FOUNDRY TRADE JOURNAL
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Foundry Trade Journal
April 30, 1953

FOUNDRY DUST

Controlled by the ACI ROTOCLONE*

DUST FROM

SHAKEOUTS, SAND HANDLING SYSTEMS, SWING FRAME, SNAGGING and PORTABLE GRINDERS, TUMBLERS, MULLERS, and ABRASIVE CLEANERS ; SMOKE AND FUMES FROM ELECTRIC FURNACES

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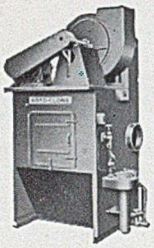

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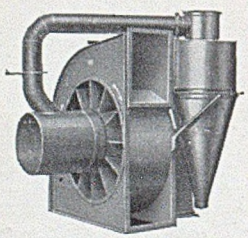

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AIR CONTROL INSTALLATIONS LTD

RUISLIP **MIDDX.**

'Phone : RUISLIP 4066 (8 lines)

'Grams : CONTROLAIR, RUISLIP

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*ROTOCLONE is the trade mark (Reg. U.S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and fabric arrestor types. AIR CONTROL INSTALLATIONS LTD. are the sole licensees for the manufacture of these plants in this country.

Photograph by courtesy of Messrs. John Stirk & Sons Ltd., Halifax

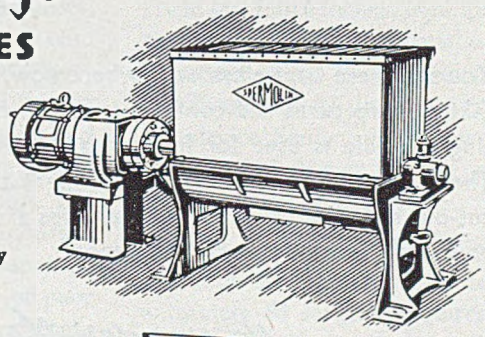
WRITE FOR FULL INFORMATION OF

the Spermolin range

OF FOUNDRY SPECIALITIES

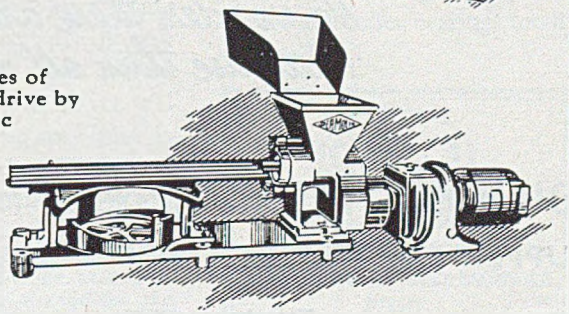
CORE OILS & BINDERS FOR EVERY TYPE OF CASTING

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

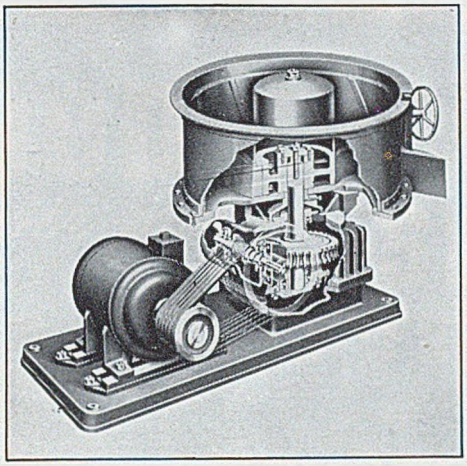
This SPERMOLIN Rotary Core Maker is simple, efficient and economical in operation and offers a wider scope than any similar machine.

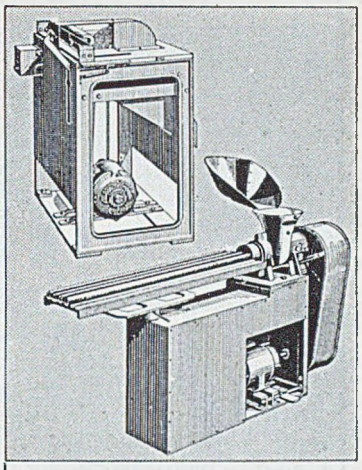
WRITE TO SPERMOLIN LIMITED, HALIFAX, ENGLAND

Telephone: Halifax 4197 Telegrams: Spermolin, Halifax

FORDATH MACHINES IN THE FOUNDRY

—*lower costings in the office*





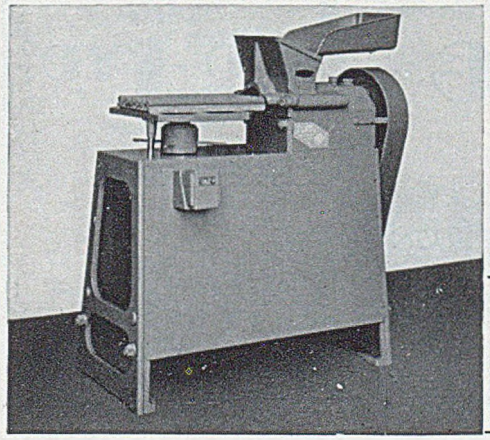
(ABOVE LEFT) FORDATH 'NEW TYPE' MIXING MACHINES *use the well known Fordath principle of rubbing and folding without crushing in each of the seven models in the range.*

(ABOVE RIGHT) FORDATH CUT-OFF MACHINES *have many years of satisfactory service built into them.*

The FORDATH MULTIPLE ROTARY CORE MACHINE *has an enviable reputation for accurate extrusions in foundries everywhere.*

Fordath 'New Type' Mixers, one for everybody, seven sizes to cope with batch capacities from 20 lbs. to 1 ton. To mix foundry silica sands with core bonding compounds *without crushing*. Stiff compounds as low as 1% can be completely dispersed through the sand, coating each grain with a film of binder. Mixing blades rotate in a horizontal plane, conveying the sand from the centre of the pan, rubbing it thoroughly against rubbing plates and tumbling it back to the centre. Two to three minutes is enough and the batch is discharged in a well aerated homogeneous mix. Gears and bearings totally enclosed.

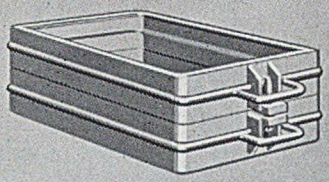
The Fordath Multiplunger Core Machine is going to town, to the country, to export markets, wherever there are foundries. The thrust of the core sand through the multiple die is provided by plunger action instead of a rotating worm. Quality and consistency of the core sand mixture are not critical factors. Dimensionally accurate extrusions are satisfactory with sands of poor quality and even facing sand or plain red moulding sand can be extruded. With all sands, the core mix is at its best when Glyso is the bonding agent.



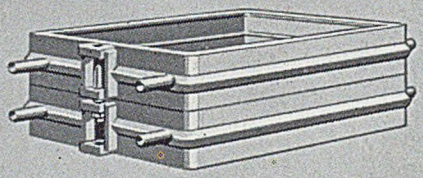
The FORDATH MULTIPLUNGER CORE MACHINE *admirably exemplifies the success of equipment designed by foundrymen for foundrymen.*

The Fordath Multiple Rotary Core Machine extrudes cores from $\frac{1}{8}$ inch to 6 inches. Multiple extrusion of up to ten (smallest diameter) cores simultaneously and accurately. All dies have venting device. Senior model (power driven) and Junior (power or hand operated bench model).

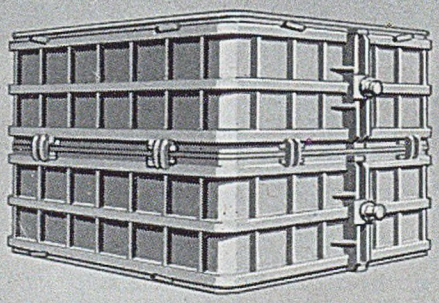
Fordath Core Cut-off Machine cuts cores up to 3 inches diameter accurately to lengths required. Motor and roller bearings totally enclosed.



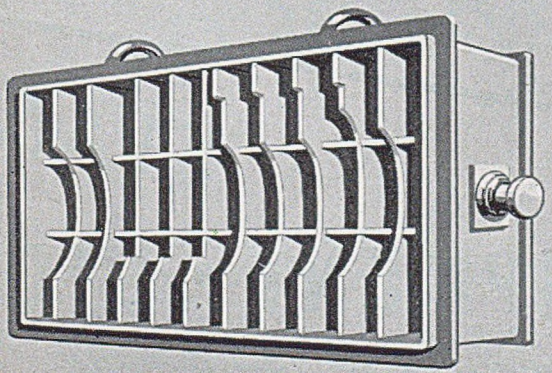
LIGHT WORK - 1 MAN LIFT



MEDIUM WORK - 2 MEN LIFT



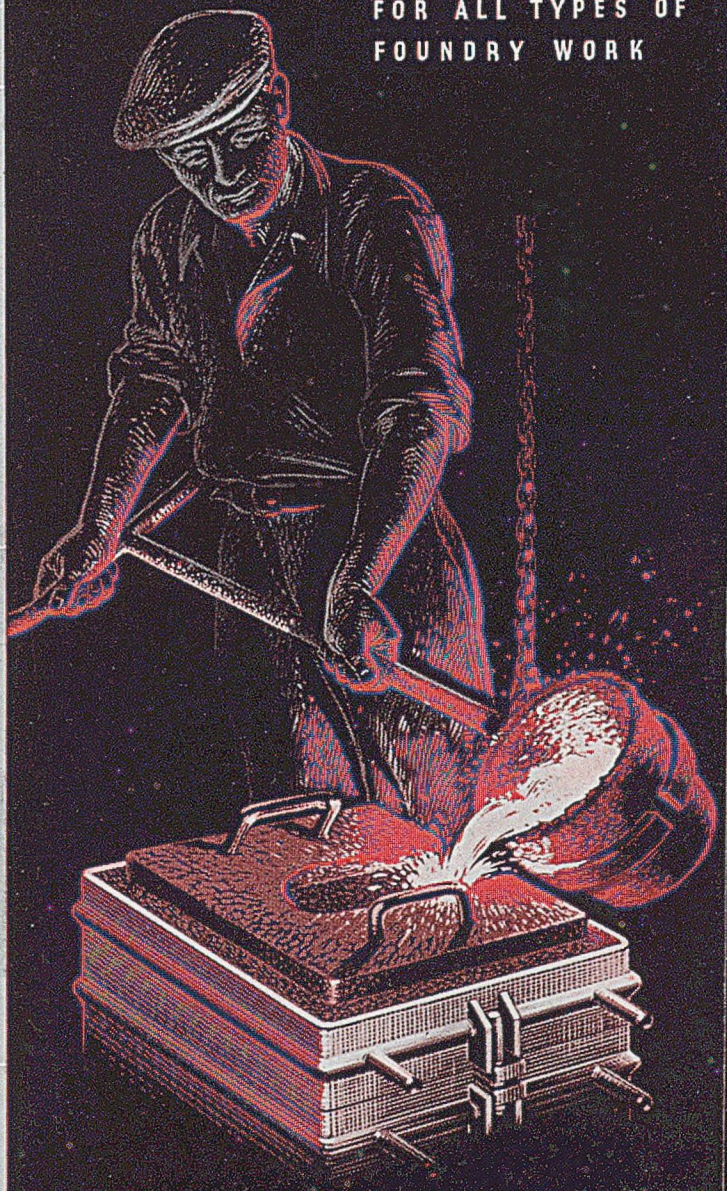
MEDIUM WORK - CRANE LIFT



HEAVY WORK

Sterling

MOULDING BOXES FOR ALL TYPES OF FOUNDRY WORK



seasoned in foundry service

STERLING FOUNDRY SPECIALTIES LTD., BEDFORD

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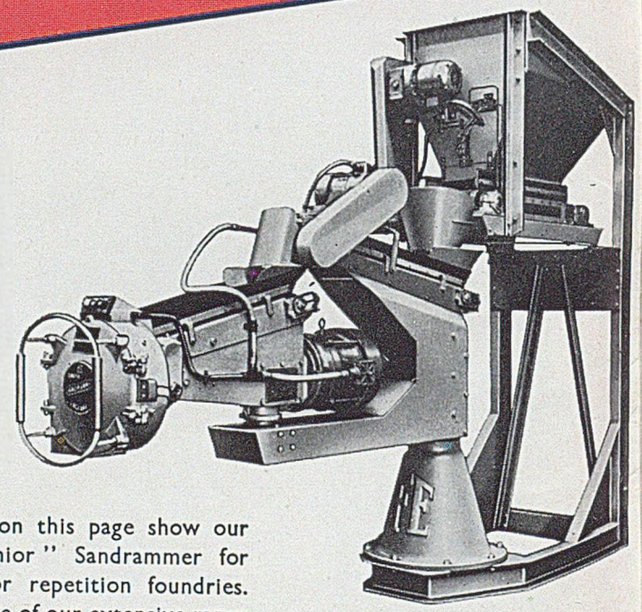
for
Foundry Efficiency
TRADE MARK

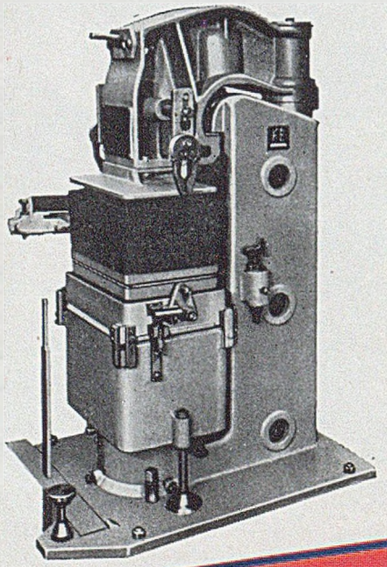
CASTLE BROMWICH BRITISH INDUSTRIES FAIR

APRIL 27TH MAY 8TH
BIRMINGHAM

This year we have 1,400 sq. ft. of space packed with new and improved machines to aid foundrymen throughout the world. We shall give practical working demonstrations of the machines illustrated, together with many other items of equipment. Our Representatives will be in attendance to give you every possible service.

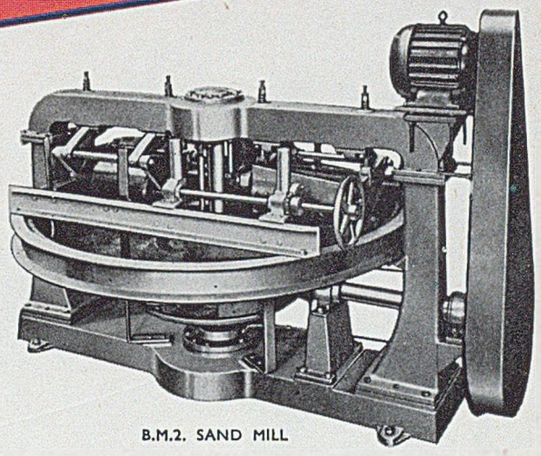


"JUNIOR" SANDRAMMER



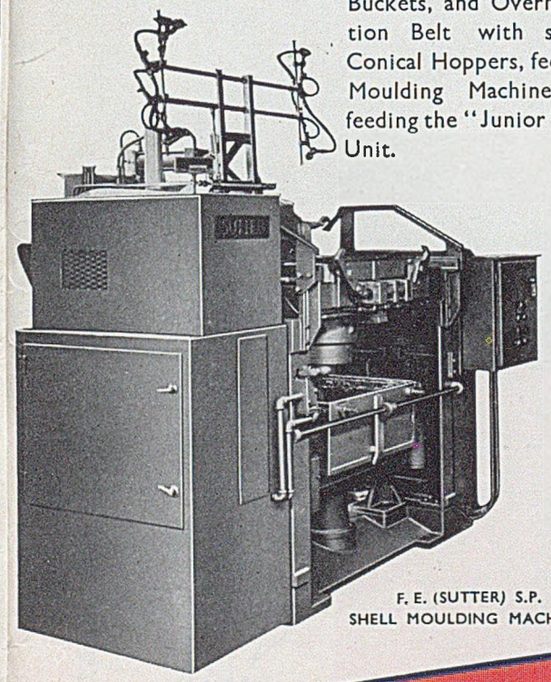
B.1. MOULDING MACHINE

The illustrations on this page show our well-known "Junior" Sandrammer for use in jobbing or repetition foundries. This is one example of our extensive range of Sandrammers. The machine on the left is our famous B.1 Hydraulic Boxless High Speed Moulding Machine now available, for the first time, with Independent Oil Hydro-Electric Pump Unit, dispensing with expensive large pumps and accumulators and long pipe lines. Visitors will also be able to see our F.E.2 Hydraulic Under Sand Frame Moulding Machine operated, for the first time, with a similar compact unit.



B.M.2. SAND MILL

The B.M.2 Sand Mill needs no introduction, and this will be seen in operation together with the Electro-Vibratory Screen, Feeder Belt with Magnetic Pulley, Vertical Elevator fitted with our latest self-cleaning and clearing Stripper Buckets, and Overhead Distribution Belt with spring loaded Conical Hoppers, feeding our two Moulding Machines, and also feeding the "Junior" Sandrammer Unit.



F. E. (SUTTER) S.P. 1000
SHELL MOULDING MACHINE

For the first time in Europe, foundrymen will be able to see a British made F.E. (Sutter) Shell Moulding Machine producing complete shells in automatic cycles. The latest design of Resin Sand Mixer will be shown in conjunction with this machine. We have already announced our appointment as sole manufacturers and distributors for the whole of Western Europe and other territories for all machines previously manufactured and sold only by Sutter Products Company of Dearborn, Michigan, U.S.A.

STAND No. D.301/200

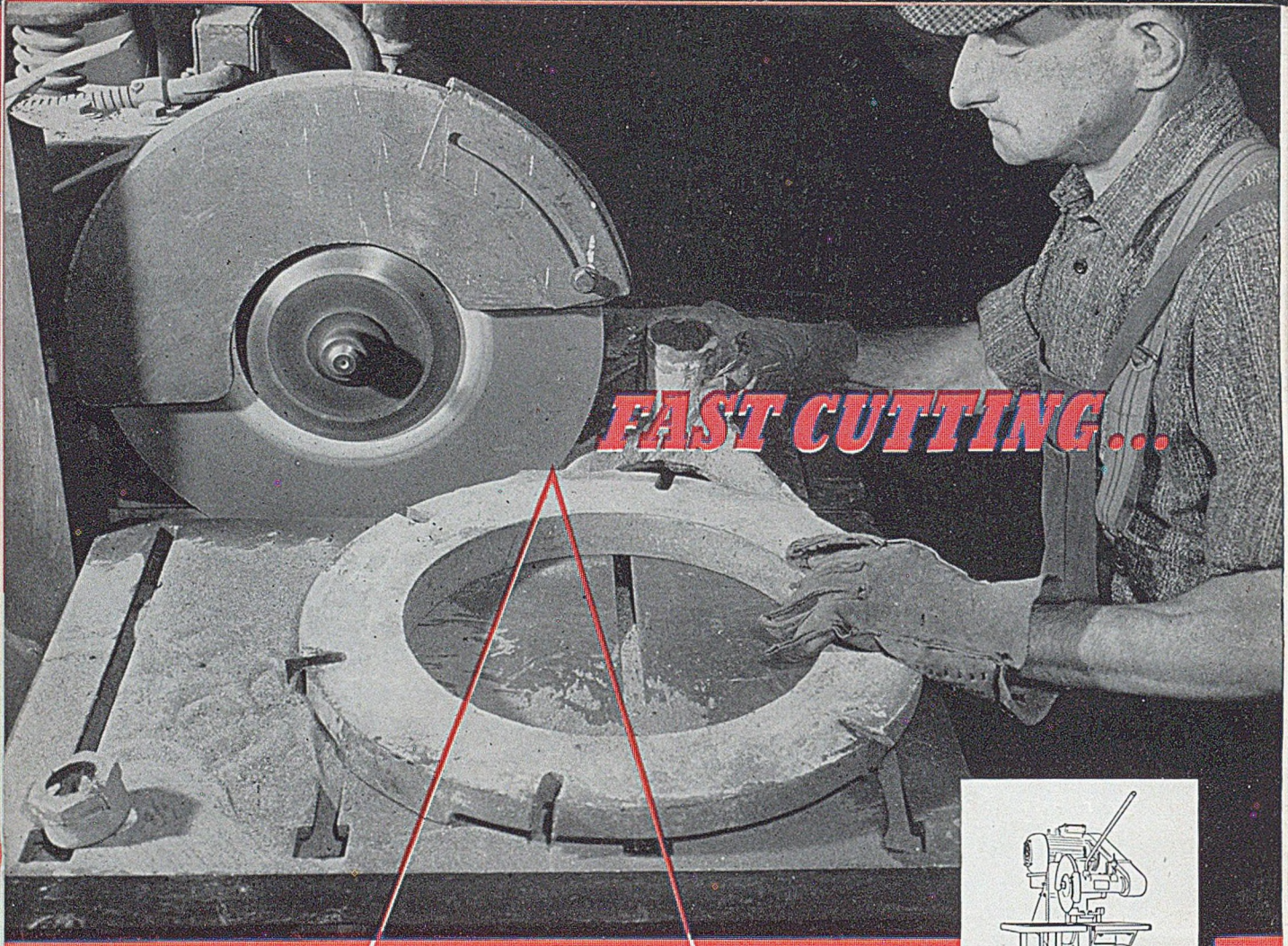
FOUNDRY EQUIPMENT LTD.

Telephone: LEIGHTON BUZZARD 2206-7-8 Telegrams: "EQUIPMENT" LEIGHTON BUZZARD

SUTTER

LINSLADE WORKS,
LEIGHTON BUZZARD, BEDFORDSHIRE

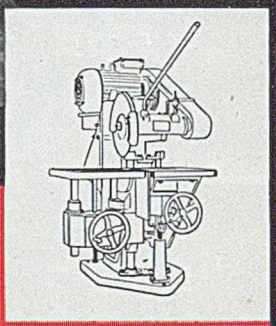
PATENTS GRANTED, PENDING OR APPLIED FOR IN ALL INDUSTRIAL COUNTRIES, COVERING ALL MACHINERY ON OUR STAND

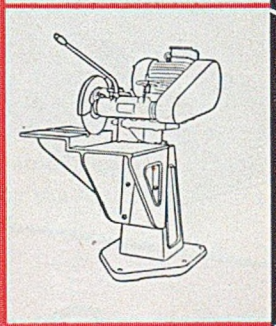


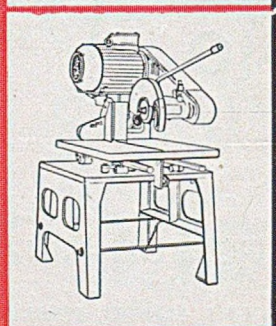
FAST CUTTING...

COST CUTTING...

We have always pioneered the most modern foundry methods and equipment and to-day are proud of the fact that many foundries in the United Kingdom and Overseas Countries have installed our Abrasive Wheel Cut-Off Machines, thus reducing costs and increasing output.







Illustrated particulars of our Abrasive Wheel Cut-Off Machines will gladly be sent to you on request.

THE COLEMAN-WALLWORK CO. LTD.

