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THE HISTORY
OF THE
"COAL DEVOURING" COOKING RANGE
AND ITS PROGENY
SMOKE & FOG,
AND THE REMEDY.

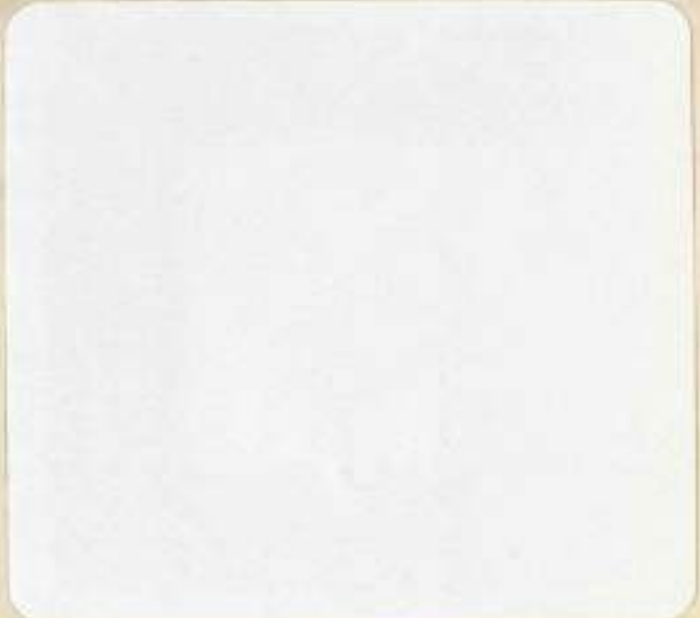


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By the Author of
"HOT WATER SUPPLY."

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INTRODUCTION.

IT is proposed to give in the following pages a brief, but if possible, an interesting history of Cooking Appliances, showing their progress and development, and it will be seen that in actual principle and construction, Cooking Ranges have undergone (except in the instances herein mentioned) scarcely a perceptible change or improvement during the past 80 years. Many of the appliances in the market at the present day, although capable of fulfilling what are recognised as the duties of the average cooking range, are so constructed as to consume the fuel not only with shameful extravagance but in a manner that is positively barbarous.

The economy of fuel is of course a subject of very considerable moment, but there is a question involved in this extravagant consumption which is of importance to the community at large, and which is at present but very imperfectly controlled by legislation. This is the totally unnecessary quantity of smoke and soot and noxious products of *imperfect combustion* that are discharged in such prodigious volumes into the air surrounding the habitations in many of our towns or thickly populated places, and which is not only detrimental to health, but is seriously injurious to everything that is susceptible to its attacks, and our cooking ranges are largely responsible for this.

There is another great evil which the majority of our ranges still possess in all its primitive originality, and that is their total

inability to cook many of our common articles of food in such a manner as they should be cooked or prepared. Take, for example, the general arrangement by which heat is applied to an oven; any housewife or cook will testify that the ovens of even our modern ranges are totally unfit for pastry baking, as their construction will not admit of their having a perfect bottom heat, which is so absolutely essential. It would however occupy too great a space here to attempt to enumerate all the faults that are to be daily met with.

There is one person, however, who is largely responsible for this trouble and annoyance, and that is the Speculative Builder, who, to suit his own purposes, selects ranges that have the best external appearance, and he invariably uses what are known as "Brick Flue" Ranges, which require his Range-fixer to determine the size of the flues, and to afterwards build them. The deciding as to what size flues to construct is a duty that *he cannot be able to carry out efficiently*, except by guess work, as every make and every size of every make of range requires flues of a different size and character, but this will be spoken of more fully hereafter.

It must be repeated that the progress of improvements in the principles and manufacture of Cooking Ranges has been abnormally slow. It seems incredible that a range introduced in 1802 should at this day be in regular use, with scarcely any perceptible improvement, yet this is the case, and it is undoubtedly a fact that Manufacturers yet only faintly or imperfectly realize what is required of them.

In concluding this introduction it must be observed that there is no reason whatever why all the various essential features should not be combined in the one Cooking Range, and the reader, it is hoped, will be readily able to judge whether a desirable state of perfection has been arrived at.



CHAP. I.

FROM the earliest periods up to a comparatively recent date the methods of cooking have been confined exclusively to boiling in vessels suspended over and exposed to an open fire, and roasting on a spit. Boiling was the method most generally adopted, but we read at a very early date of birds and locusts being cooked on a spit.

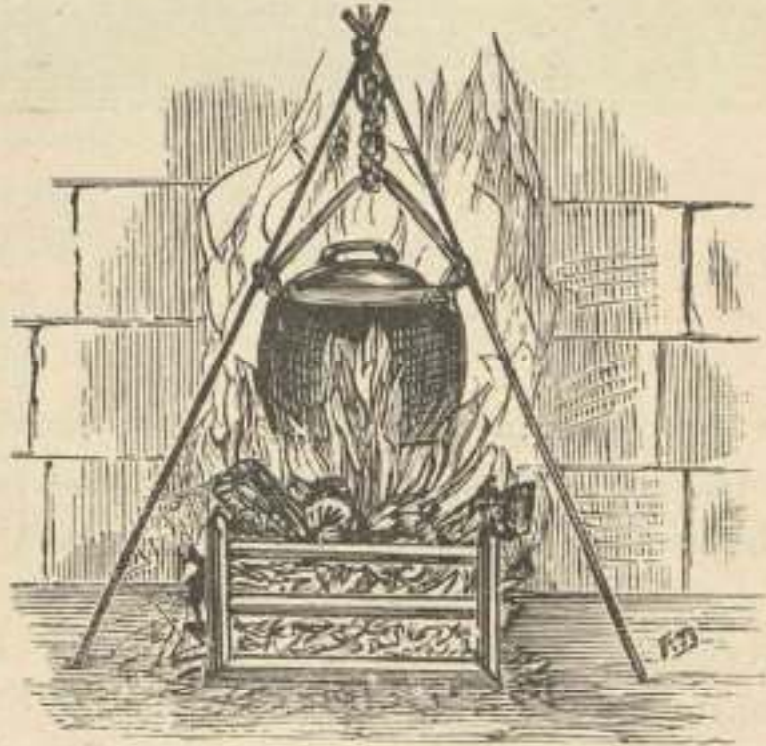
The fire was usually made on a hearth of stones, with other suitable stones placed to support the vessels, and although coal



was recognised as a fuel at a very early period, yet wood and charcoal fuels were almost invariably used by the Egyptian and other ancient races.

From the various sculptures and paintings of Egyptian origin we find that meat was both boiled and roasted, the boiling being

effected in a caldron supported by a tripod, and the roasting



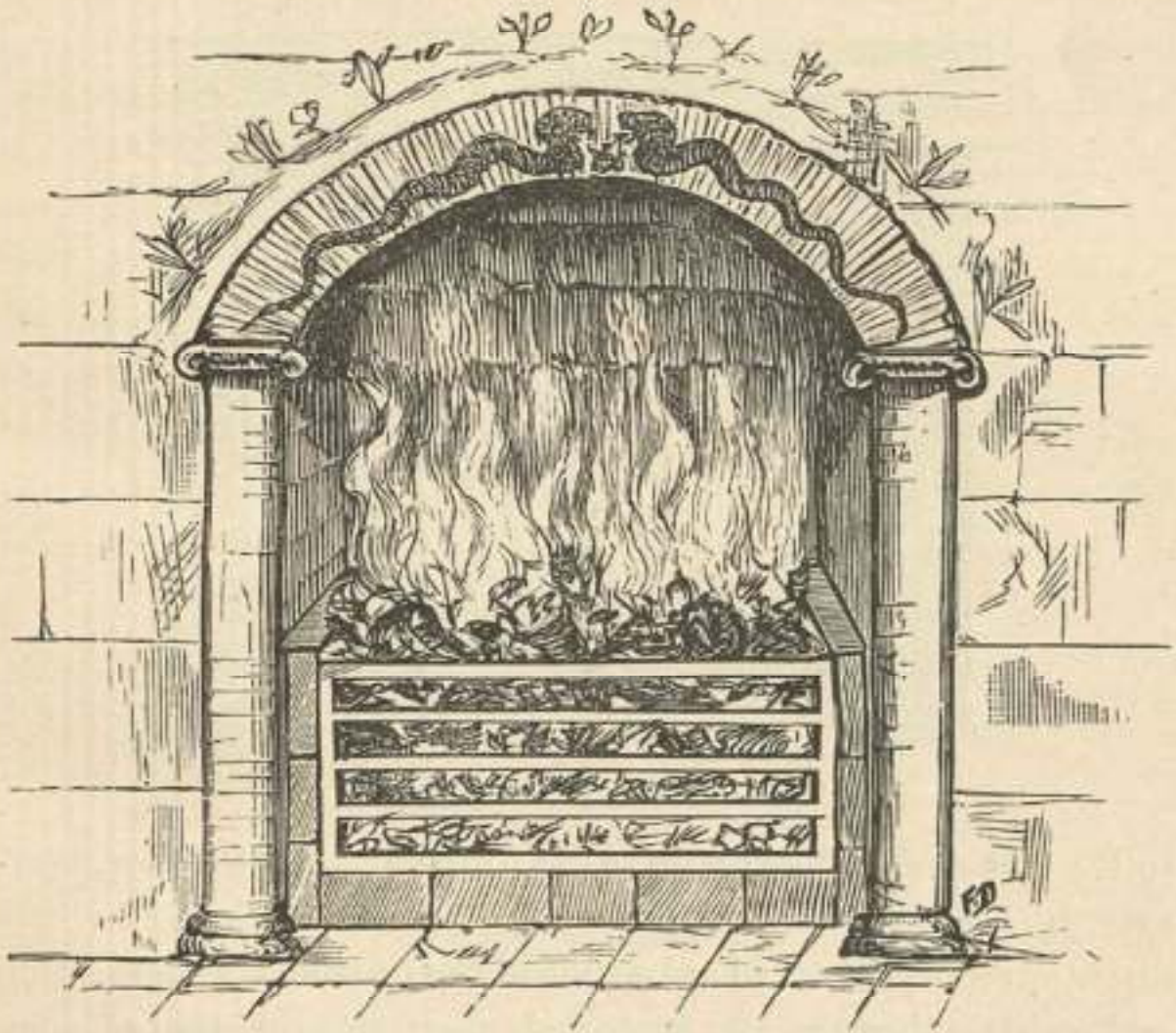
over a fire contained in a grate this is the earliest appearance of a grate of any form. It is interesting to notice that an article generally supposed to be a comparatively modern invention appears in these representations, viz., the Syphon, which was used for drawing liquids from within the huge suspended caldrons.

We find mention made of bread and pastry at this time, but no correct account of how the baking was effected. It can only be concluded that a chamber was made of earth and stones, and the necessary temperature obtained by building a fire within it, which is still the common practice in rural districts even at this date. A sort of cake or biscuit was however made by baking paste in a shallow open pan over the fire, much like the "damper" of the Australian backwoods.

In Europe, we find the Greeks carried the art of cooking to a high state of perfection, after which the Sicilians cultivated this art to such an extent that a Sicilian book upon Cookery is mentioned by Plato.

It is from the Romans we first have authentic information that coal was quite commonly used as a fuel, and this is confirmed by the discovery of cinders of coals in the débris of the various Roman stations, and furthermore, mention is made of coal scoops (*prunæ batilla*).

The Romans lived luxuriously, and the kitchen was sometimes their chief and largest room, many of the kitchens being

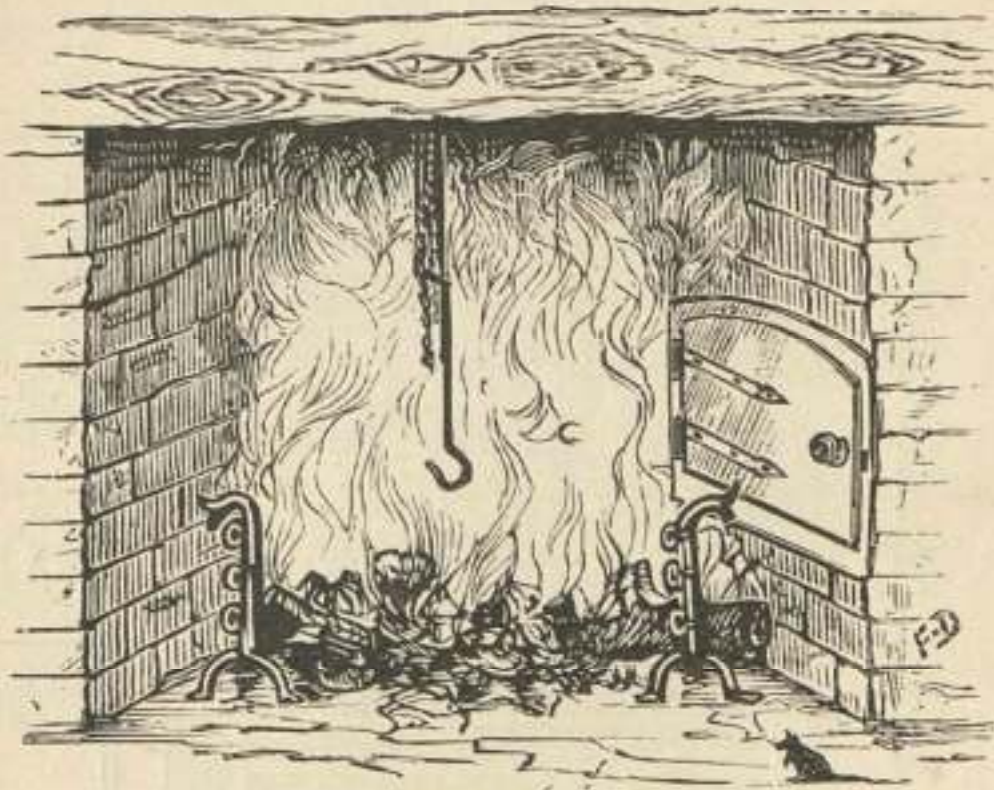


exceedingly spacious and richly ornamented with frescoes. The usual emblem or ornament over the hearth was a snake. Special baking ovens (for bread) were at this time recognised features connected with the kitchen.

Italy is generally credited with being the birthplace of the more modern art of cookery, from whence it was introduced to

France, and from thence to England, and it is curious to note that so far as culinary utensils are concerned, we appear to be using almost similar vessels and contrivances now as are illustrated in a book upon cookery published about A.D. 1500.

Passing now to the earliest English records we find that the importance of coal fuel for cooking and domestic purposes was fully recognised in A.D. 1259, when Henry III. granted liberty

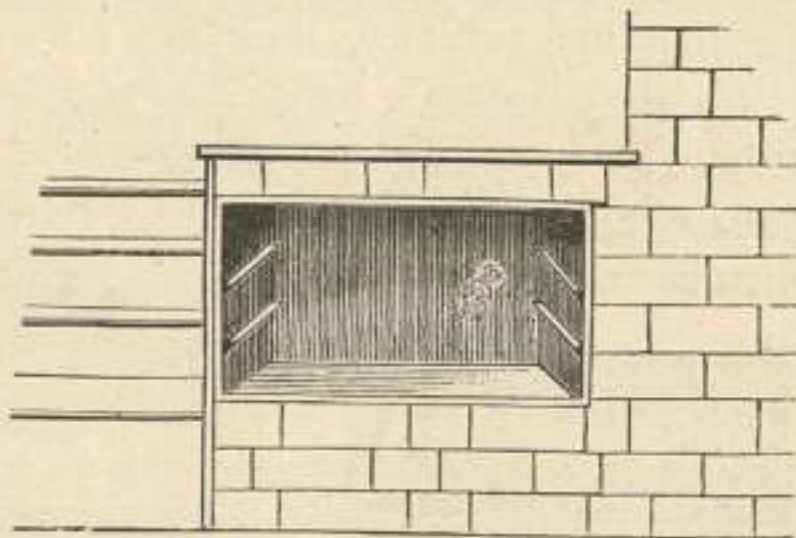


to the freemen of Newcastle to dig for coal. A little later, however, in 1306, Edward I. forbade the use of this fuel as so little attention was paid to what became of the products of combustion and so little thought was bestowed upon the question of combustion itself, that the smoke and noxious gases given off eventually became a nuisance of a serious character, in fact it is described in the State papers of that time as being "generally injurious."

This edict of Edward I. was, however, soon abolished for various reasons, the chief one being that it caused a consider-

able decrease in the revenue, and from that period until this date we do not find any stringent measures again adopted to remedy the smoke nuisance, except the late Smoke Abatement Act, which principally affects manufactories. Whatever abatement has been effected beyond this, is wholly due to the interest evinced by the public from time to time.

We get no further record of interest relating to cooking apparatus until towards the end of the 17th century when their manufacture became a noticeable industry, and it was then that the existing type of open range was introduced. Previous to this time very rude forms of fire grates existed in our English kitchens, wood being the fuel chiefly used, and this accounts for the enormous spaces provided to contain the fuel. Another object of such large fires was that practically everything was roasted in front of them.



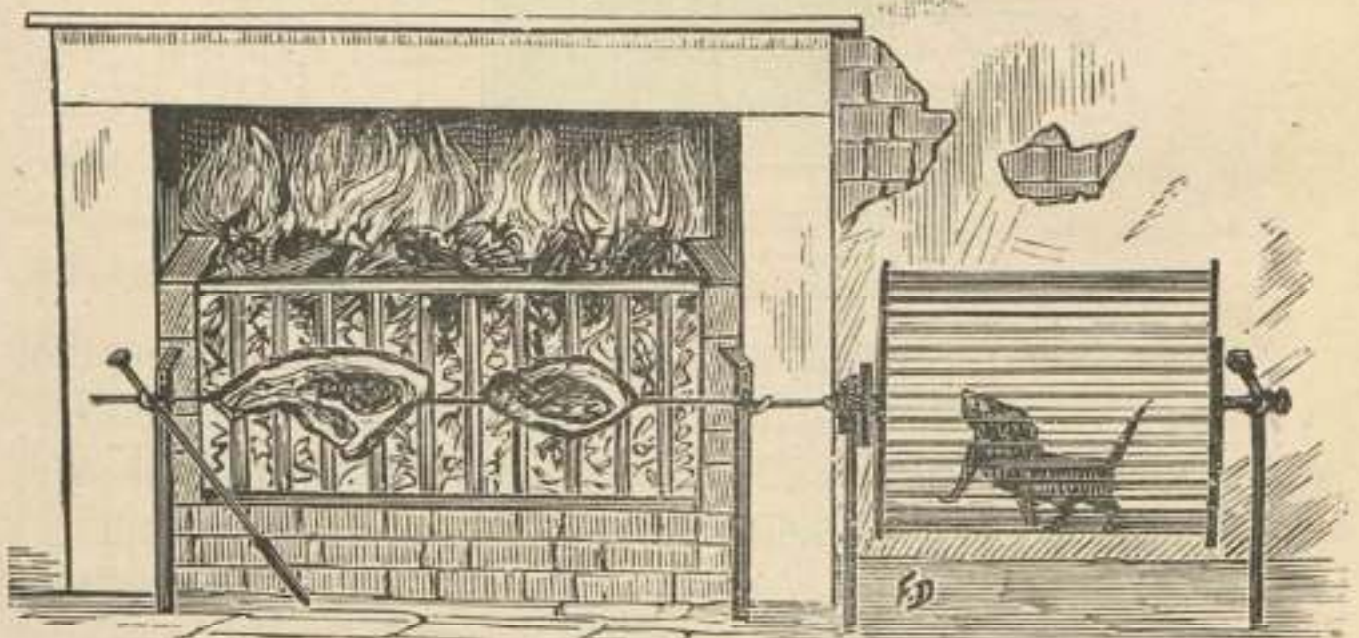
In the year 1780, October 21st, Thomas Robinson patented a kitchen range, the specification of which agrees in nearly every detail with the Open Range of to-day. It says, "One side
 "of the fire is the oven, and the other side is made to wind up
 "with a 'cheeck.' The top bar in front is made to fall down
 "occasionally to a level with the second bar. The moving
 "'cheeck' is made with a socket in it to receive a swinging
 "trivet. The oven is made of cast iron, nearly square in front,

“the door hung with hinges and fastened with a handle and a turnbuckle, and the oven is provided with fillets for the shelves to rest upon. The oven must be enclosed with bricks and mortar, &c., &c.” This particular range was provided with a means of removing the lowest fire bar so that the cinders and ashes could be easily removed; this convenience, however, appears to have fallen into obscurity, as it cannot be met with now in this class of range.

