FOUNDRY TRADE JOURNAL

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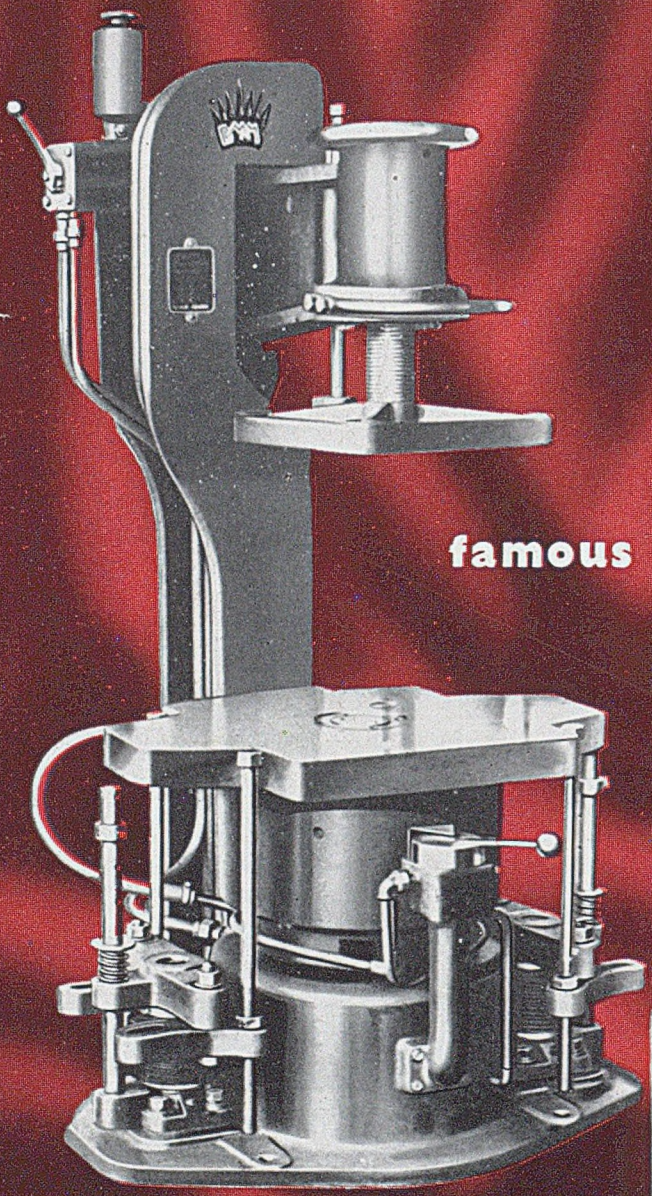

famous throughout the world

HPL *Moulding machine*

BRITISH MOULDING MACHINE CO. LTD

FAVERSHAM KENT

Ensure sound consistent CASTINGS

WRITE FOR FULL INFORMATION OF the Spermolin range OF FOUNDRY SPECIALITIES

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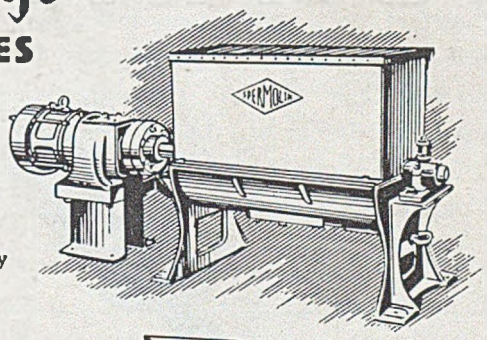
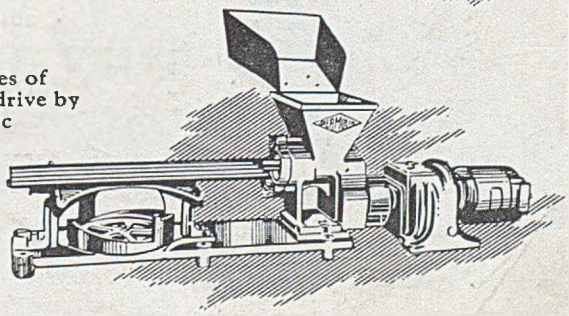


CORE OILS & BINDERS FOR EVERY TYPE OF CASTING

The cores shown above are used in the casting of 12 ton planing machine beds. A good green bond and dry strength are required for this type of core and it is essential that no distortion takes place. This modern foundry employs similar cores for all types of castings, from 5 to 20 tons and these are made entirely with SPERMOLIN Core Oils and Binders. The cores break down easily when castings reach the fettling shop, thereby saving time and labour costs.

SAND MIXING MACHINES

The SPERMOLIN Major thoroughly mixes batches of sand and oil in 4 minutes. Supplied with direct drive by 5 H.P. motor or belt drive and provides automatic discharge. Machine stops when safety grid is open.



ROTARY CORE MACHINES

This SPERMOLIN Rotary Core Maker is simple, efficient and economical in operation and offers a wider scope than any similar machine.

WRITE TO SPERMOLIN LIMITED, HALIFAX, ENGLAND

Telephone: Halifax 4197 Telegrams: Spermolin, Halifax

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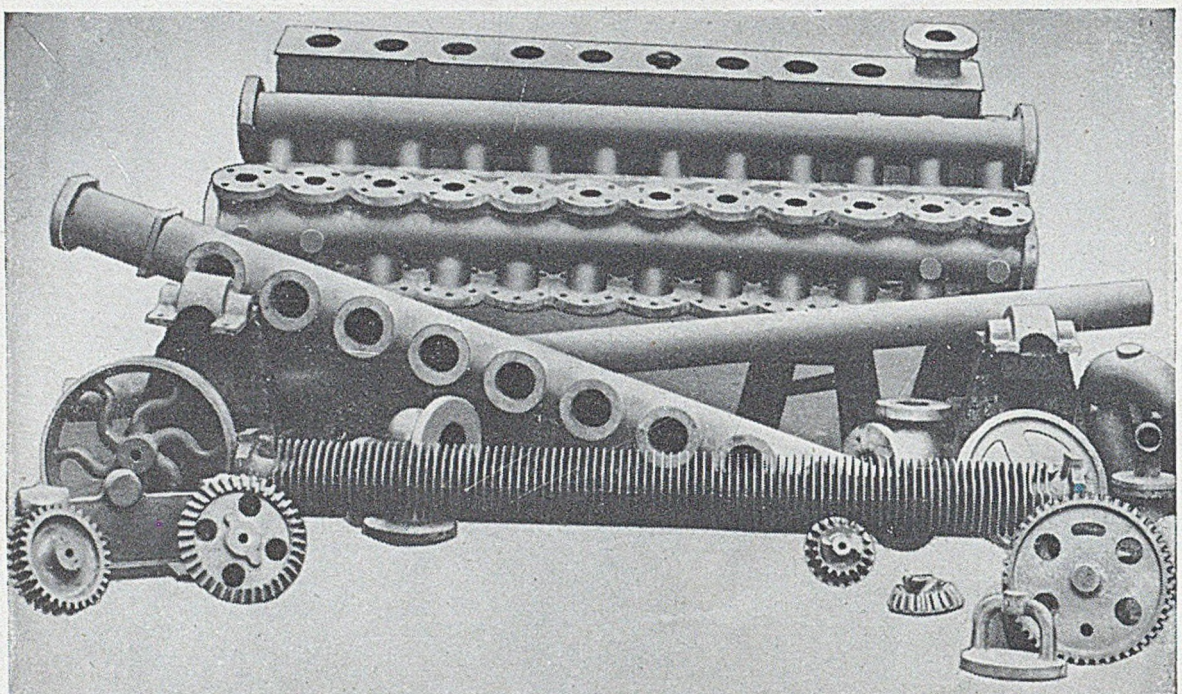

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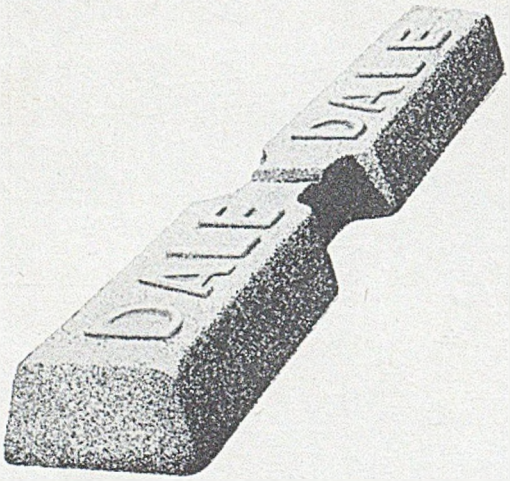


REFINED PIG IRON

Designed to meet the demands of high-quality castings, which are: strength, machine-ability, and resistance to wear.

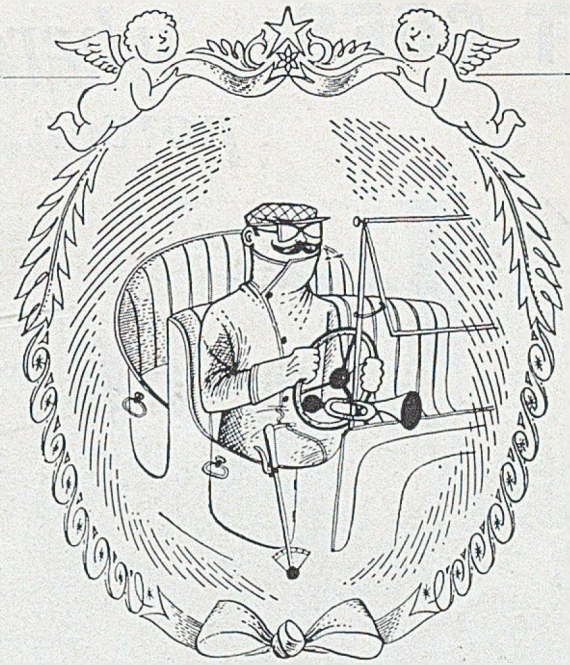
All these can be secured by using Stanton-Dale Refined Pig Iron in your cupolas.

The above illustration shows a group of castings made from this iron by a well-known economiser maker.

PROMPT DELIVERY

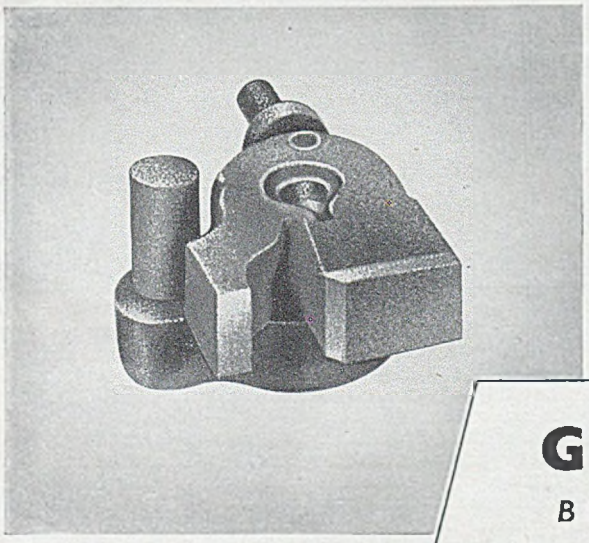
THE STANTON IRONWORKS COMPANY LIMITED NEAR NOTTINGHAM

Mr. FETTLEWELL'S ALBUM



working at astounding speeds

MR. FETTLEWELL surprised some of his friends when he told them that as a result of Fordath's pioneering in their own laboratory, Glyso-Resyn joined the field of bonding agents in 1948.



In big foundries, where the outlay for radio-frequency equipment is warranted, dielectric heating will bake small section Glyso-Resyn bonded cores in two minutes. This is an impressive overall economy where cores of regular section have to be dried in large numbers. With normal equipment, the use of Glyso-Resyn enables cores to be baked in half the time of cores baked with an oil binder.

Glyso-Resyns are clean powders, simple to measure and foolproof in mixing.

SHELL MOULDS with BAKELITE RESINS

TRADE MARK

The phenolic resins developed by Bakelite Limited for the shell mould process are based on 40 years' leadership in the production of synthetic resins and are *available in quantity*. This unretouched photograph of typical shell moulds shows the high surface finish and freedom from blemish that characterise moulds based on BAKELITE Resins. For technical advice on the shell mould process in general, and the use of BAKELITE Resins in particular, please telephone any of our sales offices or write for illustrated booklet.

Our Development and Research Laboratories at Tyseley will give full assistance and advice on any aspect of the shell mould process. Illustrated below are some of the stages in the production of castings by this process.

1 *The powdered BAKELITE Resin is mixed with sand.*

2 *The heated pattern is sprayed with a suitable parting agent.*

3 *The partially cured resin/sand mixture formed on the hot pattern before stoving.*

4 *The heat-hardened half-mould being stripped from the pattern.*

5 *Molten metal being run into the shell.*

1 2 3 4 5

FORMITE

BAKELITE RESINS

REGD. TRADE MARKS

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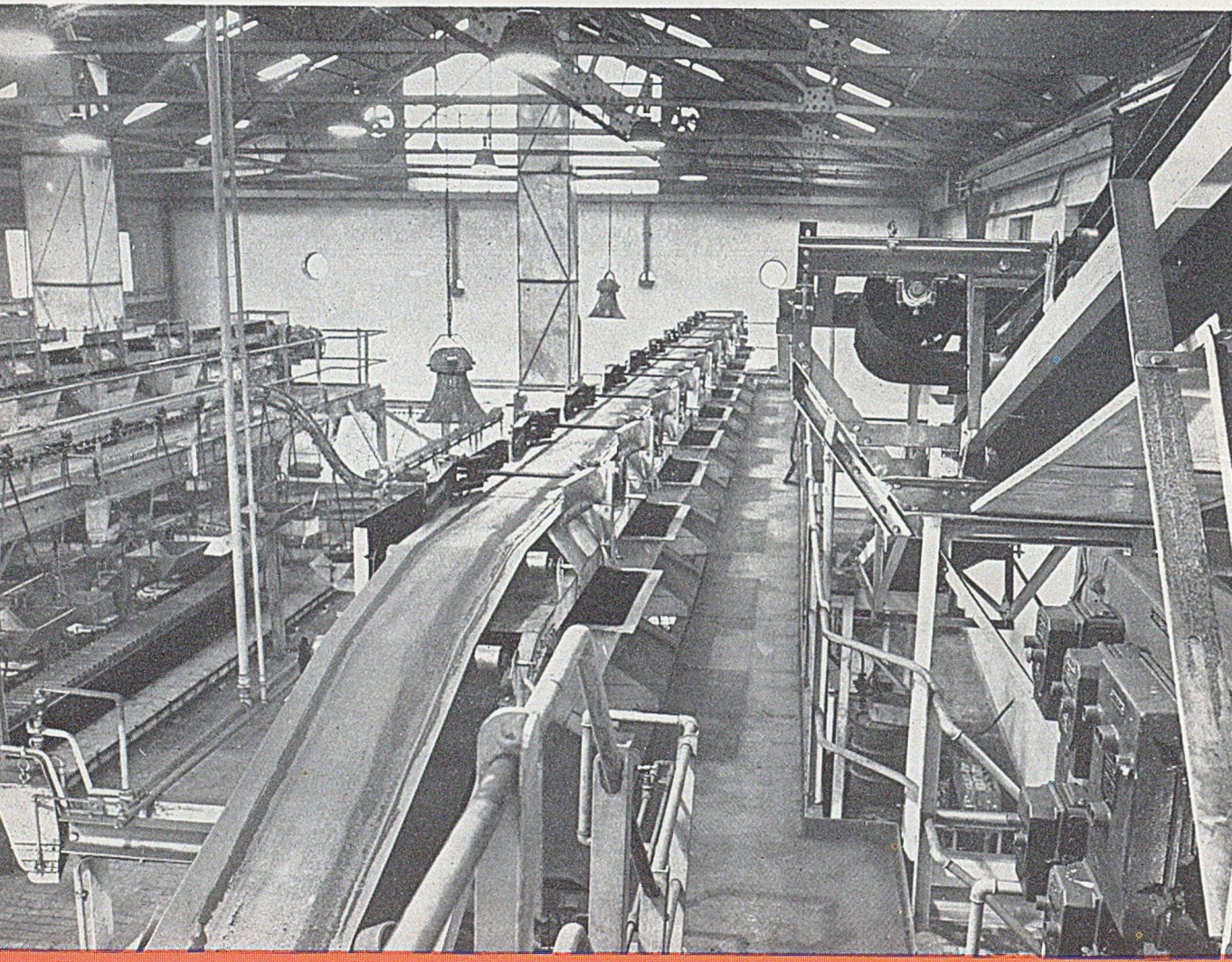
B

Foundry Mechanisation at its best



It is said that the best is cheapest in the long run. It's true, goods of quality usually outlive the cheaper articles and so prove their worth in the end. So it is with mechanisation. The success of COLEMAN-WALLWORK equipment, the long and trouble-free service it gives, demonstrates that we understand the problems and needs of the Foundry Industry, and can design and manufacture machinery and plant of the highest quality. No matter what the initial cost, it will prove to be the most economical in the long run, in fact, mechanisation at its best.

THE COLEMAN-WALLWORK CO. LTD.

Member of the J. Stone Group

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FOR PERFECT MOULDS

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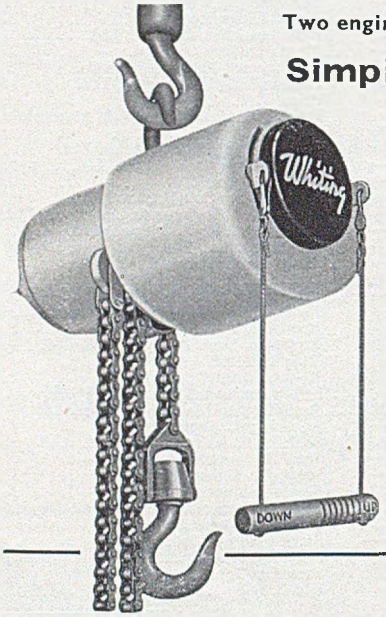
Two engineering products of outstanding merit specially designed for

Simplicity, Compactness and Lightness



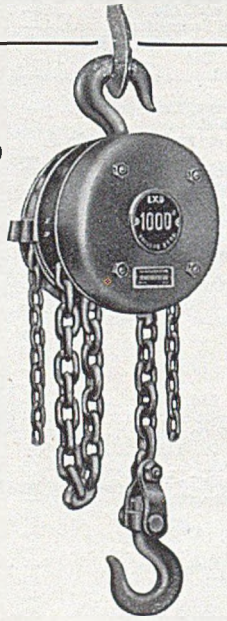
The Whiting Hoist

The streamlined exterior conceals a rugged construction, and worm gear gives smooth silent power.

Capacity ..	½ ton	1 ton	2 tons
Motor	2 h.p.	2 h.p.	2 h.p.
Lift	10ft.	10ft.	10ft.
Lifting speed ..	24 f.p.m.	16 f.p.m.	8 f.p.m.
Load Chains ..	Roller	Roller	Roller
Weight with Chains ..	86 lbs.	92 lbs.	128 lbs.
Headroom ..	17¼in.	19¼in.	27½in.
Price	£120	£125	£160

Delivery ex stock.

The Exo Pulley Block (triple geared)



Forged steel gears and a case-hardened mainshaft are enclosed in a pressed steel casing. Drop stamped, heat-treated load hook and high tensile steel chain. (BSS 1663).

Capacity ..	½ ton	1 ton	1½ tons	2 tons
Lift	10ft.	10ft.	10ft.	10ft.
Headroom ..	12in.	15in.	16½in.	18½in.
Weight with Chains ..	28 lbs.	46 lbs.	62 lbs.	78 lbs.
Price	£15 10s.	£17	£23	£26 10s.

Delivery ex stock.

(Models available up to 40 tons)

HAND and GEARED TROLLEYS
for Whiting Hoist and Exo Pulley Block

	Hand Trolley Weight	Hand Trolley Price	Geared Trolley Weight	Geared Trolley Price
½-ton ..	20 lbs.	£6 10s.	40 lbs.	£12
1-ton ..	31 lbs.	£7	55 lbs.	£14
2-ton ..	55 lbs.	£11	97 lbs.	£21

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(Other models available—prices quoted on application.)

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FOUNDRY TRADE JOURNAL
Established 1902
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British Ironfounders' Association and British Bath Manufacturers' Association.— Director and Secretary : J. Galbraith Sneddon, C.A., 145, St. Vincent Street, Glasgow, C.2. 'Phone : Central 2891 ; 'Grams : "Groundwork," Glasgow.

British Grit Association.—Secretary : J. Campbell MacGregor, 10, Bank Street, Airdrie, Lanarkshire.

British Malleable Tube Fittings Association.—Secretary : F. B. Ridgwell, 196, Shaftesbury Avenue, London, W.C.2. 'Phone : Temple Bar 6052-3 ; 'Grams : "Brimatufia," London.

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Cast Iron Axlebox Association and National Ingot Mould Association.—Secretaries : Peat, Marwick, Mitchell & Company, 301, Glossop Road, Sheffield. 'Phone and 'Grams : Broomhill 63031.

Cast Iron, Heating, Boiler and Radiator Manufacturers' Association.—Secretary : Stanley Henderson, 69, Cannon Street, London, E.C.4. 'Phone : City 4444.

Cast Iron Pipe Association.—Secretary : T. Clark, Crusader House, 14, Pall Mall, London, S.W.1. 'Phone : Whitehall 7941.

Cast Iron Segment Association.—Secretary : H. A. D. Acland, 5, Victoria Street, London, S.W.1. 'Phone : Abbey 1394.

Greensand Pipe Founders' Association.—Secretaries : McClure Naismith Brodie & Company, 77, St. Vincent Street, Glasgow, C.2. 'Phone : Glasgow 9476 ; 'Grams : "Lycidas," Glasgow.

National Association of Malleable Ironfounders.—Secretary : Miss L. Verity, Chamber of Commerce Offices, Tudor House, Bridge Street, Walsall. 'Phone : Walsall 5671.

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Chairman : **D. Graham Bisset**, Enfield Foundry Co., Ltd., Waltham Cross. *Director* : **R. Forbes Baird**, 117, Church Lane, Handsworth Wood, Birmingham, 20. 'Phone : Northern 0343 & 0037 ; 'Grams : "Irocast," Birmingham.

