Explanation of a new method for warming and purifying the air in private houses and public buildings : for totally destroying smoke, for purifying the air in stables, and every kind of buildings [sic] in which animals are lodged.

Contributors

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EXPLANATION

OF A

NEW METHOD

FOR

WARMING AND PURIFYING THE AIR

IN

PRIVATE HOUSES

AND

PUBLIC BUILDINGS;

FOR

TOTALLY DESTROYING SMOKE,

FOR

PURIFYING THE AIR IN STABLES,

AND

EVERY KIND OF BUILDINGS IN WHICH ANIMALS ARE LODGED.

LONDON:
PRINTED BY SCHULZE AND DEAN,
13, POLAND STREET.
AND SOLD AT THE PATENTEE'S LICENSE OFFICE, 56, HOWLAND ST., FITZROY SQR.; AND AT ALL BOOKSELLERS.

1815.

Price One Shilling and Sixpence.

EXPLANATION

OF A

NEW METHOD

FOR

WARMING AND PURIFYING THE AIR IN HOUSES,

&c. &c. &c.

EVERY one knows that air, being breathed, is deprived of its vital base, and is, in that state, unfit for respiration. The danger of dampness and currents of air, in rooms, is equally well known. There are few persons who have not experienced the painful sensation arising from an immediate transition from a warm room to one which is cold, and who has not been often pained by the inequality of temperature, in an apartment where a large fire is kept. The suppression of these four principal causes of the greater part of our diseases, must, undoubtedly, be esteemed an universal benefit. Stimulated by the hope of discovering a remedy for them, the Inventor has put in prac-

tice every possible means to arrive at this desirable end. Although he believes that he has completely succeeded, yet he has not had that confidence in his own opinions which supersedes the fear of drawing other persons into errors, which he himself might eventually, and against his own knowledge, have adopted: he has desired, therefore, before he made the invention public, to submit it to the inspection of the most celebrated Physicians, Chemists, medical Gentlemen and other scientific characters of the Metropolis; also, to Architects and Fire-Insurance Companies, to examine the principles upon which this is constructed, with regard to health, safety and economy.

To the Physicians and Medical Gentlemen in London.

GENTLEMEN,

I BEG leave to invite you, personally, to examine a method, I purpose to submit to the Public, for warming and rendering houses more salubrious. Permit me to lay before you a succinct explanation of the principles, the application of which, I trust, will meet your approbation; you will then be better able to judge of the success attending the means I have employed, and you will also comprehend, much better, the details I shall enter into when you shall please to honor me with your visit.

Nothing would tend so much to the salubrity of dwellings as the expulsion of miasmata, more or less putrid, which arises from our breathing and perspiring, especially in bedrooms. The exclusion of damp air, the avoiding too sudden a passage from a warm to a cold room, and the

guarding against obnoxious currents of air, (all of which are causes of numberless diseases), are the objects I have endeavoured to attain, and, I trust, I have completely succeeded.

Air, being the great agent of our existence, on its purity depends, in a great degree, our health, and all the comforts of life. Every one knows that, wherever man breathes, the constant introduction of fresh air is indispensible, and that the breathing of tainted air produces langour, decay, and. finally, death. The experience of all ages bears evidence of its influence on health and longevity. Under these considerations I apprehend, Gentlemen, you will be of opinion, that an efficacious method of purifying it and regulating its admission, at pleasure, into your dwellings, is a most desirable object, and a most beneficial discovery. I consider this object as effectually obtained; and, I trust, should you honor me with a visit, that, by examining my apparatus, you will find in it sufficient ground to sanction it by your approbation.

PURIFICATION OF THE AIR.

The means I employ are simply these:—I have placed a Ventilator on the roof of my house, which I call an Air Pump, as it must continually draw up and let out from the interior the rarefied air, which by its own nature and lightness, is apt to rise; by which, means a constant renewal of it is obtained. This Ventilator, by a single tube, leads to a box, with which all the bed-rooms in the 3d and 2d floors have a separate communication, by a pipe, of which one extremity passes through the ceiling of each bed-room. In this manner, during night, the exhalations sent forth by the human body, proceed towards it and are carried off by that channel: fresh air is immediately drawn up and admitted by the apertures of doors and windows

or, as experience has taught me, to be preferable, by a communication to the bed-rooms, through the drawing-rooms and parlours, from a low room, which I call a Recipient of Air, into which I admit the external air. It must necessarily follow that when the exterior temperature does not allow the windows to be left open, the Recipient below must answer the call for fresh air made by the Ventilator above: thus fresh air flows in almost imperceptibly, but yet with rapidity enough to carry off all the tainted air which may have collected in the rooms. In cold weather the mildest temperature will be enjoyed within doors by heating the air in the Recipient, and nothing is more easy.