There are undoubtedly few who really know what an antiquated article this particular range is, but everybody surely knows what a semi-barbarous affair it is; it has no redeeming feature, but it has disadvantages that are now sufficient to appal a modern skilled cook, but these will be referred to presently.

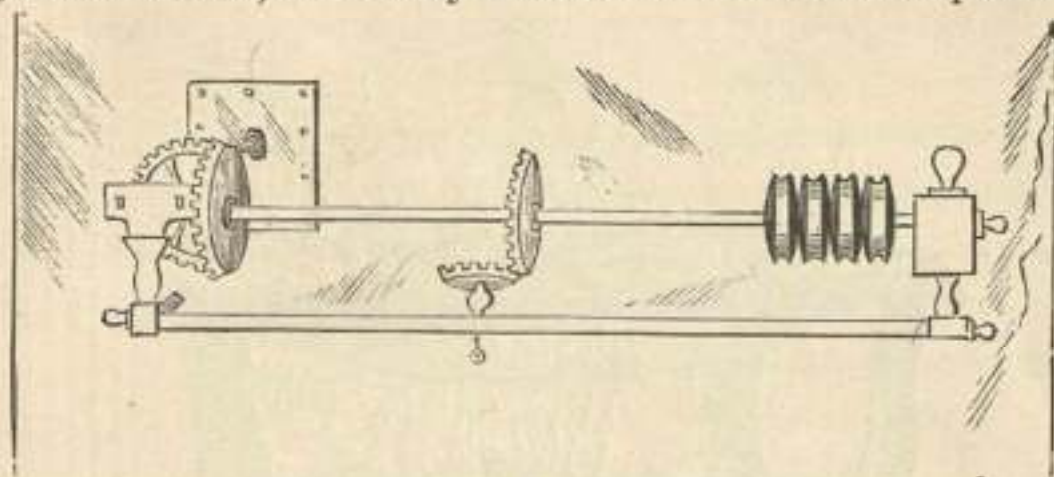
Between the years 1500 and 1600 roasting spits were in general use in England for supporting the joint, &c., before the fire. These were at first turned by hand, and reference to this is made in “Gammer Gurton’s Needle,” a very old English Comedy, written about A.D. 1550, a beggar says:—

“And many a broche spit have I turned and basted.”



Dogs were afterwards trained to this duty; these animals eventually became a distinct breed and were known as ‘Turnspits.’

The smoke jack was next introduced (which still survives in many old kitchens) turned by the smoke from the old open range.



SMOKE JACK.

Ovens for cooking came into use about this time, but received very little favour, as the general construction and arrangement was so imperfect that very unsatisfactory results were obtained. At this time no great encouragement was given to makers of such appliances or scientists, as quantity was preferred to quality.

In A.D. 1636, June 23rd, Roberte Lindsey and John Hobarte patented an invention which is described as follows:—
 “A new way whereby soe great expense of wood may be saved,
 “by use of sea coales, peate, turfe, or any other fewell with
 “much lesse expense thereof than hath beene used, *noe fire nor*
 “*smoake coming into the oven*, and yet their baking, roasting
 “and boyling *shal-bee sweete* and att farre lesse charges than
 “they nowe are att.” From this we learn that ovens at this period might possibly be filled with ‘smoake’ during cooking operations, and consequently the joint, &c., would not be very ‘sweete;’ but this was about the time that English people conveyed food to their mouths with their fingers, and one FYNES MORRISON in his ‘Travels’ cautions Englishmen against using the ‘spoonne and forke’ of Italy.

At this time also cooking vessels of metal were luxuries, brass pots costing 13s. each, whereas a sheep could be purchased

for 17d. and a quarter of wheat for 6s. 8d. The culinary operations of the Scotch at this time were particularly crude,



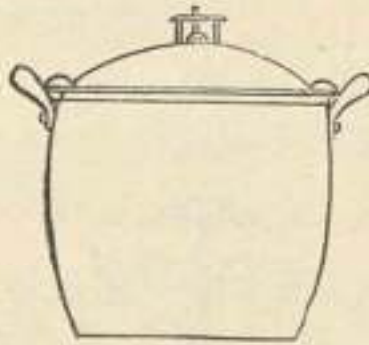
having no pans or chaldrons, "they would seeth flesh in its own skins stretched out on stakes."

In 1769 WATT'S Steam Engine was introduced. This undoubtedly stimulated the coal industry, and the use of this fuel became much more general for domestic purposes. The old fireplaces which had been originally intended for wood burning, being thoroughly unsuited for coal, the manufacturers of fire grates had to turn their attention to making something better adapted for this purpose, and this is proved very strongly by the Patent Office Records. These show that genuine interest was developed in the manufacture of efficient coal-burning cooking ranges very shortly after this date.

A very ingenious and practical apparatus or cooking utensil which deserves mention, and which at the time of its introduction (1680) created considerable interest, is the Digester invented by Monsieur Papin, F.R.S. The inventor refused to patent this, thinking that more general good would be derived if it came

into common use. There is no doubt that at that time it was looked upon as a scientific success of some moment, as Evelyn in his "Diary" describes a supper given by the Royal Society, *all the viands being cooked in Papin's Digester.*

This utensil is, in fact, a saucepan of good size, with a special lid. It is now tolerably well known that the temperature at which water boils in ordinary vessels depends entirely upon the pressure of the atmosphere; it is only at sea-level that the temperature of boiling water is 212°, whereas at the summit of a mountain, where the pressure of the atmosphere is less, ebullition takes place at a much lower temperature, and in such elevated places the heat of boiling water is not sufficient for many culinary operations. By making a vessel with a tightly fitting lid an artificial pressure is created, and we can make the water boil at what temperature we choose by the



PAPIN'S DIGESTER.

regulation of a valve; the Digester then is simply a steam-tight saucepan furnished with a safety-valve to prevent explosions, and to regulate the temperature of the water.

An extract of the description of the supper given by the Royal Society, just referred to, will describe the results:—

“Both fish and flesh was all dressed in Monsieur PAPIN’S ”
 “Digesters by which the hardest bones of beefe itself and ”
 “mutton were made as soft as cheese without water or other ”
 “liquor, producing an incredible quantity of gravy; and for ”
 “close of all a jelly made of the bones of beefe, the best for ”

“clearness and good relish. We eat pike and other fish bones”
“without impediment, &c., &c.”

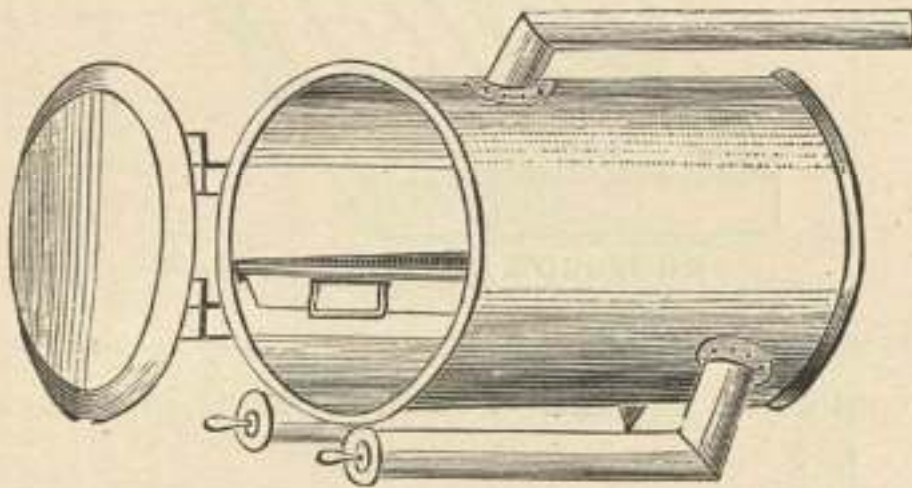
This utensil is still in common use, and can be obtained at almost any ironmonger's shop. Its chief property is the extraction of everything nutritious from the viands, but the meats so cooked of course suffer by being rendered next to tasteless unless very great care is used. The method now adopted in potting provisions produces somewhat similar results to these just described. The Digester excels as a stock pot.

It is interesting to note that this is the earliest mention of a safety-valve attached to any form of boiler.



CHAP. II

IN A.D. 1802 the subject of ovens and improved cooking appliances became of general interest, and received a considerable stimulus through the instrumentality of the celebrated Count Rumford, who, at this period, delivered his famous lectures and suggestions upon this question, and also by the various articles of his invention, amongst which was his "Roaster."

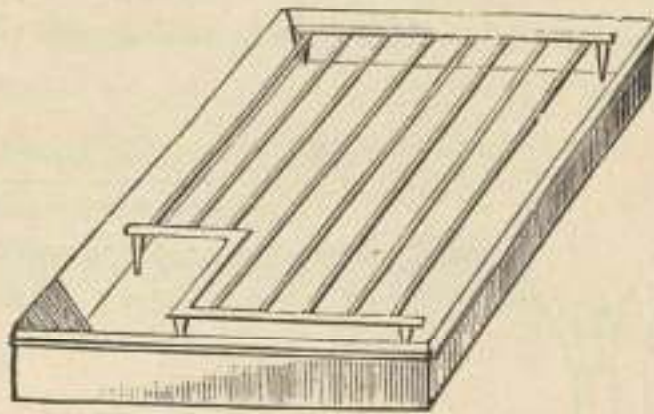


COUNT RUMFORD'S ROASTER.

Count Rumford's "Roaster" was in reality a circular roasting oven, consisting of a cylinder, which formed the oven, this being within another cylinder, the space between which constituted the flue. The furnace was situated at the bottom and the smoke outlet at the top, and a ventilator was provided at the upper part for the escape of the objectionable vapours. The peculiar feature of this apparatus consisted of two iron tubes carried from the front along each side of the furnace terminating in the oven, as shewn in the illustration, these tubes were fitted with caps in front, and their purpose was as follows:—

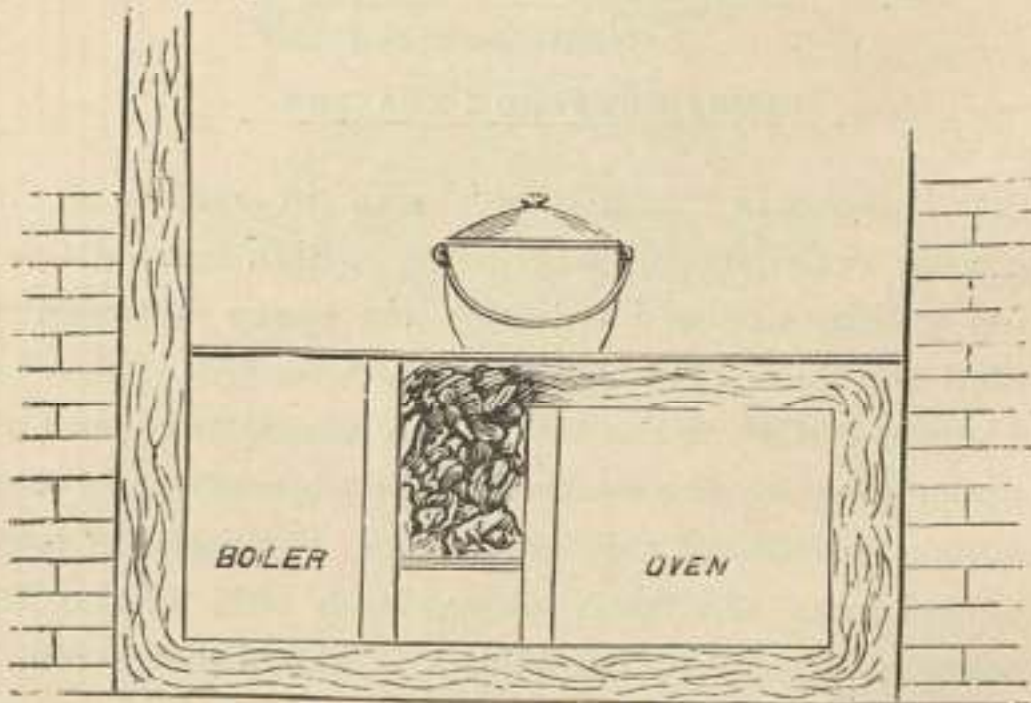
The caps were kept on the tubes until the roasting was nearly completed, then the fire was urged, and when the tubes were red hot the caps or plugs were removed and the top ventilator opened. This induced a blast of hot air to pass through the oven, by means of which the meat was browned.

It is peculiar to note that the baking pan invented by Count Rumford to be used in this oven is in every respect identical



RUMFORD'S ROASTING PAN.

with the most modern form of roasting pan of to-day, and which is quite commonly considered to be a recent introduction.



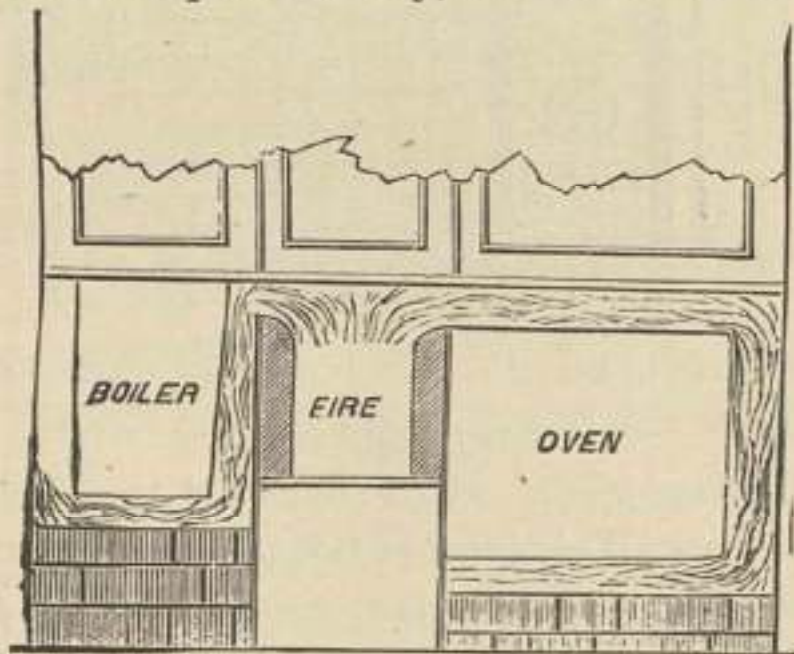
THE "BODLEY" RANGE A.D. 1802.

(With Front Plates removed shewing the Flues.)

This form of pan is an important feature in *oven* roasting, and will be spoken of further.

An important epoch in the progress of the cooking apparatus occurred A.D. 1802, February 27th; this was the invention of the "Bodley" range. To Bodley undoubtedly belongs the credit of being the first inventor of a practical *closed fire* cooking range, which was an enormous advance on anything previously made.

The illustration, which is copied from the Patent Specification, will show that it differs very little from the Leamington Range as it is made at the present day, and so far as the oven and

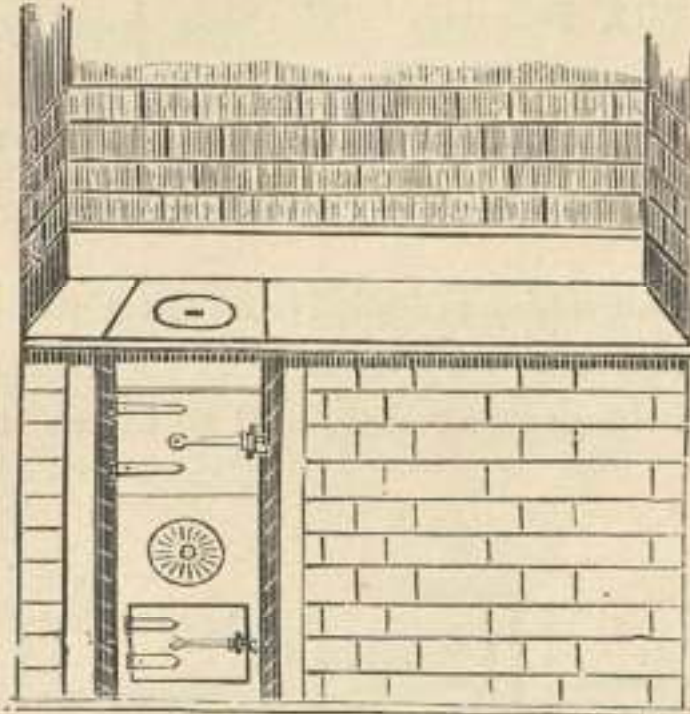


LEAMINGTON RANGE, 1892.

oven flues are concerned (the most important part of the range) they are practically identical.

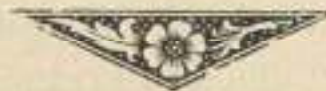
To Count Rumford every praise is due for the interest promoted in this cause, and he is justly considered the pioneer and originator of improved cooking apparatus from a scientific standpoint. But it must be said that Bodley's invention was equally advanced and valuable as Rumford's, as Bodley's oven is still used and is still a most satisfactory form for meat roasting provided a modern and efficient system of ventilation is fitted.

Bodley's invention also provided a hot plate heated from the same fire that heats the oven; the value of this combination is most important and obvious.



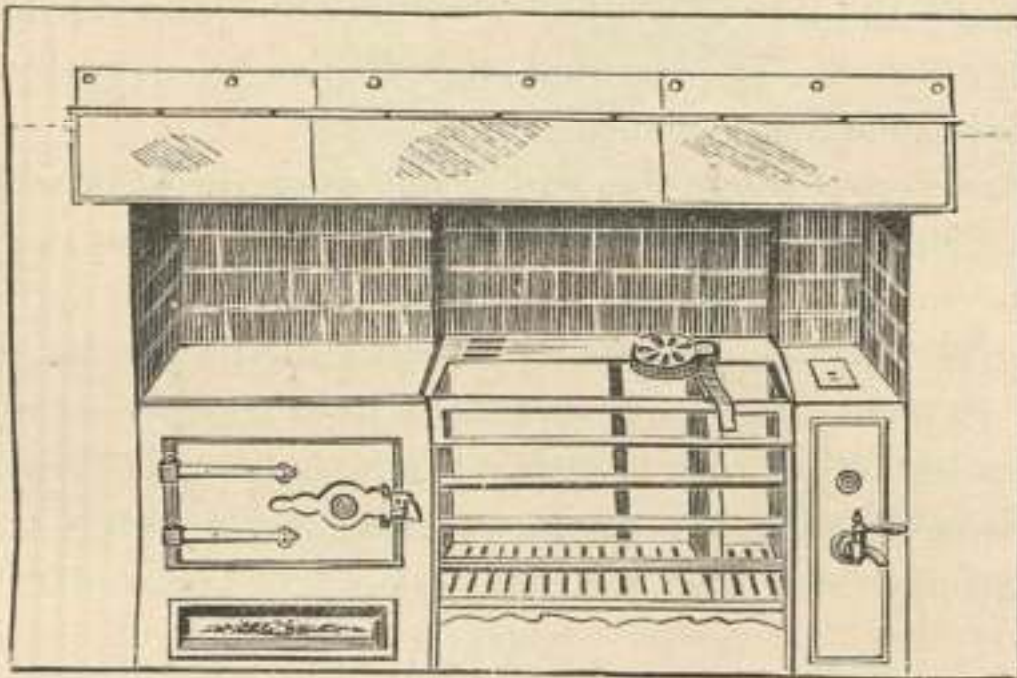
HOT PLATE.

Of course what is known as a hot plate was made previous to Bodley's range, but it was simply a plate with a furnace to heat it, this furnace being independent and in addition to the kitchen range fire. This form of hot plate was intended to be used in conjunction with the open roasting range, and it is no uncommon thing to find in kitchens at this day *three fires to do what one fire does most efficiently in a good quality modern range.* The three fires are—one to an independent baking oven for pastry and bread; one to an independent hot plate, and one large roasting fire. The fuel used by these three primitive arrangements is undoubtedly five times as much as would be used in a good modern range in doing the same work.