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North Staffordshire Ironfounders' Association.—Secretary : Bourner, Bullock & Co., Federation House, Station Road, Stoke-on-Trent. 'Phone : Stoke-on-Trent 44245.

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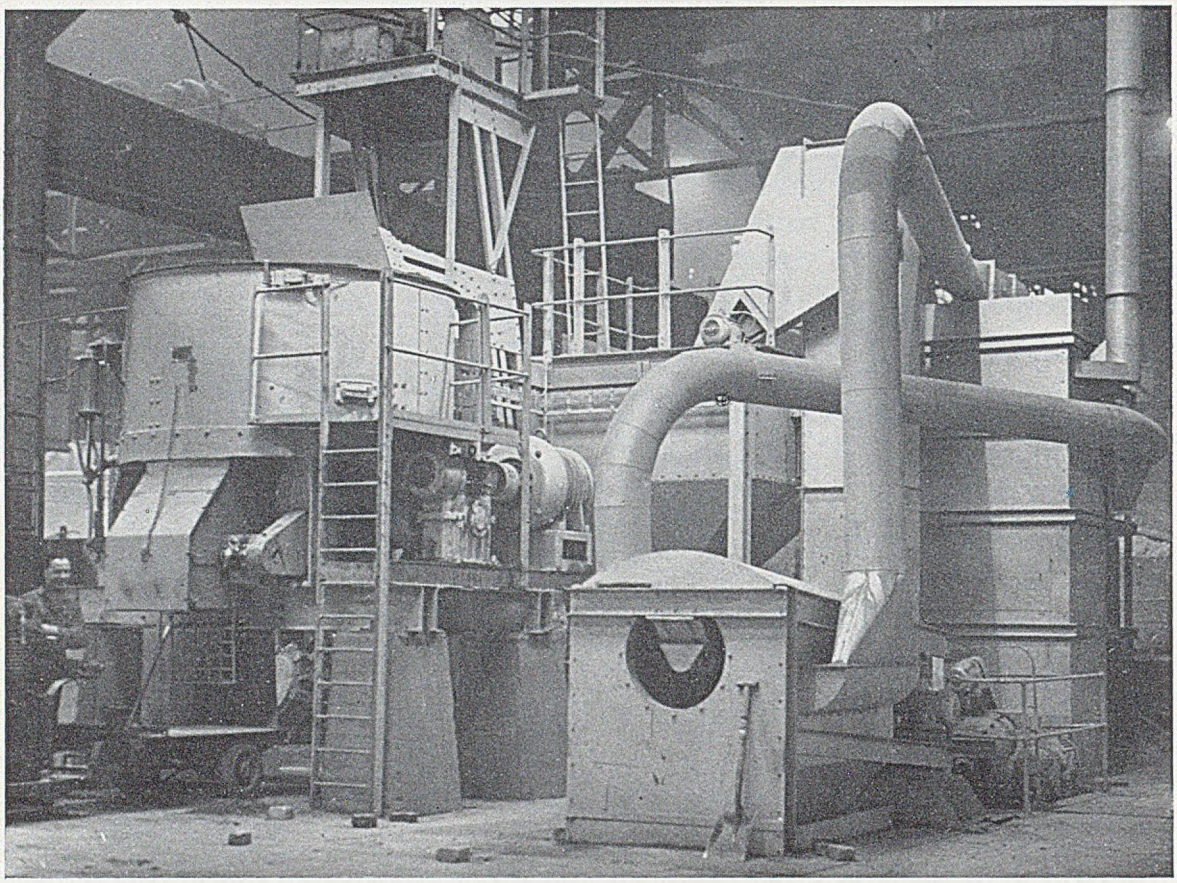
West of England Ironfounders' Association.—Secretary : R. Forbes Baird, 117, Church Lane, Handsworth Wood, Birmingham, 20. 'Phone : Northern 0343. 'Grams : "Jacelace," Birmingham.

West Riding Ironfounders' Association.—Secretary : C. D. Buckle, 13, Cheapside, Bradford. 'Phone : Bradford 25346.

BRITISH CAST IRON RESEARCH ASSOCIATION

Alvechurch, Birmingham. 'Phone and 'Grams : Redditch 716.

Scottish Laboratories.—Blantyre Industrial Estate. Blantyre, Lanarkshire. 'Phone 486.



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Review of the Foundry Industry—1952

Ironfounding

The statistics of production for the iron and steel, and ironfounding industries for 1951 had scarcely been released, when quite a vicious attack by the former was made on the latter for acquiring too much scrap and pig-iron. Whilst steel ingot production was reduced in 1951, that of iron castings had been increased to give a record figure of 3,750,000 tons. Subsequently, the daily Press published much "tripe" as to the replacement of castings by steel pressings. The controversy ignored the fact that ironfoundry owners have no prejudice against alternative materials and, when they have been found to be economic they have been tried out and either adopted or discarded. Pressed-steel baths were made for a time, but the market preferred the traditional product. The Council of Ironfoundry Associations organized a very successful Press conference to explain the foundry angle and the controversy then petered out. During the year, lustre was added to the escutcheon of the foundry industry, by the holding of a Guildhall Banquet. Organized by the Joint Iron Council and graced by the presence of the Lord Mayor and Ministers of the Crown, the function was indeed a memorable one. The inclusion of the ironfounding and steel castings industry in the control to be set up under the clauses of the Bill dealing with the denationalization of iron and steel caused some consternation. The resulting controversy is still active, and indeed potentially volcanic. For the first half of the year, trade in iron castings was still booming, and production was at the rate of about 4,000,000 tons a year; in the third quarter, however, there was a distinct recession and this has persisted ever since. We shall be surprised if the final figures attain last year's record.

Brass and Bronze Founding

The great event of the year was the holding of a well-attended Productivity Conference at Harrogate during June. Never in the history of brass and bronze founding has there been such a representative gathering of technicians and executives of the industry. It was excellently organized, extremely useful and went far to place this section of the industry on the industrial map. The getting together of the Association of Bronze and Brass Founders and the National Brassfoundry Association has undoubtedly strengthened the bonds of friendship between the two bodies and their individual members. The production of copper-base castings should exceed 53,000 tons and make a better showing than 1951 despite all the handicaps which have beset the trade during the year.

Steelfounding

For this section of the industry, 1952 has been a year of solid progress; only recently at a Press conference—commented on editorially— its major advances were detailed in the field of productivity.

1952 *Review*

This has obviously been reflected in total production, and from the latest information available the output should be of the order of 300,000 tons, as against 250,500 in 1951 and 240,700 in 1950. The figures show that the industry is well managed and distinctly progressive.

Light-alloy Foundries

The Aluminium Development Association last autumn organized parallel conferences in Birmingham and London with the object of finding out what users required from their products; to tell them something about what has been accomplished, reinforcing this aspect by a number of well-chosen exhibits, and to learn something of failures and so forth. In general, the customers' designers and buyers were not too forthcoming, but it was obvious that it was an effort well worth repeating. Indeed, another section of the industry is to emulate their example in the near future, whilst in yet a further case, there was more criticism than was really acceptable or perhaps even deserved. In 1951, the output of aluminium castings was 72,245 tons; last year, it should have grown to the order of 80,000 tons.

Technical Topics

The annual conference of the Institute of British Foundrymen was held at Buxton and Sheffield under the presidency of Dr. C. J. Dadswell. Whilst stress was laid on the techniques associated with the production of steel castings, there was the usual well-balanced programme of lectures, works visits and social events. For the third year running, a Foremen's Conference was held. The popularity and usefulness of this function has probably established itself as a permanent addition to the Institute's many activities. Informative conferences have also been organized by the British Cast Iron Research Association and other foundry organizations. Here, we might interpose a word of warning. The tendency to organize conferences is growing too rapidly. They are taking too many men, too frequently and for too long a period from their work. It would appear that a conference on the limitation of conferences will soon be necessary. Naturally, there must be the continuation and reinforcement of the established annual events, such as last year's great and highly successful international foundry congress at Atlantic City. This was attended by a large party of British who were loud in praise of the warmth of their reception and the excellence of the programme arranged for their instruction and entertainment.

Wherever foundrymen have foregathered during the year, gossip has invariably turned to shell moulding. Its great potentialities are now generally being appreciated; techniques are being developed and experience is being gained, whilst new equipment is being designed and shortly will be marketed. Information is being disseminated by the C-Process Patent owners, and large firms of resin manufacturers. Great progress has also been made with synthetic-resin-bonded sand for core making, and the importance of the foundry industry as a customer for plastic materials is being widely recognized.

A technical development announced during the year was a novel method of using up swarf in cupola practice. Nodular iron is finding its place as an engineering material, though its growth has been steady rather than spectacular. During the period under review, this JOURNAL celebrated its fiftieth birthday, and marked the occasion with a Special Issue to put on record the progress achieved in the industry it serves.

Foundry Plant

After years of activities virtually limited to exhibition matters, the Foundry Equipment & Supplies Association have launched out into quite a wide field of activities. Its committee work includes foundry atmospheres, dust exhausting from grinding wheels, and representation on standardization committees. Under the leadership of Mr. Frank Webster, these new activities are more likely to be enlarged than contracted.

Conclusions

Because of the newer technical developments and the reports of the various productivity teams, a more rational view is being taken by foundry owners and their executives of their whole business as manufacturers of castings. This mental attitude bodes well for the industry, though there are still a few owners as well as workpeople devoid of ambition. On balance most are finding their tasks more interesting than ever before. It will be the editorial policy of the JOURNAL to foster this interest by every means at its disposal.

Dinner

MR. G. J. DANIELL

At the " A la Broche " restaurant last Monday, a complementary dinner was given to Mr. G. J. Daniell, foundry manager, Hayward-Tyler and Company, Limited, Luton, by a group of his personal friends to wish him *bon voyage* as he is to take charge of a new works being built by his firm in Canada. Mr. D. Graham Bisset presided and amongst those present were Mr. S. R. Birchmore, Mr. Barrington Hooper, Mr. Giles P. E. Howard, Mr. V. C. Faulkner, Dr. A. Ivanoff, Mr. B. Levy, Mr. A. R. Parkes, Mr. T. Robertson, Mr. A. Talbot, Mr. E. Thomson, Mr. F. Arnold Wilson and Mr. W. Wilson.

The function was organized by Mr. W. G. Mochrie.

Quantity Production of Shell Moulds

Rotary Machine developed by Polygram

Several years ago, the writer on his first visit to the works of the Polygram Casting Company, Limited, discussed with the management the need for mechanizing the production of shell moulds. The problem so far as sand handling is concerned was relatively simple, but that of actual moulding had still to be solved. A later visit revealed that a method offering a partial solution was installed. A series of pattern-plates were attached to the four faces of a rotatable oblong block. In the uppermost and "eastern" positions, the pattern plates were heated up, but when reaching the "southern," the plates automatically descended into a swept-up bed of the sand-plus-phenol-resin mixture for a predetermined period. Then, after a further cycle, the "biscuits" were removed for assembly and casting.

New Machine

On the occasion of the most recent visit, it was pleasing to see in operation the machine illustrated in Fig. 1. It has been designated Mark IV and two prototypes have been installed. The dimensions of the machine are 6 ft. 6 in. overall diameter by 4 ft. 3 in. to the crown of the oven dome. It carries four patternplates spaced equidistantly on a rotary mechanism, thus creating four stations. At all times, three plates are within the gas-fired oven, consuming 200 cub. ft. of gas per hour for warming up the plates initially—in, say, about 20 mins.—and 150 cub. ft. per hour thereafter. The oven is thermostatically controlled to take care of the lowering of the temperature by the entry of each new mould, and a governor regulates the gas supply accordingly. For rotating the machine, a 1 h.p. electric motor is installed. This is protected from mechanical overload by a safety clutch on the main-shaft drive. A sensible safety device is incorporated, whereby, unless the pattern-plate is returned to its carrier before the indexing motion starts, the motor will automatically cut out.

Cycle of Operation

The mould-making process consists of filling the investment bin with the 7½ per cent. resin/sand mixture. (As a temporary measure this is being done by bringing over the bin a monorail-suspended container with a flexible delivery hose.) The hot pattern and carrier is swung over to form the closure of the bin. Then the bin is rotated, and its bottom portion lowers to press the investment tightly against the pattern-plate, so as to ensure a better and finer impression. The time being given for the adherence of the investment at the time of the writer's visit was of the order of 12 secs. The bin is returned to its original position and the mould is then passed through its three oven stages; the baked shell, through the operation of lifting pins, is taken off and removed to a table. It is subsequently transferred to neat wire cages for transport to the foundry. The output of the Mark IV machine is of the order of 120 half-moulds per hour. Providing a plate be properly warmed before installing, it can be placed into the sequence virtually without interrupting production.

To demonstrate the extremely high porosity of shell moulds, a 9 by 4 in. mould cast on the flat was treated to a cup of cold water a few minutes before casting up with gun-metal. There was much steam but no explosion.

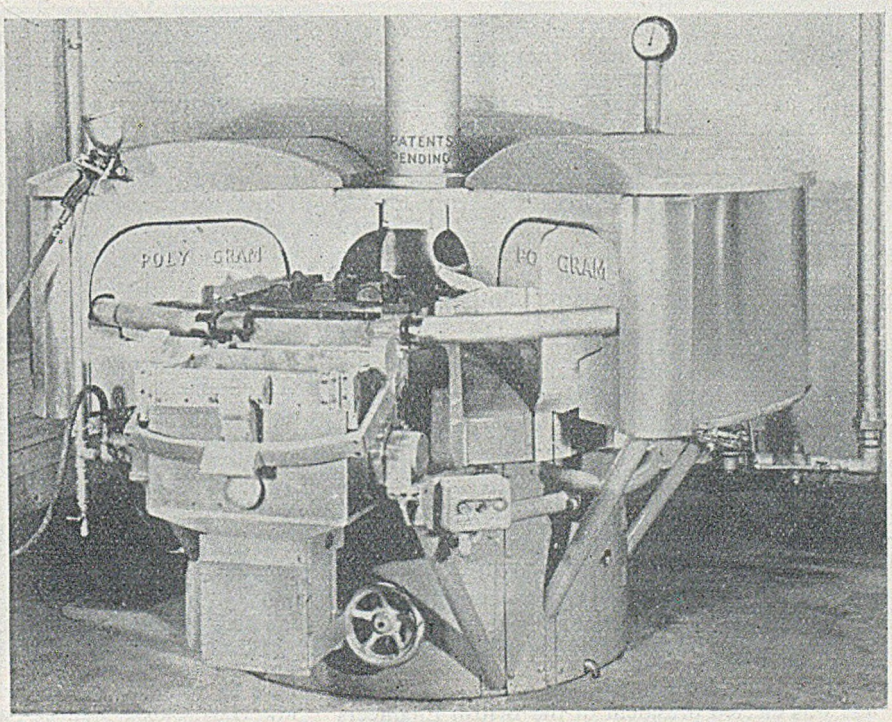

FIG. 1.—*Automatic Shell-moulding Machine, Mark IV, newly developed by the Polygram concern. The machine carries four Patternplates which in turn are brought to the operating position by a rotary indexing motion. During three-quarters of each cycle, the Patternplates with the Sand "Biscuits" adhering are contained in the Curing Oven.*

New Year Honours

Many people associated with the foundry, iron and steel, and allied industries are included in the New Year Honours List. Notes on some of the awards are given below.

BARON

SIR CLIVE LATHAM BAILLIEU, chairman of the Dunlop Rubber Company, Limited, for public services. Sir Clive, who became deputy chairman of the Dunlop Rubber Company in 1945, succeeded Sir George Beharrell as chairman in 1949. His services have been utilized freely by the Government over a period of many years.

Sir Clive's work on behalf of the Federation of British Industries is well known. He was elected deputy president of the F.B.I. in 1944, and for three years from 1945 he was president. He served for some time as a member of the council of the Institute of Metals and is an honorary member of the Australasian Institute of Mining and Metallurgy.

KNIGHTS BACHELOR

MR. ALFRED GEORGE ERNEST BRIGGS, deputy controller of supplies, Ministry of Supply.

DR. HAROLD ROXBEE COX, chief scientist, Ministry of Fuel and Power, since 1948. The long-term work of the Ministry of Fuel and Power in connection with fuel conservation research and development is carried out by Dr. Cox and his staff, and Dr. Cox outlined that work when he gave the Thomas Hawksley Lecture to members of the Institution of Mechanical Engineers on November 16, 1951.

MR. ARTHUR CROFT, for political and public services at Bradford. He is chairman and managing director of Crofts Engineers (Holdings), Limited, and Crofts (Engineers), Limited, chairman of Carter Gears, Limited, Crofts Associated Industries, Limited, and H. Brammer & Company, Limited, manufacturers of patent V belting, of Leeds.

MR. LINCOLN EVANS, general secretary of the Iron and Steel Trades Confederation since 1946. He was a member of the Iron and Steel Board from 1946 to 1948, and in the New Year Honours of 1948 he was awarded the C.B.E. In 1949 Mr. Evans was appointed to fill a vacancy on the Economic Planning Board, of which he is still a member. Early last year, he went to Geneva as workers' representative in the British delegation to the fourth session of the iron and steel committee of the I.L.O., which met to discuss conditions in certain major industries.

MR. IAN LESLIE ORR EWING, M.P., for political and public services. He is a director of Hall Telephone Accessories, Limited.

MR. CHARLES KENNETH FELIX HAGUE, deputy chairman and managing director of Babcock & Wilcox, Limited, and deputy chairman of the Royal Ordnance Factories Board. In addition to being associated with the Babcock & Wilcox group of companies at home and overseas, Mr. Hague is also a director of Power Securities Corporation, Limited, and other companies.

He was elected president of the British Engineers' Association early in 1948, while he has also served as a member of the council of the Institution of Mechanical Engineers and as a member of the Council of Industrial Design.

MR. JOHN JAMES CRAIK HENDERSON, for political and public services in Scotland. He is a director of a number of companies, among them being Aluminium Castings Company, Limited, and James Howden & Company, Limited, engineers, etc., of Glasgow.

MR. REUBEN JAMES HUNT, for political and public services in Essex. He is chairman of Ransomes, Sims & Jefferies, Limited, manufacturers of agricultural machinery, etc., of Ipswich.

MR. WILLIAM HENRY PILKINGTON, chairman of Pilkington Bros., Limited, glass manufacturers, of St. Helens (Lancs), and vice-president of the Council of Building Material Producers.

ALDERMAN THOMAS DALRYMPLE STRAKER-SMITH, for political and public services in Northumberland. He is a director of Smith's Dock Company, Limited.

ORDER OF THE BATH

Civil Division

C.B.

MR. J. BUCKINGHAM, director of research programmes and planning, R.N. Scientific Service, Admiralty.

MR. V. P. HARRIES, Under-Secretary, Ministry of Supply.

ORDER OF THE BRITISH EMPIRE

Civil Division

G.B.E.

LT.-COL. JOHN THEODORE CUTHBERT, BARON BRABAZON OF TARA, for services to civil aviation. He is chairman and managing director of Associated Commercial Vehicles, Limited, a director of the David Brown Corporation, Limited, founders, tractor and farm implement manufacturers, Huddersfield, Kodak, Limited, and many other companies.

EDMUND COLQUHOUN, EARL OF LIMERICK, chairman of the council of the Territorial and Auxiliary Forces Association. He is chairman of Ascot Gas Water Heaters, Limited, and a director of the Industrial & Commercial Finance Corporation, Limited, and other companies.

K.B.E.

SIR ROBERT GOULD, chief industrial commissioner, Ministry of Labour and National Service.

COL. HAROLD CHARLES SMITH, chairman of the Gas Council. He was president of the Institution of Gas Engineers in 1937-38. Other appointments he has held include the chairmanship of the Gas Research Board and membership of the Scientific Advisory Council appointed by the Minister of Fuel and Power.

C.B.E.

CAPT. K. J. G. BARTLETT, deputy chairman of the European Purchasing Commission, Ministry of Supply, and a director of the Bristol Aeroplane Company, Limited; MR. F. J. BYWATER, chairman of the Council for Codes of Practice for Buildings, Construction and Engineering Services; MR. H. F. CARPENTER, for services as secretary of the British Electricity Authority. MR. H. A. CRUSE, a director and general works manager

(*Continued on page* 54)

Core-assembly as a Production Aid to the Jobbing Founder*

By E. H. Beech and J. Hoyes

In presenting this Paper the Authors have attempted to move somewhat from the general trend. Through the last few years, mechanization on repetition production of the smaller type of castings has made extensive progress; but, generally speaking, the jobbing founder's problem has remained. With this in mind, it is felt that any contribution that will assist the jobbing founder to get the maximum output from his limited supply of skilled labour, will obviously be a welcome feature. This Paper is a practical one, but as practicability is, and always will be, a very important fundamental in the production of castings, it is hoped it will be of major interest.

It may appear provocative to say that many jobbing founders making the larger type of intricate castings successfully are reluctant to change their methods, being aware of the uncertainty inherent in such departures. Be that as it may, skilled labour to-day is in critical supply, and to alleviate this condition it has become necessary for the jobbing founder to devise methods which will take some of the skill element out of the job; only by this evolution can the constantly increasing demands for production be met. The success of changed methods to some degree is dependent on suitable facilities being available, that is to say, that the type of work being produced is amenable to the change and that one is given freedom to develop new ideas.

* Presented to the Lancashire branch of the Institute of British Foundrymen.

Foundry Layout

To enable foundrymen to see their problem in its correct perspective, a survey of the foundry with which the writers are connected, should provide an appropriate introduction.

