

UNITED STATES PATENT OFFICE.

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METHOD OF JAPANNING.

SPECIFICATION forming part of Letters Patent No. 563,417, dated July 7, 1896.

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To all whom it may concern:

Be it known that I, ALVAH H. SABIN, a citizen of the United States, residing at Long Island City, in the county of Queens and State of New York, have invented a new and useful Improvement in Methods of Japanning, of which the following is a specification.

In the art of japanning articles of metal as heretofore practiced, the japan which is employed is composed, essentially, of asphaltum, linseed-oil, resin, and a volatile thinner, such as turpentine or benzene. This japan is a liquid at the ordinary temperature, and the articles are coated therewith, usually by dipping, and are then dried by subjecting them in a drying-oven to a moderate heat, and are finally baked at a higher temperature for hardening the japan and uniting it with the metallic surface. During the operation of drying the articles, preparatory to baking, the thinner, which is very volatile, is driven off in the form of a vapor. Japan of this character is not suitable for japanning large articles, because the volume of inflammable vapor generated in the operation of drying is so large that the risk of fire and explosion is prohibitory of this process.

The object of this invention is to render the process of japanning applicable for the protection of large articles of metal, for instance, the cast and wrought iron or steel pipes used for water-mains, steam-conduits, &c. Such pipes are now usually protected by painting them with coal-tar, or a composition containing coal-tar, which treatment is unsatisfactory because the protection afforded thereby is not sufficiently complete and thorough and lasts but a short time, and because the coating is not sufficiently durable to withstand the handling, riveting, and other manipulations required in transporting the sections of pipe and putting the sections together for use. Such pipes have also been coated with by-products of petroleum; but this coating lacks durability and is not uniform in quality and undergoes constant deterioration in use by the gradual removal of the more volatile and soluble ingredients, leaving, finally, the more solid portions as an earthy coating, which in the case of water-mains offers on the interior a good foothold for fresh-water algæ and

other plants and sponges which gradually diminish the capacity of the pipe.

In practicing my invention I employ a japan which is substantially free from highly volatile ingredients, such as benzene, turpentine, &c., and which is not liquid, but semisolid, at the ordinary temperature. My improved japan consists, approximately, of equal parts of raw linseed-oil and asphaltum; but these proportions may be varied for different kinds of work, say from three parts of asphaltum and one part of linseed-oil to one part of asphaltum and two parts of linseed-oil. A portion of the asphaltum may be replaced by resinous substances, such as kauri or other resin, for increasing the hardness and expediting the drying, and if it is desired to make a japan which is not black and more or less transparent all of the asphaltum may be replaced by such resinous substances.

The addition of driers, such as compounds of lead or manganese, even in small quantities, impairs the durability of this japan and causes the same to become burned or brittle under the high temperature which must be employed for baking the articles, and the use of a drier is, therefore, not recommended. This semisolid japan is liquefied by heating it and the pipes or other articles are then coated therewith, preferably by dipping them in the liquefied japan, after which they are allowed to drain. The pipes are then placed in a suitable oven and baked at a temperature varying from about 400° Fahrenheit to 600° Fahrenheit for several hours. The pipes are preferably supported in a vertical position in the oven, and the drip from the pipes is recovered and used over again. The coating of japan thus formed on the pipes or other articles is very thin, but absolutely continuous, elastic, and closely adherent, so that it protects the iron thoroughly and does not scale off in the coldest weather under the blow of a hammer or during transportation.

The employment of a japan which is free from highly-volatile ingredients compels the baking at a high temperature, much higher than that employed in ordinary japanning, where the temperature seldom exceeds 250°. This peculiar character of the japan and of the treatment results in the following important

advantages: The cost of the thinner, such
as turpentine or benzene, which is eventually
driven off in ordinary japanning, is saved,
the risk of fire or explosion attending the use
5 of such thinners is avoided, the volume of
the japan is reduced about one-half, the great-
est possible durability and permanency of the
coating is obtained, and the coating is ren-
dered uniform throughout and is capable of
10 enduring high temperatures, as in steam-
pipes, without change or deterioration.

I claim as my invention—

The herein-described method of japanning

articles of metal which consists in liquefying
by heat a semisolid japan composed of as- 15
phaltum and linseed-oil and free from highly-
volatile solvents, such as turpentine, benzene,
&c., then coating the article with the heated
japan and then baking the article, substan-
tially as set forth. 20

Witness my hand this 18th day of Decem-
ber, 1894.

ALVAH H. SABIN.

Witnesses:

CHARLES I. OHRENSTEIN,

SAMUEL V. V. HUNTINGTON.