

(No Model.)

J. G. LAURIE.

ROLLING MILL.

No. 343,643.

Patented June 15, 1886.

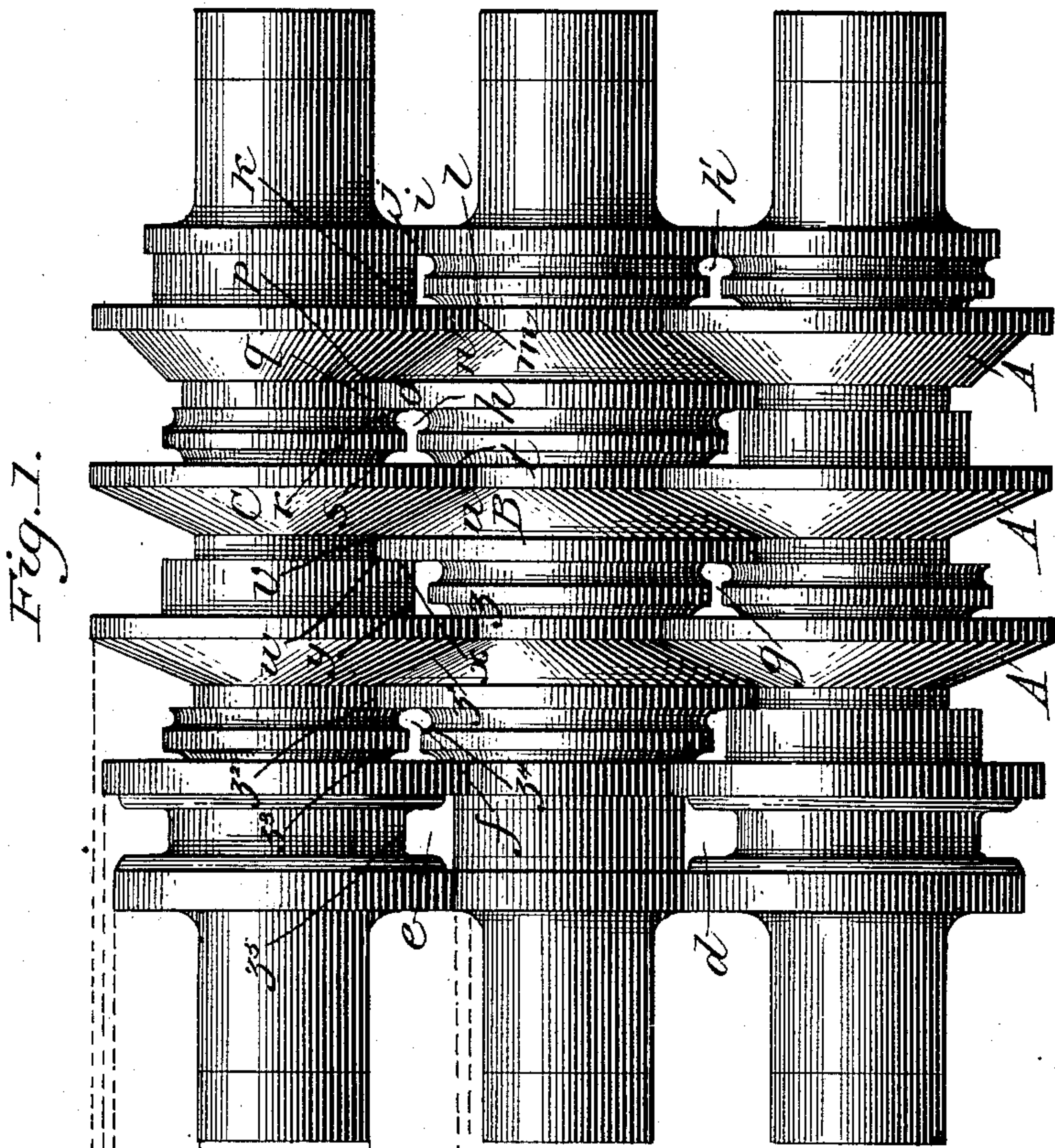


Fig.

