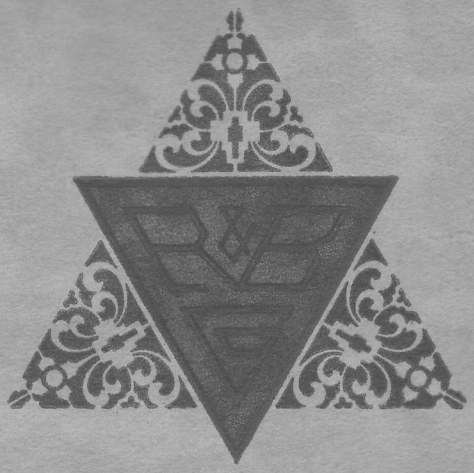
RICHARDSON BOILERS

and

HOT WATER SUPPLY BOILERS



J. F. REBER & COMPANY
Distributors
Plumbing, Heating, Tinning & Mill Supplies
Lewisburg, Pa.

RICHARDSON & BOYNTON CO.

RICHARDSON
REG. U. S. PAT. OFF.

BOILERS

FOR STEAM, HOT WATER AND VAPOR HEATING

Richardson & Boynton Co.

Manufacturers of

"Richardson" "Perfect"

Heating and Cooking Apparatus

Since 1837

260-5th AVENUE, NEW YORK

UTICA, NEW YORK

Boston, Chicago, Providence, Philadelphia, Buffalo,
Cincinnati, Newark, Minneapolis, Detroit

Preface

The Richardson & Boynton Company was one of the pioneer manufacturers of cast iron Boilers for heating systems. Their solicitation of the heating trade has naturally developed a consciousness of trade protection, and of responsibility to the public for quality in manufacture and service.

There is no economy or satisfaction from the use of poor material. Purchases require the highest obtainable grades of iron and coke, and a chemical analysis must show that the material is qualified for *"Richardson"* castings.

Each section is tested at high water pressure, is carefully reamed and machined, and all sections of the Boiler are fully assembled before shipment. When assembled, the Boiler is again tested at high water pressure to make sure that all connections and sections are "perfect" in every respect. This is an exceptional practice and an expensive one, but it is typical of the Company's attitude of responsibility to heating contractors and the public.

Every heating contractor or member of the professions allied with or interested in the heating industry will be welcomed to inspect our manufacturing facilities and methods. It is a pleasure to have the trade see for themselves and thereafter tell the story better for themselves.

NIPPLES

The sections of all *"Richardson"* Boilers are connected to each other by machine-cut tapered CAST IRON push nipples. They are of the same metal as the sections and prevent unevenness in contraction or expansion.

FIRING TOOLS

Each Boiler has shaker, poker, flue brush and hoe.

SPECIAL GRATES

Pea coal grates are furnished with any size of *"Richardson"* Boiler without extra cost when so ordered.

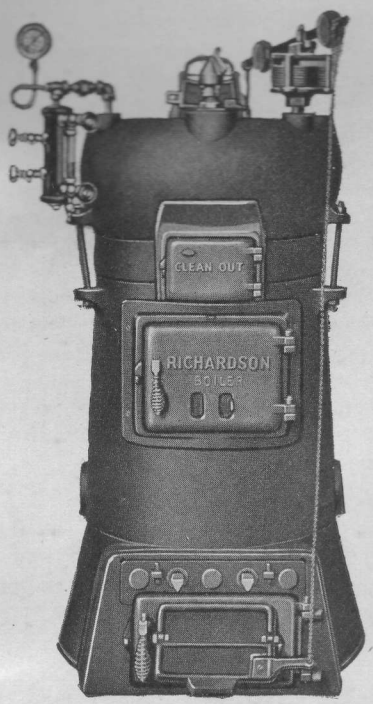
BOILER COVERING

We recommend that all Boilers, mains and risers should be covered with best quality asbestos boiler covering for efficiency and economy.

Richardson Round Boilers

19-22-25-28 Series

For Anthracite, Oil and Gas



"Richardson" Steam Boiler

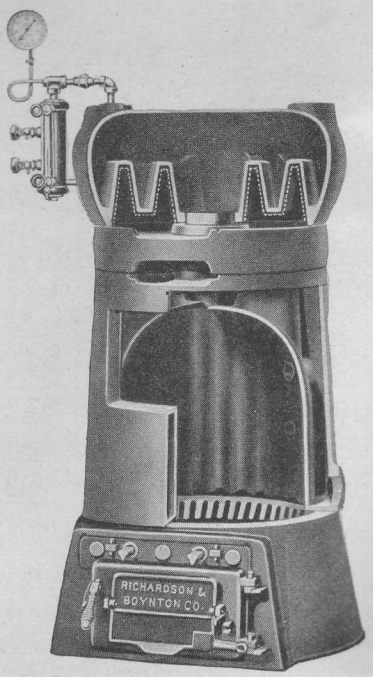
"Richardson" Boilers have a larger proportion of heating surface to grate area, and more real heating and fuel economy value than the average type of Round Boiler on the market. The following details of construction prove their advantages and the explanation of these features to your prospects will undoubtedly enable you to take the contract out of competition.

Base: One-piece base of proper height and wide door opening for the easy removal of ashes. Flap of ashpit door admits the proper amount of air for draft through the fire.

Richardson Round Boilers

19-22-25-28 Series

For Anthracite, Oil and Gas



Sectional View of "*Richardson*" Boiler

Grate Bars: Triangular revolving grate bars have 65 per cent free air space, and have clinker cutting edges. These features assure a clean bright fire even when banked. The bars are reinforced by three straight edges extending the total length of the bar and will not warp or break when left in the proper position.

Series 19 to 25 inclusive have five bars, and Series 28 has six bars, which shake in combination so that only a part of the fire is disturbed and cleared of ashes at the same time. Grates can easily be released by removing yoke plate at the top of the ashpit front.

Richardson Round Boilers

19-22-25-28 Series

Steam

No.	Height to Top Outlet Inches	Nom. Diam. Grate Ins.	Grate Area Sq. Ft.	Height Water Line Inches	Outlets No. and Size	Inlets No. and Size	Ratg. Sq. Ft.
1190	46 13/16	19	1.97	42 1/4	2–2 1/2	2–2 1/2	500
1191	51 1/16	19	1.97	46 1/2	2–2 1/2	2–2 1/2	575
1192	55 5/16	19	1.97	50 3/4	2–2 1/2	2–2 1/2	650
1220	48 3/8	22	2.64	43 1/2	2–2 1/2	2–2 1/2	725
1221	52 5/8	22	2.64	47 3/4	2–2 1/2	2–2 1/2	850
1222	56 7/8	22	2.64	52	2–2 1/2	2–2 1/2	950
1223	61 1/8	22	2.64	56 1/4	2–2 1/2	2–2 1/2	1050
1251	53 7/8	25	3.41	49	2–3	2–3	1100
1252	58 1/8	25	3.41	53 1/4	2–3	2–3	1200
1253	62 3/8	25	3.41	57 1/2	2–3	2–3	1300
1281	55 1/4	28	4.28	50 1/2	2–3 1/2	2–3 1/2	1350
1282	59 1/2	28	4.28	54 3/4	2–3 1/2	2–3 1/2	1475
1283	63 3/4	28	4.28	59	2–3 1/2	2–3 1/2	1600

For other dimensions see pages 60 and 61.

Size of Smoke-pipe

19 Series	8 inches	25 Series	10 inches
22 Series	9 inches	28 Series	10 inches

Firepot: Heavy corrugated firepot with at least 5 per cent more heating surface because of the solid cast top or crownsheet. Anyone can appreciate the value of this extra heating surface in direct contact with the hottest gases from the fire. Narrow waterways cause an immediate and rapid circulation of the water after fire is started, and increase the efficiency of this Boiler.

Generous door opening for adding fuel will be appreciated by every house-owner.

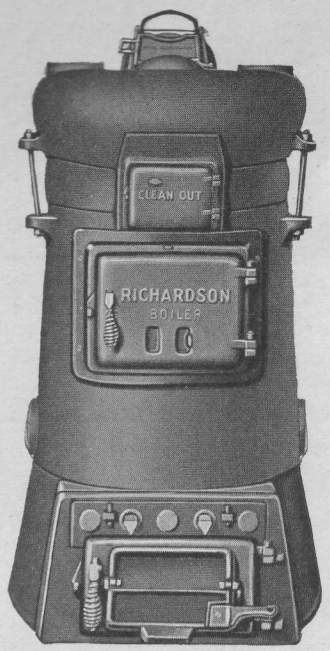
The full grate area requires less frequent firing and subsequent fuel economy. The sides of the firepot slope inward slightly and receive the greatest benefit of heat from the direct fire.

Openings at rear are for direct water heating coil.

Richardson Round Boilers

19-22-25-28 Series

For Anthracite, Oil and Gas



"*Richardson*" Water Boiler

Intermediate Sections: Larger sizes of Boilers but with the same grate area are built by adding one, two or three intermediate sections between firepot and dome. These sections have the same narrow waterways, and generous heating surface for fuel economy. Openings for the travel of the heated gases are staggered so that the distance traveled is greater and the heat is transmitted to the water more quickly.

Dome: Heated gases are forced to travel to the front of the Boiler and to the rear on either side before passing out the smoke box. They are in contact with nearly 50 per cent more heated surface because of the fluted construction within this dome. Temperature of the heated gases passing out the smoke box is naturally lower because they have been in contact with more water heating surface and have given up the largest part of their available heat value.

Richardson Round Boilers

19-22-25-28 Series

Water

No.	Height to Top Outlet Inches	Nom. Diam. Grate Ins.	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Outlets No. and Size	Inlets No. and Size	Ratg. Sq. Ft.
1190	44¾	19	1.97	8	2–2½	2–2½	800
1191	49	19	1.97	8	2–2½	2–2½	900
1192	53¼	19	1.97	8	2–2½	2–2½	1050
1220	45¾	22	2.64	9	2–2½	2–2½	1200
1221	50	22	2.64	9	2–2½	2–2½	1400
1222	54¼	22	2.64	9	2–2½	2–2½	1550
1223	58½	22	2.64	9	2–2½	2–2½	1700
1251	51½	25	3.41	10	2–3	2–3	1750
1252	55¾	25	3.41	10	2–3	2–3	1950
1253	60	25	3.41	10	2–3	2–3	2100
1281	53	28	4.28	10	2–3½	2–3½	2175
1282	57¼	28	4.28	10	2–3½	2–3½	2375
1283	61½	28	4.28	10	2–3½	2–3½	2575

For other dimensions see pages 60 and 61.

Nipples: Cast-iron machine tapered nipples connect firepot, intermediate sections and dome. They are absolutely watertight without danger of breakage from expansion.

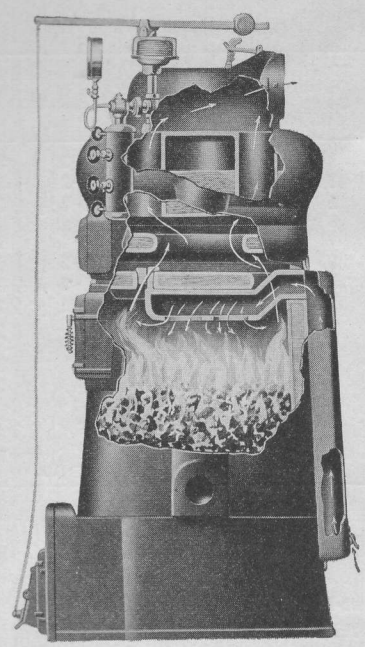
Clean-outs: Provision is made for easy cleaning of the Boiler from the front and rear, between firepot and intermediate section, and sections, and dome. Doors and openings are amply large for the usual steel wire brush.

Special Grates: Special grates will be furnished for burning small sizes of anthracite when so ordered.

Richardson "Perfecto" Round Boilers

REG. U. S. PAT. OFF.

23-26-29 Series



"*Richardson*" "Perfecto" Round Steam Boiler

In this Boiler, efficiency and combustion have been materially increased by the adoption of an old principle, scientifically applied. This has never before been accomplished in a Round Boiler for home heating. A problem has been solved in this new "*Richardson*" "Perfecto."

No more need fuel particles and rich gases be wasted and drawn up the chimney. Science and demonstration have proven conclusively that by injecting superheated air over a live fire and mixing it with the fuel particles and gases arising from the fire, a more intense heat for the same amount of fuel is produced. A great economy in fuel naturally results.

"Perfecto" Round Boilers

23-26-29 Series

Steam

No.	Height to Top Outlet Inches	Nom. Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Height Water Line Inches	Outlets No. and Size	Inlets No. and Size	Ratg. Sq. Ft.
43-S	53½	23	2.89	9	48¼	2–3	2–3	800
53-S	57¾	23	2.89	9	52½	2–3	2–3	900
63-S	62	23	2.89	9	56¾	2–3	2–3	1000
46-S	55½	26	3.70	10	49½	2–3½	2–3½	1050
56-S	59¾	26	3.70	10	53¾	2–3½	2–3½	1150
66-S	64	26	3.70	10	58	2–3½	2–3½	1250
49-S	60	29	4.58	10	53½	2–3½	2–3½	1300
59-S	65⅜	29	4.58	10	58⅞	2–3½	2–3½	1425
69-S	70¾	29	4.58	10	64½	2–3½	2–3½	1550

For other dimensions see pages 62 and 63.

