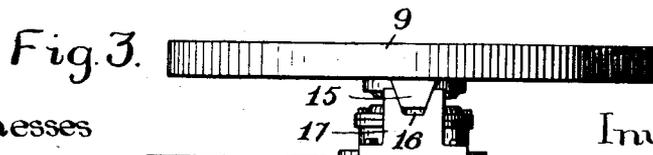
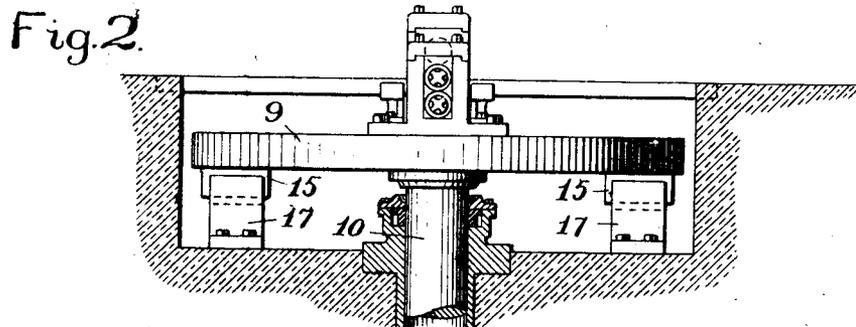
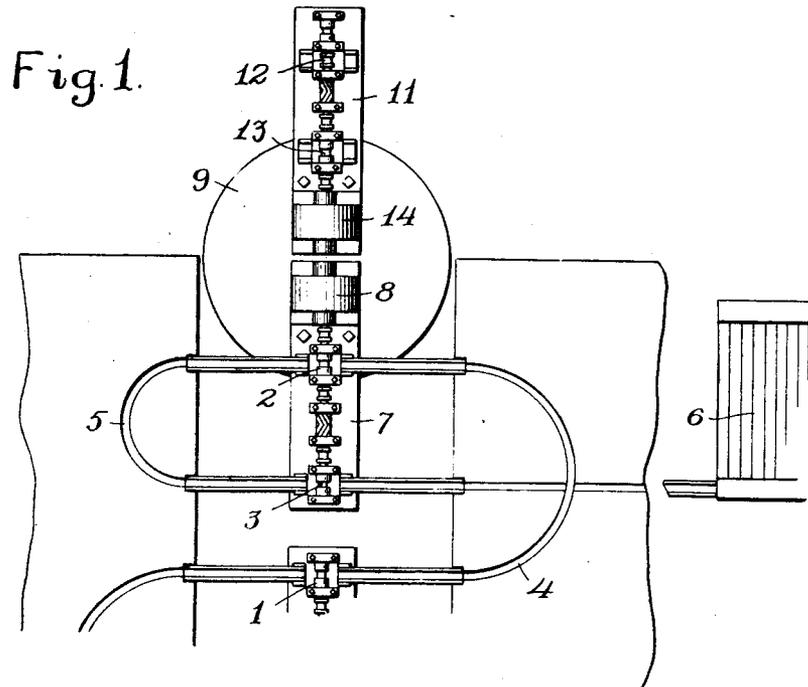


V. E. EDWARDS.  
 ROLLING MILL.  
 APPLICATION FILED OCT. 5, 1908.

1,031,055.

Patented July 2, 1912.



Witnesses

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# UNITED STATES PATENT OFFICE.

VICTOR E. EDWARDS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO MORGAN CONSTRUCTION COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## ROLLING-MILL.

1,031,055.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed October 5 1908. Serial No. 456,142.

*To all whom it may concern:*

Be it known that I, VICTOR E. EDWARDS, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Rolling-Mills, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a plan view of a series of pairs of rolls for the consecutive reduction of a rod, and forming the finishing rolls in a continuous rolling mill. Fig. 2 is a transverse sectional view on a larger scale, and Fig. 3 is a detached view of the roll supporting turntable.

Similar reference letters and figures refer to similar parts in the different views.

The object of my invention is to provide means for bodily transferring from their operative position in a continuous mill, one or more pairs of finishing rolls with their housings, and substituting therefor other pairs of rolls with their housings by a single operation.

Referring to the accompanying drawings 1 denotes the final pair of rolls in a series of pairs for the consecutive reduction of a rod and forming a continuous reducing mill.

2 and 3 denote pairs of finishing rolls, rolls 2 being arranged to receive the rod from rolls 1 through a curved trough or repeater 4. From rolls 2 the rod is delivered through a curved repeater 5 to the last pair of finishing rolls 3 which give to the rod its final dimensions and which deliver it to a conveyer or to a cooling bed 6.

It is sometimes necessary to replace the rolls 2 and 3 when they become worn, or to exchange them for other rolls, giving slightly different dimensions to the finished rod. To remove the rolls 2 or 3 from their housings and substitute others requires a prolonged interruption of the mill, and it is the purpose of my present invention to provide means for effecting this exchange by a single operation, and without seriously interrupting the work of the mill. I accomplish this result by mounting the roll housings of the rolls 2 and 3 upon a bed plate 7, preferably driving the rolls independently from the remaining rolls of the continuous mill, by means of an electric motor 8, located at the end of and in alignment with the roll shafts. The motor 8 and bed plate 7 are

supported upon a turn table 9, mounted upon the upper end of the plunger 10 of a hydraulic elevator which enables the table 9 to be raised and lowered. Mounted upon the table 9 is a second bed plate 11 supporting the roll housings of rolls 12 and 13, and also an electric motor 14 operatively connected with the rolls 12 and 13. The under side of the table 9 is provided with lugs 15, 15, having oblique or beveled sides and adapted to engage similarly shaped recesses 16 in the stationary blocks 17, by which the table 9 is held from rotative movement when in its lowest position, in which position the rolls supported upon the table are brought into the proper horizontal plane to cooperate with the repeaters connecting the rolls with the other pairs in the continuous mill.

