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Contributors

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A.D. 1802 N^o 2583.

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

OF

BRYAN HIGGINS.

KILN, OR APPARATUS FOR HEATING AIR.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

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1854.





A.D. 1802 N° 2583.

Kiln, or Apparatus for Heating Air.

HIGGINS' SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, BRYAN HIGGINS, of the Parish of Saint Ann, Soho, in the County of Middlesex, Doctor in Physick, send greeting.

WHEREAS His most Excellent Majesty King George the Third, did, by
5 His Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster, the Nineteenth day of February, in the forty-second year of His reign, give and grant unto me, the said Bryan Higgins, His especial licence, that I, the said Bryan Higgins, during the term of years therein mentioned, should and lawfully might use,
10 exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "**AN APPARATUS FOR HEATING AIR EQUABLY TO ANY REQUISITE DEGREE, AND METHOD OF APPLYING THE AIR SO HEATED, WITH PECULIAR ADVANTAGE, EFFICACY AND ECONOMY OF THE FUEL, TO THE NUMEROUS PURPOSES FOR WHICH STOVES AND KILNS HAVE BEEN HERETOFORE EMPLOYED;**" in which said
15 Letters Patent there is contained a proviso obliging me, the said Bryan Higgins, under my hand and seal, to cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be enrolled in His Majesty's High Court of Chancery within one calendar month after the date of the said recited Letters Patent, as in and by the same
20 (relation being thereunto had) may more fully and at large appear.

Higgins' Improved Kiln, or Apparatus for Heating Air.

NOW KNOW YE, that in compliance with the said proviso, I, the said Bryan Higgins, do hereby declare that my said Invention is described by the Drawings hereunto annexed, and the following explanation thereof, that is to say:—

The first, second, and third of the annexed Figures are intended to illustrate 5 the description of this Invention in regard to the application and structure, by which it serves with peculiar advantages for a great number of most useful purposes to which kilns, cockles, stoves, and other contrivances have been heretofore applied, and for the sake of brevity this application and structure is called a kiln in the following Specification. Figure 1 is a plan of the lower 10 parts of the kiln; the shaded stripes A B, B C, C D, and D A, shew the thickness and course of the house wall. The like shading around E represents the masonry of the chimney shaft bounding the upright square flue E, when a vertical mason flue is preferred to a vertical metallic flue tube. The darker shaded stripes F G, G H, H I, and I F, shew the breadth and course of the 15 slender wall, which at the height of three feet or more above the floor is to support the sides and ends of the kiln which are to enclose the floors or platforms. The space between the kiln wall I H, and the house wall A D, is for a passage, giving easy access to side doors of the kiln; and it is in order to facilitate the use of tools employed in raking or turning the charge of the 20 kiln, that this passage is widened by recesses in the house wall such as the Figure shews. At these recesses are to be the house doors and windows, corresponding with the side doors of the kiln. Similar shading shews similar things at the further part of the Figure. K, L, represents a wall, which, being built to the height of two feet, is to be a basement of five pillars represented 25 by five small squares between K and L. The same wall also serves for a part of a mason channel hereafter to be described. The rectangular Figure *a, b*, shews the place and extent of the ash pit and grating, and the break *b, M*, in the shading of the walls shews the course of the ash pit avenue and of the doorway for fuel thro' these walls. The dotted Figure *c, d, e, f, g, h*, shews the 30 place of a cast-iron stove, which has this outline at its greatest diameters near the top; but which stove narrows downwards to correspond by the lower part with the Figure *a, b*, so as to include the place of the grating, and rest on the masonry which bounds the grating. This form serves for wood fuel; but for sea-coal fuel, and the like, the stove may have other forms, and may be as 35 large at the bottom as at the top. The dotted lines which run parallel from *h* and *c*, to bend at *i*, and again at *k*, and again at *l*, to terminate in the flue E, shew the length, diameter, and course of a metallic flue tube which joins with the iron stove near *h, c*, and conveys the smoke into the upright

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flue E. When the course of this metallic tube is horizontal, as the Figure represents, or nearly horizontal, it is expedient that there should be a small opening near the ground into the upright flue E, in order that a draught may easily be made in this upright flue by burning in it a few chips or the
 5 like. When this draught is attained the opening is to be closely stopped, and then there will be a competent draught from a fire recently lighted in the stove. When the draught becomes quicker than is necessary it may be moderated to any required degree by removing a part or the whole of the stopper to cool the upright flue by the admission of cold air. The deeply
 10 shaded narrow bordering on each side of the dotted flue tube and of the dotted stove shews the course and width of a mason channel, in the wider part of which the stove stands, and in the remainder of which the flue tube runs near the center of the height and width of its proper part of the mason channel. The same bordering also shews the extent with which thin iron
 15 plates or slates or the like are placed to cover in the mason channel closely by the aid of luting from the point *b*, to the whole extent of the mason channel in the course *b, i, k, n*. The break in the shading of the house wall at *n, o*, is to shew that the mason channel is continued thro' it with the whole area of this mason channel for the free admission of air in the course
 20 of the metallic flue tube. The continuation of the described bordering from *n* to *o*, is to shew that the thin plate iron covering is to be luted here on a flat bar laid across the mason channel, and touching the wall and luted to it. If the plate iron covering be made to terminate at the inside of the kiln wall not far from *n, o*, it is to be luted there in the last-mentioned manner or to the
 25 like effect. Between *G* and *n* is a break in the shading to shew the width and place of an opening by which a workman may have access for the purpose of cleaning the flue tubes. At all other times this opening is to be closely stopped with masonry; such an opening will serve equally well if made at the other end of the kiln. Figure 2 is intended to shew the elevation of
 30 parts at or near the central vertical section of the whole kiln.

