

3-1-1965

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

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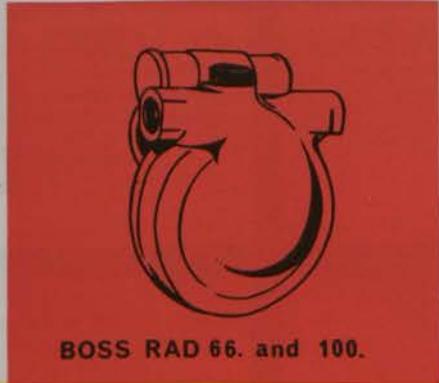
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ENGINEER



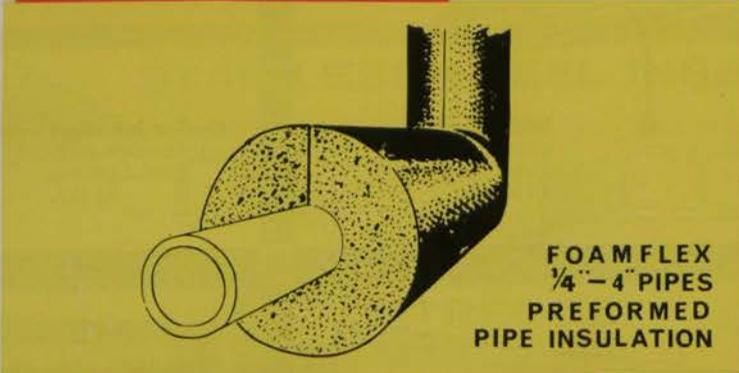
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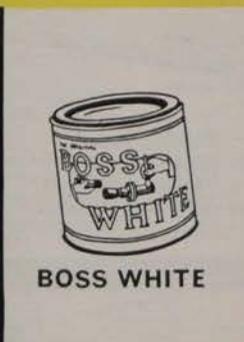


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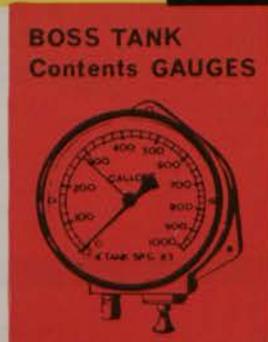


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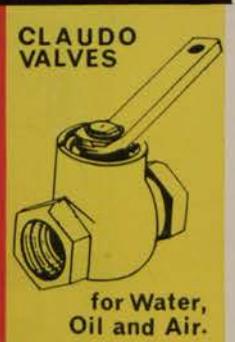
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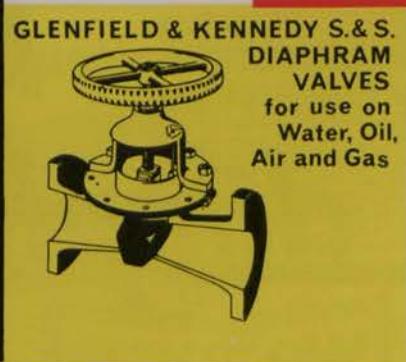


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Contents GAUGES

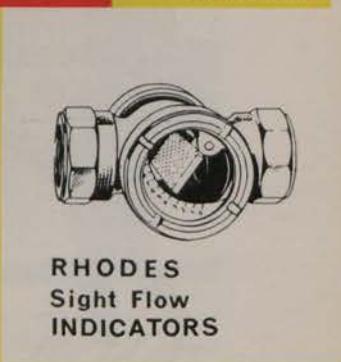


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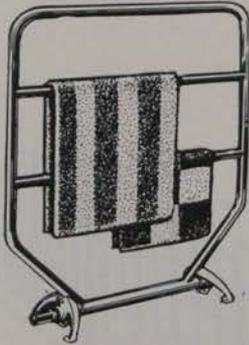


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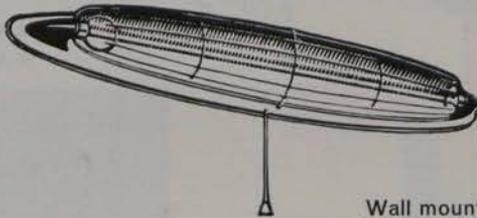
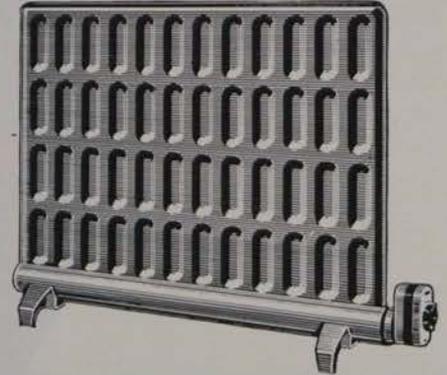
RHODES
Sight Flow
INDICATORS

HOME HEATING BY DIMPLEX



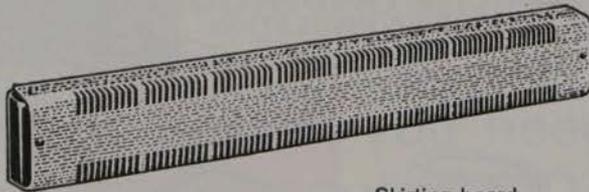
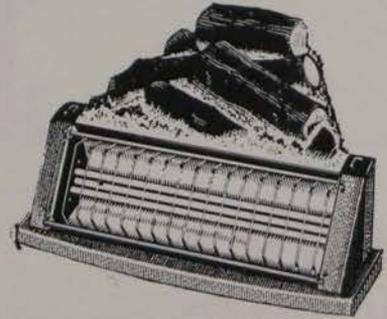
Permanently oil-filled electric towel rails. Loadings from 90 to 200 watts.

Permanently oil-filled thermostatically controlled electric radiators. Loadings from 300 watts to 2 kW.

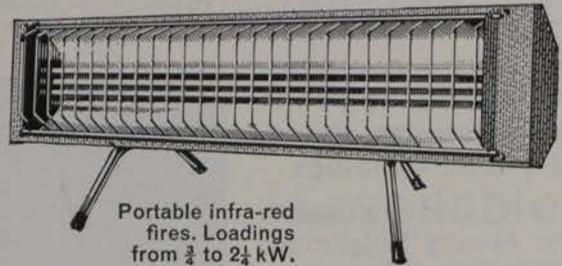


Wall mounted infra-red heaters. Loadings $\frac{3}{4}$ and 1 kW.

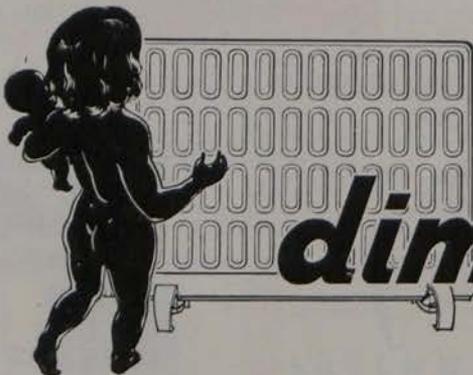
Coal or log effect infra-red hearth fires. Loading $2\frac{1}{4}$ kW.



Skirting board style convector heaters. Loadings 300 and 500 watts.



Portable infra-red fires. Loadings from $\frac{3}{4}$ to $2\frac{1}{4}$ kW.

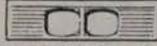
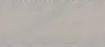
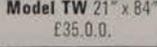
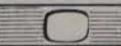
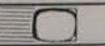


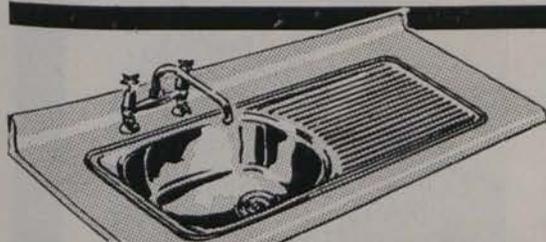
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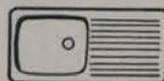
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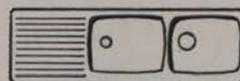
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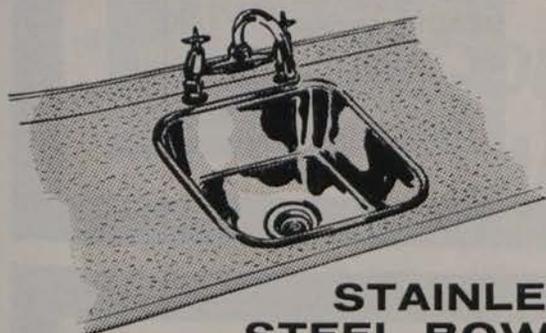
STAINLESS STEEL INSET SINKS



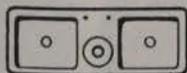
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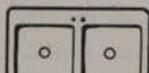
STAINLESS STEEL BOWLS



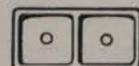
Model XOX 16½" x 45½"
£32.0.0.



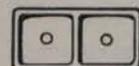
Model X 18" x 16" x 7" deep
£7.10.0.



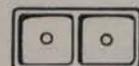
Model WXX 31" x 21" x 7" deep
£17.0.0.



Model WZZ 19" x 35" x 7" deep
£18.10.0.



Model XX 31" x 18" x 7" deep
£15.10.0.

