

XXX. *Specification of the Patent granted to Mr.*

*RICHARD FISHWICK, of Elswick, in the Parish
of Newcastle upon Tyne, White-lead Maker, for
his Invention of a new Method of making White-
lead.*

Dated January 15, 1787.

TO all to whom these presents shall come, &c.
WHEREAS the general and usual method or pro-
cess of preparing and making white-lead, for ma-
ny years past, has been as follows; that is to say,
within a brick building, or any other building
covered in, and secured from the weather, spread
upon the floor a bed, stratum, or layer, of horse-
litter, two feet thick, or thereabouts; upon which
place close to each other as many earthen or other
vessels, in size from a pint and a half to six pints
each, as can be placed horizontally upon the sur-
face of the said bed of horse-litter; then put into
each of these earthen or other vessels, a wine-
measure pint of vinegar, or other acid liquor;

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then

then place or suspend thin sheets or plates of lead; loosely rolled, or folded together in a circular manner, over such vinegar, or other acid liquor; in such manner as not to touch such vinegar, or other acid liquor; such plates or sheets to be perpendicularly placed within the vessels, or otherwise, upon the edge thereof, and to be from one sixteenth of an inch to one fourth of an inch in thickness; the bed, stratum, or layer, to contain in the whole two pounds and a half of lead, of avoirdupois weight, to each or every vessel of vinegar, or other acid liquor, placed upon such bed, stratum, or layer: The lead and vessels to be then covered over with other similar sheets or plates of lead, laid flat upon the surface thereof, and those sheets or plates of lead, so laid, covered with deal boards; or with straw, which completes the first bed, or stratum. The next bed, or stratum, and as many more as are wanted, may be composed and formed in the same manner as is above described. Then let the whole contents of the said beds, or strata, remain in the said state, until the vinegar, or other acid liquor,

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is exhausted, or evaporated, which will generally be in about two calendar months. Then let the beds, or strata, be drawn, or taken off and removed, and let the corroded and white lead be separated from the other part of the lead, (which remains blue and uncorroded,) and mixed with such a quantity of water as will make it pass between a pair of mill-stones, and in that state let it be ground between a pair of mill-stones; then let the finer parts be separated from the coarser, by washing, the same in a large vessel of water, containing five or six successive partitions or divisions, communicating with each other by a small passage at the top; so that the white-lead being pumped, poured, or ladled, into the first of the said partitions or divisions, the finer parts thereof may pass off into the other successive partitions or divisions; the last three of which will contain the fine lead, which must be taken out and put into another back, or large tub, to subside, and then the water should be carefully removed, or ladled off; and, after a few days, when the lead is become nearly of the consistence of a paste, it must

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be

be exposed to the air, or to the heat of a stove, in small flat lumps or parcels, of about seven pounds each, separate from each other, until it is perfectly dry. Now KNOW YE, that, in compliance with the aforesaid proviso, in the said letters patent contained, and for particularly describing and ascertaining the nature of my said invention, and the manner in which the same is to be performed, (having previously described the general or usual method or process of making or preparing white-lead, as aforesaid,) I, the said Richard Fishwick, by this instrument in writing, under my hand and seal, intended to be forthwith enrolled in his Majesty's High Court of Chancery, do testify and declare, that my said invention is the substituting in such process for preparing or making white-lead, as aforesaid, in the room or place of horse-litter, the use of the common tanners bark; or of the bark of the oak-tree, after the same has been previously applied or used by tanners, for making the liquor or tan which is used in tanning, and preparing hides for leather; and that I have found, by repeated experiments, that such tan-

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ners' bark will communicate an equal degree of heat to be placed over or upon it, than hath hitherto been found to do. I further declare, that the method of using such bark, in such method or process of making white-lead, as aforesaid, is to spread such brick or other building of such tanners bark, as aforesaid, of such thickness, or thereabouts, in the bed of horse-litter of two or three or thereabouts, as aforesaid; and so to use the same, and so many more as aforesaid, adding or applying the same to the fore-mentioned articles, in the same proportions, quantities, and in the same manner as is herein before mentioned or described in the said general or usual method or process of making white-lead. And I declare, that any tanners bark or do for the purpose of making white-lead, which is used in tanning, or preparing leather, will also answer, and I

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Patent for a new Method

the air, or to the heat of a stove, in
ups or parcels, of about seven pounds
e from each other, until it is perfectly
now y^e, that, in compliance with the
viso, in the said letters patent con-
for particularly describing and ascer-
nature of my said invention, and the
which the same is to be performed,
viously described—the general or usual
process of making or preparing white-
resaid,) I, the said Richard Fishwick,
rument in writing, under my hand and
led to be forthwith enrolled in his Ma-
h: Court of Chancery, do testify, and
at my said invention is the substituting
rocess for preparing or making white-
resaid, in the room or place of horse-
use of the common tanners bark, or of
of the oak-tree, after the same has been
applied or used by tanners, for making
r or tan which is used in tanning, and
hides for leather; and that I have
y repeated experiments, that such tan-
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of making White-lead.

