THOMSON'S AIR EXTRACTOR.

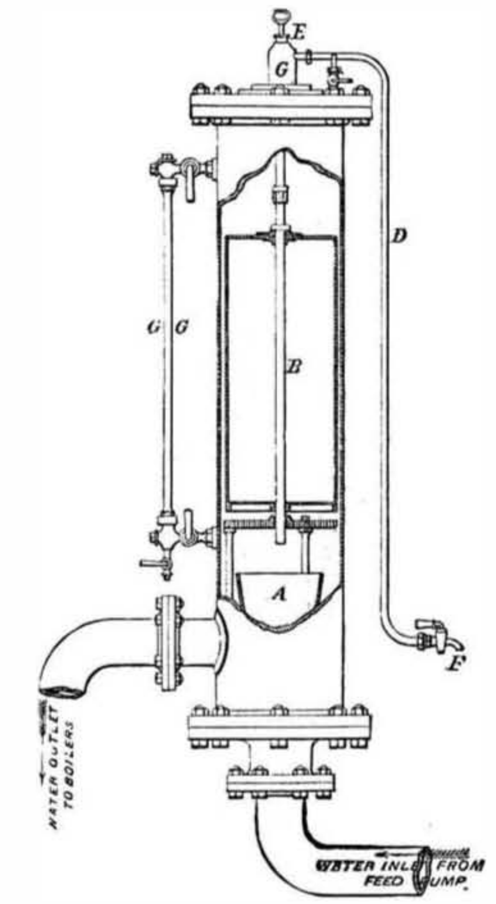
We subjoin an engraving of an arrangement of air extractor for getting rid of the air which is discharged with the water by the feed pumps of marine engines, this arrangement being one designed and patented by Mr. Archibald Thomson, the superintendent engineer of the Union Steamship Company, at Southampton.

The practical experience of the last few years has led most marine engineers to the conclusion that the presence of air in the water contained in a marine boiler is decidedly harmful, the air materially assisting, if not actually originating, the corrosive action on the plates, while it subsequently, after passing through the engines with the steam, tends to impair the vacuum in the condenser.

In marine engines, as ordinarily constructed, the feed pumps have a far larger capacity than is absolutely required, supposing all to be in good order, and under the usual conditions of working they discharge into the boiler with the feed a certain—or rather, we should say, uncertain—quantity of air, which is drawn in through the pet cocks, etc. In the apparatus now under notice the water is discharged from the feed pumps through a bell-mouthed pipe, A, into a cylindrical vessel provided near its bottom with a branch pipe leading to the boilers, and having at its top a piston air discharge valve, G, which is connected by a rod to the float, B.

The air separating from the feed water on its discharge from the pipe, A, collects in the upper part of the cylindrical vessel, and so long as the air valve is not closed by the rising of the float, escapes through the air valve, G. If, however, this escape takes place more rapidly than the air enters, the water level rises in the vessel and the float, B, is lifted, thus closing the air valve, until a further quantity of air has collected. A glass gauge, G G, at the side of the vessel shows how the apparatus is working, while the air valve, G, discharges into a pipe, D, which is furnished with a stopcock, F, by means of which the engineer can control the working of the arrangement in the event of anything going wrong with the float or air valve.

The whole apparatus is very simple, and in practice it has been found to answer its purpose well. Now that the desirability of separating air from feed water is well understood, we expect, says *Engineering*, to see Mr. Thomson's separator largely applied.

