

Specification of Andrew Kurtz : artificial fuel.

Contributors

Kurtz, Andrew.

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A.D. 1842 N° 9234.

S P E C I F I C A T I O N

OF

ANDREW KURTZ.

ARTIFICIAL FUEL.

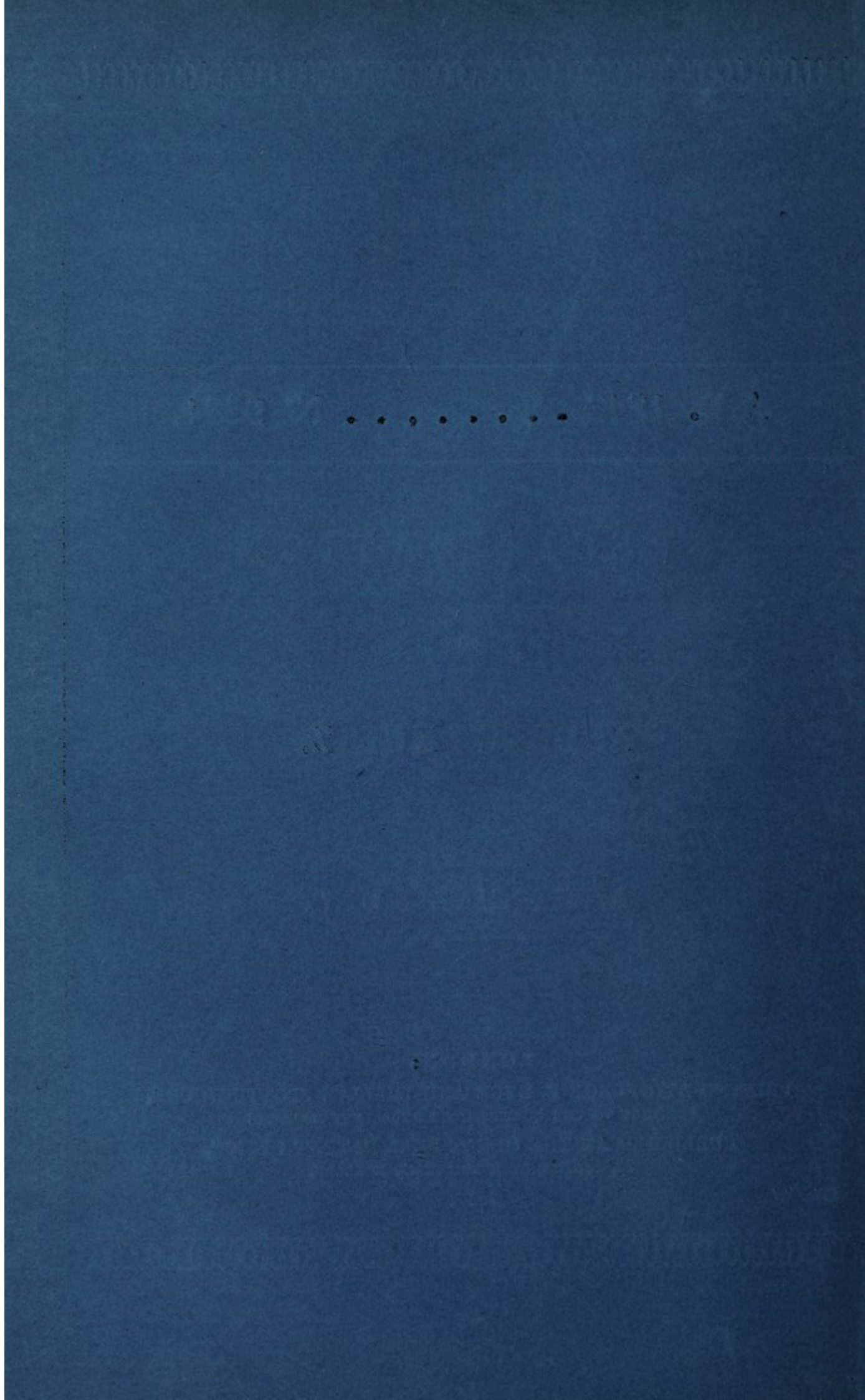
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A.D. 1842 N° 9234.

Artificial Fuel.

