(No Model.)

F. H. DANIELS.

ROLLING MILL.

No. 352,521. Patented Nov. 16, 1886.

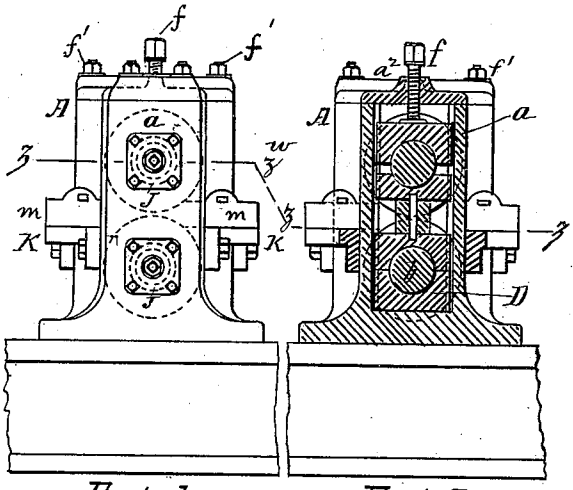


Fig. 1

Fig. 2

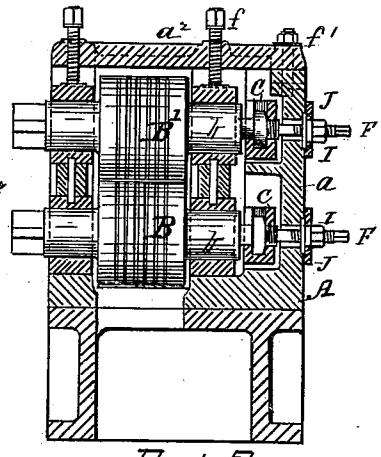


Fig. 3

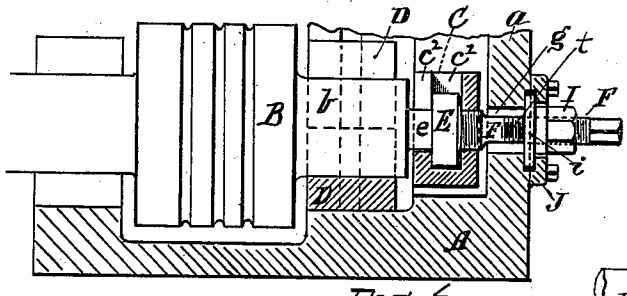
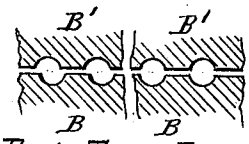


Fig. 6



Figs. 7 & 8.



Fig. 9

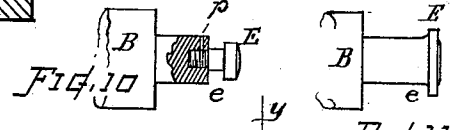


Fig. 10

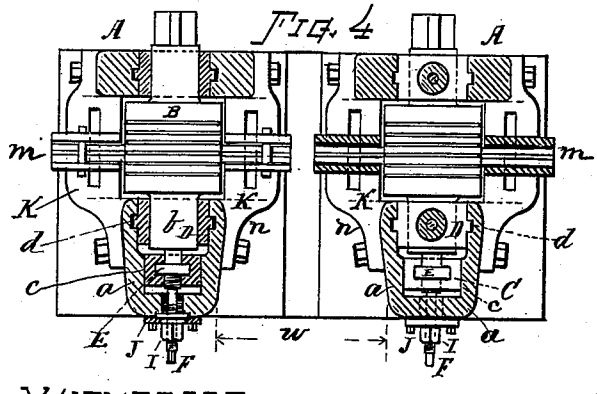


Fig. 4

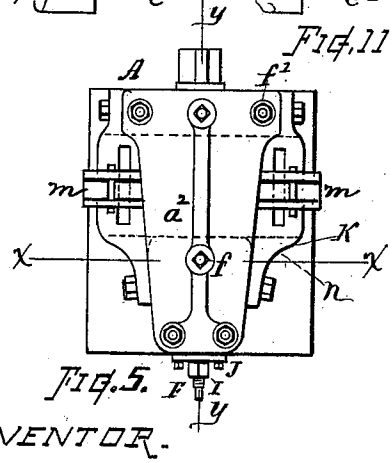


Fig. 5.