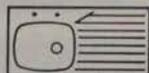


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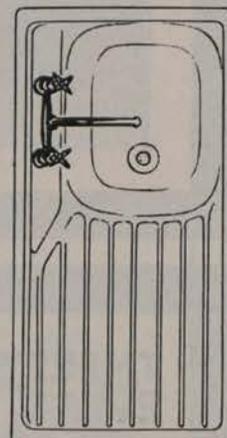
Model VN
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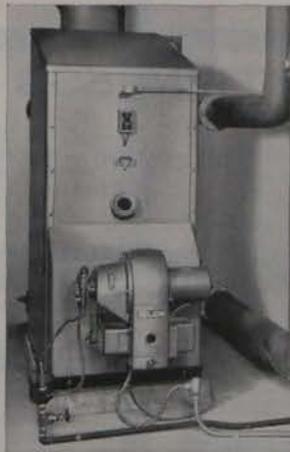
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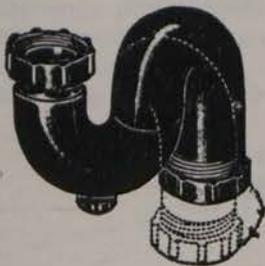
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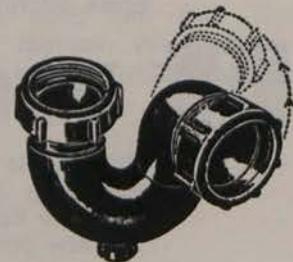
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Orthodox Shape!
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NEW Wallflame 75

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

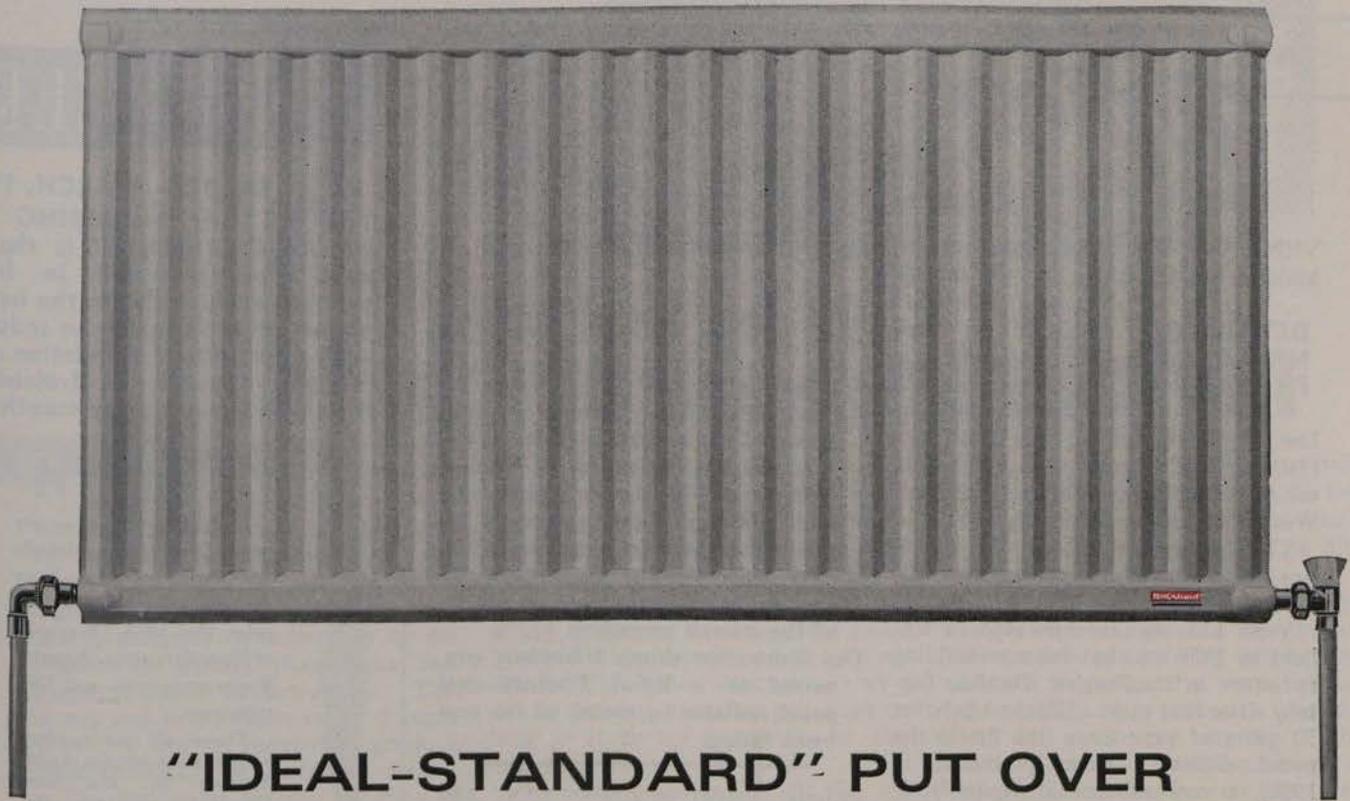
This simple dependable burner for the smaller installation enjoys evergreen popularity. This year we give it an up-to-the-minute look with a restyled casing similar to the popular Wallflame range. The new price is attractive, too, at **£67 retail**.

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



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

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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.

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FOR FULL DETAILS WRITE TO THE RADIATOR PEOPLE:—



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

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THE LEADERS IN HEATING AND SANITARY EQUIPMENT



trade Topics

VEHA Ltd., who will commence the building of a factory for the manu-

DETAILS OF NEW RAD FACTORY

facture 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.

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 Vention 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



● 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 Mee-

anite oil fired boilers, which are sold through a network of 16 representatives covering three 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.

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 Vention range.

* * *

THE Bell Type D high output back boiler unit has been designed to suit

VERSATILE BELL BACK BOILER

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.

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 exceptionally 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.

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.

●

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 Callaghan Chambers, 13/15
 Dame Street, Dublin 2.
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the 7 deadly sins of domestic installation

PART TEN



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 combustion.



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 ex-

ample, 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 is 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.

The Irish Plumbing and Heating Engineer.

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.

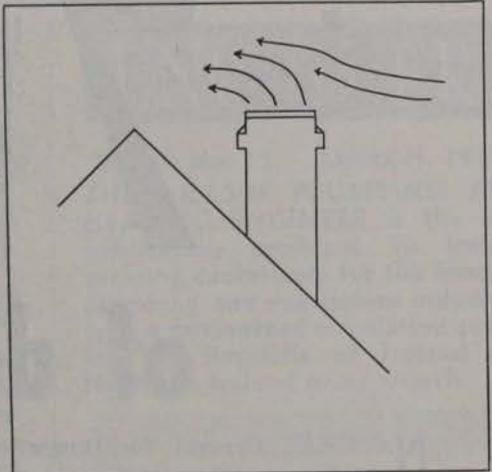
Wind influence can adversely affect draught under several different sets of conditions. **Figure 2** illustrates various conditions. Since winds tend to follow ground contours, an air stream may strike a flue terminal at a downward angle because it has been following a downward path. Nearby trees or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

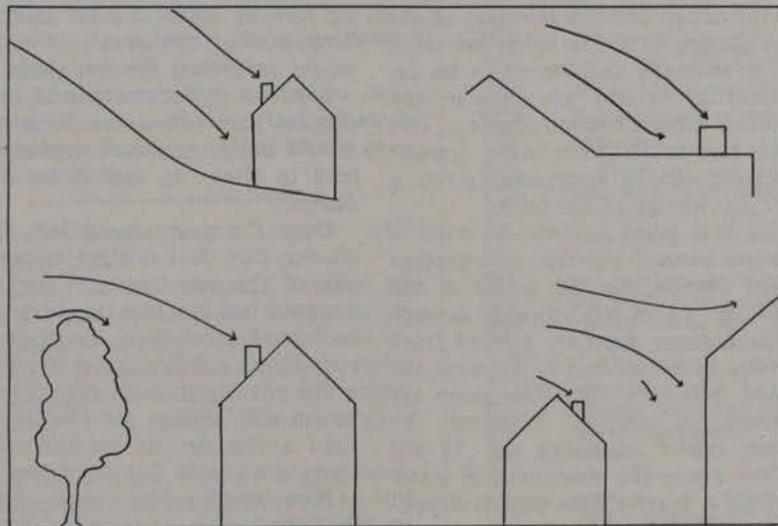
Seven deadly sins of domestic installation

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 ("Hot-springs" 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 repellent 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. G. J. Connick.

Instantaneous HOT WATER from steam—without storage

Cox Steam and Water Mixers deliver from 50 to 24,000 gallons per hour.

They operate with the highest efficiency at all pressures. Silent, efficient, compact and easy to install, replacing bulky and costly calorifiers.

MODELS:

- ★ (1) BABY COX (½") for wash-basins, sinks, etc.
- ★ (2) JUNIOR COX 1—5 (¾"—2") for process work, vats and general purposes.
- ★ (3) SENIOR COX (2½"—8") for large volumes of hot water for process hot water supplies.