CHAP. III.

THE Open Range is rapidly becoming discarded, and there is no doubt that its manufacture will become quite



OLD OPEN RANGE.

obsolete in the course of a few years ; there are still, however, a few made, but the demand is practically gone. It will, unfortunately, be many years before this low type of cooking apparatus becomes extinct, for, it may surprise many of our readers to know that there are some hundreds of thousands of these wretched contrivances still in daily use, and they are largely accountable for the impure smoky atmosphere of London.

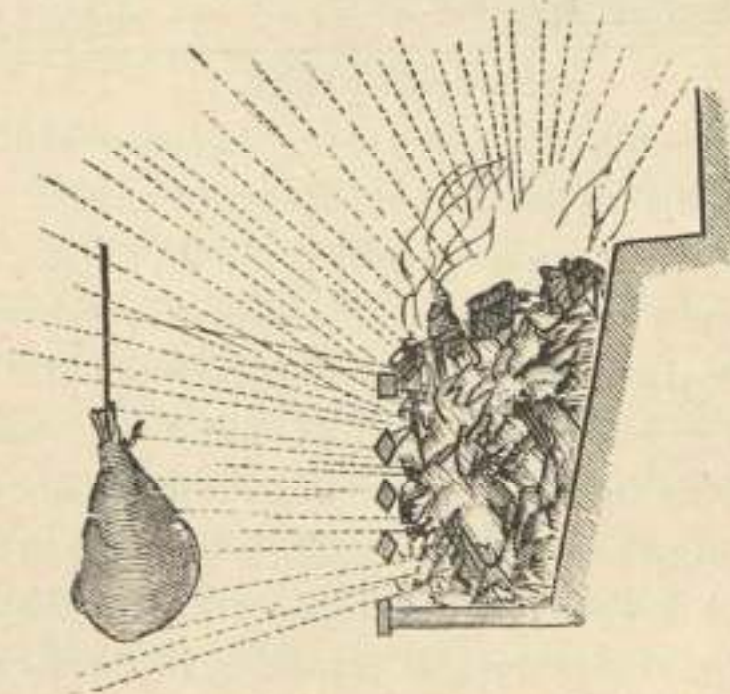
The open range has one redeeming feature that makes many tolerate it, which is that it will roast in front of the fire. With the ordinary closed fire range, roasting in front, except on a small scale, is well nigh impossible, and so the idea has become prevalent that one cannot roast in front of a closed range, but this is a decided mistake. *A closed range that has a fire prepared*

and made suitable for front roasting, will give better results than an open range. In the first place a much more intense heat is evolved with a closed range, and this heat is radiated directly on the object being roasted. All authorities upon cooking agree that in roasting, the joint should be first subjected to a fierce heat to seal the outer pores and vessels, and so form an envelope to retain all the nutritious juices within the joint during the finishing process. The roasting should then be completed at a greater distance from the fire.

With an open range this end is not so easily attainable, as the maximum heat radiated is not usually more than the joint should be subjected to when finishing.

It is almost unnecessary to add that with the large fire front of an open range quite three-fourths of the radiant rays of heat miss the object that is suspended in front.

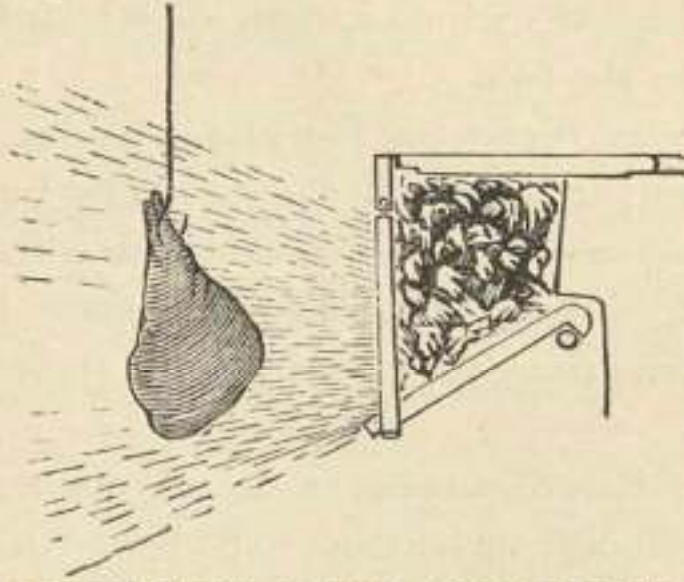
After using an open range for roasting, a cook nearly always entertains the idea that the small closed fire is insufficiently



RADIANT HEAT FROM OLD OPEN RANGE FIRE.

large for practical front roasting, but this fallacious notion is fortunately soon forgotten after one trial.

With a closed range the cook has a vastly more comfortable time in attending to the roasting than with an open range



RADIANT HEAT FROM CLOSED FIRE OF EAGLE RANGE.

with which there is such a general and lavish distribution of the heat where it is not required. With the open range a screen, commonly called a plate warming screen, has to be used, and this article might reasonably be christened a "cook protector," as without it the cook in many instances would be seriously inconvenienced by the heat.

There is nothing more inconstant than the heating of an oven of an open range. This oven is heated by the fire that lays against its side, also by the fire surrounding the "conductors" attached to the oven, and (in many) by poking some of the bright fuel into a space provided under the oven, *therefore success depends entirely upon the skill of the cook as a stoker.*

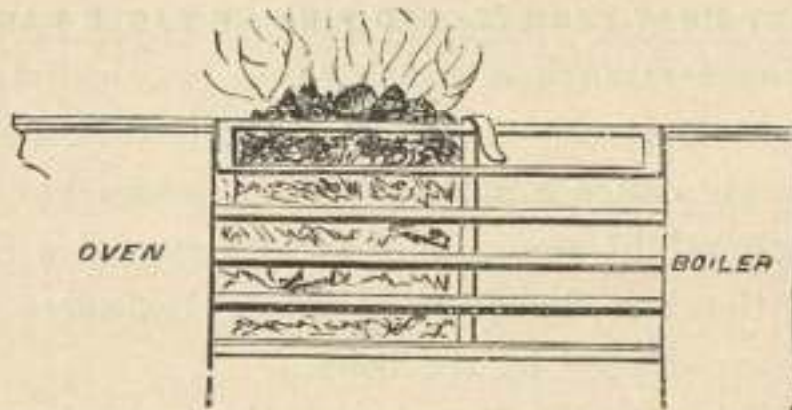
A tremendous objection to the open range in the eyes of a modern cook is the entire absence of a hot plate. Modern cookery is essentially hot plate cookery, and a good range should have an efficient hot plate extending from end to end.

Now, with the old open range, the boiling or stewing is done by either perching the saucepans on a swing trivet, or placing them directly on the burning coals, the saucepans of course boiling most irregularly, sometimes furiously and other times

stopping, and when the coal burns away, if they are not carefully watched, the vessels become upset. Added to this they are constantly loaded with soot, some of which frequently gets inside and taints the food.

This is the very reverse of hot plate cooking, which admits of easy regulation, at one-fourth the cost in fuel, and is perfectly clean, as the saucepans never get fouled with soot and the contents cannot be tainted. Clean saucepans boil with half the fuel in half the time, for sooted vessels absorb heat so very slowly.

A very peculiar arrangement in all open ranges is the disposition of the boiler or boilers. The boiler that supplies the



OPEN RANGE: Showing Fire drawn away from Boiler.

kitchen with hot water is always fitted in the range at the end opposite to the oven and extending round a portion of the back, and the fire is generally fitted with a movable cheek which is shifted by a winding gear.

This cheek is provided for the purpose of contracting the fire towards the oven side when not required for front roasting, but this attempted economy in reducing the size of the fire has a serious drawback in taking the fire away from the boiler side, so that little or no hot water can be obtained. This thin high fire is the worst possible shape for obtaining even fair combustion, so that the fire is always smoky and dull.

When a circulating or what is commonly called a high

pressure or bath boiler is fitted to this range, it is usually situated centrally at the back of the fire, but at the best of times good results are only attainable with this when the fire is well burnt up, and certainly not during the early morning when the bulk of hot water is required for baths, &c.

In the ordinary way bath boilers in open ranges heat slowly, but once heated they remain hot for a good time, but this is no advantage as hot water is not usually required two or three hours after the fire is extinguished at night. If they would retain the heat for, say, 8 or 9 hours, then the water would be in readiness for the morning bath, but this of course they will not do, *but with a modern range, fitted with an efficient system of hot water apparatus, this is quite possible*, supposing it to be necessary, and the boilers fitted to best class closed ranges will heat up a body of water in thirty minutes from lighting the fire, starting nearly cold.

Users of open ranges who have become accustomed to the too frequent periodical visits of the sweep, will be surprised to know that with a well-constructed modern range the main chimney only requires sweeping once in about every twelve to eighteen months.

From a specialist's view, one of the worst features of the old open range is the very imperfect manner in which combustion

COMPARATIVE SMOKE SHADES.



Old Open Range. Leamington Range. Eagle Range.

is effected. Such prodigious volumes of smoke and noxious gases are vomited into and out of the chimney, *all these products being purely and simply unconsumed, and consequently, wasted*

fuel, which in its new gaseous form carries endless damage and annoyance everywhere.

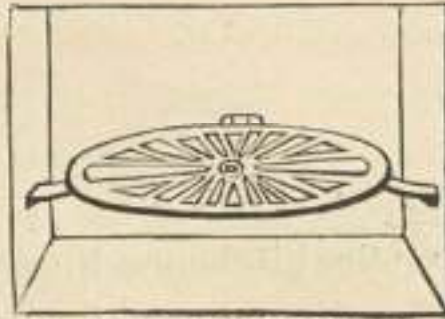
Count Rumford is said to have stated that whenever he stood upon Highgate Hill and viewed the dense cloud that overhangs London it was always with a wish to calculate the weight or quantity of unconsumed fuel that this cloud represented.

From a recent report of the Smoke Abatement Institute we gather that the weight of the smoke cloud enshrouding London is estimated at 60 tons of solid carbon and 200 tons of hydrocarbon and other gases. Basing a calculation upon these figures, we find that about two and a quarter millions sterling is wasted annually in this way, to which might be added injury to property to the extent of quite two millions annually by our smoke and acid-laden atmosphere.

There is no doubt whatever that fully three-fourths of this is due solely to two articles, viz, our open ranges and the many forms of modern (?) fire grates which are constructed upon the worst of principles, for both are totally unable to consume the fuel under anything like proper conditions.

No doubt many of the unscientific ideas embodied in the earlier ranges are due to the fact that at the time these were introduced range makers were not specialists, that is to say, the demand for improved cooking ranges was so small, and so little interest was exhibited, that it would not pay anyone to devote themselves and their business to this one article only. Consequently, it remained for the ironfounder to make ranges, mechanically, so to speak, with the hundreds of other articles he sold, and no one thing received more thought or attention than another, *but this order of things is greatly changed now.*

A serious objection exists with every open range, and that is the very unequal heating of the oven, it being very much the hottest at the side nearest the fire. This necessitated the



REVOLVING SHELF OF OPEN RANGE OVEN.

introduction of a revolving shelf in the oven for the purpose of turning the articles being cooked. This requires constant attention, for if neglected the joint gets "caught" on one side.

These ovens are very small compared with the size of the fire, and in fact the cooking powers of an open range are so disproportionate to the amount of fuel consumed that an improved closed range of 4ft. 6in. in width will do as much actual work as an open range twice its size.



CHAP. IV.

THE ordinary close-fire kitchener, known as the Leamington Range, is generally supposed to be a comparatively recent invention and quite modern in its character, but these ideas are dispelled by the description of the Bodley Range (A. D. 1802) before spoken of.

If the reader will refer to chapter II., it will be found that the flues by which the Bodley Oven is heated are nearly identical with those of the Leamington Range.

By directing the flame and heat from the fire across the top of the oven, then down the outer side, and lastly across the bottom, the result is very naturally a greater heat at the top and sides of the oven than at the bottom. It is to be said in favour of this arrangement that it still remains the best method of heating an oven for roasting purposes, as an excess heat at the bottom would only tend to burn and splash the fat that drips into the roasting pan; but the mere fact of heating the top and sides of an oven more than the bottom does not necessarily constitute it a good roaster, as there are other essential features which will be described later on.

When the closed-fire range was first made, it was something so vastly different, so positively strange to what had hitherto been used, that the great marvel is how it ever survived. When a man invents a range, or an improvement upon a range, he does not think of scientific critics, nor of the public who he hopes will patronise him, but his whole mind is centred upon pleasing the average cook. If he does not do this his invention will, without doubt, prove a miserable failure. It can, therefore, only be concluded that, in the early part of this

century cooks must either have been very different to what they are now, or else the inventor was gifted with a courage bordering on recklessness.

At this time cooks had no knowledge of draught, nor dampers, nor, in fact, of anything that pertains to a closed range: they had been accustomed to a fire (very similar to many of our present day grates) which was simply a receptacle for fuel to be thrown in, and she who wielded the poker most skilfully obtained the best results. Therefore, it is hardly an exaggerated analogy to say that the change was like giving a present-day cook a locomotive engine in her kitchen and telling her to cook the dinner with it.

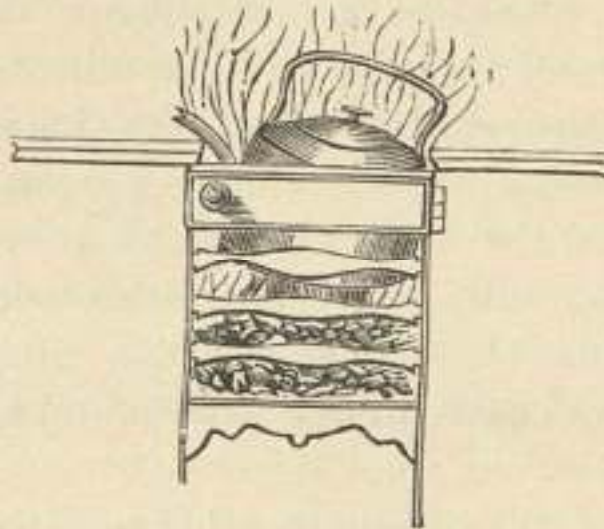
But, however, the closed range has survived, and we ought to be sincerely thankful, for they are now being thoroughly and most exhaustively understood, and with a good range a cook who knows her business can successfully rival the baker, the pastrycook, and the confectioner, and this is saying a great deal.

The closed range, which may be said to have superseded the open range, is the Leamington type; this, as we have shown, is now getting somewhat aged, and it is fairly time that some improvement upon it was made, as it has many imperfections.

The greatest complaint against the Leamington Range, and which heads the list, is its extravagance with fuel. The highest record with this range that has met the writer's notice came from one of our West End Squares, where a 5ft. range was in use, which used 15 ordinary scuttles of coal per day. Perhaps some one of the readers may be able to break this record, notwithstanding that it is almost incredible.

The fire of the average Leamington Range is generally more than double the size it need be, and the time this disadvantage is so keenly felt is when the fire is first lighted, or at any time when the fire has been allowed to burn down, and is required

for some small culinary purpose or for the boiling of a kettle. In the latter case, the fire must either be made up to its full extent (the same as for the largest cooking operation), or the top



plates must be removed, and the kettle or saucepan must be dropped down into the fire box to the fire at the bottom. This, in results, is *worse* than an open range, as, in the first place, the hot top plates have to be got off *somehow*, and then the smoke and vapours rise up out of the fire box into the kitchen, as there is then nothing to carry them off; and the third annoyance is that it covers the vessels with dirt, and makes the handles intolerably hot.

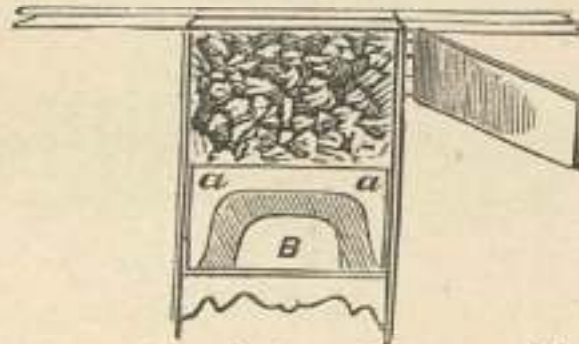
(All that is being written now is quite familiar to anyone who has used a Leamington Range, or seen one used.)

Then, again, supposing the oven is unexpectedly required for some trifling purpose, such as the baking of a small milk pudding for the nursery, or for any of the little cooking operations that are constantly being required between meal times, then there is but one course to adopt, and that is to make up the fire to its full capacity. This not only makes a tolerable inroad into the scuttle, but it also takes some time, *as the oven will not heat until the firebox is full right up to the hot plate with bright fuel*, as, of course, the same heat must be attained

in the oven for a small article of pastry as when the oven is quite filled.

This serious inconvenience has been greatly felt by all users of closed ranges, and various attempts, more or less unsuccessful, have been made to remedy the evil. The attempt usually takes the form of a "false bottom," which when placed in the fire box, practically brings the bottom of the fire up about four inches higher than the original bottom. This is a "first step in the right direction," as it will be found that however deep the fire is from top to bottom, even if it measured a yard, no heat would be obtained in the oven or at the hot plate unless the fire was full up to the extreme top with bright fuel. Therefore, the inference is very naturally arrived at that with a few inches of fuel at the extreme top of the fire the same results would be obtained as with the deep fire, and this inference is strictly correct.

A false bottom will decrease the consumption of fuel, provided the range is not fitted with a high pressure or bath boiler; if this latter exists a false bottom cannot be used, for the simple reason that the flue of the boiler being at the bottom,



aa False Bottom fixed in Leamington Range, raising Fire above Flue of Bath Boiler B.

the false bottom lifts the fire up above this flue, and the result is an absolute failure in the supply of hot water. The real and only remedy for all this trouble is a range provided with a movable bottom grating to the fire, *provided this grating is designed and made on proper mechanical principles.* It is not sufficient that the range simply has a bottom grating that can

be shifted, it must be efficient, otherwise it may become an intolerable nuisance. *A movable bottom grating, to be a success, must be the essence of simplicity, easily moved, easily and cheaply renewed, and easily raised or lowered when full of burning fuel.*

A movable bottom grating, combined with a suitable fire front, has these following advantages :

By keeping the bottom grate up in its highest position the fire is reduced to a few inches in thickness (depth), *and this is amply sufficient* for all ordinary oven and hot plate purposes, and for heating the boiler. A moment's consideration will shew (and a moment's experience would prove) that as good results will be obtained with this small shallow fire as if it was twice, or even six times, the depth.

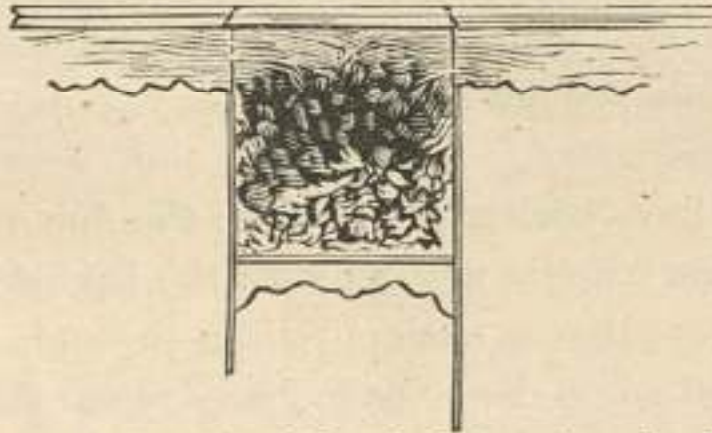


CHAP. V.

BEFORE explaining the remainder of the advantages gained by the use of a movable bottom grate, perhaps the reader would like to know why it is that a closed fire range does not work efficiently unless the fire box is quite full of fuel.

With the open range the heating of the oven is principally due to the fire lying against its side, this fire having its heat transferred by conduction through the iron forming the sides of the oven; *but with any form of closed range* there is no heat whatever passing through the side of the oven nearest the fire, and it will be found that there is invariably a fire brick or some device provided expressly to keep the fire from acting upon that side of the oven.