MEMBERS OF THE J. STONE GROUP

Registered Office & Works:

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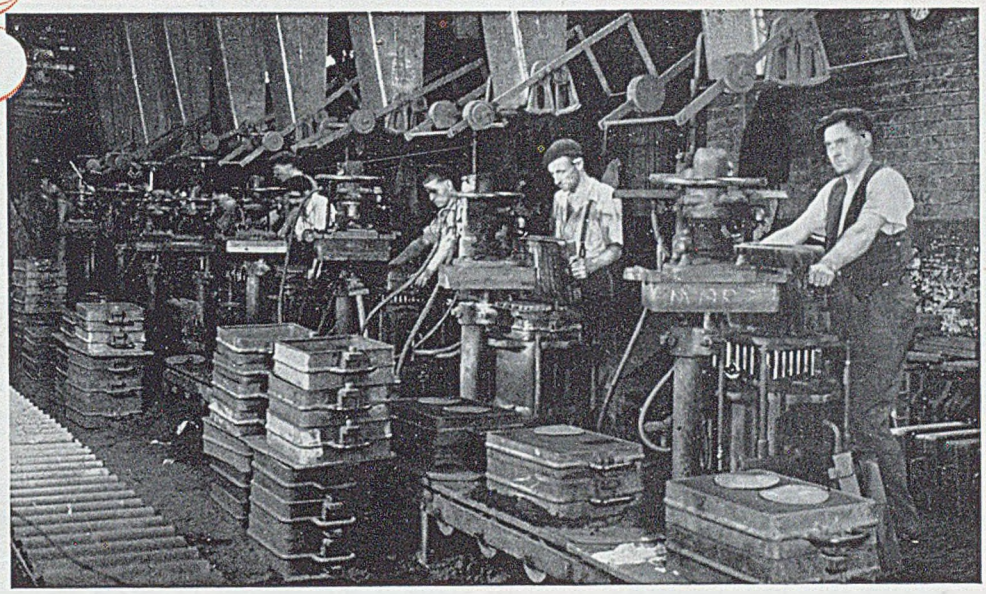

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Mr. G. Clancey, Managing Director of
MESSRS. G. CLANCEY, LTD., HALESOWEN, writes:--

"We first installed one of your Moulding Machines ten years ago, and it has given an excellent performance ever since.

"For our new mechanised Foundry (*see photo above*) Molineux Moulding Machines were an automatic choice. We now have eight of them in operation."

SQUEEZES & JOLTS IN 1 OPERATION—

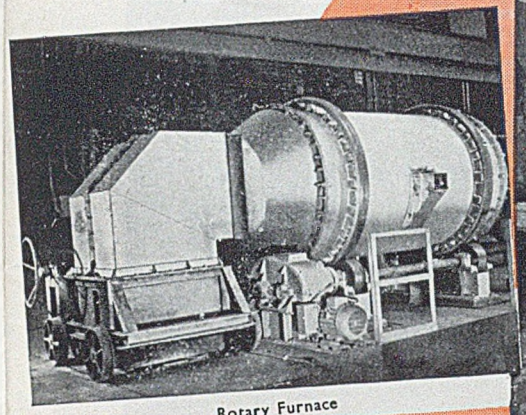
this is the unique feature of Molineux Type X.1 Moulding Machine. A uniformly dense mould is produced complete in 2-3 seconds.

MOLINEUX MOULDING MACHINES

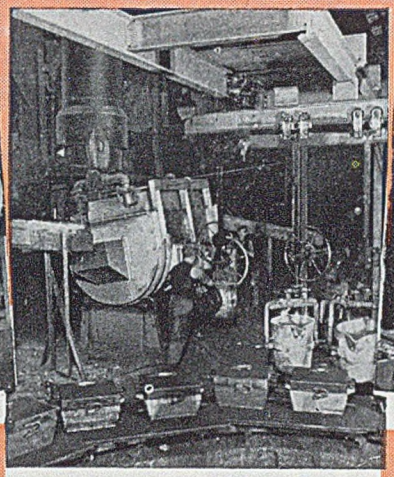
MOLINEUX FOUNDRY EQUIPMENT LIMITED
Marlborough Works, Marlborough Road, London, N.19
Phone: ARChway 4127

C

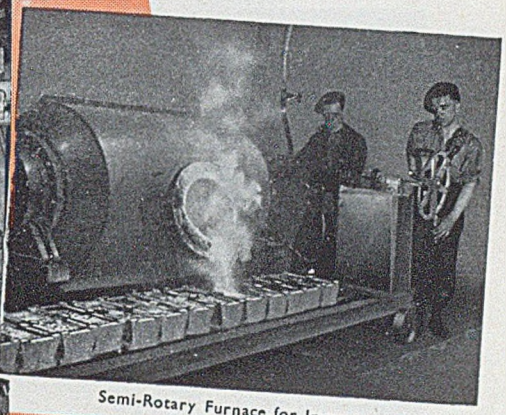
MONOMETER



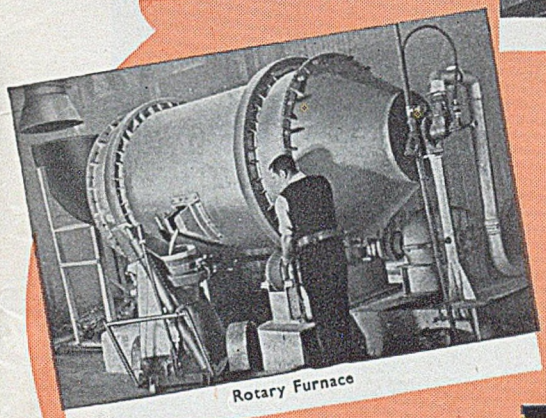
Rotary Furnace



Hot Metal Receiver



Semi-Rotary Furnace for Ingotting



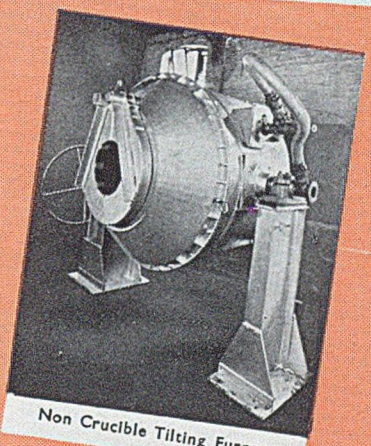
Rotary Furnace

19 53

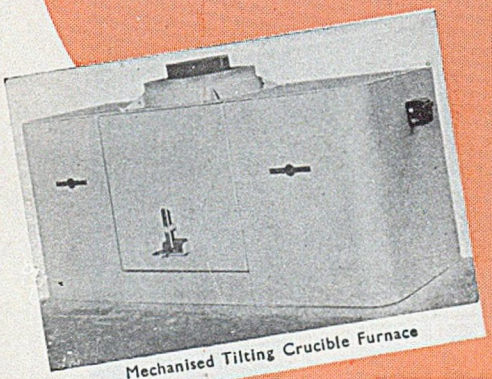
27 APRIL – 8 MAY
CASTLE BROMWICH
BIRMINGHAM

SEE OUR EXHIBIT

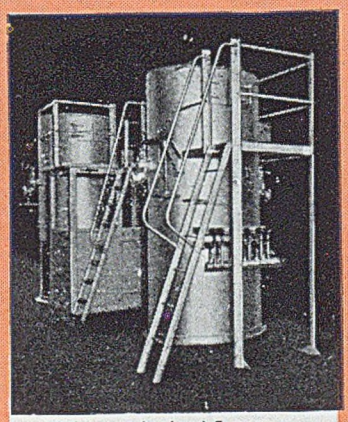
STAND No. D731



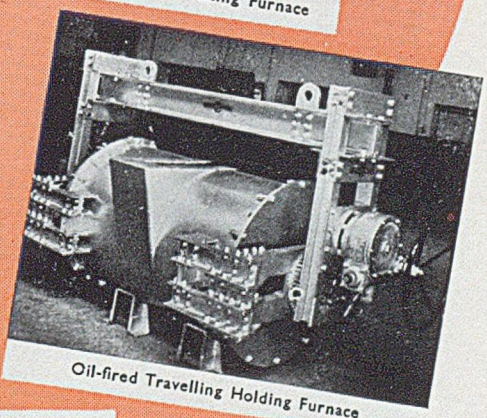
Non Crucible Tilting Furnace



Mechanised Tilting Crucible Furnace



Valve-outlet Lead Furnace



Oil-fired Travelling Holding Furnace

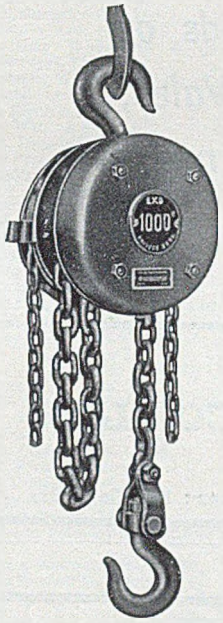
MELTING FURNACES FOR ALL METALS

OIL or GAS FIRED

MONOMETER MANUFACTURING Co. LTD

SAVOY HOUSE • 115-116 STRAND • LONDON W.C.2 • *Temple Bar 9025*

The *Exo* Pulley Block and the *Whiting* Electric Hoist



Two engineering products of outstanding merit specially designed for

Simplicity, Compactness and Lightness

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.)

S.W.L.	½ ton	¾ ton	1 ton	1½ tons	2 tons	3 tons
Price for 10ft. lift	£13 10s.	£15 10s.	£17	£23	£26 10s.	£32 10s.

S.W.L.	4 tons	6 tons	8 tons	10 tons	12 tons	16 tons
Price for 10ft. lift	£40	£55	£70	£90	£160	£190

Delivery ex stock up to 16 tons. (Models available up to 40 tons.)

HAND and GEARED TROLLEYS

with ball bearing wheels and grease nipples.

	Hand Trolley	Geared Trolley		Hand Trolley	Geared Trolley
¼ ton	£5 10s.	£12	2 tons	£11	£21
½ ton	£6	£12	3 tons	£14	£23
1 ton	£7	£14	4 tons	£18	£28
1½ tons	£9	£16 10s.	6 tons	£27	£39

Delivery ex stock.

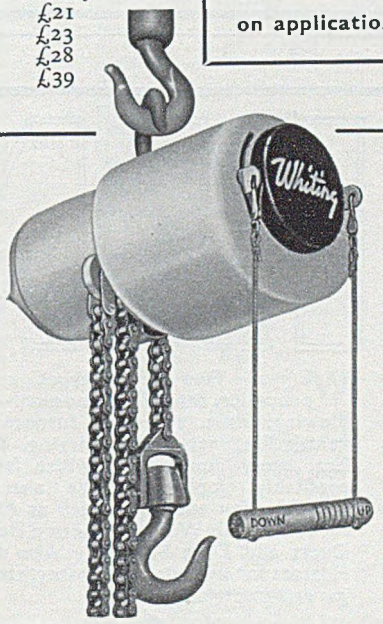
Other Models available— prices quoted on application

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.



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FOUNDRY TRADE JOURNAL
Established 1902
WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

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Secretary : **T. Makemson, M.B.E.,** Saint John Street Chambers, Deansgate, Manchester, 3. 'Phone and 'Grams : Blackfriars 6178.

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COUNCIL OF IRONFOUNDRY ASSOCIATIONS

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Participating Associations : British Cast Iron Research Association (affiliated) ; Institute of British Foundrymen (affiliated) ; and the following :—

Automobile Ironfounders' Association.—Secretaries : Heathcote and Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15. 'Phone : EDGbaston 4141. 'Grams : " Clarify," Birmingham, 15.

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.

Cast Iron Chair Association.—Secretaries : Peat, Marwick, Mitchell & Co., The Cast Iron Chair Association, Queen's Square, Middlesbrough, Yorkshire.

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.

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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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Cardiff and District Founders' Association.—Secretary : G. Morris, 12, West Bute Street, Docks, Cardiff. 'Phone : Cardiff 32701.

Leeds and District Ironfounders' Association.—Secretary : F. H. Foster, H. J. Gill & Co. (Leeds), Ltd., 194, Cardigan Road, Leeds, 6. 'Phone : 52020.

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Liverpool and District Ironfounders' Association.—Secretary : J. S. Hassal 16/18, Hackins Hey, Liverpool, 2. 'Phone : Central 0114.

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Monmouthshire Founders' Association. — Secretary : I. J. Smith, Tredegar Foundry, Newport, Mon. 'Phone : Newport 4275 ; 'Grams : " Rogerwinch," Newport.

North of England Ironfounders' Association.—Secretaries : Mann, Judd Gordon & Co., 61, Westgate Road, Newcastle-upon-Tyne. 'Phone : Newcastle 20836 ; 'Grams : " Mannca," Newcastle.

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Scottish Ironfounders' Association.—Secretaries : Mann, Judd, Gordon & Co., 142, St. Vincent Street, Glasgow, C.1. 'Phone : Central 2857 ; 'Grams : " Mannca," Glasgow.

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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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PRINCIPAL CONTENTS

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Customer/Founder Convention II

Last week we gave some general impressions of the convention organized by the British Steel Founder's Association, the objects of which included the creation of better co-operation between the seller and buyer of steel castings. Practically everything that transpired was of interest to the whole of the foundry industry, as the problems apply to all manufacturers of castings. There is one exception, however, and that is, for other than steel castings, no demand exists for acid pickling as a method of revealing defects. However, when dealing with an alloy of such a high melting point as steel, the defects thereby revealed are more difficult to overcome.

All customers of our industry complain from time to time about excessive weight, with consequent extra machining time, and buyers were asking for the introduction of the shell-moulding process, so that dimensional tolerances would be nearer to the blue-print. There seems to be some difficulty in shell moulding for steel owing to carbon pick-up from the synthetic resins used. Yet, we think this difficulty is not incapable of being surmounted. In steel, as in other cast products, weight reduction can be effected providing that the buyer is prepared to pay for alloyed material with or without heat-treatment. In this, as in the question of design, the buyer—or in truth the designer—needs more enlightenment. The steelfounders say they will open their doors for the reception of designers to work in their foundries, as this is perhaps the best means of inculcating a proper knowledge of what happens in a mould when metals cool from liquid to solid. A lack of knowledge amongst founders is also prevalent, and a request was made for solid models instead of mere drawings, especially where this concerns the production of very complicated castings. The obvious rider to all this is that the buyer should be quality- rather than price-conscious —a concept usually foremost when acquiring goods for personal use. Care as to the placing of jigging points—long an important practice of ironfounding —has now reached the steelfounders, but it does not pose unsuperable problems.

Of importance to the whole foundry industry was the confession by one buyer, that the expenditure of £750 on a pattern was the best investment he had made for years. We learn that the final session was just as well attended as the first, and enquiries were received as to whether the exhibition could be prolonged. The obviously interested, large audience was the finest testimony to the excellence of the organization of the Convention, and everybody who attended endorsed very heartily Mr. Summerson's thanks to the B.S.F.A's publicity specialists, and to Mr. Barber, the secretary and his staff.

Australia offers £1,000 Fellowship in Metallurgy

The Victorian Agent-General in London, The Hon. Sir John Lienhop, announces details of a Fellowship in Metallurgy which is to be made available during 1954 to a British subject with at least ten years' residence in the United Kingdom. The "British Memorial Fund" has been established by the people of the State of Victoria, Australia, as a "gesture of loyalty, gratitude and affection" to the British people in recognition of their "rôle in saving civilization in the Second World War." It takes the form of offering, each year, a number of Fellowships, tenable in Victoria, to graduates and young persons in the United Kingdom in the hope that they will return to their own country with a desire to strengthen the ties between it and Australia. The Fellowship is for £1,000 (Australian). This is to cover travelling expenses to and from Melbourne and ten months' living expenses in the State. The tenure would normally be for the academic year commencing March, 1954, and candidates should be prepared to travel to Victoria during January, 1954. Accommodation will be arranged for selected candidates. Wives and children are welcome but no extra expenses can be paid to cover them. Applicants for the Fellowship must be under the age of 35 on January 1, 1954.

The Fellowship is available to any graduate, diplomate or specialist in primary metallurgical processes in the production of concentrates and metals from their ores. This Fellow will work in close liaison with the Professor of Metallurgy at Melbourne University, who will make facilities available for research of a type in which the Fellow shows particular interest. Full particulars may be obtained from the Hon. Sir John Lienhop at Victoria House, Melbourne Place, London, W.C.2, the closing date for the receipt of applications being June 10, 1953. Simultaneously with the Metallurgy Fellowship, similar Fellowships are being offered by the Fund for Pre-School Education and Child Development; Arbitration (Industrial); and British Commonwealth Studies. The same conditions apply in each case.

Luncheon

BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION

At a luncheon held at the Savoy Hotel last week the chair was taken by Lt.-Col. the Hon. R. M. Preston, D.S.O. The toast of the Association was proposed by Mr. A. R. W. Low, C.B.E., D.S.O., M.P., and replied to by the chairman. Prof. Sir Ian Heilbron, D.S.O., F.R.S., responded to the toast of The Guests, proposed by The Hon. John Grimston, M.P. Among the guests were Mr. Norman Robertson, Mr. R. D. Hamer, Sir James Helmore, K.C.M.G., Mr. A. Dando, Mr. F. C. Braby, Q.C., Brig.-Gen. Sir Harold Hartley, K.C.V.O., C.B.E., M.C., F.R.S., Sir Ben Lockspeiser, K.C.B., F.R.S., Dr. O. H. Wansbrough-Jones, C.B., O.B.E., Dr. Horace W. Clarke, Mr. H. E. Jackson, Mr. E. Fletcher, Mr. V. P. Harries, C.B., Dr. Maurice Cook, Mr. C. C. A. Spencer, C.B.E., Mr. R. Walker, Prof. C. W. Dannatt, Prof. A. J. Murphy, Mr. D. P. C. Neave, Mr. E. W. Colbeck, Dr. Alexander King, Mr. W. F. Brazener, J.P., Dr. U. R. Evans, F.R.S., Sir Charles Goodeve, O.B.E., F.R.S., Dr. H. Sutton, Mr. E. J. Vaughan, Dr. L. B. Pfeil, O.B.E., F.R.S., Mr. A. M. Baer.

THE LINCOLN OFFICE of British Insulated Callender's Cables Limited has been transferred to 113, Canwick Road. The telephone number is Lincoln 654.

Securing Best Brains for Industry

Engineering needs young men of good quality to come forward in increasing numbers for technological education. It may seem strange in an industrial country such as ours that a career in engineering is looked on by many as "something messy, something that nice young men ought not to get mixed up in," to quote Lord Hives, chairman and managing director of Rolls Royce, Limited. Careers masters or headmasters cannot easily assess a boy's possibilities as an engineer under the present system. Engineering is not taught in schools, and information about engineering as a career is not as easily obtainable in schools as it should be. Many pleas for more co-operation between the grammar and public schools and industry have been made lately, because it is evident that the best quality brains seek their careers in other directions. Lord Hives pointed to the high position in society that the Americans give to industry, and urged that we should continue to imitate it in this country. It is clear that this would be a step in the right direction if this country's engineering industry is to maintain its unique position in the world. Lord Hives was speaking at the opening of a new engineering extension at Nottingham University.

Exhibition of Photography

The Institute of British Photographers is holding a Coronation Exhibition at the R.B.A. Gallery, Suffolk Street, London, S.W.1, from April 23 to May 16 (Monday to Thursday, 10 a.m. to 5 p.m.; Friday and Saturday, 10 a.m. to 7 p.m.). There is a great diversity of subject matter and treatment, and a comprehensive display of industrial photographs, most of which give exceptional interest to an ordinary subject. No particularly outstanding pictures of interest to foundrymen were remarked by our representative visiting the exhibition, although there is a picture of castings which makes a pleasant design, and there are the usual quite impressive pictures of pouring, including a colour transparency of casting aluminium. Several pictures were shown of the dismantling of the South Bank Exhibition.

Engineering Marine and Welding Exhibition

This biennial show is again being held at Olympia from September 3 to 17. The foundry equipment industry shows every four years, and is due to take space in 1955—the year of the international foundry congress in London. This year, however, there is a new section, the Chemical Plant Exhibition. Amongst the exhibitors are dozens of foundry concerns and it is always of real interest to foundrymen to see the products of their industry. In addition there are quite a number of suppliers to the industry. There is to be an official visit by the Institute of British Foundrymen. From a survey of the publicity matter issued, it is evident that there is much to make visits by foundrymen well worthwhile.

Export Control Consolidation.—The Board of Trade announces that all amendments to the Export of Goods (Control) Order, 1952, have now been incorporated in a new consolidation Order. This Order, the Export of Goods (Control) (Consolidation) Order, 1953 (S.I. 1953, No. 671) came into operation on April 27, and can be obtained from H.M. Stationery Office and branches, price 1s. 6d.

New Foundry for Heavy Non-ferrous Castings

By A. R. Parkes

In many directions, design of foundries has made enormous strides since the war, and a person entering a new or re-built foundry may well be amazed at the progress wrought in ten years or so. Nowadays, it is commonplace to see really well-laid-out iron and steel foundries, for both jobbing and repetition working and some light-alloy foundries, too, are models of good-housekeeping. If there has been tardiness shown in the development of one branch of founding—heavy non-ferrous—much of it has been due possibly to reverence of the truly venerable and the belief that, particularly when engaged on jobbing work, this type of foundry was not amenable to much improvement by re-housing. It has been said that there is little to gain from the introduction of scientific control and flow-production methods, where the work put into making a brass or bronze casting is so often overshadowed by the high price of the raw material. Nevertheless, these ideas are dying, and in at least one case—that of the foundry of J. T. Price & Company, Limited, which will be described—old-fashioned notions are well and truly routed and the buildings and workmanship are to be classed amongst the finest anywhere.

During the war, in 1941 to be precise, the business of J. T. Price & Company, Limited, brass and aluminium founders, of Newcastle-under-Lyme, North Staffordshire, came into the control of the present principals, Mr. W. Sweetmore and Mr. A. H. Betteley. It was a modest concern, with small workshops situated in almost the centre of the town, and there was no room for growth or for improvement of existing working conditions. Forthwith, they decided to husband their resources and, when circumstances permitted, to branch out into what they pictured in their dreams would be an ideal foundry for their work. The chance came, the architects* and builders translated the dreams to reality, and the new foundry premises shown in Fig. 1 (and other illustrations) came into being for a first cast about 18 months ago. A site of 2½ acres was chosen just outside Newcastle town, close to where a new trunk road is to be built and the present imposing buildings were built, covering some 30,000 sq. ft. under one roof. By now, the interior has been fully developed and already extensions are being envisaged.

All this has come about, by not putting all the "eggs in one basket," by making a vast range of non-ferrous castings of high quality, for a large number of different customers and different industries. Twenty-five tons per week of castings are now produced, of alloys ranging from high-duty aluminium-bronze, manganese bronzes, gunmetals, phosphor bronzes, lead-, nickel- and silicon-bronzes to aluminium alloys, chill-cast bar and proprietary heavy non-ferrous alloys. The weight range stretches up to 3 tons for copper-base alloys and 1 ton in aluminium, but the majority come within the lifting capacity of one man. Many are intricate, both in

* Wood Goldstraw & Yorath, Tunstall, Stoke-on-Trent.

