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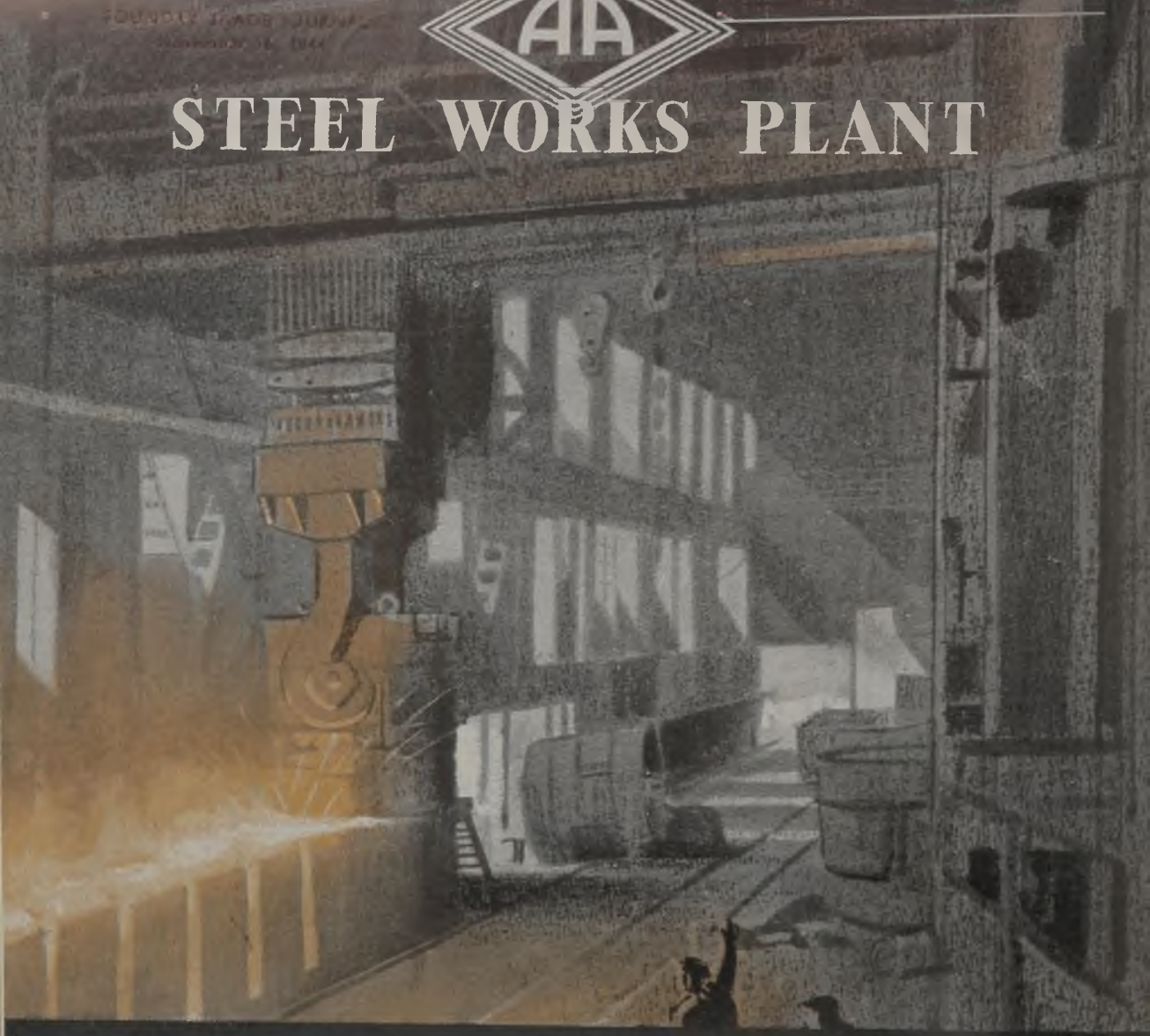

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FOUNDRY TRADE JOURNAL
Established 1902
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Forty Years of Service

Due to the war, the Institute of British Foundrymen has been unable to celebrate in fitting manner the fortieth anniversary of its establishment. If it had been held under peacetime conditions, it would have then been possible to honour its founders and stalwarts in a manner worthy of them. We thus utilise this column as a poor substitute for recording some salient features in its history. The founders were not prosperous foundry owners, but enlightened managers and foremen, who realised the benefits the Americans were receiving through their organisation, the American Foundrymen's Association. Most of the "Science" in those early days was provided by Prof. Turner, who is still as enthusiastic as ever on the subject of cast iron; the late Dr. Percy Longmuir, and Dr. T. Swinden, whose recent death is still being mourned by all foundrymen; Mr. F. J. Cook, and Mr. John Shaw. There quickly arose grumbles that the Papers were too scientific, and these have persisted ever since with a noticeable *diminuendo*. The Institute has always been at the "cross-roads," and still is. This is due to the fact that the service it has ever been giving to its members has widened its vista and brought about an atmosphere of doubt as to whether these services are or are not out of balance and more should be given to this or that interest. The outstanding feature has been that it has been the only link between a large number of quite divergent industries.

Whether it was an accident or a set policy to establish branches throughout the country from the very inception of the Institute can only now be guessed, but the fact remains that by so doing worth-while technology was brought to the doors of a much larger number of members than had hitherto been the case. It is a policy that has been emulated by nearly all the great national technical institutes. It is probable that following a discussion held in Sheffield many years ago and sponsored very largely by the late Mr. C. Buchanan, the industry became research-minded, and resulted a few years later in the establishment of the British Cast Iron Research Association. Somewhat later, after we had published a series of articles on "Foundry Educational Facilities," covering most of the teaching establishments in the country, an Education Committee was set up and, under the enlightened guidance of Mr. Makemson, the Institute's first full-time secretary, real progress was made by the establishment of the City and Guilds Examinations. From that time onwards, Mr. S. H. Russell has presided with distinction over its educational activities, and the recent issue of a report on the subject was met with general approbation. The Institute after the last war embarked on a policy of international technical co-operation and participated in conferences in the United States, France, Belgium, Czecho-Slovakia, Poland, Spain, Italy and Germany, and was host to overseas foundrymen in 1929 and 1939. This policy permitted to a limited extent of two meetings each year of the most progressive elements in the industry, but at the same time it imposed a barrier against holding the usual spring and autumn meetings—traditional in most British technical institutes. International collaboration could still be quite effective by either holding a meeting of the Institute abroad or by inviting overseas foundry associations to visit us—but one at a time. We have participated in and appreciated both types, yet we favour "unilateral" co-operation as being the most satisfactory, and satisfying.

Milestones in the history of the Institute were its incorporation under a Royal Charter in 1920, when its name was changed from the British Foundrymen's Association, for which action the late Mr. Tom Firth was largely responsible; Mr. Oliver Stubb's year of office, in 1921, which saw the inauguration of the first

(*Continued overleaf, column* 2.)

Contents

SEGREGATION IN ALUMINIUM-SILICON ALLOYS*

By E. MEYER-RASSLER and L. LAURS

When melting alpax for die-casting, containing about 8 per cent. Si, to 6 per cent. Mn, and to 0.65 per cent. Fe, a heavy, very viscous lump is formed at the bottom of the melting pot that reaches a weight of about 15 lbs. in a day for a charge of only 660 lbs. This cake melts at about 900 deg. C., but segregates again in cooling between 800 and 900 deg. C., and must be scrapped. The analysis of the cake showed an extraordinary high Fe and Mn content as compared with the charge, *e.g.*, 8.5 Fe, 14.3 per cent. Mn.

Investigation of the reasons for the occurrence of this segregation led to the conclusion that Mn forms segregations in aluminium-silicon alloys at low melting temperatures, the magnitude of the segregation depending on temperature and manganese content. The formation of the cake means loss of metal and increased wear of the melting pot.

In order to avoid these disadvantages, it is necessary in die-casting to maintain a sufficiently high temperature in the melt (620 to 670 deg. C.) by the use of automatic temperature control, to use a manganese content of the aluminium-silicon alloy of about 0.2 to 0.7 per cent., as even with 0.5 per cent. Mn and die-casting temperatures above 630 deg. C. a considerable cake formation can take place.

The iron content of the alpax alloy should be as low as possible, as it was found that at 0.6 per cent. Fe, especially in presence of manganese, the iron is segregated. With iron contents of 1.5 to 1.8 per cent. (as provided in the German standard DIN-1744), cake formation cannot be avoided even with higher casting temperatures. Graphite crucibles must be used for melting to prevent increase of iron content in the melt by dissolving the crucible material. The undesirable cake formation also offers, however, a possibility to purify aluminium-silicon alloys by tempering slightly above the melting temperature if they have been adulterated by iron and manganese.

* A "Metals and Alloys" abstract of an article in "Die Giesserei."

INDUSTRIAL LAW FOR EXECUTIVES

The Industrial Welfare Society's correspondence course in industrial law has proved of great benefit to a large number of persons who have been drafted into executive positions in industry and who required a working knowledge of industrial law, but who could not afford to give a prolonged study to the subject. The course consists of six lectures, each of which can be read in 1 to 1½ hrs., and students are invited to submit any questions they wish on the lectures. The lectures are normally sent weekly, but they can be sent all at once or at longer intervals at the wish of the individual student. Particulars can be obtained on application to the Secretary, Industrial Welfare Society, 14, Hobart Place, London, S.W.1.

CORRESPONDENCE

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

Founder Members of the Institute

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—I notice on page 163 of your October 26 issue that you refer to the presentation made to Mr. F. J. Cook at the last council meeting. You say in the final sentence of your notice that Mr. Cook is the only founder of the Institute who is still a member. This should read, who is still a member of the Council, and perhaps you would like to correct the statement so as not to upset the other eleven founder members who are still members of the Institute.

Yours, etc.,
JOHN BOLTON,
Acting Secretary.

The Institute of British Foundrymen,
St. John Street Chambers,
Deansgate,
Manchester, 3.
October 31, 1944.

[We regret any implied discourtesy to those who joined the Institute in 1904, but we had in mind those who participated in the inaugural meeting.—EDITOR.]

FORTY YEARS OF SERVICE

(*Continued from previous page.*)

foundry trades exhibition; Mr. Makemson's appointment as secretary in 1926; the creation of a technical committee in 1932, which soon became the special interest of this year's President, Mr. J. W. Gardom. Under his guidance, the work of the Institute expanded and received well-merited recognition in the wider circle of technical interests. Finally, we come to the war period, when the Institute, after but slight hesitancy, embarked upon a really progressive policy. The number of Papers, especially to the annual meetings, equalled those of the pre-war era; the Technical Committees exhibited increased activity and one of them actually designed and equipped a series of specialised foundries for war production. Practically all the Branches expanded—a new one was created at Bristol, whilst the South African Branch started sections at Cape Town and Durban. It is obvious that great efforts will have to be made in the post-war era to maintain this level of activity, and no longer can so much reliance be placed on the old stagers, who have brought the Institute up to its present healthy condition. "Cross-roads" will again be the topic, but we have confidence that the sound edifice built up through 40 years of patient endeavour will be extended and embellished by the rising generation.

THE MECHANISED PRODUCTION OF ALUMINIUM GRAVITY DIE-CASTINGS FOR THE MERLIN ENGINE

Advantages of gravity die-casting over sand castings

By JOHN VICKERS

(*Continued from page* 199).

