

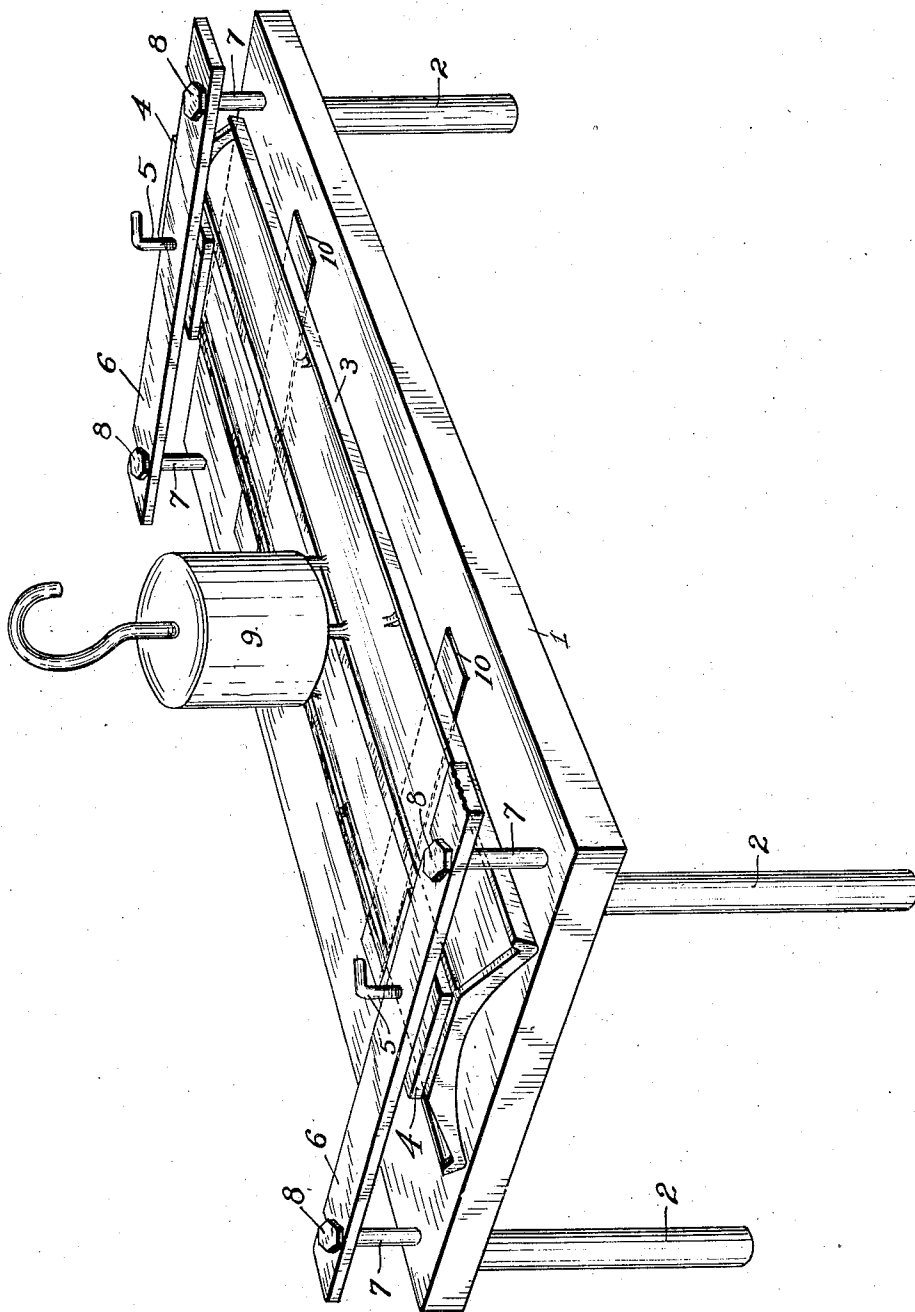
Dec. 11, 1928.

1,695,239

A. B. NORTON

METHOD OF PREVENTING WARPAGE OF CASTINGS IN COOLING

Filed Aug. 4, 1926



INVENTOR

Allen B. Norton

BY

Richey & Watts
ATTORNEYS

UNITED STATES PATENT OFFICE.