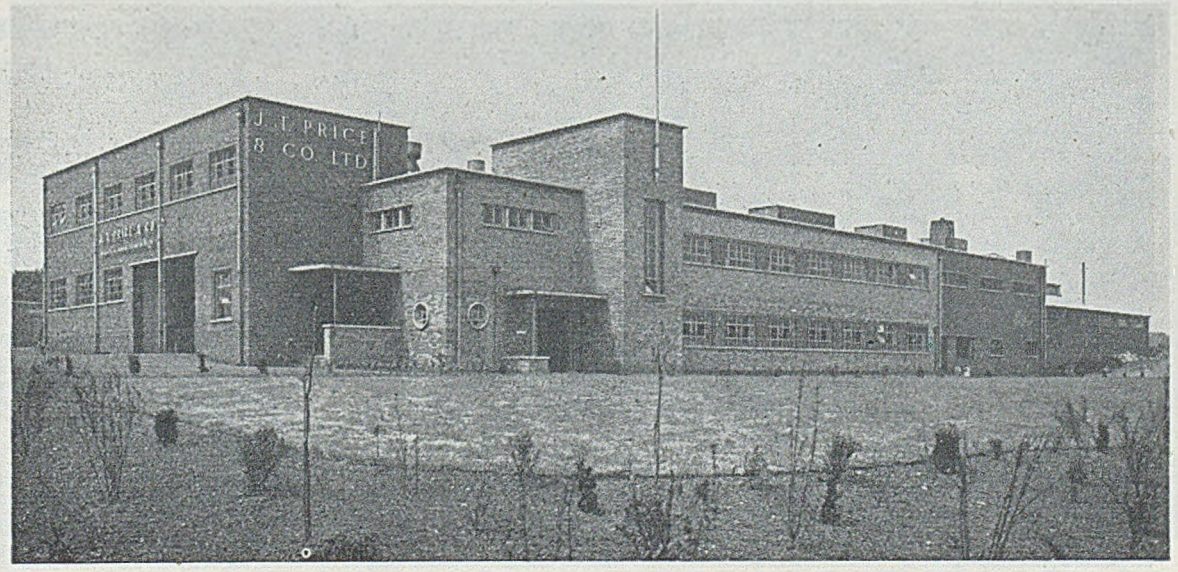

FIG. 1.—*Exterior of Price's New Foundry at Newcastle-under-Lyme, Staffs; note the Imposing Frontage and attractive blending of Office and Workshop Buildings.*

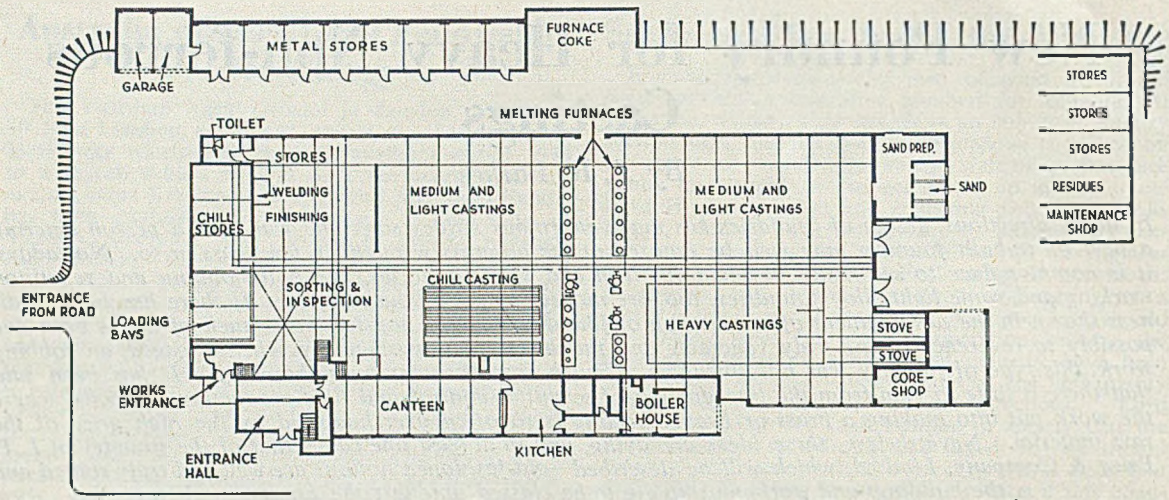

FIG. 2.—*Ground-floor Layout of the New Foundry. On the First-floor, a Patternshop is built over Stores and Loading Bays; General and Executives' Offices over the Canteen and Kitchen; Ablution Rooms over the Boiler House and a Patternstore over the Sand-preparation Plant. Note the well-separated Metal Stores.*

moulding and coring, as the examples show. Promptitude and a sense of urgency have been chosen as the motto for inculcation throughout the works and, it is claimed, are well lived up to.

Figs. 2 and 3 show a plan and general view of the whole foundry at ground-floor level and little elaboration in this text is required for foundrymen to appreciate the salient points. Immediately, the segregation of melting operations to the centre of the moulding bays (where fume spread is restricted by baffle sheets reaching to within 8 ft. of the floor) commends itself as a worthwhile feature, borrowing as it does what is best from the usual American brassfoundry layout and adapting it to the closer working of British jobbing founders. Some idea of the separation of melting from moulding may be gained from Fig. 4 which is taken from inside the melting part proper, looking out towards the chilled-stick casting bay. It will also be realized from the plan view (Fig. 2) how conveniently to hand, yet well segregated, are the coke and ingot stores.

Raw Materials and Melting

All metal is bought in ingot form from reputable suppliers, to suit the various B.S.1400 and other relevant specifications. Scrap arising in the shop, too, is carefully sorted and returned to its proper bin each day in the metal stores. Over 100 tons of ingots are normally held in stock, a view of the ingot stores being shown in Fig. 5. Transport of metal to and from the stores was originally by

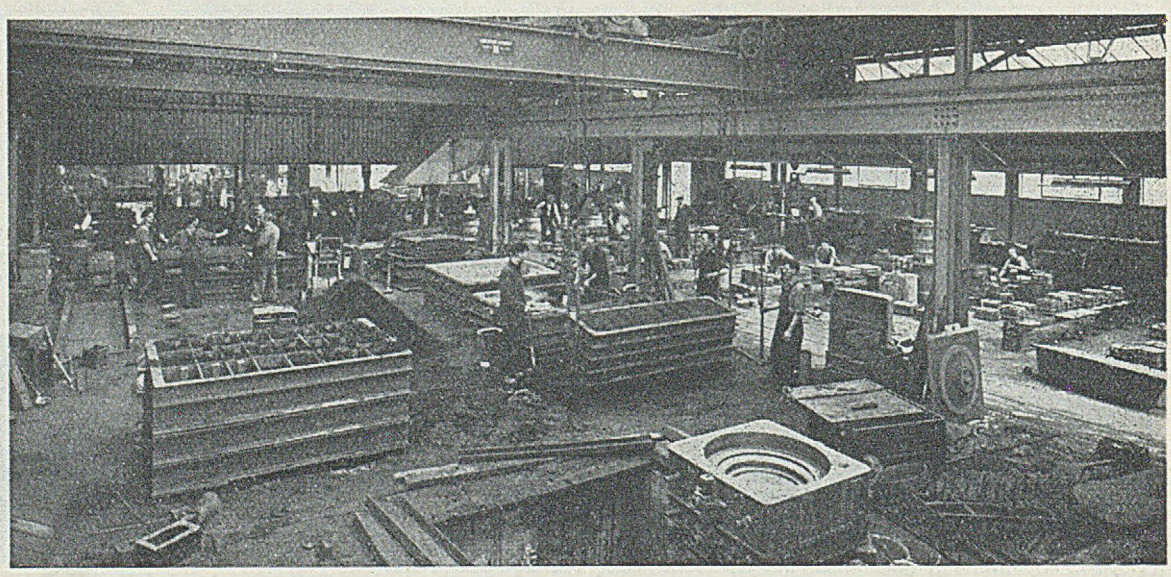

FIG. 3.—*General View inside the Foundry Bays. The Total Area is about* 160 *by* 80 *ft., divided across the Centre by the Melting Plant. In the Foreground is the Heavy Castings Bay.*

trolley, but the site of the stores was changed and barrows are used at the moment.

For charge make-up at the furnaces, four leading charge hands are responsible, one in each bay and these in turn are issued with metal by the storekeeper. Independent laboratory facilities are drawn on for checking raw materials and for analysis and physical testing of finished products—mainly, in the latter case, through the medium of cast-on test-bars. Similarly, for the moulding, one man is held responsible in each section for the issuing of jobs and checking pattern quality and availability as well as that of other tackle.

For melting, there are twenty-two 150-lb. capacity, forced-draught, coke-fired, pit furnaces and three large oil-fired tilters (one shown in Fig. 4) made by Waterhouse. There is much disappointment in the shop about the poor life of crucibles, the position being so erratic that the firm has stopped keeping individual heat-life records for them. It is, however, intended to tackle this and other problems of costing, now that the new works is settling down. Proprietary fluxes and de-gassers are used on all alloys where appropriate, and immersion temperature measurements are recorded for alloys where casting temperature is critical.

Moulding

Much of the moulding is highly-skilled bench or floor work, but four moulding machines (Adaptable) have been installed and these will be followed by others and additional mechanical aids as the foundry develops. Raw sands are Mansfield red and Swynnerton yellow and grey, together with the Southport variety mainly for cores, supplemented by some local river sand. A typical mixture is 170 lb. sea sand, 10 lb. red sand and 5 lb. cereal. Little or no oil binder is used in the core-sands, major reliance being placed on cereals. Quite a fair proportion of the work requires cores.

Dry-sand moulds are left overnight in controlled-cycle stoves, (each with two bogies) running at 200 to 250 deg. C. and furnished with recirculatory systems. This equipment was built by Modern Furnaces and Stoves Limited and has proved very satisfactory. Some of the largest jobs are contained in box-parts 18 by 3 ft., up to 7 ft. square, the largest casting in this category made in gunmetal (a pump body) weighing 50 cwt. There is also a drawer-type stove for the smaller cores. Proprietary mould dressings are sometimes used for dry-sand work. Knocking-out is done manually on the casting site and a Royer is used to treat the backing sand. Facing sand is milled in a separate plant and taken by barrow to the moulders. Here there is also a Fordath core-sand mixer. Feeding flux of the exothermic variety is used to assist in promoting soundness of difficult-to-feed alloys, such as aluminium-bronze and some gun-metal castings. In the "light" and "medium" sections of the foundry (see Fig. 2) there are 24 bench moulders and it is here the four Adaptable machines are placed. These sections cater for such a range of work as can be accommodated in box sizes from 10 to 30 in. square. Orders of the jobbing type are preferred to long runs, as, then, skilled moulding methods are brought into play and the interest in such work is maintained among the workpeople. The output of 25 tons weekly includes about 2 to 3 tons in aluminium alloys, 4 to 5 tons in small gunmetal and in aluminium-bronze castings, 10 to 15 tons of chill-cast sticks and the rest comprises heavy castings. Each moulder has a labourer to help him to pour his own moulds, and for knocking-out and repreparing backing sand.

FIG. 4.—*Impression gained by looking from the Melting Section, under the "Curtain" to the Chill-cast Bay. The "Curtain," which effectively prevents fumes from spreading, reaches to within 8 ft. of the Concrete Floor.*

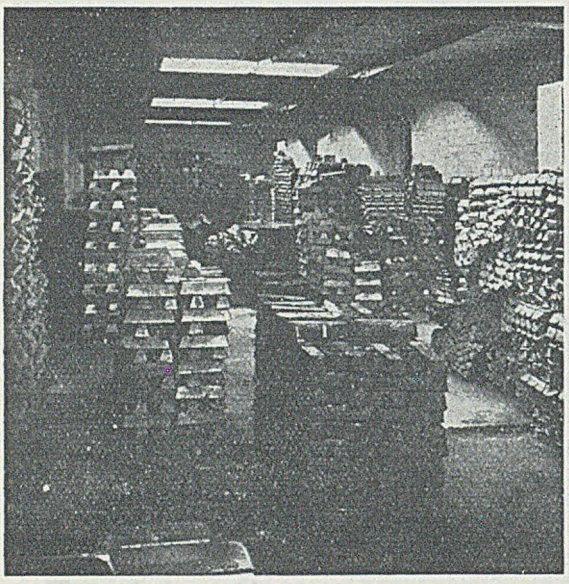

FIG. 5.—*View of Stacked Non-ferrous Ingots in Part of the Metal Stores; Each Batch is kept separate according to Specification and All Scrap arising in the Works is similarly treated.*

Chill-cast Stick

So large is the proportion of chill-cast stick now produced by this firm, that a special part of the foundry has been set aside for its manufacture (Fig. 6) and a proper stores (Fig. 7) is maintained. In the latter, 50 tons or more are always in stock held in readiness for immediate dispatch to customers of any one of up to 1,500 sizes in from 24- to 26-in. lengths and in diameters up to 10 in., cored or solid. The alloys used for this class of work are mainly straight phosphor-bronze and the leaded variety, with some gun-metal and a little brass making up the balance. The cast-iron chill moulds are obtained from T. Masters & Sons (Park Foundry) Company, Limited, of West Bromwich (who are specialists) and are machined locally. A proprietary chill-dressing is used, thereby realizing a good "life" and when failure of a chill does occur, it is usually from hardening on the working face and the incidence of a characteristic "crazing."

Labour

The total labour force at J. T. Price & Company, is about 100 and is split up into 10 floor moulders, 25 on medium and light work, and 10 to 12 on chill casting. Of the rest, six are general labourers and the staff of 20 includes six girls. Much reliance is placed on working in quite small teams under the various chargehands, themselves responsible to the works' manager. All the moulders are paid on a time-piecework system at well above district rates. All the employees are local men and there is a fair number of boys coming along as learners.

Dressing, Inspection and Despatch

Small jobs are put through the dressing shop in boxes, but for others the means are suited to their size. For instance, the Spencer & Halstead barrel-type impellor type shot-blast plant is found ideally suited to the smaller work, but it will not accommodate the larger jobs. There are two Coleman abrasive cut-off wheels, one being in continuous use for chill-cast material. When a truly flexible wheel is developed it should prove very useful, for much of this firm's work could be well adapted to the flexible-shaft grinder at present in use. On infrequent occasions, and then only as an insurance against possible "leakers," plastic impregnation of castings is resorted to, where the customer so desires.

The despatch deck is well engineered for convenient loading and Figs. 8 and 9 show some of the larger and more intricate jobs that have "passed out" from this section. One is of a large bronze pump casing and impellor and the second, a pair of silicon-aluminium gear-case castings, the pair weighing about one ton.

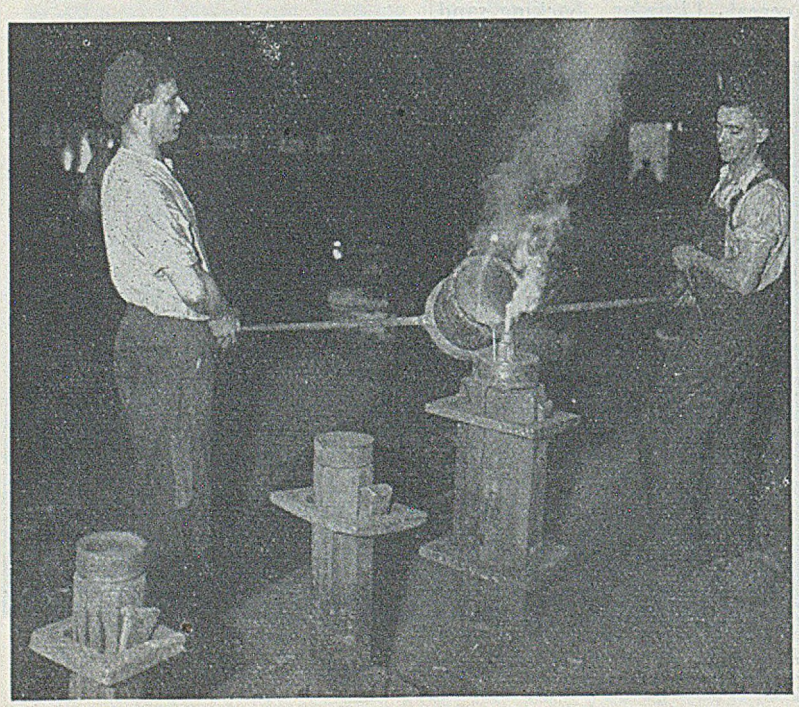

FIG. 6. — *Casting of Chilled Phosphor-bronze Cored Stick; the Cast-iron Moulds are Wedged into Collars for Casting.*

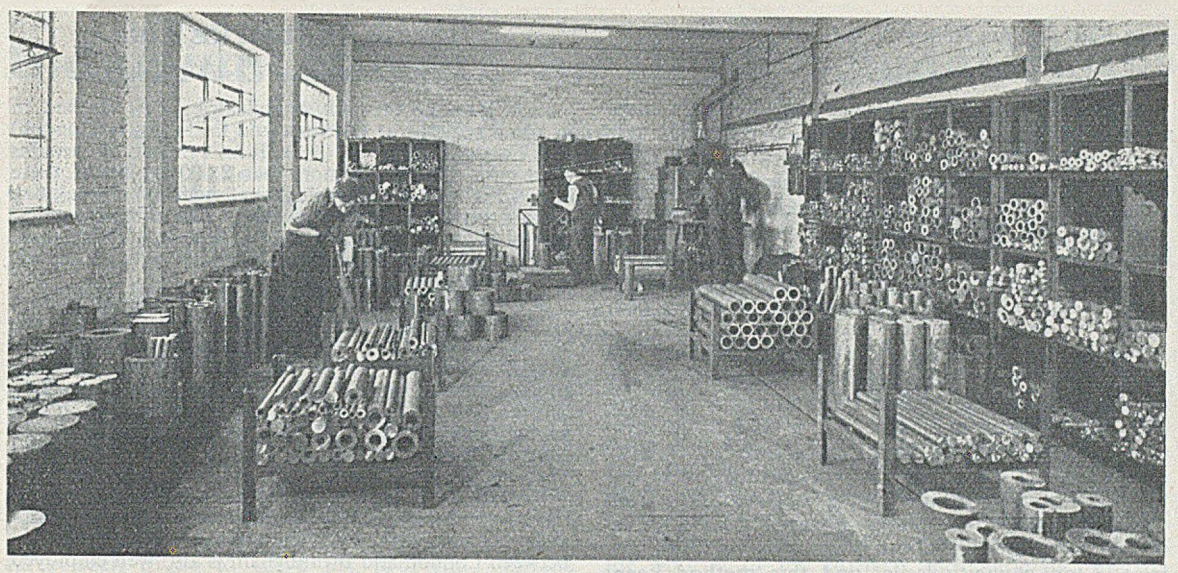

FIG. 7.—*View of the Chill-cast Stores where over* 1,500 *sizes are available for Immediate Despatch.*

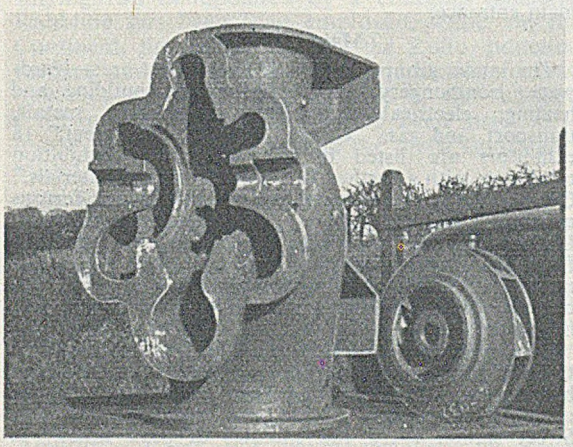

FIG. 8.—*Large Bronze Pump Casing and Impellor.*

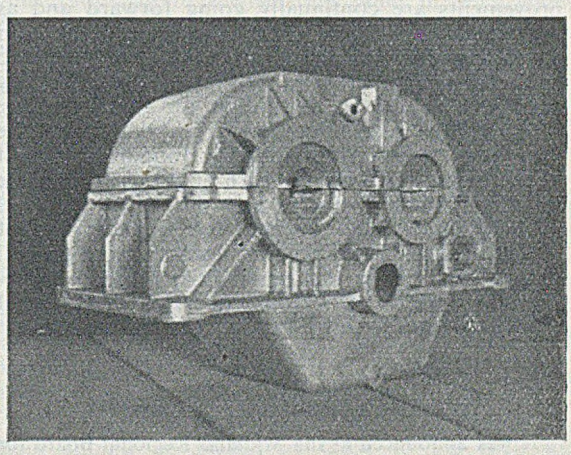

FIG. 9.—*Pair of Silicon-aluminium Gear-case Castings.*

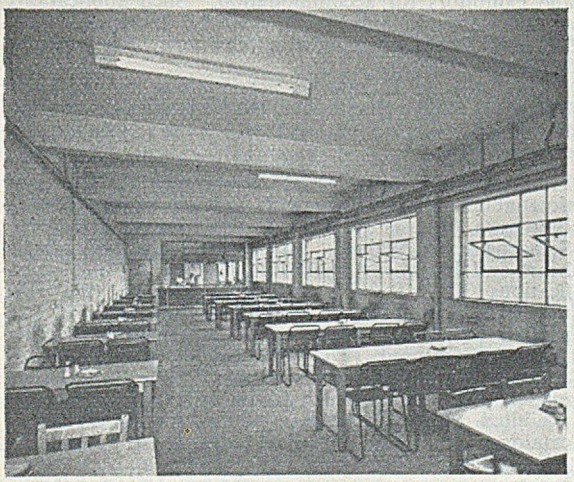

FIG. 10.—*View of the Well-appointed Canteen.*

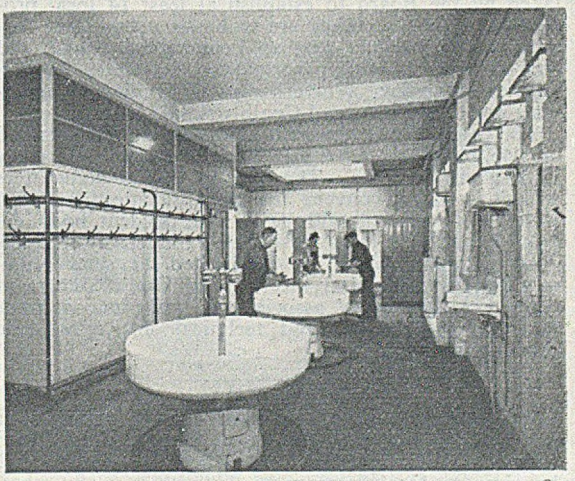

FIG. 11.—*Cloakroom and Washing Accommodation*

New Foundry for Heavy Non-ferrous Castings

Amenities

In the new foundry layout, the directors have made adequate provision for the welfare of their employees. There is a well-appointed canteen (Fig. 10) to seat up to 100, and now serving 50 main meals and numerous sandwich meals per day. The washing facilities are housed in a building (Fig. 11) having tiled walls. There is a heated cloakroom, two shower-baths, and three circular communal washbasins. Hot water and roller-towels are provided.

Ventilation in the shop is still being studied and finality has not yet been reached, though as already mentioned, the segregation of melting in the central, curtained-off enclosure was a wise move initially. A large exhaust main, extracting fumes from over these furnaces, has not worked out too well—there is found to be too much heat radiation from the main itself! A canopy-covered station is reserved for degassing aluminium alloys in bulk, *i.e.*, in a 3-ton capacity ladle, and this method keeps fumes from the rest of the shop. These sort of improvements are continually going forward and as the works does much of its own steel fabrication (including the making of moulding-box parts) no delay takes place between the birth of an apparently feasible idea and its institution for trial purposes.

Truly this installation has given the lie to the idea that non-ferrous jobbing foundries cannot align themselves with the sort of progress possible in other foundry spheres and the writer will feel he has done a little towards the emancipation of such foundries if this account leads to more general appreciation of the real possibilities of good housekeeping open to *all* brassfounders, irrespective of whether or not a new "house" can be provided.

Local Productivity Councils

It was announced at the Midland Regional Board for Industry on April 21 that at the request of the Chancellor of the Exchequer, immediate steps are to be taken by the Board to establish at least 14 local productivity councils. They are to be set up to serve Birmingham, Coventry, Rugby, Leamington, Stoke and Stafford, Shrewsbury, Worcester, Hereford, Kidderminster, Warwick, Wolverhampton, Dudley, Wednesbury and Darlaston, and Coalbrookdale areas.

The councils will represent management, workers and outside bodies, their purpose being to increase efficiency in Midland factories. The Board's district committees will, it is stated, convene the inaugural meetings, after which each council will be an independent body entitled to ask help from the British Productivity Council. Among organizations to be invited to send representatives to inaugural meetings will be chambers of commerce, employers' associations, trade unions, trade societies, professional and technical institutions and educational authorities.

THE INDUSTRIAL WELFARE SOCIETY is arranging a one-day conference at the Royal Station Hotel, Newcastle-on-Tyne, on May 5, at which five lectures will be given to local foremen.

