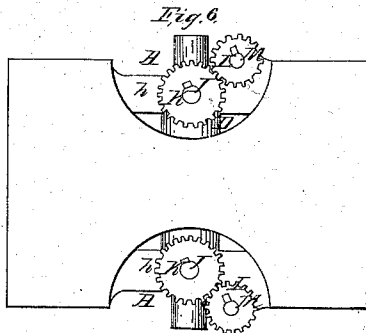
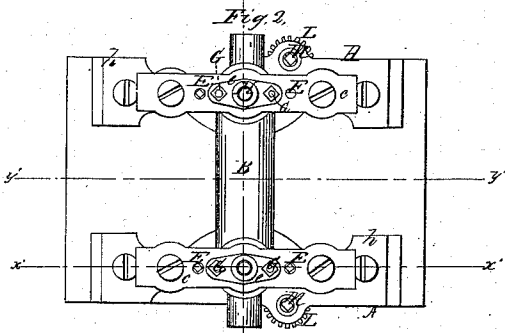
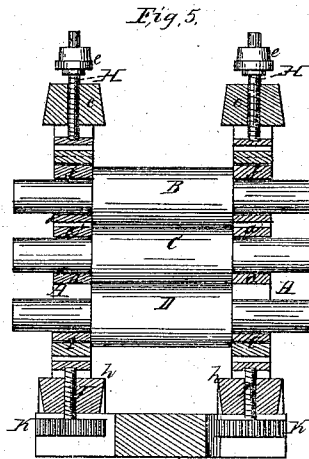
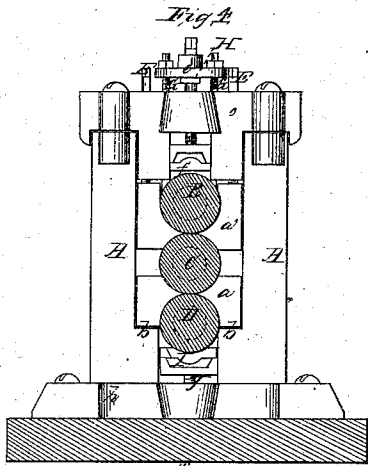
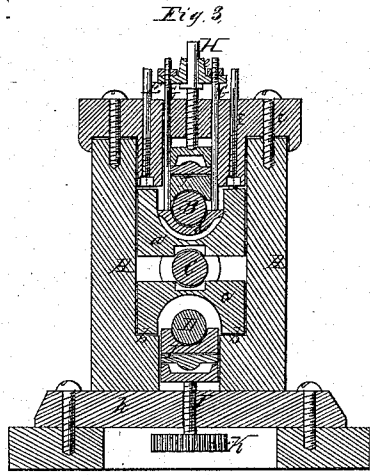
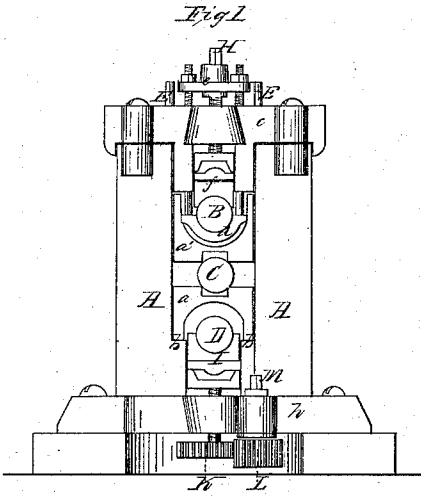


W. F. Burden.

Rolling Plates, Bars and Shafting.

N^o 37, 274.

Patented Jan. 6, 1863.



Witnesses.
Richard Durston
J. C. Lawrence

Inventor
Wm. F. Burden
By Geo. Alley
Mason, Greene & Lawrence

UNITED STATES PATENT OFFICE.

WILLIAM F. BURDEN, OF TROY, NEW YORK.

IMPROVEMENT IN ROLLING-MILL STANDS, &c.

Specification forming part of Letters Patent No. 37,274, dated January 6, 1863.

To all whom it may concern:

Be it known that I, WILLIAM F. BURDEN, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Roll-Stands and Carriages or Bearings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of my invention; Fig. 2, a plan or top view of the same. Fig. 3 is a section in the line $x' x'$ of Fig. 2; Fig. 4, a section in the line $y' y'$ of Fig. 2; Fig. 5, a section in the line $z' z'$ of Fig. 2; and Fig. 6 is an inverted plan.

