R. T. COLE.

GRAPHITE METAL AND METHOD OF PRODUCING IT.

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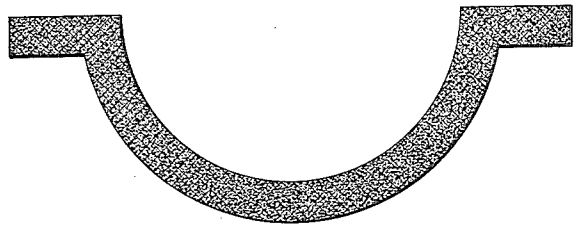
1,022,465. Patented Apr. 9, 1912.



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UNITED STATES PATENT OFFICE.

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GRAPHITE METAL AND METHOD OF PRODUCING IT.

1,022,465. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed November 9, 1910. Serial No. 591,435.

To all whom it may concern:

Be it known that I, RAYMOND T. COLE, a citizen of the United States, and resident of South Portland, in the county of Cumberland and State of Maine, have invented new and useful Improvements in Graphite Metal and Methods of Producing It, of which the following is a specification.

My invention consists of an improved lubricating composition and the method of producing it.

The object of my invention is to produce a metal for bearings which shall contain finely divided graphite inclosed in and uniformly distributed through a metal matrix.

The method is characterized by a preliminary preparation of graphite flakes, which renders them easily wetted by a fluid metal and by conditions which preserve this characteristic of the graphite until the metal matrix is solidified.

I proceed by coating the individual flakes or particles of graphite with a metal which has a higher melting point than the matrix metal, and then impregnating the matrix metal with a desired proportion of these coated graphite flakes, preferably subjecting the mixture to pressure while the matrix metal is fluid, and then allowing the whole to solidify, when the graphite will be uniformly distributed through and embedded in, the metal.

As a specific example of my process, I prepare graphite by immersing a quantity of flaked graphite in a copper sulfate solution in which metallic zinc is immersed. Each graphite flake becomes coated with a thin film of copper. If heavier plating is desired a cyanid or acid sulfate process may be employed. After plating, the graphite should be washed in a mildly alkaline solution to neutralize the acidity of the liquid adhering to the plated flakes, which should then be dried. I then introduce the copper plated graphite flakes in desired proportion, into a mass of melted Babbitt metal, which should be at a temperature slightly if at all, above its melting point. The circumstance that copper alloys with babbitt undoubtedly assists in the result; the plated graphite is instantly wetted by the Babbitt metal, distributes itself with the assistance of mechanical stirring, and does not separate out by flotation. The fact that copper has a higher melting point than the babbitt prevents the copper films from being melted off the graphite particles so that while the metal matrix cools, the metal plated graphite particles do not tend to separate by flotation as they would if stripped of their metal envelop.

The composition will be improved in its strength and consistency by being subjected to pressure while the matrix metal is fluid; preferably therefore the mixture should be compressed in a mold while solidifying. The graphite particles contribute the lubricant property and the matrix metal the strength, to the composition. The proportions of the ingredients may be varied to produce various qualities and results.

In the drawing hereto annexed there is illustrated in a somewhat conventional manner and in end view a journal bearing composed of the above described improved bearing composition. While the graphite flake content is in this drawing illustrated by dots, it must be understood that this illustration is quite conventional as in the actual product the distribution of the graphite is such that the shading or color of the material is apparently uniform and darker or lighter according to the proportion of graphite contained.

What I claim and desire to secure by Letters Patent is:

1. The method of forming a lubricant bearing-composition, which consists in coating graphite particles individually with a metal having a relatively high melting point, and distributing the coated graphite in a liquid mass of metal having a relatively low melting point, and allowing the said liquid metal to solidify and form a matrix inclosing the distributed graphite particles.

2. The method of forming a lubricant bearing-composition, which consists in coating graphite particles individually with a metal having a relatively high melting point, and distributing the coated graphite in a liquid mass of metal having a relatively low melting point, subjecting the fluid metal containing the graphite to pressure, and allowing the said liquid metal to solidify and form a matrix inclosing the distributed graphite particles.

3. The method of forming a lubricant bearing-composition, which consists in coating graphite particles individually with copper, distributing the copper-coated graphite in a liquid mass of metal having a lower

melting point than copper, and allowing the said liquid metal to solidify and form a matrix inclosing the distributed graphite particles.

4. The method of forming a lubricant bearing-composition, which consists in coating graphite particles individually with copper, distributing the copper-coated graphite in a liquid mass of metal having a lower melting point than copper, subjecting the fluid metal containing the graphite to pressure, and allowing the said liquid metal to solidify and form a matrix inclosing the distributed graphite particles.

5. The method of forming a lubricant bearing-composition, which consists in coating graphite particles individually with copper, distributing the copper-coated graphite particles in liquid metal having a lower melting point than copper with which the copper alloys, and thereafter allowing the liquid metal to solidify and form a matrix inclosing the distributed graphite particles.

6. The method of forming a lubricant bearing-composition, which consists in coating graphite particles individually with copper, distributing the copper-coated graphite particles in liquid metal having a lower melting point than copper with which the copper alloys, subjecting the fluid metal containing the graphite to pressure, and thereafter allowing the liquid metal to solidify and form a matrix inclosing the distributed graphite particles.

7. A lubricant bearing-composition consisting of a matrix of metal having a relatively low melting point and having distributed through its mass graphite particles individually coated with a metal having a relatively high melting point.

8. A lubricant bearing-composition consisting of a matrix of Babbitt metal having distributed through its mass graphite particles individually coated with copper.

Signed by me at Boston, Massachusetts, this 4th day of November, 1910.

RAYMOND T. COLE.

Witnesses:
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