British Industries Fair

Over 1,000 *Stands at Castle Bromwich*

Last Monday the British Industries Fair opened in its usual sections at Olympia and Earls Court (London) and Castle Bromwich (near Birmingham); it remains open until May 8. Of more than 2,000 exhibitors, there are 1,174 in the Birmingham section, representing engineering and heavy industry (including foundry) and hardware. Here, some 345,000 sq. ft. of space is occupied indoors and the size of the outdoor section is of increasing importance.

Reports so far to hand from the three centres of the Fair suggest that full advantage is being taken by both home and overseas buyers to inspect this annual trade show and to see for themselves what new goods Britain has to offer to the world markets. Information is also forthcoming of substantial orders having been placed. The number of acceptances from overseas buyers invited personally by the Board of Trade is greater, by about 35 per cent. than last year.

Visitors from abroad have taken advantage of the travel concessions and facilities made by air lines, shipping companies, and railways, while the air link between London and Birmingham is also well employed, the journey taking one hour each way and the planes alighting at Castle Bromwich within 100 yds. of the main entrance.

Main Groups

The main groups at Castle Bromwich are:—Hardware, ironmongery, and brassfoundry; building and heating; electrical equipment; engineering, metals, transport, and gas. Under "foundry equipment," 18 exhibitors are listed in the voluminous exhibition catalogue, with a further 12 under "foundry materials." Over 50 firms are showing ferrous and 35 non-ferrous castings, though there is some overlapping. Undoubtedly, this year sand bonding receives emphasis from the foundry point of view, as there are a fair number of stands showing corebinders with not a few covering shell-moulding. All are quoted in the lists mentioned.

The exhibition hall is situated a few miles outside the city of Birmingham, and is served by railway and bus routes, services having been augmented for the duration of the B.I.F., with trains running from New Street station every few minutes at peak times. In Birmingham, too, a special accommodation officer deals with applications from both home and overseas buyers and exhibitors for accommodation. Such applications should be made direct to the British Industries Fair, 95, New Street, Birmingham (telephone: Birmingham, MIDland 5021).

The Duke of Edinburgh, accompanied by the Lord Mayor of Birmingham (Ald. W. T. Bowen) is touring the Castle Bromwich section of the fair to-day (Thursday).

One foundry firm, which is showing for the first time at the Castle Bromwich section of the British Industries Fair, is Castings Limited (stand D.751) of Selborne Street, Walsall. The firm produces both whiteheart and blackheart malleable castings to B.S. specifications 309/310. Not only castings, but the raw materials, laboratory control, instrumentation and pattern equipment which contribute towards making them are featured. The company claim a customer rejection rate of as low as 2.7 per 1,000. A weldable malleable cast iron which has been developed is also exhibited. An unorthodox announcement in the B.I.F. catalogue entry for this firm consists of a personal guarantee of their products signed by the three directors.

Induction Stirrers for Molten-metal Baths

*By P. E. Hammarlund**

Users and manufacturers of electric-arc melting furnaces were informed at a meeting and film show in London last month of modern developments in stirrin g molten steel, contained in such furnaces, by means of induced currents. The phenomenon has long been associated only with induction furnaces, but its effective application to arc-furnace melts is both novel and opportune. Means of speeding the reactions in metal baths have long been sought and effective stirring will be a major contribution towards solving the problem. Reduction of refining time and improvement of slag reactions are among the obvious advantages.

In many processes of steelmaking, it is beneficial to introduce some form of stirring of the melt. There are various reasons for this, *e.g.*, need for thorough contact between the molten components, thorough mixing in the shortest possible time, equalization of alloy concentration and temperature distribution in the melt. Many and varied attempts have been made to solve the problem. In the U.S.A., trials have been made with a ceramic-coated stirring rod manipulated by a charging machine. Rabbling has been long employed, while, on the Continent, the Perrin process, the Rohn induction furnace and the dual frequency induction furnace (invented by Dr. Ludvig Dreyfus of the A.S.E.A. company in Sweden) have also been used as a means of getting the slag and the metal thoroughly mixed.

In Sweden, the problem of introducing electrodynamical means of stirring the metal in the bath was taken up for study by Dr. Dreyfus in 1936. The problem then was to produce a stirring effect in a hot-metal mixer, but although the electrical stirrer proposed for this particular purpose was not actually built, it became the forerunner of a stirrer applied to a 15-ton electric-arc furnace in 1939, and this formed the prototype. To-day, six induction stirrers have been installed in Sweden and one in America; others are being installed in Spain, France and Belgium in the near future. Technical features of the A.S.E.A. induction stirrer have already been published.[1, 2, 3, 4]

Flow Pattern

It is rather surprising to find that there is so little inherent bath motion in arc furnaces. On first thoughts, one would expect great forces to act on the melt arising from the high alternating current of the arcs, because the basis for practically all electric motors, namely currents in magnetic fields, exists also in arc furnaces. It can be shown, however (as was done by Dr. Dreyfus), that the currents and the magnetic fields in arc furnaces combine in such a way that the stirring effect is negligible from a practical point of view in contrast to such electrical furnaces as high-frequency induction furnaces and similar ones where it may often be a prob'em of avoiding too forceful a motion in the melt. It is possible to achieve motion in the melt of an electric arc furnace in several different ways, but the practical and useful ways are few. Dr. Dreyfus's proposal to use a travelling magnetic field in accordance with the induction motor principle has proved to be successful if so applied that the bottom layers of the melt are accelerated along the bottom of the furnace and made to flow upwards and sidewards at the end of their linear path, thus returning to the starting point in very wide eddies enclosing large surfaces. The flow pattern is indicated in Fig. 1 and the coil arrangement to achieve this is a two-phase winding fed by very-low-frequency a.c. currents (Fig. 2). The travelling field can also be produced by means of moving d.c. magnets, but it is then of importance that they be so arranged that the field motion is as close as possible to that achieved by a multiphase winding in order to obtain satisfactory stirring. This latter way, with various arrangements of moving d.c. poles under the furnace, was investigated at an early stage during the development of the stirrer in Sweden but it was found much more practical and useful to use a static winding which, in fact, was identical with a part of a huge induction motor stator, the melt itself being the rotor.

The stirrer producing the travelling magnetic field should be placed as close to the melt as possible for high efficiency. It is obvious that some robust protection must exist between the hot metal

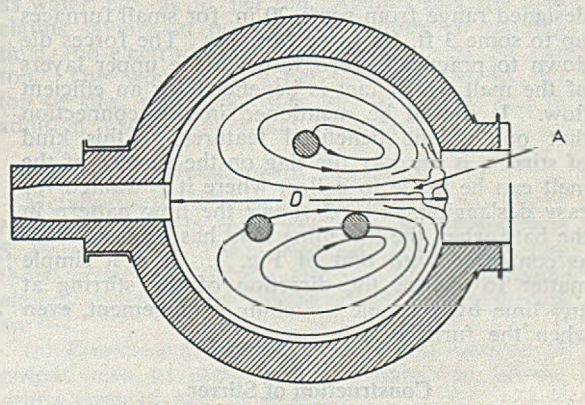

FIG. 1.—*Flow along the Furnace Bottom obtained with Multiphase Coil (A—Mixing Zone).*

* The Author is manager of the furnace department of the Swedish A.S.E.A. concern.

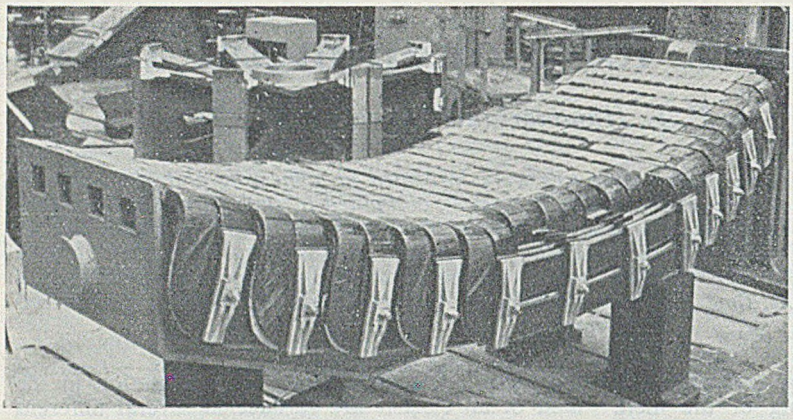

FIG. 2.—*Two-phase Induction Stirrer for a 30-ton Arc Furnace.*

and the field-producing members. The practical approach to this was to equip the furnace with a bottom of non-magnetic material, and it is a design problem to choose the frequency so that it is sufficiently low to avoid excessive eddy current losses in the bottom plate, but at the same time sufficiently high to ensure that the motive forces generated in the bottom layers of the melt are able to stir the melt thoroughly in a short space of time.

Stirring Forces

A certain amount of practical experience has already been gained as to the amount of stirring force that the stirrer should be designed for, but there is no doubt room for more investigation on this particular feature. It is here that the opinions of the users of stirrers will be most valuable, although it has been found that the stirrers so far in use in various steel works have produced a satisfactory stirring effect. Apart from the electrical design of the stirrer, the thickness of the bottom lining of the furnace has great influence on the stirring forces, which decrease rapidly with increased distance from the stirrer, so the bottom lining should not be made too thick. Practical values of lining thickness for which the stirrers are designed range from some 20 in. for small furnaces up to some 3 ft. for large furnaces. The forces die down to practically zero value in the upper layers of the melt which fact is beneficial for an efficient flow. It should be mentioned in this connection that one of the beneficial features of this kind of stirring is the way the slag on the surface of the melt can be made to collect where it is wanted for easy deslagging. Fig. 3 shows the flow pattern in the bath when the travelling field has been reversed as compared with that of Fig. 1. It is a simple matter to change the direction of the stirring at any time by a simple switching arrangement, even when the furnace is in use.

Construction of Stirrer

The magnetic yoke of the stirrer is built up of laminated steel, for example, 1 in. gauge, bladed in the same way as in an induction motor. Wide and deep slots house the heavy conductors which form the winding. Cooling can be provided in different ways, the most efficient means being achieved using hollow copper conductors through which cooling water flows. Air cooling by forced air draught has also sometimes been employed. Generally the stirrers are suspended directly from the furnace casing with a space between the upper surface of the stirrer and the bottom of the furnace which is of the order of 1 in.

A few words should be added here about the hazards of placing a piece of equipment of this kind underneath a furnace containing many tons of molten steel. First of all it should be stated that it is not altogether correct to use the word hazard in this connection. Experience has shown that a break-through of the *bottom* of an arc furnace occurs very seldom indeed, and, in fact, nowadays, it is possible to have devices installed which continuously tell the operator the condition of the bottom lining. All furnaces with stirrers have been equipped with temperature indicating elements placed under the bottom of the

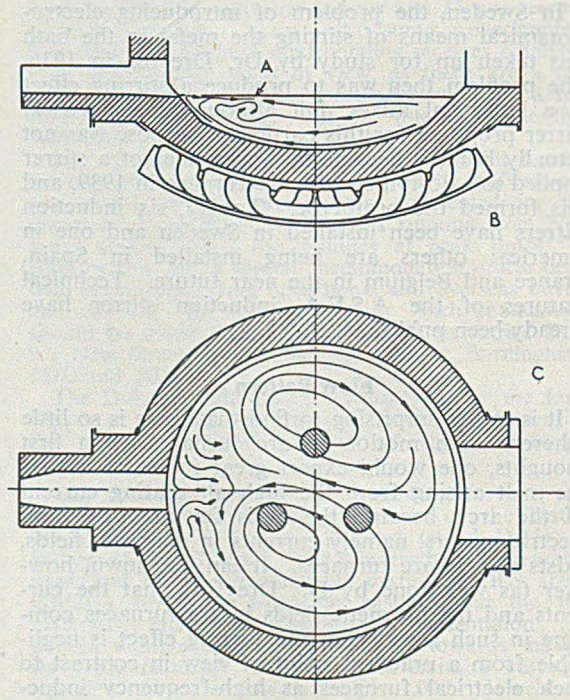

FIG. 3.—*Flow in Bath during Slagging (A—Mixing Zone; B—Two-phase Electric Stirrer; C—Flow at Bath Surface.*

furnace and arranged so that an alarm and indication is given when the temperature at any one spot exceeds a certain preset value. The operator then knows that the lining at that particular spot needs repairing before the next charge. However, if by accident the hot melt should come out on top of the stirrer this melt can be made to flow off by tilting the furnace (and therewith the stirrer). The stirrer itself is protected by a refractory coating on the top of the same character as that used in foundries.

As already mentioned, the bottom of the furnace has to be made of non-magnetic material, preferably chromium/nickel steel (18/8) or other types of steel with certain specified values of permeability and resistivity. The bottom thickness should not be too great, 1 in. or so is an acceptable value. It has been found practical in large furnaces to make the bottom of strips of butt-welded non-magnetic material. Fig. 4 shows a non-magnetic bottom for a 30-ton arc furnace under manufacture. The joint to be welded can be seen in the middle. Care must be taken when welding so that the non-magnetic properties are not destroyed.

The low-frequency currents in the stirrer are produced by a motor-generator set consisting either of two single-phase generators or of one two-phase generator driven by an induction motor. The power consumption is low. As an example, a stirrer for a 30-ton arc furnace (16 ft. inner shell diameter) consumes about 115 kw. at a power factor of 0.5. The magnetic field does not have any noteworthy heating effect on the melt. The total power consumption, including cooling equipment and exciter, is some 180 kw. It might also be of interest to mention that a standard stirrer for a 30-ton furnace weighs about 10 metric tons. A stirrer of this type is shown in Fig. 5. The fixing arrangement can be seen on the short end of the stirrer. In addition to pushbuttons for starting and stopping the motor-generator set and the stirrer, the control panel contains the reversing push-buttons, temperature-control equipment for the furnace bottom and instruments for current, voltage, etc. Controls are interlocked so that the equipment can be operated by labour unskilled electrically.

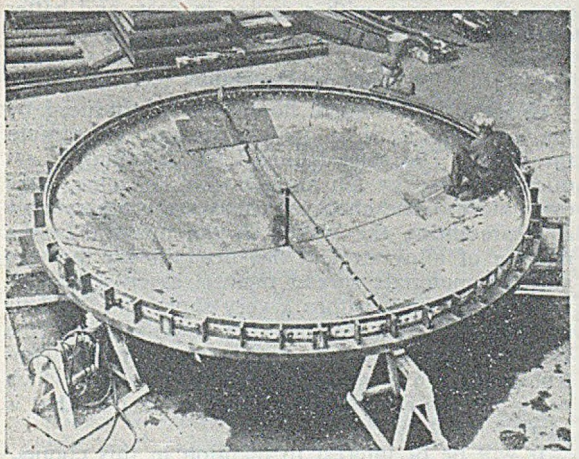

FIG. 4.—*Non-magnetic Furnace Bottom for a 30-ton Arc Furnace.*

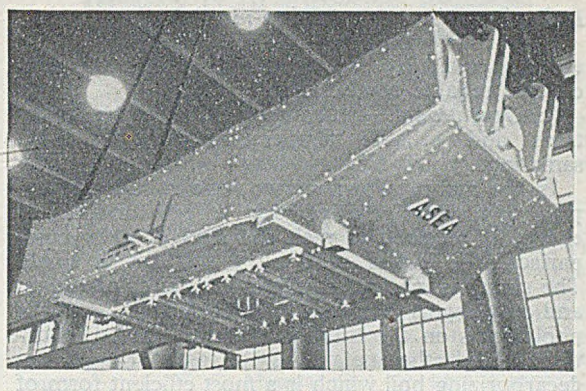

FIG. 5.—*Water-cooled Induction Stirrer to be Used under a 30-ton Arc Furnace.*

Operating Costs

Before describing any of the results gained with stirrers in actual service, a rough indication can be given of the operating costs for a stirrer installation. Such a calculation can, of course, only be made in a tentative way as conditions vary much. Such savings as result from the better yield of alloy materials, reliable analysis, easy and improved deslagging, the lessened amount of slag inclusions, etc., although fluctuating with the melting procedure and other local conditions, constitute by far the greater part of the gain. In the brief review of costs given below only such savings as result from a reduced refining time for the melt are taken into consideration.

When considering costs, from figures claimed by A.S.E.A., it may be estimated that the total cost of stirring a 30-ton furnace by this means is of the order of 3s. 6d. per ton—this is derived from capital costs of, say, 2s. 3d. per ton, assuming the amortization of the equipment at £5,000 p.a.; power costs of 1s. per ton, with other charges, such as water, etc., at 3d. per ton. Against this, the firm claims savings in power by reduction of refining time, and electrode savings, to be worth 5s. 5d. per ton. This would give a net saving of 1s. 4d. per ton of steel produced using this technique, and in addition, production would be increased.

Metallurgical Benefits

Metallurgical advantages of the stirrer have been reported earlier in some detail by F. Nilsson and S. Fornander.[1, 2] The advantages claimed fall into three groups, of which the first and last have already been touched upon above. The groups are:—

(*a*) *Economical.*—Saving of time and increase of output, also to some extent a reduction of the prime costs of raw materials.

(*b*) *Metallurgical.*—Improvement in the quality and cleanliness of the steel; quick homogeneity of

the melt and a closer approach to equilibrium conditions; reliable composition.

(c) *Operational.*—Much improved slagging conditions and reliable temperature control; rapid sampling.

In the melting-down period, one should not expect any great change, for a set amount of energy is required to melt the steel and, by comparison, the power used by the stirrer is small. The stirrer is, of course, intended to circulate liquid and only begins to have an influence when a molten pool forms on the furnace bottom. In the oxidation period, the metal has the assistance of the decarburizing boil which is a most efficient form of stirring. When, for some reason, the boil stops, the stirrer undertakes the agitation of the bath and it has been noticed on some occasions that this may be the means of restarting the boil. The rate of decarburizing is much accelerated by stirring at this time when it would otherwise be at its lowest. It has, furthermore, been shown that it is possible to obtain steels with a very low carbon content simultaneously with a low oxygen content. This has previously been a matter of compromise within fairly well-defined limits.

Refining Period

It is in the refining period that the effect of the stirrer is particularly marked. Due to the agitation of the melt there is a much more intimate contact between the slag and the metal. The active contact area is greatly increased and the chemical reactions proceed towards their equilibrium points more quickly.

Lowering of the oxygen content is much accelerated and more complete; in fact it has been found possible to make steels with a lower oxygen content than ever before (as little as 0.0005 per cent.). The time saved is from 30 to 40 min. and occasionally up to one hour.

Lowering of the sulphur content is also accomplished in less time. A saving of 20 to 30 min. is usual and as much as an hour has been saved in special cases.

Lowering of the phosphorus content.—This process also is considerably speeded up and taken further towards completion. It is made possible by the increase in basicity of the slag which also has a lower FeO content.

Production is increased.—Not only does the stirring shorten the total time of the melt by some 10 to 20 per cent., but it so increases the effective surface area of the bath that it now becomes possible to use a deeper bath and to take a larger charge with each melt. The total advantages so gained at one furnace amounted to a production increase of 20 per cent. per annum. This gain is particularly important where arc furnaces are taking hot charges for refining only, as the proportional improvement can then be much greater.

Quality of the steel.—The effect of the stirring is also to produce a homogeneous, clean steel, free from porosity and inclusions. Such a steel naturally has better physical properties. The advantage is marked in furnaces engaged on the production of high-quality steels. Although more investigation is needed on this point, reported results so far have been positive. In one case, for example, with a steel containing 0.25 per cent. C, 1 per cent. Cr, and 0.25 per cent. Mo, the number of inclusions per surface unit at " step-down turning tests " was only a third of the number found in steel made without the aid of the induction stirrer.

Better yield of alloys such as chromium, nickel, tungsten, etc., has been claimed. One of the reasons for this might be that the analysis at sampling is so much more reliable due to the homogenization of the melt by the stirring that it is possible to have no lower margin of safety for the achievement of a specified alloy percentage. This increased reliability in sampling is claimed by one steel works producing alloy steel to be the main advantage of the stirrer. Another steel works using the oxygen lance for making stainless steel claims that the stirrer is a useful factor in the success of the method, particularly for recovering the oxidized chromium.

Slagging

The stirring effect is arranged to create a flow of surface metal towards the slagging point. The slag is thus carried towards the door or tapping spout as required, and pushed out, while the hot metal scours the furnace walls where an operator could not reach conveniently with a rabble. The work is done by the movement of the metal itself and operators are glad to work on furnaces provided with this type of equipment (they are quick to report the fact if, for any reason, the stirrer is shut off). The ease of slagging is a help, especially in those processes which require more than two slags, and it also makes it possible to handle the large volumes of slag associated with the dephosphorization of low-grade scrap. One furnace which previously used 50 per cent. low-grade scrap has, since being fitted with a stirrer, turned over to 100 per cent. cheap scrap with a saving in costs and better quality of steel produced.

Furnace Operation

Because of the quick homogeneity produced by the stirring, it is a simple matter to sample the melt. The time required for sampling is reduced by five or ten minutes and in some cases even more. The check analyses are more reliable as representing the whole of the metal. In the making of alloy steel, it has been shown that the alloying materials spread themselves evenly to all parts of the bath within a very short time of their addition. Further, temperature equalization in the bath is attained quickly, making temperature control easier and eliminating local overheating, which probably reduces the quantity of burnt iron that is carried away by the slag.

It will be of interest to mention in this connection that a stirrer is in process of manufacture for a 150-ton arc furnace with an inner shell diameter of 24 ft. which mainly will produce ordinary carbon

steel, the purposes of the stirrer being temperature equalization, homogeneous analysis and easier slagging, as these factors are real problems in such a huge furnace.

It is of importance that the furnace bottom should be kept clean. The influence of the magnetic field produced by the stirrer depends upon the thickness of the bottom which should be as small as is convenient. The scouring effect of the metal does, to a certain extent, help to keep the bottom clean. It ought to be mentioned here, however, that it has not been observed whether the stirring increases the life of the lining or not.

Future Possibilities

The future possibilities of this equipment are difficult to assess, but it seems reasonable to assume that it may equally well be applied to the open-hearth furnace, particularly where large outputs are required and refining is difficult. In many instances, mixers could be equipped with stirrers. The same principles apply in the production of ferro-alloys and the stirrer is capable of producing an appropriate stirring effect. In many other types of melting furnace the same is true. At present, however, these applications have not been tried out and their possibilities are just suggested.

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[2] S. Fornander and F. Nilsson, "Inductive Stirring in Arc Furnaces," *Journal of Metals*, Vol. 188, No. 1, 1950, p. 22 and p. 256.
[3] L. Dreyfus, "An Induction Stirrer for Arc Furnaces," *ASEA Journal*, 23, 1950, pp. 46-54; "Ein Induktionsrührer für Lichtbogenöfen," *Radex Rundschau*, 1952, pp. 191-199.
[4] S. Fornander, "Metallurgical Aspects of Inductive Stirring in Arc Furnaces," *ASEA Journal*, Vol. 23, 1950, pp. 55-65.
[5] E. S. Kopecki, "Induction Stirring in Electric Furnace Steel making," *Iron Age*, September 22, 1949.

Export of Metal Goods

From April 27, the export of some copper and iron and steel goods to any destination other than China, Hong Kong, Macao or Tibet under Open General Licence, is permitted if the value of the goods exceeds the value of the copper, copper alloy, iron or steel content, calculated at the rate of £380 per ton for copper, £250 per ton for alloys mainly of copper, and £30 per ton for iron and steel. These licences apply to goods specified in Group 6(2) of the First Schedule to the Export of Goods (Control) (Consolidation) Order, 1953.

Under similar previous licences, which are revoked, the values were £430 per ton for copper, £350 per ton for alloys mainly of copper, and £40 per ton for iron and steel. The reduction in the minimum values have been made in order to facilitate the export of certain ranges of copper, copper-alloy and iron and steel manufactures. Enquiries regarding the open general licences referred to in the first paragraph should be made to Export Licensing Branch, Board of Trade, Atlantic House, Holborn Viaduct, London, E.C.1. (Telephone: CITy 5733.)

