AN ALTERNATIVE METHOD OF MACHINE-FIRING BY COAL OR GAS.

As the question of gas-firing is apparently coming into prominence again in some parts of the Dominion, and as in some directions there is plenty of discussion on the subject, our readers will no doubt be interested in the interesting installation recently completed by Edward Bennis & Co., Limited, Little Hulton, Bolton, Eng., at the South Staffordshire Mond Gas (Power and Heating) Company's works at Dudley Port, Tipton. The plant comprises eight producers, each capable of gasifying 20 tons of fuel per day of 24 hours, and generating sufficient gas to drive gas-engines of 2,000 h.p. continuously. The total capacity of the present section is thus equal to 16,000 h.p.

The fuel is brought by boat into the canal basin, or by rail onto the siding, both having been specially constructed, and is loaded by hand into bunkers; the entrance to these from the boats is a little above water-level, and at the ground-level from the trucks. From these bunkers the fuel is automatically fed into two conveyers, each having a capacity of 40 tons per hour, and which convey and distribute the fuel into the storage bunkers over each set of producers. The bunker over each producer will hold 40 tons; i.e., sufficient to keep the producer working for two days.

The gas, after leaving the producers, is thoroughly washed in mechanical washers, and after passing through the ammonia recovery and gas-cooling towers, is further purified by large centrifugal fans and then passed through the scrubbers and the meters, before being compressed and sent through the mains for distribution. The machine-stokers, which are arranged to burn either coal or gas, are of the Bennis sprinkler type, of which an integral feature is the self-cleaning compressed air furnace. The boiler plant of the gas company consists of three Lancashire boilers each 9 ft. x 30 ft. with extended flues, working at 120 lb. pressure. They are fitted with superheaters, the gases discharging into an economizer containing 4,000 sq. ft. of heating surface. The total grate area of each boiler is about 57 sq. ft.

Some time ago it was decided to substitute mechanical firing for hand-firing, and a definite guarantee was given by the stoker-makers that the evaporation of each boiler should not be less than 12,000 lb. of water per hour, with an over-load evaporation of 15,000 lb. per hour when desired for short periods, and an efficiency of 72% was also conceded.

The qualified staff of practical chemists employed by the gas company were entrusted with the task of making tests which should establish the results of the work actually done by the boilers. The tests showed not only that the guarantees were maintained, but an appreciable increase on the figures had been achieved. For instance, the overload evaporation of 17,000 lb. of water per hour from each boiler, instead of 15,000 lb. per hour, was obtained.

The gas company, prior to the installation, had found no little inconvenience owing to the fact that steam was required to be kept both during the night and from midday Saturday until Monday morning, when it was desirable that labor duties should stand at a minimum.

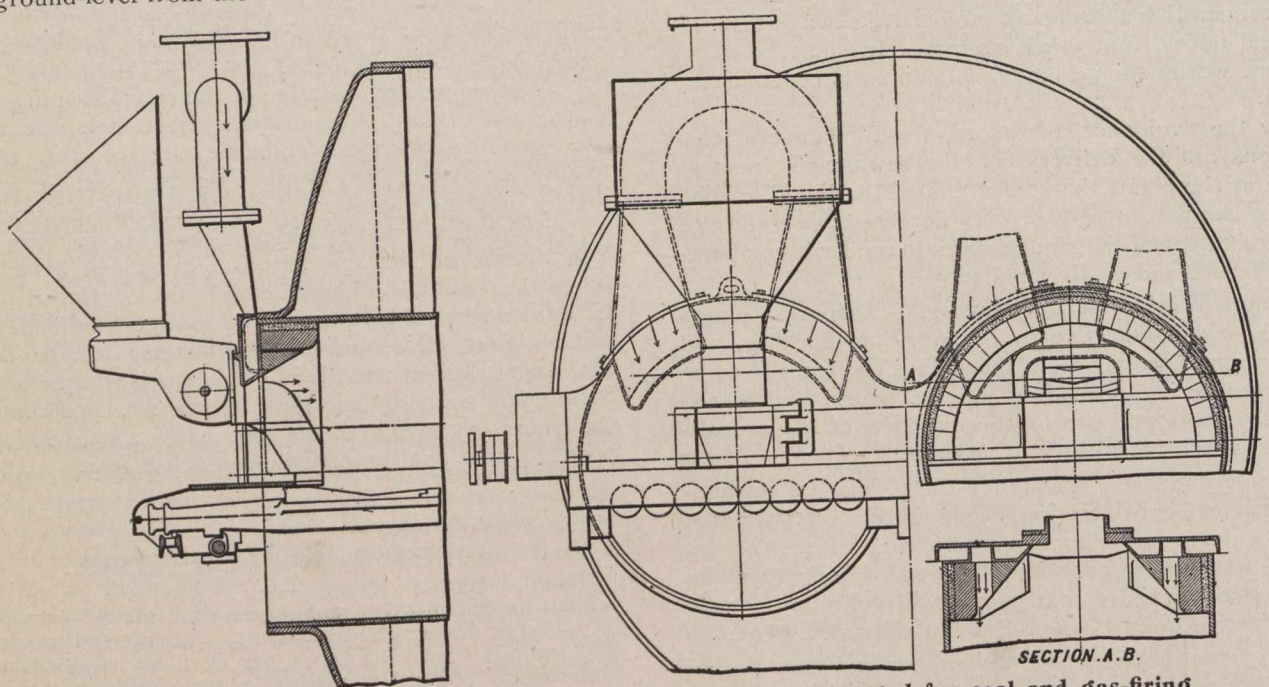

Fig. 2.—The stoker and self-cleaning compressed air furnace arranged for coal and gas-firing.

The problem was: could the mechanical stoking plant be so arranged that it could be coal-fed in the ordinary manner at ordinary times and the boilers gas-fired during the hours of night and at the week-ends? It was shown that, owing to the flexibility of the system of machine-stoking, illustrated herewith, the desired duality was perfectly practicable.

A reference to the illustration will show the gas ducts let into the top flange of the stoker front and secured by means of a gas-tight joint. The baffler plates which are situated behind the front are arranged with a passage, the outlet being over the grate; the gas passes thus from the ducts to the furnace. There are two ducts to each flue; that is, of course, four to each boiler, each pair containing a breeches pipe placed immediately behind the hopper and passing thence to the gas supply, constituting an extremely simple and satisfactory arrangement. It is, of course, essential that air should have access to the gas; a valve is, therefore, placed on the furnace front with an adjustable cover to regulate the amount of air supply. The air is conveyed into the furnace through a separate