

V. E. EDWARDS.
ROLLING MILL.
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1,041,757.

Patented Oct. 22, 1912.

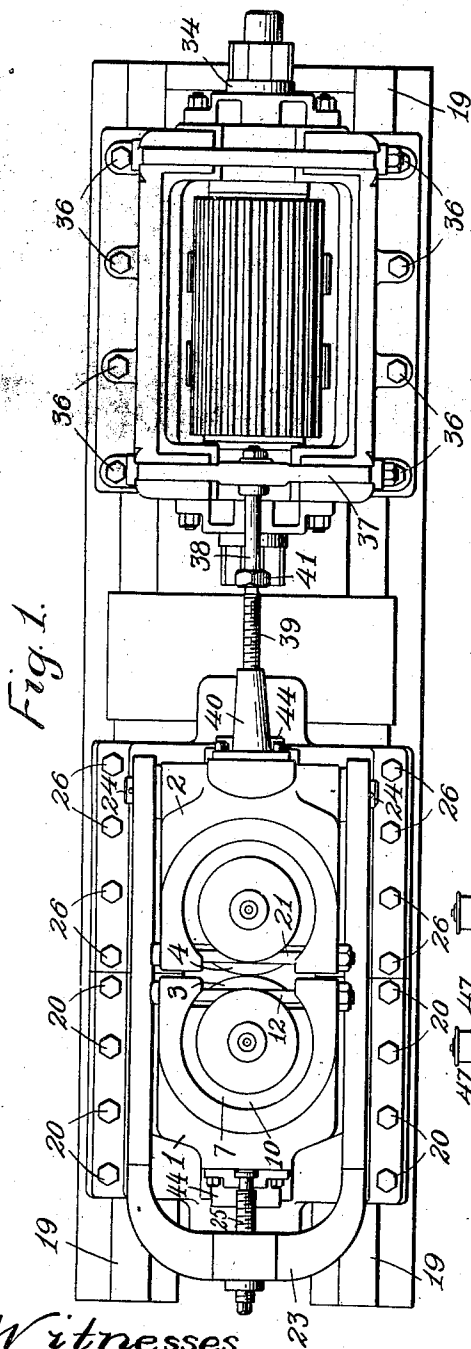


Fig. 1.

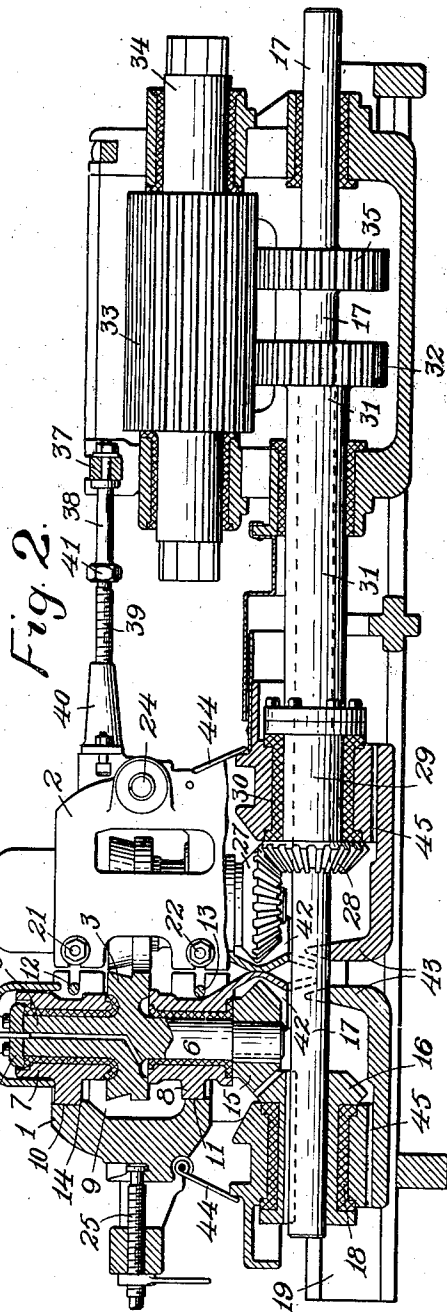


Fig. 2.

Witnesses

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ROLLING-MILL.

1,041,757.

Specification of Letters Patent.

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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 pair of rolls of a rolling mill, having means for adjusting and driving the same, embodying my present invention, and Fig. 2 is a side elevation of the rolls with their driving and adjusting mechanism shown in Fig. 1, represented partly in section.

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

The objects of my present invention are to provide means for adjusting a pair of rolls of a rolling mill with reference to each other and with reference to the cooperating pairs of rolls; to provide means for driving said rolls in their adjusted positions, and further to provide an improved method of housing said rolls, and I accomplish these objects by the construction and arrangement of parts as hereinafter described and pointed out in the annexed claims.

