

(No Model.)

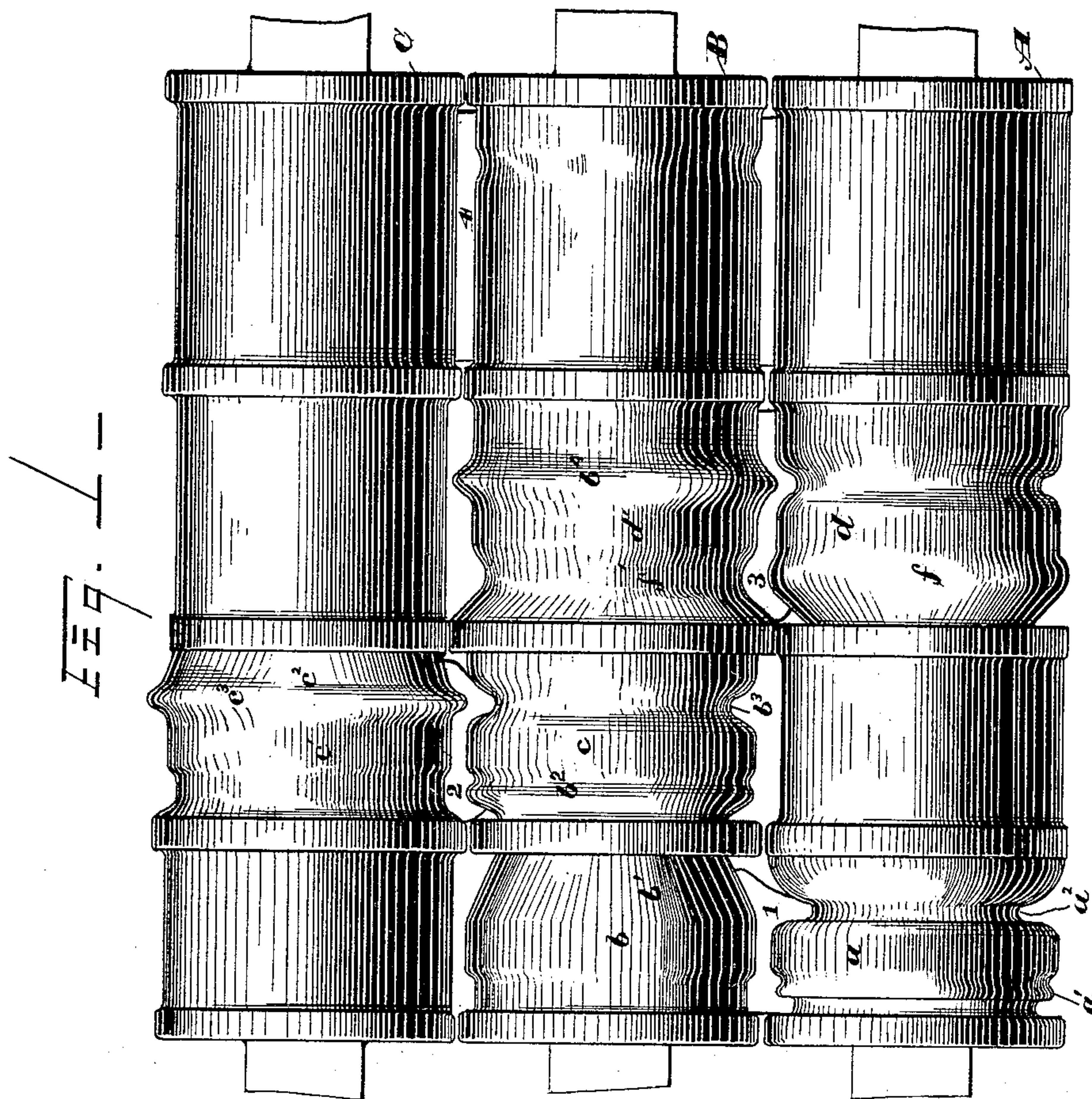
2 Sheets—Sheet 1.

S. McCLOUD.

ROLLS FOR REDUCING OLD RAILS.

No. 350,833.

Patented Oct. 12, 1886.



