

Radiant Heating

for

THE MODERN HOME

1947



KOHLER OF KOHLER



KOHLER *Radiant* HEATING EQUIPMENT

Modern scientific research is combined with care and thoroughness in manufacturing Kohler Radiant Heating Equipment. Designed in accordance with the latest discoveries of Kohler thermal research laboratories, and constructed of durable, time-tested and approved cast iron, Kohler boilers and radiators establish new high standards of efficiency, economy, and durability.

Kohler boilers and radiators withstand the disintegrating action of rust, electrolysis, and corrosion. Their consequent durability means long life and low cost and they are manufactured in a wide range of sizes to meet every requirement.

Like Kohler Plumbing Fixtures and Electric Plants, Kohler Radiant Heating Equipment is made in the factories at Kohler, Wisconsin, where manufacturing experience of almost seventy years is employed in their production. Uniform conditions and centralized supervision guarantee the same high quality in Kohler Heating that is characteristic of all other Kohler products.

Methods of Heat Transmission

Scientists have long known that heat can be transmitted three ways: . . . radiation, convection, and conduction.

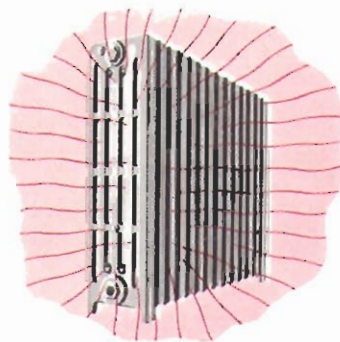
Radiation is the direct projection of heat through space. Heat of the sun reaches the earth solely by radiation. Radiant heat travels through air in straight lines without heating the air, and may be absorbed or reflected by objects in its path.

Convection is the transfer of heat by circulation. Any fluid medium such as air or water may act as the circulating

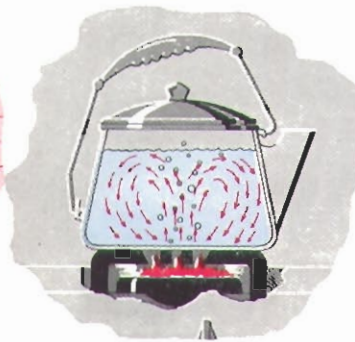
agent. Thus, if the air in a room is heated at one point, the heat is circulated by "convection" of the warmed air to other parts of the room.

Conduction is the transmission of heat through contact. If one end of a metal bar is placed in a fire, heat is conducted to the other end of the bar.

Modern heating plants employ all three methods in varying degrees. Any one of them alone has disadvantages. A combination of the three gives modern comfort with economy and efficiency.



RADIATION



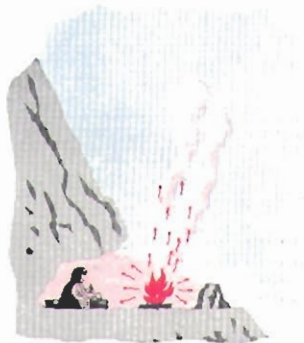
CONVECTION



CONDUCTION

PRIMITIVE FORMS OF HEATING

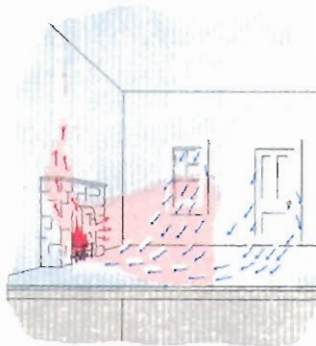
Long before recorded history, mankind sought control over environment and the forces of nature. Foremost among man's aims has been the promotion of comfort, protection against the elements, and better methods of warming his shelters against the icy blasts of winter. It is probable that the first rude abodes—caves, or huts made of the skins of animals—were unheated except for the slight radiant heat from an open fire outside.



Primitive Form of Heating

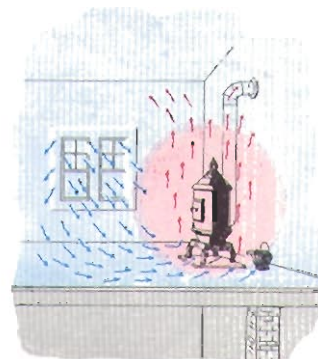
When people began building homes of wood and stone, a forward stride in the art of heating became necessary, and the open fireplace, with a

chimney to carry away the smoke and gases, resulted. This was a revolutionary improvement, but only a poor expedient as measured by modern standards of heating comfort. Furnishing radiant heat alone, the fireplace was both uncomfortable and inefficient. Cold drafts along the floors were inevitable.