Cover Plate and Guide

A die for a very intricate casting is shown in Fig. 11, this particular job representing the highest achievements in die design and manufacture. From the die designer's point of view, difficulty is experienced in designing a die to collapse away from the irregular contour and numerous undercuts on the casting, while at the same time maintaining strength and rigidity. This object has been achieved by forming most of the cavity in loose cores and pick-off pieces, *i.e.*, cores that, when the die is opened, remain in position on the casting, to be afterwards removed, the two die blocks only forming a small section of the cavity, but containing the runners and risers and acting as an assembly piece for the various cores.

In order that the die blocks may be opened without fear of wrenching the casting, they are guided in direction of travel on the die base by means of keys and a special opening device has been incorporated to ensure that the die halves are parted parallel to each other. This takes the form of a cam on the split-line of the die at each side of the casting actuated by levers projecting out from the die base. The operation of drawing back the blocks then leaves the casting suspended, with loose pieces attached, on a bottom core in the die base from which it is removed by with-

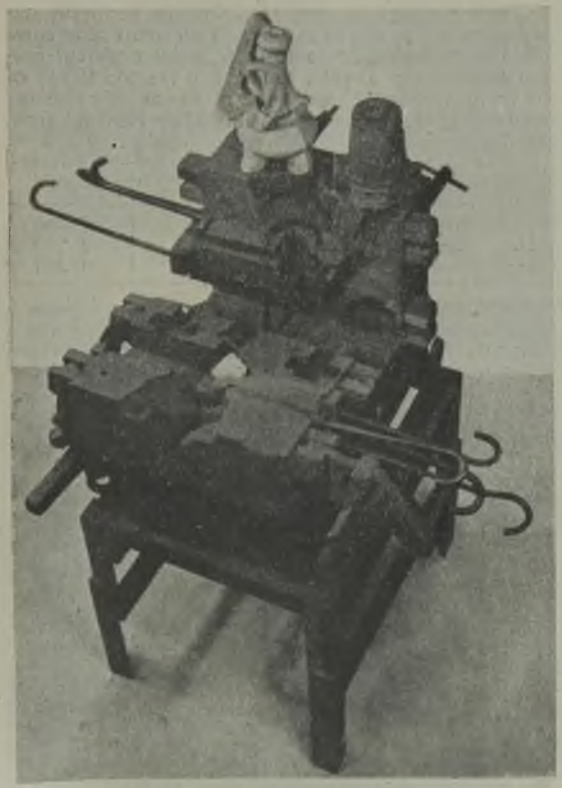

FIG. 11.—CONSTRUCTION OF DIE FOR COVER PLATE AND GUIDE.

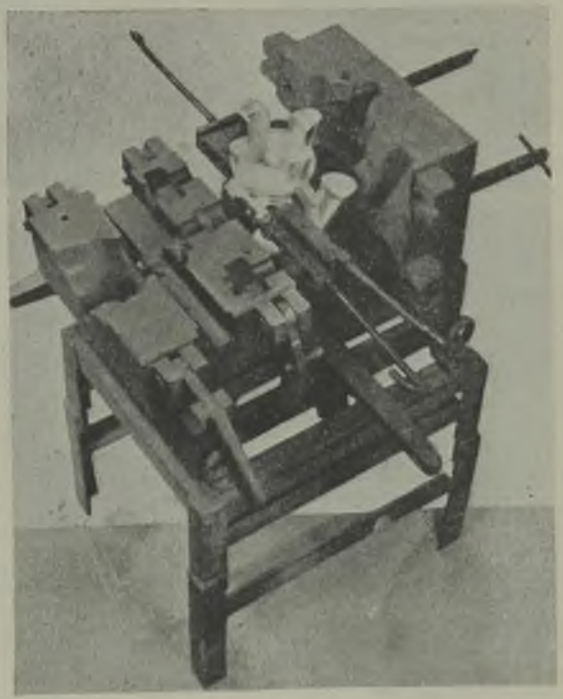

FIG. 12.—REMOVING PICK-OFF PIECES FROM COVER PLATE AND GUIDE CASTING.

Aluminium Gravity Die-Castings

drawing the core with the aid of a cam action situated in the base.

The illustration in Fig. 12 shows the casting in position on the die base prior to removing the pick-off pieces; the cams for opening the die are also visible. One small sand core is used to form a triangular-shaped pocket halfway up the casting.

Because of the intricacy of the die cavity, bottom pouring is essential; therefore, the metal is directed down an inclined runner and through a ring runner into the bottom of the casting. To obtain ideal thermal conditions in the solidifying metal the runner is gated into a boss, part way up the casting, and then into the base of the top riser, thus ensuring hot metal for feeding purposes.

The many intricate and delicate loose pieces in the die calls for care and skill on the part of the operators in order to ensure their proper alignment. Methods such as dipping the cores in colloidal graphite, after every cast, are introduced to facilitate removal from the casting with the minimum of exertion. As in the case of the previous example, the "sand" and "die-cast" methods can be compared with the following information:—

Details.	Sand-cast.	Die-cast.
Bonus time allowance (mins.)	66.000	44.750
Finished casting weight (lbs.)	1.875	1.706
Standard cost per casting (S.)	1.063	0.708

FIG. 13.—REMOVAL OF PICK-OFF PIECES FROM COOLANT INLET CASTING.

Coolant Inlet

A further example illustrating the use of loose pick-off pieces is shown in Fig. 13. The pick-off pieces, of which there are six, are necessary to form pockets under the flange of the casting. Two small sand cores are also incorporated to form a badly undercut portion between the angular facing and the top flange of the casting. Fig. 13 shows the operation of removing the loose pieces from the casting after removal from the die.

Details.	Sand-cast.	Die-cast.
Bonus time allowance (mins.)	68.750	46.250
Finished casting weight (lbs.)	2.750	2.250
Standard cost per casting (S.)	1.271	0.667

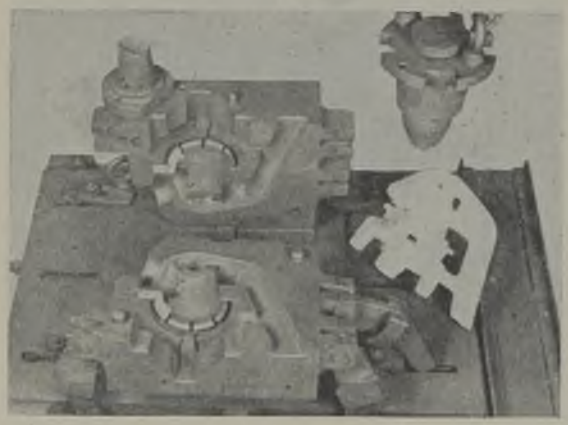

FIG. 14.—GENERAL VIEW OF CONSTRUCTION OF COOLANT INLET DIE.

The die proper is constructed in two-block form, a large top core forming the inside of the casting and a side core forming the angular boss. This latter core is located in position by means of a substantial dowel

FIG. 15.—POURING COOLANT INLET CASTING.

pin in the side of the die. Fig. 14 illustrates the general construction. It will be observed that a large body of feed metal has been provided in the bottom of the die, the purpose of which is to feed a heavy boss on the inside of the casting directly above it. A gate has been cut into the thin wall of the casting to supply heat to this section, thereby avoiding hot tearing due to excessive solid contraction.

Because the dimensions of the feeding gates in the bottom of the die do not offer any effective choke for the ingoing metal—if they did, the runner could not act as a feeder also—the die has to be tilted to avoid turbulence in the bottom of the mould (Fig. 15). It has been found that, despite the inevitable complications introduced by incorporating loose pieces or pick-off pieces in gravity dies, their use still results in a high rate of production and, provided the pieces themselves and their location are designed and constructed properly, no technical difficulties are encountered.

Cylinder Skirt Die

The policy of manufacturing as die castings as many castings as possible on the Merlin engine is obviously very keenly pursued when one considers that the latest venture is a gravity die for producing cylinder skirt castings, the casting itself measuring 3 ft. 6 in. long and weighing 53 lbs.

Very careful consideration has entered into a design of running system for this job, which will ensure castings being metallurgically sound, and the decision

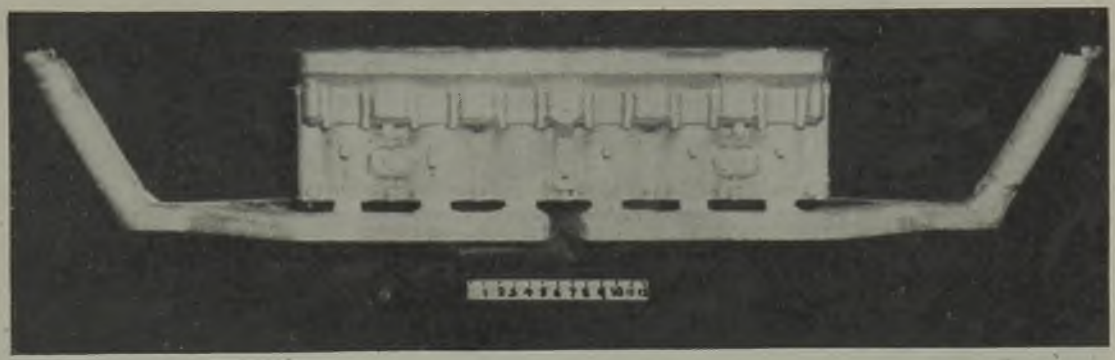

FIG. 16.—CYLINDER SKIRT DIE-CASTING WITH RUNNERS AND RISERS.

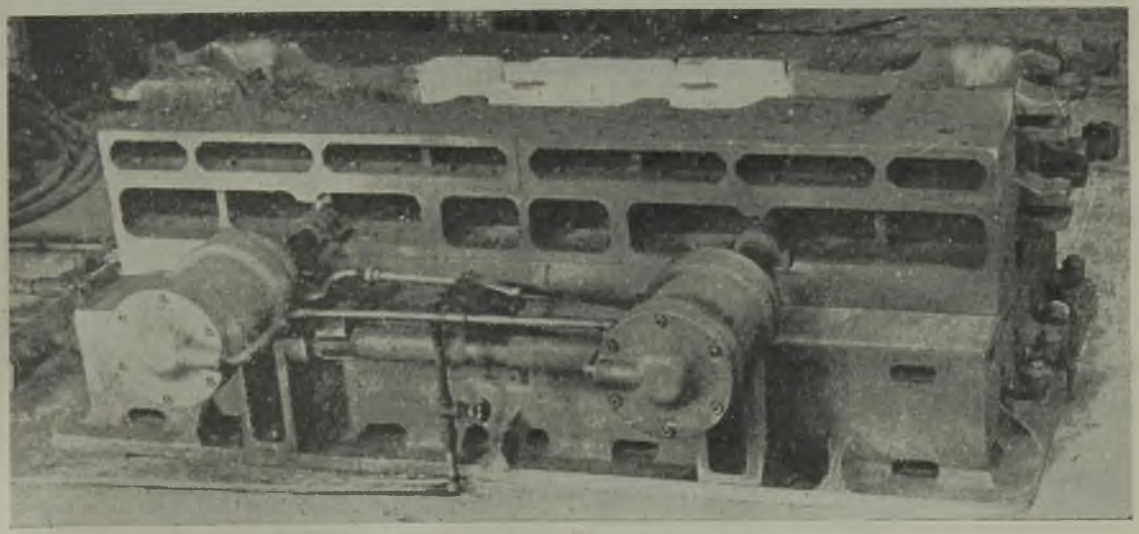

FIG. 17.—VIEW OF THE DIE FOR MAKING THE CYLINDER SKIRT.