The shading *A, B*, and *C, D*, represents the end walls of the house, and the deeper shading *E, F*, and *G, H*, is to shew the end walls of the kiln, of which end walls *A, I*, is the ground line. The dotted lines *a, b*, and *a, c*, shew a part of the metallic flue tube from the elbow at *a* to the juncture at *b, c*, with the
 35 cast iron stove *c, d, e, f, g, h, b*. The dotted lines which run horizontally outwards from *g* and *f*, and which define a break in the shading there, shew the course of the doorway thro' the walls, but the width of this doorway will vary with the thickness of the walls, and with the quality of the fuel; the aperture between *d*, and *e*, shews the length of the fire-place near the grating, but shews

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this in subservience to the description of the first Figure. K, D, shews the pavement of the ash pit, which opens outwards along K, D, to the height of the line above H; and e, H, shews a plate or tile by which this part of the ash pit avenue is to be covered in to guide the air from the ash pit into the stove. In some cases the fire bars or grating may be within the stove between d, and e, 5 but for sea coal fuel it is most convenient to place them lower on bearing bars, so that there may be a small interval between the grating and the plate e, H, for by such interval the clinkers may most conveniently be drawn forth.

The interval between the ground line A, I, and the line L, M, shews the height of the mason channel for the metallic flue tube; and L, M, represents the plate 10 iron covering of the mason channel. The air flowing in by this channel along the flue tube and around it, and then flowing around the stove c, d, e, f, g, h, b, is at liberty to ascend into the kiln by the end M of the covering plate, and by the interval between M and the kiln wall O, h. It is expedient for the security of any timber on which this current of hot air would strike imme- 15 diately, that a thin iron plate or slate should be placed horizontally in the course of the line O, N, to answer the purpose of spreading the hot air widely under the first platform or floor on which things are to be heated or dried; such first platform is represented by the horizontal shaded stripe k, l; the dotted line i, i, i, i, i, i, is the line by which a scantling runs from end to end of the 20 kiln, at the central line of its area, and is the line by which this scantling rests on the upright pillars described in the preceding Figure; the quadrilateral Figures i, i, i, i, i, shew the parts of this scantling by which it rests on these pillars. This scantling so resting on the pillars supports the central parts of the floor or platform, the thickness, elevation, and course of which are shewn by 25 the deeply shaded narrow stripe k, l; in like manner the Figure shews the horizontal scantlings and the floors of all higher platforms; the small squares which appear above i, i, i, i, i, respectively shew where upright scantlings, continued from the mason pillars upwards perpendicularly, support the horizontal scantlings and the platforms near the midline of the area of the kiln. Each 30 platform, like k, l, is provided with a skirting board or border board, like m, l, at both ends, to retain things charged into the kiln within the proper limits. It is convenient that where the kiln meets the end walls of the house, this end wall should be faced with boarding, which the Figure represents by the deeply shaded bordering E, n, and G, P. Between this facing of the end walls and 35 the skirting boards, such as l, m, of the numerous platforms or floors, there is an interval, as the Figure shews, for the current of hot air, of which interval the breadth is shewn by the Figure; but it is to be understood that this interval extends in length from one side of the kiln to the other. The heated air

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ascending between M and the wall O, *h*, is compelled, by the first platform *l*, *k*, to flow to the aperture at *k*, and into the interval *k*, *n*. And by the floor *n*, *o*, it is compelled to flow along six platforms to the interval *m*, *o*, and by the interval at *o*, it ascends into an upper chamber, of which the walking floor
5 is *n*, *o*. Of this upper chamber the ceiling *p*, *q*, compels the stream of hot air to flow from *o*, *q*, towards *p*, along three platforms, the representatives of any greater number that may be required, and finally the exit of the hot air is by an interval or trunk, such as the Figure indicates at *p*, *w*. Under the floor
10 *n*, *o*, the Figure shews six platforms for work on subjects to be aired, heated, or dried in this lower chamber, and such lower chamber may be provided with any greater or smaller number of platforms; but of such platforms the lowest and the highest will be hotter than the intermediate, and will heat and dry bodies quicker. In every case in which this inequality of the heating and
15 drying power may be inconvenient, or in which it is required that the whole charge of the lower chamber of the kiln shall be dried equally or nearly so in equal times, the following expedient or the like is to be used: a moveable valve, of board or any other proper material, and represented by *r*, *s*, is to be slung so that it may be made to check at pleasure the quantity and the course of the hot air flowing along the first platform. A similar valve *n*, *t*, will
20 serve for the sixth or uppermost platform of the lower chamber, and as these valves are more or less raised or lowered, their respective platforms will feel more or less of the effects of the hot air, and by due management of such valves the heating and drying on all these platforms may be equalized. But when the platforms are numerous, more valves will be required than are
25 represented in this Figure to prevent the two uppermost or two lowermost tiers from being hotter, or from drying quicker, than the intermediate. It is also expedient for some purposes that the aperture *o*, P, should be provided with a valve *u*, P, by the shutting of which the upper chamber may be entered without annoyance to the workmen by the hot air, even whilst the lower
30 chamber of the kiln continues to be strongly heated. In Figure 3 is shewn an elevation of the side of the kiln, to which side the other is exactly similar. A, B, and C, D, shews the house end walls, and B, C, the ground line. B, E, F, C, shews the low slender wall which supports the side of the kiln; the seven equally shaded stripes which run from the kiln wall E, F, vertically, to meet
35 the floor G, N, at G, H, I, K, L, M, and N, respectively shew the places of the upright scantlings, which may be notched into the horizontal scantlings to save the labour of tenon and mortice. The shaded stripe O, P, and the similar parallel stripes below it, shew the course of the horizontal scantlings which support the platforms or floors. The deepest shading between the upright