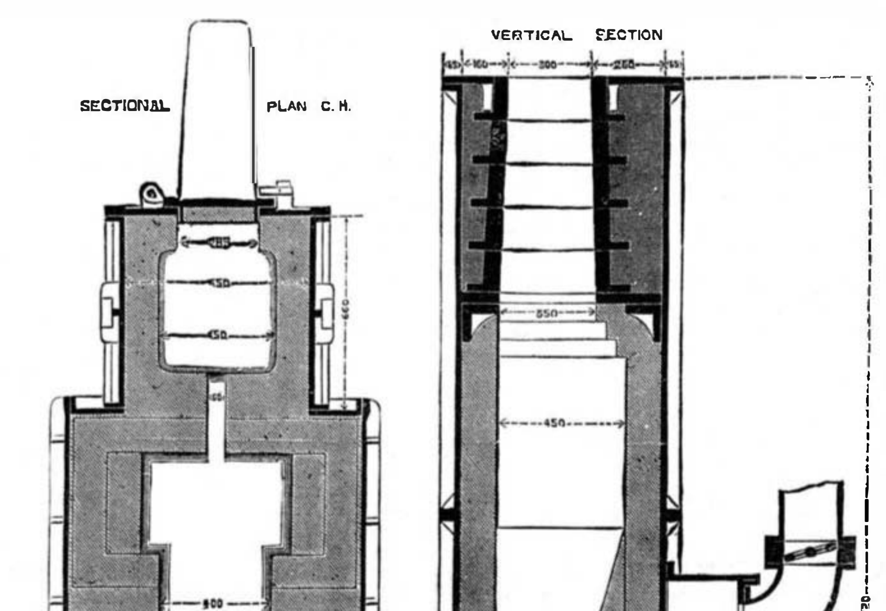


AIR EXTRACTOR FOR FEED PUMPS.

IMPROVED FOUNDRY CUPOLA.

This furnace has now been at work about two years and a half in Mr. Pintsch's works, with the results which we now give. The furnace is square in section, having a cast iron case and built up inside with fire-bricks the lower part being covered with refractory sand. The blast enters at the curved pipe shown fitted with a throttle valve. In the door at H, which gives great facility for manipulation of the reduced materials, are eye pieces, through which the working of the furnace may be observed.

After two and a half years' work, Mr. Pintsch says he doubts whether for his purpose, namely, the production of very clean light castings, he could have a better cupola than Kriegar's. After it has been filled with coke to commence blowing, he is able to melt 100 pounds iron with 4½ pounds Westphalian coke or with 5 pounds of Lower Silesian coke. The blower employed with the furnace is also Kriegar's, and works with 18 inches water column pressure. The process of melting begins after about twenty-five minutes, the furnace rendering a good hot iron, and an addition of 30 per cent of wrought iron may be added. For a daily casting of from one to two hours he believes it is the best furnace in use, but for periods of more than two hours it has been known to give trouble by slagging up.—*The Engineer.*



KRIEGAR'S FOUNDRY CUPOLA.

Coke, Coal, and Gas as Heating Agents.

At a recent meeting of the Manchester Section of the Society of Chemical Industry a paper on "The Use of Gas as a Heating Agent Compared with Solid and Liquid Fuel" was read by Mr. G. E. Davis, Government Inspector of Alkali Works. The author recommended the use of coke for house fires. If cooking could not be done well with this fuel, gas should be used sparingly. Manufacturers might also fire with coke, or if coal was still considered desirable, a mechanical stoker should be employed. A ton of dry coke had the same heating nature as a ton of ordinary dry Lancashire coal when properly burned, and in many instances, owing to its freedom from volatile matters, it could be used in such a manner as to do far more work, weight for weight. Coke recommended itself to the householder as well as to the manufacturer, and if means were only found for its continual production in a suitable form for use in domestic grates, a new era of fairly smokeless cities would quickly commence. It would be well for us to remember that when we burned coal at 10s. per ton we got 65 unit tons of heat for one penny; while when coke was burned the number of unit tons of heat for the same money was 84, reckoning coke at 7s. 6d. per ton.

Heating in any ordinary way by gas, dwelling rooms for instance, was entirely out of the question until gas was reduced far below its present price. Even at half that now charged gas heating would be considerably dearer than coal; and from his own experiments, burning gas in the best manner and coal in the usual reckless mode we were all so fond of, the heating values would only be equal with gas at 10d. per 1,000 cubic feet. To look the matter fairly in the face, the lowest price at which gas was put into the mains was in London, where it was said to cost 13d. per 1,000 feet; at one of the works of the Manchester Corporation it cost 14d. per 1,000, so that coal gas for purposes of the continuous warming of rooms, heating of steam boilers, etc., could not be expected to compete successfully with coal for a long time to come. Though gas cooking had its advantages, the high price now charged for gas showed practically no pecuniary benefit, and it was certain that the price of gas must be much reduced in order to tempt people to consume it. There was no reason why its price should not be reduced at once to 1s. 6d. per 1,000 cubic feet, and if the manufacture was not a monopoly, it would have been below this price long since.

