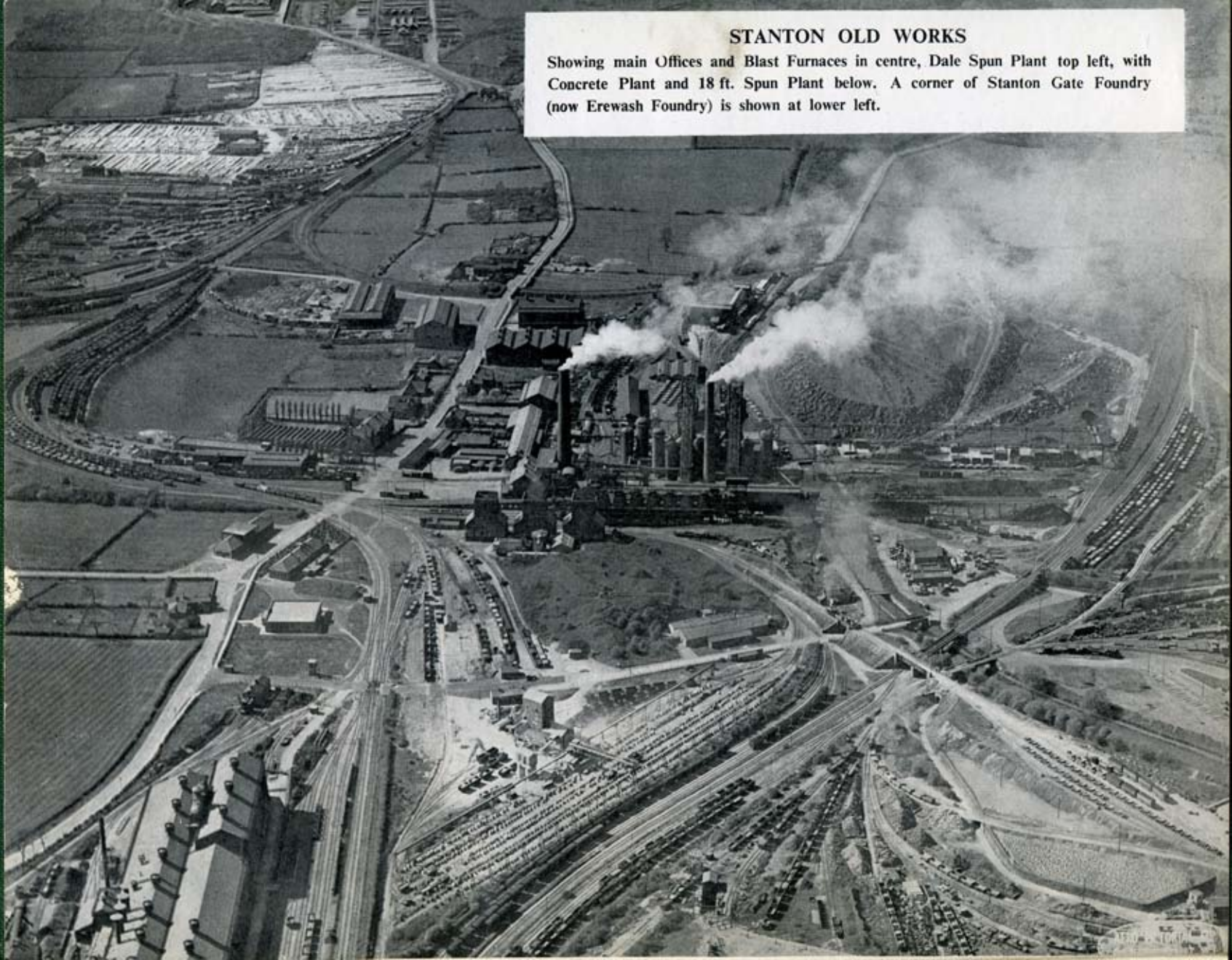


STANTON OLD WORKS

Showing main Offices and Blast Furnaces in centre, Dale Spun Plant top left, with Concrete Plant and 18 ft. Spun Plant below. A corner of Stanton Gate Foundry (now Erewash Foundry) is shown at lower left.

STANTON AT WAR

The story of the part played by Stanton

1939-1945

THE STANTON IRONWORKS COMPANY LIMITED
NEAR NOTTINGHAM ENGLAND

Dedicated to

the Memory of

the 137 employees of the Company

who have given their lives,

and

to the other 2,126 employees,

both men and women,

who served with H.M. Forces

during the war

1939 - 1945.

INDEX

STANTON GATE FOUNDRY

EARLY in the war the Royal Air Force called for a large and continuous supply of 500 lb. bombs, the result of which was an approach to Stanton by the Ministry of Supply for co-operation in the design and management of a mass-production unit for this purpose. The methods employed were novel in many instances, and in some cases revolutionary, but they were fully justified by the results and Stanton Gate Foundry was an outstanding success amongst the Ministry of Supply factories.

A completely new plant consisting of melting shop and foundry was built on 25 acres of farm land, and production of bombs commenced exactly eleven months after the erectors' arrival on the site. The machine shop however, was ready two months earlier, as existing buildings were adapted to house these machines.

The factory operated for four years on single and double shift, and during that time 873,500 bombs were cast ; 785,169 were delivered to the filling factories,

and a large quantity to stock, representing a total weight of 175,260 tons of loaded bombs for the R.A.F.

THE STEEL PLANT

The Steel Plant comprised four cupolas, two rotary furnaces and four side blown converters, and the process visualized the use of 100 per cent steel scrap melted in cupolas, super-heated in rotary furnaces and charged into the converter at a temperature at which the carbon reaction would commence.

The cupolas were 7 ft. 6 in. internal working diameter with 16-8 in. diameter tuyeres. The normal daily throughput was 300 tons during a 22-hour blow, and on two occasions a continuous run of 30 hours was made, the metal throughput being 400 tons.

The rotary furnaces were 23 ft. long and 10 ft. diameter, with a nominal capacity of 12 tons. They were lined with an acid monolithic material, and operational technique was developed which gave a lining life of 10,000 tons of metal

FRONT SIDE OF CUPOLAS

throughput. The furnaces were fired by pulverized anthracite.

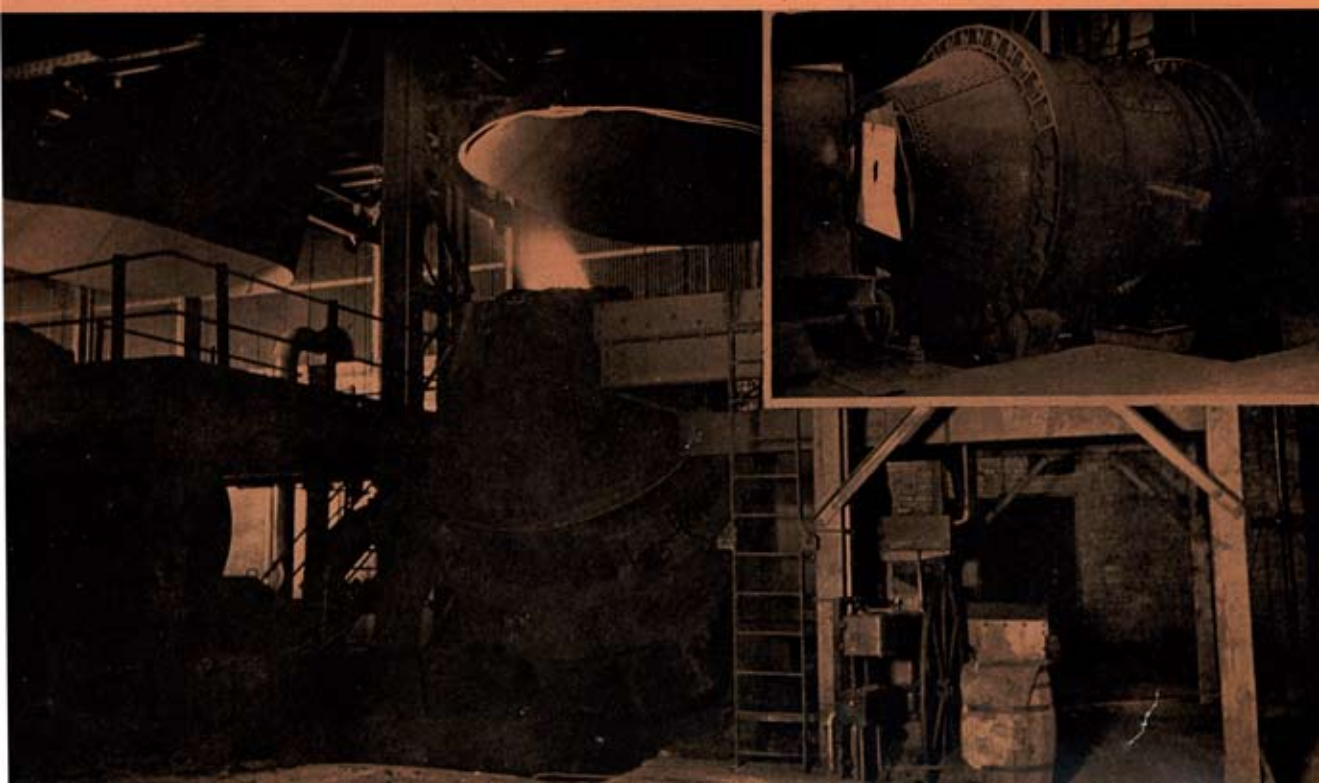
The converters were of 3-3½ tons capacity, lined with silica brick and had six 1¾in. diameter tuyeres.

As the cupolas were to work on 100 per cent steel scrap with no additions of silicon, they were specially designed to give a high pick-up of carbon during the melting process. The use of all-steel scrap resulted in very high sulphur in the remelted metal, and the use of soda ash with a special technique of double pouring was developed, which increased the efficiency of the normal desulphurizing process, so that 80 per cent of the sulphur was removed. The metal was then poured into the rotary furnace and heated up to 1,500 degrees centigrade, the calorific input of pulverized fuel being adjusted to provide this temperature to 15 tons of metal per hour. The converters were charged from this furnace, and after a "blow" of 8-12 minutes, the metal was ready for alloying.

The steel output during the operation of the plant was 148,139

ONE OF FOUR TROPENAS CONVERTERS

Inset—ONE OF THE TWO SESCI ROTARY FURNACES

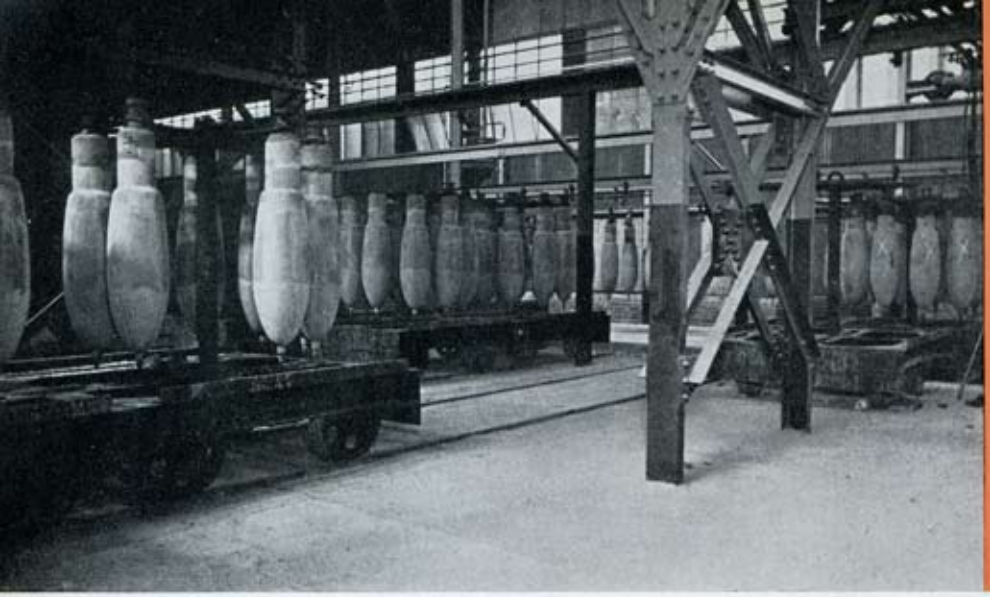


TRANSFERRING CORES FROM THE COREMAKING MACHINE TO THE DRYING STOVE BOGIE

tons, and the largest output in a week of 100 hours was 1,628 tons. This output went into bombs and 3½ ton soft steel ingots for rolling purposes.

THE FOUNDRY

The mechanical devices and conveyor systems for a designed production rate of 100 bombs per hour more than fulfilled expectations. The greatest output in a double shift of 20 hours' working time was 2,056 bombs, and for a week of 100 hours, 9,350 bombs were produced; the best hour produced 144 bombs. After casting, the moulds were knocked out on jolt machines and the sand returned to a storage bunker. There was a central sand plant operating on 70 per cent returned moulding sand and 30 per cent new sand, at which mould and core sand was prepared. New sand in the correct proportion was added by the adjustment of gates on the bunkers, and the mixed sand was passed through a cooler and mixer which incorporated a de-silting system. The sand was then transferred to separate feed bunkers over eleven batch mills. The mill operators were women, and the



CORE BOGIES CONTAINING DRIED CORES BETWEEN EXIT END OF CORE STOVE AND CONVEYOR

output per shift was 500 tons of moulding sand and 150 tons of core sand.

The cores were made in eight specially designed vertical machines which incorporated a turntable on which the cores were made in three distinct operations. A feature was the rotation of the core box and the mechanical ramming at one stage.

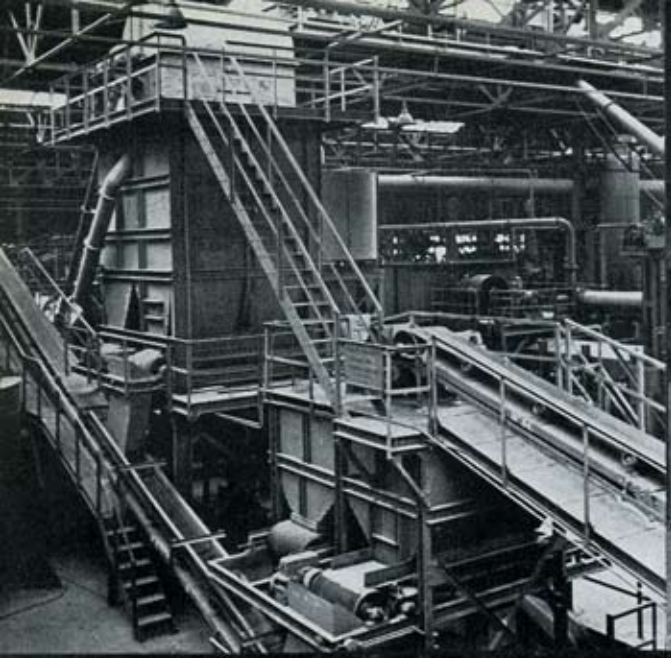
Each machine produced cores at an average speed of 20.7 per hour working time. They were then passed through a drying stove, and after a coat of refractory paint, were placed on a conveyor which passed through the moulding station.

The moulds were produced by sand-slingers, each box comprising two bomb moulds. The boxes were placed on an elliptical continuous bogie conveyor and the cores inserted on the way to the casting point. The core bars were removed and returned to the wrapping station by overhead conveyor. After stripping, the bombs were placed on bogies and passed through a cooling tunnel, the hot air from which was used in the pre-heat section of the core stoves.

The bombs, still in pairs as cast, were next passed through a shot blast plant on a continuous chain conveyor, after which they were separated by cutting off the runner with oxy-gas burner. Final stages were the removal of the feeder head by oxy-gas flame or cold saw, the smoothing of the bomb where the runner had been burnt off, by swing frame grinders, and the air-pressure tests.

THE MACHINE SHOP

Two existing furnaces were adapted for the heat treatment of the bombs. They worked on a



1.—Section of Sand Handling Plant, showing new sand hoppers in foreground and reclaimed sand screen in background.

2.—Inserting cores into drag portion of mould.

3.—Cutting off ingates with oxy-acetylene flame.

4.—Casting.

MACHINE SHOP (DALE SPUN IRON PIPE PLANT)

24-hour, 5-day week basis, and their construction enabled each bomb to have in effect individual heat treatment ; eight thermo-couples in the soaking zone showed a maximum temperature variation of plus or minus 10 degrees at 950 degrees centigrade. This was reflected in the machine shop and drop hammer tests on the bombs, which always had a large margin of reserve over the specified test results.

The machining of the bombs was preceded by wheelabrator treatment and internal grinding, the handling from the furnaces to this section being carried out by overhead continuous chain conveyor.

