are concentric and the passes E and F eccentric, the eccentricity of the passes being produced or effected by the eccentric or cam-shaped collars *ab* on the upper roll A, and in the pass F the groove in the lower roll B and the collar *b* on the upper roll are tapered or widened laterally in both directions around the roll and on both sides to produce the fantail or swell *b'* in the axle G.

In turning or dressing the rolls A B the roll A is provided with cam-rings *cc*, applied to the necks *dd* of the roll to produce the proper eccentricity of the collars on the upper roll

for the passes E and F while the roll revolves upon the necks *dd* in the housings, and after the roll has been turned the cam-rings are removed.

On the ends of the lower roll B are attached cam-rings *ee* in reverse position, the high portion of one cam being diametrically opposite the other, as shown in Fig. 1, the cam-rings bearing against the inner surface of the journal-boxes or brasses of the bearings in the housings (not shown) to cause the roll to move longitudinally while one side of the groove in the pass F is being turned to give the proper inclination thereto. The cam-rings are then removed from each end of the roll and each ring reversed and placed on the same end of the roll to cause the roll to move longitudinally while the opposite side of the groove is being turned, and after the groove has been completed the cam-rings are removed from the ends of the roll.

The dimensions of the several passes vary according to the size of axle being made. Thus in making what is known to the trade as a "fifteen-sixteenths axle" the narrow portion of the pass F would be fifteen-sixteenths of an inch square and one and one-fourth inches by three-fourths at the largest portion of the pass, which would produce an axle fifteen-sixteenths of an inch square at the ends, one and one-fourth inches wide, and three-fourths of an inch thick in the center.

Each pass is provided on the rear side of the rolls with a guide *fgh* to release the metal from the groove in the lower roll and direct it outward from the roll.

The collar on the upper roll in the pass E is provided with a lug *k* on the high side of the collar, against which the metal being rolled is placed when the lug is in the groove of the pass to enter the metal at the proper place in the pass with reference to the circumference of the rolls, and the collar on the upper roll in the pass F is provided with a lug *l* on the low side of the collar for the same purpose.

In the rolling of axles the metal after leaving the pass D is turned on its edge to enter pass E, in which pass the metal gets its final shape, except the reduction of its thickness in the center of the axle.

Having thus fully described my invention, what I claim is—

1. A mill for rolling fantail axles comprising an upper and a lower roll provided with concentric passes C, D, and eccentric passes E, F, the latter pass being continuously tapered laterally throughout the circumference of the rolls.
2. A mill for rolling fantail axles comprising an upper and a lower roll provided with concentric passes C, D, and eccentric passes E, F, the latter pass being continuously tapered laterally and the collars of said passes E, F, provided with lugs on opposite sides of the roll.

3. A mill for rolling fantail axles comprising an upper and a lower roll provided with concentric passes C, D, and passes E, F, having concentric grooves in the lower roll and eccentric collars on the upper roll and the groove and the collars of the latter pass continuously tapered laterally throughout the circumference of the rolls.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE E. RHOADS.

Witnesses:

HENRY M. BOYER,
A. P. BEATTIE.