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The Irish Plumber and Heating Contractor, April 1962 (complete issue)

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THE IRISH PLUMBER & HEATING CONTRACTOR



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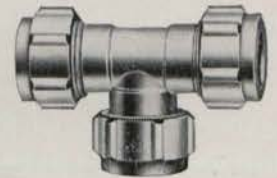


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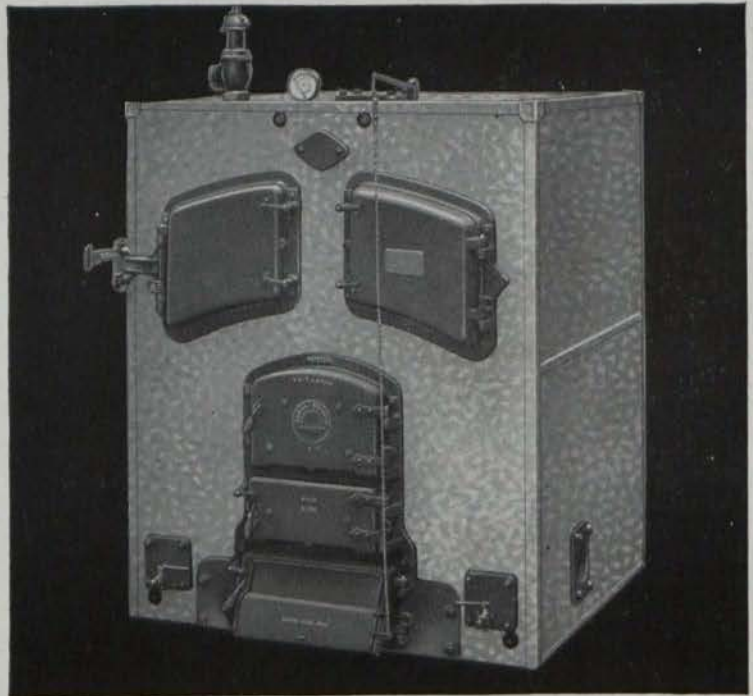
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APRIL, 1962.



THE IRISH PLUMBER & HEATING CONTRACTOR

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the
author

John G. Bolton

Lecturer in Plumbing and Heating at the College of Technology, Bolton Street, Dublin.

OXY-ACETYLENE WELDING OF MILD STEEL PIPELINES

WE have, so far, in these articles discussed the various welding techniques and pipe preparation methods with regard to their suitability for the jointing of mild steel tubes. It is now opportune to consider the actual welding of butt joints, branches, reducers and so forth.

We will, therefore, deal first with the chief characteristics to be looked for in a butt weld.

Butt Welds.—The main point to watch here is that the operative gets down to the root of the weld and fuses the pipe together. In doing this, however, care must be taken that projections are not left protruding inside the pipe. In general, it is agreed that the permissible projection should not exceed 1/16 in. on the internal bore, although, of course, commonsense must be used, especially in cases where an occasional slight penetration in excess of this figure may occur.

Strengthened

ON the external pipe surface, the weld should be strengthened or reinforced by depositing extra metal, the edges of which are waved out to match up with the pipe surface. This process may, however, lead to undercutting and perhaps eventual joint failure if the welder should not be experienced. In Fig. 1 will be seen some of the right and wrong ways to finish the weld.

Again, it sometimes happens that a butt weld must be made to an existing pipeline where the wall thickness of the old and new pipes vary. This should present no difficulty, but if the difference between the two pipes is more than about 1/4 in. the thicker pipe should be filled or tapered off to meet up with the thinner walled tube.

Branch Joints.—When welded branches are required on a pipeline, the

opening of the pipe is usually made by gas cutting. The required hole should be marked with chalk and then removed by a gas cutting blowpipe, although for small jobs, the welding blowpipe with an excess oxygen flame may be called into service if nothing else is available. On this point, it may be useful to mention that several makers produce an all-purpose blowpipe which adapts from welding to cutting simply by exchanging nozzles.

Clean edge

When cutting, great care must be taken to ensure a clean edge to the opening, and to see that all loose scale, projections, etc., are removed from inside the pipe. Next, the end of the branch must be curved or contoured to make a neat fit to the main pipe. When doing this, the edge can also be bevelled to an angle of at least 45° so as to allow for full weld penetration.

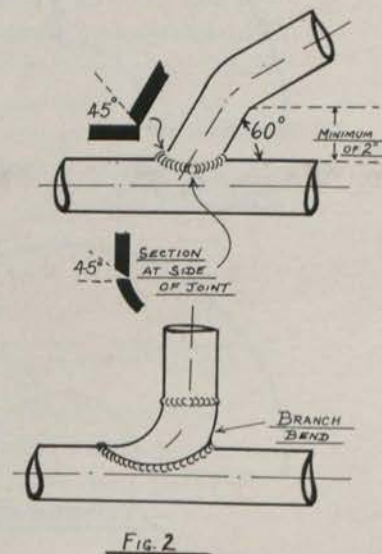
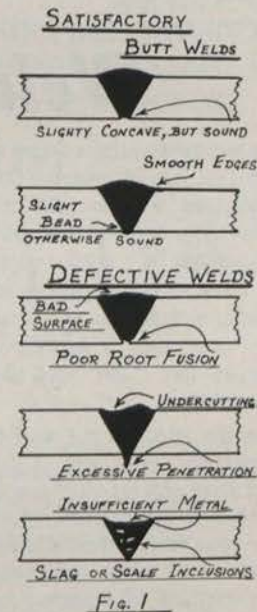
Time spent on accurate fitting will be well repaid. How often do we see on jobs a jagged hole with a poorly fitted branch, so that even a Class A welder would find it impossible to make a good weld!

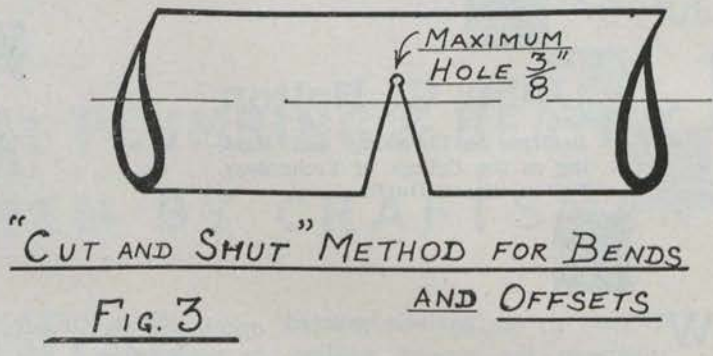
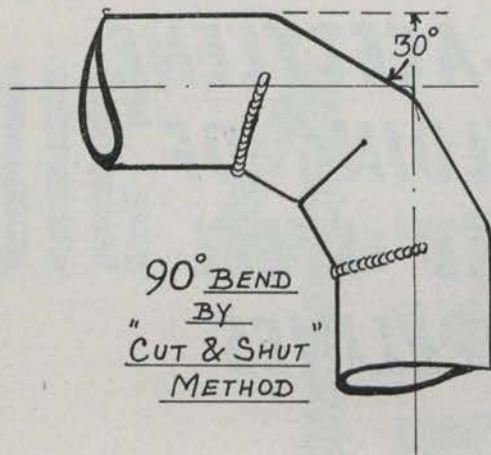
From the point of view of easy welding, branches which enter at 90° are the simplest, but often this is not possible, and the branch must enter at an angle to assist flow and reduce friction.

This angle, however, must never be less than 60°, otherwise it will make for difficulties in welding. Where the branch pipe is approaching the main at less than 60°, it may be bent to enter at the required angle (Fig. 2).

On most heating installations, branches are usually of the sweep pattern. These can readily be formed from specially manufactured weldable branch bends or, alternately,

continued overleaf





"CUT AND SHUT" METHOD FOR BENDS AND OFFSETS
FIG. 3

from previous page

Welding mild steel pipelines

from a weldable elbow from which the back is cut, so forming a saddle.

Bends and Offsets.—On most jobs nowadays the use of hydraulic bending machine is commonplace, but where very sharp radius bends are necessary, a weldable elbow will make a very neat job. Another method, known as the "cut and shut," can also be used.

Here the pipe is cut and then bent and rewelded as in Fig. 3. It will be noticed that sets of 30° are about the maximum to give satisfactory bends.

This maximum should apply to all diameters and radius of pipes.

This method of forming bends and

sets has, however, drawbacks, because any movement due to expansion or contraction in the pipeline will have its greatest stress at changes of direction—in short, just where the pipe is welded. It follows, therefore, that, if for some reason segmental bends or sets must be formed, they should be anchored or so arranged that the minimum movement takes place. The best advice is, of course, to bend the pipe by machine or forge, or else use factory made weldable bends.

Reducers.—Where a pipeline has to be reduced in size, the joint between the larger and smaller pipe can be made by using weldable reducers.

These fittings can be obtained in concentric or eccentric patterns, the latter being chiefly used on steam mains, or where air lock might occur on hot-water mains. These reducers make a very satisfactory job, but, of course, necessitate two welds plus the cost of the fitting (Fig. 4).

A less costly method is to swage or dress down the larger pipe so as to conform with the smaller diameter. This is done by heating the pipe end to a red heat and then dressing down with a hammer, reheating in the pro-

continued page thirty-one

SEAMLESS STEEL BUTT-WELDING PIPE FITTINGS

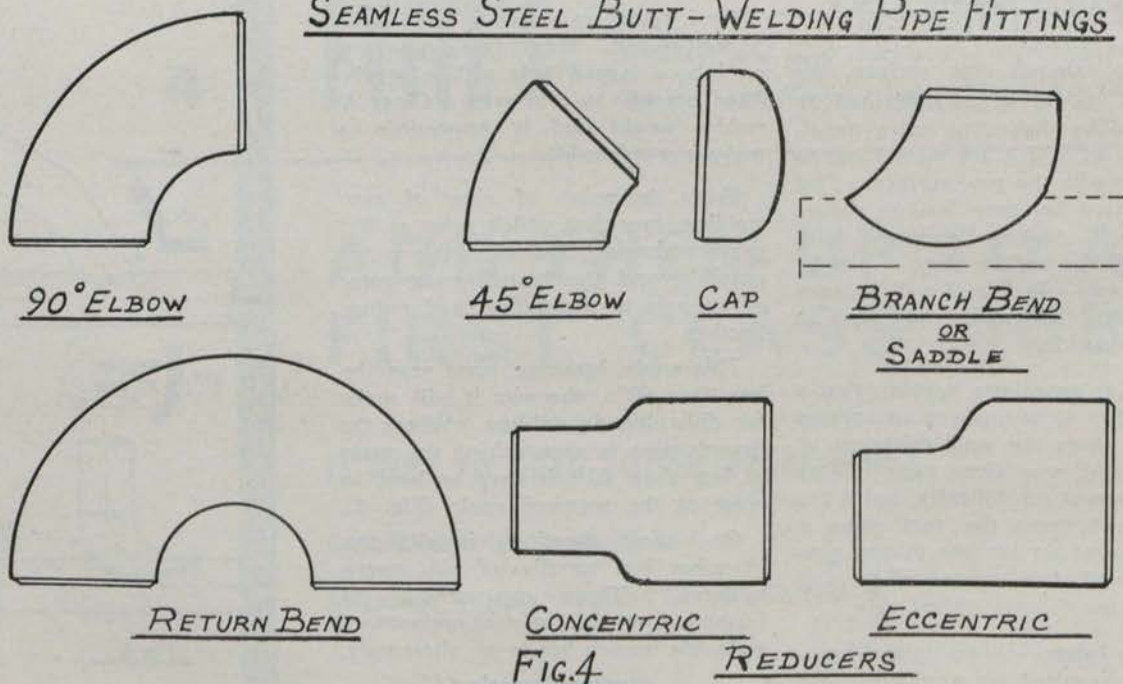


FIG. 4

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WATER SOFTENERS: CHOOSING SIZE

A. J. writes: "A recent article on the water softener prompts me to think of having one installed for a client. How does one decide what size to choose?"

COST, convenience, and space are factors which will influence the size of water softening appliance to be selected.