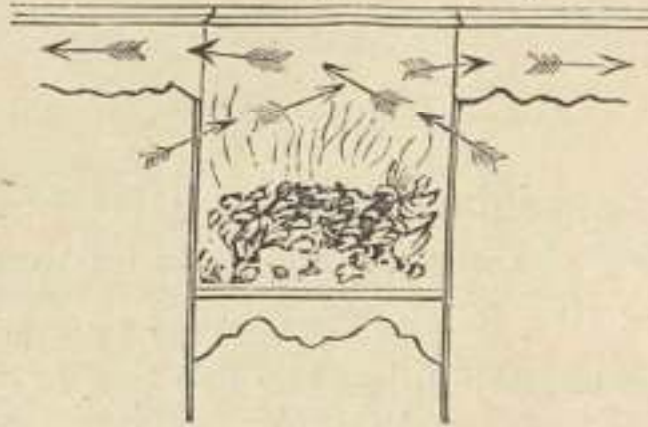
Closed fire ranges are heated by flues, and the flame leaving the fire passes into the entrance of the flues, which is situated



LEAMINGTON FIRE as required for Cooking, shewing Flame and Heat passing into flues.

at the top of the fire just beneath the hot plate. It is for this reason that fuel must always be kept up at the top of the fire box, for should there be no fuel there, a clear passage is opened for cold air to pass into the flues, which will effectually cool the ovens instead of heating them.

If the fire box of a Leamington Range is but three-fourths



LEAMINGTON RANGE FIRE burnt down, allowing a Free Passage for Cold Air to be drawn into the flues as indicated by arrows, which effectually COOLS the Ovens.

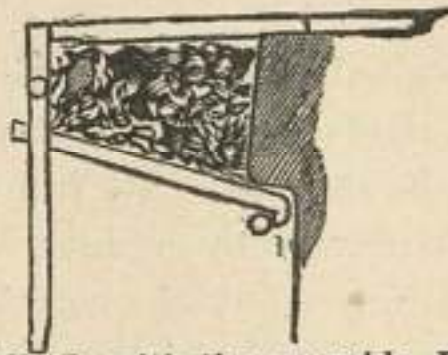
full of fuel it will be found that the ovens every moment grow less hot for the reason already explained.

It is absolutely necessary, with all closed ranges, that all the air that is drawn into the chimney must first pass through the fire otherwise failure must ensue.

The reader may say, "Why don't they have the entrances to the flues at the bottom or near the bottom of the fire box?" It is for the simple reason that fuel and ash would fill up the flue in a few hours, as it must be understood that the particles which compose a fire are never stationary, a fire is a perpetually shifting mass.

Attempts have been made to place the flue entrances at the sides of the fire, using a grating with the bars sloping upwards from the fire to prevent cinders rolling through, but the writer has found (and so no doubt have many range makers) by more than one unfortunate experience, that bars, however strong, in this position burn out most rapidly; if not very strong they will melt in a few hours.

To return to the movable bottom grate and its economy and convenience. The advantage already explained in chapter IV. effects a very great saving in fuel, and its convenience cannot be over estimated. With the fire up close to the hot plate at all

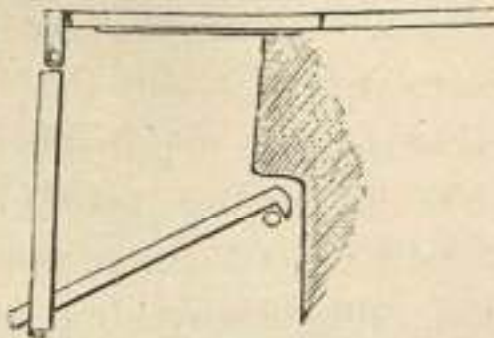


FIRE BOX OF EAGLE RANGE, with the movable Bottom Grating raised, thus bringing the burning fuel immediately at the flue entrances, and thereby preventing any admission of Cold Air to the Flues.

times it is *ever ready* for use, and when first lighting, *immediately the coal becomes ignited, the oven and hot plate become heated*, instead of having to build up twelve or fourteen inches of fire to make it reach to the kettle. *Now this is an advantage fully appreciated by the cook*, as will be readily understood, and if the cook has to do the carrying of coals, she will appreciate the less quantity of fuel used as well as her mistress.

So far we have only spoken of the bottom grating when up in its highest position.

A properly constructed adjustable fire will roast perfectly at the front when the movable bottom grating is lowered to its lowest position, and, as already explained, the roasting can be done in a better and more convenient manner than before an open fire.



FIRE BOX OF EAGLE RANGE, with the Movable Bottom Grating lowered for Roasting in the front of the Fire (the only purpose for which it needs to be lowered).

By referring to the illustration, it will be seen that when the bottom grate is lowered to its greatest extent it slopes towards the front, and a large surface of red hot fuel is

obtained, specially suited for front roasting, and this desirable result is brought about without materially increasing the quantity of fuel in the fire box. Its front roasting powers are also considerably increased by a door under the front bars which can be closed to prevent the admission of air through the bottom grating, thus causing all the draught to pass through the front bars, so that the fire front is always kept bright and clear, and specially suited for front roasting. It is, however, the writer's intention to treat the subject of roasting more fully in the chapter upon oven cooking.

The idea of making the fire bottom movable is not exactly new, as an attempt to introduce a range with a movable bottom grating to the fire was made as long as 35 years ago but though this one possessed some merit, yet like all others, with one exception, it lacked the simplicity which is so absolutely essential.

The *Eagle Range*, manufactured by the Eagle Range and Foundry Company, Limited, is provided with this particular advantage in a really perfect form ; it consists of a simple but strong iron grating resting on projections at the back of the fire box, so that it can be raised or lowered at the front, as will be seen by the illustrations. If the fire box is at its greatest size and the cook wishes to reduce it, she simply lifts the grating with the poker until it is at the required height, and to increase the size of the fire she lowers the grating by the same means. The mechanism (if such a word can be applied to so simple an arrangement) is so devoid of anything complicated that the most stupid servant cannot put it out of order or fail to understand its use.

A movable bottom grating to be raised or lowered by any toothed wheels or complicated levers, or in fact by any complex mechanical device, has two formidable opponents, first the cook, who will not trouble to use it, and secondly, the fire which soon puts it out of order.

CHAP. VI.

THE user of a Leamington Range is always confronted with the problem as to what should be done with the fire during the time that elapses between meals, when it is not required for cooking. A cook cannot entertain the idea of letting the fire go out, as she may have an unexpected request for something to be prepared, and she must have hot water ready for any emergency. She would be in a dilemma if she had to relight the fire at such times and have to lay and make a fire before every meal, so this arrangement cannot be thought of. The alternative is to keep the fire going all day, and this is where the evil exists, as the fire is so large and burns so rapidly that it wants constant attention and stoking the same as when cooking operations are in full swing.

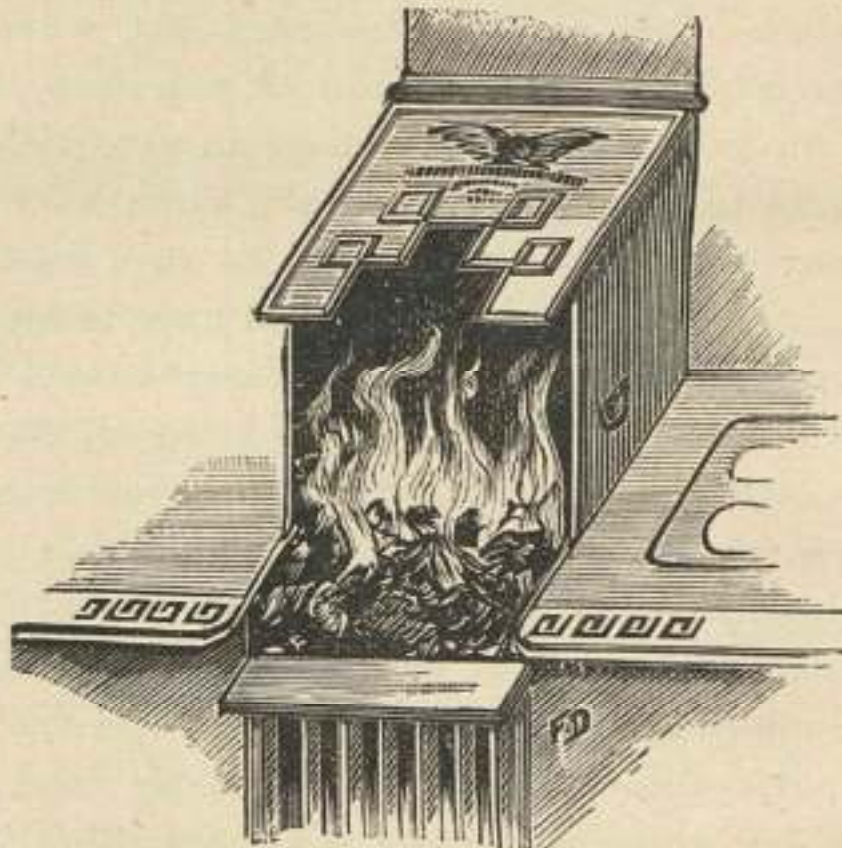
Of course every range is, or should be, fitted with sliding plates, commonly known as dampers, which are provided for regulating the draught and consequently the speed of combustion, but these require so much attention and adjustment that the average cook simply leaves them full open and trusts to her powers of stoking.

Dampers answer a useful purpose for regulating the heat of the oven, but are practically useless when required to make a slow burning fire.

Now, in many residences, the actual cooking does not occupy more than 5 to 7 hours or about half each day at the utmost, consequently the fire is going full speed to no purpose for the other half, and although some cooks are credited with a desire to burn as much fuel as possible, yet no cook enjoys paying attention to and feeding a fire that is doing no work whatever.

Yet with most closed ranges this has to be done ; and even if the range had a movable bottom grating, as just explained, there is no reason why the fire should burn its fastest when not required for use.

A simple remedy, *and which finds favour with those in the kitchen*, is to provide a means of making an open fire (this must not in any way be confounded with the open range).



FIRE OF EAGLE RANGE, OPENED (2 movements only).

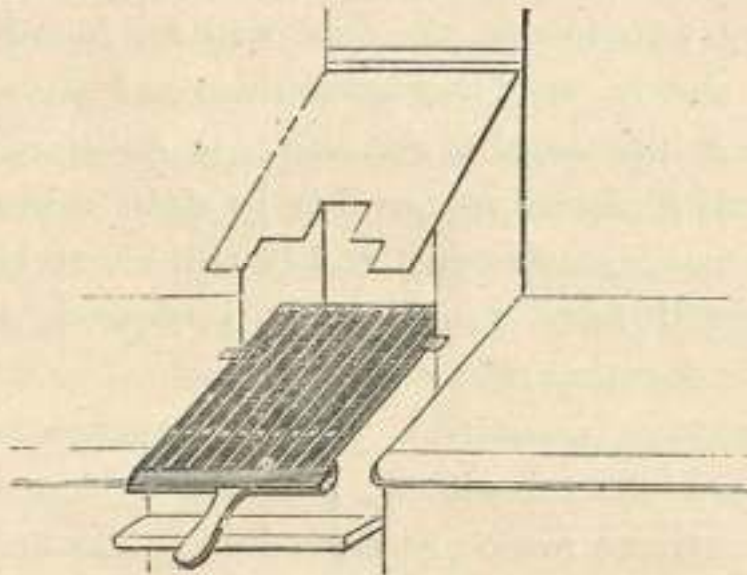
This open fire has really many advantages : firstly, when cooking is completed the fire is opened and the *immediate result is a cessation of all draught and fierce burning*, reducing the speed of combustion to about one-sixth or one-seventh of that when it was closed,* and the fire will take care of itself from meal time to meal time if once fed.

This is a great convenience, apart from the *positive economy* effected ; but the advantages of this arrangement do not end

*The old open range fire sometimes burnt slowly, but to do any work a great bulk of fuel was required, and fuel in bulk soon attains a high speed of combustion.

here. An open fire is one of the most successful forms of ventilators, and the kitchen *always* needs ventilation, and should the servants occupy the kitchen in the evening, an open fire, if any fire is needed, is much more acceptable than one that is closed. Last, but not least, perhaps, the fire bricks, bottom grate and all such wearing parts, last four to six times as long as when a range is always closed.

The open fire is not adapted for any form of cooking, except grilling, (see chap. XII.), but it keeps the oven at a suitable



EAGLE OPEN FIRE. WITH GRILL IN POSITION.

temperature for use as a hot closet ; and after a bath boiler and apparatus has been heated up in the morning, an open fire will keep it hot most efficiently between the times that the fire is closed.

Now the mechanism of the open fire arrangement must be simple in every sense of the word, and the change from open to close, or vice versa, *must be easily and rapidly effected*, or the cook will settle the difficulty by declining to use it. You cannot expect cooks to lift plates and covers, &c., sufficient to be an annoyance and cause a noticeable loss of time.

There have been many attempts to make a convertible open close or fire range in which the mechanism for opening or closing should be simple and easily worked, but most of these have

been comparative failures in consequence of their liability to smoke or the difficulty of manipulation, and those that have been made with a tubular or tunnel shaped contrivance (which draws out to make the open fire) effect such a slight decrease in the draught that the real advantage of the open fire is entirely lost.

The fire when open certainly should not smoke, neither should it burn in the least degree faster than an ordinary open grate.

With a good arrangement of this kind, when the fire has been open, say, two hours, the fuel will be found bright but burning very slowly, and the temperature of the oven will be about 200°. A fire in this condition is quite ready for any emergency, and if closed up for five to eight minutes the fuel will then become incandescent, and in this short time the heat of the oven will have considerably increased, and will be sufficiently hot for almost any purpose.

This advantage, combined with a movable bottom grate (kept up in its highest position), provides a slow burning fire ready at an instant's notice, as immediately the fire is closed it commences active work, the fuel being ready at the flue entrances.

A thoroughly reliable, simple, and convenient form of convertible open or close fire is embodied in the Eagle Range already referred to. By the simple pulling of a loop and the pushing back of a plate, the close fire is instantly converted into an open one, and by reversing the movement it is closed again. It has all the advantages, already explained, of instantly changing a fierce burning closed fire into an extremely slow but cheerful burning open fire, with thorough ventilation of the kitchen, making a perfect grilling stove, and becoming necessarily very economical in fuel.



CHAP. VII.

ROASTING *can be as successfully and as conveniently done in a good oven as before the fire.* This statement will, there is not the slightest doubt, be emphatically contradicted by many, if not the majority of those who may read this pamphlet.

The writer hastens to say that it is not his intention to advocate oven roasting in preference to front roasting, but a good range should be able to do both at one and the same time. The range should be capable of roasting joints in front in the most perfect manner possible, and it should be capable of roasting in the oven with results equally perfect.

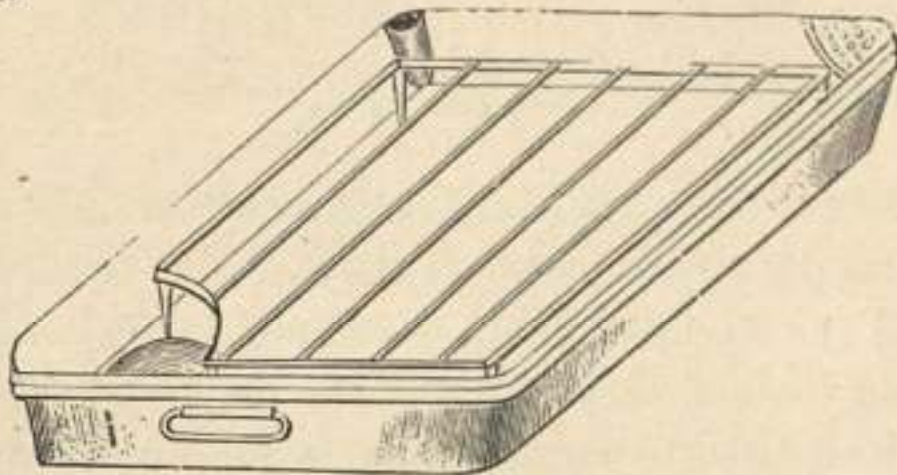
Mattieu Williams, an eminent authority, in his "Chemistry of Cookery," goes to some length to prove that oven roasting is superior to front roasting if conducted in a proper manner, but he very sagely adds that he despairs of getting any Englishmen to believe him.

Count Rumford, in one of his works, says—"Meat of every kind, without exception, roasted in an oven is *better tasted, higher flavoured, and much more juicy and delicate* than when roasted on a spit in front of the fire." (The italics are a copy of his original quotation.)

This statement of Count Rumford's ought to go a great way towards conviction, as at the time it was made front roasting was as perfectly understood as now, whereas roasting ovens were in their infancy.

The essential features in a perfect roasting oven are few, consisting of a tolerably equal heat being radiated from the top

and sides; thorough ventilation *under control*; a properly-constructed roasting pan; and lastly, but certainly not least, cleanliness.



IMPROVED DOUBLE ROASTING PAN.

The ventilators are provided for the purpose of carrying off any objectionable odours that may arise while the roasting is proceeding, *but objectionable odours do not arise* from meats unless they have been hung and are in a semi-putrid condition, in which case they require to be carbonised and disinfected as rapidly as possible. Mattieu Williams says: "There is nothing in the vapour of beef that will injure the flavour of beef, nor in the vapour of mutton that is injurious to mutton." And he further says: "Meat should be cooked by the action of radiant heat projected towards it from all sides, while it is immersed in an atmosphere nearly saturated with its own vapours, *but let it be clearly understood I mean its own vapours, and not the vapours of burnt dripping.*"

This is exactly what causes the majority of failures: *foul ovens*. If the ordinary form of single baking pan is used, the fat which has dropped into it will be in a spluttering state for the greater part of the time that it is in the oven, particles flying in all directions, these particles becoming calcined or burnt immediately they touch the oven plate, and causing an intolerable odour, which proper ventilation of the oven would thoroughly remove. This is the case with a clean or new oven

but if the oven has been neglected and allowed to become dirty, then every repulsive odour that can be conceived to distress a sensitive organ may be obtained at a moment's notice. Imagine a delicate dish being in an oven such as this. It has been no uncommon thing to find ovens literally caked at the bottom and sides with partly burnt, fatty, and other matter that has accumulated layer upon layer until the mere heating of the oven sends forth an intolerable stench, which would be a disgrace to a fourth-rate cook shop. Yet people wonder what makes oven-cooked meat sometimes taste so disagreeably, and what causes the horrible smell that pervades the whole of the house.

The wonder is, however, soon disposed of by the simple process of blaming the cook for roasting the meat in the oven instead of roasting it outside, thus crediting the meat with the possession of properties almost diabolical, but which remain latent till put in an oven.

The spluttering of the fat and the cleaning of the oven can be reduced to a minimum by the use of what is known as a double roasting pan; this was invented by Count Rumford, and is now tolerably well-known and used everywhere.

This pan is in reality two pans, one resting within the other, but in such a manner that the upper one does not touch



SECTION OF DOUBLE ROASTING PAN.

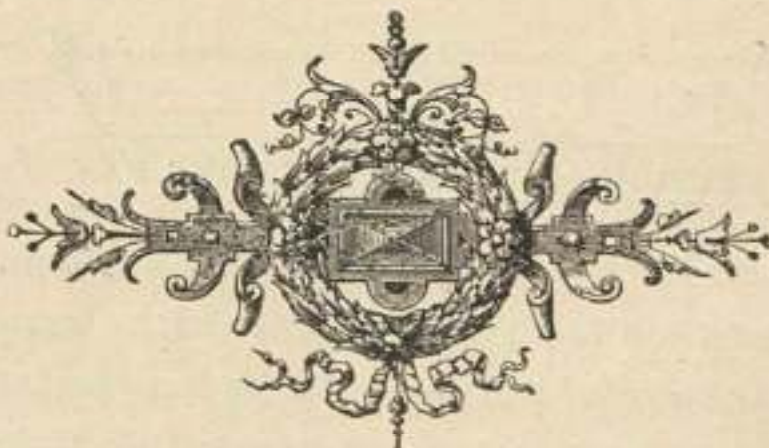
the bottom of the lower one by about half an inch. When in use the space between the pans is filled with water, and this water answers the useful purpose of keeping the fat in the pan at a sufficiently low temperature to prevent its violent spluttering and splashing.