ALLEN B. NORTON, OF CLEVELAND, OHIO, ASSIGNOR TO ALUMINUM COMPANY OF AMERICA, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METHOD OF PREVENTING WARPAGE OF CASTINGS IN COOLING.

Application filed August 4, 1926. Serial No. 126,979.

This invention relates to the production of straight, unwarped castings, and more particularly to a method of and apparatus for controlling the shape of castings.

5 An object of the invention is to provide a method and means which will be efficient, effective, and economical in producing castings of a desired shape.

Other objects will hereinafter appear.

10 The invention will be better understood from the explanation of one practical embodiment of the apparatus and description of the method as practiced therewith.

In the accompanying drawing, the figure 15 is a perspective view of one form of apparatus for preventing warping of ironer shoe castings made of aluminum alloy. These castings are made of an alloy which possesses very little ductility when it has cooled. The 20 castings are true when removed from the molds but warp during cooling. Due to the lack of ductility they cannot be satisfactorily straightened after cooling.

When such a casting is removed from the 25 mold at a relatively high temperature it can be easily deformed to a moderate extent. If it is immediately deformed and restrained in the deformed position or if it is merely clamped so as to hold the form it had when 30 it came from the mold, it will on cooling retain the form in which it was restrained during the cooling process and after cooling will retain that shape in normal use even though it may be alternately heated to 35 approximately 300° F. and allowed to cool in air.

The apparatus shown consists of a flat bed 1 supported by legs 2 and upon which the shoe casting 3 is clamped. The clamping 40 means consist of blocks 4 which are pressed upon the shoe by hand operated screws 5. The screws are threaded through bars 6 which are detachably held to the bed by cap screws 7 having heads 8.

45 In practice a weight 9 has been placed on the central part of the shoe casting, although clamping means similar to those used at the ends of the shoe might be substituted therefor. Shims 10 may be inserted between the 50 casting and the bed to give the casting a slight curvature as a compensation for any flexure occurring when the casting is released from the clamping means, or in service.

The operation of the apparatus is as follows: A casting is made and taken directly 55 from the mold to the bed while still at an elevated temperature. The clamps are immediately tightened and the weight placed upon the casting so that it is held firmly upon the bed. The casting is now left to cool, 60 after which it is removed. It will then retain its shape under atmospheric temperature and is not permanently distorted by subjection to the normal operating temperature. 65

While in the example above set forth the apparatus and method have been described as being applied to a casting which it is desired to maintain straight upon cooling or to give only a slight curvature, it will be 70 obvious that they may be applied to castings of various articles which are cast in one form and, after being removed from the mold, are bent to some other form.

For instance, a casting might be formed 75 in a mold without the curvature which is desired in the finished article, if this were desirable for any reason such as to facilitate the casting operation, and when the casting is placed upon a table or form, suitable 80 arrangements of weights, clamps, etc. would shape the casting to the desired form and retain it in this shape while it cools. Due to the freedom of movement of the particles of the metal in their hot state, these would 85 readjust themselves and relieve any internal stresses that would ordinarily be set up during cooling of the casting.

Again, some types of casting might be more conveniently cast in a curved shape and bent 90 or straightened thereafter to the form desired in the finished article.

While I have described one particular form of apparatus, it will be readily apparent that many modifications and variations thereof 95 may be made, and, in fact, must be made for differently shaped castings, and I do not therefore limit myself to the precise details shown but claim broadly the method and apparatus by which it may be performed, 100 claiming all equivalent methods and structures which come within the scope of the appended claims.

I claim:

1. The method of treating aluminum alloy 105 castings, which comprises taking the hot cast-

ings directly from the molds, placing them upon a surface of the desired configuration, clamping them to said surface, and allowing them to cool while so clamped.

- 5 2. The process of treating aluminum alloy castings which comprises taking the casting directly from its mold while hot, bend-

ing the casting to a desired shape, and thereafter restraining the movement of parts of the casting during cooling.

In testimony whereof I hereunto affix my signature this 20th day of July, 1926.

10

ALLEN B. NORTON.