Referring to the accompanying drawings, 1, 2, denote the roll housings of a pair of rolls 3, 4, which, in the present instance, are represented as vertical rolls. The rolls 3 and 4 are similarly journaled in bearings supported in the housings 1 and 2, and a description of roll 3, which is shown partly in section in Fig. 2, will also apply to roll 4. The roll 3 is provided with gudgeons 5, 6, the former being journaled in a bearing 7 and the latter being journaled in a bearing 8. The housing 1 is recessed at 9 to provide a space for the roll 3, and the recess 9 is provided at the top and bottom with circular openings 10 and 11. The bearings 7 and 8 are held in the circular openings 10 and 11 in the housing 1. The circular openings 10 and 11 are open on the inner side of the housing 1, which is provided with clamping bolts 12 and 13, by which the housing is clamped upon the bearings 7 and 8. The circular opening 10 is provided with a shoulder 14 which forms a support for the bearing 7, and the roll 3 and bearing 8 are smaller in diameter than the inside diameter

of the shoulder 14, thereby allowing the roll and its bearings 7 and 8 to be removed from the housing through the circular opening 10.

To the gudgeon 6 is attached a beveled gear 15, which is in mesh with a beveled gear 16 keyed to a driving shaft 17, and held from longitudinal movement in a bearing 18 formed in the framework of the housing 1. The housing 1 is mounted upon a track 19, to which it is adjustably attached by bolts 20. The roll 4 is similarly supported by the housing 2 in bearings which are clamped in the housing 2 by clamping bolts 21, 22. The rolls 3 and 4 are held in proper relation to each other by means of adjustable connecting mechanism between the housings 1 and 2, consisting, in the present instance, of a yoke 23 which is pivoted on studs 24 carried by the housing 2, and is provided with an adjusting screw 25 which bears against the housing 1 to resist the spreading of the rolls 3 and 4. The housing 2 is mounted upon a track 19 and is adjustably attached thereto by bolts 26.

To the lower gudgeon of the roll 4 is attached a pinion 27, which meshes with a pinion 28 carried upon a sleeve 29, and held from longitudinal movement in a bearing 30 in the housing 2. The sleeve 29 is extended at 31 and carries upon its opposite end a pinion 32, which is in mesh with a long toothed pinion 33 upon a driving spindle 34. The shaft 17 is likewise provided with a pinion 35 in mesh with the driving gear 33, so that rotary motion is imparted individually to the rolls 3 and 4 from the pinion 33, to the roll 3 through the pinion 35, shaft 17, and beveled gears 15 and 16, and to the roll 4 through the pinion 32, sleeve 29 and beveled gears 27 and 28.

The housing in which the pinion 33 and shaft 34 are journaled is rigidly attached to the track 19 by bolts 36, and is provided with a yoke 37 in which is journaled an adjusting bolt 38 provided with a screw threaded section 39, which enters a screw threaded nut 40 attached to the housing 2. The bolt 38 is held from longitudinal movement in the yoke 37, and is provided with a polygonal enlargement 41 to receive a wrench, by which the bolt may be turned in order to adjust the position of the housing 2 on the track 19.

By loosening the bolts 20 and 26 both of

the housings 1 and 2 will be released from the track 19, and may be jointly adjusted thereon by the rotation of the adjusting bolt 38, in order to bring the pair of rolls 3 and 4 into alinement with other cooperating pairs of rolls, and the position of the roll 3 relatively to the roll 4 may be determined by the adjusting screw 25. By loosening the clamping bolts 12 and 13 the roll 3, together with its bearings 7 and 8 and its attached pinion 15, may be lifted vertically entirely free from the housing 1, but, when in operative position, the vertical position of the roll 3 and pinion 15 will be determined by the shoulder 14. Similarly, the roll 4 and its connected bearings and pinion 27 may be removed from the housing 2 by loosening the clamping bolts 21 and 22, and the vertical position of the roll 4 is determined in like manner as the roll 3 by a shoulder like the shoulder 14 shown in Fig. 2.

As the bearings of the pinions 16 and 28 travel with the housings 1 and 2, as the latter are adjusted, the beveled driving pinions of both rolls are always maintained in mesh, any desired adjustment of the housings being provided for by the length of the teeth in the pinion 33.

In the present instance I have shown the rolls 3 and 4 as having vertical axes and, in such cases, I protect the beveled pinions 15 and 27 by means of depending shells 42, 42, extending downwardly from the inner sides of the lower bearings of the rolls 3 and 4 and overlapping the raised flanges 43 of the housings 1 and 2, in order to prevent the admission of water from the rolls to the pinions. I likewise protect the bearings of the pinions 16 and 28 by means of hinged covers 44. The lower portions of the housings 1 and 2 are also provided with drip channels 45, to allow any water to escape which may lodge between the flanges 43 and the bearings 18 and 30.

