

**Specification of Jean Frederick Marquis de Chabannes : apparatus for ventilating apartments, ships, &c., and for promoting draught in flues, &c.;**

**Contributors**

Chabannes, Jean-Frédéric de, marquis de Curton, 1762-1836.

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A.D. 1817 . . . . . N° 4192.

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

OF

JEAN FREDERICK MARQUIS DE  
CHABANNES.

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APPARATUS FOR VENTILATING APART-  
MENTS, SHIPS, &c., AND FOR PROMOTING  
DRAUGHT IN FLUES, &c.

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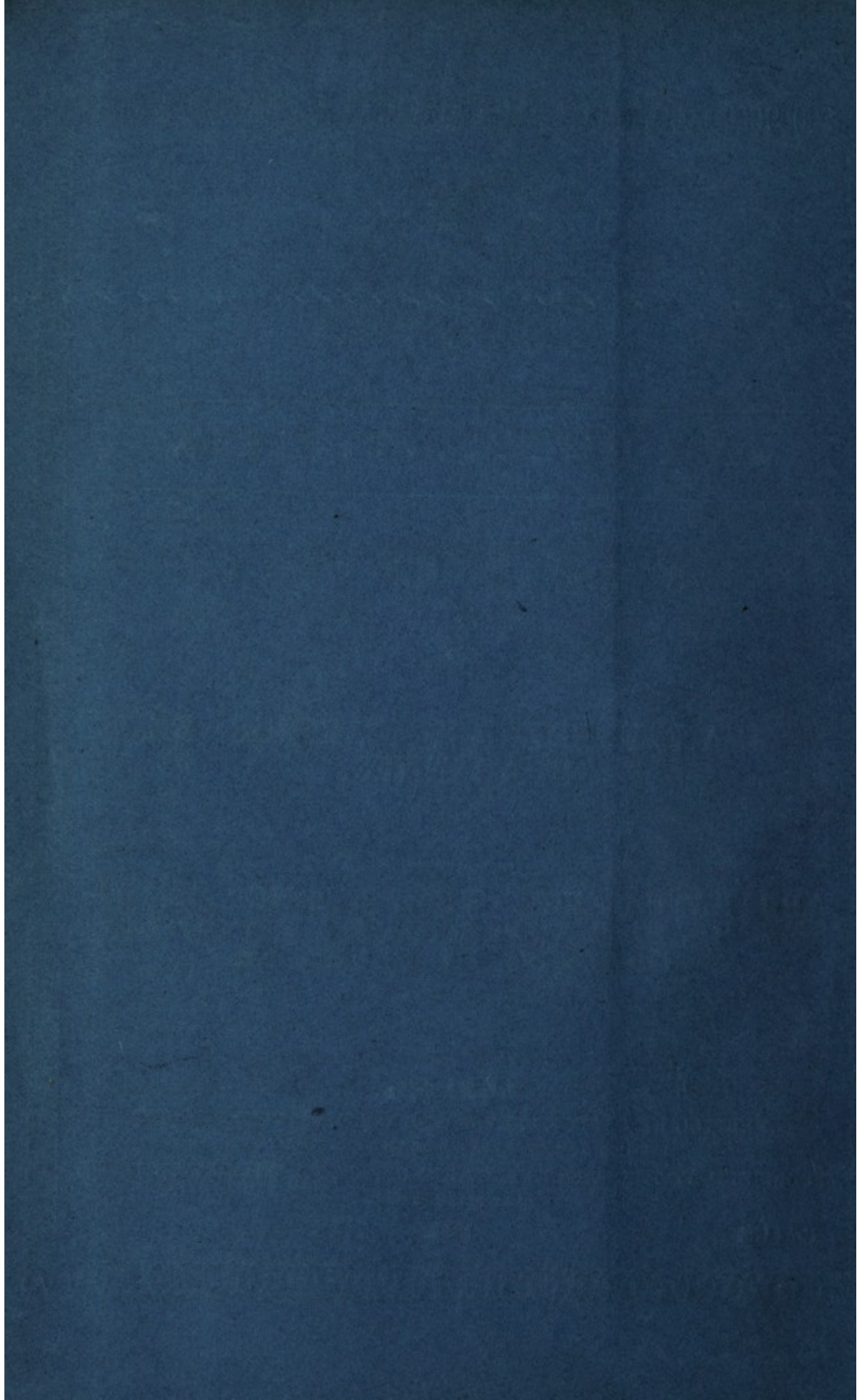
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Apparatus for Ventilating Apartments, Ships, &c., and  
for Promoting Draught in Flues, &c.

