

Specification of Thomas Crook and Thomas German : apparatus for promoting the escape of smoke in chimneys, &c.;

Contributors

Crook, Thomas.

German, Thomas.

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A.D. 1795 N° 2032.

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

OF

THOMAS CROOK AND THOMAS GERMAN.

APPARATUS FOR PROMOTING THE ESCAPE
OF SMOKE IN CHIMNEYS, &c.

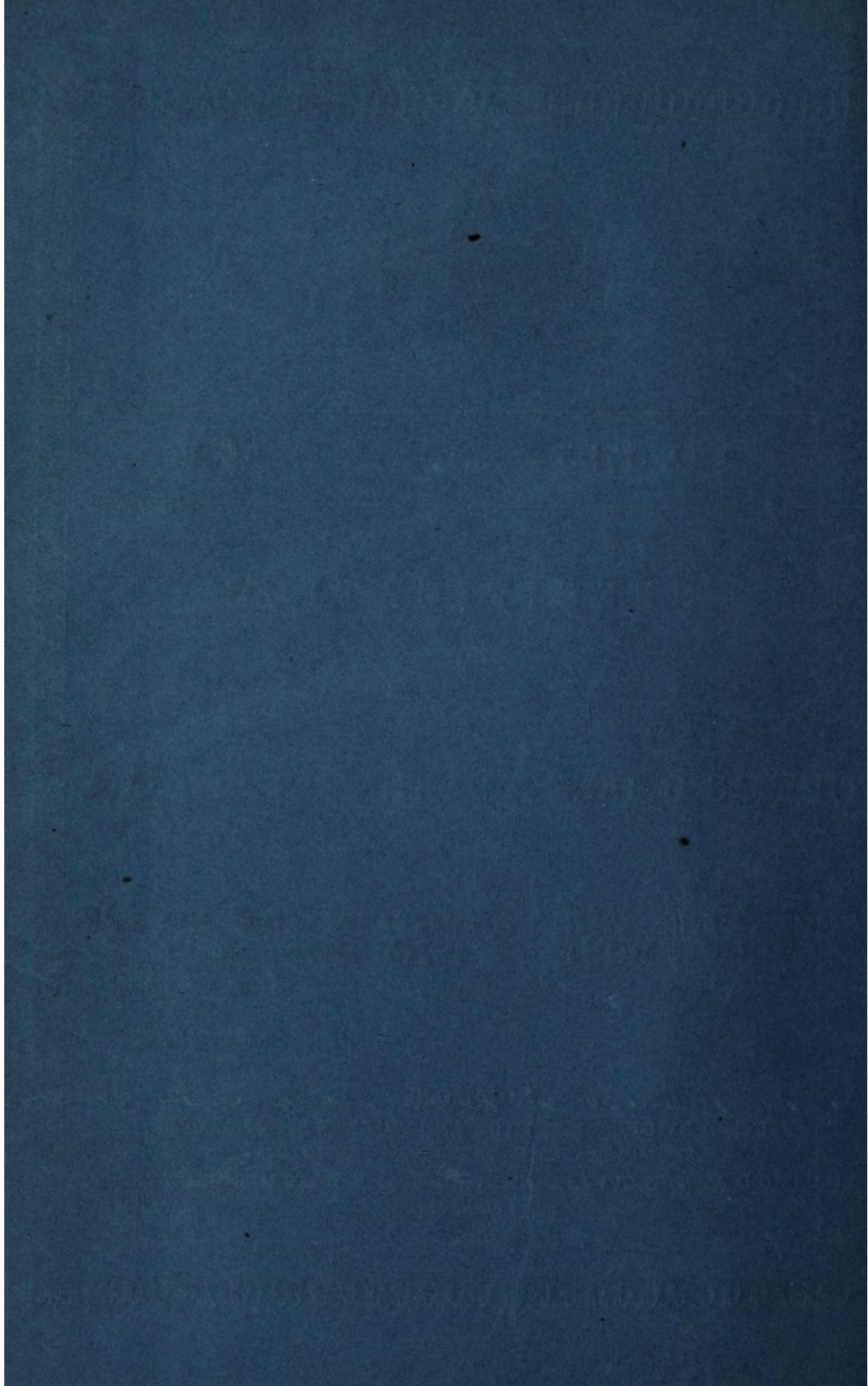
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A.D. 1795 N° 2032.