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scantlings shews the parts which are boarded up closely, or which are plaistered up, or walled up. All intervals, such as *a*, *b*, or *c*, *d*, are apertures between the platforms, thro' which apertures tools may be introduced to move and turn, or to draw forth the charge of the kiln; and the bars between these apertures consist of the thickness of the horizontal scantlings, and of the thickness of the 5 flooring boards of the platforms. But it is to be understood that when the kiln is at work, each of these apertures is to be shut up by a fitting board, secured in its proper place by buttons or pins at each end, and that a closing board is not to be removed except for the time and purpose of examining, moving, or turning the charge of the kiln. The part of the Figure above the 10 floor *G*, *N*, is merely to shew the correspondence of the vertical and horizontal scantlings, and of the platforms of the upper chamber, with those exhibited in the preceding Figure. When the first platform is made of boards, they ought to be narrow, to provide against the inconvenience of their shrinking asunder by the heat, and they ought to be tongued together to 15 prevent the passage of dust to the covering plates beneath. The like precautions are to be attended to in all boarded inclosures of the cavity of the kiln; but generally every platform above the first ought to consist of narrow boards, which, by shrinking, will leave some intervals to give the platform a sieve-like property, without allowing the intended charge of the kiln to fall 20 through. For the work of the kiln on divers substances, platforms will serve that are terraced or plated, or laid with canvas or other materials. When the substances are to be laid very thin, or when they do not require to be moved or turned, there is less occasion for side passages between the kiln, and the house side walls and the platforms may extend to the whole length 25 and width of the house. To save time and labour in charging such a number or any greater number of platforms with grain or any other suitable subject, the following contrivance serves:—At the middle of each aperture, such as *a*, *b*, or *c*, *d*, the narrow board which runs from this side of the kiln to the opposite side, to compleat its proper floor or platform, is not to be nailed to 30 the scantlings on which it rests, but is to be buttoned to or pinned so that it may easily be raised and placed aside to give an opening thro' its platform. When such boards of all platforms, except the lowest, are removed, the grain, or other subject shovelled through such an interval between *H* and *I* will charge the lowest platform. In like manner the part of the lowest platform 35 under *L*, *M*, may be charged. Then the described charging interval of the second platform being closed by its proper board, the descending substance will charge the second platform, and so on for the third and for higher platforms. Two movable tressels, on which a broad board may be supported at various

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heights, serve to elevate the workman occasionally to the height of any high platform at which he may be required to work in a kiln of considerable height, between the ground and the floor of the upper apartment. The stove is placed so far distant from the outer opening of the fire door and ash pit avenue to
5 prevent the heat from being wasted thro' the ash pit avenue at the fire door; and for the same purpose the ash pit avenue is provided with a stopper at the coldest part, which stopper is to be so placed that no more air shall enter by the ash pit avenue than is necessary for the due maintenance of the combustion of the fuel in the stove; and for the same purpose a stopper of clay or metal
10 is placed in the doorway close to the stove, when the charge of fuel is made in order that little or no heat may reach to the outer hinged door to be wasted by transmission to the external air. The described with of the aperture for the entry of air by the metallic flue tube, and of each of the apertures by which the hot air flows through the kiln, and then forth from the kiln, is
15 eligible for most purposes. In particular cases it may be expedient to lessen the current and efflux of hot air by stopping a part either of the aperture by which the air enters the mason channel, or of the aperture by which the hot air flows outwards from the kiln; but for general use the kiln will be found to have this singular property, that with the widest apertures for the described
20 current of air, and consequently with the greatest influx of the external cold air, the air in the kiln, and the subjects on the platforms, become hottest by a given fire. It is also in the circumstance of the freest influx of air by the described course that there is little or no abatement of the heat of the kiln when a side door is kept open during the time necessary for moving, raking,
25 or turning any part of the kiln charge; so the structure serves perfectly to defend the workman from the heat of the kiln, and to prevent the action of the kiln from being interrupted by his opening a side door of the kiln for the necessary time. Of a kiln of this kind there may be divers accommodations to local circumstances. The extent of the platforms, the number and distances
30 of them, and the materials of them, and divers other particulars, may be in accommodation to the nature of the intended charges and uses of the kiln, and it is easily deducible from the structure exhibited in Figure 2, that the platform may be so laid that the whole of the hot air shall flow first along the lowest platform, then over the second, and then over the third, and so on
35 for the rest of the platforms. When the kiln charge admits of this method of leading the hot air, according to the nature of the charge, and the management of the heat and ventilation, this kiln will serve for things which require to be sweetened by ventilation, and heat for things which require to be seasoned, or shrunk, or hardened, and almost for all things that require