Another effect, and which no class of men has so much an interest to investigate and appreciate as you, Gentlemen, is that, by the Recipient, all the purposes of pneumatic medicine may be served. In it any artificial atmosphere may be made, and will then ascend into the apartment of the invalid.

A simple objection may be offered, and I will, beforehand, answer it. I may be told that the ordinary chimney acts as a ventilator. in each apartment, and answers the purpose which I propose, by the new contrivance, for the renewal of the air. Now, the chimney does not answer the purpose at all, and for this reason: in a room, the air which is most heated, always rises to the ceiling, while the cold air, coming in by the door or windows, lies in the lower part. The air which has been heated in breathing, therefore, rises, and the pure air remains below. Now, only the air which is below the level of the chimney-piece can enter the chimney, and this we have shewn is the pure air, while the higher air which has been breathed, or otherwise rendered impure, remains there and is breathed again and again, in the gradual descent which takes place as it cools.

PREVENTION OF DAMPNESS.

It is known that in certain sudden changes of weather and such as happen very often in this climate, in every room of a house where there is not a fire, the walls and furniture become damp and cold—when this affects the beds and clothing of the inhabitants it is a most frequent cause of rheumatism, and diseases of a similar nature.—In a house warmed, according to my plan, this occurrence can never happen.

EQUALITY OF THE TEMPERATURE.

There is hardly a single person who does not feel, in the interior of his house, how painful a sudden transition is from a warm room to a much colder one; the insalubrity of so disagreeable a change is also ascertained: to prevent it the only known way is to multiply the fires. The method I propose is far superior and more economical, it consists in managing the heat produced by a single fire, lighted in the lower part of a house, so as to warm all the rooms above at the will of its inhabitants.

SUPPRESSION OF DRAUGHTS OF AIR.

In an ordinary chimney not only does the small quantity of air necessary to feed the fire pass off, but a much larger quantity additional, as much, indeed, as can enter the chimney between the bottom of the mantle-piece and the fire. Now, it is this second and useless abstraction of the air, from the apartment, which produces the powerful draught of which we are sensible near the fire,—my contrivance prevents this altogether.

People in general, knowing that colds, stiff necks, rheumatisms, &c. are produced by draughts of air, are careful to avoid being placed between an open door and window, but the danger is not less when they are exposed to the

influence of a powerful fire on one side, and of the immense draught which tends towards it on the other.

In northern countries chimnies are not in use; they are looked upon as detrimental to health and deficient in point of heat; in England, with a milder climate, the cold weather is more felt, because proper means are not employed to guard against it.

Such are, Gentlemen, the four principles of which I wish to submit the application to your superior knowledge. I hope I have been sufficiently explicit in respect to them, and that when you shall do me the favor to examine the application, you will be perfectly satisfied with its simplicity and facility of execution, and with the little expence attending the whole process.

I have the honor to be,

Your most obedient servant,

Dec. 11, 1815.

No. 1, Russel Place,
Fitzroy Square.

The Marquis de CHABANNES.

In consequence of the invitation above-mentioned, a number of the most respectable characters in science and medicine, have examined the application of those principles which have been explained, and have unanimously subscribed (with the exception of four persons only) to the following Certificate :—

I have inspected the plan, proposed by the Marquis de Chabannes, for Ventilating Houses, and I account it more perfect than any other now in use, and therefore very important.

I have also considered his method of Warming Houses, which, with little expence, possesses the advantage of heating the air uniformly throughout

the house; thus preventing the possibility of injury from cold draughts and all sudden changes of temperature, and I find no objection to counterbalance these advantages.

The following is the Certificate signed by a number of Architects and Surveyors.

I have examined the Certificate, signed by several medical gentlemen and other scientific characters, and after having myself examined the process, I coincide in opinion with these gentlemen, and think it just to add, that by the means which the Patentee proposes to adopt, his plan will tend to improve future constructions, while it is easily adapted to those actually existing.

