Booklet cover

GAS LIGHT COMPANY

INAUGURATION OF THE NEW CARBONISING AND COKE SCREENING PLANT

18TH JANUARY, 1940

The new Showroom, in the High Street, Bridgwater

BRIDGWATER GAS LIGHT COMPANY

DIRECTORS 1940.

W. H. BENNETT, Esq., M.Inst.Gas.E. *(Chairman).*

J. H. DONALDSON, Esq., M.Inst.Gas.E.

W. L. STENNING, Esq., M.B.E., J.P.

J. URQUHART, Esq., M.Inst.Gas.E.

A. E. WHITCHER, Esq., M.I.Mech.E.

J. H. CORNISH, Esq., M.Inst.Gas.E.

MANAGING DIRECTOR:

J. H. CORNISH, Esq., M.Inst.Gas.E.

MANAGER & SECRETARY:

J. H. CORNISH, Esq., Jun., M.Inst.Gas.E.

DIRECTORS 1938:

(At the time when the new plant was put in hand.)

A. E. MANCHIP, Esq. *(Chairman)*

F. L. CARSLAKE, Esq.

T. J. SULLY, Esq., J.P.

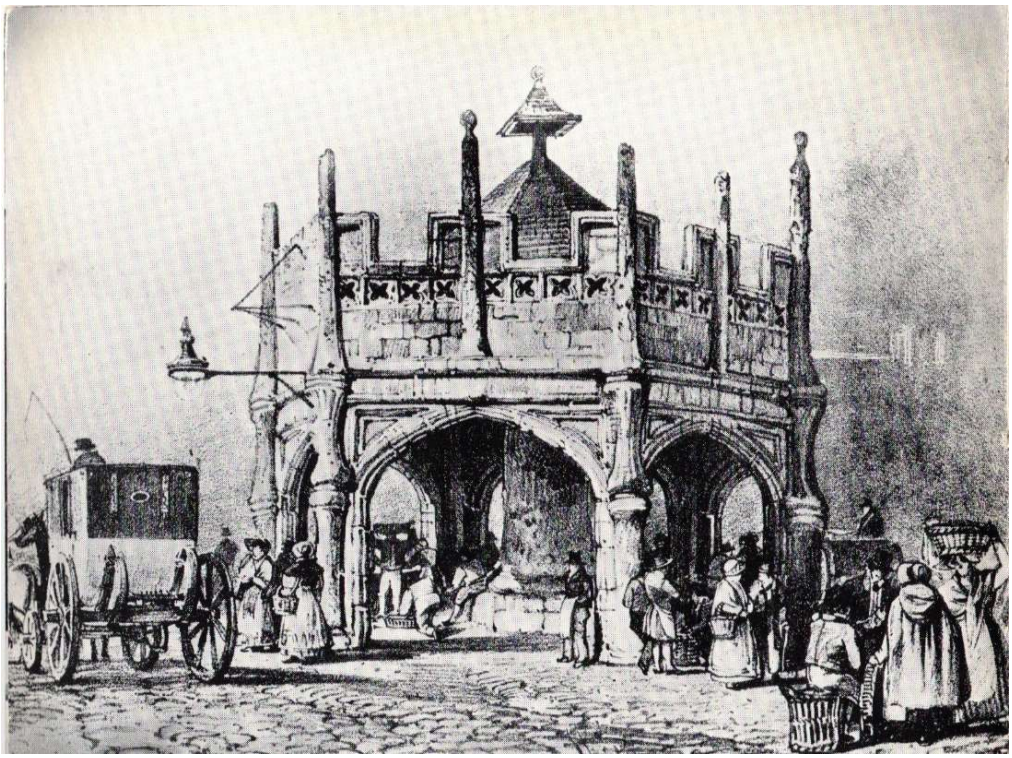
F. H. ALLEN, Esq., J.P.

H. S. DOSSON, Esq J. H. CORNISH, Esq.

W. H. TAMLYN, Esq.

WORKS:—OLD TAUNTON ROAD, BRIDGWATER.

THE TOWN OF BRIDGWATER



THE OLD HIGH CROSS

Destroyed in the early 19th century. Under it the Duke of Monmouth was proclaimed King by the Mayor in 1685

The seaport and market town of Bridgwater has stood more than a thousand years at the important crossing of the swiftly-flowing Parrett. The original charter of the town dates back to 1201.

In the Seventh Century the Britons halted the Saxons here, and held them for 25 years along the Parrett, but were eventually driven back to the Quantocks. The Danes, in King Alfred's day, again and again sailed up the river to burn and slay, and it was in Canning-ton Park that the raiders of Hubba, the Dane, met the levies of Odda, Saxon Alderman of Devon, and lost the day, their leader and his magic Raven standard, supposed to flap its wings in token of victory.

Seamen of Bridgwater have played a noteworthy part in England’s history. It is a tradition that a Bridgwater ship, owned by one Humphrey Blake, Mayor of Bridgwater, brought the first news that Spain's Armada had sailed. This Humphrey Blake’s eldest son Robert was that Blake who laid the foundations of England's modern sea power, trouncing in turn Prince Rupert's fleet, the Dutchmen, and the pirates of Tunis, and finally capturing the Spanish Treasure Fleet at Cadiz, and in the seemingly unassailable harbour of Santa Cruz itself. Moreover, Bridgwater men had sailed with Cabot to find America, and a Bridgwater ship with Frobisher to seek the North West Passage.

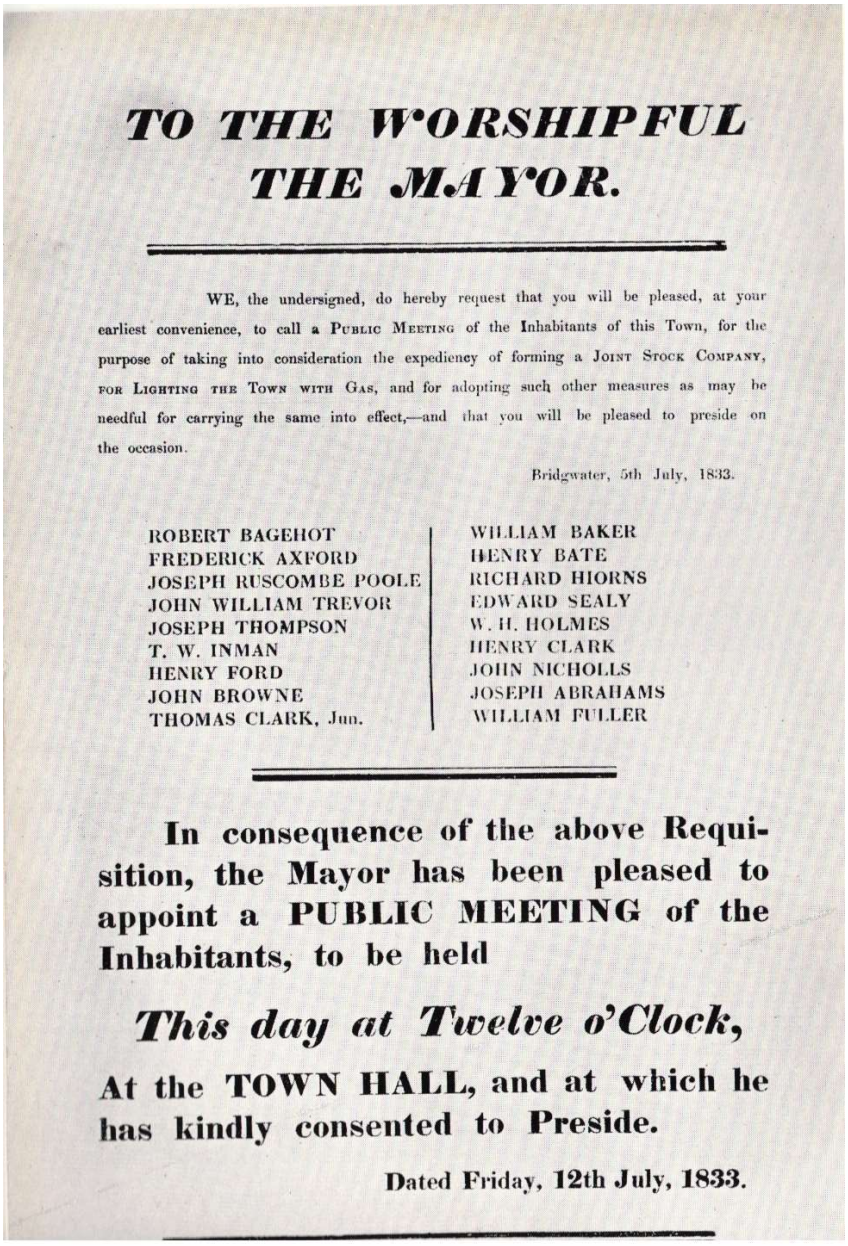
Under the High Cross of Bridgwater, which stood till the early 19th Century on the Cornhill, the ill-fated Duke of Monmouth was proclaimed King ; from the tower of the fine old Church of St. Mary he watched for the approach of" the forces of James II, destined to destroy his hopes at the Battle of Sedgmoor, the last great battle fought on English soil ; through Monmouth Street he marched his men out to disaster.