Fireplace — Drafty, Uneconomical

The invention of the stove, long after the fireplace was first contrived, marked another milestone in the search for heating comfort. Far greater economy was achieved, since the stove, standing free in the room, afforded not only radiant heat, but warmed the surrounding air as well through convection. Drafty



Stove — Improvement Over Fireplace

floors remained, dirt and dust were still serious drawbacks.

CENTRAL HEATING SYSTEMS

The invention of central heating solved the problem of one source of heat sufficing for the entire structure. Today central heating plants are of two basic types: First, the hot air furnace; and, second, the boiler and radiator system.

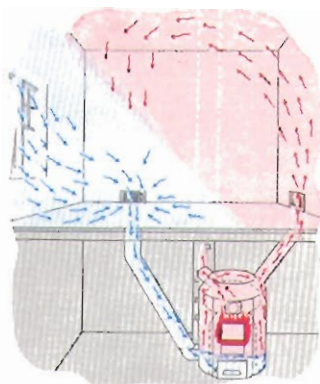
Both these basic systems can be modified by the addition of mechanical devices for promoting circulation, or for automatic or semi-automatic firing. Both are adapted to the use of any of the common fuels. But the results obtained differ considerably.

THE HOT AIR FURNACE

The earliest form of central heating plant was the hot air furnace, which is essentially a stove encased in a sheet steel jacket. Air passes around the stove inside the jacket and is delivered to the various rooms by convection through hot air registers on the inside walls. Cold air return registers are placed at the floor on the outside walls to circulate cold air back to the furnace,

While the hot air furnace represents a marked advance over previous methods of heating, it leaves much to be desired in the way of complete comfort and cleanliness. The high temperature of the air from the furnace creates currents of hot air entering the room at the registers. On cold days with a strong wind blowing, the gravity circulation of a hot air furnace is usually not sufficient to overcome the pressure of the wind so that it may be impossible to heat rooms on the exposed side of the house. A wide temperature difference exists between floor and ceiling.

While not expensive in first cost, the hot air furnace, with its sheet steel ductwork and relatively high temperature fire-pot, is subject to corrosion and strain.

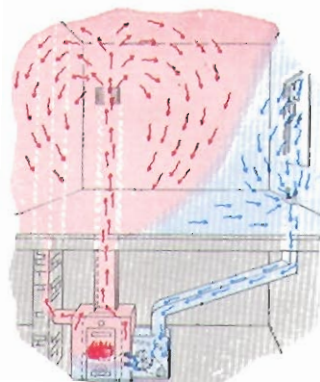


Furnace -- Improvement Over Stove

FAN-FILTER-FURNACE COMBINATIONS

To overcome the limitations of the hot air furnace, various accessories have been added, such as blowers and filtering devices for mechanical air cleaning. Hot air furnaces with these accessories are being offered as "air-conditioners." Despite these additions, the essential limitations of the furnace remain. Much has been claimed for equipment designed to add humidity to the air in winter, but very little scientific research has been done to prove the advantage of this step. At a meeting on house building technics, Yale University,

an eminent Yale professor declared: "There is a common belief that dry air in itself exerts a harmful effect upon the skin and mucous membranes; but there is no convincing evidence that the increase of atmospheric moisture which can actually be introduced by humidification into the air of occupied rooms has any effect upon health and comfort. All controlled experiments on this point have yielded negative results. Ventilating engineers' standards of ventilation permit a wide range in relative humidity. All in all, there seems no adequate justification for artificial humidification in the ordinary dwelling."



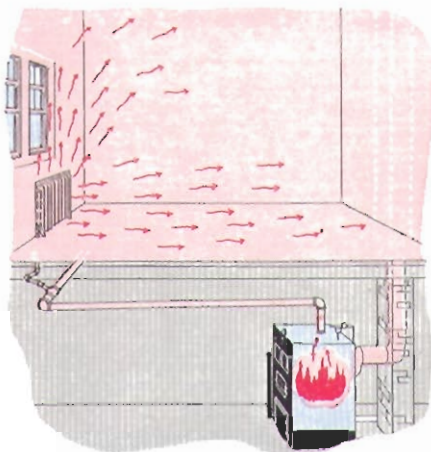
Furnace with Forced Circulation

RADIANT HEATING SYSTEMS

A well known engineer—probably the foremost authority on air-conditioning in the world—has said: "Good heating means, first of all, warm floors and a uniform distribution of temperature throughout the room. This uniform distribution of temperature must come not only from side to side, but—as far as possible—from floor to ceiling. To prevent cold floors the first principle is to disrupt and counteract the current of cold air flowing over the windows. This is done by placing the source of heat under the windows to counteract the cold at this source and to produce an upward circulation which will induce cold air to mix and rise with the heated air rather than spread out along the floor."

