

Abstract

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Page 13

Trends in Heating Developments

75

As Told to

K. C. RICHMOND

Editor, COAL-HEAT, in a recent survey

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INDEX

	Page
Trends in Heating Developments..K. C. Richmond	5
To See Many Changes and Improvements.....Marc G. Bluth	6
New Products to Obsolete Old Heating FacilitiesP. B. Zimmerman	8
Lighter Weight Plants, Automatic Firing.....Joseph C. Fitts	9
Better Housing Construction Means Smaller PlantsH. P. Mueller	10
Smokeless Furnace.....H. S. Sharp	11
Standardization to Come.....S. Konzo	12
Forced Circulation, Better Sizing.....R. E. Ferry	13
To Heat, Cook, Cool Thru Domestic Gas ProducerA. W. Thorson	16
Smaller Houses, Insulation, Stimulate Progress..Norman J. Radder	17
Small Packaged Heating Apparatus to Come....C. M. Lewis	18
Developments of Great Interest and Value.....Clifford Strack	19
Better Air Distribution and Control...R. M. Gehl	20
Magazine Heaters May Prove to Be the AnswerSumner B. Ely	22
"Things" as We Know Them to Be Quite Obsolete To Get Convenience Never Before Offered....Neil H. Cargile	25
Trend Toward Fully Automatic Heating.....H. T. Kucera	26
Definite Betterment.....R. C. Cross	27
Need Better and Larger Stoker Furnaces.....C. V. Beck	28
War to Create Demand for Better Equipment...Elmer C. Graves	30
"Eggs Under the Hen".....H. E. Grossenbacher	31
Influx of Sub-Standard Equipment Unfortunate...Allen J. Johnson	32
New Stoves, Stokers, Great Step Forward.....H. A. Glover	33
To See Vast Improvements in Heating FacilitiesA. K. Knudsen	34
New Products; New Materials.....	35
Radiant Heating—The Answer.....J. E. Fullman	36
Create Desire So People Will Want to Buy.....	38
Expect Great Improvements.....	39
Looks Forward with Confidence.....Albert Ponn	40
"Marking Time".....Samuel Dunckel	41
Many New Things.....Ben L. Boalt	41
Must Learn Something About Their Furnaces...Ralph G. Johansen	42
Must Pay More Attention to Care of Equipment..W. Walter Timmis	43
Summer Service.....	44
Absenteeism.....	45
Basic Factors.....	45
New Markets for Coal and Better Heating Equip- ment.....	46
Some General Trends.....K. C. Richmond	47

Dwarf Former Efforts

"When victory is won we shall witness peacetime production on a scale to dwarf our former efforts," says Eric A. Johnston, president of the Chamber of Commerce of the United States.

"Expansion of old industries, creation of new industries, new manufacturing methods, new materials and products—all spelling jobs and better living for every body—will be ours as a result of the lessons learned in war production. Tomorrow will be the greatest adventure, the most thrilling age America has ever known."

Trends in Heating Developments

• K. C. RICHMOND

Editor, COAL-HEAT

LONG-TIME TRENDS in housing, building construction, shortages of materials owing to the war, governmental restrictions, availability of fuel, research, competition, consumer demands—each is contributing to marked changes in heating equipment design, manufacture and distribution.

Our first job is to help win the war, of course, but that will be done—thanks to our resources in coal, oil, iron, manufacturing facilities and man power.

As soon as the war is over, however, a "battle-royal" for the housing, heating and fuel markets can be expected. It is inevitable. Years of neglect of most of the heating equipment in use will result in a tremendous market for repairs, replacement, and modernization. Coupled with the pent-up demand for new housing and the shifts in population, a building boom is anticipated.

The restrictions under which industry is working will only intensify the competition between the furnace, boiler, stove, and heater outlets—between the coal, oil and gas interests. That there will be no little competition in general for the consumer's dollar goes also without saying. Some industries will be forced to fight for their survival.

Some Fundamentals

If we think in terms of human comfort, successful heating becomes inseparable from (a) housing or building construction; (b) the heating system as a whole; (c) the operation and maintenance of the heating facilities. Basically, we must remember that (1) no fuel is any better than the equipment in which it is used; (2) the equipment is no better than the skill of the operator; (3) what happens to the heat after it leaves the boiler or furnace is what counts. Housing and fuel and heating

equipment are as inseparable as scrambled eggs. What progress we make is going to depend largely on how we recognize these fundamentals. The day is fast passing when we can "get by" with blind selling.

To find out what the situation is; what we can look for after the war; and how we can prepare to meet the problems that will come up, we recently asked several of the best informed men we know to summarize some of the trends and developments *as they see them*. Here is what they say:

To See Many Changes And Improvements

• **MARC G. BLUTH**
Secretary
Stoker Manufacturers Association
Chicago, Ill.

WE SHALL see many changes in fuels brought about by the war limitation on the use of natural gas and petroleum. I expect to see these limitations continued into the years of peace, modified or revised as conditions demand. Natural gas and petroleum products are too precious to waste as this country has been doing.

Coal will increase in importance and become more essential and useable in many more forms than ever before. At the same time, I look to see serious and concerted efforts to conserve the resources of all fuels, including coal.

We can expect the development and design of coal burning equipment that will prove both astounding and necessary in order to meet the requirements and necessities of tomorrow.

Because of recent limitations and the scarcity of metal, manufacturers in the heating industry have the incentive to devote their attention to the development and design of equipment that will be so much more efficient and so much more adaptable to fuel requirements that the coal industry in particular, because of the accent on coal as the basic fuel, will be able to provide its customers the best service and the greatest satisfaction that we have ever known.

It is hard to believe, because of the attention being given to the war and all of its myriads of problems, that any manufacturer has either the inclination or the money, not to speak of the time, to devote its attention to what might be termed post-war problems. But it is a fact that in the laboratories, and even in the field, many manufacturers in the heating industry today are quietly going forward with considerable amount of research and development work.

With all of their problems manufacturers are devoting serious attention to the development of better equipment. We shall see stoves, space heaters, and cooking ranges, furnaces and boilers, and stokers that will be not only much more simple in operation and design, but improved in performance and efficiency to provide the carefree and the trouble-proof devices that we so earnestly desire.

Surge of Buying

After this war is over, we will see a great surge of buying on the part of millions of American home owners who have been deprived of new equipment during the war years; whose heating equipment is either beyond repair or so inefficient that they will provide a market that will exceed all previous records.

Will we see ash removal? Yes. Will we see stoves smokeless in operation? Yes. Will we see panel heating at costs that the average home owner can afford? Yes. Will we see air conditioning for homes improved and available at reasonable prices? Yes. All of these developments cannot, of course, be brought about by war or the demands that war creates. Neither will these developments be possible by wishful thinking. They will be brought about by the fact that a manufacturer and his organization are selfishly seeking to find a way to continue in business and the competitive spirit in free enterprise will make this possible.

There will be many new customers for coal created during these war years and the coal dealer, both those selling coal burning equipment and those who do not, have before them

the greatest opportunity in their lifetime to make friends of these new customers, to serve them well during these difficult times by providing the best service they know how.

There will be casualties in the heating industry resulting from the war. We will have orphans—stokers, stoves, furnaces, boilers, and other heating devices—that will be deserted because their manufacturers cannot stay in business and they cannot serve their dealers with parts or supervision. Someone is going to have to service these machines and this servicing is going to fall on the dealers of competitive products. They can perform this service, not only as a patriotic duty, but as a matter of practical, good business sense, because those people may be their customers some time when this thing is over. Thus servicing is going to be a very important part of keeping our customers and adding to the list. It is not going to be easy because of the scarcity of materials, as well as the absence of many competent service men participating in the war effort, either in the front lines or in the war factories. These are war conditions that we must frankly face.