**Apparatus for Promoting the Escape of Smoke in
Chimneys, &c.**

CROOK AND GERMAN'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, we, THOMAS CROOK, of Great Queen Street, Lincoln's Fields, in the County of Middlesex, Coachmaker, and THOMAS GERMAN, of Baldwin's Gardens, in the said County of Middlesex, Gentleman, send greeting.

5 **WHEREAS** His most Excellent Majesty King George the Third did, by His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twelfth day of January, in the thirty-fifth year of His reign, give and grant unto us, the said Thomas Crook and Thomas German, His especial licence that we, the said Thomas Crook and Thomas German,
10 during the term of years therein mentioned, should and lawfully might use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, our Invention of "A MACHINE, CONTRIVANCE, OR DEVICE FOR THE PREVENTION AND CURE OF SMOAKING CHIMNIES;" in which said Letters Patent there is contained a proviso obliging us, the said Thomas Crook and Thomas
15 German, by an instrument in writing under our hands and seals, to cause a particular description of the nature of our said Invention, and in what manner the same is to be performed, to be inrolled in His Majesty's High Court of Chancery within one calender month after the date of the said recited Letters Patent, as in and by the same (relation being thereunto had) may
20 more fully and at large appear.

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NOW KNOW YE, that in compliance with the said proviso, we, the said Thomas Cook and Thomas German, do hereby declare that our said Invention of a machine, contrivance, or device for the prevention and cure of smoaking chimnies is described in manner following (that is to say):

The first principles of this discovery depend on keeping the air immediately 5 above the fire as it successively passes upward so much heated and rarified, that is, ascends with great force and rapidity. And the better to explain the nature and reason on which the Invention is founder it will not be improper to mention a very common experiment dayly practised by almost every person where a coal fire is used. When the fire is low, and in danger of going out, 10 it is usual to lay the fire shovel horizontally over the top of the fire, which, unless it is too far gone, seldom fails to recover it. This is a simple experiment in general use, but perhaps there are thousands who practice it for one that has considered the reason on which it depends, and hence it is proper to elucidate it. 15

The reason then is that the fire shovel thus placed over the fire soon gets considerably heated, as does also the air immediately under it, which air, thus heated and rarified, rushes up by the sides of the shovel (or through the holes of it if it be a sifting one, and which is must best for the experiment) with great quickness, its place being continually supplied by other air coming from 20 under the grate, passing through the fire, and pressing it upwards, so that all the air which successively passes through the fire under the shovel being additionally heated by passing through the hot space under the shovel, it successively ascends upwards with rapidity, and a quick circulation of air is kept up through the fire, and thus the fire, which before was dying, is revived. 25 To ascertain what improvements might be made on the simple principles here laid down, and to render them useful in the cure of smoaking chimneys, as well as in quickly raising a dead fire, we have frequently covered the whole top of the grate of a smoaking chimney horizontally just over the fire with a plate of copper or iron, with holes in it like the holes of a sifting shovel for 30 the smoke to pass through, and always found the air under the plate to be so rarified by this experiment as to rise through the holes with immense rapidity and quickness. We have applied it to the most smoking chimnies, and always found that if the other parts of the chimney place above the grate were closed in so as to prevent the smoke being driven back into the room through 35 the other parts of the chimney place, the chimney could not possibly smoke (for all our experiments proved it to be impossible for any puff of wind, however strong, to force the smoke back through the holes in the plate covering the fire. We also found that, though the plate was placed some considerable

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distance above the fire, so as to leave a considerable space above the fire between that and the plate, yet if the cheeks and back of the grate were continued up flush with the sides of the plate, and the other parts of the chimney place closed, as before mentioned, the space above the fire between
5 that and the horizontal plate, though considerable, was not material, after the horizontal plate, which is also called the rarifier, was once sufficiently heated, provided that space was not too large for the rarifier to have sufficient operation. But because when a chimney is but little inclined to smoke, the rarifier or horizontal plate, after it is sufficiently heated, will be more effectual at the dis-
10 tance of two feet or more above the fire than it will at the distance of half a foot at the first lighting of the fire when the chimney, from the wind or any other cause, is violently disposed to smoke. In order that the Invention may be universally useful, and a certain cure for chimnies of every description, and in all circumstances, we have contrived several different methods for raising and
15 lowering the rarifier, so as to place it at any distance above the fire, from one inch to two feet or more. In order to affect this, and prevent any smoke from passing either upwards or downwards otherwise than through the holes of the rarifier, and that the Invention may be applicable to all sorts of grates, we use a three-sided oblong funnell of iron or other metal, which may be either cast
20 together in one piece, or composed of three plates fastened together at the sides. The three sides of this funnell form two sides and a back, and must be of the same depth and width as the upper part of the two cheeks or sides and back of the fire grate and fire, and must extend in length from the top of the grate up into the chimney behind the mantle piece somewhat higher than the
25 mantle piece, which length in a small chimney may be about a foot or a foot and an half more or less, but in large chimnies it will sometimes require to be much more, according to the distance from the top of the grate to the mantle piece. Thus prepared, the two sides and back of the funnel are to rest at the bottom upon and be fixed to the top of the two sides and back of the grate,
30 and thus standing, the front of the funnel is of course open from the top of the grate up to the mantle piece, unless when closed by lowering the rarifier, together with a moveable frontispiece, as will presently be explained. Whatever space may be on each of the sides of this funnell, from thence to the sides of the chimney must be compleatly closed either with brick, stone, or plates of
35 metal, or in any other manner as fancy may direct, provided it be so done as to prevent any air passing either up or down the chimney otherwise than through the funnel.