Home owners are entitled to expect in modern heating equipment automatic or semi-automatic control, complete cleanliness, silent operation, and freedom from drafts or perceptible air circulation. Movement of air is vital, regardless of temperature, because it tends to cool the human body, so that heated air, moving at velocities that can be felt, not only is disagreeable and uncomfortable, but may be cooling as well.

The development of radiant heating systems marks the closest approach to the scientific ideal of heating comfort. Consisting of a steam or hot water boiler centrally located and connected with small piping to cast iron radiators placed under windows



Boiler and Radiator System—Providing Both Radiant and Convected Heat

in the various rooms, radiator heating alone has solved the problem of cold floors, drafts off the windows, and wide temperature differences. By their position at the very source of cold, they break up and counteract the current of cold air flowing over

the windows. The air passing over the slender tubes of the radiator is heated, and rises by convection, spreading warm air evenly and gently throughout the room.

Radiators also send out heat rays which, on striking floors, furniture, and walls, warm them directly.

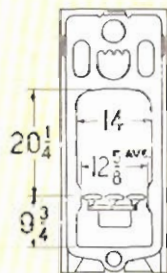
And with automatic boiler and radiator heat, you may have domestic hot water for bathroom, kitchen, and laundry in summer, winter, spring, and fall, without extra equipment.

Exhaustive tests by foremost heating engineers, working independently in many laboratories, have established that only radiator heat completely satisfies the requirements for positive, adequate, silent, economical, draftless heating comfort. Only radiator heat combines the principle of infra-red ray radiation to warm the floor and furnishings of the room with the principle of convected heat to warm the air. Only radiator heat can prevent the stratification that results in too hot ceilings, too cold and drafty floors. Only radiator heat can provide continuous, gentle warmth instead of blasts of hot air alternating with unpleasant sensation of chill. **Only radiator heat can give you modern heating comfort!**



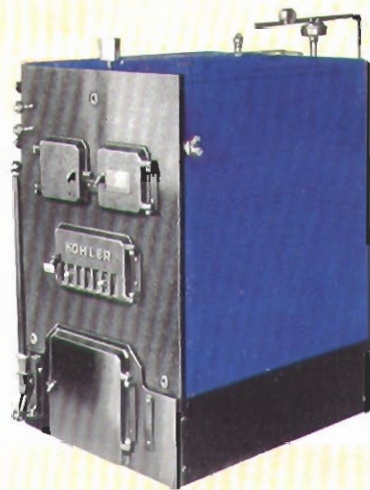
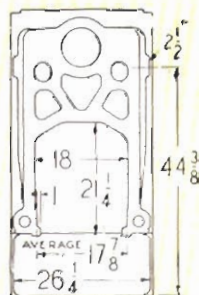
**"A" BOILER
FOR HAND-FIRING**

The "A" is an efficient and compact, wet-base boiler for the smaller home. Easily convertible for oil firing. For either steam or hot water systems.



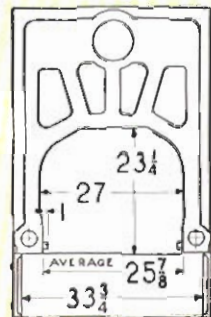
**"G" BOILER
FOR HAND-FIRING**

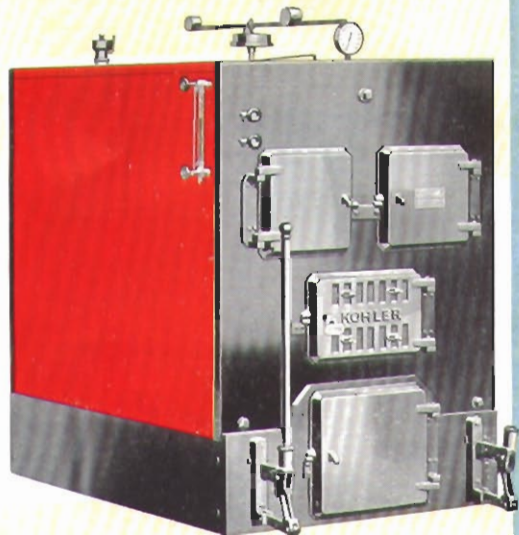
This boiler is designed for hand-firing but can be converted at any time for oil or stoker-firing with good results. It burns all fuels effectively and very economically.