WITNESSES
Wm. H. Montrose
Geo. W. King

INVENTOR
Sidney McCLOUD
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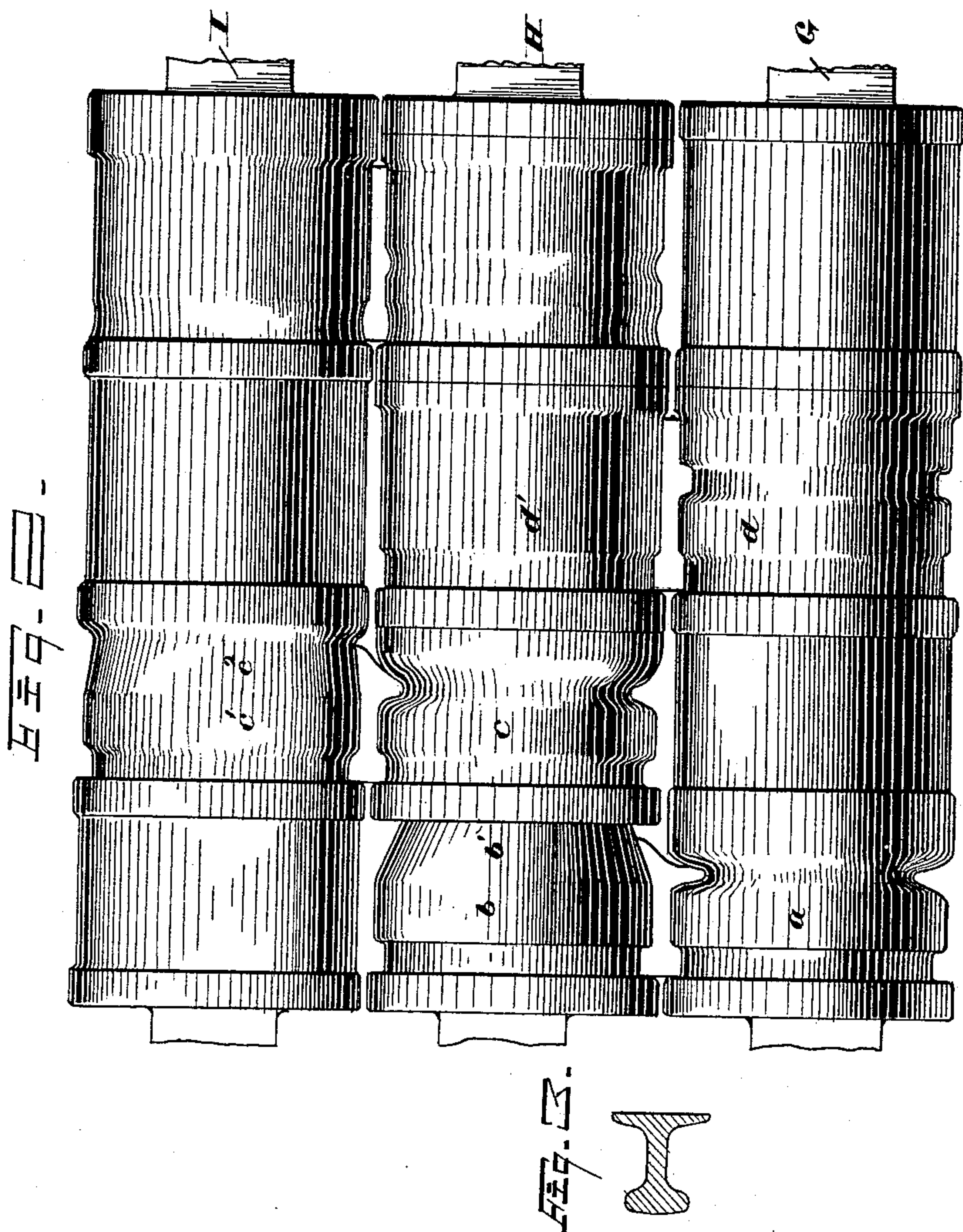
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UNITED STATES PATENT OFFICE.

SIDNEY McCLOUD, OF HAMILTON, ONTARIO, CANADA, ASSIGNOR OF ONE-HALF TO CHARLES E. DOOLITTLE, AS TRUSTEE FOR THE ONTARIO ROLLING MILL COMPANY, OF SAME PLACE.

ROLLS FOR REDUCING OLD RAILS.

SPECIFICATION forming part of Letters Patent No. 350,833, dated October 12, 1886.

Application filed July 31, 1885. Serial No. 173,150. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY McCLOUD, of Hamilton, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Rolls for Reducing Railroad-Rails; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improved rolls for reducing railroad-rails, and is designed more especially for the reduction of old steel rails to nail-plates and to other desired forms, the object being, first, by means of rolls of peculiar construction to extend the rails widthwise to the desired dimensions, and without producing folds, laps, or so-called "cold-shuts" in the metal, after which, by means of ordinary rolls, the bar is extended lengthwise and reduced to the required thickness. The reduction of iron rails is not attended with much difficulty, as such rails can be broken down in a variety of forms and made into fagots or piles and rewelded. With the present state of the art steel rails cannot practically be rewelded. The products made from old steel rails therefore are limited to such as can be produced by the reduction of the rails by rolling or hammering.

Old steel rails are offered at a very low price, and the market is becoming glutted with them, and any method by which such rails can be converted into other useful forms, especially such products as are required in large quantities by the demands of trade, will be of great commercial value.

The greatest difficulty encountered in reducing old steel rails arises from the overlapping or crimping of the metal in crushing down the flange and head of the rail, as such overlapping or folding parts will not weld, but will leave cold-shuts that greatly injure the product, and for many purposes render the product worthless. In view of this difficulty various expedients have been resorted to, such, for instance, as shearing off the flanges and a portion of the head, or shearing off one of the flanges and bending the remaining flange into the same plane with the web

of the rail. Such methods are objectionable for various reasons, among which are the waste of the severed metal and the cost of the shearing operation.

