Building Services Engineering

Volume 4 | Issue 12 Article 1

3-1-1965

The Irish Plumbing and Heating Engineer, March 1965 (complete issue)

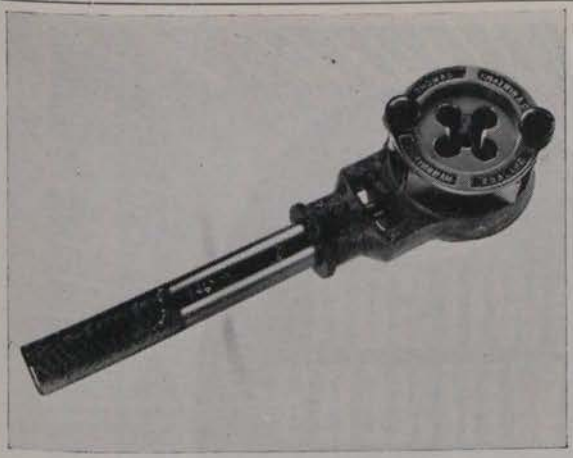
IRISH PLUMBING & HEATING
ENGINEER

MARCH 1965
Vol. 4 No. 12

SPECIAL MONTHLY SUPPLEMENTS: NORTHERN IRELAND REVIEW
INDUSTRIAL HEATING & VENTILATION IN IRELAND

https://arrow.tudublin.ie/bsn/vol4/iss12/1
DOI: 10.21427/D79X3F

Building Services Engineering, Vol. 4 [1964], Iss. 12, Art. 1



418 PATTERN RATCHET DIESTOCK

Better threads, easier cutting, and quick and simple die and guide changing are the attractive features of this Chatwin product. The 418 Pattern Ratchet Diestock and die must satisfy the need for a tool which makes pipe thread cutting economical. Dies are available for the standard range of B.S.P. threads and alternatively, to Whitworth, U.S. standard, and Unified, within capacity of stock.

Chatwin Chatwin Chatwin Chatwin

Ample Strength for the TOUGHEST JOB

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Heat treatment of the handle and jaw gives correct degree of hardness and prevents bending and breakages. Sturdy, light in weight and easy to handle, these wrenches are guaranteed against defects in material and workmanship.

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Victoria Works, Great Tindal Street, Birmingham, 16
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ONE OF THE BROCKHOUSE COMPANIES

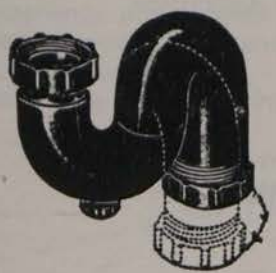
A NEW PRODUCT

"THE DUBOIS PLASTIC TRAP" (Regd.)

A NEW PRODUCT

Provn. Pat. No. 38070/60.

1¼" and 1½" diam. x 1½" seal "S" and "P" BLACK HIGH DENSITY PLASTIC TRAPS



Orthodox Shape!
Smooth Bore Tubular construction.
Outlets can be turned through 220°.
A two-piece trap at a one-piece price.
Outlet on 'S' trap turned to inlet forms a through-bore bottle trap.
Frost and damage resisting.
Light weight = lower transportation costs.

Manufactured by:—

THE DU BOIS COMPANY LIMITED

15 Britannia Street, London, W.C.1

Telephone No.: TERminus 6624-5. **Telegraphic Address: "Bleitrap, London."**

NEW Wallflame 75

Now, to the five tough, dependable models which make up the outstandingly popular Wilson Wallflame range comes a sixth—the new Wilson Wallflame 75. Styled to match its sister models, rated at 75,000 BTU/hrs., here's the ideal answer for the 'in-between' installation.

NEW Radiator price reductions

New low prices for Standard Range **single and double radiators at only 5/-** per square foot of heating surface. **Brackets** supplied **free** for all radiators. Standard Range now extended to include more sizes at the popular 18" and 30" heights. New heating surfaces which fall into line with current trade practice.
Finally, remember that every Wilson radiator has a **guaranteed heat emission figure** determined after tests by the Heating and Ventilating Research Association.

NEW Wilson Mk IV Vapouriser

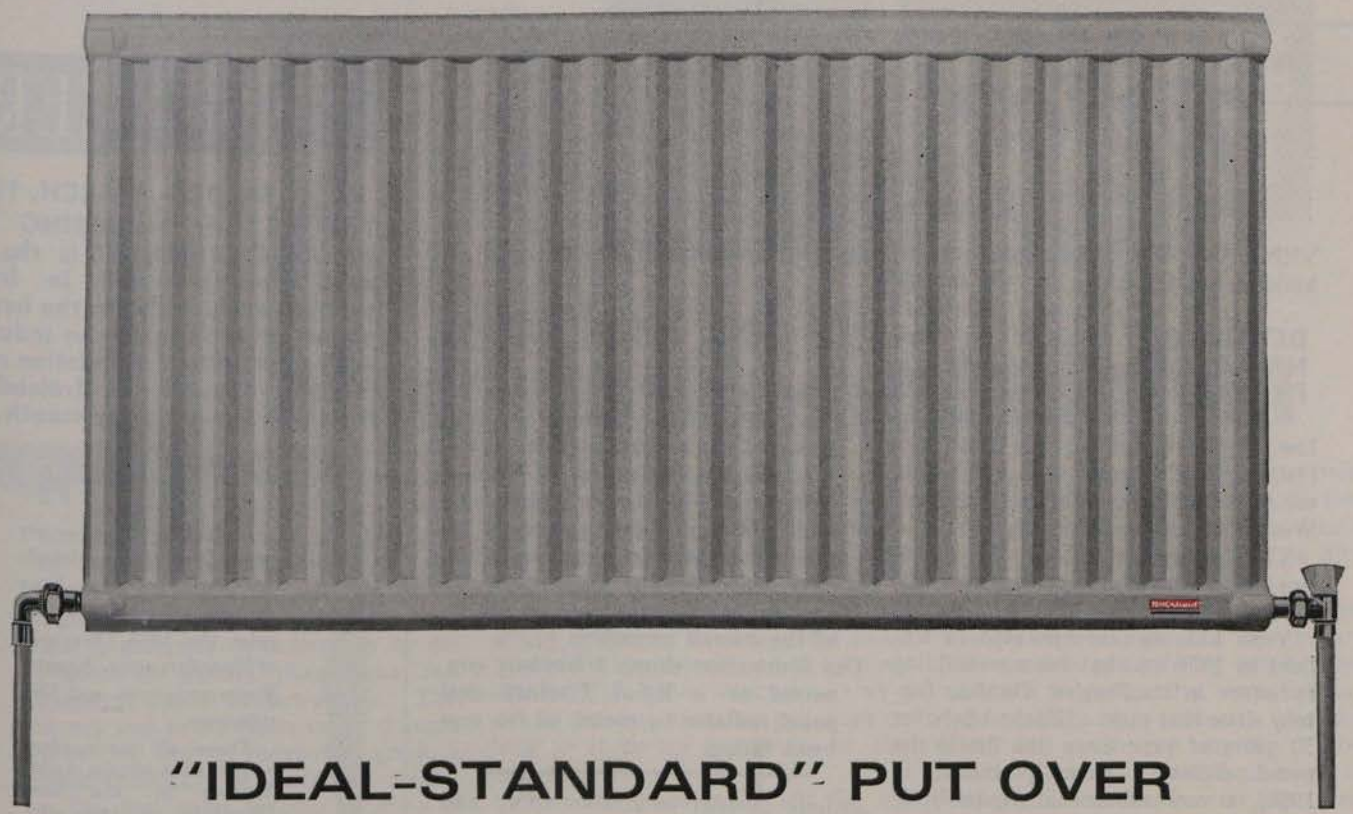
This simple dependable burner for the smaller installation enjoys evergreen popularity. This year we give it an up-to-the-minute look with a restyled casing similar to the popular Wallflame range.
The new price is attractive, too, at **£67 retail.**

125 years unbroken experience in making heating equipment, a top-class design team, exhaustive laboratory and field tests, national distribution, country-wide spares and after-sales service —you can be sure they don't let you down at Wilsons.
Full details of products and services from

Henry Wilson

Henry Wilson & Co. Ltd.

Sales & Service Office, George A. Reid Esq.,
16, Fade Street, Dublin.
Telephone: 76009.



"IDEAL-STANDARD" PUT OVER 60 YEARS OF EXPERIENCE INTO THEIR NEW STEEL RADIATOR

60 years experience in making radiators goes into this new addition to the "Ideal-Standard" range.

Experience that demands strength in a radiator—tested to 100 lbs. per sq. inch.

Experience that requires high standards of workmanship and absolutely accurate dimensions.

Experience in research that produces a radiator with smaller water content —that means more rapid response to thermostatic control.

Experience in the radiator market —offering either a primed finish or these four popular colours in high-quality stove enamel—White, Cream, Primrose, and Dresden Blue.

Experience with the problems of installation—and so including brackets, air vent, plug and bushings in the price whenever required. And making available a choice of heights —12", 18", 24" and 30".

"Ideal-Standard's" experience is what goes into their brand-new steel radiator. What comes out of it all is more profitable business for you.

FOR FULL DETAILS WRITE TO THE RADIATOR PEOPLE:—

H4

IDEAL-STANDARD LIMITED, P.O. BOX 60, HULL, YORKS

"Ideal-Standard" is a trade mark of Ideal-Standard Limited

THE LEADERS IN HEATING AND SANITARY EQUIPMENT

IDEAL-Standard LIMITED

trade Topics

VEHA Ltd., who will commence the building of a factory for the manufacture of steelplate radiators for central heating in the near future, on the Murrough, Wicklow, is a member of the J. B. van Heijst group of companies with factories and offices in Holland, Belgium, West Germany and Britain.

DETAILS OF NEW RAD FACTORY

The factory, which will be developed on a staged programme, will initially employ about 150 workers.

Veha Ltd. was incorporated in Ireland in 1956 and has been assembling radiators in its Finglas, Dublin, factory since that time. Backed by over 30 years of experience (the first Veha panel radiators were produced in 1930), a very substantial export business has been built up and this is expanding rapidly, as are the home market sales.

* * *

TO meet the steadily growing demand for complete toilet installations, a newly designed bidet has been introduced in the Royal Venton range of vitreous china sanitary ware.

ROYAL VENTON INTRODUCE NEW BIDET

The new bidet (No. 420) has been developed to meet the requirements of users and the building industry. Special features include a contoured shelf seat, integral rim for use with hot and cold water faucets, and concealed plumbing. Standard fittings include diverter to rim or spray and pop-up waste.

Styled in the modular concept to blend with other units in the range of modern sanitary ware produced by John Steventon & Sons Ltd., the bidet is available in white or the five pastel shades of the Royal Venton range.

* * *

THE Bell Type D high output back boiler unit has been designed to suit 16" Bell Supaheat underfloor draught fires or Bell raised metal fires. These fires will provide heating for a room of 1,500 cubic feet and more and at the same time the boiler will provide hot water for all domestic purposes plus space heating by radiators in several other rooms. If hot water is not required, the boiler will provide considerable central heating.

VERSATILE BELL BACK BOILER

The Bell Type D High Output boiler is of welded steel construction and is pressure tested and guaranteed. It is an all around boiler with a self-contained flue, damper and throat unit. There is an access door for easy flue cleaning. The whole unit is in one piece for exceptionallyl easy fixing.

The boiler will provide domestic hot water plus 100 sq. ft. of radiator and piping surface (an indirect cylinder of 25/30 gallons must be used) when used for central heating only.

● Mr. N. F. Langley, who was recently appointed Sales Manager of the John Harper & Co. Ltd. Oil-Fired Boiler Division. He will be in charge of the rapidly increasing sales of the Harper Meehanite oil fired boilers, which are sold through a network of 16 representatives covering these islands as well as numerous export agents.

● The new B.S.A. Harford 90 deg. bend fitting.

90 deg. bend fitting

A new 90 degrees bend fitting is now available from B.S.A. Harford Pumps Ltd., for use with both the ½ in. and ¾ in. models of the Kosmos thermostatic regulator. This bend will enable the fixed phial to be fitted to a radiator even more easily than before, whilst its use will undoubtedly enhance the appearance of the overall assembly.

Our illustration shows a Kosmos connected to a B.S.A. Harford steel panel radiator by means of the new bend fitting.

IRISH PLUMBING & HEATING
ENGINEER

Vol. 4. No. 12. MARCH, 1965.

THE IRISH PLUMBING AND HEATING ENGINEER is the only publication produced in Ireland catering exclusively for the heating, plumbing and ventilation industries with a guaranteed circulation covering the Republic of Ireland and Northern Ireland every month.

In this issue — on page forty-three—details are given of the June issue, which will comprise the 1965 Directory of Manufacturers, Agents, Representatives and Distributors.

Those of our readers who wish to obtain classification in the new Directory, or those who wish to make alterations to previous entries, are advised to note carefully closure date for receipt of this information.