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to be dried by the aid of heat and air, and this kiln will serve with peculiar advantage for drying wheat which has been recently washed from taint or smut, and for drying malted barley for the brewing of the palest and best flavored ale or beer, and for all things that are apt to be depreciated by the flavour, colour, or character which they acquire in the ordinary processes of kiln drying or stoving. The greater is the metallic surface of the flue tube by the size and length of it in its appropriated horizontal channel, or in so much vertical channel as may be consistently with the required current of air, the less will be the waste of heat by the course of the smoke, and such length may be made out by more numerous elbows or convolutions of the flue tube. The principles of this Invention consist of such structure, contrivances, and applications as the aforesaid, and such as are analogous and fit to produce the aforesaid effects and advantages, and to serve purposes such as the following:—The purpose of applying the heat most advantageously to the charge of the kiln; the purpose of augmenting the efficacy of the hot air by virtue of the permanent current of it along and around the charge of the kiln; the purpose of securing such charge from being injured by unequal heat, and from being tainted by the smoke or fuliginous vapour of the fuel, or by such vapour as in divers ordinary structures has been found to arise in consequence of the deposition of dust on the heated stoves, plates, or flue tubes; the purpose of preventing waste of the heat generated from the fuel, and especially the purpose that there shall be the least waste of heat by the course of the smoke or fuliginous vapour of the fuel in comparison with the waste by this course in the ordinary structures for heating air or other things; the purpose of leading all the heat which the whole length and expanse of the metallic flue tube can transmit, in the circumstances most advantageous to such transmission, back to hotter and hotter parts of the tube and then to the stove, so that the stove, exposed only to air which has acquired the heat of the hottest part of the flue tube, shall become hotter by a given fire than it could be made by such fire in the ordinary structures, and that the stove shall consequently act the most effectually towards the transmission of heat and towards heating equally every part of the air which flows into the kiln; the purpose of facilitating and expediting the business of charging the kiln, and the business of spreading, moving, or turning the charges of the platforms; and the business of drawing forth such charges when the process of heating or exsiccation is completed. The structure by which this Invention is applied to the purposes of cooking, and to divers other uses, is shewn by Figure 4 and Figure 5 annexed, and it is called the kitchen, of which Figure 4 is a plan. A, B, and C, D, shew the course and thickness of the side walls, and A, C, and B, D, shew the end walls. The dotted

