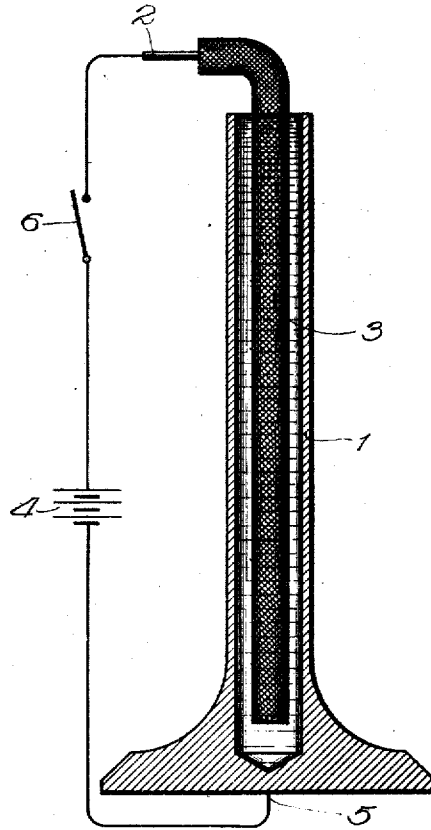


C. W. BALKE.
PROCESS OF AMALGAMATING STEEL BODIES.
APPLICATION FILED MAY 31, 1918.

1,349,999.

Patented Aug. 17, 1920.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PROCESS OF AMALGAMATING STEEL BODIES.

1,349,999.

Specification of Letters Patent. Patented Aug. 17, 1920.

Application filed May 31, 1918. Serial No. 237,459.

To all whom it may concern:

Be it known that I, CLARENCE W. BALKE, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented a certain new and useful Improvement in Processes of Amalgamating Steel Bodies, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to a process of amalgamating steel bodies and is especially concerned with the process for amalgamating the inner surfaces of mercury cooled valve stems.

The object of my invention is to simplify the method and shorten the time required for amalgamating the inner surfaces of the hollow stems of mercury cooled valves.

The method by which I accomplish this object is more or less diagrammatically illustrated in the accompanying drawing, in which I have shown a valve for internal combustion engines in longitudinal section and the means which I employ for amalgamating the inner surface of the hollow stem of this valve.

In carrying out my improved process I fill the hollow valve stem 1 with a solution of mercuric chlorid in hydrochloric acid, the proportions being about one quarter pound of mercuric chlorid to about seven pounds of commercial hydrochloric acid. I then insert an anode 2 in the stem of the valve, the said anode being covered by woven fiber material 3 which prevents the anode 2 from contacting with the walls of the valve stem, but at the same time permits the current to flow from all portions of the anode immersed in the solution. I then connect the cathode of a storage battery 4 of approximately six volts with the anode 2 and the anode of said storage battery with the valve, as indicated at 5. A switch 6 may be provided for closing the circuit. When the switch 6 is closed the interior of the valve

stem becomes very quickly amalgamated to the desired degree, and I find that it is unnecessary to renew the solution in the valve stem in order to secure sufficient amalgamation.

While I have described my invention in connection with the amalgamation of the inner surface of a hollow valve stem, it will of course be readily understood that my invention can be employed for amalgamating the surfaces of other steel bodies.

Having thus described my invention, what I claim is:

1. The method of amalgamating the inner surfaces of a hollow steel valve stem or other hollow steel body which consists in mixing mercuric chlorid salt with hydrochloric acid, in substantially the proportion of one fourth of a pound of the salt to seven pounds of the acid, to form an electrolyte solution, filling the hollow steel body to be amalgamated with said electrolyte, inserting an electrode in said solution in spaced relation to the walls of said steel body and then causing an electric current to flow from said electrode through the electrolyte solution to said steel body.

2. The method of amalgamating the inner surfaces of a hollow steel valve stem or other hollow steel body which consists in mixing a minor quantity of mercuric chlorid salt with a major quantity of hydrochloric acid to form an electrolyte solution, filling the hollow steel body to be amalgamated with said electrolyte solution, inserting an electrode into said solution in spaced relation to the walls of said steel body and then causing an electric current to flow from said electrode through the electrolyte solution to said steel body.

In witness whereof I hereunto subscribe my name this 24th day of May, 1918.

CLARENCE W. BALKE.

Witnesses:

MARGARET GROBEN,
IRENE SCHUMANN.