The 1965 enlarged Directory will be completely revised to include up-to-the-minute information. One copy of the Directory will be sent to all subscribers and additional copies may be ordered in advance.

This month W. J. R. Couchman contributes another Seven Deadly Sins article for the domestic heating installer, while our Special Review feature puts the spotlight on roofing materials, including drains, water heads, gutters and outlets.

●

Editorial and advertising offices:
Callaghan Chambers, 13/15 Dame Street, Dublin 2. Tel. 56465-6.

London: J. T. Robson & Son Ltd., 30 Fleet Street, London, E.C.4. Tel.: Fleet Street 4438.

Belfast: 26 Carnamena Ave., Belfast 6. Phone: 643095.

PART TEN

the 7 deadly sins of domestic installation

NATURAL Draught for Domestic Appliance.—While it is possible to control, within limits, the performance of domestic heating systems, given careful design and the selection of the right components, the behaviour of a flue is generally considered to be dependant on natural phenomena and therefore almost uncontrollable. This is not true in all cases; many draught problems can be overcome, given a basic knowledge of the facts.

The first point to bear in mind is that the base of any flue is connected to the **outside,** not the inside of the building. Cases rise upwards through a flue because they are pushed from outside, in other words because the heated, relatively light flue gases are opposed, or counter balanced, by denser, colder, incoming air. In just the same way the movement of water through a gravity flow pipe is dependant on the downward movement of the colder, denser, **heavier** water in the return. This elementary fact is often overlooked; I have often seen appliances so sited that there is insufficient incoming air to get the flue gases away or even to support proper com bustion.

Given sufficient incoming air, good draught conditions will be dependant on:—

(a) flue gas temperature;
(b) flue length;
(c) flue size in relation to volume throughout;
(d) wind influence;
(e) frictional resistance of the flue.

Flue gas temperature.—As the flue gas temperature increases density and weight decreases. The lighter the gases are, other things being equal, the faster they will move. Of course a high flue gas temperature means a high heat loss to the flue, in other words an inefficient appliance. If it was possible to produce a combustion appliance that was so efficient that the flue gases leaving the appliance were no warmer than the air entering it, then one of the resultant problems would be getting the flue gases away!

Modern appliances tend to be more efficient than older ones; this is as it should be, but modern appliances do tend to show up any faults in flue design.

Once the gases have left the appliance they start cooling at once and one of the requirements for a well designed flue is a low rate of heat loss, i.e., good insulation; or warm surroundings. Other things being equal, a flue passing through the centre of a house will always give better results than a flue on an outside wall, because the centre flue loses less heat.

Flue length.—The longer the flue, the greater the total weight difference will be between the column of flue gases and the undefined but actual column of cold air that is pushing the flue gases out. Returning to the analogy of the hot water circulation, any engineer knows that the available circulating pressure increases with the height of the system.

Flue size.—With the exception of open appliances, like the open fire, which are rather special cases, a combustion appliance requires a specific quantity of air in order to operate on a given fuel at a given output and efficiency. Too little air, and combustion will be incomplete, too much and the appliance efficiency will be reduced since it will be heating air to waste. Therefore, although this is seldom done, one can establish that a particular appliance, to do its job properly, will need to pass, for example, fifty cubic feet of gas per minute into the flue. If therefore the flue has a cross sectional area of one square foot, the flue gas velocity will be fifty feet per minute.

If, on the other hand, the flue has a cross sectional area of ten square feet the flue gas velocity will be less, and, due to the greatly increased surface and the low velocity, the flue gases will cool very rapidly. Too small a flue would be difficult to clean and might well impose too high a resistance. For normal domestic appliances the usual 9" x 9" brick flue is quite large enough, indeed in many cases it may be too large.

Wind influence.—The influence of wind may assist and increase up-draught, or it may have the opposite effect; in some cases it seems to have no effect at all. Wind may assist up-draught because of the aspirating or "scent spray" effect of a movement of air across the chimney terminal. **Figure 1** illustrates this.

In certain cases, due to the influence of wind, or of a long, hot, flue or both, the updraught may be so high that the performance of the appliance is adversely affected. A common remedy in such cases is the provision of an air leak into the flue. The effect of providing such a leak may be likened to the effect of tearing a cigarette paper and then trying to smoke the cigarette—most of the air drawn through passes through the leak and not through the burning end and so it impossible to draw deeply on the cigarette.

The air leak for a flue may be a

Continued overleaf

THE sparkling and well-informed series is by W. J. R. COUCHMAN. Mr. Couchman maintains close contact with the trade throughout Ireland and is ideally informed to compile this series.

permanent opening into the flue, from inside the house; not outside where the incoming air would be too cold. A permanent opening is, however, rather unusual and only justified in special circumstances. More often a device is fitted which opens only when the updraught is higher than required, perhaps in a gust of wind, closing again when conditions return to normal. This is the familiar stabilizer. Some appliances with special draught requirements have a stabilizer or permanent air leak (often known as a spoil-draught) fitted as standard.

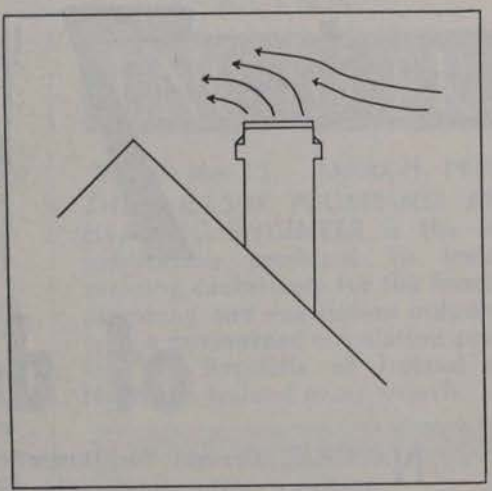
Wind influence can adversely affect draught under several different sets of conditions. **Figure 2** illustrates various conditions. Since winds tend to follow ground contours, an air stream may strike a flue terminal at a downward angle because it has been following a downward path. Nearby trees or tall buildings may give rise to turbulence around the terminal, again causing downdraught.

Often trouble may be due to the fact that the terminal is well below the roof ridge, or too low down on a

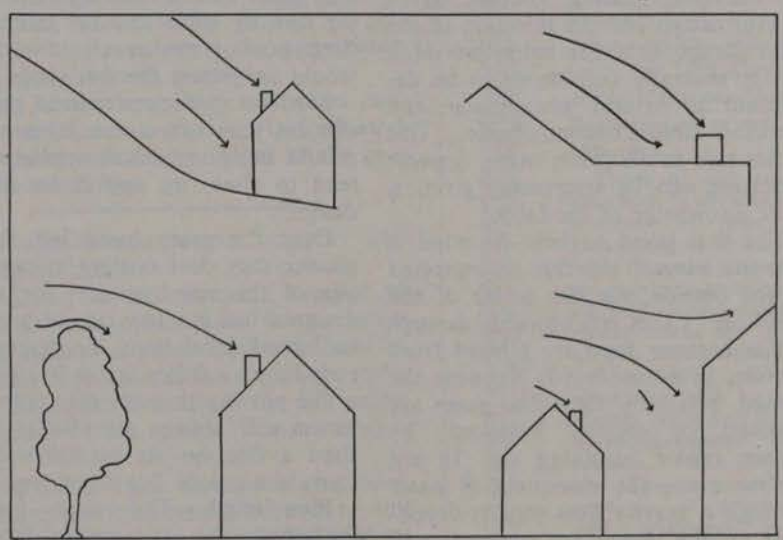
Seven deadly sins of domestic installation

from previous page

large flat roof where air turbulence may be expected. Sometimes a cure may be effected by raising the level of the terminal, although it pays to experiment with a temporary extension before going to the expense of building. In other cases a cowl may be the answer, and next month these and other relevant factors will be discussed.



ABOVE—Figure 1.
BELOW—Figure 2.



in brief . . .

NEW exhibitors at the Building Centre of Ireland include Hugh O'Neill & Company Limited (South County Hotel Bedroom Suite); Rubery Owen & Company Limited ("Hotsprings" shower cabinet); Shanks & Company Limited (bathroom suite); Steel Radiators Limited (radiators and heating products); and Skandinavisk Akryl Industri (PVC rainwater piping and guttering).

* * *

CADULAC Chemicals Ltd. of Radcliffe, Lancashire, sole distributors in Western Europe of the revolutionary Rocket WD-40, the new lubricant, moisture repellant and corrosion preventative aerosol spray, announce that Brent Chemical Products (Ireland) Ltd. (117/118 Cork St., Dublin 8) have been appointed distributors for the Republic.

* * *

MESSRS. T. and J. Connick Ltd. have opened a second office and shop at Francis Street, Dundalk—a further development for the company, which is one of the town's largest established business concerns. Connicks have also introduced a take-home coal pack. Manager of the company is Mr. D. Williams.

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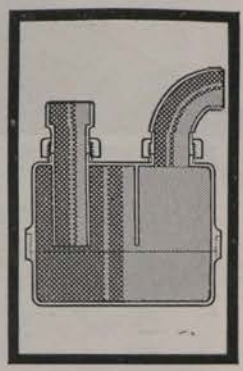
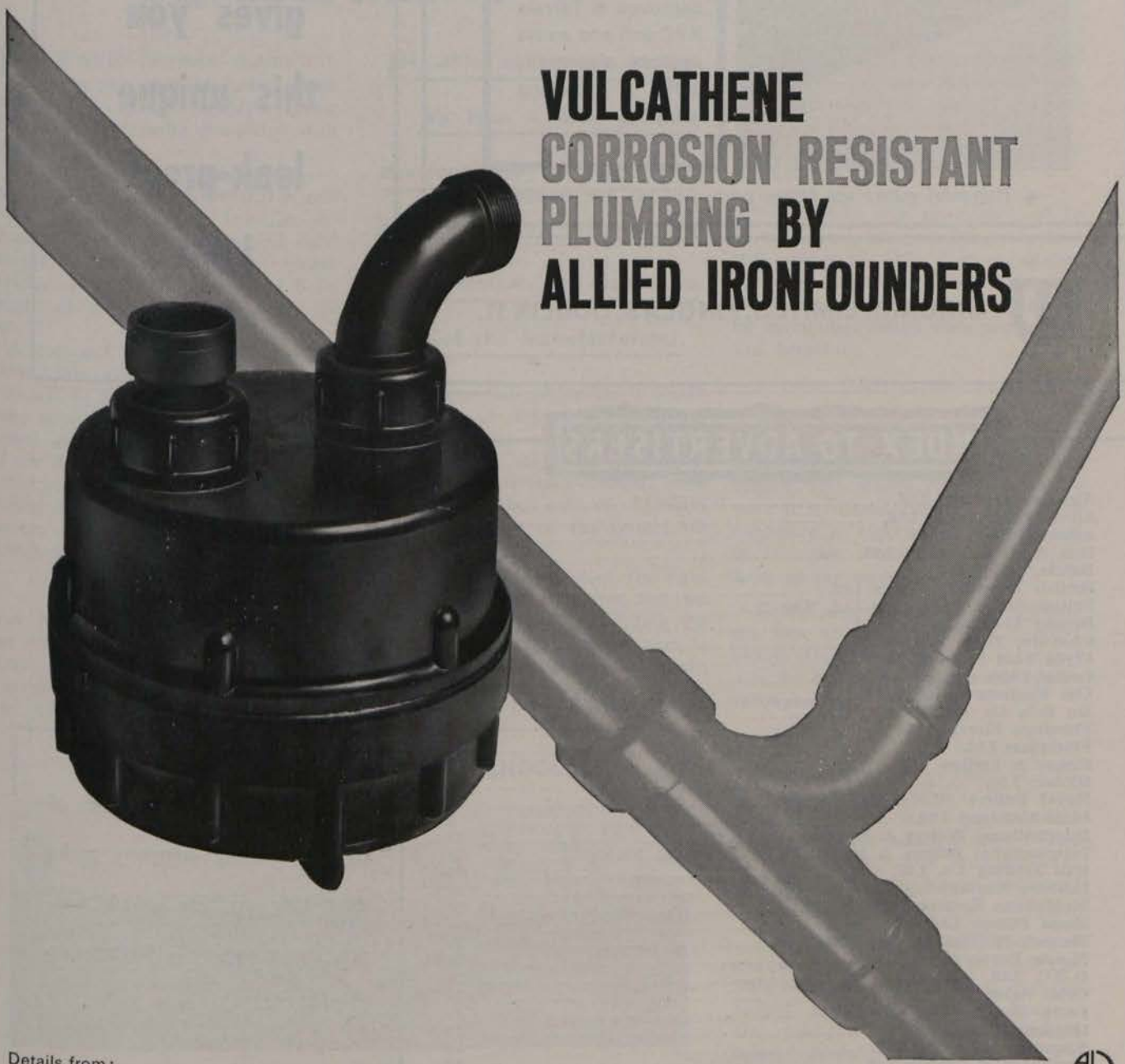
DOI: 10.21427/D79X3F

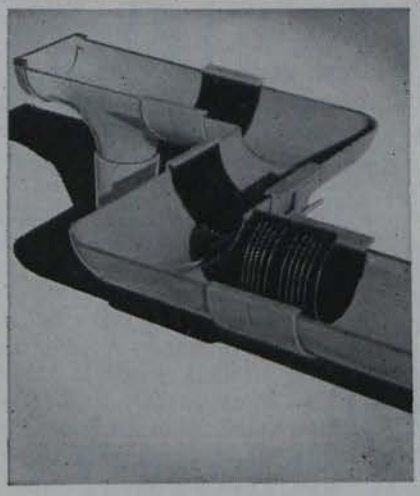
Whatever goes down in your lab Vulcathene can take away

Difficulties are sometimes experienced with conventional drainage materials in the disposal of acids, alkalis and other chemical effluents in regular use in most labs. After extensive testing with corrosives, Vulcathene fittings and the Vultex laboratory bench fittings which go with them, are being specified for more and more large laboratories. They are being chosen for industrial labs, university labs and the labs in LCC colleges and schools, not only because they offer high chemical resistance, but because they offer such a wide and comprehensive range of fittings. In many cases, these fittings take effluents from the sinks to the main drain connection and even include stack pipes. Vulcathene products are made by Allied Ironfounders, who back them with a country-wide service network and the most experienced plumbing advisory service of all.