NO TIME LAG - NO STORAGE - NO STEAM TRAPS
NO LOSS OF CONDENSATION - NO MOVING PARTS TO GO WRONG

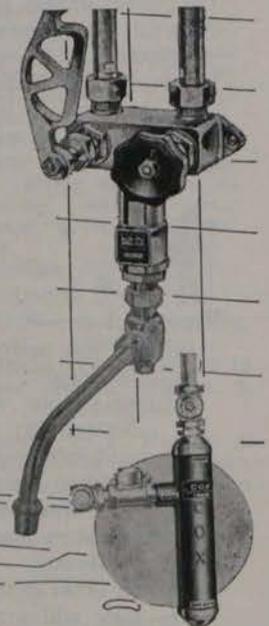
COX WATER HEATERS

Manufactured by COX ENGINEERING CO. LTD.
Dept. IP.16, 14 Park Lane, Sheffield 10.

Tel.: 62483. Telegrams: "Heaters Sheffield"

Agents:

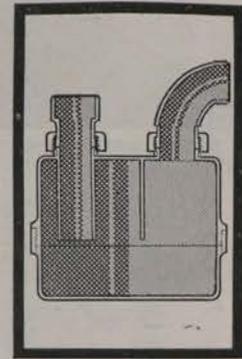
Halpin & Hayward Ltd., Unity Buildings, 16-17 Lower O'Connell St., DUBLIN. Tel. 43270.
Bedford Buildings, 7 Bedford St., BELFAST. Tel. 26343.



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.



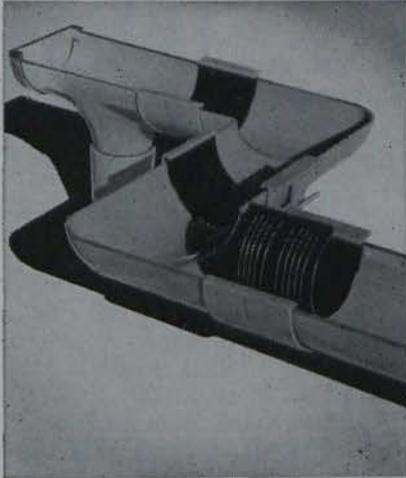
VULCATHENE CORROSION RESISTANT PLUMBING BY ALLIED IRONFOUNDERS



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**

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

MANY IMPROVEMENTS AND NEW DEVELOPMENTS IN MATERIALS

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 modi-

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).**

fied 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 fittings. 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.).

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.

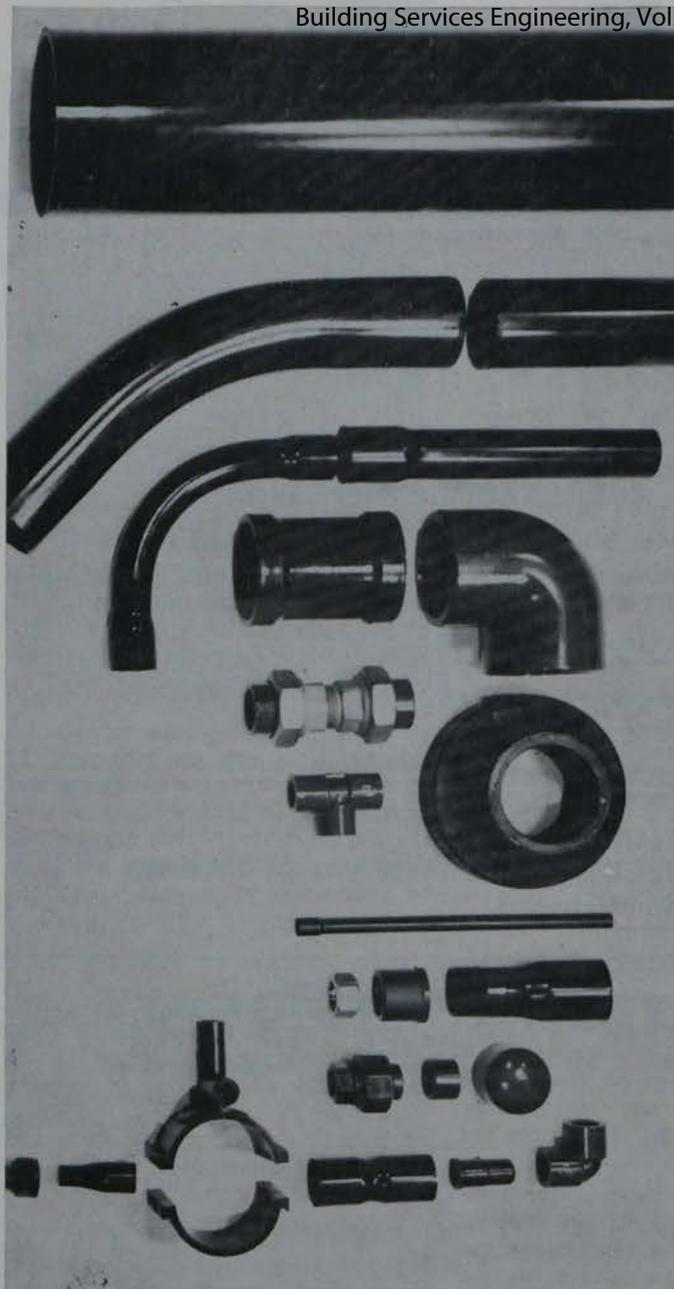
Continued overleaf

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.

Eleven



And how much would these save you?

Just a few items from Wavin's cold-water systems in Hard PVC. In all bores from $\frac{1}{2}$ inch upwards (to 12 inches, if you need!) Lighter and cheaper than copper. Full range of precision-made couplings, bends, joints, inlets and what-have-you. All fit together in seconds with a dab of cement.

Full details from your local stockist or Wavin Pipes Limited



Wavin Pipes Ltd., Balbriggan, Co. Dublin. Tel. 212260 (5 lines)

WAVIN Hard PVC Plumbing / for cold water plumbing!

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

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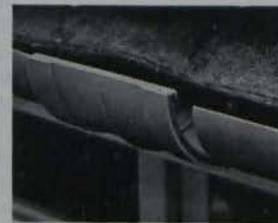
(Acrylonitrile Butadiene Styrene) waste goods, and glassfibre water systems available in 10, 25, 30, 40 and 70 gallon sizes.

* * *

AS A logical development to its established Series Ten range of rain-water 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.



**How much is this
costing you?**

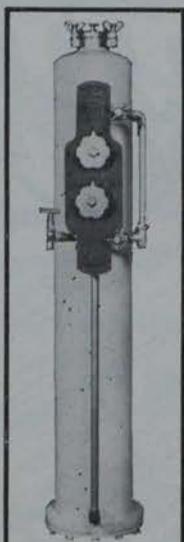
In time? In labour costs? In trouble and mess? Maybe you didn't know that you can replace the whole shebang with a hacksaw and a tin of Wavin cement—making a greater profit in the process? Take a look at the opposite page.

wavin

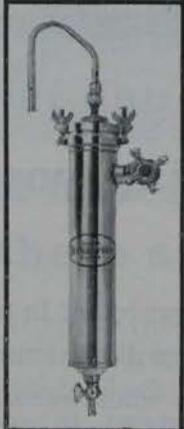
WAVIN Hard PVC Piping / for progressive plumbers!

More and more
house-owners want
softened water...
...and filtered water
—so specify
these
BERKEFELD
models

There's a special pleasure in using soft water. The best softeners for all domestic needs are British Berkefeld Mains Softeners filled with 'Amberlite', an extremely high capacity resin, and (most important this) coated inside with plastic for protection against salt corrosion, thus making them 'long-life' models. Easy to instal and maintain. In mild steel with cream cellulose finish. Capacities 650-2,500 gals. between regenerations. Price from £50. ▶



Whenever there's the least doubt about the water supply, a Berkefeld Sterasyl filter is needed. It is the only type fitted with the unique Sterasyl candle, which not only traps water-borne disease germs, but destroys them. Pattern HN (illustrated) is in brass chromium plated, complete with taps and fittings £7.10.0. ▶



Industrial models of both water softeners and filters also available.

MODERN WATER TREATMENT CALLS FOR

BERKEFELD

British Berkefeld Filters Ltd.

Dept. 244, Cannon Lane, Tonbridge,
Kent, England · Tel: 2255

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 fireside.

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 Bonnavet 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.

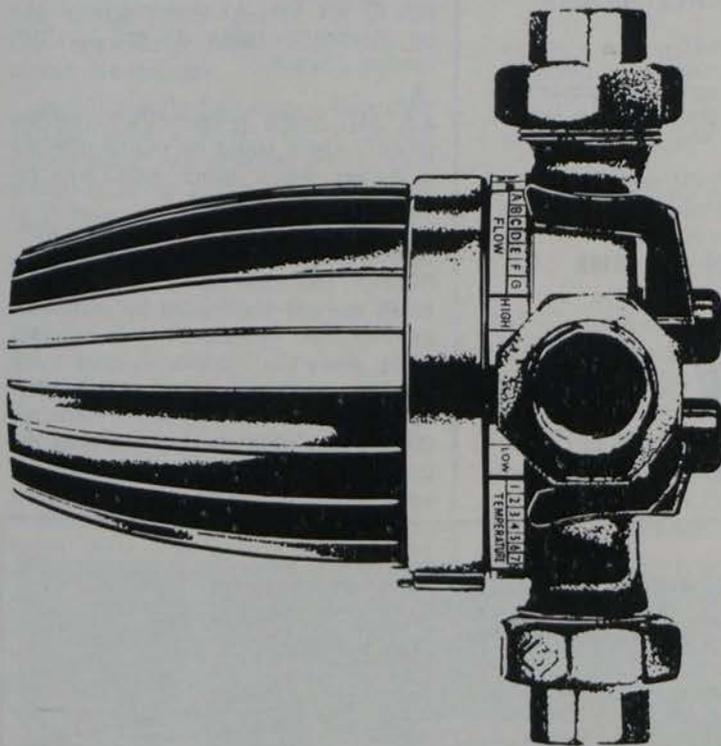
Turning to less frivolous matters, Lawrence Wright points out that all

Continued page sixteen.