This form of pan has done as much to render oven roasting perfect as any other invention yet introduced, and it proves how skilled and advanced the ideas of Count Rumford were.

There is just the possibility that oven roasting requires a little more knowledge on the part of the cook to determine what temperature the oven should be during the various stages of the cooking process, but this is now, fortunately, a skill which nearly every cook possesses.

Mattieu Williams goes so far as to say that a cook should at least know how to regulate an oven for roasting, "as any barbarian can ho'd a piece of meat in front of a fire until it frizzles."

To ensure the desired results a roasting oven should be so constructed that a fairly equal heat should be radiated from all sides ; it should be provided with *two* ventilators, *an inlet and an outlet, and the inlet ventilator should be provided with a means of heating the air before it enters the oven for reasons that must be obvious to everyone* ; and in use the oven should be kept clean, and a water pan, such as just described, used. By the use of the water pan the cleaning is reduced to a very simple and easy process.



CHAP. VIII.

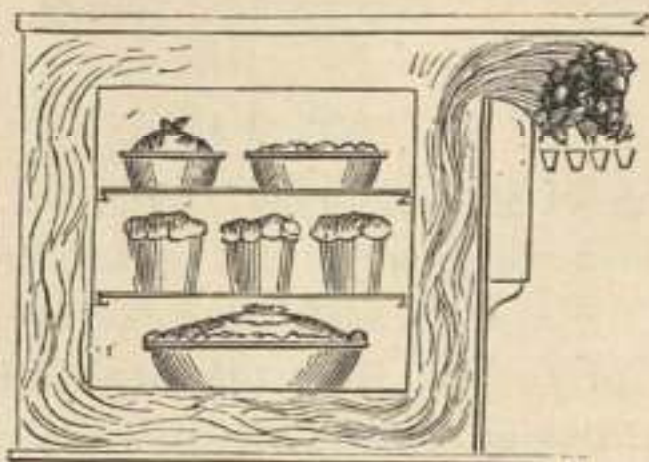
THE baking of pastry, bread, cakes, &c., strange to say, is a subject which seems to be totally ignored in the construction of the average cooking range, even in the so called new inventions of to-day. Yet this neglect cannot be said to be due to thoughtlessness, as on nearly every range which has two ovens we find one carefully labelled "Roaster" and the other "Baker," yet it would puzzle a clever person to detect the least difference in the construction of the two. In nearly every case they will be found to be both meat ovens, the flues being carried precisely as already explained.

A roasting oven is no more suited for pastry baking than it is for stewing or boiling. A pastry oven may be shaped like a roaster, but there the similarity ends.

It has already been explained that, provided a meat oven has a good and fairly equal heat at the top and sides, little thought need be bestowed upon the very effective heating of the bottom surface; *but with a pastry oven this order of things is completely reversed*, otherwise it cannot be called a pastry oven.

How proverbial it has become that pastry can but seldom be baked at home in the manner that the pastry cook supplies it. One need not look far for the cause, for if the pastry-cook took the place of your cook the pastry would still be a failure if it was baked in a Leamington Oven.

A perfect bottom heat is as essential to the bread or pastry oven in a range as it is to a baker's or pastrycook's oven, and without which neither of these tradesmen could possibly turn out saleable articles. Preparations of paste are always more or less charged with a gas which, by the application of a

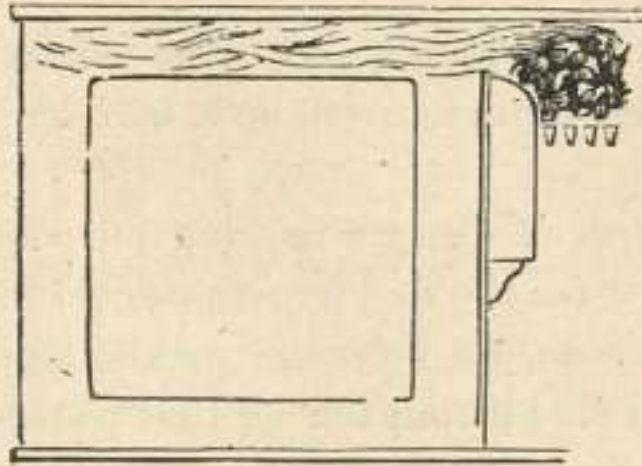


EAGLE PASTRY OVEN; Bottom Heat.

bottom heat, expands and assists in the rising process, which is the chief feature in the preparation of delicate and light pastry. It can be readily understood that if the top of a loaf or the crust of a pie is browned and set before the lower part is properly done, it will be impossible for these gases in the paste to properly expand, and so bring about the desired lightness of the pastry.

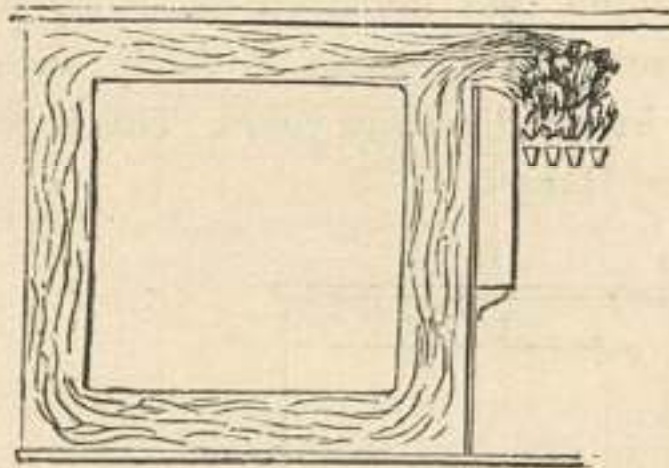
With preparations of fruit, noticeably pies, everyone knows the expedients resorted to with the Leamington Range to get the fruit cooked without ruining the crust. In the ordinary way, the crust would be baked, and in all probability burnt, before the fruit was barely warm. Attempts are made to overcome this in various ways, as laying a greased paper on top to protect the paste, or more commonly cooking the fruit in the pie dish (practically stewing it) before the crust is put on; but a pie prepared in this way is only a pie in appearance.

With a properly-constructed pastry oven the fruit can be cooked (and boiled in its own juices if desired) before the crust is even discoloured, and by the regulation of a damper the heat can then be directed to the top of the oven, and from one to two minutes is sufficient to finish the pie, browning the crust to any desired shade.



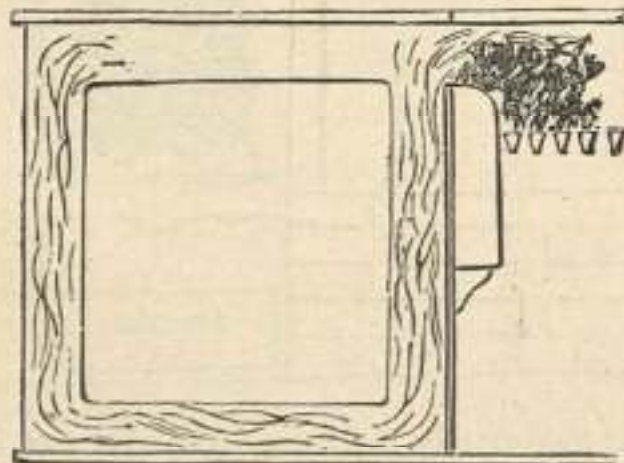
EAGLE PASTRY OVEN : Top Heat.

A really complete pastry oven should have a "Reversing Damper," by which the heat may be directed to top or bottom at will, so that, when needed, it can be converted into a roaster.



EAGLE PASTRY OVEN : Equal Heat.

The ventilation of a pastry oven is, if anything, of more importance than the ventilation of a roaster, as watery and other vapours *do not* improve all descriptions of pastry. The



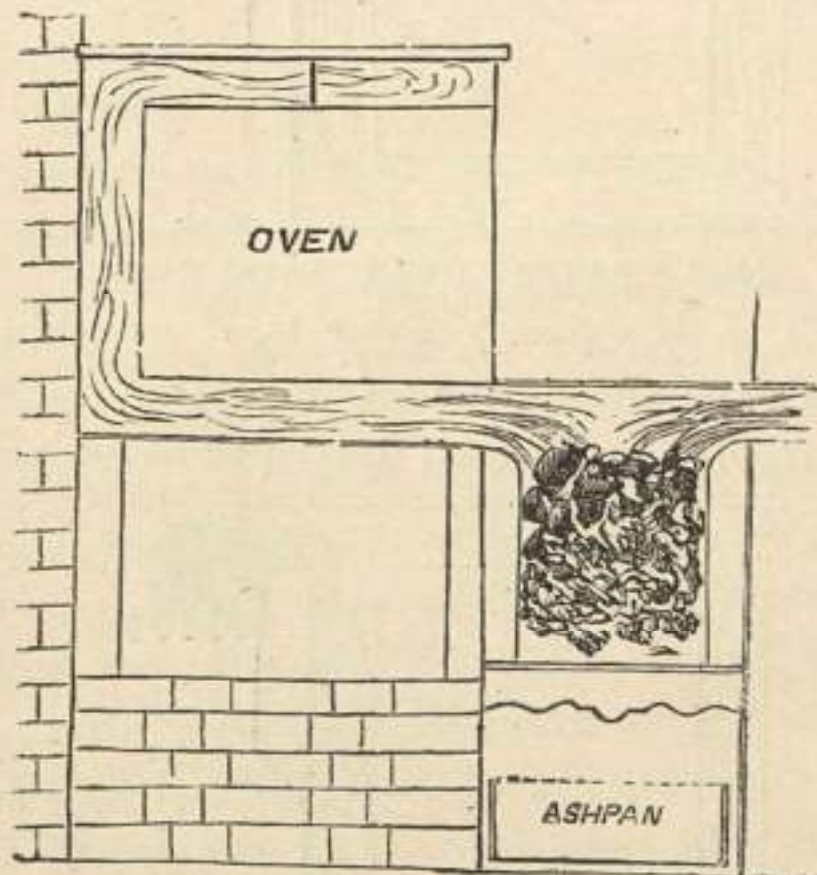
EAGLE PASTRY OVEN : Bottom Heat.

ventilation must be thorough, and by no means should cold air be admitted direct into the oven, or it will have a disastrous effect.

In fact, no form of oven for cooking purposes should have simply a hole in it for the free ingress of cold air. This must be patent to everyone, yet no range maker scarcely thinks of making provision for heating the air that passes into the oven, notwithstanding it can be done in a manner that is simplicity itself.

With a good pastry oven the bottom heat should be so perfect that water in a pan could be boiled on the bottom of the oven.

In the midland and northern counties, where coal has always been comparatively cheap, a fairly successful cooking range has been in use for many years. This is generally known as the Yorkshire Range.



This range is now generally falling into disuse in consequence of its enormous consumption of fuel, and having no hot plate

or plate rack, and the oven or ovens are of little use for roasting. It has to be acknowledged in their favour that the ovens are very good for bread or pastry baking, if the ventilation is properly arranged.

Various modifications of this range have been introduced from time to time, some with hot plates and ovens above, others with two ovens on the one side of the fire, but as before mentioned, they quite fail to compete with the new type of closed cooking range that is now being recommended, either for convenience, economy, smoke consumption, and general efficiency, and so are gradually being superseded.



CHAP. IX.

SMOKE Abatement. In 1881 an exhibition was held at South Kensington with the object of introducing all new kinds of Grates, Furnaces, and Cooking Stoves which have been specially constructed with a view to the diminution of the smoke nuisance.

Each year, as London increases in size, the smoke-laden fogs which darken the atmosphere become more and more dense, and consequently the time when the question of Smoke Abatement must be dealt with is now within the region of practical politics.

The Exhibition just referred to, although not showing any royal road to perfectly pure atmosphere, has clearly pointed out that with improved construction in our fire-places the amount of smoke pouring out of our chimney-tops might be reduced fully three-fourths.

Since this Exhibition the attention of specialists in Range and Grate Making has been seriously turned to the diminution of smoke, and hundreds of experiments have been made with this object in view. These researches and experiments have principally travelled in three distinct courses, and the difference between each separate invention is principally in detail of manufacture. The first and by far the largest number of manufacturers, have endeavoured to achieve this object by abolishing the use of bituminous fuel (Coal) entirely, substituting either Anthracite, Coke, or fuel burnt in a gaseous form, such as the ordinary carburetted Hydrogen as supplied by the Gas Companies, or air charged with Volatile Hydro Carbon oils. The second, while using the ordinary bituminous coal, have endeavoured to obtain perfect combustion by introducing each fresh supply of coal at the bottom of the fire, so that the gases generated from the coal have to pass through the incandescent

fuel above it, and so be consumed. The third, still retaining the use of ordinary bituminous coal, and the fire used in the ordinary manner, the improvement being in causing currents of air, heated to a very high temperature, to impinge on the smoke and combustible gases evolved from the coal, causing their ignition.

Many of the attempts by the first course have been fairly successful, gas stoves being now of a very improved form and in every-day use; unmixed coke and Anthracite fuels have not become popular in consequence of the difficulty in lighting the fire and of their requiring a certain amount of care in keeping them burning afterwards.

Of the second class, there is, as far as we know, no practical system of underfeeding that can be adapted for cooking apparatus, the general complexity of the mechanical apparatus necessary to raise the burning fuel and insert the fresh fuel under it has been such that it has been too difficult for the ordinary domestic to manage, and has needed constant repairs.

The third system of introducing hot air in the proper position, and heated to the right temperature, has been far the most successful.

Experiments which have been made for the last seven or eight years by the Eagle Range and Foundry Company with the object of producing a lining to the fire box of their Cooking Ranges, of a sufficiently refractory substance to bear the intense heat without cracking, and without liability to fracture from the poker, have resulted in the production of their Patent Smoke Consuming Fire Cheeks, which have now been in practical use in thousands of instances for the past three years, and have been uniformly successful, both as regards durability and the abatement of smoke.

It was found by experiment that a thick slab, cast from a special mixture of iron, fulfilled all the conditions with regard to durability, but it had the very important objection of rapidly conducting the heat into the oven at the side, thus causing

irregular heating and an actual increase of smoke compared with the fire brick slabs ; but by making this slab with a chamber at its back part, through which "Gill" plates run vertically (this chamber terminating in small conical holes at the top), most successful results were obtained in every sense of the word. These cheeks cannot be broken by the poker, however energetic the domestic may be who wields it, and after they have been in use, even for years, there is little trace of any wear, and the most important feature, the consumption, or rather, prevention, of smoke is most remarkable.

When fixed in position, these Smoke Consuming Cheeks form the sides of the fire box, their lower parts projecting beyond the bottom grating, consequently the whole of the time the range is in use there is a current of air passing up through these red hot gill plates, so getting intensely heated, and then passing out through the conical holes impinging directly on to the smoke as it leaves the fire. The result is most marked, and anyone lowering the fire door of an Eagle Range when in full operation will see apparently six large gas jets burning on the top of each Smoke Consuming Cheek, these jets being the result of the super-heated air mingling with the smoke and causing it to burst into flame.

In consequence, the quantity of fuel needed is very much reduced, and the soot formed in the flues and chimneys is small compared with the ordinary description of range fire box.

It is not claimed that this invention causes an absolute immunity from smoke, but it does reduce the quantity to a very considerable extent ; the cheeks require no cleaning or management on the part of the cook, and they cause the range to work much more steadily and regularly, and they will last longer than six or eight pairs of fire bricks.

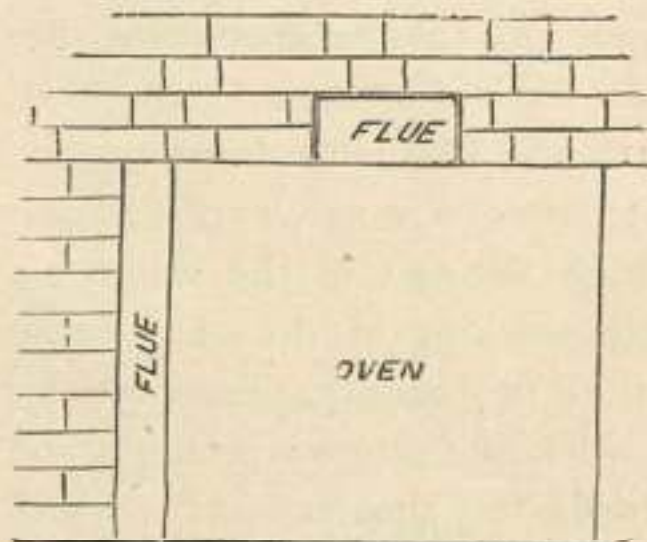
Many other attempts have been made by other manufacturers to obtain similar results by the introduction of hot air, but they have almost universally failed from either the liability of their apparatus becoming clogged up or introducing the air not sufficiently hot or in the wrong position.

CHAP. X.

PERHAPS the most important parts of a cooking range are the flues or passages by which the flame and heated air are conducted around the ovens, boiler, &c.

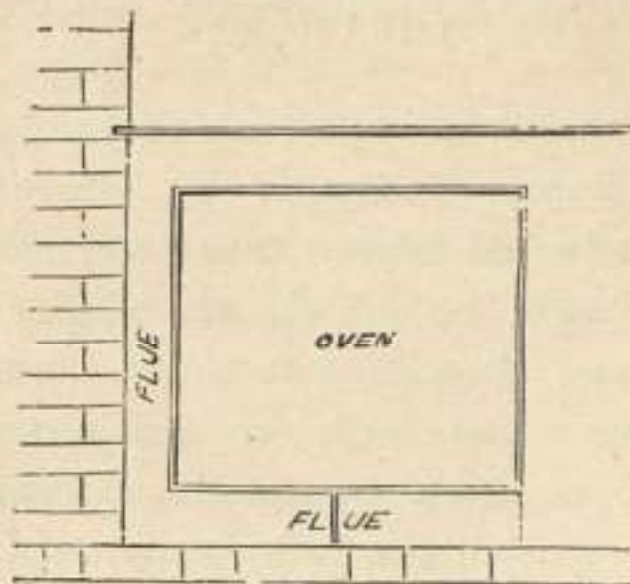
It is not intended to confuse the reader with a host of technical terms and theories, but to try and show the vast superiority of ranges made with strong iron flues (attached to and made part of the range by the manufacturer), over ranges which require to have all the flues constructed in brickwork by the person who undertakes the fixing. If a number of people were asked if they ever heard of a range wanting resetting, or of a range that was a failure through improper fixing or setting, nine out of ten would answer "yes," and many might say they knew many such instances, but there need be no hesitation in saying that not one in a thousand of such failures applied to an iron-flued range.

The term "brick flue range" means a range in which the flues are constructed in brickwork by a bricklayer, and in



PLAN SHEWING PART FLUES TO OVEN OF A BRICK-FLUE RANGE.

almost every instance it is not only the main ascending flues at the back of the range, but also the flues surrounding the ovens and boiler that have to be made in brickwork.



ELEVATION SHEWING PART FLUES TO OVEN OF A BRICK-FLUE RANGE.

With every make and every size of every make of range, there is a variation in both position, size, and shape of the flues, and it is on this account so many new ranges have to be set and reset, and ultimately the maker's aid called in before any degree of success is attained. A man would be a phenomenon if he could master the details of every range, and our most experienced and most skilled men are often baffled in fixing a new description of brick-flue range.

It is not known who first promoted the idea of leaving the construction of the flues of a range to the fixer. There is no merit attached to the idea; far from it, as the flues are a vitally important part of a range, and it matters not what the quality or how high the cost of the range may be, one little error will ruin the working of the whole apparatus until it is remedied, and, in all probability, necessitate its being reset.