Construction

By studying closely the illustration you will see how great economies in fuel consumption are effected through the use of a scientific principle ingeniously applied.

Notice the preheated air intake opening directly above the fire. This preheated air when mixed with unburned fuel particles and gases, over the live fire, develops an action akin to that performed by the carburetor on an internal-combustion gasoline engine. Were it not for the carburetor on automobile engines automatically mixing fuel, air and moisture—the right mix—the present-day mileage per gallon of fuel consumed could not be realized.

This identical principle of automatically mixing preheated air with unburned fuel particles produces a result parallel to that produced by the automobile carburetor—the efficient combustion and burning of all particles of fuel.

In studying the illustration to the left, follow the heat and fire travel as indicated by the arrows. Notice the staggered heating surfaces, the large water and steam space, and the large vertical, self-cleaning dome.

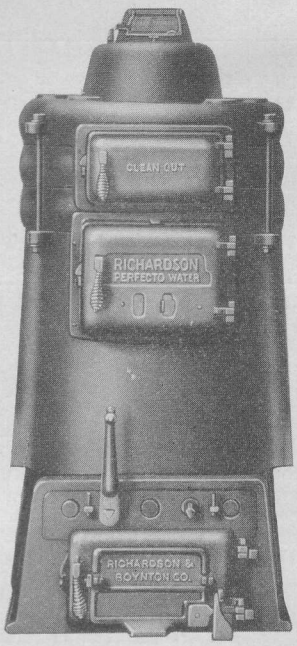
The firepot is of such a depth as to allow for the proper rate of combustion, proper amount of fuel, reasonable time between firing periods and economy in combustion.

The base section is fitted with our celebrated "Perfect" revolving triangular grate bars, which grind and crush all clinkers.

"Perfect" triangular bars or grates are made so as to give the proper amount of free air through the grates, which the size of the boiler requires. In the construction of the "Perfecto" this factor is highly important. Grates can be supplied for pea coal.

Richardson "Perfecto" Round Boilers

23-26-29 Series



"Richardson" "Perfecto" Round Water Boiler

Richardson & Boynton Company have developed the *"Richardson"* "Perfecto" Boiler after experimenting for many years in its laboratories. It is a boiler which will extract all the heat units from the fuel burned—a boiler in which fuel combustion is "Perfect" and which utilizes not only the heat given out by the burning of the fuel, but also the potential value of the heat ordinarily wasted in the unburned fuel particles and gases.

"Perfecto" Round Boilers

23-26-29 Series

Water

No.	Height to Top Outlet Inches	Nom. Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Outlets No. and Size	Inlets No. and Size	Ratg. Sq. Ft.
43-W	45¾	23	2.89	9	2–3	2–3	1350
53-W	50	23	2.89	9	2–3	2–3	1500
63-W	54¼	23	2.89	9	2–3	2–3	1650
46-W	47⅛	26	3.70	10	2–3½	2–3½	1700
56-W	51⅜	26	3.70	10	2–3½	2–3½	1900
66-W	55⅝	26	3.70	10	2–3½	2–3½	2050
49-W	50½	29	4.58	10	2–3½	2–3½	2100
59-W	55⅞	29	4.58	10	2–3½	2–3½	2300
69-W	61¼	29	4.58	10	2–3½	2–3½	2500

For other dimensions see pages 62 and 63.

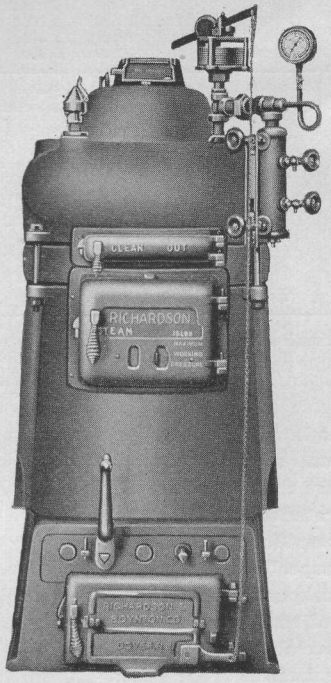
Operation

The *"Richardson"* "Perfecto" is simple to operate and requires little attention. The fire is made as in any other boiler. At the top of the fire chamber above the fire bed, there is injected a blast of superheated air at a high temperature. The mixing of this superheated air and fuel gases over the live fire produces a secondary flame, a "super" fire—a fire which produces complete combustion of all fuel particles, scientifically extracting from the fuel every element of heat energy. This causes a secondary ignition which takes place above the fire in the firepot, immediately below the heating surfaces of the boiler. This mixture of preheated air, released carbon and unburned gases promotes smoother, more minute and infinitely more efficient combustion. By completely burning all fuel particles, a safer and more efficient condition exists within the firepot and heat travel areas of the boiler, and a more sanitary condition prevails about the doors, dampers and flue, due to the fact that much of the heretofore unburned particles of fuel, which throw off heavy and dirty smoke, are consumed within the combustion chamber.

Richardson Round Boilers

17-20-23-26-29 Series

For Anthracite, Oil and Gas



"*Richardson*" Steam Boiler

The practical Boiler for residences and small buildings must be easy to operate, powerful and economical. The operation of the "*Richardson*" Round Boiler is extremely simple and requires no practical knowledge. The deep fire chamber will carry fire and generate heat for a long time without attention. It is easy to carry sufficient fire all night to insure a warm house in the early morning. The feed and ash pit doors are large and convenient.

Richardson Round Boilers

17-20-23-26-29 Series

Steam

Size	Height of Boiler, Inches	Diameter of Grate, Inches	Grate Area Sq. Ft.	Diam. Smoke Pipe, Inches	Hgt. of Water Line, Inches	Outlets No. and Size	Inlets No. and Size	Rating Steam, Square Feet
173	45¼	17	1.58	7	40	2-2½	2-2½	300
174	49½	17	1.58	7	44¼	2-2½	2-2½	350
175	53¾	17	1.58	7	48½	2-2½	2-2½	425
203	46¼	20	2.18	8	41	2-3	2-3	475
204	50½	20	2.18	8	45¼	2-3	2-3	550
205	54¾	20	2.18	8	49½	2-3	2-3	650
233	49¼	23	2.89	9	44	2-3	2-3	700
234	53½	23	2.89	9	48¼	2-3	2-3	800
235	57¾	23	2.89	9	52½	2-3	2-3	900
263	51¼	26	3.70	10	45¼	2-3½	2-3½	950
264	55½	26	3.70	10	49½	2-3½	2-3½	1050
265	59¾	26	3.70	10	53¾	2-3½	2-3½	1150
266	64	26	3.70	10	58	2-3½	2-3½	1250
294	60	29	4.59	10	53½	2-3½	2-3½	1300
295	65⅜	29	4.59	10	58⅞	2-3½	2-3½	1425
296	70¾	29	4.59	10	64¼	2-3½	2-3½	1550

For other dimensions see pages 64 and 65.

Fuel Economy

The firepot sections permit carrying a fire 20 inches deep, thus insuring economical consumption of fuel and also sufficient capacity to permit 8 or 12-hour firing periods, according to the severity of the weather. Over the fire is a large amount of active heating surface, properly proportioned to utilize the full heat from the fire.

"*Richardson*" Round Boilers can be furnished with grates for pea coal when so ordered.

Richardson Round Boilers

17-20-23-26-29 Series

For Anthracite, Oil and Gas

"Richardson" Water Boiler

Construction

All *"Richardson"* Round Boilers for steam, hot water and vapor heating are manufactured with the same care and attention to detail that have made *"Richardson"* Heating Apparatus so popular. The same high grade materials are used in their construction throughout, and, in addition, they have many features that will appeal to the particular buyer.

These Boilers are so constructed that the first intermediate section forms the top of the firepot. The advantage of this in the event of an accident is obvious. It is not necessary to buy the whole expensive firepot section, but only the part which is needed, thus materially reducing the cost for repairs.

Richardson Round Boilers

17-20-23-26-29 Series

Water

Size	Height of Boiler, Inches	Diameter of Grate, Inches	Grate Area Sq. Ft.	Diameter of Smoke Pipe, Inches	Tappings Flow and Return, Inches	Rating Water, Square Feet
174	42¾	17	1.58	7	2-2½	550
175	47	17	1.58	7	2-2½	675
204	43¾	20	2.18	8	2-3	850
205	48	20	2.18	8	2-3	1050
234	45¾	23	2.89	9	2-3	1350
235	50	23	2.89	9	2-3	1500
264	47⅛	26	3.70	10	2-3½	1700
265	51⅛	26	3.70	10	2-3½	1900
266	55⅛	26	3.70	10	2-3½	2050
294	50½	29	4.59	10	2-3½	2100
295	55⅞	29	4.59	10	2-3½	2300
296	61¼	29	4.59	10	2-3½	2500

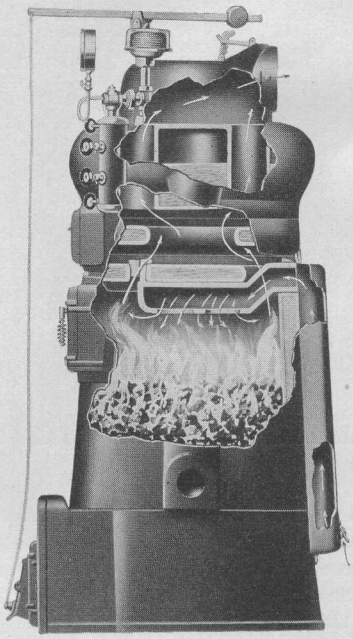
For other dimensions see pages 64 and 65.

"Richardson" Round Boilers are fitted with our celebrated Perfect Revolving Triangular Grate Bars noted for their convenience and ease of operation, their durability, and their exceptional clinker-clearing properties. The ash pits are fitted with a large door for the easy removal of ashes. For supplying oxygen to the fuel, the air inlet butterfly damper is operated from the automatic regulator on steam boilers and with a ratchet on water boilers.

The connections between all sections in *"Richardson"* Boilers are made with extra heavy machine-cut tapered cast-iron nipples fitted into tapered openings in the section, thus making an absolutely tight joint without the use of lead or packing. These boilers are fitted with one or more intermediate sections between the firepot and the dome. The flue openings in the intermediate sections are arranged so the fire travel is staggered, the opening in one section going below the heating surfaces in the section above; consequently, there is no waste heat, the products of combustion being constantly in contact with heating surfaces backed by water.

Richardson Round Smokeless Boilers for Soft Coal

23-26-29 Series



Interior view of the new "*Richardson*" Round Smokeless Boiler. The course of air preheated and injected for mixing with live fire in the firepot is clearly shown. The highest efficiency in fuel consumption regardless of fuel used, and a clean, intense heat throughout the travel of fire, is insured.

Meets Anti-Smoke Ordinances

The new "*Richardson*" Round Smokeless Boiler for Soft Coal meets the rigid anti-smoke ordinances of progressive communities. Since all the heretofore unburned fuel particles and unburned gases are burned scientifically over the live fire, within the fire chamber, only a thin, vapor-like smoke is drawn up the chimney. This means, aside from great fuel economy, more healthful conditions inside and outside the house; a clean flue and chimney, and a more efficient unit.

Richardson Round Smokeless Boilers

23-26-29 Series

Steam

No.	Height to Top Outlet Inches	Nom. Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Height Water Line Inches	Outlets No. and Size	Inlets No. and Size	Ratg. Sq. Ft.
S-432	53½	23	2.89	9	48¼	2–3	2–3	800
S-532	57¾	23	2.89	9	52½	2–3	2–3	900
S-632	62	23	2.89	9	56¾	2–3	2–3	1000
S-462	55½	26	3.70	10	49½	2–3½	2–3½	1050
S-562	59¾	26	3.70	10	53¾	2–3½	2–3½	1150
S-662	64	26	3.70	10	58	2–3½	2–3½	1250
S-492	60	29	4.58	10	53½	2–3½	2–3½	1300
S-592	65⅜	29	4.58	10	58⅞	2–3½	2–3½	1425
S-692	70¾	29	4.58	10	64½	2–3½	2–3½	1550

For other dimensions see pages 66 and 67.

Height of chimney for 23 series ..... 35 feet
Height of chimney for 26 series ..... 40 feet
Height of chimney for 29 series ..... 50 feet
Inside area of chimney flue, 23 series ..... 96 sq. in.
Inside area of chimney flue, 26 series ..... 96 sq. in
Inside area of chimney flue, 29 series ..... 144 sq. in.

By studying closely the illustration, you will see how great economies in fuel consumption are effected through the use of a scientific principle ingeniously applied.

Notice the preheated air intake opening directly above the fire. This preheated air when mixed with unburned fuel particles and gases, over the live fire, develops an action akin to that performed by the carburetor on an internal-combustion gasoline engine. Were it not for the carburetor on automobile engines automatically mixing fuel, air and moisture—the right mix—the present-day mileage per gallon of fuel consumed could not be realized.

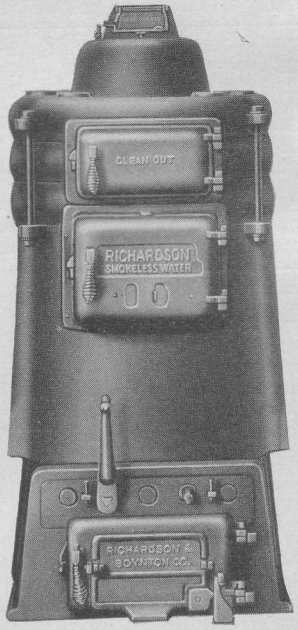
This identical principle of automatically mixing preheated air with unburned fuel particles produces a result parallel to that produced by the automobile carburetor—the efficient combustion and burning of all particles of fuel.