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

Moneyspinners!



MONEY

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.



New Silentflo

Multiflo

Thermoflo

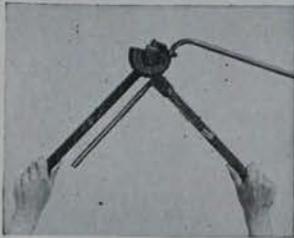
International

BOILERS AND RADIATORS LTD

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 Park House 22 Park Street Croydon Surrey Tel: Municipal 3581-5

PORTABLE TUBE BENDERS



LIGHTWEIGHT BENDING TOOLS

Types GL. O and GL. Minor

Compact machines to produce good quality sets, compound bends, etc., in non-ferrous tube. Robustly built, they can be carried in tool bag and are particularly suitable for small bore heating and similar types of installation.

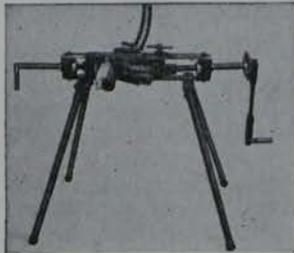
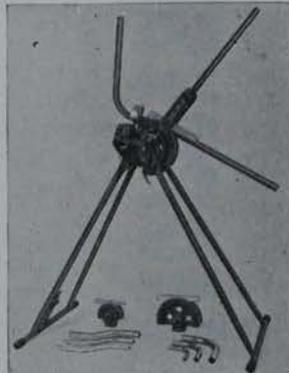
CAPACITY: GL. O— $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ " dia. copper tube.
GL. Minor— $\frac{1}{4}$ " and $\frac{3}{8}$ " dia. copper tube.

FOLDING STAND MODELS

Types GL. 2B and GL. 3B

The original and most efficient portable benders made for bending light gauge copper tube. Require no fixing or bolting down and produce good quality bends, cold and unfilled, to exact measurement on standard radii.

CAPACITY: GL. 2B— $\frac{1}{4}$ ", $\frac{3}{8}$ " and 1" dia. copper tube.
GL. 3B— $\frac{1}{4}$ ", $\frac{3}{8}$ ", 1", $1\frac{1}{4}$ " and $1\frac{1}{2}$ " dia. copper tube.



EASY-WORK RATCHET BENDER

Type RP. 5B

A machine of new design with a rotary bending action through a powerful ratchet operated screw. Completely portable, produces good quality bends speedily, accurately and with minimum of manual effort.

CAPACITY: $\frac{1}{2}$ " to 2" dia. copper tube.
 $\frac{1}{2}$ " to $1\frac{1}{2}$ " o.d. conduit.
 $\frac{1}{2}$ " to 1" nom. bore gas and steam.

SEE OUR PERMANENT EXHIBITION AT THE BUILDING CENTRE OF IRELAND, DUBLIN.

FIRST MADE



FINEST MADE

For details of range of hand-operated, hydraulic and motorised machines handling up to 8" dia. tube, apply to local stockist or write to:—
Dept. F, HILMOR LTD. (Sales and Service), CAXTON WAY, STEVENAGE, HERTS.

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,

FLUED CONVECTOR CEVE 2150 OIL HEATING UNIT

- ★ Heat output 8,000 to 28,000 Btu/h.
- ★ Generates efficient heat throughout the house
- ★ The heater is rigidly constructed in sheet steel with wipe-clean vitreous enamel finish. Stainless steel burner guaranteed for 10 years.

Enquiries to Irish Agents:

ORBIT SALES LTD.

10, South Circular Rd., Dublin Telephone: 71655.



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.

IDEAL RAD RANGE IS EXPANDED

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 $\frac{3}{4}$, 1 and $1\frac{1}{4}$ Kilowatts and are permanently sealed.

from previous page

the patent had been demolished in a law suit."

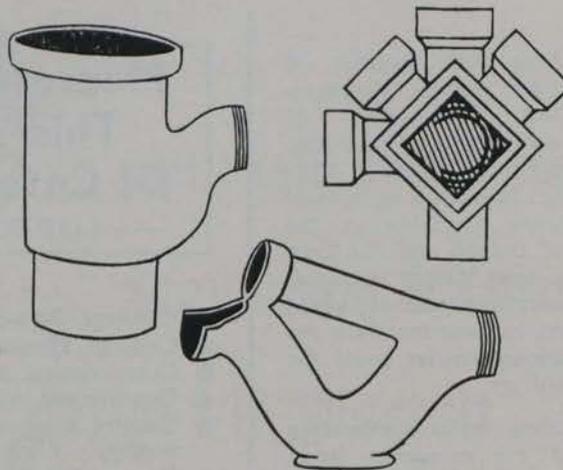
The first attempt at a thermostat was bi-metallic rods which the American Elisha Foote put in his stoves. On expanding these automatically closed the draught.

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 perturbed 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.

time proved pipe and fittings



Time has proved that vitrified clay is the one material that will retain its properties indefinitely. Many alternatives have been tested and have failed. But over the years vitrified clay pipe and fittings have unfailingly resisted the effects of sulphuric acid and all other chemical, corrosive and abrasive attacks. It is unsurpassed for mechanical strength. At our factory there is a long tradition in the manufacturing of vitrified clay sewer pipe and fittings, a tradition which has helped to supply top quality materials for Sewerage schemes, large or small, all over Ireland. We are the only manufacturers of the complete range of sewer pipe and fittings in the Republic.

Available at all leading Builders Providers and Hardware Merchants.

Write to-day for our catalogue and price list.



FLEMINGS' FIRECLAYS LTD.

Manufacturers of Vitrified Clay Sewer Pipe and Fittings
The Swan, Athy, Co. Kildare. Telephone: Wolfhill 3.

WILSON HARTNELL

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

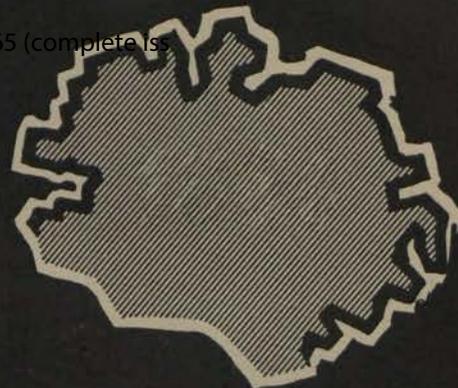
Please Check This List Of Categories

— 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
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- Gauges, Tank
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- Grit Arresters
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- Heaters, Balanced Flue
- Heaters, Gas
- Heaters, Immersion
- Heaters, Oil
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et al.: The Irish Plumbing and Heating Engineer, March 1965 (complete iss

Northern Ireland monthly review



Time
for a shower

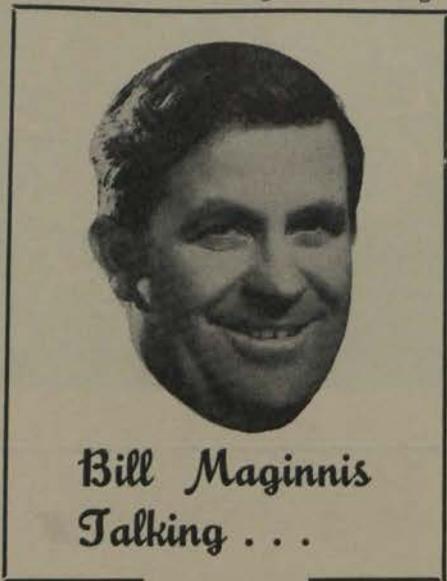
the new Leonard thermostatic shower

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.

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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



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.



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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 prepared 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 regrettably 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

Twenty-one

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 5½ inches in height by 4¾ 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 Croweller & Co. of Cheltenham were hosts at a cocktail party,

WALKER CROWELLER RECEPTION

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 Croweller Technical Representative.

* * *

WHITE-RODGERS Limited (75, South Western Road, Twickenham, Middlesex), the

NEW VALVE FOR THE "BIG JOBS"

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 automatically 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

● 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.

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.

* * *

A NUMBER of changes have been announced by Universal Asbestos Manufacturing Co. Ltd. of Watford in their range of Aspect

IMPROVED ASPECT RW RANGE

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.

* * *

OSMA Plastics Limited, manufacturers of the world's first "hot-pressed" glassfibre

B.W.A. APPROVE CISTERNS

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.

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 pyrotomics 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.