Details from:
Allied Ironfounders Ltd, Vulcathene Div, Vulcathene House, The Broadway, Mill Hill, London, NW7 Tel. Mill Hill 6961



* Rust-proof * No painting needed * Light * Choice of colours * Long-lasting * Easy to erect * Fully approved * Terrain PVC soil and waste systems also available in matching colours.

* Plain-ended gutters and fittings simply push into joint brackets

UNIDARE LIMITED, FINGLAS, DUBLIN 11.

The Terrain PVC rainwater system gives you this unique leak-proof joint

INDEX TO ADVERTISERS

For The Notice Of Heating Engineers

Former Managing Director of English heating company seeks interesting position with progressive company. Partnership considered.

Telephone: 881389

SPECIAL REVIEW

THIS MONTH

ROOFING MATERIALS, including Drains, Water Heads, Gutters, Outlets.

MANY IMPROVEMENTS AND NEW DEVELOPMENTS IN MATERIALS

IN this equipment review we take a look at new developments in the fields covered by this month's special review. (All claims are those of the manufacturers).

THE WAVIN rainwater system features a new profiled gutter which makes for extra rigidity, giving strength not normally associated with PVC gutters.

This system—it is fully approved for the purposes of government grants—has many worthwhile features, including its easy installation and light weight—a 12 ft. length of gutter weighs only 79 ozs., while a 6 ft. length of downpipe weighs only 24 ozs.

A compact range of fittings completes this system. The gutter is nominal 4½ ins., giving discharge capacity equivalent to 5 ins. on conventional gutter. The internal diameter of the downpipe is 2½ ins. nominal.

No cements or adhesives are involved in the fixing for the Wavin system with the fittings slipping together with a speedy "click" action.

* * *

A NUMBER of developments to the Aspect range of PVC rainwater goods have been introduced by the Universal Asbestos Manufacturing Co. Ltd. (Watford). They include modified intermediate support brackets, swan necks of improved design, and a straight gulley connector. These alterations, and the incorporation of sockets on bends and branches, allow economies in the use of fitments. The installed cost of the system has thus been reduced.

A socketed pipe system for light industrial and farm buildings, and two innovations designed to facilitate the fast fixing that has always been a feature of Aspect rainwater goods, are also announced. (Northern Ireland agents are John McNeill, Ltd.).

TERRAIN IN PURPOSE-BUILT SCHOOL

● Shown here is the Terrain rainwater system, as used on the purpose-built school for the Office of Public Works, at Ballyboughal, Co. Dublin.

Modified intermediate support brackets have been made available for both the 4 in. and 5 in. gutter systems. They are less expensive than the existing dual-purpose PVC gutter brackets.

Swan necks with projections of 12 in. and above are now being supplied with bends of 112½ deg. as against 135 deg. hitherto. This enables the clean line of the rainwater system to be maintained when wide projections are necessary.

* * *

UNIDARE Limited (Finglas), who pioneered here the all-plastic rainwater system and soil and waste system, and whose Terrain systems were first introduced in 1961, have continued to make rapid progress and in Limerick alone over 600 houses have so far used these systems.

Recent large undertakings include the new six-storey block at Leinster House (Dail Eireann), which incorporates the Terrain soil and waste system throughout.

* * *

THE OSMA Plastics range of PVC RW goods are available in three sizes of gutter section, 3in., 4½in., and 6in., with injection moulded fittings. They are suitable for every situation from greenhouses to the largest industrial or multi-storey block.

The Osman PVC soil, ventilation and waste goods range was successfully launched in 1962 and is now the largest range available in Europe. The company also manufactures larger diameter pipework, A.B.S.

Continued overleaf

SPECIAL REVIEW

from previous page

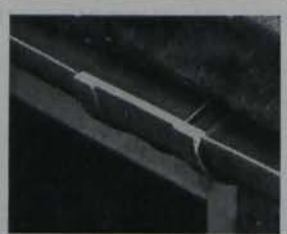
(Acrylonitrile Butadiene Styrene) waste goods, and glassfibre water systems available in 10, 25, 30, 40 and 70 gallon sizes.

* * *

AS A logical development to its established Series Ten range of rainwater goods, Celanese Building Components, a company in the Courtaulds Group, now offers the Series Ten soil and vent pipe system.

This new system with all supporting components for ventilation, is engineered on sound scientific principles. An outstanding refinement is the design of the expansion joint with its twin-scarfed Neoprene compression rings.

Celanese Building Components is continuing its development and research into new products and applications. Now in production are an Industrial Rainwater Sytem and a larger Rainwater System for terraced build-



● OUR ILLUSTRATIONS SHOW:

1. Gutter being offered to union bracket.

2. Gutter snapped into position either side of projecting tongue which allows automatically for expansion.

3. Silt bridge being snapped into position.

4. The silt bridge in place sealing the joint and preventing the entry of sand and silt.

SPECIAL REVIEW

from previous page

ing with greater roofage areas. Well advanced is development of plastic baths and bathroom units, radiator and water taps, windows, doors, floor tiles and wall coverings.

* * *

A NEW Vinyl rainwater system is announced by The Ruberoid Company Limited incorporating design features which achieve optimum flow capacity while providing an aesthetically pleasing appearance.

The system, designed by the Company's development department, is based on mechanical joints not requiring jointing compounds. It includes a unique silt bridge which snaps on to the two sections of gutter in a union bracket and, while allowing expansion and contraction to take place, covers the joint to prevent sand from roofing tiles or silt getting into the joint and causing abrasive action which might lead to leakage.

Exceptional flow capacity figures have been achieved by means of generous throat radii on gutter angles and outlets. The gutter is true half-round (4 in.), giving a flow capacity of 36½ gallons per minute when laid to a slope of 1 in. in 50 ft. with a central downpipe. The downpipe has an internal diameter of 2½ in.

RADIATION Parkray Limited have just issued an illustrated leaflet describing their gas ignition burner for use with Parkray solid fuel room heaters. The leaflet, intended solely for the trade, gives brief details of the burner, which is designed to hook on to the ashpit cover pins for quick and easy ignition of any smokeless fuel. Copies from Radiation House, North Circular Rd., London, N.W.10.

Building Services Engineering, Vol. 4 [1964], Iss. 12, Art. 1

DUBLIN HAD OWN DISTRICT HEATING — IN 1806!

ONE of the first known examples of district heating was in Dublin. This is just one of the many interesting stories told by Lawrence Wright in his book, "Home Fires Burning."

And of the Dublin "first" he tells us that, in 1806, a Mr. Stephens used waste heat from a limekiln to warm adjoining houses through flues. The idea won particular favour in America.

However, the system had its problems—the cheaper installations were wont to burst their pipes, causing, as one might well imagine, confusion in the street!

He goes on to record that the smoke from "sea coals," in other words coal brought from Newcastle to London by sea, made such wicked smog that Queen Elizabeth decreed it illegal to burn it while Parliament was sitting.

IT was at about this period that a Frenchman, Louis Savot, put iron plates behind and on either side of a fire so that they formed ducts and produced, in effect, the first convector fire.

It was in France, too, that the fire-

● A 15th century firesidle.

places were so enormous they had to be fitted with doors in summer to keep out the draughts and elements. They had their other uses too, and when Admiral Bonnivet was in a lady's chamber one night, and got news that King Francis I. was on his way. The Admiral hastily hid behind the fireplace doors. "In time, the King felt a call to use the hearth according to the insanitary custom of the day; the Admiral was lucky to emerge later damp, but unobserved." Henry II., however, had all the palace fire doors locked forming a "chastity screen" for his lady the Duchesse de Valentinois.

Turning to less frivolous matters, Lawrence Wright points out that all

Continued page sixteen.

● A quick change back to the 20th century — the Waterford inset recently launched by A. H. Masser Ltd.

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Moneyspinners!

What you should know about the £.s.d. of International Pumps

Judging by the number we've sold most installers are already sold on the better design and easier installation of the International 'Flo' line ! Now let's look at some plain facts about the hard cash.

YOUR DISCOUNT

Our retail prices are low and on these you get the most generous discount in the trade.

YOUR CASH REBATE

We give you 5/- for every pump you install, payable monthly. It mounts up quickly.

YOUR COMMISSION

You are entitled to 10/- commission for every pump maintenance contract that you place on our behalf.

YOUR MONEY-SAVING GUARANTEE

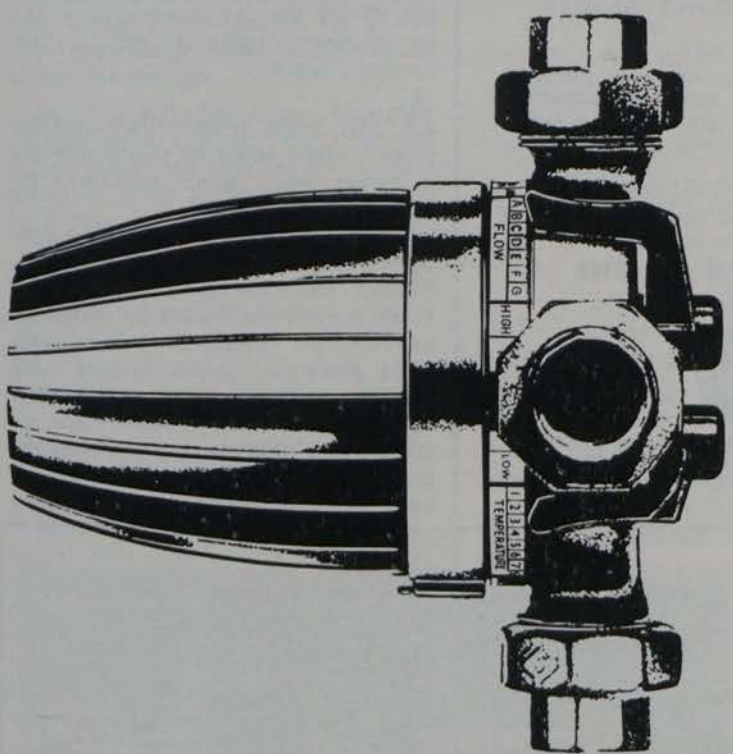
The International 2-year guarantee couldn't be fairer. If any manufacturing fault or mechanical flaw arises, the faulty part is replaced and you automatically get £1-10-0 to help offset labour charges.

If the fault's been caused by misuse, the pump will be stripped down, cleaned, repaired, re-assembled and returned for a small set charge.

OUR MAINTENANCE SERVICE

For £3-0-0 a year we will take maintenance off your hands completely. International Service Engineers are on call everywhere. They protect your good name by operating the finest service and spares supply you could wish for.

Quite simply, International offers you better products on better terms. So contact us now for full details.



MONEY

New Silentflo Multiflo Thermoflo

Sole Agents for the Republic of Ireland—
Messrs. Monsell, Mitchell & Co. Ltd.,
67-73 Townsend Street, Dublin 2.
All retail prices are subject to 5% increase to cover carriage etc.

International

BOILERS AND RADIATORS LTD

INTERNATIONAL BOILERS AND RADIATORS LTD Park House 22 Park Street Croydon Surrey Tel: Municipal 3581-5

THE UPSIDE DOWN FIRE MACHINE

from page fourteen.

the non crackpot inventions and improvements in domestic heating were evolved by men who are mostly famed in other fields: Prince Rupert, the Cavalier commander; Glauber, the chemist; Polignac, the cardinal and poet; Franklin, the statesman and philosopher, and Rumford, the social reformer who was also the first person to appreciate the importance of having the flue opening below the top of the fireplace.