The Patentee sent an invitation to all the different Assurance Offices in town, but one gentleman only, of the County Fire Office, thought proper to come, and he authorised the Patentee to declare his approbation as to the safety of his apparatus. Two Surveyors of districts, in town, came and examined the premises with the whole of his apparatus. They came with the same views as was judged might induce the Assurance Offices to inspect them. They were fully satisfied as to the absence of danger, from fire, and requested to leave as a testimony of their approbation the above Certificate.

I have examined the Certificate, signed by several medical gentlemen and other scientific characters, I coincide in opinion with these gentlemen, and think it just to add that by the means which the Patentee proposes to adopt, the danger from fire is rather diminished than increased.

The originals of these certificates may be inspected by those who visit the dwelling of the Patentee.

The four gentlemen who declined signing it, testified their highest satisfaction at the different methods employed, and objected to sign it solely from their not knowing what were the different methods which might have been employed elsewhere, for Ventilation, and therefore judged themselves incapable of pronouncing the superiority of any one.

All the questions, observations and reflections which have been made during this inspection, and above all, the objection just now stated, elicit the following explanations :

It would be an error to imagine that because in such or such hospital, or any other place, Ventilation has already been found useful and established, that the bare adoption of the principle of Ventilation should in anywise interfere with the method here made use of.

In any Ventilator, whatever, hitherto established, the air sometimes enters and, at other

times, issues in the contrary direction, whenever it is acted upon by another impulse contrary to the direction which the current ought to take. This happens frequently in the ordinary methods employed, either by the effect produced by the fire and chimney; by a change of exterior temperature; by the rarefaction of the air in the apartment itself; in fine by the greater or lesser pressure of it, in the different states marked on the barometer. In a word, in every Ventilator hitherto established, the effect of it is abandoned to all the inconveniencies above stated; and, it may be added, purely to chance.

In the method here used, the aspiration and the issue of the air upwards is forced, be the air hot or cold, heavy or light, it must obey the impulse. If the windows are shut close and there be no issue to counteract the action of the pump, the air issuing from it must unavoidably be replaced (at least a great part of it) by that which passes through the reservoir, and in the same proportion as it goes out by the action of the pump. This principle once established, (and no one sure will attempt to refute it,) a constant and uniform Ventilation may then be established, without exposing persons to the perfidious currents of the air of chimnies, or to the variations in the exterior temperature; in fine, without exposing them to an hundred accidental causes of a disagreeable influence to which the common mode of Ventilation (if it deserves that name) is subject to.

It would be carrying prejudice too far to suppose that the air which, by this method, is carried forcibly towards the ceiling, can be breathed repeatedly; or that breathing can ever be oppressive, in a dwelling house thus constantly and uniformly Ventilated.

The pump communicates directly with a box, and every apartment communicates with this box. Each separate apartment has a slide, which opens, shuts or modifies this communication. The diameter of the pump must be proportioned to the size of the dwelling, and give the means of Ventilating each room as much or as little as the comfort of its inhabitants require, and certainly no mode of Ventilation, hitherto practised, has provided for any one of these advantages. The same principle is intended to be applied to stables and every kind of building appropriated to the use of animals. It will prove an admirable means to prevent the spreading of epidemical diseases among cattle, and wherever it is employed it will preserve them in health and vigour. *(See Note A)*

If there were still any persons who might doubt of the perfect circulation of the air, which is procured by the method here employed, they may themselves verify it in the Patentee's house, where the application of this principle is made, and where by examining the entrance of the air to the recipient and its issue by the pump, and also by remarking the degrees of heat on the thermo-

meters, placed in the separate apartments, they will be fully convinced that the following effects are produced:

1st. That there is a constant evaporation of the air which has been decomposed, whatever may have been the cause of its decomposition.

2nd. That there is a constant supply of fresh air to replace that which is decomposed.

3rd. That it is impossible for any damp to exist in the rooms, because the fire is kept in the reservoir every time that it is required, and the heated air, which proceeds from thence, communicating with all parts of the dwelling, and being never below the temperature of the external atmosphere, it meets with nothing cold enough upon which it might depose the water it holds suspended; it cannot produce that effect which is called humidity. In using this means it is evident that all air which is injurious to health is conveyed off by the pump, and its place is supplied by the reservoir; the dwelling must of course be more healthy, and be inaccessible to damps.