The machine shop proper was equipped on the line principle. Thirteen machines gave nose-boring, counter-boring and facing to the bombs in an operational time of five minutes per bomb. The tail-end was next completely machined in semi-automatic turret lathes. Twenty-five of these lathes were available. The slots for the tail-end unit were then milled in one of seven machines installed.

After air-pressure testing, suspension lugs were welded on to the bombs, a single lug for British aircraft and two for the American. The three lugs were fitted to all bombs to allow for interchangeability and the final finish was given by internally varnishing and outside painting.

The bombs were cleaned on the inside by suction and placed horizontally in a cradle on the varnishing machine. A specially controlled spray then traversed the inside giving an even coating.

After the outside of the bombs was painted, stoving was carried out in thermostatically controlled gas stoves through which the bombs were passed on continuous chain conveyors.

The final operation before despatch was the assembly of components. These were the tail-filling plug comprising exploder container and tail pistol, and a locating pin for the tail unit. These were covered by a transit base for protection. The nose end was closed with a threaded exploder container and nose plug.

Manual handling was reduced

BOMBS ENTERING ANNEALING FURNACE—SHOWING HYDRAULIC PUSHING GEAR

to a very small degree. Transit of the bombs from the receiving stage was by continuous overhead chain conveyor, which fed them into the annealing furnace, and after heat treatment transported them to the wheelabrator shop.

From there the movement of the bombs through the shop was on bogies working on a continuous floor conveyor, which moved at the rate of 8 feet per minute.

All handling between conveyor and machines was carried out by hand-controlled overhead electric hoists.

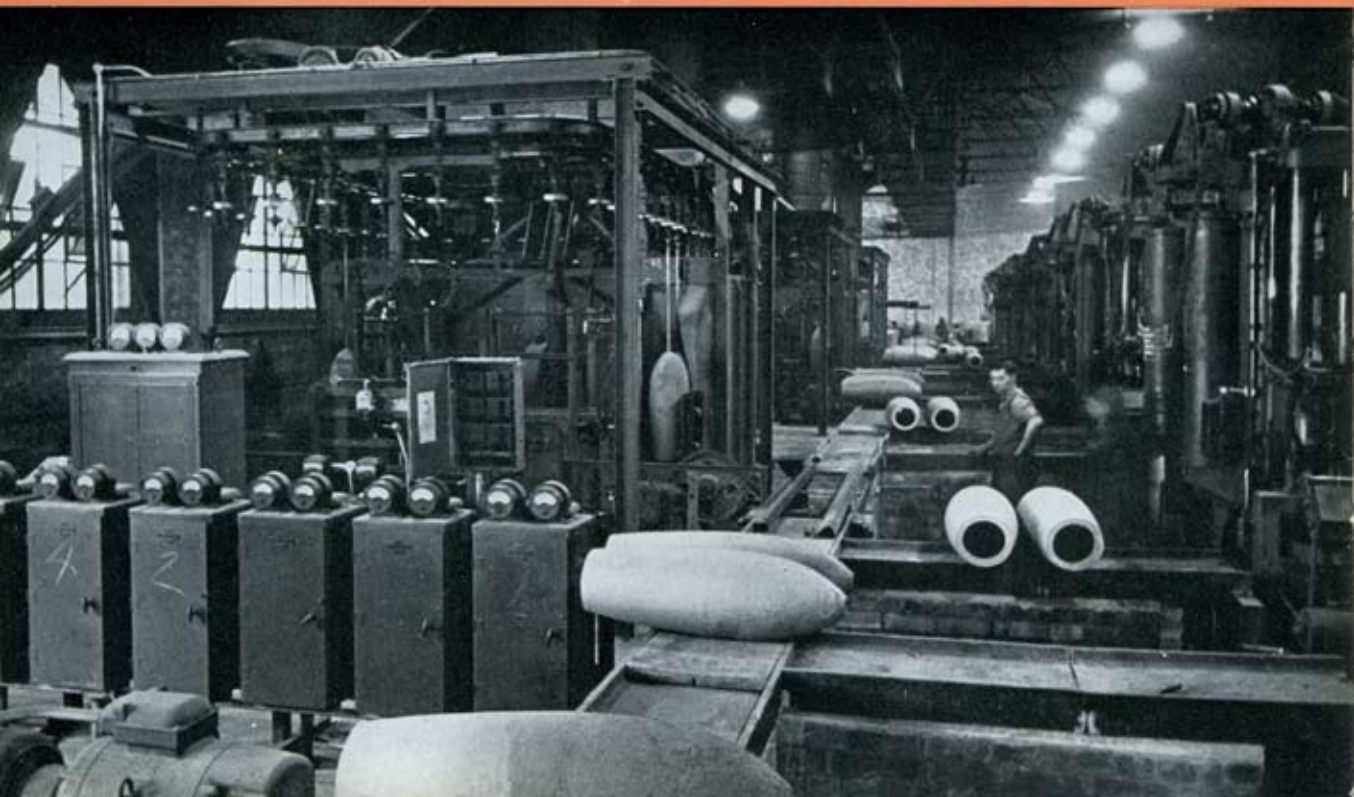
Rigid inspection was exercised at every machining operation, and the bombs were stamped at appropriate points by the inspectors.

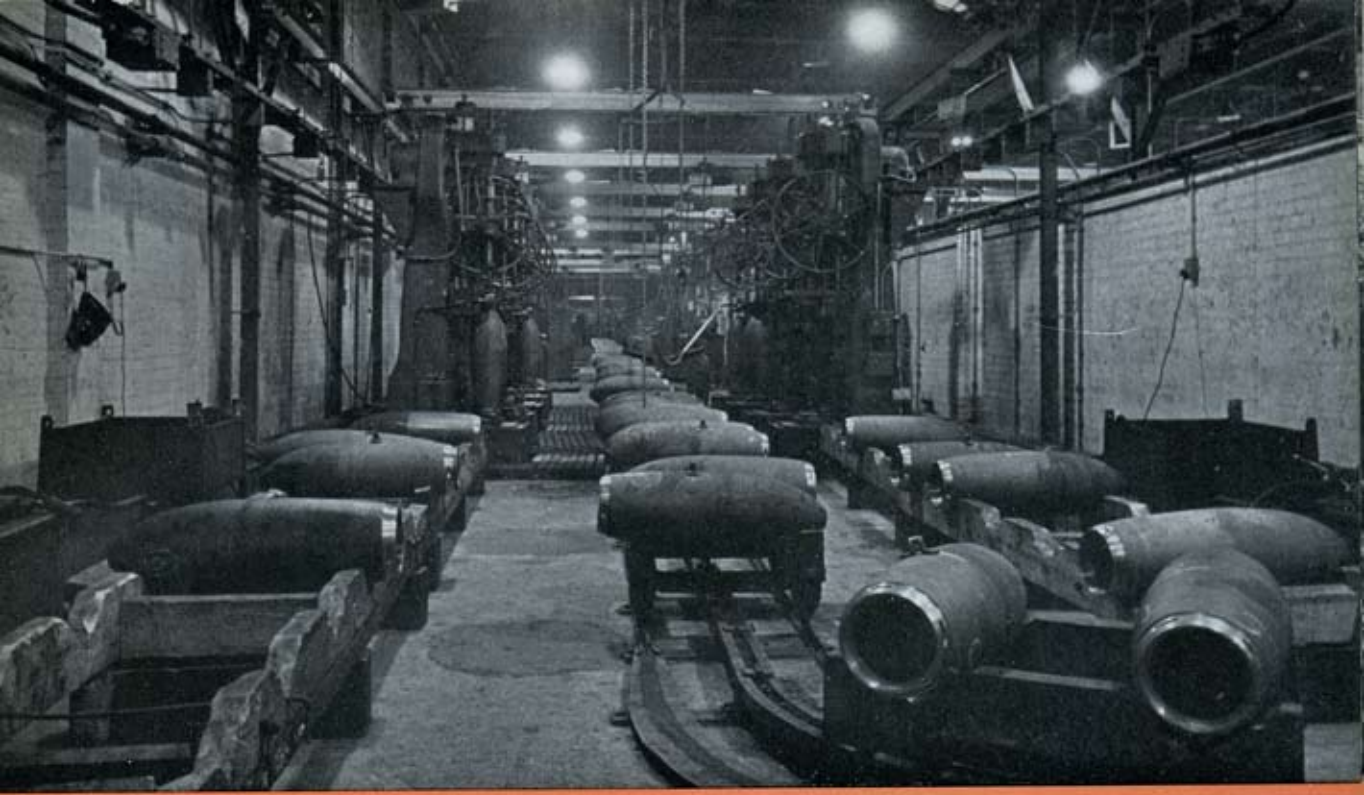
The output of the machine shop was designed to coincide with that of the foundry, and the maximum delivery was 9,096 in one week with a record number of 110 in one hour.

GENERAL

The peak personnel on double shift working was 2,000, and in view of the output figures quoted, it is worthy of note that only two

GENERAL VIEW OF WHEELABRATOR CABINET





GENERAL VIEW OF MACHINING BAY

had any previous experience of steel foundry work. Two operatives from the Stanton Iron Foundries were sent to a steel foundry for three months to train as blowers. They acted as blowers on their return and also trained others.

During the operation of the plant approximately 40,000 heats were blown, and it speaks well for the adaptability of the British workman that the number of bad heats was under 50. The same may be said of all the other workers, especially the women who constituted 40 per cent of the total.

Crane-drivers, bricklayers' labourers, core-makers, sandmill attendants, lathe operators, milling and drilling machinists, welders, sand-testers, laboratory workers, they were drawn from the home, shop and factory. Hosiery and lace workers, hairdressers and shop assistants — some were in tears when they saw the jobs they were given and yet, within a week or two they were doing them with dexterity—and contentedly.

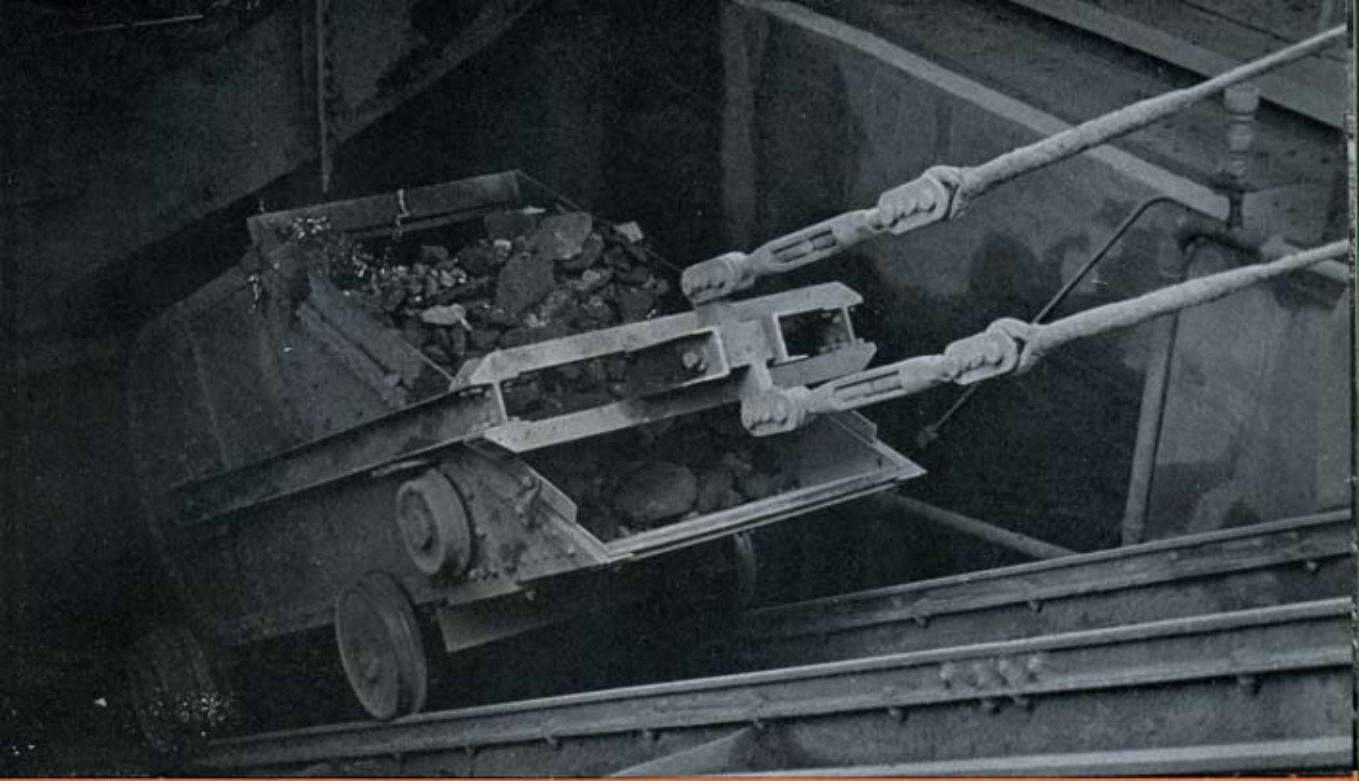
The percentage of absenteeism compared very favourably with other parts of the country, especi-

LOADING FINISHED BOMBS INTO RAILWAY TRUCKS FOR DESPATCH

ally when account was taken of the high proportion of married women, many of whom had full domestic responsibilities.

Throughout the whole four years no major labour difficulties were met with. Minor matters were overcome by both parties getting together and settling by discussion and common sense. In this connection tribute should be paid to the assistance given by the shop stewards and union representatives. Much good work was also done by the Production and Welfare Committees made up of management and workers' representatives. Changes in the latter every six months and the presence of a "visitor" each month, drawn from either sex and each department in turn, had the effect of making the work of the committees widely known. Workers' troubles were freely ventilated and the management's problems made known, and this led to mutual respect and understanding.

The Stanton Gate plant, now known as the Erewash Foundry, is being converted to meet the increasing requirements of our home and export trade, and used as a nucleus for reorganizing the foundries at Stanton Works.



IRONSTONE

THE outbreak of war had an adverse effect on the amount of shipping available for the import of foreign ore. The enemy's occupation of Europe had deprived this country of 35 per cent of imported ore, and Vichy control of North Africa cut off a further 12 per cent.

We had, in consequence, to turn to a greater use of native ore, and the output from the Company's ironstone quarries was developed from 2,200,000 tons to a maximum of 3,600,000 tons per annum, an increase of 63 per cent.

The bedded ores of the East Midlands are to-day, with those of the Frodingham district, the principal source in Britain of the raw material of the iron and steel industry. They occur over areas of varying extent in a strip of country not many miles in width, extending from the neighbourhood of Lincoln to that of Banbury. In some places the beds are close to the surface ; in others, owing to their gentle slope and often to rising ground, they pass down to a considerable depth.

Up to the present, by far the greater portion of the ore worked has been got by quarrying, known as "opencast working."

The Stanton Company and its subsidiary companies have extensive workings between Grantham, Melton Mowbray and Oakham, outlying quarries west and south of Melton and extensive workings in Northamptonshire, near Kettering, and near Wellingborough.

In order to achieve increase in production more workings were electrified and operations were extended in all the Company's quarries by prolonging existing pits, opening new quarries and working additional shifts. A number of extensive new works, chiefly of railway construction, were imperative, together with additional excavators and locomotives.

A substantial part of the war output of home ore was needed to supply those firms, chiefly in the north, which had previously depended on the foreign ore no longer available to them, and out

DRAGLINE AT BUCKMINSTER

Reproduced by kind permission of the "Farmer and Stock Breeder."

DRAGLINE REMOVING AND RESTORING SOIL AND OVERBURDEN, DIGGING AND LOADING IRONSTONE AT WOOLSTHORPE

of the total output of 18,704,000 tons, Stanton quarries despatched between September 1939 and December 1945 a total of 8,236,000 tons to customers.

A factor which contributed to the successful increase of this output was the large reserves still available in 1939 of ironstone under the Company's control that lay close to the surface.

In most of the quarries the requirements were met by employing more excavators of existing types rather than bigger machines, which were difficult to obtain.

Calcined ironstone was particularly in demand, and among the urgent extensions carried out was the provision of plant for providing this, both at Buckminster and Glendon.