There were other distinguished gentlemen whose contribution to the science of combustion was not so significant. Monsieur Dalseme's heating machine was in effect a fire upside down. The wood was placed on top of the coal and the paper on top of both. This way, it was claimed, "matters which stink abominably when taken out of the fire, in this engine make no ill scent; neither do red herrings broiled thereon."

A Mr. Smith proposed a "retiring grate" which could be pulled out like a drawer when more heat was required.

Mechanical stokers are nothing new. One was devised in 1815 by Mr. Cutler. The coal in a reservoir beneath the fire was raised by means of an elaborate mechanism of cranks, bevel gears and chains worked by a handle. By the time it had been discovered that the reservoir obstructed the draught, that the ash got into the fuel and that an unwatched fire could burn up the whole day's supply,

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DOI: 10.21427/D79X3F

IDEAL RAD RANGE IS EXPANDED

ENCOURAGED by the initial response to their oil filled radiators launched last June, Ideal-Standard Ltd. are now to increase the number of colours in the range and are also to make the radiators available for wall mounting.

Previously produced with a stove-enamelled cream finish only, the range now extends to White, Dresden Blue, Primrose and Bronze. They are available to special order only but at no extra cost.

Similarly, radiators fitted with brackets for wall mounting will be supplied at the same cost as for radiators with feet. They are available in three sizes with loadings of ¾, 1 and 1¼ Kilowatts and are permanently sealed.

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from previous page

the patent had been demolished in a law suit."

The first attempt at a thermostat was bi-metallic rods which the American Elisha Foote put in his stoves. On expanding these automatically closed the draught.

In " Unsightly Efficiency," Lawrence Wright gives a whole chapter to the closed stove. Originating on the continent, it never gained real popularity in Britain except as a hall stove.

It was not till James Watt of steam-engine fame heated his study with an iron box fed with steam from a boiler that the Roman idea of central heating found favour in modern eyes. Experiments were, however, cramped through failure to appreciate the importance of surface finish. None the less, in 1795, Watt installed central heating in a Manchester factory. Here it met with more success, partly because there was always an engineer at hand to tinker with the system and partly because, being used at about 350°F. and 135 lb./in., the smell of burnt dust that inevitably tainted the air was not so noticeable. Also the workers were, presumably, less perperturbed than the sensitive gentry by the alarming water hammers which, in private houses, " troubled slumbers by an intermittent series of bubbles, squeaks and hisses."

" Home Fires Burning," the history of Domestic Heating and Cooking by Lawrence Wright, 219 pages, 30/-. Routledge and Kegan Paul.

1965 DIRECTORY of MANUFACTURERS AGENTS, REPRESENTATIVES and DISTRIBUTORS

★ The June 1965 Register of Manufacturers, Agents, Representatives and Distributors of Domestic and Industrial Plumbing, Heating, Air Conditioning, Ventilation and Insulation equipment and materials available in the Republic of Ireland and Northern Ireland is now being prepared. The Directory this year will again be enlarged to accommodate the many additional entries under the various headings.

If you come under the heading of any of the categories listed here and have not supplied information already, or wish to make amendments or alterations to last year's entries, we would ask you to do so without delay. Changes of address should also be advised. Names and addresses of Irish Agents and/or Representatives should be included with all entries.

Specimen copies of the 1964 edition are available for checking.

Please Note!

CLOSING DATE
Saturday,
1st May, 1965

Please Check This List Of Categories

— LIST NO. 2 —

- Castings, Non-Ferrous
- Ceilings, Heated
- Compressors, Air or Gas
- Compressed Air Traps
- Control Equipment and Controllers
- Control Panels
- Convectors
- Conveyor Ovens and Paint Processing Plants
- Coolers
- Cooling Towers
- Cyclones
- Damper Motors
- Damper Regulators and Quadrants
- Data Logging Equipment
- Dehumidifiers
- Descaling Equipment
- Differential Pressure Controls
- Digestors
- District Heating Controls
- Drainage and Sanitation—Traps and Wastes
- Draught Indicators
- Draught Stabilisers
- Drying Apparatus
- Drying Ovens
- Ducting
- Duct Heaters
- Dust Collecting Plant
- Economisers, Fuel
- Ejectors, Steam
- Electric Heating Elements
- Electric Heating Equipment
- Electric Heating Tape
- Electric Motor Control Gear
- Expansion Joints
- Extractors & Ventilation Fans
- Fan Speed Regulators
- Fixing Tools and Bolt Driving Guns
- Filters, Air
- Filters, Liquid, Oil, Water, etc.
- Filter Loss Gauges
- Flame Failure and Protection Devices
- Flanges
- Flash Vessels, Condensors, etc.
- Floatswitches
- Floodlighting Equipment (Portable)
- Floor Heating Installations
- Flue-Gas Corrosion Protection
- Fuel Additives
- Fuel, Ash and Clinker Conveying Plant
- Fume Removal Equipment
- Gauges, Air, Pressure, Vacuum etc.
- Gauges, Liquid
- Gauges, Liquid Level
- Gauges, Pressure
- Gauges, Smoke Density
- Gauges, Tank
- Generators (Electric or Steam)
- Grilles, Louvres, etc.
- Grit Arresters
- Headers
- Heaters, Air
- Heaters, Balanced Flue
- Heaters, Gas
- Heaters, Immersion
- Heaters, Oil
- Heaters, Tubular
- Heaters, Water
- Heating Panels
- Heating Equipment Supplies
- Heat Exchangers
- Heat Pumps
- Heating, Storage
- Hose
- Hospital Equipment
- Hot Water Blenders
- Humidifiers
- Humidity Controllers, Indicators, Recorders, etc.

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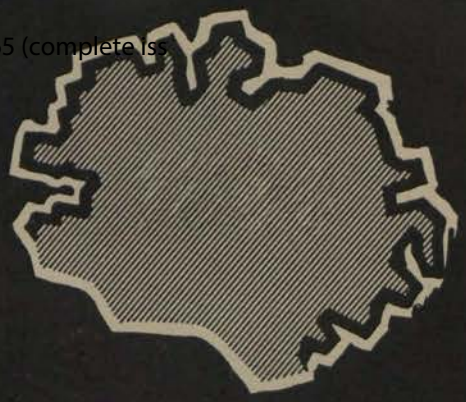
DOI: 10.21427/D79X3F

Northern Ireland monthly review



the new **Leonard** *thermostatic shower*

When did you last take a shower? On holiday....away on business....after a game at the club? You told yourself you—and the family—deserved a shower in your own bathroom. You wanted that refreshing, exhilarating feeling on tap.
The best installation for a really enjoyable shower is the Leonard thermostatic shower. It holds the temperature you want, and has a separate control for the force of the water. See your builders' merchant about the Leonard shower.

Technical Agents: Mr. Allenby S. R. Leech,
William H. Leech & Son
414 Ravenhill Rd., Belfast 6
Phone: 641787 and 649828
Manufacturers: Walker Crosweller & Co. Ltd.
Cheltenham, England.

our main stockists, Stevenson & Turner Ltd. of 1-17, West St., Smithfield, Belfast 1, display and stock a full range of Leonard thermostatic showers and valves

Bill Maginnis Talking . . .

I had the pleasure recently of being shown over the new offices, etc., of Messrs. Adam Orr Ltd. by their General Manager, Mr. W. (Billy) McKinty. What a massive set-up they will have, with the most modern office equipment and separate office accommodation for all departments —industrial, domestic and plumbing sections. A boardroom and canteen have also been added. Yes, Billy, you have done a good job and we are now looking forward to your official opening.

Interesting things happen here in the trade, but none has given rise to so much controversy than the news that a large manufacturer has tendered for and has been successful in obtaining a big heating and plumbing contract in Belfast. But, who knows, perhaps the Steel Nationalisation Bill will be in first and we can then bless the day that Mr. Wilson took over and brought a stop to this unfair competition.

During the past year the domestic heating trade here has been booming. I have no doubt, of course, that this was due to the all-out efforts of the various fuel suppliers, especially the solid fuel people and the oil companies. And in this regard I think the Shell Mex & B.P. boys seem to have the edge on their competitors. They now have a large sales and service team on the road and are covering all areas. But I've no doubt, and I know this to be true, they will have to keep on pushing if they want to maintain that lead—one or two of the smaller boys are coming up very fast and hope to overtake before next heating season.

Travel

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DOI: 10.21427/D79X3F

By F. R. McBRIDE, A.M.I.Mech.E., M.Inst.F.

Common faults in domestic heating systems

THE demand for central heating continues unabated and with this demand companies are formed practically daily to carry out installation work.

Some of the concerns are sincere, honest contractors who are endeavouring to carry out their commitments to the client's satisfaction while others are what one would call "fly by nights," in other words people who are trying to cash in on the boom irrespective of their responsibilities.

It would appear from the foregoing comments that the quality of the design and workmanship could also fall into two equal divisions, that is, good and bad, but yet this is not the case, as irrespective of the firm the workmanship is only as good as its operatives and supervisors. In travelling round examining heating systems it would appear that there are some basic mistakes being made on all manner of contracts which could be avoided. The disturbing factor about these mistakes is the regularity with which they appear, and yet when one approaches the principals of the company they are surprised that such a thing could have happened.

THE purpose of this article is to draw attention to these, what could be called standard faults, and to suggest to management that maybe a circular based on these comments plus those of their own, should be pre pared and circulated to their staffs culminating with the warning that such faults are not to be expected on future installations. The writer believes that if this is done, tiresome and expensive service calls could be reduced, contracts would be finalised sooner, and it would be hoped that the final payment would come through all the quicker.

Solid Fuel Installations. — During the last few years there has been throughout Northern Ireland an immense interest in solid fuel appliances and in fact the demand for some of the appliances was such that at certain periods it was exceeding the supply.

Let us consider first the closed stoves which for those people requiring only limited heating at a price which they can afford form a most worthwhile proposition.

Each manufacturer supplies with his unit detailed assembly and installation instructions which regretfully are not always being followed, particularly with regard to that section referred to as the building or fabrication of the convection chamber. Frequently complaints are received regarding overheated chimney breasts or the fact that the output is not being obtained from the unit and this can usually be traced to faulty convection chambers.

Sectional and Pot Type Boilers.—The most usual complaints received regarding this type of boiler is either excessive consumption of fuel or inability to bank the boiler at weekends. Many of these boilers arrive erected, but some come in sections, to be put together by the installer.

Visits to householders having sectional or pot type boilers and complaints such as have just been described usually disclose of all things "badly fitted doors." Practically all furnace and ash doors now have machine ground faces and this has been done to ensure close fitting, and it is the duty of the contractor to check that the door is in effect properly closed at all points.

The second most common fault is to be found at the thermostat; unfortunately most heating engineers seem to assume that the arm of the thermostat flap is not fitted correctly and proceed to bend and twist it to their taste. Firstly, the thermostat should not be tampered with for a couple of days until the system has had time to settle down, and then if the thermostat is to be adjusted only minor adjustments should be required.

GRAVITY Feed Boilers.—Magazine boilers present one of the success stories of the post war period. Ten years ago total numbers of these boilers in Northern Ireland did not exceed double numbers, and yet today a major portion of the principle manufacturers' output is earmarked for the Irish market both North and South.

The demand for the Gravity Feed Boiler is liable to be prejudiced if certain early precautions are not taken and at present this is happening due to the indiscriminate installation of these units.

For successful combustion conditions these boilers require practically balanced draught. If the draught is excessive the usual outcome is excessive fuel consumption, burning back through the hopper, overheating, etc.

If the heating engineer took the trouble to check the draught before the installation he would know immediately where he stood. A portable

Continued page twenty-three

Rotherhams have new accelerator

A new and remarkably low-priced accelerator pump for domestic heating systems is now available from Rotherhams Limited, the pump, clock and precision instrument makers of Coventry. The new pump, the Spey, measures only 5¼ inches in height by 4⅜ inches wide (5½ inches over couplings), and its weight is only slightly in excess of 6 lbs.

Despite its compact dimensions, the Spey's capacity is more than adequate for the majority of popular domestic central heating systems found in homes of average size—from small ones providing only background warmth, through to full scale central heating up to 70,000 B.t.u. boiler rating.

Designed after a detailed survey of popular domestic central heating requirements and installation problems, the Spey is easy to install and can be mounted in any position—upright, horizontally or any convenient angle—without detriment to its efficiency. The output control setting lever extends across the full width of the base and can be adjusted from either side with equal ease and without restriction.

The Spey is notably quiet running and capable of effective operation even in the event of a substantial voltage drop—it will deliver 75 per cent. of its maximum output with a supply of only 200 volts. It is built to high specifications and is fully protected against corrosion. High quality precision bearings ensure a long working life and positive starting, even after the usual summer switch-off.