THE MARQUIS DE CHABANNES' SPECIFICATION.

TO ALL TO WHOM THE PRESENTS SHALL COME, I, JEAN FREDERICK  
Marquis DE CHABANNES, send greeting.

WHEREAS His present most Excellent Majesty King George the Third,  
did, by His Royal Letters Patent, under the Great Seal of Great Britain,  
5 bearing date at Westminster, the Nineteenth day of December, in the fifty-  
eighth year of His reign, give and grant unto me, the said Jean Frederick  
Marquis de Chabannes, my executors, administrators, and assigns, His especial  
licence, full power, sole privilege, and authority, that I, the said Jean  
Frederick Marquis de Chabannes, my executors, administrators, and assigns,  
10 during the term of years therein expressed, should and lawfully might make,  
use, exercise, and vend, within that part of the United Kingdom of Great  
Britain and Ireland called England, the Dominion of Wales, and Town of  
Berwick upon Tweed, and also within the Colonies and Plantations abroad,  
my improvements upon the Invention for which Letters Patent were granted  
15 to me, the first bearing date the Sixteenth day of January, in the fifty-fifth  
year of His present Majesty's reign, and the second bearing date the Fifth day  
of December, in the fifty-sixth year of the same King, which improvements  
are applicable to the purposes of "WARMING, COOLING, AND CONDUCTING AIR IN  
HOUSES AND OTHER BUILDINGS, AND ALSO OF WARMING, COOLING, EVAPORATING,  
20 CONDENSING, AND TAKING THE RESIDUUM FROM LIQUIDS, AND TO OTHER USEFUL  
PURPOSES," and are partly of my own invention and partly communicated to  
me by a foreigner residing abroad, in such manner as to me, the said Jean  
Frederick Marquis de Chabannes, my executors, administrators, and assigns,  
should in our discretion seem meet; in which said Letters Patent is contained  
25 a proviso that if I, the said Jean Frederick Marquis de Chabannes, should  
not particularly describe and ascertain the nature of my said improvements.

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and the manner in which the same are to be performed, by an instrument in writing under my hand and seal, and cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted, 5 should utterly cease, determine, and become void, as in and by the said recited Letters Patent, relation being thereunto had, may more fully and at large appear.

**NOW KNOW YE**, that in compliance with the said proviso, I, the said Jean Frederick Marquis de Chabannes, do hereby declare that my said 10 improvements are particularly described and ascertained in the Drawings hereunto annexed, and the following description thereof and references thereto (that is to say):—

My improvements upon the conducting of air consist in making use of any lamp operating as an air pump for ventilating bed rooms or other apartments, 15 (not as hath already been done in different lamps by a single tube, to take off merely the smell and smoke of the burner itself,) but by employing the heat produced by it so as to obtain a rarefaction, and cause a current of air thro' a double box or other contrivance to that effect. This rarefaction breaking the equilibrium of the atmosphere, establishes a current which affords sufficient 20 ventilation for a single apartment. See Plate 1, Fig. 1; (*a*), lamp, reflecting light into the chamber; (*b*), aperture thro' which the vitiated air passes into the flue or tube conducting it out; (*c*), passage for the smoke of the lamp; (*d*), tube in which the rarefaction is occasioned by the heat of the lamp, and drawing off the impure air of the apartment thro' the aperture (*b*). Also in 25 placing a box in the upper part of the apartment, having a communication with the flue, which I denominate a ventilating box. See Plate 1, Fig. 2; (*a*), damper, moving at will, so as to give more or less draught in the chimney or more or less ventilation; (*b*), damper, to prevent the smoke coming into the apartment when the fire is first lighted; (*c*), the damper down, shutting up the 30 flue when there is no fire. The effect of this part of my improvements is to procure a very powerful ventilation when fire is lighted in the chimney below, and affording the means of regulating at pleasure the size of the said opening for ventilation, so as to increase or diminish its power. For ventilating apartments wherein fire is not lighted, and for drawing the air in any chimney, 35 which is also a remedy against the effect of the wind, I make use of the chimney ventilator described in the Specification of my former Patent, with either a single or double cone, or of the improvement thereon shewn in Plate 1, Fig. 3; (*a*), chimney flue; (*b*), arrow indicating from what quarter the wind blows;