Fig. 11

WITNESSES.

S. R. Barton

Herbert P. Barton

INVENTOR.

Fred. H. Daniels

By Chas. H. Burleigh

Attorney

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 352,521, dated November 16, 1886.

Application filed March 15, 1886. Serial No. 195,341. (No model.)

To all whom it may concern:

Be it known that I, FRED H. DANIELS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Continuous Rolling-Mills for Making Wire Rods, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

This invention relates to improved mechanism for supporting and adjusting the rolls in a rod-rolling mill, the objects being to provide a frame or housing that will afford a wide space between the front uprights sufficient to enable the operator to get at the guides and rolls, so as to look them over and to more readily observe the working of the machine, and to more conveniently effect the adjustment of the rolls and guides to proper working position; also to provide an efficient and convenient mechanism for accurately adjusting and sustaining the rolls laterally, so that the grooves of the upper and lower rolls will run in proper alignment with each other. These objects I attain by mechanism such as herein illustrated and described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a front view of a housing for a continuous rolling-mill constructed in accordance with my invention. Fig. 2 is a vertical section through the front standard at line *x x*, Fig. 5. Fig. 3 is a longitudinal vertical section at line *y y*, Fig. 5. Fig. 4 is a horizontal section at line *z z*, Figs. 1 and 2. Fig. 5 is a plan or top view. Fig. 6 is a sectional view showing the details of the adjusting mechanism on a somewhat larger scale, and Figs. 7 and 8 are sectional diagrams showing the grooves of the rolls and their relation to each other in the upper and lower rolls. Fig. 9 is a view of the adjusting-stud separate from the other parts. Fig. 10 shows the detail of constructing the axle end or head for retaining the adjusting devices in connection therewith; and Fig. 11 shows a modification in which the head or flange is made as an enlargement or collar, instead of being grooved into or connected to the axle.

Referring to parts, A denotes the housing-frame for the journals of the rolls B B'. This housing I make of the peculiar form illustrated—viz., with three uprights, the rear uprights being substantially similar to the ordinary form of housing for supporting and guiding the rear journal bearings or boxes, while the front upright, *a*, is made narrow and as a single standard, in the manner shown, so that when arranged in series a broad open space is afforded between the adjacent housings at the front of the rolling-mill, as at *w*, Fig. 4. The front standard of the housing is preferably made closed at the sides and front, with the exception of openings for the adjusting devices, and with internal guideways, as *c* and *d*, in one of which guideways the journal-bearing boxes D of the roll-axles *b* are guided and supported, while in the other of said guideways are supported adjusting-boxes C, by the aid of which the rolls are maintained in proper relation to each other, as hereinafter explained.

To the top of the housing is fitted a cap-plate, a^2, which contains the pressing-bolts *f*, and which is secured to the housing-frame by cap screws or bolts *f'*, or in other efficient manner. The journal-boxes D are preferably fitted with flanges that engage with the vertical guideways on the housing-uprights and prevent endwise movement of said boxes D, while the roll axle or journal *b* is permitted slight endwise play in the bearing-boxes.

The front end of the roll-axle is provided with an annular groove, *e*, and a head, E, and the adjusting-box C is fitted with a cavity, *c'*, and lip c^2, for the reception of said head, that corresponds with the groove, so that the parts will match together, substantially as shown in Figs. 3, 4, and 6, and the roll-axle be confined thereby. The outer part of the box C has a screw-threaded opening, preferably in line with the axle, and into this opening is fitted the screw-threaded end of a stud or bolt, F, which is screwed into the opening until its end rests against the head E of the roll-axle. The other end of the stud or bolt F is screw-threaded at *t*, and extends out through the opening *g* in the front of the housing-standard, and is supported by a screw-threaded nut, I, fitted thereon and confined by a bearing-plate, J, fastened to the housing-frame.