In studying the illustration to the left, follow the heat and fire travel as indicated by the arrows.

Notice the staggered heating surfaces, the large water and steam space, and the large vertical, self-cleaning dome. The firepot is of such depth as to allow for the proper rate of combustion, proper amount of fuel and reasonable time between firing periods.

Richardson Round Smokeless Boilers for Soft Coal

23-26-29 Series



"*Richardson*" Round Smokeless Water Boiler

This new "*Richardson*" Round Smokeless Boiler offers many new and distinctive features never before accomplished in a round boiler for residence heating with soft coal as fuel.

It is the first and only Round Smokeless Boiler on the market designed primarily for soft coal and which burns soft coal without smoke or soot. Heretofore smokeless boilers have been built only for large residences, factories and apartment houses to meet the anti-smoke ordinances.

Richardson Round Smokeless Boilers

23-26-29 Series

No.	Height to Top Outlet Inches	Nom. Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Outlets No. and Size	Inlets No. and Size	Water Ratg. Sq. Ft.
W-432	45¾	23	2.89	9	2–3	2–3	1350
W-532	50	23	2.89	9	2–3	2–3	1500
W-632	54¼	23	2.89	9	2–3	2–3	1650
W-462	47⅛	26	3.70	10	2–3½	2–3½	1700
W-562	51⅜	26	3.70	10	2–3½	2–3½	1900
W-662	55⅝	26	3.70	10	2–3½	2–3½	2050
W-492	50½	29	4.58	10	2–3½	2–3½	2100
W-592	55⅞	29	4.58	10	2–3½	2–3½	2300
W-692	61¼	29	4.58	10	2–3½	2–3½	2500

For other dimensions see pages 66 and 67.

Height of chimney for 23 series.....35 feet
Height of chimney for 26 series.....40 feet
Height of chimney for 29 series.....50 feet
Inside area of chimney flue, 23 series..... 96 sq. in.
Inside area of chimney flue, 26 series..... 96 sq. in.
Inside area of chimney flue, 29 series.....144 sq. in.

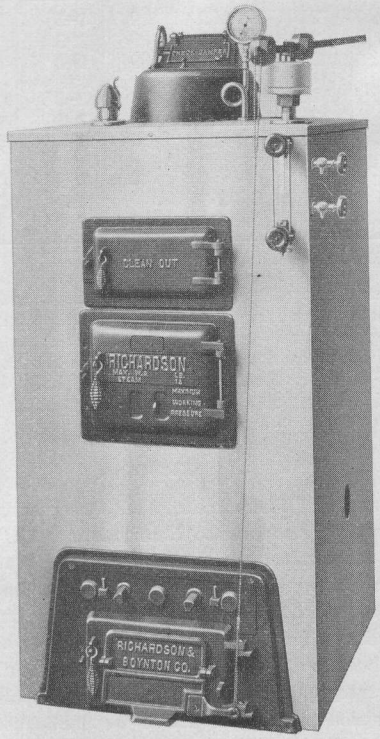
Operation

The "*Richardson*" Round Smokeless Boiler is simple to operate and requires little attention. The fire is made as in any other boiler. At the top of the fire chamber above the fire bed, there is injected a blast of superheated air at a high temperature. The mixing of this superheated air and fuel gases over the live fire produces a secondary flame, a "super" fire—a fire which produces complete combustion of all fuel particles, scientifically extracting from the fuel every element of heat energy. This causes a secondary ignition which takes place above the fire in the firepot, immediately below the heating surfaces of the boiler. This mixture of preheated air, released carbon and unburned gases, promotes smoother, more minute and infinitely more efficient combustion. By completely burning all fuel particles, a safer and more efficient condition exists within the firepot and heat travel areas of the boiler, and a more sanitary condition prevails about the doors, dampers and flue.

Richardson Square Cased Round Boilers

1-S Series

For Anthracite, Oil and Gas



A powerful, economical boiler cased in the well known Richardson blue.

Richardson Square Cased Round Boilers

1-S Series

Steam

No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Height Water Line Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
1-S-1	17	1.58	7	44¼	2–2½	50	26½	350
1-S-2	17	1.58	7	48½	2–2½	54	26½	425
1-S-3	20	2.18	8	45¼	2–3	51	29½	550
1-S-4	20	2.18	8	49½	2–3	55	29½	650
1-S-5	23	2.89	9	48¼	2–3	54	32½	800
1-S-6	23	2.89	9	52½	2–3	58	32½	900
1-S-7	26	3.70	10	49½	2–3½	55½	36	1050
1-S-8	26	3.70	10	53¾	2–3½	59½	36	1150
1-S-9	29	4.59	10	53½	2–3½	60	41	1300
1-S-10	29	4.59	10	58⅞	2–3½	65	41	1425

For other dimensions see pages 74 and 75.

This boiler has met with ready acceptance because of its beautiful appearance and its ability to perform satisfactorily under varying conditions. For the average residence it is the logical boiler.

The fire chamber is deep so that it will carry fire and generate heat for a long time without attention. The feed and ashpit doors are large and roomy, thus providing maximum convenience. In fact, every modern detail of boiler construction has been incorporated in this boiler to make it a model of convenience and satisfaction to the home owner over a long period of years.

In addition to its performance the beautiful blue casing in which the 1-S Series boiler is supplied adapts it to the most exacting surroundings. In the modernized basement where appearance is the keynote this boiler always is in good taste.

Richardson Square Cased Round Boilers

1-W Series

For Anthracite, Oil and Gas

The famous Richardson Hot Water Boiler cased in blue.

Richardson Square Cased Round Boilers

1-W Series

Water

No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
1-W-1	17	1.58	7	2–2½	43½	26½	550
1-W-2	17	1.58	7	2–2½	47½	26½	675
1-W-3	20	2.18	8	2–3	44¼	29½	850
1-W-4	20	2.18	8	2–3	48¼	29½	1050
1-W-5	23	2.89	9	2–3	46¾	32½	1350
1-W-6	23	2.89	9	2–3	50¾	32½	1500
1-W-7	26	3.70	10	2–3½	47½	36	1700
1-W-8	26	3.70	10	2–3½	51½	36	1900
1-W-9	29	4.59	10	2–3½	51	41	2100
1-W-10	29	4.59	10	2–3½	56½	41	2300

For other dimensions see pages 74 and 75.

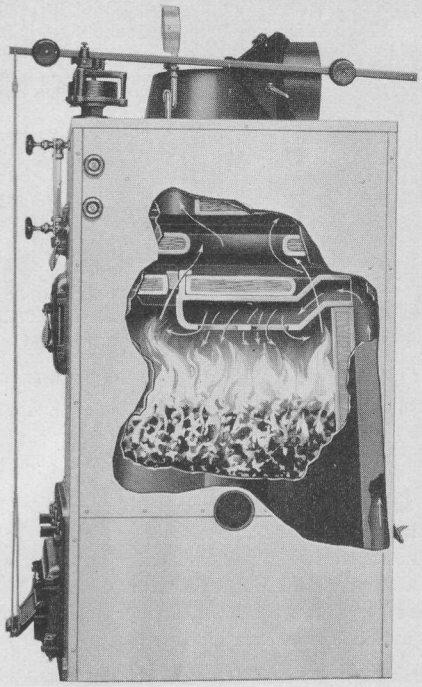
Heating apparatus, as with many other items of home equipment, has now been transformed from an unsightly necessity to an attractive adjunct. Without sacrificing any degree of practical efficiency, economy and length of service the Richardson 1-W Series boilers have been beautified by the addition of the square case finish in the Richardson blue.

Homes in which playrooms, card rooms, music rooms, etc., have been adapted to the basement call for this Richardson boiler. It blends with any scheme of basement decoration and requires minimum work to keep its colorful lustre always bright and attractive.

Thus beauty and efficiency are combined to an unusual degree to give the home owner the utmost in heating satisfaction, economy and service.

Richardson Square Cased Round Smokeless Boilers

2-S and 2-W Series



Cleanliness and beauty are combined in this cased smokeless boiler, which consumes its own smoke.

Richardson Square Cased Round Smokeless Boilers

2-S Series

Steam

No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Height Water Line Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
2-S-5	23	2.89	9	48¼	2–3	54	32½	800
2-S-6	23	2.89	9	52½	2–3	58	32½	900
2-S-7	26	3.70	10	49½	2–3½	55½	36	1050
2-S-8	26	3.70	10	53¾	2–3½	59½	36	1150
2-S-9	29	4.58	10	53½	2–3½	60	41	1300
2-S-10	29	4.58	10	58⅞	2–3½	65	41	1425

For other dimensions see pages 74 and 75.

Richardson Square Cased Round Smokeless Boilers

2-W Series

Water

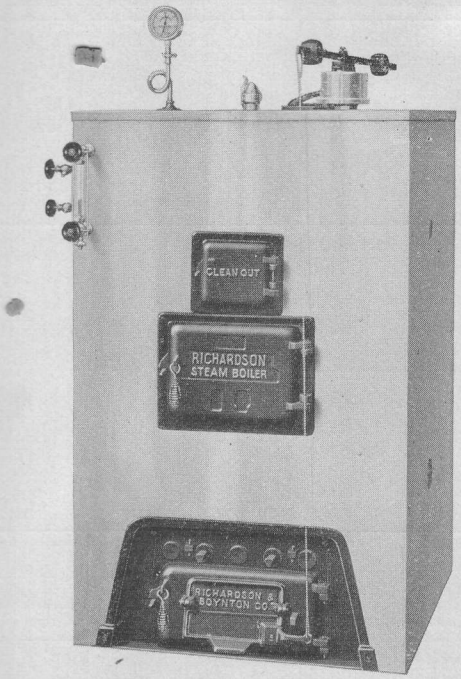
No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
2-W-5	23	2.89	9	2–3	46¾	32½	1350
2-W-6	23	2.89	9	2–3	50¾	32½	1500
2-W-7	26	3.70	10	2–3½	47½	36	1700
2-W-8	26	3.70	10	2–3½	51½	36	1900
2-W-9	29	4.58	10	2–3½	51	41	2100
2-W-10	29	4.58	10	2–3½	56½	41	2300

For other dimensions see pages 74 and 75.

Richardson Square Cased Round Boilers

(Crown Sheet)

3-S and 3-W Series



Heavy asbestos insulation, securely fastened within the cases, make Richardson square cased boilers highly efficient as well as attractive.

Richardson Square Cased Round Boilers

(Crown Sheet)

3-S Series

Steam

No.	Diam Grate Inch	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Height Water Line Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
3-S-1	19	1.97	8	46½	2–2½	52	33	575
3-S-2	19	1.97	8	50¾	2–2½	56	33	650
3-S-3	22	2.64	9	47¾	2–2½	53¾	36	850
3-S-4	22	2.64	9	52	2–2½	57¾	36	950
3-S-5	25	3.41	10	49	2–3	55⅝	38¾	1100
3-S-6	25	3.41	10	53¼	2–3	59⅝	38¾	1200
3-S-7	28	4.28	10	50½	2–3½	57¼	42¾	1350
3-S-8	28	4.28	10	54¾	2–3½	61¼	42¾	1475

For other dimensions see pages 74 and 75.

Richardson Square Cased Round Boilers

(Crown Sheet)

3-W Series

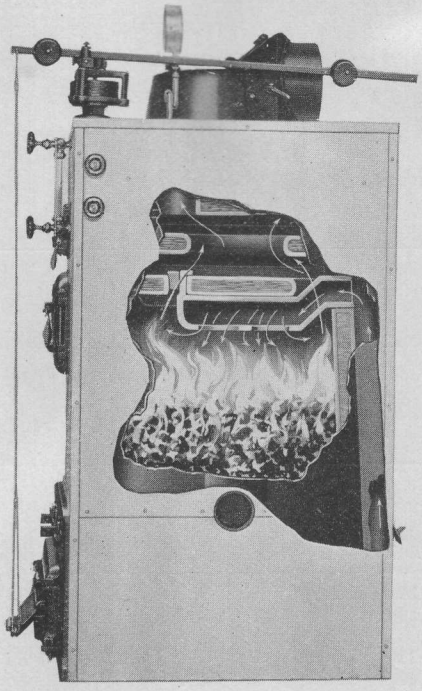
Water

No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Outlets and Inlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
3-W-1	19	1.97	8	2–2½	51½	33	900
3-W-2	19	1.97	8	2–2½	55½	33	1050
3-W-3	22	2.64	9	2–2½	53⅞	36	1400
3-W-4	22	2.64	9	2–2½	57⅞	36	1550
3-W-5	25	3.41	10	2–3	55⅝	38¾	1750
3-W-6	25	3.41	10	2–3	59⅝	38¾	1950
3-W-7	28	4.28	10	2–3½	57⅛	42¾	2175
3-W-8	28	4.28	10	2–3½	61⅛	42¾	2375

For other dimensions see pages 74 and 75.

Richardson Square Cased "Perfecto" REG. U. S. PAT. OFF. Round Boilers

4-S and 4-W Series



Cleanliness and beauty are combined in this cased boiler, which comsumes its own smoke.

