

# UNITED STATES PATENT OFFICE.

OLIVER EDWARDS, OF FLORENCE, MASSACHUSETTS.

## IMPROVEMENT IN PROCESSES OF ANNEALING CAST-IRON SKATES.

Specification forming part of Letters Patent No. 177,628, dated May 23, 1876; application filed March 16, 1876.

*To all whom it may concern:*

Be it known that I, OLIVER EDWARDS, of Florence, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Skates; 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 it, reference being had to the accompanying drawings, which form part of this specification.

In the manufacture of skates it is desirable to turn out an article possessing great toughness, malleability, and a capacity to temper, as is seen in steel, but one that can be obtained at a cost of production less than that when made of said expensive material.

Heretofore a cheap skate has been run out as an iron casting, but with all the disadvantages attendant upon such a construction; also, steel runners have been made, but, from the initial cost of the raw material, they have been of comparatively heavy cost.

My invention relates to the process of manufacturing skates or skate-runners, having as its object the obviation of the above-mentioned disabilities and objections incident to both of the manufactures referred to; and it consists in the process of annealing iron castings of skates while embedded in a packing of magnetic oxide of iron, to which may or may not have been added an admixture of the black oxide of manganese.

A skate of any agreeable pattern and form of construction is cast from iron of the same quality as is used in obtaining malleable or wrought iron. It may be either white or gray cast-iron. The casting is then packed in the iron chambers or vessels usually employed in the art, being well embedded in, and perfectly surrounded by, magnetic oxide of iron, to

which may be added a mixture of the black oxide of manganese. After being properly prepared, the same as in packing casting for annealing, and hermetically sealed, the castings are subjected to the action of an annealing-oven, being there heated by a temperature which will produce a light-red color on the casting-chambers. They are then allowed to gradually waste their heat as the oven cools slowly until lowered to the proper degree, as is well understood in annealing, when they may be removed. From five to seven days I have usually held as sufficient time.

Upon taking the skate out from the packing it will be found to be tough, malleable, and, in general, resembling in its characteristics ordinary steel.

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

1. The process of manufacturing malleable cast-iron skates, same consisting in annealing the cast-iron skate, packed in magnetic oxide of iron, substantially as and for the purpose specified.

2. The process of manufacturing malleable cast-iron skates, same consisting in annealing the cast iron skate, packed in magnetic oxide of iron, with an admixture of black oxide of manganese, substantially as and for the purpose described.

3. As a new article of manufacture, a malleable cast-iron skate, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of March, 1876.

OLIVER EDWARDS.

Witnesses:

THOS. B. HALL,  
MELVIN H. STEARNS.