Aluminium Gravity Die-Castings

arrived at is well illustrated in Fig. 16, showing the casting complete with runners and risers. The metal enters the mould, in a theoretically ideal manner—at the bottom, through a system of 12 ingates, each measuring 2 in. wide by $\frac{1}{16}$ in. thick, from a channel runner along each side of the casting. A sloping runner is situated at each end of the die leading into the channel runners.

The relative cross-sectional areas of the various parts of the running system are such that the metal is choked at the ingates, thus ensuring that the system is kept full during the casting operation.

A general view of the die is given in Figs. 17 and 18. It consists essentially of two main die blocks forming the outside of the casting and a base, whilst the inside of the casting, which is relatively intricate, is formed with one large sand core. Because of their size and weight, direct manual operation of the die

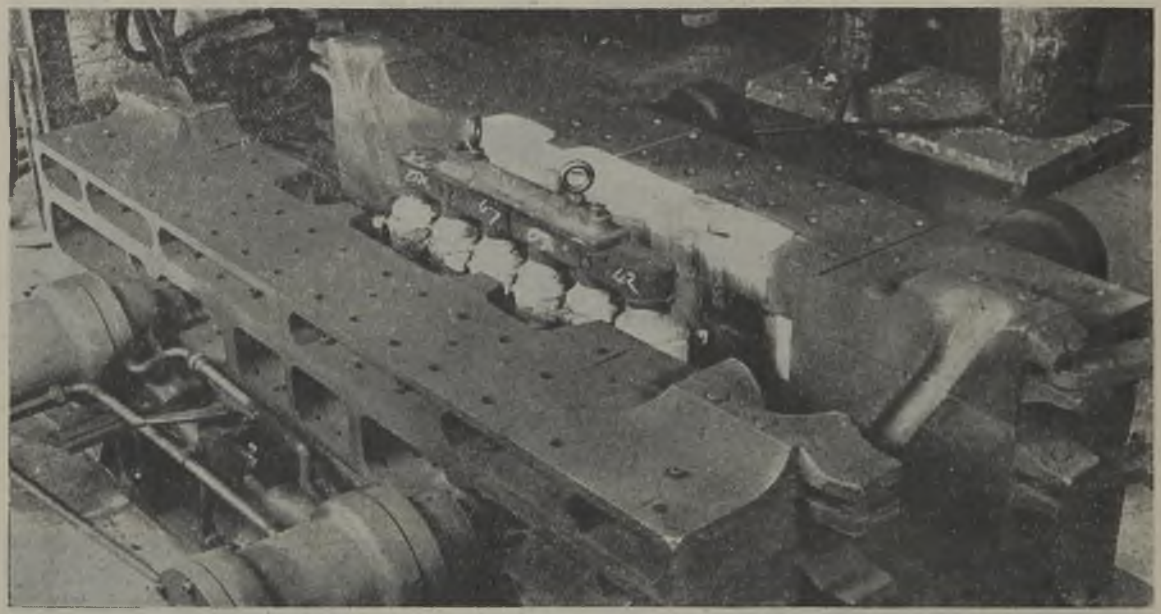

FIG. 18.—PARTIALLY OPENED CYLINDER SKIRT DIE.

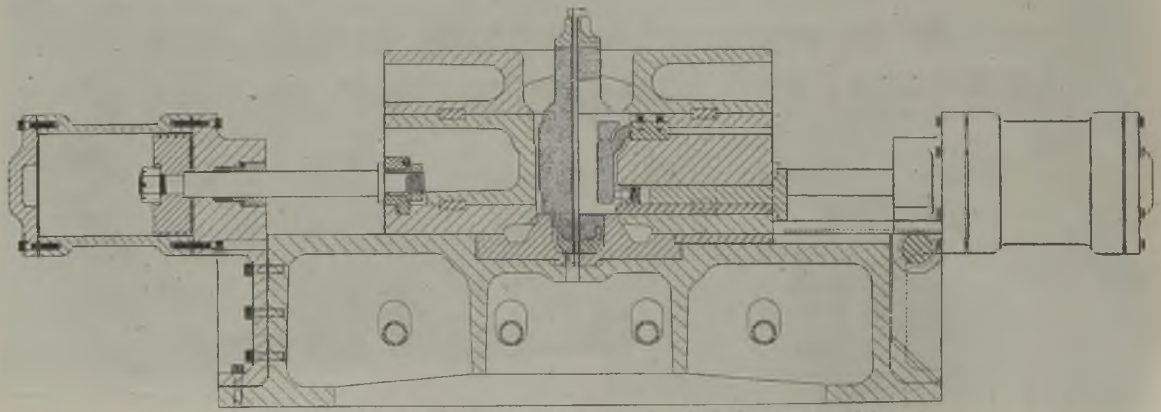

FIG. 19.—CROSS-SECTIONAL DRAWING OF DIE CONSTRUCTION.

blocks is impossible, and two 8 in. dia. air cylinders operating on 80 lbs. per sq. in. air pressure have been fitted on each side; synchronisation of the movement of the two pistons is effected by means of two racks meshing in pinions on a common shaft thus ensuring that the die halves remain parallel to each other during opening and closing. In the closed position the halves are securely clamped together at the ends by cam-action clamps. The design of the die base illustrate some of the problems encountered when a job of this size and description is undertaken. The most serious problem is to prevent the base cracking on the outside, due to the bursting stresses set up when the centre inevitably becomes heated up to a higher temperature than the outside, with the consequent greater expansion. The solution lies in (1) heating all sections of the die uniformly initially; and (2) maintaining it in that condition.

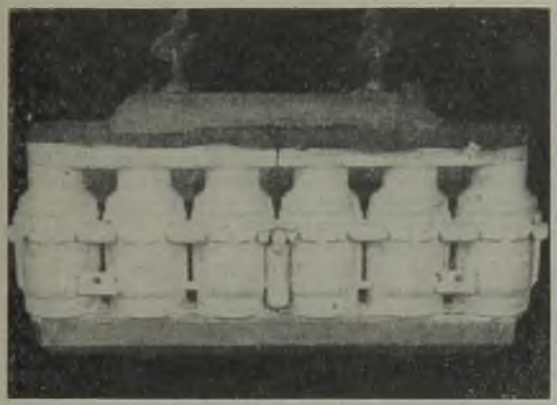

FIG. 20.—CYLINDER SKIRT CORE ASSEMBLY.

To do this a system of heating by means of gas pipes placed in the die base has been incorporated whereby heat may be applied uniformly over the whole area. During actual operation it is necessary to turn-off the gas pipes in the centre of the die, as this is maintained at a uniform temperature by heat from the metal flowing through the running system. The cross-sectional drawing through the die (Fig. 19) shows the gas pipes in the die base and the construction of the base; many strengthening webs are provided to ensure rigidity.

The problems inherent with unequal expansion due to varying degrees of heat have also to be contended with in the design of the main die-halves. It will be seen from the cross-section of the die that each die half is built up in three layers. The bottom piece, which is comparatively thin, forms part of the casting and running system, and since it becomes heated to a greater degree than the remaining sections, it is not secured to any other section of the die block, but is only located by means of keys, thus enabling it to expand freely longitudinally. A similar principle is included in the top blocks forming the feeding heads.

The inside of the casting is formed by one large sand core. This is constructed in four main sections, which are afterwards assembled in a special metal trough and secured by means of long bolts and a cast-iron strap along the top of the core prints. Eleven coolant liquid transfer port cores are assembled into the body core and secured in position. The complete core assembly is in this way handled in one unit and placed in the die on steel dowels fitting into corresponding locations in the metal core carrier, thus ensuring ease and safety in handling with consistently accurate positioning relative to the die cavity.

Fig. 20 shows the core assembly, whilst reference to the cross-section will make the core location method clear.

Summary

It is hoped that the detailed description of the aforementioned typical dies will have illustrated fully to the reader just how valuable and indispensable is the die development department to the mass-production of sound gravity die-castings.

FIG. 21.—RADIOGRAPH OF SPRAY NOZZLE BODY REVEALING SHRINKAGE CAVITY.

Every casting on the Merlin engine is treated by this section as a Class I inspection piece, although, officially, none is classified as such by the A.I.D., and it is accordingly the practice that no die may be released for production until perfectly sound castings are assured.

Details.	Sand-cast.	Die-cast.
Bonus time allowed to produce (mins.)	878.0	407.0
Finished casting weight (lbs.) ..	54.0	52.0
Labour cost per casting (S.) ..	14.167	7.396

By setting this target, the high standard of quality demanded of all Rolls-Royce products is practically guaranteed, and at the same time an important safety margin is automatically introduced to cover any slight

THE MECHANISED PRODUCTION OF ALUMINIUM GRAVITY DIE-CASTINGS FOR THE MERLIN ENGINE

(*Continued from previous page.*)

reduction in metallurgical and dimensional quality inevitably encountered under rigorous production conditions. In this respect, the radiological examination of castings is employed very extensively during die development as a means of investigating the effect of different methods of die preparation and casting technique on the quality of a particular casting.

Defects such as shrinkage and occluded bubbles of air are readily detected by this examination and, when the occurrence of these is studied in relation to both the relative thermal conditions in different sections of the die and to the casting technique, most valuable data on die design and the theory of casting are obtained, thus making the rapid elimination of faults more certain. By making a specialised study of each design in this manner, considerable scientific knowledge has been rapidly accumulated.

To illustrate the high quality achieved and also the value of radiography on die development, a few typical examples are given, showing details of faults dis-

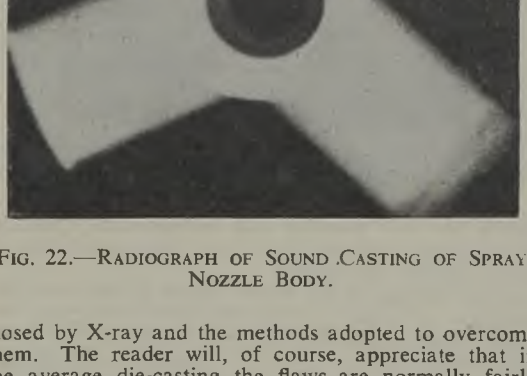

FIG. 22.—RADIOGRAPH OF SOUND CASTING OF SPRAY NOZZLE BODY.

closed by X-ray and the methods adopted to overcome them. The reader will, of course, appreciate that in the average die-casting the flaws are normally fairly small in size on the original negative, and that also a certain amount of definition is lost upon reproduction, but it is hoped that the faults can be detected on the illustrations shown.

Fig. 21 shows a radiograph of a sample casting of the first batch of castings taken from the spray nozzle body die after leaving the tool room. The shrinkage cavity disclosed on the negative revealed to the designer that insufficient feed to the casting had been provided for, and accordingly the die had to be returned to the tool room for modification. After recti-

(*Continued at foot of next column.*)

MOISTURE REMOVER FROM AIR AND GAS

For automatically and continuously removing condensate in the form of droplets, slugs or mist from compressed air and gas lines, the "Liqui-jector" has been developed by Selas Corporation of America, Erie Avenue and D Street, Philadelphia, 34. It is adaptable on lines up to 1¼-in. pipe size and normal line pressures.

No moving parts are involved and no cocks, traps or shut-offs are needed in the drain line. Action is entirely automatic and continuous through two porous ceramic tubes—one inherently water-repellent and the other water-permeable but air-impervious.

It is useful with pneumatic tools, atmosphere gas generators, compressors, air-actuated control systems, vapour quench lines, spray and blast equipment and other pneumatic apparatus. The principle is the separating of liquid and gas phases by virtue of the surface tension of the liquid.