A point of interest is that the foundry is of more than 50 years' standing, and that the Company has extended its manufactures and output far beyond what was originally intended. Nevertheless, with improved conditions, installation of mechanized plant, plus changed moulding techniques, it is meeting present-day demands without increase in the size of the building, and despite a reduced labour force. The foundry is divided into five bays and both ferrous and non-ferrous castings are produced. Fig. 1 shows the main bay where the large castings are made. The section has good natural light, is airy, and has good permanent

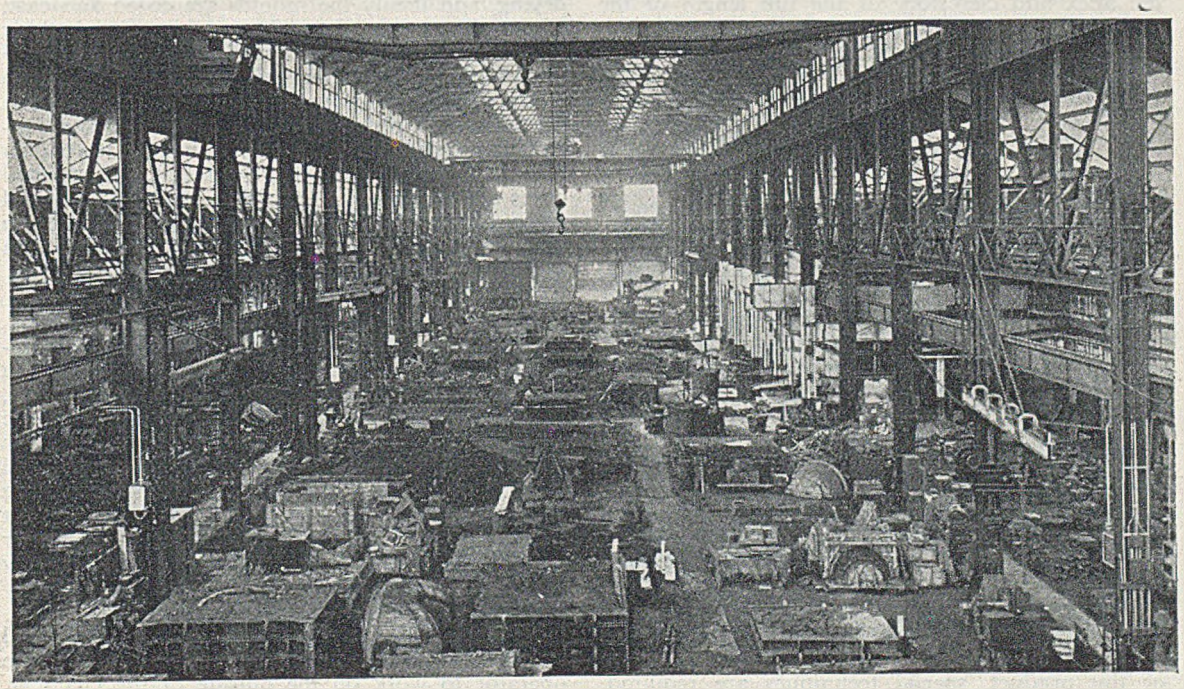

FIG. 1.—*Main Bay of Metropolitan-Vickers Foundry, where the Largest Castings are made.*

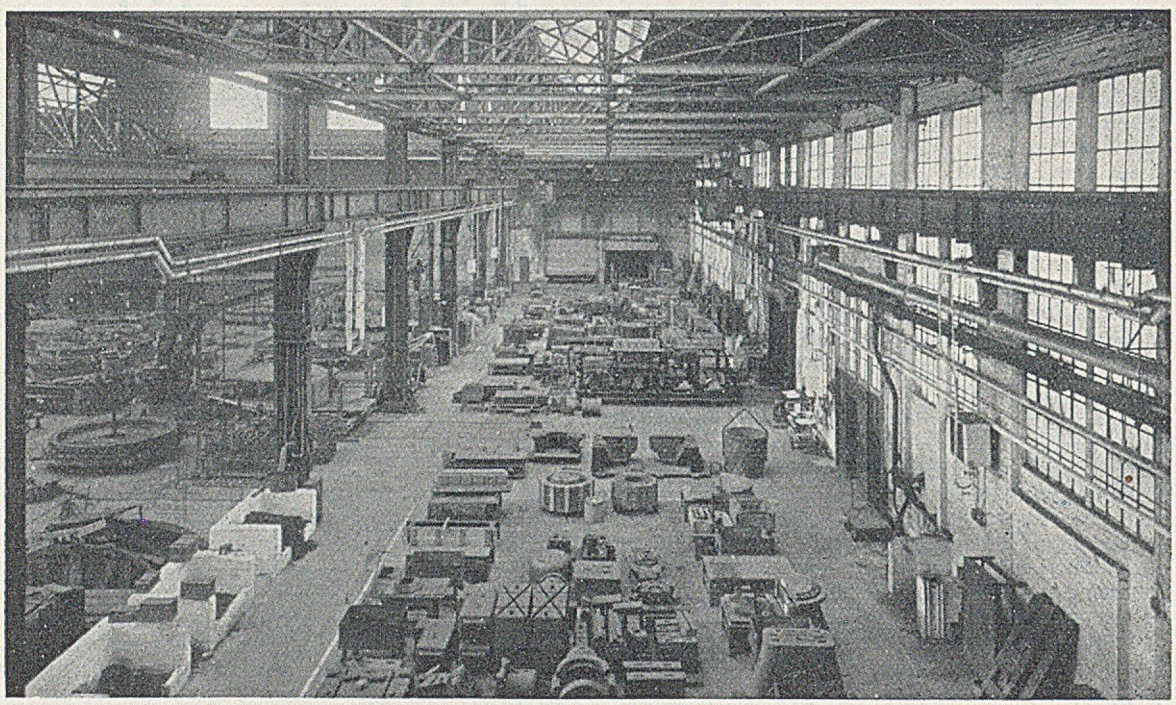

FIG. 2.—*General view of the Main Coreshop, showing* (left) *the Building Pits where the Large Cylinder Cores are prepared.*

gangways throughout, the whole of which provides excellent working conditions. The ventilation is in the apex and clerestory of the full length of the building, an even temperature being maintained at 55 deg. by unit-type fan heaters.

There are nine large moulding pits, 27 by 15 by 12 ft. for loam and sand. Some of the jobs carry a piecework price based on 6,000 hrs., which gives some idea of the type of work produced. The drying ovens are gas-fired and of the recirculating type, which has proved most successful. Three cupolas with a capacity of 35 tons per hr. serve the foundry.

A general view of the main core shop (Fig. 2) shows the building pits where the large cylinder cores are produced, as well as the storage bins for natural sands and cinders. A large percentage of cores are made in oil-sand, the sea sand for this purpose being dried in a rotary drier outside the building, lifted through ducting to a storage hopper and fed through a measuring unit into the mill. After mixing, the sand is loaded into trucks running on wheels, and distributed direct to the coremakers, thus eliminating time lag and the carrying of sand by skilled men. It is intended to install in the near future a sandslinging machine for ramming cores.

Fig. 3 shows a self-contained section of the foundry for manufacturing the static diaphragms for the turbo-generators; and owing to the nature of this product, special techniques are required. The dry-sand is put through a knock-out grid, reconditioned, and fed by means of a supply belt to a Sandslinger; the patterns being placed on boards for ramming, then transferred for finishing and drying, and finally the moulds are cored and cast. Fig. 4 shows one of the five washing and bathing rooms available to the foundry force, whilst Fig. 5 illustrates the coremaking section staffed by female labour engaged on producing detail work. An operator need never leave the bench, for she controls her own sand supply by bringing into use an overhead plough from the feed belt. Completed cores are placed on a travelling belt and conveyed to the continuous drying stove, being returned *via* the blacking bench, radiant heat driers, and then distributed to the shop.

Typical Castings

Fig. 6 shows the top and bottom halves of a cylinder pattern. The castings made from them weigh 40 tons and the time taken to produce them (that is, for the skilled coremaker and moulder) is of the order of 3,000 hrs. Fig. 7 illustrates various types of castings manufactured; Fig. 8 shows the old method of de-coring; and Fig. 9 the same casting after treatment by the Hydroblast. This plant works by high-pressure water jets, at 1,750 lb. per sq. in. It eliminates the dust and dirty work usually associated with dressing shops. The plant usually operates in two portions, one of which is a turntable enabling several castings to be positioned before washing commences, and permitting the operator to work on the outside of the chamber. Outstanding points of interest are that the gun uses 50 galls. of water and 70 lb. of sand per min.

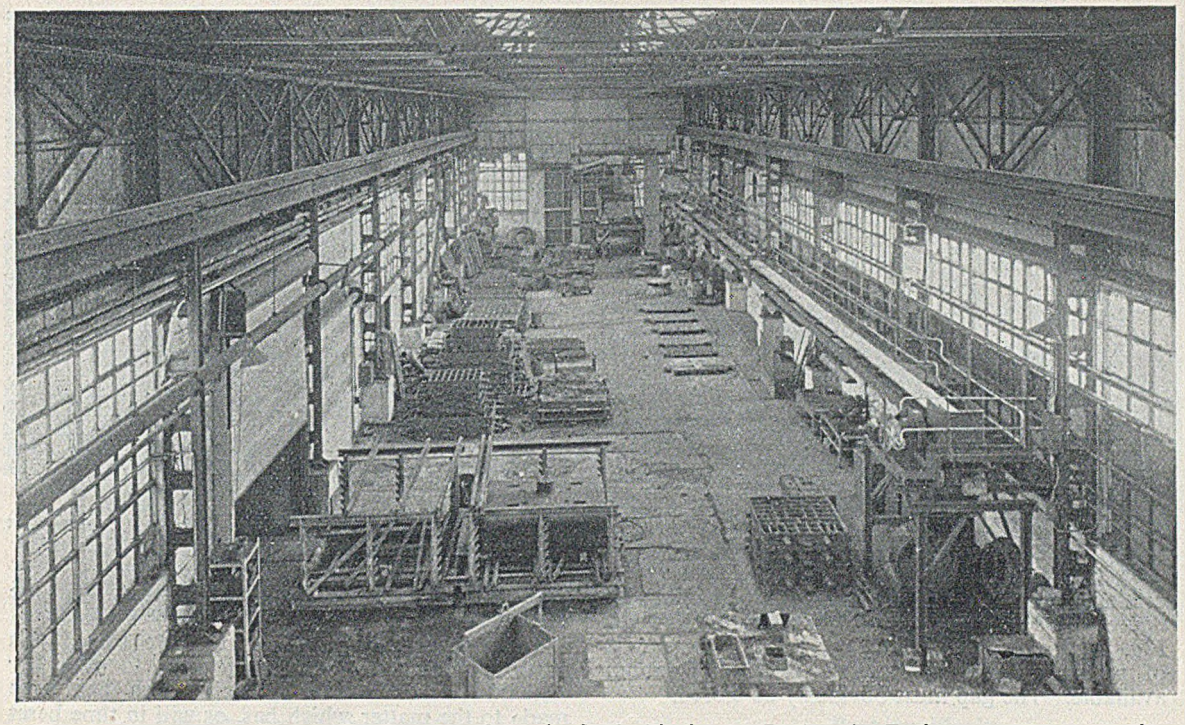

FIG. 3.—*Separate Section of the Foundry where the Static Diaphragm Castings for Turbo-generators are made.*

The speed of the jet is three miles per min. and water consumption 8,000 galls. per hr. Fig. 10 shows the pouring of a 75,000-kw. exhaust casing cylinder, weighing 58 tons, and using five ladles for its casting. The piecework price for this job is based on 6,500 hrs.

For servicing the foundry, there is a modern patternshop employing 90 skilled patternmakers, and 18 apprentices, so with these facilities available the management has unlimited scope for developing new ideas.

Skilled and Unskilled Labour

In pre-war days, there was the tendency to accept the position that production demands could be more than met by available labour, and providing that one was producing a sound economical unit there was no desire to make drastic changes, the staff being more or less bound by inherent difficulties in the processes to adopt a " safe " policy. The middle 'forties, however, saw a slump in foundry recruitment, added to which many old craftsmen reached retiring age and left the trade. So. to-day, whilst

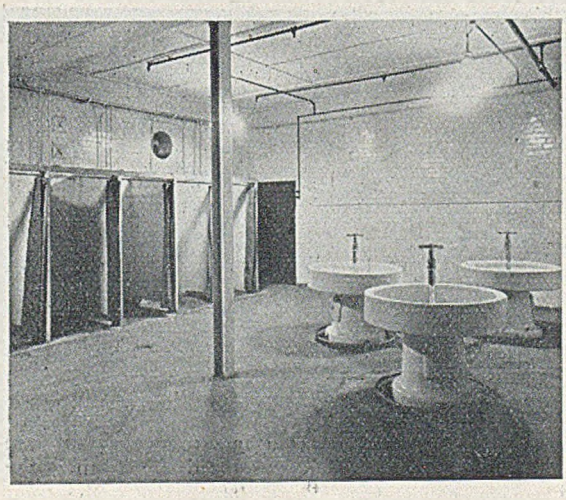

FIG. 4.—*One of the Five Washing and Bathing Rooms available to Foundry Operatives.*

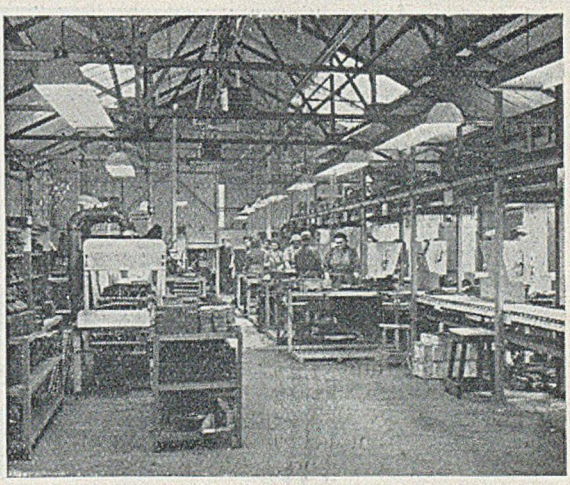

FIG. 5.—*Coremaking Section for Small Detail Work: it is staffed entirely by Female Labour.*

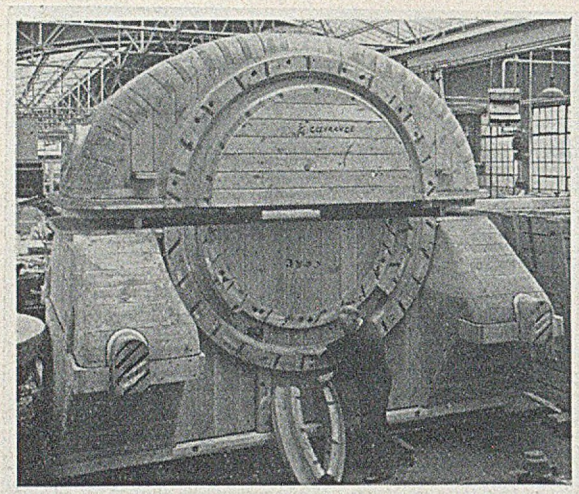

FIG. 6.—*Top and Bottom Halves of a Cylinder Pattern, the Casting from which weighs* 40 *tons.*

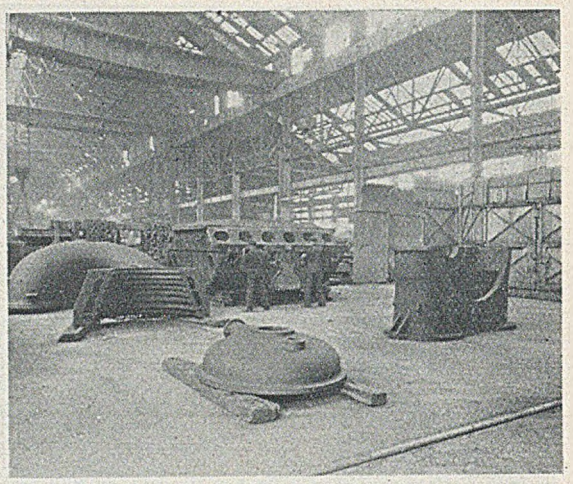

FIG. 7.—*Several of the Heavier Type of Castings in the Despatch Section ready for Shipment.*

production demands have soared, the skilled labour figure shows a tendency to sink to a dangerous level. Fig. 11 is a graph showing the relative movement of production demands against the skilled labour available. The gap must obviously be closed.

Only by changed methods or some other means could the management make the most of skilled hours. The problem which was already out of proportion became an even greater one, owing to the fact that with the present acute shortage of steel, fabricated jobs are daily returning to foundrywork, a position foundrymen naturally welcome, but one which can only be perpetuated by the production of sound economical components. Not from choice then is the management dealing with one of the most grievous troubles of the foundry to-day, *i.e.* lack of skilled craftsmen, and the need to conserve the skill of such available craftsmen to get the utmost from it.

The Authors do not claim to have solved this particular problem, but merely wish to offer for criticism, a means of approach which has been made to the matter which has, or will in time beset everybody. Briefly, then, the Authors are faced with the following factors:—(1) Intricate castings are to be produced; (2) there is a lack of skilled craftsmen and (3) a continued insistence is made for greater output. They are unfortunately aware that all foundry problems cannot be solved by mechanization, so they adopted another line of attack and called it (to coin a phrase) "simplification." This, then, is the keyword to the approach made. They now follow with a few of the problems encountered and the methods adopted to overcome them.

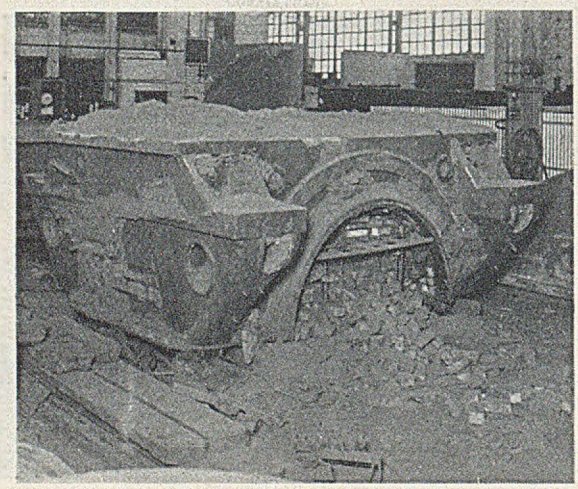

FIG. 8.—*Casting to be De-cored by Hand—the method used before installing the Hydroblast Plant.*

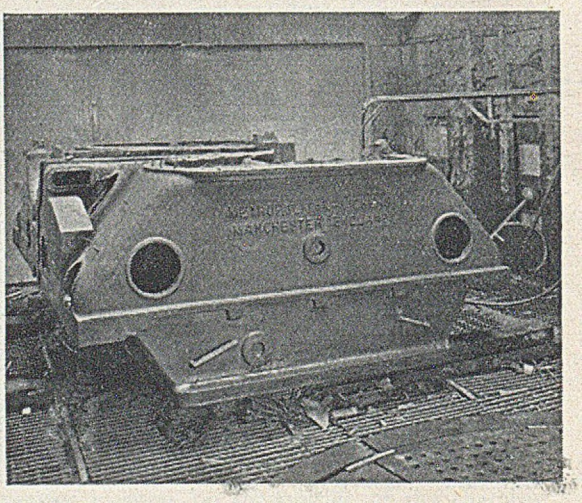

FIG. 9.—*Same Type of Casting as shown in Fig.* 8 *after Treatment in the Hydroblast Plant.*

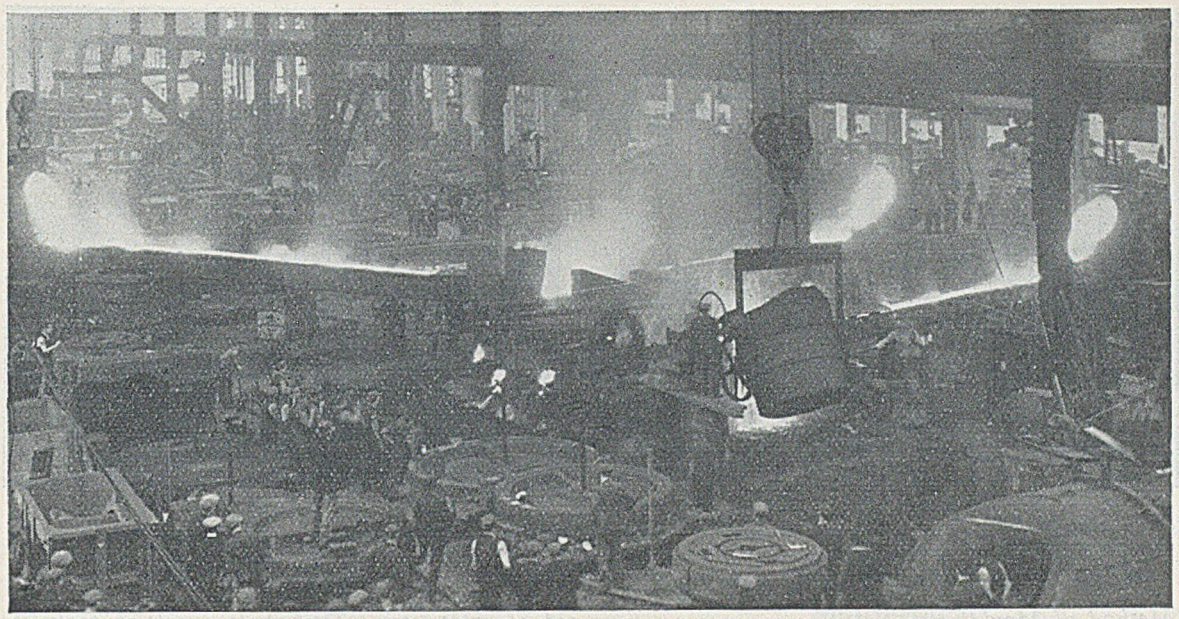

FIG. 10.—*Pouring of a 75,000 kw. Exhaust Casing Cylinder weighing 58 tons; Five Ladles were employed.*

Planning for Core-assembly

No claim is made that core assembly is revolutionary as a means of foundry production. It is a modern application to present-day needs, and comes within the sphere of usefulness of that very versatile mechanical aid—the sandslinging machine, from which the staff are all trying to get the utmost. The point must also be conceded that core-assembly is limited in its application, but realizing the importance of planning, and of studying a job at its inception, will certainly yield successful results. Even so, the application of core-assembly methods has limits. Opinions might be held that, even with a good coremaker, no two cores would be alike and that the question of dubious accuracy would exist. The Authors trust, however, that as they proceed with the various examples, at least some of this doubt will be eradicated among readers.