Softeners are "rated" according to ability to treat a stated number of gallons of water before they need regeneration. The ratings are generally based upon water of 16 degrees hardness (Clarke's Scale). Thus a softener rated in maker's literature as capable of softening 1,000 gallons simply indicates that it would remove all hardness from this quantity if it contained just 16 degrees hardness before treatment. If water to be treated contains 32 degrees hardness, then the 1,000 gallon appliance would soften 500 gallons of this water to zero hard and pro-rata for other degrees of hardness.

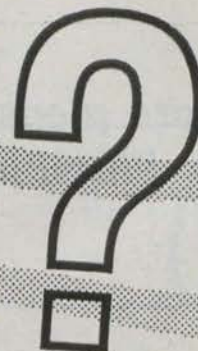
Since the capacity of a softener to treat water is directly related to the amount of softened water which can be drawn through it before the appliance needs regeneration, the size of appliance selected will have a bearing on how frequent the regeneration has to be undertaken, and hence upon the user's convenience.

Suppose a household of four adult persons, each using some 20 gallons of water daily. Total consumption for one week would then be around 560 gallons per week. If the total

Each month this column will solve some of the everyday problems of the plumbing and heating engineer when our consultants deal with queries directed to "Questions Answered." All queries will be replied to and the most interesting published.

Questions

Answered



hardness of the water was 32 degrees then a 1,000 gallon appliance would need weekly regeneration. A 2,000 gallon appliance would cost more initially but would offer greater operating convenience in running almost twice as long before regeneration, a job of only a few minutes really, but we all know how awkward it can be to find the odd few minutes these days.

Space is often at a premium even in modern well planned kitchens. A service connected water softener will need about 16 sq. ins. of floor space. Those with brine tank alongside will, of course, require more space. The dry salting models have long been popular but the semi-automatic or fully automatic appliances, though more costly, are becoming increasingly popular. The latest addition to this range is the fully automatic model by Permutit. This is supplied in a chemically inert cabinet specially designed to match standardised kitchen fitment heights. Into this cabinet dry salt is placed into water, the level of which is automatically kept. The appliance is electrically controlled and regeneration is entirely automatic—the client merely has to ensure that at pre-determined periods a delivery of dry salt is made to the appliance.

The initial cost of water softeners can seem frighteningly high. Reckoned on a useful service life of 15 years, and many are still giving good service long after 15 years of use, a water softener can show sound economic returns. A 50% saving in tea purchases per annum, a considerable saving in soaps and detergents are but a few of the economic gains of soft water usage; freedom from "scum lined" baths, etc.; the assurance of cleaner laundry; absence of damaging and fuel wasting "furr" in pipes and boilers, and the sheer joy of personal ablution in soft water—these are a few of the advantages of water softener installation upon which no monetary value can be set.

EXCESSIVE DEMAND ON FLUSHING CISTERNS

We are concerned with the modernisation of a small country school. A piped water supply will be laid on and flush W.C. closets installed. At this early stage we wonder if trouble might be experienced later from excessive demands on the flushing cisterns at "break" times and your comments would be helpful.

W.C.'s and their flushing cisterns can become seriously overloaded at "peak" periods, even in small establishments, and often with troublesome, possibly insanitary result.

Even with good supply pressures it has been known for the individual flushing cistern to be slower in filling to operating level than the hurried disrobing, evacuation, and re-dressing of the user. The unfortunate consequence is that soiled content of W.C. pan are left to view of the next hurrying user. Worse still, perhaps after this second usage the cistern fails to flush, the soiled content becomes progressively worse until a major blockage ensues. When this happens that particular W.C. is rendered inoperative and thus greater load is thrown on those remaining in functioning order.

Flushing Valves might be considered if the local water regulations permits the use of these. The questioner is strongly advised to consult his water supplier before committing himself to flushing valves.

In the interest of water conservation

continued page thirty-two

ARMITAGE WARE NEW LINES

Finest quality vitreous china for beautiful modern bathrooms.

All fixtures are available in white or any colour in the wide and handsome Armitage range.



The 'UNISYLA' V200—a WC unit with the Vacumatic syphonic action; full 3" bore trappage; quiet, hygienic, sleek tailored lines for the modern bathroom.



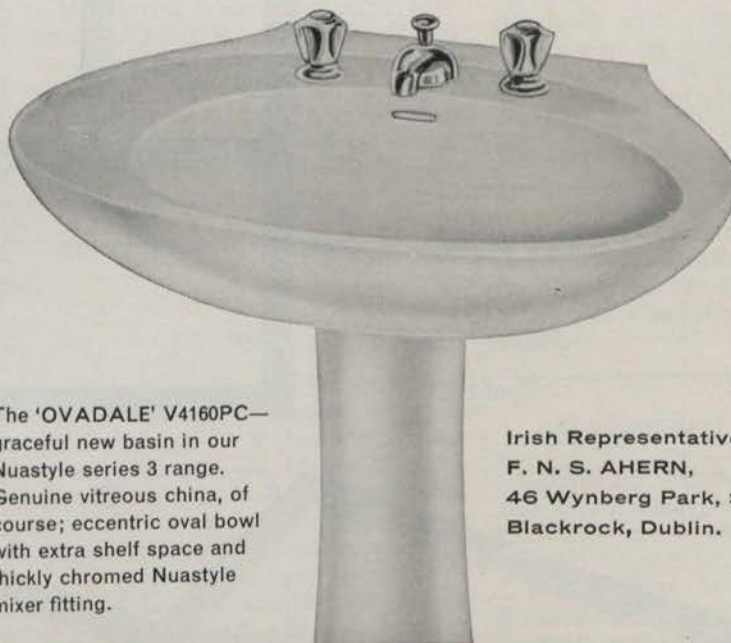
The 'ORIANA' V1001S bidet—efficient and good-looking with removable side shields (patent applied for). The bidet is becoming a 'must' in today's new homes.



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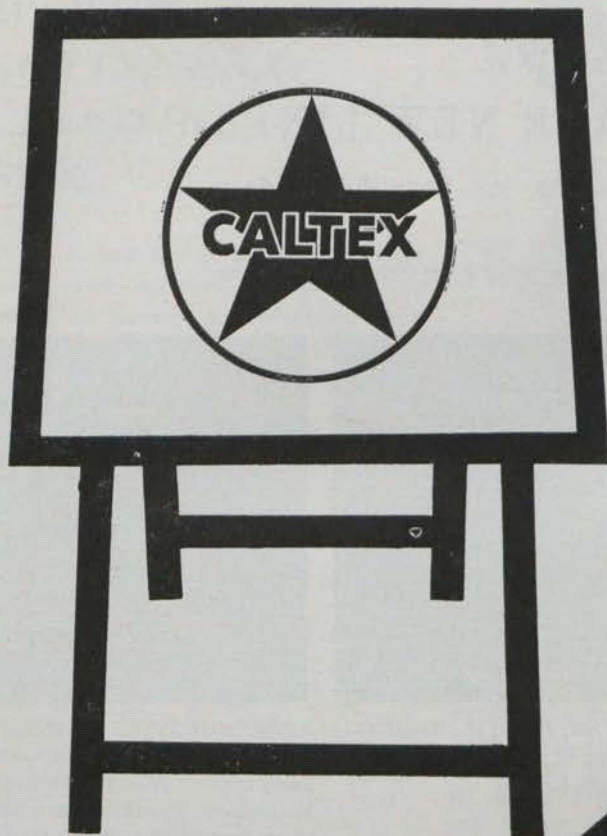
Please send brochure of 'Nuastyle' Series 3 fixtures and fittings.

BLOCK CAPITALS

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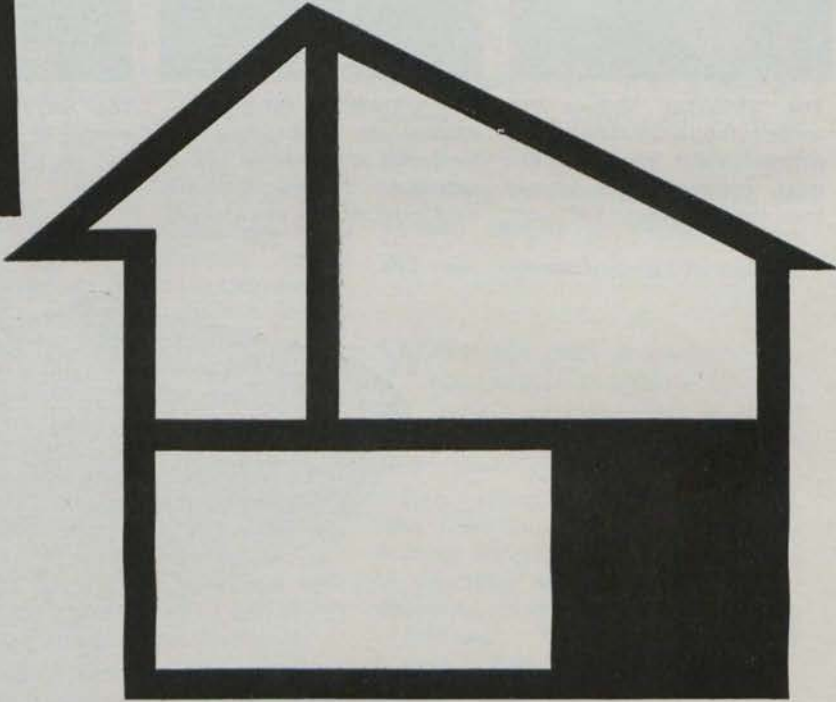
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TRADE**TOPICS****NEW BOILER
INTRODUCED
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ANOTHER well-known British fully automatic oil burner has now been introduced to this market by Messrs. Monsell, Mitchell & Co. Ltd.

This is the "Camron" Burner. It is available for application to all sizes of central heating and domestic hot water boilers with ratings of 45,000 to 10,000 B.t.u.'s/hr. For the larger sizes of boilers an emulsifying burner is used. These can be used for all grades of fuel from 200 to 300 secs. (Redwood No. 1 at 100 degs. F.) and for waste engine oils.

Camron: Light gas oil burners are available in four different sizes for boilers having ratings of 50,000 to 1,500,000 B.t.u.'s/hr. For 200 secs. fuel oil there are two models. These are suitable for boilers having ratings from 300,000—1,500,000 B.t.u.'s/hr. A complete range of these burners will be available from stock from Monsell, Mitchell & Co. Ltd.

In conjunction with this new agency a new advisory and technical-after-sales service department has been instituted. The Service Manager will be Mr. J. McMahon, and the Technical Sales Advisor will be Mr. W. Finucane. Both of the new appointees share almost forty years of experience in this particular field between them. They are, of course, already well known to the heating trade.

In addition to the supply of "Camron" Oil Burners for the conversion of heating and steam boilers to oil firing, Monsell, Mitchell & Co. will also offer these pressure jet burners with both "Potterton" and "Sunrod" Boiler burner units. One of these units can be seen in operation in their Townsend Street Showrooms.

Burner

ANOTHER innovation in the oil burner field which will be of particular interest to architects and builders is the "Bahco" portable oil-

fired building drier, with a heating output of 200,000 B.t.u.'s/hr.

This remarkable unit is the builder's answer to bad weather conditions as concreting and plastering can be continued regardless of the weather. The portable "Bahco" warm air heater can be easily and quickly wheeled or hauled to any point of a building site.

The firing efficiency of the unit is 80 per cent., making it a highly economical solution to builders' wet weather troubles. One of these units can be seen in the Monsell Mitchell Showrooms, from whom fully illustrated and descriptive literature can be obtained.

**PACKAGED BOILER
CONTROL UNIT**

Seen for the first time at the A.S.E.E. in London, the Packaged Boiler Control Unit has been introduced by Venner to provide comprehensive and convenient control over gas and oil-fired domestic central heating systems, thus promoting maximum efficiency and minimum fuel consumption.

Embodying several additional features, the Mark II. is available in two versions: one intended for installation flush with, or adjacent to, the Central Heating Boiler, and the other designed for flush or surface mounting on the wall of a kitchen or similarly convenient room in the house.

**FORMATION OF
NEW HEAT COY.**

THE formation of Heating Contractors (Ireland), Limited, has just been announced. A private company, it was registered on March 28. So far the registered office (Ireland) has not been stated. Nominal Capital—£2,000 divided into 2,000 shares of £1 each. Objects—To carry on the business of heating, cooling, ventilating, electrical engineers, etc.