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(*c, c, c, c*), arrows shewing the direction the wind takes after it comes in contact with the inclined plane (*d*), by which means a vacuum is caused at (*e*), which facilitates the issue of the smoke or air, and causes it to go off in the direction shewn by the arrows (*f*). This ventilator, from its construction, draws a  
5 current of air thro' any opening made from the upper part of the apartment into the chimney flue or thro' any opening or tube having a direct communication with the said ventilator, and when there is not wind sufficient to make it act I adopt, either in the chimney flue or in the tube attached to the said ventilator, a fire or lamp for the purpose of forcing a current of air upwards at  
10 all times, as see in Plate 1, Fig. 4. (*a*), inclined plane; (*b, c*), arrows, as in Plate 1, Fig. 3. For all large buildings I make use of a ventilating furnace, operating as an air pump, see Plate 1, Fig. 5; (*a*), fire-place; (*b*), pyramid for supplying the coal; (*c*), ash pit; (*d*), flame and smoke acting on the circumference of the air pipes (*e, e, e*), which are in immediate contact with the  
15 fire; (*f*), flue for the smoke to pass off; (*h*), recipient to receive the air from any part of the building before it enters the pipes (*e, e, e*); (*l*), flue in which the foul air passes off, and is aided in its ascent by the heat of the smoke flue (*f*) which envelopes it. The object of this part of my improvements is to draw off the impure air from any part by means of the rarefaction produced  
20 in the pipes which compose the furnace by the heat of the fire acting upon their circumference, and may be effected either by one single conductor leading from the part to be ventilated to the air chamber of the said furnace (let the distance be ever so great), or by various conductors leading to the same point from the different situations where more than one are required to be ventilated. The  
25 above-described furnace and the conductors leading to it may be used either collectively or separately for ventilating mines, &c. For ventilating ships I make use of the kitchen, cabin, or any other fire-place, which I cause to act as an air pump, adapting to it the principle of the conductors by drawing the foul air from the lower part of the vessel and causing a constant renewal of fresh air to  
30 replace it. See Plate 1, Fig. 6; (*a*), fire-place; (*b*), tube carrying off the smoke; (*c*), double tube in which the rarefaction is procured, and by means of a pipe (*d*), carried down the side of the ship to any part where ventilation is required, drawing the foul air up and consequently procuring a constant renewal of fresh air to replace it. The mechanical power that I employ or  
35 make use of to draw the air out, and which I denominate (a ventilating air pump), is similar to a winnowing machine, and for which I only claim its application as an air pump for the ventilation of all buildings or places where men or animals respire. I do also claim the application of the winnowing machine to draw out air from any chimney, flue, or any place where smoke