It now only remains to explain the manner in which is obtained an equality of temperature, and the suppression of those currents of air which are the common causes of many diseases and which are the inevitable effects of the system followed till now in the method of warming houses, and particularly in the use of stoves of the most

absurd construction that could be imagined to obtain that end.

Custom and habit have prevailed; there is even an unaccountable prejudice in favor of this method. Persons judge of the advantage of a fire stove by their eyes; it is deemed comfortable when they can burn themselves against such a fire, without paying any attention to the inequality of the temperature in every other part of the apartment.

It is remarkable that persons should not have considered the inconvenience arising from the quantity of air which passes through the opening between the fire and the mantlepiece, while they feel continually the rheumatic effects which the currents of cold air produce on the legs, the arms, the loins, and the rest of the body; yet a twentieth part of the air, which passes up the chimney, would be sufficient to renew all the air decomposed by the fire, lights and respiration. These considerations will readily convince any person of the error which prejudice has in some sort rooted in us with respect to the construction of our fire-places; and ought to be sufficient to convince any one that the greater the draught is above the fire, the more dangerous to health is the stove which produces it.

The description which has been given of the action of the air, through the recipient, and the apartments, to its issue by the pump (in the letter addressed to the Medical Gentlemen) sufficiently

indicates the means of suppressing all currents of air caused by chimnies, which are so injurious to health in our actual constructions. It shews clearly also the facility which it procures of regulating the temperature by a single fire in a calorifere-fumivore, which being placed in the recipient, suffices for procuring, in Winter, a spring or summer temperature. To satisfy, however, even prejudice itself, the Patentee has sought to accommodate either the fancy or the want of having a separate fire in an apartment with the indispensable basis of salubrity. For this purpose he has caused his calorifere-fumivores to be constructed on the following principles :

1st. To draw up, only, from an apartment the quantity of air sufficient to the combustion, and by this means to avoid the danger and inconvenience of currents of cold air.

2nd. To cause the air to act with vivacity on a small portion of fuel, and to consume every part of it which is susceptible of burning, by this means to give activity to the combustion, and unite the pleasure experienced by the sight of a brilliant fire, with the economy of fuel.

3rd. To seize the greatest quantity of caloric, on its passage to the chimney, and to render it back to the apartment, or to those adjoining or above it.

An object which may appear to some persons of a more striking interest still, for cities and large towns, and more especially for London, has been

obtained by the Patentee. Those clouds of smoke which often obscure the sky, and which, mixing with the vapours of our climate, lodge on our furniture and dress, dirtying every thing around us, will in future furnish useful chemical properties, or serve as a rich manure for the agriculturist. The same means which are employed to secure health and comfort, in our dwellings, will also purge the atmosphere from all residue produced by combustion. This is effected by causing the vent of every flue, for conducting smoke, to unite in a common centre, upon which an air pump exercises a constant action. A cistern, filled with water, is so placed that the air from the chimney flues is forced to pass through it, and consequently deposes in this medium every atom of matter it holds suspended; nothing, of course, can pass off into the common atmosphere but an elastic fluid, deprived of its noxious qualities.

This peculiar application of an air pump, simple in itself, will be, without doubt, esteemed of great importance to the general system of ventilation, inasmuch as there must result from its adoption stability in the health and growth of infancy; a diminution of the infirmities and sufferings of an advanced age, and an augmentation of comforts to every period of life. It will also finally prove of an incalculable advantage to the arts; as it may not only be applied in every situation where fire is required, but for extracting those chemical properties which are found in coals.

Such are the advantages which must result from the application of the mode and principles upon which this patent is founded. It only remains to describe the manner in which the Patentee intends to dispose of his privilege.

The Patentee, not having been brought up to commerce, and it being repugnant to him to injure any person who lives by his industry, by a monopoly; being desirous, also, to give the public every facility for using his patent, in order to render dwelling houses more comfortable and salubrious; he is therefore disposed to give licenses for the three kingdoms.

1st. To ironmongers; to make, sell, ornament and fix all the objects contained in his patents, (which concern in any way their commerce) such as the calorifere, the calorifere-fumivore, the portable calorifere, the same principle applied to cooking, to raising of the temperature in greenhouses and hot-houses, &c. also the chimney ventilator for removing the inconvenience of smoke, in all common stoves.