Names and descriptions of Subscribers to Memorandum and Articles of Association—Subscribers of One Share each: James McGhee, builder, 55 Skreen Road, Dublin, 7; Joseph Christopher Hovan, quantity surveyor, 6 Stradbroke Road, Blackrock, Dublin. Names of First Directors—Not stated.

**Appointed to
Wavin staff**

Wavin Pipes Limited, whose new factory at Balbriggan, Co. Dublin, will be formally opened in June next, have appointed to their staff Mr. D. A. Gill, B.A., A.Inst.P. Mr. Gill's duties will be concerned with quality control, product testing and product development.

Mr. Gill is currently Head of the Physics Division of the Water Research Association, a position he has held since their laboratories were set up in 1955. He has been concerned principally with problems in the distribution of the public water supply, among which his main interest was the application of plastic materials to the construction of pipes and fittings.

Previously he was with the British Paper and Board Industry Research Association working on the development of equipment for testing paper and the instrumentation of paper making machines. Mr. Gill graduated in physics at Cambridge University in 1947.

Appointments

CHARLES Portway & Son Ltd. announce the appointment of the Irish Technical and Production Company Ltd., 25, Upper Mount Street, Dublin, 2, as sole agents in Ireland for their Portway range of oil-fired boilers for domestic and industrial use.

MESSRS. G. C. Pillinger & Co. (Ireland) Ltd. have announced that Mr. R. S. Wallis has been appointed Manager from March 1 last. He succeeds Mr. W. Finucane, whose resignation, states Pillingers, has been "accepted with regret."

TRADE

TOPICS

Plumbing and all that!

HEAVERY space commitments last month prevented the mention of the publication in Britain by Hutchinson Educational Limited of "Plumbing: First Year," by A. L. Townsend, M.I.P., M.R.S.H., who is already well known to Contractor readers as one of our leading regular contributors.

"Plumbing: First Year" is at present being serialised in the Contractor by special arrangement with the publishers. In fact, more than half of this very important work has appeared in these columns.

Mr. Townsend's authoritative and highly informative style then is already familiar to Contractor readers. Suffice to say that this 240-page volume, with its wealth of excellent illustrations, is worth its 16/- price tag.

We would fault it on only one point—its cover. This is not, we think, sufficiently robust to stand up to the handling a book of this nature must expect to be given.

THE 2nd International Pipe, Pipe Lines, Pumps and Valves Exhibition and Convention took place at Earls Court (London) earlier this month.

Another major exhibition was held at Chicago this month. The four day 24th National Oil Heat and Air Conditioning Group Exposition closed on April 12.

ALUMINIUM R.W. GOODS

IN LAST month's special survey dealing with roof drains, water heads, gutters and outlets, readers will have noticed that we unwittingly omitted mention of aluminium rain-water goods.

The cast aluminium gutter and downpipe, of course, needs no introduction to the Trade here. It is already well known for its valuable rust-proof and non-corrosive qualities.

Another point worthy of consideration is the fact that this system of rainwater disposal does not require surface coating or maintenance.



"MRS. 1970" AT "DREAM" HOUSE OPENING

WHEN the Minister for Finance, Dr. Ryan, officially opened the new Ardilea Housing Development, situated at the junction of Foster Avenue and Roebuck Road, a new system of public lighting was introduced for the first time in County Dublin. By special arrangement with the Electricity Supply Board, the main power lines are accommodated underground and the lighting system is of the most advanced design.

Welcoming the guests at a luncheon after the opening, Mr. Malachy D. O'Callaghan, Managing Director of Ardilea Properties Limited, congratulated the Board, Management and staff of Irish Shell & B.P. Limited for the excellence of their professional and technical advice in connection with the central heating installation. Irish Shell & B.P. Ltd. have advised on the most up-to-date system of oil firing—Zone-A-Matic heating—which gives finger-tip control of individual temperatures in every room of the house.

Each system is tailor-made to the needs of the particular house, individually designed by the consulting engineer. Heating is by means of the latest form of skirting radiation with a separate drying room for clothes. Mr. O'Callaghan also paid tribute to the Electricity Supply Board, and all the authorities concerned in the project.

● Irish Shell and B.P.'s Mrs. 1970 was among the many guests at the opening last month of Ardilea Estate, in Co. Dublin, where the "Zone-A-Matic" system of oil-fired central heating has been installed.



The attendance at luncheon after the opening included: Minister for Finance, Dr. Ryan; Mr. J. Brennan, Parliamentary Secretary to An Taoiseach; Mr. M. Veale, Dublin Co. Manager.

Mr. T. A. Crawford Young, Managing Director, Irish Shell & B.P. Ltd.; Dr. T. A. McLaughlin, Director; and Messrs. J. M. Murphy, I. J. Duncan, E. W. Pigot, B. Carr, all of Irish Shell & B.P. Limited.

Mr. E. W. J. Kerr, Director, McConnell's Advertising Service, Ltd.; Miss Frankie Byrne, P.R.O., McConnell's Advertising Service Ltd; Mr. James G. O'Callaghan, Director, Ardilea Properties Ltd.

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AN IRISH PLUMBER & HEATING CONTRACTOR SPECIAL SURVEY

WATER PUMPING, CIRCULATORS
AND MIXING VALVES

GREAT NEW FIELD HAS BEEN OPENED UP

SINCE the advent of rural electrification in Ireland, a great field has opened in the provision of automatic water systems involving the use of pumps, etc. Prior to this, the average rural or farm dwellinghouse depended on a well, perhaps situated some distance away, and from which water had to be pumped by hand, the container then being carried to the house. Although this antiquated system has by no means disappeared, it is, however, being slowly ousted by the installation of a power driven unit, and it is in the provision and installation of these that the industry stands to gain.

Contractors are often consulted on the sinking of a well, or perhaps on the more difficult question as to the possibility of water being found at all. In connection with this latter point, the experience of one contractor may be of interest to our readers.

Automatic

A bungalow dwelling had been erected twenty years ago in North County Dublin and it was decided about two years ago to sink a well near the house and install an automatic pressure water system. Prior to this, the water supply depended on rainfall, and on a well about half a mile away.

Some doubt arose about the possibility of finding water, due to the fact that a recently sunk well in a nearby field proved a failure, delivering brackish-stained water. Recourse was made to geological experts, who, being told the facts and on checking their maps, advised that a good water supply was unlikely to be found.

This proved a setback, and as a last resort a water diviner was called in. He covered the suggested area with the usual "twig" and pointed out two spots, one of which he declared would give an excellent supply.

A well-sinker was then called in and agreed to dig and line the well at £2 per foot, no guarantee being given as to results. He was instructed to go ahead at the point indicated and dug until the 30ft. mark was reached, whereupon water began to flow in rapidly. The digging was continued for another few feet under difficulty, due to the inflowing water, which eventually found its normal level about 25ft. from the surface.

The water was tested and found to be excellent, whereupon an electrically operated jet pump coupled to a pressure tank was installed, so providing a fully automatic water system which has given every satisfaction to this day, so much so that a hot-water

system, modern bathroom with septic tank sanitation, etc., has been installed since.

Pumps

IT may be asked "why a jet pump"?

The answer, of course, is that the water level in the well only came to within 25ft. of the surface, which is the normal recognised maximum suction lift of an ordinary hand or power driven pump, and it was thought better to install a pump designed for greater lifts in case the water table might fall later.

When selecting a pump, the specific requirements of the job must be understood, because there are available on the market at present dozens of different sizes and types.

The main points to keep in mind are: (1) Distance from ground level to water surface in well—this will decide if a shallow or deep well pump is needed. (2) quantity of water required in gallons per hour. (3) Position of pump house. (4) Distance water has to travel from pump and type of motive power available.

For general use in rural areas, the pump is usually sold as part of a pressure water system complete with



This special survey—the ninth in a series on important aspects of the plumbing and heating trades—has been compiled by technical experts John G. Bolton and A. L. Townsend, M.R.S.H., M.I.P.

galvanised tank, pressure switch, which is pre-wired to motor and attached to pump, air valve, relief valve, pressure gauge, and connecting tubes, etc.

The unit is pre-set to cut-out when the tank pressure gauge reaches 40lbs. per sq. in. This means that when a tap is opened, the water will flow out at 40lbs. pressure, gradually reducing to 20lbs., whereupon the pump automatically switches on and continues to run until the tap is shut and the pressure again builds up to 40lbs.—hence the description “automatic water system.”

It is not necessary to install the pump directly over the well; it may be more convenient to fit it some distance away in a pump-house, so that it is protected from frost. The main point is that the vertical height measured from the pump to the well water level does not exceed 25ft., otherwise a deep well pump will be required. The horizontal distance from the well to the pump is not important except in so far that extra friction will be caused in the suction pipe and supply pipe, so necessitating more power from the pump.

On this point it is interesting to note that it takes about 18lbs. pressure

from previous page

Too small pipe a false economy

to pump 5 gallons of water per minute through 100ft. of $\frac{1}{2}$ in. pipe. But only $4\frac{1}{2}$ lbs. pressure is required to pump 5 gallons of water per minute through a $\frac{3}{4}$ in. pipe, thereby showing that it is false economy to use a smaller pipe than is required in a well-designed water system.

Hydraulic rams

WHERE electricity is not available, a good method of pumping water is to install a hydraulic ram. This requires, however, a local river or stream from which a supply can be taken to drive the ram. There are many design available, some of which even utilise water unfit for domestic use to provide the motive power to raise water from a nearby well. Although not as frequently in-

stalled to-day as in former years, the ram is an excellent pumping machine provided suitable conditions for its installation are available.

It also has the advantage of no running costs. Before selecting a hydraulic ram, the makers should be provided with details of available fall from river, etc., quantity of water required, and so forth, so that a suitable type can be supplied.

Most of our readers are aware that the Government policy throughout Ireland, both North and South, is to encourage the rural dweller to install a water system. To enable this to be done, substantial grants—up to two-thirds of the cost—are available, and contractors could make this a good selling point when advising on the installation of pumping appliances.

Survey continued overleaf



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The Irish Plumber and Heating Contractor.

A. L. Townsend writes—

BOUNDLESS OPPORTUNITIES FOR THE TRADE



A WELCOME and growing desire by householders to improve comfort conditions in their homes is a trend which offers boundless opportunities for the plumber and hot water contractor.

It presents a golden opportunity for the trade to raise its status through the informed provision of these services. It also presents a profitable market in which to purvey up to date "know how" and adapted traditional trade skills.

All applaud the remarkable improvements in potable water supply distribution. Many, however, still rely upon well water supplies but even these can now be harnessed to simple automatic pumping installations which enable simulation of a mains supply.

Domestic hot water systems are now universally recognised for the added hygiene and comfort which they offer. Most homes are now equipped with some form of D.H.W. supply system, or await the progressive plumber to offer advice as to what can be done these days to provide effective yet economic systems.

House warming has so caught the public imagination that it now features as a major selling point for new houses.

Comfortable

Older houses, too, can be made so much more comfortable at relatively low cost, and therefore so much more attractive to their present owners—or prospective buyers.

The potential housewarming custom from these sources should not be neglected.

The Small Bore Force Circulated

L.P.H.W. heating system was devised specifically for installation in existing homes, with economy, unobtrusively, and with minimum of structural damage during installation.

The development of this admirable system was entrusted to the British Coal Utilisation Research Association. The design aim was initially to make more economic use of solid fuels. To provide a combined system of D.H.W. supply and central heating from one boiler seemed an obvious step. To provide a central heating installation capable of quick fixing without serious upset within the home, and with pipes small enough as to be barely noticeable, was another requirement not so easily solved.

Circulation

Combined systems operating on gravity circulation was no new idea but the large pipes needed to reduce water flow resistances to within the available minute circulating pressures had to be somehow dispensed with. The design team decided to work backwards. Settling upon a $\frac{1}{2}$ in. diameter pipe as the standard for the heating circuits, they then determined the extent of circulating pressure which would be necessary to promote adequate flows through typical layouts. It was found that circulating heads from 2ft. 6ins. to 5ft. were about average. Then followed the problem—how to develop this motivating force.

Clearly, a pump would be needed. But although circulating pumps were not new either, all those then made were of the glanded type which needed frequent periodic attention—hardly a

feature likely to make them popular with the householder. Furthermore, existing pumps, designed and used for large commercial and similar premises, were somewhat noisy. Not sufficiently so to render them unfit for their intended use but of too high a noise level for the quiet of a sleeping household.