An interesting sidelight on the story of the town is that in the upper part of the High Cross was supported a water tank or reservoir for supplying the town through wooden pipes made of hollowed tree trunks joined together with lead-flanged connections. From time to time these old wooden pipes and junctions have been found in the course of excavations for gas mains.

Today Bridgwater has achieved a happier harmony between the ancient and the modern than is the case in many old towns. Her townsmen have been no less progressive, but perhaps more mindful of their heritage. As a market town Bridgwater is still predominant in the West, and there are flourishing industries, including the manufacture of bricks and tiles, shirts and collars, wickerwork and furniture. Recently a large factory has been erected by British Cellophane, Limited.

Recently, too, there has been established in the town an extensive carpet factory, and there are also wire rope works and considerable engineering works.

BRIDGWATER GAS LIGHT COMPANY



TO THE WORSHIPFUL THE MAYOR.

WE, the undersigned, do hereby request that you will be pleased, at your earliest convenience, to call a PUBLIC MEETING of the Inhabitants of this Town, for the purpose of taking into consideration the expediency of forming a JOINT STOCK COMPANY, FOR LIGHTING THE TOWN WITH GAS, and for adopting such other measures as may be needful for carrying the same into effect,—and that you will be pleased to preside on the occasion.

Bridgwater, 5th July, 1833.

ROBERT BAGEHOT	WILLIAM BAKER
FREDERICK AXFORD	HENRY BATE
JOSEPH RUSCOMBE POOLE	RICHARD HIORNS
JOHN WILLIAM TREVOR	EDWARD SEALY
JOSEPH THOMPSON	W. H. HOLMES
T. W. INMAN	HENRY CLARK
HENRY FORD	JOHN NICHOLLS
JOHN BROWNE	JOSEPH ABRAHAMS
THOMAS CLARK, Jun.	WILLIAM FULLER

In consequence of the above Requisition, the Mayor has been pleased to appoint a PUBLIC MEETING of the Inhabitants, to be held

This day at Twelve o'Clock,

At the TOWN HALL, and at which he has kindly consented to Preside.

Dated Friday, 12th July, 1833.

The Bridgwater Gas Light Company was formed in 1834, by an act entitled " An Act for Lighting with Gas the Town or Borough of Bridgwater, in the County of Somerset, and Suburbs of the said Town or Borough."

The Company operated under this act up to the year 1903, when a new Act was passed under which it still operates, with modifications, of course, in accordance with subsequent legislation governing the Gas industry.

Among the interesting documents still in the possession of the Company is a copy of the original notice convening a Town's meeting for its formation. This is reproduced on the opposite page. Another

document of interest is an early letter tendering for the building of the original works ; this reads as follows :—

" To the Committee of the Bridgwater Gas Light Company.

Gentlemen,

I estimate the expence of the various work requisite to the building and laying pipes, etc., in establishing a Gas manufactory to light the town of Bridgwater as per plans, elevations, sections, and Specification by Mr. Tregellis[1], to amount to two thousand nine hundred and seventy Pounds, for which amount I engage to compleat the same in four months from the commencement, or subject myself to the penalty of twenty pounds if it exceed one month of that period, and twenty pounds per week for every further week, to be deducted from the amount then due, provided the delay be not occasioned by any cause over which no human foresight could prevail, the whole to be done under the direction of your Surveyor.

Your Obedt. Servt.,

Sam Bromhead,

Builder, 5, Red X Street, Bristol."

From the following year has been preserved the notice of the first reduction in Gas prices :—

"GAS LIGHT OFFICE, BRIDGWATER.

July,1835.

I have much pleasure in informing you that, from and after the 25th June last, Gas will be charged at 12/- per 1,000 cubic feet, instead of 15/- as heretofore, and the Rent of Meters will be reduced to 1/- per quarter. The Committee have been induced to make these reductions in the expectation that the consumption of Gas will be considerably increased, and thus the Company may still calculate on a remunerating profit. I beg to add, that considerable attention is paid in purifying the Gas, and that it has been introduced into Sitting-Rooms, with comfort and economy to the Consumers.

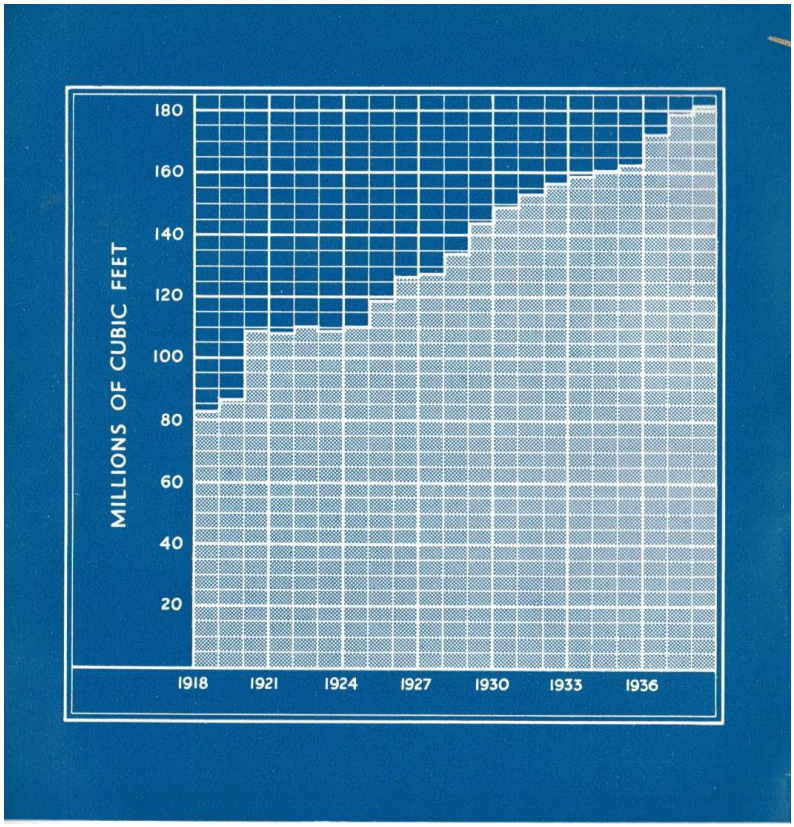
As we have reason to expect considerable Orders for Fittings, it might be well to state, that Orders will be attended to according to the date when they are given.

I remain,
Your obedient Servant,
DOWN DOWN,
Clerk

By 1859 the price had fallen to 6/- per 1,000 cubic feet.

In 1859, Mr. James Hughes Cornish was appointed Clerk of the Company, in which position he carried on the executive management of the Company under the Board of Directors for 45 years, until, in 1904, his son, also James Hughes Cornish, the present Managing Director, succeeded him. He, in his turn, was succeeded in 1924 by his son, also James Hughes Cornish, at present Manager and Secretary of the Company. Thus the executive management has been in the hands of three successive generations of the same family for 80 years, over threequarters of the Company's history.