When this war ends there will be new companies and new faces in the solid fuel equipment field. Numerous companies engaged in other enterprises today with vast and capable resources of money, manpower and engineering ability are right today making exhaustive studies of coal as the fuel of the future and of equipment to do a better all-around job of burning coal. We have reason to feel optimistic in the face of unprecedented problems.

New Products to Obsolete Old Heating Facilities

• **P. B. ZIMMERMAN**
Vice Pres. and Gen. Sales Mgr.
Airtemp Division, Chrysler Corp.
Dayton, Ohio

THE AIR CONDITIONING and heating industry may look forward to a great new business in the post-war period. The new products that this industry will offer should obsolete those in use today. The greatly

improved service obtained from these new developments will be in such great contrast to what we now have that the discerning householder will want only the new.

The American home has become smaller in size, better sheltered and insulated and fully mechanized for labor-saving. The most neglected feature in this new American home is a year-round weather-making plant.

It has been the practice in this industry to sell a heating product and its mechanical features and as a result we continue to pour raw heat or raw coal into homes without proper mixture or good control over temperature and humidity. The public will be eager to buy year-round air conditioning once the idea is sponsored by the industry and the press and is offered a dependable product.

It is my firm belief that year-round air conditioning will become one of the great new products for the sales specialist in the post-war period and that this service will make a great contribution to better health and an improved living structure.

Lighter Weight Plants, Automatic Firing

• **JOSEPH C. FITTS**
Secretary, Heating, Piping & Air
Conditioning Contractors National
Association
New York City

ONE MUST approach prophesying about the post-war period with considerable care, and yet one of the most important jobs before the business world today is a study of ways and means of carrying on business, and making the necessary adjustments in this post war period.

It would seem that this period would be marked by a considerable demand from the civilian population for heating installations to replace those which have not been well kept up during the war period. The design of heating plants has progressed considerably during the depression period, and in these replacements the contractor will undoubtedly

use the small tubed radiator recessed, or a convector.

The tendency in home heating prior to the war, which will undoubtedly be resumed after the war, was always better regulated heating plants, either through the use of mechanical circulators for hot water systems, or through the control of the fire itself. Insulation has come to play such an important part in home building that conditions can be kept at a much more even level than was possible in the old home.

The heating plant of tomorrow, too, will undoubtedly be influenced by the studies which have been made during the war period, aimed primarily at the reduction of weight. This, in the post war period, will probably bring us a light weight small radiator heating plant which can be put in the smallest type of home, and will give the owner the benefits of radiator heating. Automatic firing, which has been frozen by restrictive orders, will offer big possibilities as soon as material for the manufacture of mechanical firing devices again becomes available.

The heating contractor will have a backlog of business awaiting him which should mean busy days in this post-war period.

Better Housing Construction Means Smaller Plants

- **H. P. MUELLER**
President,
L. J. Mueller Furnace Co.
Milwaukee, Wis.

IN REGARD to the furnace of the future, we anticipate that furnace designs are going to be required to conform more and more to the approved types of construction of the home of the future.

Insulation has made a considerable difference in the size and type furnace that is installed in certain size homes. There is still a large part of the country in which the average home has a relatively high heat loss, due to the losses of the windows. As soon as the public demands that these heat losses be reduced, the heat loss of a home will be consid-

erably lower than the heat loss of the same size house of the past.

The furnace of the future is undoubtedly going to be a comparatively small, compact unit that will be equipped with controls, making it possible for the furnace to operate on a virtually continuous basis, regardless of whether the outside temperature is 50 degrees or 10 degrees below zero.

Another factor that has become increasingly more prominent is that instead of installing one large furnace in the larger type home, two or even three small, individual furnaces are installed. We believe that the trend will be more and more toward this type of installation in the future.

As mentioned above, the control of the forced air, winter air conditioning units, is going to be one of the most important factors of equipment of the future.

Smokeless Furnace

- **H. S. SHARP**
Vice-President
The Henry Furnace & Foundry Co.
Cleveland, Ohio

IT IS DIFFICULT to make a guess what the post war period has in store for us, but we all agree that improvements in design of coal burning equipment will be necessary in order to make the use of coal for home heating interesting to the average home owner.

We believe for residential work a type of smokeless burning furnace, where several days' supply of coal is bedded in the unit at one time, will probably be developed to a point where it will be marketable. It will bring to the home owner a unit which will burn coal for him economically and with less dirt than is now necessary.

The matter of improved designs for the post war period is being given consideration by the National Warm Air Heating and Air Conditioning Association now, and undoubtedly a complete plan will be worked out for the entire coal burning warm air heating industry in the near future.

Standardization to Come

• S. KONZO
Special Research Associate
Professor, Univ. of Illinois
Urbana, Ill.

HERE are a few trends that may possibly carry over into the future:

1. Intensification of standardization movement. As an example, the National Warm Air Heating and Air Conditioning Association has recommended standard sizes of gravity warm air pipes, fittings, registers and grilles, in which about 80 per cent of sizes listed in the past have been eliminated. The same development is in progress on forced air fittings.

2. Tendency towards setting up standards of construction and installation, construction codes, testing codes, and performance codes have been under consideration and will probably be greatly emphasized in the future.

3. A great stimulus has been given use of storm sash and insulation even into territories where they have not been commonly used.

4. A greater number of architects have been made conscious of the fact that the mechanical equipment going into buildings is an integral part of the structure. There should be an increasing demand for compact heating units planned as an integral part of the structure and not as an afterthought.

5. Studies in smokeless coal combustion together with studies on briquetting processes should bear some fruits. Coal men will have to push these developments if they wish to avoid a large loss of market to expanded fuel oil and gas developments that are liable to open up.

6. Conversion of individual room heaters to central heating systems is a distinct possibility. The seller's market now should not blind the coal producers to the fact that unless they can minimize dust and soot and handling, the present experience of home owners will be unsatisfactory and many conversion jobs will go to oil and gas instead of to coal.

7. My hunch is that the low cost house is here to stay. Prefabricated house development will hinge on labor's acceptance of the development.

Forced Circulation, Better Sizing

• R. E. FERRY
General Manager
The Institute of Boiler and Radiator
Manufacturers,
New York City

THE INFLUENCE of the war economy on the design of homes and domestic heating systems will be reflected in the developments and construction in the post war period.

Competition, shortage of metals and fuels, and the small basementless homes have focused attention of the designers on factors which will reduce first costs, reduce the weights of materials used, and permit the boiler or furnace to be located on approximately the same level as the first floor of the house. It is obvious that any discussion of heating trends will have to be predicated on the future, when materials will again be available for the manufacture of heating equipment.

In the steam and water heating industry the forced-circulation hot-water heating system lends itself most readily to modifications for meeting requirements of lower first cost, less weight of metals, lower fuel consumption, and adaptation to the basementless house. On this account there have been more development and advances made with this type of system, both in the equipment available and in the method of installation.

Competition and performance have demanded a better sizing of the equipment to the job. This necessitates accurate heat loss calculations and the selection of equipment of the proper capacity. Neither competition nor performance will permit the installation of a system which is grossly oversize. The heating loads of the three, four and five-room defense homes are relatively small, and errors in capacities may be a large percentage of the total load, thus causing inefficiencies in operation and performance which would not be apparent in larger homes. The need for more accurate ratings of equipment has been recognized and met by the establishment of test-

ing and rating codes for boilers, radiators and convectors. The requirements of the small home have been met by additions of smaller boilers to each manufacturers line of equipment, and the new small-tube type of radiator and convector which are readily recessed meet the requirement that heating units be unobtrusive and removed from the room.

In general, the quality of the component parts of hot-water heating systems for all classes of homes has been maintained at a high level, and the modifications which have been made to meet the requirements of the low-cost, medium-cost and higher-priced homes has been in the sizing and arrangement of the equipment, the deletion or inclusion of valves and control equipment, and in the design and operating temperature of the water.