2nd. To architects, surveyors and builders; to direct all constructions which relate to his mode of Ventilation, (such as conducting the Ventilation in dwellings and buildings appropriated to the lodging of animals; the construction of the calorifere-fumivore furnace, establishing the air pump, and, in fine, all that relates to Ventilation) and to fix all other objects included in his patent, made by a licensed ironmonger.

3rd. To any individual who may himself desire, in his own habitation, to direct the purification of the air, and apply the means of salubrity practised by the Patentee. This license will authorise any one to employ such workmen as he may judge proper, in his own house, for every article of construction which relates to Ventilation.

The Patentee only requires a moderate compensation for the use of his privilege.

That the fruit of his reflections may become useful to society, is what he aspires to as his most valuable reward.

The entrance to the Office, for Licences, is No. 56, *Howland-street, Fitzroy-square,*

Where persons may subscribe for one, or for three years, or procure a ticket for a day, to be admitted to the house which the Patentee has fitted up on purpose, and where any one may verify the following facts.

REGULATION OF THE TEMPERATURE.

Whatever may be the exterior temperature, the apartments will be kept to the following degrees of heat. That is to say, in Winter,

The Ground Floor.

Monday, Wednesday and Friday, between 55 & 60
Tuesday, Thursday and Saturday, between 60 & 65

First Floor.

Monday, Wednesday and Friday, between 60 & 65
Tuesday, Thursday and Saturday, between 55 & 60

Second Floor.

Monday, Wednesday and Friday, between 55 & 60
Tuesday, Thursday and Saturday, between 60 & 65

Third Floor.

Monday, Wednesday and Friday, between 60 & 65
Tuesday, Thursday and Saturday, between 55 & 60

And in the hot days of Summer always under the exterior temperature.

There may be seen, in this house, models of all the stoves, and a list of persons licensed by the Patentee, for supplying the public; also, the operation of conducting the air and destroying smoke; as well as the demonstration of the impossibility that a chimney, upon this construction should ever take fire.

On particular stated days there will be exhibited a new method of heating and cooling liquids. *(See Note* B, *at the end.)*

(Note A.) It will not appear improper to observe here, also, that some ironmongers, confounding the principle upon which the caloriferes and calorifere-fumivores are founded, have said—Francklin, Walker, Rumford and others have used certain methods for rarefying the air. Jackson, Moser and Romilly, and all ironmongers after them have warmed the air and disseminated it in the apartments. To this is replied, that several centuries, even before Francklin, the rarefaction of the air by fire was known and practised in dwellings in Russia, Sweden, Germany and France; that it is not upon the principle of heating the air that this patent is founded, but upon a different application of this principle.

The basis upon which the patent for the calorifere rests, is to surround any open fireplace with air tubes. These tubes, open at both ends, are constantly heated upon their whole surface; the air passes in them with such ease and rapidity, that it carries off the caloric as soon as it is deposed, without injuring it, and without the possibility of its being decomposed.

The calorifere-fumivores are of a quite different construction. In these, the coals are contained in a box placed over the burning fuel in the grate. This box furnishes to it the quantity of coals necessary to supply a regular consumption. The smoke and gases, which are disengaged by its radiation from the surface of the coals, being placed immediately over the fire, have no other issue to the chimney but through a white heat, and in their passage, being acted upon by the surrounding atmosphere, are furnished with a sufficient quantity of oxigenic gas to complete their combustion.

The caloric which is produced by this process, is communicated to the apartments by the same means as that which is employed in the caloriferes. The fireplace is surrounded with air tubes which perform the office of collecting the heat and rendering it back to the air in the apartment where it is placed.

It has been said, also, that Franklin invented a method of burning fuel in a vase by a reversed flame, which burns the smoke. If Francklin's invention was a practicable one and offered any advantage superior to the common practice, why has it not been used? The fact is, that no one makes use of it, and that is a proof that either it offered no advantages above the common method, or his plan was an impracticable one.