Now the rarifier, which consists of a plate of copper or any other metal full of holes like the holes of a sifting shovel, and of a size exactly sufficient to

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cover the fire horizontally in any part of the funnel, which through its whole length is uniformly of the same breadth and depth, the fire will be compleatly covered by the rarifier as well when it is higher up the funnel as when down close to the fire. But it is necessary that the front part of the funnel above described as open should, as well as its two sides and back, be at all times 5 closed above the rarifier, that no smoke may be forced when the rarifier is down through the space above between that and the chimney piece, and because whatever thus covers and closes the front of the funnel above the rarifier must move up and down with the rarifier, as occasion may require. Another plate of iron, copper, brass, or other metal (being the moveable front or fronticepiece 10 above alluded to) must be prepared of dimensions sufficient to extend from the top of the grate somewhat higher than the mantle piece, and of a width exactly equal to the width of the funnel, so as to form a moveable front to the funnel, which being suspended by a chain in such manner as to be drawn up and let down behind the mantle piece, and close to the inside of it, will when 15 down compleatly close up the front of the funnel from the top bar of the grate quite up to the mantle piece, so that when it is down no air can pass otherwise than through the fire, but it may at pleasure be drawn up behind the chimney piece so as to leave any space open from the top of the fire up to the mantle piece, or so far as to go up entirely out of sight behind the mantle piece about 20 an inch above the bottom edge; and on the inside of this moveable front or frontispiece the outside edge of the rarifier is fixed by hinges, so as to be turned up and stand perpendicularly against the inside of the moveable front when the chimney is swept. At all other times it is to be down, and compleatly cover the fire horizontally, or nearly so, resting upon two short bars or props, 25 fixed one of them on each side the moveable front immediately below the rarifier. In this position the frontispiece being moved by means of its chain upwards, or let downwards perpendicularly, carries the rarifier up and down with it horizontally, so that the rarifier can be placed at pleasure either close over the top of the fire, or moved with the fronticepiece upwards, and placed so 30 high as to leave any open space at pleasure not exceeding the heighth of the chimney piece above the grate. The better to keep the moveable front or fronticepiece & rarifier in a steady possition, as it is thus drawn upwards or let downwards, the two side edges of the moveable front pass through grooves formed for that purpose on each side the moveable front in the plates of stone 35 or metal or other materials with which the two sides of the chimney piece are before described to be closed. The chain by which the moveable front is raised up or let down is fixed at its lower end to the center of the moveable front, and at its upper end to the end of a round metal plug of about an inch