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is caused to pass, which principle I have already specified in my former Patent. And in drawing the air by this means I conduct it either under ground or in any required direction or places, to any extent, and by causing it to pass thro' a rain or any cold medium the smoke it contains is condensed and falls to the bottom. My improvements upon warming air consist in applying my appa- 5  
 ratus to different purposes to which they may be applied, and which are not mentioned in the Specification of my former Patent. 1<sup>st</sup>, to kilns for drying corn, malt, hops, &c. I make use of a calorifere fumivore furnace similar in construction to the ventilating furnace above described, which with the additions hereunder described is applicable to the warming of buildings, and 10  
 which may be applied to a drying kiln, as in Plate 2, Fig. 1; (*a*), fire-place; (*b*), pyramid for supplying coal; (*c*), ash pit; (*d*), flame and smoke acting on the outer tubes; (*e*), tubes in which the grain is contained and dried; (*f*), inner tubes pierced with small holes into which a current of air is admitted at (*g*), evaporating and carrying off the steam from the grain in the 15  
 tubes (*e*); (*g*), admission of cold air to the tubes; (*f*), (*h*), valves which are open to discharge the grain underneath when dried, and which are shut during the time the grain is drying; (*i*), double tube affixed to the pipes nearest the fire to prevent the effect of too powerful heat on the grain; (*k*), floor from which the grain is thrown into the tubes (*e*). The same effect may also be 20  
 produced by employing pipes heated by liquid or steam instead of fire. 2<sup>nd</sup>, for ovens in general, I make use of the calorifere fumivore air furnace, and construct them in brick or iron, upon the plan of that seen in Plate 2, Fig. 2; (*a*), fire-place; (*b*), pyramid for supplying of coal; (*c*), ash pit; (*d*), flame and smoke acting on the air pipes in its passage to the oven 25  
 flue (*f*), thro' which they pass over the oven into the main flue (*g*); (*e*), tubes thro' which the hot air is admitted into the body of the oven; (*h*), body of the oven; (*i*), plate on which the loaves and articles to be baked are placed, and introduced into the oven at one end and taken out at the other at (*m*); (*k*), chamber for admission of air to the pipes; (*l*), small valve for evaporation 30  
 of steam from the bread, &c., and to proportion the quantity of warm air in the body of the oven; (*m, m*), door at each end of the oven to introduce and draw out the bread, &c. For warming carriages, rooms, and various situations where fire cannot be made, I make use of a calorifere box placed in different ways, according to the objects for which it is intended, see Plate 2, Fig. 3; 35  
 (*a*), the lamp; (*b*), pipes of air warmed by the circulation of heat and smoke from the lamp among them, as seen by the arrows which indicate their passage. Another object of my improvements in the warming and conducting of air is in applying warm air in lieu of vapour or steam, and which I denominate

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warm air bath, in which the temperature may be raised to a degree of heat which vapour and steam would not admit of without affecting the skin of the patient. The warm air bath may be used as a means of administering remedies thro' the pores, which the state of the stomach will not permit to  
5 be administered internally. And, 4<sup>thly</sup>, for warming air by steam, I make use of cylinders or boxes containing a number of air pipes, which present a larger surface to the contact of caloric than the double cylinder in present use. See Plate 2, Fig. 4; (a), cylinder or box into which the steam is introduced; (b), air pipes. Another part of my improvements in conducting of air is by  
10 placing what I denominate an air purifier at the place where the cold air enters; this purifier is composed of a box containing several slides of wire-work, each finer than the other, the bottom having the largest openings, by which means the air deposits in its passage thro' them the greatest part of the particles of dust with which it is loaded; see Plate 2, Fig. 3; (a), box with  
15 three slides; (b), one of the slides. My improvements upon warming liquids are applicable to boilers of every description; I place a tube attached to the upper part of the boiler, into which the more rarefied water will ascend, and carry this tube to any distance, according to the purpose intended, and return it at the lower part of the boiler, as seen in Plate 3, Fig. 1; (a), boiler;  
20 (b), tube by which the water ascends; (c), tube communicating with the bottom of the boiler at one end and with the tube (b) at the other, by which, after the water has been conducted to the parts wanted, it returns to the boiler, thereby producing a continual circulation of water thro' the boiler and the various apparatus for different purposes which may be connected with it;  
25 the idea of this part of my improvements is what was communicated to me from abroad, but which I have subsequently improved in a very considerable degree by my own experiments. Also to heating a greater quantity of liquid from the same fire, and procuring from it a power of steam for other purposes, I make use of the said boiler and tubes, and cause the upper tube, into which  
30 the rarefied water ascends, to communicate with a main tube or cylinder above, and connected with a number of additional boilers, either of the same or different shapes, and these boilers being joined to a main tube or cylinder below, from whence the tube or the continuation of the tube originally issuing from the upper part of the main boiler, is returned to the lower part, as before  
35 described, for the purpose of effecting a constant circulation of water thro' the boiler immediately in contact with the fire and the different apparatus which are or may be connected to it. Plate 3, Fig. 2: (a), pipe communicating from the top cylinder to the boiler; (b), five separate boilers, on the entire circumference of which the flame and smoke act, and connected to the top cylinder



