

No. 688,751.

Patented Dec. 10, 1901.

J. STEVENSON, JR.  
ROLLING MILL.

(Application filed June 5, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

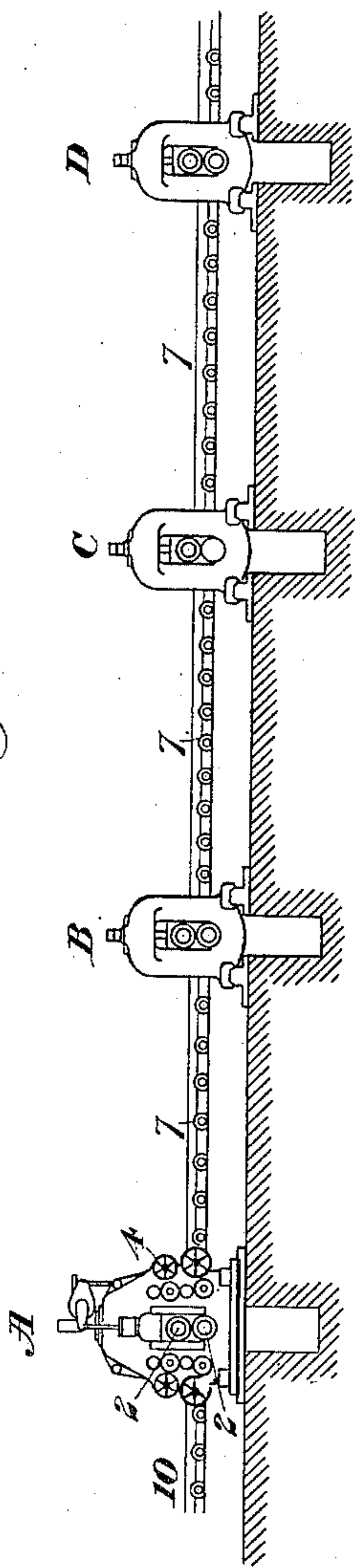
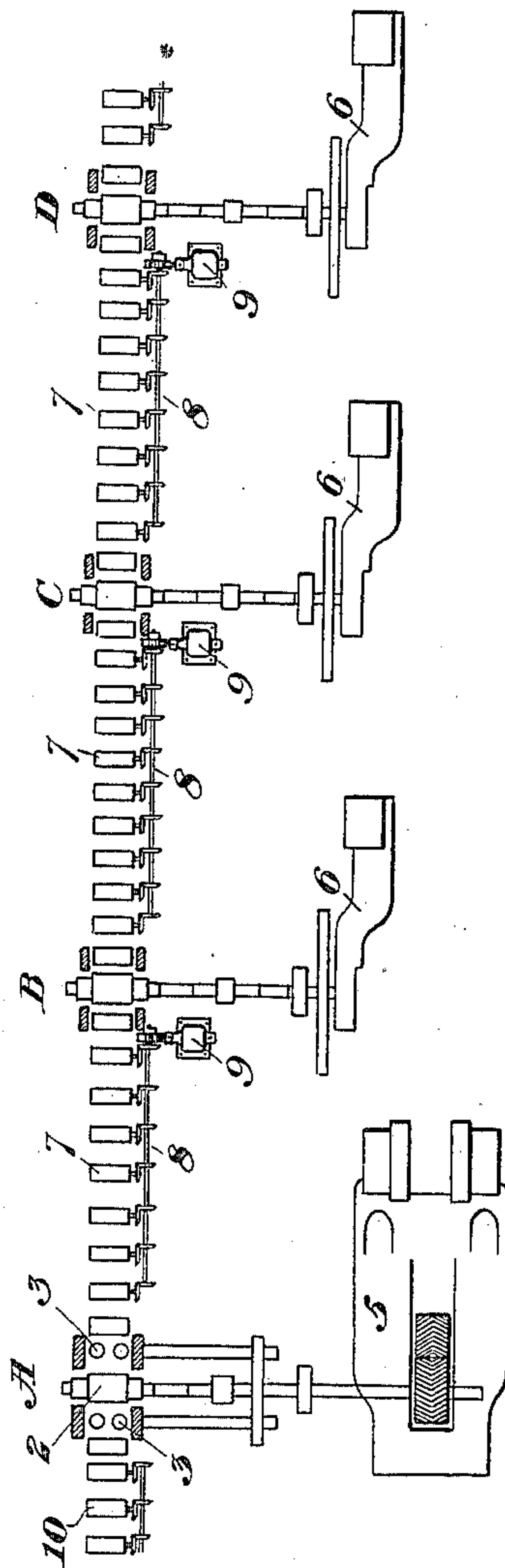


Fig. 2.



