UNITED STATES PATENT OFFICE.

CORNELIUS A. BURNS AND CORNELIUS E. RAAB, OF PITTSBURG, PENNSYLVANIA.

COMPOUND FOR HARDENING IRON.

No. 806,060. Specification of Letters Patent. Patented Nov. 28, 1905.

Application filed March 17, 1905. Serial No. 250,600.

To all whom it may concern:

Be it known that we, CORNELIUS A. BURNS and CORNELIUS E. RAAB, citizens of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Compounds for Hardening Iron, of which the following is a specification.

This invention has relation to a compound for hardening iron, and has for its principal object the provision of a novel compound for hardening cast-iron of the ordinary quality and cast-iron of that character known as "malleable" cast-iron.

We are aware that it has been proposed to harden cast-iron by subjecting the same to the chemical action of certain materials while the iron is in a heated state; but we are unaware of any composition which may impart to malleable casting or to malleable cast-iron the degree of hardness which we impart by the means hereinafter described.

In carrying our invention into effect we prepare a compound composed of the following materials, preferably in the proportions given after each: chlorid of sodium, three parts; saltpeter, three parts; rock-alum, three parts; carbonate of ammonia, three parts; salt of tartar, three parts; yellow prussiate of potassium, one part; white cyanid of potassium, one part; red prussiate of potassium, one part. These materials are thoroughly mixed together, and the iron to be tempered is heated to a red heat approximating a cherry red, and the composition, which has been reduced to a powdery form, is sprinkled upon the iron and allowed to remain in contact with the same a short time, and the iron is then dipped into cool water, whereupon it will be tempered and given a hardness approximating to or even exceeding that of hard tool-steel, the degree of hardness being dependent upon the length of time to which the iron has been subjected to the action of the compound above described and to the action of the water.

While we have found that the composition given above in the proportions specified gives eminently satisfactory results, we do not wish to be limited to the precise composition as it is set forth above, as certain variations of the materials used and the proportions specified may be made without departing from the spirit of our invention.

What we claim is—

1. A compound for hardening cast-iron consisting of three parts chlorid of sodium, three parts saltpeter, three parts rock-alum, three parts carbonate of ammonia, three parts salt of tartar, one part yellow prussiate of potassium, one part white cyanid of potassium and one part red prussiate of potassium.

2. A compound for hardening cast-iron consisting of chlorid of sodium, saltpeter, rock-alum, carbonate of ammonia, salt of tartar, yellow prussiate of potassium, cyanid of potassium and red prussiate of potassium.

3. A compound for hardening iron containing chlorid of sodium, saltpeter, alum, carbonate of ammonia, salt of tartar, prussiate of potash and cyanid of potassium.

In testimony whereof we affix our signatures in the presence of two witnesses.

CORNELIUS A. BURNS.
CORNELIUS E. RAAB.

Witnesses:
H. C. EVERT,
E. E. POTTER.