Sidings at Stainby quarry to accommodate new calcining banks and the provision of specially-designed container wagons with an electric crane for tipping the containers on to the banks, with a

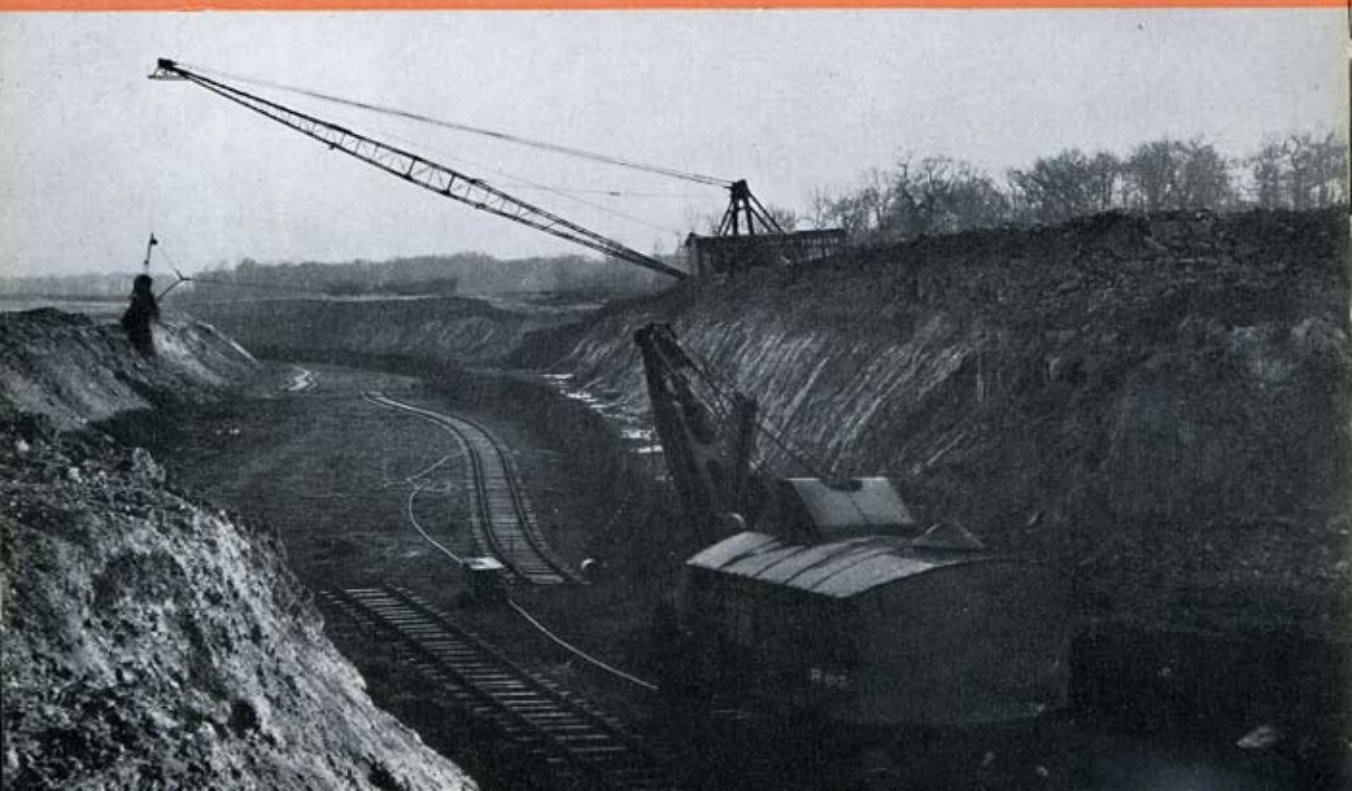
similar layout at Glendon Quarry, were but part of the new developments carried out.

Alongside the L. N. E. R. at Stainby, siding accommodation was doubled and a new railway $3\frac{1}{4}$ miles long was constructed to open out a virgin area of ironstone at Harlaxton, near Grantham. By 1943 the new quarries here had attained a length of considerably over a mile. The railway involved a bridge under the 60 ft. highway from Melton Mowbray to Grantham, and a substantial loco shed and fitting shop.

At Glendon a new ironstone face was opened out and excavation carried out for the additional $1\frac{1}{2}$ miles of siding accommodation laid in by the L.M.S. to accommodate the new traffic.

Lengthy extensions of narrow gauge tramways at Woolsthorpe, Tilton and Wellingborough were made as more outlying stone was opened out and worked.

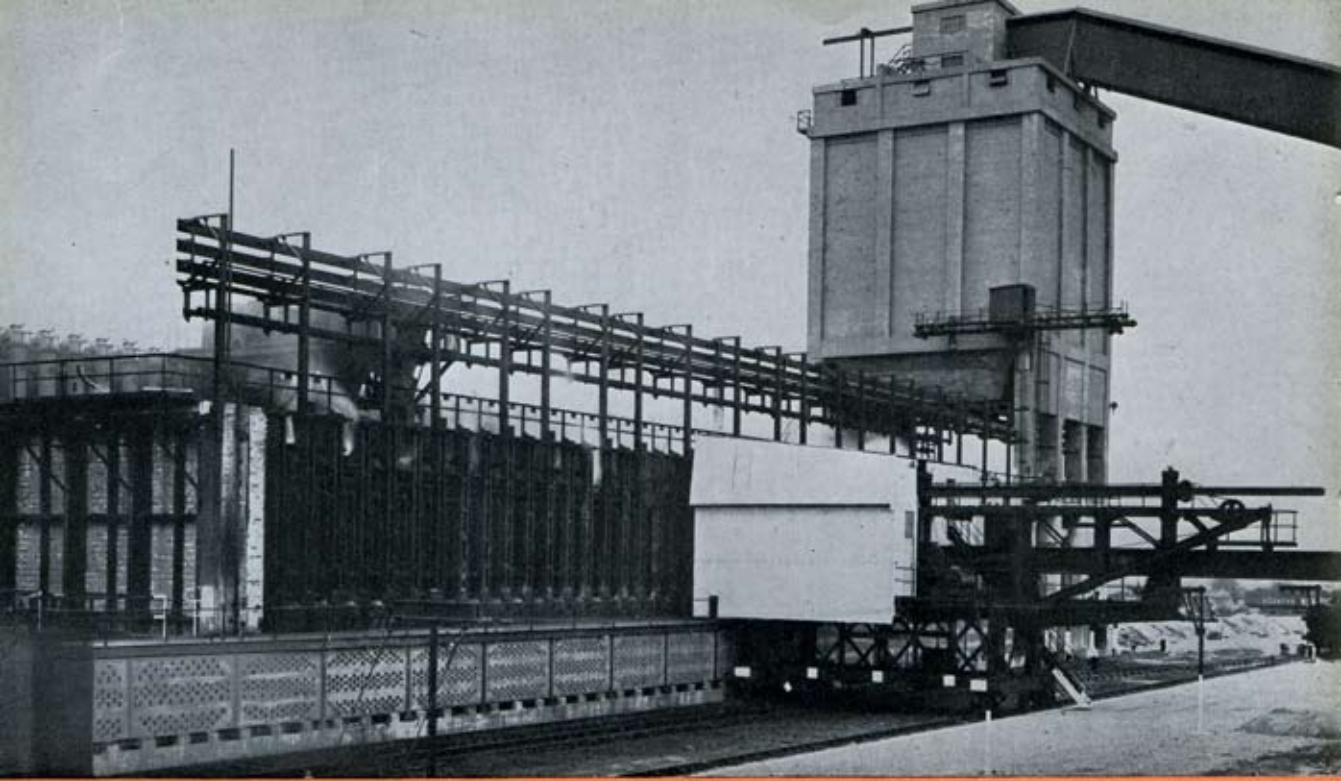
GEDDINGTON PIT, GLENDON QUARRY



"5366" ELECTRICALLY DRIVEN SHOVEL AT GLENDON QUARRY

Two Ruston-Bucyrus Walking Draglines with 135 ft. booms and 3 cubic yard buckets were installed at Wellingborough and Glendon, and a Ransomes & Rapier 5366 electrically driven shovel weighing 650 tons, with 100 ft. dumping radius and a 9 cubic yard bucket, was introduced at Glendon.

In all a total of twenty excavators (12 electrically operated) and 11 locomotives were added to the quarries plant, together with over seven miles of railway and over three miles of siding accommodation.



COKE OVENS

TO conform with the Stanton Company's policy of being as self-contained as possible, the construction of a Coke Oven Plant was commenced in 1938.

The plant was designed to carbonize a mixture of the low rank coking coals from the Stanton Colleries, and higher rank coking coals from South Wales and Yorkshire, to produce a coke suitable for use in the blast furnaces of the Company.

Towards the end of 1940, South Wales coal became unobtainable and a substitute had to be procured from Durham. Apart from minor modifications, this type of coal blend was used throughout the war, producing a coke equal to the better Yorkshire grades.

The whole of the large coke produced during the war period—over a million tons, was used in the Company's blast furnaces, the smaller sizes amounting to 155,000 tons being sold for industrial and domestic heating.

The necessity for conforming with black-out regulations presented no unusual difficulties on the by-product plant, but the ovens presented a more difficult problem, due to the glare when pushing and charging.

Whilst the anti-glare precautions adopted were satisfactory for normal black-out working, during alerts it was necessary to suspend operations at the ovens. This caused a slight drop in production, but with the virtual cessation of alerts after 1941, production was maintained at peak level for the remainder of the war.

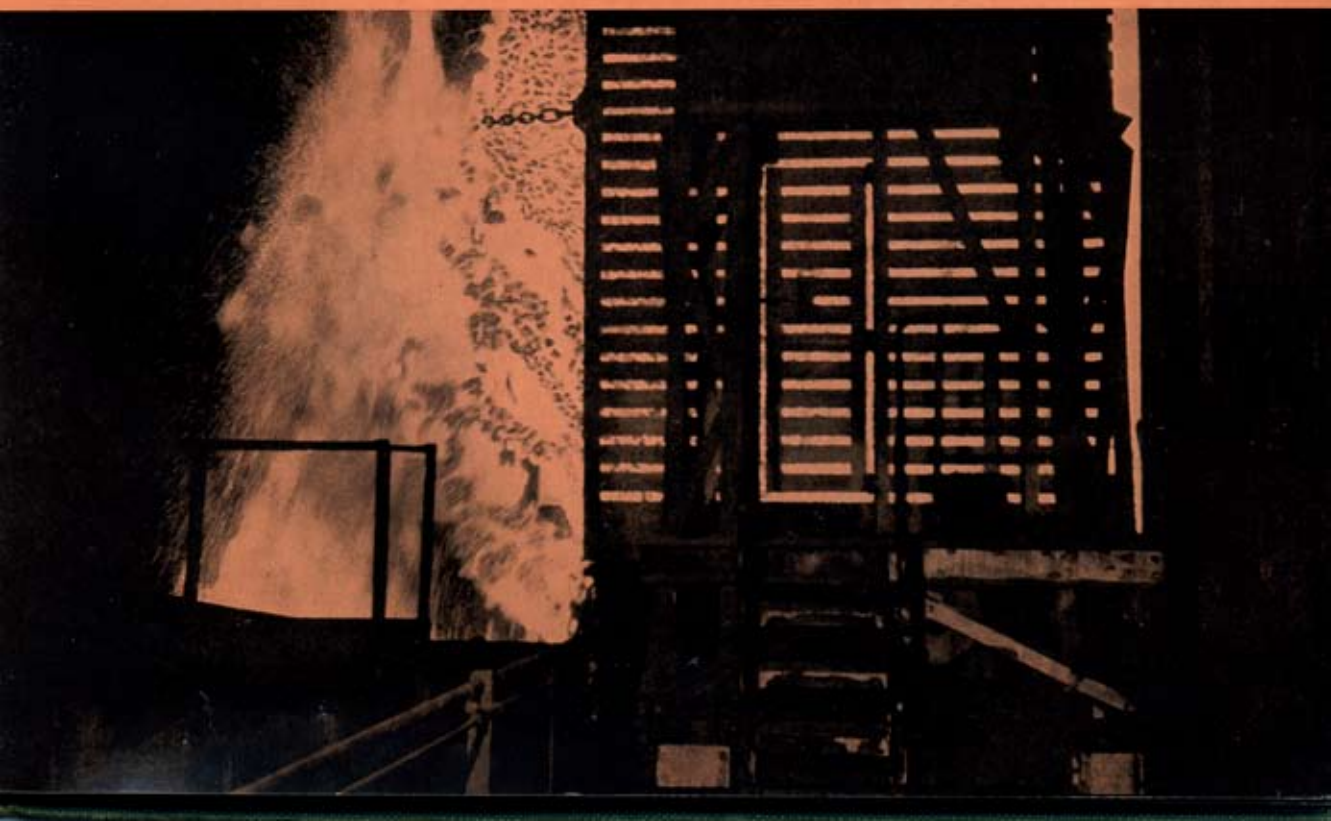
In common with all industrial undertakings during the war, the labour shortage was acute and working conditions were, in many cases, made worse by black-out precautions.

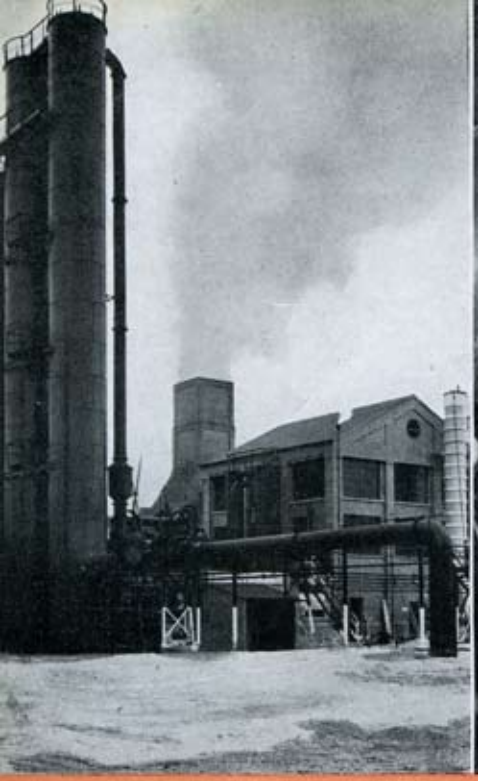
By-products recovered at the Coke Oven Plant included coke-oven gas, crude tar, crude benzole, naphthalene and spent oxide, all of which had important uses in the war effort.

Three neighbouring towns, Nottingham, Derby and Long Eaton, were linked with the Coke Ovens, and the purified gas, amounting to 11,033 million cubic feet, was boosted to these towns where it helped to supply the thermal requirements of the rapidly expanding munitions industry.

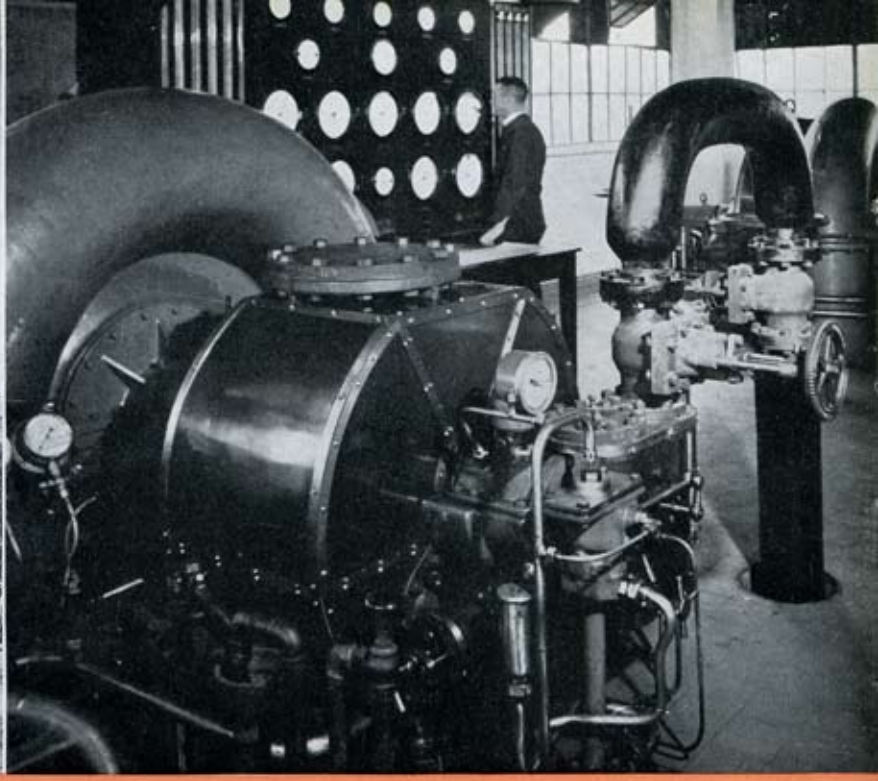
The spent oxide resulting from the gas purification process was sold for the manufacture of sulphuric acid and prussian blue.

DISCHARGING COKE INTO COKE CAR





BENZOLE HOUSE AND SCRUBBERS
QUENCHING TOWER IN BACKGROUND



INTERIOR OF EXHAUSTER HOUSE
SHOWING INSTRUMENT PANEL

Seventy-three thousands tons of crude tar produced were sent to the tar distilling companies who obtained from it such products as benzole, toluene, creosote oil, phenols, naphthalene, pitch and pitch-creosote mixtures, the latter proving valuable indigenous substitutes for imported fuel oil, thereby releasing valuable shipping space.