Perfecto Square Cased Round Boilers

4-S Series

Steam

No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Height Water Line Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
4-S-5	23	2.89	9	48¼	2–3	54	32½	800
4-S-6	23	2.89	9	52½	2–3	58	32½	900
4-S-7	26	3.70	10	49½	2–3½	55½	36	1050
4-S-8	26	3.70	10	53¾	2–3½	59½	36	1150
4-S-9	29	4.58	10	53½	2–3½	60	41	1300
4-S-10	29	4.58	10	58⅞	2–3½	65	41	1425

For other dimensions see pages 74 and 75.

Perfecto Square Cased Round Boilers

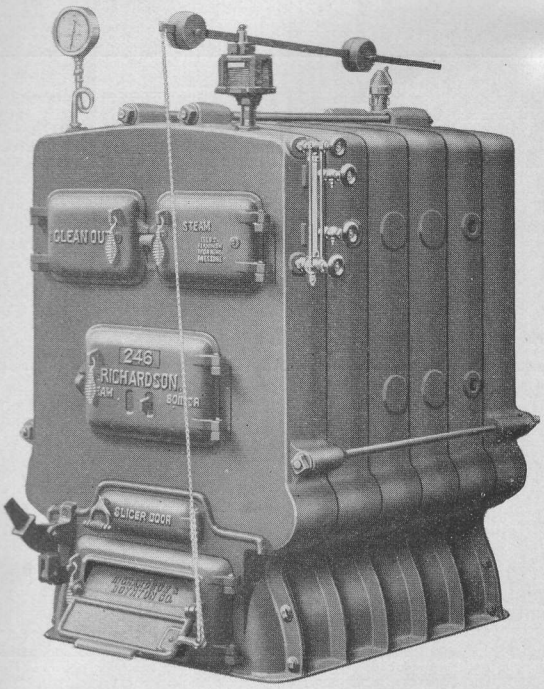
4-W Series

Water

No.	Diam. Grate Inches	Grate Area Sq. Ft.	Size Smoke Pipe Inches	Inlets and Outlets No. and Size	Height of Jacket Inches	Square of Jacket Inches	Ratg. Sq. Ft.
4-W-5	23	2.89	9	2–3	46¾	32½	1350
4-W-6	23	2.89	9	2–3	50¾	32½	1500
4-W-7	26	3.70	10	2–3½	47½	36	1700
4-W-8	26	3.70	10	2–3½	51½	36	1900
4-W-9	29	4.58	10	2–3½	51	41	2100
4-W-10	29	4.58	10	2–3½	56½	41	2300

For other dimensions see pages 74 and 75.

Richardson End Feed Sectional Steam and Water Boilers



24 Series "*Richardson*" Sectional Steam Boiler

These boilers present to the direct rays of the fire a very large percentage of heating surface, yet with a long fire travel to hold back the gases and prevent their too rapid escape to the smoke outlet. The "*Richardson*" Boilers have deep firepots and high combustion chambers.

All boilers have cored openings in back section for coil; and steam boilers are tapped on second section from rear, both sides, for indirect water heater. Steam Boilers can be fitted with fusible plugs

24 Series End Feed Sectional

Steam

No.	Total Length Inches	Grate Area Sq. Ft.	Water Line Inches	Outlets Inches	Inlets (Rear Section) Inches	Ashpit (Inside) Inches	Rating Sq. Ft.
244	32 3/8	**2.84**	43 3/8	1–3	2–3	26 1/4 x 21 3/4	800
245	38 5/8	**3.78**	43 3/8	2 3	2–3	26 1/4 x 28	1050
246	44 7/8	**4.74**	43 3/8	2–3	2–3	26 1/4 x 34 1/4	1300
247	51 1/8	**5.68**	43 3/8	3–3	2–3	26 1/4 x 40 1/2	1550
248	57 3/8	**6.62**	43 3/8	3–3	2–3	26 1/4 x 46 3/4	1800

Water

244	32 3/8	**2.84**	....	1–3	2–3	26 1/4 x 21 3/4	1275
245	38 5/8	**3.78**	....	2–3	2–3	26 1/4 x 28	1675
246	44 7/8	**4.74**	....	2–3	2–3	26 1/4 x 34 1/4	2075
247	51 1/8	**5.68**	....	3–3	2–3	26 1/4 x 40 1/2	2475
248	57 3/8	**6.62**	....	3–3	2–3	26 1/4 x 46 3/4	2875

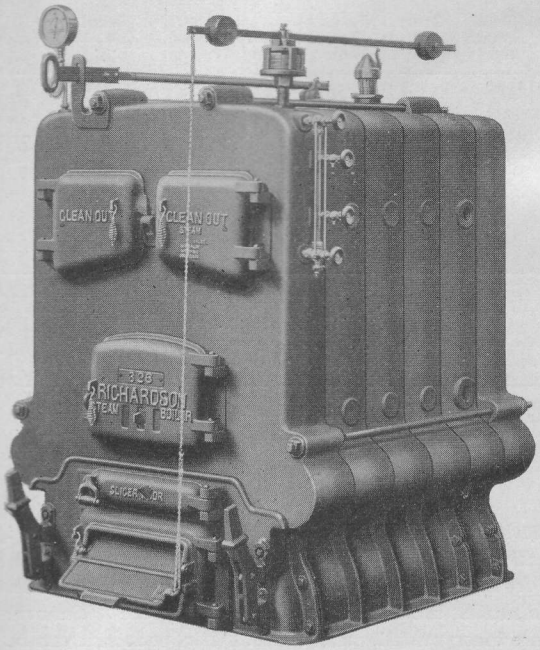
Castings only. Height 49 3/8 inches. Width, 34 3/16 inches.
Size of smoke-pipe, 9 inches.
For other dimensions see pages 68 and 69.

24 Series End Feed "*Richardson*" Boiler specially designed for heating residences with low cellars. Can be furnished with grates for burning large or small sizes of coal as may be desired. In this smaller model all the advantages of the "*Richardson*" units are incorporated, and, like all other models, it can be furnished with double doors for wood fuel.

32 Series End Feed "*Richardson*" Boiler. A very efficient heating unit in medium size homes, store buildings and small public buildings.

39 Series End Feed "*Richardson*" Boiler provides ample facility for easy firing and cleaning. This model of "*Richardson*" Boiler is particularly suitable in the larger size country residences, small libraries and other public buildings. Two large upper doors furnish access to the flue surface for cleaning. The fire door is wide and high, so that all parts of the fire can be easily reached.

Richardson End Feed Sectional Steam and Water Boilers



32 Series "*Richardson*" Sectional Steam Boiler

The fitter is interested in a boiler that is not only efficient, but one that can be assembled in the shortest possible time, reducing labor charges. This is realized in all "*Richardson*" Boilers as they are assembled with machine cut tapered cast-iron nipples and tested and assembled at factory before delivery for structural strength and manufacturing precision.

All boilers have cored openings in back section for coil; and steam boilers are tapped on second section from rear both sides, for indirect water heater. Steam Boilers can be fitted with fusible plugs.

32 Series End Feed Sectional

Steam

No.	Total Length Inches	Grate Area Sq. Ft.	Water Line Inches	Outlets Inches	Inlets (Rear Section) Inches	Ashpit (Inside) Inches	Rating Sq. Ft.
325	49½	6.66	48	2–4	2–4	38⅞x32¾	2250
326	56⅞	8.33	48	2–4	2–4	38⅞x40⅛	2800
327	64¼	10.00	48	3–4	2–4	38⅞x47½	3350
328	71⅝	11.67	48	3–4	2–4	38⅞x54⅞	3900
329	79	13.34	48	4–4	2–4	38⅞x62¼	4450

Water

325	49½	6.66	....	2–4	2–4	38⅞x32¾	3600
326	56⅞	8.33	....	2–4	2–4	38⅞x40⅛	4475
327	64¼	10.00	....	3–4	2–4	38⅞x47½	5350
328	71⅝	11.67	....	3–4	2–4	38⅞x54⅞	6225
329	79	13.34	....	4–4	2–4	38⅞x62¼	7100

Castings only. Height, 55 in. Width, 46½ in.
Size of smoke-pipe, 12 in.
For other dimensions see pages 68 and 69.

Architects and engineers need have no hesitancy in specifying Richardson & Boynton Co. Sectional Safety Steam and Water Boilers. The name "*Richardson*" in itself is their guarantee of efficient service at low cost to their clients. With every "*Richardson*" Boiler goes the Richardson & Boynton Co. guarantee of perfection in workmanship and materials and efficiency in operation.

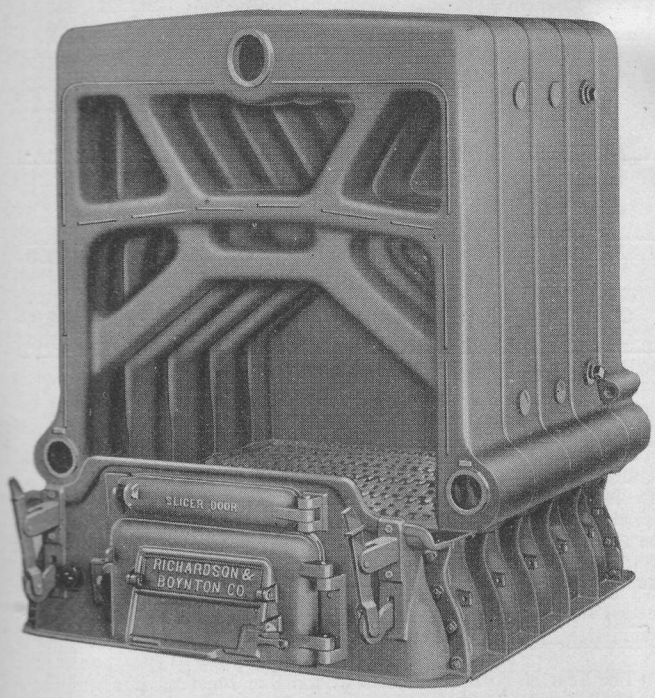
All "*Richardson*" Boilers are rated according to accurate standards—they are dependable.

The heating equipment in any home or building is a very important factor. It can be a source of great comfort, or, on the other hand, an annoying inconvenience and discomfort.

Behind every "*Richardson*" Boiler is an experience of many years standing in the heating of buildings of all kinds, and, from this experience comes a knowledge of how best to meet any conceivable heating condition. "*Richardson*" Sectional Safety Steam and Water Boilers are the result of many years' experience in building heating units. If it were possible to build a better boiler, we would build it.

"*Richardson*" Sectional Steam and Water Boilers can be furnished with grates for burning large or small sizes of coal. They are particularly adaptable where oil burners are to be used.

Richardson End Feed Sectional Steam and Water Boilers



Sectional View of "*Richardson*" Sectional Boiler

The leg section shows in detail the features of the "RICHARDSON" End Feed Sectional Boilers. The ample fire and combustion chamber with the low overhanging active fire surface; the thin water ways conducive to the rapid circulation of the water and the large flue spaces suitable for burning any quality of fuel. Connections between sections are made with extra heavy cast-iron slip nipples, making the boiler absolutely tight.

39 Series End Feed Sectional

Steam

No.	Total Length Inches	Grate Area Sq. Ft.	Water Line Inches	Outlets Inches	Inlets (Rear Section) Inches	Ashpit (Inside) Inches	Rating Sq. Ft.
395	56¼	**9.20**	56	2–5	2–5	44⅞x37	3400
396	64⅝	**11.50**	56	2–5	2–5	44⅞x45⅜	4200
397	73	**13.80**	56	3–5	2–5	44⅞x53¾	5000
398	81⅜	**16.10**	56	3–5	2–5	44⅞x62⅛	5800
399	89¾	**18.40**	56	4–5	2–5	44⅞x70½	6600

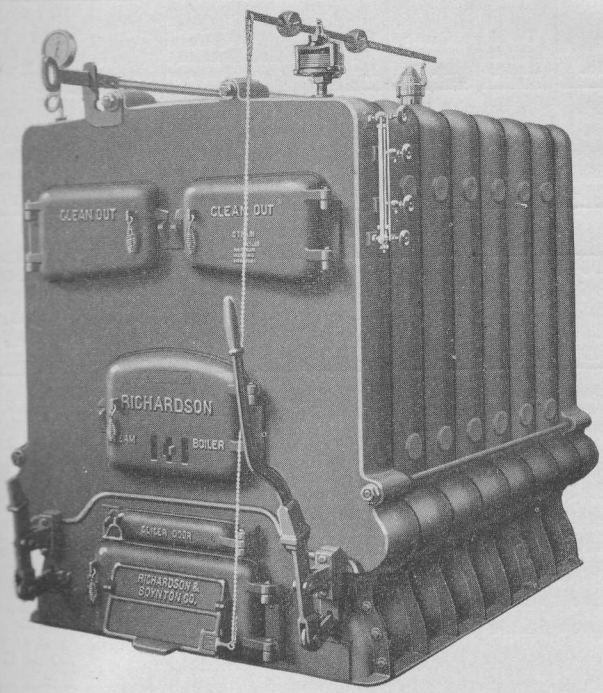
Water

395	56¼	**9.20**	....	2–5	2–5	44⅞x37	5450
396	64⅝	**11.50**	....	2–5	2–5	44⅞x45⅜	6725
397	73	**13.80**	....	3–5	2–5	44⅞x53¾	8000
398	81⅜	**16.10**	....	3–5	2–5	44⅞x62⅛	9275
399	89¾	**18.40**	....	4–5	2–5	44⅞x70½	10550

Castings only. Height, 63 in. Width, 53½ in.
Size of smoke-pipe, 14 in.
For other dimensions see pages 68 and 69.

