Patented Jan. 21, 1930 1,744,116

UNITED STATES PATENT OFFICE

PAUL T. HANNEN, OF CABIN JOHN, AND HERBERT D. BRUCE, OF CHEVY CHASE, MARYLAND, ASSIGNORS TO THE SECRETARY OF COMMERCE OF THE UNITED STATES AS TRUSTEE FOR THE GOVERNMENT AND PEOPLE OF THE UNITED STATES

COMPOSITION OF MATTER

No Drawing. Application filed April 10, 1928. Serial No. 269,598.

(GRANTED UNDER THE ACT OF MARCH 3, 1883, 22 STAT. L., 625)

The invention described hereafter may be used by the Government of the United States or any of its officers or employees in prosecution of work by the Government, or by any other person or persons in the United States without the payment to us of any royalty thereon.

This invention relates to a composition of matter intended to be used for permanently marking signs, or indicia of quantity of value, such as letters, figures or other characters or graduations on objects, particularly on measuring receptacles and mathematical or scientific instruments.

The objects of our invention are, among others:

First, to provide a material that will resist heat, steam, gases, alcohols, oils, acids, antiseptic solutions or other disintegrating or obliterating substances and causes;

Second, to provide a substance easily applied and resistant to ordinary friction or abrasion;

Third, to provide an inexpensive substance for the purposes set forth;

Fourth, to provide a substance that will not easily fade or change color.

Our invention is particularly applicable to thermometers, though we do not limit ourselves to its use in connection with those or any other devices or class of devices.

It is usual to engrave or etch graduations or characters on the stem of such thermometers or on other parts of other instruments or objects, and then fill in the etched mark with a material or pigment visibly contrasting with the material of which the article is made, so as to be readily discernible.

Heretofore no satisfactory substance has been found which is inexpensive and permanent. Organic materials have been used but unsatisfactorily because of their liability to injury or destruction by the conditions of use, such for instance as the exposure to acids, heat or other deleterious influences, as above mentioned.

An enamel of low fusing point has been applied and fused at a high temperature, but this application is difficult and expensive.

In thermometers and certain other measuring instruments, it has been found that the materials heretofore used to bring out or accentuate the etched mark burn out at high temperatures, and are removed or deteriorate, and the markings become otherwise more or less indistinguishable, often after a very short period of use.

Furthermore, antiseptic solutions, acids, alkalies, oils, gases or other substances have the same effect. This is particularly true of carbon or other pigments suspended in an organic vehicle such as asphalt, varnish or other bituminous or oleo-resinous compound.

By our invention we avoid these difficulties and deficiencies.

In carrying out our invention we prefer to utilize an inorganic material, such as a metallic oxide of any desired color, either alone or with a vehicle such as sodium silicate, known as "water glass". Where the instrument is not to be subjected to great heat, organic materials may be used in the water-glass vehicle.

One particular combination or composition which we have found has proven satisfactory is finely divided manganese dioxide either alone or with an organic material such as carbon, mixed with a 10% solution of water-glass thinned with an equal volume of water. The pigment so deposited may be allowed to harden in the air or may be made even more permanent by heating to high temperatures.

Instead of using a metallic oxide, we may substitute a chemically stable compound such as a metallic salt, for instance, lead chromate.

The use of water-glass such as we have mentioned as a vehicle, has the advantage that it is inexpensive, can be easily mixed with either an organic or inorganic pigment of any desired color, and can be easily applied; furthermore, it is resistant to friction, protects the pigment mixed therewith from both mechanical and chemical changes due to the action of the acids, alkalies, alcohols, oils, gases and other substances, and is unaffected by variations in temperatures.

Where we have used the word "engrave" we include any methods of permanently scoring,

incising, or otherwise implacing indicia, such as by etching, etc.

While not limiting ourselves to any exact proportion, color or ingredient, or to the use of the composition for any particular object or any particular material—

What we claim is:

1. A composition for permanently marking indicia on instruments or objects, consisting of sodium silicate, and a plurality of finely divided pigments which are resistant to different adverse influences.

2. A composition for permanently marking indicia on instruments or objects, consisting of sodium silicate, a metallic oxide, and a metallic salt, which are resistant to different adverse influences.

3. A composition for permanently marking indicia on instruments or objects, consisting of sodium silicate, and an organic, and inorganic pigment, which are resistant to different adverse influences.

4. A composition for permanently marking indicia on instruments or objects, consisting of sodium silicate, and an inorganic pigment, and carbon, which are resistant to different adverse influences.

5. A composition for permanently marking indicia on instruments or objects, consisting of sodium silicate and a finely divided pigment which is resistant to different adverse influences.

6. A composition for permanently marking indicia on instruments or objects, consisting of a substantially 10 per cent. solution of sodium silicate, a substantially equal volume of water, and a finely divided pigment, which is resistant to different adverse influences.

7. The process of permanently marking indicia on instruments or objects, which consists of engraving the objects, and then filling in the engraved marks with a composition comprising sodium silicate, and a finely divided pigment.

8. The process of permanently marking indicia on instruments or objects, which consists of engraving the objects, and then filling in the engraved marks with a composition comprising sodium silicate, and a plurality of finely divided pigments.

9. The process of permanently marking indicia on instruments or objects, which consists of engraving the object, and then filling in the engraved mark with a composition comprising sodium silicate, and a finely divided pigment which is resistant to different adverse influences.

Signed at Washington, D. C., the 3rd day of April, 1928.

PAUL T. HANNEN.
HERBERT D. BRUCE.