Crude benzole was refined to produce motor benzole, pure benzole, nitration toluole and crude naphthalene.

Nitration toluole was used for the manufacture of explosives, and pure benzole for chemical purposes. During the latter part of the war large quantities were shipped to the United States of America for the manufacture of cumene, used in the preparation of high octane aviation spirit.

Sulphuric acid, in combination with the ammonia, produced by the carbonization of the coal, produced sulphate of ammonia, 20,000 tons of which were supplied to give soil fertilizers.

This is but a brief review of the importance of the Coke Oven Plant during the war period, not only to the Stanton organization, but also to the iron and steel industry as a whole, and shows how the proper utilization of by-products made a direct and valuable contribution.

BLAST FURNACE. Casting at night.

BLAST FURNACES

THE first effect of the war in 1939 was to increase the demand for pig-iron.

In normal times, production was mainly confined to foundry types of pig-iron and basic pig-iron for steel making was made at the Wellingborough works only prior to the war.

As the war progressed, the demand for basic iron increased ; the steel works in Scotland and South Wales, which had up to then depended to some extent on imported pig-iron, found their supplies cut.

At the urgent demand of the Iron and Steel Control, Stanton now turned over to the manufacture of basic iron for steel making because war industry not only demanded iron, but must have the particular brand for the job.

Manufacture was now undertaken both at Stanton and Holwell, and reached a maximum in 1942 when 371,000 tons were made.

To increase production still further a completely new furnace was erected at Wellingborough to produce a further 100,000 tons per year, and this furnace was blown in during November 1942.

Apart from creating a demand for increased output, the outbreak of war presented the furnaces with a very difficult problem due to the amount of glare caused by their operations. To obscure all this from the air seemed impossible, but it was accomplished and must rank as a major achievement.

The blacking-out of all glare at the furnaces during casting time, when the iron is being run into the pig beds was not possible until permanent black-out sheds could be erected. Arrangements were made to give a prior warning of any expected enemy air action.

A system was evolved by which phone operators and runners operating in conjunction with the time office, communicated the preliminary warning to the shift foreman.

Upon receipt of any warning, all casting and slagging operations were stopped immediately and glare reduced to a minimum. To enable casting operations to be stopped at a few minutes notice, special large mud guns were fitted to the furnaces.

These arrangements continued until May 1940 when owing to increased enemy activity, instructions that no glare was to be emitted during the black-out period were issued. Furnaces were to be tapped before dusk

and then kept on slack blast until daybreak.

During this period the erection of black-out sheds on the furnaces and ore bunkers was being pressed forward. The erection of four pig casting machines—one at each works, equipped with 30-ton hot metal ladles—was proceeded with so that casting could be carried out at night.

In October 1940 the first casting machine was put into operation.

The working conditions for the blast furnacemen during the black-out hours were arduous, and although great attention was given to ventilation, the conditions imposed considerable strain on all concerned.

For the remainder of the war the furnaces were kept on full blast throughout black-out periods and air-raids. The effects of enemy action were negligible, there was no loss of life and no interference with production.

MUD GUN FOR SEALING TAPPING HOLE

18 ft. Spun Iron Pipe Plant and part of Concrete Plant.

THE SPUN IRON PIPE PLANTS

THE three Spun Iron Pipe Plants which, up to the commencement of the war were producing some 1,400,000 pipes per year, representing 3,700 miles, were, in common with other Stanton departments, incorporated in the war effort.

The outbreak of war created an urgent need for the maximum output of munitions, and the 4 in. Spun Plant ceased production in March 1940 and its capacities were devoted to the machining of 500 lb. bombs.

About the same period, a pig bed was laid down and the cupolas in that plant were used for the production of special grades of Dale Refined Iron, an average production of 500-600 tons per week being maintained.

The importance of Dale Iron for high-duty castings was well known. Intended for direct use in the foundry, it provided a blended iron of unvarying quality, valuable in those days when supplies of steel scrap and low phosphorus iron were both short

and uncertain. Its value in the production of castings such as locomotive cylinders, tank track links (more commonly known as caterpillars), hydraulic and other high-duty castings was readily appreciated.

The Nutbrook Plant continued until May 1942 when it was requisitioned as a military store by the Royal Army Ordnance Corps. The pipe stockgrounds were similarly used at various periods throughout the war.

The changing phases of the war necessitated the movement of personnel to vital sections of the war plants, and concentration on meeting urgent war needs was responsible for the transfer of men to meet the requirements of Stanton Gate Foundry. Due to the shortage of man-power, the normal activities of the 18 ft. Spun Plant were gradually curtailed, but as pipes were indispensable both to civilian and military authorities for the conveyance of gas, water, etc., the plant was never shut down. Its output during 1944 was 208,000 pipes representing 560 miles.

GUN BARRELS MACHINED AT SPUN IRON PIPE PLANT

The expansion of the Government's re-armament programme meant a period of intense activity. Production had to be speeded up in the early stages of the war, and contracts were arranged with the Ministry of Supply for the machining of gun barrels. To give the necessary output, arrangements were made to double the size of the existing Boring Shop and plant capacity.

Whilst this work was being carried out, the existing plant was utilized for various machine operations to increase the production of the Royal Ordnance Factory at Nottingham.

During the whole of the war period, practically all the Spun Plant was used for the production of various types of armaments. Machine work was carried out on 1,322 gun barrels of 3.7 inch calibre and 258 of 4.5 inch, whilst for the larger calibre of 5.5 inch, which played a prominent part in the North African and Italian campaigns, 316 gun barrels were handled.

The 3.7 inch gun did excellent work in shooting down enemy aircraft and flying bombs, in addition to driving enemy raiders away from vital targets. It was a delicate piece of mechanism, extremely accurate up to its range of 39,500 feet, and fired a high-explosive shell of 28 lb.

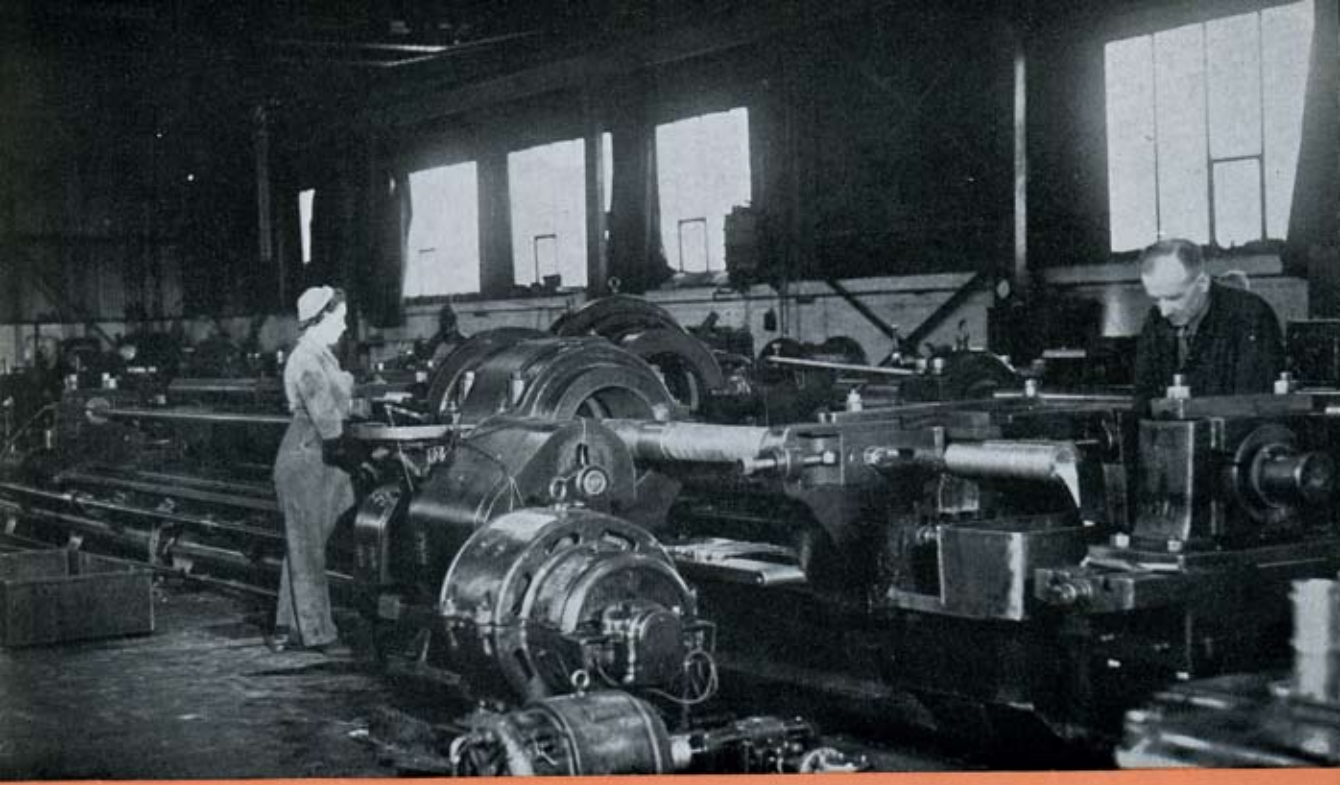
The gun was provided either as a static weapon for fixed anti-aircraft defences or mounted on a platform for use in the field. The 4.5 inch gun is a weapon firing a 54½ lb. shell to a range of 42,240 feet.

Another important feature was the machining of Petard weapons. This was a type of 12 inch mortar used principally against fortifications. The charge thrown has a devastating effect upon reinforced concrete fortifications and was used to a great extent in D-Day operations.

The Petard was a short range weapon mounted on the Churchill tank and called A.V.R.E. (Assault Vehicle Royal Engineers).

The machining of 367 – 3 inch O.S.B., Mark 1 ; 802 – 3 inch 17 pdr., Marks 1 and 2 gun barrels, were some of the activities of the Boring Shop. Incidentally, the 17 pdr. was considered by military circles to be the finest anti-tank gun in the world.

In addition, such vital requirements as 68 – 10 inch solid and cast-iron rocket projectiles, known as "Uncle Toms" for experimental stations, were machined, as well as 2,332 – 18 inch and 1,163 – 21 inch torpedo body forgings, 2,151 – 100 lb. bombs, 10 inch armour-piercing (cast-iron),



GUN BORING

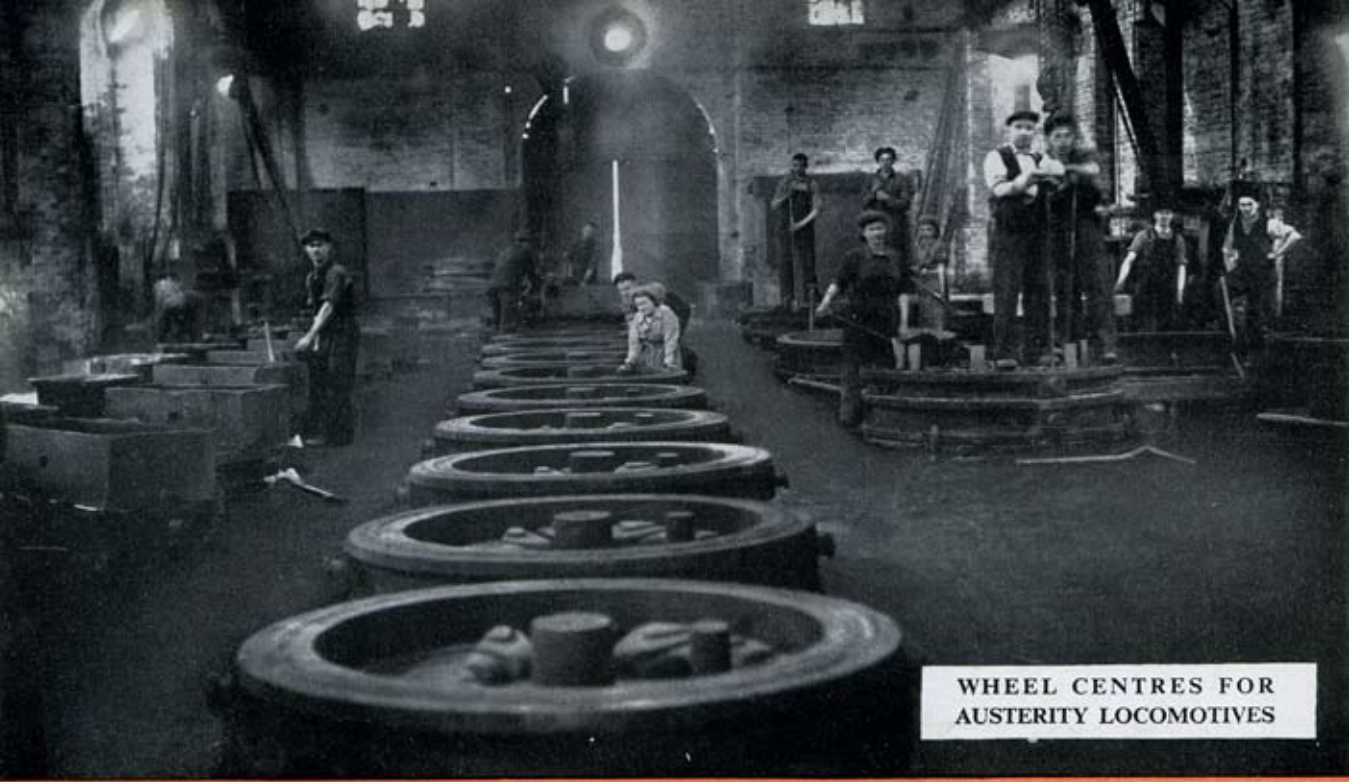
22–10 inch high-explosive armour-piercing shells, and 298–6 pdr. buffer cylinders and compressors.

Amongst the war activities of the Spun Plant was the heat treatment, turning and boring of torpedo tubes for another local company who were handicapped by the shortage of furnaces.

With the assistance received from Stanton they were enabled to increase their output by the 2,376 tubes heat-treated and 3,483 machined.

The total personnel employed on war work numbered 112, of whom 40 were women, and the plant, which had been established in peace, became invaluable in war, coping with the urgent need of the many varied war requirements.

Now, in turning from war to peace, the Spun Plant resumes its place with equal vigour in Stanton's normal activities.



WHEEL CENTRES FOR AUSTERITY LOCOMOTIVES

THE FOUNDRIES

WAR and all its implications is not new to Stanton when it is realized that certain of its foundries have been in existence nearly 150 years.

At our Riddings works situated near Alfreton, there exists to-day a group of buildings bearing the dates 1802, 1817 and 1824, the development of which can be traced to its part in the manufacture of shot and shell for the Crimean War (1854-56), when cast-iron cannon balls up to 6 in. diameter formed part of the munitions of war supporting the British Army at the battles of Alma and Inkerman.

The foundries at Stanton, whilst not so old, can nevertheless trace their history back to 1870 when the manufacture of cast-iron pipes was commenced.

Holwell foundries, situated one and a half miles north of Melton Mowbray, are the youngest of the group, having commenced in 1902. In 1931 and 1937 they were further modernized by the addition of two fully mechanized shops, which today are without equal for the production of pipe specials up to 6 in. diameter.

In common with most foundries, the outbreak of hostilities resulted

in a change from normal production to war-time requirements, and the Stanton foundries were all concentrated to meet this demand.