When it is desired to shift the finishing rolls, the table 9 is raised sufficiently to release the locking lugs 15 from the stationary blocks 17, which enables the table to be rotated one half a revolution. It is then lowered to bring the locking lugs 15 into engagement with the blocks 17, thereby locking it in position. This operation carries the rolls 2 and 3 into the position occupied by the rolls 13 and 12 in Fig. 1, and carries the rolls 13 and 12 into the position occupied by the rolls 2 and 3 in Fig. 1, and in proper position to cooperate with both the rolls 1 and the cooling bed 6.

The shifting of the finishing rolls as described above, requires but a short period of time and occasions no material delay in the operation of the mill. If it becomes necessary to change the rolls in the housings owing to the wear of the grooves, or to substitute other rolls having grooves of different dimensions, the exchange of rolls can be made in the pair of housings which are out of commission and during the time that the other pairs of rolls are in operation, without causing any interruption in the work of the mill, for example, the rolls 12 and 13 can be taken from their housings and other rolls substituted therefor while they are in the position shown in Fig. 1, without interrupting the operation of rolls 2 and 3.

In Fig. 1 I have shown two sets of rolls only, each containing two pairs of rolls and mounted upon diametrically opposite sides of the table 9, giving duplicate sets of finishing rolls, as this number fulfils the usual requirements in rolling mill practice, but if

desired, three or even four sets of roll housings may be mounted upon the same table, and the locking lugs 15 so arranged as to lock either set in operative position.

5 By the use of independent motors I can put either set of rolls into motion, if desired, for any purpose, independently of their position relatively to the remaining rolls of the mill, and I avoid the necessity of connecting and disconnecting the several sets of rolls from a common motive power.

I claim,

1. A rolling mill, comprising a pair of reducing rolls, a support for rolls rotatable 15 about a vertical axis, separate sets of rolls mounted on the upper surface of said support and in the same horizontal plane, each set arranged to be brought into and out of operative relation with said reducing rolls 20 by the rotation of said support.

2. A rolling mill, comprising a support rotatable about a vertical axis, a pair of rolls mounted on the upper surface of said support, with said support arranged to be 25 rotated to bring said pair of rolls into and out of operative position as desired.

3. A rolling mill, comprising a horizontal support, with a pair of rolls mounted on its upper surface, with said support arranged 30 to be rotated to bring said pair of rolls into and out of operative position as desired, and means for holding said support in a stationary position.

4. A rolling mill, comprising a support 35 rotatable about a vertical axis, independent pairs of rolls mounted on said support, with said support arranged to bring by its rotation each independent pair of rolls into operative relation with the remainder of the 40 rolling mill, and means for holding said support in a stationary position.

5. A rolling mill, comprising a support rotatable about a vertical axis, independent 45 pairs of rolls mounted on the upper surface of said support, a curved trough or repeater leading from a stationary pair of rolls, and means for raising and lowering said support to bring the rolls mounted thereon into the proper horizontal plane to cooperate with 50 said repeater.

6. A rolling mill, comprising a horizontal support rotatable about a vertical axis, separate sets of rolls mounted on the upper surface of said support, with said support 55 arranged to be rotated to bring each set of rolls into and out of operative position, and independent means for operating each set of rolls on said support.

7. A rolling mill, comprising a support 60 rotatable about a vertical axis, independent pairs of rolls mounted on the upper surface of said support, with said support arranged to be rotated to bring each independent pair

of rolls into operative relation with the remainder of the rolling mill, means for raising 65 and lowering said support to bring the rolls mounted thereon into the proper horizontal plane to cooperate with the remainder of the mill, and means for holding said support from rotation in said proper horizontal 70 plane.

8. A rolling mill, comprising a pair of rolls held in a stationary position, a horizontal rotatable turntable with a pair of rolls mounted thereon, with said turntable 75 arranged to bring by its rotation said rolls mounted thereon into operative relation with said stationary rolls, means for maintaining said turntable in said operative position, comprising a stationary block, a lug 80 on said table arranged to engage said block when said table is in said operative position, and means for raising said table to disengage said lug from said block.

9. A rolling mill, comprising a pair of 85 rolls held in a stationary position, a horizontal rotatable turntable with a pair of rolls mounted thereon, with said turntable arranged to bring by its rotation said rolls mounted thereon into operative relation 90 with said stationary rolls, means for maintaining said turntable in said operative position, comprising a locking mechanism arranged to operate when said table is in operative position, and means for raising said 95 table to disengage said locking mechanism.

10. A rolling mill, comprising a horizontally rotatable support, with a pair of rolls mounted upon the upper surface of said support, with said support arranged to 100 bring by its rotation said rolls mounted thereon into operative position, and means for holding said support from rotation and for insuring the correct operative position of said rolls. 105

11. A rolling mill, comprising a horizontally rotatable support, with a pair of rolls mounted on the upper surface of said support, with said support arranged to bring 110 by its rotation said rolls mounted thereon into operative position, means for maintaining said support with said rolls in said operative position, comprising a stationary block having a recess with oblique or beveled sides, a similarly shaped lug on said support 115 arranged to engage said recess and thereby bring said rolls into operative position, and means for raising and lowering said support to bring said rolls into the proper horizontal plane. 120

Dated this first day of October 1908.

VICTOR E. EDWARDS.

Witnesses:

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