

UNITED STATES PATENT OFFICE.

WILLIAM ANSYL PHILLIPS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO RHEOLITE COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

COMPOSITION OF MATTER AND METHOD OF MAKING THE SAME.

959,068.

Specification of Letters Patent.

Patented May 24, 1910.

No Drawing.

Application filed September 12, 1907. Serial No. 392,484.

To all whom it may concern:

Be it known that I, WILLIAM ANSYL PHILLIPS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a certain new and useful Composition of Matter and Method of Making the Same, of which the following is a full, clear, and exact specification.

This invention relates to a composition of matter and its methods of production more especially designed for use as an electric conductor, and where conductors of high resistance are required, as, for example, in resistance boxes, or rheostats, or electric heaters, and the invention has for its primary object to provide an improved composition of matter of the described character which will be efficient and lasting.

Another object of the invention is to provide an improved composition of matter of the described character which will be practically indestructible by the electric current, and which also is capable of resisting the destructive effects of fire, water, and the action of the atmosphere. The described material is also very hard and firm, and capable of resisting many acids. These qualities adapt the material for a variety of uses aside from electrical purposes.

With these ends in view, the invention consists of certain features of novelty which will now be fully described, and then more particularly pointed out in the claims.

This improved composition of matter consists primarily of calcium and a metallic conductor, such, for example, as iron or lead in varying proportions, fused and melted together. The calcium in the form of lime or any of its various compounds or salts is used as the non-conducting material, and is mixed with the metal preferably when the metal is molten and boiling. The preferred metal is iron or lead, which may be used either singly or together, but it is found that nearly, if not all, of the common metals may be used, such as copper, tin, zinc and the like.

In attempting to combine and fuse the calcium or lime compound with the metallic element, it is found very essential to make use of an element to promote the fusion or combination of the metallic element and the calcium or its compound. For this purpose, either one or more of the following elements may be employed: sulfur, phosphorus, tel-

lurium, selenium and arsenic. It is also found that a salt of the metallic element may be employed to accomplish the same purpose as the sulfur, phosphorus, tellurium, selenium or arsenic.

In the preferred manner of carrying out the invention, the metallic element employed is first heated or reduced to a molten state, and the calcium or lime compound, to which has been added a given amount of either one or more of the elements above enumerated, as sulfur and the like, for promoting the fusion or combination of the materials, is added, after which the whole is stirred or puddled until a homogeneous mass has resulted, when it is ready to pour into molds or be wrought into shape by mechanical means, as the hammer, after partially cooling. The metallic element to be employed may be in the form of oxids, sulfids, phosphids, tellurids, selenids, or arsenids, or other salts, in either their natural or artificial state, to which, in their molten form, the calcium or lime compounds may be added, in which case there will be no need of adding the elements enumerated for promoting fusion or combination, as the sulfur, phosphorus, tellurium, selenium, arsenic, or the salts of the metal or metals employed, except, possibly, when oxids of the metals are used, or other salts not enumerated above.

It is sometimes desirable to melt the metallic conductor with the non-conducting material in such a manner as to dispense with a mold or form into which the metal is poured, and which would have to be taken down and rebuilt at each operation. In such cases, the powdered metallic element or oxid or salt of the same may be mixed with powdered calcium or lime compounds, to which may be added, if desirable, the required amount of the element for promoting combination or fusion, as already described. It is sometimes desirable to add to the calcium or lime compounds a quantity of refractory substance, as fire-clay, slate, and the like. The whole is then intimately mixed and pressed into any desired shape, after which it is heated to the fusing point of some of the ingredients but kept below the fusing point of some of the more refractory substances, as the fire-clay, in order that the material may not break down or lose its form. The addition of the refractory non-conducting material, as fire-clay or slate, greatly increases the fus-

ing point of the compound, and is, for many purposes, found a desirable addition to the calcium or lime compound. For this purpose, in addition to refractory clay or slate, it is found that talc, silica and compounds of silica, alumina and magnesia, or, in fact, any non-conductor of electricity that will bear a temperature of 1500° Fahrenheit without deterioration may be employed.

10 Since the metallic element serves as the conducting material and the calcium or the lime compound is the non-conductor, the resulting material may be given any desired quality of conductivity by varying the proportions of the ingredients.

15 In practicing the invention, it is found that iron in the form of iron pyrites forms a convenient and economical metallic element, and likewise carbonate of lime furnishes the calcium or non-conducting material in a convenient and economical form. Sulfur is a convenient and economical material for use with these last mentioned materials as the element for promoting fusion or combination.

Claims covering a composition containing iron, carbonate of lime and a sulfur flux and method for making the same have been allowed in my application No. 481,542.

30 What I claim is:

1. The herein described composition of matter containing a metal, calcium and sulfur, melted and fused together.

35 2. The herein described composition of matter containing a metallic electric conductor, calcium, and an element adapted to promote fusion or chemical combination, all melted and fused together.

40 3. The herein described composition of matter containing a metallic electric conductor, a non-conducting metallic salt, and an element adapted to promote fusion or chemical combination, all melted and fused together.

45 4. The herein described composition of matter containing a metal, calcium, and a highly refractory substance melted and fused together.

50 5. The herein described composition of matter containing a metal, calcium, and a substance more highly refractory than either the metal or the calcium, melted and fused together.

55 6. The herein described composition of matter containing a metal, calcium, a substance more highly refractory than either

the metal or the calcium, and an element adapted to promote fusion or chemical combination, melted and fused together.

7. The herein described composition of matter containing a metallic electric conductor, calcium, a substance more highly refractory than either the metal or the calcium, and sulfur, melted and fused together.

8. The herein described composition of matter containing iron, carbonate of lime, and sulfur, melted and fused together.

9. The herein described composition of matter containing iron pyrites, carbonate of lime, and sulfur, melted and fused together.

10. The herein described method which consists in mixing a metallic element with calcium and fusing them together in the presence of sulfur.

11. The herein described method which consists in mixing a metal, calcium, a substance more highly refractory than either the calcium or the metal, and fusing them together in the presence of an element adapted to promote fusion or chemical combination.

12. The herein described method which consists in mixing a metal, calcium, a substance more highly refractory than either the calcium or the metal, and fusing them together in the presence of sulfur.

13. The herein described method which consists in mixing iron and carbonate of lime and fusing them together in the presence of sulfur.

14. The herein described method which consists in mixing iron pyrites with carbonate of lime and sulfur and subjecting the same to a degree of heat sufficient to melt and fuse the materials together.

15. The method of making the herein described composition of matter which consists in mixing together a metallic electric conductor, a non-conducting metallic salt and an element adapted to promote fusion or chemical combination of the said conductor and salt, and subjecting the mixture to the action of heat until melted and the elements thereof fused together.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 4th day of September A. D. 1907.

WILLIAM ANSYL PHILLIPS.

Witnesses:

CHAS. H. SEEM,
A. L. SPRINKLE.