Gas Manufacture and Supply.

[BY OUR LONDON CORRESPONDENT.]

Street lighting in the City of London and the metropolitan boroughs is now largely done by means of incandescent gas burners. Many systems of high-pressure gas supply have been adopted, and it is possible to secure equal or even more light with gas than electric arc lamps. In fact, in London and many cities electric lamps of large power are at present fast disappearing The flat-flame burners that ten years ago did duty for street lighting, burning 4½ to 5 cubic feet per hour, have almost entirely disappeared; the upright C. Welsbach or Nern burner having taken their place. With them it was possible, with a consumption of about 3½ft. per hour, to obtain a light of thirty candles or more. The last twelve months have, however, seen still greater advances; the inverted incandescent gas burner has now been adopted for street lighting.

In Edinburgh Mr. W. R. Herring, M. Inst. C.E., engineer of the corporation gasworks, has put up a very considerable number of street lanterns, and installed in them inverted burners which consume only an average of 2¾ feet of gas per hour, and give an illumination of 75 candle power. Mr. Herring's lead is being followed by others, at West Bromwich, Mr. Harold E. Capp, engineer of the gasworks, has introduced into street lanterns an inverted burner and double reflector. This arrangement is very similar to the Edinburgh lantern, and practically the illuminating effect is as good.

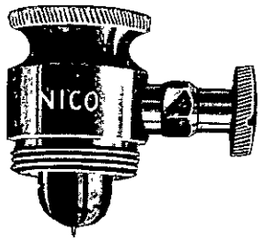
Much attention is being devoted to the adjustment of the gas supply to inverted burners. In the use of these burners Russia plays a considerable part, and it is generally admitted that the gas supply, or rather the pressure at which it is supplied, must be under control. The new inverted incandescent gas-lamp company have brought out what they term the "Nico" gas-regulator (see illustration). The regulator is constructed on such principles that a perfect jet issues into the burner tube and is in no way affected by the heat evolved. The gas passes in to a hollow, or crescent-shaped, form; this is said to be preferable to the solid stream of gas, and secures a more perfect mixture. A crank on the inside of the adjuster makes it impossible for the needle, which is really the active regulator, to become tight, but it is extremely sensitive. The "Nico" adjuster takes the place of the ordinary injector so that the burner is not much larger with it than without it.

Tested with a well-known No. 4 "Nico" inverted burner, with a consumption of 3.4 cubic feet the result obtained was a luminosity of 65.5 candles, or a duty of 19.26 candles per cubic foot of gas. With a No. 5 "Bijou" burner the readings were:—consumption 1.3 cubic feet; illuminating power, 30 5 candles; and a duty of 23 5 candles per cubic foot of gas consumed.

Although gasworks are now almost universal in all parts of the kingdom, there are uses for small gas-making installations. Recently, when on a visit to the Dublin Exhibition, we were interested in a small petrol gas plant operated under the Elwell-Smith patents. The well-known method of making gas by passing air over petroleum spirit of 650 degrees specific gravity, and so obtaining a mixture, which gives a rich gas for illuminating purposes, is the foundation of the manufacture of petrol safety-gas; in the Elwell-Smith process, the proportion of petrol and air are unvaried. The apparatus starts and stops automatically; the generator continues to operate until the demand for gas ceases, and then it stops until gas is again required. In isolated houses, institutions, churches etc., petrol safety-gas will be of great service.

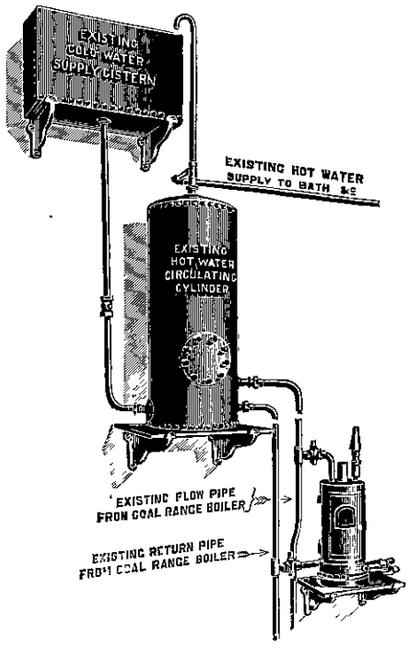
All the world over the name of the "Richmond" Gas Stove Company, of London and Warrington, is coupled with gas stoves; the firm are most enterprising, quite the most recent apparatus that they have placed upon the market is the "Neptune" water heater They tell us that with gas at 3s per 1000 cubic feet, for an expenditure of 3½d, it is possible to have 50 gallons of boiling water with one burner only of the heater The "Neptune" will provide hot water to any number of taps at the same time on differe it levels in any part of the house; the heater may be connected up to existing hot-water pipes and the circulating cistern is used for storage of the hot water. The gas burner is made to swing out clear of the boiler, and consists of two rings with separate taps The smaller ring at ten-tenths pressure consumes 8 cubic feet per hour, and we understand it is found to be ample to provide a sufficient supply for the ordinary domestic requirements and to maintain the cistern full of hot water at night. The "Neptune" is very compact, standing 25 inches high over-all and having a diameter of about 10 inches, prices range from a few pounds with cast-iron water circulators, and gun-metal chambers. They are made in two sizes. There is every probability of their being very generally fitted up in houses where the "gas range" is used for cooking and gas fires for heating. The "Neptune" appears to us to be far in advance of the bath "Geyser" as with it the hot-water supply to the house remains intact.