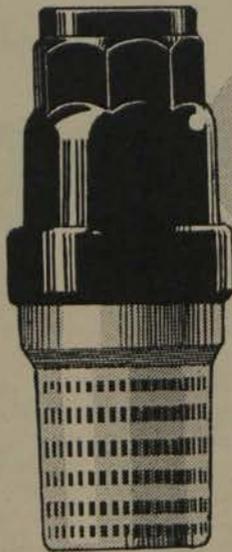
Oil distribution companies have produced booklets and leaflets giving details as to the proper method of erecting a storage tank giving information as to the degree and direction of slope which it should be afforded and yet time after time tanks are erected sloping in the wrong direction and devoid of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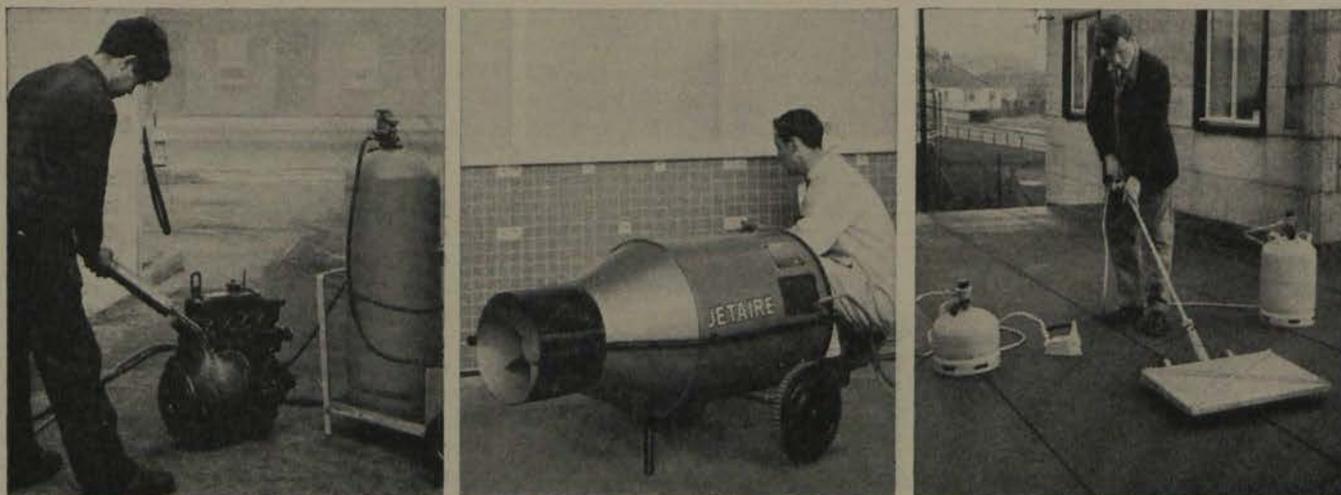
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from previous page

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 independent 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 Fibreglas, announce the introduction of Owens-Corning Fibreglas Aeroflex duct liner, which is a thermal and acoustical insulation material with an extremely smooth surface, unusual toughness and high sound absorption characteristics.

Fibreglas 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.

Kosangas and the Roofing Industry

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Insulated BITUMEN BOILERS in sizes from 9 to 40 gallons, complete with thermometer and immersed drain-off cock.

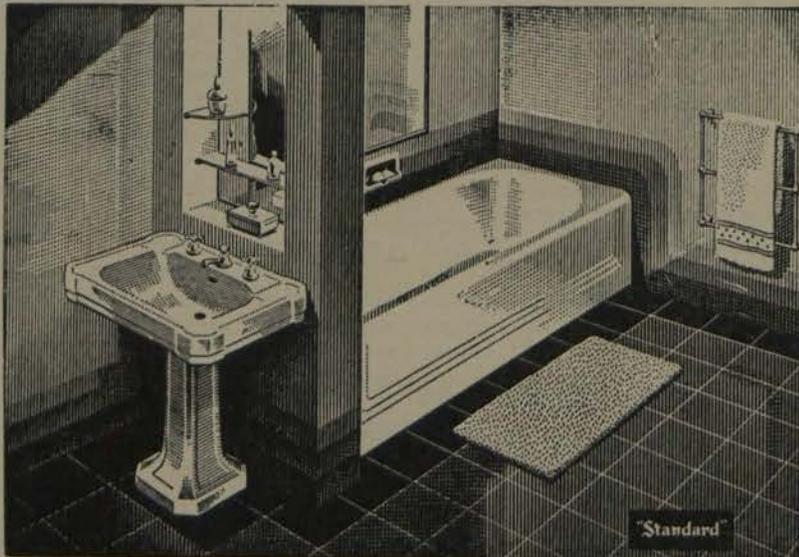
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THE Irish Welding Association has prepared a publication, "Safe Practices for Metal Arc Welding." The **WELDING ASSOCIATION PUBLICATION** rules outlined in the new publication apply to the prevention of electric shock and the minimizing of certain 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).

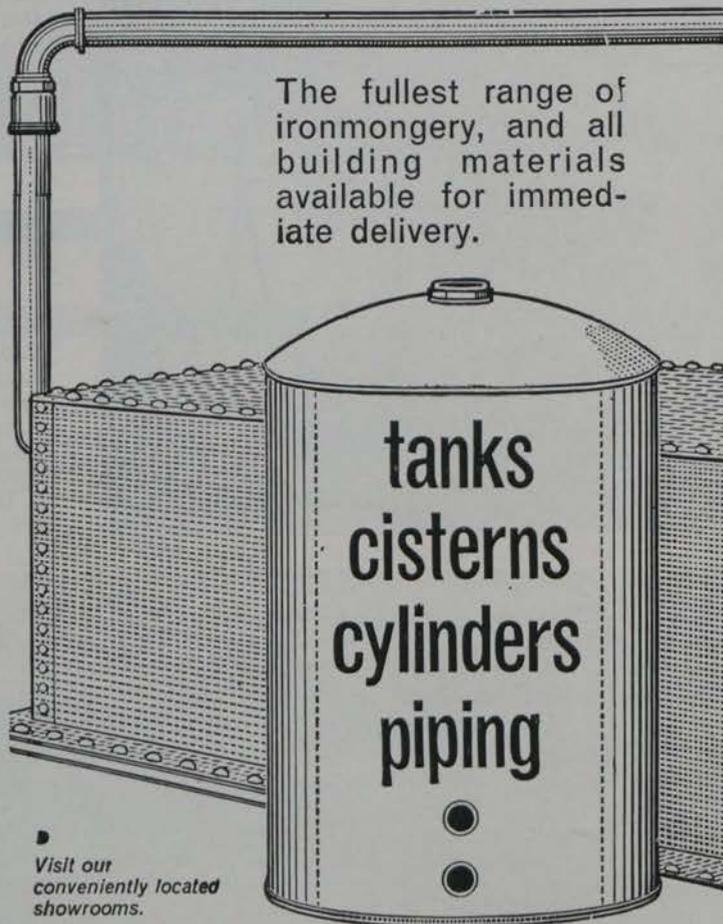
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A FILM show and lecture was given to the Engineering and Scientific Association of Ireland last month by Mr. Chadderton (Chas. Warren & Co. Ltd., Dublin)

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 emphasizing 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.



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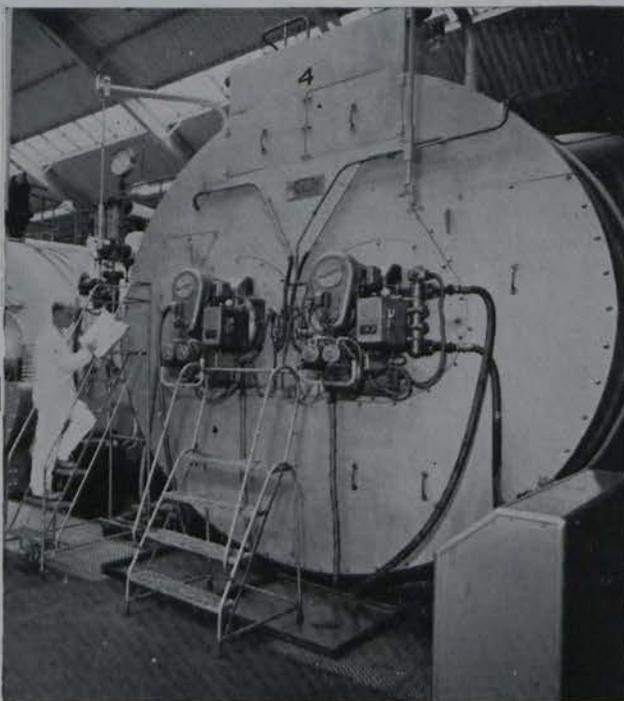
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ARROW

Twenty-seven

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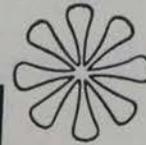
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Yes, we have almost every size of cast iron heating boiler you need . . . in stock . . .

and STEEL COLUMN RADIATORS, too

(phone Jimmy — he can maybe get them out same day) in all sizes and number of sections.

Telephone 693940 and 693943. Telegrams Quadrant Dublin.

QUADRANT ENGINEERS

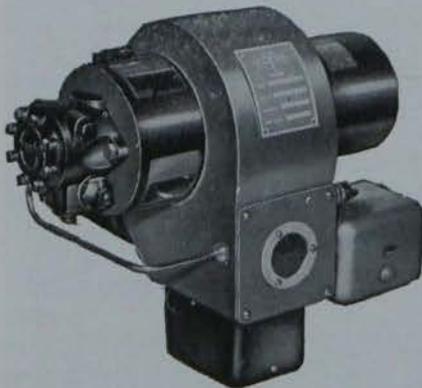
167 STRAND ROAD, MERRION GATES, SANDYMOUNT, DUBLIN 4.