Throughout that period the Company has steadily progressed. The make of gas in 1859 was 9,414,000 cubic feet ; in 1918, it was 83,500,000 cubic feet, practically nine times as much. Perhaps even more impressive, in view of intensified competition from other forms of fuel, has been the increase since the last war. The make has gone up, as will be seen from the chart opposite, steadily year by year, with one slight exception, from 83,500,000 cubic feet to 181,000,000 cubic feet in 1938, or by over 117%. Up to the outbreak of war, a similar rate of increase was achieved in 1939.



Annual output of gas, 1918-1938

The Company has always maintained a progressive sales policy and a tradition of ready service to its consumers. In furtherance of that policy, it has recently carried out an extensive reconstruction and modernisation of its showrooms and offices in the High Street. A far more commodious and attractive showroom has thus been achieved, in which the most modern forms of apparatus are well displayed. In addition, the rooms occupying the first floor frontage of the building have been combined to form a new demonstration room. This room can provide accommodation for some 65 persons, and has, at one end, a dais on which the Company's lady demonstrator can conduct test demonstrations. At the back of the dais is a well-designed recessed sink and cupboards, the sink being ingeniously lighted by concealed gas lighting. The room is designed in a simple, restful and most dignified style, which is enhanced by the attractive and efficient gas lighting, and is in complete keeping with the designs of the showroom and the staircase by which it is approached.

Careful attention has always been paid to the lighting load, and at the outbreak of war, and before the advent of " black-out " conditions, the Company maintained some 600 street lights.

The Company employs between 50 and 60 persons, the annual wage bill being about £8,500. It has long been a tradition that the welfare of the employees should be a leading consideration, and the Company's Co-partnership and Pension Fund scheme was established in 1911, in the earlier days of this modern practice. The scheme is devised on a generous basis, and today the employees' savings invested in the Company amount to £3,500. In pursuance of the same policy, a new workmen's messroom and lavatory has been built at the works at the time of the building of the new carbonising plant, the rooms being well-lighted, and finished with tiled walls and floors so that they can be kept clean. Ample washing facilities are provided.

The Company has always been ready to take advantage of improvements in methods of gas manufacture. It was, in 1913, quick to adopt continuous vertical retorts, which were then in the comparatively early days of development, and which, apart from their economic advantages, offered a considerable advance over previous methods, as regards both local amenities and working conditions for the operatives. The plant then installed, which consisted of twenty retorts, gave good service in its

original form for many years. It was remodelled and greatly increased in capacity in the years 1926—32 and continued to give satisfaction until, in 1937, it became evident that it was approaching the end of its useful life. This fact, combined with the constantly increasing demand for gas, led the Directors to consider the provision of new plant. It was decided to build a completely new installation on an adjacent site. Tenders were called for, and after due investigation it was decided to place a contract for an installation of Woodall-Duckham Continuous Vertical Retorts. This installation is described in the ensuing pages. The construction of the new plant was started in June, 1938, and it commenced to make gas in the autumn of 1939.

The new Showroom

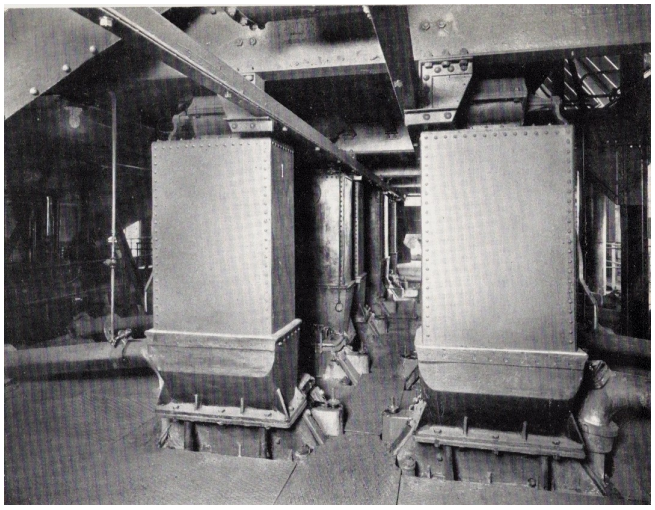
One end of the Demonstration room before the completion of the furnishing and heating arrangements

Furthermore, in the past eight or nine years, considerable additions have been made to the condensing, exhausting, ammonia recovery, tar extraction, purifying, and gas compressing equipment, and the Company is now in the position of having a thoroughly modern works able to meet all demands in what may be a most trying period.

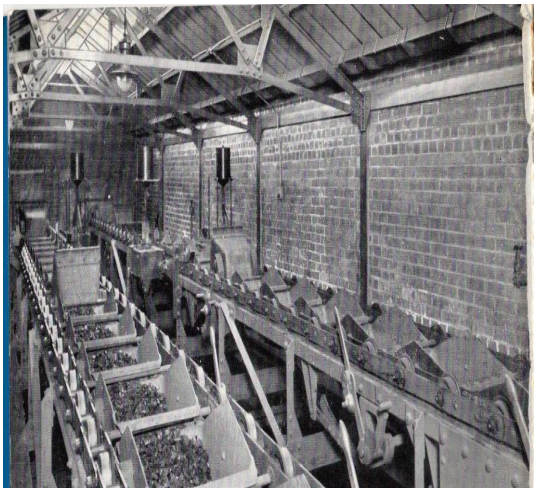
THE NEW CARBONISING AND COKE SCREENING PLANT

The new installation comprises one bench containing twelve upwardly- heated Woodall-Duckham Continuous Vertical Retorts, and is capable of carbonising 61 tons of coal and of producing 1,200,000 cubic feet of gas a day. The retorts are heated by means of hot producer gas made in a battery of three producers situated at ground floor level at one side of the bench. The installation is provided with complete coal and coke handling and coke screening and storage plant, and with a waste heat boiler, and is erected in a new steel-framed, brick-panelled retort house. The retort installation is arranged for future extension by a further four retorts, the retort house, bench steelwork, producers, waste heat boiler, and coal and coke handling plant being all large enough for a completed bench of sixteen retorts, and the various mains and services being designed suitable for the extension. An electrical generating set has been installed to generate electricity from the surplus steam from the waste heat boiler, for use on the plant and elsewhere on the works, and a water softening plant for treating the water required for the waste heat boiler.

It should be appreciated that in order to comply with wartime lighting restrictions it has been necessary to provide blinds and light-traps throughout the works. Accordingly, many of the photographs reproduced in this brochure do not give a true impression of the plant as it was originally designed and constructed.



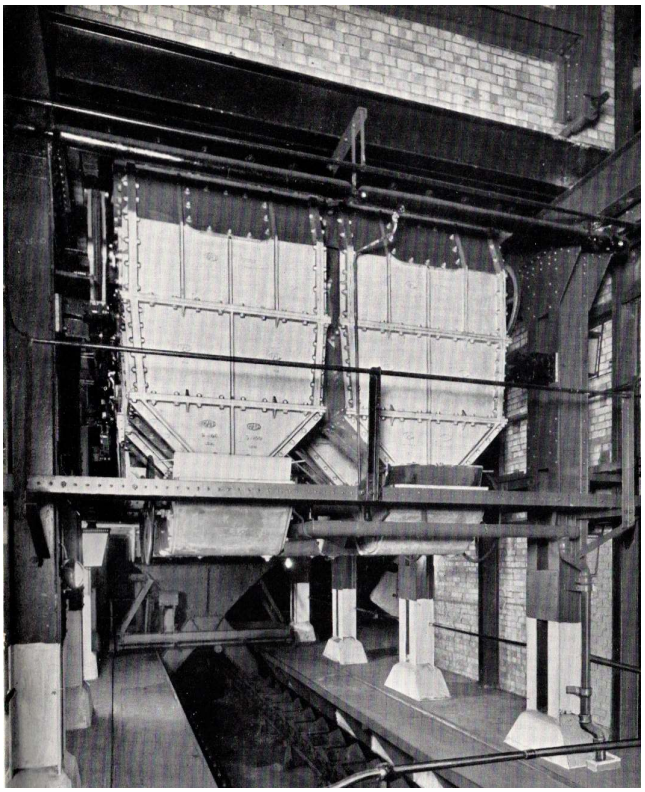
Top charging platform. Showing auxiliary coal hoppers and liquor sprayed gas offtake pipes



Above the overhead storage hoppers. Showing coal being discharged from the overlapping bucket conveyors by means of the fixed dumpers

RETORT DESIGN AND HEATING SYSTEM.

