

# UNITED STATES PATENT OFFICE

WILLIAM HAINSWORTH, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO  
THE PITTSBURG STEEL-CASTING COMPANY, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF CASTINGS FROM WROUGHT AND CAST IRON.

Specification forming part of Letters Patent No. **169,261**, dated October 26, 1875; application filed  
September 28, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM HAINSWORTH, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Manufacture from Wrought and Cast Iron of Homogeneous Refined Castings; and I do hereby declare the following to be a full, clear, concise, and exact description thereof.

Many articles required in the arts can be made much cheaper of cast-iron than of wrought-iron, but which, for practical purposes, must have, to a greater or less degree, the properties of wrought-iron. By my improvement I am enabled to make such articles by the operation of casting, and also secure in the product most or all of the desired properties of wrought-iron, or, in other words, I make wrought-iron castings.

In carrying out my process I first mix together and melt wrought-iron and cast-iron, varying the proportions somewhat according to the quality of the materials employed, increasing or lessening the percentage of wrought-iron according as the pig-iron contains a high or low percentage of carbon, or according as a greater or less degree of malleability and toughness is desired in the product. With ordinary materials, and for ordinary purposes, about equal proportions of wrought and cast iron may be employed, varying from this, or even a little less than one-half of wrought-iron, to ten or twenty per centum of an excess of wrought-iron. The melting may be done in any suitable furnace or crucible, and other ingredients may be added, if so desired. For convenience in mixing and melting the materials may be reduced to comparatively small pieces. As soon as the mixture is melted I run it off into pigs in the manner well known in

similar operations. I do this partly because the iron needs still further refining before answering perfectly for the uses I have in view, and partly because it is not sufficiently homogeneous. I then break up the pigs and remelt them in crucibles, or in an open hearth or other suitable furnace, and as soon as melted run it off into the molds suitable for making the article or articles desired. Any kind of molds, such as are employed in ordinary foundry-work, may be used. The remelting has a refining effect on the iron, and also gives it a more homogeneous character; and the production may be still further refined by adding a small percentage of wrought-iron—say, five to ten per centum—in the second melting. In this manner I secure after annealing a cast product which has all, or nearly all, the desirable properties of ordinary wrought-iron. It is tough, strong, malleable, and ductile.

I am aware that, broadly, it is not new to mix and melt wrought and cast iron in metallurgic operations, and hence I make no claim thereto; but

I claim as my invention—

The process of making homogeneous refined castings from wrought and cast iron, by first mixing and melting wrought and cast iron in about the proportions specified; second, running the molten mixture off into pigs; third, breaking up and remelting the pigs; and, fourth, running the remelted product off into molds, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM HAINSWORTH.

Witnesses:

JNO. A. WILSON,  
GEORGE H. CHRISTY.