

# UNITED STATES PATENT OFFICE.

NORMAN K. MORRIS AND JOHN W. BAILEY, OF DENVER, COLORADO.

## WHITE LEAD.

SPECIFICATION forming part of Letters Patent No. 493,173, dated March 7, 1893.

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*To all whom it may concern:*

Be it known that we, NORMAN K. MORRIS and JOHN W. BAILEY, both of Denver, in the county of Arapahoe and State of Colorado, have invented a certain new and useful Improvement in White Lead, whereof the following is a specification.

Our invention consists of a new type of the article commonly known in the arts as white lead, under which generic name are comprehended the various admixtures of lead, carbonate and hydrated lead oxide, used in conjunction with oil for painting purposes. As heretofore produced (usually by the well known Dutch process) white lead is obtained as a crude product in the form of solid flakes or scales of such cohesion as to require treatment by grinding in order to prepare it for use in the arts; furthermore, it resists mixture with the oil which is to be its vehicle, and such admixture needs to be effected by grinding the ingredients together. Other processes are in use for the manufacture of white lead by which the carbonic acid gas required for the corroding process is obtained from the combustion of coke or charcoal. In these, the products of combustion are more or less contaminated with carbonic oxide, sulphurous acid, &c., producing an impure article which lacks body, spreading and covering qualities, the product (as in the case of the Dutch method also) having but limited readiness for combining with the oil necessary for its application as a paint.

The physical characteristics of the white lead of our invention are, first, extreme natural comminution and entire homogeneity, and, second, exceedingly intimate natural admixture with a minute quantity of a volatile oil, of the petroleum type, which is inherently intermingled with the individual particles. The percentage, or relative quantity, of the volatile oil, thus present, may be, and preferably is, a mere film upon the particles, and does not interfere with the apparent dryness of the product, although it modifies the actual condition thereof. The valuable qualities due to these physical characteristics, are, great freedom from adhesiveness between the particles when in their dry and unmixed state, which prevents obstinate coherence in masses,

or caking, and insures ready disintegration without grinding; also great avidity for combining or assimilating with oil (usually linseed) which is to be the vehicle for application as a paint; also a vast increase of covering and spreading power and increased whiteness, as compared with other analogous products.

We will now proceed to describe the preferred method of manufacture adapted to produce the white lead embodying our invention. We take lead fiber, or threads of metallic lead, form it into rolls without substantial compression, dip it in dilute acetic acid, permit the surplus acid to drain out during an exposure to the air of say twenty minutes, and then place it in a corroding chamber of any well known form. We then introduce into said chamber the products of combustion, and derivative or accompanying vapors, of crude petroleum or petroleum residue, which we utilize preferably as follows: We take the crude petroleum, or petroleum residue, and by means of a steam jet or any convenient device for atomizing or vaporizing it, we spray it, in conjunction with steam, against an incandescent or highly heated surface in a proper combustion chamber. We prefer to employ a limekiln for this purpose, since incidentally the carbonic acid gas, driven off from the lime-stone, adds to the total volume of the corroding gas without impairing the specific value of the products of combustion and derivatives or accompanying vapors of the hydro-carbon and decomposed steam. The lime in a state of incandescence affords a very efficient heating surface for decomposing the steam and "cracking" the hydro-carbon oil and insures the thorough combustion of so much thereof as is directly consumed, thus securing entire freedom from soot and preventing the formation of carbonic oxide, which would in some degree reduce the hydrated lead oxide formed during the corroding process, and develop minute spots or particles of metallic lead locally distributed throughout the mass. The carbonic acid gas and the derivatives or accompanying vapors resulting from the treatment to which the petroleum is subjected are cooled down and admitted, preferably at a temperature of about 80° Fahrenheit, to the corroding chamber in which

the lead previously treated, as described, by means of acetic acid, is exposed. Air is admitted in suitable quantities to insure proper combustion, a forced draft being preferably maintained by means of a blower interposed between the lime kiln or other combustion chamber and the corroding chambers, and it will be understood that any suitable means for securing the admission of air may be employed. We find that under these circumstances, a very vigorous corroding attack upon the lead takes place, and that the particles of white lead formed are naturally comminuted and thus require no grinding whatever, but are capable of collection in proper form for use by levigation alone. We further find that the resultant product is characterized by the peculiar features hereinbefore pointed out, which features permanently inhere in the white lead.

Having thus described the white lead of our invention and the best method known to us for producing it, we wish it to be understood that we do not limit ourselves to a product which has been obtained by the process above set forth. We believe that to obtain the article in the highest degree of perfec-

tion it is desirable that all the components should be of substantially con-nascent production, but as we are unable to state with absolute certainty the exact reactions which occur, we prefer to use in our claim the expression "inherently commingled" as defining the condition of the solid particles and the volatile oil. By this we mean that such commingling is attendant upon, or an incident of, the corroding process as a whole.

We claim—

As a new composition of matter, a white lead consisting of lead carbonate and hydrated lead oxide, in a naturally comminuted condition, and having its particles inherently commingled with a volatile oil of the petroleum type, substantially as set forth.

NORMAN K. MORRIS.

JOHN W. BAILEY.

Witnesses as to the signature of Norman K. Morris:

JOSEPH W. HOWARD,

H. R. MCCLELLAND.

Witnesses as to the signature of John W. Bailey:

S. M. JANNEY,

JAMES H. BELL.