It is found that the metal in old steel rails, if properly treated, is adapted to the manufacture of cut nails of a superior quality. I have therefore devised means for reducing such rails to nail-plates and to plates for other purposes where a considerable width of plate is required, in which method the rail without severing any of the parts, or causing folds or cold-shuts, is first extended widthwise to the required dimensions, and then by the use of ordinary rolls is drawn out lengthwise and reduced to the required thickness.

The rolls for reducing the steel rails to substantially a flat bar suitable for engaging the ordinary rolls are illustrated in the accompanying drawings.

Figure 1 is a side view in elevation of rolls substantially such as I employ when it is desired to extend the rail widthwise as much as possible. Fig. 2 is a side view in elevation of a set of rolls that may be employed when the rail is extended widthwise only to moderate proportions. Fig. 3 is an elevation in transverse section of an ordinary rail.

In Fig. 1 the rolls A, B, and C are arranged to give four passes, by means of which the rail is reduced substantially to a broad plate suitable for further reduction in ordinary rolls. The first peculiarity of these rolls that I will mention is shown at *a* and *b* of the rolls A and B, where the rolls are made to grasp the web of the rail firmly, but without materially compressing the web, and these annular projections are shaped to fit in snugly between the flange and head of the rail, so that any lateral extension of these parts caused by a pressure of the rolls on the same must be outward. Second, a fuller, *a'*, is arranged on the roller A, to groove the head of the rail. Third, the groove *a'* of the roll A is made somewhat shallower than the engaging portion of the flange, in order to crush down or compress the flange, the groove being sufficiently broad to allow the compressed metal to extend outward while the opposite roll at *b'* is made conical and is of such form that it bends the engaging por-

tion of the flange outward. In the second and third passes the parts of the rolls for engaging the web of the rail are substantially the same as in the first pass, except the shoulders of these parts are somewhat changed to correspond with the changed form of the head and flange. These parts (shown at $c\ c'$ and $d\ d'$) simply grasp the web of the rail without materially changing its form, and by engaging such shoulders as are left of the head and flange causes any lateral extension of these parts to be outward. In the second pass the fuller b^2 is broader than the fuller a' of the first pass, and consequently bends outward that portion of the rail outside of the groove made by the fuller a' and compresses the head and extends it in width materially; also, the groove b^3 is shallower and broader than the groove a^2 , and the part c^2 is less inclined to the axis of the roll, by means of which the engaging part of the flange is made to approximate a horizontal position. A fuller, c^3 , grooves the rail opposite to that part of the flange that is being reduced. In the third pass the fuller b^4 is broader and projects farther from the roll more in a radial direction, and hence the groove made by the fuller c^3 is spread out and the plate is materially extended widthwise; also, the grooved part of the head is spread out by the parts f and f' . The fourth pass reduces the rail so nearly to a flat bar that the latter is in condition to be reduced by ordinary rolls. The rolls G, H, and I, in Fig. 2, operate substantially the same as those just described, except the fuller for grooving the head and flange is omitted, and consequently a bar less in width is made. The process for bending one part of the flange outward and compressing the other part of the flange and the head and holding the web so that the lateral extension of the rail is outward, is the same as just described. The parts $a, b, b', c, c', c^2, d,$ and d' are substantially the same as the corresponding parts shown in Fig. 1 and perform the same functions.

I cannot recommend the rolls shown in Fig. 2 for making nail-plates, as the plates would be narrower than is desirable, but for narrower and thicker plates these rolls may be operated successfully.

I do not wish to be understood as limiting myself to the product of sheet and plate metal, but claim my invention for all purposes to which it may be adapted.

What I claim is—

1. In a machine for reducing railroad-rails, a pair of rolls, the one roll having a shallow groove in which one side of the head of a rail is compressed, and the other roll having an annular rib or projection for grooving the opposite side of the head of the rail, substantially as set forth.

2. In a machine for reducing railroad-rails, a set of rolls provided with shallow grooves wider than the head of the rail for compressing said head and permitting it to expand laterally while being compressed, and with ribs for grooving said head, substantially as set forth.

3. In a machine for reducing railroad-rails, a pair of rolls, one of which is provided with a shallow groove, in which the head of the rail is compressed, and the other roll provided with an inclined portion for bending outward one side of the head which has been previously grooved, substantially as set forth.

4. In a machine for reducing railroad-rails, a pair of rolls, one of which is provided with a groove, in which one portion of the flange is compressed, and the companion roll provided with a rib for grooving the rail opposite the portion of the flange being compressed, substantially as set forth.

5. In a machine for reducing railroad-rails, a set of rolls having projections for firmly grasping the web of the rails, and constructed to compress the head, allowing it to expand laterally, and having a rib for grooving the said head, substantially as set forth.

6. In a machine for reducing railroad-rails, a set of rolls having grooves, ribs, and inclined portions, substantially as described, for compressing and grooving the head portion of the rail, and for bending and grooving the flange, substantially as set forth.

7. In a machine for reducing old rails, a set of rolls having grooves and ribs, substantially as described, for compressing one side of the head portion and one side of the flange portion, and for grooving the other side of the head portion and the other side of the flange portion, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 24th day of July, 1885.

SIDNEY McCLOUD.

Witnesses:

EDWARD MARTIN,
N. G. MUNRO.