The search for a glandless, silent, circulating pump was on. Manufacturers rose nobly to the task. The Sigmund "Thermo-Pac," one of the earliest small bore circulators, was born, and employing pumps of this kind, the new system was given extensive field tests.

Exceeded

The success of the system and its purpose designed circulators exceeded all expectations. Its subsequent installation in countless homes gave rise to an "Industrial revolution" in more ways than one.

The trade now found itself with its own modern form of central heating. Progressive masters and operatives attended lectures and read installation manuals in order to equip themselves technically for this new trend in trade practice. Manufacturers, ever keen and responsive to progressive trade trends, weighed in with improved boiler, radiator, mixing valves and circulators to meet the ever growing demand.

So successful has the small bore system proved that it is now used with solid, oil, or gas fired boilers. But the circulator remains the essential motivating component.

Circulators

THE Circulator provides the requisite "head" or circulating pressure to overcome the frictional resistance of the small bore circuits.

Circulators, basically of the same design—a silent, canned rotor electric motor driving a glandless centrifugal pump, are now made by upwards of fifteen concerns—a clear example of industrial drive aimed to meet the need of the modern trade.

Choice of circulator can therefore appear somewhat bewildering at first glance. Basically, the choice will depend upon the longest length of heating circuit involved, and the heat emission load it is intended to carry. Greater circuit lengths will result in

continued page twenty-one

6 Good reasons why

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TENDERS

Water supply for Carlow

CARLOW COUNTY COUNCIL—Carlow Regional Water Supply Scheme.—Tenders are invited for the construction of the above Scheme. The work consists of the construction of Intake Works on the River Burren about two miles south of the Village of Myshall, Co. Carlow, with slow-sand filters and clear water tank near the Intake; the laying of about 3,900 lin. yards of 8 in. dia. C.I. and A.C. main to a 250,000 gallon R.C. Main Service Tank at Myshall; the laying of A.C. and C.I. distribution mains from the Main Service Tank to serve the Villages of Myshall, Fenagh, Newtown, Ballon, Kildavin and Clonegal, and the construction of a 40,000 gallon tank at Ballon and of 25,000 gallon Service Tanks at Newtown, Kildavin and Clonegal.

The following approximate lengths of main, complete with valves and fittings, will be required:—

(a) Cast Iron:

8 in. dia. — 1,630 lin. yds.
7 in. dia. — 6,380 lin. yds.
5 in. dia. — 750 lin. yds.
4 in. dia. — 22,050 lin. yds.

(b) Asbestos Cement:

8 in. dia. — 2,800 lin. yds.
4 in. dia. — 9,300 lin. yds.

Alternative tenders are required for the construction of the 5 inch and 4 inch dia. portions of the Scheme in Hard P.V.C. pipes.

The works are to be carried out in accordance with the Plans, Specification, General Conditions of Contract and Bills of Quantities prepared by the Consulting Engineer, Pierce F. Purcell, M.Inst. C.E., of Ashton, Killiney, Co. Dublin.

Form of Tender and Contract Document may be obtained from the undersigned on payment of a deposit cheque for £25.

Sealed tenders enclosed in an envelope endorsed "Carlow Regional Water Supply Scheme," and accompanied by the Contract Documents, should be delivered to J. F. Cassidy, County Secretary, Carlow County Council, Athy Road, Carlow, not later than 12 noon on Saturday, April 28.

* * *

OFFICE OF PUBLIC WORKS—Heating Contract.—Sealed tenders addressed to the Secretary, Office of Public Works, 51 St. Stephen's Green, Dublin, 2, and receivable up to noon on May 4 next, are invited for supply and installation of a Steam Boiler Plant at Government Buildings, Kildare Street, Dublin, in accordance with plans, specification and conditions of contract exhibited at this Office. Plans and specification may be obtained from the Secretary on deposit of £50 (refundable).

ALUMINIUM

ROOFWORK

ALUMINIUM was first produced towards the end of the nineteenth century. It is, therefore, a comparatively new material, but its properties of lightness, resistance to corrosion, and in certain forms its strength, combine to make it a very effective and much used metal. The modern plumber, quick to realise the value of these properties in a roofing material, accepts aluminium as a plumbing material.

Its properties are similar to those of copper in many ways, and so it is understandable that methods for working and jointing it have followed the same lines as hard metal technique.

Commercial Sizes.—Strip aluminium for plumber's roofwork is available in many widths, but the most convenient are 1' 6" and 2' 0", which are generally regarded as the standards. The material is supplied in rolls or coils of standard weights of 28lbs. or 56lbs. The length of the coiled strip will depend upon its gauge or thickness and, of course, its width; for example, one 56lb. coil of 20 S.W.G. aluminium 2' 0" wide, will cover about 110 square feet. It might be interesting to compare this area with the areas that could be covered by a similar weight of other roofing materials.

Aluminium is very light and easily worked. It is highly resistant to corrosion, does not creep, is fire resistant, and is quite pleasing in ap-

pearance. Gauges commonly used are 22SWG for flashings and well secured small areas. For larger areas, for example flat or pitched roofs, 20SWG must be used.

Resistance

THE PURITY of a metal affects its resistance to corrosion and its working properties. It is generally true to say of all metals that these properties improve as the metal becomes purer. Aluminium is made in many grades of purity. These vary from 99.99 per cent. pure aluminium through 99.8 per cent., 99.52 per cent. to the commercial purity grade fixed at 99 per cent. For special purposes, less pure aluminium alloys are made. The so-called "impurities" in these are, in fact, carefully controlled quantities of other elements, which give the material further properties where these are necessary. For plumber's roofwork, however, workability and resistance to corrosion are the most important properties, and so an aluminium of high purity must be used. Commercially pure aluminium, to B S 1470 NS3, can be used in certain tempers and gauges for roofwork in areas or bays, but, for the reasons already given, the purer the material the better. Super purity 99.99 per cent. pure aluminium is recommended for all plumber's roofwork, and its

extra malleability makes it very suitable for flashing and weathering details.

Temper.—These materials are obtained in "dead soft," $\frac{1}{4}$ hard, and harder tempers, but the plumber is concerned only with the soft and $\frac{1}{4}$ hard varieties. "Dead soft" aluminium should be used for flashings, and for such weathering details as chimney flashings; $\frac{1}{4}$ hard temper aluminium is recommended for roofwork in areas where winds are strong.

The greater stiffness of aluminium at this temper helps it to resist the suction effects of strong winds, which might otherwise tend to lift this very light metal. At this temper aluminium is still very easy to work, and in many cases the very slight extra stiffness is a help in manipulating and working the material.

Specifications

SPECIFICATIONS for aluminium coiled strip for roofwork would be as follows:—

For flashings and weatherings—super purity aluminium strip, flashing quality, "dead soft" temper, to B.S. 1470 22 SWG or 20 SWG, as required.

For roofwork in bays—super purity aluminium strip, roofing quality, $\frac{1}{4}$ hard temper, to B.S. 1470 20 SWG, or commercial quality NS3 aluminium in $\frac{1}{4}$ hard temper, 20 SWG to B.S. 1470. But remember that the higher purity aluminiums are better for working and for resistance to corrosion.

Some practical tips for the working of sheet aluminium.—Aluminium, copper and zinc are referred to as "hard" metals as distinct from the "soft" metal, lead; consequently these three are all worked by much the same methods.

SEE pages twenty-seven and twenty-eight for illustrations



A. L. TOWNSEND
M.R.P., M.R.S.H.

The author, a lecturer at Oxford College of Technology, continues the first part of a four stage course on plumbing.

continued page twenty-five



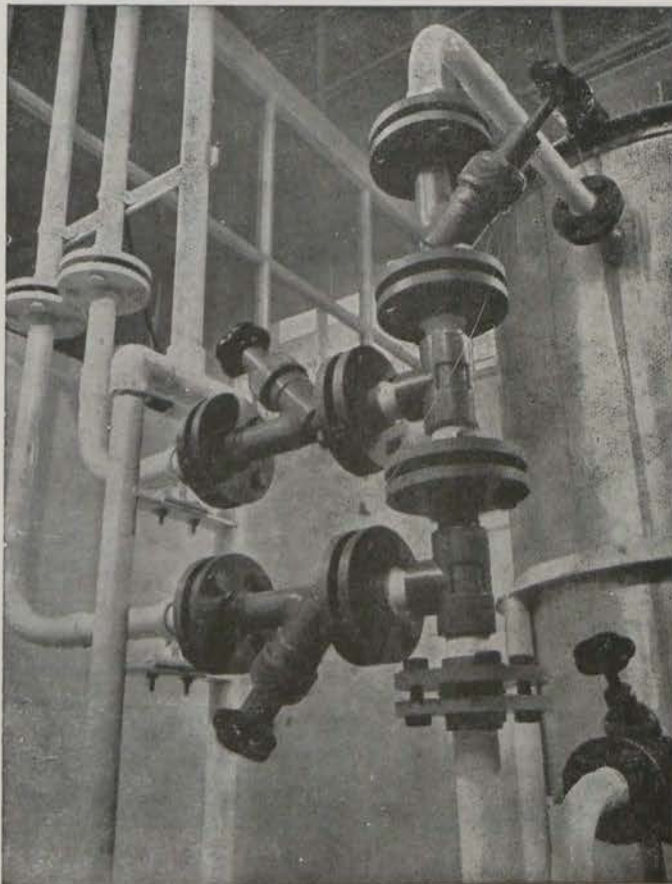
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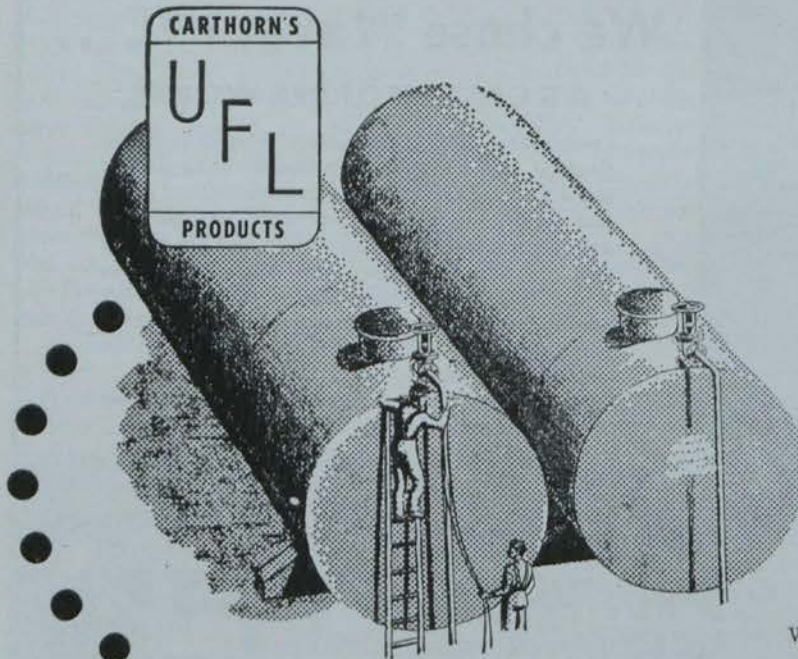
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greater frictional resistance to heating water flows, and greater pump "heads" will be needed. Excessive heat load will demand commensurately greater volume of water circulation and, again, a pump with higher delivery capacity will be needed.

Although it is no trouble at all to select a circulator ideally suited to any given system length and heat load, it is more convenient and therefore more usual to first provisionally select a pump and then effect a design compromise between the known capacities of the pump, the circuit lengths, and their proposed heat loads. In other words, the circuit lengths and heat loads carried are adjusted to be jointly within the known pump performance rating.

Circulator selection is aided by reference to maker's literature. The May, 1961, issue of the Contractor carries an article by James M. Haig which clearly outlines a well tried method of pump selection for given duties.

Other aids to circulator selection will be found in the Copper Development Association's publication No. 55. This is available free from 55 South Audley Street, London, W.1.

Another excellent free booklet for plumbers and heating engineers is entitled "Small Pipe Heating Systems." This is obtainable free of charge from the Coal Utilisation Council, 3 Upper Belgrave Street, London, S.W.1.

Basic principles

TRENDS in Circulator design do not deviate from the basic principles so successfully incorporated in earlier pumps of this kind.

