

UNITED STATES PATENT OFFICE.

WILLIAM M. PICKSLAY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF BARS AND ARTICLES OF IRON AND STEEL COMBINED.

Specification forming part of Letters Patent No. 59,644, dated November 13, 1866.

To all whom it may concern:

Be it known that I, WILLIAM MORTON PICKSLAY, of Philadelphia, Pennsylvania, have invented an Improvement in the Manufacture of Bars and other Articles of Iron and Steel Combined; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to an improvement in the invention for which Letters Patent of the United States were granted on the 19th day of September, 1865, to Charles Sanderson, of Sheffield, England. In order that my improvement may be thoroughly understood, I will first proceed to describe that portion of the invention of the said Sanderson to which my invention specially relates.

In his specification Sanderson says: "I take a bloom of ordinary puddled or piled iron, of any desired size—say, for example, six inches square and twenty-four inches long—and heat this bloom to a red heat in a suitable furnace. I then place it in the center of a cast-iron or other mold, leaving a space between the bloom and the mold, into which space I pour molten steel or molten homogeneous iron or steel made as aforesaid"—viz., by the Bessemer process. "By this means a mass is obtained having a wrought-iron core, and surrounded by cast-steel or homogeneous iron or steel made as aforesaid. The compound metal is then hammered and rolled in the usual way, and will thus produce a soft wrought-iron railway-bar having a surface of cast-steel or of homogeneous iron or steel."

After many careful experiments, I have discovered that the process described by Sanderson cannot be carried out so as to produce a perfect union between the iron and steel of

which the bar is composed. The bar is therefore the weakest at the point where the two metals are in contact, so that they will separate when the bar is subjected to severe strains.

In order to obtain a perfect union of the two metals I first heat the bloom to a welding-heat instead of to a red heat, as required by Sanderson's process, and while in this condition I introduce the bloom into a mold of a suitable shape, and then fill the space in the mould round the bloom with molten steel, or molten homogeneous iron or steel.

When the mass has cooled it will be found that there is a perfect union between the iron and steel, and that no strains to which the bar can be subjected will disclose any weakness at the point of union of the two metals.

Care should be taken to introduce the steel into the mold while the iron is at the proper temperature, as it is absolutely necessary in order to effect a perfect union that the iron bloom in contact with the molten steel shall be at a welding-heat.

I claim as my invention and desire to secure by Letters Patent—

The manufacture of bars and other articles of iron and steel combined by applying the steel in a molten state to the iron while the latter is at a welding-heat, and subsequently rolling or otherwise working the combined mass.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

W. M. PICKSLAY.

Witnesses:

CHARLES E. FOSTER,
JNO. B. HARDING.