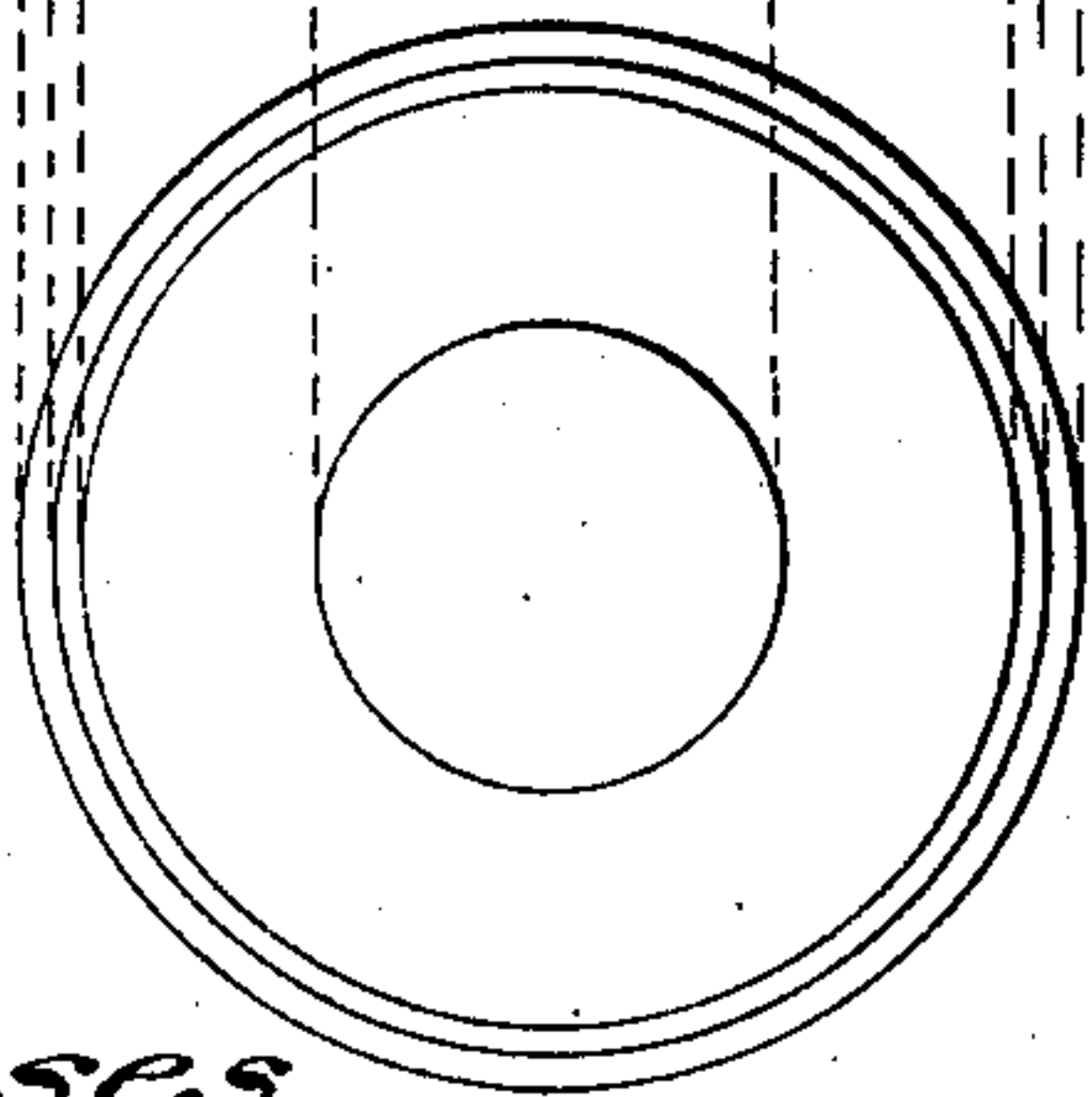