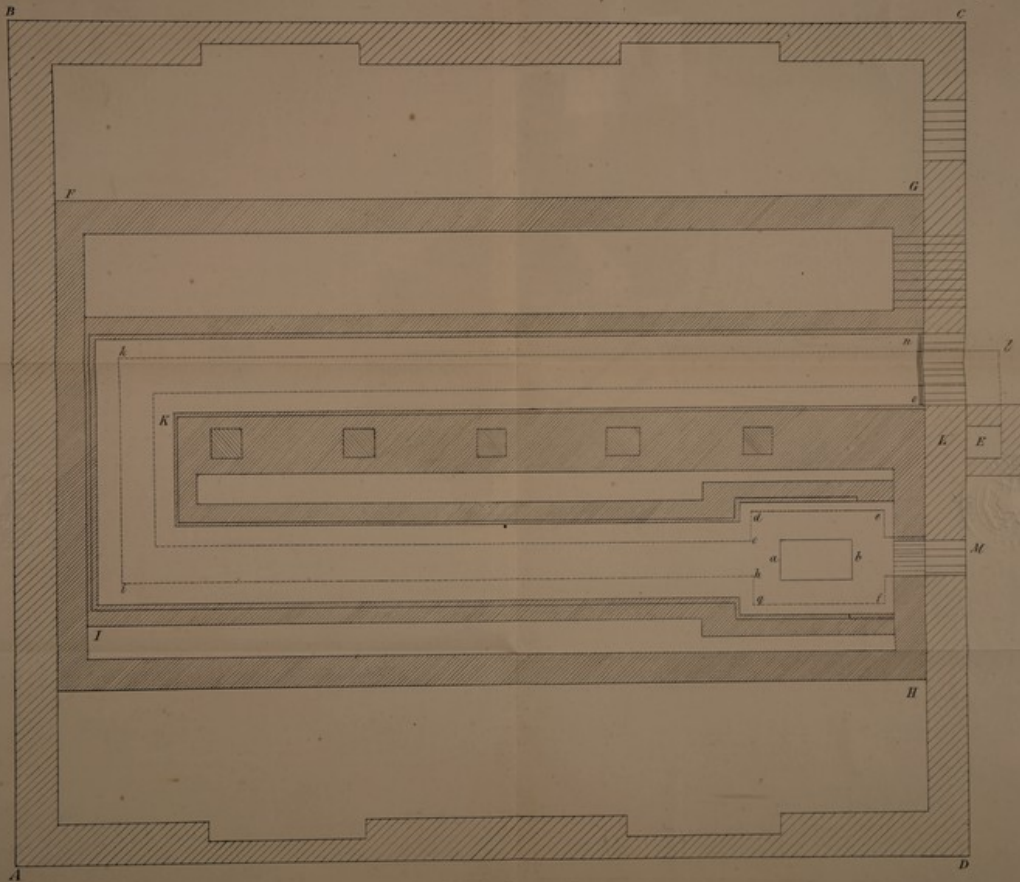
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square, in the center of which is E, shews the place of a cast iron stove, and the parallel dotted lines in the course E F, F G, and G H, shew the horizontal course of the metallic flue tube from the stove E to where the flue tube passes thro' the end wall to H, thereabouts to enter a perpendicular mason or other flue, 5 as was shewn in one of the preceding Figures. The interval which appears between these dotted lines and the corresponding nearest continued lines parallel to the dotted lines, shews the distance between the metallic flue tube and the sides of the mason channel in which it runs, supported on cross bars. The narrow deeply shaded bordering shews the extent of the plates by which the 10 mason channel for the flue tubes and for the stove itself is covered in closely. The iron plate *a, b, c, d*, constitutes the top plate of the stove, and is a continuation of the substance or cast of the stove, and of so much of the flue tube as reaches from the stove E to *f*. For the chief part of this length the cavity of the flue tube is flat, and broad at the top next the flat iron plate, and is round at the 15 lower part to give this part of the flue tube a semi-cylindrical cavity of sufficient area; but from *e* to *f* this part of the flue tube assumes a cylindrical form to fit and join at *f* with the flue tube *f, F*. Next to the covering and cooking plate *a, b, c, d*, lies the covering plate *g, h, i, k*, which may rest on the masonry by the side borders only when the whole expanse of it is required for cooking or 20 other uses. Under this plate the mason channel needs only the width between *l, m*, and *n, o*, but may be beveled at the edges to allow the heated air to spread towards the borders *g, h*, and *i, k*, of this covering plate. The space bounded by these plates below, and bounded above by the inclosures hereafter to be described, is that which is fittest for cooking and the other purposes for which the greater 25 heat is required, but the heat of the covering plates in the course F, G, H, may serve for things which require the lesser heat. The break in the shading at *p, q*, shews the place of the doorway of the stove E, under which door is the ash pit avenue. The border *b, c*, being that by which the hot air ascends from the mason channel in which the stove stands, the floor of this channel terminates at 30 a line directly under the line *b, c*, and from this termination the masonry slopes upwards into the end wall D, B, in such manner that the hot air may issue by an aperture extending from the border *b, c*, to the corresponding part of the end wall D, B. Figure 5 is an elevation in a vertical section thro' the length and middle of the hotter parts of the kitchen. A, B, is the bottom of the 35 mason channel; the shading at A, C, and B, D, shews the masonry of the end walls. The dotted square E shews the place of the doorway of the stove. The dotting *a, b, c*, shews the diameter and course of that part of the flue tube from the elbow at *b* to the juncture at *a, c*, with the semi-cylindrical flue tube; the narrow deeply shaded stripe *d, e*, shews the height and course of the great flat

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iron plate which covers the corresponding part of the mason channel, and also constitutes the top plate of the stove *f, g, h, i, k, f*. The lines *f d, d a*, and *c g*, shew the length and vertical diameter of the semi-cylindrical flue tube, which is of the same piece or substance with the covering plate *d, e*, and which, between *d* and *a* becomes cylindrical to fit the cylindrical flue tube at *a, c*. Above the plate *d, e*, the plate *l, d*, covers in the corresponding part of the mason channel, and gives the interval which the Figure shews between this covering plate *l, d*, and the flue tube *a, b, c*; the continuation of the mason channel from this anterior part of the kitchen to the posterior part is covered in with plates or slate at the height *l, d*, or any greater height that may be preferred for particular purposes. The space *i, e, m*, is that by which the heated air ascends, but by metallic or wooden sides and ends and roof a space is inclosed from *C, D*, to *G, F*, and by this inclosure the hot air is determined to flow from the aperture *e, m*, along the iron covering plates *e, f, l*, and to pass off by a trunk *G, I, K, H*, of which the aperture, whatever be its form, is to be nearly equal to that at *e, m*; the dotted circle concentric to *o* shews the place at or near which meat or other things may be roasted, either stationary or revolving on a spit or axis *o*, and hereabouts the heat is fittest for baking or broiling quickly, either on a shelf above *O* or on the plate. For cooking things which require not more heat than that of boiling water, it is sufficient that they be contained in close covered vessels placed on tripods or tiles in the current of hot air from *e, m*, to *G, H*. For cooking things which require to boil quickly, or which will bear a greater heat to be applied to the vessels in which they are contained, these vessels are to be placed with flat bottoms in full contact with the plate *d, e*, or the plate *l, d*; the small square *n*, and the small square *p*, mark the place of the upright bar by which roof or ceiling *H, F*, is supported, and by which are to be hinged two of the shutters of this side of the kiln. A shutter hinged by *F, D*, meeting a shutter hinged by *n, p*, closes so much of this side of the kitchen, and similar shutters, hinged by *G, l*, and *n, p*, close the remainder of this side of the kitchen. This Invention will serve divers other uses of the hot plates or of the hot air with considerable economy of the fuel, and the air so heated may be led to many additional uses to warm or to dry in places at any convenient distance from the kitchen. When this Invention is to be applied chiefly to the purpose of heating air, and of delivering a current of heated air to warm and ventilate laundries, rooms, edifices, or any other places, or to warm or to dry bodies either near the structure or at any necessary distance from it, the structure will consist chiefly of the parts which lead in and heat the air, and of an inclosure much shallower than that shewn by *C, G, F, D*, or which may be sufficient for the current of hot air from *e* to *l*, and to a trunk above *l*, by which