The retorts are about 25 feet high, rectangular in plan, and tapered to allow continuous regular descent of the coal. They are 53 inches long and 10 inches wide at the top. They are arranged so that any one retort can be controlled without affecting the others, and, in addition, transverse air- cooled division walls are built between each group of four and the next, to enable each group to be let down cold for repair or other purposes, without interfering with the working of neighbouring retorts.

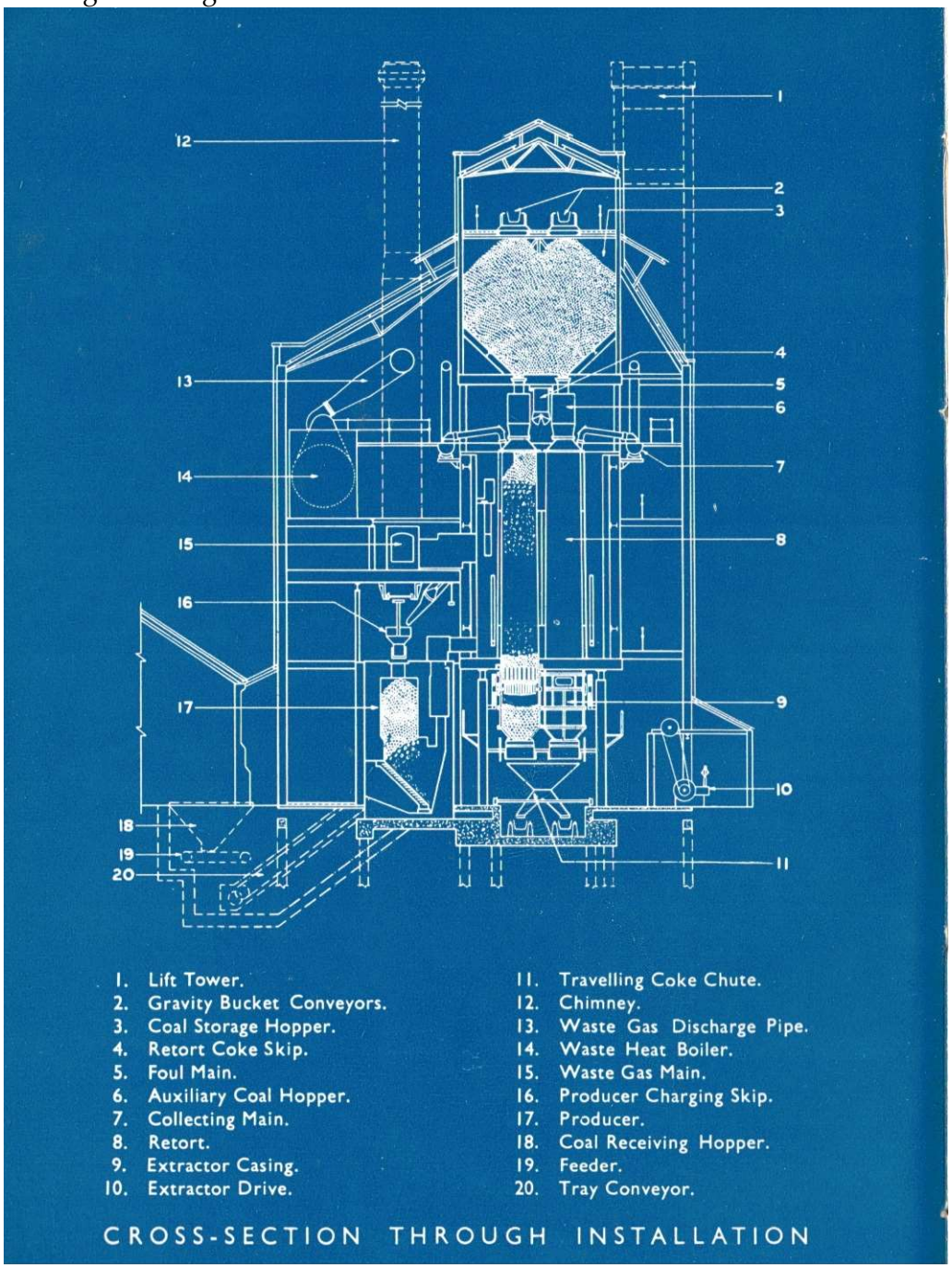


View beneath the settings, showing bottom coke hoppers and discharger, travelling coke chute and overlapping bucket conveyors

Coal is fed from overhead storage hoppers through rotary valves into auxiliary supply hoppers attached to the retort tops. From these it falls into the retorts, and is heated and converted into coke during its passage by combustion of producer gas in a series of vertical combustion chambers built at each side of the retort. The speed of descent is regulated by the rate of extraction of the coke at the

bottom, and the various gases and by-products are evolved in the appropriate zones of temperature. The residual heat in the coke is utilised for the formation of water gas within the retort, steam being introduced through nozzles fitted into the curved plate of the coke extractor box. The coke is finally quenched by a specially-designed water spray within the extractor box and is discharged dry and cool and without dust or smoke.

The retort design is in accordance with modern Woodall-Duckham practice. The combustion of the heating gases takes place in an upward direction. This permits a zoning of heats which has been found to give the following advantaged :—



(a), Perfectly regular travel of coal.

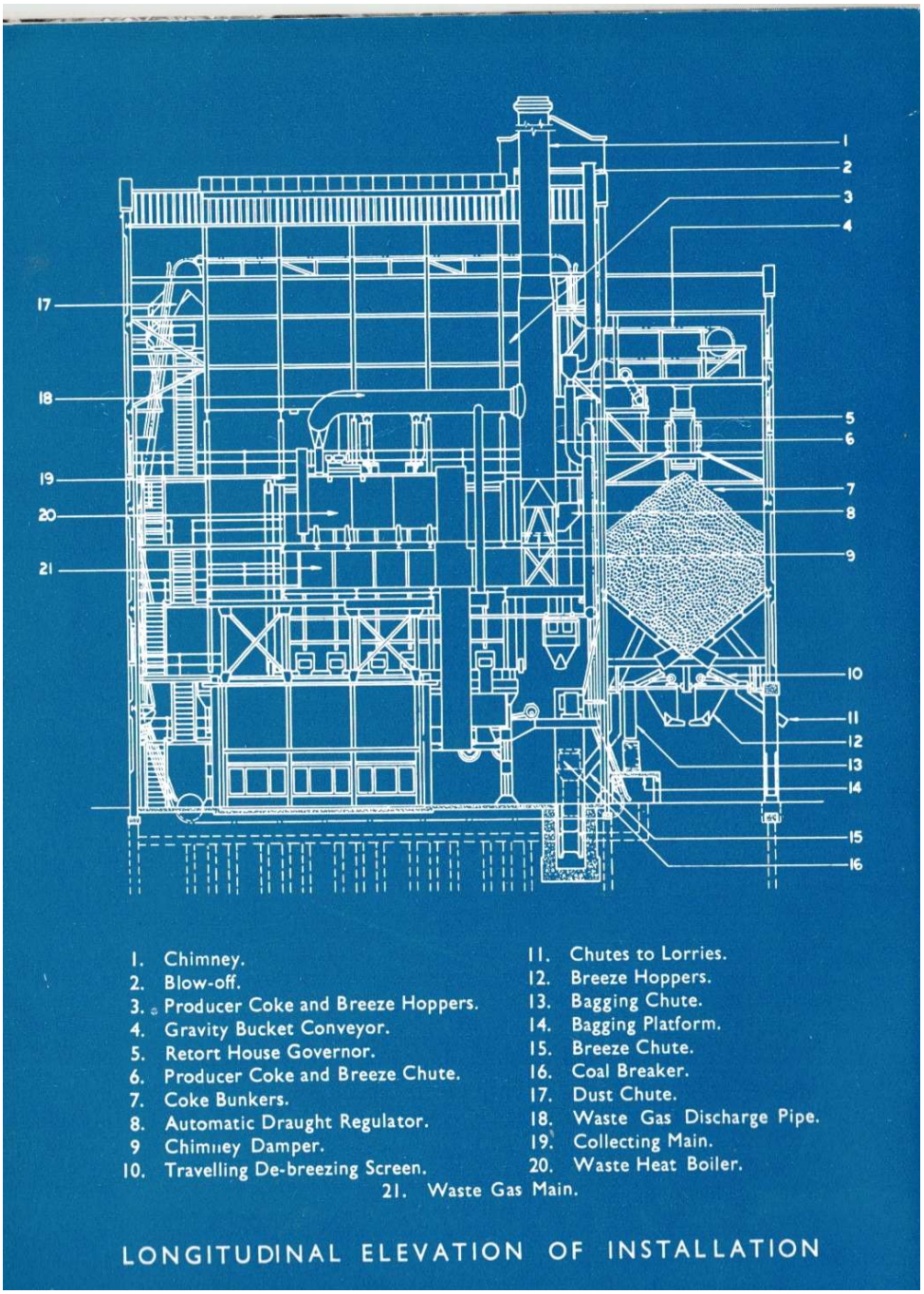
(b), Less scurf formation, and less loss of time at scurfing periods.

