(No Model.)

D. W. BRADFORD.

ROLL FOR ROLLING MILLS.

No. 324,807. Patented Aug. 25, 1885.

Fig. 1.

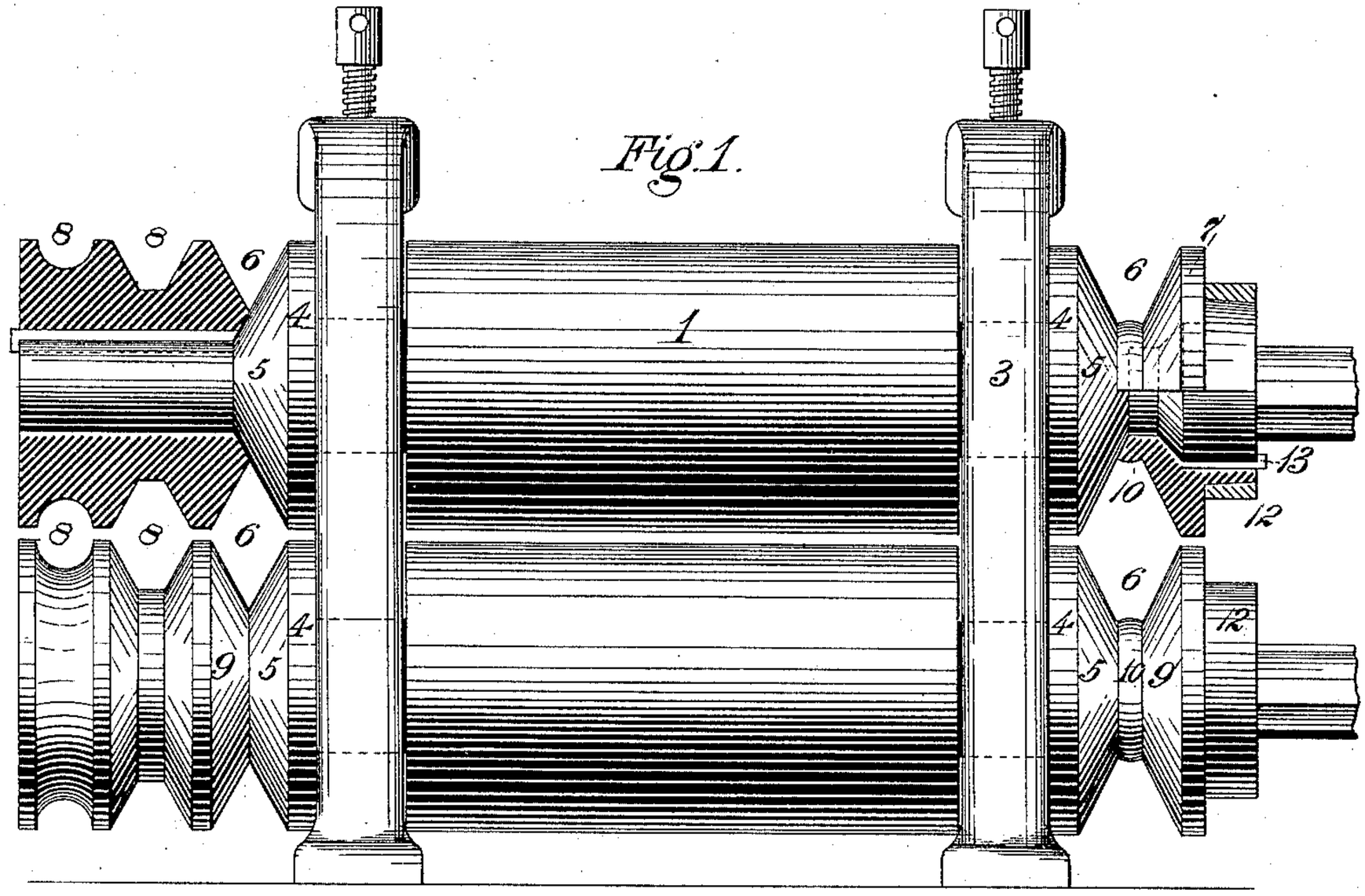


Fig. 2.

