

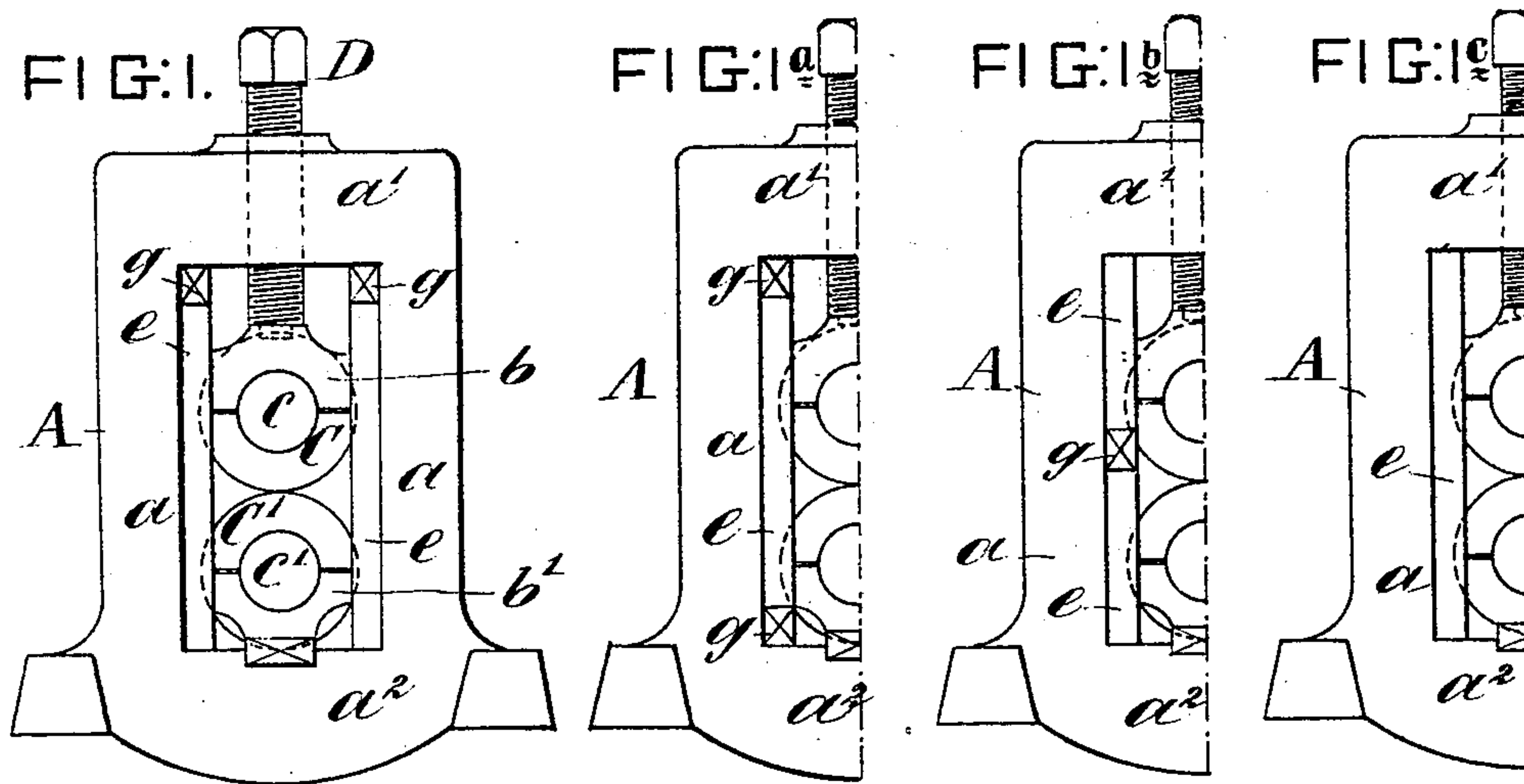
No. 632,002.

Patented Aug. 29, 1899.

G. UHR.
HOUSING FOR ROLLING MILLS.

(Application filed May 12, 1897.)

(No Model.)



WITNESSES:

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HOUSING FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 632,002, dated August 29, 1899.

Application filed May 12, 1897. Serial No. 636,208. (No model.)

To all whom it may concern:

Be it known that I, GUSTAF UHR, a subject of the King of Sweden and Norway, and a resident of Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Housings for Rolling-Mills, (for which a patent has been granted in Sweden, No. 7,583, dated December 12, 1895,) of which the following is a specification.