Smaller Pipe Sizes

In the low-cost home the convectors or radiators may be located at the inside walls instead of at the outside walls under the windows, permitting a small saving in material and labor in the piping. While this location of heating units may not give the ultimate in performance, it will provide an acceptable condition. The use of higher water temperatures, in the neighborhood of 240° F., gives greater heat output per square foot of surface, and permits the installation of smaller radiators and convectors. Current information indicates that pipe sizes, especially the size of mains, may be materially reduced on all classes of forced-circulation hot-water heating systems without materially affecting their performance. If this is confirmed by actual tests, savings will be possible in both the labor and material used in the piping. At the I-B-R Research Home at the University of Illinois, sponsored by The Institute of Boiler and Radiator Manufacturers, tests are now under way to determine how far a reduction in pipe sizes can go on the type of forced-circulation hot-water system installed in this house.

In one section of the country both labor and material costs have been substantially reduced in all classes of houses by using copper tubing

in a so-called manifold system, instead of conventional black pipe and screwed fittings. This system employs a small supply and return header located at the boiler, and each radiator is connected separately to these headers with ½ inch O.D. copper tubing. In the basement-less house, tubing has been particularly adaptable to placement in furred spaces between sub-floors and finished floors.

Another promising innovation in the low-cost field has been the connecting of several radiators or convectors in series. This is made possible by the positive head provided by the circulator, and in the future the idea may be used more extensively in larger homes. Valves are usually omitted from the supplies and returns in low-cost jobs, but if convectors are used, dampers are usually provided in the cabinets of those located in bedrooms in order that they may be turned off at night.

The ideal heating system is one which automatically maintains a comfortable and healthy environment in the home under all conditions of weather, with a minimum amount of attention from the home owner. The introduction of heat to the heated spaces must be done with equipment which is unobtrusive and which does not interfere with the location of furniture, the interior decorations, or floor space. It must not occupy a large amount of space in the modern basement, and it must be quiet and efficient in operation. The quantity of heat supplied should be modulated in accordance with the heat load on the structure, and it should be flexible enough to follow the vagaries of the weather. Developments in the future will be aimed toward obtaining these ideals.

To Heat, Cook, Cool Thru Domestic Gas Producer

• **A. W. THORSON**
Assistant to the President
Carnegie Institute of Technology
Pittsburgh, Pa.

IF WE HAD adequate funds for research, I would suggest that we spend them, as far as domestic heating is concerned, on the development of still better stokers, a small sized stove for smokeless combustion of bituminous coal, and a domestic gas producer. I can visualize the home of the future in which all of its utilities are supplied by coal. This could be done with a satisfactory gas producer.

The public has voted its preference for gas as a heating fuel by the preponderance of the better new homes thus heated in the past few years. The gas producer could furnish this fuel. It could also furnish fuel for cooking. We could use it in an absorption refrigeration system for summer air conditioning.

In rural areas electric service could be supplied by producer gas through a combustion gas turbine.

We could also operate our automobiles or airplanes on producer gas fuel. The cylinders for storage of liquefied gas could be charged over night during the off-peak load period.

Hot water service could be supplied either by the gas or from the jacket water of the producer.

Such a gas producer would undoubtedly need to be located outside of the house and should, of course, be magazine-fed to avoid unnecessary attention. The chief difficulty would be scrubbing tar from gas produced by bituminous coal. We could, of course, fire coke and eliminate this difficulty.

Such a scheme is not as fantastic as first thought would indicate. In Europe gas producers are being used for practically all of these functions. Our problem would be one of developing a producer that could do all of them and one which would satisfactorily use a wide variety of fuels including our bituminous coking coals.

Our most immediate problem, however, is to arrange to hold, during the post-war period, business which has gone to coal during this period of scarcity of oil and gas. The attitude of Washington toward a national fuel conservation plan will undoubtedly well tend to preserve our gas and oil supplies for the purposes best suited to their use, using coal more generally for fuel than in the past.

The stove, whose development is being completed at Batelle, is certainly a fine contribution, but a couple of years late, through no fault of the industry's research groups but to the inability to get going because of lack of funds. At the moment the government is buying thousands of stoves for war housing projects. If we could have had our improved stove in production now all of this low cost housing would be equipped with up-to-date coal-fired equipment which would be permanent business for the industry. As it is, I am afraid that many of these stoves will be thrown out after the war and replaced with appliances burning competitive fuels.

Smaller Houses, Insulation Stimulate Progress

• **NORMAN J. RADDER**
Secretary, Plumbing and
Heating Industries Bureau,
Chicago, Ill.

REDUCED to its simplest terms, the prime function of a heating system is to change an uncomfortable indoor environment to a comfortable one and do it quickly, evenly, quietly, cleanly and economically.

When the highly efficient automatically-fired forced circulation hot water heating plant of today is compared with its predecessor of only a few years ago, it is obvious that great progress has been made. One of the objects of the research program at the University of Illinois sponsored by The Institute of Boiler and Radiator Manufacturers is to accurately determine the conditions which various hot water and steam heating systems are capable of producing in order that such accurate

knowledge may constitute a basis for further improvements.

It is obvious that developments in heating will follow housing trends. Even before the war, the public favored the small, compact, servantless type of house. This trend toward the small house has been accelerated during the war.

Two factors—small houses and thorough insulation of houses—will encourage manufacturers to devote a greater proportion of their engineering and designing talent to the special problems of the small heating plant. It is in this field of small house heating with hot water and steam, automatically fired, that we are most likely to see the most significant post-war developments.

Small Packaged Heating Apparatus to Come

• C. M. LEWIS
Sales Manager
Anchor Stove & Range Co.
New Albany, Ind.

SMALL PACKAGED goods will be the trend. We know now that hundreds of thousands can live in much smaller houses. The "after the war" automobile unquestionably will be a lot smaller. With packaged vitamins getting so popular and so reasonable in price, it might be conceivable that we could take another hitch in our belt and go to work in the morning on a slice of toast and two vitamin pills.

The smaller home, possibly packaged or prefabricated, is due to reach a new popularity. If so, the small packaged heating apparatus, either fired with packaged fuels, small stokers, magazine feed types, etc., should be a definite trend, in my opinion. A better and broader understanding of overall efficiencies of fuel burning apparatus will help, furnace fans are better understood as well as pumps in connection with hot water and condensation with more general acceptance of insulation all help lead me to this thinking.

Developments of Great Interest and Value

• CLIFFORD STROCK
Editor
Heating & Ventilating
New York City

IT IS QUITE possible that many of the changes in design of heating equipment which will come about in the next three to five years may be those due to a changed fuel situation. The present oil shortage is giving both anthracite and bituminous coal at least a short-term advantage; the work of the research laboratories at Primos and Columbus is bound to be of great importance over the long run.

Oil is temporarily in a tough spot and it is not too improbable that if aviation sharply expands after the war and if refining methods are somewhat altered it may prove unprofitable to burn petroleum products as a heating fuel.

If some of the legislative questions bothering the utilities are ever cleared up definitely one way or another, perhaps the time will not be too far distant when such organizations will still more actively promote (1) district heating, (2) gas heating, and (3) begin real work on off-peak storage of electrical energy for building heating.

Perhaps, too, Dr. Abbot's sun-heat boiler or some similar device may be available for certain uses. Local developments, such as a spread of sawdust burners in wood-producing areas and even alcohol burning in corn-producing areas, may take place.

Fuel conservation agitation of which we may see more this winter than ever before may possibly have a profound effect in bringing about further adoption of insulation, storm windows and weather-stripping, and this in turn is bound to affect heating design.

