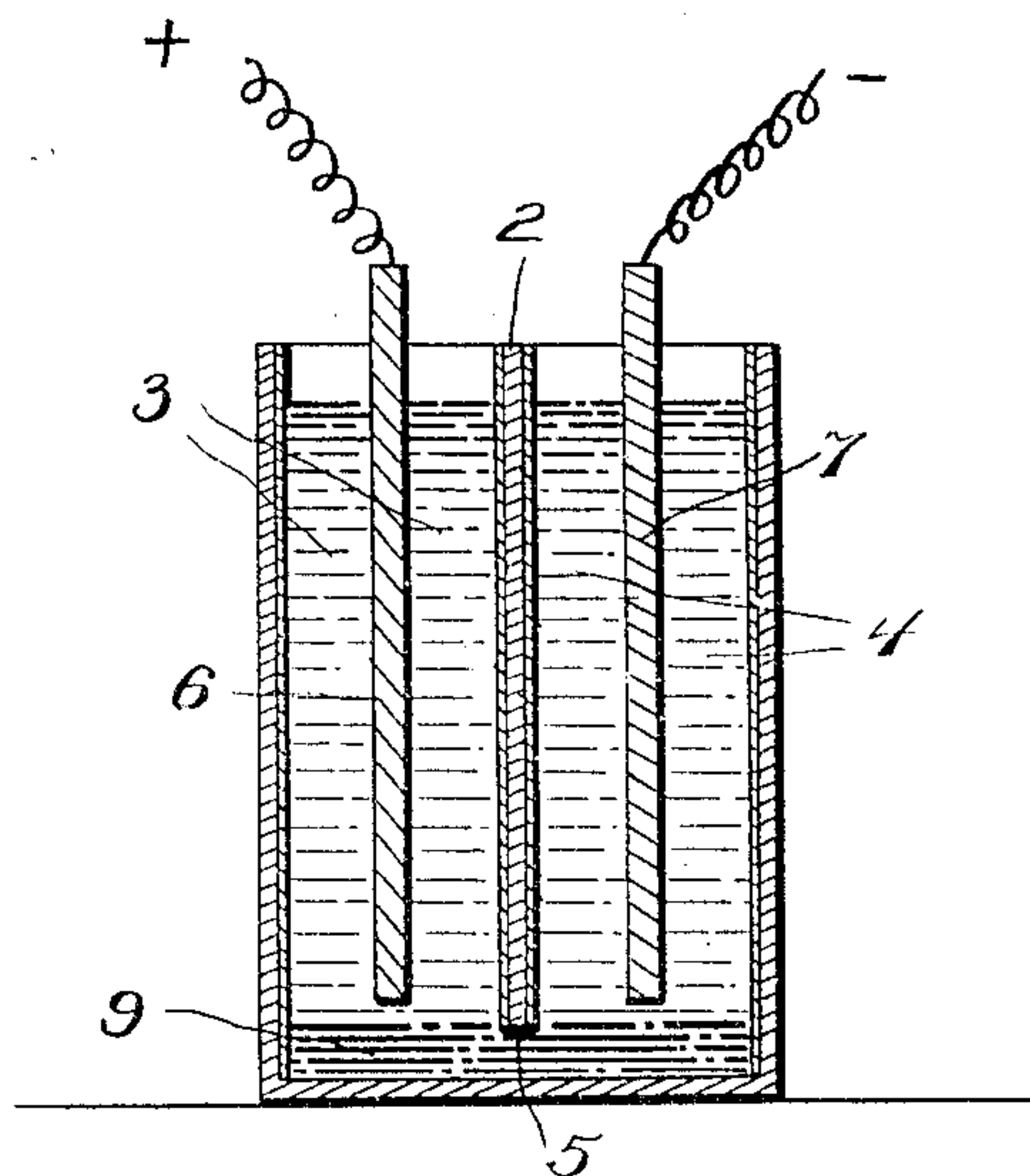


871,947.

PATENTED NOV. 26, 1907.

F. W. MORRIS.
PROCESS FOR THE MANUFACTURE OF WHITE LEAD.
APPLICATION FILED DEC. 28, 1906.



WITNESSES:

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FRANK W. MORRIS, OF VICTORIA, BRITISH COLUMBIA, CANADA.

PROCESS FOR THE MANUFACTURE OF WHITE LEAD.

No 871,947.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed December 28, 1906. Serial No. 349,828.

To all whom it may concern:

Be it known that I, FRANK W. MORRIS, a citizen of the Dominion of Canada, residing at Victoria, in the Province of British Columbia, Canada, have invented a new and useful Improvement in a Process for the Manufacture of White Lead, of which the following is a specification.

This invention relates to an improved process for manufacturing carbonate of lead or the hydrated carbonate of lead which forms the "white lead" of commerce.

The invention is fully described in the following specification reference being made to the drawing by which it is accompanied, in which: is shown a vertical section through a particular form of electrolytic tank generally suited to the requirements of the first part of the process.

