J. REESE.

MODE OF UTILIZING OLD RAILS.

No. 182,533. Patented Sept. 26, 1876.

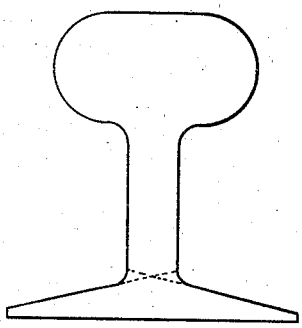

Fig. 1.

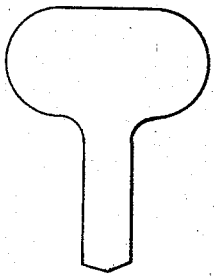

Fig. 2.

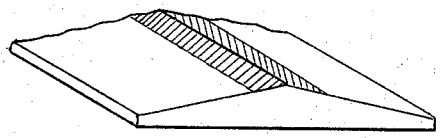

Fig. 3.

WITNESSES.

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IMPROVEMENT IN THE MODE OF UTILIZING OLD RAILS.

Specification forming part of Letters Patent No. **182,533**, dated September 26, 1876; application filed July 20, 1876.

To all whom it may concern:

Be it known that I, JACOB REESE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Utilization of Old Rails in the manufacture of nail and other plates; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 represents a portion of a rail, which has been cut to a convenient length for the operation of reducing it into a nail-plate. Fig. 2 represents the piece having the flange separated or slit from the web and head of the rail. Fig. 3 represents the flange.

My invention relates to the manufacture of sheet or plate from old rails or rail ends.

The process by which plates or the blanks from which nails are made are at present constructed is as follows: Pig-metal is puddled. The iron is then squeezed and rolled into muck-bars. These bars are cut into suitable lengths, taken to a reheating-furnace, and when heated are passed through suitable grooved rolls until the plate formed thereby has acquired a width of about sixteen inches, and is of the required thickness, and from twelve to twenty feet long. The plate is then cut into strips, the length of which lie transversely to the plate, and the width of the strip is equal to the length of the nail to be made from it.

A special quality of iron is required for the manufacture of nails, the object being to get iron that will cut clean and smooth, and be able to stand the heading operation without splitting, to possess a clean and bright appearance when finished, and that will bend to a given degree without breaking. In order to obtain these desirable results, the manufacturer has to use a red-short iron of very close and fine texture or grain. When nails are made from this kind of stock, they cut and head well when they are cut cold, but when cut hot, as is the case with the larger sizes, are apt to split when undergoing the heading operation, and look rough when finished.

One of the other disadvantages incident to the manufacture of nails when red-short iron is used is that the plate often cracks along the edges when it is being rolled. This is caused by the red-short nature of the iron that the manufacturer is compelled to put into it, in order that the cutting and heading operations can be done well, and that the nail will bend to some degree without breaking when finished. Even when made from the quality of iron most suited for their manufacture, they will bend but little without breaking, and it is found necessary, when nails are required that possess this quality to any great degree, to have them manufactured from Sweed or Norway iron. As these brands of iron are very costly, it brings up the cost of production to such a figure that it is found impossible to sell such a nail, except for special purposes.

One of the other disadvantages incident to the manufacture of nail-plate as it is at present conducted is that during the reheating operation cinder, and sometimes fire-clay, are apt to get into the iron, and not thoroughly expelled during the rolling of the nail-plate. When such is the case, there will be spots or cinder-holes in it, which will produce bad nails when cut, and take or wear off the cutting-edges of the knives of the nail-machines, thus causing an increased amount of labor and loss of time consequent on the stoppage of the machines.

Now, for the purpose of overcoming these disadvantages, and for the purpose of economy in the manufacture of nails, and also for the utilization of old steel or iron rails, I have invented and use the following new and useful method of their manufacture, which I will now proceed to explain, so that others skilled in the art to which it appertains may use and put into successful operation.

I take old rails of any conformation, and shear them into suitable lengths, say from sixteen to twenty inches. These pieces are then heated, and passed through a pair of slitting-rolls, which are so arranged that the flange is separated from the web and head of the piece as it passes through them, as shown in Fig. 2. These pieces are then, at the same heat, passed through an ordinary pair of sheet-rolls, the length of the pieces being parallel with the axes of the rolls, and

by a succession of passes are reduced to the proper thickness, and are of such length as the piece will elongate to by being reduced to the thickness required.

Care should be taken, in rolling the web and head, that the web should be made to enter the rolls first. By that means the head will be rolled out away from the web, and thus prevent any seam or lap at the point where the head and web unite: but if the head is caused to enter the rolls first, it will overlap in a measure the web, and leave a defect in the plate.

It will be observed that while the fiber of muck-bar, when used in the manufacture of nail-plate, runs parallel with the length of the bar, and that it was passed transversely through the rolls when rolling the nail-plate, it will also be seen that the fiber of a rail runs parallel to its length, and that when rolling I caused it to pass through the rolls with its line of fiber parallel with the axis of the rolls, changing its condition so that the line of fiber runs at right angles to what it did in the rail. The effect of this change is well known to metallurgists, it being the method adopted when making boiler-plate, so as to procure a homogeneous texture.

Though in practice I find it convenient to cut the rails into such lengths as will correspond to the width of the plate or sheet to be produced, still I do not wish to confine myself to that practice alone, as I have often cut the rails into lengths of five or six feet, spread them out to a certain width, then changing the line of fiber by passing the plate one-half of the passes parallel with the axis of the rolls and one-half of the passes with the length of the sheet transversely with the axis of the rolls.

Steel rails are, as is well known, very hard to weld, and no process has yet been discovered by which they can be utilized by welding. Now, by my process I cut the rails or rail ends into suitable lengths, slit off the flange, and roll the pieces into plates, and I find that they make a nail which cuts better and cleaner, does not split in heading, has a finer appearance, is not so apt to bend in using, and is in every way superior to an iron nail. I also find that no nails are lost by reason of cinder or fire-clay in the plate, and that the knives are not so apt to get scored, as the steel is free from such impurities.

The steel nails which I am manufacturing from the scrap ends of Bessemer steel rails are much lighter than such nails are when made from iron, and owing to the superior quality of the steel over iron, are much stronger, and can be made by annealing to be able to take any clinch that may be required, and owing to the direct process of their manufacture I am enabled to produce them at a cost below the market price of ordinary iron nails.

When using, by my process, old iron rails, which can be bought at a price equal to that of good pig-iron, the manufacturer of nails will avoid the cost of puddling, and thereby save from ten to fifteen dollars for each ton of nails manufactured, and will produce a very good quality of iron nail.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

The method herein described of utilizing old rails or rail ends in the manufacture of sheet or plate metals, consisting of, first, cutting the rails or rail ends to suitable lengths; second, separating the flange from the web and head; and, third, presenting the pieces so prepared to the rolls sidewise—that is, the axis of the piece parallel to the axes of the rolls, and thus reducing the piece to a sheet or plate by spreading it in a direction transverse to its longitudinal axis.

In testimony whereof I, the said JACOB REESE, have hereunto set my hand.

JACOB REESE.

Witnesses:

JAMES I. KAY,

FRANK REESE.