Similar letters of reference in the several figures indicate corresponding parts.

The nature of my invention consists in so arranging an upper and a lower roller, in combination with an intermediate roller, that either the upper roller or lower roller, or both, may be adjusted independently of the intermediate roller, and so that the intermediate roller shall at all times maintain its permanent position with respect to the upper and lower rollers. Heretofore the usual means of adjusting rolls, when used in triplets, to each other has been by stopping the "train," and with a bar raising and separating the rolls and placing packing between the brass and carriages or bearing-boxes. This has been tedious, and by no means accurate. Besides, that mode, whenever the iron or other metal passed between the middle and top or middle and bottom rolls, the pressure was increased upon the journals of all the rolls. My invention obviates these inconveniences and difficulties, as the middle roll is held independently and the top and bottom rolls are made adjustable to it, as hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and operation of the same with reference to the drawings.

A A designate the housings in which the rollers are arranged; B C D, the three rolls. Of these the middle one, C, has its journals supported between bearings $a a'$, which are properly fitted to the journals, and also snugly between the uprights of the housings. The lower bearing-pieces, $a a$, are arched on their under sides and rest upon abutments $b b$ of said up-

rights, and thus they have no chance to descend. The upper bearing-pieces, $a' a'$, are also arched, but on their upper side, and abut against vertical screws E E, which extend down through the capping-plates $c c$ of the housings. The screws keep the bearing-pieces $a' a'$ down upon the journals of the middle roll, C, while the abutments $b b$ keep the lower bearing-pieces, $a a$, up against the same. Thus the middle roller cannot move up or down unless the screws E E are slackened. The top roller, B, has its journals suspended in the arch of the bearing-pieces $a' a'$ by means of narrower bearing pieces $d d$, which are attached to the lower ends of vertical screws G G, said screws extending down through yokes $e e$ and the capping-plates $c c$ of the housings. The upper bearings, $f f$, of the roller B are fitted loosely in the capping-plates $c c$, and held down by larger screws H H, which also extend down through the yokes $e e$ and the capping-plates $c c$, as shown. The screws G G are furnished with nuts at their upper ends, and are fitted to slide up through the yokes $e e$, while the screws H H are made square on their upper ends, and are fitted to turn in the yoke and to descend with it. With this arrangement the screws G G support the top roller and its carriages or bearings independently of the middle roller, while the screws H H keep it down to its work. The lower roller, D, is hung on sliding bearings I I, which are narrow enough to extend up into the arch of the lower bearing-pieces, $a a$, of the middle roller, C. These bearings I I are fitted between the uprights of the housings, and rest on vertical screws J J, which extend up through the base-plates $h h$ of the housings. On the lower end of each of the screws a narrow spur-wheel, K, is keyed, and into this wheel a long pinion, L, gears, said pinion being on a turnkey-shaft, M, as shown. With this arrangement the lower roller, D, has an independent adjustment toward or from the middle roller, C, for if the pinions L L are turned, the spur-wheels and screws are caused to revolve, and during the revolution the screws and spur-wheels rise or descend, accordingly as the adjustment is made, carrying the bearings of the lower roller with them.

My arrangement, as a whole, affords great convenience for adjusting the upper and lower rollers, and that, too, with accuracy, as the po-

sition of the middle roller does not change its relative position.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a rolling-mill which has its middle roller fixed and its top and bottom rollers adjustable, the manner, substantially as described, of applying the screws *E E* for the purpose of holding down the middle-roll bearing *a'*.

2. In a rolling-mill which has the middle roll fixed and its top and bottom rollers adjustable, the arrangement of the screws *H*, *G*, and *E* with the top-roller bearings *d f* and upper bearing, *a'*, of the middle roller, substantially in the manner described.

3. The combination of the bearings *I*, screws *J*, spur-wheels *K*, pinions *L*, and key-shafts *M* with the bottom rollers, substantially in the manner described.

4. In a rolling-mill which has its middle roller fixed and its top and bottom rollers adjustable, the use of bearings *a a'*, of arch or analogous form, so that the bearings *I d f* may be adjusted within the arch thereof, and thus compactness secured, substantially as described.

WM. F. BURDEN.

Witnesses:

JNO. L. G. KNOX,
JOHN L. ARTS.