**"D" BOILER
FOR HAND-FIRING**

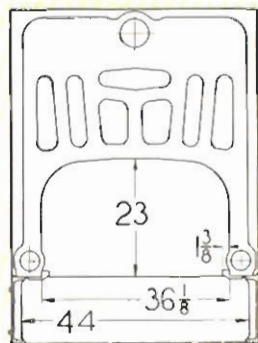
Incorporating the same fundamental features producing economy and efficiency of "G" Boilers, this boiler was designed for larger installations. Hand, oil, or stoker fired.





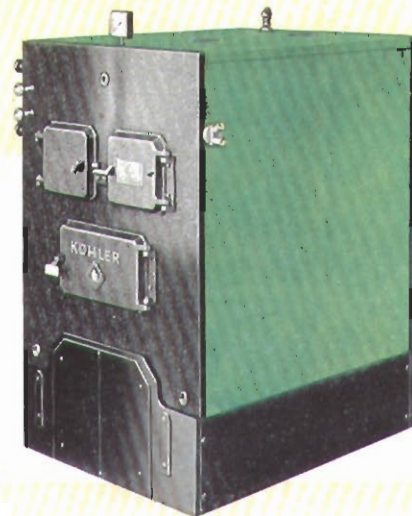
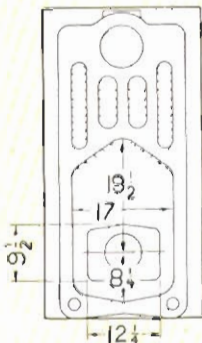
"F-36" BOILER FOR HAND-FIRING

The "F-36" is intended for large installations such as apartments, stores, office buildings, and garages requiring up to 4,700 sq. ft. of installed steam radiation or 7,520 sq. ft. of hot water.



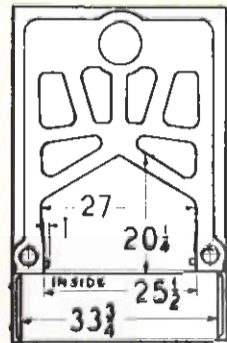
"22" OIL BOILER FOR GUN-TYPE BURNER

The "22," with wet-base principle, is designed specifically for oil burning and priced to compete with conversion boilers. Illustration shows extended jacket to house oil burner. Flush jacket regularly furnished.

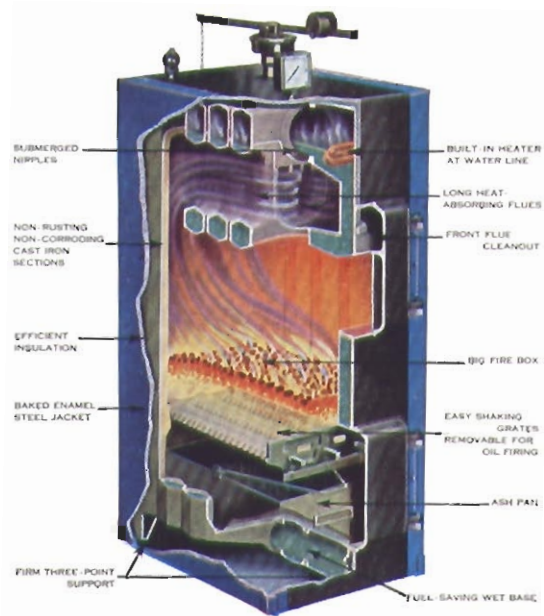


"32" OIL BOILER FOR ANY TYPE BURNER

The "32" Oil Boiler is built for larger oil burning installations. Two additional flues lengthen fire travel by two passes through the boiler, greatly increasing the heat-absorption.



KOHLER "A" BOILER BRINGS RADIANT SUNLIKE WARMTH TO SMALL, LOW-COST HOMES



The "A" Boiler is designed and engineered to the special requirements of the smaller home. Incorporating the features of larger boilers, it combines efficiency with compactness. The "A" is a general-purpose unit, adapting itself to coal or oil firing. Can be used for either steam or hot water systems. The wet base, long flue passages, and effective insulation assure maximum efficiency.