Entering the Liqui-jector, compressed air passes through the water-repellent tube, where it is stripped of moisture. The action is by coalescence of droplets on the surface of this tube, a coarse ceramic material with an average of 50,000 pore openings per sq. in., each so small that the pressure drop across the tube is insufficient to permit water passage against the resisting diaphragm action of its surface tension.

The coalesced moisture drops to the bottom of the unit, where it passes through the second tube (without loss of air) to outside atmosphere. This tube is of microporous porcelain, 720 million pore openings per sq. in., and (being constantly wet by its wick action) constitutes a perfect air seal up to the rated limit working pressure of the unit. This rated pressure may be manipulated to user specification. Its oval shape permits flush-against-the-wall installation, directly in the line, without the addition of elbows or other fixtures.—"Metals and Alloys."

CO IN COMPRESSED AIR

Though it has been known for several years that compressors might deliver air contaminated, recently their uses, some fatal, have come to light and are reported in the "Industrial Accident Prevention Bulletin." The causes are somewhat diverse, but the overheating of the compressor is usually a feature.

(*Continued from previous column.*)

fication by altering the shape of the feeder on the defective branch, perfectly sound castings were obtained, as illustrated in Fig. 22.

Prior to the release of the rocker cover die to the production foundry, radiographs taken of sample castings produced disclosed the presence of shrinkage cavities, and in this particular case the course adopted to overcome this fault was the modification of the method of coating the die.

(*To be continued.*)

THE FOUNDRY INDUSTRY

MR. BUTTER'S PRESIDENTIAL ADDRESS TO THE EAST MIDLANDS BRANCH

When Mr. F. G. Butters assumed the chair of the East Midlands Branch, he delivered the following inaugural address, in the course of which he said:—

Mr. Smith and Gentlemen,—The foundry industry has now passed through five critical years of war, during which time its resources, both technical and material, have been taxed to their limit, and it is due in no small measure to the untiring efforts of the Institute of British Foundrymen, with its various technical committees, that the industry has been enabled to meet and fulfil demands unparalleled in its history. It is therefore appropriate in the light of this knowledge of past achievement that the members may be justifiably proud of their connection with an Institute which has rendered such valuable service in the national cause.

Notwithstanding this it is not suggested, nor is it likely, that the Institute as a body, or any of its individual members, will be satisfied to rest on their laurels, but rather should they be regarded as a stimulating feature conducive to even greater efforts to improve the status of the industry, not only by the promotion of the intellectual welfare of all concerned, but also by the promotion of higher ethical standards in the founding industry thereby contributing in some measure to the proposed post-war industrial reforms. Such reforms, from the standpoint of industrial welfare, include facilities for proper lighting, heating and ventilation, also provision of canteens and facilities for the workers to wash and, in general, to make themselves more presentable to those whom they may contact when returning home.

From the educational standpoint there is every prospect of a revival of the apprentice training schemes on much better and more attractive lines than hitherto experienced in the past. Such schemes will involve part-time continuation classes in addition to the established system of evening classes. To some, who it is hoped are in the minority, such reforms can only be interpreted as being Utopian in conception and may be considered as ideals, the attainment of which is only practicable in the more prosperous establishments of our industry, but if we are to keep in line with post-war industrial developments we should appreciate that there is a unique opportunity of raising the craft of founding to its rightful position in engineering.

Training and Education

It is not my intention to dwell on the subject of improved workshop conditions, nor the provision of social amenities, although they are closely allied to the general improvement of standard conditions, but I would rather appeal for your sympathetic consideration of a subject to which we should give our most serious attention, namely, that of training and educating those whom, we hope, may be attracted or induced to choose foundry work as their vocation. In this respect we should be fully conscious that on their shoulders will rest the responsibilities of management or equally important appointments in the foundry of the future, and from this standpoint we, as members of a progressive Institute, in co-operation with the industry in general, should bend our efforts to this all important task.

This problem has already aroused deep concern in a national sense, and has been provocative of many sound discussions following the presentation of the Report on "Industry and Education," by Harbach and Horton. It should, therefore, be realised that, just as the proposed educational reforms will, if carried out, be of inestimable value to the youth of the country, so our industry must attune itself to the same end.

It is not difficult to visualise that, even from such ambitious educational reforms, boys of all types with varying abilities and characteristics will emerge, and from such a collection some will be required for the foundry. Now choosing the right boy becomes a problem, and the traditional specification of the foundry trade, in common with other trades, is "Boy of a suitable type," but the nature of such a specification is much too haphazard and may prove disappointing to the boy and foundry trade alike. Reference is made to the qualifications of the "suitable type of boy," by Douglas Jepson in his Paper, "Education of the Foundry Worker," in which he states that the boy should be alert, eager, responsive, honest and diligent, who can be relied upon to give of his best without undue supervision. In short, it is moral characteristics which form the fundamental basis of this "suitable boy."

Moral Background

Mr. Jepson goes on to emphasise that skill with the hands and agility of the brain may be necessary, but the utmost manual dexterity or the most brilliant mind will not make a morally weak boy into a suitable one, for it is on the rock of moral strength allied with good health that it is possible to build up an appropriate education, scholastic and practical, with certainty that the results will be beneficial to the individual, to the trade, and to the community as a whole. Without this moral background the educational edifice, lofty as it might be, is liable to bring no lasting benefit to anyone, and might well prove to be a disaster. The foundry industry must, therefore, accept, foster and develop these moral virtues and, by its own sincerity, honesty and generous treatment, show that they do indeed form the basis of its post-war policy.

As the fulfilment of such a long cherished ideal is naturally dependant on the return of stable conditions may we hope that the near future will restore peace and prosperity to all, and that the energy and genius of man, which, during the last five years, has been directed to destructive ends may be diverted to the happier work of reconstruction which will be of lasting benefit of mankind throughout the world?

After the formal proceedings had ended Mr. Butters called upon Mr. J. L. Francis, of Birmingham, who gave an interesting address on "The Inoculation of High-duty Cast Iron," after which a spirited discussion followed.

NOTES FROM THE BRANCHES

Birmingham, Coventry, and West Midlands Branch.—This Branch is making arrangements to hold its annual dinner and dance at the Botanical Gardens, Edgbaston, on April 13 next. In asking members to reserve the date, Mr. G. R. Shotton (President) expresses the hope that the function will approach the pre-war standard even if it did not prove to be their first post-war social gathering. On November 25, Mr. J. V. Smith will give a Paper on "Principles of Mechanical Handling."

East Midlands Branch.—No fewer than 120 members participated in a visit to the works of Bamfords, Limited, Uttoxeter, the foundry manager of which—Mr. F. G. Butters—is the President of the Branch. On arrival the members were received by Mr. H. B. Bamford, Mr. H. V. Bamford, Capt. H. J. Bamford, and Mr. Butters.

The tour of the various shops was organised to show the progressive stages of manufacture of the various products of the firm from the time they left the moulding shop through the several processes of turning, drilling, welding and assembling until the final stage of painting and finishing in the various colours which characterise the Bamford machines. Particular interest was shown in the special section of the works devoted to the production of internal combustion engines, which power units are manufactured in both petrol and Diesel models, and when it is realised that in a small 2-b.h.p. petrol engine, some 170 different parts are involved, a great number of which are castings, it shows what great skill and organisation are necessary to co-ordinate supplies of the various castings in order to keep the machine and other shops working.

The centre of interest for the visitors was, of course, the foundry, which comprises four large shops staffed by both male and female labour. These shops have in recent years been equipped with the most modern machinery for the large production of both large and small castings. Of particular interest was the automatic machines of various types in which most of the laborious operations previously done by hand are performed by pneumatic power, so that girls can operate the smaller types of machines quite efficiently. Recent introductions are the shot-blast machine for cleaning castings and a sand-reconditioning plant. The core shop, which is adjacent to the moulding shop, is equipped with a conveyor belt which serves to convey the finished cores to the oven, in which they are placed on trays, these trays being carried on conveying mechanism which carries them round a complete cycle to the loading point where the dried cores are removed. The temperature of the oven is so regulated that the cores are perfectly hardened by the time they have gone through the oven.

On the completion of the tour the party were entertained at tea at the Town Hall by the directors of the company. Mr. E. M. Mellor (chairman, Uttoxeter Urban District Council), Mr. A. J. Fryer and Mr. J. S. Bagnall were amongst those present. At the conclu-

(*Continued at foot of next column.*)

IRONFOUNDRY FUEL NEWS—XXIX

It has long been recognised that one of the principal ways in which coke can be saved in cupola melting is by reducing the number of melts per week. This is, of course, because the total coke consumption can be divided into two parts—the charge coke, which is proportional to the tonnage melted, and the bed coke, which is proportional to the number of melts. Those foundries who are experiencing a falling off in orders will be in a better position to have cupola coke by reducing the number of melts than they have been for the last four winters. A number of foundries have already discontinued Saturday melting with satisfactory results, and it is likely that this is the procedure which will be most commonly followed.

A rather more difficult proposition was met at a foundry in the West Midlands, where a number of widely varying mixtures were being melted. The practice was almost always to melt more than once per day, the furnace being blown down each time. By applying closer control it was possible to keep the number of melts strictly down to one per day, and the overall coke consumption was thereby reduced by 31 per cent. A number of new moulding boxes had to be purchased, but their cost was quickly covered by the coke saved.

Copies of the booklet, "The Effect of 'Yield' and of Fewer Melts on Cupola Coke Consumption," are still obtainable from the Fuel Officer, Ironfounding Industry Fuel Committee, Alvechurch, Birmingham.

B.C.I.R.A. ELECTS NEW MEMBERS

The following have been elected members of the Association. The name of the official representative is given between brackets:—

Ordinary.—James Brown, Limited, Durban, Natal (Mr. E. Aitken Quack); Cruikshank & Company, Limited, Denny (Mr. W. M. Shanks); J. & R. Forgan, Limited, Port Pirie, S. Australia (Mr. J. Forgan); Forwood, Down & Company, Limited, Adelaide (Mr. Frank W. Forward); Harland Engineering Company, Limited, Alloa (Mr. K. W. Atchley); Moffats, Limited, Blackburn (Mr. T. L. Moffat).

Trade.—John Gardom & Company, Ripley, Derbyshire (Mr. J. W. Gardom); and Metal Box Company, Limited, London (Mr. R. K. Sanders).

(*Continued from previous column.*)

sion of tea, Mr. J. W. Gardom (National President of the Institute) thanked the directors for their hospitality, and for giving them a very interesting afternoon, and Mr. H. B. Bamford suitably responded on behalf of the company.

After a short interval, the party reassembled for the inauguration of Mr. F. G. Butters as President of the East Midlands Branch for the coming year. Mr. Butters has been in charge of Bamford's foundry for the last 12 years, and in opening the proceedings Mr. Gardom and Mr. Smith (the retiring Branch-President) both spoke in eulogistic terms of the new President's work for the Institute. His address is printed elsewhere in this issue.

AN AMERICAN'S VIEWS ON BRITISH INDUSTRY

WARTIME ACHIEVEMENTS AND HOPES FOR THE FUTURE

By MR. J. H. VAN DEVENTER, Editorial Director of the "Iron Age"

It has been my great privilege during the past six weeks to visit a cross section of British industry as a guest of your Government. During this time I have had opportunity to examine plants in the steel industry, in light metals, heavy forgings and castings, as well as some of your aircraft, machine-tool and light engineering works and shipyards.

The purpose of my visit was twofold. First to see what you had done in connection with your war effort, and second, to appraise your post-war economic problems with the view of promoting co-operative effort with American industry for our mutual benefit. Permit me first to say a few words about what you have done before discussing the future.