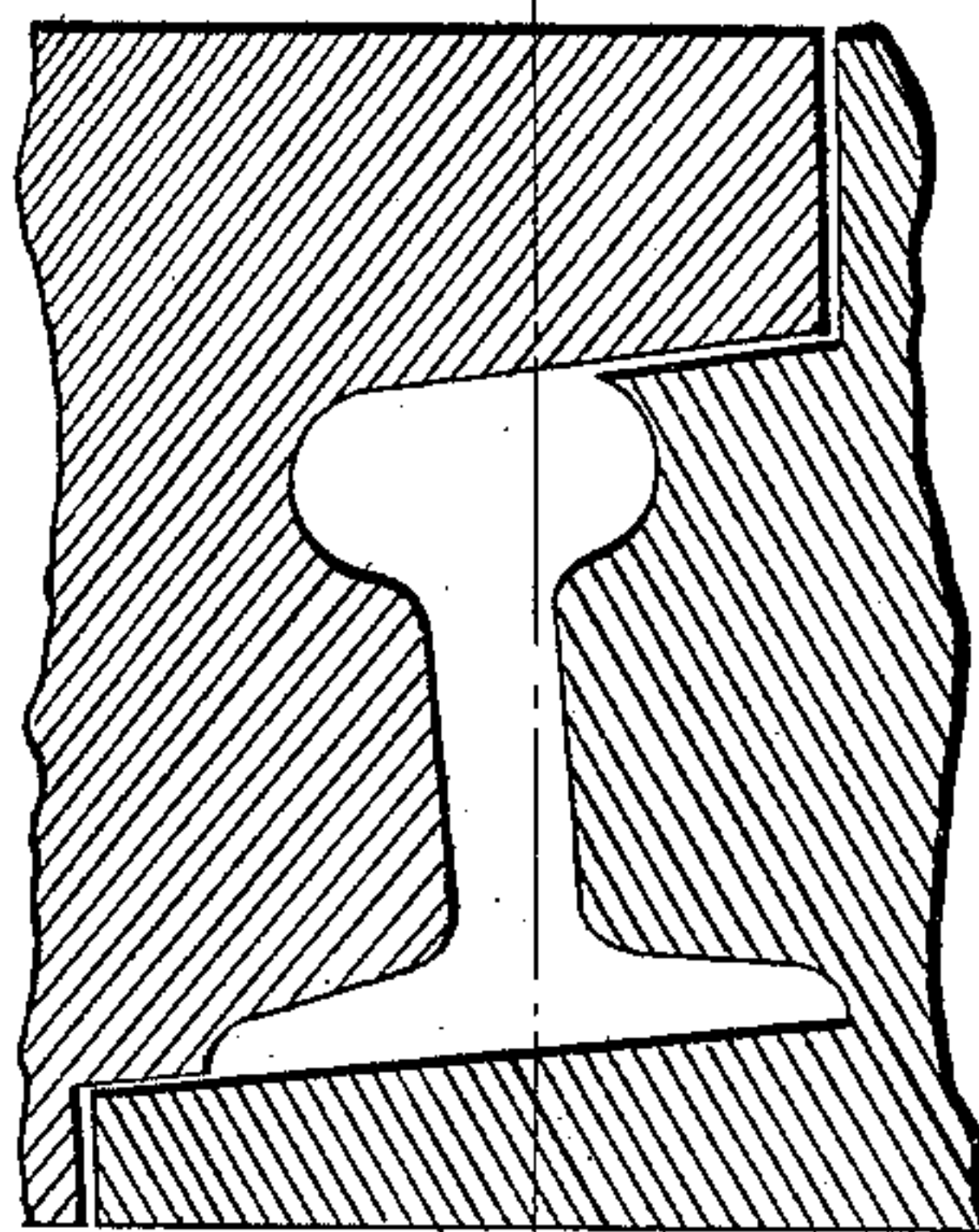