UNDER AN AGREEMENT providing for an exchange of goods worth £30,000,000 sterling in each direction, Pakistan has agreed to issue for Japan single country import licences of £1,500,000 for iron, steel, and other metals and £6,000,000 for capital goods and machinery.

British Non-Ferrous Metals Research Association

At the thirty-third ordinary general meeting of the Association, held at the Savoy Hotel, London, W.C.2, on April 22, the Chairman of the Council, Lt.-Col. the Hon. R. M. Preston, D.S.O., in the course of his address, made the following references of interest to the foundry industry.

"In a few days' time we shall be taking leave of our chief liaison officer, Mr. W. L. Hall, who is taking up a post with a member company. He has been with us since 1938, successively as investigator, as a member of the liaison department, and since 1947 as chief officer of the Department. He has served the Association well and he takes with him the good wishes of his colleagues for his new career. We are glad to welcome as his successor Mr. E. C. Mantle, who has been a member of the liaison department since 1946 and is well known to many of you.

"The drive for higher productivity which has been much discussed of late falls closely in line with the work of the Association, particularly that of the liaison department. Nearly all our efforts directed for example towards better and sounder castings, new and improved materials, more rapid methods of analysis and so on, aim ultimately at economics in time or material. During the past year we took part in a Brassfoundry Productivity Conference which arose out of the visit of a British Productivity Team in the United States. Three papers at the conference were from members of the staff, including one who had been on the American tour."

In the annual Report there was a further reference to foundry practice under "Review of Research Progress." It stated:

"The study of methods of inhibiting the reaction between water-vapour and certain aluminium-magnesium alloys when they are cast into sand moulds has now been concluded, the work completed during the year having revealed no means of improvement on the reasonably satisfactory methods of inhibition developed earlier in the research."

National Federation of Iron and Steel Merchants

At the annual general meeting of the National Federation of Iron and Steel Merchants held recently a Report was presented which stated that a most important development during the year had been the ratification of the Schuman Plan and the setting up of the European Coal and Steel Community. This meant that as from May 1 there would be one open market for steel for the six countries adhering to the Schuman Plan, namely, France, Germany, Belgium, Holland, Italy and Luxemburg. It might be that this development would have far-reaching consequences, and the position would be closely watched in the interests of merchants in this country.

As a result of an approach to the Ministry of Supply, it was understood that although a British delegation had been appointed to the High Authority of the Community, it was not intended to be a large and fully-representative delegation at that stage, but the Minister would hope to consult with the Federation in the event of any questions arising in connection with merchanting matters. The Federation would continue to maintain contact with the merchants in the Schuman Plan countries through the International Federation of Steel, Tubes and Metal Merchants.

Notes from the Branches

London—East Anglian Section

The February meeting of the East Anglian section of the Institute of British Foundrymen took place at the Central Library, Ipswich, when the Institute's sub-committee T.S.35's film "Flow of Metal" was presented by Mr. R. W. Ruddle, one of the original members of the sub-committee. Mr. R. J. Hart, president of the section, introducing Mr. Ruddle, said the sub-committee work represented one of the many services offered to members by the Technical Council of the Institute. After the film was shown, Mr. Hart remarked that the film demonstrated the need for considerable thought when laying out patterns for production, if wasters caused by faulty gating were to be eliminated. A lengthy and lively discussion followed, many members asking questions. At the close of the meeting, a vote of thanks to Mr. Ruddle was proposed by Mr. Wincer.

The March meeting of the section took place on March 17, when Mr. J. Fallows, of the Polygram Casting Company, Limited, presented a paper entitled, "Past, Present and Future Developments of Shell Moulding." He was introduced by Mr. R. J. Hart, president, who said that Mr. Fallows had had large experience of the shell-moulding process, as a director of his firm.

The discussion on this occasion was opened by MR. BOOTH, who asked if the springs of the lifting pins were inclined to lose their temper after a given period in work; if a water-cooled rim was used on the dump-box; whether or not shells tended to warp; and lastly, what type of sand was used for shell moulding.

MR. FALLOWS replied that the springs of the lifting pins do tend to lose their temper in use, and it was more economical to buy cheap springs and replace them often; no use was made of water-cooling on the dump-box. Under certain circumstances, there could be some shell distortion, particularly at the joint when shells were unsupported. In answer to the last question, numerous suitable sands were available in this country for operation of the process.

MR. LOCK asked if the rapid cooling of thin sections did not lead to chilling.

MR. FALLOWS, in reply, said that generally, there was a retarded cooling effect in shell moulds, but that the chilling action of water in the sand was eliminated, and also a very high permeability existed to allow excess gas rapidly to diffuse through the mould.

MR. CATES asked what the cost of shell moulding was likely to be in comparison with the normal moulding techniques.

MR. FALLOWS replied that hand moulding of shells was cheaper than a bench-moulded equivalent, using normal moulding techniques, and that prices were generally on the way down, and compared very favourably. Another point in favour of shell moulds was their phenomenal store life, due to lack of affinity for water.

Patterns

MR. BRIDGER wanted to know if there was any difficulty in manufacture of patterns for this type of work, whether a methods department was necessary, and what means were used for risering and gating.

MR. FALLOWS said that there was no difficulty in manufacturing patterns for shell moulding; methods departments were not essential and risering and gating were rather different from those of conventional foundry practice.

The meeting concluded with a vote of thanks to Mr. Fallows proposed by MR. TAYLOR, who said it was a privilege to hear such an informative and competent lecturer deal with a subject with which he was fully conversant. It was obvious that tremendous progress had been made with this method of moulding since Croning's time, and Mr. Fallows was to be congratulated on pioneering shell-moulding in this country. Mr. Taylor also said that to his mind, the process had a remarkable versatility, and the interest with which it was being received in this country was shown in the animated discussion which had taken place that evening. Mr. Lock, seconding the vote of thanks, said he thought the process inaugurated a new era.

Wales and Monmouth—West Wales Section

The West Wales section of the Institute of British Foundrymen arranged a works visit to the Machynis Foundry, Llanelly, of Richard Thomas & Baldwins, Limited. Members from all parts of Wales and Monmouthshire took part and the total number exceeded a hundred. Accompanying the Cardiff group was Mr T. Makemson, secretary of the Institute.

Mr. Dimmock, general manager, welcomed the visitors on arrival, who were headed by Mr. Raymond Jones and Mr. C. G. Jenkins, section president and secretary. Under the care of competent guides, groups toured the works, comprising steel foundry, roll foundry, non-ferrous foundry, fettling shop and machine shops. The melting plant was also visited. This included cupolas, side-blown converters for steel production, reverberatory furnaces for roll casting, and Sklenar furnaces in the non-ferrous foundry. The dust-extraction plant in the fettling shop attracted some attention.

Subsequently the party was entertained to tea in the modern canteen. Proposing a vote of thanks to the Company, Mr. Makemson referred to their broad-minded attitude in inviting members of the Institute to view their new factory and displaying all that had been accomplished, rather than hiding their light under a bushel. It was his first official visit to the West Wales section and he realized the difficulties of catering for such a scattered area. He was sure, however, that attendance at Institute meetings would be an advantage to all who made the effort. Progress came from exchange of ideas and Institute meetings were ideal gatherings for that purpose. This present meeting was an indication of the interest that Institute members had in their industry.

Mr. R. H. Dimmock, acknowledging the vote of thanks on behalf of the company, said that Richard Thomas & Baldwins had always welcomed visitors to their works. He was pleased to see such a number of foundrymen present and hoped they had derived some pleasure in going around the various departments.

Mr. John Hird then presented the Report of Sub-committee T.S. 35 on "Flow of Metal," illustrated with film and lantern slides. Following an interesting discussion, during which Mr. Hird dealt with questions satisfactorily, a hearty vote of thanks, proposed by Mr. Ivor Rees and seconded by Mr. Gwilym Rees, was accorded with acclamation.

GEOLOGISTS HAD PROVED DEPOSITS of 568,000,000 tons of high-grade ore in a new area on the north-east coast of Ungava, Quebec, where an iron-ore mining and processing project is to be undertaken by Fenimore Iron Mines, said Mr. Duplessis, the Provincial Premier, last week. The project will cost about $68,000,000 (£24,550,000).

National Brassfoundry Association

Abstract from the Annual Report

At the annual general meeting of the National Brassfoundry Association held in Birmingham recently, the Report for the year ending December 31, 1952, was presented, from which the following has been abstracted :—

Metals Orders—Prohibited Manufactures

The grave concern, expressed last year, as to the damaging effect on this industry of the Orders prohibiting certain manufactures in zinc, copper, and their alloys has been proved only too well founded. The Council is happy and relieved to report, therefore, that its unceasing pressure for the ending of these Orders has now borne fruit. It must be said, however, that the cancellation was not made until long after it was obvious that the supply position was vastly improved, and it is considered that the announcement was overdue by several months. This was attributed to the necessity for consultation with the Office for European Economic Recovery. During this period, the Council was aware of much competition from the Continent, prohibited articles being imported into the domestic market. If international co-operation is to mean such considerable delay in reaching agreement, whereby foreign manufacturers are given unfair advantages over the British, a case would appear to be made out for this country to resume control over its own affairs.

The Orders prohibiting the use of nickel for a variety of purposes remain. The Council accept that nickel is in short supply, but it is concerned that this is the only reliable protective base for plating and, particularly in the case of zinc-based goods. Not to use it is bound to lead to rapid deterioration and wastage of metal. At least, the Council would ask the Government, in fairness to honourable concerns, to ensure that the Orders are carried out—or to withdraw them—and it adds the plea that withdrawal should not lag far behind the time when the supply position eases.

New Offices

The outstanding domestic news of the year is the fact that, after some ten years of searching the Association now has solved the problem of office accommodation. With the kindly help of the Calthorpe Estates Office, the Association was offered a house at 4, Calthorpe Road, Five Ways, Edgbaston, Birmingham, which, although in a very bad state of repair, seemed eminently suitable for its purpose. Accordingly the Council has entered into a lease for seven years, renewable for a further fourteen years and for as long thereafter as is desired, subject to plans for redevelopment for the area (which it is thought are remote of accomplishment). It has been found necessary to spend a considerable sum on the new offices, which needed a new roof, and renewal of plastering, electric wiring, plumbing, gas-piping and some flooring, and complete decoration. Approximately half of this expense has been recovered from the landlords. As a result, the Association at last has offices of which it may well be proud, and worthy of its importance and standing. The offices were opened informally with a "house-warming" party at which the president and vice-president welcomed members who expressed considerable satisfaction with the excellent office accommodation and the manner in which the work had been done.

Membership

As always happens during a period of decline in trade, the membership of the Association has been slightly reduced, although the Council take the opportunity of acknowledging the loyalty which has sustained the Association's strength. It is good to know that members are becoming so well aware that membership is their finest defence against bad trading practices. New members were:—Samuel Gratrix, Limited, Manchester; Arthur Raybould, Limited; and Edwin Showell & Sons, Limited (transfer to full membership from the export group section). The total membership is now 227.

Exports

Members have faced many difficulties in the export field following import restrictions in many markets and notably within the British Commonwealth. Yet it is difficult to see how other countries can be expected to import from this country at a time when our own Government is severely restricting imports. Although the British Industries Fair was attended by fewer overseas visitors than for many years, there have been numerous enquiries passed to members through the Association. The Association's secretary remains a member of the National Council of the Institute of Export.

Applications were made in South Africa for increases of tariffs against imported builders' and cabinet hardware. The Association submitted a strong case in opposition, pointing out that local manufacturers already enjoy the considerable protection afforded to them by import restrictions, apart from the extra cost on imports involved through carriage, etc. At the time of writing, the outcome is not known. An application was also made in South Africa at the end of the year for increased tariffs against plumbers' brassfoundry; again, the Association has prepared a strong case in opposition.

Home Trade

Home trade has not developed during the year under review on as wide a scale as was expected, notwithstanding the very welcome expansion of the housing programme. This may be due to a concurrent lessening of the number of buildings of

other types, especially public buildings which normally use better-class fittings.

Another cause is undoubtedly the ban on the use of copper- and zinc-base metal for a wide range of building components, which has given a great fillip to competing materials. The Council is confident, however, that trade will recover from this difficulty, since brass and bronze are unsurpassed in finish, durability and quality.

It is also probably true that the trade has, in common with others, felt the effect of the restrictions placed on credit and bank loans, which has been so necessary to restore the national balance of payments. The immediate outcome of this has undoubtedly resulted in the withholding of orders, greatly reduced stocks on distributors' shelves and even, occasionally, attempts to return goods for credit. Indeed, some merchants have attempted practices that could, if allowed to continue unchecked, be most detrimental to the industry. It is the merchants' function to carry stocks, yet some, although certainly not all of them, have been increasingly ordering in very small quantities or sending labels for forwarding goods direct to their customers. By agreements directed to put an end to these and similar malpractices, and with the traditional co-operation and goodwill of our friends in the distributive trades, it is hoped that developments that are inimical to the interests of both sides of the industry will be terminated speedily.

Foundry Industry

The Council has watched with interest the proposals for nationalization of the iron and steel industries by the late Government and the amended proposals by the present Government, directed at exercising no small degree of control over these industries and their foundries. The Association's interest is natural, having regard to the ever-present possibility that what could be applied to one section of the foundry industry could quite easily be extended to the others. Having this very real danger in view, it is more than ever clear that the trade should build for itself a very strong and representative Association and for that reason alone the secession of firms from membership is deeply to be regretted, as well as the absence of so many other firms from membership of any trade organization.

Taxation

Gratitude is expressed to Mr. Martin Lindsay and other Members of Parliament who pressed for and secured substantial modifications in Treasury rulings governing purchase tax, notably in respect of coronation souvenirs. The Association's files on this subject grow larger every year, due to the almost capricious decisions which emerge, and there is ample proof that it is a sound policy to be undeterred by rejections of applications, no matter how emphatically they are expressed, since, if the application is reasonable and logical, the Association owes it to its members to pursue the matter irrespective of discouragements, until success is achieved. The Association has continued to add representations to those of other organizations, in urging the Government to make administrative economies and so to give relief from the burden of taxation. In particular, it has urged consideration of the disastrous effect of death duties on family businesses, such as constitute so high a percentage of the membership. The Association has also supported the Federation of British Industries, the National Union of Manufacturers and like bodies in their representations against the heavy taxation of profits, which are such a grievous handicap to the expansion of trade.

Productivity Conference

The Association supported a conference at Harrogate, organized by the Association of Bronze and Brass Founders, aimed at the full implementation of the work of the Productivity Team. The vice-president took the chair at certain sessions and some thirty members were present. All expressed the view that the conference was extremely valuable, and the publication of the conference report in February has added a valuable source of knowledge to the trade's bookshelves.

Congratulations

Congratulations are made to the president, Mr. George Gummer, who celebrated his fiftieth year, and his brother, Mr. W. H. Gummer, his fifty-second year in the service of the family concern of Gummers, Limited, which was founded seventy-five years ago.

The Association also expresses thanks to members serving on a great number of committees of the British Standards Institution. Their services to the industry are insufficiently well known. Some concern should be expressed at the increasing influence of officials from Government departments on the work of the B.S.I. The only means of averting this and of ensuring the supremacy of the opinions of those with practical knowledge of their industries, is for the financial support that the Institution requires, to come from industry in far greater measure than at present, instead of from the Government.

B.S. 1010.—The long search for agreement on a standard water fitting that would be the one and only fitting permitted was furthered, but the acceptance of a compromise standard by the water and steam section of this Association was conditional upon its general and exclusive adoption. Unexpected opposition has arisen from merchant interests, but it is hoped that before long the fruits of nearly 20 yrs.' labours to seek a unified standard will be realized.

The Report is signed by Mr. George Gummer, president, and Mr. Edgar N. Hiley, secretary. The new president is to be Major R. C. Watts, M.C., of T. J. Cooke & Son, Limited, Wolverhampton.

SHEFFIELD STEEL PRODUCTION during March brought the average for the first quarter of this year to 48,600 tons a week, nearly 4,000 tons a week more than in the first quarter of 1952.

Castings for the Smithy and Forge*

By W. S. Spenceley

(*Continued from page* 473)

ANVIL BLOCK CASTING

An anvil-block casting can quite wrongly be regarded as something large and solid and one of the least important of iron castings and also one of the easiest to manufacture. For its size, the bulk of metal it contains, and the amount of work expected from it, it is both a complicated and important casting. It constitutes a problem by virtue of the fact of the comparatively thin-section cores which are required in its mass of metal. For this, core materials have to be sufficiently strong to withstand the large amount of metal, and sufficiently refractory to keep to a minimum all materials which will frit to an iron-like consistency under prolonged heating, yet having the fine grain to prevent metal penetration.

The importance of the casting rests essentially on its ability to withstand high shock loads under onerous working conditions. Fig. 20 shows an anvil-block mould with its core assembly. The weight of this casting is 20 tons; the standard and die-block holding-down cores are 6 in. dia. and the cotter cores leading off from these cores 6 by 2 in. thick. The prolonged concentration of heat due to the bulk and the length of time the metal remains liquid tends to "metallize" these cores—that is, there appears to be an impregnation of metal into the cores, giving them a rock-like consistency and rendering them extremely difficult to extract from the casting. This trouble can, to a very large extent, be overcome by a combination of correct core-sand materials, but even with optimum core material and a perfectly sound core free from any cracks, some difficulty is experienced because of extremely thin metal veins cutting across the cores and predominating in the section of the core nearest the bottom of the casting. All the cores have a 1-in. vent hole through their centres, which is rammed tightly with fine ashes. This is found to be the most suitable method for preventing the vent becoming filled with metal.

* Paper presented to the Wales and Monmouth branch of the Institute of British Foundrymen. The Author is attached to Joseph Berry, Limited.

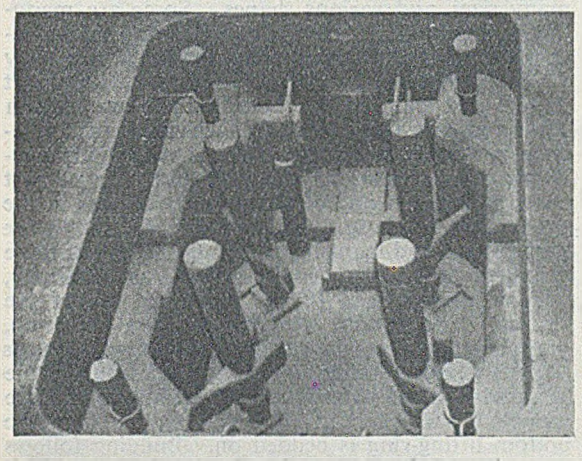

FIG. 20.—*Anvil-block Mould with its Cores assembled in Position.*

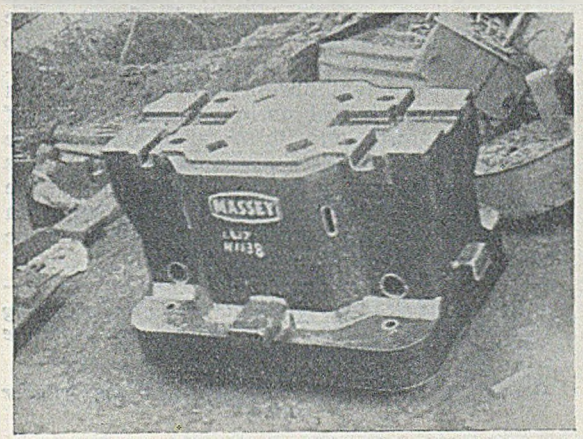

FIG. 21.—*Complete Anvil-block Casting. Note the Smallness of the Holes produced by Coring.*

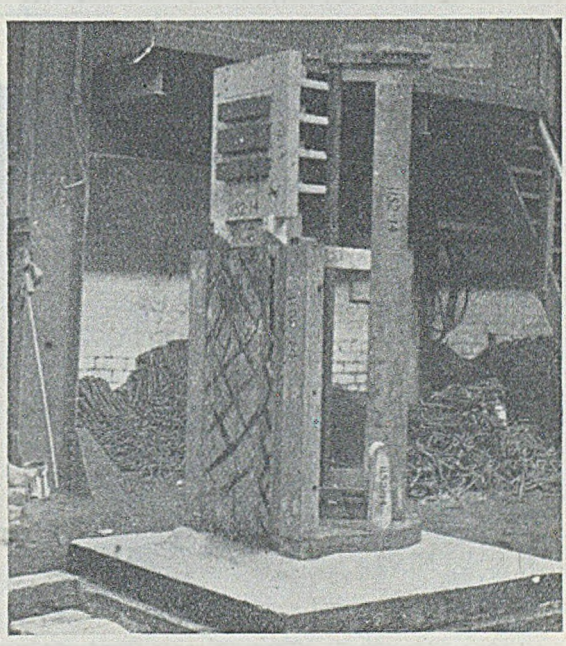

FIG. 22.—*Part Pattern and Loam Board for a Large Cylinder Casting for Steam or Compressed Air.*

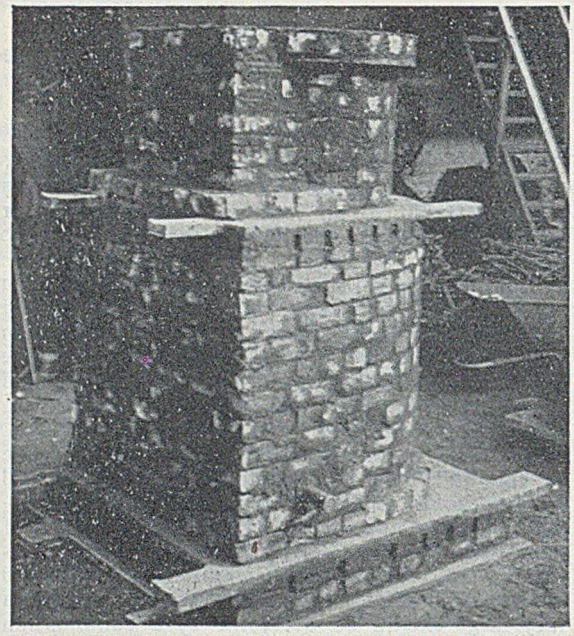

FIG. 23.

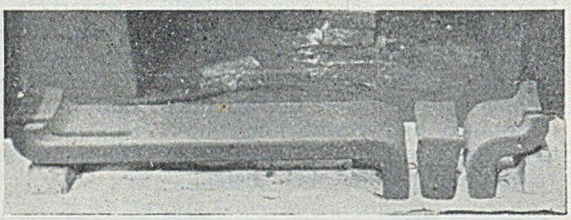

FIG. 24

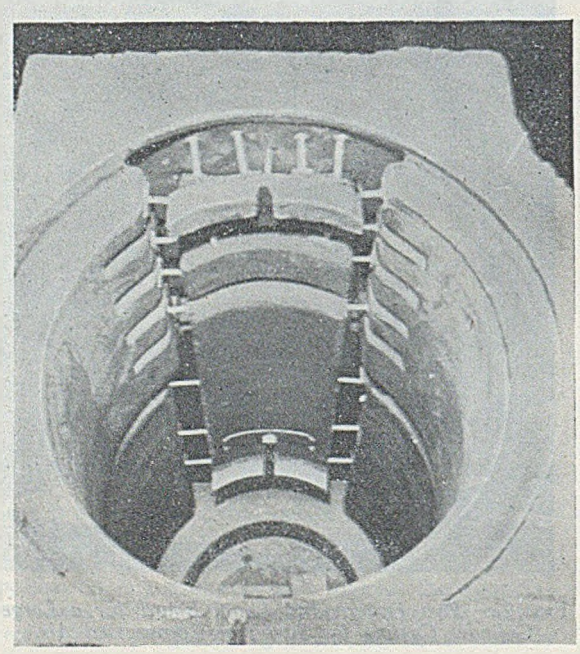

Fig. 21 shows the completed casting, where attention is drawn to the thin section of cotter core and also the other cores; it will be appreciated that the reinforcement of these cores also presents a problem. It is obvious that it is essential that this casting should be completely solid and this is achieved by suitable feeding-head arrangements; thus a head 16 in. dia. and 3 ft. deep is placed in the centre of the casting. The method of feeding is to keep as shallow a depth of metal in the feeding head as is consistent with safety, and making up the losses due to liquid shrinkage with supplies of hot metal when necessary. Finally, after a period of six to nine hours, dependent on the particular casting, the feeding head is completely filled and insulated.