39 Series End Feed "*Richardson*" Boiler. The leg section shows in detail the features of the "*Richardson*" End Feed Sectional Boiler; the ample fire and combustion chamber with the low overhanging active fire surface; the thin water ways conducive to the rapid circulation of the water, and the large flue spaces suitable for burning any quality of fuel.

Richardson End Feed Sectional Steam and Water Boilers



45 Series "*Richardson*" Sectional Steam Boiler

These boilers have been carefully and scientifically tested many times, and consequently the ratings can be relied upon. All the connections between sections are made with large, extra heavy cast-iron tapered slip nipples.

All boilers have cored openings in back section for coil; and steam boilers are tapped on second section from rear, both sides, for indirect water heater. Steam Boilers can be fitted with fusible plugs.

45 Series End Feed Sectional Boiler

Steam

No.	Total Length Inches	Grate Area Sq. Ft.	Water Line Inches	Outlets Inches	Inlets (Rear Section) Inches	Ashpit (Inside) Inches	Rating Sq. Ft.
457	75	**15.90**	59	3–5	2–5	50¾x53¾	6600
458	83⅜	**18.55**	59	3–5	2–5	50¾x62⅛	7600
459	91¾	**21.20**	59	4–5	2–5	50¾x70½	8600
4510	100⅛	**23.85**	59	4–5	2–5	50¾x78⅞	9600
4511	108½	**26.50**	59	5–5	2–5	50¾x87¼	10600

Water

457	75	**15.90**	....	3–5	2–5	50¾x53¾	10550
458	83⅜	**18.55**	....	3–5	2–5	50¾x62⅛	12150
459	91¾	**21.20**	....	4–5	2–5	50¾x70½	13750
4510	100⅛	**23.85**	....	4–5	2–5	50¾x78⅞	15350
4511	108½	**26.50**	....	5–5	2–5	50¾x87¼	16950

Castings only. Height, 68 in. Width, 59½ in.
Size of smoke-pipe, 16 in.
For other dimensions see pages 68 and 69.

The pride people take in their homes can be reflected in no better way than in the heating equipment they install.

The comfort of the public, in libraries, schools, hospitals and small public buildings is best insured by the installation of heating equipment which is efficient in severest winter weather, and, at the same time, thoroughly dependable under any circumstances.

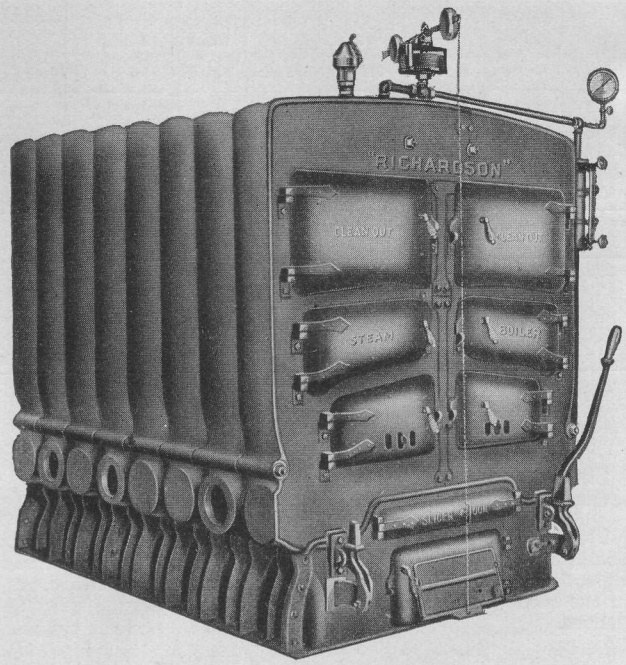
"*Richardson*" Sectional Boilers are ideal heating units for large residences, store buildings, schools, hospitals, libraries, etc. More than this they are constructed to give maximum efficiency with the lowest possible fuel consumption.

"*Richardson*" Sectional Boilers are in great demand among those who know and appreciate their value. The fact that an ever increasing demand is made for these boilers would indicate their great popularity among particular owners.

If you want an efficient heating unit, if you want continuous trouble-proof service from your heating unit, if you want low fuel costs, if you want comfort, you can do no better than install a "*Richardson*" Sectional Boiler.

If you want years and years of dependable service, with no trouble, inconvenience or discomfiture, follow the judgment of many thousands of others, install a "*Richardson*" Steam or Water Boiler.

Richardson End Feed Sectional Steam and Water Boilers



53 Series *"Richardson"* Sectional Steam Boiler

These boilers have been carefully and scientifically tested many times, and consequently the ratings can be relied upon. All the connections between sections are made with large, extra heavy cast-iron tapered slip nipples. The two halves of the back section are connected with a yoke, furnished with the boiler, so that the whole boiler can be drained.

All boilers have cored opening in back section for coil. Can also be tapped for indirect water heater. Steam Boilers can be fitted with fusible plugs.

53 Series End Feed Sectional Boiler

Steam

No.	Total Length Inches	Grate Area Sq. Ft.	Water Line Inches	*Outlets Inches	Ashpit (Inside) Inches	Rating Sq. Ft.
536	78¼	18.94	70½	2–6	55x55	10000
537	89	22.68	70½	2–6	55x65¾	11200
538	99¾	26.40	70½	3–6	55x76½	12400
539	110½	30.12	70½	3–6	55x87¼	13600
5310	121¼	33.88	70½	3–6	55x98	14800

Water

536	78¼	18.94	....	2–6	55x55	16000
537	89	22.68	....	2–6	55x65¾	17900
538	99¾	26.40	....	3–6	55x76½	19800
539	110½	30.12	....	3–6	55x87¼	21700
5310	121¼	33.88	....	3–6	55x98	23600

For other dimensions see pages 70 and 71

53 SERIES ONLY

* For each outlet there are two 4-inch inlets on steam boilers—one on each side, and two 6-inch inlets on water boilers—one on each side; also two 4-inch returns in back section of each boiler. Size of smoke-pipe, 6 and 7 section, 17 in.; 8 section, 19 in.; 9 and 10 section, 21 in.

"Richardson" Sectional Boilers are ideal heating units for large residences, store buildings, schools, hospitals, libraries, etc. More than this they are constructed to give maximum efficiency with the lowest possible fuel consumption.

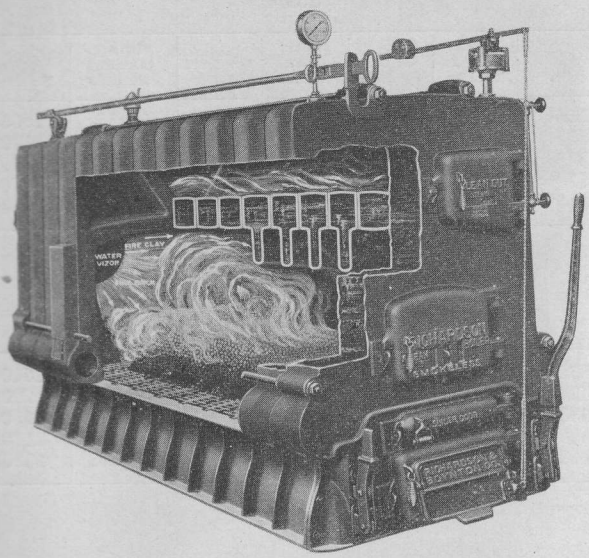
"Richardson" Sectional Boilers are in great demand among those who know and appreciate their value. The fact that an ever increasing demand is made for these boilers would indicate their great popularity among particular owners.

If you want an efficient heating unit, if you want continuous trouble-proof service from your heating unit, if you want low fuel costs, if you want comfort, you can do no better than install a *"Richardson"* Sectional Boiler.

If you want years and years of dependable service, with no trouble, inconvenience or discomfiture, follow the judgment of many thousands of others, install a *"Richardson"* Steam or Water Boiler.

Richardson Hot Blast Smokeless Boilers

End Feed Sectional Steam and Water



Special features of the "*Richardson*" Hot Blast Smokeless Boilers.

They are made in sectional form and can be erected at any time, whether the building is new or old. This enables the boiler to be installed with a minimum handling expense.

The natural fire travel and draft eliminate excessive heights in chimneys.

Long smoke travel and no obstruction to the flames aid combustion to the perfection point and utilize maximum heat from the fuel.

"Y" Flue Construction equalizes the circulation and assures a steady water line.

Overhanging prime heating surfaces are at the maximum, producing the highest evaporative power.

During the process of the fuel coking, gases are drawn back into a large chamber in front of the bridgewall, which has two port holes at the top center, making it impossible for gases to accumulate and explode.

The base is made in sections, permitting enlargement of a boiler if ever necessary.

Fire door: Replacing of grates through fire door big enough for man to enter means important saving in time. The size of this door permits even distribution of fuel over the fire.

Smokeless Sectional

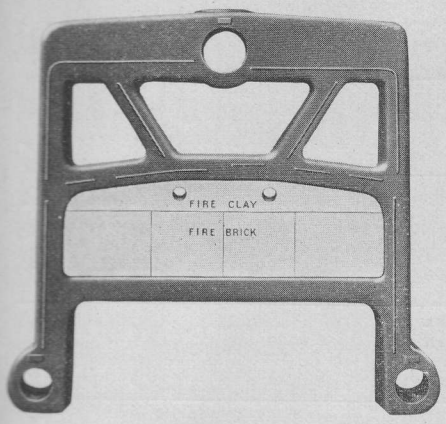
No.	Rating Sq. Ft.	Rating Sq. Ft.	Grate Area Sq. Ft.	Length Overall	Water Line In. Stm.	Smoke Pipe Inches	Ash Pit (Inside) Inches	Steam Outlets Inches	Water Outlets Inches	Steam & Water Inlets (Rear Section)
3207	3500	5600	10.00	64 1/4	48	14	38 7/8 x 47 1/2	3–4	3–4	2–4
3208	4050	6450	11.67	71 5/8	48	14	38 7/8 x 54 7/8	3–4	3–4	2–4
3209	4600	7300	13.34	79	48	14	38 7/8 x 62 1/4	4–4	4–4	2–4
3210	5150	8150	15.01	86 3/8	48	14	38 7/8 x 69 5/8	4–4	4–4	2–4
3907	5150	8150	13.80	73	56	16	44 7/8 x 53 3/4	3–5	3–5	2–5
3908	5950	9400	16.10	81 3/8	56	16	44 7/8 x 62 1/8	3–5	3–5	2–5
3909	6750	10650	18.40	89 3/4	56	16	44 7/8 x 70 1/2	4–5	4–5	2–5
3910	7550	11900	20.70	97 3/8	56	16	44 7/8 x 78 7/8	4–5	4–5	2–5
745	6750	10800	15.90	75	59	20	50 3/4 x 53 3/4	3–5	3–5	2–5
845	7700	12300	18.55	83 3/8	59	20	50 3/4 x 62 1/8	3–5	3–5	2–5
945	8650	13800	21.20	91 3/4	59	20	50 3/4 x 70 1/2	4–5	4–5	2–5
1045	10600	15300	23.85	100 1/8	59	20	50 3/4 x 78 7/8	4–5	4–5	2–5
1145	11550	16800	23.85	108 1/2	59	20	50 3/4 x 87 1/4	5–5	5–5	2–5
1245	12500	18300	23.85	116 7/8	59	20	50 3/4 x 87 1/4	5–5	5–5	2–5
1345	13450	19800	23.85	125 1/4	59	20	50 3/4 x 87 1/4	6–5	6–5	2–5
1445	14500	21300	23.85	133 5/8	59	20	50 3/4 x 87 1/4	6–5	6–5	2–5
1545	15450	22800	23.85	142	59	20	50 3/4 x 87 1/4	7–5	7–5	2–5
1645	16400	24300	23.85	150 3/8	59	20	50 3/4 x 87 1/4	7–5	7–5	2–5
1745	17350	25800	23.85	158 3/4	59	20	50 3/4 x 87 1/4	8–5	8–5	2–5
1845	18300	27300	23.85	167 1/8	59	20	50 3/4 x 87 1/4	8–5	8–5	2–5
1945	19250	28800	23.85	175 1/2	59	20	50 3/4 x 87 1/4	9–5	9–5	2–5
2045	20200	30300	23.85	183 7/8	59	20	50 3/4 x 87 1/4	9–5	9–5	2–5

For other dimensions see pages 72 and 73.

Richardson Hot Blast Smokeless Boilers

End Feed Sectional Steam and Water

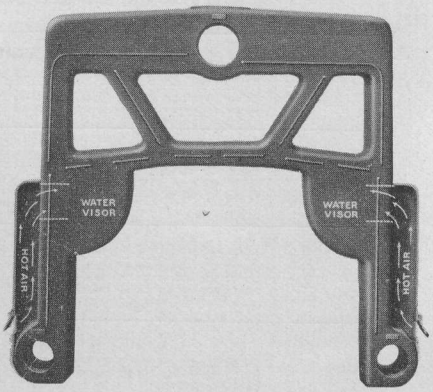
The Bridgewall Section



This section forms the rear end of front combustion chamber. It contains a water curtain faced with fire brick. Fire brick facing retains heat more readily and at an extremely high temperature. Air injected into the combustion chamber through the air blast section in front of the bridgewall is heated by direct contact with this brick facing. This curtain effect forces the rising products of combustion to follow a circular motion before being drawn down underneath its lower edge. Two gas vents at the top center relieve any gas pockets.