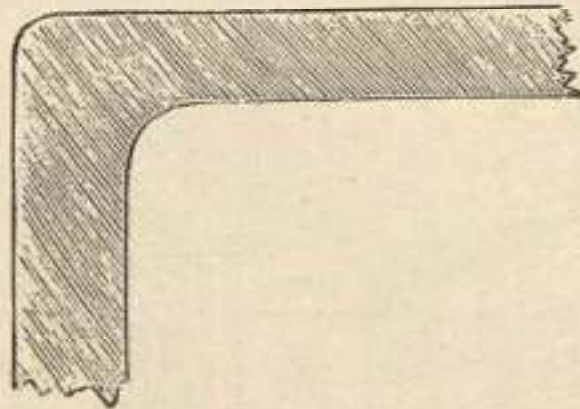
Supposing a brick-flue range is well set and works successfully, how long does this success last? Until the continuous unequal expansion and contraction causes the brickwork to

become disconnected from the range and all the flues leak one into another, so that the dampers will not fulfil their purposes, and the range becomes first eccentric, then useless, requiring to be reset. This resetting has of course all the attendant risks just explained, in addition to which is the almost unbearable annoyance and inconvenience, and lastly the expense.

Properly speaking, there should be nothing of a brickwork nature in connection with the body of a range. Why should two such opposite substances as brickwork and iron be made to work together? Everyone can understand that when a newly set range is first used there is a considerable expansive force exerting itself in the metal, the metal pressing irresistibly against the surrounding brickwork, flues, &c., and when the contraction upon cooling takes place the iron and brickwork part company never to unite again; *this happens the first time the range is used.*

Now a range provided with iron flues cannot possibly suffer from any of these drawbacks: when expansion or contraction takes place *it is equal everywhere, and all pull the same way.*

It hardly seems necessary to point out what a convenience



SECTION SHEWING THICKNESS OF IRON FLUES OF EAGLE RANGE.

and reduction in expense this proves in the fixing, and a very important feature is that, if desired, the range can be used independently without fixing, or if fixed it can be taken out and refixed anywhere almost without trouble, in fact, it almost renders the owner independent of skilled labour.

The following letter was received from a gentleman who purchased a full sized "Eagle" Range with two ovens, and of the ordinary description used in England, and it will interest many of our readers, as the circumstances are most exceptional.

"St. Mary's Parsonage,

"Bay of Islands,

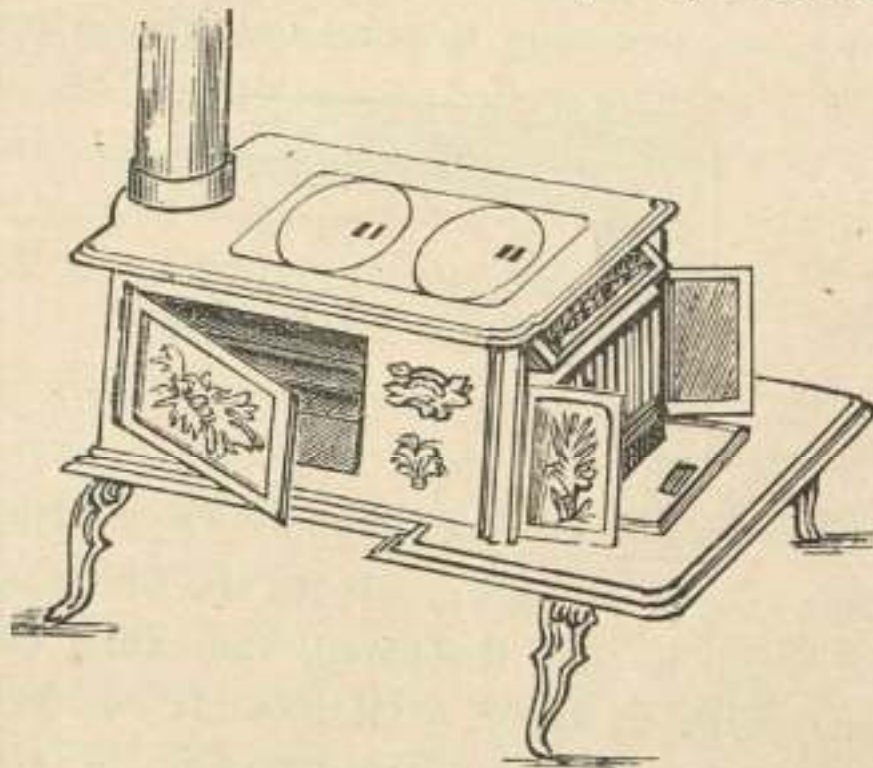
"Newfoundland.

"DEAR SIR,

"The kitchen range is now in working order, and we"
 "are thoroughly satisfied with it. Our cook happened to be ill,"
 "and for some time we had to look after it ourselves, and"
 "were delighted with its economical working, and surprised to"
 "find that it would burn rather poor anthracite coal when"
 "open as well as when closed. *I feel that it is only due to*"
 "*you to say that for want of skilled labour here we had to put*"
 "*it up ourselves, and how pleased we were when doing so to*"
 "*find all the parts fitted so simply and so well.*"

"Yours, &c.,

"(Rev.) J. J. CURLING."



AN AMERICAN RANGE.

The reader must please not fall into the error that all ranges having iron flues are of the "American" character, the iron flues now recommended are to simply take the place of the brickwork flues that are required with the Leamington and most modern ranges.

A superiority possessed by iron flue ranges, which would be quickly recognised in many instances, is the more efficient way in which they "draw." In cases where there is but a poor draught to the chimney, brick-flue ranges will oftentimes only "draw" well when newly set, for as soon as there is the least leakage of air into the flues the draught decreases in a like ratio, and this is often sufficient to cause a failure, but with an iron flue range such a leakage cannot occur.

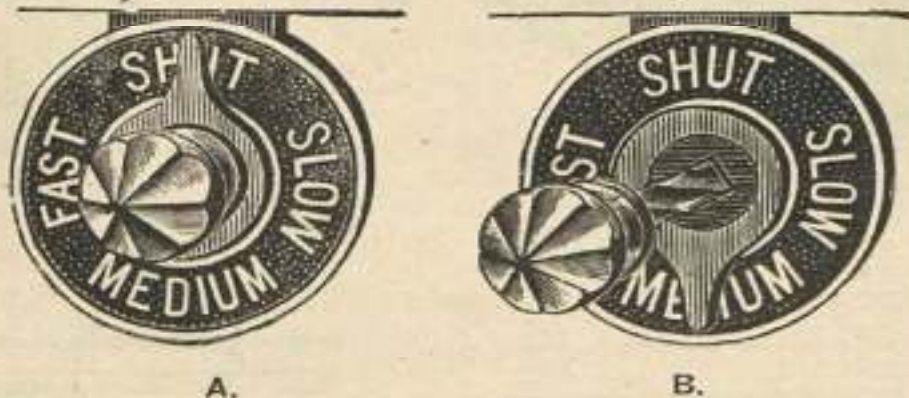


CHAP. XI

AS mentioned in Chapter VI, the dampers which are provided in ranges for the express purpose of regulating the draught, and, consequently the speed of combustion, are seldom used as they should be. The results of this neglect are threefold, viz., waste of fuel, unnecessary wear and tear to the range, and the ovens, &c., becoming overheated and unmanageable, burn or spoil the contents. The range maker is frequently confronted with a complaint that instead of the ovens not heating sufficiently they get too hot, and whatever may be put into them is burnt on the outside before it is properly cooked through. This complaint is always accompanied by a statement that the consumption of fuel is too great. This is invariably caused by neglect in regulating the dampers. The dampers of a range are the sliding plates in the back, over the hot plate, and are provided expressly to regulate the draught, and thereby the general results of the range. They are arranged to slide in and out of the flues, so that by drawing them out the draught has free passage, and the range works very fast, and the fire generally roars. By pushing these dampers right in, the passage of the draught is totally stopped, and not only will the ovens fail to heat, but the fire will not even keep alight. It is obvious that by just drawing the damper to some point intermediate between those just explained, we shall get intermediate results in exact accordance with the position of the damper. Nothing will act more perfectly than this simple form of damper, and if those using the range would only

understand what excellent regulators they are, complaints would be less frequent. One of the chief causes of the dampers being neglected is the fact that they are rather awkwardly situated at the back of the range.

The Patent Eagle Indicating Damper most efficiently removes these disadvantages, and the mechanism is exceedingly simple, consisting of merely a twisted rod, which on being pulled out or pushed in causes a small index pointer to revolve. At the back of this pointer is a plate marked with the words "Shut," "Slow," "Medium," and "Fast"; as the damper is pulled out the pointer rotates and points to these words, so that the cook can see at a glance how the range is working. The accompanying illustrations will clearly explain the action.



A.

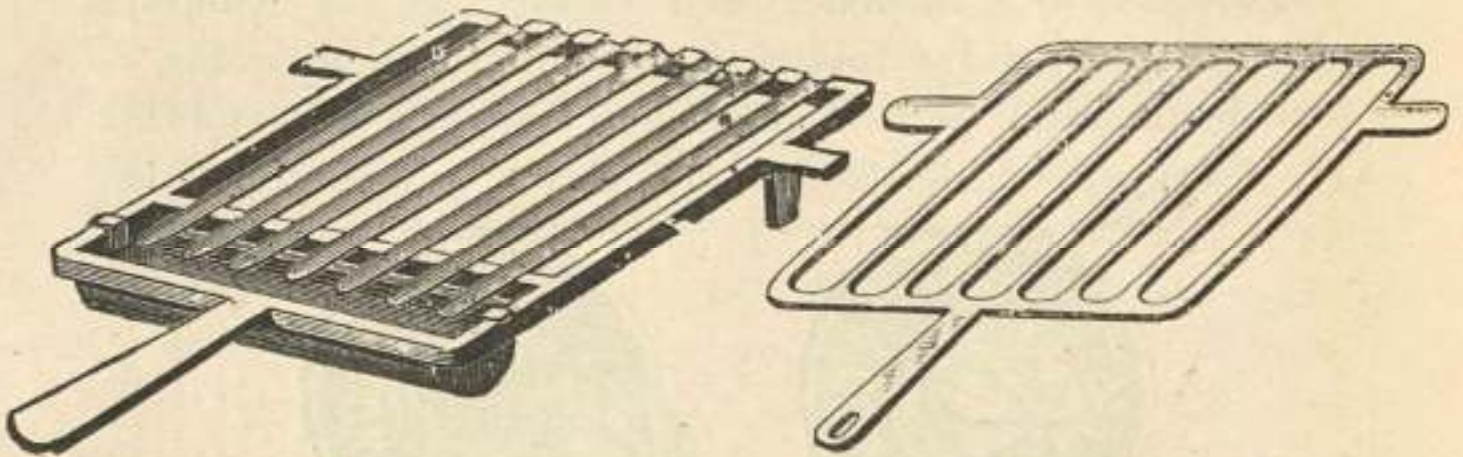
B.

Illustration A shows the pointer just over the word "Shut," and illustration B shows it over the word "Medium." Nothing could be more simple, yet so accurate and certain. It is absolutely impossible for it to indicate falsely, and it being situated immediately in front of the range, and directly in a line with the eyes of any person of ordinary height, nothing but absolute darkness would prevent it being seen. Those who have had these indicators fitted praise them highly, and they are as satisfactory to the purchaser as to the user, the cook, and this is a very desirable end attained.



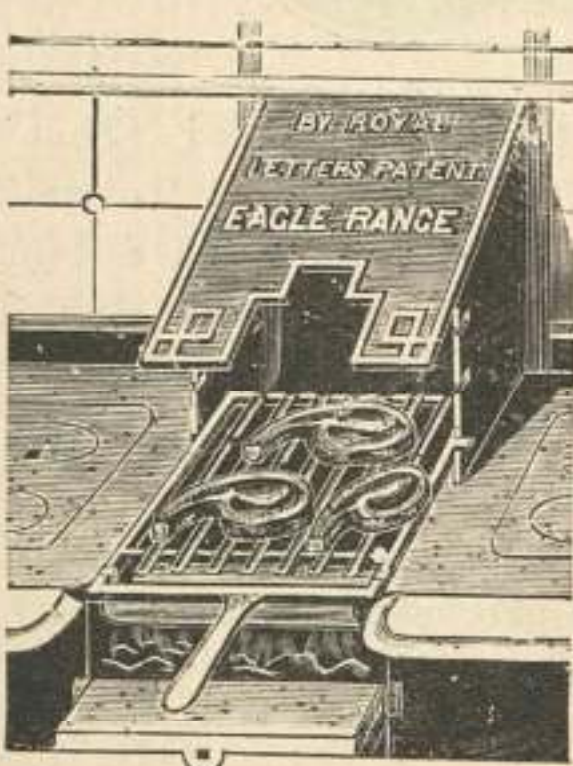
CHAP. XII.

GRILLING is fast becoming one of the most important methods of cooking, but the ordinary cooking range is entirely deficient of any appliance for properly grilling chops, steaks, kidneys, fish, &c., &c., otherwise than toasting at the



A

B



C



D

front of the fire, or immediately on the top of it; but this toasting gives very different results to grilling.

To grill perfectly it is necessary to treat the chops and steaks in the same manner as they are on a large restaurant or hotel grill. They are first brought near the hottest part of the fire, and turned quickly until browned on the outside, thus forming a crust which seals up the pores of the meat, and prevents the loss of the juices. When this is accomplished the chop or steak is raised to a cooler part, and the meat is then cooked slowly until done. By this method the meat is tender and nutritious, and nearly all the juices are retained.

This arrangement, which is quite impossible with an ordinary cooking range, is most easily accomplished with the Gold Medal Eagle Cooking Ranges, as explained by the illustrations A, B, C, and D.

Illustration *A* shows a gridiron made of polished steel, with fluted bars and loose gravy pan. This gridiron is intended for cooking anything of which it is desirable to retain the fat or gravy.

Illustration *B* shows a gridiron made of polished steel, with plain instead of fluted bars, and without gravy pan. This gridiron is principally intended for fish.

Illustration *C* shows the gridiron fitted on to the Range, and lowered close to the fire for browning the outside of the chop, &c.

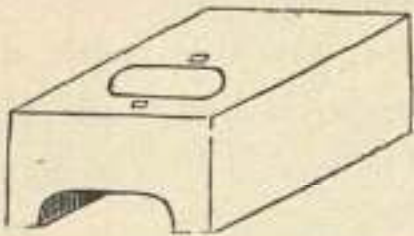
Illustration *D* shows the gridiron raised to complete the cooking slowly.

The gridiron can be fixed at any position between these two points as may be most convenient.

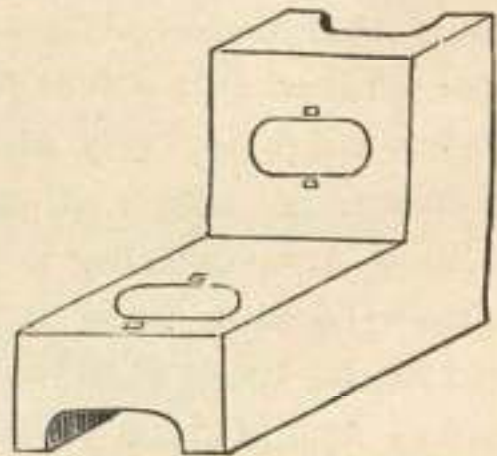


CHAP. XII.

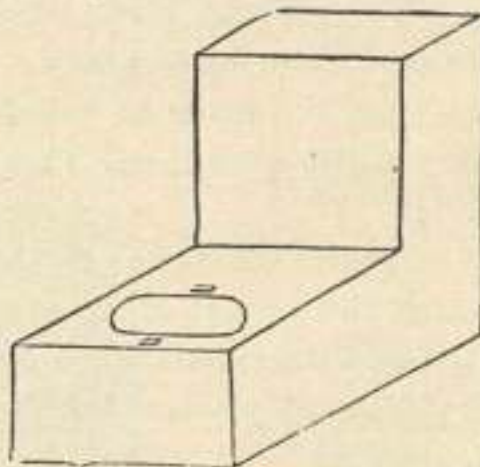
THERE is a most important adjunct to a cooking range which might with advantage have been spoken of earlier—viz., the Bath Boiler.



"SADDLE" BATH BOILER.



"BOOT" BATH BOILER.



"BOOT" LOW PRESSURE BOILER.

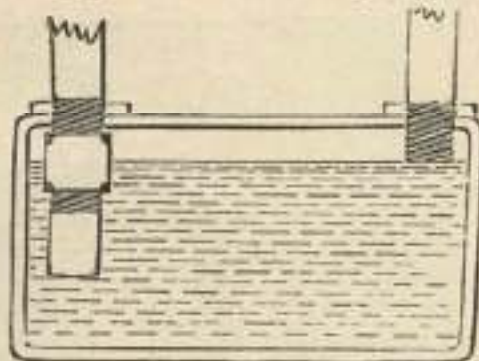
This article is favoured with various names, such as "High Pressure" Boiler, "Circulating" Boiler, &c., used indiscriminately by the trade as well as the public, and its shape partakes of greater variety than its names.

A bath boiler is daily becoming of greater importance as an adjunct to the cooking range, as nearly every class of house has now to be fitted with hot-water services throughout,

without which it cannot be considered complete, for an abundant supply of hot water in all parts of a residence is no longer considered a luxury, but simply a common comfort ; yet how few study this question in the manner that it should be.

If a range is not capable nowadays of providing (by its boiler) plenty of hot water, it is condemned as strongly as it would be if it failed in its cooking capacities, and it must be concluded that the majority of range makers forget or are ignorant of what a boiler is required to do. It is in the early morning almost immediately after the fire is lighted that the bulk of hot water is required for bathing purposes, yet many ranges are fitted with boilers that will not give *hot* water until after the breakfast hour, and this inconvenience needs no describing.

Of course the failure is sometimes due to the imperfect manner in which the system of hot-water pipes is carried out, for it would be no exaggeration to say that a fair sized volume



SECTION OF BOILER ; Shewing a common fault with a Hot-Water Apparatus.
could be filled with the various errors that have been discovered in apparati of this sort.

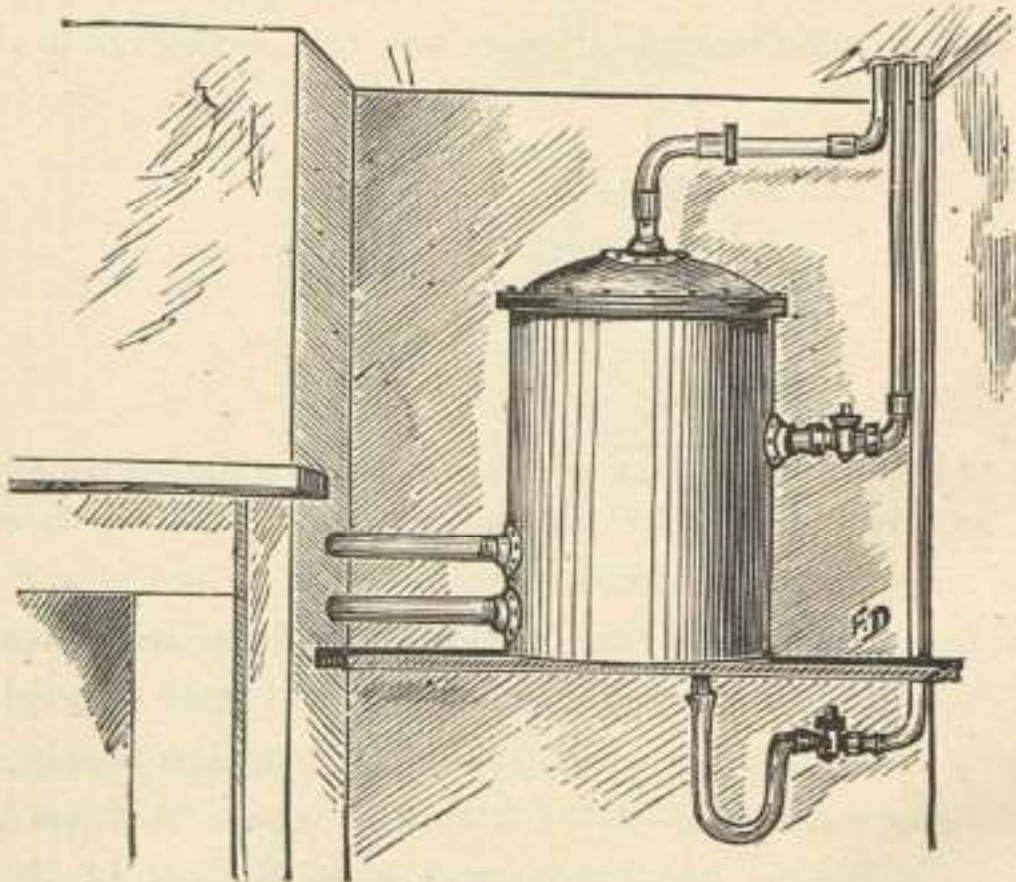
No doubt the majority of such blunders arise from the simple fact that most mechanics know nothing of natural laws, and many of the foremen that overlook them are nearly, if not quite as ignorant. Hot-water fitting in a perfect form might fairly be classed as a science, and a good deal of thought, practice, and some study need to be devoted to it before a man

should feel every confidence in his abilities as a superintendent of such work.