Northern NOTES

WALKER CROSWELLER RECEPTION

WALKER Crosweller & Co. of Cheltenham were hosts at a cocktail party, lecture and film show held in the Midland Hotel, Belfast, last month. More than 100 representatives of consulting engineers, architects, heating and plumbing contractors and officials of the Ministries of Commerce and Finance from all over the North of Ireland were given a full briefing on the latest developments in the Leonard range of thermostatic valves.

At the reception to receive the large attendance was Mr. Allen Leech, the Walker Crosweller Technical Representative.

* * *

NEW VALVE FOR THE "BIG JOBS"

WHITE-RODGERS Limited (75, South Western Road, Twickenham, Middlesex), the heating control manufacturers, announce the addition of a heavy duty "no-stick" motorised globe valve to their line of hydronic zone controls.

The sturdy, versatile motorised globe valve adapts to many applications in flow control of steam, water, oil or air. The primary use of providing zone control in single pipe steam or hot water heating systems, is extended with the two position valve to control liquid levels, maintain desired pressure conditions and auto matically control a complete process on a time or programme basis. Common applications are commercial and industrial heating, steam drying, control of processing equipment or oil supply lines, steam heating of chemical bath cleaning equipment and commercial dishwashing.

These heavy duty Motorised Globe Valves are designed to operate to a pressure capacity of 150 P.S.I. The gear-motor operator is life-time lubricated for continuous, trouble-free service.

* * *

IMPROVED ASPECT RW RANGE

A NUMBER of changes have been announced by Universal Asbestos Manufacturing Co. Ltd. of Watford in their range of Aspect PVC rainwater goods. The well-proven design of the pipes and gutters remains unaltered except for the introduction of socketed 3in. and 4in. pipe. The main improvements have been made in fittings and fixings which will simplify and speed erection, particularly on farm and light industrial buildings.

Aspect rainwater goods are made in an unplasticised compound based on Breon PVC from British Geon Limited. The finish of all colours in the Aspect range (blue/grey, light grey and black) is in a long lasting semi-gloss to match the Aspect Soil System, and is not dulled by urban grime.

* * *

B.W.A. APPROVE CISTERNS

OSMA Plastics Limited, manufacturers of the world's first "hot-pressed" glassfibre cisterns, have announced that their new 25/15 and 30/20 gallon Glassfibre Cisterns have been tested and accepted by the British Waterworks Association.

Osma Cisterns are manufactured throughout in polyester/glassfibre using a match-metal moulding technique, which as well as ensuring an even wall thickness throughout, gives a smooth finish to both the external and internal surfaces.

Osma Plastics Limited have also announced new cartons and outers for their full range of rainwater goods fittings.

● THE Heating and Ventilating Contractors' Association have announced that explanatory notes for employers and operatives about the procedures under the industry's sick pay scheme that will come into operation on May 31 next are under preparation.

Success of O.H. plan

OPERATING with success is the Gulfplan scheme, a most comprehensive oil-fired heating system under which a new 10-year repayment plan is now available.

Under the scheme there is no deposit with repayments running at as little as 18/6 a week. Other attractions are free life insurance to cover repayments and the income tax benefits.

draught gauge of the type necessary for domestic work costs about five pounds and yet how many heating companies have invested in this simple piece of equipment.

For most magazine boilers the draught should not exceed .02" W.G., and if this figure is being exceeded an effective method of reduction should be applied.

In many cases, however, stabilizers have benefitted indiscriminately in an effort to reduce draught and without effect, whereas the cure was in structural alteration to the chimney or, alternatively, a different position should have been chosen for the boiler, but the real answer is to check the conditions before installing the boiler.

As regards these boilers, attention should also be given to ensure that the doors are closing properly and that the inlet to the forced draught fan is correctly adjusted.

There has been of recent years a tendency by installers when they receive complaints from their customer regarding the unsatisfactory operation of a magazine boiler, to immediately blame the fuel, and while no fuel merchant would claim that everything

from page twenty-one.

CHECK CONDITIONS BEFORE INSTALLING THE BOILER

he does is perfect, as mistakes do happen and at times the fuel may be to blame, investigations clearly indicate that the bulk of such complaints as we are discussing arise from one or a combination of the points mentioned, particularly as regards excessive draught.

Oil-Fired Boilers.—We have dealt with the every day faults of coal fired installations, taking each type of boiler separately; it is proposed to deal with oil fired boilers collectively as it is found that the points which arise are common to all types.

A common and surprising mistake is the use of the wrong oil, and this we believe to be due to the fact that many of the suppliers' trade names for each grade are too alike and the public and heating engineer become confused, particularly between the kerosene and light fuel oil ranges.

We now come to the trouble which afflicts all boiler installations, solid and liquid fired, and which has been dealt with in solid fuel section, namely, excessive or lack of chimney draught.

As we have stated earlier, chimney draught should be measured beforehand, the boiler manufacturer consulted on his minimum and maximum requirements.

Most people will agree that an oil burner has to be serviced, and for servicing to be effectively carried out it is necessary to remove the burner. When wiring between the burner and the control box contractors will persist in either using pyrotenics or conduit, thus making it impossible to remove the burner without serious interference to the normal wiring. There is no reason why the last few feet of the wiring could not be carried out in flexible tubing.

Oil distribution companies have produced booklets and leaflets giving details as to the proper method of erecting a storage tank giving information as to the degree and direction of slope which it should be afforded and yet time after time tanks are erected sloping in the wrong direction and devoid of sludge cocks.

The absence of content gauges regularly leads to the embarrassing situation whereby an irate householder telephones to say that his burner is not working and the service engineer arrives to find an empty fuel tank.

The selection of the correct nozzle for the burner and the boiler is very necessary and when in doubt the advice of the burner representative should be sought.

If it is necessary for refractory work to be carried out in the boiler it does not pay to skimp either materials or workmanship; if so the refractory will collapse after a short period.

Though the writer has not experienced the following difficulty he has learned from those concerned with the sales and service of oil burners that they are constantly having to request installers to remove fire valves as they will insist on placing them at ground level, the coldest spot in the boiler house, and yet they should be at high level or a spot where there is liable

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DOI: 10.21427/D79X3F

from previous page

to be temperature build up in boiler house.

On some of the cheaper installations there has been of late a tendency to leave off oil control valves between the burner and the tank, surely this is cheeseparing carried to the extreme.

Irregular burning of vapourising and pot type burners is very often due to the fact that the heating engineer has forgotten to ensure that the boiler was levelled at all four corners.

Accelerators. — Now we come to what is practically the heart of the modern heating system, for if the pump, or as it is now known by its grandiose name, the accelerator, fails, the whole system fails.

At one time the designer had to accurately size his pump and pipe runs but fortunately or unfortunately the production of the variable head pump has simplified small bore heating even further.

The writer finds a great reluctance on behalf of contractors to fit a filter before the pump and if this were done it would eliminate many of the breakdowns caused to pumps in the early days of an installation due to the release of hammer scale, cuttings, jointing paste, etc., into the system.

HOWEVER, the most recurring offence when it comes to the fitting of pumps is not the neglect in fitting a filter, which is a matter of personal opinion, but the regularity with which one goes into a house in which there is a considerable amount of pump noise.

Pumps in themselves make practically no noise in themselves, at any rate insufficient to cause a nuisance. Pump noise is usually caused by vibration being transmitted through the pipes of the system or alternatively by a loose bracket near the pump.

If the pump is sitting directly on the floor or if the pipework is dipped on either side of the pump and the clips are not firm around the complete bearing surface, it is probable that a high noise level will result. Furthermore, if the pump is fitted on a horizontal main and there is a long length of unsupported pipe again we can expect pump noise.

We would suggest that a lot of this trouble could be overcome if either the pump is placed on a small rubber cushion or if, in the case of the brackets, a simple answer is to line them with a piece of rubber, or something which is readily available on a building site—a piece of roofing felt.

Radiators and Pipe Circuits. — As stated previously, the development of the variable head pump and the use of somewhat independable ready reckoners has resulted in the somewhat inaccurate sizing of both radiators and pipes and this is readily seen by the difference in heat transmission which is to be found from individual radiators on many installations.

THE practice of fitting non-return valves on radiators and balancing valves on circuits seems to have ceased on many modern installations, and yet if these had been fitted it is highly probable that the radiators and the circuits could have been properly balanced.

There would appear also to be a shortage of top brackets to judge by many installations, particularly on the extra long radiators, and while this does not affect the efficiency of the system to an observer it does represent a weakness.

It is also surprising the number of installations in which the radiators are incorrectly levelled, and even more so the number at which the air cock is at the wrong end.

Hot Water Cylinders.—Here we have a suggestion to offer regarding the siting of the cylinder, particularly in Bungalow Installations. It is usual on opening the hot press in a single storied house to find that the cylinder has had to be lifted about thirty inches from the ground, and that in the space under the cylinder the pump has been installed.

In the modern house the average ceiling height rarely exceeds eight feet, and for a 30 gallon cylinder we have already eliminated six feet of this space, if the top space is to be used as a clothes store. In addition to the foregoing most people will agree that to expect the housewife to store linens at a minimum height of six feet is somewhat ridiculous.

For most textiles, particularly linen and cotton, the average storage space above the cylinder is far too hot anyway, and instead of protecting materials it actually damages them.

IN view of the foregoing it is suggested that the cylinder should be placed at the very top of the hot press or alternatively carry the flow and return pipes up inside the linen cupboard and place the cylinder in the roof space. This latter method is quite common in Scotland and certain parts of England.

● Aeroflex duct liner

New duct liner

VAN den Bosch Ltd. (Europair House, Alexandra Road, Wimbledon, S.W.19), sole U.K. agents for Owens-Corning Fiberglas, announce the introduction of Owens-Corning Fiberglas Aeroflex duct liner, which is a thermal and acoustical insulation material with an extremely smooth surface, unusual toughness and high sound absorption characteristics.

Fiberglas Aeroflex duct liner is designed for use as a thermal or acoustical insulation for heating and cooling ducts operating at velocities up to 6,000 fpm. It has been tested at velocities up to 8,000 fpm without surface erosion and can be used at temperatures up to 250 degrees F.

Aeroflex duct liner is simple to install, being extremely light in weight, easy to handle and easy to cut. It is suitable for installation either by cutting pieces to fit the interior of the duct or it may be adhered to flat metal sheets and brake-formed with the metal.

The duct liner is available in 100 ft. rolls of 47½ ins. wide in thicknesses of ½ in. and 1 in. The product has a density of 1½ lbs. per cu. ft.

Conclusion.—It must be said the easiest thing in the world to do is to sit back and criticise other people's work and effort, and the writer would like it to be known that he appreciates that many of the shortcomings which have been discussed are not always due to carelessness or lack of knowledge but more to the shortage of first-class labour, and secondly, in many cases, due to the extreme competitiveness of the domestic heating trade.

However, the mistakes which have been mentioned are elementary and could easily be avoided and, as stated, earlier, the writer believes that if more attention could be given to them, many of the complaints and calls for after sales service could be eliminated.

In brief...

● THE first of a series of displays under the heading, "Heating Your Home," was held during the latter part of last month at the premises of R. J. McConnell & Co., Estate Agents, Rosemary St., Belfast. Each of the four fuels are being dealt with in turn and the first—oil—was organised in conjunction with Esso Petroleum Co. Ltd., and D. W. Stothers & Co. Ltd. Similar displays for gas, electricity and solid fuel will follow during the coming months.

* * *

● RCM (Air Distribution) Limited have announced revisions to the present price structure of all RCM fittings. Included is a reduction in price of 2½ per cent. on all RCM fittings, and a reduction in price of all extruded aluminium Deflecto grilles to make them equal to those of steel.

* * *

● A LOW voltage mercury switch thermostat— T-99 —specially designed for use on 24 volt systems for domestic or commercial heating, is now being marketed by Robert Maclaren & Co. Ltd. (Kilbirnie Street, Glasgow, C.5). The thermostat is fitted with variable heat anticipation and with night cut-off. The mercury switch operation is silent and the contacts are hermetically sealed.

industrial heating & ventilating IN IRELAND

WELDING ASSOCIATION PUBLICATION

THE Irish Welding Association has prepared a publication, "Safe Practices for Metal Arc Welding." The rules outlined in the new publication apply to the prevention of electric shock and the minimizing of certain associated hazards in arc welding.

The Association has also arranged a series of lectures and demonstrations throughout the country.

Coming Association events are: Certificate Presentation at the Building Centre (April 26); annual general meeting at the College of Technology, Bolton St., Dublin (April 29); and the annual dinner in the Shelbourne Hotel, Dublin (May 12).

* * *

USES OF PNEUMATIC CONTROLS

A FILM show and lecture was given to the Engineering and Scientific Association of Ireland last month by Mr. Chadderton (Chas. Warren & Co. Ltd., Dublin) under the heading "Pneumatic Controls."

The first of two films illustrated the application of pneumatic cylinders in various industries. For instance, among other applications, pneumatic controls were shown assisting in the production of Santon immersion heaters. This was followed by a talk given with the object of emphasising the main considerations to be made in applying pneumatic controls. A brief survey of air line installation, siting of filters, regulators and lubricators. Cylinders (single and double acting) were mentioned in more detail. Control valves and simple circuits were explained with a view to underlining that equipment of this type is quite versatile and adaptable.