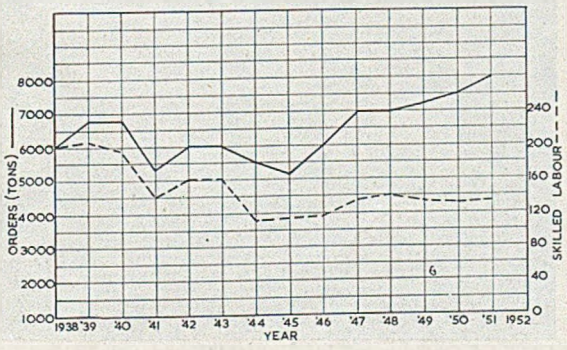

FIG. 11.—*Graph showing the Tonnage of Casting Orders related to Skilled Foundry Labour (since the pre-war period.)*

Packing Blocks

Fig. 12 shows a simple example of core-assembly, and one upon which the founder need spend little time thinking of method. This illustration is used, however, to show the advantage to be gained. Even a job of this description can be built up with cores and thus progress through the shop more speedily. The dimensions are:—Length 8 ft. 6 in.; depth 19 in. and width 18 in. For casting, 5,480 lb. of metal is required. The obvious method of manufacture would be to use a block pattern suitably printed for the cores, but urgency demanded that some quicker and simpler method should be found, and the following system was adopted:—The pattern equipment consisted of one main corebox to make the two outside cores, with the addition of a frame dowelled on the corebox to make the centre cores; a corebox for the T-heads; a set of prints, and a slab corebox. The cores were made in half-lengths 4 ft. 3 in., and it can be readily seen that such simple cores lend themselves to sandslinging practice in oil-sand, the T-heads being hand rammed.

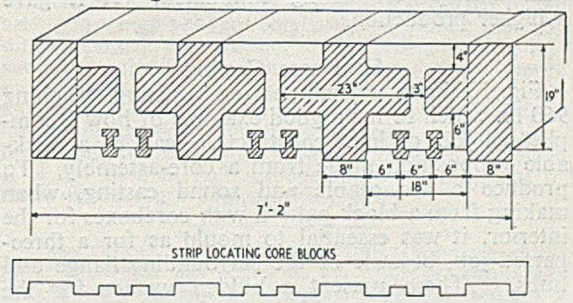

FIG. 12.—*Simple Method of Core Assembly for a Job 8 ft. 9 in. long, 19 in. deep and 18 in. wide, using over 2½ tons of Metal.*

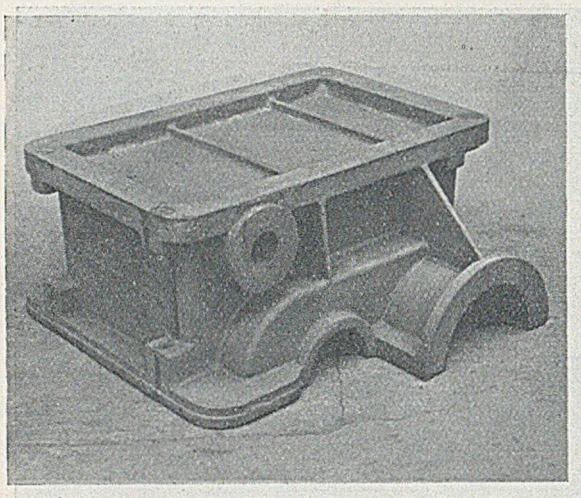

FIG. 13.—*Small Gear-case Casting weighing 8¼ cwt. —Ordinarily a Three-part Moulding Job.*

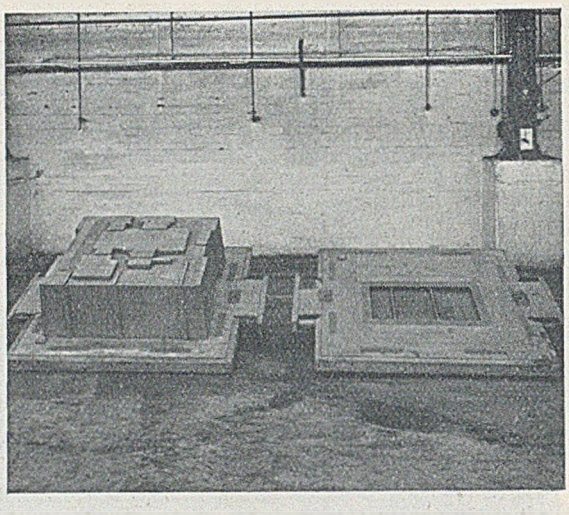

FIG. 14.—*Pattern Equipment for Producing the Casting shown in Fig. 13 by Core-assembly Methods.*

Method of Moulding.

A level, black-sand bed was made, 20 in. below floor level; the prints for cores were placed on the bed and located in their correct position, with gig strips one at each end. The bottom face of the mould was then rammed up and finished, and the prints withdrawn. The T-head cores were placed and sprigged, then the side and main cores were set in the prints, together with the slab cores covering each end. Two 1⅛ in. dia. ingates for each casting at one end had been arranged for during the making of the slab cores. The mould was then rammed up and jointed—a 10 by 7 ft. top part being used for covering. This had been bricked up as in loam practice, faced with loam and strickled level. Gating was arranged and this part dried. As soon as possible after casting, the top part was lifted off, and the burnt loam stripped off, after which the mould part was re-faced and dried. On the average, six casts were made before re-bricking the top-parts and one man, working two pits, arranged for a cast every other day. Two castings per day were made when using the block-pattern method, for which a corebox was required. With the core-assembly system, the corebox was modified, and patternmaking eliminated, yet it gave a higher production.

Gear-case Casting

Fig. 13 shows a small gear-case casting, weighing 960 lb. which forms a good example of how a complicated job, of light construction, can be a workable proposition made from a core-assembly. To produce a serviceable and sound casting, when making from a block pattern with coreboxes for the interior, it was essential to mould as for a three-parted job, because of the surrounding flange and hubs. These present a hidden surface for the moulder to finish, and to assemble his cores; and foundrymen are only too well aware of the work entailed—that is, in carrying middle-parts with the aid of grids, etc. The whole operation took 30 skilled hours to produce, plus time spent by unskilled men to strip the casting.

By core-assembly methods, using a pattern such as is shown in Fig. 14, new equipment was needed. This consisted of a tapered block on a board with prints, and also, of course, a top board. The runners were a permanent fixture. The pattern being set up (Fig. 15), the bottom was covered with facing sand and the job then completely rammed by sandslinging. The top part was gaggered, tightened by hand ramming and completed by sandslinging. Both parts were stoved in 4 hrs. The whole process was a semi-skilled operation. Fig. 16 shows the corebox equipment necessary for making this mould. They are of simple design and suitable for sand-

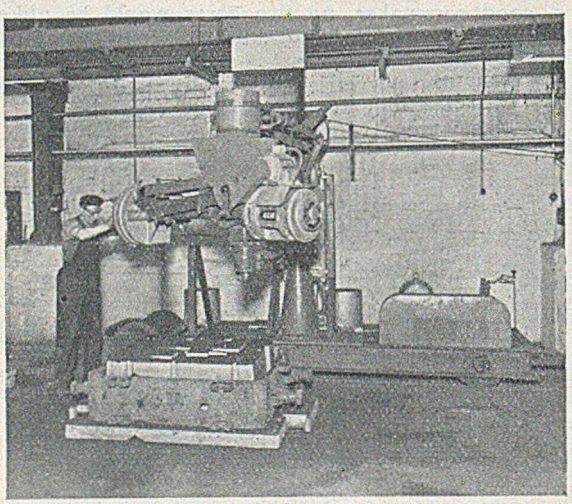

FIG. 15.—*Pattern shown in Fig. 14 set up for Ramming by Sandslinging. The Top-part was prepared in similar manner.*

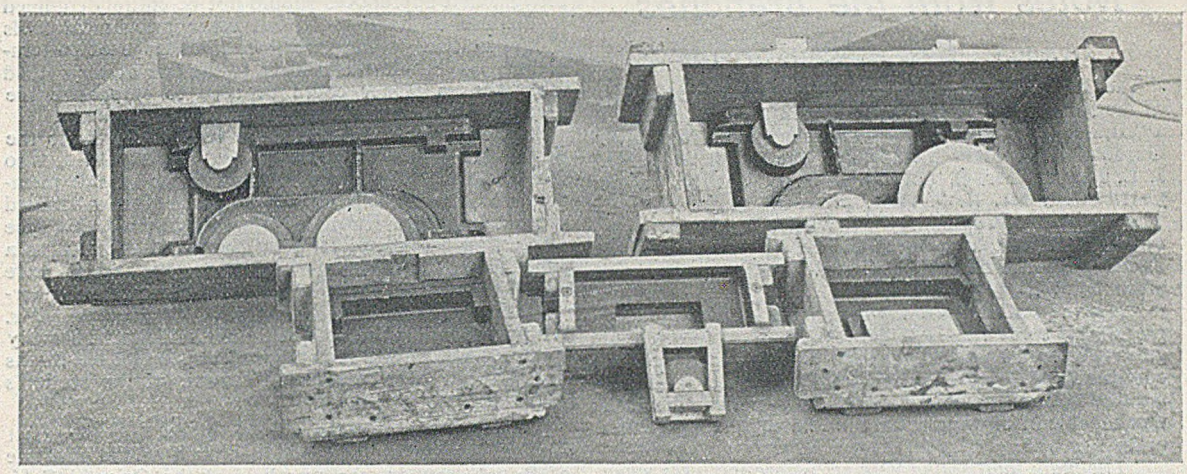

FIG. 16.—*Corebox Equipment complementary to the Gear-case Block Pattern shown in Fig.* 14.

slinging, and take three hours to produce. Fig. 17 shows the mould partly assembled within bearing cores, the body core, and the two side cores in position. The job required 12 hrs. plus three hours for cores, a total of 15 hrs., as compared with a total of 30 hrs. for making from block pattern; moreover, this method eliminated the number of unskilled hours required previously for releasing the grids, box-bars, etc. The result was a 100 per cent. increase of tonnage per man/hour, that is, two castings instead of one, and an operation established which called for much less skill.

Pattern details.

Owing to the pattern being set on boards and blocked, the cost of this was increased by 12½ per cent., but it was quickly offset by the number of castings required—20 on first order—and by the higher rate and reduced cost of production.

(*To be continued*)

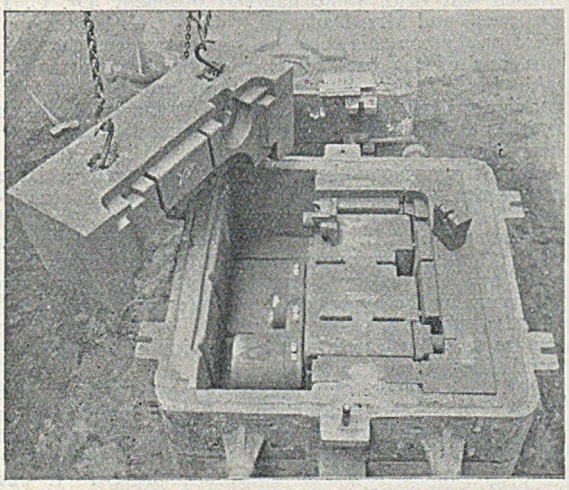

FIG. 17.—*Gear-case Mould partly assembled with Bearing Cores, Body Core and Two Side Cores in Position.*

"Vacuum Metalling" and "Cathode Sputtering"

A communication from the National Research Corporation, Massachusetts, U.S.A., states that a wide variety of metals and plastics can be plated or metallized by high vacuum evaporation. The evaporation technique differs greatly from "sputtering" with which it is often unwittingly confused. Commercial vacuum evaporation is comparatively new but is growing rapidly because of extremely low processing costs, brilliant finishes, and economical consumption of critical metals.

Articles to be coated are placed upon suitable jigs and introduced into the chamber which consists of a bell jar, or in large industrial units, a steel tank. A small amount of the coating metal is placed on filaments arranged in the chamber. The chamber is evacuated to the required degree of vacuum, and low voltage current is fed to the filaments which become incandescent and heat the coating metal to a point where it boils and vaporizes. The metal vapour thus generated condenses on the articles in the chamber, producing a bright coating of microscopic thickness. When the coating is applied to only one surface of an article, it may be held stationary in the chamber. When a number of surfaces must be coated or where irregularly shaped pieces must be completely covered, rotary jigs are employed.

The cathode sputtering process, although related to vacuum evaporation, differs in several aspects. In sputtering, the metal to be coated is transferred to the article by high-voltage bombardment rather than by direct thermal evaporation. Equipment required is similar to the evaporation unit except that a more moderate vacuum with provision for adding an inert atmosphere is required, and a high-voltage rather than high-amperage power supply is employed. The sputtering process is used mainly in work with precious metals. It is not used in high production, since the rates of metal transfer are comparatively low.

MASS PRODUCTION of the first Hungarian-made caterpillar excavator has begun at the transport equipment factory near Budapest. The machine is based on a Soviet design and is powered by a Diesel engine. Another new machine is the S-6 scraper, made by Dimavag, and is of standard design.

Notes from the Branches

London—East Anglian Section

The November meeting of the East Anglian section of the Institute of British Foundrymen took the form of a " Brains Trust," under the chairmanship of Mr. J. W. Gardom. The other members of the Team were Mr. J. L. Francis, Mr. B. Levy, Mr. W. L. Hardy, Mr. D. Carrick and Mr. R. J. Hart, president of the section. There were approximately 27 written questions submitted of a wide and varied nature, and an interesting discussion followed each question. Some of these are given below:

" *Has the Brains Trust any experience of core-blowing green-sand cores* ? "—The general impression was that green-sand cores were difficult to blow on conventional core-blowers, due to the high bond of green sand and reduced flowability, but a new type of American machine was capable of blowing green sand having green strength up to 7 to 8 lb. per sq. in.

" *The main fault found with resin core mixtures when used on core-blowing machines is the ' sagging ' condition encountered with ' stand up ' cores. Is the core binder at fault and can it be remedied* ? "—The team considered that resin-bonded cores did tend to sag more than oil-bonded cores, and this appeared to be one of the main difficulties with resins. It was suggested that if adequate reinforcement of the cores was employed, this would to some extent obviate the sagging.

" *Why do cast-iron mixtures containing steel give off sparks at the cupola spout* ? *Can any use be made of this* ? (e.g. *to indicate the change from one mixture to another).*"—Cast-iron mixtures containing steel which give off sparks at the cupola spout are usually associated with oxidation or over-blowing of the cupola. It is difficult to say what use can be made of this condition to indicate the change from one mixture to another, as the high-carbon/medium-silicon iron very rarely exhibits sparks at the spout; however, when the silicon approaches a basic minimum of 1.75 per cent. or lower, sparks are usually given off, and this should be a sign that some action should be taken.

" *It is an established fact that a casting which has been allowed to ' weather ' for a period will give much better service than one being used straight from the foundry. What information can the Team give as to the relationship between the ' period of weathering ' and ' mean casting thickness or weight '.*"—It was stated than " weathering " of castings had been an established practice over a good many years; however it was slow, and, where facilities allow, had to a large extent been superseded by low temperature heat-treatment. The Team did not agree that a casting which had been weathered gave better service than one which had come straight from the foundry. As far as the Team were aware, there was no relationship between the " period of weathering " and " mean casting thickness or weight."

" *In the selection and lay-out of plant and equipment, should the foreman's views be sought before or after the installation is completed* ? "—The general opinion seemed to be that the foreman or operators should be consulted before plant is installed, as it was reasonable to suggest that mechanical engineers see foundry equipment from an engineering viewpoint, and not entirely as foundrymen. Invariably, there were snags with the installation of new equipment which could be modified if free discussion were allowed before installation.

" *During the first two or three years of a pattern-maker's apprenticeship, does the Team consider that he should be allowed to use hand tools only* ? "—The Team thought that apprentices should not be entirely confined to the use of hand tools, but other mechanical tools should be used to improve their knowledge of pattern-making, as an additional asset to the use of their hand tools; thus a planer could be used to emphasize the accuracy necessary when using this type of tool.

At the close of the meeting, a vote of thanks to the Brains Trust was proposed by Mr. V. W. Child, who said that the section were indebted to the outside members for the excellent way in which they had handled the questions put forward. He thought that this type of meeting was particularly instructive in as much as a wide range of questions were asked, and the answers were supplied in non-technical language which could be understood by the more practical type of foundryman. Mr. Whipp, seconding the vote of thanks, said that he heartily endorsed Mr. Child's remarks, and hoped that the Brains Trust would be a permanent feature of the section's activities.

Annual Dinner.—The annual dinner of the East Anglian section of the London branch of the Institute of British Foundrymen was held at the Oriental Café, Ipswich. There were approximately 50 members present, including the president of the London branch, Mr. D. Graham Bisset, who was welcomed by Mr. R. J. Hart, president of the section. The entertainment was of an impromptu nature, several local artists taking part. The arrangements were in the able hands of Mr. H. S. Ward, senior vice-president of the section.

Tees-side

The Tees-side branch of the Institute of British Foundrymen is receiving excellent support from its members. The first meeting of the season took place on October 10, when the lecturer was Mr. H. P. Hughes, of Sheffield. His subject was " Controlling the Structure and Composition of Cast Iron by the Addition of Ferro-alloys." No doubt many of Mr. Hughes' listeners had had considerable experience with the inclusion of such alloys in cast iron, but the lecturer seemed to have covered all types. Many of those present were able, at discussion time, to seek advice from Mr. Hughes on the problems which arose from the addition of ferro-alloys.

On October 31, the annual social evening of the branch was held. The national president, Dr. C. J. Dadswell, and Mrs. Dadswell, with Mr. T. Makemson, were present on this occasion. It was agreed that this was one of the best social functions ever arranged, with Mr. Frank Shepherd, the branch secretary, proving a lively M.C., and Mr. E. W. Dowson, branch president, with Mrs. Dowson, had a good beginning to his year of office.

On Friday, November 14, there was again a large attendance when the paper " Progress with Synthetic-resin Sand Binders " was given by Mr. P. G. Pentz, of Southampton. Mr. Pentz previously gave this paper at the Annual Conference of the I.B.F. at Buxton this year, and also to the French Foundry Congress. On this occasion, he made additional reference to the " C " Process, which aroused a great deal of interest. The lecture was illustrated with a selection of exceedingly good slides.

Mr. J. R. Jones, of South Wales, who was to give a paper entitled " Production of Large Ingot Moulds from the Sandslinger in a Mechanized Foundry " at the branch's next meeting on December 12, was unfortunately unable to do so because of illness. It was accordingly agreed that films would be shown instead, and among those chosen was a coloured sound film " A Case for Handling."

Evolution of Engineering and High-strength Irons*

By M. Ballay, D.Sc.

This brief survey describes a number of grey irons which are to-day available to the designer, indicating the essential characteristics of each type. For detailed information, reference should be made to specific papers, covering one or other of the materials and properties discussed.

As a particularly inexpensive material, grey cast iron still offers the engineering designer the advantage of providing sound castings even of complex shape, and of good machinability; they are also superior to steel in wear resistance. For the metallurgist, grey cast iron is characterized by the presence of graphite and the absence of hard particles of iron carbide. For the engineer, it is above all an easily-mouldable material, and one which machines well and gives good service under frictional stresses, dry or lubricated, much better than most ferrous alloys. The impression that grey iron is necessarily brittle and lacks the capacity for plastic deformation and elongation is widespread. Moreover, for many designers, cast iron is still a material which can only work under light loads in service.

Grey iron has developed greatly during the last thirty years and none of the above characteristics is now generally valid except mouldability, ease of machining, and wear-resistance. Some cast irons can withstand considerable shock loads without fracture and undergo appreciable plastic deformation. Others possess tensile, or static bending strength allowing them to be used under the same loading conditions as steel. The heat-treatments capable of being applied to certain irons have likewise widened the field of their application.

Methods of Recording Values

Some of the properties of grey iron are easily expressed numerically; others, however, can only be defined with greater or less accuracy. The mechanical properties are defined by the numerical values of the tensile strength, capacity for plastic deformation, impact and fatigue strength. It is proposed to give for the various types of iron the salient characteristics, which are defined and denoted as follow:—The tensile test gives: (RT), ultimate tensile strength in kg. per sq. mm. (× 0.635 = tons per sq. in.); (ET), elastic limit in tension in kg. per sq. mm.; and (A per cent.), percentage elongation before fracture in tension. In practice, for most of the grey irons known until four years ago, and not following Hooke's law, the elastic limit and elongation values were rarely stated, since these were not conveniently measurable. The advent of spheroidal-graphite grey iron has radically changed the situation.

It should be pointed out that for the normal run of grey cast irons, the tensile test is significant only if it is made with adequate precautions to avoid parasitic stresses, which would cause premature failure. The static transverse test likewise furnishes a strength characteristic, the ultimate bending strength, generally expressed in kilograms (or lb. for the British counterpart) for a test-piece of standardized shape and cross-sectional area, and, additionally, a characteristic of plastic deformation—which is the ultimate bending deflection. In this Paper, the results of bending tests on Fremont samples of 8 by 10 by 35 mm., broken between 30-mm. centres, are given, for which RF signifies the total breaking load in kg. and fF the deflection in mm. To-day, in most countries, including France, a transverse test sample is used of circular section of great length compared with the diameter, but such a test-piece is not suitable for all types of irons, particularly the spheroidal-graphite grey irons. Thus the Author in this Paper gives preferably only results obtained on the Fremont sample.

Other Tests

Impact strength can be measured in different ways. In this Paper, the work of impact is stated in terms of m.kg. per sq. cm. of useful section necessary to fracture with one blow a test-piece of 10- by 10-mm. section set between 40-mm. centres according to whether the test-piece is or is not notched. The following indications are given:—(KNE), impact energy of fracture in m.kg. per sq. cm. of effective cross-section of the plain test-piece; (KE2), impact energy of fracture as above, for Mesnager sample with a 2-mm. notch; and (KE5), impact energy of fracture as above for VF sample with a 5-mm. notch.

The fatigue limit, determined in rotary bending (equality of stress on either side of zero) will be shown in kg. per sq. mm. by the symbol LF. The ratio $r = \frac{LF}{RT}$ (the fatigue limit/ultimate tensile strength) will also be used. The hardness, which is easily measured and often gives valuable information, will be stated in the following symbols:—(HB) for the Brinell test (750 kg. load with a 5-mm. ball or 3,000 kg. with 10-mm. ball) or (HV) for the Vickers test, which is particularly suited to heat-treated irons. Shear strength is stated as the unit fracture load in shear, (RC) in kg. per sq. mm. The use of small samples (5.64 mm. (0.22 in.) dia.) enables this to be measured on samples from the actual castings or on cast-on coupons.