WITNESSES

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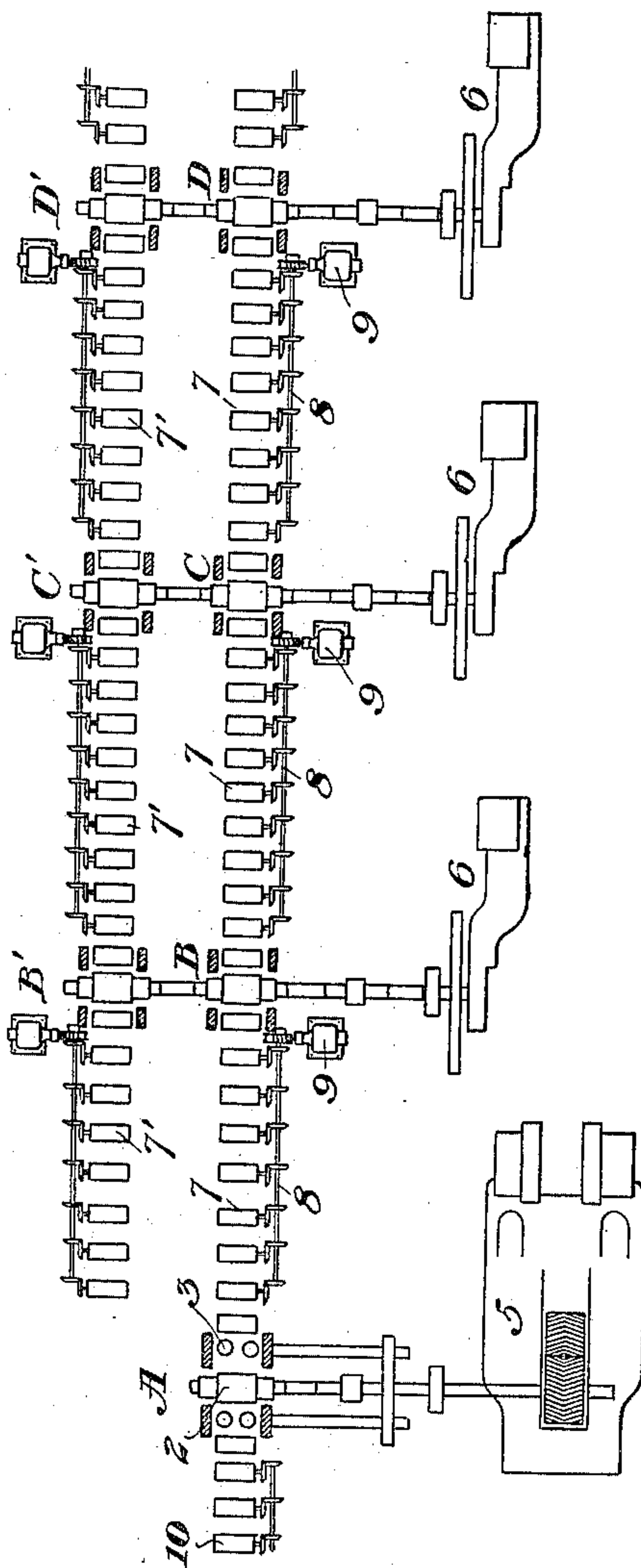
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*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

JOHN STEVENSON, JR., OF SHARON, PENNSYLVANIA.

## ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 688,751, dated December 10, 1901.

Application filed June 5, 1901. Serial No. 63,305. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN STEVENSON, Jr., of Sharon, Mercer county, Pennsylvania, have invented a new and useful Rolling-Mill, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of rolling-mill constructed in accordance with my invention. Fig. 2 is a top plan view of the same, and Fig. 3 is a top plan view showing a modified form.