The great interest in radiant heating during recent years may be accentuated; some organizations are working on variations of this with metal foil insulation used to retain the radiant energy from human beings in the enclosure supplemented by artificial radiant

energy in the walls, coupled with absorption of human radiant energy by cool walls in summer.

High temperature hot water (somewhat misleadingly called high pressure) systems have begun to appear in this country, following their wider use abroad, and this may increase. Work is also reported as under way on steam heating boilers using forced circulation to reduce heat transfer surface in the boiler and thus reduce boiler size.

Whether these or other developments take place, we can be sure of one thing: there will be developments of value and great interest to all of us concerned with heating.

Better Air Distribution And Control

• R. M. GEHL
Sales Manager, Stoker Division
Gehl Brothers Mfg. Co.
West Bend, Wisconsin

LIKE the female bear, who hibernates during the cold weather and comes out in the spring with a couple of brand new cubs, stoker manufacturers will have a first class chance to bring out new models or to make definite improvements in the present ones.

Right now no new stokers can be built. Manufacturers have been given a limited time in which to assemble present part stocks into stokers. After that no more can be built (without priority) for the duration.

No doubt every stoker manufacturer who expects to resume operations after the war has his engineering department looking toward improvements, utilizing this idle period to put into concrete form the many ideas he has so far been unable to develop. It would be pretty difficult at this time to visualize the stoker and heating equipment that will be offered for sale after the war. One trend that seems to be taking shape is toward the pre-fabricated house. Most of these are small—probably will be sold as a more or less standard package. No doubt most of the fittings will be especially designed for this type of home, and a special heating system will prob-

ably be in order—some sort of single unit, including both stoker and furnace all in one; something that would be moved in, connected up and put into operation in a few hours.

New home construction, however, has never accounted for too great a proportion of the stoker business—most are sold to be installed in existing furnaces, so these will probably be much the same as they have been heretofore—with improvements.

We would not be honest with ourselves if we said that present models were the last word. More economy, greater efficiency is still possible. I look for some new developments especially in air distribution and control, allowing greater flexibility—the ability to produce an ideal fire under varying conditions. Perhaps also we may be able to develop some “foolproof” controls—a draft balancer, for instance, that could be set at the factory and could not be “monkeyed with.”

Perhaps we might even have a thermostat that when set “down” will immediately lower the room temperature. There seems to be a strong demand for that sort of thermostat. I notice some users expect that from the present instruments. But I guess we’ll have to wait. Most manufacturers like to surprise the public as well as their competitors.

Unlimited Possibilities

“We are on the verge of a new industrial age, an age of light metals and plastics and chemicals, an age of unlimited possibilities . . . more abundant housing, cheaper transportation . . . With the unrestricted production of these new light metals the whole price structure will be lowered. The consumer’s dollar is going to be worth much more. Millions of jobs will be created by unleashing this new productive capacity,” said Trustbuster Thurman Arnold in speaking at a meeting of the National Federation of Sales Executives recently.

Magazine Heaters May Prove to Be the Answer

• SUMNER B. ELY
Superintendent
Pittsburgh Bureau of Smoke
Prevention
Pittsburgh, Pa.

WE WILL see some cheaper heating apparatus developed, particularly that which will burn cheaper coal satisfactorily.

In Pittsburgh, for example, there is already a City Ordinance on the books but which will not be effective for some two years yet when everybody—private individuals and corporations—will be required to burn some sort of smokeless fuel unless they are equipped with some anti-smoke device for burning high volatile coal smokelessly.

As the large corporations are already equipped with stokers and proper fuel burning equipment, they will not be affected by such a restriction, but the private individual will. So the problem, generally speaking, resolves itself into how to take care of the poor man. If he cannot afford to buy a stoker, he must purchase a higher priced fuel.

In Pittsburgh there are some 120,000 domestic stacks; a few of these are gas and oil fired, so that roughly there are something like 100,000 using coal. These might again be separated into say 35,000 better class, equipped with furnaces, stokers, down draft, or other devices, and the remaining number of poorer class using stoves, small hand-fired grates, etc. The figures are: 35,000 better class using 440,000 tons of coal per year, and 65,000 to 100,000 poorer class using 400,000 to 840,000 tons of coal per year.

The poorer class only will be obliged to use smokeless fuel, which will run something like \$2.75 to \$3.00 a ton additional. As Pittsburgh has a population of 670,000, the increase is $400,000 \times \$3$

— \$1.80 per capita per year.

670,000

There is considerable work being done on this type of stove at the present time. At Battelle Memorial Institute they have worked

on many designs, one of which is practically perfected and at the point where it is ready for manufacture. If these can be manufactured in large enough quantities, they might possibly be sold as cheaply as the ordinary stove which is in use today. This may be the answer for the poor man.

Also, it may be possible to extend this magazine principle to larger equipment and apply it to furnaces; in fact, a few months ago I saw a furnace some 6 or 7 feet square and 6 or 8 feet high holding some 600 or 700 pounds of coal, that would run for a week or 10 days without touching it. Ashes accumulate in the pit at the bottom during this period; electrical controls maintain the required temperature in different rooms. I do not know that this is applicable to domestic use and mention it only as a very interesting device.

Favorable Factors

"Four favorable factors will be in operation when the war ends," said Arthur R. Upgren, chief of the National Economics Unit at a recent meeting of the New York Chapter of the American Marketing Association: "(1) National income will be at a high level when the war ends. (2) The need for all types of goods—especially civilian goods—will be great. Economically one of the greatest distinctions between our handling of this war and the first World War is that there was very little cutting down of civilian production in 1917 and 1918 with the result that manufacturers, dealers and consumers were well stocked when peace came. (3) Consumer debt will have been greatly reduced through the virtual elimination of time payment selling during the war. (4) Heavy savings accounts and War Bond investments will provide a financial cushion during the change-over period."

"Things" as We Know Them to Be Quite Obsolete

WE HAD STARTED in 1941 on what we then believed to be a very comprehensive product development program looking forward to the immediate future. December 7 changed all that and the impact of the war program has been so severe that our engineering facilities, as well as manufacturing facilities are being devoted to not only the production of war materials, but also to engineering research on war materials, writes the general sales manager of one of the heating industry's outstanding organizations.

The impact of the War has brought about facilities for the production of materials, such as light steels, aluminum, magnesium and plastics way beyond any thinking that might have been in mind in 1941. These greater facilities are going to make available materials for fabrication at low cost, that have been out of reach and that will now be available when the war is over.

Any planning that was done in 1941 has had to be skipped and today the entire heating picture is being re-examined to determine the form, size and shape of the "new equipment" which will come after the war. Personally, I am of the opinion that "things" as we know them today and which seem quite modern to us, will be quite obsolete in 1945.

We have been hard at work for months checking the entire fuel situation (all fuel) as to sources, quality, life, costs at source, costs of transportation, and their competitive position in each market. We also have been checking the smaller heating requirements of homes due to new methods of construction, location of homes geographically by climatic conditions and the entire domestic heating picture in many other regards. This study already has assumed such proportions, which, when tied in with new methods for production and with new available materials, makes it impossible to say at this time what the final trends and developments will be.

Anything at all on the subject will be thought-stimulating and will be much desired by the small manufacturer who has neither the time nor the facilities to further investigate the subject. One thing we can all be assured of and that is, the business will be very highly competitive and on costs far under those we operate on today.

To Get Convenience Never Before Offered

• NEIL H. CARGILE
General Manager
Allen Manufacturing Co.
Nashville, Tenn.

WITH THE conversion of stove manufacturing plants into war work, and the restriction of production in order that vital materials may be used in our war effort, most manufacturers will, I believe, wait until the war is over and victory is achieved before introducing the developments on which they are now working and will be working during the war.

