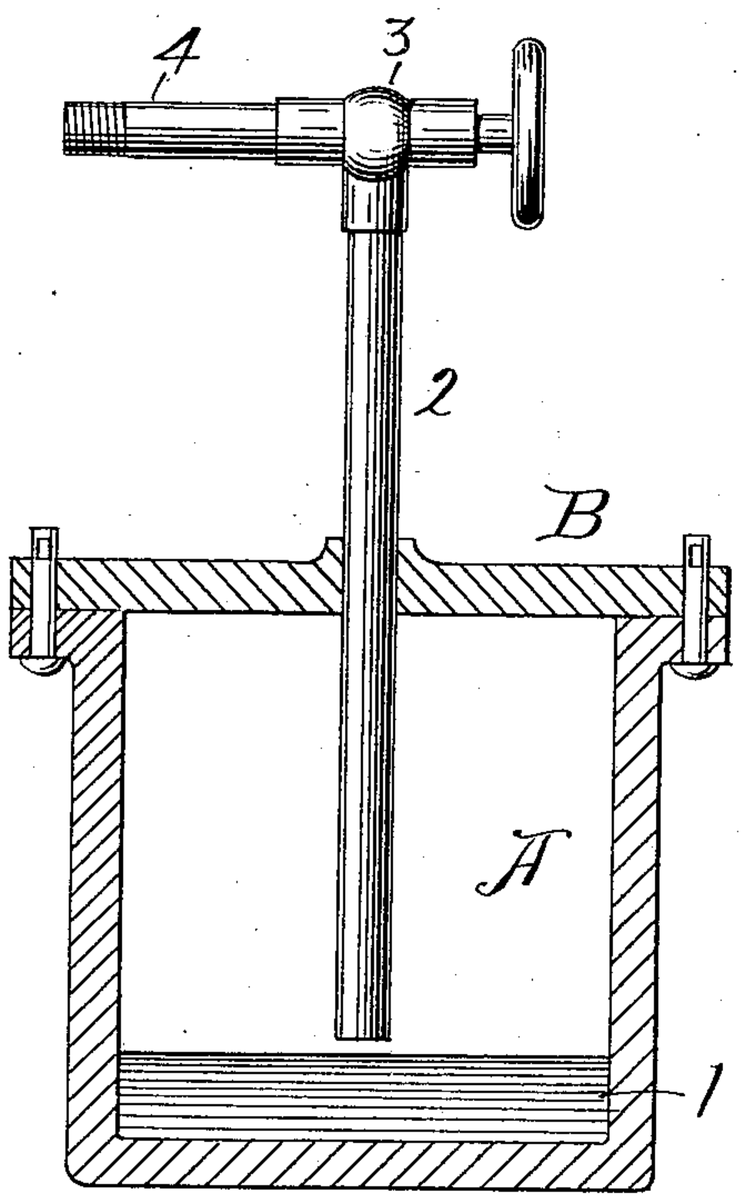
(No Model.)

H. K. JONES.

PROCESS OF ANNEALING METALS.

No. 563,380. Patented July 7, 1896.



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UNITED STATES PATENT OFFICE.

HORACE K. JONES, OF HARTFORD, CONNECTICUT.

PROCESS OF ANNEALING METALS.

SPECIFICATION forming part of Letters Patent No. 563,380, dated July 7, 1896.

Application filed May 13, 1895. Serial No. 549,066. (No specimens.)

To all whom it may concern:

Be it known that I, HORACE K. JONES, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Processes of Annealing Metals, of which the following is a specification.

My invention relates to improvements in the process of annealing metals, and the chief object of my improvement is to provide a simple and efficient mode of annealing metal under subjection to a non-oxidizing gas.

In the accompanying drawing the only figure shows partly in vertical section and partly in elevation an annealing-pot and pipe connections by means of which my process may be practiced.

A designates the portable annealing pot or vessel, which may be sealed tight by means of the cover B, secured thereto and properly luted or sealed. Within said vessel I inclose the metal to be annealed and preferably a quantity of carbonaceous or other gas-producing material, as, for example, oil or sawdust, as at 1. The metal will, however, upon being heated give off gas to a considerable extent. The vessel or annealing-pot is provided with a suitable vent and pipe connection, which, as shown, is formed by the pipe 2, extending to a point near the bottom of the vessel and provided with any ordinary cock 3, by means of which the vent in the pipe may be regulated as may be desired. Extending beyond the cock is a pipe 4, screw-threaded at the end or otherwise provided with means for connecting it with a pipe or pipes or an ordinary hose or flexible tube leading to a suitable gas-supply, as, for instance, the gas-pipes in the building for supplying illuminating-gas.

Instead of providing a special vent-hole the joint between the cover and the vessel may be used as a vent, care being taken not to make the vent too large. In lieu of placing the oil in the bottom of the vessel the articles to be annealed may be coated with oil and the gas generated therefrom will answer the same purpose, provided one is not particular about having the work come out with a clean surface. I place the vessel thus charged into the fire, leaving the vent open. The carbonaceous material will generate gas, which with the air in the inclosed vessel may flow out of the vent. The vent is left open continually during the heating process, so as to relieve the chamber from excess of pressure, the carbonaceous material generating sufficient gas to fill the vessel and keep it filled, thereby excluding therefrom the flame and products of combustion of the heating medium through the expulsive action of the gas given off and thus allowed to escape. The vessel is then removed from the fire for cooling and connected in any suitable way with a gas-supply, for example, by securing a hose, tube, or pipe connected with any of the gas-pipes of the building to the threaded end of the pipe 4, so that when any shrinkage of the gas within the vessel occurs fresh gas may come in from the gas-supply and keep the vessel filled with gas until it is cool.

I do not claim, broadly, subjecting the metal during annealing to a non-oxidizing gas, neither do I claim, broadly, the connection of the annealing vessel with a gas-main, the same being shown and described in my Patent No. 427,768, dated May 13, 1890.

In my present process the annealing vessel is disconnected from all outside gas-supplies until ready for cooling, and too great pressure is avoided by leaving the vent open during the process of heating and expansion.

I claim as my invention—

The method of annealing metal which consists in placing it in an inclosing vessel, heating the vessel and contents without admitting gas thereto until the metal begins to give off such gases as may be contained therein or gases are generated from other contents of the vessel, simultaneously venting the vessel to permit the gas generated therein to escape, continuing the heating until the metal is raised to the desired annealing temperature, then discontinuing the heat and introducing into the vessel while the gaseous atmosphere therein is contracting a non-oxidizing gas until the metal has cooled the pressure within the vessel during the introduction of such gas being maintained at such a low point that substantially no carbon is taken up by the metal if a gas containing carbon is employed.

HORACE K. JONES.

Witnesses:
JAMES SHEPARD,
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