In homes without basements, the "A" Boiler can be installed on the first floor. Because the wet base prevents heat loss to the floor, special fireproofing underneath is unnecessary. The unusual three-point support assures a steady footing. Without jacket and insulation, the "A" Boiler heats the room in which it is located.

The domestic water heater is in the hottest area in the boiler—in a steam system, just below the water line. The heater gives an abundance of hot water, and with automatic firing it can be used for year-around supply.

For oil burning, a gun-type burner can be installed in the front or rear, but rear firing is recommended. A precast refractory combustion chamber is available.

Necessary flow and return tapings and tapings for automatic controls are provided. The heavy-gauge, steel jacket in baked enamel finish is durable and easily kept clean.

WITH FUEL-SAVING WET BASE

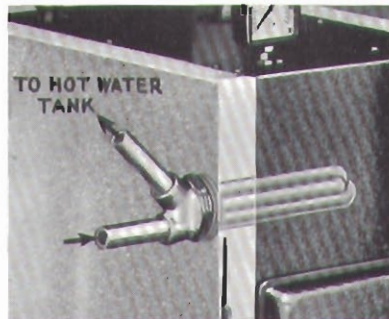
The important wet-base feature of circulating water completely around the firebox forces high heat absorption, a principle of the "A" that's superior for either coal or oil firing. Heat cannot escape through sides and base of firebox.



COAL FIRING

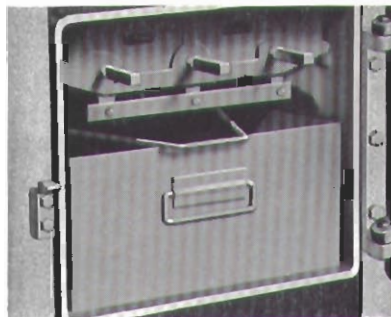


OIL FIRING



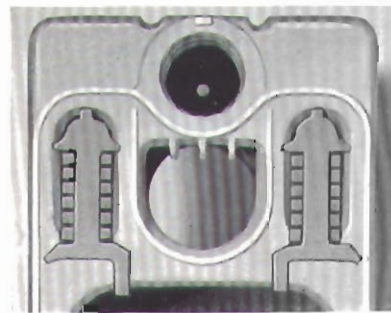
Domestic Water Heater. A built-in trombone tubular type heater is installed on the front section, either side. It is available in two sizes.

Ash Door. For coal firing, an ash pan is provided for tidy ash removal. Door fits tightly. Grates shake easily, and can be dumped completely.



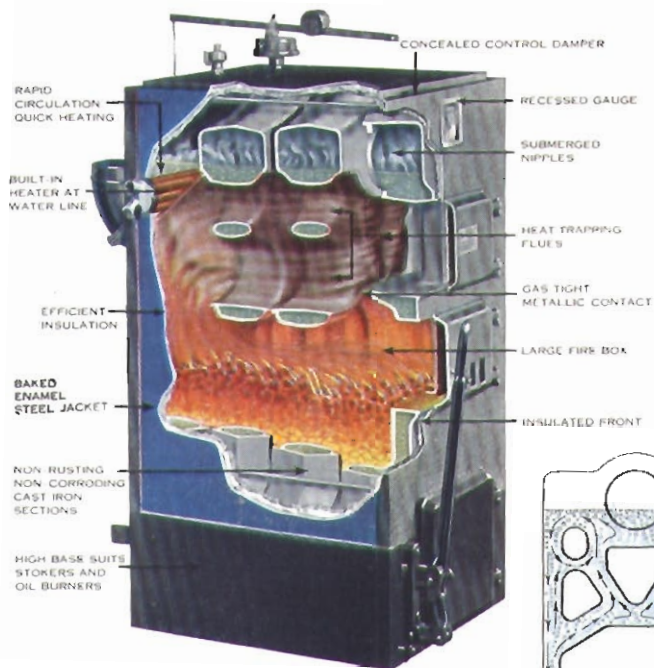
Choke Damper. This concealed control lever at the front operates the choke damper in the smoke outlet on jacketed hand-fired boilers.

Economizer Baffles. For oil firing, the baffles inserted between sections prevent hot gases from leaving boiler too quickly, thus giving up most of the available heat.

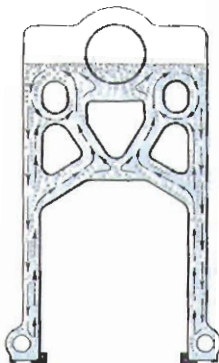


KOHLER "G" 3-WAY BOILER

for Hand, Oil and Stoker Firing



The extra large upper nipples are partly below the water line, thus promoting free circulation of water between the sections (right). Rapid internal circulation promotes quick response, and makes a domestic hot water heater possible.