Due to the smoke abatement problem in our cities, competition from other types of fuel, plans that have been developed for and the construction of more compact, less expensive modern homes without basements, and the availability after the war of many new and different materials which have not been thought practical to be used in the construction of coal burning appliances for the home, which materials (aluminum, for example) should be available in such amounts that they will be used in place of other materials for the sake of utility, appearance and construction, I believe we will find manufacturers selling coal burning heaters, ranges and water heaters which will operate under automatic control, practically smokeless, and with efficiencies, conveniences and features never before offered in this type of equipment.

Trend Toward Fully Automatic Heating

• H. T. KUCERA
Vice-President
Marsh Tritrol Company
Chicago, Ill.

THE PRESENT threatened fuel shortage is teaching the American public that erratic and excessive building temperatures are not only unnecessary, but undesirable. The fresh air crank who thought he could not live without having his window wide open is now being looked upon as an Axis operative.

A building owner or operator who has in the past been at the mercy of the tenants and was required to maintain from 75 to 80 degrees temperature in the building throughout the day and through most of the night, now finds that the simple explanation that he is holding building temperatures down to a healthful and comfortable minimum during normal heating hours in order to conserve fuel for the War Effort and to circumvent the possibility of fuel rationing which might necessitate greater curtailment of heat, satisfies the complaining tenants.

The trend in heating is therefore directly towards full automatic heating. Now more than ever the stoker will be given the credit it so justly deserves. Where such stokers are fully automatic in their operation, being supplied with adequate thermostatic and combustion controls, they can now be operated at maximum efficiency with most economic operation.

Operators of stokers, principally in multiple-occupancy buildings, installed to operate on pressure control only, are now taking advantage of the recent development in outside type thermostatic controls to automatically control the heating of their buildings. Such outside regulators are now available for controlling the stokers in all types of buildings, with all types of heating systems, and at a price which makes such a control a sound investment in even the two-family building.

Indications are that the coal and stoker industry see in the enforced conservation pro-

gram an opportunity to educate the American public on the advantages of fully automatic heating. By the proper exploitation of all of the automatic controls now available, the coal and stoker industry is now in a position to prove the fact that most comfortable, healthful and economical heating can be attained with coal.

Definite Betterment

• R. C. CROSS
Engineering Department
Sears, Roebuck and Co.
Chicago, Illinois

IN TIMES of stress, such as we are now undergoing, stimulation of thought is provided leading to new applications of basic principles, new material usages, new products, and new concepts of production and consumer satisfaction.

General development now under way may be divided into two classes, that furnishing temporary expedients intended only for the duration of the emergency, and that providing better and improved equipment through the use of new applications, materials and methods.

A general consideration of this latter class of effort furnishes the belief that the present tremendous increases in production, and the advances in the knowledge of certain materials will, no doubt, result in a definite betterment in the design and fabrication of post war heating equipment. The utilization of such materials will lead to greater production, lower costs both to the producer and consumer, higher efficiency with attendant lower operating costs, improved appearance, and general increase in consumer satisfaction.

Expressed in general terms, these are the developments that I believe we may expect, and I think the detailed application of these generalities will result in some very interesting and novel devices.

*Hy industries post-war comp. -
-ation will come from new
concerns - large corporations -
New methods of distribution -
middle man and former
outlets may be li. passed.*

Clegg - you should visit Cross.

Did a 70,000,000 mg. & 100,000,000 mg. - 1941 - 280,000,000

Need Larger and Better Stoker Furnaces

• C. V. BICK
President
Florida Coal Company
St. Louis, Mo.

THE DEVELOPMENT of stokers and controls is coming along very satisfactorily. After the war I expect redesigning of both, which will show some detailed improvement, but generally along the lines of the present equipment. We will have some new ash removing stokers.

There seems to be a remarkable development in the making of stoves. We will certainly see a number of stoves of the magazine smokeless type as well as entirely new designs.

The one point that I am somewhat blue about is the fact that standard furnaces, hot water heaters and steam boilers do not seem to be modernizing as fast as other branches of the industry. Something should be done to wake manufacturers up to design such equipment to better accommodate stokers. This has been a pet hobby of mine for a long time. There are three different avenues of exploration for furnaces, boilers and hot water heaters to accommodate stokers:

1. They should be made larger in circumference, even in small furnaces, which could be made lower, if desirable, in order to attain the desired size. One of the most common faults in installation is that the furnace is too small to allow for a proper clinker space for the accumulation of clinkers. This, more than any other factor, dictates the length of time between cleaning periods. Even the smallest furnace should be 20 ins. in minimum diameter, even for the smallest stoker, as there should be a shelf completely around the stoker retort of not less than 5 ins. from the outer edge of the retort to the furnace wall in every direction on which clinkers and ash can accumulate which should be even larger in the larger sizes.

2. The doors through which clinkers are removed should be dropped 2 ins. or 3 ins.

lower than they are at the present time in all stoker models and they should be made even larger than at present. These two factors are the simplest things in the world to design into a furnace, but seem to be universally disregarded. All you have to do is simply to change the proportions and patterns a little bit to realize these necessities which promote the ease of tending a stoker tremendously.

3. A fly ash trap should be incorporated in all stoker furnaces. It could be designed very simply.

Manufacturers of furnaces and boilers could very easily apply themselves to these ideas and produce simple but much more satisfactory lines than have appeared on the market to date. Some of the special stoker furnaces that have appeared are more or less "Goldberg" models. If we would throw away our old ideas about revamping a hand fired furnace and start all over to design the simplest chamber possible to properly accommodate stokers, bearing in mind simply the fact that it should be big enough to accommodate a large supply of clinkers and ash so that tending it could be made at the longest possible intervals, rather than at the shortest, and that the removal of the clinkers should be facilitated to the greatest degree, we should be on the right track.

Incidentally, these ideas contribute materially to proper combustion as with plenty of side space the fuel bed automatically takes care of itself in much better shape, as the deep fuel beds that are inevitable in the small barrel furnaces which contribute to many stoker troubles are avoided. More combustion space automatically results.

War to Create Demand For Better Equipment

• **ELMER C. GRAVES**
Chief Engineer
Phillips & Buttorff Mfg. Co.
Nashville, Tenn.

THE WAR has and will further clear away many illusions about the inexhaustibility of oil supplies both as to transportation and in actual output. The terrible battles being waged for possession of oil supplies and the question of how much oil we will control in the final world set-up will not be readily overlooked by the future purchaser of heating and power equipment. Greater and greater quantities of oil will be diverted away from the heating of buildings to the propulsion of ships, aeroplanes, and to industrial uses now being forced into practical application by war emergencies. It is not entirely unlikely that the use of fuel oil will be permanently restricted, either immediately after the war or in the not far distant future.

If the geologists are right that our coal supply is almost inexhaustible and that our oil supply is very small in comparison, then there is no justification in the continuance of promiscuous use of oil. There is every reason to expect this condition to be recognized in the new world we must live in after the war.

Coal is much cheaper per B.t.u. than oil. The relative efficiencies of the two fuels at the burner are equal. Either may be adapted to heating units capable of producing equal overall efficiencies. Either fuel can be burned smokelessly, noiselessly and without the handling of the fuel by the home owner. Coal, of course, burns with a residue, but in a few cases this is handled automatically. The stoker manufacturing industry is ready to offer automatic ash removers if the demand warrants the change.

If stoker manufacturers have been remiss in failing to create universal demand for stokers with complete automatic handling of both fuel and ash and a demand for combined stoker furnace units, then this war will probably create this demand for them.

Likewise the field of small heating units seems on the threshold of complete modernization to meet the demand for efficient, smokeless coal burning for installations where stokers are not practical. Only the manufacturers' lack of ingenuity to develop and market satisfactory coal burners at moderate prices now stands in the way of the adoption of coal as the universal heating fuel.