FIGURE 1.



Scale of two feet in an inch.

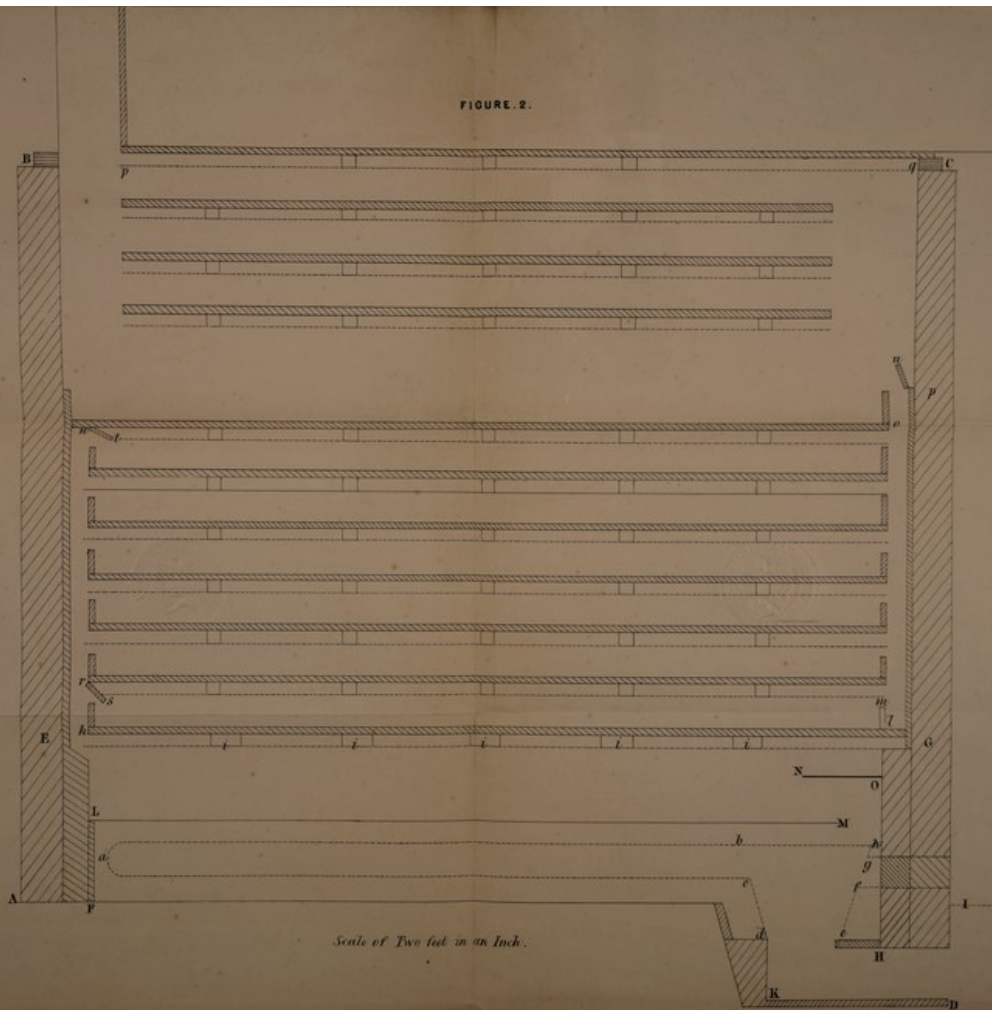
The enrolled drawing is not colored.