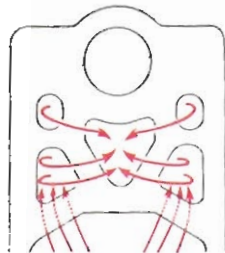


Designed for the efficient combustion of all types of fuels, Kohler "G" Boilers embody the most modern innovations in cast-iron boiler engineering. Large upper nipples to provide internal circulation between sections, scientific heat-trapping flue design, large and effective heating surfaces, and efficient heat-retaining insulation enclosing the entire boiler, all contribute to the remarkable operating economy of this boiler.

A built-in heater, located at the water line of steam boilers, provides domestic hot water at low cost. A large firebox with ample fuel capacity permits long firing periods. Recessed gauges, concealed damper control, and the heavy gauge baked-enamel finish contribute to the modern appearance.

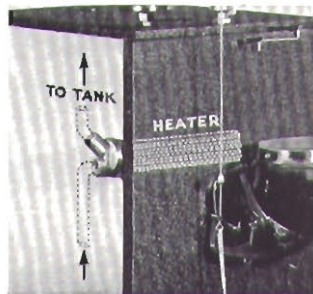
Kohler "G" Boilers have been tested and rated in accordance with the Testing and Rating Codes of the Institute of Boiler and Radiator Manufacturers. Such ratings are designated by the symbol $I=B=R$.

Hot gases pass from the firebox (right) through a double gallery of side flues to the front of the boiler where the direction is smoothly reversed into a large center flue. This arrangement increases the period of contact between hot gases and the heating surface. Flues are designed to give maximum effective heating surface with minimum of horizontal areas to collect soot and dirt.





Domestic hot water heater is built in below water line where water is hottest. Horizontal trombone tubular type, mounted on a bronze head with 2½" pipe thread. Two sizes are available.



OTHER FEATURES

Heavy-gauge, steel jacket finished in hard, durable, baked enamel. Easy to clean. Knock-outs for all tappings.

Efficient insulation completely covers boiler, including front.

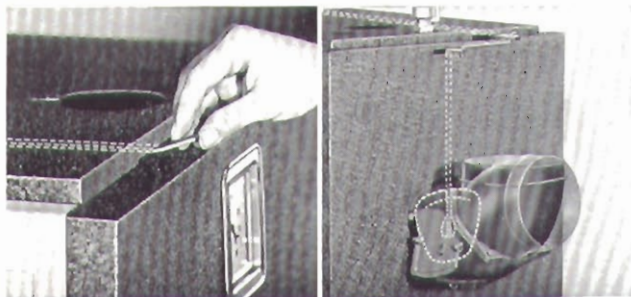
Large fire door for convenient hand-firing. On oil boilers, fire door has a shielded Pyrex peep-hole.

The dome-shaped firebox, 18" wide, 21¼" high, holds more than the usual amount of fuel. This means fewer trips to the basement and less attention.

Flues are easy to clean through the large flue door.

Grate bars will not dislodge. Open, wedge-shaped rib design permits air to circulate freely. Smooth-operating shaking mechanism locks grates in flat position.

The non-rusting, non-corroding cast-iron sections have gas-tight, air-tight contact.



An ingenious, concealed control makes it possible to regulate damper from front.

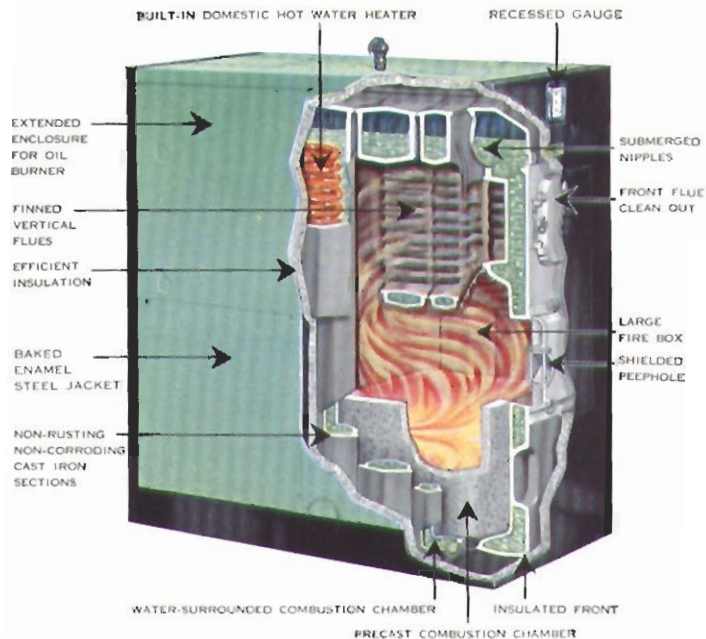
On hand-fired boilers the smokehood is adjustable to four positions. The smooth streamlining facilitates installation and reduces draft loss.