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by five separate pipes (*c, c, c, c, c*), and by the pipes (*d, d, d, d, d*) to the bottom main (*e*), which has a communication with the boiler at its lower part; (*f*), chimney flue; (*g*), damper to regulate the draught; (*h*), damper kept open till the fire is perfectly lighted; when it is shut it causes the smoke to descend at (*i*) and to ascend at (*k*), and thence pass into the flue (*f*). Also 5  
for boilers of every kind, according to their situation and purpose, I make use of the reversed flame, as described in the Specification of my former Patent, and introduce it into the liquid by employing an independent boiler, which from its construction forms the pyramid or box containing the coal; I also make use of a moveable air grate, raised or lowered by means of a rack or 10  
otherwise, so as to lessen or increase the body of fire at pleasure, which has never before (to my knowledge) been practised in a boiler; see Plate 3, Fig. 3; (*a*), boiler surrounding the fire; (*b*), second boiler, forming and in lieu of the pyramid; (*c*), fire-place; (*d*), issue to the flue; (*e*), rack joined to the grate, which by means of a pinion (*f*) may be raised or lowered at pleasure; 15  
(*g*), opening underneath the boiler to clean out the ashes; (*h*), opening by which the fire is lighted and air may be admitted when wanted; (*i*), pipe by which the heated liquid escapes, and re-enters thro' pipe (*k*) at the bottom of the boiler; (*l*), pipe by which the heated liquid from the pyramid escapes to re-enter by the pipe (*m*), and descending to the bottom causes 20  
the same circulation described in the other boilers. I also make use of a boiler, with or without the reversed flame, composed of different pipes connected together, either forming a square, round, or oval stove or fire-place, and by the fire acting on the circumference of the pipes composing the stove, stoves, or fire-place, I introduce more heat into the pyramid than a boiler 25  
which presents only a flat surface. In case I want to apply it to produce steam as a power, I place another vessel over the same or in any way or position that may be deemed the most convenient for the purpose wanted, into which I introduce the heated liquid, and at the bottom I place a pipe communicating with the bottom of the boiler, but in some cases I omit this pipe, 30  
as may be thought proper, both of which I believe will be perfectly understood by the following description, see Plate 3, Fig. 7, 8, and 9; (*a*), tubes or pipes surrounding the fire and communicating with each other by the boxes (*b*), seen in each corner; (*c*), pipe in which the heated liquid ascends into the vessel; (*d*), (*e*), pipes by which the liquid returns to the boiler at the bottom; 35  
(*f*), floater which acts upon the valve (*g*) to supply the water; (*h*), cistern to supply the boiler; (*i*), pipe communicating to the bottom of the boiler; (*k*), grating; (*l*), ash hole; (*m*), flue by which the smoke goes off; (*n*), door to supply the fire with coal when the steamer (*d*) is applied; (*o*), case of cast

