

UNITED STATES PATENT OFFICE.

B. LAUTH, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO JONES & LAUTH,
OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF IRON.

Specification forming part of Letters Patent No. 25,235, dated August 23, 1859.

To all whom it may concern:

Be it known that I, BERNARD LAUTH, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful process for hardening and finishing iron rods, bars, railroad-rails, sheets, or plates, or those of steel by what I term "cold-rolling"—that is to say, by passing them through between rolls when in a cold state—by which means I reduce said pieces in size, and at the same time add to their stiffness and strength without injury to the fiber of the metal; and I do hereby declare that the following is a full, clear, and exact description of the same, and of the results which I have obtained by actual experiment.

By "cold-rolling" I mean bars or sheets of iron or steel that are in such a state as not to be susceptible of welding, but whose fiber may be packed without injury to it. The bars or sheets may be entirely cold; but in the process it may not be economical to wait until they are entirely cold, as they may still retain some degree of heat and still receive the same effect by reducing and packing the fiber by the pressure of rollers.

The nature of my invention therefore may be said to consist in rolling iron and steel in a cold state, to strengthen it and at the same time give it a finished appearance.

To enable others skilled in the art to make and use my process, I will proceed to state what is the result of an experiment which I have made, viz:

I placed a piece of round iron seven-eighths of an inch in diameter and five feet long, and which had been rolled in the ordinary way on two supports, one at each end of the bar, and at an elevation of two and a half feet. By applying weight to the center of this bar I found that three hundred and fifty pounds bent it (the weight) to the ground, the bar bending about ten inches, and when the weight was removed the bar retained its bent form. I then took a piece of the same kind of iron and originally of the same size, but which had been subjected to the cold-rolling process and reduced in diameter thereby nearly one-sixteenth of an inch, and put it to the same test as above mentioned. It required five hundred and forty pounds weight to send it (the weight) to the

ground, and when the weight was taken off the bar sprung back into very nearly a straight line, thus showing that the lateral strength of the bar was increased by the cold-rolling more than 50 per cent. Indeed the iron after being cold-rolled has more of the character of steel than of iron.

It is probable that this process of cold-rolling may not be very essential as applied to steel from the compact nature of that metal; but for iron it is exceedingly valuable, being able to use lighter rods, bars, plates, or sheets, and yet have the same or even greater strength in them. The iron thus cold-rolled is very nearly as hard and dense as steel, and for many purposes will take the place of that article. The pressure or amount of rolling must not be so great as to injure the quality of the metal, and I find that the better the quality of iron the more pressure in rolling it will stand, and bars or sheets of iron may be treated by my process after they are rolled out in the common way, and while a slight heat is retained in them; but they are better when cold or practically cold—that is, cool enough for the fiber not to be affected by the heat.

Any shaped bars or rails that can be drawn through rolls may be treated as above.

Having thus fully described the nature and object of my invention, I would state that I am aware in covering one metal with another—such as making tin or galvanizing iron—the plates or sheets have for certain purposes been passed through rollers in a cold state; but here it is only sheets or plates and not for the purpose which I contemplate—viz., the packing of the fiber of the metal. To such rolling by plates or sheets I make no claim, as they are or may be reheated afterward without any injury to them; but

What I do claim as new, and desire to secure by Letters Patent, is—

A new article of manufacture made by rolling iron or steel in a cold state for hardening and adding strength to it without injury to its fiber, and at the same time reducing it in size, as herein set forth.

BERNARD LAUTH.

Witnesses:

THOS. STEEL,
T. M. RINAHART.