The Air Blast Section

This section is designed with two hot air intakes, one on each side just under the crown sheet. Cast iron air ducts are attached to the outside, covering these air intakes. These form air channels leading directly into the front combustion chamber. Upon entering the front combustion chamber, the heated air crosses the hot brick on the bridgewall section. The high temperature of this air so greatly aids the general combustion that it eliminates all smoke, even with the poorest grades of coal.



Richardson Hot Blast Smokeless Boilers

Suggestions

1. In order to get the best results with firing tools, we recommend the suspension of a chain from the ceiling in front of firing door of boiler of the proper length with a hook to hold the poker or scraper while being used. This will make the tools much more easily handled.

2. We recommend that under no circumstances ***mix the coals before recharging with fresh fuel.*** The coals should be simply ***broken,*** the fresh fuel thrown on evenly throughout the entire fire chamber.

3. The cast plate which fits in the ashpit, to prevent the draft from going past the bridgewall section, should be placed just behind the last grate bar.

4. In erecting all "*Richardson*" Smokeless Boilers we consider the quickest way is to begin at the front and work toward the back.

5. We recommend all boilers be erected over a pit.

6. We recommend two or more boilers in large operations. This is particularly emphasized in factories, warehouses and apartments and assures continuous operation of the heating plant in case of one boiler being out of commission.

7. After the fire brick is placed on bridgewall section, the space above this brick should be filled in with fire clay to present a solid face to the fire.

8. The blank space behind the last grate bar in boiler, sizes Nos. 1145 to 2045, inclusive, should be filled in with either cement or dirt, at the same time placing fire bricks in a slanting position so as to produce an incline toward the back section.

Caution should be used to grade the incline as suggested, otherwise valuable fire surface will be lost. This arrangement provides an easy method of raking out ashes which sometimes accumulate behind the bridgewall.

Clean Water Guaranteed by the Richardson Galvoxide REG. U. S. PAT. OFF. Process

In many sections the chemical composition of the water makes it impossible to obtain clean hot water, free from rust or discoloration, except by using brass sections in the tank and laundry heaters. Several years ago the Richardson & Boynton Company perfected a new type of heater with a galvoxide water section so treated by a special process that it is not affected by the chemical properties in the water in any way whatsoever. The result is that clean hot water is available at all times.

Thousands of successful installations in the past few years have so established the Richardson Galvoxide Hot Water Supply Boiler as a solution for the clean water problem that the Richardson & Boynton Company now guarantee their Galvoxide Hot Water Supply Boilers to keep the water free from rust or discoloration.

Architects and plumbers find the guaranteed Galvoxide Water Section so thoroughly satisfactory in all ways that they do not hesitate to recommend it without reservation to their clients.

Hot Water Supply Boiler Ratings

The capacities in gallons shown for the different styles of Hot Water Supply Boiler indicate the size of storage tank to which Boiler should be connected for ordinary domestic supply systems; and Boilers have the capacity to impart from 25 to 40 degrees of heat per hour to the water, which fulfills the requirements of such systems.

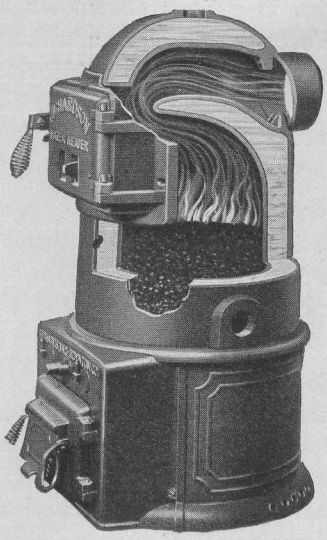
Where a specific quantity of water is required to be raised to a certain number of degrees per hour for special purposes, the boiler capacity required must be figured as follows:

Multiply the number of gallons to be heated per hour by 8⅓ lbs., which is the weight of one gallon of water, and this result by the number of degrees temperature water is to be raised; divide this result by 8,000 (the heat units utilized from one pound of fuel), and the result will be the number of pounds of coal which must be burned per hour; this, divided by the rate of combustion at which the boiler is to be run, will give the square feet of grate required.

Important

When Hot Water Supply Boilers are subject to an unusual pressure or when the pressure is increased in the night, or during fires, it is necessary to provide the system with a water pressure-reducing valve and relief valve.

Richardson
Hot Water Supply Boilers



No. 110T-112T-114T

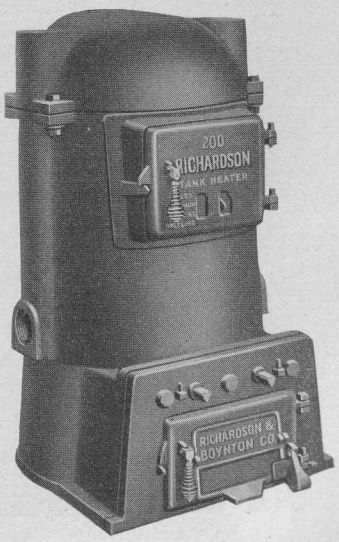
Fitted with Triangular Grates

Can be furnished with Cast Iron or Galvoxide Water Section

Size	Capacity in Gallons of Water	Capacity in Sq. Ft. of Radiation	Diameter of Grates, Inches	Tappings, Flow and Return, Ins.	Smoke Pipe	Height, Inches
110T	150	115	10	1½	6	34
112T	250	200	12	2	6	36⅜
114T	350	280	14	2½	6	37⅞

For other dimensions, see page 76.

Richardson
Hot Water Supply Boilers



No. 170-200-230

Fitted with Triangular Grates

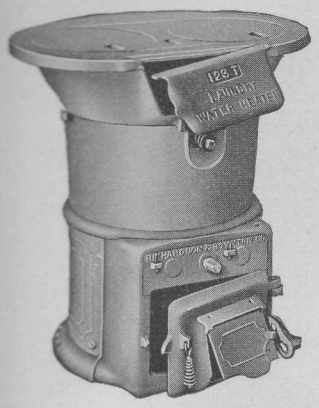
Can be furnished with Grates for Pea Coal

Size	Capacity in Gallons of Water	Capacity in Sq. Ft. of Radiation	Diameter of Grates, Inches	Tappings, Flow and Return, Ins.	Smoke Pipe	Height, Inches
170	475	380	17	2-2½	7	42
200	600	480	20	2-3	8	42⅞
230	800	600	23	2-3	9	46

For other dimensions, see page 77.

Hot Water Supply Boilers

No. 123T, 25¼ inches high.



No. 124T, 28¼ inches high.

Top 24x16 inches.
Grate 10½ inches.
Smoke-pipe 4½ inches.
1-inch flow and return tappings

Fitted with high ash pit and "Perfect" revolving grate bars.

No. 123T for 80 gallons

No. 124T for 125 gallons

Can be furnished with Cast Iron or Galvoxide Water Section

No. 225 Hot Water Supply Boilers

Capacity 125 gallons.
Height 30⅞ inches.
Grate 12 inches.
Smoke-pipe 5 inches.
1¼" flow and return tappings.
One size only.

A course of fire brick under water section prevents ashes and dead coal from coming in contact with heating surface, insuring maximum efficiency.

Fitted with high ash pit and "Perfect" revolving grate bars.

430 sq. in. direct heating surface.

Can be furnished with Cast Iron or Galvoxide Water Section

Hot Water Supply Boilers
No. 1-B Union

Height 27½ inches.
Top 21x14¼ inches.
Capacity 40 gallons.
Smoke-pipe 6 inches.
1-inch flow and return tapping.

Can be furnished with Cast Iron or Galvoxide Water Section

The No. 1-B has a course of fire brick under water section which prevents ashes and dead coal from coming in contact with heating surface, insuring maximum efficiency.

Leg Base fitted with draw center grate.

No. 4 Union

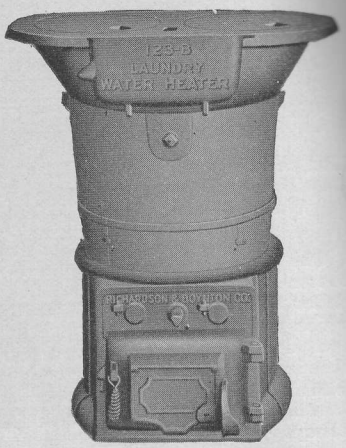
Height 27½ inches.
Top 21x14¼ inches.
Capacity 50 gallons.
Smoke-pipe 6 inches.
1-inch flow and return tappings. Fitted with high ash pit and "Perfect" revolving grate bars.

Can be furnished with Cast Iron or Galvoxide Water Section

The No. 4 has a course of fire brick under water section which prevents ashes and dead coal from coming in contact with heating surface, insuring maximum efficiency.

Hot Water Supply Boilers

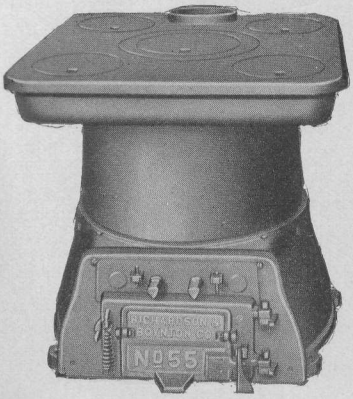
No. 123B, 28¾ inches high
Top 24 by 16 inches
Capacity 100 gallons
Grate 10½ inches
Smoke-pipe 4½ inches



1-inch flow and return tapping. Fitted with high ash pit and "Perfect" revolving grate bars. Brick ring prevents accumulation of dead ashes at bottom of water section.

Can be furnished with Cast Iron or Galvoxide Water Section

No. 55 "Perfect" Hot Water Supply Boiler



Capacity 225 gallons
Height 26¼ inches
Top 28 inches square
Smoke Collar, 6 inches
Tapping, 1½ inches

Can be furnished with Cast Iron or Galvoxide Water Section

Richardson Hot Water Supply Boilers

Western Series Soft Coal

No. 601

Capacity
125 Gallons

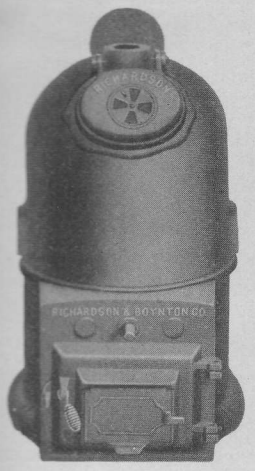
Dimensions

Radiation, 65 feet
Height over all, 33 in.
Grate, 10 in.
Depth fire, 14 in.

Smoke pipe, 5 in.
Tappings, 1½ in.
Floor space, 24½"x28"
Fire door, 8"x6"

Fitted with Triangular Grates

Richardson Hot Water Supply Boilers



No. 411-T

No. 411-T
100 Gallons

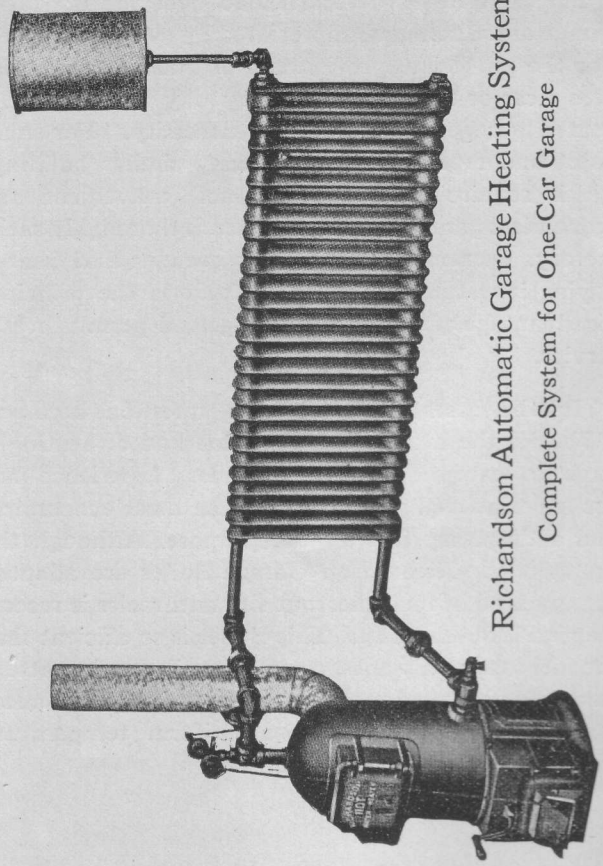
Radiation, 50 feet
Height over all, 27 in.
Grate, 10 in.
Depth of fire, 10 in.
Smoke pipe, 5 in.
Tappings, 1¼ in.
Floor space, 18″ x 18″
Fire door, 6″ x 4½″

No. 411
100 Gallons

The Number 411 is similar to the No. 411-T except that it has a leg base and revolving flat grate.

No. 1A
30 Gallons

Radiation, 25 feet
Height over all, 25½ in.
Grate, 9 in.
Depth of fire, 9 in.
Smoke pipe, 3¾″ x 7″
Tappings, 1 in.
Floor space, 18″ x 18″
Fire door, 6½″ x 4½″



Richardson Automatic Garage Heating System
Complete System for One-Car Garage

Richardson Automatic Garage Heating System

The advantages of the heated over the unheated garage are known and appreciated by every car owner. For the physician, professional or business man who uses a car or truck nearly every day in the year, a heated garage is practically a necessity. For small paint and repair shops, and many similar buildings which require heat, the compact, convenient and economical garage Heating System is thoroughly satisfactory. Owners of community garages find heat a paying investment because it obviates the principal disadvantage of this form of garage and permits better service.