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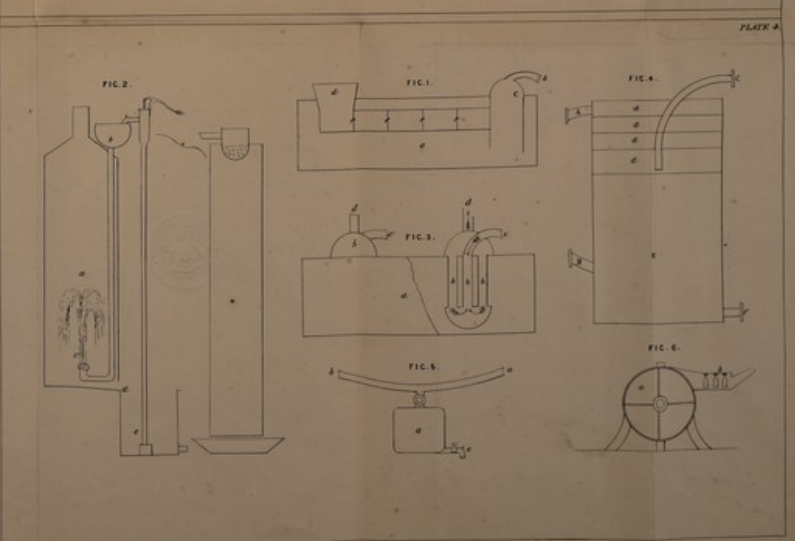
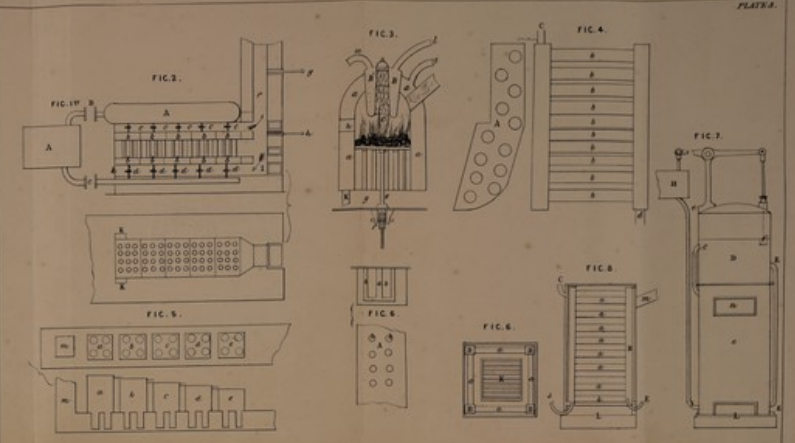
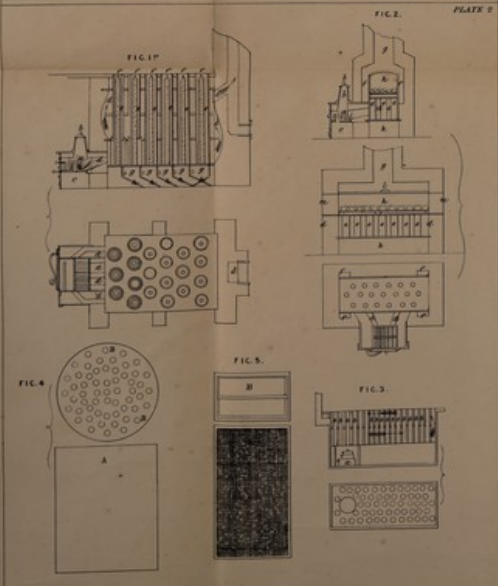
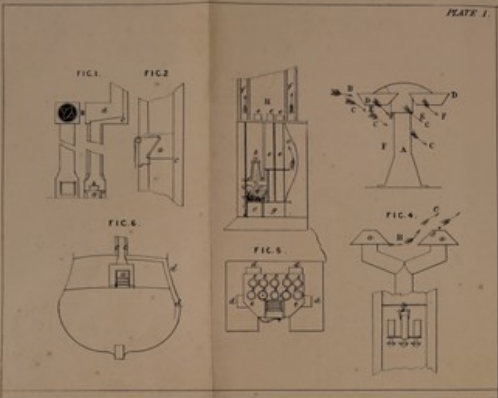
iron, brickwork, or any other proper materials, forming the outside coating of the boiler. Fig. 8, side view of the boiler without its outside coating; Fig. 9, ground plan of the same. The coal is either supplied by the top when the vessel (*d*) is not made use of, or by the side, by suppressing of the upper pipes, 5 or others, to leave a sufficient opening for the supply of coal at (*n*). For small boilers behind kitchen ranges or otherwise, I make use of different pipes, so placed as to form a boiler or boilers of themselves, as seen in Plate 3, Fig. 4; (*a*), section of the pipes; (*b*), pipes; (*c*), tube by which the rarefied liquid goes out; (*d*), tube by which the liquid re-enters, and I place the same 10 either behind or at the side, top, or bottom of a kitchen range or any other fire-place in lieu of boilers of the present shape. The tube herein-before described, and issuing from the upper part of the said boiler and returning to the bottom, and causing a continual circulation of the water, may be used or not at pleasure. This pipe returning to the lower part of the boiler may 15 also be applied to various apparatus for various purposes. For heating liquids in different boilers or pipes which are not in contact with the fire or connected to the main by the upper pipe, but which are placed above and serve as reservoirs for supplying the main boiler, I make use of the heat and smoke escaping into the flue, and which would otherwise be lost, by placing these 20 different boilers or pipes in the flue, which obstructing the passage of the smoke extract from it the greater part of the caloric with which it is charged. These boilers should be gradually elevated one above the other, so as to cause a continual fall of water, that before it reaches the main boiler it may be nearly in a boiling state; see Fig. 5, Plate 3; (*m*), flue in which are placed 25 the boilers (*a, b, c, d, e*), each supplied the one from the other, and in which the liquid acquires by degrees more heat as it approaches the main boiler, or I place a plate on the top of the flue in which I place pipes, connected or independent of each other, which when filled with water produce a damp heat very favorable to the growth of plants; see Plate 3, Fig. 6; (*a*), a common 30 flue; (*b*), pipes placed in the flue at will. My improvements upon evaporating, condensing, cooling, and taking the residuum from liquids are as follow:—For evaporating liquids, if the fire is continued, or for cooling liquids, if the fire has ceased to act upon them, I cause a current of air to pass thro' the liquid, either drawn up by a pump, as seen in Plate 4, Fig. 1, or forced 35 thro' the liquid by a pair of bellows, as seen in Plate 4, Fig. 4, hereafter described. Plate 4, Fig. 1; (*a*), vat containing the warm liquid; (*b*), tube communicating with a mechanical air pump; (*c*), vessel to which this tube is attached and in which the vacuum is caused by the action of the pump, which draws the cold air from the aperture (*d*), and causes it to pass thro' a