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CLYDE

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Clyde Fuel Systems manufacture a wide range of light oil burners for converting boilers from solid fuel. Illustrated is model 'Junior' which can be easily and quickly installed.

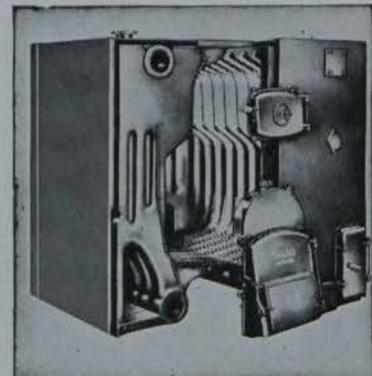
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Clyde "TASSO" cast-iron sectional boilers are available for solid fuel, oil, or mechanical stoker firing with operating efficiencies of approximately 80%. Suitable for central heating and hot water systems with ratings from 60,000 to 2,575,000 B.T.U.'s per hour.

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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 equanimity 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 essentially 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 turbulence.

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 $\pm 1/32"$. 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 ($3'-3\frac{1}{8}"$) 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



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

Continued page thirty-three

Thirty-one

WATER STORAGE

the
ASBESTOS
way



No water storage problems
if you instal Asbestos
Cement tanks. Strong,
light and economically
priced Asbestos Cement
tanks cannot rust
or corrode and
require no maintenance.

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Asbestos

Grosvenor

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.

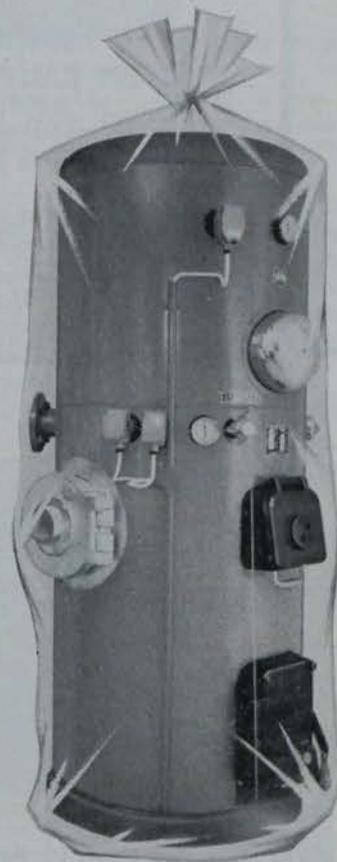
The design of these vessels requires specialised knowledge and is best left to a competent manufacturer. The purchaser's responsibility lies in ensuring that no pressure vessel is used above its design pressure, that the vessel is well maintained and that it is operated efficiently.



● 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).



Package deal

Hoval send complete boiler installation—you fit it and forget it!

From the moment of delivery Hoval make boiler installation fast and easy for you. All fittings arrive together, from one maker—Hoval. So there's only one set of paperwork to deal with. *The calorifier is contained within the boiler!* Installation can take as little as one day! Hoval guarantee all parts of their boilers, and once you've fitted a Hoval, you forget it. Your customers will soon be asking about the Hoval's 20% saving or more in running costs and greater heat capacity. Why not anticipate them?

There are 2 ranges of Hoval Boilers. TKS (80,000—2,000,000 BTU's/hr) which can burn oil or gas—also solid fuel or combustible waste in an emergency.

TKD (400,000—4,000,000 BTU's/hr) with pressurised combustion and high efficiency. All boilers are of welded steel and compact for their capacity, actually contain the calorifier and are offered with fully automatic controls. Heating only boilers are also available. Fast delivery of all models.

Our technical advisory service is ready to assist you. Send for illustrated literature to:-

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79, O'Connell Street, Limerick.
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All boilers are manufactured at:-

Hoval

The Farrar Boilerworks Limited,
Newark-on-Trent, Notts.

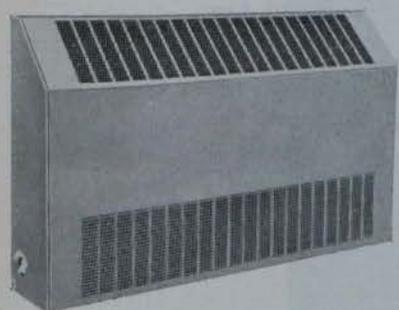
Thirty-three



Here are five good reasons for specifying Biddle Heating Equipment

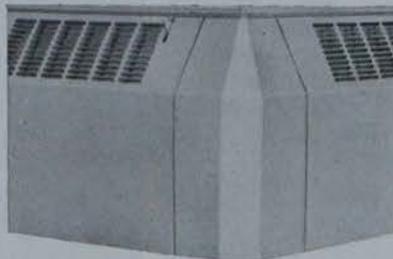
(write in and you can have
plenty more)

forceflo



Trim - Elegant - Quiet . . . a guaranteed noise rating criteria under any conditions. When you have sound level problems specify Forceflo, because Forceflo is the only unit tested through all audible frequencies. There is a wide variety of sizes, outputs (up to 62,000 Btu/h) and designs: free-standing, concealed, remote and ceiling mounted. Standard Forceflo is 28" high. Other heights are in production and readily available for all applications.

warmline



Warmline is a highly efficient and adaptable method of heating ideally suited to modern building design. Warmline skirts the perimeter of a room to supply unobtrusive warmth. Three heights (12½", 16½", 20½") are available, offering a high heat emission per foot run . . . inexpensively! Heat is distributed evenly over the run so that partitioning can be erected anywhere without interfering with output. A damper can be provided in each panel length for individual control. Warmline is available in two styles, both smart and neat in appearance. Easy to install and maintain. Warmline is perfect for long straight runs and fits smoothly around corners.

As one of the largest and most progressive organisations in the fields of heating, cooling, ventilating and air-conditioning in the United Kingdom, spreading warmth and goodwill is a Biddle tradition. They have made their presence felt in the comfortable conditions prevailing in many of the world's largest and most famous structures. Coventry Cathedral, Shell Centre South Bank, London Airport, Royal Festival Hall, Vickers House, The British Museum, The Old Bailey and The Queen Elizabeth II Hospital, Welwyn Garden City, are just a few of the buildings in the U.K. where Biddle installations are in operation. The wide experience and resources of the Biddle organisation are combined with imagination. Research and Development Engineers are continuously engaged in projects designed to meet the needs of modern industrial and commercial building for the best heating and ventilating equipment.

Your heating problems of tomorrow could be solved by a call to Biddle today.

Literature giving details of construction and dimensions is available from our offices or representatives.

uniflow



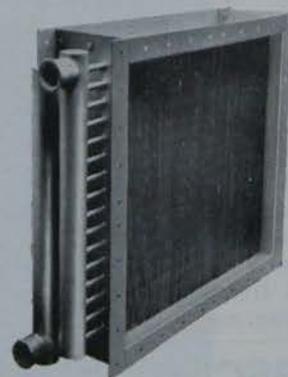
The modern styling and recognised efficiency of Biddle Uniflow Unit Heaters has made them a popular choice for many new factories and industrial organisations. Uniflows are available as horizontal or vertical discharge units for use with low, medium and high pressure hot water, low or high pressure steam. The horizontal unit is ideal for creating a flow of warm air along exposed walls, into narrow aisles and blanketing large doorways. The vertical unit is particularly useful in projecting heat downward, regardless of obstacles which may impede the airflow from a horizontal unit. Uniflows are available for direct attachment to ductwork where a positive supply of outside air is required.

vectair



Vectairs are the last word in convection heating. Available as floor, wall, recessed and semi-concealed units. These outstanding convectors have heating elements that are unique in construction: the plate fins and tubes are mechanically bonded, metal to metal, ensuring the most permanent and efficient heat transfer yet made. Vectairs are available in a comprehensive range of sizes for hot water or steam systems—conventional or small bore. Installation is simple and the clean design harmonises with every decor.

coils



Standardised Biddle Coils have been designed to meet all the requirements of modern air heating and cooling equipment. These coils are of welded construction and are tested to 400 p.s.i.g. air under water for a working pressure of 200 p.s.i.g. for special applications. Over 60 fin and tube combinations are available in standard casings ranging from 12" x 12" x 1 row to 25 ft² nominal face area by 8 rows deep.

Biddle Standardised Coils are available in four main types suitable for use with the normal heating and cooling mediums.

Forceflo and Uniflow both now available from stock in Ireland.

AGENT FOR EIRE:

Thermal (Ireland) Ltd., 85 Lower Baggot Street, Dublin 2. Dublin 61237.

AGENT FOR NORTHERN IRELAND:

Samuel Stewart (Thermal Engineering) Ltd., 26 Neills Hill Park, Belfast 5. Belfast 655759

F. H. BIDDLE LTD. 16 Upper Grosvenor Street, London, W.1. (HYDe Park 0532-9).

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DOI: 10.21427/D79X3F

biddle



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

MORRIS

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Works: 126, James' Street, Dublin.

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 pre-casting 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 pre-fired. 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, be-

cause 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.



A NEW self-contained air conditioning unit suitable for buildings where large air flows are

FOR LARGE AIR FLOW BUILDINGS

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 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.

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Domestic and Industrial. Swedish elegance and efficiency. Competitive prices, did you try?

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Light and Heavy oil. Swedish ingenuity, simple construction. Low priced, low maintenance costs.

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Outstanding P-4 combustion pot for easy conversion to oil, robust and cheap.

