J. C. HENDERSON,
MELTING POT OR CRUCIBLE.
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John C. Henderson, Inventor
By his Attorney
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To all whom it may concern:

Be it known that I, John C. Henderson, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Melting-Pots or Crucibles, of which the following is a full, clear, and exact description.

My invention relates to melting pots or crucibles for melting metallic substances of high melting point, such as brass, copper and the like, and has for its object to provide a commercially practicable cast metallic melting pot or crucible for use in the manufacturing arts for melting copper, brass and the like in quantities such as the now named graphite crucibles. It further has for its object to provide such a melting pot or crucible in which the time and fuel required for melting substances of high melting point is reduced largely below that required in present practice. It further has for its object to produce such melting pots or crucibles which shall not be liable to break when hit or handled and may be repeatedly used for many times.

The cost of using crucibles such as at present used is very great, due to the fact that they frequently break so that they not only have to be replaced but also often lose their contents, and, moreover, they transmit the heat so slowly as to consume what I have found to be an unnecessarily long period of time and great amount of fuel in each heat.

I have discovered that the cost and loss can be largely reduced by using a crucible such as below specified.

The method of making a crucible involving my invention, I cast the same from an alloy containing from five (5) to thirty (30) per cent. of chromium and fifty (50) to ninety (90) per cent. of nickel. The combined chromium and nickel preferably amount to sixty (60) per cent. The preferred alloy contains chromium twelve (12) per cent., nickel sixty (60) per cent., iron twenty-six (26) per cent., and manganese one and one-half (1 ½) per cent. Cobalt can be substituted for nickel, being of substantially the same character. Cobalt is associated with iron in Mendeleef's table and is of substantially the same atomic weight. Good results can be obtained if the iron content above referred to is omitted.

The following is a description of a crucible embodying my invention, reference being had to the accompanying drawing which shows a vertical section of a crucible embodying my invention for use in an ordinary furnace.

Referring more particularly to the drawings, 1 is the wall of a crucible of ordinary external shape cast of the alloy above referred to, which is very refractory, and of a conductivity which is low though higher than the conductivity of graphite. It has a flat bottom 2 and is adapted to stand upon the floor of a furnace. The wall thickens somewhat as it approaches the base, since the pressure and heat are more severe at that point.

The walls of the crucibles embodying my invention are thin, being about one-half as thick as the walls of a commercial graphite crucible of the same dimensions. They are thin enough to be kept from melting under ordinary brass or copper melting conditions, by the cooling effect of melting brass or copper contained therein, until the brass or copper reaches the required pouring temperature. If too thick the wall, on account of the poor heat conductivity of its alloy, is liable to soften and become porous. In a crucible ten inches in diameter at the top I have found that making the average thickness of the wall about five-eighths of an inch gives good results. My crucibles, on account of their thinness and specific conductivity, conduct the heat of a furnace to their contents much more readily than do graphite crucibles so that the time and fuel for each melt is reduced. They resist the action of molten brass or copper so that the quality of such contents is not affected by the crucible. They remain strong at the high temperature necessary to melt brass or copper and can be used repeatedly many times. They do not have to be heated or dried before using as is the case with graphite crucibles and it is unnecessary to keep a large reserve stock on hand. They are highly resistant to oxidation and though a slight film forms, constituting a coating upon the surface, that film protects the body of the crucible and is itself refractory non-flaking and very resistant to the action of its contents.

In operating with a crucible embodying my invention, it is put into a furnace in the
ordinary manner. Care should be taken not to overheat it, i. e., to not expose it to a melting temperature above 2000° F. for a considerable period, after the melting of the contents is completed, since if that is done it may be injured. It will, however, withstand any heat treatment necessary for melting brass, copper and the like.

As will be evident to those skilled in the art, my invention permits of various modifications without departing from the spirit or the scope of the appended claims.

What I claim is:

1. A cast thin walled metallic melting pot composed of a highly refractory alloy of low heat conductivity and resistant to the action of molten brass, said pot having a refractory, non-flaking coating upon its exposed surface.

2. A cast metallic melting pot composed of a highly refractory alloy containing chromium and a metal associated with iron in Mendeleef's table and of substantially the same atomic weight as iron.

3. A cast metallic melting pot composed of a highly refractory alloy containing chromium and a metal associated with iron in Mendeleef's table and of substantially the same atomic weight as iron, said pot having a refractory, non-flaking coating upon its exposed surface.

4. A cast thin walled metallic melting pot composed of a highly refractory alloy containing chromium and a metal associated with iron in Mendeleef's table and of substantially the same atomic weight as iron, said pot having a refractory, non-flaking coating upon its exposed surface, and the wall thereof increasing in thickness as it approaches the base.

5. A cast metallic melting pot, composed of a highly refractory alloy containing nickel and a metal having the characteristics of chromium, the combined nickel and said other metal amounting to at least sixty per cent. (60%) of the alloy.

JOHN O. HENDERSON.