My invention relates to the rolling of plates or strips, such as skelp, and is designed to reduce the expense and labor incident to reducing an ingot into plates or strips and simplify the construction of the mill, while enabling the entire reduction to take place without reheating.

In the drawings, referring to the form of Figs. 1 and 2, A represents a universal mill having two horizontal rolls 2 2 and pairs of vertical rolls 3 3 on opposite sides of and co-acting with the horizontal rolls. These vertical rolls may be simultaneously adjusted toward and from each other through suitable mechanism, (shown at 4.) This mill is a reversing mill and may be driven from engine 5. This universal mill is used for performing the roughing operation upon the ingot, and the finishing operation is performed on one or more pairs of bull-head rolls located in tandem with the universal mill. Thus in Figs. 1 and 2 I show three stands of bull-head rolls B, C, and D, each two-high and all arranged in line, so that the metal passes from the universal mill continuously in the same direction through the sets of finishing-rolls. I have shown each set of rolls as driven by a separate engine 6, though other driving connections may be used, such as an engine driving the central pair of bull-heads direct, the others being connected thereto by rope-driving connections. All of the sets of rolls are located a sufficient distance apart that the metal shall be shorter than the distance between the sets, the metal leaving one set of rolls before it enters the succeeding set, and between the sets I employ feed-tables of any desirable form. I have shown these tables as having feed-rollers 7, connected by bevel-gearing to a longitudinal shaft 8, driven

through slow-motion gearing from an electric motor 9. The ingot is fed to the universal mill over suitable feed-rollers 10 and is passed back and forth through said mill a sufficient number of times to obtain the desired reduction, the horizontal vertical rolls being adjusted between the successive passes to give these successive reductions. The metal is then fed forward over the feed-table and passes through the first set of bull-head rolls, thence over the second feed-table and into the second set of bull-heads, and thence over the third feed-table and through the finishing set of bull-heads. The reduction in this last set is preferably slight.

In Fig. 3 I show the invention in a more complete form and arranged for finishing either plates or skelp roughed on the universal mill. The mill is arranged similar to that of the form of Figs. 1 and 2; but a second line of bull-head rolls B' C' D' is arranged parallel with the first line and adjacent thereto. In this form the one line may be arranged for finishing plates and the other line for finishing skelp, and after the metal has been roughed on the universal mill it is either passed forward in line through the bull-heads B, C, and D or is drawn sidewise upon the feed mechanism 7' and thence fed successively through the bull-heads B', C', and D'. A mill is thus provided in which the ingot is roughed down on a single universal mill and is then fed forward and finished into either plates or skelp, as desired, and the rough product may be divided between the two lines of the finishing-rolls.

The advantages of my invention result from the use of a reversing universal mill on which the ingot is roughed in combination with one or more sets of bull-heads arranged in line therewith, since a simple and compact arrangement is thus afforded by which the ingot may be reduced to plate at a single heat and with economy in labor and time.

The number of sets of two-high finishing-rolls may be varied as desired and different forms of universal mills may be used without departing from my invention.

I claim—

1. A rolling-mill comprising a reversing universal mill having sets of vertical rolls on both sides of the horizontal rolls and a set of

plain-faced two-high rolls arranged to receive the metal therefrom, and in line with said universal mill; substantially as described.

2. A rolling-mill comprising a reversing  
5 universal mill, having sets of vertical rolls on both sides of the horizontal rolls, a two-high mill having plain-faced rolls arranged in tandem therewith, and driven feed mechanism between said mills; substantially as de-  
10 scribed.

3. A rolling-mill comprising a reversing universal mill, having sets of vertical rolls on both sides of the horizontal rolls, a series of sets of two-high mills having plain-faced rolls  
15 arranged in tandem therewith, and a second series of sets of two-high rolls arranged in a

line parallel with that of the first set; substantially as described.

4. A rolling-mill comprising a reversing universal mill, having sets of vertical rolls on 20 both sides of the horizontal rolls and two lines of plain-faced two-high rolls arranged to receive the metal therefrom, one of said lines being arranged in tandem with the universal mill; substantially as described.

In testimony whereof I have hereunto set  
my hand. 25

JOHN STEVENSON, JR.

Witnesses:

E. H. WARD,  
J. R. WHITLA.