* Paper presented to the Fourth International Mechanical Engineering Congress. The Author is a past-president of the *Association Technique de Fonderie Française.*

Evolution of Engineering and High-strength Irons

Unalloyed Grey Irons

The irons used at the beginning of this century had tensile strengths (RT) which often did not exceed 6 tons per sq. in. Many irons even to-day have strengths of the order of 9 tons per sq. in. and they are satisfactory in most cases; they are easy to machine; their abundant graphite gives them good anti-friction properties, and when the castings are liberally dimensioned, they satisfactorily resist the stresses to which they are subjected. When it is necessary to increase the working load, *i.e.*, to have a lighter structure or use higher unit stress, the designer requires stronger irons. To satisfy this requirement, the ironfounder has means available, increasing in variety with the increasing demands on strength. He can control the origin and composition of the original pig-iron; add steel to the cupola charges; lower the carbon content; or use special improving processes. In France, the current specifications for the minimum properties of the irons are as follow:—

RT.	Tons per sq. in.	RF.	RC.
14	8.89	360	16
18	11.4	480	21
22	13.9	580	25
26	16.5	700	30
30	19.0	820	35

These figures are obtained on separately-cast samples of diameters corresponding to the average thickness of the casting. Higher tensile strengths, exceeding 22 tons per sq. in. (ultimate) can be obtained with unalloyed irons, but the user should ask the founder if the castings he requires can be furnished sound in these high-duty irons in the thicknesses desired; if they will exhibit no machining difficulties and what ratio exists between the strength of the actual castings and of the separately-cast test-pieces.

Mechanical Strength.—If only mechanical strength be considered, it is tempting to endeavour to reduce the graphitic carbon content of the irons, since graphite is one of the causes of weakness. These low-carbon irons, 2.8 per cent. or less, give good tensile and transverse values, but the lowering of the carbon content has two undesirable results: (*a*) the fluidity, that is to say, the ability of the iron to fill the mould, diminishes as the carbon decreases, and (*b*) it becomes difficult to obtain castings free from specific faults. On the other hand, the frictional resistance, being related to the quantity of graphite, is reduced. A compromise is therefore necessary, between the properties demanded; "castability" (obviously the first consideration, since it is useless to have test-pieces giving high figures if the castings suffer from blowholes, draws and cracks); good antifrictional properties (which require for any given purpose a minimum free-graphite content and suitable structure); good tensile and bending strengths.

Wear Resistance.—For resistance to certain frictional loadings, it is desirable in addition to free carbon to have a certain degree of hardness, whence comes a fresh difficulty, since the more carbon present, the softer the iron becomes. With unalloyed irons it is difficult to exceed a Brinell hardness of 250 because it would be necessary to modify the composition and speed of cooling in such a way that free carbide would appear and this would cause machining difficulties. Further reference to this subject will be made.

Impact.—The impact strength of unalloyed grey iron is low and varies with the depth of the notch. The following are some figures referring to a good grade of engineering cast iron in current use (RT = 25 kg. per sq. mm., RF = 740 kg., HB = 241):—

KNE 0.28
KN2 .. .. .. 0.17 } m. kg. per sq. cm.
KN5 .. .. .. 0.20

The notch effect is more pronounced in samples tested under gradually-increasing static load. Notch effect (defined by the ratio of the breaking loads of the notched and plain sample respectively) is usually less in low-tensile than in high-tensile irons. The following results have been obtained from transverse test-bars broken between supports spaced 30 mm. apart, one (Fremont bar) having a rectangular cross-section of 8 by 10 mm., the other of square cross-section of 10 mm. side with a 2-mm. notch of 1-mm. bottom radius; both bars thus having the same useful cross-section of 8 by 10 mm. The values given below are for an unalloyed cast iron having a flake-graphite structure and a breaking strength in tension of RT = 25 kg. per sq. mm.; and a cast iron with spheroidal-graphite having a strength RT = 65 kg. per sq. mm.

	Breaking load in transverse (kg.).		Ratio A : B
	A Test bar 8 by 10 mm. plain.	B Test bar 10 sq. section 2 mm. notch.	
Cast iron with flake graphite, RT = 25 kg. per sq. mm.	750 to 720	570 to 565	1.29
Cast iron with spheroidal graphite, RT = 65 kg. per sq. mm.	3260 to 2980	1400 to 1320	2.28

Although high-strength cast irons are relatively more seriously affected by notching, their absolute strength values are nevertheless higher.

Fatigue.—Similar observations can be made on the fatigue limit, *e.g.*, in the alternating-stress test on a rotating sample. Although the experimental results obtained diverge rather widely, it may be stated that in general:—(*a*) For a polished, plain sample, the fatigue limit, LF, varies according to the type of iron between 0.50 and 0.35 of the ultimate tensile strength, the ratio, r = LF:RT, being higher for the grades of lower tensile strength, although the absolute fatigue limit usually increases with the tensile breaking load; (*b*) the ratio of the fatigue limits for the plain and notched samples, respectively, also increases with the quality

of the iron, as represented by the ultimate tensile strength. From nearly unity for irons with a strength of 14 kg. per sq. mm. (9 tons per sq. in.) it may rise to above 1.30 for an ultimate tensile strength of 30 kg. per sq. mm. (20 tons per sq. in.). It is obvious, therefore, that to get the best results from a high-grade cast iron, the design of the casting should be carefully studied to avoid notch effect as far as possible.

Vibration.—A further important consideration is the vibration-damping effect. This increases with the graphite concentration and particle size, *i.e.*, with decreasing static strength: the higher the ultimate tensile strength the nearer the logarithmic decrement of the damping approaches that of steel. It is generally considered advantageous to have a high damping-capacity in castings subjected to considerable vibration, since this reduces the real stress values, as in the case of crankshafts. Here again, the shape of the casting should be adapted to and suitable for the characteristics of the material. Generally, the elastic modulus in tension and the damping-capacity, are inversely related. It may be recalled that the modulus of elasticity of steel is in the region of 20,000, while ordinary, unalloyed grey cast iron has a modulus between 6,000 and 14,000, at least for low stress values; since, as already indicated, the stress/strain diagram has no true straight-line section.

Alloyed Cast Irons

Having exhausted all possibilities for the improvement of grey cast iron by proper selection of the primary materials, melting technique, method of working, or cooling rate, further progress is only practicable by recourse to the addition of alloying constituents. The effect of the various special additives is complex and the results obtainable are widely divergent. Only the latter will now be briefly summarized as inducing:—

(*a*) Greater homogeneity (uniformity) of the castings, by reducing the difference in mechanical properties of portions of the casting of varying thickness. This homogeneity may be obtained by simultaneously increasing the hardness of thick and thin parts; but by suitable selection of special additives (chromium, molybdenum, nickel, etc.) in relation to the percentage of normal constituents (carbon, manganese, silicon), it is possible to increase the hardness and strength of the thicker parts while reducing the hardness of the thinner parts in order to improve machinability.

(*b*) Increase of hardness to the limit of machinability, by the methods already used for unalloyed cast iron. This effect of increased hardness is obtained by controlling the constituent associated with the graphite, without permitting the formation of iron carbides. In some cases, remarkably high wear-resistance can be obtained by this means. The additives permit the machining of castings up to 300 Brinell hardness, while with ordinary cast iron, as has been mentioned previously, machining becomes difficult at a Brinell hardness exceeding 260, owing to the presence of hard carbide areas.

(*c*) Increased tensile, shear, transverse and fatigue strength. Additions of molybdenum, nickel, chromium, etc., can improve the mechanical properties of a cast iron, by their effect on the graphite, but particularly on the accompanying constituent; this is an effect well familiar from the example of alloy steels. Without giving elaborate detail, the highest mechanical strength values may be cited, which have been obtained in castings without heat-treatment (or, at most, after simple annealing, having rather the effect of stress-relieving). The so-called acicular cast irons (2.9 to 3.1 per cent. C, 2 per cent. Si, 1 per cent. Mn, 1 per cent. Mo, 1.2 to 2.0 per cent. Ni) of the nickel-molybdenum type, in thicknesses of 1 to 1.6 in., show the following values:—RT, 45 to 52 kg. per sq. mm.; RF, 950 to 1,100 kg; KNE, 0.5 m.kg. per sq. cm.; and HB, 300 to 340. These cast irons are machinable up to a hardness of 340 Brinell, owing to the absence of carbides, the increased hardness being due to a pearlite/bainite transformation.

(*d*) The addition of special alloying constituents permits, or at least considerably facilitates, the application of heat-treatment, which will be dealt with in the next section.

These various results are obtained to a greater or lesser extent, by the separate or simultaneous addition of chromium (0.2 to 1.5 per cent.), molybdenum (0.1 to 1.25 per cent.), nickel (0.5 to 5 per cent.), sometimes copper (0.2 to 1.0 per cent.) to grey cast iron of carefully-selected composition. Being expensive, the additions should be used judiciously and with high-grade cast iron only. If these requirements be duly observed, there should be no difficulty in finding an economical solution for any particular problem.

Methods of Heat-treatment

If it be required to produce machinable castings which, for reasons of wear or friction in service, have to have a greater degree of hardness than that possessed by the untreated irons mentioned above, recourse must be had to some method of heat-treatment. Ordinary cast irons are seldom heat-treated, and the technique has only been developed recently with the introduction of alloyed cast irons. If the hardness is to be increased by thermal treatment, *i.e.*, heating to 800 to 850 deg. C. followed by quenching in water or oil, unalloyed cast iron will be found to respond very badly, either developing cracks or failing to attain the desired degree of hardness. Special alloy constituents improve the thermal behaviour of the iron, allowing the rate of cooling after heating to be much reduced, compared with the cooling speed required for ordinary cast iron; by this means cracking can be avoided. It is possible to obtain cast irons which harden sufficiently by simple air-cooling after heating. This considerably simplifies the treatment and permits application to complicated castings of very variable thickness.

Heat-treatment can be applied in different ways, it being assumed that the castings are intended

to be machined at some stage in their manufacture, *e.g.*:—

Cast irons machinable as-cast and heat-treated subsequently by heating and quenching.

Let the hardness in the as-cast state be, for instance, less than 260 Brinell, and capable of being increased by quenching, to above 400 Brinell. Controlled heat-treatment under selected conditions will relieve the stresses and reduce brittleness. The following is an example of results obtained from a cast iron containing 2.90 per cent. C, 1.0 per cent. Mn, 1.55 per cent. Si, 2.23 per cent. Ni.

	H B.	RC.	RF.
As cast	255	36.7	830
Oil-quenched from 825 deg. C.	450		
Oil-quenched from 825 deg. C., Tempered at 425 deg. C.	340	55.7	920

Cast Irons with Spheroidal Graphite

Cast irons with spheroidal graphite, possessing some remarkable properties, are the subject of a Paper [to the Stockholm Congress] by Dr. A. B. Everest, and only their principal characteristics will be recapitulated here. All the types of cast iron hitherto discussed contain graphite in a more or less developed flake form, in particles with more or less sharp ends, practically excluding any possibility of plastic deformation. The development of processes enabling the flake-type graphite to be converted into the spheroidal form, has considerably furthered progress in cast iron technique. The spheroidal graphite may be accompanied by pearlite (as-cast), ferrite (irons subjected to a short annealing at 700 to 740 deg.), or mixed ferrite and pearlite (irons either as-cast or after controlled annealing). The following table summarizes the characteristics being obtained at the present time, and the minimum corresponding requirements listed in design specifications:—

Iron.	H.B.	Tensile.			Resilience sample, 10 by 10 by 55 mm.	Static transverse (Fremont sample).		Shear.	Design specification.		
		RT.	ET.	A per cent.		RF.	fF.	RC.	RT.	ET.	A per cent.
A. Pearlitic	280	58 to 75	42 to 66	1 to 2	0.8 to 1.2	1900	0.4	68	58	42	1
B. Ferrite and pearlite	200	50 to 58	38 to 44	5 to 10	2 to 5	1800	2.2	43	50	38	5
C. Ferrite	175	42 to 48	32 to 40	10 to 18	10	1550	4.0	37	42	32	10

Recourse may also be had to a more-highly-alloyed cast iron which is harder in the as-cast state due to the formation of martensite, but free from carbides. Annealing at about 600-650 will reduce the hardness to 300 to 340 Brinell, making the material machinable. The cast irons mentioned in the last section, which are hard in the as-cast state, can be softened by heat-treatment for machining, and then air-hardened to a hardness exceeding 400 Brinell. These are, in fact, self-hardening cast irons, resembling the self-hardening nickel steels, and giving a very even hardness. Quite delicate castings can be tempered in this manner, *e.g.*, air-cooled cylinders for internal-combustion engines.

Heat-treatment being essentially applicable to cast iron with a high content of free graphite, it may be said, in general terms, that the problem of obtaining a hard and at the same time machinable cast iron, has been solved by the development of alloyed irons capable of taking a martensitic quench. Heat-treatment may be localized and not extended over the whole casting. The heat may be applied in different ways—superficially by means of a blow-pipe, or by high-frequency current, or locally by immersion in lead or salt baths. By this means, surface-hardness values up to 450 Brinell, have been obtained. Such treatment is applied to crankshafts, camshafts, etc. Some alloyed cast irons containing chromium, molybdenum and aluminium, can be hardened by nitriding, *i.e.*, by heating in a stream of ammonia at about 525 deg. C. for 50 to 70 hrs. The nitrided layer is very hard (up to 1,000 Vickers) and wear-resistant, the thickness being a few tenths of a millimetre.

These cast irons, in addition to their very favourable mechanical characteristics, both in regard to tensile strength and capacity for deformation before fracture, are also capable of giving sound and non-porous castings, frequently better than those attainable in steel. Their machining qualities are high; with equal hardness and tensile strength, the alloyed irons are the more easily machinable, as has been particularly appreciated in the United States.

Such new types of cast iron appear suitable in substitution for:—(*a*) Cast iron with flake graphite where the mechanical strength of the latter is inadequate, but it is desired to retain the characteristics of a cast iron—castability and frictional resistance—imparted by the graphitic structure; (*b*) unalloyed cast steel where very high strength or resilience are not required, for sound castings of complicated shape having reasonable frictional properties; and (*c*) malleable-iron castings where a higher limit of elasticity is desirable or the wall thicknesses are considerable.

Cast iron with spheroidal graphite is similarly suitable for heat-treatment by hardening and tempering, enabling the highest strength values possible for grey iron to be obtained. The following strength values were obtained by the Author* with nickel/molybdenum cast iron containing spheroidal graphite, after annealing and tempering:—

Sample I: HB, 375; RT, 112; ET, 100; A per cent., 0.5; RF, 2,320; and KNE, 1.5. Sample II: HB, 500; RT, 130; and RF, 2,730.

* Ballay, Chavy and Grilliat: "Some Properties of Cast Irons containing Spheriodal Graphite," 14th Foundry Congress, Paris 1951; *Fonderie*, 1951, No. 68, pp. 2589-2604, and No. 69, pp. 2636-2662.

Corrosion-resisting and Special-duty Cast Iron

The addition of chromium, copper or nickel, in amounts of the order of 1 per cent., has but little effect on the corrosion resistance of cast iron. To obtain any definite improvement, it is necessary to aim at an austenitic structure, calling for substantial percentages of chromium, manganese, nickel and copper. Considering only grey cast irons, the austenitic Ni/Cu/Cr types called "Ni-Resist" in Great Britain and the United States, may be cited. The principal types, with flake graphite, have the percentage compositions listed below:—

	Type I.	Type II. with 20 per cent. Ni.	Type III. with 30 per cent. Ni.	Type IV. (30/5/5).
C	max. 3.00	max. 3.00	max. 2.75	max. 2.60
Si	1.00 to 2.50	1.00 to 2.50	1.00 to 2.00	5.00 to 6.00
Mn	1.00 to 1.50	0.80 to 1.50	0.40 to 0.80	0.40 to 0.80
Ni	13.50 to 17.50	18.00 to 22.00	28.00 to 32.00	29.00 to 32.00
Cu	5.50 to 7.50	max. 0.50	max. 0.50	max. 0.50
Cr	1.75 to 2.50	1.75 to 2.50	2.50 to 3.50	4.50 to 5.50

The ultimate tensile strength and hardness values are:—Type I: RT, 18 to 30; HB, 130 to 190. Type II: RT, 18 to 30; HB, 130 to 190. Type III: RT, 17 to 25; HB, 120 to 150. Type IV: RT, 17 to 25; HB, 150 to 180.

These cast irons machine well and their resistance to certain forms of corrosive attack, *e.g.*, by dilute acids, is 200 to 400 times greater than that of ordinary cast iron. Cast iron of Type IV is moderately resistant to tarnishing and scaling. All these irons, excepting Type IV, are non-magnetic. A further type of cast iron, called "Minvar," may be cited, of the following percentage composition: C, max. 2.4 per cent.; Si, 1 to 2; Mn, 0.4 to 0.8; Ni, 34 to 36; Cu, max. 0.5; and Cr, 0.10 max. It has a low coefficient of thermal expansion, *viz.*, 3.9×10^{-6} between 10 and 100 deg. C., while ordinary grey cast iron has a coefficient of about 12×10^{-6}. This type of cast iron is used where the dimensions of the casting have to be maintained within narrow limits, *e.g.*, in precision machine-tools and measuring instruments or gauges. It is also possible to produce austenitic cast irons having a high coefficient of thermal expansion, of the order of that of light alloys. Austenitic irons can also be produced with a spheroidal-graphite structure, having the same resistance to corrosion, but higher mechanical strength; *e.g.*, in the as-cast condition:—RT, 43 to 45; ET, 27 to 28; A per cent., 12 to 16; and HB, 155.

Resistance to Wear and Friction

Opinions on the wear-resistance and frictional properties of cast irons, vary exceedingly, and are often contradictory; which may be explained by the variety of conditions of service and the lack of testing machines for reproducing such conditions. It is recognized that there is no direct relationship between the hardness of any iron, and its frictional properties: metals as different as blister steel or tempered steel, and tin-base anti-friction metals, have a similarly high wear-resistance, although their Brinell hardness differs in a ratio of 100:1. However, in the case of grey cast iron, experience indicates certain characteristics by which selection may be guided. These may now be summarily reviewed in an examination of the possibilities offered by the different types of cast iron already described; it is assumed that the parts in question are not required to withstand any high degree of wear before becoming unfit for service (parts of crushers are in a different class; they need to withstand highly-abrasive loading and impact shocks which set up high unit pressures):—

(*a*) The graphite content of grey cast iron aids its property of self-lubrication and prevents seizing. A pearlitic cast iron has a better frictional behaviour than a heat-treated steel of the same degree of hardness. Austenitic nickel/chrome steels have a very moderate wear resistance, while austenitic nickel/chrome cast irons behave like ordinary, grey cast iron.

(*b*) The graphite structure plays an important part. In cast irons with flake graphite, the presence of long and regular flakes or bands is considered favourable. The so-called "inter-dendritic" or eutectic form graphite structure (Type "D" of the A.F.S. and A.S.T.M. classifications in the United States) should be avoided, since it only allows of low unit loads before the appearance of grooving and seizing. Cast irons with a spheroidal-graphite structure, more particularly with a high content of graphitic carbon, appear to behave better under friction than those with a flake-graphite structure.

(*c*) It is often said that the soft cast irons of some forty years ago had a better wear-resistance than modern types; however, it is the frictional conditions which have changed. Ferritic grey iron (HB 170) with a coarse graphitic structure, may give satisfactory results if well lubricated and working under low unit loads. For heavier loads, it is inadequate, and it is agreed that pearlitic irons (HB 200) are preferable for such purposes. Ferrite in particular should be avoided if the graphite is present in the form of inter-dendritic or eutectic form varieties. A small percentage of carbide or phosphide eutectic is not harmful, provided no machining difficulties are entailed.

(*d*) With further increasing loading, the hardness must also be increased and, with due regard to machining stresses, recourse must be had to alloyed irons or to heat-treatment. The example of cams, push-rods, bearings, some crankshafts, lathe beds, etc., will be familiar.

(*e*) A high degree of hardness is only desirable if unaccompanied by brittleness, which would lead to cracking and fretting of the material. Cast iron with a coarse graphite structure should always be stress-relieved by annealing. Cast iron with a very fine flake or spheroidal-graphite structure is less sensitive to this form of attack, and appears to be a suitable material for the highest loads hitherto permitted with grey cast iron generally. Some useful results have already been obtained with such material, in gear wheels of a variety of types.

News in Brief

A NEW DIESEL erecting shop is nearing completion at the Stafford works of W. G. Bagnall, Limited, locomotive engineers.

AN EXTENSION estimated at £200,000 is nearing completion at the Universal Grinding Wheel Company, Limited.

EIGHT SENIOR APPRENTICES from Birmid Industries Limited are to visit the British Cast Iron Research Association at Alvechurch on January 28.

OVER 600 GUESTS attended the first of two parties for children of employees at the works canteen of Ley's Malleable Castings Company, Limited, Derby.

THE BOARD OF TRADE announces that the Token Import Scheme will continue in 1953 for imports from Canada and the U.S. virtually on the same basis as in 1952.

THE WEST RIDING OF YORKSHIRE branch of the Institute of British Foundrymen announced that the closing date for the S. W. Wise Memorial Competition, 1952-53, is February 9.

THE 10,000-TON UNION CASTLE LINER, Llandovery Castle, which ran between South and East Africa, was brought into the Inverkeithing yard of Thos. W. Ward, Limited, last week for breaking up.

THE FIRM of H. W. Hobson Limited, Wolverhampton, famous for its contributions to early motoring history, which included Claudel-Hobson carburetters and Pognon plugs, celebrates its silver jubilee on January 15.

REDUCED BUYING PRICE FOR TUNGSTEN ORE.—The Ministry of Materials announces that from December 30, its buying prices for tungsten ores of standard 65 per cent. grade and ordinary quality will be: Wolframite 370s. and scheelite 360s., both per long ton unit c.i.f. U.K. port.

RAPID MAGNETIC MACHINES, LIMITED, held their annual social on December 9, when two further members were inducted into the "25" Club. Admission into the club is only possible after 25 years' service, and is open to all employees. A sum of money for each year of service is also awarded.

SEVEN BELLS at St. Werburgh's Church, Derby, have been bought by John Taylor & Company, bell founders, Loughborough, and their removal began last Monday. The bells have been silent for 50 years, as it was found unsafe to ring them. One bell was cast in 1605, and the six others were cast in 1845.

THE THIRD Summer School of Welding organized by the British Welding Research Association will be held at Ashorne Hill, near Leamington Spa, Warwickshire, from Monday, April 27 until Saturday, May 22. This year, the general theme of the school is welding fabrication and production.