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or less in diameter, which passes through a round hole bored for that purpose through the brickwork from the inside of the chimney into the room at the distance of the length of the rarifier above the mantle piece; and that end of the plug which comes into the room has a small wheel and catch, with a knob
5 or handle to turn it round, which together form a jack of the same nature as the spring jack of a curriole, and which being turned either backward or forward coils or uncoils the chain round the inner end of the plug, and raises up or lets down the moveable front and rarifier as the spring jack of a curriole raises up and lets down the body at pleasure; and the knob and wheel of the
10 jack being of a circular form, and placed just over the center of the mantle piece, are, when made of polished and shining metal, besides their utility, an ornament to the room. The apparatus being thus compleated at the first lighting of the fire, and when the wind sets in such manner as violently to incline the chimney to smoke, it will in a very desparate case be proper to let
15 down the front so low that the rarifier may cover the fire just above and almost close to the top of the grate, in which position it is impossible that any chimney can smoke the room; and when the fire has been lighted some little time, and the rarifier becomes thoroughly heated, it may, together with the moveable front, by means of the jack and chain, be moved and suspended further up from the
20 fire, so as to leave a considerable open space between the fire and bottom of the moveable front; and when the wind is yet more favorable, and the chimney less violently disposed to smoke, it may be moved still higher, and yet the chimney will not smoke. Our rarifier, as already described, has nothing but small holes in it for the smoke to pass through, but we have tried some expe-
25 riments with a small ventilator inserted in a circular hole cut or cast to receive it in the centre of our rarifier, which ventilator is such as is often placed in a window or door, with this difference, however, that our ventilator is composed of copper, iron, or other metal sufficiently thick to bear the fire, and that, instead of being in a perpendicular position, it moves horizontally in the middle
30 of the rarifier. In trying the force of the rarifier, both with and without a ventilator, as our principle of reflecting down the heat upon the top of the fire whilst the smoke ascends upwards is preserved, we have found the effect to be the same whether a ventilators is placed in the center of the rarifier or not, and for this reason, that if there is a ventilator in the rarifier it admits the smoke
35 up through the ventilator, and all the small holes that surround it, and if there is not a ventilator, as its place is supplied by small holes, there are more small holes which answer the same purpose, and hence we shall sometimes insert a ventilator, and sometimes not. When near the fire our rarifier is either way

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an infallible remedy in the most desparate cases ; and when removed a foot or even two feet above the fire it will seldom happen after the fire is thoroughly lighted, and the rarifier heated, that any chimney in which it is placed will be capable of smoking. If it does, the rarifier and moveable front must be let further down, and the smoking in any case will instantly cease. In a parlor 5 or any room where cooking is not required it can never be any inconvenience to have the rarifier down pretty near the fire, because where there is no cooking a large space is never necessary above the grate, so that the frontice-piece and rarifier may be always kept so near the fire in all parlors and sitting rooms as to make it impossible for them ever to smoke ; and though in kitchin 10 chimneys the rarifier must, when it is necessary to set large pots and kettles on the fire, be moved up high enough conveniently to admit them, yet even when so far elevated and removed up from the fire the rarifier will not be deprived of all its effect, but will even then cause the smoke to ascend with greater vivacity than it would without it ; and as soon as the pots and kettles 15 are taken away, as well as before they are set, on being lowered it will produce the same infallible effect as in other chimnies. As for roasting, that, so far from requiring a great elevation of the rarifier, will be better performed when it is lowered somewhat near the fire, because the draft will be the stronger, the fire the more brisk and lively, and the heat the greater. But inasmuch as 20 the cheeks of a kitchen grate have screws, by which the fire is contracted or widened as the purposes of cooking require, the two sides and back of the funnell passing from the top of the grate up behind the chimney piece, as above described, must be sufficiently wide, when applied to such grates, for the two sides of the funnel to rest on the upper bar of the grate on the two outsides of 25 its cheeks when the cheeks and fire are the most widely extended ; and then, whether fire is contracted or expanded, it will not be material, because the rarifier, which must be of dimensions sufficient to extend across the funnel, and cover the whole fire when extended, will consequently cover it when contracted. But we have another contrivance which we shall sometimes use to apply our 30 rarifier to kitchin chimnies ; this is by means of a frame of barrs in the form of a gridiron, but sufficiently thick and strong for potts or kettles to stand on, and being of somewhat larger size than the rarifier, the rarifier is fastened close under it, and both together placed horizontally just over the fire, and there supported by two strong legs which the frame has before at each end 35 of it, resting on the top bar of the grate, and supported on another bar, or two props placed behind for that purpose, with hinges, on which it may be turned up occasionally so as to stand up quite out of the way against the back of the