It has always been a vexed question as to whether it would be policy to test gas consumers' fittings and the internal pipes. The Britisher's house is his castle and he very vigorously defends it against all comers; he is always suspicious that the "gas man's one aim in life is to best him, to charge him for gas that he never consumed, and as generation after generation become gas consumers, still the gas man is very little more popular than he was fifty years ago. In most cities and towns, pipes and fittings for water supply are rigorously tested, and every effort made to detect and stop leakage, the loss by leakage having to be borne by the supplier. Water is paid for by rate levied in accordance with assessment of the house and not by measurement. Gas on the other hand, is paid for by measurement, and any leakage past the meter is a loss to the consumer and



THE NICO ADJUSTER.

not to the gas supplier. The Corporation of Liverpool have taken up the matter of testing gas pipes and fittings on consumer's premises for a normal sum, and their action is likely to prove highly beneficial to the public, both on economic and hygienic grounds. We are told that so far only some seventeen applications for tests have been reported; in five of these the fittings were found to be sound, in the remaining twelve there were escapes aggregating a rate of 25 97 cubic feet of gas per hour, or an annual money loss to the consumers of £29 10s 8d. These figures prove that such testing of consumers' pipes



THE NEPTUNE WATER HEATER.

and fittings is exceedingly desirable Much of the leakage of gas is due to the use of composition pipe, it has, however, now become almost universal to "run" wrought-iron pipe to all "points" and to have no soldered joints

Owing to the large quantities of tar that are produced by coke-oven plants the price has continued to fall, and gasworks tar has become almost a drug in the market. Much interest is therefore being taken in the proposals to use it on roads as a protection against dust, and already there is very considerable demand. The rapidly increasing motor traffic, and the abominable dust evolved, have rendered it absolutely imperative that something should be done to make the roads more suitable for motor running, and so far it appears that the coating or painting them with hot tar is the best and cheapest means of reaching the desired ends. Gas engineers are quite jubilant, and hope to secure the business and so find a new market for their tar.

The Gaslight and Coke Company, the premier gas undertaking of the world, having a capital of £27,000,000, an annual output of 22,963,382,000 cubic feet of gas, and no less than 492,910 consumers are bestirring themselves in every possible way to extend the use of gas, and to increase the day consumption. In this matter they are being greatly aided by the ability and untiring energy of their chief inspector, Mr. F. W. Goodenough, who has a staff of 200 officers, and more than 2000 workmen, engaged entirely at the "Commercial End" In addition, the company have lady demonstrators who wait on consumers and give practical lessions in the use of gas stoves, cookers etc., pointing out the special features of each apparatus and advising as to the most economical method of using them. Another new work being done by this and other gas companies is the maintenance and upkeep of incandescent gas burners and mantles The charge is purely nominal to the consumer, his fittings and burners are overhauled at regular intervals everything is kept "well found" and in working order. The maintenance cost per annum per burner, to the company, does not, in many cases exceed threepence The benefit to the public is very great, but still with it all they do not as a whole take kindly to the inspection, and often will suffer faulty burners, broken mantles, cracked chimneys and other ills, rather than have the periodical visit of the "gas man," as the public dub all and singular connected with gas supply.

Correspondence.

[TO THE EDITOR.]

SIR,—Some of your readers who are fond of figures may find the following matter interesting. I lately read in an American paper that some mathematician had announced the curious persistency, under multiplication, of the figures 142857, thus:—

142857	142857	142857
2	3	4
285714	428571	571428

142857	142857
5	6
714285	857142

The way in which the figures follow each other seems undisturbed, till multiplying by seven we get the extraordinary departure:—

142857
7
999999

Here, so far as my information went, the matter ended, apparently with the idea that the series was exhausted. Out of curosity I carried it further:—

142857	142857
8	9
1142856	1285713

Now, in these we have in each one figure too many to compare with the original number, but if we add it in we get the same series, *viz.*, 1142856—6 *plus* 1=7 so 142857; 1285713—3 *plus* 1=4, so 285714.

Of course 142857 *plus* 10=1428570 and the series begins again with outside figures added Multiplied by 35, or any other multiple of seven, the result is always in the 9 series, *viz.*, 499995 the 5 and 4 end figures making the full 9.—Yours faithfully,

EDW. TREGEAR.

Wellington, 4/10/07