(c), Better steaming conditions.

With upward heating, the temperature in the vertical combustion flues is sufficiently low, at the point where erosion of the silica normally takes place, to allow the retorts to be constructed at this level

with perfect safety in firebrick. By the time the coal has travelled past this belt of firebrick and enters the silica portion of the retort, it has acquired a sufficient heat to avoid the extreme differences in temperatures on either side of the retort wall, which are the main cause of the erosion of silica material at this point.

Both the side walls and the top of the bench are efficiently insulated, with the double object of improving the working conditions and saving fuel.



COAL SUPPLY TO THE RETORTS.[2]

Coal is brought to the works in steam waggons and tipped into a steel receiving hopper of 4 tons capacity arranged below yard level. From this hopper, the coal is fed by means of a drag-bar feeder on to an inclined tray conveyor, which delivers it to a single-roll coal breaker arranged inside the retort house. A screen fitted in the feed chute to the breaker provides for the bypassing of small coal. The broken coal, together with the small coal by-passing the breaker, is delivered by way of a two-way chute to one or the other of two overlapping bucket conveyors encircling the retort bench longitudinally.

These bucket conveyors distribute the coal by means of a series of fixed dumpers into an overhead coal storage bunker arranged above and along the retort bench. This bunker has a capacity equivalent to 48 hours supply to the retorts, and from it the coal is fed by rotary valves into the auxiliary coal hoppers attached to the top mouthpiece of the retorts.

The overall capacity of the coal handling plant is 45 tons of coal per hour.

A 25 cwt. lift is provided to convey goods and passengers to the various working levels of the plant.

COKE EXTRACTION.

It is essential for the successful working of the retorts that the coke extraction device shall ensure regular and even discharge of the coke without causing crushing or shearing, and that the rate of coke extraction shall be simply and readily altered.

In the Woodall-Duckham Coke Extractor, the coke rests on a curved cast- iron plate at the base of the retort and slides off this place at a rate controlled by an extractor roller. This roller consists of a series of cast-iron stars mounted on a shaft, each star having a slight lead on its neighbour, so that in effect a helix is formed. In this way uniform extraction is ensured. The speed of the revolution of the roller can be altered over the whole range from zero to maximum extraction by the adjustment of a clamp on the reciprocating driving bar which operates the extractor wheel. The coke falls into a cast-iron hopper which holds about two hours' make of coke.

The bottom of the hopper is closed by a gas-tight water-sealed door which is opened by hand every two hours to discharge the coke.

It is well known that with continuous vertical retorts there is a tendency for the ash liberated by steaming to attack the joints in the lower parts of the retorts, where there is no protection by scurf formation. By spraying the retort faces regularly, when the retort is empty for scurfing, around the region where this chemical action takes place, " slagging " of the brickwork can be avoided and the life of the retort indefinitely prolonged. In the Woodall- Duckham bottom castings specially easy access is provided for inspection and spraying without dismantling the castings.

GAS OFFTAKES AND COLLECTING MAINS.

The gas issues from the top of the retort through an offtake pipe situated at one end of the retort. The coal entering the retort is kept clear of this offtake by a special deflecting plate which allows ample space for the gas flow from the coal.

The offtake pipe, which is so arranged as to be readily cleaned, leads the gas into a liquor-sealed dish valve, which is connected to the top of the collecting main. This valve provides for the closing-off of the individual retort from the collecting main, when the retort is being scurfed or is let down cold. Each offtake pipe is fitted with a spray whereby it is sprayed with hot ammon- iacal liquor. This liquor keeps the valves and offtakes clean and also serves to seal the dish valve when the retort is shut off from the main.

Two collecting mains are provided, one situated along each side of the bench. The collecting mains are of the dry type, and are arranged with a fall towards a cleaning well in the centre, where heavy tarry products are deposited and removed at intervals. The mains are occasionally flushed with hot liquor.

The gas passes from the collecting mains through uptakes into the foul main. In the uptakes it is sprayed with hot ammoniacal liquor, this ensuring further cleaning. In the foul main is arranged a retort house governor, which regulates the pull on the retorts.

To clear the gas mains of air at starting-up, or after shut-down periods, a, blow-off pipe is provided. Also an automatic "Peebles " relief valve has been fitted in the main.

The hot liquor from the sprays flows back into the collecting mains and thence to the cleaning wells. The surplus tar and liquor here flow over a weir to cast-iron pipes leading to a tar-liquor separating

tank, where the tar is deposited and rises over an adjustable weir whence it flows to the tar well.

The decanted liquor passes through screens into a separate compartment, from which it is pumped back to the sprays in the foul main and offtakes.

In this manner there is constituted a closed ammoniacal liquor circuit, and a regular supply of hot liquor is ensured.

PRODUCERS.

To provide the gas for heating the retorts, three producers are provided at the retort house floor level at one side of the bench. The. producers are arranged so that any producer may be shut down without interfering in any way with the working of the other producers. The gas from any of the producers may be taken to any of the retorts.

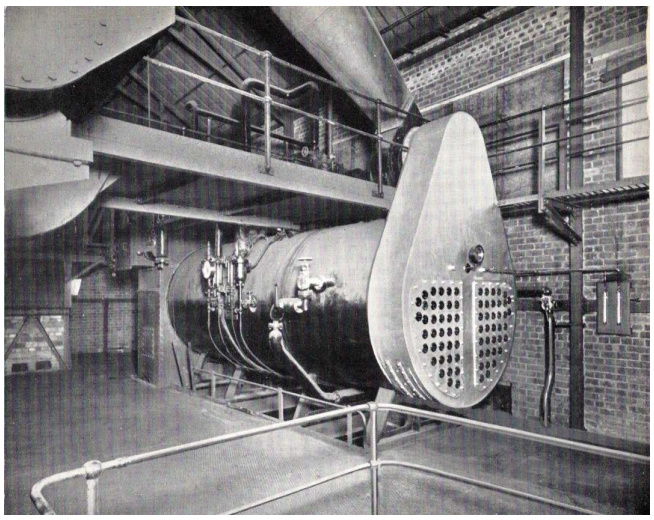
The producers are of the step-grate type, and are constructed with ample grate area for the efficient heating of sixteen retorts when using a mixture of coke and breeze, as well as for burning the additional amount of fuel required for a supplementary supply of producer gas to the waste heat boiler.

The step-grate eliminates the need for clinkering. The only attention required to keep the producer fire in proper condition is a periodical pricking up at intervals of four hours or longer, dependent on the class of fuel used.