The composition of metal used for anvil blocks is:—T.C. 3.0 to 3.2; Si 0.8 to 1.0; Mn 0.75 to 1.0 per cent.; P 0.25 max. and S 0.12 max. per cent. The lower values for the constituent elements are used for larger block castings.

STEAM OR COMPRESSED-AIR CYLINDERS

Of steam or compressed-air cylinders there are many sizes and various shapes. Some are manufactured from a complete pattern having the valve-chest integral with the casting, in which case they are cast horizontally. Others are made with a part pattern and loam strickle boards; these are built in loam and cast vertically. In such cases, the valve-chest is a separate casting. Proper venting arrangements are necessary in the inlet and exhaust port cores and this is one of the primary factors in the production of these cylinders. Fig. 22 shows the part pattern and loam board set up for one of these cylinders to be made in loam and cast vertically, with a feeding head 18 in. above the top of the casting. The bottom joint having been struck-up, the main core-receiving print and bottom flange is mounted and "stuffed under." Afterwards, the remainder of the pattern and the striking board are mounted and checked for position. Then, the bottom lifting-ring is bedded on. Building follows up to the level of the major flange where a second joint is struck. Then a second lifting plate is bedded on as shown in Fig. 23. The building is completed to the top of the cylinder flange. The feeding head for these cylinders is struck up separately and assembled during the closing stages. It will be noted that during the building of this mould, openings have been left for the purpose of bolting the cores back, with adequate room for the core vents. The runner is also incorporated; in this case it is directed into the main flange and at the bottom of the casting. The joint lines are then suitably marked, and stripping and finishing are the final operations.

FIG. 23.—*Building of the Mould for the Cylinder Casting Completed up to the Top of the Flange. Note the Holes left for bolting back the Cores.*

FIG. 24.—*Inlet and Exhaust-port Cores for the Cylinder Casting.*

FIG. 25 (BOTTOM).—*Complete Mould for the Cylinder ready to receive the Main Barrel Core and, later, the Feeding Head.*

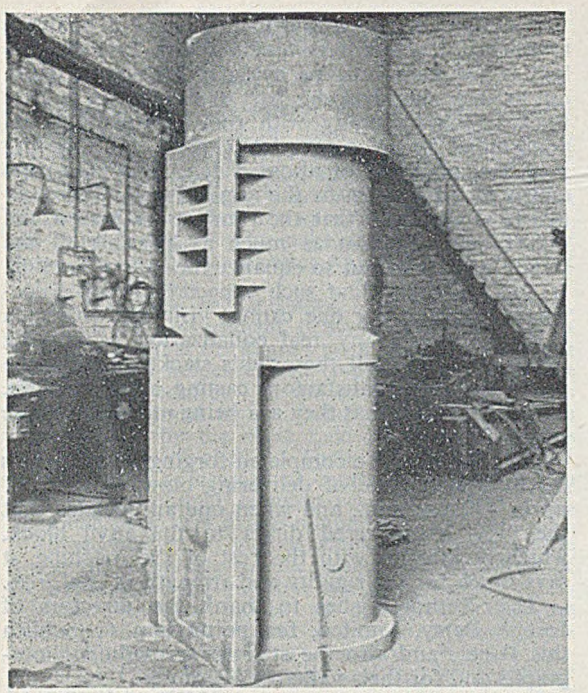

FIG. 26.—*Finished Cylinder Casting, showing the Port Openings. The Feeding Head is still attached.*

Coremaking

Fig. 24 shows the inlet and exhaust-port cores, which are reinforced with $\frac{1}{4}$ in. dia. wrought-iron. Four irons pass through lengthwise and they are reinforced with $\frac{1}{4}$-in. dia. cross irons. To assist in the extraction of these core irons after casting, no wiring together or welding of the reinforcement frame is resorted to, but four $\frac{3}{8}$-in. wax vents—the length of the core— are inserted. These are interconnected with cross vents, and the whole of the venting is brought to one outlet at one end of the

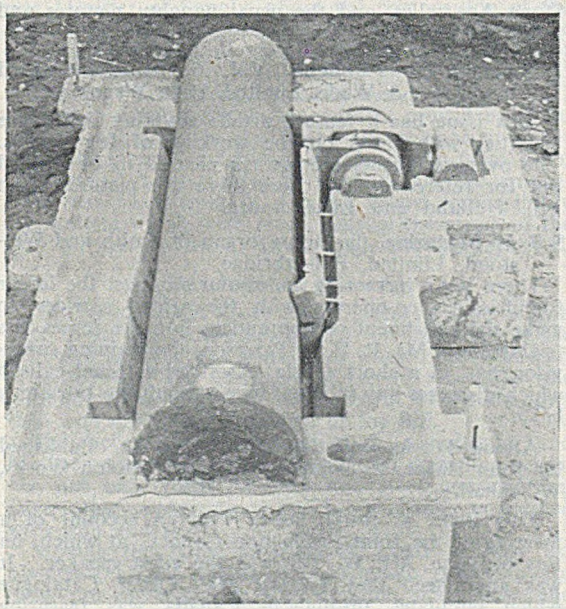

FIG. 27.—*Mould and Core for a Cylinder, for which a Complete Pattern was available.*

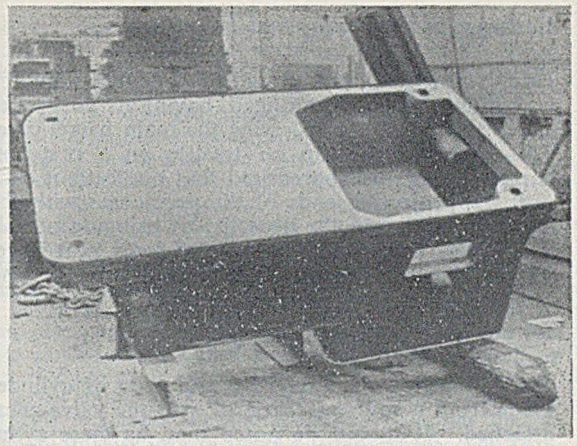

FIG. 28.—*Casting in which the Solid Anvil Block is cast integrally with the Cylinder Base-plate which is only $\frac{7}{8}$ in. thick.*

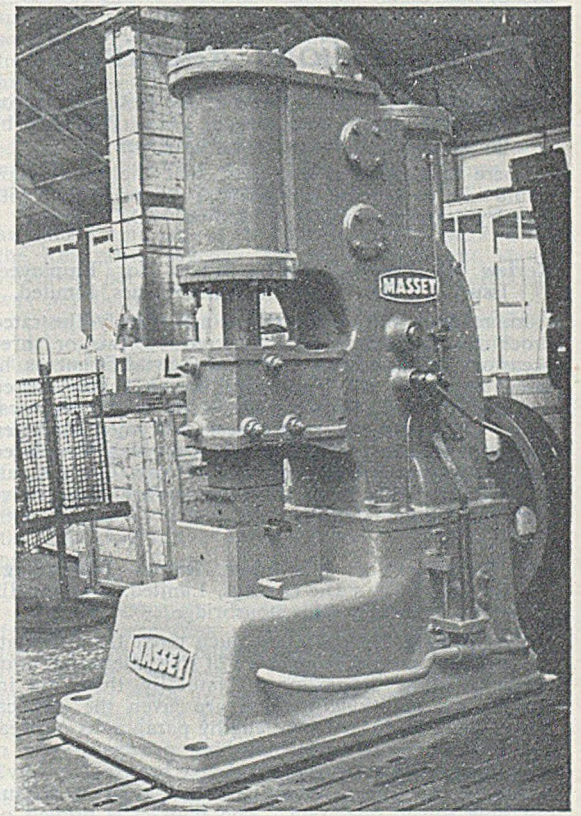

FIG. 29.—*Forging Hammer on Test; for this the Base-plate and Anvil were cast in One Piece (see Fig. 28).*

core. In Fig. 25 the mould is complete with the exception of the feeding head, having its port-cores assembled ready for receiving the main barrel-core. This core is struck-up on trestles on a cast-iron barrel. It will be appreciated that one cannot connect the projecting ends of the port cores with the main barrel, hence the necessity of bringing out all the vents, particularly from the long port core. Fig. 26 illustrates the finished casting with the head attached showing the port openings.

Working with a Full Pattern

Fig. 27 shows a mould for the type of cylinder made from a complete pattern, with the valve-chest attached. It should be noted that, as these cylinders get smaller in size, so the thickness of the port core decreases, and to make it still more complicated, the vents from these cores have then to travel through the valve-chest core. Again, the port cores have four longitudinal wax vents brought to a centre, where they are connected to a direct vent in the valve-chest core, and so out of the lower part of the moulding box through a tube. By the term "direct" vent is meant one unobstructed by any material such as ashes.

A design of casting shown in Fig. 28 is contrary to normal foundry recommendations, because one half is the standard-type cylinder base-plate, cored out at each side, and this part of the casting is $\frac{1}{8}$-in. thick. Cast integrally with this base-plate is the anvil-block which is completely solid. This casting is cast at an angle of about 5 deg. The base-plate end is at the bottom of the angle and it is through this base-plate end that the runners are placed, the object being to heat as much as possible of the mould and cores and so equalize the rate of cooling. It will be agreed that such expectations are somewhat optimistic, for one cannot visualize with such varying sections any real equalization of cooling rates. Yet, with all these odds stacked against the production of a satisfactory casting of this nature, the fact remains that they are being made and made successfully.

Fig. 29 shows the completed forging on test. This machine is capable of delivering blows at rates of up to 170 per min., and when one appreciates that the blow is delivered direct to the anvil block, which is integral with the rest of the machine, it says much for the rigidity and strength of cast iron.

The Author wishes to thank the directors of Joseph Berry, Limited, for permission to publish this Paper, and also the staff for providing photographs and for their valuable assistance.

Publications Received

Bulletin and Foundry Abstracts of the British Cast Iron Research Association. March, 1953. Published by the Council, Alvechurch, Birmingham.

There is a note in this issue that the Association would like to borrow for its work in connection with foundry atmospheres 200- to 250-volts D.C. fans.

Review of Progress 1952.—Report for Employees Issued by The United Steel Companies, Limited.

In reading this well-written and nicely-illustrated brochure the reviewer encountered on two or three occasions a momentary sense of bewilderment as he failed to notice the black captions on yellow tucked away at the side of top edge—bled is the technical term. Of special interest to the foundrymen employed by this firm, is news of the restriction which was placed on the Distington Engineering Company, Limited, due to need for giving to the steelworks what should have been their raw materials.

The Properties of Aluminium Bronze Die-castings. Issued by Fry's Die-castings, Limited, Brierley Hill Road, Wordsley, Nr. Stourbridge.

This 16-page booklet does much more than tabulate the ordinary strength properties of this interesting alloy when tested as die-castings. Naturally these are included, but additionally there are given the physical properties. There are also lengthy paragraphs on wear and corrosion resistance; finishing processes—one of which can make the surface look like bronze, but why?; design considerations; soldering and welding—a difficult but now solved operation. The booklet is printed on yellowish paper and is profusely illustrated. It is available to our readers on application to the Stourbridge address given above.

House Organs

600, Vol. 27, No. 122. Published by George Cohen Sons & Company, Limited, Cunard Works, Chase Road, London, N.W.10.

This issue contains a description of the manufacture of "Sintrex" iron powder, some excellent pictures of Stone Age relics, and the usual naughty pictures and funny stories.

Broomwade News Bulletin. Vol. 16, No. 2. Published by Broom & Wade, Limited, High Wycombe.

This issue has a feature article covering lighthouse activities with stress on the working of fog signals. The overseas agents are always pleased to be singled out for references, and here there are pictures from Fiji, Holland and Luxembourg.

S & W Magazine, the house organ of Smith and Welstood, Limited, Bonnybridge.

There is an increasing endeavour amongst the larger foundries to co-operate with the armed services to make the enlistment of apprentices into the forces less frightening. Mr. R. F. T. Paterson, the training supervisor, has, in a short article, described a recent call-up which disperses any inherent wonderment the boys may have.

Albion Works Bulletin, Vol. 7, No. 1. Published by John Harper & Company, Limited, Albion Works, Willenhall.

This issue, as usual, starts with an account of a meeting of the Joint Production Council, at which, on this occasion, Mr. W. Tait was the guest speaker. It was announced that Eaton's Mail Order Catalogue which circulates throughout Canada was featuring Harper's No. 1,000 mincer as a result of a visit to that country of the sales manager. The Poole establishment is making good progress.

Parliamentary

Steel Bill in the Lords

The House of Lords devoted three days last week to the committee stage of the Iron and Steel Bill. On Monday an Opposition amendment to give the Board power to exercise control over the industry was rejected. Moving the amendment, LORD WILMOT said that if the Board were to be effective it must be a controlling body, and must have power to make its will felt. For the Board not to have such power was to make a mockery of the whole thing.

THE MARQUESS OF SALISBURY, Leader of the House, said that the Government believed, and intended to prove its case, that the Board's work would best be done by persuasion, influence, and co-operation rather than by autocratic control. In the long run better results would be achieved by the Board and by industry as partners than by the more rigid relationship of controllers and controlled. There were some limited spheres where a measure of control was necessary to deal with abnormal circumstances that might arise. They had been kept to the minimum.

An amendment to include among the duties of the Board the promotion of the equitable distribution of the products of the industry, was negatived.

LORD STRABOLGI moved an amendment that the chairman of the Board and at least four other members should be whole-time members. He was supported by LORD WINSTER, who said that a supervisory body must be strong.

LORD MANCROFT, resisting the amendment, said that it was intended that the chairman of the Board should be independent and full-time and that there should be a nucleus of full-time members including men drawn from both sides of industry, consumers, and possibly an independent member. The Government was most desirous of seeing that the Board was strong and effective. Its final composition might be that set out in the amendment, but the Opposition should agree with the sentiments expressed by Mr. Strauss, when he was Minister of Supply, about the composition of the Iron and Steel Corporation; the Minister should be given a free hand to choose the best and strongest Board possible.

The amendment was, by leave, withdrawn.

Further support for an amendment moved by LORD BURDEN to place on the Board the responsibility for the maintenance of full employment came from LORD STRABOLGI. LORD SALISBURY replied that the amendment was an attempt to give the Board responsibility for matters which were really outside the scope of the iron and steel industry. The amendment was negatived.

Development of Metals

On Tuesday, the Government gave its first acceptance to an Opposition amendment on this stage of the Bill, and another was withdrawn when Lord Mancroft promised that the Government would reconsider the question of including the development of metals other than iron ore within the scope of the Bill.

The accepted amendment gives the Board and Minister power to obtain information regarding activities not only from the iron and steel industry, but from other organizations which are mainly concerned with iron and steel.

Moving the latter amendment, LORD WILMOT explained that the object was to make provision for other raw materials—such as tungsten, manganese, and chrome—as well as iron ore. These were alloy metals used in the production of high-grade steels.

LORD OGMORE said that the aircraft industry was using more and more light steel needing particularly alloys. Instancing discoveries in Uganda of important substances needed in this particular field, "If the Board does not look out it might find itself being very late in the queue for some of these materials," he said.

LORD WILMOT also moved an amendment to ensure that if any iron or steel producer intended to close a works of substantial size, three months' notice of intention should be given to the Board, instead of notice "as early as practicable," as contained in the Bill. LORD SALISBURY said that he doubted if it would be possible to fix a period as long as three months, but he undertook to examine the problem. The amendment was withdrawn.

A further amendment, moved by LORD WOLVERTON, was accepted. It was designed to delete from the Bill the powers of the Minister himself to own, build, or operate sea-going ships.

LORD SALISBURY, in accepting the amendment, said it had not been the Government's intention that it should directly own or operate cargo vessels. The U.K. had resisted policies of intervention by the Government in the normal processes of international shipping, and to depart from that policy would be a step in the long run against our own best interest as a leading maritime power.

An amendment, moved by LORD SILKIN, seeking to extend the board's powers so it would supervise existing facilities as well as new ones and those about to go out of existence, was rejected.

Joint Supervision

Recalling that under the Bill the Board had to consult with iron and steel producers for the purpose of securing efficient, economic, and adequate supplies of iron and steel products, LORD SILKIN said there was a hiatus in the arrangements, for the Board had no supervision over existing production facilities.

LORD SALISBURY said the Government entirely rejected the basic assumptions underlying the amendment. Competition was a far greater guarantee to efficiency than an over-exercised control.

Concluding the committee stage on Wednesday night, an amendment, moved by EARL JOWITT to provide that the Realization Agency, for the Government, should retain 40 per cent. of the shares in the undertakings, was negatived.

LORD MANCROFT said it was a novel amendment which had not been thought of or discussed in the House of Commons. But it was a complete contradiction of the declared objective of the Government, embodied in the Bill, that the steel industry should be returned to private ownership.

LORD SALISBURY said that the amendment went very far indeed. It involved in one important respect a complete alteration in the character of the Bill. Under the Bill the agency was a temporary organization. Under the amendment, the agency would become a permanent body.

THE GOVERNMENT was to allow a greater measure of freedom to exporters with regard to credits to be extended to overseas buyers, said Mr. Peter Thorneycroft, President of the Board of Trade. The Government also intended to speed up the machinery of control so that decisions could be given as speedily as possible

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HE CAN SEE no chance of the company's resuming business at a satisfactory level until copper is dealt in freely on the London Metal Exchange, says the Earl of Verulam, chairman of Enfield Rolling Mills, Limited, in his statement accompanying the accounts for 1952.

Iron-ore Imports

Iron-ore imports in March and the total for the three months of the year to date, with comparative figures for 1952, are shown below.

Country of origin.	Month ended March 31.		Three months ended March 31.	
	1952.	1953.	1952.	1953.
	Tons.	Tons.	Tons.	Tons.
Sierra Leone	61,020	94,000	194,493	181,218
Canada	—	34,690	31,929	123,475
Other Commonwealth countries and the Irish Republic ..	3,138	20	6,108	3,713
Sweden	275,657	250,281	794,771	694,147
Netherlands	1,148	460	1,998	1,390
France	38,757	55,677	103,980	131,174
Spain	57,307	31,021	167,959	123,327
Algeria	138,628	117,887	432,583	399,081
Tunis	52,328	38,670	115,498	116,190
Spanish ports in North Africa	37,350	—	83,504	5,600
Brazil	9,100	42,375	19,361	59,778
Other foreign countries	30,309	96,171	117,285	265,861
TOTAL	705,342	761,252	2,069,469	2,104,954

Over-production of Steel?

Two warnings of possible over-production in the steel industry have been made in the last weeks. Speaking at the annual conference of the No. 6 division of the Iron and Steel Trades Confederation at Swansea last week, Sir Lincoln Evans, general secretary, said that it seemed almost certain that there would be a world surplus this year and competition in the world markets was likely to be intensified because of current Continental developments. It was confidently anticipated, however, said Sir Lincoln, that the comparative cheapness of British steel and the industry's technical superiority would more than enable the U.K. to hold its own.

In a report to the half-yearly meeting of the Cleveland district delegate council of the National Union of Blastfurnacemen, Ore Miners, Coke Workers and Kindred Trades, Mr. J. Owen, general secretary, said: "While Great Britain to-day holds a commanding position as the leading steel producer of Western Europe, as a result of the slowing down of rearmament there could be created in a few years a situation of over-production after all consumer needs have been met."

Solway Chemicals' Project

The Treasury has announced that Sir Henry Tizard and Mr. N. M. Peech have been nominated as its representatives on the board of Solway Chemicals, Limited, which is building a plant at Whitehaven, Cumberland, to produce sulphuric acid from domestic anhydrite. The cost of the plant, which is expected to come into operation during next year, is estimated at £2,000,000, some £1,700,000 of which is being provided from Government funds. The project should help reduce this country's dependence on imported sulphur for supplies of acid.

Sir Henry, who was chairman of the Advisory Council on Scientific Policy, and of the Defence Research Policy Committee from 1946 to 1952, is a member of the National Research Development Corporation. Mr. Peech is chairman and managing director of the Steetley Company, Limited, Shireoaks (Notts), and a director of Sheepbridge Engineering, Limited.

Residual Stresses in High-carbon Steel

Founders interested in residual stresses will find the subject discussed by A. L. Christensen and E. S. Rowland in a paper entitled "X-ray Measurement of Residual Stresses in Hardened High-carbon Steel," submitted to the 34th National Metal Congress organized by the American Society for Metals and held in Philadelphia recently. Although theoretically it should be possible to measure the strain imposed in a metallic crystal by a known load by measuring the lattice parameters before and after loading, the procedure has never given satisfaction, especially for hard steel, it being impossible to measure with sufficient accuracy the small differences in the crystal lattices. The Authors point out that many of the difficulties arise from the fact that lines refracted from hardened steel, when X-radiation from the usual cobalt or iron targets are used, are wide with no well-developed peaks and stand up only a little above the self-induced background radiation. The authors avoid this by filtering out this background radiation by 0.001-in. vanadium foil, and using long wavelength X-rays from chromium. This is a "soft" radiation and does not penetrate very far into the sample under study; the reflections therefore come from surface layers on the specimen.

The Authors, after discussing the requirements for accurate work, quote the relation between their methods and strain-gauge techniques and conclude by giving a number of stress distribution values.

"Gecalloy" Magnets

Magnets claimed to equal any made from cobalt steel are now being produced by powder metallurgy. A special process has been developed by the General Electric Company, Limited, the new magnets being known commercially as "Gecalloy," and made by the Salford Electrical Instrument Company, Limited, a G.E.C. subsidiary. Factors of importance are that, strength for strength, a "Gecalloy" magnet only weighs approximately half as much as a conventional steel magnet, and that, as every iron particle can be insulated from every other particle, the magnet is an insulator and is therefore free from eddy currents when used in an inductive device. Although the size is at present restricted to that required for magnetos, there is a wide field of use for these small magnets in other electrical apparatus.

Coking Plant for Margam

The Steel Company of Wales, Limited, has placed with Simon-Carves, Limited, Cheadle Heath, Stockport, a contract worth more than £2,250,000 for new coke ovens in connection with its £40,000,000 steelworks extension programme at Margam (Glam).

The new plant will comprise 90 compound regenerative ovens with a throughput of 1,650 tons of coal per day, with associated coal and coke handling equipment and a new by-product plant to produce crude tar, crude benzole, and sulphate of ammonia.

The new oven battery will be built parallel to the present line of batteries, but on the opposite side of the existing by-product plant. Clearing of the area has already begun, and delivery of materials to the site is expected to begin shortly.

Personal

MR. W. B. G. COLLIS has been appointed assistant sales manager, traction department, in charge of traction sales in London, of Metropolitan-Vickers Electrical Company, Limited.

MR. THEO. F. GILBERT, manager of British Pigirons, Limited, Abbey House, 2, Victoria Street, London, S.W.1, for the last seven years, has been appointed a director of the company.

COMMENDATORE MARIO OLIVO, the president of the National Association of Foundry Machinery Suppliers of Milan, has been the recipient of the Order of Merit from the Italian Government.

MR. JOHN S. BIRD has been appointed sales liaison executive of Kent Alloys, Limited, who for some time have specialized in the production of castings and engineering for the aircraft industry.

