UNITED STATES PATENT OFFICE.

SAMUEL DOUBLEDAY, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN ANTI-FRICTION METALS FOR JOURNAL-BEARINGS, &c.

Specification forming part of Letters Patent No. **178,841**, dated June 20, 1876; application filed June 10, 1876.

To all whom it may concern:

Be it known that I, SAMUEL DOUBLEDAY, of Baltimore, county of Baltimore, and State of Maryland, have invented a new and Improved Metal for Journal-Boxes, Bearings, and other purposes; and I do declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same.

This invention relates to that class of metals known as metal composition for journal-boxes, bearings, &c.; and it consists in uniting together, in the ordinary crucible or cupola, certain ingredients with a certain proportion of various kinds of metals, by which an anti-friction metal is formed, which will be more fully hereinafter described.

To prepare this composition I take, say, five pounds cast-iron, five pounds copper, three pounds glass, three-fourths of a pound antimony, one-half pound tin, one-fourth of a pound spelter, and one-fourth of a pound lead. These ingredients are fused together in a crucible or cupola, in the ordinary manner of making brass, bronze, or other alloys. The cast-iron being in a state of fusion, the remaining materials are added. I then prepare the glass by breaking it into pieces about the size of ordinary grains of corn, which is then added. A flux composed of broken oyster-shells, charcoal, &c., may be used, which will be found to be of great advantage, having a decided beneficial effect on the metal.

This metal will prove to be of the greatest density, hardness, solidity, strength, and durability, equal, if not superior, to more costly compositions now used for light work, such as clock machinery, steps, &c.

I have, by experiment, given this metal very severe tests—viz., on street-railroad and other car boxes and bearings. It is well known to practical men, this sort of work requires metal to be of hard and smooth wearing-surface, and which will withstand the greatest attrition with very little lubricants, in fact, the smooth wearing-surface to which it attains shows in itself a lubricity that I have never found in any other metal.

The general applicability of this metal cannot be enumerated in a specification without running into prolixity; but it may be stated that it can be used in making of journal-boxes, bearings, shafting, axle-boxes, gibs, and guide-boxes for engines, saw-mills, planers, &c.; piston-rings, lining for cylinders, and all purposes for machinery requiring hard rubbing-surfaces, and in which great frictional parts are exposed. For cocks, plug-valves, slide-valves, cylinder-faces, puppet and other valves, I am not aware of its being excelled.

Car-wheels may be made or cast of this metal one-fourth lighter than are now used or made; though the first cost may be greater, still in the end will be cheaper, by their safety, durability, and general utility; for instance, forty pounds on each wheel of a long train of cars would be a great saving in motive power, which would be a great desideratum.

Journal-boxes and other bearings of large dimensions, which would cost too much to make of this metal entirely, and which are generally cast with cavities in them, and which cavities heretofore have been filled with a composition, may be lined or filled with this metal with the best results, both in economy as to first cost, durability, as well as in lubricants.

While the above ingredients produce an excellent metal, still the quantities may be increased or diminished, as the metal may be required to be made harder or softer, as the case may be, particularly in the use of more or less antimony or tin.

Having now fully described and pointed out the manner of making and the application of my process, for the purpose of obtaining a greater degree of hardness, density, and durability, as well as lubricity, by the fusing of glass, in combination with iron, as illustrated in the manufacture of my anti-friction metal, I desire to state that I do not wish to confine myself to the exact proportions herein set forth, as they may be changed in quantities to conform to the degree of hardness to which the metal is required without departing from the spirit of my invention.

I therefore claim and desire to secure by Letters Patent—

An anti-friction metal, consisting of cast-iron, copper, glass, antimony, tin, spelter, and lead, substantially as described.

SAMUEL DOUBLEDAY.

Witnesses:

W. S. WILKINSON,

JAMES C. G. UNDUCT.