Variable capacity circulators have made their bow. These offer facility for adjusting flow rates and may prove very convenient where a small installation is adopted initially but with a view to later extension. The variable capacity pump would serve the initial circuits on lower flow rate, and the later more extensive circuits when set up to a higher flow rate.

Such pumps might also relieve stocking problems since pumps of this kind are adjustable to suit a wide range of differing system designs and heat loads. The need to stock a variety of different capacity pumps is thus obviated.

Packaged Boilers have made considerable impact upon the householder and the trade. The discerning house-

holder gratefully accepts the clean, uncluttered appearance of these boilers and the trade finds them quick and simple to instal.

Packaged boilers are those in which the boiler shell and all ancillary equipment such as thermostatic controls, circulators, and mixing valves are integrally incorporated to form one complete unit within a handsome, easy clean cabinet.

Avoidance of noisy water circulation is an important factor in force cir-

from page sixteen

Circulators: cleanliness a practical requirement

culated systems. Noise is generally traceable, where noise exists, to excessive water flow velocities. Here again, the variable capacity pump may be usefully employed to give some measure of variability of flow to meet the required demand but without too high a velocity.

Requirement

CLEANLINESS of system interior is a practical requirement emphasised by all circulator manufacturers. This is understandable when the fine engineering tolerances, balance, and design care which goes into these splendid little pumps is fully appreciated.

Before fitting the pump, the completed system should be water filled and drained so as to remove swarf, etc., which might have gained access to the pipework and emission appliances. After this initial flushing the pump may be installed, the system re-filled, and heat applied at the boiler. One more drain down after the initial heating up of the system will ensure removal of greasy flux and joint compounds from the system. Subsequent trouble free pump operation will well repay care taken in this system flushing and will, in turn, enhance your reputation as a conscientious plumbing engineer.

After Sales Service for circulators is a noticeable trend in circulator marketing. As trouble free as these components normally are, it is worth noting that some manufacturers now offer guarantees for extended periods of use. Many now also offer re-

placement pumps on a pro-rata exchange basis after the guarantee period is over.

Before ordering circulators it will pay to question the availability of these services before committing an order.

Fixing Circulators is simple enough **but please** pay careful attention to maker's fixing instructions. Neglect to do so might result in loss of efficiency or, even more unfortunate damage to the circulator.

Whilst some types may be fitted in the vertical or horizontal, i.e., "in line" positions, others are so designed that the impeller shaft **must be** horizontal.

Efficiency

MIXING Valves add to the operating efficiency of the small bore system. They afford a measure of temperature control over circulating water and thus enhance comfort conditions and operating economy in milder weather when lower radiator temperatures are needed but the boiler must be maintained at 180° F. in order to meet the D.H.W. load.

Although not absolutely essential to small bore operation, their advantages cause them to be regarded as standard items of equipment. In any case, their low initial cost, ranging from £10 to £20, is a wise investment by the client and should be regarded as such.

The Function of the Mixer or Blending Valve is to enable continuous economic firing of the boiler at 180° F. (for indirect D.H.W. heating) whilst permitting selective temperature choice on space heating circuits.

This variation of heating temperature is attained by a thermostatically operated valve which moves compensatory fashion to adjust a blend of hot boiler flow water with an amount of cooler return water to achieve the desired heating circuit water temperature.

continued overleaf

The Irish Plumber and Heating Contractor.

from previous page

Radiator circuit temperature selection may be manually pre-set and then automatically retained at that temperature by the movement of the thermostatic valve. This kind of Mixer, e.g., the Sigmund "Sigmix," is probably that in most common use.

Alternatively, a blending valve operated by an externally mounted heat sensitive phial may be used. In this case the external device monitors changing external air temperatures, relays these modulations to a special mixer valve which then adjusts radiator circuit water temperatures to give warmth conditions within so as to be consistent with outside temperature variations. The Satchwell B.M.T. automatic blending valve is of this kind and was developed especially for the original small bore design team.

Choice of one or the other is very much a matter of taste, requirement, and cost.

Refinement

THE Harford "Aquamix" valve is a refinement of the blender principle for small bore installations. It permits controlled flow temperatures to both the heating and D.H.W. circuits. Thus, with the boiler maintained at 180° F. under control of its own thermostat, the heating system can be run at temperature best suited to prevailing climatic conditions, and in like manner a blended flow to the primary heater of the indirect hot store cylinder prevents a wasteful overheating of that part of the system.

Incidentally, the "Opio" pump as marketed by the Harford Pumps Ltd. is also sold subject to guarantees and favourable subsequent service replacements as previously described.

Pump Head is an important factor in mixer choice. Whereas manual mixers will operate at any pump head, the B.M.T. mixer, by virtue of its design, requires a minimum of 4ft. head at the valve. It follows that a minimum pump head of 5ft. will be required with this type of blender. Not that this is problematical. It is no trouble to select a pump to suit any system or any type of valve, but it is a point to be noted when designing a system and making tentative choice of components.

Zonal Control further enhances economic system operation without detracting from the all important warmth comfort conditions in the home.

● *In conjunction with this special survey on Water Pumping, Circulators and Mixing Valves, we review products from the leading manufacturers' ranges.*

SIGMUND RANGE FROM MONSELL MITCHELL

THE availability of central heating circulators such as the Sigmund "Thermopak" and "Silentflo" range is one of the important contributory factors to the remarkable growth of the industry in the past decade.

The basic design of these proven pumps are now well-known.

These units are all of the "canned rotor" type, having no gland between the motor and impeller. With this design there is no possibility of water leakage, and no oiling or greasing is required since the bearings are water lubricated. No maintenance has so far been found necessary, after the unit is installed in the system.

Rotating

A unique feature of the Thermo-Pak" is the use of a hydraulic balance disc on the rotating part, so that when running the rotating element is virtually floating round the fixed centre spindle, with no axial thrust in either direction, thereby doing away with the need for a thrust bearing. This, and the care which is taken in design and manufacture of the electrical parts, is the reason for the "Thermo-Pak's" silent running.

The Sigmund "Sigmix" Blending Valve consists of an automatic three-way mixing valve, with a bi-metal spiral in the upper part of the valve casing, controlling the movement of the double clack in the lower part, which either opens the inlet port or closes the return port, so that a mixed flow temperature can be selected and maintained. These valves can be supplied to suit 1" to 3" pipes.

Construction

The popularity of the Sigmund "Sigmix" Valve has been largely due to its robust simple construction, which has ensured trouble free and thoroughly dependable service.

The "Sigmund" Circulator and "Sigmix" blending valve are offered



● *The Thermo Change*



● *The Sigmund "Sigmix"*

to the Trade at very attractive prices and delivery can always be given from the large stocks carried by the Sole Agents and Distributors, Messrs. Monsell Mitchell & Co., Ltd., 67-73 Townsend Street, Dublin. Messrs. Monsell Mitchell & Co., Ltd., also stock the Sigmund "Thermo Change" external calorifier. This unit simplifies the work of converting an ordinary direct supply domestic hot water system to indirect supply.

The Sigmund "Zonomatic," which, as its name indicates, is an automatic method of providing pre-selected space temperatures in two different zones of the house at different periods—usually day and night.

★ ★ ★

PEDESTAL type Stuart centrifugal pumps are made of non-ferrous metal in all parts which are in contact with water.

Suction lift varies according to the speed of pump with a maximum of 5ft. and 15ft. for various models. Pumps running at speeds lower than 2,500 r.p.m. must have flooded suction.

Manufacturers are Stuart Turner Ltd., Henley-on-Thames, Oxon, England. Further information on the range of Stuart products may be obtained from Mr. D. P. Engert, 5 Ardee Road, Rathmines, Dublin.

continued next column

FROM the Mono range of pumps we look at Model MII, which provides 165 gallons of water for less than a halfpenny in power cost. The MII is self-priming and has a suction lift of 20 feet.

This model is notably silent in operation and can also be used for pumping supernatant water from cess-pools. No oiling or greasing is required.

The MII is manufactured by Mono Pumps Limited, of Sekforde Street, London, E.C.1. Irish office: 31b Central Hotel Chambers, Dame Court, Dublin.

★ ★ ★

All capacities B.S.S. and A.P.I. specifications of welded steel tanks for fuel oil storage at domestic and industrial installations are available from Carthorn Ltd., Commercial Buildings, Dame St., Dublin, sales company for Universal Fabricators (Dublin) Ltd.

The firm's interests in Northern Ireland are looked after by W. D. Craig & Co., 32 Arthur St., Belfast. Readers are invited to write for an illustrated "Standard Tanks" folder.

★ ★ ★

LISTER PUMPS, by R. A. Lister & Co. Ltd., 19a Hogan Place, Dublin,

are supplied in a wide range. Dependable, they feature great ease of installation.

Electric pumps of 250 gallon per hour capacity are available (80, 120 and 150 ft. head). In a 180 g.m.h. model (250 ft. head), as with all other Lister pumps, head includes 25 ft. suction lift. Air-cooled, petrol-engined, models also figure in this range.

★ ★ ★

THE Osma 30/25 gallon cold water storage tank is made entirely from polyester glass fibre. The inherent insulating properties of polyester glass fibre reduce the risk of frost damage and obviates the change of fungus growth. The manufacturers are Osma Plastics Ltd., Grove House, London Road, Isleworth, Middlesex, England.

★ ★ ★

THE AQUAPACK comprises a C.P. Range Opio pump, with its self-cleaning filter and combined viewing panel and air vent. It is mounted in the flow from the boiler and maintains any temperature between 125 degrees F. and 175 degrees F. given sufficient boiler capacity.

The distance from the boiler is

immaterial and this unit—particularly if used in conjunction with T.A. proportional output radiator valves—gives complete control of a central heating system from inside the house.

The manufacturers are Harford Pumps Ltd., Harford House, Charlotte St., London. The Aquapak Combines accelerator, thermostatic mixing valve, thermometer and controls in one streamlined unit.

★ ★ ★

Galvanised tanks and copper cylinders in all sizes and capacities are available from Hammond Lane Industries Ltd., 111 Pearse St., Dublin.

★ ★ ★

"RADPUMP" major and minor circulators for small bore heating have two new features in circulator design. The Output Regulator obtains precisely the characteristics required for any given installation, and any difference in calculated and actual head capacity rating of the system can be met, adjusting the pump characteristics accordingly.

continued overleaf

manufacturers
of quality
for over
80 years



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Works, Prince Regent Road Castlereagh
Belfast
Telephone : Belfast 59365

Twenty-three

from previous page

The resilient mounting of the motor eliminates still further the possibility of noise transmission, which although the circulator itself may be of very little noise level, pipe and radiator may magnify the small vibrations to a large degree throughout the structure of the house.



The pump is constructed in cast iron with all internal surfaces protected against corrosion by a high temperature stoving enamel. The motor absorbs 76 watts.

Maximum operating temperature is 110 degrees C. (230 degrees F.), but normal operating temperatures are around 82 C. (180 F.). From the British Steam Specialties Ltd., Leeson Park, Dublin, who are distributors in Ireland for the manufacturers, Sealed Motor Construction Co. Ltd., Bristol Road, Bridgwater, Somerset, England.

★ ★ ★

A NEW range of jet-pumps to operate down to 160 feet, will shortly be offered for sale by Unidare Ltd., Finglas, Dublin. It is expected that they will be included in the Unidare display at the R.D.S. Spring Show.

The new pumps, which will be in addition to the existing range of the well proved $\frac{1}{4}$ h.p. and $\frac{1}{2}$ h.p. Aquadare pumps, will be available for operation either by electric motor, or by a separate four-stroke petrol engine, from which the drive will be taken by V-belt.

Optional V-belt drives on all Aqua-

dare pumps is another important development in the Unidare range.

Up to the present Aquadare pumps have only been fitted with integral electric motors. An offer of optional V-belt drives on these pumps should appeal particularly to building contractors, farmers, and all those whose work involves pumping water in rural areas where electric supply is not readily available.

★ ★ ★

Celtic Engineering Co., 25 Great Strand St., Dublin, invite trade enquiries about Goulds balanced flow for wells down to 25 ft., and for deeper wells, Goulds Jet-O-Matic.