The cell represented in the drawing is one known as the "Cactner Kellner", wherein the body of the tank or cell is divided by a vertical partition 2 into two compartments 3 and 4. The partition does not extend quite to the bottom where a passage 5 is left, but this passage is sealed against the admixture of the contents of the two compartments by a body of mercury 9.

The tank and the partition is made of such material as will resist attack by the electrolyte used or any of the products therefrom during the process.

Both compartments of the tank are filled with a solution of a formate of a salt of one of the alkali metals, sodium or potassium, which forms the electrolyte. This formate may be produced by any approved method which need not be here described as it forms no material part of the invention.

In one compartment 3 is an anode plate 6 of metallic lead and in the other 4 a cathode plate 7 of the same material to which plates, are connected the positive and negative wires of an electric circuit.

On a current being passed through the electrolyte the formate is broken up and formic acid is produced in the compartment 3 of the anode and caustic soda and hydrogen in the compartment 4 of the cathode. The formic acid attacks the metal of the anode plate 6 and produces lead formate in the anode compartment 3 and spongy lead and caustic soda or caustic potash is formed in the cathode compartment 4. The electric current is now cut off and the spongy lead shoveled from the cathode compartment 4

into the anode compartment 3 where it is dissolved by the remaining free formic acid, and produces lead formate.

The presence of the formic acid which dissolves the lead, but does not alter the mercury prevents the amalgamation of the spongy lead with the mercury.

Applicant might further mention that in the practical application of this invention the spongy lead is only produced when the density of the current is in excess of what is required, and that when the current density is properly proportioned to the immersed area of the electrode the spongy lead is not produced at all, or if it is, it is at once dissolved by the formic acid of the electrolyte and forms the desired product formate of lead; thus when the current strength is properly proportioned very little spongy lead is formed, but when the current strength is in excess then the spongy lead formed is shoveled over into the anode compartment, as heretofore stated, where it comes in contact with an excess of formic acid. This lead formate is siphoned out of the anode division into a tank where it is associated with an alkali carbonate such as ammonium carbonate causing the precipitation of carbonate of lead, which as the desired product is allowed to settle in the bottom of the tank, the ammonium formate being drawn off as a valuable by-product for subsequent treatment.

The carbonate of lead thus produced is substantially pure and will serve all the requirements for which the hydrated carbonate, or white lead of commerce, is at present used; but if hydrated carbonate is required ammonium hydrate is associated with the ammonium carbonate in the required proportion in the settling tank, when a hydrated carbonate of lead is precipitated instead of a pure carbonate.

Having now particularly described my invention and the manner of its operation, I hereby declare that what I claim as new and desire to be protected in by Letters Patent is:

1. As a process for the production of white lead, the formation of formic acid by electrolytic action on a solution of a formate of one of the alkali metals, the addition of lead to the formic acid whereby formate of lead is produced and the addition to the formate of lead of an alkali carbonate.

2. As a process for the production of white lead, the formation of formic acid and spongy

lead by electrolytic action, keeping said formic acid and spongy lead normally separated, then adding the spongy lead to the formic acid and then precipitating lead carbonate from the lead formate so produced by the addition thereto of an alkali carbonate.

3. As a process for the production of white lead, the formation of formic acid and spongy lead by electrolytic action on a solution of a formate of sodium as an electrolyte, and in the presence of an anode and cathode of metallic lead, maintaining said anode and cathode separated, and means for maintaining the anode and cathode products separated the addition of spongy lead formed at the cathode, to the formic acid formed at the anode, and the precipitation of carbonate of lead from the formate of lead so produced by the addition thereto of ammonium carbonate.

4. A process of the character stated consisting in acting upon metallic lead in the presence of a suitable electrolyte, simultaneously producing lead-formate and spongy lead while maintaining the spongy lead and lead formate separated, substantially as specified.

5. A process of the character stated consisting in acting upon metallic lead in the presence of a suitable electrolyte; simultaneously producing lead-formate and spongy

lead while maintaining the spongy lead and lead-formate separated, and simultaneously producing formic acid in the electrolyte, substantially as specified.

6. A process of the character stated, consisting in acting upon metallic lead in the presence of a suitable electrolyte, simultaneously producing lead-formate and spongy lead while maintaining the spongy lead and lead-formate separated, simultaneously producing formic acid in the electrolyte, then treating the spongy lead with formic acid to produce lead-formate substantially as specified.

7. A process of the character stated, consisting in acting upon metallic lead in the presence of a suitable electrolyte, simultaneously producing lead-formate and spongy lead while maintaining the spongy lead and lead-formate separated, simultaneously producing formic acid in the electrolyte, then treating the spongy lead with formic acid to produce lead-formate, then treating the lead-formate with an alkali carbonate to produce carbonate of lead substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK W. MORRIS

Witnesses:

JOHN B. HUNKER,
J. J. BAIRD.