The rolls are provided with circular plates 46, attached by bolts 47 to the upper ends of the roll gudgeons, said plates 46 overlapping and being in contact with the upper bearings, causing the rolls to be suspended from the upper bearings, which are in turn supported upon the shoulders 14.

I claim,

1. In a rolling mill, the combination with a pair of rolls, an independent housing for each roll of said pair, means for maintaining said housings in a fixed relation to each other, and means for the joint adjustment of said housings.

2. In a rolling mill, the combination with a pair of rolls, of an independent housing for each roll of said pair, means for adjusting one of said housings relatively to the other, and means for the joint adjustment of said housings.

3. In a rolling mill, the combination with a pair of rolls, of a separate housing for each roll of said pair, means for maintaining said housings in a fixed position, means for the independent adjustment of one of said housings, and means for the joint adjustment of said housings.

4. In a rolling mill, the combination of a track, a pair of roll housings adjustable along said track, means for adjusting one of said housings relatively to the other, comprising a yoke attached to one of said housings, and an adjustable screw between said yoke and the other of said housings.

5. In a rolling mill, the combination with a pair of rolls, journal bearings at each end of said rolls, an independent housing for each roll having an opening of larger diameter than the diameter of the roll and its journal bearings, clamping means for clamping each housing upon the journal bearings of the corresponding roll, and means for adjusting said housings.

6. In a rolling mill, the combination with a pair of rolls, a beveled pinion carried by each roll of said pair, a shaft carrying a beveled pinion engaging one of said roll pinions, a sleeve inclosing said shaft and carrying a beveled pinion engaging the other of said roll pinions, and means for engaging both said shaft and said sleeve and rotating them simultaneously.

7. In a rolling mill, the combination with a pair of rolls each provided with a beveled pinion, a shaft having a pinion engaging one of said roll pinions, a sleeve concentric with said shaft and provided with a pinion engaging the other of said roll pinions, a spur pinion on said sleeve and a spur pinion on said shaft, and a common driving gear engaging both of said spur pinions.

8. In a rolling mill, the combination with a pair of rolls having independent housings and means for adjusting said housings relatively to each other, of means for rotating said rolls in their adjusted positions, comprising a driving shaft provided with a pinion and a concentric sleeve provided with a similar pinion, and a rotating driving gear having long teeth for the simultaneous engagement of said pinions.

9. In a rolling mill, the combination with a roll and its housing, of bearings for said roll, said housing being provided with openings to receive said bearings, with one of said openings in said housing larger than said roll and the other bearing, whereby said roll and its bearings are removable from said housing by a longitudinal movement of said roll.

10. In a rolling mill, the combination with a roll and its housing, of bearings for said roll, said housing being provided with openings to receive said bearings, means for clamping said bearings in said openings,

with one of said openings in said housing larger than said roll and the other bearing, whereby said roll and its bearings are removable from said housing by a longitudinal movement of said roll.

11. In a rolling mill, the combination with a roll having a vertical axis, of a removable bearing for said roll, a housing for said roll having a shoulder for supporting said bearing against gravity, and means for supporting the weight of the roll by said bearing.

12. In a rolling mill, the combination with a pair of rolls and a housing for each roll, of bearings for each roll, each of said housings provided with openings to receive the bearings of one roll said openings being of greater diameter than the diameter of the roll, means for securing the bearings of one roll in said openings, said means being arranged to be released as desired and thereby to permit the removal of each roll and its bearings from the housing.

13. In a rolling mill, the combination with a vertical roll and its housing, of upper and lower bearings for said roll, said housing provided at its top and bottom with openings for said bearings, with the opening at the top of said housing of larger diameter than the diameter of said roll and its lower bearing, whereby said bearings and

said roll are longitudinally removable through said upper opening.

14. In a rolling mill, the combination of a pair of vertical rolls, a housing for each roll, each roll having journal bearings, beveled roll pinions carried by each lower roll journal, beveled pinions carried by said housings engaging said roll pinions, means for imparting independent rotary motion to each beveled pinion from a single means of rotation, and openings in said housings to receive said upper and lower journal bearings, with the upper opening of sufficient area to permit the lengthwise removal of the roll and its bearings.

15. In a rolling mill, the combination with a pair of vertical rolls, of a journal box at each end of said rolls, an independent housing for each roll with a circular opening for each journal box, said opening being open upon the inside of said housing, clamping bolts in said housing for closing said inner opening and clamping said housing upon said journal boxes, means carried by said housings for rotating said rolls, and means for adjusting said housings.

Dated this seventh day of January 1909.

VICTOR E. EDWARDS.

Witnesses:

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