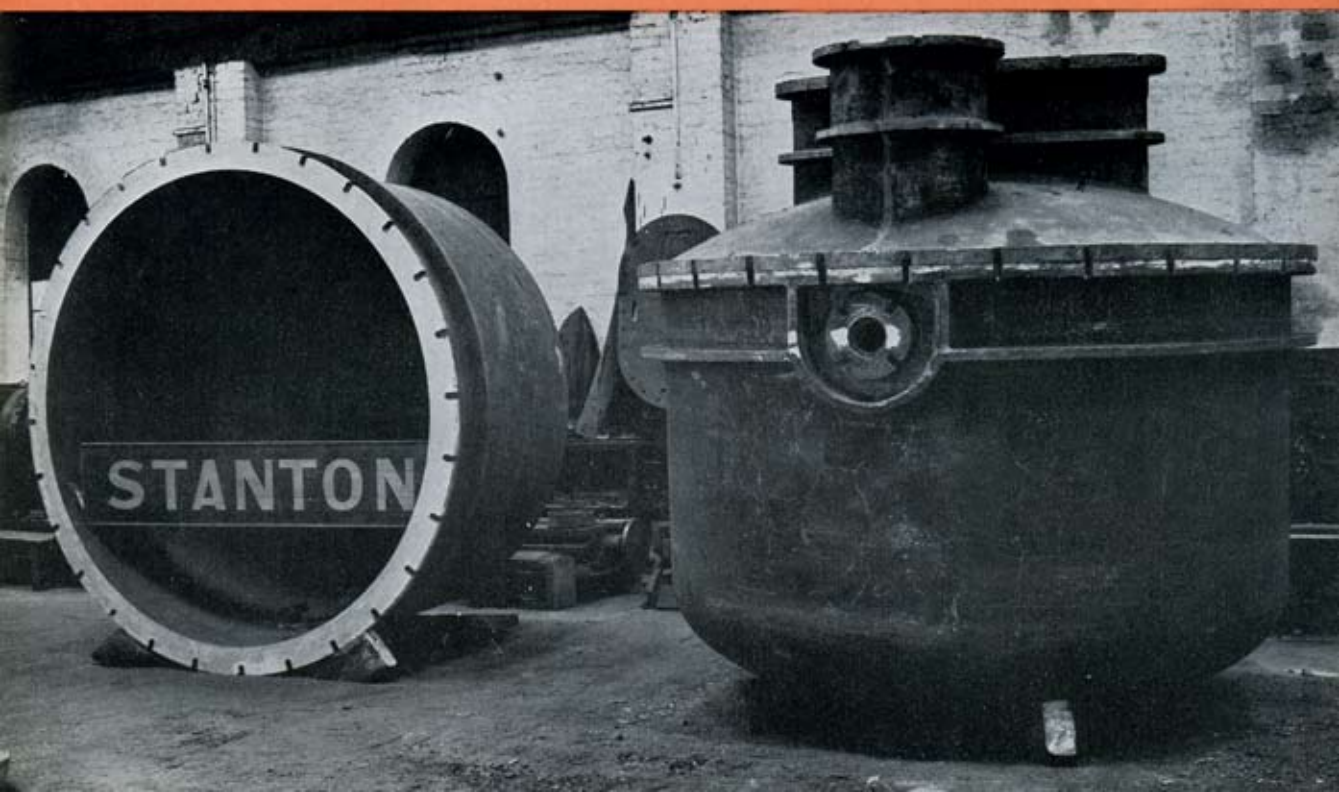
Total war requires total mobilization of industrial resources, and industry must not only arm the fighting forces, but also supply its requirements of fighting men and technicians, thereby depleting its man power.

The call-up left gaps in the production machine, and the recruitment of women for foundry work became necessary.

The variety of work undertaken by the Stanton foundries was remarkable, when it is realized that the staple products in normal times were pipes and pipe specials. The range of products manufactured for essential war purposes fell under the main headings of castings for the Admiralty, Army, Air Force, Ministry of Agriculture, Railway Engineering, Chemical Engineering and Steel Works Plant.

One of the first jobs to be undertaken by the foundries was the manufacture of stills used by the Royal Ordnance Factories in the manufacture of sulphuric acid. Production was split between

STILLS USED IN THE MANUFACTURE OF SULPHURIC ACID



CASTING AN ACID STILL

Stanton and Riddings, and by the end of hostilities upwards of 200 were despatched to factories situated in various parts of England, Scotland and Wales, and as far away as Australia. These castings measuring over 9 feet inside diameter by 9 feet deep, and weighing 11 tons complete with cover, were cast in a mixture containing 90 per cent of Stanton Dale Refined Iron.

About the end of 1941 there was an urgent call for large numbers of cast-iron cylinders and castings which looked like two-bladed propellers, which we subsequently learned were utilized in the construction of piers for the landing of troops, stores and war materials at Stranraer on the west coast of Scotland. Here again production was split between Stanton and Riddings, both of whom had considerable experience in the manufacture of large diameter vertically cast pipes.

When our armies in North Africa were in difficulties owing to the lack of tanks and tank parts, the Stanton, Riddings and Holwell foundries were all called upon to take a vital part in the supply of annealing cans used in the manufacture of malleable cast-iron tank

track links. These annealing cans had to withstand a temperature of 1,200 degrees centigrade during the annealing of track links and so had to be cast in a white alloyed cast-iron, a material which had not been previously handled in our foundries. Soon all three were producing amongst them 3,000 castings per week.

Stanton and Riddings were both actively engaged in the manufacture of brake drums for such famous fighting vehicles as the Churchill and Crusader tanks; also Lloyd Personnel Carriers. The moulds for these drums were made in oil sand by female labour, a technique new to our foundries, and one which achieved considerable success.

A third tank component made at Stanton and Riddings was the rota trailer wheel centre. These castings formed the hubs on tank trailer wheels around which were constructed hollow dished wheels, the space so formed around the hub being utilized as a container in which extra petrol was stored for the tank.

Another product worthy of mention was the wheel centre for the austerity locomotive, manufacture of which was undertaken at the request of the Ministry of War Transport, at a period when steel castings normally used for wheels were practically unobtainable, thus averting what might have proved a serious bottle-neck in the output of locomotives.

Cast-iron for locomotive wheel centres is not new to locomotive engineers, but prior to the war its use had been restricted to slow-moving light engines mainly engaged in shunting operations. The confidence in the cast-iron wheel has proved to have been fully justified in the knowledge that some 7,000 wheels have been supplied and fitted to austerity type locomotives. The whole process of manufacture of these wheels was conducted under close metallurgical control, an important feature of which was a 36-hour period in the soaking pits after shaking out to ensure thorough normalizing and relief of casting stresses.

Following on the success of the austerity locomotive wheels, further orders were received for some 2,000 main line wagon wheel centres, 1,500 austerity shunting loco wheel centres, and 200 wheels with chilled treads for Diesel locomotives.

In addition to the manufacture of wheels, very large quantities of chairs, axle boxes and brake blocks were, and are still, being supplied for the main line railways of this country.

On our continuous casting plant at Holwell, 50 per cent of the

output was, for a considerable time, devoted to railway chairs and axle boxes, the production figures being 7,000 chairs and 1,500 axle boxes per week. On occasions brake blocks took the place of axle boxes when the figures were 7,000 chairs and 5,500 brake blocks per week.

Although Stanton products were in the main utilized for schemes on land, our war activities included many interesting projects for naval purposes.

Towards the end of 1943 orders were received for considerable quantities of 18-inch flange and spigot pipes, 5 feet long, and as they were ordered to the code name "Phoenix" there was considerable speculation amongst our workpeople as to their ultimate use.

They had to be ready by a certain date to suit the tides, otherwise the operation for which they were intended could not proceed.

Efforts in Stanton, Riddings and Holwell foundries were speeded up, and army lorries stood by night and day until the contract was completed, well within the specified time.

HOLWELL CONTINUOUS CASTING PLANT

SAND-SLINGER MACHINE

Soon after D-Day reports and pictures began to appear in the newspapers, and the news of that stupendous operation known as "Mulberry" was made known to the world at large.

It was only then that Stanton learned that these apparently innocent castings were fitted as fairleads to the decks of "Mulberry," the code name for the prefabricated port at Arromanches, Normandy, one of the most imaginative pieces of war engineering in history.

A few days after D-Day another operation was begun, which, when it became known, not only impressed the British public, but surprised them and the whole world.

"Operation Pluto" (Pipe Line Under The Ocean) was a wholly British achievement, and in the words of Mr. Churchill, "a feat of amphibious engineering skill of which one may well be proud."

It is common knowledge that Stewarts and Lloyds were the main contractors of one of the pipelines (Hamel Pipe), but it may not be generally known that the Stanton Foundry played its part

in providing certain castings which formed part of the channels adjacent to the storage racks for handling the 4,000 feet lengths of 3-inch inside diameter pipe which were wound on to huge drums and eventually laid on the bed of the sea. These castings, 175 of which were made at the New Works Foundry, were generally referred to as "Jacob's Ladders" by the workers in the foundry.

As soon as the first casting was produced and checked, manufacture was carried on night and day until completion of the contract, the castings being despatched direct to the factory at Tilbury Docks, London.

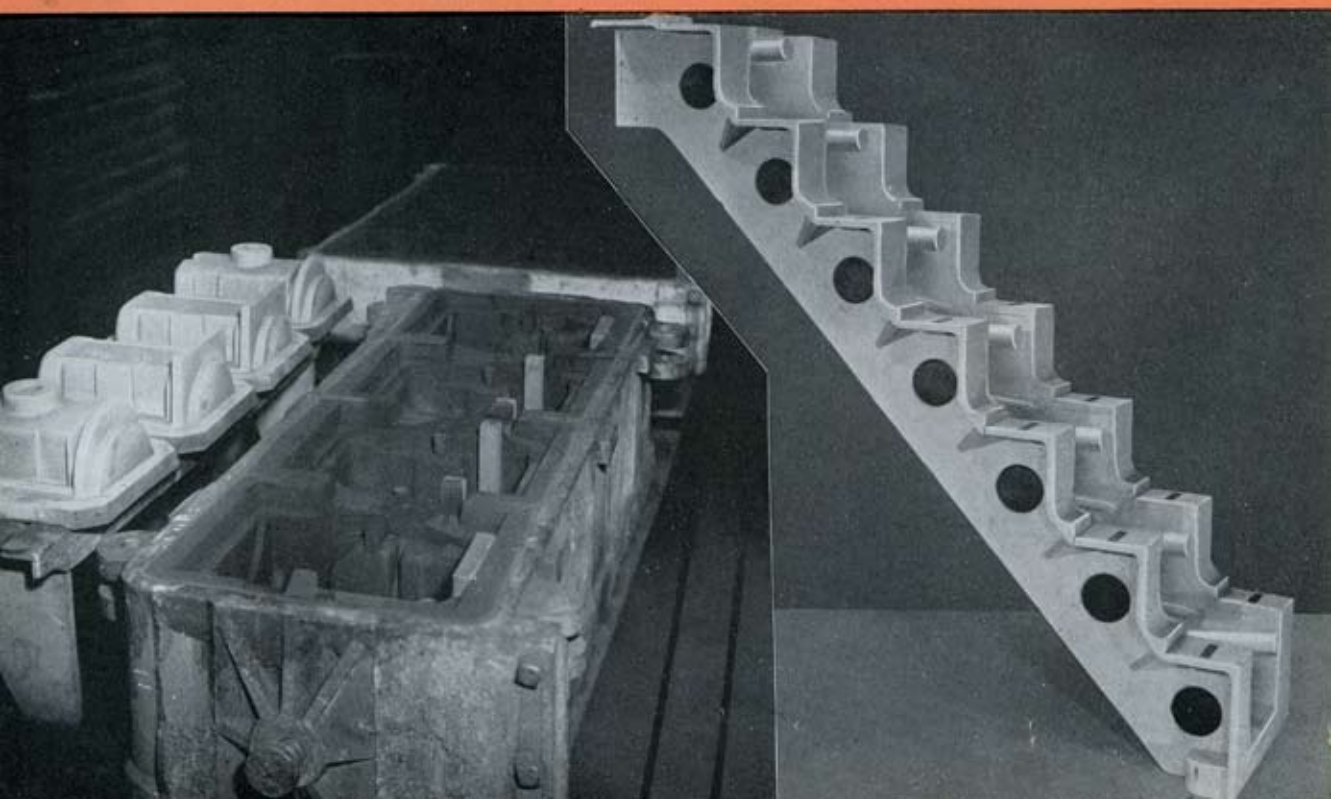
Other castings for naval purposes, but perhaps less spectacular, were the seven corvette engine bedplates made at Riddings, each weighing approximately 19 tons.

The war created an enormous expansion in the demand for dockside cranes to load and unload supplies at the various ports at home and on the Continent, following our invasion.

Nearly 4,000 balance weights for use on Diesel electric dockside cranes were supplied by Riddings, many of which eventually went to

AXLE BOXES

PLUTO "JACOB'S LADDERS"



STORAGE RACKS FOR HANDLING THE 4,000 FT. LENGTHS OF 3 IN. PIPE FOR "PLUTO"

the Far East. A final order from the Admiralty was for the supply by Holwell of 2,600 flywheels for installation in submarines.

The Ministry of Aircraft Production also made calls on the services of our foundries. Stanton Foundry cast upwards of 2,000—1,600 lb. practice bombs for the training of bomber crews. Some 11,000—250 lb. bombs were also produced at the New Works Foundry for similar uses.

Stanton shared in another great project, this time "Operation Fido." This method of fog dispersal from aerodromes entailed a series of pipes laid in trenches around the landing areas through which petrol vapour was pumped and ignited. The terrific heat generated dispersed the fog enabling planes to touch down safely. Stanton New Works Foundry produced 6,000 cast-iron supports which encased the vapour-carrying pipes.

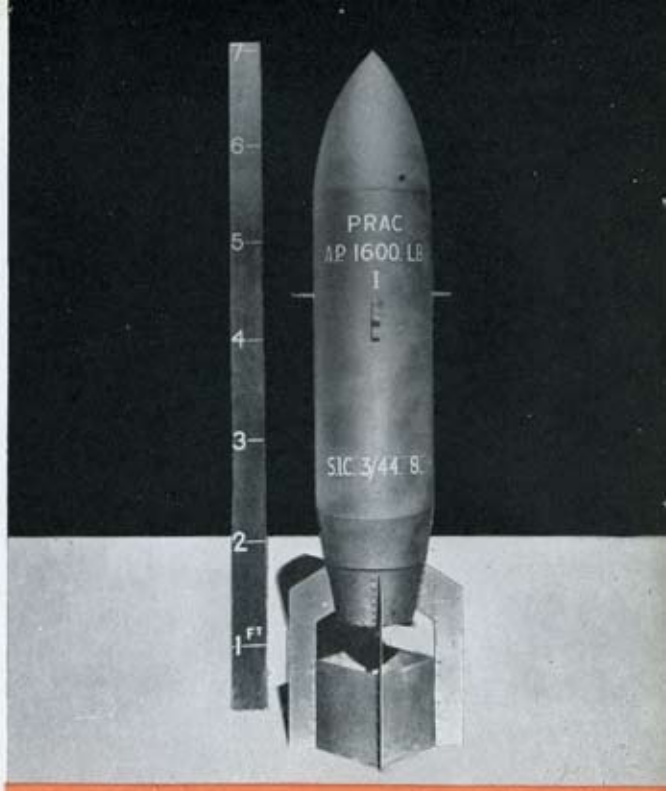
It was clear that a determined effort would be required to build up potato stocks to carry us through the winter of 1943-44,

and Stanton were asked to help in the manufacture of castings for potato diggers.

Their contribution was close on 19,000 wheels for these machines, 18,000 being made at the New Works Foundry and 1,000 at Riddings.

Demands for the maximum output of home-grown food were responsible at this time for the intensive development of British agriculture, and Holwell played an important part in this drive by the production of over 100,000 ploughshares.

It is interesting to learn that these ploughshares were produced on the Continuous Castings Plant, side by side with trench mortar bombs, and at the same rate of production.



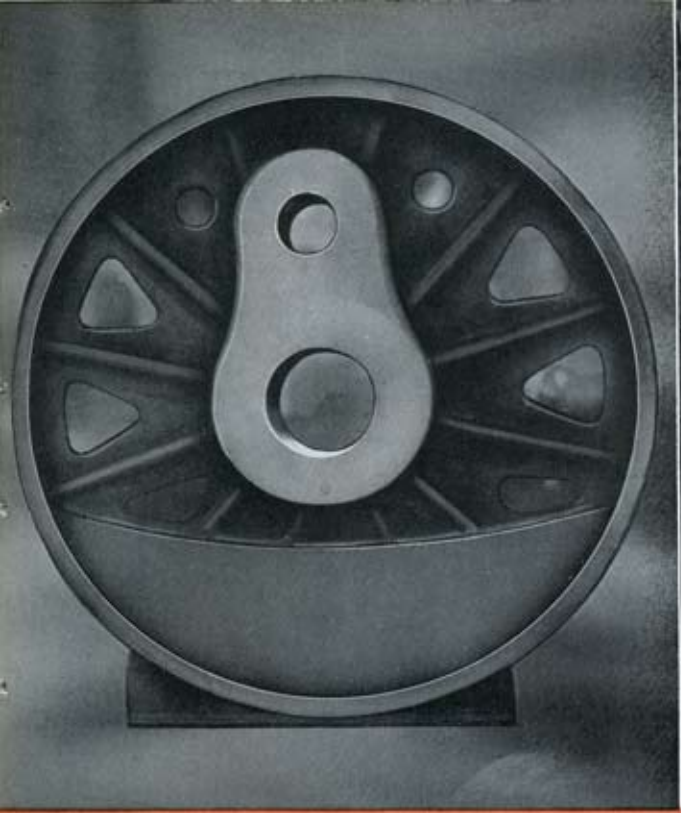
1,600 LB. PRACTICE BOMB

Regarding Stanton's efforts in the production of projectiles, an outstanding success was the production of some one and a half million 3 in. and 4.2 in. trench mortar bombs. These castings, like railway chairs, axle boxes, brake blocks and plough shares, were produced on the mechanized plant at Holwell, at the phenomenal rate of 8,000 per week.