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Walter & Sons, 1, 10

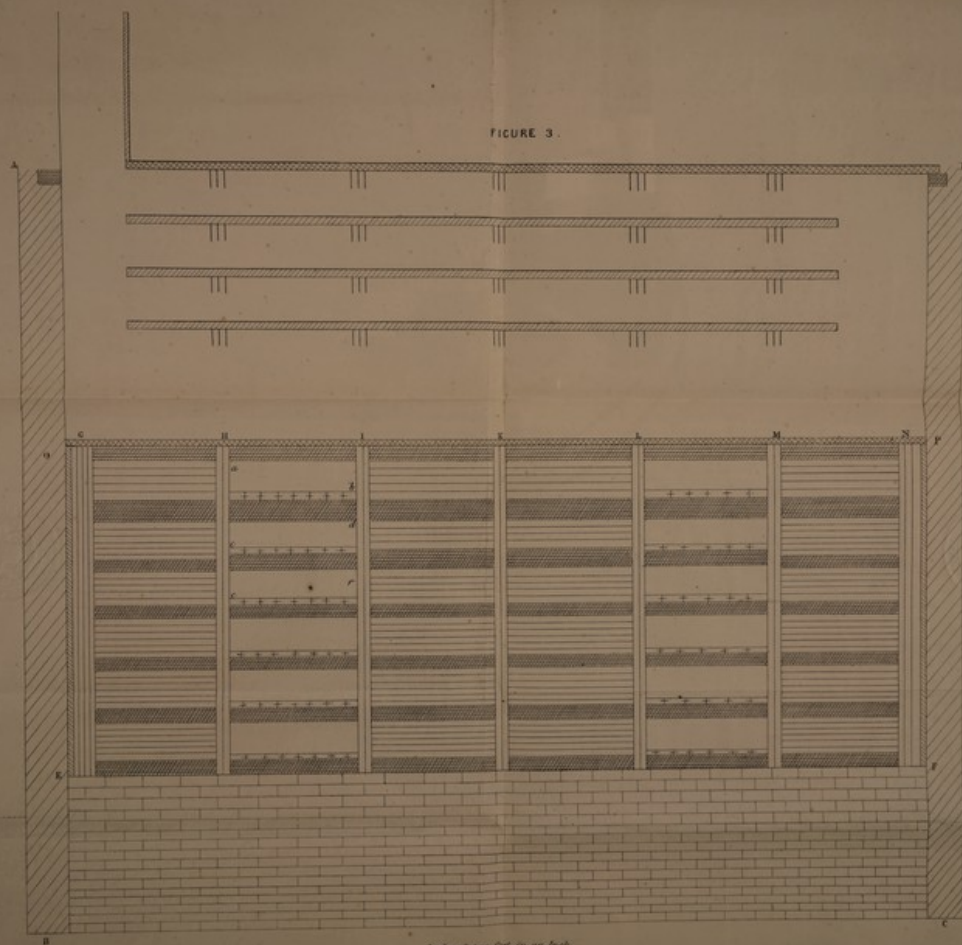


FIGURE 2.



The enrolled drawing is not colored.





The enrolled drawing is not colored.

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Printers, in the Strand, near FLEET STREET, 1802.

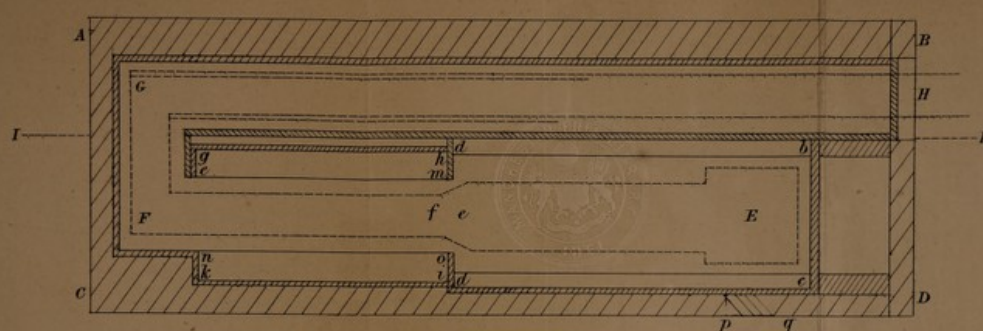
Mulby & Sons. Eds.



A.D. 1802. FEBRUARY 19. N^o 2583.

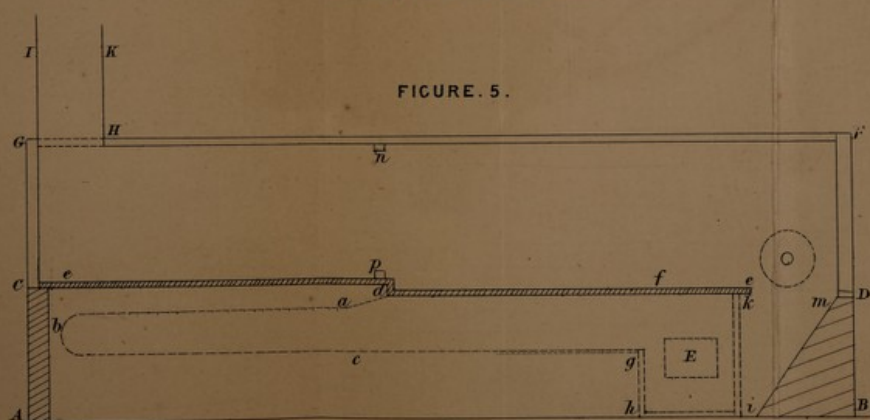
HIGGIN'S SPECIFICATION.