WEST KESTEVEN (LINCS) RURAL DISTRICT COUNCIL has taken up with the Ministry of Housing and Local Government an intimation by Stewarts and Lloyds, Limited, and the United Steel Companies, Limited, that about 550 houses will be required for employees in the Colsterworth area during the next 15 years.

AT A CEREMONY held on January 3, in the canteen of J. Blakeborough & Sons, Limited, engineers and valve makers, Woodhouse Works, Brighouse, Mr. Robert A. Blakeborough, the 71-year-old acting chairman of the firm, who has himself 56 years' service with the firm, presented awards to 37 long-service workpeople.

IN CONSEQUENCE of a "very advantageous offer" from the Iron and Steel Federation to buy tram-track scrap steel at £12 per ton (double the current price) if 6,000 tons can be recovered before September this year, the Birmingham Corporation has decided to accept the contract and to put the work in hand by the end of January.

EXCEEDING its previous record by more than £1,000,000, the Power-Gas Corporation, Limited, of Stockton-on-Tees, has booked orders during the past year to the total value of nearly £7,000,000. The company caters principally for capital equipment for the iron and steel, chemical, gas, petroleum, and edible oil industries.

MR. VINCENT JOBSON, chairman and managing director of Qualcast Limited, Derby, presented clocks to four employees with 20 years' service, and to four with ten years' service. The annual social gathering and donation of long-service awards took place at the King's Hall, Derby, on January 2. Among those present were Mr. H. Clarke, works manager; Mr. E. J. Appleby, secretary; Mr. J. Higgins, general manager (group finished products) and Mr. A. C. Malcolm, general manager (finished products division) Derby.

WEDNESBURY AND DARLASTON section of the National Trades Technical Society is making an attempt to revive the local Foundry and Patternmaking Society which has been dormant for some time. The revived organization will aim at increasing the industrial knowledge of workpeople by such means as discussions on factory problems, lectures, and visits to local firms. The section already has in operation subsidiary societies of a like nature, for electricians and engineers, and now wish to make such facilities available to foundrymen. At the meeting on January 5 the section showed technical films.

THERE IS SOME PESSIMISM in the Falkirk area about the future of the ironfounding industry. This is revealed in a report published by the local employment committee, which states there are now over 1,000 on the unemployment register, the highest for some time. This is principally due to short-time working, which has increased recently among foundry workers. There is a feeling in the industry that iron founding may not always be the main employing industry. The committee suggest the attraction of light industries would be to the future advantage of the Falkirk area. Normally, Falkirk's foundries employ a total of 8,500 workers.

RUBBER BODIES for wheelbarrows are announced by the Dunlop Rubber Company Limited. The thickness of the rubber varies according to the purpose for which the barrow is designed and the body is fastened to a skeleton steel frame mounted on the chassis. Tests prove that its flexibility prevents damage where the barrow is carrying something fragile and that where its contents tend to stick these can now be readily emptied. For all practical purposes the barrow is not affected by acids or alkalis, and it is both lighter than the ordinary barrow and stands up better to tough jobs. Apart from its usefulness to industry in general, the barrow can be specially adapted for heavy work.

SYNTHETIC RESINS are now well known to patternmakers as water-resistant wood glues and the foundry managers as binders for sand-cores. It is not so widely known that one resin adhesive, marketed under the name of "Redux," has superseded riveting on a considerable scale in the aircraft industry. In the "Comet" jet airliner, it is employed extensively. The importance of this development is emphasized by the visit to the United States of Dr. N. A. de Bruyne, managing director of Aero Research, Limited, makers of the "Resolite" brand of core-binders.

Correspondence

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

IRON AND STEEL BILL

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—I am surprised to learn (JOURNAL, January 1, 1953) that Mr. Crabtree alleges the industry has been kept in the dark. I should have thought that from the Press statements as far back as November, 1951, it was clear that iron foundries were involved. If Mr. Crabtree and others feel so strongly opposed to the Bill now, why did they not raise their voices then? Surely they had their opportunities even in March, and again in July when the White Paper was issued, to get their Associations to voice strenuously their opinions at the quarterly meetings of the C.F.A.

For Mr. Crabtree to blame Mr. Newman is to say the least most unjust. He forgets that Mr. Newman is acting as chairman and that he, with the members of the Council, take their instructions from the associations which go to make up the C.F.A. If local associations fail to brief their Council members adequately, then Mr. Crabtree, in blaming the C.F.A., must carry the matter to its logical conclusion and blame the local associations and probably even a step further and blame himself for not taking an active part in the proceedings of his associations.

The controversy over the Iron and Steel Bill brings out the fact that member firms of the associations have been far too lax in not showing sufficient interest in their association and when matters like this arise, are only too ready to blame others. Regarding "non-member firms," it only goes to show that it does not pay to "play the lone wolf." How can they expect the C.F.A. to interpret their views if they are not prepared to play their part?

I sincerely hope that this will make every foundry, big or small, tied or otherwise, join its appropriate association and what is more important, to take an active part so that their Council can and does speak with one voice in the best interests of the industry as a whole.—Yours, etc.,

MALCOLM J. GLENNY,
Director.

The Dover Engineering Works, Limited,
68, Victoria Street, London, S.W.1.

January 2, 1953.

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—I thank Mr. Scopes for his letter in your issue of December 25, and comment as follows:

1. I maintain that the Council of Ironfoundry Associations has a heavy responsibility for the dangerous position which has arisen. The Minister naturally feels encouraged by the support given him by the Council of Ironfoundry Associations. The Government of course has the ultimate decision in its hands, and must bear its share of the responsibility. In any case it cannot be denied that the Bill proposes to put a *permanent* statutory supervision on foundries for all time.

2. Mr. Scopes says: "It is a complete mis-statement to say 'it is now admitted that there is no need to come under the Bill to secure this protection'"—that is, to ensure adequate raw material supplies. Let us not forget that the foundries also require supplies of coke, coal, electricity and gas. Was it necessary in order to secure supplies of these materials and services that the foundries should be supervised under the Coal Nationalization Act, and so on? Of course it wasn't necessary, and it wasn't done. It did not inevitably follow that the Coal Board had no interest in, or responsibility for the raw material supplies of the iron foundries.

As to the suggestion that the best way to get the iron and steel industry out of politics is to marry two such incompatible partners as the steel works and iron foundries, I would suggest that as a matter of good organization it would be a much sounder and long-lasting job to deal with the blast-furnaces and steel works alone. Even in such matters as wage-negotiations the steel plants and iron foundries are not lumped together. The negotiations are quite separate. On the other hand, for wage purposes engineering and iron-founding *do* go together, and there has been quite a recent wage award of 7s. 4d. a week to both of them.

Be wise! Leave the foundries out of the Bill, just in the same way as engineering is left out.—Yours, etc.,

T. WHITTHAM,
Managing Director, Blakey's Boot Protectors Limited.

January 1, 1953.

IRON and STEEL BILL: WHOSE POWERS?

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—Referring to recent correspondence published in your JOURNAL, since when have the Council of Iron-foundry Associations had power to make far-reaching decisions and to negotiate about a Bill which could virtually take the control of foundries away from the private owner? In all the correspondence and debate over the Bill I have never yet seen it stated where in the C.F.A. constitution the power is given, or when members gave up their rights as directors of companies to control their own concerns. Non-members have certainly never given any authority to the C.F.A. If such powers are really vested in the C.F.A., it is time the members thought about who is to be the master and who the servant.

As a director, I will not, without protest, delegate to either a statutory board or to an association, however well-meaning, the right to take decisions which seriously affect the future of my company. I should expect my shareholders to take me to task if I let these decisions pass out of the proper hands.

Can any one be so naïve as to believe that the Bill will take the industry out of politics? Read what the Opposition said at the "Second Reading." There is no doubt that if they are returned, they will use the extension of control to extend re-nationalization. In other words, the Government will be strung up on their own yard-arm—do we want to be strung up with them? These manœuvres are surely a warning to other industries to keep a watchful eye on the officials and executives of their trade associations, as the Opposition will use this set-up to put them in a strait jacket.—Yours, etc.,

W. T. HOBKIRK,
Managing Director, J. Hobkirk, Sons & Company, Limited.

Ampthill Road, Bedford.
December 30, 1952.

(Correspondence continued overleaf)

Correspondence

BASIC- AND ACID-ELECTRIC STEEL

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—I read with interest the comments of Mr. Barnes on my paper published in the FOUNDRY TRADE JOURNAL of November 27, 1952. It is regrettable that persons holding responsible positions in the British foundry industry still appear unable to comprehend the purpose and content of even a purely descriptive and simply-written article.

The purpose of this article was to describe, with practical details, a balanced and highly-efficient melting unit, worked at rated capacity as a planned component in the production cycle of a modern steel foundry. It was never suggested by me that acid electric-melting practice was a recent metallurgical development, but that working with the practice was new to me, and that difficulties were *alleged* to be associated with the practice.

Though it is gratifying to note that, in 1936, Mr. Barnes produced, with the aid of 5,000 kva, an output of 3 tons in 50 min., which is equivalent to 1,700 kva per ton, this is considerably higher power input than the furnaces described in the article.

Regarding Mr. Barnes' remarks on the relationship of charge size with sulphur and phosphorus content of acid steel, it is obvious that he is quoting completely out of context, and I can only suggest that he should re-read the whole paragraph.—Yours, etc.,

L. W. SANDERS.
Lake & Elliot Limited,
December 31, 1952. Braintree, Essex.

Changes at Appleby-Frodingham

The United Steel Companies, Limited, announce the following impending changes at the Appleby-Frodingham Branch, Scunthorpe. Engineer Rear-Admiral C. W. Lambert, C.B., who is now general works manager, will retire at his own request on June 30, 1953. It is intended that he shall be succeeded by Mr. Albert Jackson, who is at present works manager (steel) and deputy general works manager.

Mr. T. P. Lloyd, B.Sc., A.I.M., T.D., has been appointed assistant works manager (steel), in which capacity he now assists Mr. Jackson. On July 1, consequent upon the appointment of Mr. Jackson as general works manager, Mr. T. P. Lloyd will be appointed works manager (steel).

Compensation to Ex-Serviceman

A moulder who was refused his job back at the Coltness Iron Company's works at Newmains, Lanarkshire, after R.A.F. service, was awarded compensation of £34 10s. (five weeks' pay) by Motherwell Reinstatement Committee on November 27. The firm claimed it could not re-employ him because of the redundancy and pending closure of the factory, but the moulder said he could have been switched from the steel foundry to the iron foundry, like others with less service.

Change of address. Since last Monday, all departments of Monsanto Chemicals Limited, sales division, have been housed at Victoria Station House, Victoria Street, London, S.W.1. Telephone: Victoria 2255.

Ferro-silicon Supplies

The Council of Ironfoundry Associations has recently been investigating the position regarding the supplies of ferro-silicon for use in iron foundries. The Ministry of Supply announced that the restriction on the importing of ferro-silicon would be lifted and that licences to import would be granted to individual firms from January 1, 1953. It seems, however, that most of the available supplies have already been purchased, and ironfounders have been invited to sign an agreement to continue to purchase their requirements through the British Iron and Steel Corporation, Limited, which is the purchasing agency of the British Iron and Steel Federation. Those ironfounders who have signed the agreement with B.I.S.C., Limited, will be free to revoke the agreement on December 31, 1953, provided notice is given by June 30, 1953. This means that consumers of ferro-silicon will have a year in which to make arrangements for privately importing their requirements in 1954. Licences to import ferro-silicon will be granted on the basis "first come, first served" but it is understood that provision will be made for a currency quota sufficient to cover all reasonable demands.

Distribution Plans for Nickel

The manganese/nickel/cobalt committee of the International Materials Conference has announced that its 14 member Governments have accepted a plan for the distribution of primary nickel and oxides in the first quarter of 1953. The recommended plan of distribution has been forwarded to all interested Governments for implementation.

As in the distribution plans for the last two quarters of 1952, provision has been made whereby any nickel allocated to, but not used by countries participating in the plan of distribution, will become available for purchase by consumers in the United States and other countries. Japanese production has reached a level which will permit the export in 1953 of a small amount of refined nickel.

The recommended allocations still fall considerably short of requirements and as a result, the committee's report to all Governments again stresses the need for strict economy.

I.M.C's Sulphur Allocations

The sulphur committee of the International Materials Conference has announced the allocation plan of crude sulphur for the first quarter of 1953, unanimously accepted by its member Governments. A statement issued by the I.M.C. in Washington said that a substantial improvement had taken place in the sulphur position over the last six months of 1952. This had been brought about both by an increase in production, and by some reduction in demand resulting from the fact that the level of industrial activity in many countries was lower than previously anticipated, from the increased use of other sulphur-bearing materials, and from various conservation measures.

In the first quarter of the year the United States and Canada are due to share between them 1,190,800 tons of sulphur. The United Kingdom is allowed 83,000 tons. The total to be distributed is 1,675,100 tons.

GOLD WATCHES have been presented to 280 employees of the Stanton Ironworks Company, Limited, Nottingham, for long service.

Pig-iron and Steel Production

Statistical Summary of October Returns

The following particulars of pig-iron and steel produced in Great Britain are from statistics issued by the British Iron and Steel Federation. Table I summarizes activities during the previous six months; Table II, production of steel ingots and castings in October, and Table III, deliveries of finished steel. Table IV gives the production of pig-iron and ferro-alloys in October, and number of furnaces in blast. (All figures weekly average in thousands of tons.)

TABLE I.—*General Summary of Pig-iron and Steel Production.*

Period.	Iron-ore output.	Imported ore consumed.	Coke receipts by blast-furnace owners.	Output of pig-iron and ferro-alloys.	Scrap used in steel-making.	Steel (incl. alloy).			
						Imports.[2]	Output of ingots and castings.	Deliveries of finished steel.	Stocks.[3]
1950	249	174	197	185	197	9	313	241	995
1951	284	170	206	186	175	8	301	243	585
1952—May	326	183	231	201	174	45	312	264	580
June	310	186	231	200	170	43	313	258	657
July[1]	306	194	233	202	150	38	274	221	762
August	300	194	232	202	151	31	280	213	816
September	318	198	234	209	184	30	330	275	783
October[1]	302	196	227	204	182	31	328	—	725

TABLE II.— *Production of Steel Ingots and Castings in October*, 1952.

District.	Open-hearth.		Bessemer.	Electric.	All other.	Total.		Total ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derby, Leics., Notts., Northants and Essex	—	3.8	11.1 (basic)	1.9	0.2	15.9	1.1	17.0
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire	1.7	20.5	—	2.0	0.6	23.5	1.3	24.8
Yorkshire (excl. N.E. Coast and Sheffield)	1.7	20.5	—	2.0	0.6	23.5	1.3	24.8
Lincolnshire	—	35.4	—	—	0.1	35.4	0.1	35.5
North-East Coast	1.9	60.6	—	1.3	0.5	62.3	2.0	64.3
Scotland	4.0	38.0	—	1.6	0.8	42.3	2.1	44.4
Staffs., Shrops., Worcs. and Warwick	—	17.6	—	1.2	0.8	17.7	1.9	19.6
S. Wales and Monmouthshire	6.4	53.5	5.8 (basic)	1.3	0.1	66.4	0.7	67.1
Sheffield (incl. small quantity in Manchester)	9.9	27.1	—	10.0	0.6	45.3	2.3	47.6
North-West Coast	0.6	1.1	5.3 (acid)	0.4	0.1	7.3	0.2	7.5
Total	24.5	257.6	22.2	19.7	3.8	316.1	11.7	327.8[1]
September, 1952	25.8	259.1	21.8	19.4	3.7	318.3	11.5	329.8
October, 1951[1]	24.9	232.8	22.2	17.0	3.7	290.3	10.3	300.6

TABLE III.—*Deliveries of New Non-alloy and Alloy Finished Steel.*

Product.	1950.	1951.	1951.	1952.	
			Sept.	Aug.	Sept.
Non-alloy steel:					
Ingots, blooms, billets and slabs[4]	3.6	4.0	4.6	4.5	4.9
Heavy rails, sleepers, etc.	11.3	10.1	10.6	8.4	10.9
Plates ¼ in. thick and over	40.0	41.0	42.9	35.1	47.1
Other heavy prod.	40.2	30.9	41.0	37.6	45.0
Light rolled sections and bars	47.6	47.1	49.1	40.2	54.2
Hot rolled strip	19.4	19.5	21.6	15.6	20.7
Wire rods	16.3	16.1	16.6	16.1	18.6
Cold-rolled strip	5.5	6.0	6.8	5.0	6.4
Bright steel bars	6.3	6.6	6.7	5.0	6.8
Sheets, coated and uncoated	30.5	30.4	31.7	25.4	33.4
Tin, terne and blackplate	14.3	13.8	15.5	12.1	16.4
Tubes, pipes and fittings	20.0	20.8	22.0	15.9	23.1
Mild wire	12.5	11.9	12.3	11.8	14.9
Hard wire	3.5	3.7	3.5	3.2	4.3
Tyres, wheels and axles	3.5	3.7	4.5	2.5	4.1
Steel forgings (excl. drop forgings)	2.2	2.3	2.4	2.9	3.0
Steel castings	3.5	3.8	2.4	3.9	3.9
Tool and magnet Total	[7]	[7]	[7]	0.4	0.6
Alloy steel:	10.6	12.1	12.4	12.4	15.6
Total deliveries from U.K. prod.[5]	290.8	292.8	306.6	258.0	333.9
Add: Imported finished steel	3.8	4.9	7.3	12.9	10.1
	294.6	297.7	313.9	270.9	344.0
Deduct: Intra-industry conversion[6]	55.6	56.9	60.8	59.1	70.8
Total net deliveries	239.0	240.8	253.1	211.8	273.2

TABLE IV.—*Production of Pig-iron and Ferro-alloys in October*, 1952.

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derby, Leics., Notts., Northants and Essex	24	—	16.7	23.1	1.5	—	41.3
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire	6	—	8.4	—	—	1.0	9.4
Yorkshire (incl. Sheffield, excl. N.E. Coast)	14	—	27.6	—	—	—	27.6
Lincolnshire	25	7.5	41.5	0.2	—	1.6	50.8
North-East Coast	9	0.8	13.1	3.0	—	—	16.9
Scotland							
Staffs., Shrops., Worcs., and Warwick	8	—	7.8	1.7	—	—	9.5
S. Wales and Monmouthshire	9	3.0	27.7	—	—	—	30.7
North-West Coast	8	10.7	—	0.2	—	1.1	18.0
Total	103	28.0	142.8	28.2	1.5	3.7	204.2[1]
September, 1952	103	26.6	148.2	28.3	2.1	3.4	208.6
October, 1951[1]	100	26.0	131.3	28.2	1.1	3.1	189.7

[1] Five weeks.

[2] Weekly average of calendar month.

[3] Stocks at the end of the years and months shown.

[4] Other than for conversion into any form of finished steel listed above.

[5] Includes finished steel produced in the U.K. from imported ingots and semi-finished steel.

[6] *i.e.*, Material for conversion into other products also listed in this table.

[7] Included with alloy steel.

Personal

THE INSTITUTION OF METALLURGISTS have pleasure in announcing that His Royal Highness THE DUKE OF EDINBURGH has graciously accepted election to honorary membership.

The United Steel Companies Limited announce that MR. C. R. BLICK, M.B.E., T.D., has been appointed assistant commercial manager of the Workington Iron and Steel branch.

MR. DAVID R. DUGUID, B.Sc., of Bridge of Allan, has been appointed engineer in charge of the construction of the new $7,000,000 hydro-electric scheme on the Bow River, Calgary, Canada.

MR. ANDREW BLYTH, general manager of William Mills, Limited, aluminium-alloy founders, of Wednesbury, Staffs, has been appointed a director, and joins the board as from January 1.

IT IS ANNOUNCED that MR. T. L. PURVES has been appointed Bristol branch manager of British Insulated Callender's Cables, Limited; MR. L. R. GREET has been appointed to a similar post at Cardiff.

MR. GEOFFREY WOODS has been appointed hon. secretary/treasurer of the Fan Manufacturers' Association as and from January 1. All communications should now be sent to Copthall House, Copthall Avenue, London, E.C.2.

MR. A. HAROLD PLEWS, a director of Neepsend Steel & Tool Corporation, Limited, Sheffield, returned recently from a round-the-world business trip, during which he visited all the principal cities of New Zealand and Australia.

LIEUT.-COLONEL H. RIGGALL, deputy chairman and managing director of Ruston & Hornsby, Limited, engineers and ironfounders, etc., of Lincoln, has been appointed a governor of the Loughborough College of Technology.

MR. S. B. RIPPON, general sales manager, heavy castings division of Newton Chambers and Company, Limited, Thorncliffe Ironworks, Sheffield, has been elected president of the Sheffield and District Iron Founders' Association.

THE ROVER COMPANY, LIMITED, announce that MR. H. HOWE GRAHAM, who has been a director for many years, has been appointed deputy chairman of the company, and MR. L. G. T. FARMER, the secretary, has been appointed to the Board as commercial director.

STEEL SUPPLY COMPANY (EASTERN) LIMITED, 57, High Street, Bedford, announce that MR. ERIC C. LOTT has joined their Board, as from January 1. For the past 17 years Mr. Lott has been chief purchasing officer to Britannia Iron & Steel Works, Limited, Bedford.

SIR MAURICE DENNY, BT., who is retiring from the chairmanship of Wm. Denny & Bros., Limited, Dumbarton, and Mr. John M. Denny and Mr. William Denny, who are retiring from the board, were presented with illuminated addresses and gifts by the staff and workers of the firm.

A PLEASANT CEREMONY took place last week at the Brown Square Iron & Brass Foundry, Limited, Belfast, the occasion being presentations to MR. JOHN MORELAND on his retirement after 45 years' service with the company, made by Mr. Philip B. Jamison, managing director, and Mr. James Black.

AT A CHRISTMAS DINNER given to long-service employees by C. & W. Walker, Limited, gasworks engineers and ironfounders, of Donnington (Salop), the directors presented a tankard to MR. GEORGE HARRIS, who is now 93 years of age and who served the company for 70 years—from 1873 to 1943.

MR. W. WILKINSON, of Hawick, has been appointed works manager of a giant new £4,000,000 plant recently brought into operation in Toronto by Frigidaire Products of Canada, which employes 1,800 people. Mr. Wilkinson served his time as an engineer with James Melrose & Sons, Hawick, and went to Canada as a service engineer.

