

IMPROVED VENTILATING HEATER.

A new heater is illustrated in the annexed engraving, which, besides supplying a uniform current of hot air, thus warming the apartment, is so constructed as to draw in fresh air, thus at the same time ventilating the room. There is no contact of the incoming air with red hot metal or with the hot coals, and hence the warm current is delivered pure and uncharged with carbonic acid. For churches, school rooms, halls, and other apartments where ventilation is much more frequently bad than good, the ventilating heater appears to be especially suited, and may advantageously replace the usual forms of stove. A perspective view of the invention is given in Fig. 1; the construction is exhibited in the sectional view, Fig. 2. From the latter it will be seen that there is a direct connection between fire box and flue, so that there can be no impediment to the draft. Surrounding the flue is a chamber, A, into which fresh air is led by the pipe, B, the latter connecting with the space between the flooring and with the atmosphere outside the building. In passing up through the chamber, as shown by the arrows, the air traverses several perforated metallic plates, one of which is shown in Fig. 3. These, in addition to impeding the flow of the current, heat the same, since the plates themselves become quickly warmed by the flue walls. The heated air then makes its escape into the room through the openings at C.

We are informed that the consumption of fuel in the stove is small, one hod of coal being sufficient for a ten hours' supply, provided the fire be properly cared for. Either hard or soft coal may be burnt. The construction is simple, and there are no parts to get out of order, nor is there any opportunity for fouling or clogging in the flues. Dampers being absent from the stove, all casualties from careless regulation are avoided. Patented through the Scientific American Patent Agency, September 7, 1875. For further information, address the inventor, Mr. M. C. C. Church, Parkersburg, W. Va.

PORTABLE STEAM ENGINES.

The portable engine illustrated on this page is one manufactured by Messrs. Clayton and Shuttleworth, of Lincoln, England, and was awarded the first prize given for portables at the last trials of the Royal Agricultural Society of England. The competitive trials by the Royal Society are of the most severe and searching nature; and in the case of all descriptions of engines, paid engineers of responsibility and eminence are intrusted with the duty of minutely examining and reporting as to the merits of each competing engine, embracing the distinctive points of strength, proportional and general construction, economy of fuel, quality of material, workmanship, and general efficiency. A combination of these advantages, it is claimed, have given to Messrs. Clayton and Shuttleworth the leading position in England, as portable engine makers, and to this date they have manufactured 13,000 of such engines, and their present production is 25 engines per week.

The following are some of the distinguishing features of the engine herewith illustrated.

The boiler is butt-jointed and riveted by hydraulic machinery, which process of manufacture makes incomparably stronger work than the old plan of hammering. The fire box is invariably of Low Moor iron. The boiler is lagged and covered with iron plate and banded, and the cylinder is steam-jacketed and lagged. All wearing parts, such as slide bars, nuts, pins, etc., are case-hardened. The engines are fitted with improved adjustable side blocks, carriages, and bearings, all of the best quality of gun metal. The crank

shaft is bent, in preference to using the cheaper overneck kind. A second lock-up safety valve and Salter's spring balance are affixed to each engine. Reversing gear is added, allowing the engine to run either way. The feed pump is supplied with an arrangement for heating the water; it is continuous in its action, and cannot get out of order.

The workmanship and material used in the construction of these engines are of the best kind obtainable, and the

meeting, looking not tired and weary, but quite refreshed with his bodily labor."

The Origin of Coal.

The discovery of diatoms in coal, by Count Castracane, recently announced, is of much interest, as throwing additional light on the mode of formation of carboniferous coal. These minute forms of plant life have not been recognized in

any but very modern formations; but Count Castracane has succeeded in showing that they date from the palæozoic epoch, and as far back, at least, as the carboniferous period. He says: "All the forms I have been able to observe among the ashes of the coal present such an appearance that the most practised and sharpest eye could not detect the slightest difference between them and actually living diatoms: outline, structure, shape, and number of the flutings—in short, all the peculiarities which characterize the species that we meet with in the state of actual vegetation—agree exactly with those of the carboniferous period." It can scarcely be denied that the existence of these minute forms of aquatic vegetation in the substance of carboniferous coal goes to confirm the view of those who (like Professor Bischof) hold that this mineral has been formed in presence of water, and the great preponderance of fresh water forms of the diatomaceæ proves that this was fresh water; still the occasional occurrence of marine forms leads to the inference that the waters of the ocean occasionally had access to the lagoons or inland lakes.