The specification for trench mortar bombs called for castings to very close limits for dimensions, weight, internal capacity, solidity and strength, and every casting was subjected to 13 different inspections in the course of its progress after casting.

Many thousands of practice shot were also supplied for the training of our tank crews and anti-tank and field artillery gunners. They were produced solid in the following sizes: 6 pdr., 12 pdr., 25 pdr., and 6 inch at all three of our foundries.

Holwell also contributed to the manufacture of special armour-piercing steel for shells by supplying some 200 tons per week of



WHEEL CASTING FOR AUSTERITY LOCOMOTIVE

PATTERNS FOR RAILWAY CHAIRS AND TRENCH MORTAR BOMBS

ingot moulds for this special steel to Stewarts and Lloyds at Corby, Bilston and Glasgow.

The war-time specification for high duty castings and special castings for war purposes, e.g., loco wheels, brake drums, caustic pots and acid stills created a special demand for refined cylinder and malleable iron. Hostilities had cut off the bulk of the supplies of important hematite ores used in the production of low phosphorus iron, and Stanton Dale Refined Iron supplied that want.

Produced under rigid metallurgical control, this iron is of close grain and uniform structure.

Its low carbon and phosphorus content gave the high tensile strengths essential in high quality casting.

Stanton were the largest makers of this refined iron and produced a large proportion of the country's requirements.

Cupolas at the sand and spun foundries each contributed their share of this tremendous output and so helped to play their part in the vital struggle for munitions of war.

CONCRETE PLANT

THE conversion of an industry from peace to war constitutes a major problem in organization, and the main impression gained when the visitor entered the Concrete Plant was the rapidity with which the switch-over had been accomplished after hostilities commenced.

The shop producing spun concrete lighting columns ceased production and turned over to concrete air-raid shelters, of which subsequently 100,000 tons were manufactured, principally for the Air Ministry.

Reinforced concrete proved an ideal material for the construction of air-raid shelters, being strong and resistant to shock, with no deterioration with the passing of time.

We became accustomed during the war years, to seeing shelters of many kinds. Here the segment shelter was manufactured. This was of simple design and low cost. Any length of shelter could be built up from the pre-cast steel reinforced concrete segments.

The segments were 20 inches wide, a pair of them formed an

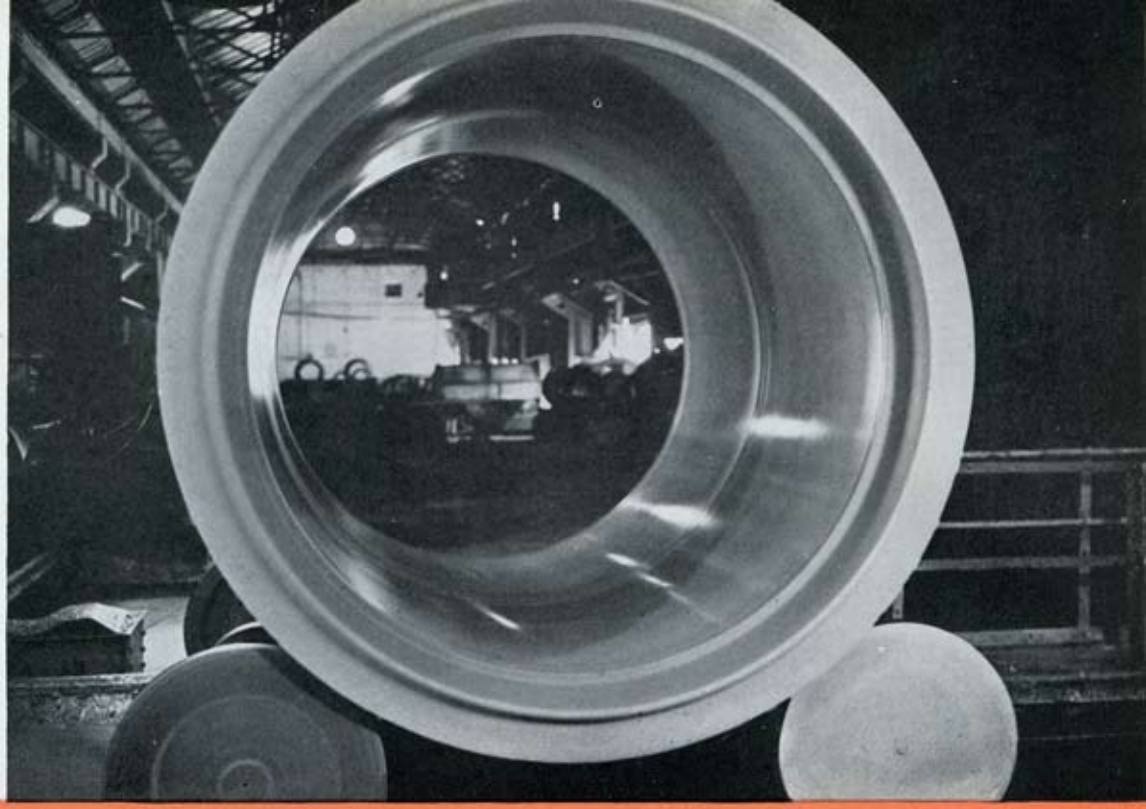
BIRD'S EYE VIEW OF THE CONCRETE PLANT STOCK YARDS

arch 7 feet high, and transverse struts were provided to ensure rigidity. These fitted into longitudinal bearers, which were grooved to receive the foot of each segment. Each pair of segments were bolted together at the apex of the arch and each segment was also bolted to its neighbour, the joints being sealed with a bituminous compound.

The convenient handling of these segments enabled them to be transported on to sites, where close access by motor lorry was not possible. Partly buried in the ground and with a suitably screened entrance, this bolted arch shelter afforded safe protection against blast and splinters.

In those months before the war when air-raid precautions became a feature of our everyday life, there was a constant demand for a shelter which met the requirements of the Civil Defence Act, and employers of labour had for some time encountered practical difficulties.

Stanton spun concrete pipes of 90 in. diameter were manufactured



SPINNING 72" CONCRETE PIPE

reinforced with a framework of closely-spaced steel rods of 40 tons tensile strength. Here was a tubular shelter, designed to overcome those difficulties. By placing a number of tubes end to end, a shelter of any desired length was constructed. Precast concrete end slabs were fixed in position at each end and all joints sealed with a jointing compound.

Spun concrete is completely impervious to moisture, and this type of shelter proved very suitable for installation in water-logged ground, the water level in many cases being 30 inches higher than the bottom of the shelter. The same type was also driven 32 feet into the base of a disused slag heap, erected beneath an existing concrete floor and buried beneath large coal heaps in gasworks yards.

In the construction of Stanton air-raid shelters, 1,000 tons of concrete per week were used; they were turned out at the rate of one complete shelter (consisting of over 60 parts) every working hour.

On the termination of the air-raid shelter contracts, the Lighting Column Shop turned over to the manufacture of concrete practice rocket bombs, 25 lb. and 60 lb., of which over half a million were completed for the Ministry of Supply. At the peak period, an average of 3,000—25 lb. and 7,000—60 lb. practice rocket bombs were made each week. Each one was subject to a rigid inspection and weight test before being passed out.

The beginning of 1942 saw the manufacture of experimental torpedoes for use on aircraft. The greatest concern was the necessity to secure absolutely correct weight and centre of gravity. They had to be made to fine limits with regard to weight and dimensions, such tolerance not usually being associated with work in concrete.

Concrete slabs are made on a special paving slab-making machine in accordance with British Standard Specification, and subjected during manufacture to a hydraulic pressure of 500 tons.

EXPERIMENTAL TORPEDO

CONCRETE RAILWAY SLEEPERS

This is universally acknowledged to be the best process of manufacture for this class of product, ensuring great density and strength.

These slabs were manufactured in considerable numbers and were made use of in connection with the Ministry of Works huts.

In a building known as the Specials Shop, work proceeded at an astonishing rate on frames for huts, known as the Ministry of Works Huts.

The influx of American troops into this country, and the never-ending stream of prisoners of war, provided a big problem for the authorities in the matter of accommodation. The M.O.W.P. hut fulfilled this urgent need by providing a quick method of erection, and owing to the timber problem, the concrete alternative was quickly appreciated.

The framework consisted of vertical posts and roof members, and on completion the huts erected for this purpose measured 60 feet in length and accommodated on an average 50 men.

British agriculture's task in this war, as in the previous one, was clear. Our increased needs drove home to us the urgent necessity of producing as much food as possible, as quickly as possible. Farming in consequence became of prime importance, and with it the erection of farm buildings.

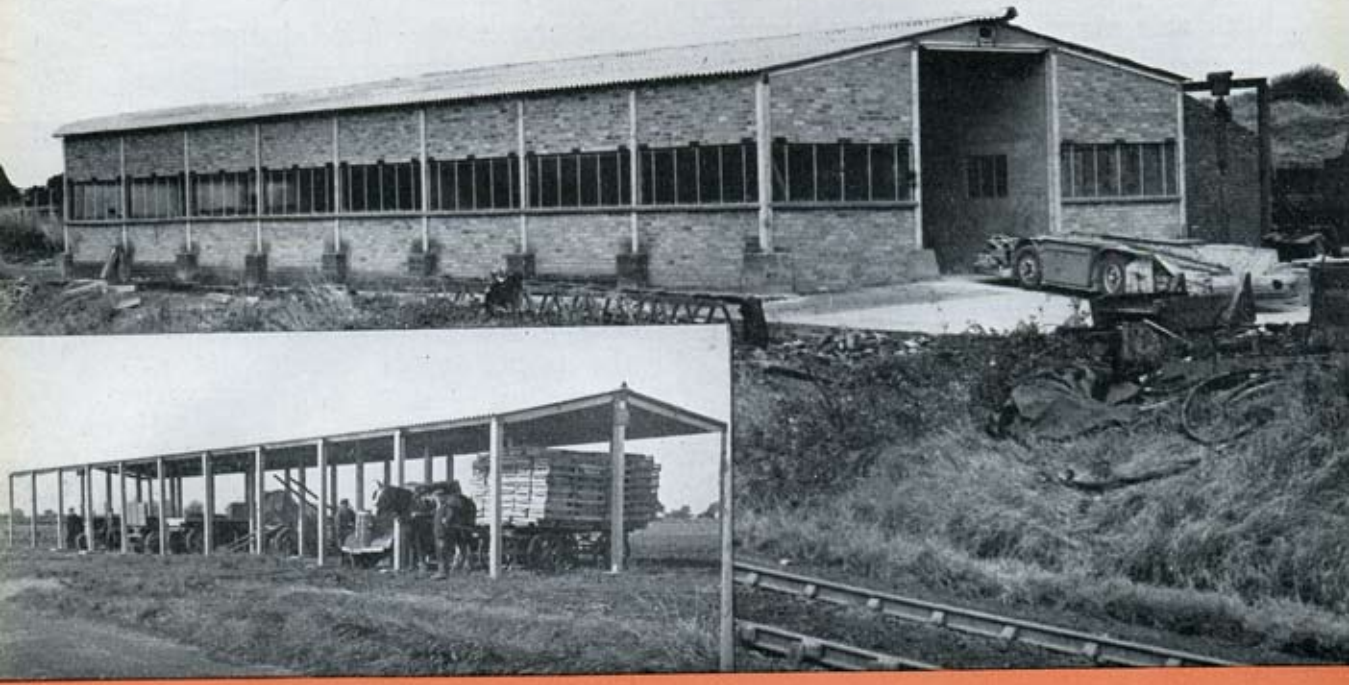
In the same shop one saw sections of general purpose sheds ready for despatch. These sheds were in use in all parts of the country as dairies, cow houses, cart sheds, granaries, etc. Adaptable to any plan, they could be erected without special gear.

The Ministry of Agriculture, owing to the shortage of feeding stuffs, induced farmers to adopt silage for feeding their livestock during the winter, and silos became a war-time feature.

In this connection the Plant designed a circular silo on the post and panel principle, employing the use of pressed paving slabs. This design was adopted, and thousands of silos were put into use throughout the country.

In the Concrete Pipe Moulding Shop two concrete pipe machines were taken out and machinery substituted for the manufacture of concrete railway sleepers. One million of these were manufactured at the Plant during the war and are in use either in war factories or on main and secondary line railways in this country.

These sleepers have proved satisfactory as a substitute for wooden sleepers which were unprocurable, and there is no doubt that had concrete not been available for the purposes of laying new railway tracks and maintaining old ones, the question of the laying down of new factories and



GENERAL PURPOSE SHEDS

the transport of war materials would have been an almost impossible proposition.

Special vibrating machinery was used in their manufacture, and the concrete was made in such a way as to ensure perfect freedom from voids and giving a hard, smooth finish.

The special reinforcements for sleepers were manufactured in the Reinforcement Assembly Shop, women being engaged on this work, electrically welding the reinforcements which were made of high tensile British steel, the necessary amount of reinforcement being determined by calculations from the required tests.

These women also took over the Bending and Welding Shop, where they proved invaluable in various capacities, and to see them at work one was impressed by the speed and sureness with which they accomplished the change-over.

The women did a grand job of work on the Plant, especially in connection with the reinforcements, and there is no doubt that

this plant could not have carried out the immense amount of work required by the Government without their full co-operation.

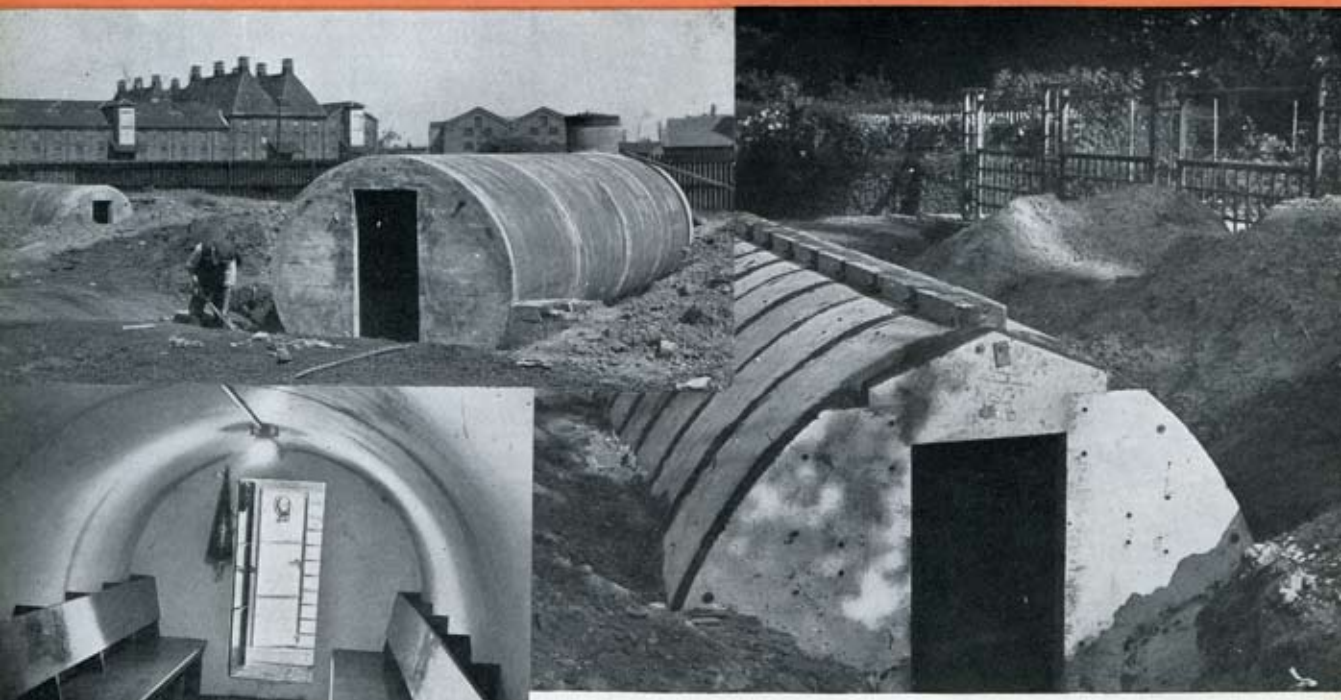
Spun concrete pipes are the foremost and chief products manufactured by the Concrete Plant. The year 1921 saw the commencement of the manufacture of concrete tubes by the centrifugal process, producing a dense and non-porous concrete of great strength and durability.