The large base door covers ash pit and clean-out opening. Large ash pit makes removal of ashes easy.

Stoker boilers come with reversible open side. On special order, two open sides.



"22" Oil Boiler with the Fuel-saving WET BASE



THE "22" IS NOT A MAKESHIFT CONVERSION BOILER, BUT IS ESPECIALLY DESIGNED FOR *Oil Firing*

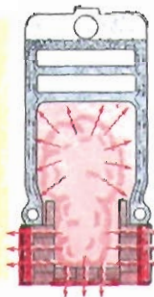
The Kohler "22" Oil Boiler brings to home owners a new conception of oil heating with its accompanying advantages — all-year-round domestic hot water, cleanliness, automatic operation. It fits the decorative scheme of modern basements. The neat green jacket encloses boiler sections, oil burner, and operating mechanism.

Underneath the jacket there is a boiler embodying the most modern principles of heating engineering . . . features which contribute to your comfort in coldest weather . . . to the economy of fuel in which every home owner is vitally interested.

Give serious consideration to a Kohler "22" Oil Boiler when you build that new home, or when you want to bring new comfort, new convenience, and economy into your present home.



Designed for gun-type oil burners, the Kohler "22" Oil Boiler incorporates the important "wet-base" principle in its completely water-surrounded combustion chamber (left). No radiant heat is lost through base sides and floor as is the case with ordinary boilers (right).



Large Upper Nipples — Large submerged nipples promote internal circulation between the sections.

Vertical Water Passages — Slender vertical water passages between the flues further promote rapid internal circulation and assure quick response to the burner flame.

Firebox — Large firebox has an abundance of heating surface directly exposed to the burner flame. Multiple heat-extracting finned surfaces are cast into the top of the firebox.

Insulation — Boiler is covered with a thick blanket of heat-and-sound-insulating rock wool.

Access Doors — Flues are accessible for cleaning through twin doors at the front. Fire door has a shielded Pyrex peephole for observation of flame.

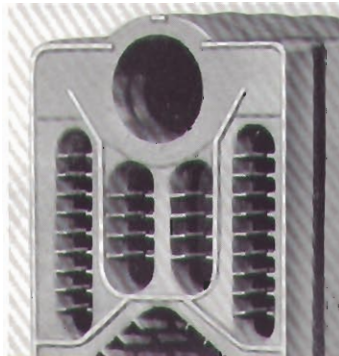
Oil Burner Mounting — Provision has been made for a flange mounting of oil burner on the back of the boiler.

Tappings — Tappings for necessary control equipment are provided on the back section. Controls are easily accessible for adjustment.

Jacket — Heavy-gauge, substantially-built steel jacket finished with a hard, durable, baked enamel, in colors. Easy to clean. Instrument flanges and door handles are chromium.

Instruments — Recessed gauge is flush with jacket. Steam boilers have a water gauge, combination pressure and vacuum gauge and safety valve; water boilers a combination thermometer and altitude gauge.

Gauge glass to indicate the boiler water level is enclosed in the burner compartment of extended jacket steam boilers, yet is readily accessible for cleaning and service.

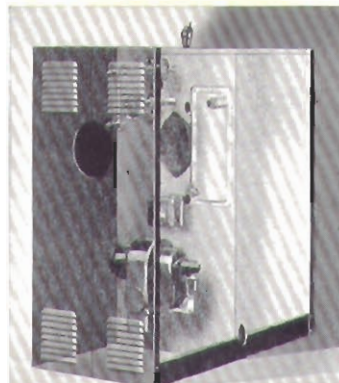


FINNED FLUES — Multiple finned surfaces have been cast into flues to obtain maximum heat absorption and economy.



BUILT-IN WATER HEATER — Year-round hot water is provided by a domestic hot water heater built into back section.

EXTENDED JACKET — The rear extended jacket to house the oil burner and controls is available at small cost. Flush jacket regularly furnished.