In fine, the presence of diatoms, taken in connection with the stratigraphical phenomena of carboniferous coal beds, appears to bear out the views of those who hold that the mineral has been formed from the decay of successive generations of plants and forest trees, growing with their stems partially immersed in the stagnant waters of vast lagoons, these lagoons being nearly on a level with the waters of the sea, which sometimes gained access to them, and carried with them marine forms.

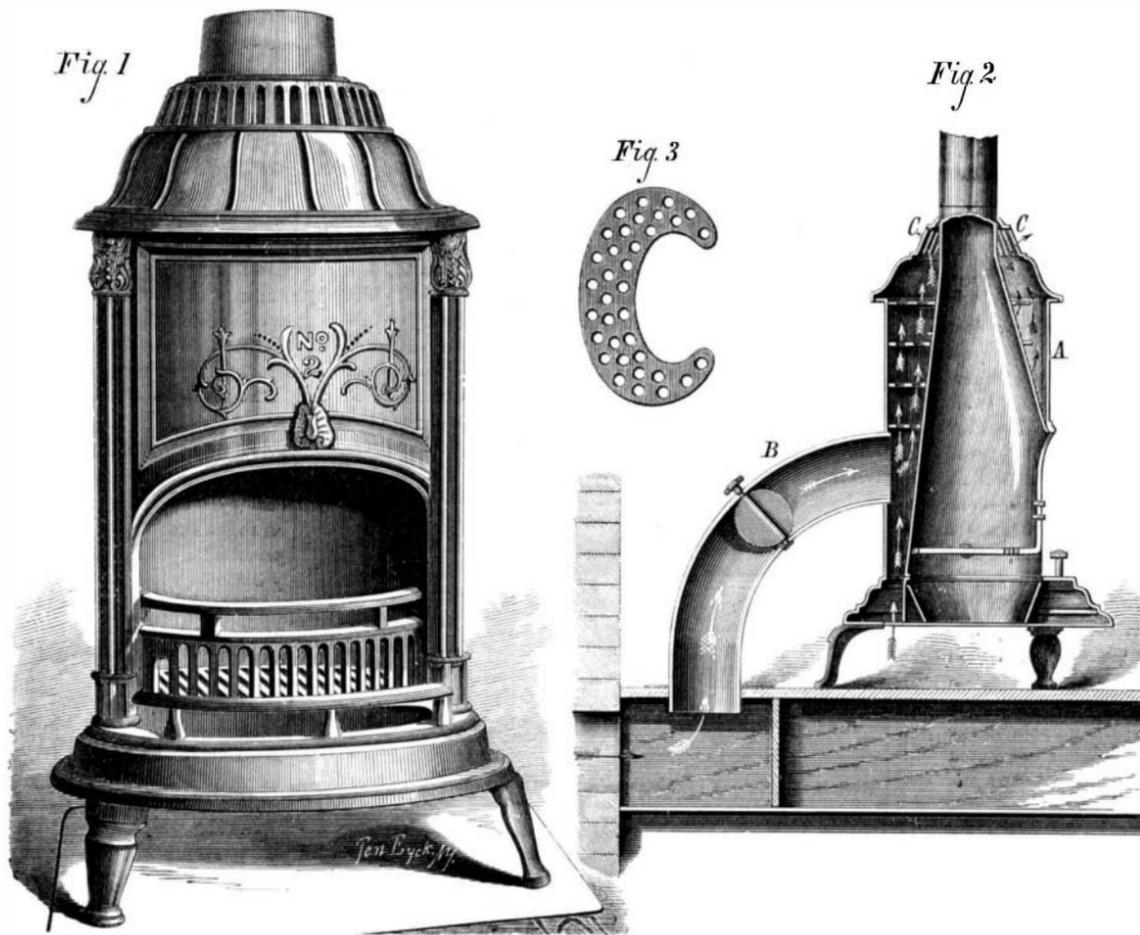
Epizootic in Horses.

This disease, that swept over this entire country and proved so serious in the fall of 1872, is appearing again this fall, though probably in a milder form. Nearly all the horses of this and other cities are affected with it already, and it is certain to spread to the country very soon. Horses that are in good condition will suffer the least from its attack. Its first symptom is a slight cough, which gradually becomes more frequent and severe, accompanied with running at the nose and swelling of the throat between the jaw bones. Horses that are in good heart and are properly taken care of will probably only be slightly affected.