The second film showed pneumatic control systems in operation at a car body factory.

FOR KING-SIZE STEAMPOWER
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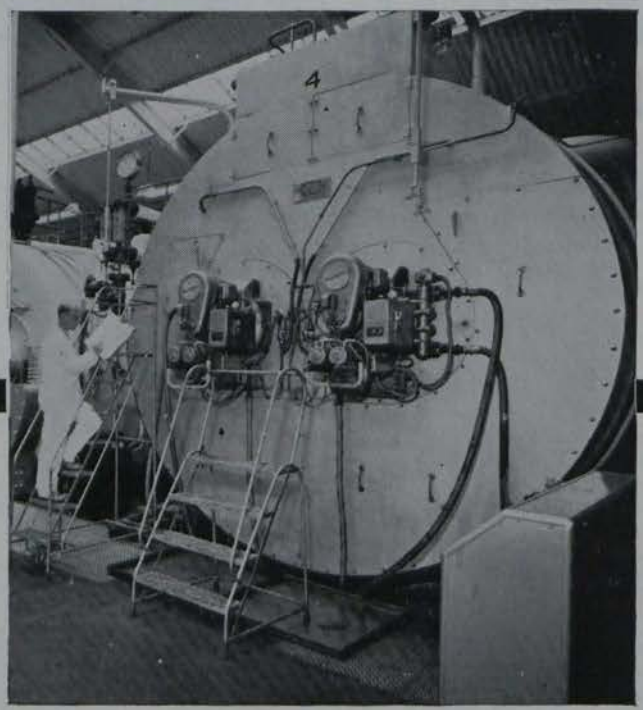
(up to 40,000 lb/hr!)



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JOHN THOMPSON GROUP

If you would like more proof of the sound economic value of Britain's best-selling package boiler—and of the superb Multipac Maintenance Service, write JOHN THOMPSON PACKAGE BOILER DIVISION, LILYBANK WORKS, LONDON ROAD, GLASGOW, E.1.

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MONTHLY SPECIAL REVIEW

1 CALORIFIERS AND CYLINDERS, PRESSURE VESSELS, TANKS.

The supply of calorifiers, tanks and pressure vessels

IRISH contractors are well served in so far as the supply of calorifiers, tanks and pressure vessels are concerned. A number of excellent foreign manufacturers are represented here and provide all the technical assistance necessary in making the correct choice of equipment.

The fact that many of the items required in this field fall into the category of "specials" and that the process of manufacture is not unduly complex, has induced a number of home manufacturers to enter this field. While these were no doubt initially assisted by tariff protection, continuous development has enabled quite a few firms to reach a high degree of competence and to look forward with equinanimity to the gradual removal of tariff restrictions.

Calorifiers form one of the most important items of the group. With the soaring prices of copper, they can also be one of the most expensive. This makes it essential to size them properly and utilize them efficiently. Being esentially heat exchangers, their operation depends on the principles of heat transfer, a notoriously tricky and unpredictable subject. The rate of heat transfer from the primary medium depends on the surface film resistances, more so than the resistance of the material. Surface resistance can be considerably reduced by increasing the velocity of the water passing across the surface and in the case of steam, by increasing the dryness fraction.

Reductions in surface resistance can only be affected to the inside surface of the battery for storage calorifiers, as there is as yet no method of making a considerable increase in outside surface velocity. However, in non-storage calorifiers the water turbulence can be increased by arranging the connections at top and bottom opposite ends of the calorifier. This can have a considerable effect on the heat transfer.

Batteries for horizontal calorifiers have generally a higher heat transfer per square foot than vertical calorifiers. Higher primary velocities in a horizontal calorifier battery are due to the required heating surface being available from longer but fewer coils; thus each coil carries a greater quantity of water at a higher velocity.

A further increase in battery output is achieved by using indented tubes. This does not increase the tube surface area in any way, but does have the effect of increasing transfer due to increased turbulance.

Tanks.—In industrial processes, the main use of tanks is for the storage of hot and cold water and for petroleum products. Other applications, such as the storage of acids, chemicals, potable liquids, etc., are frequently encountered. These usually require special design and the use of special materials, such as plastics, earthenware, stainless steel, etc. These are catered for by specialised manufacturers. In general, however, the tanks mostly encountered are of mild steel or cast iron.

Cast iron sectional tanks are widely used for the storage of water, condensate and slightly corrosive solutions. They are available in 2 feet, 3 feet or 4 feet square units, and may be bolted together to form any size of tank usually up to a maximum depth of 12 feet.

The plates are cast in grey iron in the foundry and the flanges machined square and true to ± 1/32". Pads for connections are cast on the plates and later drilled and tapped as required by the purchaser.

Pressed steel sectional tanks find much favour for the storage purpose. They are much lighter than their equivalent in cast iron, but need careful inside and outside treatment to prevent corrosion. Considerable advances have been made in recent years by the paint industry in providing protective finishes and this has no doubt helped to increase the use of steel tanks. Plate sizes are usually 4ft. square, but plates of 1 metric (3'—3⅛") are available for restricted spaces. As with cast-iron tanks, internal or external flanges can be used, the former being preferred where the tank is to be placed on a solid floor or where there is working space of less than 18" around the tank.

Welded storage tanks with dished ends are intended for the storage of oil and other liquids not corrosive to mild steel. Standard sizes and nominal capacities are laid down in BS.2594 : 1955 and BS.2654 : 1956.

Pressure Vessels.—Pressure vessels comprise a very wide range of equipment. Boilers, accumulators, air receivers, liquid gas containers, etc., all fall into this category. Since they constitute a hazard particular care is

Continued page thirty-three

THIS MONTH'S SPECIAL REVIEW ARTICLE WAS COMPILED BY TECHNICAL EXPERT MICHAEL J. WALSH.

https://arrow.tudublin.ie/bsn/vol4/iss12/1
DOI: 10.21427/D79X3F

Dublin Show by Elliott Automation

ELLIOTT-Automation has organised an exhibition of Instrumentation, Control and Automation Equipment at the Montrose Hotel, Dublin, from March 30 to 1st April next. The exhibition will illustrate the contribution which automation can make to the country's rapidly expanding industrial economy.

In addition to the display of equipment, there will be films and papers during the afternoon session illustrating various aspects of automation. The general public will be able to visit the exhibition from 10 a.m. until 12.30 p.m.

Although, in the space available, only a small selection of the Company's comprehensive range of automation equipment can be shown, the display will include Farris, Gordon and Continental valves; load cells; Londex relays and timers; Satchwell heating, ventilation and air conditioning controls; quality control instrumentation; Gravitrol and Rotameter equipment; control consoles, recorders and electrical test sets. Models of Elliott computers which are used in a wide range of industrial, scientific and business applications, will also be on show.

The papers to be given will cover automation in the food industry, applications of electrical weighbridges and the use of temperature controllers in a variety of applications. The films will deal with subjects ranging from computers to sugar processing and from cocoa handling to fluid control valves.

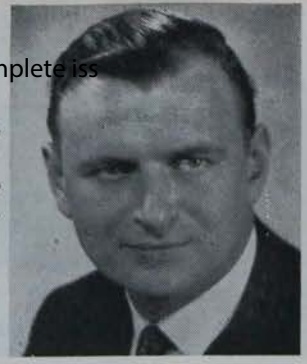
SPECIAL REVIEW

from page thirty-one

necessary in their manufacture and installation. Various British Standard Specifications lay down stringent requirements for their manufacture and a test certificate and regular inspection by a competent engineer is required by the Factories Acts.

The design of these vessels requires specialised knowledge and is best left to a competent manufacturer. The purchaser's responsibility lies in ensuring that no pressure vessel is used above its design pressure, that the vessel is well maintained and that safety [illegible] efficiently.

● Mr. N. P. Whelehan who has, with Mr. M. T. Liddy (right), been promoted to Executive Director of H. R. Holfeld Ltd.



RECENT promotions announced by H. R. Holfeld Ltd., of Stillorgan, Co. Dublin, are Mr. N. P. Whelan, B.E., as Executive Director for their Engineering Dept., and Mr. M. T. Liddy, as Executive Director for their Pump Department. The Company's mechanical and engineering sections have recently supplied two Steambloc packaged boilers to Chemici Teo and Jefferson Smurfit Ltd. in addition to those already supplied to Irish Industry including the Irish Sugar Co. their pump section have recently supplied Holfeld pumps to the new offices of the Irish Sugar Co., Aer Lingus and the Irish Transport and General Workers Union (Liberty Hall).

Building Services Engineering, Vol. 4 [1964], Iss. 12, Art. 1
https://arrow.tudublin.ie/bsn/vol4/iss12/1
DOI: 10.21427/D79X3F

MONTHLY SPECIAL REVIEW

2 REFRACTORIES—We begin here the first of a series of articles by special correspondent M. Morris on this important subject.

The need for super duty refractories in industry

THE continuous trend in furnace work is towards higher outputs, higher temperatures and more severe operating conditions. But, unless something is done about the refractories, the rise in maintenance costs can be steep enough to annul the gains due to increased efficiency, and shut-downs can wipe out the gains due to higher output. However, a furnace with high maintenance costs usually has high fuel costs also, for it does much of its work with the refractories in bad condition.

The solution to this dilemma is obviously the use of refractories which will stand up to the higher duty. In fact it is the rapid improvement in refractories that has made modern furnace design possible. These super-duty refractories require extraordinary care in manufacture and are consequently more expensive, but in any furnace that is at all hard driven they quickly save their cost.

UNFORTUNATELY we have not in this country a firm with the means of manufacturing refractories for super-duty furnace building. Super-duty refractories are usually thought of in the form of squares and shapes, kiln-fired during manufacture. One of the types most common to this country is of Morgan Refractories Ltd. manufacture.

This company has developed a range of mouldable and castable refractories that can be fired in situ and yet have a performance comparable to that of the best super duty prefixed refractories. This is the Tri Mor range. With these refractories it is possible to obtain the advantages of monolithic construction (in freedom of design, efficiency in shape and so forth), combined with a performance in terms of long life and low maintenance.

Tri-Mor mouldable and castable refractories have found their way into every industry that uses a furnace, an oven or kiln. The use of castable refractories gives the furnace designer complete freedom to design a furnace, oven or kiln exactly as he wishes without restriction.

The most generally useful of these refractories is Tri-Mor standard castable. Small furnaces and some sections of larger units can readily be cast in situ using a simple form of anchoring for greater stability. Special shapes are cast separately, using simple woollen formers. Refractory linings and shapes can be taken into service 24 hours after casting. Another factor in the use of castable refractories is the by-passing of delays incurred by having to wait for pre-fired special shapes to be made and delivered. It also eliminates the alternative of having to hold large stocks of such shapes.

REFRACTORY castables are concretes designed to withstand high temperatures. Instead of using gravel or crushed rock as aggregate, refractory castables use a material which is stable at high temperature and which

from previous page

is capable of withstanding fluctuations in temperature without disintegration. These materials are referred to as grogs and can be Calcined Fireclay, Sillimanite, Bausite, Fused Alumina, or, in the case of insulating castables, Porous Fireclay.

The grogs are blended with a suitable binder to give setting properties similar to those of ordinary structural concrete, i.e., through chemical action between water and the binder ceramic bond is formed when the refractory is subjected to high temperatures. No one refractory castable is suitable for all conditions and a full range of castables is designed to meet most industrial furnace conditions.

The Tri-Mor is specially developed for conditions where there is a relatively high degree of mechanical damage in service, such as in boiler ash hoppers, furnace hearths, and kiln wickets. It has a limiting service temperature of 1,250° C. The standard castable is a material most suitable for operating at temperatures up to 1,350° C. It is an excellent general purpose castable and has very good resistance to thermal shock. It is suitable for precasting or casting in situ and can be used for lining furnace flues, boiler baffles, furnace doors, and covers, truck tops, burner blocks and complete furnace linings.

We have only briefly mentioned in this article refractories that are not prefired. In later editions we will discuss what structural refractory bricks and mortars mean to furnace building and industry in general.

Refractory protection for domestic boilers

AN answer to the question of providing refractory protection for domestic boilers is provided in the simple process of fitting a P-4 combustion chamber.

The P-4 combustion chamber is manufactured in Sweden by B. Palm & Co. AB, the Swedish largest burner manufacturers. This combustion chamber is cast in one piece, the vibratory treatment before the burning process ensures for the maximum density, giving great durability and capability of being subjected to high temperatures without deterioration. The P-4 combustion chamber is scientifically designed, the deep walls and rounded corners ensure minimum resistance to flame and flame pattern, and yet contain the flame within its own volume, thus preventing any possibility of flame impingement on any part of the boiler surface.