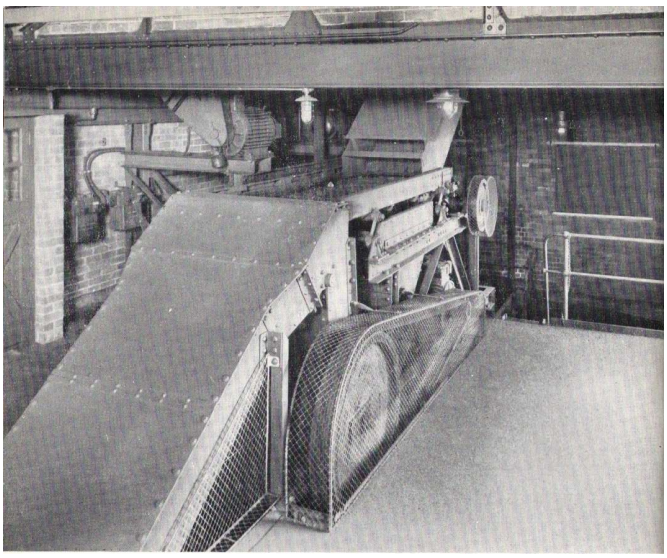
In order to give the producers maximum flexibility, both as regards producer gas output and as regards quality of fuel used, doors are provided on the front of the producers and arrangements made whereby primary air may be injected by steam into the producers in order to overcome the resistance of the fuel bed.

The tops of the producers are faced with good quality paving bricks on edge.

WASTE GAS FLUES AND WASTE HEAT BOILER.



The W-D induced draught waste heat boiler



The Primary coke screen

The flow of waste gases from the combustion chambers of each retort is controlled by two dampers, one for each side of the retort. The waste gases from each pair of retorts pass into a common flue and out through a steel- cased neck, lined with firebrick, into the waste gas main, which is of steel- braced brick construction. Through this main the gases pass either directly to the firebrick-lined chimney or to a waste heat boiler provided for utilizing the major portion of the heat contained in the gases.

The waste heat boiler, which is of the W-D horizontal fire-tube induced draught type, is designed for a working pressure of 120 lbs. per square inch. It is of a size to deal with the whole of the waste gases from an extended bench of sixteen retorts.

In order that the boiler may give its maximum output, pending the completion of the sixteen retort bench, or, if at any time some of the retorts are not in operation, provision is made whereby a supplementary supply of producer gas can be burned in a special combustion flue and the products of combustion passed into the waste gas stream before it enters the boiler.

To provide for conditions in which the degree of the " producer gas augmentation " is so high as to give rise to temperatures which might be injurious to the boiler, which is designed for dealing with waste gases, provision is made for recirculation of part of the cooled waste gases leaving the boiler into the boiler inlet flue, thus lowering the temperatures of the mixed gases to within safe limits.

A superheater capable of giving an additional superheat of 100°F. is provided in the boiler inlet flue.

The induced draught fan is driven by a non-condensing steam turbine. Two vertical, single-cylinder, direct-acting feed water pumps are provided for feeding water to the boilers.

A " Neckar " water softening plant, working on the hot lime soda process, has been installed to treat the water required for use in the waste heat boiler. It is capable of dealing with 650 gallons of water per hour.

COKE HANDLING, SCREENING AND STORAGE PLANT.

The contents of the coke chambers beneath the retorts are discharged into the bottom strand of one or the other of the overlapping bucket conveyors through a travelling chute running on rails beneath the bench.

Coke required for the producers and for filling the retorts at starting up or after scurfing periods is delivered by the bucket conveyors, by means of fixed dumpers, into an overhead producer and retort coke storage hopper forming an extension at one end of the overhead coal storage hopper. Breeze required for the producers is fed by a chute from the breeze compartment of the outside coke and breeze storage bunkers into one or the other of the bucket conveyors, and is discharged therefrom by means of a fixed dumper into an overhead breeze storage hopper forming an extension of the overhead coke storage hopper. These hoppers provide accommodation for 24 hours' supply of fuel to the producers.

From the overhead coke and breeze storage hoppers, coke and breeze are fed as required through a double chute fitted with discharge doors into a hand-propelled, top-hung, bottom-discharging turntable skip. This skip runs on an overhead track above the producer charging platform and discharges coke and breeze directly into the producers.

The coke required for filling the retorts at starting up or after scurfing is fed from the overhead coke hopper into a hand-propelled retort-filling skip running on an overhead track fixed to the underside of the cross-joists supporting the overhead storage hoppers. From this skip it can be discharged directly into any of the retorts.

The coke for sale is delivered to the coke screening plant from the bottom strands of external loops of the bucket conveyors, which pass through the retort house wall into the top of the screening plant. Here the coke is passed over a " Cort's " reciprocating screen, which scalps all coke of size 2" and over. This oversize coke passes either into a coke cutter, or through a bypass chute directly into the large coke compartment of the storage bunkers below. The coke cutter, which is a " P.S.C." machine, reduces the coke to 2" and under and delivers it to a secondary " Cort's " reciprocating screen, this screen also taking delivery of the undersized coke from the scalping screen.

The secondary screen grades the coke into three sizes, 0"—⅜",⅜"—1", and 1"—2", these sizes being delivered directly to their respective compartments in the storage bunkers. The bunkers have a total capacity of 150 tons, and are of reinforced brick and steel construction, the vertical sides, ends, and division walls being formed by filling in the steel framing with reinforced brickwork, and the sloping bottoms being steel, lined with blue tiles set in cement. The bunkers are divided into four separate

compartments for storing the four gradings mentioned above.

Each coke compartment is fitted at the bottom with two outlet chutes with hand-operated quadrant doors ; one for discharging into road vehicles, and one for discharging to a concrete bagging platform. Beneath each line of outlets, a “Pegson” travelling debreezing machine is provided, that on the bagging platform side discharging the debreezed coke through a travelling chute, while that on the opposite side feeds it to the road vehicles through fixed chutes attached to the bunker structure.

All coke and breeze delivery chutes throughout the coke handling, screening and storage plant are lined with pressed blue tiles set in cement.

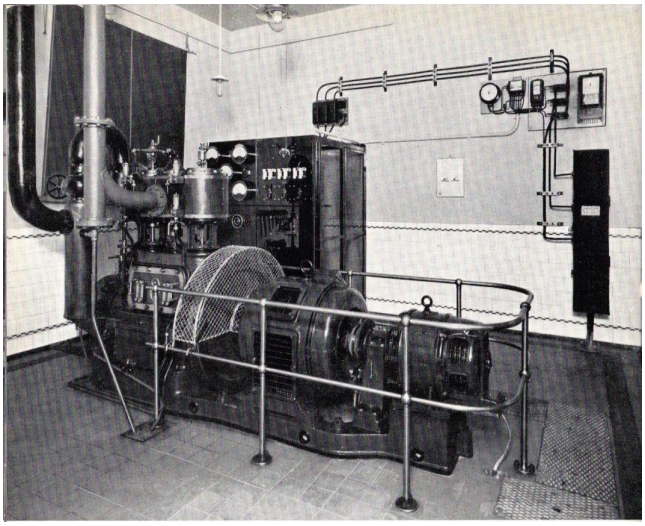
POWER AND STEAM SUPPLY.

All power-operated units on the coal handling plant and coke handling and screening plant are driven by totally-enclosed, dust-proof, gasworks type electric motors, the drag-bar feeder and the tray conveyor being actuated by a common motor.

The coke extractors are operated by means of two horizontal non-condensing steam engines, one of which is a standby. These drive an overhead shaft by means of belts, countershafts and spur reduction gearing. This shaft bears two cast-iron eccentrics connected to two lines of reciprocating bars extending the full length of the bench, one on each side. Adjustable driving blocks on these bars engage with rocking arm levers mounted on the coke extractor driving wheels.

The ammoniacal liquor pumps and boiler feed-water pumps are steam driven ; two of each are installed, one as a standby. The induced draught fan of the waste heat boiler is driven by a non-condensing steam turbine.

The whole of the steam required for the retorts, producers, liquor pumps, feed-water pumps, and fan turbine is supplied by the waste heat boiler and there is a surplus of some 3,000 lbs. per hour for other purposes.