In sections like Nashville, St. Louis and others, where smoke palls have been known to occur, modern coal burning equipment is rapidly becoming the accepted order. In such cities stoker sales per capita lead and modern stoves have had a great degree of acceptance. Smoke abatement committees and officials are recommending stokers and are frantically looking for other means of burning coal smokelessly. Their demands can and will be met by the manufacturing ingenuity, spurred on by post-war demand.

"Eggs Under the Hen"

• **H. E. GROSSENBACHER**
President
Grossenbacher Furnace Co.
St. Louis, Mo.

WE ARE glad to see more interest in the development of new heating apparatus. When all the smoke is cleared away from this world trouble we will offer some new developments and improvements in our warm air furnace and also our stoker. When we are ready with it, we will be glad to announce it to the world. Just how great it will be, we do not know at this time, but we do have some "eggs under the hen."

COAL-HEAT certainly deserves a lot of credit for carrying such wonderful articles, and we only wish that everyone could read and study them so we could all derive the benefits out of them.

Influx of Sub-Standard Equipment Unfortunate

• ALLEN J. JOHNSON
Director
Anthracite Industries Laboratory,
Primos, Delaware County, Pa.

SO MANY of our heating accessory plants have found it easy to do war work that I am rather doubtful as to whether war time experimentation in the heating industry is proceeding at the same pace as in some other industries. For this reason, unless definite steps can be taken by influential sources, I cannot see any particular reason for optimism.

Without research during this manufacturing interim, there can be very little upon which to predicate an assumption of greatly improved equipment after the war, whereas, on the other hand, war time necessities have, in many cases, caused a definite lowering of equipment standards, with the result that we have already an influx of sub-standard equipment that we are having to accept because of the times. This, enjoying a lucrative market, will tend to carry on after the war is over.

Good equipment is developed and not just born and without ground work, which is certainly not now taking place.

In many fields the war found the heating industry with plenty of room to improve their equipment, so that if research could be carried out in anticipation of a post-war business, the changeover of the factories would be an excellent time to promote better devices of all types.

I believe not only in the approval of equipment but also I advocate a stronger plan through which fuel interests go the complete way to describe their conception of entire heating plants and service water hook-ups for the use of their fuels. I can see no reason why this should not apply equally to bituminous and anthracite.

New Stoves, Stokers Great Step Forward

• H. A. GLOVER
Vice-President in Charge of Sales
Island Creek Coal Sales Co.
Huntington, W. Va.

WONDER if the coal industry realizes the significance of the fact that Battelle Memorial Institute in two years of effort has succeeded in developing a stove which does burn high volatile coal smokelessly and while it, of course, will have some "bugs" in it, they can and will be taken out as soon as it is possible to put out 75 or 100 and use them throughout the season. They also have a stoker which will eject its own ashes using even low fusion coals. It will also burn high fusion coals. This is ready to be tried out in actual service. Thus in two years' time a research project financed largely by the coal industry and the railroads interested in the production and transportation of coal, has really shown remarkable results.

Even though the industry will be handicapped during the war by restrictions, we have an opportunity now which does not come very often to really demonstrate to a much enlarged clientele just what can be done with solid fuel.

In the past two years the most notable development which has come to my attention has been the increased number of dealers and operators alike who are thinking in terms of better heat service for solid fuel, and joint action between producers, wholesalers, and retailers to accomplish something along this line. I am thinking now of the recent show put on by the Chicago Coal Merchants Association, Better Home Heating up in the Northwest, the splendid work which is done by the Milwaukee Solid Fuel Institute, and the hundreds of additional dealers who are becoming merchandise and service minded. This augurs well for possibilities for joint action to take a very great step forward in the promotion of solid fuel for home heating as soon as the war is over and we are at liberty to organize and go ahead with any plans of this kind which can be developed.

To See Vast Improvements In Heating Facilities

• **A. K. KNUDSEN**
Sampsel Time Control, Inc.
Spring Valley, Ill.

BOILERS will be developed weighing only one-third to one-half of the present conventional types with equivalent capacities and with faster water heating and steaming qualities.

Steel warm air furnaces, as they will be constructed to fire liquid, gas or solid fuels, will spell the doom of cast iron furnaces. These new furnaces will have greatly increased prime heat radiating surfaces and their design will include tubes which can be thoroughly cleaned in a few minutes.

Warm air heating systems will triumph over steam and hot water systems. Home owners are tired of having ugly year 'round space consuming radiators, one or more to a room, and a system which is worthless for summer comfort except for those units equipped with indirect water heating facilities.

It is granted that water for domestic uses can be heated very inexpensively if the fuel used is coal or oil, fired automatically. The price of this equipment has heretofore been so expensive as to scare out the potentially large market except for a fairly substantial number of owners of anthracite stoker fired jobs, but the percentage of these installations is still small compared to the total not so equipped.

Controls will show vast improvement. Simpler, more positive controls especially designed for a particular application will be widely employed and most of them will be factory installed on package unit heating plants. No longer, for instance, will forced flow hot water boilers with domestic water heating equipment with its controls look like a "Christmas tree with ornaments." In the future one or two inconspicuous combination controls will suffice.

Bin fed bituminous and anthracite stokers will get a real play in post war heating equipment sales. Mr. John Q. Public has about

made up his mind that the gas supply invariably "peters out" just when he needs it worst and that oil is expensive and may also be difficult to get during emergencies. The fact that a number of oil and gas jobs will be forced to switch to solid fuel will result in a great deal of adverse cost comparison publicity for both oil and gas.

New Products; New Materials

"It is now clear that out of this war are going to come new methods of operation, new materials for much of our merchandise, and new ways of living for large groups of our customers," says J. A. Donaldsen, vice-president, Butler Brothers.

"Vast increases in the production of aluminum, magnesium and plastics of all kinds will cut deeply into the steel and wood industries of today. Mass production will become much more general with resulting lower manufacturing costs.

"Retailing methods will need to become more streamlined and simplified. Decentralization trends and geographic changes in population will bring this about.

"Goods will be manufactured and distributed in greater quantities than ever before. Competition will be keen and profit margins will trend downward. High volume will be essential to a successful retail operation. A greater proportion of the total consumer buying power of the country will have shifted to the lower income brackets of our population.

"New products and changes in customers' tastes and acceptances during the war will make obsolete many old lines of merchandise that have for years been the backbone of many retail operations.

"Labor costs will continue much higher than before the war. More flexible and more economical methods and procedures for retail operating will have to be devised. A continuation of much more government supervision and control of business than before the war should be anticipated."

Radiant Heating —The Answer

• **J. B. FULLMAN**

Manager, Engineering Service
Dept., A. M. Byers Co.
Pittsburgh, Pa.

OUR company has been conscientiously developing and promoting the new heating method known as radiant heating, or panel heating, for the past four years.

I say "new" because the system has been relatively unknown to the building industry in this country until recent years, although it is the oldest central heating method in existence, having been originally developed during the days of the Roman Empire. Houses reconstructed at Bath, England, and other locations show fire pits under marble floors, and hollow walls through which the heat flowed to openings in the middle of the roofs, thus creating warm, radiant surfaces throughout entire chambers.

Following the fall of the Empire, heating by surface radiation apparently went out of existence and had no renaissance until some 30 years ago in England when A. H. Barker, an inventor, rediscovered the principle. Like Archimedes, Newton, or Franklin, Barker made his discovery with dramatic simplicity. He noticed one day that at the same air temperature, one room of his house was more comfortable than another due to the warming of one wall by furnace flues. After experimentation, he embedded hot water pipes in the walls of other rooms and created the same effect. Following his discoveries, radiant heating developed rapidly in Europe, and I understand that there are nearly a thousand installations in England and France alone.