It is difficult for an objective writer who has been trained to avoid superlatives adequately to express the accomplishment of British management and labour under circumstances that defy imagination. Suffice it to say that the attainment of your production goals in the face of five years of such handicaps as blitzing, buzz bombing, blackout, deprivation of not merely the comforts but also the very necessities of life, is a record of which you are entitled to be far more than proud.

An Exporting Nation

Now a word as to the future. You have been and must continue to be primarily an exporting nation. I find among your industrialists and business men and in your public Press somewhat of a spirit of defeatism as to your possibilities of post-war export trade. I also find that this feeling is based upon the thought that the United States, with its enlarged plant capacity, will be a serious competitor for world trade. A feeling of defeatism is perfectly natural after the punishment that you have taken. But you are wrong on both counts. Any nation which has shown the ingenuity such as yours has in producing the greatest engineering achievement of all time, namely, the "whales" and their kindred which made D-Day possible and successful, need not fear competition of the mind and spirit which, after all, is the only competition worth fearing.

A Prosperous and Strong Britain

In spite of what you may read in sensational newspapers, America does not want to run you out of business, and could not if it did. The responsible people of America want to see in the post-war world a prosperous Britain, because we realise that our own prosperity will be short lived if yours is also. And beyond this we want to see a strong Britain, because we realise that our own national security is inextricably linked with yours.

America with its large consuming population has never been primarily interested, as you must by nature be, in export trade. Our average pre-war exports have never exceeded 10 per cent. of our total production. And even should some of our more individualistic producers wish to adopt the ruinous policy of exporting their unemployment by dumping goods abroad, it will be most improbable that they will be permitted to do so. For in the extremely unbalanced condition of exchange that will persist until the world is again upon its feet, it is inevitable that exports and imports will be regulated by governments and not by individuals for some years to come.

As for the much talked about superior efficiency of American production, I find that it applies to those mass-production products where demand is such as to permit of integrated mechanisation. This is possible for a limited number of products where demand is of the order of 130 million people, but not possible where the population is but 40 million. Thus with a market of five million automobiles per year we can manufacture more cheaply than you with a market for 500,000.

Costs Comparison

On the contrary, on small lots, as witness machine tools, your costs are but 50 per cent. of ours, type for type. Part of this is due to a somewhat lower wage scale than in the States, but the principal reason lies in your general use of incentive pay. You pay for work put out; we pay for time put in. Comparatively few concerns in the States apply the incentive system because of the opposition of labour.

After spending considerable time in your country, and most pleasantly too, I am convinced that you can overcome the handicap of a comparatively small domestic demand for proper Empire economic planning. That will mean the subordination of politics to statesmanship, but you are quite capable of that as history shows. It may mean some quite drastic reorganisation of certain industries and further consolidations to secure larger volume per unit. It will mean concentrating on what you can do better than others and finding and filling your real supremacy areas. That you may do this and with utmost success is my sincere hope and the wish of all right thinking Americans.

CATALOGUE RECEIVED

High-duty Cast Iron. A second edition has been issued by the International Meehanite Metal Company, Limited, of 66, Victoria Street, London, S.W.1, of its brochure "The Specification of Meehanite Metal." Devoid of frills and showmanship, this 32-page pamphlet sets down in plain English the properties of twenty grades of cast iron produced by Meehanite processes. Moreover, it does so in such a manner as to give to the engineer-designer confidence in the materials specified, because it is made so clear that the diverse requirements of modern engineering cannot be met otherwise than by having recourse to a series of alloys of definite and controlled properties.

BRITISH EXPORTS OF IRON AND STEEL

Figures of exports of iron and steel and manufactures thereof from the United Kingdom during the years 1938, 1942 and 1943 are contained in the following table, which has been taken from returns recently issued by the Board of Trade:

Figures for 1940 and 1941 are expected to be published shortly.

Total Exports of Iron and Steel and Manufactures Thereof.

	1938 Tons	1942 Tons	1943 Tons	1938 £	1942 £	1943 £
Eire	55,713	18,682	15,521	1,390,925	828,804	598,882
Channel Islands	7,416	—	—	222,179	—	—
Palestine	8,070	5,516	1,064	192,257	155,330	57,805
British West Africa	49,740	16,188	11,508	1,175,685	569,722	450,337
Union of South Africa	231,075	48,988	28,296	4,865,146	1,725,098	1,099,077
Northern Rhodesia	20,574	5,444	2,403	392,127	172,650	97,586
Southern Rhodesia	36,209	2,686	2,248	620,100	116,966	96,417
British East Africa	25,928	9,516	3,347	575,963	283,074	144,550
Anglo-Egyptian Sudan	8,290	3,372	3,868	195,697	91,983	106,230
British India	158,607	18,528	8,483	3,237,477	893,176	474,018
Burma	18,510	1,120	—	401,036	49,575	—
British Malaya	66,582	1,788	—	1,414,577	62,447	—
Ceylon	26,027	4,916	1,397	471,173	179,114	63,641
Hong Kong	23,592	215	—	425,420	10,756	—
Australia	170,834	7,583	10,719	4,496,315	691,492	709,863
New Zealand	131,878	23,724	10,133	2,588,896	735,470	431,172
Canada	85,395	4,232	799	2,306,533	243,094	118,699
British West India Islands	44,250	4,462	3,523	949,830	166,033	126,160
Other British Countries	21,918	2,916	2,292	520,634	116,276	98,046
Dutch East Indies	27,300	2,288	—	654,469	89,100	—
Dutch West India Islands	2,464	2,402	612	57,762	77,669	41,590
Portuguese East Africa	14,220	252	376	298,092	11,245	15,705
Egypt	34,404	11,493	4,764	630,653	325,448	185,417
Iraq	25,740	2,051	733	505,286	68,810	34,195
Iran	110.380	34,574	5,420	2,223,884	1,162,095	238,271
United States of America	2,187	756	209	109,316	41,371	16,114
Chile	6,293	33	60	149,026	3,906	5,646
Brazil	16,989	801	78	450,833	40,233	9,800
Uruguay	7,585	59	46	147,040	5,484	4,881
Argentine Republic	79,350	1,427	209	1,725,506	86,798	34,465
Enemy and Occupied Europe	245,786	—	—	4,136,554	—	—
Japan	6,954	—	—	255,679	—	—
Iceland	144,942	2,303	432	3,769,509	117,472	44,498
Other Foreign Countries		19,307	17,404		706,326	770,160
Total	1,915,202	257,622	133,944	41,555,579	9,827,017	6,027,225

IN A COLLECTION of maps and photographs of military and industrial objectives in Britain discovered amongst German documents in Europe was an aerial photograph of the works of Ley's Malleable Castings Company, Limited, Derby. A transcription of the German caption to the photograph reads, "Large Foundry of Ley's Malleable Castings Company."

MANUFACTURE OF MAGNESIUM METAL ceased at the works of Magnesium Metal & Alloys, Limited, on December 31 last. The company is a wholly owned subsidiary of Murex, Limited, whose chairman, Mr. George P. Joseph, states in his annual report that it is unlikely that the productive capacity at these works will be required again during the war period.

NEW TRADE MARKS

The following applications to register trade marks appear in the "Trade Marks Journal":—

"ENSECOTE"—Chemical products for use in industry. NEWTON, CHAMBERS & COMPANY, LIMITED, Thorncliffe, Sheffield.

"FIR VIC"—Metal goods. FIRTH-VICKERS STAINLESS STEELS, LIMITED, Staybrite Works, Weedor Street, Sheffield.

"BATURNAL"—Brass alloys. BIRMINGHAM BATTERY & METAL COMPANY, LIMITED, 705, Bristol Road, Selly Oak, Birmingham, 29.

"INSUL"—Installations for heating and cooking. A.V.E. COMPANY, LIMITED, 1343, London Road, Norbury, London, S.W.16.

"CHIKSAN"—Metal pipes and pipe joints. CHIKSAN TOOL COMPANY, c/o Marks & Clerk, 57/58, Lincoln's Inn Fields, London, W.C.2.

"PROMONTORY"—Electrical welding apparatus. THOS. P. HEADLAND, LIMITED, 164-168, Westminster Bridge Road, London, S.E.1.

"B.M.M." (AND DEVICE)—Foundry moulding machines. BRITISH MOULDING MACHINE COMPANY, LIMITED, 1, East Street, Faversham, Kent.

"BRAILEY"—Unwrought and partly wrought common metals and their alloys. BRAILEY ELECTROPLATERS, LIMITED. 167, Chapel Street, Salford, 3.

"VERSILEX"—Alloys of nickel, cobalt and iron, in the form of strip, wire, rod, or tube. MALLORY METALLURGICAL PRODUCTS, LIMITED, 78, Hatton Garden, London, E.C.1.

"PLIKODA"—Refractory material in plastic or powdered form for use in lining furnaces. JOINTLESS FIREBRICK COMPANY, LIMITED, Westmorland Road, The Hyde, London, N.W.9.

"HYMATIC"—Metal pipes and containers for compressed air, and tanks or vessels of steel or cast iron. HEYWOOD COMPRESSOR COMPANY, LIMITED, Glover Street, Redditch, Worcestershire.

"FERROLASTIC"—Bituminous or asphaltic compositions containing iron or iron compounds, for use in road or building construction. WILLIAM BRIGGS & SONS, LIMITED, East Camperdown Street, Dundee.

"PENETRAL"—Unwrought and partly wrought common metals and their alloys, machine belts, machinery and machine tools, metal parts of instruments, boilers and furnaces. FOLLSAIN METALS, LIMITED, Lutterworth, Rugby.

STEEL PRICE SCHEDULES

Following the publication last August of the steel price schedules relating to alloy steel, stainless steel, bright carbon steel bars and flats, bright mild-steel wire (in straight lengths), and wire products (wire netting and second-hand barbed wire), the Iron and Steel Control have now published similar summaries of the schedules for heavy steel products, rolled and re-rolled steel products, and cold rolled strip. These can be obtained on application to the Iron and Steel Control, Ashorne Hill, Leamington Spa, or Steel House, London.

DORMAN, LONG & COMPANY

APPOINTMENT OF SPECIAL DIRECTORS

The directors of Dorman, Long & Company, Limited, indicate in a circular to shareholders that it will not be possible for the accounts for the year to September 30, 1944, to be ready for presentation before the end of the calendar year, as certain important matters must first be settled with Government departments. The proceedings at the annual meeting on November 30 will therefore be formal, and the meeting will be adjourned to a later date.

An extraordinary meeting will follow the formal annual meeting for the purpose of authorising certain amendments of the articles which will permit of the appointment of special directors. The amendments are in pursuance of the board's policy of making the fullest use of the abilities of members of the staff who have risen to responsible positions in the company's employment. The appointment of certain senior officials as special directors will effect an improvement in their status and will afford them opportunities for acquiring wider experience of the company's affairs. Any special directors appointed will continue in their present executive offices and will not be subject to the responsibilities carried by full members of the Board.

LONDON METAL EXCHANGE

Mr. J. D. Wolff, chairman of the London Metal Exchange, told the members at the monthly meeting last week that the committee had been working with the idea of being ready to meet post-war conditions. The rules and regulations of the Exchange had been revised and were awaiting legal approval. New contracts were being drawn up for copper and zinc.

Discussions had taken place with the Ministry of Supply, the Board of Trade, the Treasury and the War Cabinet being represented. The committee put the case of the Metal Exchange before them, and pointed out the urgency for a resumption of ordinary trading at the earliest possible moment. No promises were made—in the present conditions they would be impolitic—but the delegates went away feeling that some progress had been made which might be crystallised at another meeting in the near future.