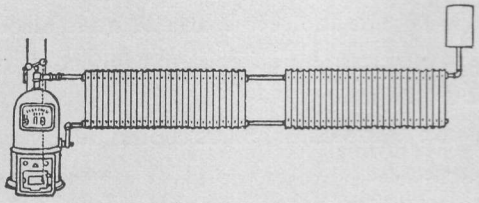
In the cases mentioned the question becomes, "What is the most satisfactory method of heating?" Save in exceptional circumstances, experience has proved that coal is still by far the most economical and satisfactory fuel for the purpose. Although the grates of the Richardson Garage Boiler are adapted for any kind of fuel, chestnut size anthracite is recommended for best results. This Boiler is so efficient that the fuel cost is only a few cents a day. It requires attention only night and morning, because the special automatic regulator maintains a uniform temperature irrespective of weather conditions.

The Richardson Automatic Garage Heating System

Is carefully constructed of the highest grade of iron and thoroughly tested before shipment. It is fitted with a high ash pit fitting close to the cement floor and with our celebrated "Perfect" triangular grate bars. The fire box is of sufficient depth to hold an ample supply of fuel and is cast in one piece. The grates are adapted for burning any kind of fuel—chestnut size anthracite is recommended for best results.

All parts being carefully cut and fitted, the necessary work in installing the Richardson Automatic System is most simple, requiring only a short time to set up heater, fasten water radiator to wall and make the connection. After the apparatus is set up, fill with water until it shows in the bottom of tank, start the fire, and adjust the regulator.

Two-Car System



Important Facts

"Richardson" Boilers are rated according to accurate standards and upon the assumption that sufficient radiation will be used, the piping system properly arranged and the boiler connected to a flue of ample capacity and good draft. With steam at 2 lbs. boiler pressure and with hot water at a temperature of 180° Fahrenheit.

Our ratings provide that all piping (mains, risers and returns), in addition to the direct radiation to be used, shall be figured as radiating surface in estimating the size of boiler necessary. One size larger boiler for reserve power is best used.

For indirect radiation add 75 per cent to surface for such radiation, and where pipe radiation surface is used, add 25 per cent for same to equal the usual amount of direct radiation.

When a pipe coil or cast-iron section is placed in the fire pot for heating water for domestic uses, additional capacity must be figured at the rate of 1½ square feet of direct radiation for a steam boiler and 2½ square feet of direct radiation for a hot-water boiler, for each gallon of water to be heated per hour.

"Richardson" Boilers are tapped for coils to be placed in the fire box for heating water. Steam Boilers have tappings for Indirect Water Heaters also.

Do not bush outlets on boilers; connect all of them full size to the mains.

To secure best results boilers should be covered with Asbestos cement.

Guarantee

Every *"Richardson"* Boiler is sold under a guarantee as to its perfection in manufacture, and its ability to carry the rating shown in our printed matter, provided that a sufficient amount of radiation is installed, the piping system properly run, and the boiler connected to a flue of sufficient size and draft for the size of the fire box.

Coal

"Richardson" Boilers can be furnished with grates to burn the small sizes of coal when so ordered.

Directions for Remedying Unsteady Water Lines in Steam Boilers

It is a well known fact that most water line troubles are due to the foaming action of the water caused by impurities, such as oil, grease and sediment. In the past, hundreds of dollars have been needlessly expended in endeavoring to find the cause of these troubles, when all that was necessary was a thorough blowing off or washing of the boiler. There are several ways that this can be done.

Blowing Off Under Pressure

Mix one pound of Babbitt's Lye with a half gallon of water. Take off the safety valve and pour the mixture into the boiler. For large sectional boilers, use two or three pounds of lye, mixing in the same way. Replace safety valve and get up steam in boiler. Steam pressure should be carried for at least two hours. The coal fire should then be dumped and entirely removed from the boiler. A wood fire should be started and all radiator valves closed. When pressure is raised to a point where the safety valve starts to blow off, open the draw-off cock and allow all of the water to be blown out of the boiler, under pressure. Immediately draw the fire and open all doors and drafts and allow the boiler to cool down. When the boiler is sufficiently cool, fill with cold water up to the safety valve and then again open the draw off cock and allow this to run off. Then, refill boiler to the water line and start the fire. For best results, the draw-off cock should be at least 1 inch.

Washing Out Sectional Boilers

Remove safety valve and connect a nipple and tee under same, replacing safety valve on the top of tee. Run a 1 inch pipe from side of tee to the nearest plumbing fixture or window. Turn on cold water supply full and let the water flow out through the pipe until it comes cold and clear. The cold water supply can then be shut off and the water drawn down

to the regular water line, through the draw-off connections. This can be done without disturbing the fire in the boiler.

Washing Out Round Boilers

The simplest way to do this, on round boilers where the water column is connected only to the dome section, is by removing the lower tri-cock on water column and turning on the cold water supply. The water can be carried in pails to the nearest plumbing fixture, or a pipe connection can be taken from this opening to convenient point. Follow the same general directions as for washing out a sectional boiler.

Washing Out Round or Sectional Boilers When There is a Valve and Check Valve on Main Return

Close off the return valve and take top off the check. Turn on cold water supply and let it run until all of the hot water in the boiler has gone up through the mains and out through the open check valve. This is the most effective washing out process as it thoroughly cleans out the mains and returns, as well as the boiler. When the water runs clear and cold through the check valve, close off the cold water supply and open the return valve; allowing the water to be drawn down to the proper water line. Then, shut off the return valve and replace top of check; being sure that the return valve is again opened.

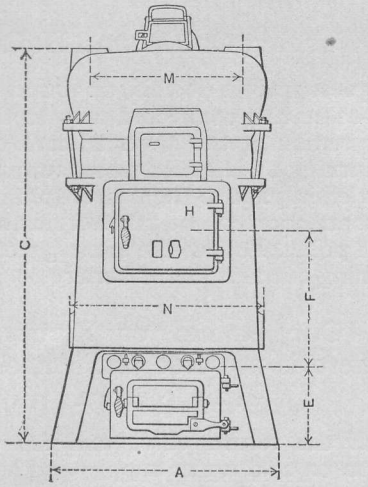
Special Notice

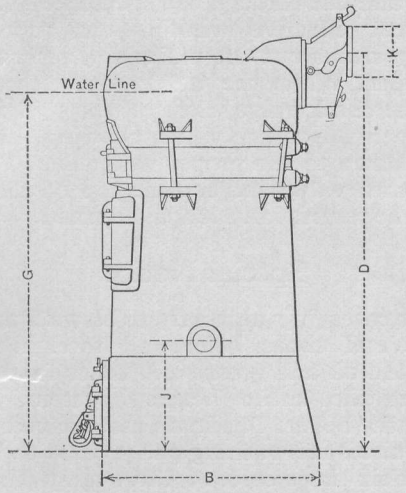
In many cases, it is necessary to blow off or wash out boilers several times before all foreign matter is removed. All oil and grease and other foreign matter throughout the entire heating system, gradually returns to the boiler. Obstinate cases have been found which required the washing out process to be carried out five or six times before a thoroughly clean system and a steady water line were obtained.

These rules apply to any boiler.

Round Steam and Water Boilers

19-22-25-28 Series





These line drawings apply to steam and water boilers. Measurements are given on Page 61.

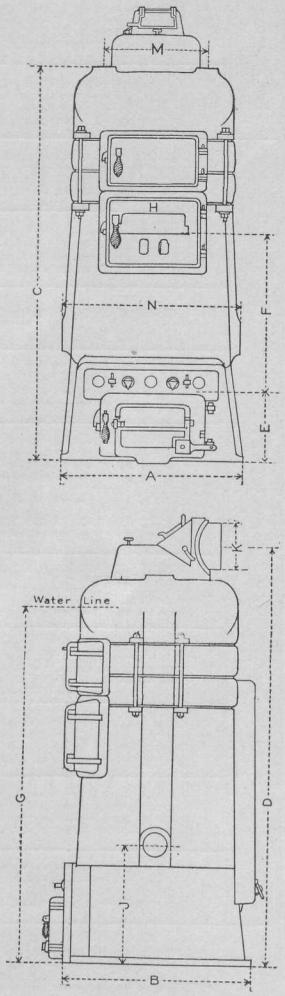
Round Boiler Measurements

19-22-25-28 Series

Table of distances between points as indicated on line drawings, Page 60. All measurements are given in inches

Size	For Steam and Water										For Steam Only		For Water Only
	A	B	D	E	F	H	J	K	M	N	C	G	C
1190	29 3/4	28 3/4	44 3/4	10 1/2	16 13/16	10 x 12 1/2	14 3/4	8	19 15/16	25 1/2	46 13/16	42 1/4	44 3/4
1191	29 3/4	28 3/4	49	10 1/2	16 13/16	10 x 12 1/2	14 3/4	8	19 15/16	25 1/2	51 1/16	46 1/2	49
1192	29 3/4	28 3/4	53 1/4	10 1/2	16 13/16	10 x 12 1/2	14 3/4	8	19 15/16	25 1/2	55 5/16	50 3/4	53 1/4
1220	33 1/4	31 3/4	46 1/16	11	17 1/16	10 x 13 3/4	15 9/16	9	22	28 1/2	48 3/8	43 1/2	45 3/4
1221	33 1/4	31 3/4	50 5/16	11	17 3/16	10 x 13 3/4	15 9/16	9	22	28 1/2	52 5/8	47 3/4	50
1222	33 1/4	31 3/4	54 9/16	11	17 3/16	10 x 13 3/4	15 9/16	9	22	28 1/2	56 7/8	52	54 1/4
1223	33 1/4	31 3/4	58 13/16	11	17 3/16	10 x 13 3/4	15 9/16	9	22	28 1/2	61 1/8	56 1/4	58 1/2
1251	35 3/4	34 1/2	51 7/8	11 1/2	17 1/2	10 x 15 1/2	17	10	24 1/2	32 1/2	53 1/8	49	51 1/2
1252	35 3/4	34 1/2	56 1/8	11 1/2	17 1/2	10 x 15 1/2	17	10	24 1/2	32 1/2	58 1/8	53 1/4	55 3/4
1253	35 3/4	34 1/2	60 3/8	11 1/2	17 1/2	10 x 15 1/2	17	10	24 1/2	32 1/2	62 1/8	57 1/2	60
1281	39 3/4	38	53 1/2	11 1/2	18 1/8	10 1/2 x 16	16 1/2	10	27 1/2	34 1/2	55 1/4	50 1/2	53
1282	39 3/4	38	57 3/4	11 1/2	18 1/8	10 1/2 x 16	16 1/2	10	27 1/2	34 1/2	59 1/2	54 3/4	57 1/4
1283	39 3/4	38	62	11 1/2	18 1/8	10 1/2 x 16	16 1/2	10	27 1/2	34 1/2	63 3/4	59	61 1/2

"Perfecto"
Round Steam and Water Boilers
23-26-29 Series



These line drawings apply to "Perfecto" steam and water boilers. Measurements are given on Page 63.

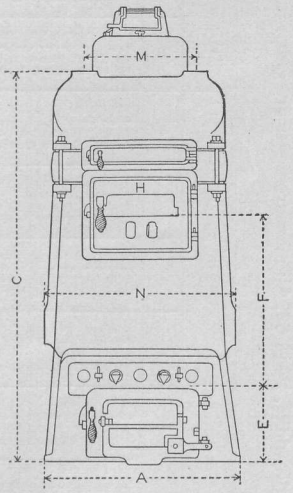
"Perfecto" Round Boiler Measurements
23-26-29 Series

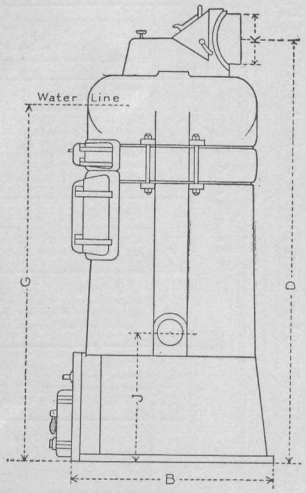
Table of distances between points as indicated on line drawings, Page 62. All measurements are given in inches.

	Steam and Water									For Steam Only				For Water Only		
No.	A	B	E	F	H	J	K	N	C	D	G	M	C	D	M
43	30	31½	13½	20½	9½x13½	16½	9	29¾	53½	58½	48¼	22½	45¾	51¼	22½
53	30	31½	13½	20½	9½x13½	16½	9	29¾	57¾	62½	52½	22½	50	55¼	22½
63	30	31½	13½	20½	9½x13½	16½	9	29¾	62	66½	56¾	22½	54¼	59¼	22½
46	33½	35	14	22	9½x15½	17½	10	32¾	55½	60¼	49½	25	47⅞	52¼	24⅝
56	33½	35	14	22	9½x15½	17½	10	32¾	59¾	64¼	53¾	25	51⅛	56¼	24⅝
66	33½	35	14	22	9½x15½	17½	10	32¾	64	68¼	58	25	55⅛	60¼	25
49	38	40	13½	22¼	10 x15½	18	10	35¾	60	64⅞	53½	30½	50½	55⅞	25
59	38	40	13½	22¼	10 x15½	18	10	35¾	65⅜	70⅛	58⅞	30½	55⅞	61⅜	25
69	38	40	13½	22¼	10 x15½	18	10	35¾	70⅜	75⅜	64½	30½	61¼	66⅝	25

Round Steam and Water Boilers

17-20-23-26-29 Series





These line drawings apply to round steam and water boilers. Measurements are given on Page 65.

