

Sheet 11-2, Sheets.

B. Lauth,
Rolling Sheet Iron, &c,
N^o 41,307.
Patented Jan. 19, 1864.

Fig. 2.

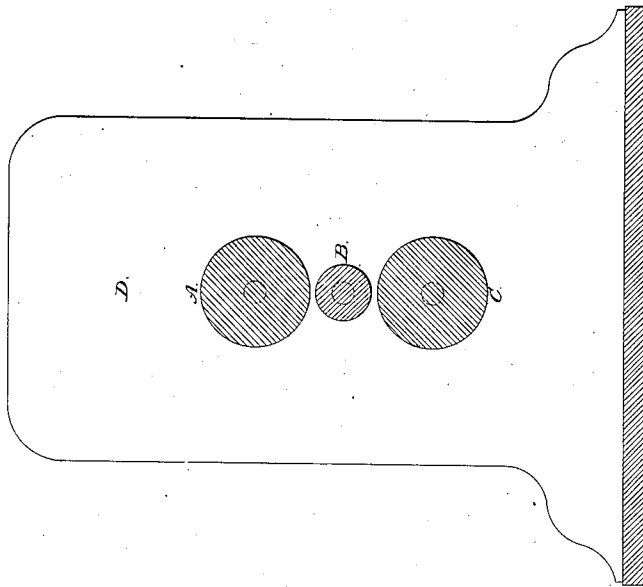
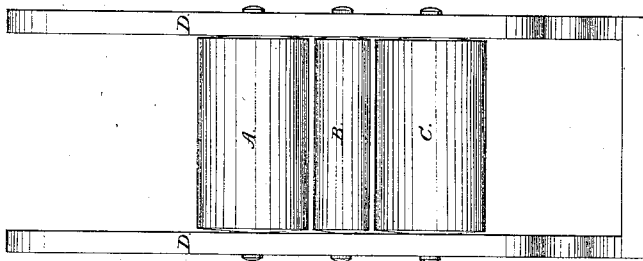


Fig. 1.



Witnesses;
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Inventor;
Bernard Lauth,
By atty. H. B. Stronglin.

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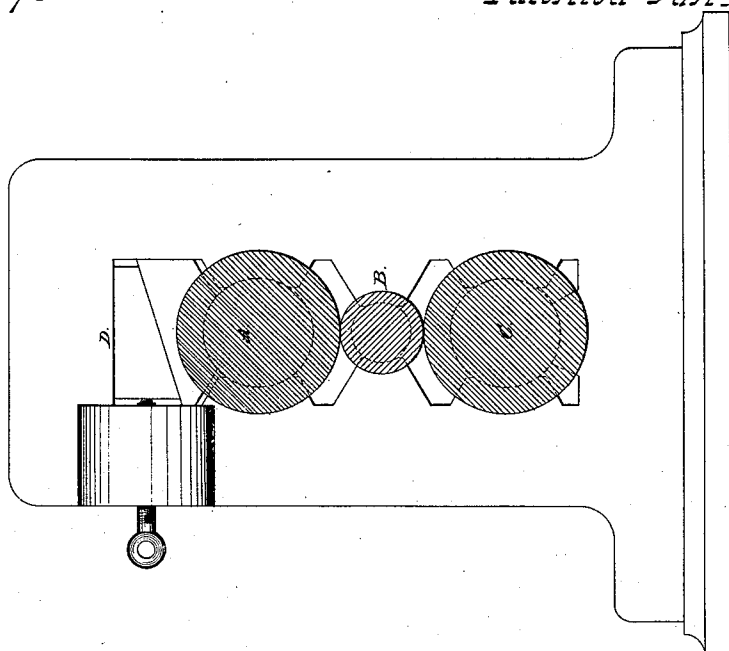
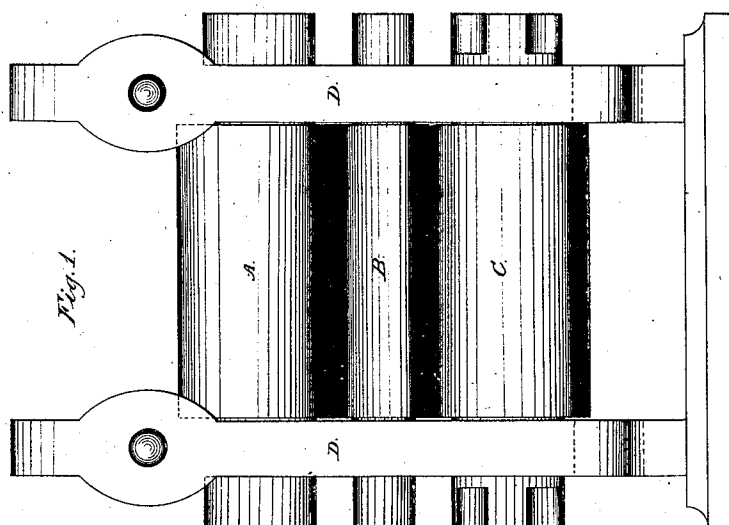


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Witnesses;

P. B. Wilson,
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Bernard Lauth,
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UNITED STATES PATENT OFFICE.