When a machine is in operation, there is always a giving or yielding of the parts which are subjected to the greatest strain, and this is especially true of the frame. This giving or yielding does not generally cause any inconvenience, because the different parts of the machine have always ample strength in order to resist breaking. There are, however, cases in which such giving or yielding has an unfavorable influence on the product of the machine, inasmuch as this latter is thus given another form or contour than the one intended. This is especially the case in rolling-mills. If the rolls in the housing have been set for a certain thickness of plates, this dimension will always be a little larger than the one intended on account of the elasticity of the housing-frames. Moreover, it is not sufficient to set the rolls for a somewhat less thickness than the one intended, for one piece passing through the rolls will offer more or less resistance than another—as, for instance, when the different pieces are not equally heated or when the blooms or billets have varying degrees of hardness. It may also occur that the same piece offers different resistance at different parts of its length. If the piece is a long rod, the end thereof which last passes through the rolls is usually not so hot as the end which is first rolled, and therefore said rod will not be of equal thickness at both ends after it has passed through the rolls. Such variations in the thickness of the finished material may often cause great inconvenience—as, for instance, when the material is required for certain purposes where no difference in its thickness, &c., is allowed—as, for instance, when the material has different shapes and is intended for cutting in small pieces which must all have exactly the same shape or section—as, for example, horseshoe-nails, &c.—and especially when the material is to be cold-rolled. In this latter case the difference in

thickness of the ends of the rod will show up very quickly and cause much trouble. To this it may be objected that the inconvenience arises from the housing-frames not being made strong enough. This is, however, true only to a certain extent, for it is clear that, no matter how heavy and strong the housing-frames are made, their elasticity is not destroyed, since this property (the elasticity) belongs to the material, usually cast-iron, of which the housing-frames are made.

It has been proposed to overcome the difficulty above stated by employing means for putting the housing-frames under tension in the direction of the strain in rolling; but so far as I am aware this object has not heretofore been successfully accomplished or accomplished in a satisfactory manner. Hence the object of the present invention is to provide a means for putting the housings of the rolls under tension throughout their entire length and independently of the adjusting or housing screws.

In effecting the object sought it is desirable that such a tension shall be put upon the housing as will be substantially balanced by the maximum tension put on the frame by the passage of a piece between the rolls, and the means employed should form a part practically of the housing and have no operative connection with the bearings for the rolls and housing-screws.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a side elevation of a housing-frame of a plate-rolling mill, and Figs. 1^a, 1^b, and 1^c show slight variations in the stretching or tension devices for the frame.

Referring first to Fig. 1, A is one of the housing-frames of a rolling-mill, of which *aa* are the upright side pieces, *a'* the top piece, and *a²* the bottom piece. The upper bearing *b* takes over the journal *c* of the upper roll C, and the lower bearing *b'* takes under the journal *c'* of the lower roll C'. Between the bearings *b b'* and the respective side pieces *aa* are placed two upright side bars *ee*, and between the upper ends of these bars and the top piece *a'* are driven wedges *g g*, whereby the side pieces of the frame A are stretched longitudinally with great force. Obviously there may also be wedges like the wedges *g*

between the lower ends of the bars *e* and the bottom piece *a*² of the frame, or between the lower ends of the bars *e* and the frame only, or between the ends of the bar *e* when the latter is cut in pieces. These modified constructions are illustrated, respectively, in Figs. 1^a and 1^b.

If the wedges *g* are driven in with sufficient force, they will so stretch the frame and put it under such a degree of tension as to overcome its elasticity and prevent it from yielding when a piece of metal is passed between the rolls or, at least, reduce such giving or yielding to a minimum.

For the stretching or tension device described and consisting of the bars *e* and wedges *g* another means may be employed, in which the wedges are omitted. This consists in cutting the bars *e* of a length a little greater than the space between the top piece and bottom piece of the frame A, then heating the frame to expand it, then fitting the bars in place cold, and then allowing the frame to cool. This puts the side pieces of the frame under the proper longitudinal tension; but care must be taken not to produce a tension sufficient to crack the frame. This construction is illustrated in Fig. 1^c.

As will be seen, the specific form of the stretching and tension device or means is capable of much variation or modification; but in all cases the construction is such that the housing-frame is put under and maintained under tension in a direction corresponding to that exerted upon it by the rolls when a piece of metal is passing between them, and this tension also exists while the mill is at rest or not in operation. Thus the yielding or giving of the frame due to the elasticity of its material is taken up by the means described, and the frame can yield practically no more in the operation of rolling. Moreover, in this construction the housing-screw D has no connection with the tension-producing device.

The views show but one housing-frame A;

but it will be understood by all familiar with the art that two like housing-frames are employed for each mill.

Having thus described my invention, I claim—

1. In a rolling-mill, the combination, with the rolls, their bearings, the housing-screws, and the housing-frames open to receive said bearings, of a tension device in and forming a part of each housing and independent of said housing-screw, said tension device comprising side bars in the opening of the housing and embracing the roll-bearings, substantially as set forth.

2. In a rolling-mill, the combination with a housing-frame having side pieces, a top piece and a bottom piece, the bearings for the rolls in said frame, and the said rolls, of means for stretching the side bars of said frame, and for putting them and maintaining them under tension at all times, said means consisting of upright side bars between the end pieces of the frame, substantially as set forth.

3. A rolling-mill having a housing-frame A of somewhat elastic metal stretched, normally, and put and maintained under tension by side bars *e*, *e*, and wedges *g*, *g*, substantially as set forth.

4. In a rolling-mill, the combination with the rolls, their bearings, and the housing-frames in which said bearings are mounted, of the side bars in the housing-frame and adjacent to the side pieces thereof, and the wedges driven between the ends of said side bars and an end piece of said frame, whereby the latter is stretched and put under tension, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GUSTAF UHR.

Witnesses:

ERNST SVANQVIST,
A. F. LUNDBORG.