A writer in the *Ohio Farmer* advises the simplest treatment possible. Keep the horses in a warm, comfortable, clean, and well ventilated stable, blanketed in wet, cold weather; feed well with oats and sweet hay (corn is too heating), with a good bran mash once a day; the only medicine needed is to thoroughly rub the throat with some good liniment if it should become much swollen, and be very careful not to let them take cold. A little exercise every day at light work or careful driving, we deem

beneficial; but any violent exercise, or anything approaching over exertion, will be almost certain to produce serious results.

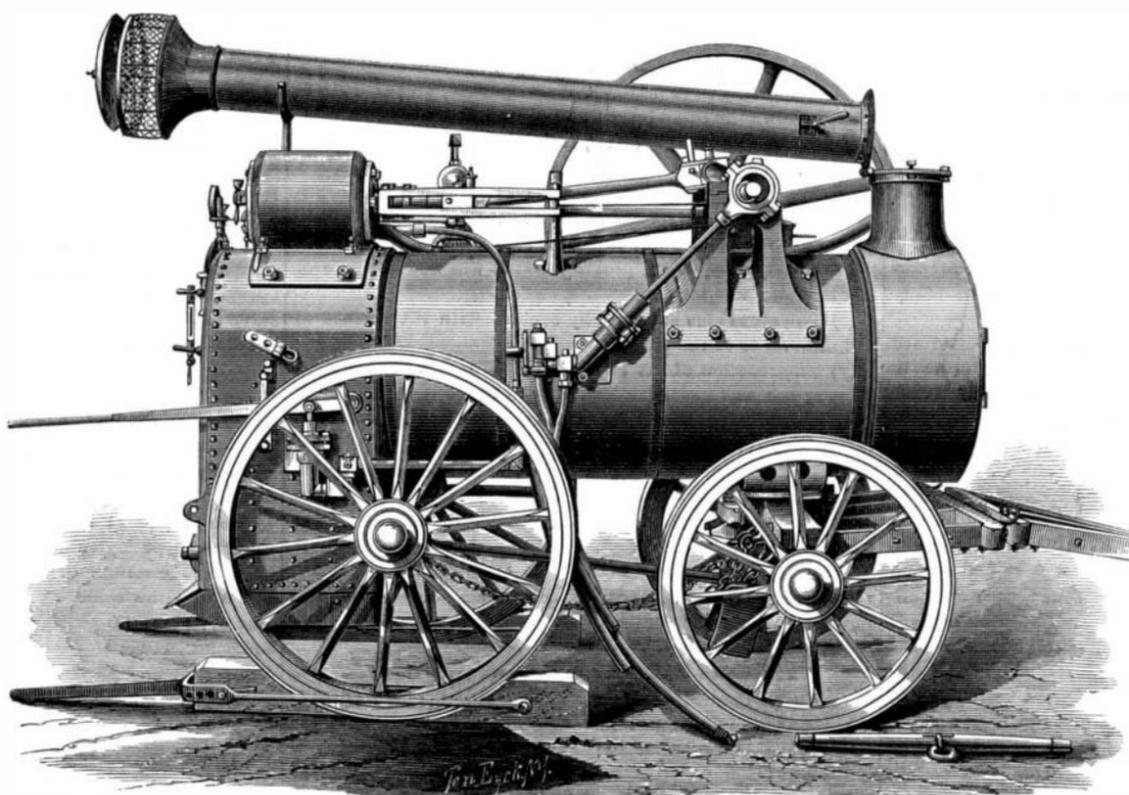
The aim should be to keep the horse in as strong heart as possible, and Nature will soon work out the disease. The usual term of this distressing and destructive malady is from twelve to twenty days.

**CHURCH'S VENTILATING HEATER.**

boilers are tested to 200 lbs. per square inch. Mr. W. C. Oastler, 43 Exchange Place, New York, the agent for Messrs. Aveling & Porter's road engines, steam plows, etc., is also the representative of Messrs. Clayton and Shuttleworth in the United States.

Laborious Rest.

Speaking of the habits of English statesmen, a Liverpool paper states that two hours before the recent meeting at Hawarden "Mr. Gladstone was engaged in his favorite exercise of felling trees. For a portion of two days he has

**CLAYTON AND SHUTTLEWORTH'S ENGLISH PORTABLE ENGINE.**

been welding the ax upon a large tree in a lane at the outskirts of Hawarden village, and he succeeded in bringing it to the ground late yesterday afternoon. Those who saw him say that he went to work in true woodman fashion, with his braces thrown off behind him and his shirt collar unfastened. After completing his task, he walked home with his ax slung over his shoulder, and two hours afterward was at the