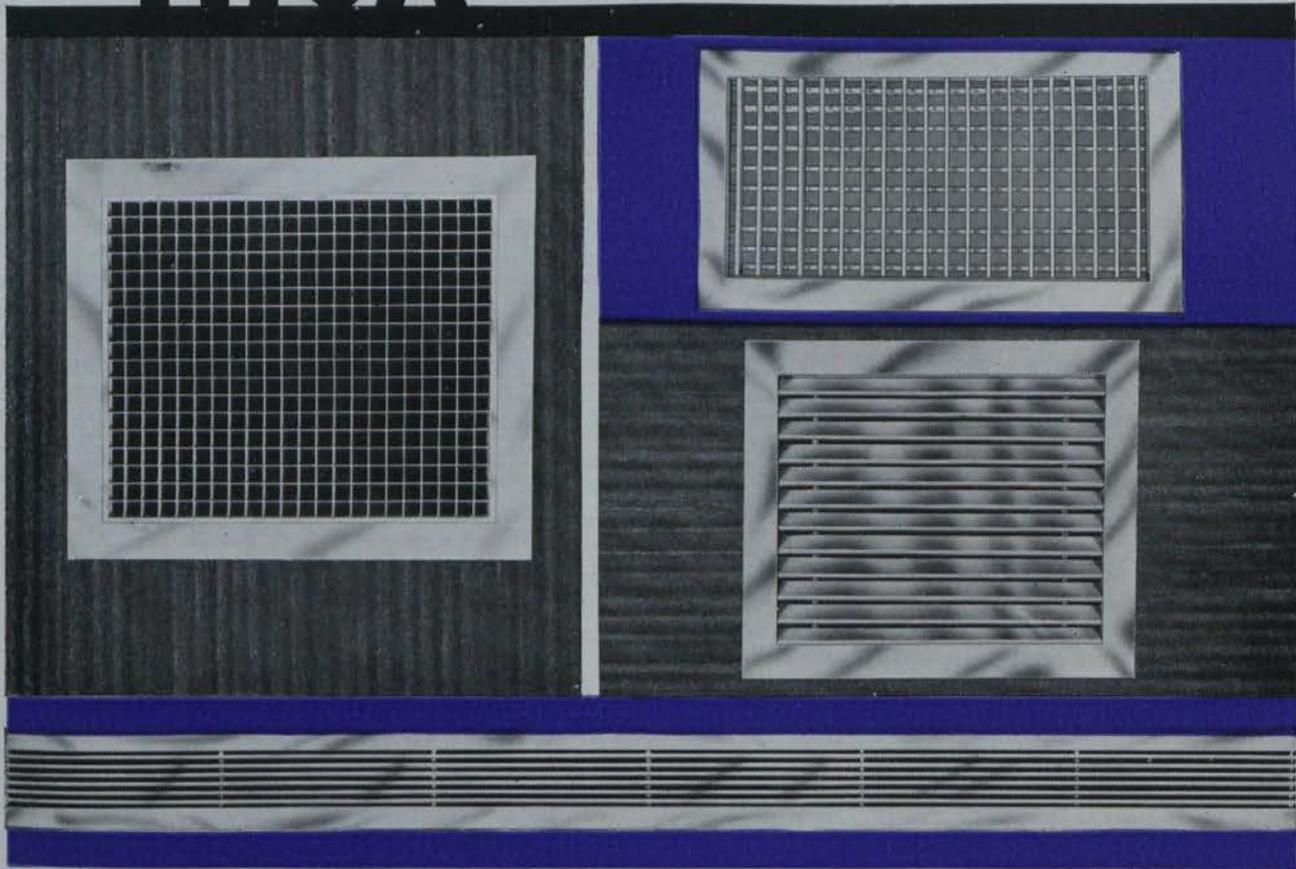
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Scandinavian design over 300 different sizes, very good delivery times.

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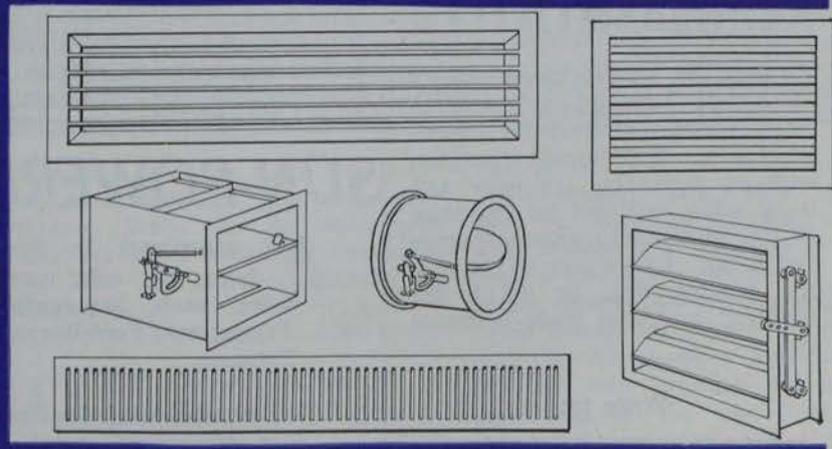
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Manufactured from solid extrusions, TROX high quality aluminium registers and grilles feature the unique TROX secret fastening device. Their fine finish and elegant design enhance the architectural merit of any modern building, while their performance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

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Heating Costs Seasonal correction factor table

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.

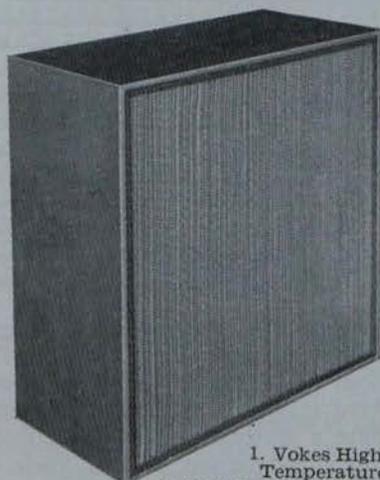
The question of the provision of heating outside the normal heating season is a matter of interest as the Office Act stipulates a mandatory minimum temperature of 63 degrees

	Installation Temp.	Seasonal correction factor table											
		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
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
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
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
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	88	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	

Continued page forty-two

Where purity is essential . . . install

VOKES 'ABSOLUTE' AIR FILTERS



1. Vokes High Temperature 'Absolute' filter. To withstand temperatures up to 1000° F.

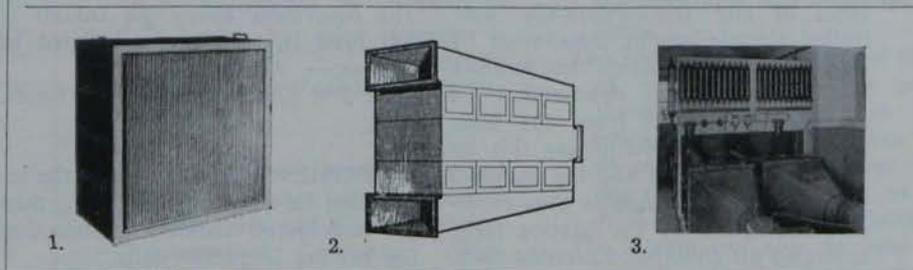
2. Vokes 'UNIPAK' system, available in many different sizes for a wide range of air volumes.

3. The methylene blue test rig at Henley Park, headquarters of the Vokes Group.

Vokes 'Absolute' air filters were developed for use in nuclear energy applications where inefficient filtration could lead to hazardous conditions for both equipment and personnel. Their outstanding performance (99.95% efficiency against particles in the 0.1-0.5 micron range) has quickly led to their adoption by laboratories, food processing plants, etc.—In fact, wherever a need for super efficiency filtration exists. For further information please write for catalogue HJ.

Variants of the 'Absolute' filter include High Temperature High Humidity, and Acid Resistant types—all with a guaranteed efficiency of 99.99% against sub-micronic particles. 'Absolute' filters are available as canister types using an all welded canister assembled between headers, and Vokes can also supply 'UNIPAK' systems for housing several panels in easily-serviced, space-saving units.

Vokes 'Absolute' filters are tested in accordance with BSS.2831 on a methylene blue test rig. Every filter is subjected to a stream of air containing particles of methylene blue 'dust' ranging in size from 0.1 to 0.5 microns, and rejected if its efficiency is less than 99.95%. Vokes is the only British company to guarantee minimum performance figures in this way and Vokes filters are therefore widely used in all applications which require scientific filtration.