★ ★ ★

A wide range of packaged pumping, multi-stage pumps and piston pumps, are available from J.L.C. pumps which are manufactured for boiler feed and general purposes by the J.L.C. Engineering Co., Ltd., Oxgate Farm Works, Coles Green Road, London, N.W.2.

The Irish agent for the Company is P. J. Casey, 38 The Rise, Mount Merrion, Co. Dublin.

★ ★ ★

TECHNICAL advantages of the Lomatic electrical household pump made by N. V. Duroplast, Machelen, Kerklaan 67, Belgium, include perfect resistant to corrosion, water tightness, ensured by the cell being made in special thermoharden, a superpolyamid rotor, suction valve of bronze, nylon filter, and two special seals with stainless springs.

Irish agents are Couper Distibutors Ltd., 28 Herbert Park, Ballsbridge, Dublin.

★ ★ ★

THE NEW Byrne "Lilliput" water unit is a complete, reliable, low cost pressure system for automatic water supply in the small-medium size household. Specifications are: capacity, 220 gallons per hour; total head, 108 ft.; suction lift, 23 ft.; complete with $\frac{1}{4}$ h.p. B.T.H. motor with overload protection device.

Alternatively, Byrne "Kongo" with Specifications the same as the "Lilliput," has a 32-gallon horizontal cylinder. Sole distributors are Lenehans of Capel St., Dublin.

WITH a working pressure of 75 psi (173 feet) total head (i.e. static pressure and developed head combined) the Holden and Brooke Limited manufactured "Selfin" silent heating accelerator features, among its many points, rustless non-leak gland, pump isolator and unrestricted gravity flow.

Working parts are easily accessible without draining the system. The unit construction incorporates a non-return valve reducing installation work to a minimum.

Holden and Brooke, Limited, Sirius Works, Manchester 12, are also manufacturers of the Wython and Nordon range of calorifiers. The Nordon range of mild steel fabricated calorifiers with cast iron steam boxes and solid drawn copper U tubes are supplied in capacities up to 8,000,000 Btus (steam pressure 5 to 100 psi).

The Wython range is built to the requirements of B.S.S. 853 and models here are available in capacities up to 6,000,000 Btus per hr. (steam pressure 5 to 100 psi).

WE NOW look at the Hendron Deming "Marvel" pump from the range of Hendron Brothers Limited, Upper Dominick St., Dublin. Their circulating pumps can be supplied for any desired mounting position, and in h.p. ratings from 1/50 h.p. to 2/3 h.p.



● "Stork" circulating pump from Hendrons

The range varies from the ordinary householders' and small farmers' type of pump—the Myers "Olympian" and the Deming "Marvel"—to the very latest in contractors' pumps. In between lie pumps for every conceivable operation.

Hendrons offer a service to those who need pumps only intermittently. A hire service makes all types of pumps available for long or short periods.

Survey continued page twenty-nine

from page eighteen

Aluminium roofwork

1.—Work-hardening is unlikely to occur in normal applications of aluminium, and may be avoided by seeing that the blows of dresser or mallet are firmly and expertly delivered; but if it does occur at all, the sheet can be annealed by heat treatment.

The annealing temperature cannot be judged against the light-coloured aluminium, and so the plumber applies heat with a blowlamp, occasionally pausing to draw a match-stick across the heated surface. When the correct temperature has been reached, the match will leave a black charcoal line on the sheet, which can then be quenched in water or allowed to cool in the air.

2.—As with other hard metals, sharp snips must be used and snags avoided on all cut edges, or these might develop into tears during working.

3.—Tools must be clean and in no way contaminated with minute particles of other metals, particularly copper. Electrolytic corrosion could result from the thoughtless use of tools previously used on copper work.

4.—Fixings are particularly important with aluminium as with all light roofing materials. They must be carefully arranged so that the metal is securely held on the roof in high winds.

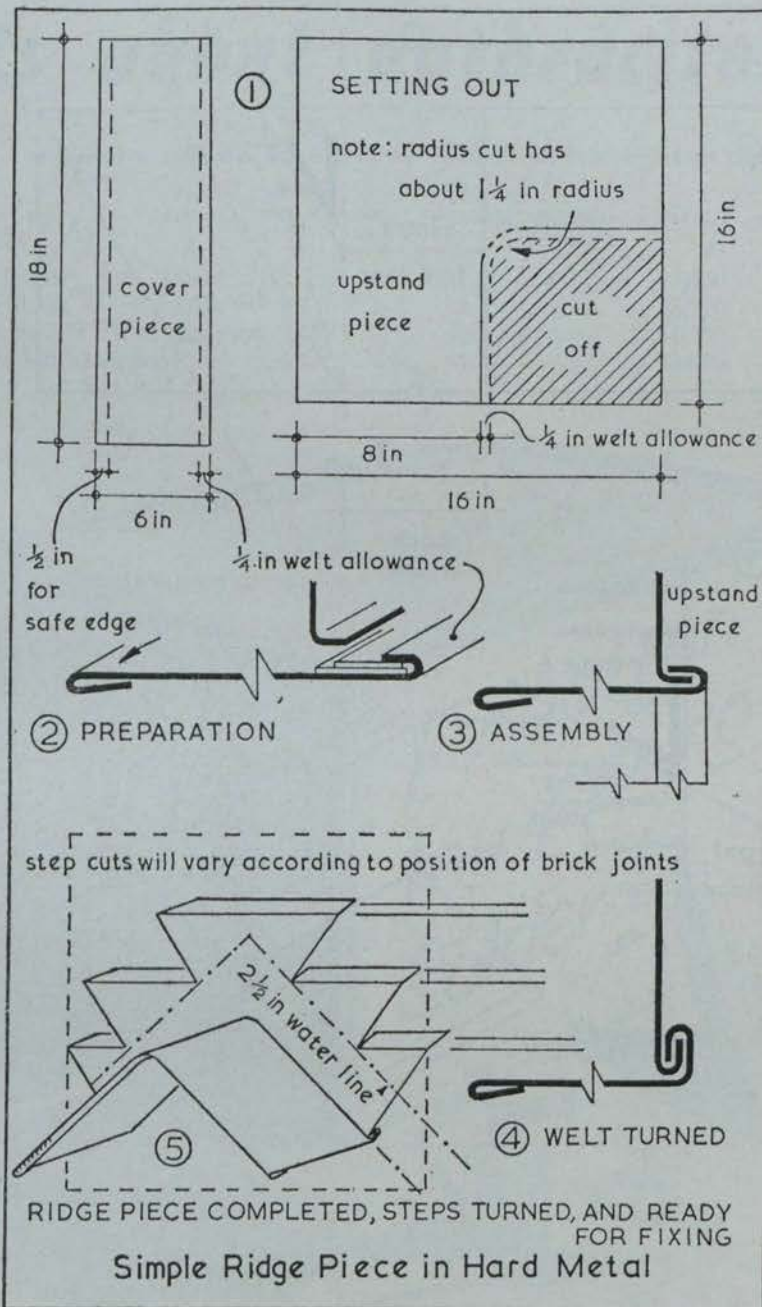
5.—Clips of aluminium are prepared and used in the way described for copper roofwork last month.

6.—Nails for fixings should be large headed and of hard aluminium alloy to B.S. General Engineering Specification N6, but good quality large headed galvanised iron nails could be used. Copper nails and brass screws must not be used because of the risk of electrolytic corrosion.

7.—Setting out. The extra thickness of the recommended 20 SWG aluminium takes up extra metal in the welt or seam formations. For aluminium work allow $\frac{3}{8}$ " to $\frac{1}{2}$ " for welt undercloaks, and $\frac{7}{8}$ " to 1" for welt overcloaks.

Earlier

ABUTMENT Flashings in Aluminium.—The setting out, preparation and fixing of soakers and cover



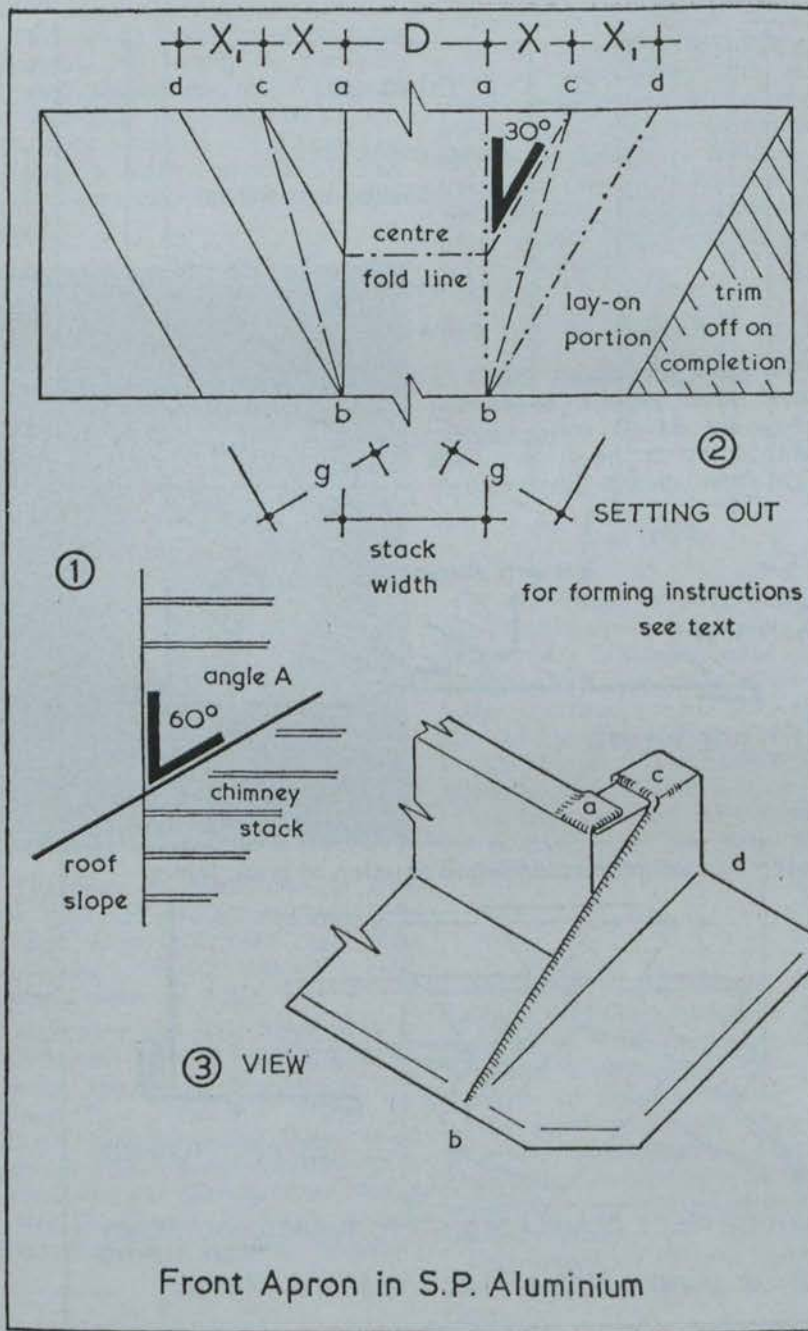
flashings are all as described earlier in the series and the few pages following it. The lighter "hard" metal sheetings need a stiffening bead at their free, unfixed edges. Do not forget to allow $\frac{1}{2}$ " extra for this when marking out aluminium flashings. "Tags" of aluminium made from narrow strips rolled into small coils are used to fix the flashings at the brick joints. Illustration shows the setting out and forming of a ridge piece in hard metal.

Chimney Back Gutters in Aluminium.—These are easily and quickly

made on the bench by the method described previously.

One slight variation is made possible by the extra malleability of dead soft temper aluminium; the 2" x 2" wooden angle fillet at the angle formed by the gutter and the back wall of the stack may be left out, and the back gutter side pieces set out at that angle to a radius of a penny. In other words, instead of setting out two 45 degree angles and working them, you can work one rounded 90 degree angle in the aluminium gutter.

continued overleaf



Front Apron in S.P. Aluminium

from previous page

Aluminium roofwork

Front Aprons in Aluminium.—

A very good way of making aluminium front aprons has been shown but there are at least four other ways of doing it. One of these is a slight variation on the cut and seam method shown here; two, use methods of

apron from one piece of metal, and, lastly, it is possible to boss a dead soft temper aluminium apron.