PARLIAMENTARY NOTES

Gas Cookers

CAPT. THORNEYCROFT suggested to the President of the Board of Trade that the production of improved types of gas cookers from sheet steel was being retarded by manufacturers of gas cookers who, as owners of foundries, were closely tied to the use of cast iron; and asked what steps he was taking to secure a larger supply of improved types of cookers.

MR. DALTON: According to my information the use of sheet steel in the manufacture of gas cookers is increasing. I am taking steps, in consultation with the Minister of Fuel and Power, to increase the output of gas cookers and to ensure that they are of the most efficient types.

NEWS IN BRIEF

REPRESENTATIVES of 53 firms decided at Newcastle-upon-Tyne last week to form a North-East engineering bureau at a cost of £4,500 a year. This organisation, the first to be set up in the North, aims at ensuring an increased volume of employment in the district engineering trade, instituting an exchange service which will find work for the area and place it with member firms, advise members on where markets can be found for new products, and train apprentices to form a pool of engineers skilled in scientific production and management.

IN DISCUSSING the Board of Trade's proposal to send missions throughout the Empire to recover pre-war trade, the Australian Chambers of Manufacturers urge that there should be an understanding with the United Kingdom on sharing the Australian market after the war. Their view is that there is no reason for conflict between the interests of the two countries in the development of trade, and they suggest that by collaboration the United Kingdom can supply Australia with goods which are not within the scope of Australian manufacturers, who can meet other needs.

STATISTICS RELATING to trade disputes in August, published in the "Ministry of Labour Gazette," show that 88,000 working days were lost by 15,000 workpeople involved in 55 disputes in the metal, engineering and shipbuilding industries during the month, compared with 16,000 working days, 4,600 workpeople and 19 disputes in July, and 2,000 working days, 2,500 workpeople and 20 disputes in June. The totals for all industries were 125,000 working days, 33,800 workpeople and 177 disputes in August, 64,000 working days, 20,900 workpeople and 77 disputes in July, and 42,000 working days, 27,100 workpeople and 127 disputes in June.

THE MINISTRIES OF PRODUCTION and Supply announce that, consequent upon his appointment as head of the Economic Division of the British element of the Control Commission for Germany, Sir Percy Mills has relinquished the position of Controller-General of Machine Tools, in which capacity he was jointly responsible to the Ministers. He will be succeeded by Mr. S. F. Steward. As head of the Production Division of the Ministry of Production, Sir Percy will be succeeded by Mr. H. S. Burn. Mr. Steward, who is in America, is a high official of the Machine Tool Control. Mr. Burn is an official of the Ministry of Production.

GIVING HIS presidential address to the North-East Coast Institution of Engineers and Shipbuilders at Newcastle-upon-Tyne, Sir Summers Hunter announced that 50 per cent. of the mercantile tonnage built in Great Britain and Ireland during the war, had been constructed on the North-East Coast. The shiprepairing industry had also done Herculean tasks. Sir Summers stressed that after the war unemployment would not have to be looked upon as something which could not be avoided, and the problems of peace could be solved by the methods adopted in wartime—courageous action and systematic planning. The speaker advocated international agreements to prevent cut-throat competition after the war.

MR. W. CLAYTON-RUSSON (Barmouth), Mr. G. H. Haigh (Colwyn Bay), Messrs. W. A. Summers and Geoffrey Summers (Chester), Mr. J. Rogers-Prys (Pwllheli), and Mr. James Rankin (Dolgarrog, Caernarvonshire) have been asked to confer with the Welsh Parliamentary Party on post-war industrial development in North Wales. The establishment of this special committee is part of the move by the North Wales Post-War Development Council to bring industries to North Wales. The industrial liaison committee mentioned consists of members who have practical knowledge between them of the iron and steel industry, light industries, electricity, boat and ship building, and the motor industry.

IN A SURVEY of 41 steel plants last year by the U.S. Department of Labour, it was found that out of the total number of employees working directly on production, approximately 10 per cent. of the number were women. The Department pointed out that women were working in practically every production department, including coke plants, blast-furnace, steel furnace and rolling mills. Although the ratio of women to men in the mills is reported to be comparatively small at the present time, there is a possibility that more and more women will be employed if the man-power situation becomes any tighter, because the employment of women in the steel industries is said to have proved successful.

VICTORY SERVICES CLUB

The provision of a headquarters, including living accommodation, etc., for the ex-Service man and woman, is the aim of the £1,000,000 Victory Club Fund which has been launched under the auspices of the Victory (Ex-Services) Association. Speaking in London recently, General Sir Walter Kirke said that the only headquarters of repute of this nature was the Allenby (Services) Club, which provided all the amenities on an inadequate scale. It was situated somewhat far from the centre of London, and it had suffered badly through enemy action. He said that the establishment of a headquarters open to all ex-Service men and women of the British Empire (irrespective of rank, race or religion), and of which Allied naval, military and air forces might become honorary members when living in or visiting London after the war, as a permanent symbol of comradeship in war and fellowship in peace, and a place of reunion, remembrance, rest and recreation, would require about £1,000,000, and he appealed to industrialists to come forward and contribute towards this great venture. The project had the cordial good wishes of the Prime Minister, the three fighting Services, and the British Legion. Further information may be obtained from Mr. Cyril J. Ross, chairman of the Publicity Committee, 47, Bedford Row, London, W.C.1.

COMPANY RESULTS

(Figures for previous year in brackets)

Drake & Gorham—Dividend of 5% (same).

Barton & Sons—Interim dividend of 3% (same).

Thomas Blackburn & Sons—Dividend of 8% (7½%).

Guest, Keen & Nettlefolds—Interim dividend of 4% (same).

Ward & Goldstone—Interim dividend of 10% (same).

British Piston Ring—Final dividend of 15%, making 20% (25%).

Tube Investments—Final dividend of 12½% (10%), making 22½% (20%).

Lightalloys—Final dividend of 7½d. per share (same), making 1s. 3d. (same).

Wombwell Foundry & Engineering—Final dividend of 10% (same), making 16% (same).

Arthur Lee & Sons—Final dividend of 25% on the ordinary shares, making 40% (same).

Atlas Steel Foundry & Engineering—Final dividend of 17½% and a bonus of 10%, making 42½% (same).

Metal Industries—Interim dividend on the "A" and "B" ordinary stock of 3 per cent., less tax at 9s. 10½d. (2½%, less tax at 9s. 9d.).

Yarrow & Company—Profit for the year to June 30, 1944, after depreciation, £61,091 (£58,816); to general reserve, £30,000 (£35,000); dividend of 10% and bonus of 5%, both free of tax (same); forward, £43,988 (£35,397).

Herbert Morris—Net profit, after taxation and deferred repairs, £145,684 (£125,455); interest and dividends, £5,543; profit on investments realised, £25,000; depreciation, £13,931; to general reserve, £40,000 (nil); dividend on the ordinary shares of 20%, free of tax (same); forward, £78,999 (£67,125).

John Dale—Trading profit for 1943, after charging depreciation, £133,052 (£184,419); rents, £1,303 (£852); interest, £1,359 (£208); pensions, £4,018 (£3,396); commissions, £12,200 (£12,700); A.R.P., £4,731 (£5,575); net profit, £111,197 (£172,154); preference dividend, £4,125 (same); war damage, £839 (nil); taxation and rebates, £92,000 (£155,000); forward, £65,342 (£51,109).

Arthur Lee & Sons—Net profit for the year to July 31 last, £105,717 (£92,306); to plant obsolescence, £45,000; dividends of 10% net on the issued 5% (tax free) "A" preference participating shares and of 10% gross on the 10% non-cumulative "B" preference stock, £8,650 (£8,591); dividend on the ordinary shares of 40%, less tax, £51,250 (£50,521); forward, £49,438 (£48,621).

Thos. W. Ward—Profit for the year ended June 30, 1944, after charging working expenses, interest, and reserve for taxation, £164,899; depreciation, £44,452; net profit, £120,447 (£116,982); dividend on the first preference shares, less tax, £12,500; dividend on the second preference shares, tax free, £25,000; dividend on the employees' shares, tax free, £3,513; interim dividend of 3¾% on the ordinary shares, less tax, £20.625 (same); to employees' benevolent fund, £5,000; final dividend of 6¼% on the ordinary shares, less tax, £34.375 (same); to reserve, £15,000; forward, £133,394 (£128,960).

PERSONAL

MR. JOHN HARPER BEAN has been elected to a seat on the board of Guest, Keen & Nettlefolds, Limited.

MR. A. R. GRAY, general manager and a director of John Summers & Sons, Limited, Hawarden Bridge Steelworks, Shotton, is leaving shortly on a visit to the United States.

COL. W. C. DEVEREUX, F.R.Ae.S., managing director of High Duty Alloys, Limited, has accepted the Council's invitation to present the Edward Williams Lecture to the Institute of British Foundrymen in 1945.

MR. LESLIE J. DAVIES has joined the board of directors of Richard Thomas & Company, Limited, and to mark the occasion the West Wales managerial staff of the company and its subsidiaries held a presentation dinner at Swansea.

MR. W. HAGUE has retired after nearly 50 years' service at the Vickers Works, Sheffield, of the English Steel Corporation, Limited. He was in the armour plate department for nearly 30 years, and has since been in charge of the progress and despatch department.

DR. W. F. CHUBB, B.Sc., a member of the Institute of British Foundrymen, has been appointed to the newly-created Chair of Metallurgy at Istanboul University, and took up his duties in September. Correspondence may be addressed to him c/o Ingiliz Kültür Heyeti, 32, Emlak Caddesi, Nisantas, Istanboul, Turkey.

MR. F. S. THOMPSON, Mayor of Wolverhampton, who is chairman of Thompson Bros. (Bilston), Limited, has been presented by the members of the Wolverhampton Town Council with a silver salver, together with a pendant and necklet for the Mayoress, to commemorate their golden wedding anniversary, which they celebrated recently.

MR. F. F. H. HALESTRAP has been appointed chief engineer and elected a director of Dewrance & Company, Limited, engineers, Great Dover Street, London, S.E.1. MR. W. G. SUFFIELD will retire from his position as general manager, at his own request, on December 31 next, but will retain his seat on the board of directors. MR. J. M. STOREY has been appointed to succeed Mr. Suffield as general manager, and will join the board.

MR. COLIN A. SAMUELS, A.S.A.A., A.M.I.A.A., has been appointed commercial division manager in charge of home and export sales of the Glacier Metal Company, Limited. MR. PHILLIP T. HOLLIGAN, B.Sc., M.Inst.M., M.I.B.F., D.F.C., has been transferred from research to act as technical adviser to the commercial division. MR. T. RUMBLE, assistant service manager, has been appointed regional manager for the western area, and MR. W. H. CLARKE and MR. E. FRANCIS CALE have been appointed technical representatives.

MR. STANLEY EDWARD COLE, a director of J. H. Sankey & Son, Limited, manufacturers of firebricks and fire cements, died on October 31, aged 54.

Raw Material Markets

IRON AND STEEL

The markets are still listless. Producers are giving regular deliveries of licensed tonnages of pig-iron, but demand is still on a limited scale, and the outlook is obscure. Obviously, a decision on the part of the Government to make a start on the housing programme would give a tremendous impetus to the light-castings trade, and would at once stimulate the demand for foundry iron. Similarly, the prospects for the engineering and speciality foundries are governed by the speedy implementation of the plans for industrial reconversion. Of the long-term outlook for the consuming trades, no apprehensions are entertained. Only the duration of the transition period is in doubt, but until those doubts are dispelled no improvement in the call for pig-iron is expected. Blastfurnacemen are still smelting an unusually high proportion of low-grade native ores, and express disappointment with the limited quantities of good-class imported ores which are placed at their disposal. The extent of these supplies is, of course, primarily governed by available shipping space, and until this is more freely available, the scarcity of hematite iron in particular is likely to persist. Foundries are finding no difficulty in obtaining supplies of scrap.