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ners' bark will communicate a more certain and
equal degree of heat to the vinegar and lead,
placed over or upon it, than the horse-litter has
hitherto been found to do. And I do hereby
farther declare, that the manner of applying the
bark, in such method or process of making white-
lead; as aforesaid, is to spread upon the floor of
such brick or other building, as aforesaid, a bed
of such tanners bark, as aforesaid, of one foot
thick; or thereabouts, in the room or place of a
bed of horse-litter of two feet thick, or there-
abouts, as aforesaid; and so with the next bed or
stratum, and so many more as may be wanted, as
aforesaid, adding or applying the other herein-be-
fore-mentioned articles, ingredients, or things, in
the same proportions, quantities, and manner, as
is herein before mentioned or expressed to be the
general or usual method or process of preparing
or making white-lead. And I do hereby farther
declare, that any tanners bark which will answer
or do for the purpose of making the liquor or tan
which is used in tanning, or preparing hides for
leather, will also answer, and be applicable, as a
substitute

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is exhausted, or evaporated, which will generally be in about two calendar months. Then let the beds, or strata, be drawn, or taken off and removed, and let the corroded and white lead be separated from the other part of the lead, (which remains blue and uncorroded,) and mixed with such a quantity of water as will make it pass between a pair of mill-stones, and in that state let it be ground between a pair of mill-stones; then let the finer parts be separated from the coarser, by washing the same in a large vessel of water, containing five or six successive partitions or divisions, communicating with each other by a small passage at the top; so that the white-lead being pumped, poured, or ladled, into the first of the said partitions or divisions, the finer parts thereof may pass off into the other successive partitions or divisions; the last three of which will contain the fine lead, which must be taken out and put into another back, or large tub, to subside, and then the water should be carefully removed, or ladled off; and, after a few days, when the lead is become nearly of the consistence of a paste, it must

LIII. *Specification of the Patent granted to ARCHIBALD Earl of DUNDONALD; for a new Method or Methods of making Ceruse or White-Lead.*

Dated August 18, 1797.

TO all to whom these presents shall come, &c.
Now know YE, that in compliance with the
said proviso, I the said Archibald Earl of Dun-
donald do hereby declare, that my said invention,
as to one method or process thereof, is described
in manner following; that is to say, lead is to be
brought to the state of a calx or oxide, the calx
is to be mixed with muriat of potash or *sal-*
digestivum Sylvii, or with the oxygenated muriat
of potash, or with the solution of either of these
salts, in the proportion which shall be found re-
quisite; this, for the most part, may be reckoned
at one part of salt, by weight, to five parts of the
calx of lead. The materials are to be intimately

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mixed

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mixed by grinding, or otherwise, and are to be stirred at different times, to expose fresh surfaces to the action of the air; and are to be alternately wetted with water, (either impregnated, or not, with fixable air or carbonic acid,) and dried by exposure to atmospheric air, or to any air in which carbonic acid is contained, until the complete action of the materials, the one on the other, is effected: in this state, they consist of a ceruse or white-lead or carbonat of lead, and muriat of potash. The muriat of potash is, by washing, to be separated from the ceruse or white-lead; to be concentrated by evaporation; and to be preserved, to act again on more of the calces of lead. Lastly, the white-lead is to be ground, levigated, and dried. It is proper here to state, that muriat of potash or salt of Silvis has, in most chemical treatises, been represented to be of little or no use in the arts; and, as it is a salt which very rarely occurs as a residuum from chemical mixtures or combinations, it might the more easily escape the notice and experiments of chemical persons, or of persons in search of discoveries connected with different branches of manu-

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manufacture. Muriat of potash possesses properties different from muriat of soda or sea-salt; and, in the present instance, produces a change on the calces of lead, not effected when muriat of soda only is used. The application of muriat of potash to the calces of lead, for the production of ceruse or carbonat of lead, is not therefore to be confounded with the attempts of others to produce a carbonat of lead, by the mixture of muriat of soda with the calces of lead. When the muriat of potash, or, more properly speaking, its solution, is mixed with the calx of lead, a change takes place; the vegetable alkali of the muriat of potash is disengaged in a caustic state, while the muriatic acid enters into combination with the calx of lead, and forms muriat of lead. By the exposure of the materials to atmospheric air, or to air containing the carbonic acid, this acid is attracted by the caustic vegetable alkali, and, as it is received, is transmitted to the lead, forming therewith a carbonat of lead or ceruse; while, in return, the alkali takes back, from the muriat of lead, the muriatic acid, in a