It would be impossible in these pages to treat this subject exhaustively, but it can be said without hesitation that with proper provision in the range, with a good boiler and a properly-constructed apparatus, sufficient hot water should be obtained for all purposes at any hour of the day, and *by a very simple arrangement the water can be kept hot all night, so that a fairly warm bath can be had before the fire is lighted in the morning.*

The designing and fitting up of bath and hot-water apparatus is fast becoming a special and distinct business generally associated with those who make a speciality of cooking apparatus, as the range and hot-water services in connection with it may be looked upon as one undertaking, one being dependent upon the other for its successful working.

A few years ago it was considered that to supply a bath, the



A CORNER IN A KITCHEN.

scullery sink, and the housemaid's closet with hot water was as much as could be reasonably expected from the boiler in a kitchen range. It is just possible that this idea is still generally entertained, as there certainly are many ranges of fair size sold at this day that would have difficulty in doing more than just stated; but a good sized range of an improved make, with a properly constructed boiler, should be capable of providing a thoroughly efficient supply of hot water to a large residence with as many as *twenty* hot water draw off services. This is concluding that the circulating apparatus is arranged upon a proper system.

A really good bath boiler should have the following features:—

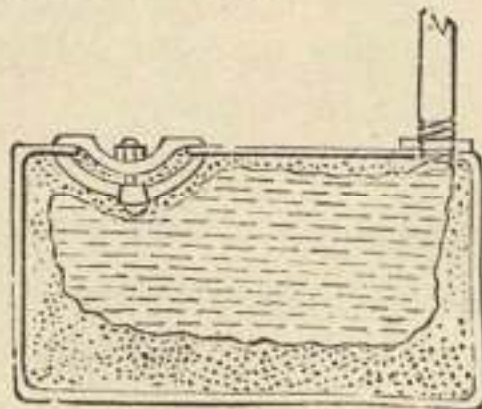
- 1st.—The iron should be of the best quality boiler plate of not less than $\frac{3}{8}$ of an inch in thickness with thoroughly sound welds or joints.
- 2nd.—The flue should be of the correct shape to ensure a sufficiency of heating surface, and all sharp corners should be avoided, and it should be easy of access for cleaning.
- 3rd.—The manhole should be in such a position and of such a size that the parts of the boiler in which the greatest amount of "fur" is deposited should be readily got at for cleaning.
- 4th.—The proper position of the manlid is most important, and the lid itself should be so constructed that it can be fixed or removed by an inexperienced person (for further particulars see page 65).

A range that has a movable bottom grating to the fire, such as the "Eagle," is, *when the bottom grating is up in its highest position, as capable of heating the boiler rapidly and well as the deepest Leamington fire made.*

While upon the subject of boilers it would be interesting, perhaps, to many to ventilate the question of fractured bath boilers, that is, bath boilers that have become cracked or leaky, and so needed renewing, which is a most expensive and unpleasant experience.

It is no exaggeration whatever to say that *quite three-fourths of the cracked bath boilers in London and the South of England owe their failure to a want of regular cleaning*, that is, the removal of the incrustated deposit, or "fur," which invariably accumulates when what is known as "hard" water is used. This occurs to a more or less degree in most parts of England; but in some districts the water is nearly free from lime or chalk, and the deposit is of a muddy nature which can be flushed or washed out.

In London, the water supplied by the different companies is of a variable "hardness," this hardness being caused by the water being more or less charged with chalk in solution (bicarbonate of lime). When this water is raised to a high temperature the chalk undergoes a chemical change, and is precipitated, this precipitate (carbonate of lime) adhering firmly to the inner surfaces of the boiler, particularly where the boiler is subjected to the greatest heat.



SECTION OF BATH BOILER : Shewing it badly "furred with incrustated Deposit.

Everyone is aware that if a boiler is exposed to the fire

when empty it quickly becomes destroyed and precisely the same result is experienced (although at a much slower rate) when the fur has become of sufficient thickness to prevent the water having contact with the iron.

The "fur" soon forms an internal lining to the boiler, and being a very poor conductor, it is with great difficulty that the heat is passed from the boiler plate through this "fur" lining into the water, and as this incrustation increases in thickness the difficulty becomes greater, and ultimately the fibrous nature of the iron is destroyed and the boiler plate becomes fractured.

With London water the deposit is very dense, and an inch and a quarter thickness is generally sufficient to destroy the boiler, and a boiler in regular daily use, if it is a rapid heating one, will have this quantity of deposit in from one and a half to two and a half years. Many instances occur in which well-made boilers have remained sound when an incredible amount of "fur" has accumulated, especially if the fur is of a porous character, yet an inch and a quarter of hard London "fur" generally causes a fracture. A good and reliable plan is to have the deposit removed once every six months. With this attention the boiler will last many years.

The cleaning out of a boiler *should be* a moderately easy task, never occupying a workman more than an hour or two, but, unfortunately, there are many ranges made that have practically no provision for this easy cleaning, that is to say, the boiler may be provided with a man hole and the necessary lid, but the task is to get at this lid after the range is fixed. In many cases it is necessary to partially dismantle the range, removing some portion of the upper part and the hot plate to reach the boiler, making the kitchen uninhabitable for perhaps more than a day; therefore it is no wonder that many people prefer to let the boiler go unopened until it fails, then have it

replaced by a new one, this causing but little more dirt and discomfort than the cleaning.

Now take an opposite example, as with the Eagle Range. With this *it is only necessary to remove one small loose plate to expose the boiler lid*, that is to say the interval that elapses between the time the workman first touches the range to the time that he commences to remove the boiler lid need not exceed *half a minute*, whereas in the first-mentioned case this interval may be four hours, and this means about another four hours to replace the parts after the cleaning is done.

With the Eagle Range the periodical cleaning seldom costs more than four to eight shillings (inclusive of time and expenses of travelling, which, of course, vary with the distance).

Many of the readers residing in districts where there is but little chalk in the water will hardly understand the importance of this subject, but to those who reside in districts in which the water is hard (chalky) it will, no doubt, be of the greatest interest.

In the Southern counties—Sussex, for example—the chalk in the water is a subject of serious moment to all who use boilers, the percentage of lime being much higher than the London waters, and many boilers that are in constant use cannot be safely left more than one month; in a case like this a boiler that is easily got at is a positive boon.

If the “fur” is cleared from the boiler regularly it greatly assists in keeping the pipes clear and in good working order also, and the water heats quicker and with less fuel.



CHAP. XIV.

IN the preceding pages the description of the development of the cooking apparatus has been, it is hoped, interestingly traced from its earliest stages to its latest development,—the Eagle Range. The description has been entirely confined to the practical working of the cooking appliances, and but little or no mention has been made of the manner in which they are constructed, although as much improvement has been made in the mode of manufacture as in the cooking stove itself.

A well designed but badly manufactured cooking range would be as great a failure as a well constructed and badly designed one, and as much or even more care has been displayed in the construction of the Eagle Range than even in the designing and developing its many improvements.

The Eagle Range and Foundry Company Limited is one of the very few makers who construct ranges in their entirety, and it is in the earlier stages of the manufacture that they are enabled to ensure a thoroughly durable article being made.

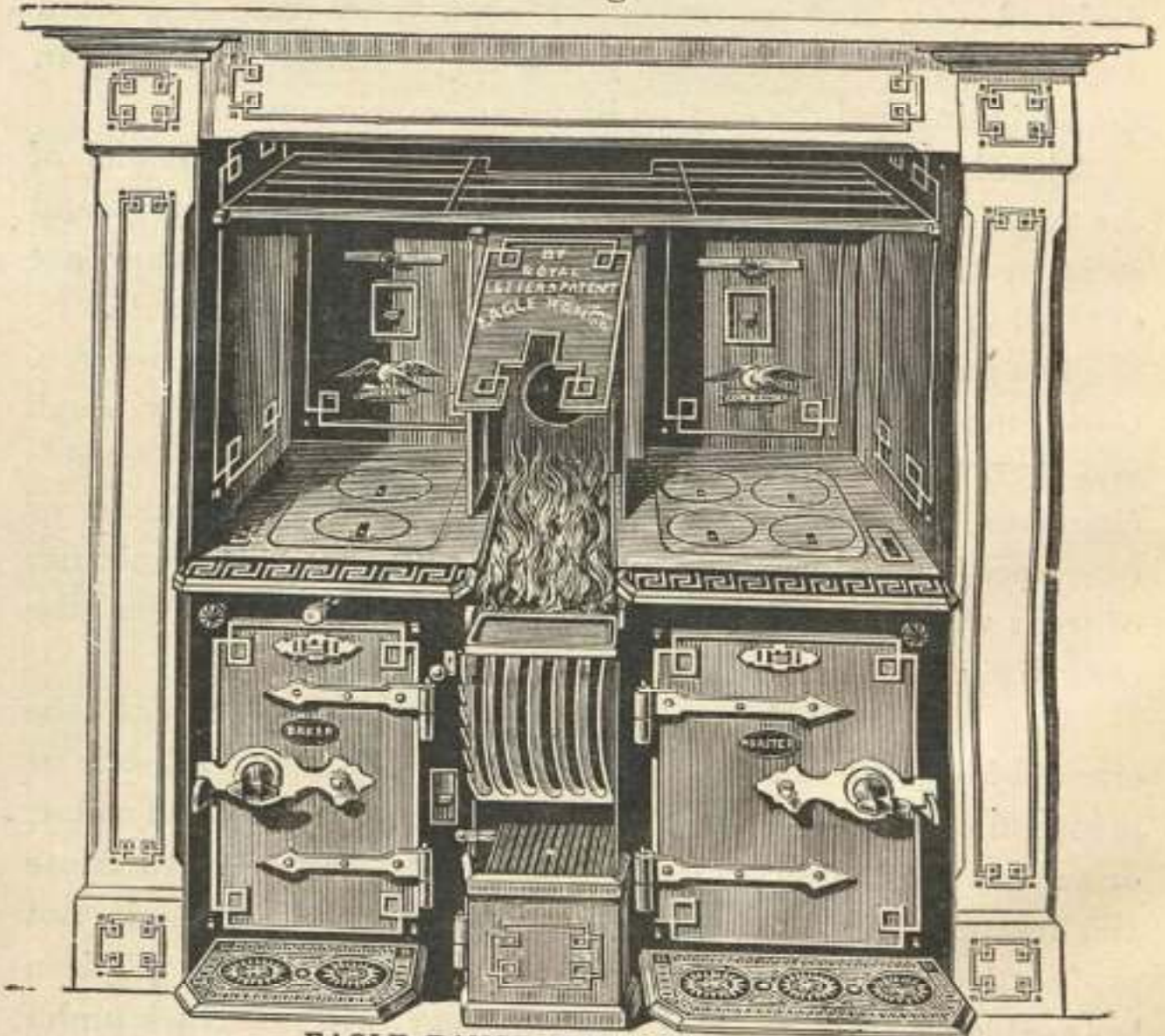
The principle parts of a cooking range are made of cast-iron. Cast iron has the peculiarity of being either particularly tough and durable metal, or of a highly brittle and unreliable character, and either of these peculiarities are caused or developed by the class of pig-iron used in forming the mixture of irons which have subsequently to be melted to form the ordinary castings.

Most of the readers may, perhaps, be familiar with the cracked hot-plate of a cooking range; the filling of a kettle or saucepan on the hot-plate, or the sudden slopping of cold water, or a slight blow from a poker is generally sufficient to cause this fracture. Now the Eagle Range manufacturers do not profess that their combination of different brands of pig-iron has enabled them to produce a casting that will not crack under any conditions, but they have undoubtedly combined a mixture

of high-class irons, and the resulting casting is of a particularly tough and tenacious character, and cracking of parts is an exceeding rare occurrence, and then it is strictly confined to those parts that are easily renewed.

The general fitting and finish of these cooking ranges are of a very high-class character, and they are quite equal in their general appearance to their efficiency in cooking.

THE EAGLE RANGE, which has the many advantages already referred to, is made by the Eagle Range and Foundry Company Limited, of 176 Regent Street, and 58 St. Paul's Churchyard, London, of 2 St. Augustine's Parade, Bristol, and Catherine Street, Aston, Birmingham.

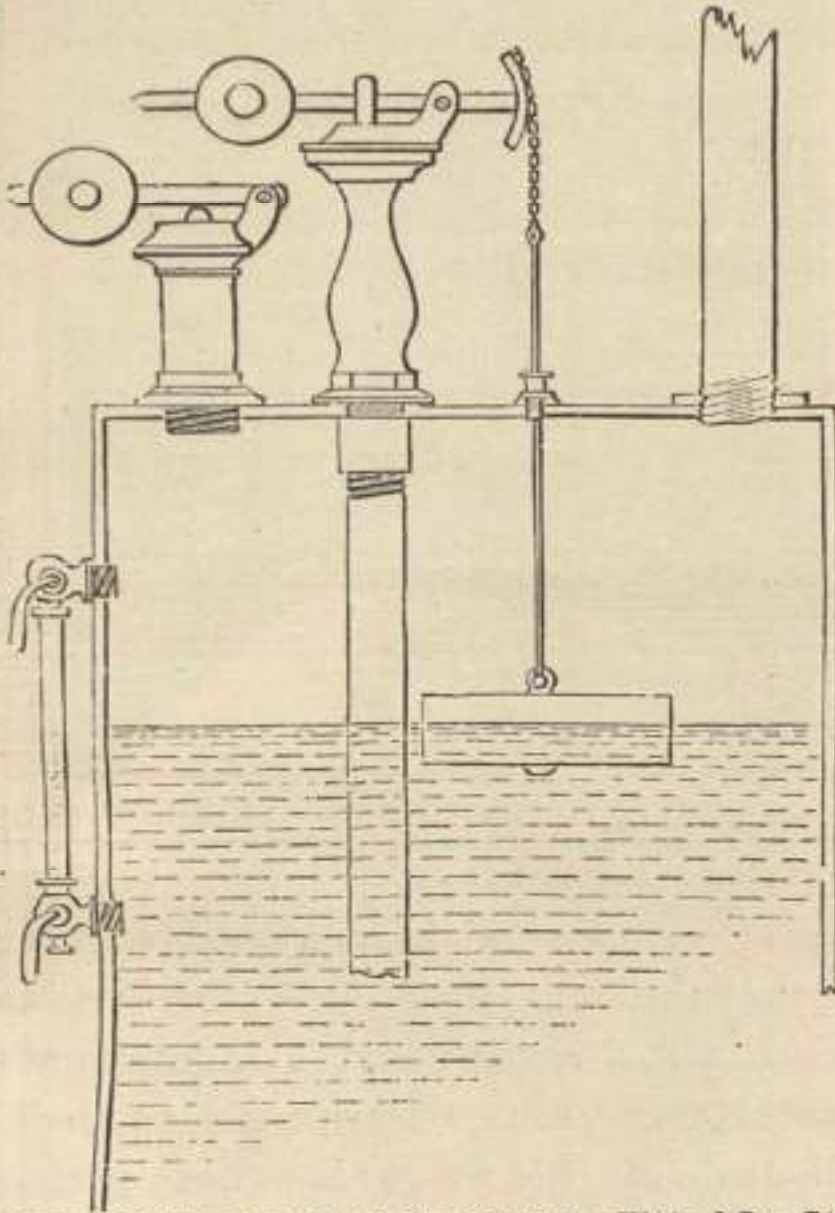


EAGLE RANGE WITH TWO OVENS.

Made in all sizes 4ft. to 20ft., With 2 to 10 ovens.

See Catalogue for Prices and Particulars. (Post free.)

These ranges are made in every size and style, the same as ranges of the common type, ranging from 2 ft. to 10 ft., having one to four ovens. All sizes can be fitted with bath boilers as required, and the medium and larger sizes can be fitted with boilers for steam cooking &c.



SHEWING UPPER PORTION OF RANGE BOILER, Fitted for Steam Cooking.

Low pressure boilers are, of course, provided when bath boilers are not used, or if desired, both can be had in one range.

Hot closets can be fitted to any except the very small ranges, and the ordinary conveniences, such as a plate rack, &c., &c, are fitted as a matter of course.



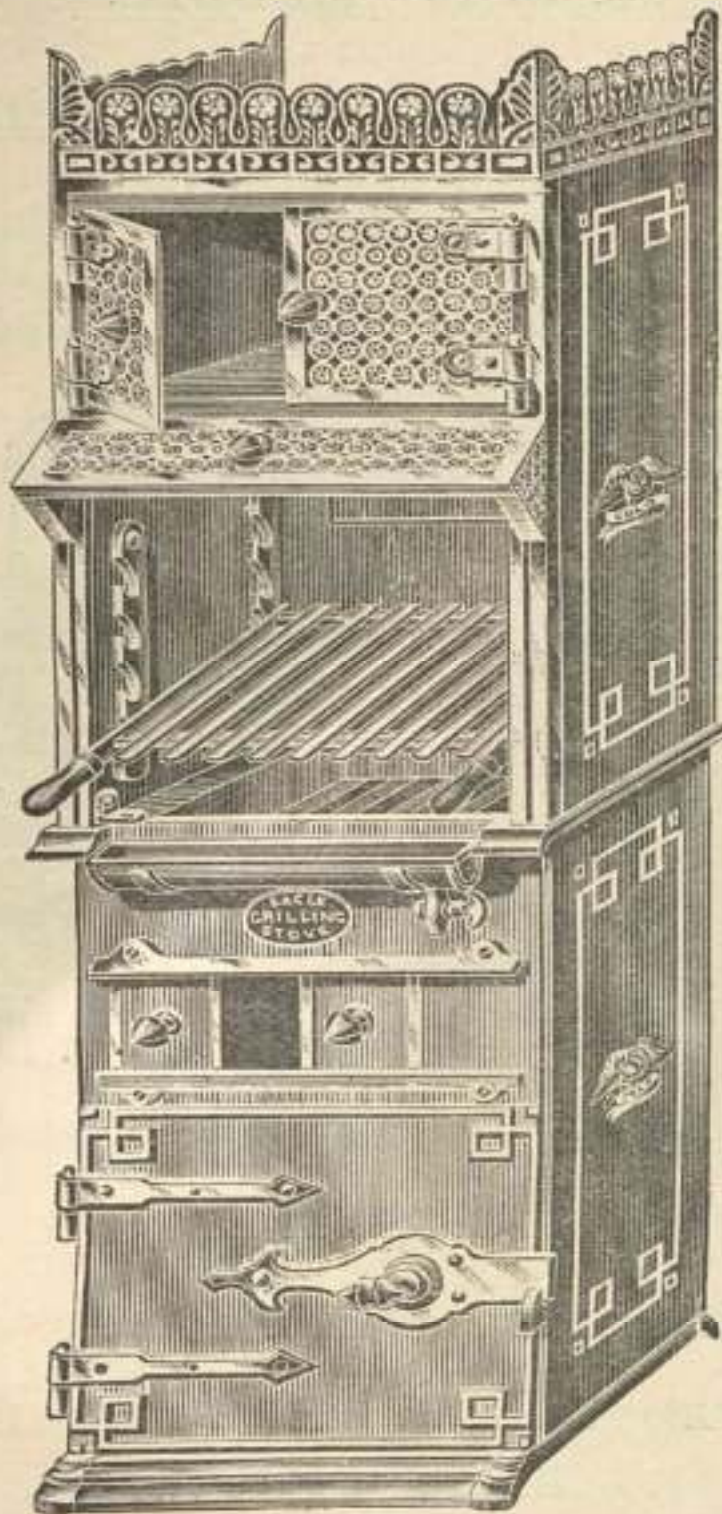
EAGLE RANGE, WITH TWO OVENS AND HOT CLOSETS

Made in all sizes from 4 ft. to 20 ft., with 2 to 10 ovens.