Just one more word about the "bossed" aluminium apron. Although this can be done, it takes much longer than any of the cut and seam or fold methods. Since time costs money, the aim must be efficiency with economy of cost, and it would therefore be better to use one of the quicker ways, and keep all "bossed" work to a minimum.

CORNERS can also be "bossed" in "dead soft" S.P. aluminium, but again these take a longer time and

considerably more effort than the folded "dog eared" corner, which is generally used for aluminium, copper and zinc roofwork.

Plumbers develop a natural ingenuity, and often invent new and better ideas for doing certain jobs. No doubt there will be many new ideas for roofwork; perhaps you yourself will think of one.

SETTING OUT AND MAKING ONE SIDE OF A FOLDED ALUMINIUM APRON

Method:

- (1) Obtain the angle between roof and stack "A" as in diagram (1), Figure .
- (2) Mark the centre fold line on the sheet.
- (3) Mark the line a to b at right angles to the centre fold line.
- (4) Place the bevel, set at HALF angle "A", along line a to b, and with the point or apex of the bevel angle at the centre fold line.
- (5) Mark line c to the centre line along the bevel.
- (6) Mark off distance x, which is equal to distance x, or distance a to c.
- (7) Mark off line d to b.
- (8) Finally, on the **opposite** side of the sheet, mark line c to b.

Making:

- (1) Lightly chase wedge line c to b, and a to the centre line, on the **back** of the sheet.
- (2) Begin to fold the upstand to position along the centre fold line.
- (3) Fold the part that is to lay over the slates along line d to b.
- (4) With finger and thumb, manipulate an inside fold along line c to the centre line.
- (5) Close the folds by squeezing with your hand until the apron takes the desired shape.
- (6) Finally, dress the folds close, but not necessarily dead close; trim off, turn the edge stiffening beads, and prepare the turn in to the brickwork.

Note: Both ends of the apron should be worked at the same time, following this sequence of operations.

NEXT MONTH

Joists and fixings for copper and aluminium roofwork; joints with the flow; joints across the flow; and additional fixings for sheet copper and aluminium.

Some facts about anthracite

ANTHRACITE coals differ from other coals in their low volatile and high carbon contents. It is hard fuel and more dense than the higher volatile coals, and burns with no smoke. Inherent ash and sulphur contents are generally low.

Anthracite Sizes:

Cobbles, 6"—2½"; Nuts, 2½"—1¼"; Beans, 1¼"—¾"; Peas, ¾"—⅝"; Grains, ⅝"—3/16"; and Rice, 3/16"—1/10".

Irish Anthracite Production (1959):

	Tons.
Large	1,715
Cobbles	10,541
Nuts	21,534
Beans	8,933
Peas	11,708
Grains	1,099
Duff	77,091

These tonnages have expanded considerably in recent years.

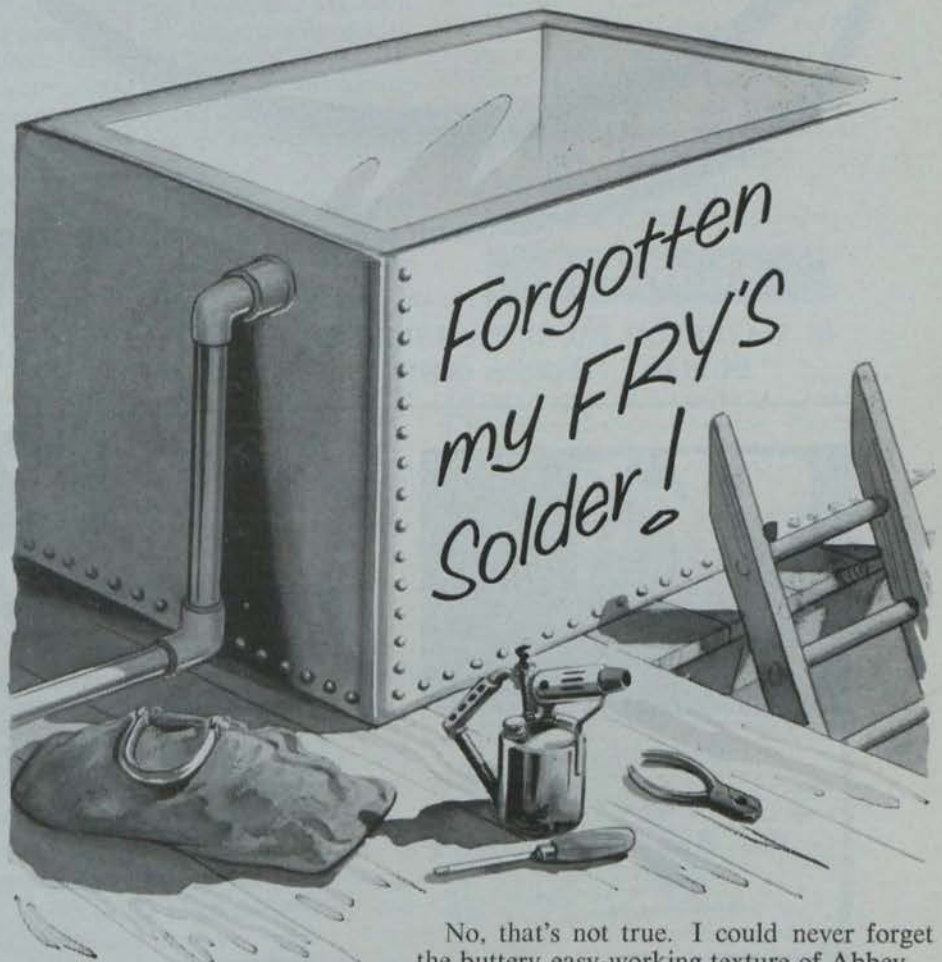
Fuel Storage.—With any solid fuel boiler, there should be covered storage space for at least four weeks' supply of fuel based on the highest winter rate of consumption. This factor is as important as any major control.

Approx. Bulk Densities for Solid Fuels (in cubic feet per ton):

Cobbles, 46/48; Nuts/Beans, 45; Peas, 42; Grains, 40; and Gas Coke, 80/84.

Comparative Analysis on Air Dried Basis from four different collieries.

Nut Size Sample	Fixed Carbon. %	Volatile Matter. %	Ash. %	Moisture. %	Sulphur. %	B.T.U.'s. lb.	Ash Fusion. °C.
WELSH ..	88.0	7.2	3.3	1.5	0.82	14,760	1,430
WELSH ..	86.6	6.4	5.7	1.3	0.87	14,290	1,480
IRISH ..	90.1	3.1	2.5	4.3	0.83	14,260	1,320
IRISH ..	88.0	4.3	4.0	3.7	1.88	14,090	1,350



Classification of welders

Classification of Welders.—This problem of good welding technique will shortly enter a new era in Ireland. The Irish Welding Association have taken steps to conduct tests on the welding of pressure pipes, etc., and issue certificates of competency to welders which will be fully up to Lloyds and A.P.I. Standards.

As the Association has the approval and support of the most prominent engineers and employers in the industry, it will fulfill a long-felt want in Irish welding and will obviate the necessity for individual firms to conduct their own tests when employing craftsmen.

(See "Welding of Mild Steel Pipelines," page seven).

No, that's not true. I could never forget the buttery easy-working texture of Abbey and Belfry . . . or the way they cool, dead smooth without a crack or blemish. No, I've not forgotten my Fry's plumbers metals—I've just left them behind! Better phone up . . .

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VOKES

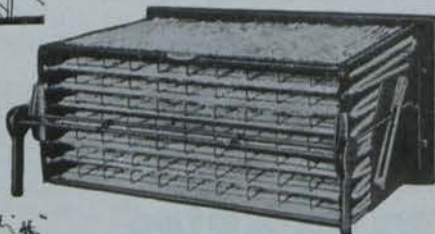
K.600 KOMPAKS to clear the air

Perfected by years of research and development in the Vokes laboratories and in the field, the K.600 'Kompak' air conditioning filter is the most efficient as well as the most widely used of its type. Features which have led to its popularity include long life, reliability and extreme ease of maintenance.

Efficient air conditioning filters are essential in the provision of clean

air inside buildings of all kinds. Impurities in the air supplied to factories can cause contamination of products or damage to valuable plant; in public buildings unfiltered air shortens the life of furnishings and decorations. Vokes K.600 'Kompaks' are installed in the air conditioning systems of large commercial and industrial office blocks, factories and engine test houses, public libraries and picture galleries, hotels and cinemas, concert halls, hospitals, multiple stores and establishments for scientific, pharmaceutical and photographic research and processing.

*You can trust K.600 'Kompak' because like all Vokes air filters it is fully tested in accordance with BSS. 2831.



Simply constructed and using an inexpensive, easily replaced filter medium, the K.600 'Kompak' has a normal rating of 600 cubic feet per minute with an initial resistance of 0.15 inches w.g. The actual velocity of the air passing through the developed area of the filter is only 22.5 feet per minute. Tested in accordance with BSS.2831, using highly penetrating test dusts, the 'Kompak' recorded an efficiency of 95% against Aloxite 50, and 93% against Aloxite 225. Write now for comprehensive literature on the 'Kompak' and 'Vokes' other air filters to:

SOLE AGENTS IN IRELAND:

THE LEINSTER ENGINEERING CO. LTD.

158-159 CHURCH STREET, DUBLIN. Phone 77093/4.

SPECIAL SURVEY

from page twenty-four

THE Mini-Pump is a new glandless circulating pump featuring a new reverse thrust principle, enabling hydraulic variable output control by means of a simple control knob at the end of the pump.

A flat base with rubber feet ensures that the pump can be truly mounted direct in line with the pipe-work. Direct copper connection fittings save extra adaptors (Weight: 11½ lbs.).



Three models are available: the Variomatic 100X, 200X, and 300X. They cover the range from 1 to 10 feet water gauge. Manufacturers are Rotherhams Ltd., Holborn Circus, London, and Spon St., Coventry.

★ ★ ★

Rutledge & Thompson Ltd., 3 Corn Exchange Place, Dublin, announce that they are now in a position to offer from their range "Home" pumps in both Colonial and Yard patterns.

★ ★ ★

A wide range of space saving "Monobloc" pumps are available from Worthington-Simpson Ltd., 20 Herbert Place, who can also supply compressors and heat exchange equipment.

TRADE

TOPICS

Full patent for Irish boiler

DUBLIN engineer and contractor, Mr. Edmund D. Ryder, has been successful in obtaining a full British patent on his "Augustine" Electric Boiler. Mr. Ryder, of 46 Lower Drumcondra Road, developed and manufactured his boiler over a period of five years.

The boiler is ideally suited for fully automatic central heating systems as its advantages are many, such as being self contained without need for fuel, storage facilities or boilerhouse.

Boilers are produced in various kilowatt ratings and to date over a score have been installed and commissioned in various types of premises. Each boiler is a self-contained unit incorporating automatic electric control gear and circulating pump.

Principle

The boiler principle is to heat a small amount of water circulated around the system quickly through small bore piping. All piping laid in floor and vertical voids is insulated with glass wool lagging to ensure maximum efficiency.

The electric control equipment is very sensitive and incloses or discloses the loading as required, quickly and in an efficient manner, thereby effecting an efficiency approaching 100 per cent. and eliminating an over spill which would increase running costs.

For business premises a double tariff heating rate averaging 1.4d. per unit is obtainable, while for private residences the usual domestic rate of 1.5d. per unit (reducing) would apply.

A recent installation was the Portmarnock Country Club Hotel, which comprises the hotel and a new ball-room extension, now centrally heated and supplied with domestic hot water by the Augustine Electric Boiler.

IRISH TECHNICIANS

GERMAN TRAINING

A GROUP of young Irish technicians have left Dublin for a ten-week training course in Frankfurt-on-Main, Germany. Their training will deal with temperature and flow measurement, pressures, flow of gases and also chemical and electrical measurement.

The trainees are James Lehane, Mallow, a member of the staff of the E.S.B. power station at Portarlinton, and Michael Duffy, Emo, Laoighis, on the staff of the power station at Lanesboro, Co. Longford; Brendan Higgins, Tuam; John Moore, Carlow; William Kenehan, Thurles, and Sean Smith, Mallow, from the Irish Sugar Co., and Malcolm Grant, Dublin, from Messrs. H. R. Hoifeld, Ltd., Merville Road, Stillorgan.