The P-4 combustion chamber, because of its method of fixing, is quickly and easily removed from the boiler, thus greatly facilitating the cleaning of the combustion chamber.

It is also the ideal solution to your conversion problems, where the size of the combustion chamber does not allow for a brick-lining to be incorporated, easy fixed, simple to install.

The P-4 combustion chamber makes dual firing possible by using the Electro-Oil Sesam double door. Capacity of the P-4 combustion chamber, 0.5 gph. to 0.75 gph.

Agents for Ireland: Irco Trading Comp. Ltd., 9, Eden Quay, Dublin, 1.

trade Topics

FOR LARGE AIR FLOW BUILDINGS

A NEW self-contained air conditioning unit suitable for buildings where large air flows are necessary, is being introduced to this country by Reznor Nesbitt, a division of ITT Industries Ltd. (Connaught House, Aldwych, London, W.C.2).

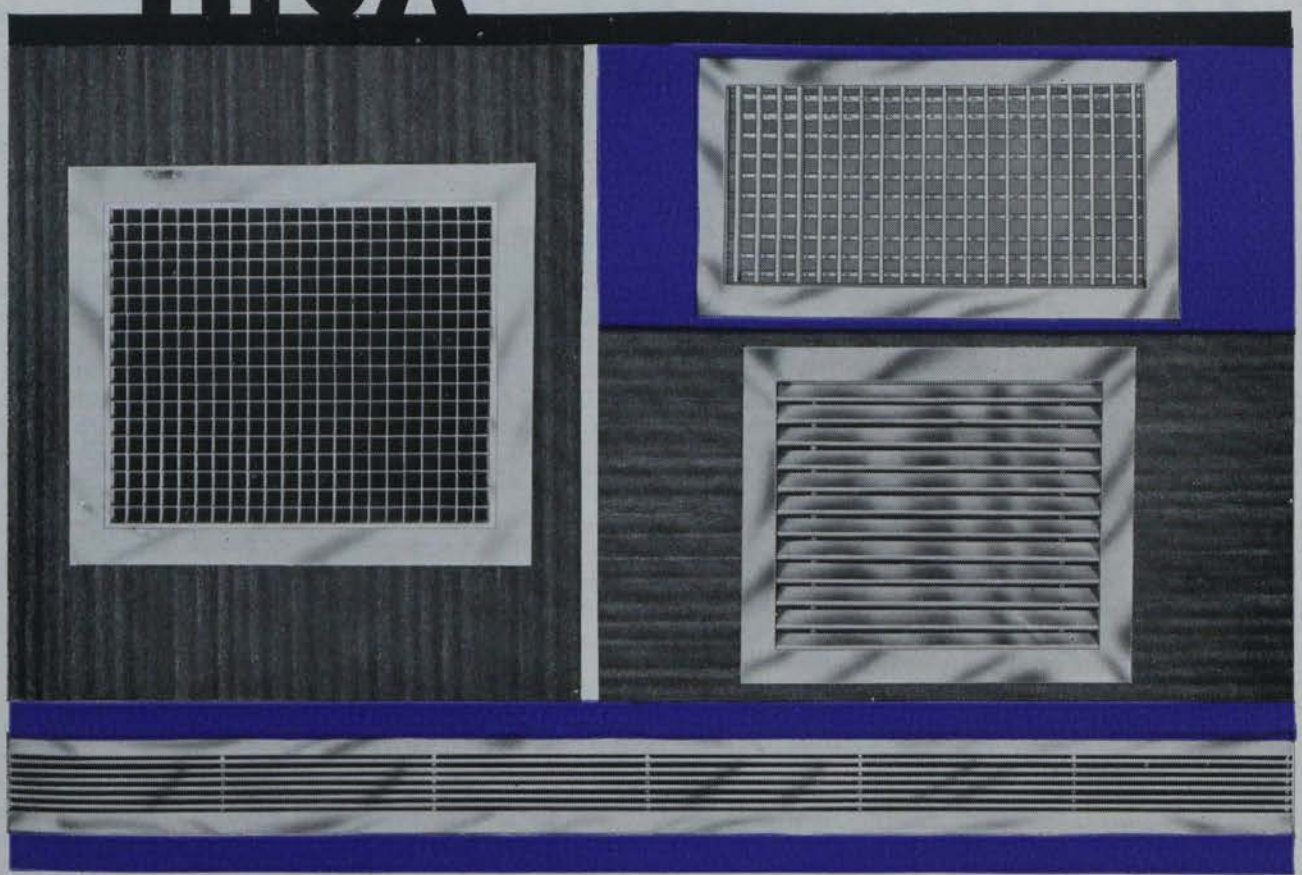
The unit is the Centracon and it is available in 13 basic sizes. However, the essence of the Centracon design is its versatility, for it can be built up from modular components to any specifications required. Therefore, it provides complete flexibility for a wide range of heating, ventilating and air-conditioning applications.

There are two basic Centracon models—Series M and Series G. The M is a multi-purpose complete air condition unit, the G is a a general purpose heating and ventilating unit supplying tempered make-up air for industrial exhaust ventilation or heated ventilated air for occupied spaces.

The Centracon's heating capacities range, according to basic size of the unit, from 30,000 to 4,500,000 B.t.u./hr., 1,000 to 55,000 c.f.m. Cooling capacities are 2 to 285 tons, 1,000 to 33,000 c.f.m.

https://arrow.tudublin.ie/bsn/vol4/iss12/1
DOI: 10.21427/D79X3F

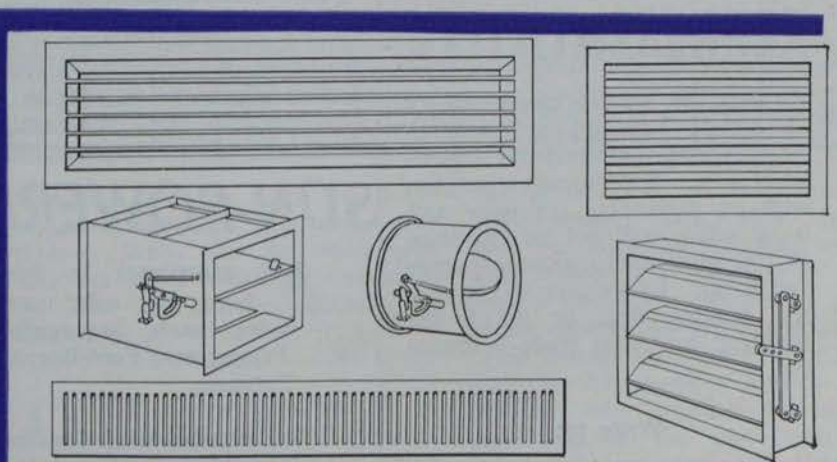
TROX *air distribution equipment*



EXTRUDED ALUMINIUM GRILLES
WITH SECRET FASTENING

Manufactured from solid extrusions, TROX high quality aluminium registers and grilles feature the unique TROX secret fastening device. Their fine finish and elegant design enhance the architectural merit of any modern building, while their performance versatility enables the most critical air distribution requirements to be fulfilled.

Every item in the comprehensive range of TROX equipment is a well designed, high quality product. TROX technical facilities are available to offer recommendations for all special requirements.



TROX

TROX BROTHERS LTD 238-240 Bethnal Green Road, London, E 2

Agents for Ireland: W. Finucane & Co. 5 Upper Pembroke St., Dublin Tel: 63634

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Heating Costs

from previous page

88% for 65 degree heating, i.e., 12% of the heating load for maintaining a temperature of 65 degrees falling outside the normal heating season. In comparing with a low pressure hot water installation operating over the heating season, October to mid May inclusive, a correctional factor of .88 is applied to the consumption based over the whole year with the result that the figure is reduced to an equivalent of 880 hours at full load representing an annual consumption of 44,000 units for the usual heating season as compared with the figure of 50,000 units for the whole year.

The question of the provision of heating outside the normal heating season is a matter of interest as the Office Act stipulates a mandatory minimum temperature of 63 degrees

Continued page forty-two

Seasonal correction factor table

	Installation Temp.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.
Sept.	45	—	—	13	32	61	82	95	100	100	100	100	100
	50	—	3	15	33	55	74	90	98	100	100	100	100
	55	1	7	19	35	54	71	86	95	99	100	100	100
	60	3	10	22	37	53	68	82	91	96	98	99	100
	65	5	13	24	37	51	64	77	86	92	96	97	100
	70	6	14	24	36	49	61	72	82	89	93	97	100
Oct.	45	100	—	13	32	61	82	95	100	100	100	100	100
	50	100	3	15	33	55	74	90	98	100	100	100	100
	55	100	6	18	35	53	70	85	95	99	100	100	100
	60	100	8	20	34	50	65	79	89	94	96	96	98
	65	100	8	20	32	46	60	72	82	88	91	94	96
	70	100	8	19	31	44	56	63	77	83	88	91	95
Nov.	45	100	100	13	32	61	82	95	100	100	100	100	100
	50	100	100	12	30	52	72	88	95	100	100	100	100
	55	95	100	13	29	48	65	80	89	93	93	93	93
	60	91	100	12	27	43	58	72	81	87	89	89	90
	65	92	100	12	25	38	52	65	74	80	84	86	88
	70	92	100	11	23	36	48	59	69	75	80	83	87
Dec.	45	100	100	100	20	48	70	87	100	100	100	100	100
	50	86	89	100	18	41	60	76	84	86	86	86	86
	55	82	88	100	16	35	52	68	77	81	81	81	81
	60	80	88	100	15	31	46	60	70	75	77	77	78
	65	81	89	100	13	27	41	53	63	69	73	74	77
	70	82	90	100	12	25	37	48	58	65	69	73	76
Jan.	45	73	73	85	100	29	52	68	73	73	73	73	73
	50	68	71	83	100	22	42	58	66	68	68	68	68
	55	66	72	84	100	19	36	51	60	65	65	65	65
	60	67	75	86	100	16	32	45	55	60	62	63	65
	65	68	75	86	100	14	28	40	50	56	60	61	64
	70	70	78	84	100	13	25	37	46	53	58	61	64

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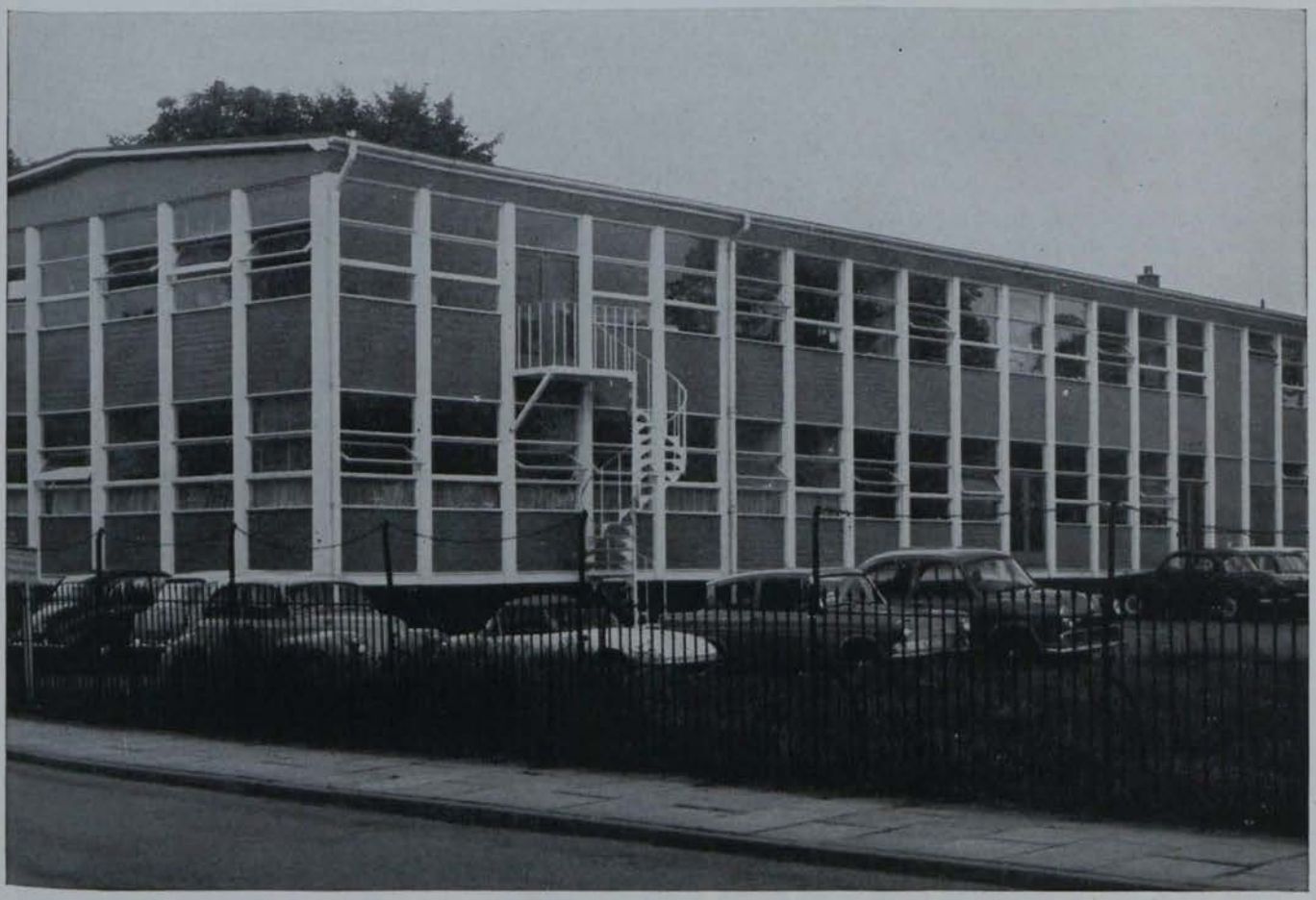
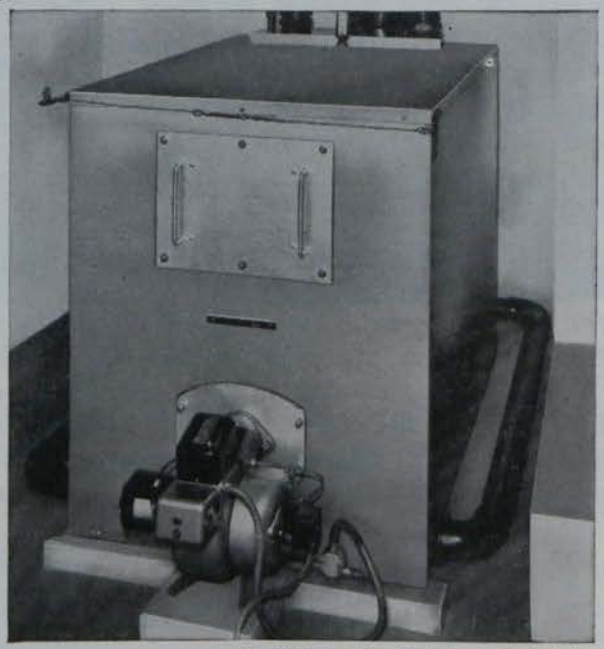
DOI: 10.21427/D79X3F