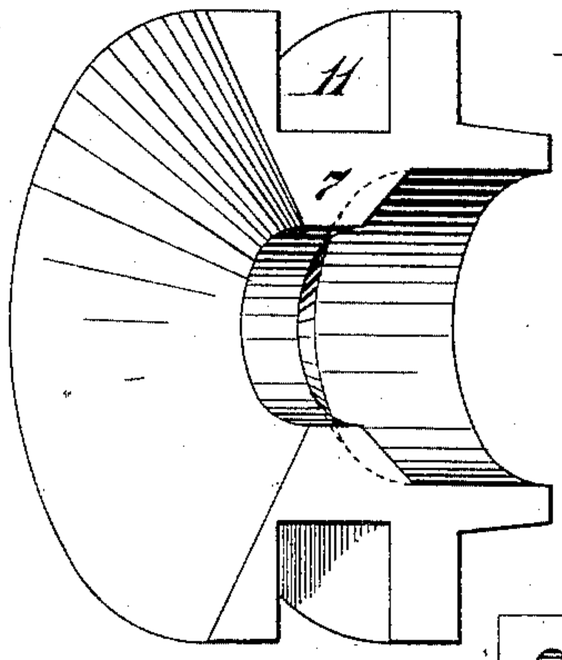


Fig. 3.

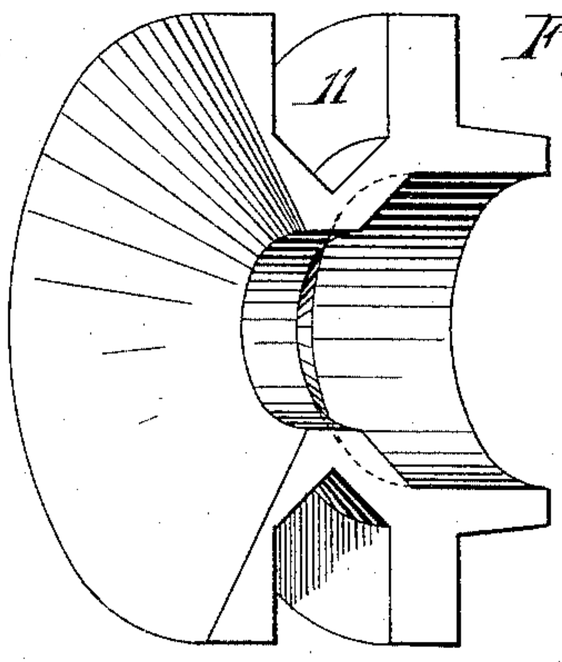
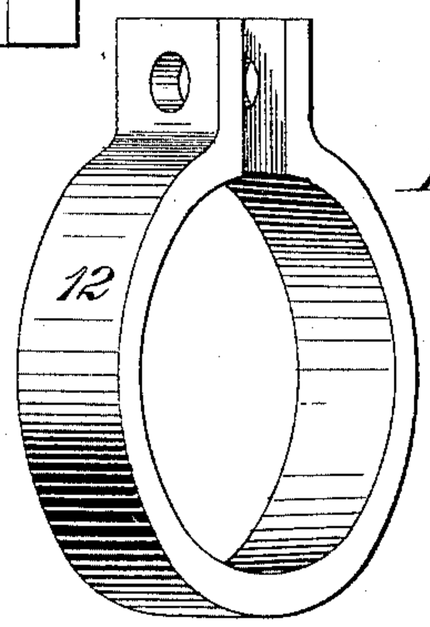


Fig. 4.



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DANIEL W. BRADFORD, OF ALLEGHENY, PENNSYLVANIA.

ROLL FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 324,807, dated August 25, 1885.

Application filed December 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. BRADFORD, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Rolls, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a view in side elevation of a rolling-mill, certain portions of the rolls being shown in section. Figs. 2 and 3 are detail views, on an enlarged scale, of removable edging-collars. Fig. 4 is an enlarged view of the clamping-ring.

My invention relates to an improvement in rolls for rolling metal bars and plates; and the object of my invention is to so construct such rolls as to permit of the same pair of rolls being used in the reduction of bars and plates widely differing in size and shape, and thereby increase their capacity; and to this end my invention consists in general terms in the construction and combination of parts, all as more fully hereinafter described and claimed.