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state more oxygenated than that in which it existed in the muriat of potash when first applied. The muriat of potash recovered is to be applied for making, with the calces of lead, more ceruse or carbonat of lead. It has been found most advantageous not to use the calx of lead very highly calcined: in this highly calcined state, I generally use a small proportion of lead in a metallic state along with the calx. The process of mixing lead with the calx or calces of lead, for making, with muriat of potash, ceruse or carbonat of lead, is to be included under the patent to which this specification refers. And I do hereby farther declare, that the other method or process for making ceruse or white-lead, for which the letters patent herein before recited have been obtained, is as follows; that is to say, in this method or process, muriat of soda or sea-salt is to be substituted for muriat of potash, and it, or its solution, is to be mixed in the same manner, with the calx or calces of lead, as in the first process or method before mentioned. To this mixture, and the proper degree of action has taken place, a suff-

a sufficient quantity of vegetable alkaline salt is to be added, to give, or procure to the lead the carbonic acid, which is more speedily done when the vegetable alkali is in a state of carbonat. The salts are then to be separated from the ceruse or carbonat of lead, by washing off the two salts, consisting of soda or mineral alkali, and muriat of potash; or the soda may be separated before the potash is added to the materials. Lastly, the ceruse or carbonat of lead is to be levigated, and dried. The muriat of potash, when separated, is to be preferred, and applied to operate on more of the calx or calces of lead; and this comes under the description given in the first method or process herein before mentioned. In witness whereof, &c.

*XLIII. Specification of the Patent granted to Mr,
JOHN ATKINSON, of Harrington, near Liver-
pool, Colour Manufacturer; for his Invention or
Discovery of the Use and Application of certain
Materials, for making a valuable White Paint or
Colour, and of making Paint or Colour from the
said Materials, which will, in a great Degree,
answer the Purposes of White-Lead.*

Dated March 8, 1796.

TO all to whom these presents shall come, &c.
Now know ye, that I the said John Atkinson,
in compliance with, and conformity to, the said
proviso, do hereby particularly describe and as-
certain the nature of my said invention, as fol-
loweth: I do declare that the materials of which
I have discovered the use and application, for
making a valuable white paint or colour, are
a mineral calx, called blende or black jack,
lapis calaminaris or calamine, or any other ore
of

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of zinc, called or known by the name of zinc-
spar, or any other calx, ore, mineral, or metal,
resolvable to zinc, or from which the same may
be obtained. And that the method of making
paint or colour from the said materials, which
will, in a great degree, answer the purposes of
white-lead, is as follows; that is to say, first
convey the mineral calx, calamine, ore of zinc,
zinc-spar, or other materials as aforesaid, to an
oven or furnace, commonly called a reverberatory
furnace; where the flame must pass over it for
the space of six hours, or thereabouts, in which
process it parts with, or from, all the ferruginous
volatile principles which it contained. Thence
convey it to a mill, and lay the same upon a flat
surface, where, by means of a stone which is to
roll over it, it is crushed or bruised small; or
make use of any other machine which will an-
swer that purpose; and, when the same has been
so crushed or bruised, mix it with about one-
eighth part of its weight of powdered charcoal;
after which, it is to be removed to a furnace, com-
monly called a close-furnace or muffled furnace.
This furnace should be provided with two aper-
tures

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tures or openings, one on each side, and dilated at the end from the furnace by a distance of about twenty feet; but a greater or less distance may be used, as the case may require: the other end immediately joins and enters the body of the furnace. In this state the ore should be introduced, through the top or crown of the said furnace; and, when it is perfectly ignited or made red-hot throughout, a large thick white cloud or smoke, with a bright blue flame, will be produced, which will convey itself into the apertures or openings before mentioned and described, and will be collected in the form of a very pure white metallic calx. These apertures or openings should each be provided with a door at the farthest extremity, in height about five feet, or sufficiently large to admit a man to go in, for the purpose of collecting the colour. It should then be conveyed to a mill or machine, and be ground, (regard being had to the colour,) being first duly mixed with water sufficient to dilute it; after which, it should be conveyed from the mill or machine, by a plug to be fixed about twelve inches from the bottom of the tub, into gutters or
4 spouts,

spouts, to convey it into fine sieves; whence it may be received into cisterns or vessels, which communicate one with another by means of gutters or spouts, or otherwise, by which means, the finer particles float into the farthest cisterns. I make use of six cisterns, but a greater or less number may be used; and, after standing about twenty-four hours in this state, the water may be drawn from it, and the colour be collected and removed to a pan or receiver, or other vessel, made of bricks, or other materials capable of bearing heat, by which it may be dried, by means of fire or otherwise; in which state it will become saleable, but when it is wanted in powder it should be finely ground. In witness whereof, &c.

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