Radiant heating developed much more slowly in the United States, and only scattered installations appeared until quite recently. Notable early examples are as follows: Phipps Psychiatric Clinic, Baltimore, 1911; River-view Inn, Schenectady, 1915; Sacred Heart Church, Pittsburgh, 1928; British Embassy, Washington, 1930. Few additional installations occurred until in 1938, when Frank

Lloyd Wright designed the Johnson Wax Building in Racine, Wisconsin. He placed wrought iron coils in gravel under the concrete floor slab and created a mild sensation in the architectural and engineering professions. Since then interest in radiant heating has increased rapidly and several hundred installations have been made throughout the entire country.

Depends on Radiation

This type of heating differs basically from the more commonly used systems in that it depends largely upon radiation and only incidentally on convection for distribution of heat. Research has shown that the human body loses about twice as much heat by radiation as by convection, so it would seem that radiant heating has a better chance of reaching the ultimate in efficiency and economy than other methods. To go a little deeper into the subject, one of radiant heating's main advantages is physiological. Large areas of radiant surface counteract the radiant loss from the body, thereby permitting a feeling of complete physical well-being even when actual air temperatures are low. An extreme example of this phenomenon lies in the ability of skiers at Sun Valley to go about under the rays of the sun clad only in shorts even when the thermometer is below zero.

The most popular and generally used method of radiant heating in this country consists of continuous coils of pipe which run under floors or in ceilings and are attached to standard hot water heating systems.

Although by 1938 we had already begun a research file on the subject of radiant heating, it took the Johnson Wax Building job to kindle our enthusiasm and start us on the path that we have been following ever since. It was in 1938 that we became convinced that radiant heating not only had great possibilities, but that wrought iron pipe adapted itself very well to the radiant heating system because of its resistance to corrosion and the similarity of its coefficient of expansion and contraction to that of concrete.

Since then we have studied hundreds of radiant heating installations throughout the country of such diversified nature as to furnish us with excellent records. These records are, of course, available to designers who are in need of technical data on this type of heating.

During the last year alone, installations have been made in churches, industrial buildings, homes, hospitals and even in such unusual places as the bar room of a beer garden and the snake house of a zoo.

Because our records show that radiant heating has saved up to 30 per cent in fuel cost and has been surprisingly inexpensive in installation cost, we feel that some day it will become one of the most popular heating methods in existence.

Create Desires So People Will Want to Buy

"Every unsatisfied desire for the goods and products of our factories has been a stimulus to our way of life. Men with desires are men who satisfy their ambitions with productivity. Men without desires lack incentive to work. It is advertising that fans the spark of desire into action. By creating demand for the products of our mills advertising has necessitated factory expansion, increased employment and national wealth. Advertising, providentially, has mothered the necessity of the invention of our mass production technique," says Walter D. Fuller, president of the Curtis Publishing Co.

"Great markets oil the machinery which provides employment and payrolls in industry. If America had been careful about this oiling operation we certainly could have lessened and perhaps even have prevented the depression of the 30's. Do you realize that in that era there were an estimated six million homes in this country which did not have bath tubs? There were ten million rural homes without central heat. There were 18 million without telephones. We could have produced and

financed these needs and more. We failed to do the selling job. We failed to make desire strong enough. We failed to make people want those things hard enough so they would go out and find ways to earn them."

Expect Great Improvements

IN THESE days of startling military upsets and surprises, many people who have prognosticated freely have been proved so completely wrong that I do not wish to join their ranks by predicting what the future is going to bring in the way of stoker equipment, writes a former president of the Stoker Manufacturers Association.

At this time, every patriotic American manufacturer either is or should be concentrating his attention and facilities on the production of war materials for the winning of the war. Never has this nation been in such grave peril as now. We are winning the battle of production and if we can just win the battle of transportation the war can be over by this time next year.

When the war is over there will be a period of reconversion to peacetime production. I think our program will be like that announced by General Motors. We will use our current jigs, tools, and dies for immediate production while we are tooling up for new items. I believe the first peacetime products will be very similar to those made before conversion to war production, such as refrigerators, automobiles, and many other items of durable goods. This will fill the immediate need of the markets which have been war starved. Within about two years after signing the peace we will see real activity, for with all the knowledge and experience gained in the war effort turned loose on peacetime developments, we can expect great improvements in all types of heat utilizing equipment.

When we again focus our time and attention on peacetime activities we will have things of interest to offer.

Looks Forward With Confidence

• **ALBERT PENN**
President
Penn Electric Switch Company
Goshen, Ind.

I AM NOT of the opinion that there is going to be any radical change in the heating field from what we have had. Of course, there will be refinements both in the heating plant itself, prime heating unit, whether oil burner, gas or stoker, as well as in controls for all three.

We are maintaining our Research Division and carrying forward some developments which we have had under way for a period of time and, of course, shall have these available for promotion when the war comes to an end. I have the feeling that control manufacturers have more than kept pace with the industries which they serve. Controls have been more foolproof, more streamlined, and certainly have been offered at an amazingly low price. The functions which these controls perform are the functions which will be called upon by any future controls, and at this time I see no indication that there is going to be any material deviation from the controls as we have offered them for the past year or more.

Some years ago, eight or more, our company offered a thermostat which operated on a different principle than those produced in the past. This operated on the principle of heat anticipation or heat acceleration, whichever term you care to supply, and this accomplished the very desirable result of maintaining more uniform room temperature—so uniform that it was approximately a straight line. Therefore, I am not of the opinion that this particular instrument will be replaced because you will have a difficult time finding something to function better than 100 per cent, or in other words, hold a uniform, straight line temperature in space to be heated by an automatic heating plant such as a stoker, oil or a gas burner.

I have no doubt there will be certain industries that will spring up from developments during the war which will be new and revolu-

tionary. I see no such development, however, in the heating field or in the controls for the heating industry. I recognize that there will be improvements but the controls will fundamentally perform the functions as heretofore.

We are vigorously experimenting and developing devices which will permit us to enter fields not heretofore covered by our regular line of controls. By this method we look forward to the after war period with confidence. Not only will we be able to maintain our volume which we enjoyed previously but through additions and improvements to our regular line, plus the addition of these new devices which will permit us to enter new fields, our business should be expanded very materially after a proving period immediately following the war.

"Marking Time"

• **SAMUEL DUNCKEL**
Managing Director
Institute of Cooking and Heating
Appliance Mfrs.
Washington, D. C.

I DOUBT whether many of the smaller companies are doing much research or designing on coal heaters at present. They are rather marking time until we can see more definitely what will develop in the line of a smokeless heater at Battelle.

The stove manufacturers who are sponsoring research do not think that the new cross-feed coal heater is sufficiently developed to warrant publicity at this time.

Many New Things

• **BEN L. BOALT**
Vice-President
Perflex Corporation
Milwaukee, Wisconsin

WAR, research and development bring out many new things and I know that some development work relates directly to heating. No doubt, there are a good many other instances of this same progress.

Must Learn Something About Their Furnaces

• RALPH G. JOHANSEN
The Hays Institute,
Chicago.

MUCH TOO OFTEN the building owner is more concerned about the coal he buys, whether it is good, bad or indifferent, than he is about where that coal is to be used and the results that he expects to get from it.

If the average building owner, large or small, would acquaint himself with the method of operation of his heating plant and the things connected thereto like warm air ducts, registers or radiators, he would find that he would accomplish considerably more with considerable less fuel. The trouble with the average furnace owner is that he doesn't seem to realize that there is anything that he ought to know about the furnace with the exception that it is a place to throw coal and make some minor adjustments of drafts in order to be sure that the coal will burn or stop burning.

One of the main things that the heating industry, which includes coal men as well as the stoker men, should do is to try and impress upon home owners that they ought to learn something about their furnace. Whether they have had a furnace for 20 years or not makes little if any difference. The point is they don't know anything about it no matter how long they have had it and that is proven by the condition that most of these domestic furnaces are in.