These ranges can be seen in use *i.e.*, working with fire in them, at any of the Company's establishments, and those of most of their accredited agents, and their catalogues describe a variety of some 100 different descriptions of their particular range. Without doubt this range is as near perfection as it is possible to get such an article, combining those three very essential qualities, *viz.*, the utmost efficiency in cooking, &c., with the utmost economy in fuel, simplicity in management, and really substantial construction.

All Eagle Ranges and Grates are delivered Carriage Free to any Railway Goods Station in England.

CATALOGUES FREE BY POST.



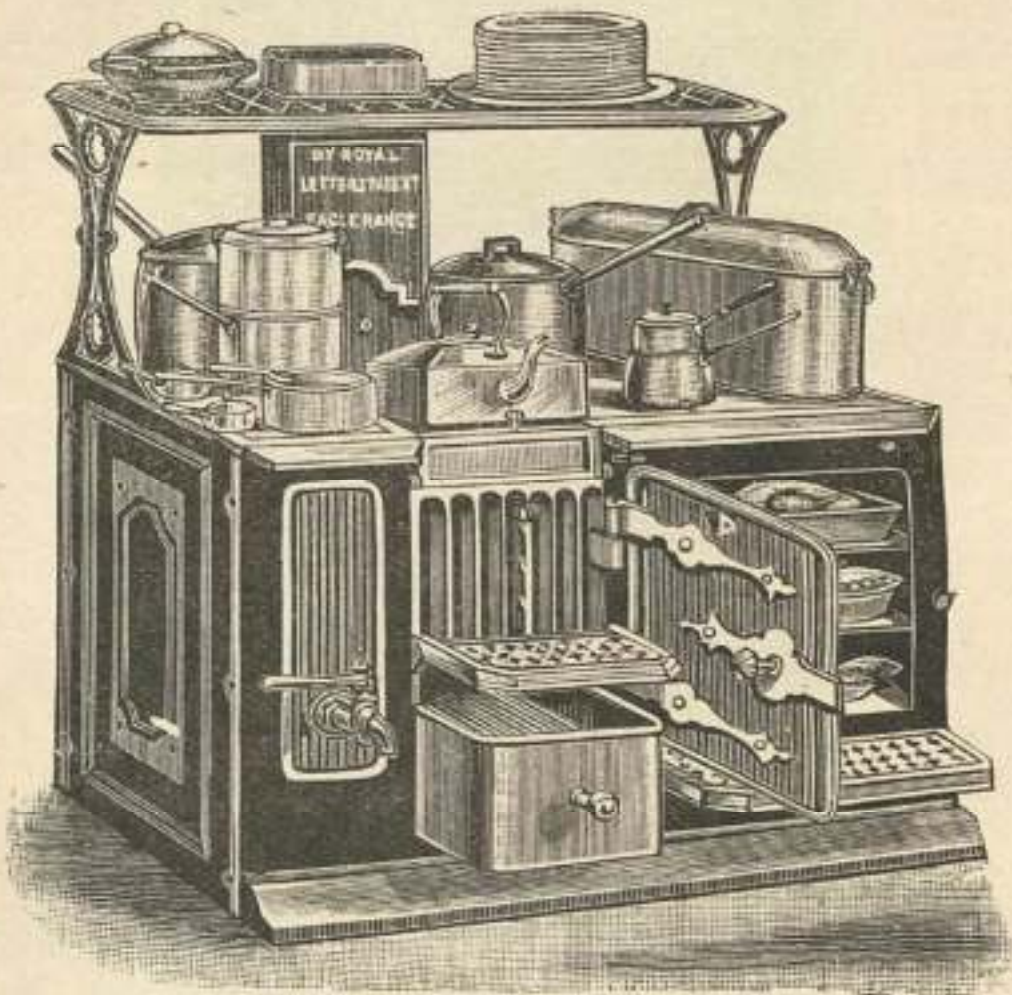
EAGLE GRILL STOVE.

See Catalogue for Prices and Particulars.

MADE IN SEVERAL SIZES AND QUALITIES.

20 GOLD MEDALS.

27 FIRST PRIZE SILVER MEDALS.



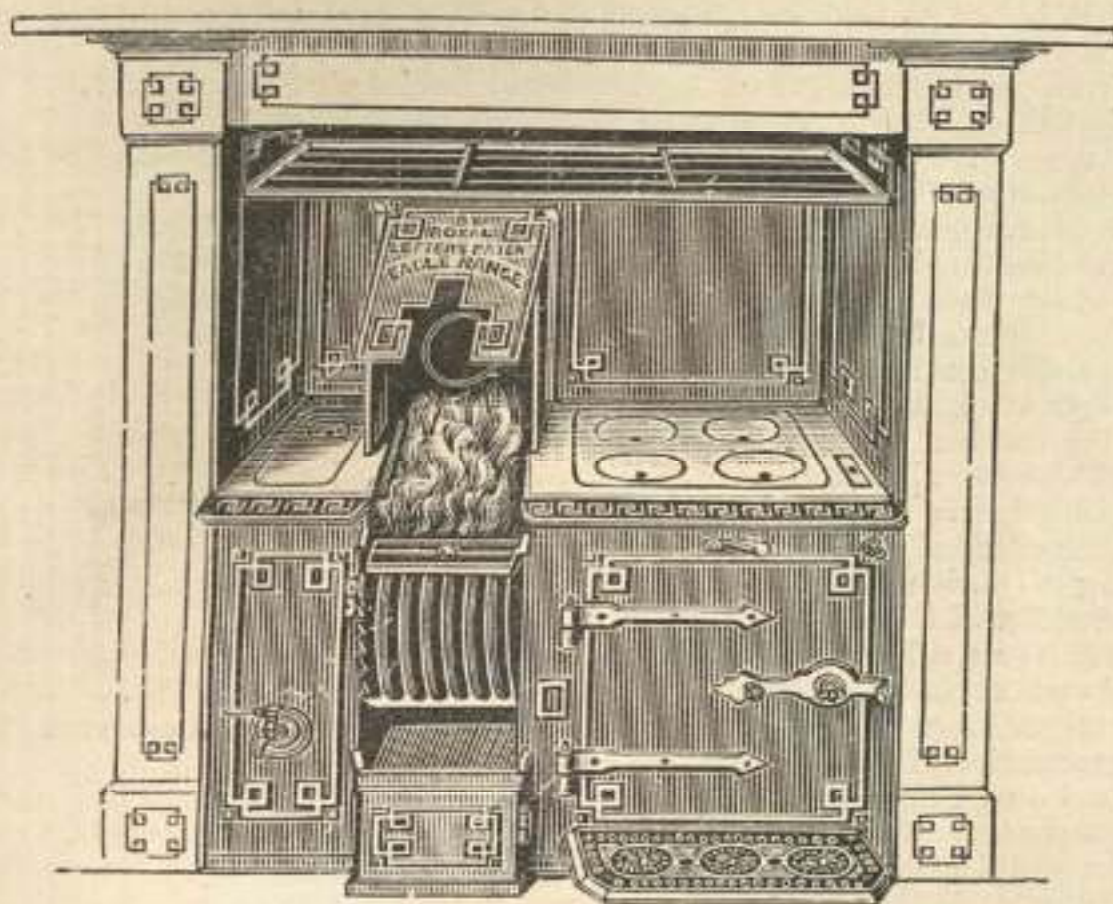
EAGLE PORTABLE RANGE.

This Illustration shews the Range closed up for Cooking.

AWARDED A GOLD MEDAL AT THREE INTERNATIONAL
EXHIBITIONS.

Made any size from 2ft. 2in. to 4ft.

SEE CATALOGUE FOR PRICES AND PARTICULARS.

20 GOLD MEDALS.27 FIRST PRIZE SILVER MEDALS.EAGLE RANGE WITH ONE OVEN AND BOILER AT SIDE.

This Illustration shews the Range working with an Open Fire.

AWARDED THE GOLD MEDAL BY THE SOCIETY OF ARCHITECTS,
FIVE YEARS IN SUCCESSION.

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Made any Size from 3ft. to 5ft

SEE CATALOGUE FOR PRICES AND PARTICULARS



**The following HIGHEST PRIZE MEDALS have been awarded to the PATENT EAGLE RANGES.**

- Exhibition of Sanitary Apparatus and Appliances, Leamington, 1877.  
The Industrial Exhibition, Wolverhampton, 1878.  
The Worcestershire Agricultural Society's Show, 1878.  
The International Food Exhibition, London, 1880.  
The International Food Exhibition, London, 1881.  
The Health Congress & Domestic & Scientific Exhibition, Brighton, 1881.  
The International Food Exhibition, London, 1882.  
The Smoke Abatement Exhibition, London, 1881-2.  
Special Prize of 25 Guineas, awarded by the Ladies' Committee of the Smoke Abatement Institute, 1881-2.  
The Wirral and Birkenhead Agricultural Society's Show, 1882.  
The Worcestershire Agricultural Society's Show, 1883.  
The National Health Society's Hygienic Exhibition, London, 1883.  
The International Health Exhibition, London, 1884.  
The Architectural and Building Exhibition, Plymouth, 1885.  
The Architectural and Building Exhibition, Sheffield, 1886.  
The Architectural and Building Exhibition, London, 1886.  
The International Cookery Exhibition, London, 1886.  
The International Exhibition, Liverpool, 1886.  
The International Exhibition, Glasgow, 1886.  
The International Exhibition, Edinburgh, 1886.  
The Architectural and Building Exhibition, London, 1887.  
The Staffordshire Agricultural Society's Show, 1887.  
The International Exhibition, Newcastle-on-Tyne, 1887.  
The Anglo-Danish Exhibition, London, 1888.  
The Cardiff and South Wales Exhibition, 1888.  
The Architectural and Building Exhibition, London, 1889.  
The Electrical and Industrial Exhibition, Birmingham, 1889.  
The International Health Exhibition, Hastings and St. Leonards, 1889.  
The International Exhibition, Brighton, 1889.  
The Food and Cookery Exhibition, London, 1889.  
The International Food and Cookery Exhibition, London, 1890.  
The Art and Industry Exhibition, Plymouth, 1890.  
The Midland Trades Exhibition, Birmingham, 1892.  
The South African International Exhibition, Kimberley, 1892.  
The Brewers' and Allied Trades Exhibition, Birmingham, 1893.  
The Northumberland Agricultural Society's Show, 1893.  
The National Trades and Industrial Exhibition, Birmingham, 1894.

**The following HIGHEST PRIZE MEDALS have been awarded to the PATENT EAGLE GRATES.**

- The Architectural and Building Exhibition, Sheffield, 1886.  
The Architectural and Building Exhibition, London, 1886.  
The International Exhibition, Glasgow, 1886.  
The Architectural and Building Exhibition, London, 1887.  
The Cardiff and South Wales Exhibition, 1888.  
The Architectural and Building Exhibition, London, 1889.  
The International Exhibition, Brighton, 1889.  
The South African International Exhibition, Kimberley, 1892.  
The Brewers' and Allied Trades Exhibition, Birmingham, 1893.  
The Northumberland Agricultural Society's Show, 1893.  
The National Trades and Industrial Exhibition, Birmingham, 1894.



## CAUTION.

# Re SHAM EAGLE RANGES.

We are compelled to issue this notice in consequence of many flagrant attempts now being made to foist on the public Cooking Ranges, somewhat like ours in appearance, and which are represented as "Being very similar to the Eagle" or "That work just like the Eagle," while the resemblance is in the external appearance only. The well-known economy and convenience of the Gold Medal Eagle Range has caused us to have many imitators, and as one of our old and obsolete patents of movable bottom gratings lapsed a short time since, this opportunity has been seized by some manufacturers to add these old bottom gratings to their Ranges, and to advertise them as Ranges with the "Eagle Patent Fire." These adaptations are always more or less failures, as the flues and general arrangement of these Ranges are utterly unsuitable for movable bottom gratings.

These attempts have (unfortunately for the purchasers) been successful in several cases, and one has just occurred—"A gentleman who had purchased an Eagle Range some time ago was so satisfied with it that he recommended it to his brother, who decided on purchasing an Eagle of a similar size, but, unfortunately, instead of communicating with us direct, or with our accredited agents, he placed himself in communication with a firm who recommended him a Range which was to have the 'Eagle Patent' embodied in it." To his cost he soon found his Range used more than 7 cwt. of coal per week, and its cooking powers were most defective; whereas his brother's large Eagle Range was cooking most satisfactorily, using 3 cwt per week. We found, on examination, that the only part of the Range that had any possible similarity to ours was that a movable bottom grating (one of our old and obsolete patents) had been used, but the remainder of the Range was of the worst possible type, in fact only a shell front and hot plate. This is the type of Range that is frequently recommended by firms as similar to the Eagle, their only reason for so doing being that on these inferior types of Ranges they are able to obtain a larger profit.

**THE GOLD MEDAL EAGLE RANGE IS THE ONLY ONE THAT HAS  
Our Improved Patent Movable Bottom Grate.**

- " " Automatic Open and Close Fire.
- " " Grilling Apparatus.
- " " Reversing Damper for Perfect  
Pastry Baking.
- " " Smoke Consumers.
- " " Cinder Sifter.

and, most important of all, our Ranges require no Brickwork Flues, as all flues are contained in the Range itself, so that they are independent of a bricklayer's setting. These advantages are to be found only in the genuine Gold Medal Eagle Range, and the average consumption of fuel is about one half that of the ordinary brick-set Range.



# List of a few PURCHASERS of the EAGLE RANGE and GOLD MEDAL FIRE GRATE.

His Grace the Duke of Northumberland  
 His Grace the Duke of Wellington  
 His Grace the Duke of Buccleuch  
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 The Most Noble the Marquess of Londonderry  
 The Earl of Cork and Orrery, K.P., P.C., F.R.G.S.  
 The Earl of Caledon  
 The Earl of Dundonald  
 The Earl of Shrewsbury and Talbot  
 The Earl of Portsmouth  
 The Earl of Levan and Melville  
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 Viscount Pollington  
 Viscount Bury  
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 Lord Hindlip  
 Lord Norbury  
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 The Dowager Marchioness of Waterford  
 The Dowager Lady Ashburton  
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 Prud's Bank  
 Capital and Counties Bank  
 London and South Western Bank  
 National Provincial Bank  
 Alliance Bank  
 London and Provincial Bank  
 Holloway's College (27 Rathes)  
 Westbourne Hotel, Paddington  
 Cadogan Hotel  
 Homeopathic Hospital  
 Newmarket Hospital  
 Hertford Infirmary  
 Houndsdown Barracks  
 Aldershot Barracks  
 Soldiers' Home, Aldershot  
 Savage Club  
 Beefsteak Club  
 British Chess Club  
 St. Joseph's Retreat  
 St. James' Home  
 Metropolitan Fire Brigade  
 Eastern Counties Asylum  
 District Lunatic Asylum, Sligo  
 Middle's Library  
 Saddler's Hall  
 Saenger's Amphitheatre  
 Birmingham Central Tramway Co.  
 Children's Home, London, E.  
 " Gravesend  
 " Leytonstone  
 Police Orphanage, Strawberry Hill  
 The Girls' High Schools, at Dulwich, Brixton, Sydenham, Clapham, and Tunbridge Wells.  
 The Royal Institution  
 Alliance Marine Assurance Co.  
 Young Men's Christian Association  
 Young Women's " " " "  
 Mildmay Park Institute  
 Royal Astronomical Society  
 Great Northern Railway Company  
 London and North-Western Railway Company  
 The Morgan Crucible Company  
 Co-operative Builders, Limited  
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 Kington Union  
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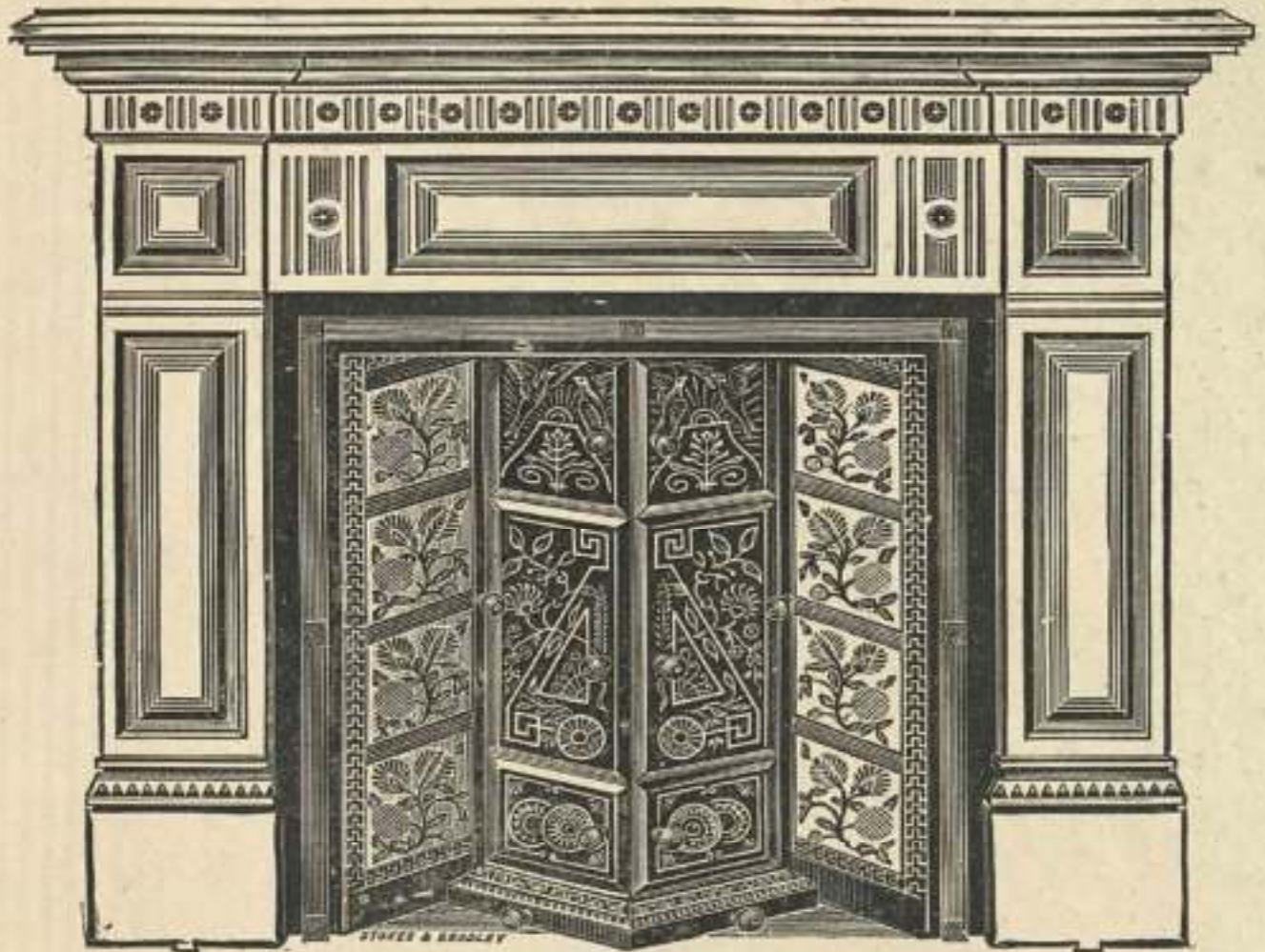
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— THE —  
**Gold Medal Eagle Grate**



*This Illustration shows Grate with all the Regulating Doors closed.*

**SPECIAL ADVANTAGES.**

Fast or slow combustion, as required.

Enormous Economy in fuel.

Fire can be lit and a good heat obtained in a few minutes.

Cures Smoky Chimneys. Perfect Safety.

Temperature of Room can be increased or decreased as desired.

**THE EAGLE RANGE AND FOUNDRY COMPANY LTD.,**

**176 REGENT STREET, LONDON, W.**

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