All gas stoves should be provided with means for carrying the products of combustion into the outside air. We should no more allow the products of combustion to pass out into the atmosphere of our rooms than we would allow a coal fire to burn in our dwellings without a chimney. It was very well to hear of stoves which consumed their own smoke or condensed all their products, but in any ordinary method of combustion such things were next to impossible. Wherever there was gas burned there must be good ventilation to carry away the products, and when he had seen small bath-rooms and kitchens heated by gas, with gas for cooking, and also water heaters in use in confined places without chimneys, he had never marveled at the complaints of headaches from the occupants, but he had wondered that the so-called "accidents" had not been more frequent. Every gas stove, whether used for heating or cooking, should be connected with a chimney, or with the outside air, in order to carry away the sulphurous and carbonic acids. No stove should be allowed in any dwelling house except under these conditions. It should be universally known that the chief product of the combustion of gas is carbonic acid, a non-supporter of combustion or life; and when present in very small quantities in the air we breathe, had a decided effect upon the living organism. It was essential, then, that this gas be eliminated from our rooms as fast as it is formed. The other impurity arose from the presence of sulphur compounds in the gas, which could easily be removed at a moderate cost. These sulphur compounds burned into sulphuric acid, commonly called oil of vitriol, and as such found their way into the articles of furniture, binding of books, brasswork, etc.

Will Posts Set "Top End Down" Outlast those Set Top End Up?

It is firmly believed by many persons that posts set in the ground in a position the "reverse" of which they stood while growing in the tree, will last much longer than when set "top end up." In the spring of 1879 I selected seasoned sticks, three feet long. These were split in two, and then cut in two crosswise, making four pieces of each. One set was placed in well drained sand, the other in clay soil. In every case two pieces were set side by side, with earth between, one as it stood in the tree, the other reversed. I tried thirteen kinds of timber. Some of these were young wood with the bark on. All contained some heart wood. Those set in sand were examined in autumn of 1881. In case of the beach, sugar maple, ironwood, black ash, and black cherry, the piece reversed or placed "top end down," was somewhat most decayed. In case of red maple, American elm, butternut, and red elm, the piece set "bottom end down" was a trifle the most decayed. In case of basswood, white ash, white oak, and blue ash, there was no perceptible difference. In autumn of 1882, the posts set in clay soil were examined. In case of the red maple, sugar maple, American elm, basswood, butternut, red elm, the piece set "top end down" was most decayed. In case of beech, white ash, black ash, black cherry, the piece set "bottom end down" was most decayed. In case of ironwood, white oak, blue ash, there was no perceptible difference.

I infer that where one piece decayed more than the other it was caused by some trifling difference in the sticks. The freshly sawed ends in each case were placed uppermost, and came an inch or two above the ground.

In some cases one half of a stick (one piece certainly the reverse of the other) lasted considerably better than its other half. As will be seen, it was sometimes the "top end down" which lasted better, sometimes the "bottom end down," and in some cases there was no difference in durability.—*W. J. Beal.*

Remedy for Erysipelas.

At the recent congress of German surgeons, Dr. Fisher, of Strasburg, drew attention to the value of naphthaline as an antiseptic. For some skin diseases, and especially in the treatment of erysipelas, it is almost specific. The application is made in the most simple manner possible, by rubbing gauze in the powdered material, or dipping any suitable fabric in an ethereal solution diluted with alcohol. Naphthaline being very cheap, this preparation will be less expensive than anything of the kind now in the market. It is extensively used in Strasburg, where it is regarded as a perfect preventive of erysipelas; and it is hoped that if this valuable property can be substantiated, it will be used for the same purpose in this country. Dr. Fisher does not state whether its use in the manner stated is attended with any inconvenience or pain to the patient; but persons employed in gas works and elsewhere who have suffered from scales of naphthaline entering the eyes, etc., would be disposed to regard the remedy with very considerable suspicion.