The Patentee never knew that Francklin had constructed such an apparatus; but for these six years past he has made innumerable trials on the principle of the reversed flame, and could never succeed in rendering any method of that kind practicable; inasmuch as no material of any kind whatever can resist a long time the action of the heat so produced. He was of course obliged to abandon that principle and turn his reflections towards another method which might produce all the heat required. without possessing the insuperable inconvenience of Francklin's. In the numerous succeeding trials he was induced to make, and in which he has spared neither labour, nor expence, he has found none so completely to answer every purpose as that which he now employs.

It has been further added, that Messrs. Cutlers and Co. ironmonmongers, in Queen-street, have a patent for a method of burning smoke, in supplying the fire with coals from below the grate. The fact of burning the smoke, said they, is neither novel nor sole of its kind.

Messrs. Cutlers offered the Patentee, in presence of other persons, all the advantages he might desire: they went further; having obtained no favorable answer from him, they endeavoured to persuade his counsel and friends to use their influence upon him, pretending that he could derive greater advantages by granting them an exclusive license. They offered to submit it to the trial of a single year, and to leave it to the Patentee's option at the end of that term either to continue or discontinue it. But he refused all their offers. His patent then, in their own estimation, can have no resemblance with theirs, and certainly they have none in the construction and still less in principle.

(Note B, p. 19.) In the present general state of instruction and laudable pursuit, of whatever has a reference to the arts, it always happens when a discovery is made, which promises any considerable degree of utility, that every head is immediately set to work, for the purpose of adopting its advantages, in that branch of the arts which is the object of each individual's pursuit. Thus, among the various modifications, to which every mechanical or chemical improvement is liable, it frequently falls out, that among the many trials which do not answer, a successful application may have some near or distant resemblance with one already tried or hinted at. Persons who are in the habit of following step by step their progress, may be sometimes led to attribute a resemblance, where there is in reality, no other than in the end proposed to be obtained. Thus a gentleman who is familiar with all our recent inventions, supposed, that the plan of the Patentee for improving steam engine boilers, as well as boilers of every description, resembled that of Mr. Woolf, who has taken a patent for a similar purpose. As he also employs a number of tubes,

whose contents communicate with those of the boiler, for the purpose of augmenting the surfaces in contact with the caloric.

He took occasion to satisfy himself with regard to the accuracy of these observations, by examining the plans and specification given by this gentleman, and convinced himself, that they in no wise interfered with the methods he employs.

Tubes through which the flame is made to pass, or where the flame is made to act upon their exterior surface, will always resemble tubes however they may be differently disposed. The Patentee lays no claim to this principle, which was known, and has been practised long ago; but his method of applying it, is different from that used by Mr. Woolf or by any other person whatever. He obtains more important effects, he can employ the whole portion of caloric produced by the fuel, on the liquid subjected to its action.

The means hitherto made use of for producing a current through the flues of furnaces of every description, is the rarefaction of the air by the fire itself. This principle obliges the constructor to permit that warm air should issue from the summit of a lofty chimney. The following reasoning will prove it evidently: If the air, going out of the chimney, was not rarefied by heat, it would, by its density, counterbalance the admission of it at the grate, and annihilate the draught. It follows of course, that the chimney which has the greatest draught carries off the greatest quantity of caloric to waste. If he wishes to employ the greatest possible portion of caloric upon the surface of his boiler, he can only obtain his point at the expence of a portion of that heat, which is absolutely necessary to maintain a current in the chimney.

The Patentee's plan does away this difficulty; the current of air necessary for feeding and exciting the fire to any degree required, does not here depend on any contingency, it is not a natural but an artificial current of air that he employs. A chimney on his plan becomes useless.

His method consists in employing a pneumatic machine of dimensions proportioned to its object for drawing a current of air through a grate, whatever may be its form, and through all flues whatever may be their windings; he fixes his apparatus above or below, or on the same plan with the boiler. Under this pneumatic machine is placed a cistern of water through which the smoke is made to pass; it is here washed, and leaving all the sooty particles, with which it is loaded, passes into the atmosphere a clear elastic fluid.

Many great objects are attained by this invention: The employment of the whole of the caloric on the surface of the boiler; To do away the expence of the enormous chimneys actually employed; To remove from their neighbourhood an insupportable nuisance.

The method he employs procures likewise a great advantage by heating steam to a high degree; to extract the saline particles from liquids with dispatch, to keep the flues clear of soot, to cool liquids rapidly, as well as to condense steam