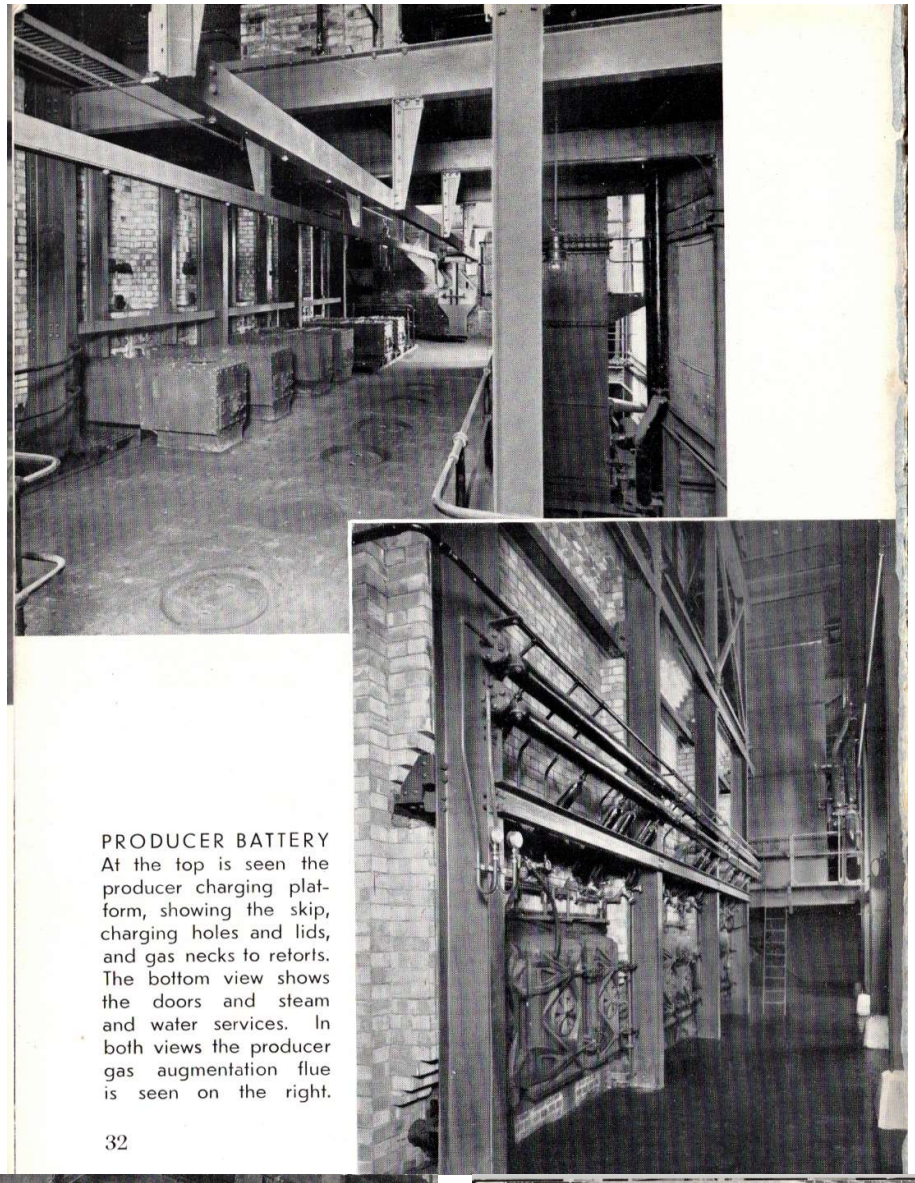
The Electric generator and switchboard

A 45 KW. Browett-Lindley steam-engine-driven generator set has been installed to produce electricity from the waste heat boiler steam. The engine is of the two-crank, compound, central valve type, the alternator being of the open type, salient pole, revolving field pattern, with a direct-coupled exciter. The speed of the set is 600 r.p.m., and its capacity is 56 KVA.'at 400 volts., 3-phase, 50 cycles.

From the switchboard in the generator house a cable is run to a distribution switch fuse board on the waste heat boiler platform in the retort house, and a standby cable from the town’s supply is connected to this distribution board. Substation boxes are provided at suitable points on the plant.

BUILDINGS.

The retort house and outside coke screening plant form integral portions of a block of steel-framed, brick-panelled buildings, the steelwork being enclosed on the external face of the brickwork. The roof is of Trafford tiles. The house was designed to provide good working conditions from the point of view of both light and ventilation, though provision for the " black-out " has, to a great extent, prevented appreciation of the fact. As it is, the ample space at working levels and the easy access by stairways and gangways to all parts of the plant are a striking feature.



PRODUCER BATTERY
At the top is seen the producer charging platform, showing the skip, charging holes and lids, and gas necks to retorts. The bottom view shows the doors and steam and water services. In both views the producer gas augmentation flue is seen on the right.

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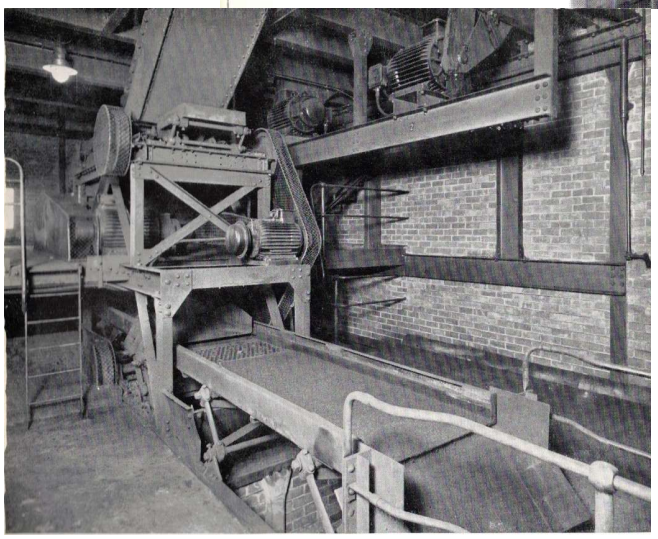
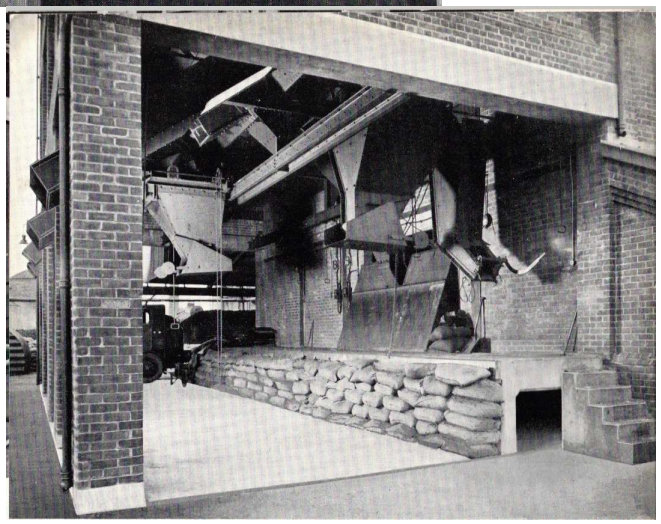


The secondary coke screen



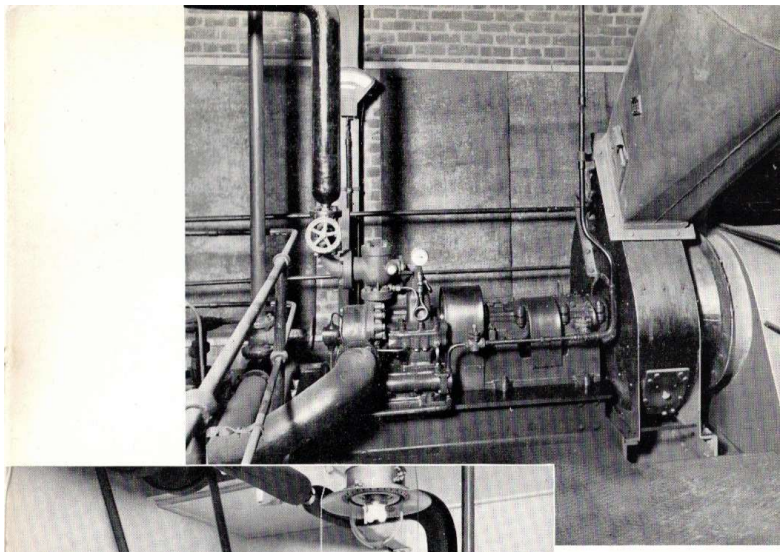
View beneath coke bunkers showing the discharge chutes, debreezing machines and bagging platform, By the use of steel plates and sandbags, an air raid shelter has been made under the platform

The extractor engines, liquor pumps, and lift motor are enclosed in a house formed within the retort house, the walls of this house being finished with a dado of white glazed tiles, above which the walls are painted, and the floor being finished with red tiles.