In the coke market, a system of programming has been brought into operation. It is understood that during the next few weeks industrial consumers using more than 100 tons per annum will be allocated specific tonnages. The coke supply position is fairly good at the moment, but it is expected that it will soon tighten.

Of all the varied branches of the steel industry, producers of light re-rolled material are most favourably placed. A steady flow of orders for small bars, light sections, strip, and black and galvanised sheets is maintained, and wire mills are still working to capacity. These operations involve a consumption of semi-finished steel which taxes the full capacity of the makers, and the call for certain classes of billets cannot at present be fully satisfied. In these circumstances extensive use is made of defective billets and other classes of re-rollable material, but the supply of sheet bars appears to be fully equal to current needs.

Some of the steel mills, notably those engaged on colliery arches, bars and props, and the rail mills are assured of regular employment to the end of the year, but bookings for heavy joists and sections are still on a disappointing scale, and most of the plate mills are in need of more orders to keep them going during the next few weeks. Notably, there has been a decline in shipbuilders' specifications, but, in view of the still pressing need for new tonnage, early expansion rather than a further contraction is anticipated.

NON-FERROUS METALS

There has recently been some encouraging, if only small, relaxation of the restrictions on the use of copper and zinc. The latest releases have all been in connection with building and repair work. In America, the withdrawal of control has been on a far larger scale, and the process of changing over from war to peace production seems to be taking place much faster than in this country. One of the main factors to be taken into consideration is the labour shortage. It seems that in Great Britain the final freeing of industry from controls is still a long way off.

Although no official announcement has yet been forthcoming, it is believed that the offer made by the Government to the Empire copper producers for the purchase of supplies during the first half of next year has been rejected. From this it seems that the offer was for an amount below the full export surpluses of these countries. The negotiations among Empire producers, which have been going on for some time, are also believed to be concerned with the general post-war marketing policy. If the British Government has not renewed its contract with the Empire countries, a problem will arise as to the disposal of the surplus production, as it is certain that the United States no longer provides a market.

The market position of tin has undergone few changes recently. There has been a very slight rising tendency in tinplate production, both in this country and America, but the general trend of consumption for war purposes continues to be downward. There is no prospect of any appreciable increase in the use of tin until larger supplies are available, although it is understood that fairly good stocks are held in reserve.

NEW COMPANIES

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

Utilal (Aluminium), 147, Broadway, Birmingham, 20—£100.

Threadex, 35, Church Road, Hendon, Middlesex—Ironfounders, engineers, etc. £100.

Gee Engineering Company, 20, Essex Street, London, W.C.2—£1,000. S. G. and D. D. Gee.

Wessel Engineering Company, 56, Buckingham Gate, London, S.W.1—£1,000. F. G. Wessell.

West Yorkshire Scrap Metals—£500. M. Laycock, 2, Ashgrove, Earlsheaton, Dewsbury, subscriber.

Ariel Fastener & Metal Pressings Company, Eldon Chambers, Wheeler Gate, Nottingham—£1,000.

E. Davies (Atlas Foundry), Atlas Foundry, Frankwell, Shrewsbury—£15,000. J. and E. Davies.

Oatey & Martyn, Wadebridge, Cornwall—Engineers, etc. £10,000. E. B. Shaw and W. R. Hudson.

E. Davies (Cambrian Foundry), Atlas Foundry, Frankwell, Shrewsbury—£6,000. J. and E. Davies.

Netherhey Engineering Company, Hill Street, Gee Cross, Hyde, Ches—£1,000. J. Blacker and E. Hall.

H. W. Taylor (Elmhurst), 47, Elmhurst Drive, Woodford—Engineers, etc. £1,000. H. W. and G. Taylor.

E. Taylor & Son (Templecombe), Tail Mill, Merriott, Som—Agricultural engineers. £100. D. C. and P. K. Baker.

CURRENT PRICES OF IRON, STEEL AND NON-FERROUS METALS

(Delivered, unless otherwise stated)

Wednesday, November 15, 1944

PIG-IRON

Foundry Iron.—CLEVELAND No. 3: Middlesbrough, 128s.; Birmingham, 130s.; Falkirk, 128s.; Glasgow, 131s.; Manchester, 133s. DERBYSHIRE No. 3: Birmingham, 130s.; Manchester, 133s.; Sheffield, 127s. 6d. NORTHANTS No. 3: Birmingham, 127s. 6d.; Manchester, 131s. 6d. STAFFS No. 3: Birmingham, 130s.; Manchester, 133s. LINCOLNSHIRE No. 3: Sheffield, 127s. 6d.; Birmingham, 130s.

(*No. 1 foundry 3s. above No. 3. No. 4 forge 1s. below No. 3 for foundries, 3s. below for ironworks.*)

Hematite.—Si up to 3.00 per cent., S & P 0.03 to 0.05 per cent.; Scotland, N.-E.Coast and West Coast of England, 138s. 6d.; Sheffield, 144s.; Birmingham, 150s.; Wales (Welsh iron), 134s. East Coast No. 3 at Birmingham, 149s.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, 140s. 6d., delivered Birmingham.

Scotch Iron.—No. 3 foundry, 124s. 9d.; No. 1 foundry, 127s. 3d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, 174s.; South Zone, 176s. 6d.

Refined Malleable.—North Zone, 184s.; South Zone, 186s. 6d.

Cold Blast.—South Staffs, 227s. 6d.

(NOTE.—*Prices of hematite pig-iron, and of foundry and forge iron with a phosphoric content of not less than 0.75 per cent., are subject to a rebate of 5s. per ton.*)

FERRO-ALLOYS

(*Per ton unless otherwise stated, basis 2-ton lots, d/d Sheffield works.*)

Ferro-silicon (5-ton lots).—25 per cent., £21 5s.; 45 per cent., £25 10s.; 75 per cent., £39 10s. Briquettes, £30 per ton.

Ferro-vanadium.—35/50 per cent., 15s. 6d. per lb. of V.

Ferro-molybdenum.—70/75 per cent., carbon-free, 6s. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, 1s. 3½d. lb.

Ferro-tungsten.—80/85 per cent., 9s. 8d. lb.

Tungsten Metal Powder.—98/99 per cent., 9s. 9½d. lb.

Ferro-chrome.—4/8 per cent. C, £46 10s.; max. 2 per cent. C, 1s. 3¾d. lb.; max. 1 per cent. C, 1s. 4½d. lb.; max. 0.5 per cent. C, 1s. 6d. lb.

Cobalt.—98/99 per cent., 8s. 9d. lb.

Metallic Chromium.—96/98 per cent., 4s. 9d. lb.

Ferro-manganese.—78/98 per cent., £18 10s.

Metallic Manganese.—94/96 per cent., carb.-free, 1s. 9d. lb.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms and Slabs.—BASIC: Soft, u.t., 100-ton lots, £12 5s.; tested, up to 0.25 per cent. C, £12 10s.; hard (0.42 to 0.60 per cent. C), £13 17s. 6d.; silico-manganese, £17 5s., free-cutting, £14 10s. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £15 15s.; case-hardening, £16 12s. 6d.; silico-manganese, £17 5s.

Billets, Blooms and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £13 17s. 6d.; basic hard, 0.42 to 0.60 per cent. C, £14 10s.; acid, up to 0.25 per cent. C, £16 5s.

Sheet and Tinplate Bars.—£[illegible] 2s. 6d. 6-ton lots.

FINISHED STEEL

[*A rebate of 15s. per ton for steel bars, sections, plates, joists and hoops is obtainable in the home trade under certain conditions.*]

Plates and Sections.—Plates, ship (N.-E. Coast), £16 3s.; boiler plates (N.-E. Coast), £17 0s. 6d.; chequer plates (N.-E. Coast), £17 13s.; angles, over 4 un. ins., £15 8s.; tees, over 4 un. ins., £16 8s.; joists, 3 in. × 3 in. and up, £15 8s.

Bars, Sheets, etc.—Rounds and squares, 3 in. to 5½ in., £16 18s.; rounds, under 3 in. to ⅝ in. (untested), £17 12s.; flats, over 5 in. wide, £15 13s.; flats, 5 in. wide and under, £17 12s.; rails, heavy, f.o.t., £14 10s. 6d.; hoops, £18 7s.; black sheets, 24 g. (4-ton lots), £22 15s.; galvanised corrugated sheets (4-ton lots), £26 2s. 6d.; galvanised fencing wire, 8 g. plain, £26 17s. 6d.

Tinplates.—I.C. cokes, 20 × 14 per box, 29s. 9d. f.o.t. makers' works, 30s. 9d., f.o.b.; C.W., 20×14, 27s. 9d., f.o.t., 28s. 6d., f.o.b.

NON-FERROUS METALS

Copper.—Electrolytic, £62; high-grade fire-refined, £61 10s.; fire-refined of not less than 99.7 per cent., £61; ditto, 99.2 per cent., £60 10s.; black hot-rolled wire rods, £65 15s.

Tin.—99 to under 99.75 per cent., £300; 99.75 to under 99.9 per cent., £301 10s.; min. 99.9 per cent., £303 10s.

Spelter.—G:O.B. (foreign) (duty paid), £25 15s.; ditto (domestic), £26 10s.; "Prime Western," £26 10s.; refined and electrolytic, £27 5s.; not less than 99.99 per cent., £28 15s.

Lead.—Good soft pig-lead (foreign) (duty paid), £25; ditto (Empire and domestic), £25; English, £26 10s.

Zinc Sheets, etc.—Sheets, 10g. and thicker, ex works, £37 12s. 6d.; rolled zinc (boiler plates), ex works, £35 12s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £30 10s.

Other Metals.—Aluminium, ingots, £110; antimony, English, 99 per cent., £120; quicksilver, ex warehouse, £68 10s. to £69 15s.; nickel, £190 to £195.

Brass.—Solid-drawn tubes, 14d. per lb.; brazed tubes, 16s.; rods, drawn, 11⅛d.; rods, extruded or rolled, 9d.; sheets to 10 w.g., 11½d.; wire, 10⅞d.; rolled metal, 10½d.; yellow metal rods, 9d.

Copper Tubes, etc.—Solid-drawn tubes, 15½d. per lb.; brazed tubes, 15½d.; wire, 10d.

Phosphor Bronze.—Strip, 14½d. per lb.; sheets to 10 w.g.; 15½d.; wire, 16½d.; rods, 16½d.; tubes, 21½d.; castings, 20d., delivery 3 cwt. free. 10 per cent. phos. cop. £35 above B.S.; 15 per cent. phos. cop. £43 above B.S.; phosphor tin (5 per cent.) £40 above price of English ingots. (C. CLIFFORD & SON, LIMITED.)

Nickel Silver, etc.—Ingots for raising, 10d. to 1s. 4d. per lb.; rolled to 9 in. wide, 1s. 4d. to 1s. 10d.; to 12 in. wide, 1s. 4½d. to 1s. 10½d.; to 15 in. wide, 1s. 4½d. to 1s. 10½d.; to 18 in. wide, 1s. 5d. to 1s. 11d.; to 21 in. wide, 1s. 5½d. to 1s. 11½d.; to 25 in. wide, 1s. 6d. to 2s. Ingots for spoons and forks, 10d. to 1s. 6½d. Ingots rolled to spoon size, 1s. 1d. to 1s. 9½d. Wire, round, to 10g., 1s. 7½d. to 2s. 2½d., with extras according to gauge. Special 5ths quality turning rods in straight lengths, 1s. 6½d. upwards.