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tube (*e*) with several divisions in it pierced full of small holes (*f*), so as to divide the air into small portions, and thereby causing it to come into contact with a greater surface of liquid, from which it extracts the caloric. Or I make use of the apparatus, as seen in Plate 4, Fig. 2, to divide it into a sort of rain, so as to cause it to pass thro' a current of air; (*a*), evaporating and cooling 5 vessel. The liquid being admitted at (*b*), its own weight causes it to issue at (*c*) in a kind of mist or rain; (*d*), opening to let the liquid into the reservoir (*e*), from whence the pump (*f*) returns it into the vessel (*b*). For taking the residuum from liquids I make use of a receiver below the pipe returning to the bottom of the principal boiler; this receiver is connected with the said 10 pipe by a cock, which being open, the liquid as it passes deposits the residuum or heavier parts into this receiver, from whence such parts are drawn off by another cock; see Plate 4, Fig. 5; (*a*), end of the pipe coming from the top of the boiler or boilers; (*b*), end conducting it to the bottom of the same; (*c*), cock to shut off the communication with the boiler when you want to 15 draw out the residuum from the receiver (*d*) by the cock (*e*). I also make use of a reservoir below the tube returning to the boiler to draw off the residuum of such liquid, as seen in Plate 4, Fig. 4; (*a*), pipe communicating to the top of a boiler; (*b*), pipe communicating with the bottom of the boiler; (*c*), a pipe communicating with a pair of bellows or air pump, by means of 20 which the air is forced into the liquid at (*g*). (*d, d, d, d*), division plates pierced with small holes to divide the air into small portions, so as to bring the greatest quantity of air in contact with the water or liquids; (*e*), bottom of the receiver, in which the residuum of the liquids remains; (*f*), cock to draw it off when the cock in the pipe (*b*) is shut. For cooling wines or other 25 liquors in casks, bottles, or other cases, I cause a current of air to strike upon the casks, &c. intended to be cooled, as seen in Plate 4, Fig. 6; (*a*), wind machine to procure a rapid current of air in the box (*b*), in which the objects to be cooled are placed. For the cooling of the air in any place whatever I force it either to pass thro' water or to come in contact with a shower of rain 30 similar to that described in Plate 4, Fig. 2, or I introduce a shower of rain or mist into any part of an apartment or place intended to be cooled; I then make use of the air pump to draw out the air or to cause its admission, in which case I cause it to pass thro' a shower of rain or in contact with ice or any other cold medium. 35