In rolling plates or bars the bloom or billet is first broken down between rolls having a portion of their working-faces made plain or straight, and as the edges of such a bloom or billet are unconfined during the breaking-down operation they become ragged and uneven by reason of unequal reduction, such unequal reduction arising from inequalities of the metal or ununiform heating of the bloom or billet. The ragged and irregular edges are reduced by turning the plate or bar on edge and passing it through grooves in the rolls, such grooves being usually formed near one of the housings in the breaking-down rolls; but this grooving of the rolls is objectionable, for the reason that the cutting of grooves weakens the rolls, rendering them liable to break when employed for breaking down hard-steel blooms or billets. This old manner of constructing rolls for plates or bars is objectionable, for the reason that their capacity for producing plates or bars of differing sizes and shapes is limited, thereby necessitating a frequent changing of rolls or the erection of a number of mills adapted to roll various sizes and shapes; but either of the above means for increasing the capacity of a plant is objectionable on account of the expense and loss of time involved.

The above difficulties I overcome by constructing a roll with a plain ungrooved body portion, 1, provided with suitable journals at each end adapted to fit in boxes in the housings 3, as usual. These journals are extended a considerable distance outside of the housings, as shown, and are provided adjacent to the housings, with collars 4, said collars being preferably made integral with the journals, although in some cases they may be keyed or otherwise secured to the journals. The outer face, 5, of these collars is constructed to form one wall of a groove, 6, the other wall and bottom of said groove being formed by a removable ring or collar, 7, adapted to be slipped on the projecting ends of the journals, and secured thereon by keying or otherwise. The collar 7 may be, if desired, provided with a number of grooves, 8, of varying depths, widths, and contour, and the inner end of the collar is shaped so as to form the outer wall, 9, of the groove 6, and is provided with an annular rim or flange, 10, which forms the bottom of the said groove. By providing the rolls with a series of rings or collars, 7, having rims or flanges 10 of varying thickness, plates or bars of corresponding differences in width can be edged by simply changing the rings on the projecting journals.

In place of constructing the rings with their inner ends adapted to form one wall of a groove, said inner end may be made to fit the outer face, 5, of the collar 4, as shown in Figs. 2 and 3, in which case groove 11 is formed in the body of the ring, as shown. By providing a number of such rings having grooves of varying depths, widths, and configurations, the same mill can be used for rolling a like variety of plates or bars by simply changing the collars.

In some cases it is not practicable to extend the journals at the free ends of the rolls—*i. e.*, the ends opposite that to which the power is applied—and that such extension can be effected at the power end. In this case it would be necessary, when solid rings or collars are used, to remove the coupling-box in order to change the rings; but in order to avoid the delay incident to the removal and replacement of the

coupling-box the rings or collars 7 may be made in two parts, as shown in Figs. 2 and 3. These sectional rings may be clamped upon the projecting journal by a split ring, 12, provided with a bolt for drawing the ring tight around the sections, which are prevented from turning on the journal by a key, 13, as shown.

In using rolls having a permanent edging-groove cut therein it is impossible to edge a plate narrower than that for which the groove was originally cut; but it is possible to edge plates somewhat wider by adjusting the rolls apart; but even this increasing range is limited by the liability of the plate to buckle under the lateral compression in edging. In my rolls, however, wide and narrow plates can be edged by using rings or collars having deep or shallow grooves; or, when the edging-groove one of whose walls is formed by the permanent collar 4 is employed, the depth of the groove can be adjusted by the rings or collars having the rim or flange 10.

I claim herein as my invention—

1. A roll having one or both journals projecting beyond the housings, in combination with one or more collars secured to said journals adjacent to the housings, the outer faces of which are constructed to form one wall of an edging-groove, and one or more removable rings or collars having their inner ends constructed to form the opposite wall and bottom of said groove, substantially as set forth.

2. A roll having one or both journals projecting beyond the housings, in combination with one or more sectional and removable rings having edging-grooves therein and adapted to fit on the projecting journals, substantially as set forth.

In testimony whereof I have hereunto set my hand.

DANIEL W. BRADFORD.

Witnesses:

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