How Somerset County Council heated 20% more space for less money with a choice of fuels

A replacement boiler to heat 20% more space by either oil or automatic solid fuel firing at no extra cost and compact enough to get through a narrow doorway. This was the complex order the engineers at the Somerset County Architects Department handed to Allied Ironfounders in 1961. It was something even the huge Allied range of industrial boilers could not supply. So Allied built a new boiler. Installed in the County Architect's newly enlarged office, the 690,000 Btu/hr prototype not only heated the extra space but used 150 gallons less fuel than its predecessor during the bitter cold of the 1962/3 season. This boiler can be converted easily to automatically stoked solid fuel and arrived on site in three sections each less than 26" wide. From it Allied have developed the Allied GP range with ratings from 690,000 Btus to 1,200,000 Btus. Somerset C.C. have now installed these boilers in four other buildings and Wiltshire C.C. are following suit. Allied were called in because their experience, research facilities and production capacity are unique. If you need a new boiler or advice on any heating problem get in touch with Allied Ironfounders Ltd., Industrial Heating Division at Cadbury Road, Sunbury-on-Thames, Middlesex. Tel: Sunbury-on-Thames 5577.



The original Allied GP boiler as installed at Somerset C.C. Architects Dept by Fisher & Sons Ltd Taunton

INDUSTRIAL BOILERS ARE MADE BY **ALLIED IRONFOUNDERS**

Allied Ironfounders Ltd Industrial Heating Division Cadbury Road Sunbury-on-Thames Middlesex Tel: Sunbury 5577

BELFAST OFFICE: M A Graham Esq 20 Bedford Street Belfast 2 Telephone: 29087

one hour after occupation irrespective of season, a requirement which is a practical impossibility with a normal L.P.H.W. system unless means are provided for operating the plant as and when required throughout the year.

THE length of the heating season varies in practice according to weather conditions and is normally from mid September to mid May, a period of 34 weeks. It is noted, however, that following an unduly early cold spell at the end of the summer in 1952, it was found necessary to commence heating on the 6th September, and in 1963 the late spring and unseasonable temperatures necessitated the continuance of heating until the 6th June.

HEATING COSTS

from page forty

The "hour degree" method of calculating average load gave estimates of electricity consumption which were substantiated by actual usage provided that the loading was sufficient for satisfactory performance, and use is still made of this system, introduced over 35 years ago.

IN the case of underloading, which was prevalent in early electrical designs, the figure estimated was considerably exceeded in practice. Overloading seldom occurred. The calculations were based on the full difference between outside and inside temperature, and made no allowance for the fact that inside temperatures in unheated buildings are higher than the prevailing outside temperature due to solar gain together with occupational and random heat gain from lighting and other electrical appliances. In practice the over estimation due to these factors was offset by the commercial variation of the control system from theoretical requirements, and in any case, the heat gains were small as lighting intensities were low by present standards, little use was made of electrically operated equipment, and fenestration was smaller than with modern buildings.

IN the early 1930's the degree day system of load calculation was originated in America by the Gas industry, and subsequently introduced into England by Dufton, when in 1934 he produced a contoured map showing the degree days for the British Isles based on the difference between the day mean temperature and 60 degrees Fahrenheit multiplied by the number of days that the average temperature is below 60 degrees, this temperature being adopted allowing for a 5 degrees additional rise inside the building due to heat gain. It is noted that the figure indicated for Dublin was 4,000 degree days per annum. The degree day based on average temperatures rather than hourly temperatures was more applicable to the performance of L.P.H.W. installations with their relatively large thermal capacity and resultant time lag in control than to electric systems with a rapid response for which the hour degree system was more accurate. The degree day, being based on the average temperature during the heating season, was also more applicable to the heavy structure of contemporary buildings with a large thermal capacity than to modern buildings of light construction with quicker response for which the hour degree system is theoretically more appropriate. The Ministry of Works adapted the degree day system to continuous heating with a reduction in internal temperature of 10 degrees at night and at week-ends, and also alternative figures were calculated for day heating only, thus introducing the operational time element which was an inherent part of the hour degree system.

(To be continued).

A NEW APPROACH TO WARM AIR DUCTING

Fibreglass Prefabricated Ducting is built and insulated in one operation. It's a rigid slab (available ready grooved for certain standard sizes) or preformed circular duct, with an attractive outer surface of aluminium foil. On-site operations are cut to one simple assembly, so installation costs are considerably reduced. Thermal insulation and sound attenuation properties are excellent.
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trade Topics

THE LEESTAT indicating temperature controller is a recent introduction from ARIC Ltd.

NEW ARIC TEMPERATURE CONTROLLER

It is a simple robust control unit, incorporating clear temperature indication and switch setting positions, negligible pointer detent when the switch is operated, and close switch differential.

There is a wide field of operation, ranging from—110° to + 660° F, and from −80° to + 350° Centrigrade. Accuracy is within 1% of the range.

Stainless steel, brass or monel bulbs in four sizes are use, according to the range of temperature required. A robust bellows expansion unit is fitted which has ample reserve power to drive the switch mechanism direct.

The measuring system is a liquid filled thermometer which depends on cubical expansion of the liquid to develop pressure to operate the indicating and control mechanism. The bellows expansion unit converts the liquid forces into a mechanical force, yet stills maintains low locked up pressures in the system. All systems are fully compensated for head temperature variations and fully compensated systems are used for capillary lengths over 40ft. Irish office: ARIC (Ireland) Ltd.

* * *

A RANGE of centrifugal and bifurcated axial flow fans manufactured almost entirely from polypropylene has been introduced by Turner & Brown Ltd., engineers in plastics (Gibraltar Street, Bolton). Specially designed for use hospitals, laboratories and chemical plants, the fans are resistant to corrosive fumes and moist gases at temperatures up to 100°C. The new models are based on the well-known Turbro Cyclone P.V.C. Fans.

NEW FAN RANGE INTRODUCED

The range of centrifugal fans is particularly well suited for installation in all types of fume extraction plant and for laboratory ventilation. Nine sizes are available with capacities up to 16,000 c.f.m. and the fans will supply against static pressures of up to 3 in. s.w.g. The bifurcated axial flow fan unit is produced in five sizes with outputs of up to 10,580 c.f.m. Compact in size and designed for installation at any angle, they are especially useful where space is limited. Aerofoil cross-section blades provide maximum performance with non-overloading characteristics and make the fan particularly suitable for operation against moderate resistance.

* * *

TEMPERATURE Ltd. have introduced two new systems of large-scale air conditioning.

NEW AIR CONDITIONING SYSTEMS

The Versatemp system gives the occupant of each room in a building absolute control of his own environment. The basis of the system is a piped water circuit, incorporated in the building structure, to which all units are connected in parallel. The water temperature in this circuit is automatically maintained at a constant 75 degrees F. by a cooling tower (normally mounted on the roof) and a boiler/calorifier assembly which may be mounted in the basement or on the roof.

If a Versatemp conditioner (33in. wide, 30in. high and 12in. deep) is warming the room, it will extract heat from the water and transfer the heat to the stream of filtered air which is being constantly blown through the conditioner into the room. If a conditioner is cooling, it will extract heat from the room air and transfer it to the water.

This is accomplished by the Temkon Reclaim heat system which makes practical use of the wide range of temperature influences on any single building. Heat exchangers can be fitted in "hot" areas of the building, such as kitchens, machine rooms, etc., and the heat extracted fed into the reclaim water circuit.

Many of the advantages of the Versatemp system are also inherent in the Incremental perimeter system, in that it allows individual control of room conditioning throughout the year.

The owner of a building can choose air conditioning for all of his building, yet have it installed, in increments, a suite, a floor or a wing at a time. It can be installed for full air conditioning or for heating and air filtering only. Irish agents are L. Sterne & Co. (I.) Ltd.

https://arrow.tudublin.ie/bsn/vol4/iss12/1
DOI: 10.21427/D79X3F

Published by Irish Trade and Technical Publications Ltd., Callaghan Chambers, 13-15 Dame St., Dublin, 2.
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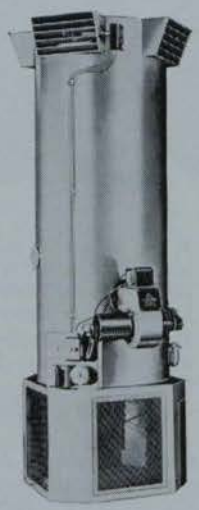
THE SUPERMATIC WALL-FLAME BOILER

The Supermatic Oil-Fired Wall-Flame Boiler is the most effective and the most economic central heating system available today. With more than 18 models to choose from, with capacities from 44,000 BTUs to 300,000 BTUs, the Supermatic range is the largest in Europe today.

Supermatic Industrial Warm Air Heater

Incorporating the patented Supermatic Wall-Flame boiler, the Supermatic Industrial Warm Air heater is designed to warm premises from 55,000 to 220,000 cu. ft. with a heat output from 250,000 BTU/hr to 1,000,000 BTU/hr.



THE SUPERMATIC HOT WATER CONVECTOR

New improved cabinet styling to an advanced hot water convector system. Designed to convect a constant flow of heated water at uniform temperature and even pressure. Heat output range from 5,000 BTUs to 60,000 BTUs.

THE GYRO-JET BOILER

An attractively designed fully automatic, fan assisted boiler unit for most domestic capacities. Exceptional silence in operation is obtained from the gyro-mounted pak burner. Heat output up to 50,000 BTUs.

SUPERMATIC WARM AIR AND DOMESTIC HOT WATER UNIT

A completely packaged heating system which can be installed into new or existing houses, the Supermatic has the wall-flame boiler unit, and was designed to be operated with ducted air home-heating while providing warm air and, in the summer, fresh air throughout the house.

THE SUPERMATIC GYRO-JET AIR HEATER AND HOT WATER UNIT

A complete packaged heating system—can be delivered ready to install into new or existing premises. Once the oil burner is ignited the entire operation of air heating becomes automatic and includes thermostatic control of selected temperatures. A boiler unit, incorporated, supplies abundant hot water for most domestic needs. Heat output capacity 50,000 BTUs to 60,000 BTUs.

THE SUPERMATIC AIR CONDITIONER

A completely new design, the wonderfully versatile Supermatic Air Conditioner acts as both cooler and space heater.

SUPERMATIC SKIRTING RADIATOR

A slim, elegant, unobtrusive skirting radiator system designed to operate with any central heating boiler. The Supermatic skirting radiator makes maximum use of the heat from the boiler to heat a home.

You would like to know **all** about the exciting Supermatic range—of course you would! Then write* today for full details.

*Or better still, why not drop in—we'll be pleased to see you.

PERRY HEATING APPLIANCES LIMITED,
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DOI: 10.21427/D79X3F