MR. E. H. KINGDON, manager of the erection and services department of Baker Perkins, Limited, manufacturing engineers and ironfounders, of Peterborough, has returned home after a 30,000-mile business trip through eight countries, including the United States and South America, during the past three months.

MR. ELIJAH N. SHAW, for the past 25 years foreman of the iron foundry of Timsons, Limited, printers' machinery manufacturers, Water Street, Kettering, was presented by his colleagues with a clock on January 1, to mark his retirement. He went to Kettering from Sheffield in 1927 and has been a foundry worker for 62 years.

MR. W. E. S. TOOMEY has resigned his position as London manager for the chemical plant division of Cannon (Holdings) Limited, to join Howard Pneumatic Engineering Company, Limited, of Eastbourne. His address remains unchanged at 57-59, Victoria Street, London, S.W.1. MR. B. H. MOORE succeeds him as the London representative for Cannon (Holdings) Limited.

MR. A. G. E. BRIGGS, joint assistant managing director of Tube Investments Limited (Electrical Division), who was loaned to the Ministry of Supply as Deputy Controller of Supplies (Munitions Production) in March, 1951, relinquished this appointment on December 31, 1952, and has resumed his full-time duties with the company. It was announced in the Queen's New Year List that the honour of Knight Bachelor is to be conferred on Mr. Briggs.

DR. C. BOOTH, general manager of Steetley Brick Works, Worksop, has been appointed assistant managing director of the Oughtibridge Silica Firebrick Company. Also appointed to the Board is MR. T. R. LYNHAM, general manager of Oughtibridge Brick Works and vice-chairman of the Sheffield branch of the Institute of Clay Technology. The company's secretary, Mr. F. W. LEDGER, has been appointed a director of Bwlchgwyn Silica Company, Limited, and Shetland Minerals Limited.

Obituary

MR. ARTHUR HOLMAN, managing director of Holman & Company (Engineers), Limited, Glasgow, died recently.

MR. WILLIAM HENRY KRAUT, chief time clerk of the Staveley Iron & Chemical Company, Limited, Chesterfield, has died at the age of 56. He had been associated with the company for 35 years.

MR. ERNEST GEORGE SHERRATT, who for many years had been chief buyer of Bamfords, Limited, agricultural engineers, of Uttoxeter (Staffs), has died at the age of 68. He had been with the company for 54 years.

MR. ARTHUR CHARLES COOPER, who has died at the age of 70, was until his retirement at the end of 1945, secretary of the Birmingham District Engineering and Allied Employers' Association for over 40 years.

MR. CHARLES ROBERT CROMPTON, who was chairman of the Stanton Ironworks Company, Limited, Nottingham, from 1915 until his retirement in 1939, died on December 29 at the age of 83. He had served on the board of the company for 42 years.

TO ALL IRONFOUNDERS

IRON & STEEL BILL

DO NOT FORGET YOUR VOTING PAPER SHOULD BE SENT IN TO REACH THE SCRUTINEERS BY 12th JANUARY 1953

- *Whether you are a small or large firm*
- *Whether you support or object to the Bill*
- *Whether you are a member of a trade association or not*
- *Even if you have already stated your views elsewhere*

DON'T FAIL TO SEND IN YOUR VOTE

Wm. Asquith Ltd., Halifax
Austin Motor Co. Ltd., Birmingham
Bagshawe & Co. Ltd., Dunstable
Blakey's Boot Protectors Ltd., Leeds
R. W. Crabtree & Sons Ltd., Leeds
Crossley Bros. Ltd., Manchester
Dartmouth Auto Castings Ltd., Smethwick
Davey, Paxman & Co. Ltd., Colchester
Davis Gas Stove Co. Ltd., Luton
Gosforth Foundry Co. Ltd., Dronfield
J. Harper & Co. Ltd., Willenhall
Heeley & Peart Ltd., Newport, Mon.
Hepworth & Grandage Ltd., Bradford
Alfred Herbert Ltd., Coventry
Lake & Elliot Ltd., Braintree
Wm. Lee & Sons, Dronfield
Leyland Motors Ltd., Leyland, Lancs.
Morris Motors Ltd., Oxford.
National Gas & Oil Engine Co. Ltd., Ashton-under-Lyne
North British Locomotive Co. Ltd., Glasgow
Ransomes, Sims & Jefferies Ltd., Ipswich
Ruston & Hornsby Ltd., Lincoln
Shotton Bros. Ltd., Oldbury
W. Slingsby & Co. Ltd., Keighley
Textile Machinery Makers Ltd., Oldham
E. R. & F. Turner Ltd., Ipswich
Wellworthy Piston Rings Ltd., Lymington

New Year Honours

(continued)

of the Westinghouse Brake & Signal Company, Limited. He is also a director of H. Hewins, Limited, ironfounders and patternmakers, of Brimscombe (Glos.), and Westinghouse Garrard Ticket Machines, Limited, and president of the Engineering and Allied Employers' West of England Association. MR. W. D'ARCY MADDEN, chairman of the North-Western Regional Board for Industry. He is chairman and managing director of Hick, Hargreaves & Company, Limited, engineers and ironfounders, etc., of Bolton, and a director of the Manchester Ship Canal Company. MR. H. J. POOLE, chief superintendent of the Armament Research Establishment, Ministry of Supply; MR. A. READ, a director and secretary of Powell Duffryn, Limited; MR. F. V. SPARK, chief accountant, secretary, and, since January, 1943, a director, of Harland & Wolff, Limited; MR. A. H. TOPHAM, joint managing director of Mawdsley's, Limited, dynamo and motor manufacturers, of Dursley (Glos); MR. L. C. TYTE, deputy chief scientific officer, Fort Halstead, Ministry of Supply; MR. S. A. H. WHETMORE, lately joint managing director, Billingham Division, Imperial Chemical Industries, Limited.

O.B.E.

MR. F. G. BURRELL, chairman and joint managing director of Shipham & Company, Limited, brassfounders and coppersmiths, etc., of Hull; MR. B. CURRAN, a director of the Edward Curran Engineering Company, Limited, Cardiff; MR. J. A. CUTHBERTSON, managing director of Jas. A. Cuthbertson, Limited, agricultural engineers, etc., of Biggar (Lanarkshire); MR. J. W. DRINKWATER, assistant director of engine research, Ministry of Supply; MR. J. O. M. FISHER, general manager of the Humber Graving Dock & Engineering Company, Limited, Immingham; MR. A. GRIFFITHS, production director and general manager of F. Perkins, Limited, Diesel-engine manufacturers, of Peterborough; MR. W. K. HALL, general manager of the Billingham Division of Imperial Chemical Industries, Limited; MR. G. L. HOPKIN, senior principal scientific officer, Ministry of Supply; MR. H. JOHNSTON, chief engineer of the North-Eastern Gas Board; MR. I. MADDOCK, principal scientific officer, Ministry of Supply; MR. A. C. NICHOLSON, chairman and managing director of W. N. Nicholson & Sons, Limited, agricultural and general engineers, etc., of Newark (Notts).

M.B.E.

MR. H. V. BATTEN, lately senior scientific assistant, British Museum; MR. A. G. BOOTH, chief technical engineer of Humber, Limited, Coventry; MR. J. F. BOOTH, managing director of the Hepworth Iron Company, Limited, Hazlehead, Sheffield; MR. T. M. CAMERON, a director of Alex. Findlay & Company, Limited, bridge builders, etc., of Motherwell; MR. S. DOMVILLE, works manager, Curran Steels, Limited, Cardiff; MR. A. ELSON, accident prevention officer, Samuel Fox & Company, Limited; MR. I. F. FISHER, works manager, British Timken, Limited, Duston, Northampton; MR. F. FLETCHER, manager, special technical productions, General Electric Company, Limited, Wembley; MR. T. GUTHRIE, technical manager of Swan, Hunter & Wigham Richardson, Limited, Wallsend (Northumberland); MR. J. L. HAMILTON, personnel manager of the Northern Aluminium Company, Limited, Rogerstone (Mon.); MR. F. HERDMAN, engineer manager, gun mounting department, Vickers-Armstrongs, Limited, Barrow-in-Furness; MR. H. S. JONES, chief engineer, Round Oak Steel Works, Limited, Brierley Hill (Staffs); MR. L. A. JOUNING, works manager, Aron Electricity Meter, Limited, Kilburn, London, N.W.6; MR. H. MOLIVER, personnel manager, Craven Bros. (Manchester), Limited, machine-tool makers, etc.; MR. B. L. NEWBOULD, manager of the steel melting department, Thos. Firth & John Brown, Limited; MR. C. PARKER, a director of the Raleigh Cycle Company and Sturmey-Archer Gears, Limited; MR. C. H. C. PAYNE, construction designer, Billingham Division of Imperial Chemical Industries, Limited; MR. J. H. PLUMMER, senior experimental officer, Armament Design Establishment, Ministry of Supply; MR. J. H. POLSON, steelfoundry moulding shop superintendent, David Brown Foundries Company, Penistone, Sheffield; MR. E. SALTHOUSE, chief draughtsman, electrical drawing office, Harland & Wolff, Limited, Belfast; MR. E. SAUNDERS, lately works manager, Silvertown Works, Imperial Chemical Industries, Limited; MR. R. SMITH, head foreman electrician, Cammell Laird & Company, Limited, Birkehead; MISS N. SULLIVAN, senior experimental officer, Department of Scientific and Industrial Research; MR. T. S. WOOD, chief draughtsman, electrical department, John Brown & Company, Limited, Clydebank.

(Concluded on (Advt.) page 29)

Ironfounders' Ballot

The Council of Ironfoundry Associations, commenting on the ballot which has been organized at the instance of a group of companies which dissent from the inclusion of iron castings in the Government's Bill to denationalize the steel industry and set up a supervisory Board for both the iron and steel industries, confirm that ironfounders throughout the country are being asked to vote "Yes" or "No" on the question: "Are you in favour of the inclusion of your ironfoundry under the supervision of the Iron and Steel Board, as proposed in the Bill?" In the opinion of the Council, this is an over simplified way of seeking an opinion on a most complex subject. The Government firmly decided, they state, that the casting of iron should be included in the Bill. From this decision, there is no appeal nor escape apart from an adverse vote in the House of Commons. Moreover, the inclusion of iron castings in the Bill has a very important bearing on ensuring the ironfounders' representation on the Government's proposed Board, and the supply of the ironfounders' raw materials. Both would be prejudiced to the disadvantage of the ironfounding industry were iron castings excluded from the Bill, it is contended.

Council's statement continues by pointing out that they have sought and obtained the Minister's agreement to promote amendments removing incidental features of the Bill that were obnoxious to ironfounders as a whole, *e.g.*, drastic limitation of the Board's power to control prices or development schemes and that it is unfortunate that the ballot paper put out by this small minority of companies takes no account of these facts. They are of the opinion that both the industry and the public can hardly fail to see in this "Have-you-stopped-beating-your-wife—Yes-or-No?" ballot an entirely unwarranted attempt to disturb the Government's aim of removing the iron and steel industry from politics and securing a workable, lasting and just solution of the vexatious and unsettling conditions caused originally by steel nationalization. They conclude by adding that, in any event, a postal ballot on these points is useless as a means of arriving at the true and responsible opinion of the industry on the Government's policy.

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Raw Material Markets

Iron and Steel

The year 1952 brought changed conditions to the foundry industry. At its opening, all foundries had plenty of business on hand and the volume of orders which was being placed was sufficient to ensure capacity production. Both home and export demands for castings were heavy, and the only drawback in achieving maximum outputs was the insufficiency of raw materials, particularly pig-iron and scrap. Hand-to-mouth working was the order of the day, as stocks had been eliminated. To add to the difficulties of the foundries in securing adequate tonnages of pig-iron, priority in the supply of basic pig-iron was essential to enable the steel industry to maintain production, owing to the severe shortage of scrap, and these supplies have been largely responsible for the gratifying outputs of steel which have been obtained.

The blowing-in of several new furnaces during the year for the production of basic pig-iron relieved considerably the raw material position at the steelworks and enabled them to restart melting furnaces which had been out of commission. Additional tonnages of pig-iron are still needed by the steelmakers before maximum outputs can be attained, and more new furnaces are expected to be brought in during 1953 for this purpose, as the prospect of obtaining an appreciable increase in the quantities of scrap is not very promising.

Until the latter half of the year all foundries were inundated with work, but restrictions in export markets have had a serious effect on some establishments, chiefly the engineering foundries which cater for the motor, tractor, and allied trades, and the foundries connected with the Diesel-engine and textile industries, all of which have suffered a sharp reverse in business. The recession has also affected indirectly many other units providing castings for oversea markets, while business at home has declined for such articles as heating and cooking stoves, refrigerators, etc., for which castings are supplied by the light foundries.

The new year opened with many foundries badly needing work to maintain full production; some are now working a four-day week, while other have found it necessary to suspend some of their operatives. A revival in export business is hopefully anticipated, as well as the removal of restrictions to assist the home trade. In the meantime, some foundries are better off for work than others. Foundries catering for the shipbuilding industry and for the steelworks and a number of the speciality and jobbing foundries are busy, but generally orders are scarce and difficult to obtain.

Supplies of pig-iron are about sufficient for current needs, and the blowing-in recently of three more furnaces in the Derbyshire area for the production of high-phosphorus pig-iron will add appreciably to available supplies of this grade. Scrap supplies are on an improved scale, but there is still a good demand for the better and heavier grades of cast-iron scrap.

Coke supplies are adequate, and ganister, limestone, and firebricks can be secured to cover requirements.

The re-rollers are receiving a fair amount of work from home consumers for small sections, bars, and strip, in which they are offering reasonable deliveries, as now that their export business has declined they are able to concentrate on home requirements. Very few orders are being placed for merchant bars and light sections for shipment oversea, and none can be expected until United Kingdom prices are on a competitive basis with those of foreign producers. Sheet rollers are exceptionally busy, and are giving priority to home needs, although they have as much work on hand for oversea buyers as quotas and outputs permit. Many re-rollers are still short of semi-manufactured steel.

Demand for plates, particularly thicknesses of ¼ in. and under, is far in excess of production. Alloy and free-cutting steels continue in short supply.

Non-ferrous Metals

The main feature of the non-ferrous metal situation last week was the reopening of the zinc futures market, which had remained closed for more than 13 years. A revised timetable of dealing times enabled a reasonable turnover to be put through in all three metals, mid-day 'Change ending at 12.40. Much speculation had naturally occurred about the level at which business in zinc would develop, but in the event the first deal was put through at £90, after which the quotation firmed up on the preponderance of buying orders. At the close of the mid-day session January was quoted at £95 10s. to £96, while April shipment was £2 cheaper.

It is unfortunate that on the very first day of the resumed dealing in zinc a backwardation should develop and it is much to be hoped that this will not be of long duration. That it should be there at all is somewhat astonishing, for very large stocks of zinc exist in this country. Unfortunately the bulk of this reserve is in the hands of the Government, which, probably rightly, is determined to do nothing to depress the price. It would, however, be much healthier if the trade held more zinc and it would appear that the consumers must make up their minds to build up their stocks and to maintain longer cover. In fact they will almost certainly find that this will be necessary for the days of provisioning by the Ministry of Supply are over.

Official prices in zinc were as follow:—

January—January 2, £95 10s. to £96; January 5, £92 10s. to £93; January 6, £89 10s. to £90; January 7, £89 10s. to £90 10s.

April—January 2, £93 10s. to £94; January 5, £89 10s. to £90; January 6, £88 15s. to £89; January 7, £88 15s. to £89.

In the early part of last week the lead market was very strong. Bear covering was in evidence on fears of a prolonged shortage of metal due to the labour troubles at the Broken Hill smelters, where production had been suspended since Christmas. Later in the week a modest reaction was seen. Encouraged by the strength of the London market, the price in the United States firmed up considerably, reaching 14¼ by the end of the year. This is equal to £118, so that, with due allowance made for freight, import duty, etc., on metal shipped to America, it can be said that the two markets are approximately in alignment. As things are at the moment U.K. consumers probably feel they are being held to ransom, but in present circumstances it would not appear that there is much they can do about it.

Official prices for refined pig-lead:—

January—January 2, £103 10s. to £104; January 5, £104 to 104 10s.; January 6, £102 to £103; January 7, £99 10s. to £100.

April—January 2, £100 10s. to £101; January 5, £101 to £101 5s.; January 6, £98 15s. to £99 5s.; January 7, £96 15s. to £97.

The following were the official tin quotations:—

Cash—January 2, £949 to £950; January 5, £950 to £952; January 6, £946 10s. to £947 10s.; January 7, £944 to £944 10s.

Three Months—January 2, £943 to £943 10s.; January 5, £943 to £943 10s.; January 6, £939 to £940; January 7, £937 to £938.

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered, unless otherwise stated)

January 7, 1953

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £13 1s. 6d.; Birmingham, £12 15s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £16 8s., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £15 5s. 9d.

Scotch Iron.—No. 3 foundry, £15 19s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £17 14s. 6d. South Zone, £17 17s.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £18 14s. 6d.; South Zone, £18 17s.

Cold Blast.—South Staffs, £18 2s.

Hematite.—Si up to 2½ per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. Coast and N.-W. Coast of England, £16 2s.; Scotland (Scotch iron), £16 8s. 6d.; Sheffield, £17 3s.; Birmingham, £17 9s. 6d.; Wales (Welsh iron), £16 8s. 6d.

Basic Pig-iron.—£13 19s. all districts.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered.)

Ferro-silicon (6-ton lots).—40/55 per cent., £57 10s., basis 45% Si, scale 21s. 6d. per unit; 70/84 per cent., £86, basis 75% Si, scale 23s. per unit.

Ferro-vanadium.—50/60 per cent., 22s. to 28s. per lb. of V.

Ferro-molybdenum.—65/75 per cent., carbon-free, 10s. to 11s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, £204 to £210 per ton; 38/40%, £235 to £265 per ton.

Ferro-tungsten.—80/85 per cent., 27s. 6d. to 28s. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 30s. 8d. to 35s. per lb. of W.

Ferro-chrome (6-ton lots).—4/6 per cent. C, £85 4s., basis 60% Cr, scale 28s. 3d. per unit; 6/8 per cent. C, £80 17s., basis 60% Cr, scale 26s. 9d. per unit; max. 2 per cent. C, 2s. per lb. Cr; max. 1 per cent. C, 2s. 2½d. per lb. Cr; max. 0.15 per cent. C, 2s. 3½d. per lb. Cr; max. 0.10 per cent. C, 2s. 3¾d. per lb. Cr; max. 0.06 per cent. C, 2s. 4d. per lb. Cr.

Cobalt.—98/99 per cent., 20s. per lb.

Metallic Chromium.—98/99 per cent., 6s. 5d. to 7s. 6d. per lb.

Ferro-manganese (blast-furnace). — 78 per cent., £48 12s. 11d.

Metallic Manganese.—93/95 per cent., carbon-free, £262 to £275 per ton; 96/98%, £280 to £295 per ton.

Ferro-columbium.—60/75 per cent., Nb + Ta, 40s. to 60s. per lb., Nb + Ta.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £25 4s. 6d.; tested, 0.08 to 0.25 per cent. C (100-ton lots), £25 14s. 6d.; hard (0.42 to 0.60 per cent. C), £27 12s.; silico-manganese, £33 8s.; free-cutting, £28 8s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £31 9s.; case-hardening, £31 17s.; silico-manganese, £34 9s. 6d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £29 8s.; basic, hard, over 0.41 up to 0.60 per cent. C, £30 8s.; acid, up to 0.25 per cent. C, £31 17s.

Sheet and Tinplate Bars.—£25 3s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £29 14s.; boiler plates (N.-E. Coast), £31 1s. 6d.; chequer plates (N.-E. Coast), £31 3s.; heavy joists, sections, and bars (angle basis), N.-E. Coast, £27 17s.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested, £31 15s. 6d.; flats, 5 in. wide and under, £31 15s. 6d.; hoop and strip, £32 10s. 6d.; black sheets, 17/20 g., £41 12s. 6d.; galvanized corrugated sheets, 24 g., £52 9s.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £50 18s. 3d.; nickel-chrome, £71 7s. 9d.; nickel-chrome-molybdenum, £79 2s. 6d.

Tinplates.—57s. 1½d. per basis box.

NON-FERROUS METALS

Copper.—Electrolytic, £285; high-grade fire-refined, £284 10s.; fire-refined of not less than 99.7 per cent., £284; ditto, 99.2 per cent., £283 10s.; black hot-rolled wire rods, £294 12s. 6d.

Tin.—Cash, £944 to £944 10s.; three months, £937 to £938; settlement, £944 10s..

Zinc.—January, £89 10s. to £90 10s.; April, £88 15s. to £89.

Lead.—Refined pig-lead: January, £99 10s. to £100; April, £96 15s. to £97.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £117 5s.; rolled zinc (boiler plates), all English destinations, £115 5s.; zinc oxide (Red Seal), d/d buyers' premises, £136.

Other Metals.—Aluminium, ingots, £166; magnesium, ingots, 2s. 10½d. per lb.; antimony, English, 99 per cent., £225; quicksilver, ex warehouse, £70 10s. to £71 (nom); nickel, £454.

Brass.—Solid-drawn tubes, 26¾d. per lb.; rods, drawn, 37d.; sheets to 10 w.g., 291s. per cwt.; wire, 32⅞d.; rolled metal, 277s. 9d. per cwt.

Copper Tubes, etc.—Solid-drawn tubes, 32⅜d. per lb.; wire, 317s. 9d. per cwt. basis; 20 s.w.g., 346s. 3d. per cwt.

Gunmetal.—Ingots to BS. 1400—LG2—1 (85/5/5/5), £195 to £218; BS. 1400—LG3—1 (86/7/5/2), £205 to £238; BS. 1400—G1—1 (88/10/2), £320 to £375; Admiralty GM (88/10/2), virgin quality, £325 to £380 per ton, delivered.

Phosphor-bronze Ingots.—P.Bl, £350 to £385; L.P.Bl, £250 to £275 per ton.

Phosphor Bronze.—Strip, 413s. 3d. per cwt.; sheets to 10 w.g. 435s. per cwt.; wire, 49⅜d. per lb.; rods, 44½d.; tubes, 42½d.; chill cast bars: solids 4s., cored 4s. 1d. (C. CLIFFORD & SON, LIMITED.)

