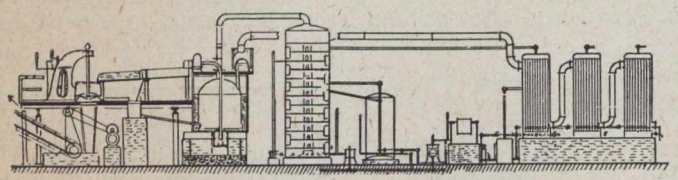
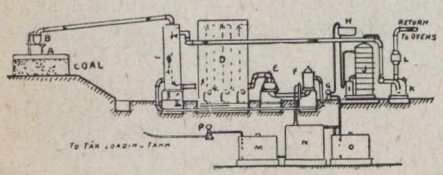
revolving drum. Burkheiser has improved on this, his original scheme, by passing his SO_2 from the purifiers together with excess of air over strongly heated iron oxide in a contact chamber, and thus converting the SO_2 to SO_3. On subsequently washing the gas with this SO_3 liquor, he obtains ammonium sulphate direct, without need for oxidation of the sulphite as in the former instance.

The writer submits for your inspection a sample of ammonium sulphate which he took from Burkheiser's plant at the Hamburg Gas Works.

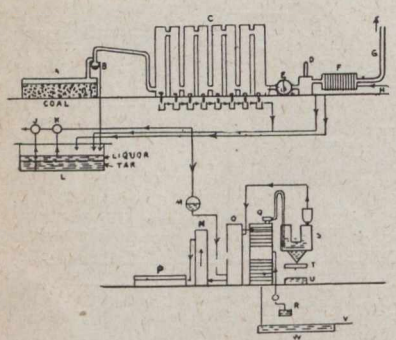
There are several important points about Burkheiser's process which are of interest to everyone connected with carbonizing plants of any kind. In the first place the natural sulphur content of the coal is utilized to manufacture sulphuric acid for sulphate re-



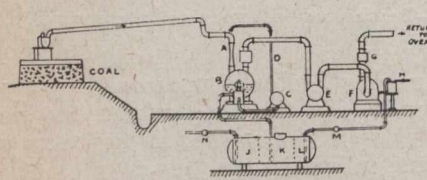
SULPHATE OF AMMONIA STILLS AND ACCESSORIES.



KOPPER S PROCESS



OLD PROCESS



OTTO PROCESS

covery representing a sum from 30s. to 35s. per ton in the cost of manufacture of the latter product, besides affording a home made supply to those plants distant from sulphuric acid works. Secondly the recovery of sulphur or purification of the gas is accomplished in small vessels, thus avoiding the heavy cost of large ground space entailed by the usual massive box purifiers universally employed at gas works. The process is of particular interest to those who are confronted with sulphur troubles in dealing with coke-oven gas for large gas engines. Burkheiser's small purifiers would be of great benefit in such cases, even if the SO_2 were turned to waste and unrecovered, on account of their small first cost and the saving in ground space afforded.

Applications of the Process.

The Utilization of Coke Oven Gas for Town's Lighting

In spite of the big developments in America and Germany which have gone forward in the application of coke oven gas for the lighting of townships, very little has been done in the same direction in this country. As long ago as 1901, Dr. Schniewind described well established coke oven gas works at Everett, Hamilton, Camden, and Sparrows Point in the United States; other works have followed at Milwaukee and Detroit, and the movement has gone ahead. In Germany at the present time progress in this direction is extremely rapid, and many towns are arranging to take their supply from coke ovens. An important review on this subject appeared in a recent issue of the Times Engineering Supplement, pointing out that 212 million cubic feet of gas of the quality usually supplied to towns are daily wasted by the coke ovens of the Ruhr Basin, which at the low price of 7d. per 1,000 cubic feet, represents a sum of £2,000,000 per annum. Essen and Mulheim have commenced to utilize this waste by closing down their town's gas works, and relying on coke oven gas solely, the price of the gas wholesale being 8½d. per 1,000 cubic feet. Bochum has followed suit by taking the gas from Krupp's Hanover and Hannibal Collieries. Barmen, Velbert, and Heiligenhaus have likewise made contracts for the supply of colliery gas, and many others have made arrangements, or are negotiating to a similar end. In all, about 600 million cubic feet per annum have been already placed.

There have been a few isolated cases in this country where coke oven gas has been employed for this purpose, but British gas engineers have not yet seriously considered the by-product coke oven as a possible aid to their industry. There are many instances where collieries or blast furnaces possessing coke oven plant, already provided for as regards their own power requirements, are situated near to large towns, and in these cases the application of coke oven gas for town's lighting might with advantage be carefully looked into. The writer does not suggest that as a gas-making machine, the by-product coke oven is the equal of the modern gas retort. The point is, that as a community we are carbonizing coal for two purposes. (a) For the manufacture of town's gas, coke being the by-product. (b) For the manufacture of metallurgical coke, gas being the by-product. From the point of view of the economy of coal supplies, the two processes overlap so that if the by-product in either instance, coke or gas respectively, can be substituted, a step towards national economy will result.

During the past generation, the main ambition of the gas industry itself has been to derive from the mother coal the maximum amount of gas obtainable, and to this end gas engineers have devoted themselves to devising retorts which would produce the greatest amount of crackling of the volatile matters. A notable instance of this development is the vertical retort, whereby 12,000 to 12,500 cubic feet of gas is made per ton, compared with 10,000 to 10,500 cubic feet when distilled in the old horizontal retort, i.e., a very important movement to conserving our coal supplies. This development has only been made possible by the invention of the incandescent mantle, whereby the thinner gases made under more economical conditions, may be made to give out three times the amount of light for a given consumption of gas. The combined effect of the gas industry's progression may