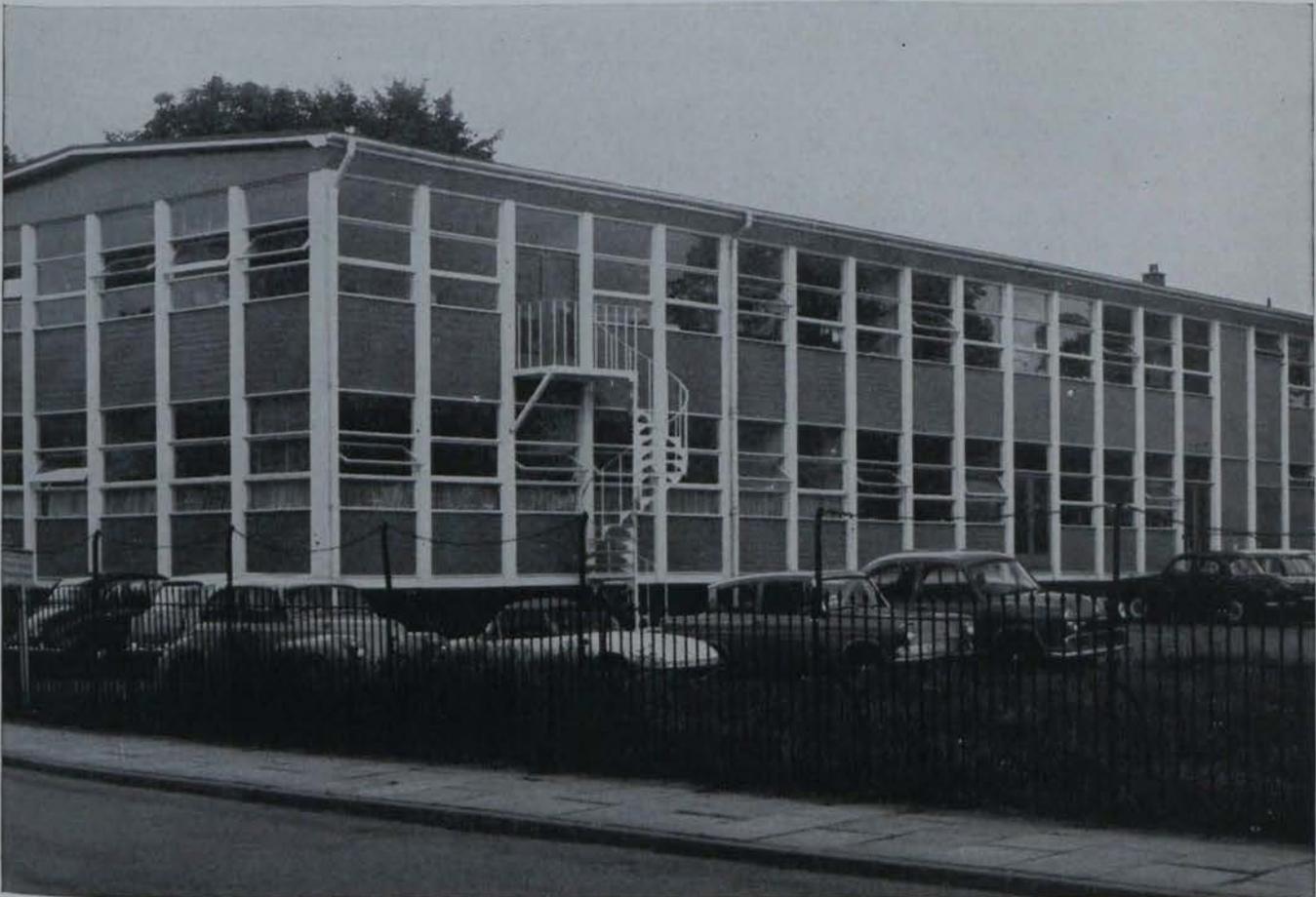


Comprehensive literature covering all Vokes filters is available on request from the Sole Agents:

THE LEINSTER ENGINEERING CO. LTD.

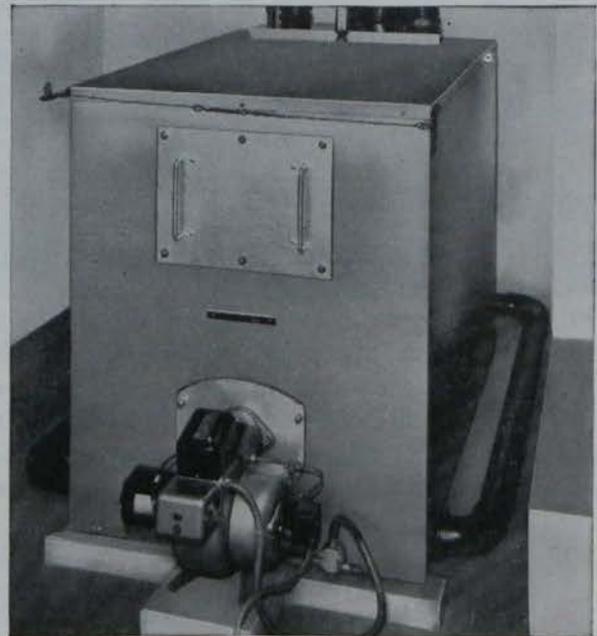


158-159 Church Street, Dublin. 'Phone 77093.



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

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 contin-

HEATING COSTS

from page forty

uance of heating until the 6th June.

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.

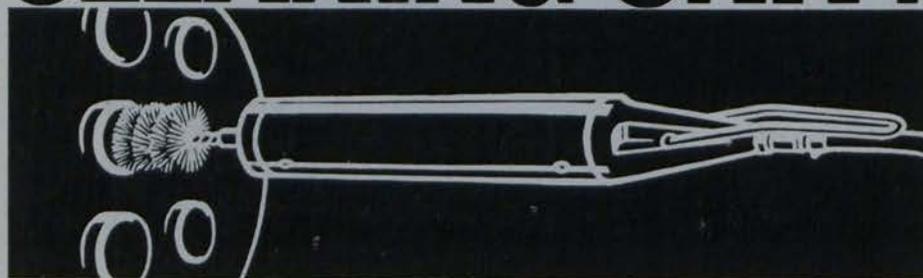
IN the case of underloading, which was prevalent in early electrical de-

signs, 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).

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 - *Gives cleaner tubes.
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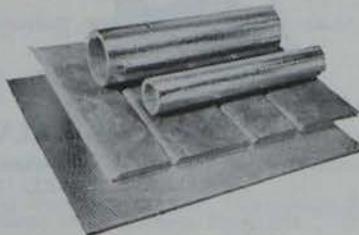
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THE LEESTAT indicating temperature controller is a recent introduction from ARIC Ltd.

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 $+660^{\circ}$ F, and from -80° to $+350^{\circ}$ Centigrade. Accuracy is within 1% of the range.

Stainless steel, brass or monel bulbs in four sizes are used, 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 still 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

NEW FAN RANGE INTRODUCED from polypropylene has been introduced by Turner & Brown Ltd., engineers in plastics (Gibraltar Street, Bolton). Specially designed for use in 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 Turbo Cyclone P.V.C. Fans.

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.



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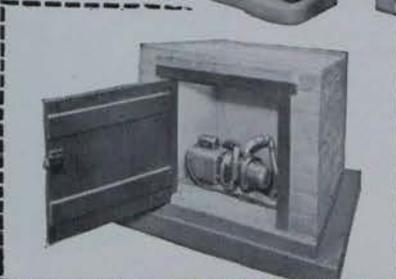
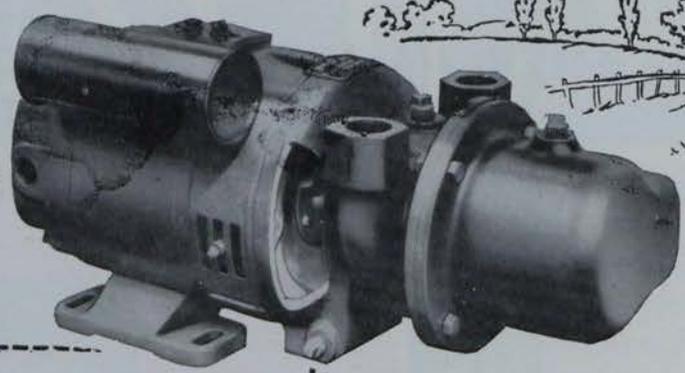
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- It can be neatly tucked away in the garden—or it is silent in operation for indoor installation.
- It can also be used for pumping supernatant water from cess-pools.
- No oiling or greasing required.

Attractive terms to dealers

The MII Mono Pump will provide 165 gallons of water for less than a $\frac{1}{2}$ d. in power cost—sufficient water for two days for the average household. And it is self-priming with a 25 feet suction lift.

The **MONO** pump

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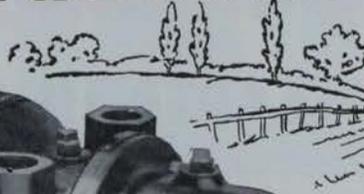
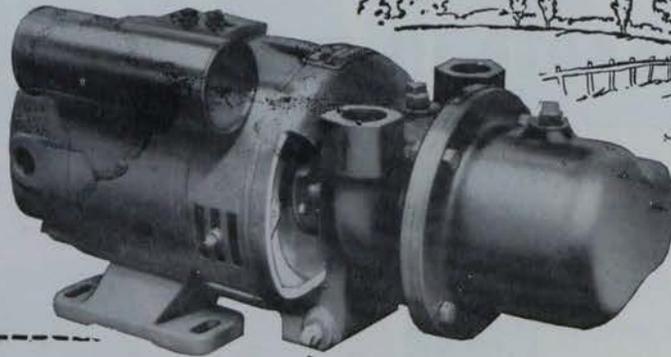
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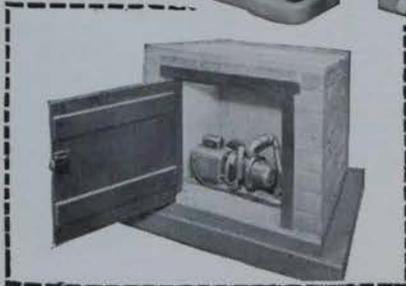
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