THE COUNCIL of the Institute of Metals has elected SIR ARTHUR SMOUT, J.P., (past-president) a Fellow, in recognition of his long and distinguished services to the Institute. The number of Fellows is limited to twelve.

CAPT. H. LEIGHTON DAVIES, assistant managing director of the Steel Company of Wales, Limited, at a dinner given to him recently by senior members of the staff, received a presentation to mark his year of office as president of the Iron and Steel Institute.

MR. J. E. TYRIE, organizer of the National Union of General and Municipal Workers, has been elected chairman, and MR. F. S. FLETCHER, general manager, of the Tees Side Bridge & Engineering Company, Limited, Middlesbrough, vice-chairman, of the Tees-side advisory committee of the Northern Regional Board for Industry.

MR. ALBERT DUGMORE started work with the Electric Construction Company, Limited, Bushbury Engineering Works, Wolverhampton, on March 13, 1903, and since that date has been continuously employed in their iron foundry. To mark the occasion of 50 years with the firm, Mr. Dugmore was recently presented with Savings Certificates by Mr. W. M. Furniss, chairman and managing director of the company.

THE FOLLOWING AWARDS are to be made at the Chicago Convention of the American Foundrymen's Society. The John H. Whiting Medal—MR. DONALD E. KRAUSE; the Joseph S. Seaman Medal to MR. WILLIAM ROMANHOFF; the Peter L. Simpson Medal to MR. JAMES H. SMITH and the William H. McFadden Medal to MR. WILLIAM H. GREBE. Honorary Life Membership is to be conferred on MR. GEORGE J. BARKER and MR. J. RICHARD WAGNER.

THE ACCENT was on youth at the Cutlers' Hall, Sheffield, last week, when the Chief Scout, Lord Rowallan, proposed the toast of "Our Young Elizabethans." MR. MARK ROBIN BALFOUR, who is descended from a line of Master Cutlers, made the reply. Presiding over the feast was Sir HAROLD WEST, managing director of Newton Chambers & Company, Limited, the Coronation Year Master Cutler. A director of several other companies, Sir Harold was knighted in 1948. In the same year he was president of the Sheffield Chamber of Commerce. He is District Commissioner for Yorkshire of the Boy Scout movement.

MR. ARTHUR WINKLES, having reached normal retiring age, is resigning his position as secretary of the Austin Motor Company, Limited, as from May 1. He will be succeeded by MR. S. J. WHEELER, chief cost accountant and deputy secretary. Mr. Winkles has been secretary of the company for 25 years and he has been with the firm since September, 1914. He is to continue to serve the company on special work. Mr. Wheeler joined the company in 1920 and became chief cost accountant in 1940. He is joint secretary of the British Motor Corporation, a position he has held since April, 1952. He is a Justice of the Peace and a Fellow of the Institute of Works and Cost Accountants.

MR. ROBERT M. SCOTT, a native of Ayrshire, who is the new director and general manager of Ferguson Industries, Limited, Pictou, Nova Scotia, has had a varied career since he served his time as an engineer with Mackie & Thompson, Limited—now the Ayrshire Dockyard Company—at Irvine during the first world war, soon becoming assistant manager. In 1928 he joined Henry Robb, Limited, Leith, becoming shipyard manager a year later. Joining Lloyd's Register as a surveyor in 1930, he served at Newcastle, Middlesbrough, Liverpool, and Greenock before going to St. John, New Brunswick, in 1942 as senior surveyor. A year later he was loaned to shipbuilders in Vancouver, and specialized in converting United States escort aircraft carriers for Britain under Lease-Lend.

A WOLVERHAMPTON man and his son have been appointed respectively to the principal offices of the two sections of the Staffordshire Iron and Steel Institute for 1953-54 session. MR. A. W. SHORE, chief engineer of the Bilston steelworks of Stewarts and Lloyds, Limited, was last week elected president of the Institute at the annual meeting in Wolverhampton. His son, MR. ALAN SHORE, who is employed in the engineering department at the same works, is the 1953-54 session chairman of Institute's associate section. Other officers elected at the meeting were:—*Senior vice-president*, MR. K. G. LEWIS; *junior vice-president*, MR. A. BIDDULPH; *secretary*, MR. H. J. E. JONES; *treasurer*, MR. G. E. LUNT. MR. V. L. NICHOLLS was elected to the council, and MR. G. B. MORRISON was elected to fill a vacancy on the past-president's section of the council.

MR. R. W. RUTHERFORD has been appointed to the post of deputy managing director of the Power-Gas Corporation, Limited, and of its associated company, Ashmore, Benson, Pease & Company, Limited, Stockton-on-Tees. Mr. Rutherford represented these companies in Japan for a number of years, and has since travelled extensively in his capacity as technical sales manager to which he was appointed in 1938. He joined the board of Ashmore, Benson, Pease in 1944 and four years later was appointed to the board of the parent organization. He is also a director of Rose, Downs & Thompson, Limited, engineers and ironfounders, etc., of Hull, which is associated with the Stockton companies. Mr. Rutherford is a member of the British Chemical Plant Manufacturers' Association, the Institution of Chemical Engineers, the Institute of Fuel, and the British Coal Utilisation Research Association.

Obituary

MR. WILFRID B. SHAW, a director since 1947 of Hardypick, Limited, steel and malleable iron founders, Sheffield, has died at the age of 57.

MR. JAMES DELDERFIELD, for 33 years a member of the office staff of H. M. Biggleston & Sons, brass and iron founders, of Canterbury, has died, aged 60.

MR. HERBERT ARTHUR LINGARD, for 17 years a director of the British Thomson-Houston Company, Limited, electrical engineers, of Rugby, died on April 18 at the age of 70. He joined the company in 1904.

Pig-iron and Steel Production

Statistical Summary of February 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 gives production of steel ingots and castings in February, and Table III, deliveries of finished steel in January, 1953. Table IV gives the production of pig-iron and ferro-alloys in February, 1953, and furnaces in blast.

WEEKLY AVERAGES 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.[1]	Output of ingots and castings.	Deliveries of finished steel.	Stocks.[2]
1951	284	170	206	186	175	8	301	244	585
1952[4]	306	190	228	202	171	29	310	252	739
1952—September	318	198	234	209	184	30	330	279	783
October[1]	302	196	227	204	182	31	328	271	725
November	312	194	229	207	189	23	345	277	717
December[1]	296	189	227	206	166	26	314	245	739
1953—January	325	199	234	214	188	25	346	277	770
February	328	194	234	214	193	19	352	—	768

TABLE II.—*Production of Steel Ingots and Castings in February*, 1953.

District.	Open-hearth. Acid.	Open-hearth. Basic.	Bessemer.	Electric.	All other.	Total. Ingots.	Total. Castings.	Total ingots and castings.
Derby, Leics., Notts., Northants and Essex	—	4.2	11.2 (basic)	1.7	0.2	16.2	1.1	17.3
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire; Yorkshire (excl. N.E. Coast and Sheffield)	1.8	22.1	—	1.8	0.6	25.1	1.2	26.3
Lincolnshire	—	37.1	—	—	0.1	37.1	0.1	37.2
North-East Coast	2.0	64.2	—	1.3	0.5	66.0	2.0	68.0
Scotland	4.7	40.3	—	1.7	0.8	45.2	2.3	47.5
Staffs., Shrops., Worcs. and Warwick	—	17.1	—	1.3	0.7	17.3	1.8	19.1
S. Wales and Monmouthshire	6.7	66.6	5.7 (basic)	1.2	0.2	79.7	0.7	80.4
Sheffield (incl. small quantity in Manchester)	9.7	28.7	—	10.0	0.6	46.8	2.2	49.0
North-West Coast	—	1.8	5.2 (acid)	0.5	0.1	7.4	0.2	7.6
Total	24.9	282.1	22.1	19.5	3.8	340.8	11.6	352.4
January, 1953	24.6	275.7	22.5	19.6	3.9	334.9	11.4	346.3
February, 1952	25.4	244.5	21.2	18.0	4.0	302.0	11.1	313.1

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

Product.	1951.	1952.	1952. Jan.	1952. Dec.	1953 Jan.
Non-alloy steel:					
Ingots, blooms, billets and slabs[5]	4.0	4.5	4.0	4.1	5.3
Heavy rails, sleepers, etc.	10.1	9.8	9.4	9.1	11.6
Plates, ¼ in. thick and over	41.0	41.4	39.2	42.6	47.1
Other heavy prod.	39.9	39.0	37.8	37.0	46.5
Light rolled prod.	46.7	46.0	45.8	45.4	53.2
Hot rolled strip	19.5	18.8	18.0	18.2	20.5
Wire rods	15.9	15.9	15.6	14.9	18.2
Cold rolled strip	6.0	6.1	7.1	5.4	6.1
Bright steel bars	6.5	6.5	6.9	6.6	7.6
Sheets, coated and uncoated	30.4	31.6	30.1	30.4	35.0
Tin, terne and blackplate	13.8	16.0	15.4	16.1	14.7
Steel tubes and pipes	20.3	20.1	20.1	20.5	20.7
Steel tube and pipe fittings	0.5	0.7	0.5	0.6	0.7
Mild wire	11.6	12.2	11.3	10.6	11.8
Hard wire	3.5	3.6	3.4	3.6	4.0
Tyres, wheels and axles	3.7	3.5	4.3	3.6	5.3
Forgings (excl. drop forgings)	2.3	2.8	2.2	3.0	3.2
Steel castings	3.8	4.2	4.3	4.1	4.1
Tool and magnet steel	[8]	0.3	0.3	0.3	0.4
Total	279.5	283.0	275.7	276.1	316.0
Alloy steel	11.4	13.7	11.8	14.4	16.3
Total deliveries from U.K. prod.[6]	290.9	296.7	287.5	290.5	332.3
Add Imported finished steel	5.8	13.8	9.9	10.2	12.8
	296.7	310.5	297.4	300.7	345.1
Deduct intra-industry conversion[7]	55.0	60.2	55.7	57.5	69.6
Total net deliveries	241.7	250.3[1]	241.7[1]	243.2[4]	275.5

TABLE IV.—*Production of Pig-iron and Ferro-alloys February*, 1953.

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derby, Leics., Notts., Northants and Essex	27	—	16.8	27.4	1.0	—	45.2
Lancs. (excl. N.W. Coast), Denbigh, Flints., and Cheshire; Yorkshire (incl. Sheffield, excl. N.E. Coast)	7	—	8.6	—	—	1.4	10.0
Lincolnshire	13	—	30.7	—	—	—	30.7
North-East Coast	25	4.9	45.3	0.2	—	1.5	51.9
Scotland	9	0.8	13.6	2.5	—	—	16.9
Staffs., Shrops., Worcs., and Warwick	8	—	7.1	1.5	—	—	8.6
S. Wales and Monmouthshire	9	3.5	29.0	—	—	—	32.5
North-West Coast	7	16.6	—	—	—	1.1	17.7
Total	105	25.8	151.1	31.6	1.0	4.0	213.5
January, 1953	105	29.9	149.5	28.7	1.8	4.0	213.9
February, 1952	100	27.9	135.2	29.4	1.8	3.1	197.4

[1] Five weeks all tables.

[2] Weekly average of calendar month.

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

[4] Average 53 weeks ended January 3, 1953.

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

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

[7] Material for conversion into other products also listed in this table

[8] Included with alloy steel.

News in Brief

STUDENTS of Sheffield University have been invited by United Steel Companies, Limited, to spend their vacation in the steelworks in order to gain practical experience.

"WHAT WE WANT is not 3, 5, or 7½ per cent. more steel; it is at least 50 per cent. more than now," said Sir Frederick Rebbeck, chairman and managing director of Harland & Wolff, Limited, at the launching of the tanker Irex at Belfast.

THE FIRST of a new series of lectures inaugurated by the Permanent Magnet Association was delivered on April 22 by Prof. W. Sucksmith, F.INST.P., F.R.S., in Sheffield. He traced the remarkable developments that have taken place in the theory of magnetism and its practical applications during the last fifty years.

MEMBERS of two technical missions, who are shortly to visit the United States of America, came from France on April 20 to spend a few days in this country, during which they will visit Guest Keen Baldwins Iron & Steel Company, Limited, Richard Thomas & Baldwins, Limited, and the Steel Company of Wales, Limited.

AT THE ANNUAL DINNER of the Wednesbury and Darlaston Manufacturers' Association on April 24, members were shown "Youth Gets a Chance," a film showing the youth training schemes in operation at F. H. Lloyd & Company, Limited. The schemes operate under the direction of Mr. J. H. Mason, training officer of the company.

WHEN THE LINING of a furnace holding molten metal collapsed at Hepworth & Grandage, Limited, engineers, Bradford, last week, metal was spilled on the concrete floor. Although no one was injured, a fire which started in the basement under the furnace destroyed a quantity of oil and some electric cables. Production capacity was not affected.

METAL PROCESSES, LIMITED, Kingsbury Road, Erdington, founded by Mr. W. J. Turner on his retirement from the Indian Army in 1932, celebrates its 21st anniversary on April 24. Mr. Turner, who is now managing director of the firm, believes that he was the first Englishman to introduce a chemical rust remover and a chemical black finish based on the old Birmingham technique of gun-blacking.

AT LAST WEEK'S SPRING CONFERENCE of the Institute of Metal Finishing, which was held at Harrogate, two scientists from the British Non-Ferrous Metals Research Association described their experiments to produce a standardized method of electroplating aluminium. As a result, they have developed a process by means of which tightly-adherent deposits of the zinc base for the final nickel coating can be made on aluminium and its alloys without the need for a stoving heat-treatment.

BRITISH INSTRUMENT INDUSTRIES' EXHIBITION is to be held from June 30 to July 11, 1953, at the National Hall, Olympia. The Exhibition has the active support of the trade associations of the industry and will cover all spheres of instrumentation in industry, medicine, research and education. In the industrial field, all classes of temperature, pressure and flow-controllers will be displayed; there will also be complete equipment for navigation by air and sea and for land-surveying.

ENGLISH STEEL CORPORATION, LIMITED, Sheffield, report good results from an experimental lubricant for machines working at high pressure and temperature. It consists of a "jam" of corn syrup or molasses, mixed with powdered molybdenum disulphide. Chiefly used so far on new machines and replaced parts, the lubricant has not needed replacing for months, while the machines have been running at full pressure. The stickiness quickly vanished, leaving only the lubricative skin.

GERMANY'S EMERGENCE in all markets during the past year was referred to by Mr. A. B. Waring, in his presidential address at the annual meeting of the Birmingham Chamber of Commerce on April 21. He pointed out that the German exporter received very considerable support from his Government through tax and other incentives, as well as special credit facilities. Mr. Waring emphasized the British manufacturer's need for more Governmental support in capturing the export markets.

DURING THE SUMMER HOLIDAYS at the end of July the firm of Honeywell-Brown, Limited, manufacturers of industrial implements and automatic controls, will move from their 30,000 sq. ft. factory at High Blantyre to the 75,000 sq. ft. building formerly occupied by Altones, Limited, at Newhouse industrial estate. When their 320 workers—two-thirds of them men—return from holiday they will go to Newhouse instead of High Blantyre. Every machine will be in place and ready to go.

BLICK TIME RECORDERS, LIMITED, are exhibiting a new product at the Business Efficiency Exhibition to be held at Olympia from June 16 to 26. It is the Blick Autoclip, the latest fully-automatic recorder made. Cards are stamped by electrical contact immediately on insertion. No levers are necessary. It is the ideal one-hand operated (the one holding the card) foolproof recorder. There can be no overstamping, the card must be inserted fully before it will receive a stamp, and once it has, it cannot be obliterated by another.

SCOTTISH INDUSTRIAL ESTATES, LIMITED, had not yet been able to meet all requirements for factory space, said Mr. W. C. Kirkwood, general manager, last week when he opened new premises of Jenolite (Scotland), Limited, at 304-312, High Street, Glasgow. He conveyed the good wishes of the chairman of Scottish Industrial Estates, Lord Bilsland, and congratulated the firm on their enterprise and initiative. The firm of Jenolite are chiefly concerned with the removal and prevention of rust and the pre-treatment of metal. A laboratory in the new premises would be used for corrosion tests.

THE SETTING UP of a steel-plate distribution scheme, to be operated on voluntary lines by the industry itself with guidance from the Government, was announced in the House of Commons by the Ministry of Supply, MR. DUNCAN SANDYS, last week. Its task will be to keep under review the needs of the plate-using industries and to consider any adjustments in the pattern of production and deliveries which may be desirable. Mr. Robert Marshall, a director of Colvilles, Limited, and a member of the Iron and Steel Corporation, will act as technical adviser to the committee and generally assist in the operation of the scheme.

GEO. SALTER & COMPANY, LIMITED, have acquired a 3¼-acres site in Smethwick, Staffs, for extensions to their existing spring factory in High Street, West Bromwich. This is part of a development plan designed for the reorganization of production now concentrated in a multi-storey building which does not lend itself to adaption for modern flow-line methods. The new site is in Spon Lane, about two miles from the parent factory, and was previously in the possession of Archibald Kenrick & Sons, Limited, founders. Existing buildings there offer 26,400 sq. ft. of floor space, and extensions are planned to add a further 9,000 sq. ft.

Raw Material Markets

Iron and Steel

Pig-iron production is running on a fairly even keel. There are now 105 furnaces in blast—five more than there were a year ago—and although other units are in course of construction, it is not expected that any of these will be available for operation for some time to come. The steel industry's appetite for basic iron is insatiable, but the position in relation to foundry grades is somewhat easier. No longer are there complaints of short deliveries to the foundries, but the limited output of foundry iron is promptly absorbed, and any quickening in the flow of orders for iron castings would probably emphasize the prudence of those consumers who are husbanding their stocks of pig-iron.

The slackness in the tinplate industry of South Wales, which is probably only a temporary phase, has made possible a slight acceleration in the deliveries of sheet bars to British consumers in other areas. But with this slight modification, the semi-finished steel position is broadly unchanged. Engrossed as they are with the provision of maximum tonnages of crude steel for their own rolling mills, home steelmakers are still unable fully to provide for the needs of the re-rollers, and substantial tonnages of semis are coming in from Continental sources. Small billets are eagerly sought, and imported tonnages of sheet bars and slabs are also indispensable.

Tomorrow (Friday) the six member States of the European Coal and Steel Pool are due to establish a common market for steel. It is a prospect calling for vigilance on the part of British interests, but assuredly not perturbation. With highly efficient plant, low production costs, and healthy order-books, British steelmakers can regard the outlook with some degree of equanimity. Home demand still taxes the maximum capacity of the industry, and within the limits of the restrictions on international trade oversea business is on the upgrade. South African requirements are heavy, substantial tonnages have recently been booked for Canada, and there are more hopeful prospects both in the Far East and South America. The heavy mills of the sheetmakers and also the plate mills are working under extreme pressure, and there is no dearth of orders for heavy joists and sections.

Non-ferrous Metals

Metals were under heavy pressure for the greater part of last week and losses were considerable, but Friday brought a sharp rally and at the close values were above the lowest points reached. It is probable that a certain amount of stop-loss selling was responsible for the final burst of weakness and, this being over, there was the inevitable recovery. To say that the fall was overdone is to state the obvious; actually this kind of thing always happens when markets plunge downwards after a spell of prolonged high prices. But whether we have seen the bottom of zinc and lead may well be doubted, for as yet there is no indication that production is being seriously reduced and there can be no doubt that usage is outstripped by production.

The American lead market gave way by ½ cent to 12 cents last week, but, rather surprisingly, zinc remained at 11 cents. This, probably more than anything, served to turn the market in London and there were, in fact, some indications on 'Change that the producing interests were taking steps to stop the rot. At its worst the price of zinc was not a lot more than half the Ministry's December price of £110 delivered user's works, and in less than four months this metal had suffered a disastrous setback. Tin certainly looked steadier in London, although the Eastern market suffered some sharp setbacks during the period under review. Non-ferrous metal prices generally have shown a firmer trend this week.

The most important and sensational price change last week was the reduction of £27 in copper to £253, announced by the Ministry of Materials on Saturday. This revised quotation is apparently based on the U.S. internal price, which at present stands at 30 cents per lb., and it would appear that this is to be the basis in the future. Actually there has been a seller on the world market at 29½ cents f.a.s. and the chances are that we shall see copper lower during the coming weeks. The fact that the Ministry's selling price is now to be linked to the American domestic quotation may well bring more frequent changes in the quotation. This step, too, must be regarded as the forerunner to the opening of a free market in London later in the year.

The following official tin prices were recorded:—

Cash—April 23, £695 to £700; April 24, £700 to £705; April 27, £720 to £725; April 28, £735 to £740; April 29, £730 to £735.

Three Months—April 23, £682 10s. to £685; April 24, £695 to £700; April 27, £712 10s. to £717 10s.; April 28, £727 10s. to £730; April 29, £722 10s. to £725.

Official zinc quotations were as follow:—

April—April 23, £63 5s. to £63 10s.; April 24, £69 to £69 5s.; April 27, £66 10s. to £66 15s.; April 28, £66 15s. to £67; April 29, £68 5s. to £68 10s.

July—April 23, £64 to £64 5s.; April 24, £69 10s. to £69 15s.; April 27, £67 to £67 5s.; April 28, £67 10s. to £67 15s.; April 29, £70 to £70 5s.

Official prices of refined pig-lead:—

April—April 23, £73 15s. to £74; April 24, £79 15s. to £80; April 27, £78 10s. to £79; April 28, £80 5s. to £80 10s.; April 29, £83 to £83 5s.

July—April 23, £72 10s. to £72 15s.; April 24, £77 15s. to £78; April 27, £76 15s. to £77; April 28, £78 5s. to £78 10s.; April 29, £81 to £81 5s.

A NEW TYPE of protective clothing for furnace and foundry workers, developed by the leathercloth division of I.C.I., Limited, was exhibited at the Royal Victoria Hotel, Sheffield, on April 23. It consists of a non-inflammable fabric coated with a flexible layer of aluminium. The makers claim that it reflects about 95 per cent. of the heat away from the wearer, thus keeping him relatively cool, though he may be working very near to molten iron or steel. Tests carried out by the British Iron and Steel Research Association have shown that a man so equipped can stay in front of an open-hearth furnace for periods of up to 20 min. without considerable discomfort.

WHEN AN ACCIDENT which occurred at the works of John Bagnall & Sons, Limited, Lea Brook Ironworks, Wednesbury, was investigated by the West Bromwich Coroner on April 20, the jury passed a rider that it should be compulsory for the driver of an internal locomotive to give warning of his approach at a works level crossing and that the locomotive should have a horn on each side. A verdict of "accidental death" was given on George Masters, aged 72, a labourer employed by the firm, who died after being knocked down by a shunting engine used in the works. The Deputy Coroner said that the locomotive travelled so slowly that it did not create any danger, but the jury passed the rider in view of the fatal accident.

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

(Delivered unless otherwise stated)

April 29, 1953

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £13 18s.; Birmingham, £13 11s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £16 14s. 6d., 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, £17 0s. 3d.

Scotch Iron.—No. 3 foundry, £16 11s., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £18 3s.; South Zone, £18 5s. 6d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £19 3s.; South Zone, £19 5s. 6d.

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 12s.; Scotland (Scotch iron), £16 18s. 6d.; Sheffield, £17 13s.; Birmingham, £17 19s. 6d.; Wales (Welsh iron), £16 18s. 6d.

Basic Pig-iron.—£14 6s. 6d. all districts.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered).

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

Ferro-vanadium.—50/60 per cent., 23s. 8d. to 25s. 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 per cent., £235 to £265 per ton.

Ferro-tungsten.—80/85 per cent., 22s. 10d. to 23s. 6d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 25s. 9d. to 28s. per lb. of W.