Fig. 2.



Inventor

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UNITED STATES PATENT OFFICE.

JOHN G. LAURIE, OF SOUTH CHICAGO, ILLINOIS.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 343,643, dated June 15, 1886.

Application filed December 10, 1885. Serial No. 185,316. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. LAURIE, a citizen of the United States, residing at South Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Three-High-Roll Mills, to be used in rolling and making rails, beams, bridge or merchant iron or steel, of which the following is a specification.

10 My invention relates to an improvement in
said mill.

One of the benefits and the improvement in my invention is, first, to provide that the engine operating the mill may be run without the necessity of reversing the action of the engine; and, second, to split the collar of the rolls on an angle, and making the male and female collar on each collar of rolls for three-high mills, and making the joints of rolls at diagonal corners of the section, so that the collar may be cut away when necessary to reduce the pass of the rolls to proper size when it has become enlarged by use. I attain these objects by the mechanism illustrated in the accompanying drawings.

Figure 1 represents a front view of the three-high mill or rolls, wherein A A A represent the lower roll, B the middle roll, and C the top roll. Said rolls are made of solid cast-iron, or a mixture of steel and cast-iron. Such rolls are of different sizes, according to size of mill. Fig. 2 represents the end view of the rolls, showing that they are circular. Fig. 3 is a sectional view through pass *f*, showing the angle at which the pass is turned.

d e f g h h' represent the passes between the rolls through which the bar to be rolled is passed. The bar to be rolled is first put in the pass at *d* and run successively through
40 passes *e, f, g, and h h'*. The rolls revolving in the same direction carry the bar to the opposite side of the mill, where it is lifted to the pass *e*, between the top and middle roll, and those rolls revolving in the same direction
45 carry the bar back to the other side of the mill, and thus through the five passes. The line marking the division between the upper and middle roll is the line commencing at *i, i to j, j to k, k to l, l to m, m to n, n to o, o to p, p to q,*
50 *q to r, r to s, s to t, t to u, u to v, v to w, w to x, x to y, y to z, z to z', z' to z², z² to z³, z³ to z⁴, z⁴ to z⁵, z⁵*

to z^o , the line marking the division between the middle and top rolls being similar to the other. The collar is split, A A A and C C C being female collars, and B B B being male collars, so that the male and female collars come on diagonal corners, so that the collars extend beyond and cover the whole face or sides of the pass. By splitting the collar diagonally q to r , r to s , s to t and making the male and female collar on each collar of rolls, as shown in the drawings, the rolls may be put on a lathe after the pass is so enlarged and the collars cut down on the lathe until the passes of rolls are reduced to their original size. This operation may be repeated until the rolls become too small for use. The rolls are supported and run on journals D in the ordinary way.

E represents the driving parts, called in 70 mill terms a "wabbler."

The rolls are elevated and lowered in the usual way after the collars are cut away by the lathe, so as to bring the rolls together in their original position.

The mill is driven by an engine in the same manner as other mills.

I am aware that prior to my invention rolling-mills for rails, beams, bridge or merchant iron have been made, and one especially by English Patent No. 978 of 1858; but my invention differs materially from said English patent. The rolls in that patent, although split so that the upper and lower rolls extend into the center roll, and thus form a joint, are not split as mine are. The iron in going through the pass enlarges it sidewise, but not on the bottom and top. In the English patent the joints are square across, and the straight sides of the pass are on the same roll, so that when the pass becomes enlarged sidewise by use there is no way to bring it back to its original size. The pass is worn sidewise and cannot be brought to its original shape. In my invention the joints are on diagonal corners, as shown in my drawings, and on opposite rolls at each pass, the large collar at each pass being on a slight angle. The straight sides of the passes are formed by collars on opposite rolls, and not on the same roll, as in the English patent, the large collars being on opposite rolls and turned at a slight angle. By this means, after the pass becomes

worn sidewise, the pass in my mill can be reduced to its original size by putting the roll on a lathe, cutting off the top and diagonal side of the collars, and re-dressing the bottom of the
5 pass to the same degree that the pass has become worn away sidewise. This could not be accomplished in the English mill, for the reason already explained. Another difference between my patent and said English patent is
10 that in my patent the rail does not have to be turned at all in changing the rail from one pass to the other in running the rail through the mill. In the English patent the rail must be turned one-half around at every pass. Thus
15 in my patent I save the labor and the time of turning the rail.

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

In three-high-roll mills for rolling rails, girders and the like, constructing the collars of one
20 so that they shall overlap the collars of the adjacent roll by obliquely-opposing surfaces, while the broad vertical surfaces of the collars on their opposite sides shall constitute severally lateral walls of the passes, and which lat-
25 eral walls of the passes shall be on opposite rolls at each pass.

JOHN G. LAURIE.

Witnesses:

JOHN M. ARMSTRONG,
WM. W. GURLEY.