

(No Model.)

A. ZDZIARSKI.

ROLLING MILL.

No. 392,484.

Patented Nov. 6, 1888.

FIG. 1.

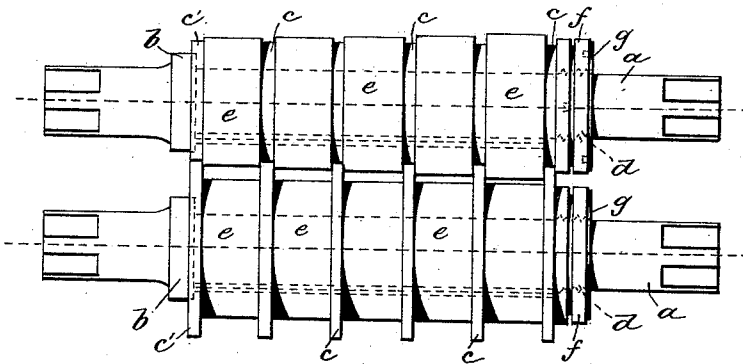


FIG. 2.

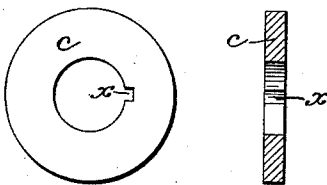


FIG. 3.

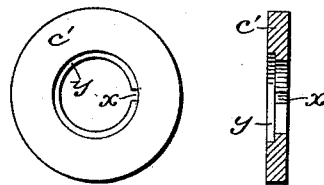
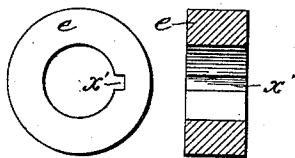


FIG. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

ANTHONY ZDZIARSKI, OF SAMARA, ASSIGNOR TO M. DE ROUTKOWSKY,
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ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 392,484, dated November 6, 1888.

Application filed September 27, 1888. Serial No. 286,579. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY ZDZIARSKI, a subject of the Emperor of Russia, engineer of the Samara-Ufe Railway, Samara, in the Empire of Russia, but temporarily residing in the city of Warsaw, in the Empire of Russia, have invented a certain new and useful Improvement in Rolling-Mills for Iron and Steel, of which the following is a specification.

My improvement in rolling-mills relates to the construction of the rolls themselves. The roll I have devised is what may be termed a "compound universal mill-roll," and it is composed, essentially, of a steel axle, steel rings, (corresponding to the collars or flanges of the ordinary mill-roll,) and cast-iron rings, which form the channels or grooves between said collars, these steel collars and cast-iron channel-rings being individually removable and adjustable.

The invention depends for its novelty as well as its practical value upon the fact that the roll is a compound one, made up of steel and cast-iron parts so constructed and combined that each new section or shape of bar or other iron to be rolled requires the change of the cast-iron parts of the roll only, these parts being so arranged that they can readily be removed and replaced by others. By the use of these interchangeable cast-iron parts the same rolls can be used for rolling iron of any section—bar, flat, angle, &c.

In the accompanying drawings I have represented a pair of such compound universal mill-rolls for rolling bar-iron.

Figure 1 is a front elevation of the rolls. The remaining three figures represent in section and elevation such of the steel collars and cast-iron channel-rings as are needed in order to fully explain the construction of the rolls.

Each roll consists of the following parts:

First. A steel axle, *a*, provided with journals, necks, &c., as is the case with ordinary rolls. On that portion of the axle between the journals is formed at one end a collar or shoulder, *b*, integral with the axle, and at the other end a screw-thread, *d*. The axle is further provided with a longitudinal spline or key, which extends throughout the whole length of the axle between the collar *b* and the screw-thread *d*.

Second. Steel rings *c*. (Shown separately in elevation and section in Fig. 2.) These rings correspond to the collars or flanges which in ordinary rolls bound the channels or grooves through which the bar-iron is passed. They fit upon the axle closely and have inner notches or grooves, *x*, to take upon or engage the spline or key on the axle. The end ring, *c'*, has in the face which adjoins the collar *b* an annular recess, *y*, Fig. 3, in which the collar *b* fits.

Third. Cast-iron rings *e*, which alternate with the steel collars *c* and correspond to the grooves or channels of ordinary rolls. They fit closely upon the axle and have notches *x'* to engage the spline or key thereon. One of these rings is shown in section and elevation in Fig. 4. It is these parts which are changed or replaced by other cast-iron rings of different shapes, according to the section of iron to be rolled.

Fourth. A steel nut, *f*, screwing upon the screw-thread *d* for tightening the sections, and a steel covering-ring, *g*, which has two pins that enter corresponding holes in the contiguous face of the nut. This covering-ring protects the nut and keeps it from rubbing against the housings. In case the sections do not fill up all the space between the collar *b* and the screw-thread *d*, additional cast-iron rings or washers may be used for this purpose, the same being interposed between the nut *f* and the end collar, *c*, next adjoining the nut.

Some of the advantages obtained by my invention may be stated as follows:

First. The main expense of my compound roll is in the first cost of the steel axle and steel collars, which is, say, about two hundred and fifty dollars per pair of rolls; but such axle and collars can then be used for rolling bars and sections of any shape, all that is required being to change one set of cast-iron rings, *e*, for another set of a shape suitable to furnish channels or grooves of the desired shape. The cost of a full set of such cast-iron rings is, at the outside, from one hundred dollars to one hundred and twenty-five dollars per pair of rolls. When it is considered that the cost of a pair of the ordinary cast-iron rolls of the same dimensions is about two hundred and fifty dollars, and that it is necessary to have a separate pair of such rolls for each different

shape or section of iron to be rolled, the saving effected by my invention is obvious, because I can use the same steel axle and collars with any number of interchangeable sets of
5 cast-iron channel-rings of the varying shapes required to produce required shapes or sections of iron.

Second. The steel axle is little liable to break—an accident which is of frequent occurrence with the ordinary cast-iron rolls—and
10 there is less wear of the journals.

Third. The expense of changing or replacing a cast-iron ring, if broken, is small.

Fourth. As each cast-iron ring is cast separately its rough dimensions can be made to
15 approximate closely those required for the finished ring, so that the cost of finishing is comparatively little.

Fifth. The cast-iron rings for the finishing
20 grooves or channels of the rolls can be readily hardened or chilled, which it is very difficult to do in the ordinary solid cast-iron rolls.

Sixth. The rings, when damaged or broken, can be readily remelted in a cupola, whereas,

on the contrary, large and expensive furnaces
25 are required for remelting ordinary rolls.

Seventh. But little space is required for storing the rings when not in use in comparison with the extensive yards required for the storage of the ordinary cast-iron rolls.
30

Having described my improvement in rolling-mills for rolling iron and steel and the best way now known to me of carrying the same into practical effect, what I claim herein as
35 new and of my own invention is—

A compound mill-roll for rolling iron and steel, consisting, essentially, of a steel axle, in combination with separate and removable steel collars and cast-iron channel-rings mounted thereon, substantially as and for the purpose
40 hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 6th day of September, A. D. 1888.

ANTHONY ZDZIARSKI.

Witnesses:

J. J. BOGUST,

ALEXANDER MOROZEWICZ.