FIGURE 4.



Scale of a Foot in an Inch.

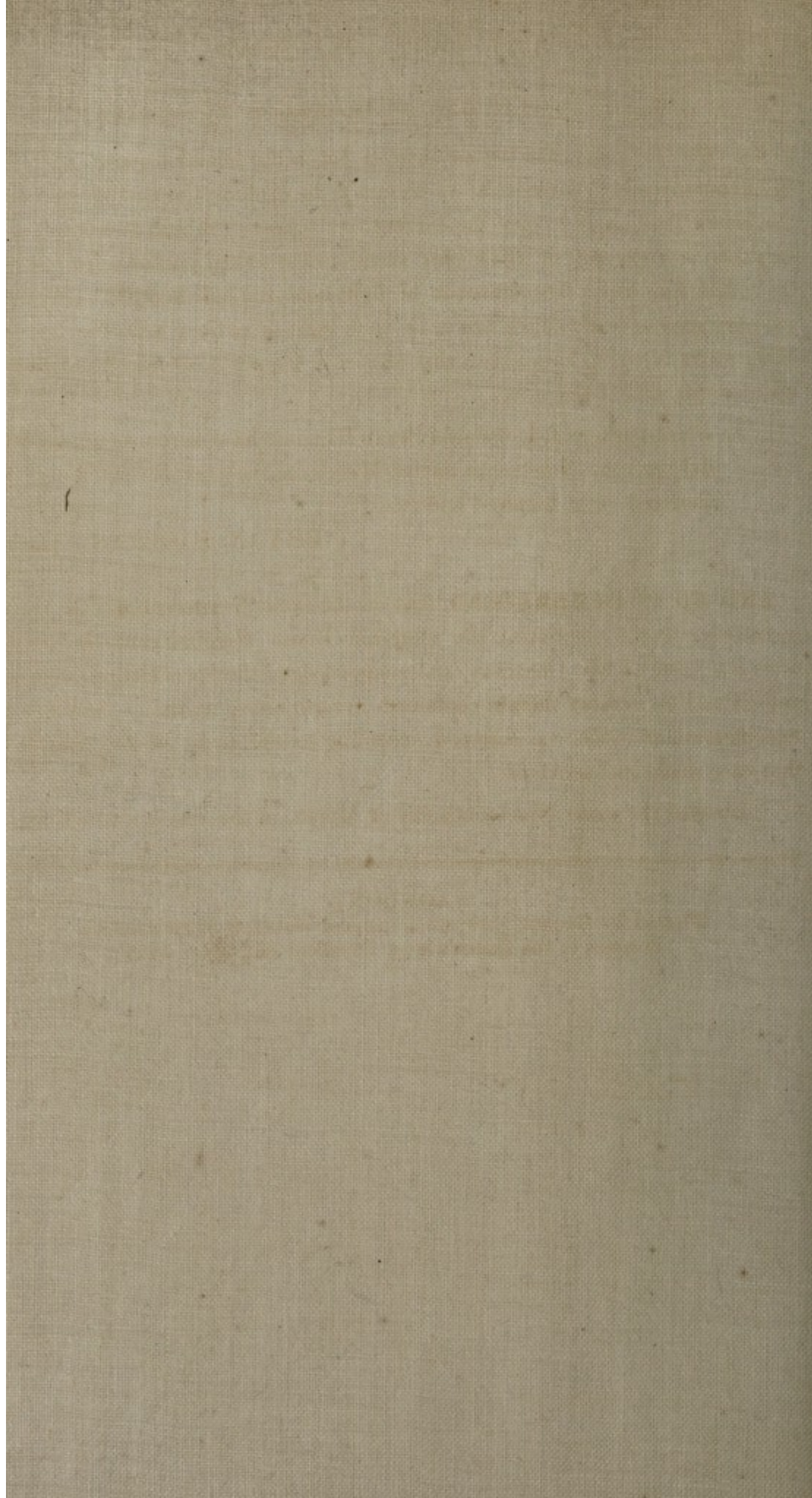
FIGURE 5.



The enrolled drawing is not colored.

Malby & Sons, Lith.

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Higgins' Improved Kiln, or Apparatus for Heating Air.

trunk, duly continued, the hot air is to be led to the intended places and uses, and generally such places ought to be made to exclude the cold air, to admit the hot air freely, and to give the current free egress. When such kitchen or structure is moreover to allow easy access to the naked fire, or a full view of
 5 the naked fire, and a free emission of light and radiant heat, for any of the ordinary uses of such naked fire or of such light or radiant heat, the doorway of the stove is to be larger than that shewn in Figure 5, or may be almost as wide as this side of the stove.

10 In witness whereof, I, the said Bryan Higgins, have hereunto set my hand and seal, the Nineteenth day of March, in the year of our Lord One thousand eight hundred and two.

BRYAN HIGGINS. (L.S.)

15 **AND BE IT REMEMBERED**, that on the same Nineteenth day of March, in the year above mentioned, the aforesaid Bryan Higgins came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the same Nineteenth day of March, in the year above written.

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