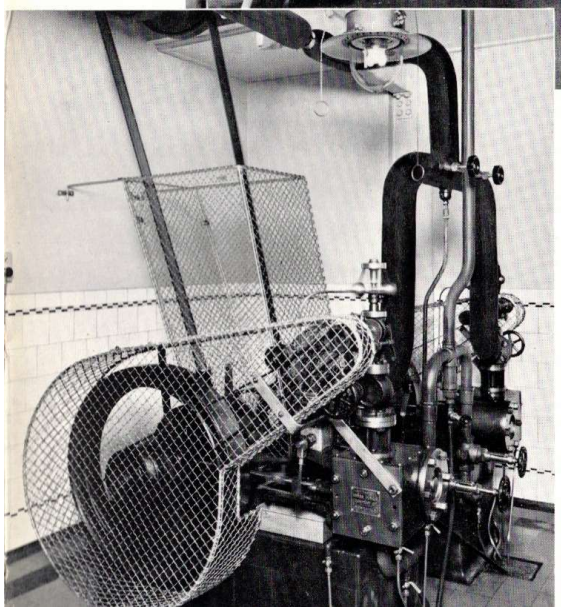
The generator house is a brick structure with flat reinforced concrete roof, and is internally finished in the same way as the extraction engine house. The type of roof was decided on as a measure of A.R.P. protection when war appeared possible. The design of other parts of the plant would probably have been different if the contract had been placed 12 months later.

FOUNDATIONS.

As the site is close to the banks of the Parrett, which is a tidal river, it was necessary to carry the whole of the retort and coal and coke handling plant on a foundation of reinforced piles. A good bearing stratum was found at an average depth of about 27½ feet, and ninety-one piles were driven, capped, and tied together with reinforced concrete beams to carry the raft foundations. These piles were cast in situ, steel tubes being first driven in sections to the bearing stratum. The reinforced concrete was then placed in the tube, section by section, the steel sections being withdrawn correspondingly as the work proceeded.



WASTE HEAT BOILER FAN & TURBINE



THE EXTRACTOR STEAM ENGINES

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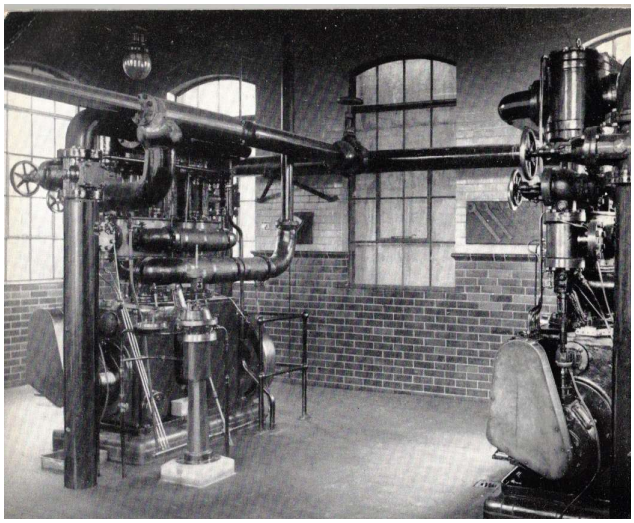
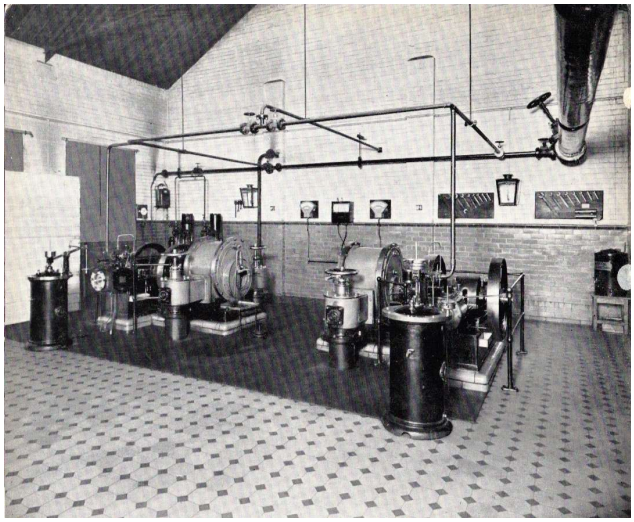
ANCILLARY PLANT

CONDENSERS.

There are two condensers, one of the annular atmospheric type and another of the Holmes water-cooled type, the latter having been installed in 1930—31.



Part of the compressor plant



The Exhauster house

EXHAUSTERS.[3]

Two Bryan Donkin 2-blade type exhausters, each with a capacity of 20,000 cubic feet per hour, were installed in 1904, but are now used for light loads only. Two further Bryan Donkin 2-blade exhausters were installed 1930—31, each with a capacity of 40,000 cubic feet per hour.

AMMONIA RECOVERY PLANT AND TAR EXTRACTORS.

This section of the plant comprises one Livesey washer, installed in 1931—32; one P. & A. tar extractor, installed in 1931—32 ; one Cockey washer and one Holmes rotary washer. All these units work in series.

PURIFIERS.

The purifying house was extended and three purifiers were installed in 1930—32. The house now contains four C.I. boxes, two of which are 25' 0" x 20' 0" x 5' 0" deep and dry sealed, and two of 24' 0" x20' 0" x 5' 0" deep and water sealed. These are connected to an 8-way reversing centre valve. There are also two guard boxes 25' 0" x 20' 0" x 5' 0" deep on separate valves.

STATION METER.

The station meter has a capacity of 20,000 cubic feet per hour, and is of the drum type.

GAS HOLDERS.

There are two 2-lift column guided holders, C.I. tank, one of 300,000 cubic feet capacity and one of 90,000 cubic feet capacity ; the latter being used as a carburetted water gas relief holder and for unpurified coal gas. There is also a spiral guided holder in a steel tank and having a capacity of 250,000 cubic feet.

STEAM PLANT.

In addition to the waste heat boiler there are four Cornish boilers, two of 18' 0" X 5' 6", installed in 1904, and two of 24' 0" x 6' 6", installed in 1930—31.

CARBURETTED WATER GAS PLANT.

This is of the Humphreys and Glasgow type, and has a capacity of 200,000 cubic feet per day. It was erected in 1904, but since 1913 has been used for peak loads and emergencies only.

GAS BOOSTERS.[4]

Two pressure-raising fans, driven by 8 hp. De Laval steam turbines, are connected to the outlet of the holders ; each fan has a capacity of 80,000 cubic feet per hour with a 10" W.G. rise in pressure. There are two Bryan Donkin steam-driven compressors capable of passing 20,000 cubic feet per hour against 5 lbs. pressure.

In 1937 however, a complete new compressing plant was installed, comprising two Bryan Donkin reciprocating compressors, each of 40,000 cubic feet per hour capacity at 5 lbs. pressure. At the same time additional high pressure radial feeding mains were installed to feed gas at five separate points through district governors into the main distributing system.

AIR RAID SHELTERS.

Shelters of both concrete and steel have been provided, along with numerous protective equipment and emergency apparatus.

A suitable number of men have been trained for emergency work.

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[1] Which Tregelles is not clear. There was a Dynasty of Tregelles family members associated with the Neath Abbey ironworks, which equipped numerous gaswork then.

[2] Coal came from the Docks then. In the very early days it would have been discharged from vessels docked at wharf alongside the works.

[3] These were photographed by George Watkins in 1968 (Steam Engine Record 1373a)

[5] These were photographed by George Watkins in 1968 (Steam Engine Record 1373b)

Both are illustrated in George Watkins, *Stationary Steam engines of Great Britain*, vol 7, pp 88-93