TENDERS

(see also page seventeen)

KERRY COUNTY COUNCIL—Abbey-Kerney Sewerage Scheme.—Tenders are invited for the construction of the above scheme in accordance with the plans, specification and conditions of contract prepared by Mr. Edward G. Pettit, B.E., M.I.C.E.I., Consulting Engineer, 7 South Mall, Cork, from whom copies of the contract documents may be obtained on deposit of £10 10s. 0d.

The work comprises the laying of approximately:—

- 497 l. yds. 6" S & S Stoneware Pipes,
- 516 l. yds. 9" S & S Concrete Pipes,
- 88 l. yds. 9" S & S C.I. Pipes,
- 193 l. yds. 9" A.C. Pipes,

together with the construction of a Disposal Works consisting of Preliminary Units, Imhoff Tank Sludge Drying Beds and ancillary works.

Sealed tenders accompanied by a Bill of Quantities, priced and extended in ink, should reach the Acting County Secretary, Kerry County Council, Kilarney, not later than 12 noon on April 30.

BERKEFELD Water Softener FOR SALE

Unused, Domestic or Industrial.

Capacity: 3,000 gallons.

OFFERS TO BOX IP/17.

TRADE

TOPICS

FROM OUR NORTH OF IRELAND
CORRESPONDENT

NORTH IS NOW CLEAN AIR DIVISION

A Divisional Council for Northern Ireland has been set up by the National Society for Clean Air.

The decision to set up the Council was taken at a meeting of members of the Society at Belfast last month.

Councillor Miss Irene McAleery was appointed Chairman, and Mr. W. E. C. O'Brien Hon. Secretary.

Committee members include Mr. R. C. Brown, Technical Director, Davidson & Co. Ltd., Sirocco Engineering Works, Belfast, and Professor John Pemberton of the Department of Social Medicine at the Queen's University, Belfast.

The Council will promote the aims of the Society—to create public awareness of the dangers and waste of air pollution and to initiate and support practical steps towards clean air.

Central heating boosted

THANKS to extensive publicity campaigns by oil companies, the Coal Utilisation Council, makers of solid-fuel burners, electricity undertakings and, more recently, gas companies, the public in Northern Ireland have become acutely conscious of the lack of comfort in Irish homes during a typical winter, and even more so during an icy winter such as we have just experienced.

As a result of this, more and more householders are turning their thoughts towards central-heating installations and the heating and plumb-

ing trade has been kept exceptionally busy in meeting this need.

Additionally, there has been a considerable amount of public contract work out for tender and Northern Ireland will also share in the new programme for the construction of over 100 new hospitals in Great Britain.

For these reasons, heating and plumbing interests are confident that 1962 will prove to be a year of great progress and that business will be maintained at a satisfactory level, if not, indeed, substantially increased over that of previous years.

LET THE ...

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**Fully Automatic ELECTRIC
BOILER Solve Your Central
Heating Needs**

CLEAN ★ COMPACT ★ ECONOMICAL
★ Manufactured in Dublin to patent specification.

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46, LOWER DRUMCONDRA ROAD,
DUBLIN.

Telephone 45992.



BRITISH PATENT No. 875, 707, 17th AUG., 1959

from page six

Welding of mild steel pipelines

cess if necessary. Care should be taken to ensure a uniform reduction all round.

A variation of this, based on the "cut and shut" principle, can also be used. This is mostly confined to larger diameter pipes where a big decrease in bore is necessary. With this method, Vee shaped sections are cut from the pipe end, which is then dressed down to size and welded. Some consulting engineers have reservations about this method, but in the hands of a competent welder it can give excellent results (Fig. 5).

Flanges.—These will not present any difficulty to the welder as most flanges have a boss which will permit a 45° fillet weld to be carried out. This boss gives greater strength and prevents flange distortion during welding.

On pipes up to and including 6in. diameter it is usual to expand the tube end tightly into the flange after welding.

In the fabrication of headers for steam and hot water installations, the welding of the branch units complete with flange is quite common. It is important, however, to allow sufficient space between the bottom of the flange and the main pipe to allow for satisfactory welding conditions. The usual rule is to allow half the diameter of the flange, viz., a branch pipe with 6in. flange must have the flange base at least 3in. away from the main pipe (Fig. 6).

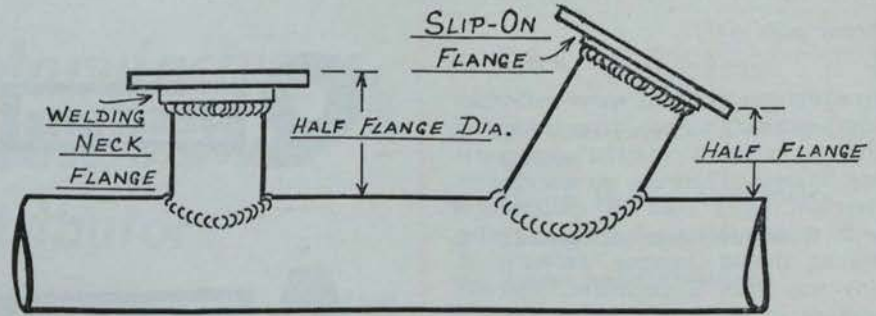


Fig. 6

Testing of Welds.—When the pipeline, or sections of it, are completed it is usual to apply a hydraulic test. This is carried out by capping off one end of the pipe with a blank flange or welded stopend, the other end is then connected to a force pump and the pipe filled with water, venting all trapped air at the same time.

On the pump is a gauge graduated in lbs. per square inch, and the pipe is then subjected to a force not exceeding twice the working pressure.

This test pressure is maintained for at least one hour, or longer if necessary, and during this time each weld should be lightly hammered and examined for defects. If a leak is detected, the defective portion should be cut out and re-welded—not just "touched up" with the blowpipe flame as sometimes happens.

When examining the joints, the "ripples" on the surface of each weld will usually give a good indication as to quality. They should be fairly regular without any pronounced "hills and hollows," particularly where one run of weld metal meets with another.

The sides of the weld should not be undercut or have sharp notches, and in butt joints, the surface of the weld should be slightly convex.

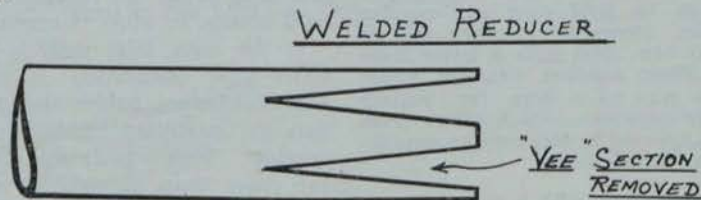
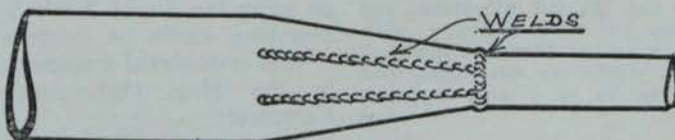


Fig. 5



WELDING TECHNIQUES



In no other branch of Engineering do so many individual problems arise as they do in Welding. We are equipped to give you a first-class Service on all your Welding problems. We supply and service the best equipment in this ever-widening field. We offer you the most up-to-date plant from the leading manufacturers in many countries.

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The Irish Plumber and Heating Contractor.

from page eight

by avoidance of waste, water undertakings generally have frowned upon flushing valves as potential water wasting fittings. There are no warning or overflow pipes used in conjunction with these valves and if such valve seating should become defective in any way then a persistent, wasteful leakage of water to drain by way of the flush-pipe and pan would result. Such leakage could not be said to be "undetectable" for it would be seen by the observant user. But since the leak does not create a mess or other nuisance, it might never be reported and rectified.

Objection

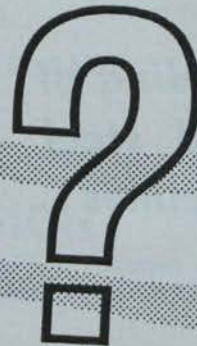
Another objection held by supply undertakings is that some flush valves are adjustable. Thus, although a stipulated two-gallon flow is normally required, such valves could be adjusted indiscriminately to give much larger—and wasteful flushes. This is in no way decrying the efficiency of the adjustable valve but the fact remains that if a minimum flush rate is prescribed by Bye-laws then any fitting which aids the contravention of this becomes immediately suspect so far as the undertaking is concerned.

Flushing Valve Installation is usually permitted where the building takes water from a metered supply. Here any wastage of water will be reflected in serious deviation from quarterly reading patterns and investigation within the building may lead to the cause—be it defective flushing valves, too frequently operating automatic flushing cisterns at urinals, leaking tap washers, or whatever.

Factories, Farms, Schools, are among those building types commonly taking water via meter, hence flushing valves might well be used in such premises.

The cost of a flushing valve is comparable to that of a good quality valveless siphonic flushing cistern. It takes less space in the W.C. compartment, is silent in operation, but requires a storage cistern at high level to supply it. A 1½ in. pipe from store cistern to valve will be needed for low operating heads. A 1 in. pipe will suffice for heads of higher order. These requirements vary according to valve design and your local stockist

Questions Answered



will gladly supply details.

Flushing Troughs are acceptable to water authorities. These elongated cisterns contain separate siphons at normal W.C. compartment plan centres. According to the type selected the separate flushing siphons will be free standing within the large water content of the trough and be provided with a simple but effective measuring device to stop flow to pan as soon as the prescribed amount has been discharged, or each siphon will be enclosed within its own chamber, into which is incorporated a calibrated inlet orifice device. In either case flushes can be obtained in very quick succession.

Troughs are commonly supplied in units of three. Some are available with socket and spigot end, much like pressed steel gutters. These are quickly built up into units of any required number. A minimum ¼ in. supply, possibly 1 in., will be needed to feed the trough. And, of course, an overflow pipe to warn of any wast-

age due to ballvalve defect, will be required.

Once again, your local merchant will gladly advise on costs, etc., of the different types and makes of troughs.

* * *

INSANITARY STATE OF KITCHEN GULLIES

One cannot fail to notice the insanitary state of gullies taking kitchen sink wastes. Even where the householder is careful in this matter he cannot always avoid even temporary collections of putrifactive foodstuffs, etc., on the gully grid. Is there no better way of dealing with such wastes?

THE simple answer is "Yes, there is." The installation of a back inlet gully would remove the unpleasant conditions so rightfully complained of. The gully grid should serve only the function of keeping extraneous matter, leaves, etc., from gaining access to the drain. It was not intended to strain out vegetable parings, food wastes, or other offensive matter.

In the back inlet gully a separate waste pipe connection is provided. This discharges **below** the grid and thus the insanitary conditions do not develop. Such a gully will cost about 14/- more than an ordinary common gully—a small price to pay for peace of mind and improved environmental hygiene.

Alternatively, and especially in new domestic construction, the possibility of using the Single Stack System of plumbing should be investigated.

This system was discussed in detail in the May, 1961, issue of the Contractor.

SPRAY TAPS

Because shortage of space last month obliged us to hold over our regular "Questions Answered" feature we do not, until now, deal with a letter from Modern Plant Limited, Crumlin Road, Dublin — agents here for Walker Croweller products—which arises from a query answered in this column appearing in the March issue.

The reply dealt with a reported malfunction of spray taps.

Modern Plant Limited have asked us to emphasise the point made by our consultant in his reply ("the taps are intended for equal pressure operation") when they say "in our experience the most frequent cause of difficulty with these units is where they are installed under heads which are not equal, and we find this to be a very common practice."

Directory Of Manufacturers, Agents, Representatives And Distributors

★ We would advise that the June, 1962, issue of this Journal will contain the first complete register of Manufacturers, Agents, Representatives and Distributors of Plumbing, Heating, Ventilation and Insulation appliances, fittings and materials available in the Republic of Ireland and Northern Ireland. This will include the names and addresses of Irish Agents and their principals in Ireland or abroad.
If you come under the heading

of any of the categories listed on the right, we would ask you to submit complete details without delay so that our records can be compiled accurately. Any literature regarding your products may assist editorial mention and will be welcome. Names and addresses of Agents and/or Representatives should be included when submitting details. If you are requiring an agent, please indicate accordingly.

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NOTE CLOSING DATE—TUESDAY, MAY 1ST.

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