When the full weight of the Nazi blitz descended on this country in the late summer of 1940, a system was developed by which concrete mains could be repaired quickly and effectively. This was accomplished by the use of a concrete collar, and the damaged section of the concrete pipe being replaced by a double spigot piece which incorporated the principles of the "Stanton-Cornelius Joint."

As with most industries during the war period, the calling-up of young men for Military Service caused tremendous labour diffi-

A TUBULAR SHELTER COMPLETED AND IN POSITION

SEGMENT SHELTER FITTED TOGETHER AND IN POSITION READY FOR COVERING



INTERIOR OF TUBULAR SHELTER

culties—more than 200 were taken from the Concrete Plant.

Their places were filled by older men as well as women, and at the conclusion of hostilities approximately 150 women were engaged on such jobs as turners, tractor drivers, crane drivers, welders, inspectors, etc., a remarkable feature when one recognizes the fact that until the war commenced not a single woman had been engaged on the Plant.

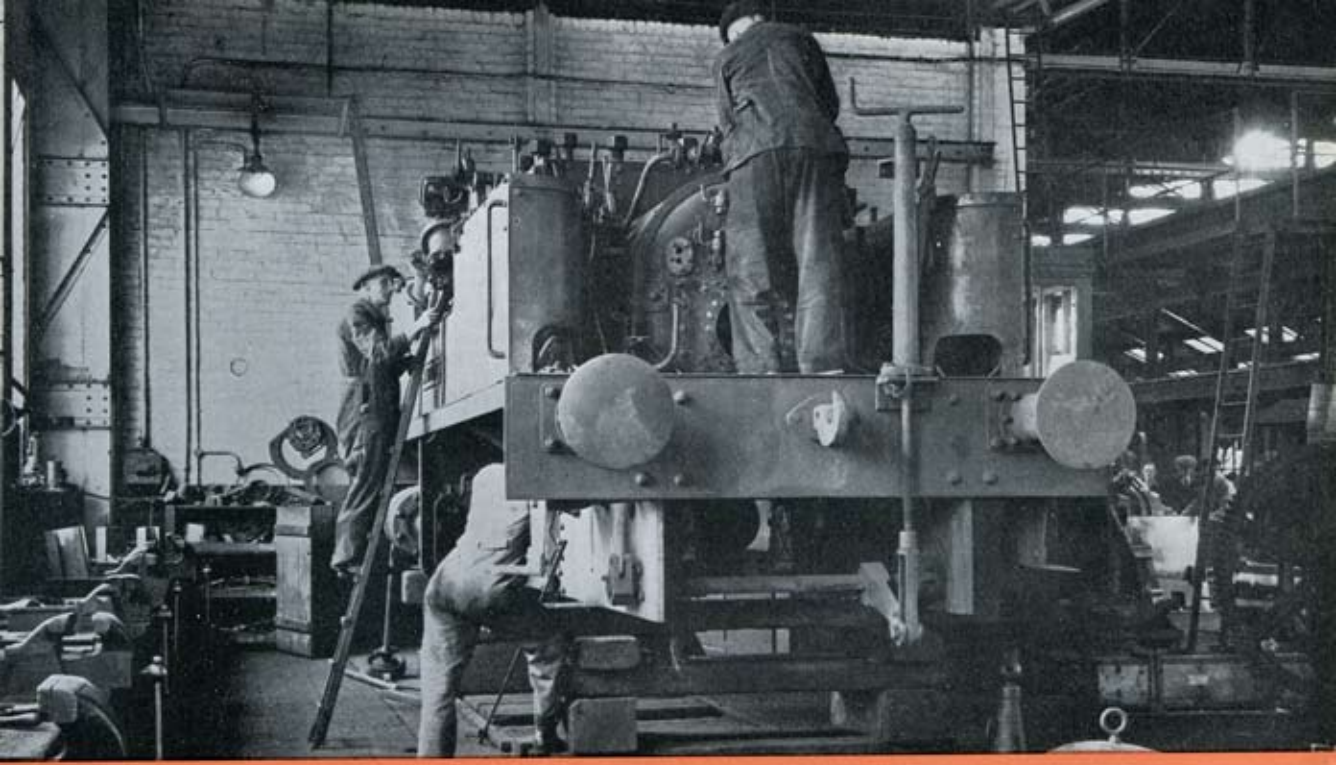
A special tribute is due to them for successfully undertaking a type of work that had not been considered suitable to their sex.

Now, with a job well done, the Concrete Plant has once more resumed its place in Stanton's peace-time activities.

BENDING STEEL RODS BY MACHINERY

VIEW OF WELDING SHOP

WELDING FRAMES FOR CONCRETE SLEEPERS



ENGINEERING

IN reviewing the various aspects of Stanton's achievements in war production, the Engineering Department's activities must not be overlooked, more especially the portion contributed to the Stanton Gate Foundry.

In connection with the construction of this foundry for the Ministry of Supply, the Engineering Department carried out much important work relating to layout design, involving the development of many special purpose machines and handling facilities incidental to a mass production foundry.

In the early days of the war, the Department's efforts were concentrated on six hydraulic forging presses for 3.7 in. shells.

At this time the British public's interest in ammunition was centred on anti-aircraft shells. The 3 in. high explosive shell had been evolved as the result of the experience gained during the First European War, and on the outbreak of war in 1939 was being produced on a large scale.

It is worthy of mention that this shell contributed most to the success of the gunners during the extensive attacks on London in 1941, and did excellent work in shooting down the flying bombs which were launched against this country in 1944-45.

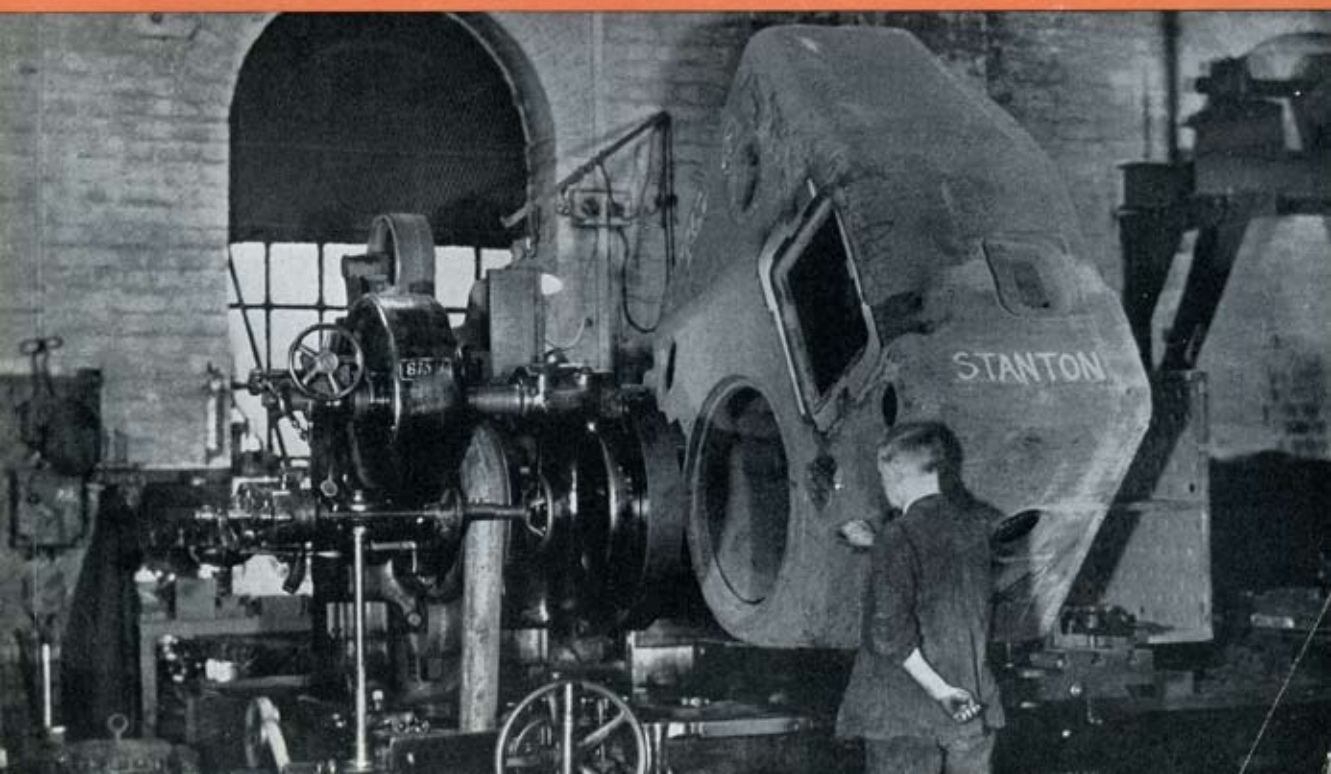
It was very soon realized that the range of this projectile was not sufficient to reach planes flying at the height that was most probable, consequently the 3.7 in. shell came into being.

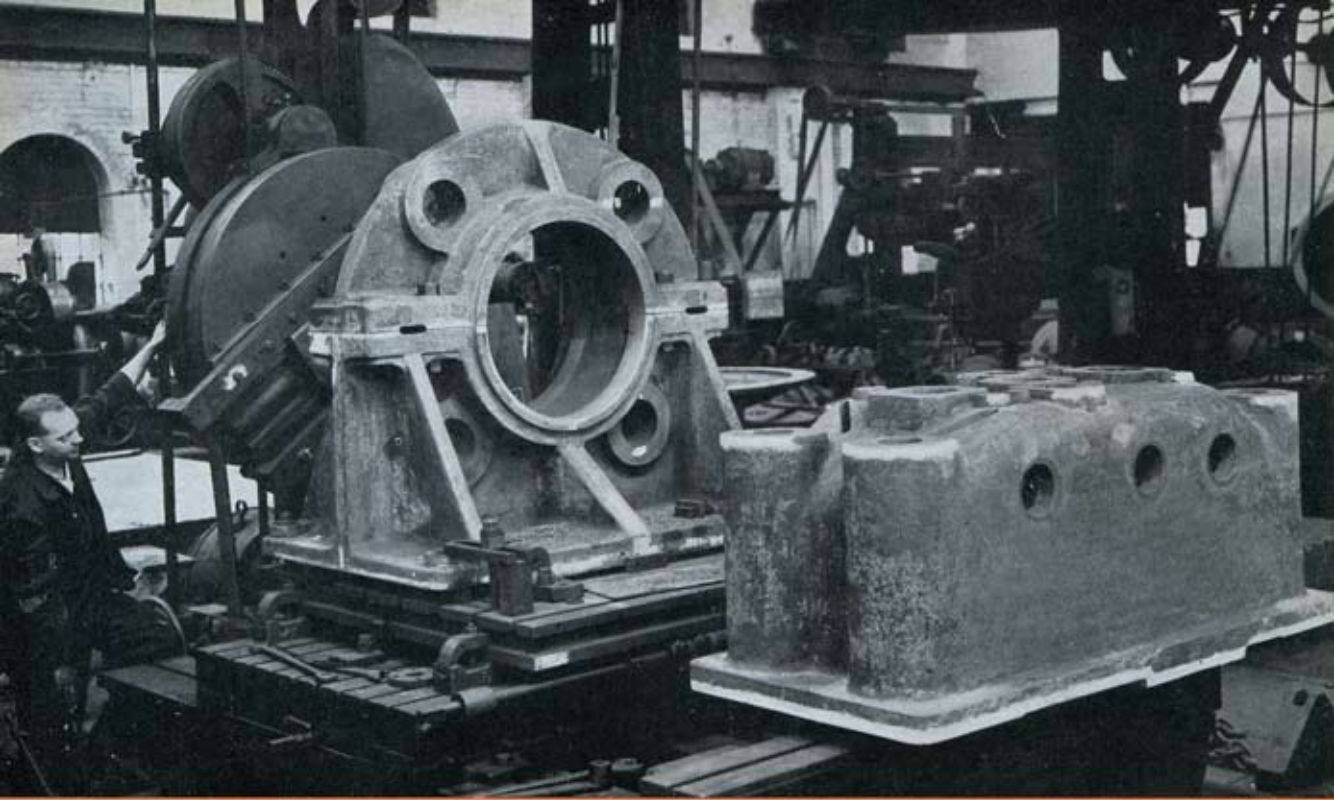
At a later period, for shipment to our Russian allies, two more forging presses for the production of 6 in. shells were completed.

For bomb production at Stanton Gate Foundry, 16 electric grinding machines were made for dressing the inside of 500 lb. bombs, four complete core-making machines and approximately 10 under-cranes for handling core and moulding boxes.

For the 20 mm. Hispano Suiza cannon, which was becoming of increasing importance in aircraft armament, we machined 108 gun

MACHINING CHURCHILL TANK TURRET





MACHINING LARGE CASTING

turrets ; 211 Churchill tank turrets, and for the Royal Air Force 225—16 lb. practice bombs and 700 gear-change wheels for machine tools for the Ministry of Supply.

Altogether more than 50,000 steel castings, ranging in size from 4.5 in. gun barrels down to nose bushes for 6 in. shells, were machined by this department.

The 17-pounder gun is considered by many in authority to be the finest anti-tank gun in the world, and the shop claims a part in its production in partly machining 1,350 gun slides.

It was developed to meet the German Tiger tank, information of the building of which had reached the British Intelligence Service, and it was a remarkable coincidence that both the 17-pounder and the Tiger went into action in Tunisia within a few days of each other.

The preparation for "D-Day" in 1944 necessitated orders being executed at short notice, and 1,500 ventilating ducts for tanks were

another contribution, besides 1,000 steel axles for tanks, which were understood to have actually been taken by air to the Western Desert.

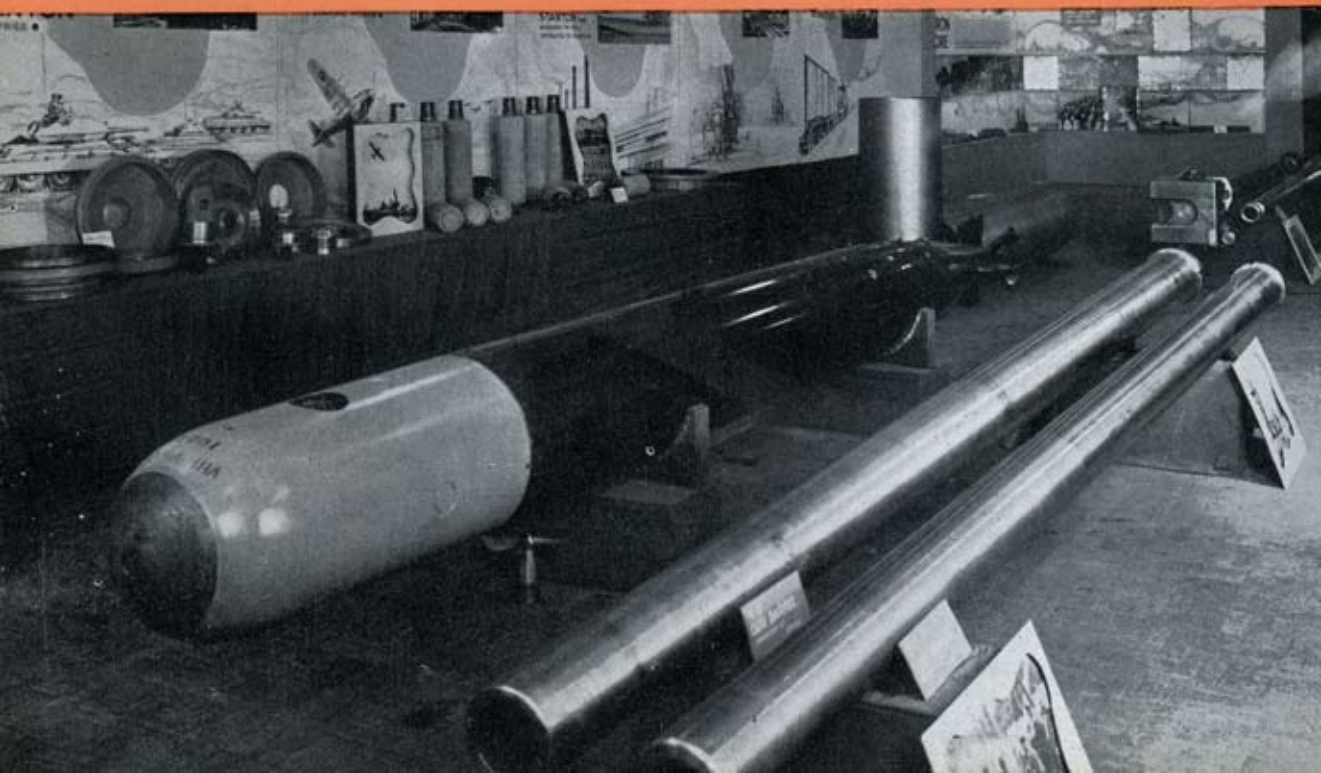
Following the Normandy landings, our tanks, in their efforts to break through the enemy's defences, encountered extensive minefields. Paths for the infantry had to be cleared, and flail tanks had been developed during the North African and Italian campaigns between 1942 and 1944.