KURTZ'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ANDREW KURTZ, of Liverpool, in the County of Lancaster, Manufacturing Chemist, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her
5 Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-seventh day of January, in the fifth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Andrew Kurtz, Her especial license, full power, sole privilege and authority, that I, the said Andrew Kurtz, my executors, administrators, and assigns,
10 and such others as I, the said Andrew Kurtz, my executors, administrators, and assigns, should agree with, and no other, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England and Wales and the Town of Berwick-upon-Tweed, my Invention of "**CERTAIN IMPROVEMENTS**
15 **IN THE MANUFACTURE OF ARTIFICIAL FUEL;**" in which Letters Patent is contained a proviso that I, the said Andrew Kurtz, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in Her Majesty's High Court of Chancery, within six calendar months next and immediately after the date
20 of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Andrew Kurtz, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, is particularly

Kurtz's Improvements in the Manufacture of Artificial Fuel.

described and ascertained in and by the following explanation thereof, that is to say :—

“ My Improvements in the Manufacture of Artificial Fuel consist principally in equallizing the strength or combustible quality of the various species of coal by bringing the several varieties to one uniform standard, and thereby impart- 5 ing by artificial means the same powers of combustion in evaporative processes to the inferior sorts of coal as possessed by the best known quality in its crude or natural state.” My improvements are effected by mixing with inferior coals such proportionate quantities of coke (made from coals), rosin, and naphthaline with pitch (made from gas tar) or other bituminous substance as 10 will equalize or counterbalance the combustible strength or evaporative power of such inferior coal with that of the best coal known or found in England and Wales. The proportionate quantities of superior combustible matters to be added to the inferior coals in order to bring them up to the same standard of evaporative power as the best English or Welsh coal, must, of course, depend 15 upon the inferiority of the coal to be improved, and as the British Government standard for contracts for artificial fuel is that one pound of fuel shall evaporate eight pounds of water, I take that as my standard, and the under-mentioned experiments will shew the manner and proportions in which the addition of combustible matters must be made to inferior coal. I have found 20 that the evaporative power of coals is as follows (by way of illustration):—One pound of anthracite coal will evaporate eight pounds of water; one pound of best Welsh coals, 7 lbs. to 8 lbs.; one pound of Liverpool coals called Smith’s coals, 7 lbs.; one pound of ordinary Liverpool coals, 4 to 6 lbs.; Newcastle coals are similar in effect to Liverpool coals; so that it will be 25 readily perceived that where the best Welsh coals wants as it were 1 of superior combustible matter, ordinary or inferior coals will require four or more parts, and that the proportions must be suited and varied according to the ascertained quality of the coal when in a natural state. And, secondly, my improvements consist in the application and use of certain machinery or apparatus for the 30 purpose of preparing and mixing the component parts of such artificial fuel, and forming or moulding the same into portable and convenient shapes or bricks for use, as follows:—The natural coal is first to be ground small between an ordinary pair of horizontal grinding stones or in a grinding mill, and is afterwards to be submitted to a drying kiln or apparatus for the 35 purpose of expelling all moisture from the coal. This drying apparatus is to be constructed with three chambers or compartments, say, twelve feet long by nine feet wide and by six feet deep altogether. The flooring of these chambers should be of plate iron, and somewhat dished or sunk in the middle, and also

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provided with a small aperture or opening, with a sliding door or cover to each, between each compartment, and around these chambers there are flues heated by the flame and air proceeding from the furnace or fireplace situate at one end of the apparatus, and each flue is to be provided with a damper to regulate
5 the heat as required. The upper chamber or compartment is open at top, and may be called the reservoir, and in this the ground coal is to be placed after being taken from the grinding apparatus, and heated or dried so that the principal part of the moisture is evaporated, the sliding door is then to be removed from the opening in the bottom of this reservoir, and the coal raked
10 or pushed down into the middle or drying chamber. In this chamber the pulverized coal is also to be further dried and heated to about three hundred degrees Fahrenheit, so that no moisture whatever remains, the sliding door is next to be removed from the aperture in the bottom of this chamber also, and the coal passed into the bottom or mixing chamber. The pulverized and dried
15 coal now lying in the lower chamber, the pitch or other auxiliary combustible matter is to be supplied through a trough or other convenient means, and in such proportions as have been previously ascertained and dependant upon the quality of the coal under operation, and after being sufficiently mixed together by raking or otherwise may be carried away in boxes or baskets to the next
20 process. The composition or artificial fuel now being in a plastic state is in the next place to be put into a machine very similar in form and in the mode of operation to an ordinary clay or pugmill as used by brickmakers. The form of this apparatus is similar to a vat, say, of six feet diameter at top, and eight or nine feet deep, and tapering downwards. This vat or chamber
25 is to be of cast iron and surrounded with a jacket or casing to act as a steam chamber in order to keep the composition under operation in a continuous heated state, and thus capable of being more efficiently worked. For this purpose a steam pipe is supplied to the lower part of the casing of the pugmill conveying the waste steam from the steam engine employed to work the whole
30 system of apparatus, and which steam is to be passed off at the upper part of the vessel, the condensed water escaping below. The interior of this pugmill is somewhat peculiar in its construction, and consists of a central upright shaft being driven from gearing below in connection with a steam engine or other moving power. Upon this shaft of about six inches in diameter at the
35 lower end, and tapering upwards to about four inches, are placed several pairs of arms or agitators, say, about six pairs, about nine inches wide, and reaching to within about an inch of the inside of the mill at the top and about six inches at the bottom, each alternate pair being set or fixed at right angles with the adjoining pair, and each arm placed at an angle of about twenty

