UNITED STATES PATENT OFFICE.

GEORGE H. JOHNSON, OF PAXTON, MASSACHUSETTS.

METHOD OF BLACKING HEATED IRON.

945,954. Specification of Letters Patent. Patented Jan. 11, 1910.

No Drawing. Original application filed December 26, 1907, Serial No. 408,188. Divided and this application filed May 11, 1908. Serial No. 432,039.

To all whom it may concern:

Be it known that I, GEORGE H. JOHNSON, a citizen of the United States, residing at Paxton, in the county of Worcester and State of Massachusetts, have invented a new and useful Method of Blacking Heated Iron, of which the following is a specification.

This is a division of my prior application on blacking for heated iron, Serial No. 408,188, filed December 26, 1907.

This invention relates to a method of treating iron which is intended to be heated in use. Many compositions for stove blackings and polishes have been made but most of them involve, as the principal ingredient, graphite which is applied mechanically and which is not in any way united to the iron but is merely rubbed on the surface of the same so that it will present a black surface for a limited period of time. The graphite is usually put up with a binder or the like which is decomposed by heat so that after the blacking or dressing is applied it will become loosened and disappear in a short time after the stove or other article on which it is used is heated to the ordinary temperatures to which stoves and the like are subjected.

The principal purpose of this invention is to provide a method of blacking or dressing which is so dependent on the ordinary heating of a stove or the like that when the composition is applied to the iron, it will produce a coating intimately united with the surface of the iron without the interposition of any binder or the like. In this way, a surface is secured which will only be more permanently fixed by heating and cannot be removed in the ordinary use of the stove except by the repeated rubbing of metal surfaces against the iron. In order to accomplish this result, the iron is dressed with a metallic salt in solution either in combination with other substances or not, said salt being of such nature that a black metallic oxid preferably having a metallic luster will be fixed to the surface of the iron when the stove is heated. Preferably also a metallic salt is used which is of such a nature that the desired result may be secured in two ways; first simply by decomposing the salt when the stove is heated to produce the black oxid; and second, by precipitating a metal from the salt upon its contact with the iron even in a cold state and leaving the metal intimately united with the surface of the iron and in such condition that when the metal is heated the black oxid will be formed and will be united with the iron as in the other case. In all cases, the black oxid is in contact with the iron when *in statu nascendi*, so that it unites therewith and thus produces a result not attained by simply coating the iron with the black oxid in suspension in a liquid, or mixed in a paste.

As a specific example of a practicable way of carrying out the method, cupric hydroxid is dissolved, preferably in ammonia water, and applied to the surface of the iron. It is well known that this hydroxid possesses the property of losing its water when heated, even when under water and being changed to black cupric oxid; consequently, if it is applied to a hot stove the result will be the production of a surface of cupric oxid on the iron and as this surface is formed in a chemical manner while in contact with the iron which is in a heated condition, it has been found in practice that it is firmly united with the iron and can only be removed by slow degrees in the ordinary use of a stove. Obviously, any further heating of the stove has no effect on it after it is once fixed unless it be to more firmly fix it in position. Consequently, the coating is exceedingly durable in practice and will be removed only in the course of time by the constant attrition which it receives by the use of utensils ordinarily employed on stoves.

Another important advantage of this method of carrying out the invention is that the cupric oxid has a metallic luster and that it is composed of a black amorphous powder which at high temperature settles together so as to form a hard coating, which can be blackened over with ordinary forms of blacking so as to receive a high polish therefrom. It is preferred also to place a black filler of any kind, as for example, tannate of iron, in the solution in any desired proportion but preferably in a small quantity. This especially gives the composition a body and serves to give a smoother surface to rough iron. It also by means of its color makes it look more like an ordinary blacking and has no deleterious effect on the article when used for the purpose for which it is intended. Another salt which can be used is the basic copper carbonate. The cupric nitrate also may be used as it is easily con-

verted by heat into black cupric oxid and as it is readily soluble in water and alcohol. When dissolved in water for this purpose, it is preferred to first heat the solution almost to the boiling point and then allow it to cool. It has been found in practice that while this action does not destroy the cupric nitrate, it prevents the formation of gases in the solution when the same is heated to moderate temperature, as for example, by being exposed to the sunlight, and thus makes a more stable article for commercial purposes. This composition also is capable of precipitation of its copper when brought into contact with the iron in a cold state, leaving the copper united with the surface of the iron in such form that black oxid will be produced when it is heated afterward. When the tannate of iron is used the nitrate should be slightly acid, and may contain free nitric acid.

While I have described the use of copper salts for this purpose because of the nature of the copper and its black oxid, I am aware that certain other salts may be used equally well, as for instance, potassium-permanganate. This is soluble in water at ordinary temperatures and can be applied in the same manner as above described so as to produce the black oxid of manganese. The manganese dioxid or peroxid has a metallic luster which renders it especially useful for this purpose although a metallic luster is not absolutely necessary. Manganous nitrate also when heated to 150 degrees produces this oxid and can be used in a similar way. All these solutions may be provided with a filler if desired, or in fact the manganese salts may be used in connection with the copper salts. In that case, on account of the greater body of the former they may be said to act in part as fillers for the thinner copper salt solutions.

I am aware that the materials used and the method of carrying out the invention may be varied by a skilled chemist without departing from the scope of the invention as expressed in the claims.

Having thus described my invention, what I claim is:—

1. A method of dressing or blacking stoves which consists in applying to the iron a solution of a metallic salt which is decomposed by heating to the ordinary temperatures of the heated stove in contact with the iron thereof to produce a black metallic oxid, and heating the stove, whereby a durable coating or surface of the black oxid will be left united and fixed to the surface of the iron.

2. A method of dressing or blacking iron which consists in applying to the iron while cold, a solution of a metallic salt which is decomposed by contact with the iron, allowing the solution to dry on the iron and then heating the iron to produce a surface of black metallic oxid on the iron.

3. A method of dressing or blacking iron which consists in applying to the iron, a solution of a metallic salt from which the iron will precipitate the metallic base of said salt, and heating the iron whereby said precipitated metal will be oxidized and the oxid will form a coating fixed to the surface of the iron.

4. A method of blacking or dressing stoves and the like, consisting in applying a mixture comprising a solution of a metallic salt which when heated to the ordinary temperature of the heated stove in contact therewith combines with the iron, and heating the stove to form a durable surface consisting of a black metallic oxid intimately and fixedly united to the iron.

5. A method of dressing or blacking iron which consists in applying to the iron a solution of a copper salt from which the iron will precipitate copper, heating the iron whereby said precipitated copper will be oxidized and the oxid will form a coating fixed to the surface of the iron.

6. A method of dressing or blacking iron which consists in applying to the iron a solution of a copper salt which is decomposed by heat to produce black oxid of copper, and heating the iron whereby a coating of the black oxid will be left united to the surface of the iron.

7. A method of blacking or dressing iron which consists in applying to the iron a solution of a copper salt which is decomposed by heat to produce black oxid of copper and which will precipitate copper by contact with iron, and heating the iron whereby a coating of the black oxid will be left united to the surface of the iron.

8. A method of blacking or dressing iron which consists in applying to the iron a solution of cupric nitrate and heating the iron, so as to produce a durable surface of black oxid of copper intimately united with the iron.

9. A method of blacking or dressing iron which consists in heating almost to the boiling point a solution of cupric nitrate in water, allowing it to cool, applying it to the iron surface and heating the iron whereby a surface of black oxid of copper is left intimately united with the surface of the iron.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

GEORGE H. JOHNSON.

Witnesses:
ALBERT E. FAY,
C. FORREST WESSON.