In the present instance the nut I is made with an annular flange, *i*, and bearing-surface, which is confined in a recess between the plate J and housing. The plate J is secured by screw-bolts to the face of the standard, or in other suitable manner. The outer end of the stud F is fitted to receive a wrench or spanner, by which said stud can be conveniently turned. The action of turning the stud F screws its threaded end into or from the front of the box C, causing it to press the head E more or less firmly against the lip c^2, thus regulating the degree of looseness or backlash between the box and roll-axle, while by turning the nut I the stud F and box C will be moved inward or outward in the guide-standard, and the head of the roll-axle being confined in said box C, it follows that the lateral adjustment of the roll B in relation to the housing or the other roll will be thereby effected. By this means the grooves of the rolls can be very accurately brought into proper relation and correspond with the grooves of its matching roll, as indicated in Fig. 8, and any liability of the rolls running with the grooves offsetting, as indicated in Fig. 7, readily obviated and corrected.

If desired, the head E on the axle can be made by turning down the metal, or by inserting a headed stud of wrought metal therein, as indicated in Fig. 10; or, again, the head could be made larger than the axle, as indicated in Fig. 11, the box C being made to conform thereto. These latter forms may be desirable when the axles *b* are of cast-iron and greater strength is desirable than is attained by cutting down the cast-iron to form the neck and flange. When using the wrought-metal head, I prefer to attach it to the axle end by screwing its shank into the axle and then fastening it with a pin, *p*, so that it cannot become unscrewed by the rotation of the parts. (See Fig. 10.)

By mounting the roll-axle in a movable box which confines the flange or head, and connecting said box with the stationary frame or housing by means of a screw-threaded adjusting device, a very minute and accurate adjustment of the rolls can be effected, and the adjusting devices do not materially affect the running, friction, and wear of the mechanism, at whatever position of adjustment the parts may occupy. Then, again, the employment of the screw-threaded bearing device for taking up the backlash and wear on the flange or head of the roll-axle also insures the more perfect running of the rolls in pairs in exact alignment with each other, so as to produce a perfectly-uniform section on the rod.

The supporting-girts K, to which the guides *m* are secured, have their front ends cut away or curved toward the housing-standards, as at *n*, so as to leave room for more conveniently getting at the rolls and guides. This feature, together with the contracted housing-front *a*, is of much practical utility in the management of a continuous rolling-mill, and will readily be appreciated by any one conversant with operating this class of machinery.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. The housing for continuous rolling-mills, having its front upright constructed, as herein shown and described, as a single narrow standard, the metal whereof is disposed to embrace three sides of a square or space within which the roll-journals and their bearing-boxes are inclosed, substantially as set forth.

2. A housing-frame for continuous rolling-mills, having its front upright formed as a single standard, and provided with openings therethrough for receiving or accommodating devices for effecting longitudinal adjustment of the roll-axles, substantially as set forth.

3. The housing-frame having its front upright formed as a single standard and provided internally with guideways for supporting the roll-journal boxes and the adjusting-boxes, whereby the roll-axles are retained in proper relation longitudinally, substantially as set forth.

4. The combination, in a continuous rolling-mill, of a series of roll-supporting housings severally constructed with two uprights for supporting the rear journal-boxes, and a single upright for supporting the front journal-boxes, said single upright being arranged to give an enlarged space between the housings of the adjacent pairs of rolls in front of the guides, substantially as and for the purpose set forth.

5. In a metal-rolling mill, the roll-axle provided with a flange head or enlargement, in combination with an adjusting-box confining the same, and means for effecting adjustment thereof in a direction longitudinally of the axis, for the purpose set forth.

6. In a rolling-mill, the roll-axle provided with the flanged head E, in combination with an adjusting-box embracing said head, and a screw-threaded stud connected with said box and extending through the housing at the end of the axle for effecting longitudinal adjustment of the roll, in the manner substantially as set forth.

7. The combination, substantially as described, of the roll-axle provided with the flange or head E, the adjusting-box C, the stud F, having the screw-threaded end passing through said box and bearing against the end of the axle, and the rotative nut I, confined to the housing-standard, for the purposes set forth.

8. The combination, in a continuous rod-rolling mill, of the housing-frames having a narrow front standard, as *a*, and guide-supporting girts K, having their forward ends cut away or curved toward said standards, as at *n*, to give space between the adjacent supports, substantially as hereinbefore set forth.

Witness my hand this 10th day of March, A. D. 1886.

FRED H. DANIELS.

Witnesses:
CHAS. H. BURLEIGH,
O. C. WHITE.