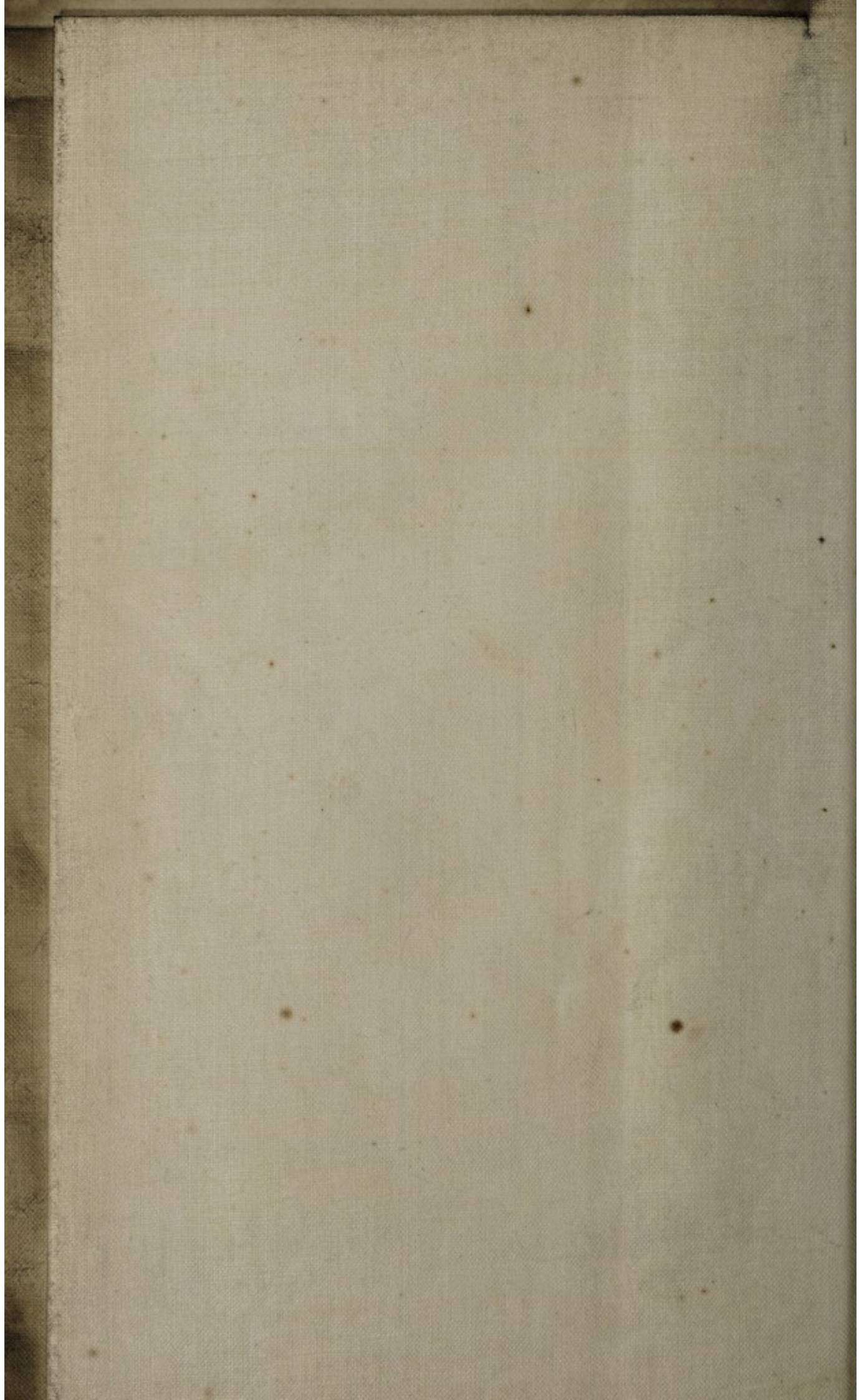
In witness whereof, I have hereunto set my hand and seal, this Eighteenth day of June, in the year of our Lord One thousand eight hundred and eighteen.

(L.S.) CHABANNES.



The enrolled drawing is partly colored.

LONDON: Printed by GEORGE EDWARDS STYER and WALTER SPENCERWOOD,  
Printers to the Queen and Lambeth Station, 1817.



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AND BE IT REMEMBERED, that on the Eighteenth day of June, in the fifty-eighth year of the reign of His Majesty King George the Third, the said Jean Frederick Marquis de Chabannes came before our said Lord the King in His Chancery, and acknowledged the instrument aforesaid, and all and  
5 everything 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 His said Majesty's reign.

Inrolled the Eighteenth day of June, One thousand eight hundred and eighteen.

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LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1854.

The following table is taken from the Report of the Committee on the State of the Union, 1817.

AND OF THE DEBTS OF THE UNITED STATES, AS FAR AS THE PUBLIC DEBTS ARE CONCERNED, AT THE END OF THE YEAR 1816. The total amount of the public debt at the end of the year 1816, was \$10,000,000. The amount of the public debt at the end of the year 1817, was \$10,000,000. The amount of the public debt at the end of the year 1818, was \$10,000,000.

TABLE

TABLE OF THE DEBTS OF THE UNITED STATES, AS FAR AS THE PUBLIC DEBTS ARE CONCERNED, AT THE END OF THE YEAR 1816.

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