UNITED STATES PATENT OFFICE.

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METHOD OF HARDENING COPPER.

No Drawing.
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To all whom it may concern:

Be it known that I, LOUIS NEMITOFF, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a certain new and useful Improvement in Methods of Hardening Copper, of which the following is a specification.

My invention relates to improvements in methods of hardening copper.

The object of my invention is to provide a novel, cheap and efficient method of hardening copper.

In carrying my invention into effect, the copper is heated to a bright red, and while so heated, it is embedded in a silicious substance, such as sand, mixed with a substance containing phosphorus, such as ground bone, the mixture being moistened with a hydrocarbon, such as white distillate oil derived from petroleum.

If a bright surface is desired, the copper after being heated to a bright red is covered with borax. The copper is then again heated until the borax is fused and burned away, at which time the copper is embedded in the mixed bone, sand and oil, as above described.

The proportions used may be varied to a considerable extent, but I have obtained good results when using equal parts of sand and bone dust moistened with the oil. The copper is permitted to remain in the mixture until cooled, and the hardening is increased by leaving the copper in the mixture for a considerable period, several hours.

I do not limit my invention to the precise steps described, as modifications therein, within the scope of the appended claims, may be made without departing from the spirit of my invention.

What I claim is:

1. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture moistened with a hydrocarbon and containing silica and phosphorus, substantially as set forth.

2. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture moistened with a hydrocarbon and comprising sand and a substance containing phosphorus, substantially as set forth.

3. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture moistened with a hydrocarbon and comprising sand and a substance containing phosphorus, substantially as set forth.

4. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture moistened with a hydrocarbon and comprising a silicious substance and ground bone, substantially as set forth.

5. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture moistened with a hydrocarbon and comprising sand and a substance containing phosphates of lime, substantially as set forth.

6. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture moistened with a hydrocarbon and comprising sand and ground bone, substantially as set forth.

7. The method of hardening copper consisting in embedding copper heated to a bright red in a mixture comprising substantially equal parts of sand and ground bone moistened with oil, substantially as set forth.

8. The method of hardening copper consisting in embedding copper heated to a bright red in mixed sand and ground bone moistened with mineral distillate oil, substantially as set forth.

9. The method of hardening copper consisting in embedding copper heated to a bright red in substantially equal parts of sand mixed with ground bone and moistened with mineral distillate oil, substantially as set forth.

10. The method of hardening copper consisting in covering copper heated to a bright red with borax, then heating the copper until the borax has fused and while the copper is at a bright red embedding it in a mixture moistened with a hydrocarbon and containing silica and phosphorus, substantially as set forth.

11. The method of hardening copper consisting in covering copper heated to a bright red with borax, then heating the copper until the borax has fused and while the copper is at a bright red heat embedding it in sand mixed with ground bone and moistened with a hydrocarbon, substantially as set forth.

12. The method of hardening copper cons-
sisting in covering the copper heated to a bright red with borax, then heating the copper until the borax has fused and while the copper is at a bright red heat embedding it in equal parts of sand and bone mixed together and moistened with a mineral distillate oil, substantially as set forth.

13. The method consisting in applying to copper heated to a red heat a substance containing hydrocarbon, silicious earth and phosphorus.

14. The method consisting in applying to copper heated to a red heat a substance containing hydrocarbon, silicious earth, lime and phosphorus.

In testimony whereof I have signed my name to this specification.

LOUIES NEMITOF.