Nickel Silver, etc.—Ingots for raising, 2s. 9d. per lb. (7%) to 3s. 10½d. (30%); rolled metal, 3 in. to 9 in. wide × .056, 3s. 3d. (7%) to 4s. 4½d. (30%); to 12 in. wide × .056, 3s. 3½d. to 4s. 4½d.; to 25 in. wide × .056, 3s. 5½d to 4s. 6½d. Spoon and fork metal, unsheared, 3s. 0d. to 4s. 1½d. Wire, 10g., in coils, 3s. 9¼d. (10%) to 4s. 10½d. (30%). Special quality turning rod, 10%, 3s. 8½d.; 15%, 4s. 1½d.; 18%, 4s. 6½d. All prices are net.

Forthcoming Events

Institution of Works Managers

Manchester branch:—"A Different Way of Looking at the Process of Management," by W. B. D. Brown, 6.45 p.m., at the Grand Hotel.

Purchasing Officers' Association

London branch:—"Temperature Measuring Instruments, with some Reference to Automatic Temperature Control," by H. F. Barnes, 6.15 for 6.30 p.m., at the Royal Society of Arts, John Adam Street, W.C.2.

JANUARY 13

Institution of Production Engineers

Birmingham graduate section:—"Lecture on Lecturing," by R. Parmenter, 7 p.m., at the James Watt Memorial Institute, Great Charles Street.

Beeston Boiler Foremen's Association

"2,000 Years of British Coins," by H. Pegg, 7.30 p.m., in the Canteen, the Beeston Boiler Company, Limited, Mona Street, Beeston, Notts.

JANUARY 14

Institute of British Foundrymen

Scottish North-eastern section:—"Flow of Metal," T.S.35 film and report presented by E. M. Currie, 7.30 p.m. at the Imperial Hotel, Keptie Street, Arbroath.

Southampton section:—"Synthetic Resins in the Foundry," by P. G. Pentz, 7 p.m., at the Southampton Technical College, St. Mary Street.

Institution of Production Engineers

Edinburgh section:—"Simplification for Production," by A. B. Brown, 7.30 p.m., at the North British Station Hotel, Princes Street.

Northern Ireland section:—"American Production Methods," by C. W. Williamson, 7.30 p.m., at the College of Technology, Belfast.

Preston section:—"Materials-handling Techniques," by W. M. Hiorns, 7.15 p.m., at the Victoria Station Hotel, Fishergate.

JANUARY 15

Institute of British Foundrymen

Birmingham & West Midlands Students' section:—Film show, 7.15 p.m., at the Grand Hotel, Birmingham.

Institute of Industrial Supervisors

Glasgow section:—"Annual general meeting and films, 7.30 p.m. at Mavor and Coulson Limited.

New Year Honours

(*Continued from page* 54)

BRITISH EMPIRE MEDAL

MR. V. A. ALDOUS, lathe turner, English Electric Company, Limited, Rugby; MR. F. ASKEM, electrician, Darwins, Limited, Sheffield; MR. S. M. T. BEACH, foreman, Ferguson Pailin, Limited, electrical switchgear manufacturers, of Manchester; MR. A. BLUNDY, foreman, hydraulic testing department, Worthington-Simpson, Limited, Newark (Notts); MR. A. C. J. CARPENTER, foreman shipwright, J. Samuel White & Company, Limited, Cowes, Isle of Wight; MR. J. T. COWNLEY, machinery erector, Wm. Foster & Company, Limited, agricultural engineers, ironfounders, etc., of Lincoln; MR. J. W. DITCHFIELD, foreman bricklayer, Lancashire Steel Corporation, Limited, Warrington; MR. W. EWART, foreman fitter, Harland & Wolff, Limited, Belfast; MR. E. GILLON, machine-tool setter, David Brown Tractors (Engineering), Limited, Huddersfield; MR. C. GISBORNE, foreman, H. H. Martyn & Company, Limited, founders, etc., of Cheltenham; MR. G. GOLDING, foreman, John Lysaght's Bristol Works, Limited; MR. C. H. KNOYLE, senior artificer, National Physical Laboratory (New Malden, Surrey); MR. R. MCINTOSH, maintenance shop foreman, Anderson, Boyes & Company, Limited, Motherwell; MR. J. P. SPEARS, plate shop superintendent, Aveling-Barford, Limited, Grantham; MR. J. STRAUGHTON, telephonist and switchboard operator, Workington Branch, United Steel Companies, Limited; MR. D. A. WALLACE, superintending foreman, Dumfries factory, Imperial Chemical Industries, Limited; MR. W. R. WHITLOCK, chief fettler, Bristol Foundry Company; MR. P. WILLIAMS, chargehand fitter, Charles D. Holmes & Company, Limited, Hull.

CLASSIFIED ADVERTISEMENTS

PREPAID RATES : **Twenty words for 5s. (minimum charge) and 2d. per word thereafter. Box Numbers 2s. extra (including postage of replies).**

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, 49, Wellington Street, London, W.C.2. If received by first post Tuesday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

EXPERIENCED FOUNDRYMAN, Managerial qualifications, ferrous or non-ferrous—light or medium castings. Over thirty years in trade, seeks position with firm in N.W. England, West Midlands or South-West. Keen disciplinarian. Opportunity for small firm to use a practical man. Age 49. A.M.I.B.F.—Box 3171, FOUNDRY TRADE JOURNAL.

FOUNDRY ENGINEER, twenty seven years' experience in Canada, U.S.A. and England. Possess drive and initiative to organise and control the maintenance and developments of building plant layout. Knowledge of mechanisation, continuous pouring up to one hundred tons per day.—Box 3176, FOUNDRY TRADE JOURNAL.

GENERAL MANAGER AND ENGINEER (41), with estimating, costing and commercial experience, desires change. Previous positions: Full control of heavy and medium jobbing, non-ferrous foundries (all bronzes and all B.S.S. specifications). Mechanised plant and designs. Sandslinger production. Shell moulding and design for same, and jig and tool departments and machine shop.—Box 3153, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 *inclusive or a woman aged* 18-59 *inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order* 1952.

WORKS MANAGER for large Light Castings Foundry, manufacturing Stoves, Grates and Cookers for solid fuel and gas. Previous executive experience in foundry producing light ferrous castings required. Must be well acquainted with modern methods of production and experienced in controlling labour—able to take full charge of foundry, pattern shop and assembly shops.—Write, stating age and full details of experience, to FORTH & CLYDE & SUNNYSIDE IRON COS., LTD., Falkirk.

A METALLURGICAL or Mechanical Engineer Graduate, age about 30, required as SALES REPRESENTATIVE for Steel Castings in the Midland and Southern District. Successful applicants may be required to work on the shop floor for 12 months to ensure practical knowledge before taking over sales duties. Staff Superannuation Scheme. — Applications, stating age, experience, etc., should be sent to the PERSONNEL SUPERINTENDENT, K. & L. Steelfounders & Engineers, Ltd., Letchworth, Herts.

TECHNICAL SALESMAN required by prominant manufacturers of Core Binders to consolidate and develop further their business in Lancashire and Yorkshire. Full knowledge of Foundry and Core Shop practices essential. Applicants must be resident in Lancashire or Yorkshire.—Write, giving full details of experience, to Box 3172, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*Contd.*

FOUNDRY MANAGER required for small well equipped Foundry producing Non-Ferrous and Stainless Steel Castings. Good position with old established firm.—Apply DEANS & SON (YORKSHIRE) LTD., Grovehill, Beverley.

WANTED for Midlands Malleable Iron Foundry (employing about 150), experienced Foundry Foreman, excellent prospects. Apply, stating experience and salary required.—Box 3178, FOUNDRY TRADE JOURNAL.

ASSISTANT FOUNDRY FOREMAN required by London Foundry making medium weight general engineering castings. Opportunity for a young man age 25-30, with a practical apprenticeship in moulding and good technical training. Keenness and capacity for constructive work more important than supervisory experience.—QUALCAST (EALING PARK), LTD., Junction Road, S. Ealing, London, W.5.

REPRESENTATIVE, with established connection, already calling on engineering and allied trades, required by firm of Non-ferrous Founders to introduce their Castings as an additional line, and obtain business on part salary and commission basis. Full particulars, stating area covered and other lines already carried.—Box 3152, FOUNDRY TRADE JOURNAL.

FOREMAN for small Patternshop servicing Mechanised and Jobbing Foundries. Staff appointment. Apply in first instance by letter, giving age, full particulars of experience and salary required; also name and address of two references. All applications will be treated in strict confidence.—RICHARDS (LEICESTER), LTD., Phoenix Iron Works, Leicester.

METALLURGIST, age about 25/35, to take charge of laboratory and technical control in progressive Cylinder Foundry in Watford, Herts. Candidates should possess initiative and be production minded.—Write, giving details of age and experience, to MACMILLAN FOUNDRIES, LTD., Cassiobury Mills, St. Albans Road, Watford.

BLACKHEART MALLEABLE and Grey Iron Foundry requires a Representative, aged about 30-35, with experience in the industry and live connection with consumers of these materials, residing in Lancashire, Yorkshire or Northumberland, to cover these areas.—Write, stating full details of experience and salary required, to Box 3175, FOUNDRY TRADE JOURNAL.

HAYWARD TYLER & CO., LTD., Luton, Beds., require for their new Canadian Foundry a METALLURGIST, not less than 25 years old, experienced in the melting, analysis, and heat-treatment of high-quality stainless and alloy steel castings. Knowledge of gamma-ray work and sand control would be useful. Salary: Canadian $6,000 per annum in the first year, rising to Canadian $7,000 in the second year. This position offers a wonderful chance to a man of enterprise and ability.

SITUATIONS VACANT—*Contd.*

REPRESENTATIVE for Heat Treatment Furnaces and Foundry Drying Equipment, for Scotland. Salary plus commission offered.—Box 3174, FOUNDRY TRADE JOURNAL.

REPRESENTATIVE required for Light Alloy Foundry situated in the North West. Sand and Gravity Casts in Aluminium Alloys of the highest class. Territory available Yorkshire and Lancashire. Existing connection preferred but not essential. Replying first instance giving full details and salary required to Box 3160, FOUNDRY TRADE JOURNAL.

PATTERNSHOP SUPERINTENDENT required by Grey Iron Foundry in Tipton, Staffs. The vacancy offers first class prospects for a man of initiative and drive capable of disciplining and training men in a well-equipped Shop. Superannuation Scheme in operation and first class Canteen facilities available.—Apply Box 3162, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER required by a leading manufacturer of plumbers' and engineers' brassfoundry situated in Birmingham. Foundry is modern and semi-mechanised and the applicant must have the ability to maintain production, control labour and possess a thorough practical and theoretical knowledge of the trade.—Box 3164, FOUNDRY TRADE JOURNAL.

FOUNDRY in the North of England invite applications for the following positions. Applicants to state age, experience, and salary required.

STEEL FOUNDRY FOREMAN.—Young man, with experience of modern production methods. Foundry producing carbon and manganese steel.

CHEMIST.—Young man, with experience of Converter practice, Grey Iron, and modern sand control.

Box 3169, FOUNDRY TRADE JOURNAL.

DRAUGHTSMAN wanted by old-established firm of Cooking and Heating Appliances in Smethwick, Staffs, with experience in this class of work. 5-day week, canteen, and pension scheme. Age about 25. —Write in confidence, giving details of experience, etc., to Box 3170, FOUNDRY TRADE JOURNAL.

MELTING SHOP METALLURGIST required, age 25/30 years, for Iron and Steel Foundry in South Yorks. Conversant with Cupola/Converter practice essential, and a working knowledge of the production of high-grade irons desirable. Applicant will serve as Assistant to the M/Shop Superintendent, and the position will provide plenty of scope for a keen worker.—Apply, in confidence, to Box 3167, FOUNDRY TRADE JOURNAL.

VACANCY in Scottish Non-Ferrous Foundry for fully trained and experienced young Foreman with Technical Knowledge. Must be able to take full charge and produce castings up to 5 cwt. Good prospects for advancement. Assistance given for housing.—Box 3177, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*Contd*

WANTED. — PATTERN MAKERS, wood and metal, for Cylinder castings. Only first-class men used to this class of work need apply. Top wages paid to those of proved ability.—Apply to MACMILLAN FOUNDRIES, LTD., 130, St. Albans Road, Watford. 'Phone: WAT. 6241.

AGENCY

MODERN fully mechanised Malleable Foundry in Midlands requires SALES AGENT to cover Lancs and Yorks area. Must have practical Foundry experience and good contacts.—Box 3138, FOUNDRY TRADE JOURNAL.

MACHINERY WANTED

BROOM & WADE type EH.251 or Ingersoll Rand Air compressor. 495. CFM. 100 lbs. W.P. 310 R.P.M. water cooled 112 H.P. 400/3/50 motor and after cooler.—Write PRIORFIELDS FOUNDRY CO., LTD., Spring Road, Ettingshall, Wolverhampton.

CAPSTAN LATHE, with Ball Chuck, urgently required. Capacity 1⅜ in. to 1⅝ in., motorised 3 phase, 50 cycle, 400/40 volt. — Particulars to: Works Engineer, JAMES BRIDGE COPPER WORKS LTD., Darlaston Road, Walsall, Staffs.

PLANITOR GRINDER, or similar new or good secondhand machine, minimum diameter of wheel 24 in., complete with dust extraction fan and motor, suitable for 440 volts, 3-phase, 50 cycles.—Please state price and where seen to SMITH & WELLSTOOD, LTD., Ironfounders, Bonnybridge, Scotland.

OFFER YOUR SURPLUS PLANT AND MACHINERY TO:—
FRANK SALT & CO., LTD.
(THE CASH BUYERS),
BLACKHEATH, BIRMINGHAM.

MACHINERY FOR SALE

20—300 lb. Aluminium Bale Out Furnaces, gas fired, complete with Burners. Morgan, etc. Offers for the lot or part. Seen at ALUMINIUM DIE CASTINGS (BIRMINGHAM) LIMITED, 52, Oxford Street, Birmingham, 5.

TROPENAS Converter Steel Plant, comprising 2—30 cwt. (nominal) converters, charging lift, Cupolas, Blowers and all electrical gear. All in working order and good condition. Price: £3,500 as it stands.—Box 3151, FOUNDRY TRADE JOURNAL.

A.G.M. Type A60 Gas Furnace complete with motor, Fan and Crucible, etc. Brand New. £135. —J.F.P. DIE-CASTING & ENGINEERING, 271, Barrack Road, Christchurch, Hants.

FOR SALE.

NO. 16 ATRITOR CRUSHER by Alfred Herbert, complete with Feed Hopper, overhauled and with a quantity of spares. Also a No. 12 Atritor by Alfred Herbert, for which we have available about 6 tons of spares. Both these machines are offered at extremely low prices for quick clearance.

SAVILLE-CALVERT (MACHINERY) LIMITED.
BIRMINGHAM ROAD,
STRATFORD-ON-AVON
Tel.: Stratford-on-Avon 3681.

MACHINERY FOR SALE—*Contd.*

FOR SALE.—COLEMAN Pneumatic Core Blowing Machine. Three plunger type. Table, 29½ in. by 15¾ in. Box, 22 in. by 22 in. Excellent condition.—R. O. GRAY, Minerva Road, Park Royal, N.W.10. Elgar 4841/4842.

ALBION TWW WORKS

AIR COMPRESSORS ACTUALLY HELD IN STOCK.

600 C.F.M., MOTOR DRIVEN, VERTICAL, THREE CYLINDER, WATER COOLED, BROOM & WADE, Cyls. 1½ in. dia. by 12 in. stroke; speed 310 r.p.m.; 145 h.p. SLIPRING MOTOR; Oil Immersed Starter, etc.

600 C.F.M., BELT DRIVEN, FOUR CYLINDER, WATER COOLED, by BROOM & WADE. Cyls. 10 in. bore by 12 in. stroke; speed 310 r.p.m.

350 C.F.M., MOTOR DRIVEN, VERTICAL, TWO STAGE, WATER COOLED, by ALLEY & MACLELLAN. 100 h.p. BROOK SLIPRING MOTOR, 440/3/50; Allen West O.I. Starter, Intercooler, etc.

240 C.F.M., MOTOR DRIVEN, TWO STAGE, AIR COOLED, AIR COMPRESSOR, by INGERSOLL-RAND. Model 50B, Type 40. Cyls. 6 in. and 5 in. by 5 in. stroke; 970 r.p.m.; 60 h.p. SLIPRING INDUCTION MOTOR, by L.D.C., 400-440/3/50; Intercooler, Aftercooler; all mounted on bedplate.

150 C.F.M., MOTOR DRIVEN, VERTICAL, TWIN CYLINDER, WATER COOLED, by BROOM & WADE. Type D22a; 1½ in. bore by 8 in. stroke; 35 h.p. SLIPRING MOTOR, by CROMPTON PARKINSON, 400/3/50; A.C. Starting Gear, Water Circulating Pump, etc.

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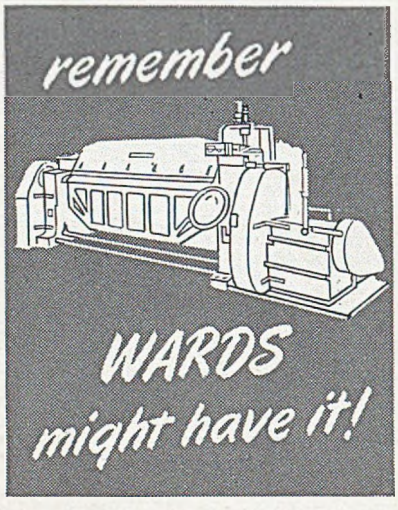

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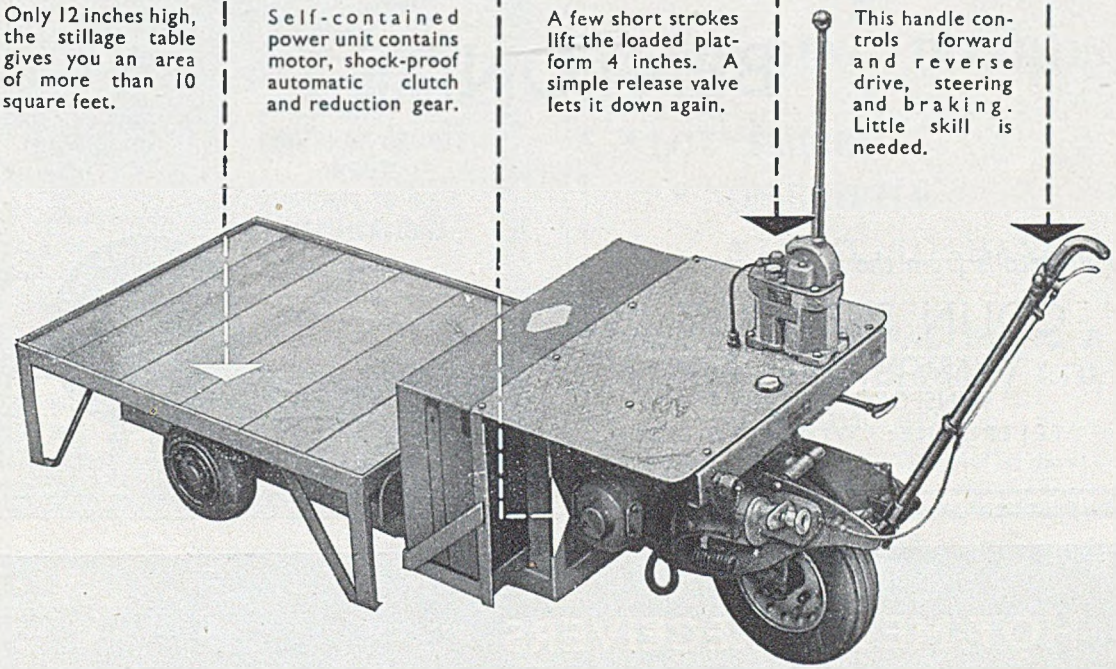

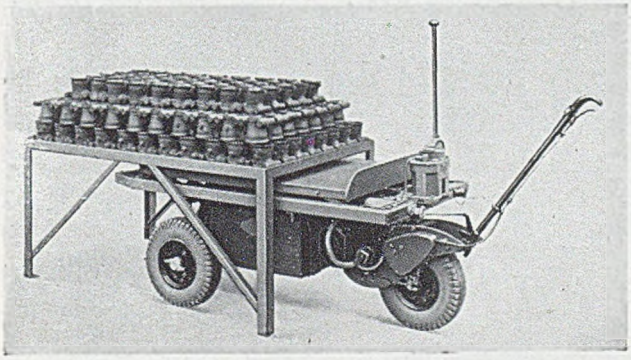

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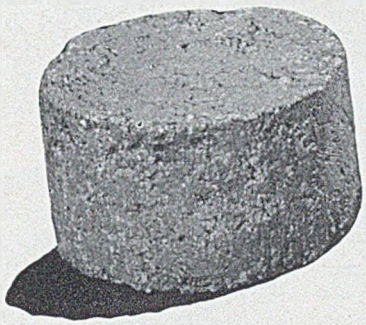

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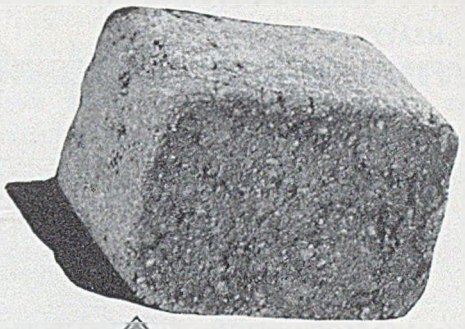

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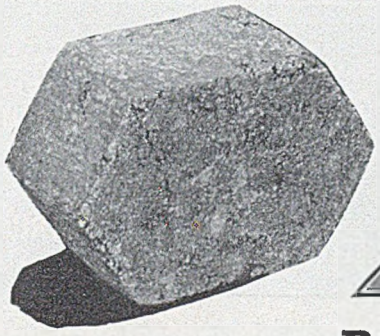

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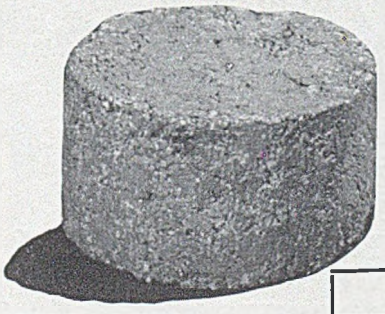

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