PRECAST COMBUSTION CHAMBER — A precast refractory combustion chamber designed for various sizes of "22" Oil Boilers available on order.



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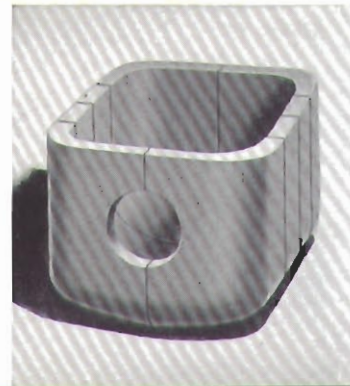
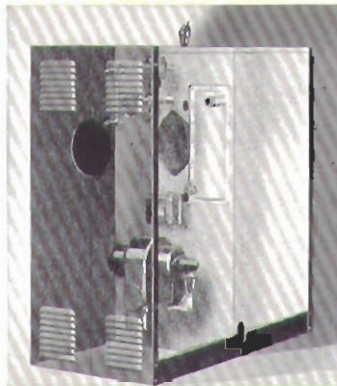


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New KOHLER

SMALL —

GRACEFUL —

EFFECTIVE

New Kohler "Compact" cast iron radiators are what their name implies — concentrated, compact heating surfaces. They are smaller, lighter in weight, and emit far more heat in proportion to their size than radiators of the larger tubular type. Their slender, graceful lines and their small space requirements make them particularly adaptable to recessing under windows, thus conserving floor space and at the same time meeting the cold where it enters the building.

Sections of Kohler "Compact" radiators are assembled with durable malleable-iron push nipples, forming a steam- and water-tight metal joint. These nipple diameters—larger than are ordinarily used on radiators of the "Compact" type—are sized to make Kohler "Compact" radiators function efficiently with any kind of steam or hot water heating system.

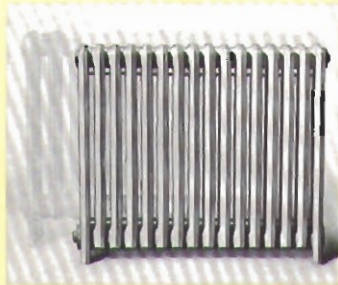


Compact and regular tubular radiators of equal capacity are substantially the same width and length. The regular tubular radiator is 28 per cent high.

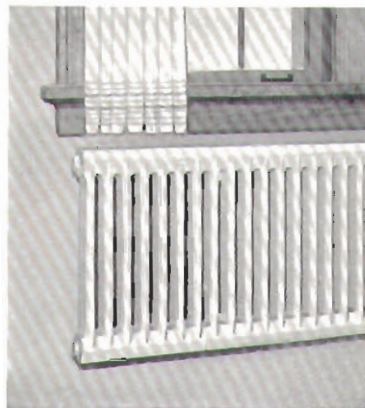
Compact Radiators



Compact and regular tubular radiators of equal capacity and substantially the same length and height. The regular tubular radiator is 45 per cent deeper.



Compact and regular tubular radiators of equal capacity and substantially the same height and width. The regular tubular radiator is 25 per cent longer.



CAST IRON *Wall* RADIATORS



Also available are Kohler cast iron tubular radiators combining unusual heat-emission characteristics with trim, modern design.

Larger nipples improve circulation and increase strength and rigidity of radiators in handling.

Three- and four-tube "Compact" radiators have $1\frac{1}{4}$ " nipples top and bottom with $1\frac{1}{4}$ " supply and return tappings. Five- and six-tube "Compact" radiators have $1\frac{1}{4}$ " upper nipples with $1\frac{1}{2}$ " lower nipples and $1\frac{1}{2}$ " supply and return tappings. Silent and positive circulation of steam or water is assured.

All Kohler "Compact" radiators are precision machined, washed, tested to 125 pounds hydrostatic pressure, and prime coated to prevent rust in transit.

The uniform, tubular construction of Kohler Wall Radiation accomplishes two purposes: first, it provides greater heating surface and consequently greater heating capacity than ordinary wall radiators of comparable dimensions; and second, in assemblies it achieves a pleasing appearance and continuity of line impossible with the ordinary frame wall radiator.

Kohler Wall Radiators are made in three sizes, to be used as single radiators, or coupled in horizontal assemblies with internal threaded nipples. A good radiator for basements, garages, factories, and public buildings.

KOHLER PLUMBING FIXTURES •



*for Modern Styling
and Greater Value*

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