Ferro-chrome (6-ton lots).—4/6 per cent. C, £85 4s., basis 60 per cent. Cr, scale 28s. 3d. per unit: 6/8 per cent. C, £80 17s., basis 60 per cent. 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.

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

Ferro-columbium.—60/75 per cent., Nb + Ta, 40s. to 70s. per lb., Nb + Ta.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £25 12s. 6d.; tested, 0.08 to 0.25 per cent. C (100-ton lots), £26 2s. 6d.; hard (0.42 to 0.60 per cent. C), £28; silico-manganese, £33 16s.; free-cutting, £28 16s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £32 12s.; case-hardening, £33; silico-manganese, £34 17s. 6d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £29 16s.; basic, hard, over 0.41 up to 0.60 per cent. C, £30 16s.; acid, up to 0.25 per cent. C, £33.

Sheet and Tinplate Bars.—£25 11s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £30 6s. 6d.; boiler plates (N.-E. Coast), £31 14s.; floor plates (N.-E. Coast), £31 15s. 6d.; heavy joists, sections, and bars (angle basis), N.-E. Coast, £28 9s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested, £32 4s. 6d.; flats, 5 in. wide and under, £32 4s. 6d.; hoop and strip, £32 19s. 6d.; black sheets, 17/20 g., £41 6s.; galvanized corrugated sheets, 24 g., £51 7s. 6d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £51 14s. 3d.; nickel-chrome, £73 3s. 6d.; nickel-chrome-molybdenum, £80 18s. 3d.

Tinplates.—57s. 10d. per basis box.

NON-FERROUS METALS

Copper.—Electrolytic, £253; high-grade fire-refined, £252 10s.; fire-refined of not less than 99.7 per cent., £252; ditto, 99.2 per cent., £251 10s.; black hot-rolled wire rods, £262 12s. 6d.

Tin.—Cash, £730 to £735; three months, £722 10s. to £725; settlement, £735.

Zinc.—April, £68 5s. to £68 10s.; July, £70 to £70 5s.

Refined Pig-lead—April, £83 to £83 5s.; July, £81 to £81 5s.

Zinc Sheets, etc.—Sheets, 15 g. and thicker, all English destinations, £94; rolled zinc (boiler plates), all English destinations, £92; zinc oxide (Red Seal), d/d buyers' premises, £99.

Other Metals.—Aluminium, ingots, £161; magnesium, ingots, 2s. 10½d. per lb.; antimony, English, 99 per cent., £225; quicksilver, ex warehouse, £70 10s. to £71 (nom.); nickel, £483.

Brass.—Solid-drawn tubes, 25½d. per lb.; rods, drawn, 33½d.; sheets to 10 w.g., 273s. 6d. per cwt.; wire, 31⅜d.; rolled metal, 260s. 3d. per cwt.

Copper Tubes, etc.—Solid-drawn tubes, 31⅞d. per lb.; wire, 312s. 3d. per cwt. basis; 20 s.w.g., 340s. 9d. per cwt.

Gunmetal.—Ingots to BS. 1400—LG2—1 (85/5/5/5), £172 to £218; BS. 1400—LG3—1 (86/7/5/2), £184 to £238; BS. 1400—G1—1 (88/10/2), £274 to £375; Admiralty GM (88/10/2), virgin quality, £307 to £380 per ton, delivered.

Phosphor-bronze Ingots.—P.Bl, £318 to £385; L.P.Bl, £236 to £275 per ton.

Phosphor Bronze.—Strip, 395s. 6d. per cwt.; sheets to 10 w.g. 417s. 3d. per cwt.; wire, 47⅞d. per lb.; rods, 42⅜d.; tubes, 41d.; chill cast bars: solids 3s. 7d., cored 3s. 8d. (C. CLIFFORD & SON, LIMITED.)

Nickel Silver, etc.—Ingots for raising, 2s. 8d. per lb. (7 per cent.) to 3s. 10½d. (30 per cent.); rolled metal, 3 in. to 9 in. wide × .056, 3s. 2d. (7 per cent.) to 4s. 4½d. (30 per cent.); to 12 in. wide × .056, 3s. 2¼d. to 4s. 4¾d.; to 25 in. wide × .056, 3s. 4¼d. to 4s. 6¾d. Spoon and fork metal, unsheared, 2s. 11d. to 4s. 1½d. Wire, 10 g., in coils, 3s. 8¾d. (10 per cent.) to 4s. 10½d. (30 per cent.). Special quality turning rod, 10 per cent., 3s. 7¾d.; 15 per cent., 4s. 1¼d.; 18 per cent., 4s. 6d. All prices are net.

Forthcoming Events

MAY 6

Institution of Production Engineers

Wolverhampton graduate section :—Works visit to Vauxhall Motors, Limited, Luton, Beds.

Incorporated Plant Engineers

Southampton branch :—"Pumps and Pumping," by J. B. Scivier, 7.30 p.m. at the Polygon Hotel.

Purchasing Officers' Association

Slough branch :—"Buying for the Future." discussion. 7.15 p.m. at the Reindeer Inn.

MAY 7

Leeds Metallurgical Association

Annual general meeting, followed by junior members' papers. 7.15 p.m., at the Chemistry Department, The University.

Institute of Industrial Supervisors

Warrington section :—"Metals in the Service of Industry," by L. Marshall, 7 p.m., at the White Hart Hotel.

Purchasing Officers' Association

West Wales group :—Annual general meeting, followed by discussion on "Purchasing Problems," 7.30 p.m., at Mackworth Hotel, High Street, Swansea.

Incorporated Plant Engineers

Peterborough branch :—Visit to the Hotpoint Electrical Appliance Company, Limited, Celta Mills, Fletton (details from Mr. C. G. Cowland, 47, Elmfield Road, Peterborough).

MAY 8

Institute of British Foundrymen

East Midlands branch :—Annual dinner and dance, at the Assembly Rooms, Derby.

Purchasing Officers' Association

South of England branch :—Films: "This is Aluminium," "The Aluminium Boat," and "The Argon-arc Welding Process," 7.15 p.m., at the Polygon Hotel.

MAY 9

Tees-side branch :—Inspection of the River Tees aboard a Tees Tug.

MAY 11

Incorporated Plant Engineers

Dundee branch :—"Textile Machinery," by Robert Baird, 7.30 p.m., at Mathers Hotel.

MAY 12

Beeston Boiler Foremen's Association

Annual business meeting, 7.30 p.m., in the Canteen, the Beeston Boiler Company, Limited, Mona Street, Beeston.

Institution of Production Engineers

Birmingham graduate section :—"Mechanized Inspection," by J. Loxham, 7 p.m., at the James Watt Memorial Institute, Great Charles Street.

MAY 13

Society of Chemical Industry

Corrosion group :—Annual general meeting and Chairman's address, 6.30 p.m., at the Chemical Society's Rooms, Burlington House, Piccadilly, London, W.1.

Incorporated Plant Engineers

East Midlands branch :—"Industrial Applications of the Thickness Gauge," by R. Y. Parry, 7 p.m., at the Welbeck Hotel, Nottingham.

MAY 13 to 16

Institute of Vitreous Enamellers

Spring conference at the Palace Hotel, Buxton.

MAY 14

Purchasing Officers' Association

East Midlands branch :—Ten-minute Papers presented by members, 7 p.m., at Boots Pure Drug Company, Limited, Lecture Rooms, Station Street, Nottingham.

Institute of Industrial Supervisors

London South-east section :—"The Foreman and the Factories Act," by F. O. Townsend, 7.30 p.m., at the Polytechnic, Woolwich.

MAY 15

Institution of Production Engineers

Stoke-on-Trent section :—"Education for Industrial Management," by Prof. T. U. Matthew, 7.30 p.m., at the Building Department, North Staffs. Technical College, Cauldon Place, Shelton.

Institute of Economic Engineering

London section :—"Planning in Practice," by P. M. Garnier, 7 p.m., at the George Hotel, Church Lane, Kingsbury, N.W.9.

MR. J. W. MCLAUGHLIN has retired from the board of Bakelite, Limited, and MR. F. S. HAGGERSON has been elected a director.

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

FOUNDRY MANAGER (44), M.I.B.F., desires progressive post. Experienced full control of jobbing, engineering, and mechanised foundries. Capable organiser; good profit record; sound experience costing, estimating, for competitive markets.—Box 3433, FOUNDRY TRADE JOURNAL.

FOUNDRY ENGINEER, age 28, seeks progressive employment in Steel Foundry. 10 years' experience, embracing Metallurgical Control, Foundry Work, including Practical Moulding and Fettling Shop Practice. C. & G. Finals Metallurgical Operations, A.M.I.B.F.—Box 3443, FOUNDRY TRADE JOURNAL.

URGENTLY WANTED, position as Manager or Foreman small Midlands Foundry; fully practical man with life experience trade; 46; M.I.B.F.; take full responsibility running and development; grey, malleable, non-ferrous; salary quite secondary for prospects; West Midlands.—Box 3441, FOUNDRY TRADE JOURNAL.

EXPERIENCED FOUNDRYMAN; 46; resident Midlands; car owner, phone, etc., requires urgently full time Representation reputable foundry; steel, grey, malleable, non-ferrous, experience wide range castings; practical and technical ability; excellent connections business 60 miles radius Birmingham.—Box 3442, FOUNDRY TRADE JOURNAL.

FOUNDRY EXECUTIVE, technically trained, practical administration, costs, sales, rigid metal, sand, control, mechanisation, pattern layout, planning, etc. Age 45. M.I.B.F., A.M.I.P.E., Inter. B.Sc. (Eng.). Accept responsibility. Midlands only considered; moderate commencing salary pending results.—Box 3439, FOUNDRY TRADE JOURNAL.

INVESTMENT CASTING.—Advertiser, fully experienced all phases process, including costing, estimating, laboratory and metallurgical control, plant layout, etc., requires position, preferably with general foundry interested starting new division. Or would act as Technical and Sales Representative to existing foundry. London area.—Box 3432, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER, accustomed full and complete charge small foundry; age 45; M.I.B.F.; grey, high duty, malleable, non-ferrous, repetition, stump, bench, plate, sand, metal control, practical technical; guarantee get results, not afraid difficulties on hard work; good contracts business, excellent records, desirous post near home, West Midlands; available short notice.—Box 3440, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN / MANAGER, urgently desires return West Midlands, now engaged south, to small foundry requiring development and organisation; Grey, High Duty, Malleable, Non ferrous; age 44; M.I.B.F.; take full charge and responsibility Administration, Sales, costs, Commercial Rate Fixing, fully practical, technical metal, sand control; excellent contacts business; Salary secondary if prospects, or Salary-Results basis, excellent record, references.—Box 3438, 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.

QUALIFIED METALLURGIST required for the control of whiteheart malleable iron production. A person who has experience of gas annealing preferred. Write giving details of age, training, experience, etc., to Box 3447, FOUNDRY TRADE JOURNAL.

SALES MANAGER required by important West of England Malleable and Grey Iron Founders. Applicants must be thoroughly experienced and have a first-class knowledge of the trade.—Write, stating age, experience, and salary required, Box 3430, FOUNDRY TRADE JOURNAL.

REPRESENTATIVE required to cover the South Midlands area for the sale and servicing of a well-known range of Core Binders. Practical experience in the use of these products essential and an existing connection decidedly advantageous. Payment by salary and commission.—Box 3451, FOUNDRY TRADE JOURNAL.

DRESSER (Foreman) for Steel Foundry in Scotland. Must be experienced in Heat Treatment, Dressing and Welding of medium weight castings, the output of which is approximately 300 tons per month. Applicant should be a good disciplinarian and must possess initiative and ability to organise. Must have had previous control of labour. House available. Superannuation Scheme operates. Apply stating age, salary expected and full particulars of experience to Box 3444, FOUNDRY TRADE JOURNAL.

STAFFORDSHIRE EDUCATION COMMITTEE.
COUNTY TECHNICAL COLLEGE, WEDNESBURY.

Principal: H. A. MacColl, B.Sc., F.I.M.
DEPARTMENT OF METALLURGY.

APPLICATIONS are invited for the post of Assistant, Grade B, to teach Patternmaking and Foundry work to the standard of the final examinations of the City and Guilds of London Institute. Candidates should be qualified Patternmakers with practical experience in the Foundry, and should have had either full-time or part-time teaching experience. Salary: Burnham Scale for Assistants, Grade B, £490 by £25—£765, together with appropriate allowances for degree and approved training.

Application form (returnable by 20th May) and further particulars relating to the appointment may be obtained from the undersigned on receipt of stamped addressed foolscap envelope.

J. H. P. OXSPRING,
Director of Education.

Dept. F.E.,
County Education Offices,
Stafford.

SITUATIONS VACANT—*Contd.*

CAST IRON MOULDERS required by Sundry Equipment Manufacturers, Pitsea Street, Stepney, E.1. Write, call or 'phone. Stepney Green 2272.

YOUNG FOUNDRY FOREMAN required for Small Jobbing Foundry in East Midlands (Iron and Non-Ferrous). Particulars of age and experience and salary required.—Box 3426, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN: Practical, Technical. Experience essential. Grey Iron up to 20 tons per week. Applications in writing only; two references.—SLOUGH FOUNDRIES, LTD., Trading Estate, Slough.

FOUNDRY FOREMAN required for Iron Foundry in South Wales. Output up to 20 tons per week, max. 2 tons. Experienced in floor and mechanical work. State age, experience and salary required. House available.—Apply Box 3452, FOUNDRY TRADE JOURNAL.

WELL-KNOWN malleable iron foundry in the Midlands producing castings from a few ounces to 5 cwts for the motor, engineering, agricultural, shipbuilding and electrical trades requires representation in South Wales, in the West of England and in London and the Home Counties.—Apply Box 3437, FOUNDRY TRADE JOURNAL.

FOUNDRY TECHNICIAN (age 28 to to 35) required by progressive Company in North-West England, to assist in Sales Technical Service covering supply to Foundries of Crucibles and Fluxes. Give details of experience, qualification, salary required. All applications treated in strictest confidence.—Box 3410, FOUNDRY TRADE JOURNAL.

FOREMAN/MANAGER required for small non-ferrous Foundry Department, Sheffield; sound all-round technical knowledge essential, also a progressive outlook upon the importance of good working conditions and high productivity; room for considerable expansion. Write in first instance stating age, experience and salary required to A. G. WILD & CO., LTD., Charlotte Road, Sheffield.

GENERAL WORKS MANAGER required to take full charge of a very large Foundry in South Wales. Age 35/45 years. Applicants must have good technical Foundry background and first rate administrative experience and ability. The position is superannuated. State full details of experience, qualifications, and age, and indication of required salary to Box 3399, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN: Young man with practical Foundry Training and some knowledge of Metallurgy to act as Foreman under the supervision of Foundry Manager and take charge during his absence. Applicants should preferably have served an apprenticeship in a Modern Foundry and be about 30 years of age. The post is a permanent one and pension scheme is in operation.—Apply, The Secretary, W. S. BARRON & SON, LTD., Gloucester.

AGENCIES

AGENTS REQUIRED, one in Northern and one in Southern England for selling mass produced light castings and high duty castings in grey iron and aluminium and aluminium bronze alloys.—Box 3418, FOUNDRY TRADE JOURNAL.

LONDON COMPANY with well established business in foundry supplies and equipment seeks an additional agency. —Box 3435, FOUNDRY TRADE JOURNAL.

PARTNERSHIP

WORKING PARTNERSHIP wanted by experienced Foundryman, in small brass or iron foundry. State approximate capital required.—Box 3449, FOUNDRY TRADE JOURNAL.

FOUNDRY FOR SALE

EAST WORKS, OLDHAM.

EXTENSIVE RAIL CONNECTED FACTORIES OR WAREHOUSES.

1—FLOOR SPACE 278,000 sq. ft.; Site area 51,000 sq. yds. Mainly Three Storeys—Concrete Floors. Five Electric Lifts, Overhead Travelling Cranes, Road and Rail Loading Docks. Fixed Foundry equipment including Cupolas, Core Drying Furnaces, etc. Suitable for heavy engineering, storage, etc. Undeveloped land approx. 4½ acres. Price: £50,000

2—Floor Space 302,000 sq. ft.; Site Area 17,000 sq. yds. Part modern, mainly multi-storied. Concrete on Brick Arch Floors. Covered Loading Yards, Road and Rail Docks. Price £40,000.

Sole Agents.—HILLIER PARKER MAY & ROWDEN, 77, Grosvenor Street, London, W.1 (Mayfair 7666.)

MACHINERY WANTED

MORRIS Screenarator Sand Conditioner.—Box 3411, FOUNDRY TRADE JOURNAL.

B.M.M. type 8E3 Roll Over Moulding Machine. Must be in good condition. State where it can be seen working, and price required.—Box 3427, FOUNDRY TRADE JOURNAL.

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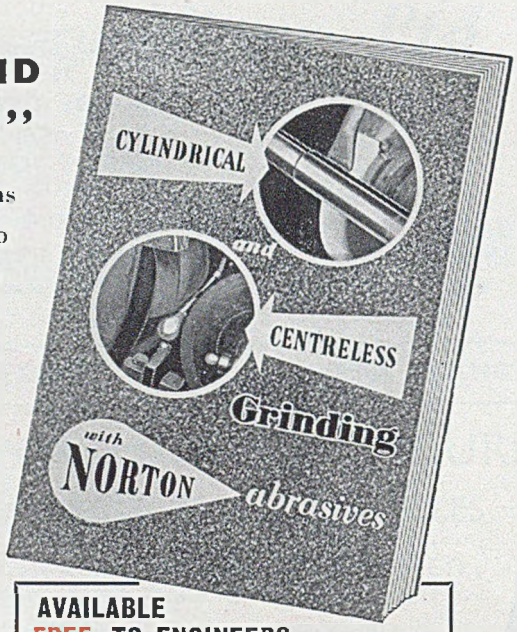

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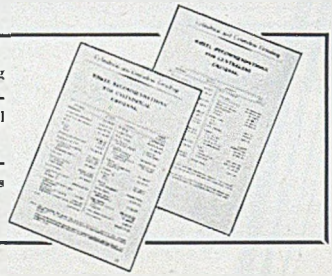

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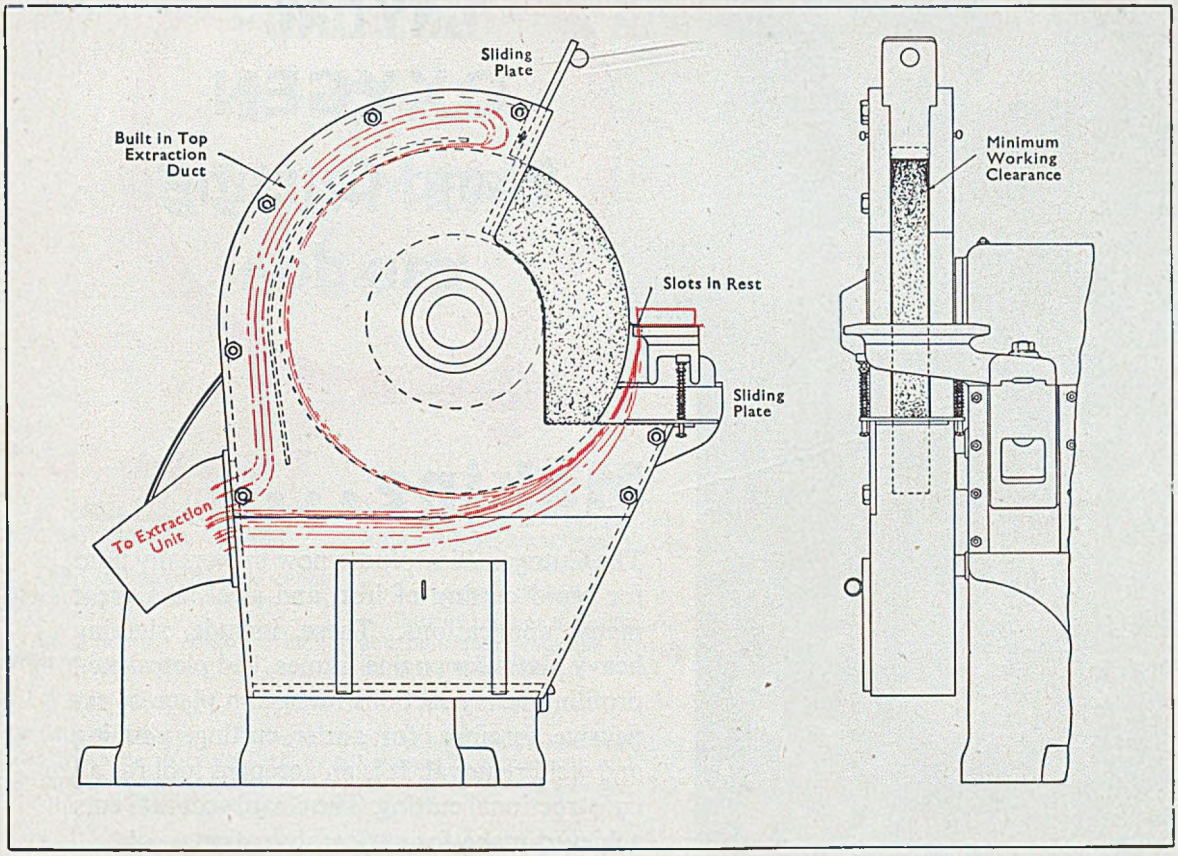

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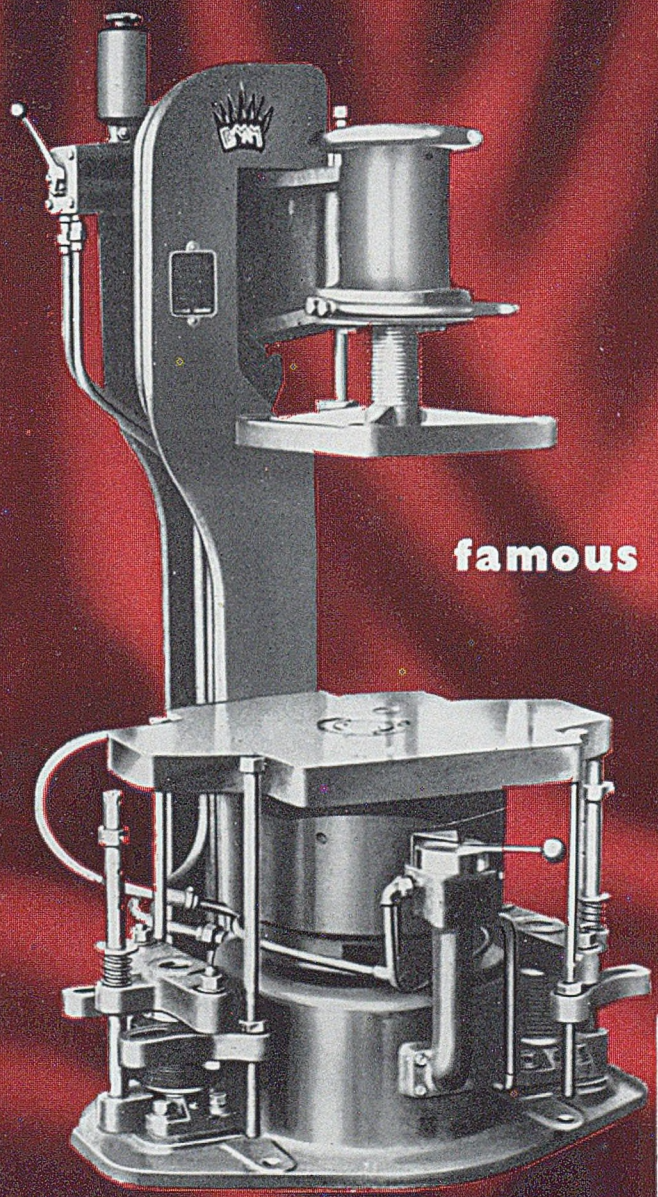

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