BERNARD LAUTH, OF BUCHANAN, PENNSYLVANIA.

IMPROVEMENT IN ROLLS FOR ROLLING METALS.

Specification forming part of Letters Patent No. 41,307, dated January 19, 1864.

To all whom it may concern:

Be it known that I, BERNARD LAUTH, of Buchanan, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Stretching Plates, Hoops, Sheet-Iron, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a front view of the machine, and Fig. 2 a vertical transverse section through the rolls.

The nature of my invention consists in an apparatus or machinery for stretching plates, hoops, sheets, &c., of iron or other metal, composed of "three-high rolls," the center one of which is of less diameter than the upper and lower one. The action of these rolls—viz., the lesser one with the greater one—in result is somewhat like that of drawing out metal upon an anvil with a hammer, but without the indentations, thus leaving smooth surfaces upon the metal, the larger roll having greater bearing-surface, and the pinching-line of the smaller roll serving to stretch out the metal passing between them. The difference between the greater bearing-surface and the lesser acting-surface of the smaller roll, which, theoretically, is but a line, but practically is greater than line, causes the metal between them to be stretched out.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A B C represent three rolls set in a housing, D, which may have the usual appliances of bearing-blocks, followers, and screws for properly adjusting them to the housing and to each other. The center roll, B, is of much less diameter than the over and underlying ones, A C, which are made substantial enough to resist the strain or spring incident to the pressure of the piece passed through between them. Suppose the passes to be made between B C, then, in this case, the upper roll, A, receives the strain or spring of the lesser one, B, which, without the upper one to sustain it, would spring away from the work and defeat its object and purpose. So, too, if the metal be passed between A and B, then the lower roll takes the strain off from the lesser one, B, which

otherwise would spring, and thus, though a small and large roll be used in concert, there is always a third roll to sustain the one most liable to yield. A small roll is necessary in connection with the large one to perform the act of stretching the metal; but without another large roll to take the strain of the smaller one upon itself the stretching could not be done. The three-high rolls are therefore necessary, though the third one is or may be said to be passive rather than active in the duty it performs.

The diameter of the center roll of the set, or three, must be much less than that of the outer rolls of the series, but its surface-speed must be the same as that of the larger rolls, otherwise the thin plates or sheets passed between them would wind up or be torn asunder.

In this machine the power is applied to but one of the series of rolls—one of the large rolls—the smaller ones, whether one or more, running by friction only. I have shown the journal of the under roll as arranged for being driven by gearing, while the others run by friction only, though the outside rolls may be geared together, but must have uniform surface-speed. By such an arrangement the rolls need not be set down so close upon each other which causes them to wear into grooves or uneven surfaces; and I find in practice that the small rolls between the greater ones wear down to smooth polished surfaces, and obviate the necessity of so much turning down, as by the plans heretofore pursued for this purpose.

In one pass through between the rolls as arranged by me the plates, hoops, sheets, or other iron or steel plate or blank can be reduced as much as by several passes through rolls as heretofore arranged and used. I have called this arrangement "three-high rolls;" but do not restrict the invention to that number, as two or more small rolls may be used, but I cannot use less than three. There must be two large outer rolls to take the strain upon, and between these there may be one or more small rolls, as the stretching cannot be so effectually and rapidly done by large rolls as by the small rolls acting against the surface of a large one or in concert with a large roll, and I get a more perfect and uniformly-smooth surface on both sides of the metal plate, sheet, &c., than by any other system of rolling heretofore employed.

If the metal to be rolled is passed only between the rolls B and C, then the roll A must be set down close to the roll B. If, however, two sheets, plates, or other articles are run through at the same time, one above and the other below the small roll B, then the top roll must be eased up accordingly, to give the gaged thickness to the articles to be stretched. It is the "knife-edged" bearing of the small rolls against the broader surface of the larger rolls that stretches or draws out the metal; but without the larger rolls to take the strain or

spring of the small rolls, the uniformly-smooth surfaces and thickness could not be attained.

What I claim as my invention is—

The combination of the three-high rolls, A B C, of which one, B, shall be of less diameter than the other, substantially as and for the purpose herein described and represented.

BERNARD LAUTH.

Witnesses:

JOHN STEVENSON,
DANIEL BERG,
O. B. STEVENSON.