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degrees from the plane of the horizon, so as the shaft revolves these arms or agitators will act as one continuous screw and keep forcing or conducting the composition in the mill towards the bottom simultaneously with the mixing and pugging process. A separate or independent arm is also fixed at the lower end of the shaft and touching the bottom of the pugmill. This arm is 5 formed helically, and its outer end forces the composition or fuel in a continuous stream or course out of an aperture or mouth-piece formed at the bottom of the mill. This aperture or trough may be shaped in any way, being open at the top, and having the sides and bottom square, so as to shape or form the plastic composition as it is being forced from the mill. Masses of this 10 compound are now to be taken from the opening at the bottom of the pugmill, and whilst in a heated state to be thrown or cast into square boxes or frames the depth of an ordinary brick, when the plastic material will flatten as it cools and spread itself evenly until it is confined by the sides of the frame; these frames may be large enough to contain a sufficient quantity to form one 15 hundred bricks or cakes of fuel. When the composition is sufficiently cooled, but not allowed to harden, it may be cut into forms or bricks by means of a cylinder having a series of rotary cutters placed thereon at given distances apart, and projecting from the cylinder so as to pass through the entire depth of the cake of fuel in the frames. This cylinder or series of cutters is to be passed 20 across the composition in the frames lengthwise, and will thus cut up the fuel into lengths, and a similar series of rotary cutters must be passed over the frames crosswise, and will thus form or cut the fuel into oblong squares or bricks. I would here observe that the frames must be well moistened with a strong solution of milk of lime, and the cutters and cylinders must also be well 25 supplied with a similar solution from a saturated brush above, so that all sides of the bricks or cakes of fuel shall be coated over with lime, and this will prevent their adhering to each other when packed closely together for use. I would also here remark that the hardness of the fuel may be varied, and its capability of withstanding the effects of different climates may be modified by 30 a greater or lesser proportion of the pitch or other emollient materials.

Having now particularly described the nature of my improvements, and the manner of carrying the same into practical effect, I desire it to be understood that I claim as my Invention the manufacture of artificial fuel, firstly, by bringing all natural coals to one uniform standard of combustible power or 35 effect by artificial means, that is, by adding such proportions of coke, rosin, and naphthaline with pitch to inferior coals as will equalize or counterbalance the combustible strength of the best coals known or found in England and Wales; and, secondly, the application and employment of the machinery or

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apparatus herein described for the purpose of preparing, mixing, and pressing or shaping such artificial fuel into convenient portions, shapes, or bricks for use.

5 In witness whereof, I, the said Andrew Kurtz, have hereunto set my hand and seal, this Twenty-sixth day of July, One thousand eight hundred and forty-two.

ANDREW (L.S.) KURTZ.

10 AND BE IT REMEMBERED, that on the Twenty-sixth day of July, in the sixth year of the reign of Her Majesty Queen Victoria, the said Andrew Kurtz came before our said Lady the Queen in Her Chancery, and acknowledged the Instrument aforesaid, and all and every thing therein contained and specified, in form above written. And also the Instrument aforesaid was stamped according to the tenor of the Statute made in the fifty-fifth year of the reign of His late Majesty King George the Third.

15 Inrolled the Twenty-seventh day of July, One thousand eight hundred and forty-two.

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KAYE, Extra.

Andrew's Experiments on the Manufacture of Artificial Silk

apparatus herein described for the purpose of preparing, twisting, pressing, and drawing such artificial silk into convenient positions, shapes, or disks for use in the various operations of the manufacture of artificial silk, and in which, wherever I, the said Andrew Huxley, have hereunto set my hand and seal, this Twenty-sixth day of July, One thousand eight hundred and forty-two, the said seal was by me affixed to the said

ANDREW HUXLEY (Esq.)

AND BE IT REMEMBERED, that on the Twenty-sixth day of July, in the sixth year of the reign of Her Majesty Queen Victoria, the said Andrew Huxley came before our said Lord the Queen in Her Chancery, and acknowledged the instrument above, and all and every thing therein contained, and specified, in form above written. And also the instrument above was stamped according to the form of the Statute made in the fifth year of the reign of His late Majesty King George the Third.

15. In witness whereof, I, the said Andrew Huxley, have hereunto set my hand and seal, this Twenty-sixth day of July, One thousand eight hundred and forty-two.

W. H. L. Esq.

Printed by George Fox and William Stott, Stationers, 15, Pall Mall, London.