The annealing of approximately 1,600 lengths of chain for the flails was undertaken by the Engineering Department.

Throughout the war, the normal engineering work incidental to the running of the Stanton Ironworks proceeded, and jobs such as the rebuilding of steam locomotives and cranes were all part of the day's work.

The blast furnaces, coke ovens, foundries and concrete plant required more, rather than less, attention during the war owing to the general lack of replacements for machinery.

CORNER OF STANTON-AT-WAR EXHIBITION SHOWING A.A. GUN BARRELS AND TORPEDOES MACHINED AT STANTON



TRANSPORT

THE Transport Department at Stanton is a closely integrated section of the Company. It is responsible for the transit of all raw materials for the blast furnaces and foundries at the various works, and for the distribution of the Company's products at home and abroad. The main office at Stanton is in hourly and daily touch with the ironstone and limestone quarries, collieries and coke ovens, from which the raw materials are drawn, and also with the railway operating staffs and wagon controls in various parts of the country.

On the outbreak of war, the Minister of Transport took control of the main line railway companies and of all privately-owned railway wagons which were requisitioned and operated in the general pool of railway rolling stock.

Prior to the war, the various Stanton works were fully equipped for their own requirements, and the 5,500 wagons which were requisitioned by the Minister con-

stituted an important contribution by the Company to the general war effort.

Throughout the war, transport was a feature of vital importance, and at times, when operating under black-out and severe weather conditions, considerable difficulties were experienced in maintaining the even flow of traffic in and out of the works (some 14,900 wagons per week) without endangering the continuous process of production.

Other factors which contributed to the difficulties were the effects of enemy action and the unprecedented volume of Government traffics, which imposed tremendous strains upon the railway efficiency. Nevertheless, during the whole of the war, only the most minor and infrequent interruptions were suffered.

On the side of road transport the Company was fortunate in possessing a large up-to-date fleet of heavy vehicles operated under a "C" licence, and even during the time of the Government Road Haulage Organization, when the operational limit was restricted to 60 miles radius, a special dispensation was granted to the Stanton vehicles. The Company was thus enabled to fulfil its delivery commitments on essential orders, and many thousands of tons of its products were delivered by Stanton vehicles to aerodromes, ordnance factories and other priority sites in all parts of the country.

The greatest use was also made of our inland waterways system, as the Company already possessed a number of narrow canal boats. The principal way in which these were employed was in the transport of bomb cases from Stanton Gate Foundry to the various filling factories, and many thousands of bombs were carried in this way. For the return journeys the boats were loaded back to the Nottingham area with foodstuffs and other vital supplies.

AIR RAID PRECAUTIONS

THE Stanton Works cover an area of approximately 400 acres, and the task of providing an effective air-raid precaution scheme for the thousands of employees was one of prime importance.

In the early part of 1939, a comprehensive scheme and a system for the treatment of casualties was developed.

In addition to shelters constructed for the personnel, additional gas-proof shelters were built for the use of key men who were required to remain at their posts during a raid. They were built of 90 inch diameter tubes of reinforced concrete. Vital structures such as the power house and boilers were protected by sandbags and steel plates.

A preliminary warning to stand by was sent to the control centre by the authorities as soon as enemy planes were reported heading for these islands. Should they be located heading for the direction of Stanton, a ''red'' warning would be received and the siren sounded. This siren was originally erected on top of the coal bin of the coke ovens, but was moved

later to a more central position on the Old Works.

The risks of serious fire were not considered great on a works like Stanton, nevertheless, the damage by an attack of incendiary bombs had to be taken into account in a complete A.R.P. scheme. As things turned out, the works were indeed fortunate, for during the full period of the war, only six incendiaries and one high-explosive fell in the works' area.

The Stanton Fire Brigade numbered 13 and 46 volunteers, with a small separate brigade established at the Coke Oven Plant.

The Fire Station was equipped with a 500 gallons per minute motor trailer pump, convertible from water to foam. The station was manned continuously by four men who were responsible for the examination and maintenance of over 250 fire extinguishers distributed throughout the works.

At the Coke Oven Plant Fire Station, two large foam machines were installed for use in an outbreak of fire which would preclude the use of water.

TRAILER PUMP OUTSIDE THE FIRE STATION AT STANTON

HOME GUARD

ANYONE who visited Stanton on anything but a lawful occasion soon realized the existence of a force which had the safety of Stanton in its keeping.

Originally named the Local Defence Volunteers, a title self-explanatory because it was local—it was defensive and it was a purely volunteer force, armed at the threatened invasion of this island, it was later to become known as the Home Guard.

Volunteers came forward, veterans from the last war and boys just from school. All sections of Stanton men were represented in the two platoons of "C" Company, 9th Derbyshire (Ilkeston) Battalion Sherwood Foresters, which eventually attained a strength of 300 all ranks.

Sections, platoons or companies were also formed from our works at Holwell, Riddings and Wellingborough.

All works' detachments took a great part in the defence schemes of

their respective areas, and intensive training and guard duties were carried on outside working hours.

During the four and a half years, precious hours were ungrudgingly given to drill, rifle practice and route marches.

Owing to the shift system, none of the works' units was able to muster a parade strength of 100 per cent, nevertheless, at the stand-down, in December, 1944, under their qualified instructors, they had obtained a high standard of efficiency.

WELFARE

THE formation of the first Stanton Works Committee in 1919, marked the inception of a welfare system which has so developed that during the war it was able to meet the needs of 14,000 employees, each of whom has, through the appropriate committee, a channel of direct access to the management.

The various types of workpeople employed, composed of skilled and semi-skilled artisans and craftsmen, were augmented during the war period by a considerable number of dilutees and a large proportion of female labour. Surplus in other industries, they arrived to be billeted, trained and initiated into a new world.

Whilst the Works Committees deal from time to time with any differences which may arise between the management and the men, it is clearly understood that they shall in no way encroach on the legitimate function of the trade unions, who, in recognition of this

STANTON MAIN CANTEEN

policy, have warmly supported the Company in the formation of committees.

Recreational facilities during the war were to a great extent curtailed, but outdoor sports were enjoyed within a short distance of the various works. Indoor activities, including dances and the formation of a dramatic society, brought further interest.

In a works of such magnitude there must obviously be an abundance of hidden musical talent, and a Works' Wonders Entertainments Committee was established to provide entertainment every week to the workers during lunch hour in their respective canteens. These concerts continued for two years, during which time three B.B.C. broadcasts were given. Various outside concerts for local charities were also arranged.

The provision of meals for war workers provided a problem, and called for a great deal of organization. The canteens expanded and

such amenities as extra rations of tea and sugar for heavy metal workers, better provisions for the making of tea, and special rations of milk for chemical workers were instituted.

Stanton's appetite was a large one. The Club House provided over 1,100 meals a week, the Main Canteen 2,000, Stanton Gate 1,500, and Dale 1,100 ; a total of nearly 6,000 dinners to be planned. Add to this total 5,500 subsidiary meals, 1,200 tea meals and 32,000 beverages and one can easily realize the amount of organization involved.

Workers drafted from various parts of the country provided another task for the Welfare Department, as billets had to be found. There were many problems as a result of the disrupting of homes that called for advice from this department.

Three hotels and their staffs, nurses' hostels and the grocery store were supervised. Office-cleaning staffs who worked loyally throughout difficult times, and the black-out, were another responsibility.

The department handled the arrangements for "Holidays on Farms" during harvesting, the result of an appeal by the Government that received a ready response, especially from girls in the offices.

Although not the responsibility of the Welfare Department, reference should be made to *The Stantonian*, the works' magazine which had existed since 1928.

Up to the outbreak of war, space had been allocated to technical matter describing our processes and products. From this a more homely style was evolved with the emphasis on employees and their families.

Paper control restrictions resulted in the reduction in publishing frequently from monthly to quarterly. The fact that we were allowed to continue this publication indicates that it was of considerable value from a morale point of view.

MEDICAL

IN a large industrial organization like Stanton, the main concentration at the outbreak of war was to keep production at as high a level as possible. The Medical Department's contribution was towards keeping the workers healthy, and as far as possible accident free in order that production should not be impaired.

Stanton had in operation at all its works and collieries a well-established Medical Department consisting of twenty-three State-registered nurses and a panel of part-time doctors available for medical examination of new entrants, advice upon medical problems and for attendance at the works and collieries in case of serious accidents or illness.

This service accustomed to the routine treatment of industrial casualties, embraced preventive health measures and a practical interest in accident prevention.

While these activities were in daily progress, it was obvious that in company with other depart-

ments, the change-over to war conditions would present fresh problems to the Medical Department. Men would be called up for war service and preparation would need to be made for the reception of women into industry—in the heavy industries—a hitherto unprecedented event. There was a possibility of air attacks with gas warfare and threats of bacterial infection.

Nurses in industry were exempt from call-up for the Services and were asked to remain at their posts. Their work was vital to the community and came under the control of the Ministry of Labour and National Service.

The ambulance stations were given every protection against bomb damage and blast. They were sand-bagged, reinforced with steel roofs, blacked-out and equipped with anti-gas curtains. Some were open 24 hours daily and during the week-ends, and the nursing staff received every assistance from members of the Stanton Corps St. John Ambulance Brigade.

CLEARING STATION, HALLAM FIELDS SCHOOLS

Plans were made for setting up first-aid posts on the works; sites were chosen, and with the help of the works' division of St. John, the posts were equipped with everything necessary for the treatment of casualties.

In preparation for gas casualties a decontamination centre was built and equipped ready with nursing staff and ambulance orderlies ready to take up their duties should the occasion arise.

In the event of air attack upon the works, involving casualties to the families of employees living in the locality, a clearing station was set up in the evacuated Hallam Fields Schools.

The services of the wives of the employees living in the vicinity were enlisted to help the nurses in the event of a blitz, and under the auspicies of the Nottingham branch of the Royal College of Nursing, the nursing staff attended lectures in gas warfare.

The possibility of air attacks upon any of the subsidiary works or collieries had not been overlooked, and arrangements were made for all available help to be mobilized.

Stanton Gate Foundry came into being during the latter part of 1941 with the employment of a large percentage of female labour. It was anticipated that the employment of women would produce difficulties hitherto unknown, probably a host of minor ailments causing considerable absence from duty, and a preponderance of accidents resulting from their employment in unfamiliar industrial surroundings amid noise and machinery — all potential dangers.

The women worked extremely well, absenteeism for minor ailments was negligible; they continued to work often under considerable difficulties, in many cases having to carry domestic responsibilities.

The call from the military and civilian fronts did not go unheeded, and Stanton responded on eleven occasions. Blood banks were set up on the works, and 1,240 donors gave their blood, several on more than one occasion.

With the object of maintaining the health of the employees and of building up a strong resistance to infection, every effort was made to keep the workers healthy.

Friendly contact with employees returning to work after illness was a function of the Medical Service, and in certain cases, following

severe illness, arrangements were made for the daily supply of additional food drinks. The Company's nurse paid visits to employees, and where necessary, arrangements made for convalescent home treatment.

It was only to be expected that during the war the number of accidents would be above average. Men joining the Services would be replaced by older men who normally would be on the retired list, and who although suffering with some form of disability were required to continue working in the national effort. Consequently, the standard of physical fitness had to be relaxed by the visiting doctors.

Men, redundant in other industries, were being drafted into the works. They were, in many cases, unfamiliar with industrial hazards and conditions. Black-out caused accidents, and together

A STANTON AMBULANCE

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A STANTON AMBULANCE

A CASUALTY

with female labour, largely contributed to the increased rate of casualties.

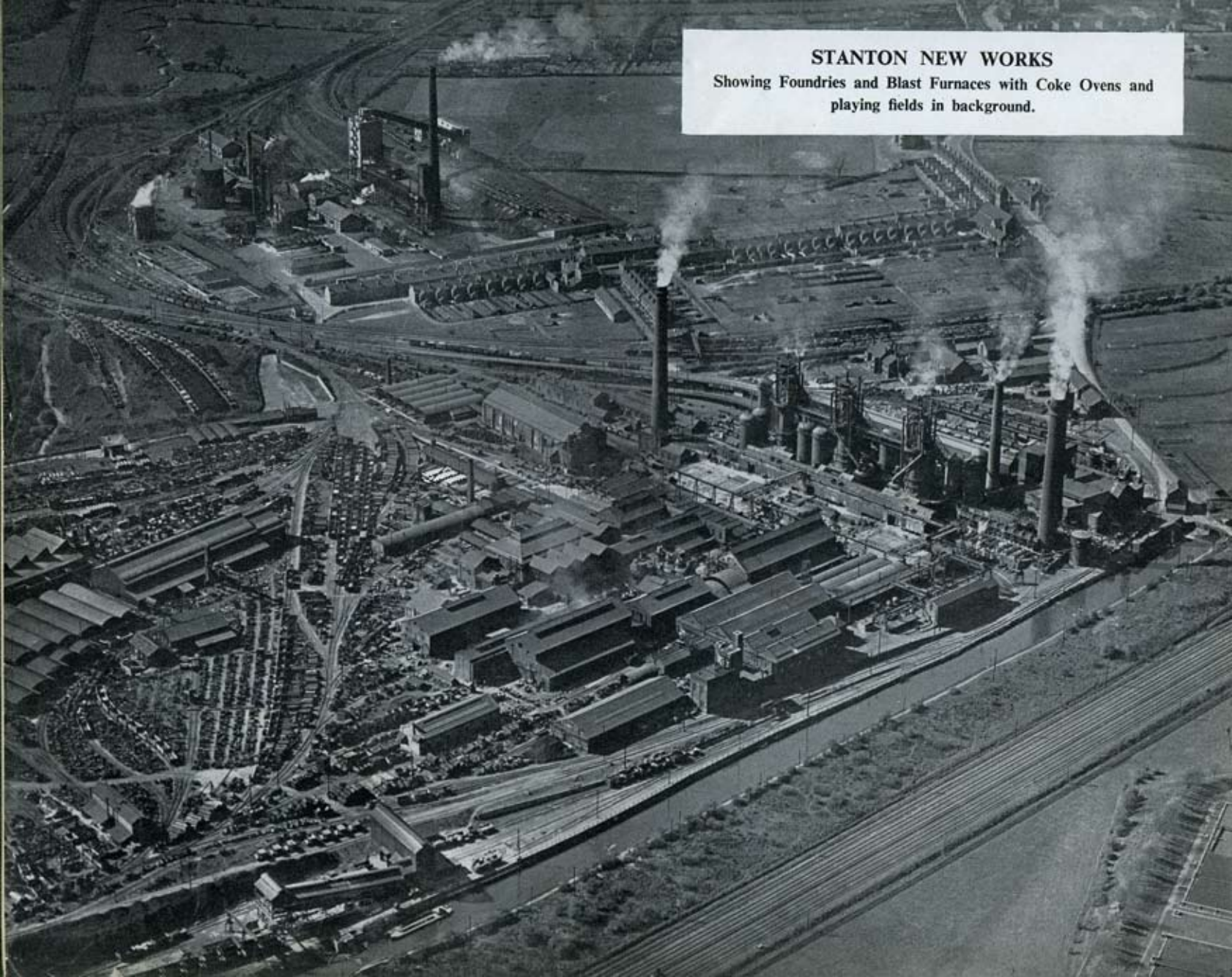
Tribute must be paid to the doctors who gave such willing and valuable service during these trying years. With innumerable claims upon their time and energy, working with depleted staff, the conditions of war imposed additional strain as the employment of more labour meant increased daily medical examinations. It is gratifying to record that throughout the Stanton organization, engaged as it was upon very important and hazardous war production, operations were carried out without any serious interference from either industrial accidents or from enemy action.

"STANTON AT WAR" is the story of a great organization, and in this brief account, the Stanton Ironworks Company pays tribute to the part played by its 14,000 workers (including those employed in Stanton Gate Foundry and at the Collieries, of whom the latter have now passed to the control of the National Coal Board).

From the day which proclaimed that Britain was at war to the day which saw the final defeat of the enemy, the personnel of Stanton took their full share in the tasks of war.

Our products have once again a peace-time vocation and Stanton's resources which made supplies possible in time of war, are now being applied to the requirements of industry.

In the heavy task of post-war reconstruction, which confronts Britain, the activities of the Company are being applied with vigour to meet the requirements of customers in all parts of the world, and to restore the service which made the name of STANTON *famous.*



STANTON NEW WORKS

Showing Foundries and Blast Furnaces with Coke Ovens and playing fields in background.

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