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chimney. When it is down, resting by its legs on the top bar of the grate, it completely covers the fire; and as the rarifier is undermost, any pots or kettles set upon the bars will, from the heat of the rarifier and hot air that passes through it, be more quickly heated than it would otherwise be, and at the same
5 time the chimney be less liable to smoke; and if a blower be at the same time hung up before the chimney piece, it will, together with the rarifier, prevent the chimney from smoking almost as well as the compleat apparatus first described, but for want of the three-sided funnel to the size of the fire some of the effect will be lost. We have likewise contrived other means for the
10 sake of cheapness and conveniency to those who cannot so well afford the expence of our compleat apparatus, such as fixing the rarifier at the bottom of a blower, by which means it may be moved up and down with it, so as to be placed at any distance above the fire; and if there is also a three-sided funnel for it to move up and down in, it answers the purpose completely in point of
15 utility, though less agreeable to the eye. It is also to be observed that though in our compleat apparatus we used a three-sided funnel, forming in its inside an oblong square, it may be of any other form, and will have the same effect, provided the rarifier is fitted to it so as to cover the fire horizontally in any part of the funnel; and indeed the principle of the rarifier covering the fire hori-
20 zontally, or nearly so, and either close or occasionally close to the fire, being rightly understood, and for which principle our Patent is obtained, many other methods of applying it might be contrived besides those here described; but it is unnecessary to specify them here, our Patent being for a new philosophical principle never before applied to the purpose of curing smoking chimnies, and
25 which consists in covering the fire horizontally, or nearly so, with a plate of any metal that will bear the fire, with either many or few small holes, or a ventilator or open hole in it, or a passage by the side of it for the smoke. And anything to cover the fire horizontally, or nearly so, and which can be put close or nearly close over the fire, so as to rarify the smoke, and cause it to
30 ascend with greater rapidity, must be constructed upon our principle, and consequently, if used by others, an infringement of our Patent, whether it should have a number of holes in it or only one ventilator or hole for a ventilator, or whether instead thereof it should only partially cover the fire. It would likewise be equally an infringement of our principles to make or sell
35 anything of the same nature, whether it should be capable of moving upwards and downwards in the manner first described, or whether a plate or other thing covering the fire or partially covering it should be fixed and stationary horizontally, either immediately above or a small distance above the grate; but a

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register stove is not on our principle, because its register is always so high above the fire that it can produce little or no effect; but to place its covering down nearer to the fire would be pursuing our principle in part, and consequently an infringement of our Patent. As a proof of the excellency of our principle as an infallible remedy for smoking chimneys, we have tried it in various 5 instances, and particularly in a chimney so violently disposed to smoke that nothing but our Invention had ever the least effect in preventing it. Register stoves and every other project commonly supposed to be useful by those who profess to cure smoking chimnies had been tried in this chimney in vain. It was at length contracted, and a small close stove erected in it, with a blower, 10 which, when the blower was let down close to the top of the grate, so that no air could pass otherwise than through the grate, had of course a very strong draft; but even this, when the wind was in the smoking quarter, and blew strong, was of no avail, and at every puff of wind a cloud of smoke was forced through the grate, the only way by which it could pass, the blower being down, 15 into the room. This afforded an excellent opportunity of evincing the value of our principle, for on raising the blower, and covering the fire with our rarifier, properly fitted for the purpose, and then again letting down the blower to meet the outside edge of the rarifier, the chimney, which the moment before (though the blower was down) emitted clouds of smoke through the grate into the room, 20 entirely ceased to smoke. It not only ceased when the rarifier was down pretty close to the fire, which was the position it was first placed in, but even on placing it considerably farther up the smoke did not return; and other experiments in like cases we have since made with the same success with our apparatus. Add to this, that our Invention, when prepared in the manner first 25 described, has other good qualities besides curing smoking chimnies, for it will stop rain and wind from coming down on the grate, and keep the room clean; and if, by the neglect of sweeping, the chimney should catch fire, water being thrown on the fire in the grate, and a wet cloth placed over the top of it, and the rarifier let down upon it, the holes in the rarifier will thereby be com- 30 pletely closed, and the circulation of air up the chimney ceasing, the fire up in the chimney will easily be extinguished. Our Invention likewise renders a room much warmer with any fire, large or small, in the grate, than it would otherwise be with the same fire, for at the same time that it rarifies the smoke, and causes it to ascend with rapidity through the holes or crevices of the 35 rarifier, the solid parts of the rarifier reflecting back the heat down upon the fire, it is thrown out into the room to a much greater degree than it would otherwise be, as we have proved by unerring experiment. It likewise, by its

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superior draft, quickly lights up a fire, and when lighted prevents the possibility of its going out from any other cause than want of fuel.

In witness whereof, we, the said Thomas Crook and Thomas German, have hereunto set our hands and seals, this Twenty-second day of January, 5 in the year of our Lord One thousand seven hundred and ninety-five.

THO^S CROOK. (L.S.)

T. GERMAN. (L.S.)

AND BE IT REMEMBERED, that on the same Twenty-second day of January, in the year above mentioned, the aforesaid Thomas Crook and 10 Thomas German 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.

T. WALKER.

Inrolled the Twenty-third day of January, in the year above mentioned.

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J. W. JONES