NON-FERROUS SCRAP

Controlled Maximum Prices.—Bright untinned copper wire, in crucible form or in hanks, £57 10s.; No. 1 copper wire, £57; No. 2 copper wire, £55 10s.; copper firebox plates, cut up, £57 10s.; clean untinned copper, cut up, £56 10s.; braziery copper, £53 10s.; Q.F. process and shell-case brass, 70/30 quality, free from primers, £49; clean fired 303 S.A. cartridge cases, £47; 70/30 turnings, clean and baled, £43; brass swarf, clean, free from iron and commercially dry, £34 10s.; new brass rod ends, 60/40 quality, £38 10s.; hot stampings and fuse metal, 60/40 quality, £38 10s.; Admiralty gunmetal, 88-10-2, containing not more than ½ per cent. lead or 3 per cent. zinc, or less than 9½ per cent. tin, £77, all per ton, ex works.

Returned Process Scrap.—(Issued by the N.F.M.C. as the basis of settlement for returned process scrap, week ended Nov. 11, where buyer and seller have not mutually agreed a price; net, per ton, ex-sellers' works, suitably packed):—

BRASS.—S.A.A. webbing, £48 10s.; S.A.A. defective cups and cases, £47 10s.; S.A.A. cut-offs and trimmings, £42 10s.; S.A.A. turnings (loose), £37; S.A.A. turnings (baled), £42 10s.; S.A.A. turnings (masticated), £42; Q.F. webbing, £49; defective Q.F. cups and cases, £49; Q.F. cut-offs, £47 10s.; Q.F. turnings, £38; other 70/30 process and manufacturing scrap, £46 10s.; process and manufacturing scrap containing over 62 per cent. and up to 68 per cent. Cu, £43 10s.; ditto, over 58 per cent. to 62 per cent. Cu, £38 10s.; 85/15 gilding metal webbing, £52 10s.; 85/15 gilding defective cups and envelopes before filling, £50 10s.; cap metal webbing, £54 10s.; 90/10 gilding webbing, £53 10s.; 90/10 gilding defective cups and envelopes before filling, £51 10s.

CUPRO NICKEL.—80/20 cupro-nickel webbing, £75 10s.; 80/20 defective cups and envelopes before filling, £70 10s.

NICKEL SILVER.—Process and manufacturing scrap; 10 per cent. nickel, £50; 15 per cent. nickel, £56; 18 per cent. nickel, £60; 20 per cent. nickel, £63.

COPPER.—Sheet cuttings and webbing, untinned, £54; shell-band plate scrap, £56 10s.; copper turnings, £48.

IRON AND STEEL SCRAP

(*Delivered free to consumers' works. Plus 3¾ per cent. dealers' remuneration. 50 tons and upwards over three months, 2s. 6d. extra.*)

South Wales.—Short heavy steel, not ex. 24-in. lengths, 82s. to 84s. 6d.; heavy machinery cast iron, 87s.; ordinary heavy cast iron, 82s.; cast-iron railway chairs, 87s.; medium cast iron, 78s. 3d.; light cast iron, 73s. 6d.

Middlesbrough.—Short heavy steel, 79s. 9d. to 82s. 3d.; heavy machinery cast iron, 91s. 9d.; ordinary heavy cast iron, 89s. 3d.; cast-iron railway chairs, 89s. 3d.; medium cast iron, 79s. 6d.; light cast iron, 74s. 6d.

Birmingham District.—Short heavy steel, 74s. 9d. to 77s. 3d.; heavy machinery cast iron, 92s. 3d.; ordinary heavy cast iron, 87s. 6d.; cast-iron railway chairs, 87s. 6d.; medium cast iron, 80s. 3d.; light cast iron, 75s. 3d.

Scotland.—Short heavy steel, 79s. 6d. to 82s.; heavy machinery cast iron, 94s. 3d.; ordinary heavy cast iron, 89s. 3d.; cast-iron railway chairs, 94s. 3d.; medium cast iron, 77s. 3d.; light cast iron, 72s. 3d.

(NOTE.—*For deliveries of cast-iron scrap free to consumers' works in Scotland, the above prices less 3s. per ton, but plus actual cost of transport or 6s. per ton, whichever is the less.*)

SITUATIONS

METALLURGIST (40), B.Sc., with steel, iron and non-ferrous foundry and laboratory experience, desires change to post of Chief Metallurgist or similar executive position.—Box 774, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOREMAN PATTERNMAKER (41 years of age) desires change; capable of taking position as Manager or Assistant in steel foundry; 25 years' practical experience in production of steel castings up to 2 tons; sound knowledge of modern methods of production.—Box 772, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

PATTERNMAKER (age 41), at present managing medium non-ferrous foundry, desires change for a more energetic position, where designing of patterns for board and machine production is required.—Box 768, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

ESTIMATING, ETC. — Practical Foundryman, with technical training, desires post on Commercial side; 14 years' experience estimating, rate fixing, planning and layout on competitive jobbing work, machine, plate, and loose patterns, including patternmaking.—Box 748, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

ENGINEER, with extensive foundry management experience, and in particular the application of mechanisation to medium size and jobbing foundries, is open to prepare schemes and act in an independent consultative capacity.—Box 756, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

A LARGE FOUNDRY of repute in the Midlands, engaged in the production of light repetition castings in Grey, High Duty and Alloy Irons, requires a CHIEF METALLURGIST, to take control, under the General Foundry Management, of the metallurgical side of the production. Applicants must be fully conversant with the above type of work, experienced in cupola practice, and capable of effectively co-operating with the management in the solution of metallurgical problems. Previous experience at organisation and labour control is desirable.

Salary £400 minimum, more according to qualifications.

Applicants should write quoting F.2858 XA, to the MINISTRY OF LABOUR AND NATIONAL SERVICE, Room 432, Alexandra House, Kingsway, London, W.C.2, for the necessary forms of application, which should be returned completed on or before 27th November, 1944.

FOUNDRY MANAGER required in North-West: mixed labour content of 350; 60 tons highly accurate castings per week (medium and light weight cored); must be fully experienced in modern methods of melting, cupola control, hand and machine moulding and coremaking in iron, aluminium and brass; knowledge of pattern making essential.—Apply, stating age, education, qualifications, practical experience, and salary required, to Box 742, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

FOUNDRY WORKS MANAGER required by General Engineering Company in the Manchester district; applicants should have good technical training and sound practical knowledge; excellent opportunity for capable young man; state age, fullest details of experience, etc., and salary expected.—Box 770, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

AGENCY

SOUTH Wales Merchants, established over 50 years, seek Agencies for Supplies to Steel and Tinplate Works and Collieries.—Reply to Box 744, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

MACHINERY

WANTED, for high priority work, 10-ton Steam Loco Crane, with 45/60 ft. jib; also 5-Tonner, with jib as long as possible.—Details, age, condition, and price to THOS. W. WARD, LTD., Sheffield.

MISCELLANEOUS.

Standard Size Adaptable Moulding Machines, etc.
"Ajax" No. 9 Macdonald Pneumatic Jolter turnover table, 36 in. by 46 in.
Coal and Coke Crusher; 2 ft. 6 in. dia.
Brearley Type Sand Disintegrator.
Macnab 5 ft. 6 in. Sand Mills, Size No. 2, with or without 3/50/400 v. motor.
Broadbent Brick Crusher; 8 in. jaw.
Broadbent Brick Crusher; 11 in. jaw.
Sandblasting Plant; 50 Air Compressors; 500 Electric Motors, Dynamos, etc.

S. C. BILSBY.
CROSSWELLS ROAD, LANGLEY,
NR. BIRMINGHAM.
Broadwell 1359.

THOS. W. WARD LTD.

One 7 in. by 12 in. Three-Throw PUMP; 200 g.p.m.; 900 ft. head; with 80 h.p. Motor, 400 volts, 3-phase, 50 cycles.

One Horizontal, 6 by 12, Three-Throw PUMP; 150 g.p.m.; 1,200 ft. head; with 60 h.p. Motor, 400 volts, 3-phase, 50 cycles.

One M.D. Centrifugal PUMP; 300 g.p.m.; 100 ft. head; 12 h.p. Motor, 400 volts, 3-phase, 50 cycles.

One M.D. Centrifugal PUMP; 200 g.p.m.; 300 ft. head; 25 h.p. Motor, 400 volts, 3-phase, 50 cycles.

ALBION WORKS, SHEFFIELD.
'Grams: "Forward." 'Phone: 26311 (15 lines).

MISCELLANEOUS

WANTED.—Sand Testing Apparatus; new or secondhand.—State price and full particulars to Box 760, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

20 TONS NICKEL-CHROMIUM CHIPPINGS.—About 30 per cent. Ni, 14 per cent. Cr, 2 per cent. W, 1 per cent. Si, 1 per cent. Mn; for sale at £25 per ton, ex Midland works.—Offers Box 746, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

LEATHER FINGER STALLS.—Made of chrome hide; very strong and hard wearing; length 3 in; price 4s. per doz.; prompt delivery; sample on application.—WILLSON BROS., Industrial Clothing Manufacturers, Epsom.

MISCELLANEOUS—*contd.*

PATTERNS for Hand or Machine Moulding; sound construction; accuracy; keen quotations; good delivery.—L. E. SLATER, Patternmaker, 267, Coggeshall Road, Braintree, Essex.

REFRACTORY MATERIALS.—Moulding Sand, Ganister, Limestone, Core-Gum; competitive prices quoted.—HENSALL SAND CO., LTD., Silver Street, Halifax, Yorks.

NORTH-EAST FOUNDRY has capacity for production of repetition Non-ferrous Castings; enquiries welcomed.—Box 736, FOUNDRY TRADE JOURNAL, 3, Amersham Road, High Wycombe.

NON-FERROUS FOUNDRY, capacity available, including sand blasting; competitive prices quoted.—ALBUTT, SON & JACKSON, Valve Makers and Brass Founders, Greenmount Works, Halifax.

PATTERNS for all branches of Engineering, for Hand or Machine Moulding.—FURMSTON AND LAWLOR, Letchworth.

LEATHER APRONS for the Foundry Trade—Made of best quality materials; various types available from 10s. each; 16-page catalogue of Aprons and other lines of industrial clothing and equipment sent post free on receipt of 3d. stamps.—WILLSON BROS., Epsom, Surrey.

PATTERN MAKERS (ENG.) CO., LTD. [Est. 1912

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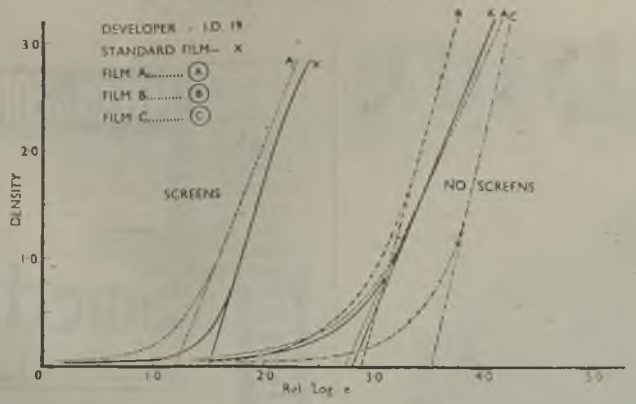

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