A large percentage of these furnaces are in such shape that it is actually remarkable that it is possible to burn anything in them with any kind of result. If these furnaces were put in fairly decent shape the poorest coal that the householder could buy would produce far better results than the best and highest priced coal that many of them are buying now and using in a furnace that is in such broken down condition that little if any results can be obtained.

Must Pay More Attention To Care for Equipment

• W. WALTER TIMMIS
Chief, Plumbing & Heating Branch
WPB, Washington, D. C.

IT IS necessary to keep all of our heating equipment in good operating condition.

The tendency in the past has been too frequently to discard equipment rather than repair it. When we had a sufficiency of all types of material, the substitution of more modern equipment was part of our normal lives. Today, however, we are faced with a shortage in all types of raw materials, and particularly those materials which go into the manufacture of steel. It is, therefore, incumbent upon all of us to make what equipment we have last as long as possible. This is particularly true of heating equipment because of its use of cast iron and steel.

The average home-owner has never paid enough attention to the care of his heating equipment. He is apt to forget all about it until it breaks down. It is really the duty of all of us to take care of our heating equipment.

Boilers should be cleaned and inspected before they are put into use in the fall. Chimneys should be checked, and every home-owner should endeavor to see that his heating plant operates with the maximum efficiency. By so doing, he will not only prevent costly repairs, but he will also use less fuel.

Each individual home-owner can certainly contribute directly to the war effort by doing this. His contribution may seem small to him, but a few hundred pounds less coal or oil used, and a few less repairs made, when multiplied by the total number of heating plants in our country, mean a terrific amount of material saved.

Anything that you can do to bring this to the attention of the individual home-owner will be greatly appreciated.

Summer Service

Summer service is particularly important. This is the time, if ever, to encourage the inspection, cleaning, repair of every furnace, boiler and stoker. Stokers need cleaning just as much as anything else.

Dirty furnaces waste fuel. "Sick" heating plants drive your customers to other dealers. If their heating plants had been in good shape a few years ago, do you think many persons would have put in oil or gas? It was the neglect of the heating equipment that drove 2,000,000 coal users to oil.

Stokers, furnaces and boilers, no less than automobiles, need attention now and then. This should be obvious but apparently it isn't, since so comparatively few fuel users bother to have their heating systems inspected, cleaned and overhauled periodically.

Yet there is no more justification for running a heating plant or a stoker for years without any outside attention or service than there is for an automobile. Some of the responsibility for this rests on the shoulders of the furnace and boiler dealer, who has been inclined to overlook the customer once the heating plant went into the basement. This has been true also of some less foresighted stoker and other dealers. Few customers, of course, appreciate what happens to the heat they buy or how important it is to operate and maintain the heating system properly.

As a result, 20 per cent of the heat that many customers buy is wasted and heating isn't what it should be—which explains why so many put in oil or gas burners, insulated their homes, and even contented themselves with lower temperatures.

To meet the situation, it appears essential (1) to get in touch periodically with one's customers; (2) to inquire about the possibilities of helping them to reduce their costs and of improving their heating results; (3) to sell them on having their heating plants cleaned, inspected—repaired, if necessary; (4) to point out some of the best methods of operating the heating system; (5) to furnish each customer

with the right kind of a heating booklet covering the hundred and one things that affect the satisfactory heating of any home; and (6) to point out the advantages of buying coal early and of keeping an ample stock on hand.

Absenteeism

Absenteeism is another problem which needs more attention. Sick and injured war workers lose 6,000,000 work-days every month. Over 20 million families have members with colds at one time. Nationally, the average man loses two to four days a year from work due to colds—women twice as much.

Faulty heating, overheating, wide variations in temperature, exposure, drafts—each contribute to the high incidence of colds. Part of the solution to the problem of absenteeism, colds and ill health, rests in the hands of the coal man, the stoker and heating appliance dealer. Better control of temperature is one of the best means of preventing the common cold.

The Basic Factors

If we itemize the basic factors that affect the success or failure of the retail fuel or heating dealer we arrive more or less automatically at the following:

1. Consumer needs and market potentialities.
2. The status of the customers' or prospects' heating equipment.
3. Maintenance and operation of the heating equipment.
4. What happens to the heat customers buy.
5. One's merchandising efforts and personal relationships with customers.
6. Type and quality of the fuel or equipment sold and methods of handling.
7. Governmental or other factors.

How we meet these factors will determine how much business we enjoy in years to come. What customers get out of what they buy now governs what they buy later.

New Markets for Coal and Better Heating Equipment

Study of the returns from the first six states on which the Census Bureau has reported the type of fuel, heating and cooking equipment used, indicates a substantial market for coal and better heating facilities.

Of the 405,000 dwellings reporting heating stoves in these states—Montana, Wyoming, Idaho, Nevada, New Hampshire and Vermont—175,000 are using wood for fuel. More than one dwelling in three (35 per cent) is using wood for cooking purposes. More use wood than coal. Approximately 7 per cent are using gas—and most of these are in Montana. Some 9 per cent are using oil heaters—1 per cent kerosene. By states, the percentages using oil follow: Nevada, 2.3 per cent; Vermont, 1 per cent; New Hampshire, 23 per cent; Wyoming, .03 per cent; Idaho, 3.6 per cent; and Montana, 3.9 per cent. Approximately 40 per cent of the total are using coal—41 per cent wood. Of the homes without central heating plants, about one in ten is using wood for fuel.

That cooking represents a sizable market, is shown by the fact that in these states over 24 per cent of the dwelling units use coal in their kitchen ranges—35 per cent wood, 17 per cent gas, 11 per cent electricity, and 10 per cent kerosene or gasoline. In some cases the kind of fuel used was not reported.

More than two out of three dwellings in these states are heated with stoves. Less than one in eight has a steam or hot water boiler. Less than one in six has a warm air furnace.

By fuels, coal is being used in 56 per cent of the homes with central fired heating plants; wood, 13 per cent; gas, 16 per cent; oil, 14 per cent.

Some General Trends

1. Better housing—design, construction, and operation.
2. Smaller, more compact homes.
3. Increased use of insulation, storm windows, and weather-stripping.
4. Smaller, more compact "packaged" or combined heating units.
5. Automatic firing.
6. Higher efficiencies.
7. Forced circulation—better distribution.
8. Closer temperature regulation.
9. "Streamlining."
10. Use of more color.
11. Greater appreciation of and demand for comfort, convenience, and efficiency.
12. Use of other or "substitute" materials.
13. Smaller pipes, ducts, radiators, and registers.
14. Concealed radiators.
15. Acceptance of barometric and automatic air controls.
16. Growing use of bin-feed stokers.
17. Greater appreciation of the advantages of coal.
18. Year-around hot water supply.
19. Reduction in fan, blower, or other noise.
20. Use of corrosion-resisting materials.
21. Improved furnace and boiler ratings.
22. Improved installation practices.
23. Better fenestration and use of solar radiation.
24. More "summer service," periodic cleaning and inspection activities.
25. Modernization or replacement of more old equipment.
26. Conversion from space to central heaters.
27. Use of circulators, pumps, blowers, etc.
28. Use of filters.
29. Humidification.
30. Ash handling.
31. Zone Controls.
32. Radiant heating.
33. Improved chimney construction; perhaps insulated.
34. Better smoke pipe.
35. Improved "hardware"—handles, etc.
36. Increased accessibility for cleaning.
37. Increased use of refractories.
38. Growing interest in better operation.
39. Broader recognition of the smoke problem.
40. Testing and approval of equipment.
41. Permits for installation.
42. More "education" for the fuel user.
43. Lower first costs.
44. More prefabrication.
45. Lower operating expenses.
46. Return to the use of basements.
47. Recognition of the stove and heater market.
48. New channels of distribution.
49. Greater competition.
50. Conservation of fuel.