Round Boiler Measurements

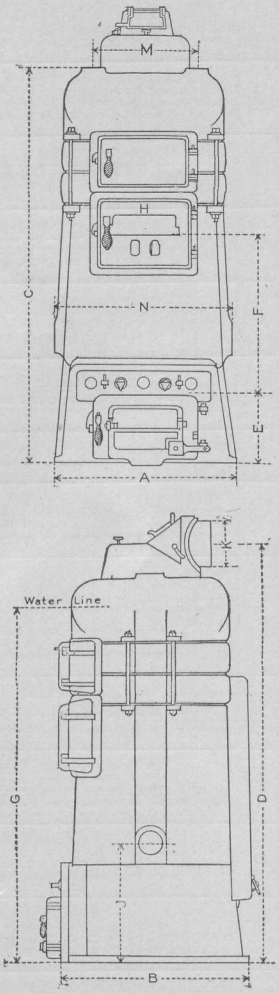
Nos. 173 to 296

Table of distances between points as indicated on line drawings, Page 64. All measurements are given in inches.

	Steam and Water									Steam Only			Water Only		
No.	A	B	E	F	H	J	K	N	C	D	G	M	C	D	M
173	24	25 1/4	12	19 1/4	9 x11 1/2	14 1/2	7	23 1/2	45 1/4	48 1/4	40	17 1/4	38 1/2	42 1/2	17
174	24	25 1/4	12	19 1/4	9 x11 1/2	14 1/2	7	23 1/2	49 1/2	53 1/4	44 1/4	17 1/4	42 3/4	46 1/2	17
175	24	25 1/4	12	19 1/4	9 x11 1/2	14 1/2	7	23 1/2	53 3/4	57 1/4	48 1/2	17 1/4	47	50 1/2	17
203	27	28 1/2	12 1/2	20	9 1/2 x12 1/2	15 1/2	8	26 3/4	46 1/4	50 3/4	41	19 1/2	39 1/2	44	19 1/2
204	27	28 1/2	12 1/2	20	9 1/2 x12 1/2	15 1/2	8	26 3/4	50 1/2	54 3/4	45 1/4	19 1/2	43 3/4	48	19 1/2
205	27	28 1/2	12 1/2	20	9 1/2 x12 1/2	15 1/2	8	26 3/4	54 3/4	58 3/4	49 1/2	19 1/2	48	52	19 1/2
233	30	31 1/2	13 1/2	20 1/2	9 1/2 x13 1/2	16 1/2	9	29 3/4	49 1/4	54	44	22 3/4	41 1/2	47 1/4	22 1/2
234	30	31 1/2	13 1/2	20 1/2	9 1/2 x13 1/2	16 1/2	9	29 3/4	53 1/2	58 1/2	48 1/4	22 3/4	45 3/4	51 1/4	22 1/2
235	30	31 1/2	13 1/2	20 1/2	9 1/2 x13 1/2	16 1/2	9	29 3/4	57 3/4	62 1/2	52 1/2	22 3/4	50	55 1/4	22 1/2
263	33 1/2	35	14	22	9 1/2 x13 1/2	17 1/2	10	32 3/4	51 1/4	56 1/4	45 1/4	24 7/8	43 1/8	48 1/4	24 3/4
264	33 1/2	35	14	22	9 1/2 x15 1/2	17 1/2	10	32 3/4	55 1/2	60 1/4	49 1/2	24 7/8	47 1/8	52 1/4	24 3/4
265	33 1/2	35	14	22	9 1/2 x15 1/2	17 1/2	10	32 3/4	59 3/4	64 1/4	53 3/4	24 7/8	51 1/8	56 1/4	24 3/4
266	33 1/2	35	14	22	9 1/2 x15 1/2	17 1/2	10	32 3/4	64	68 1/4	58	24 7/8	55 1/8	60 1/4	24 3/4
294	38	40	13 1/2	22 1/4	10 x15 1/2	18	10	35 3/4	60	67 7/8	53 1/2	30 5/8	50 1/2	55 7/8	24 15/16
295	38	40	13 1/2	22 1/4	10 x15 1/2	18	10	35 3/4	65 3/8	70 1/8	58 7/8	30 5/8	55 7/8	61 3/8	24 15/16
296	38	40	13 1/2	22 1/4	10 x15 1/2	18	10	35 3/4	70 3/4	75 3/8	64 1/4	30 5/8	61 1/4	66 5/8	24 15/16

Round Smokeless Steam and Water Boilers

23-26-29 Series



These line drawings apply to round smokeless steam and water boilers. Measurements are given on Page 67.

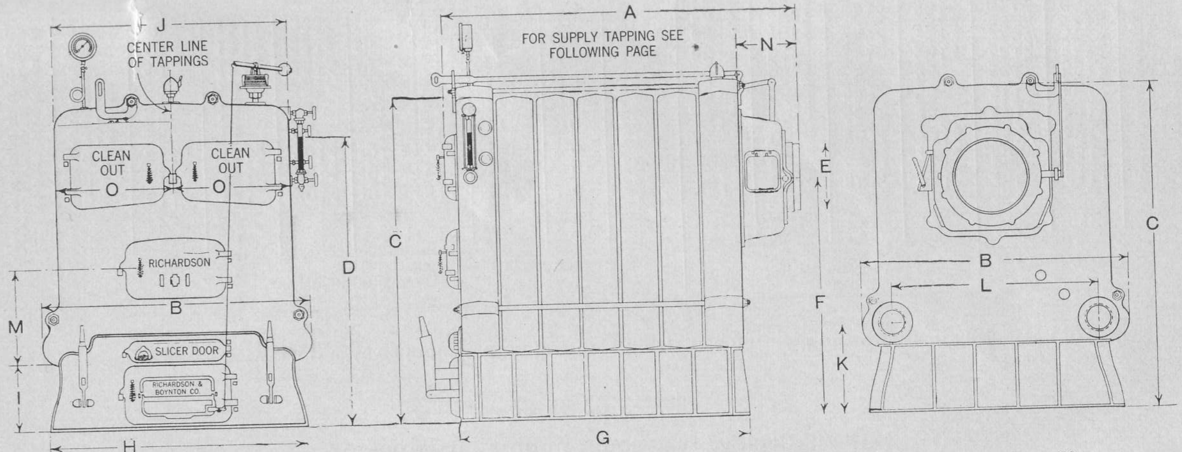
"Richardson" Round Smokeless Measurements

23-26-29 Series

Table of distances between points as indicated on line drawings, Page 66. All measurements are given in inches.

	Steam and Water								For Steam Only				For Water Only	
No.	A	B	E	F	H	J	K	N	C	D	G	M	C	D	M
432	30	31½	13½	20½	9½x13½	16½	9	29¾	53½	58½	48¼	22½	45¾	51¼	22½
532	30	31½	13½	20½	9½x13½	16½	9	29¾	57¾	62½	52½	22½	50	55¼	22½
632	30	31½	13½	20½	9½x13½	16½	9	29¾	62	66½	56¾	22½	54¼	59¼	22½
462	33½	35	14	22	9½x15½	17½	10	32¾	55½	60¼	49½	25	47⅛	52¼	24⅝
562	33½	35	14	22	9½x15½	17½	10	32¾	59¾	64¼	53¾	25	51⅛	56¼	24⅝
662	33½	35	14	22	9½x15½	17½	10	32¾	64	68¼	58	25	55⅛	60¼	24⅝
492	38	40	13½	22¼	10 x15½	18	10	35¾	60	64⅞	53½	30½	50½	55⅞	25
592	38	40	13½	22¼	10 x15½	18	10	35¾	65⅜	70⅛	58⅞	30½	55⅞	61⅜	25
692	38	40	13½	22¼	10 x15½	18	10	35¾	70¾	75⅜	64½	30½	61¼	66⅝	25

Sectional Boiler Measurements



These line drawings represent both steam and water boilers, 24-32-39-45 Series. Measurements are given on Page 69.

Sectional Boiler Measurements

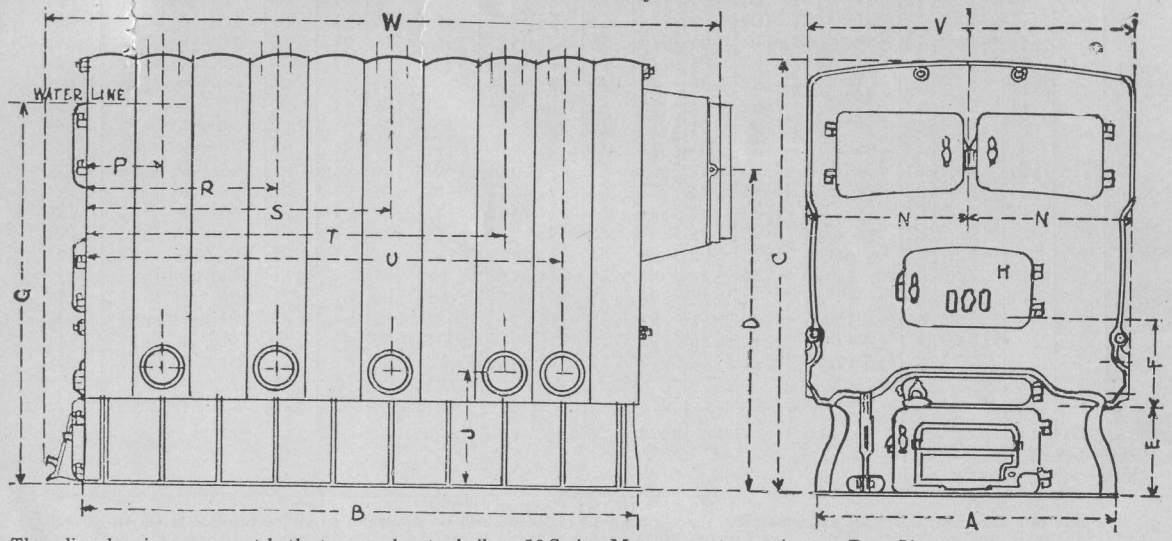
Table of distances between points as indicated on line drawings on Page 68. All measurements are given in inches and apply to all sizes 24-32-39-45 Series, end feed

For Steam and Water																*STEAM AND WATER TAPPINGS (See note below.)				
No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	1	2	3	4	5
244	32⅜	34$\frac{3}{16}$	49⅜	43⅜	9	38⅝	24$\frac{15}{16}$	30½	11½	31⅞	15⅛	27⅝	14⅛	6⅝	15$\frac{15}{16}$	15⅛				
245	38⅝	34$\frac{3}{16}$	49⅜	43⅜	9	38⅝	31$\frac{3}{16}$	30½	11½	31⅞	15⅛	27⅝	14⅛	6⅝	15$\frac{15}{16}$	8⅞	21⅜			
246	44⅞	34$\frac{3}{16}$	49⅜	43⅜	9	38⅝	37$\frac{7}{16}$	30½	11½	31⅞	15⅛	27⅝	14⅛	6⅝	15$\frac{15}{16}$	8⅞	27⅝			
247	51⅛	34$\frac{3}{16}$	49⅜	43⅜	9	38⅝	43$\frac{11}{16}$	30½	11½	31⅞	15⅛	27⅝	14⅛	6⅝	15$\frac{15}{16}$	8⅞	21⅜	33⅞		
248	57⅜	34$\frac{3}{16}$	49⅜	43⅜	9	38⅝	49$\frac{15}{16}$	30½	11½	31⅞	15⅛	27⅝	14⅛	6⅝	15$\frac{15}{16}$	8⅞	21⅜	40⅛		
325	49½	46½	55	48	12	38½	36½	42⅞	11½	39	15¾	34	12¾	9⅝	19½	10⅜	25⅛			
326	56⅞	46½	55	48	12	38½	43⅞	42⅞	11½	39	15¾	34	12¾	9⅝	19½	10⅜	32½			
327	64¼	46½	55	48	12	38½	51¼	42⅞	11½	39	15¾	34	12¾	9⅝	19½	10⅜	25⅛	39⅞		
328	71⅝	46½	55	48	12	38½	58⅝	42⅞	11½	39	15¾	34	12¾	9⅝	19½	10⅜	25⅛	47¼		
329	79	46½	55	48	12	38½	66	42⅞	11½	39	15¾	34	12¾	9⅝	19½	10⅜	25⅛	39⅞	54⅝	
395	56¼	53½	63	56	14	48½	41¼	49⅝	13	47	17½	40	15	11⅞	23½	11⅜	28⅛			
396	64⅝	53½	63	56	14	48½	49⅝	49⅝	13	47	17½	40	15	11⅞	23½	11⅜	36½			
397	73	53½	63	56	14	48½	58	49⅝	13	47	17½	40	15	11⅞	23½	11⅜	28⅛	44⅞		
398	81[illegible]	53½	63	56	14	48½	66⅜	49⅝	13	47	17½	40	15	11⅞	23½	11⅜	28⅛	53¼		
399	89[illegible]	53½	63	56	14	48½	74¾	49⅝	13	47	17½	40	15	11⅞	23½	11⅜	28⅛	44⅞	61⅝	
[illegible]	[illegible]	59½	68	59	16	49½	58	55½	13	53	17½	46	16½	12½	26½	11⅜	28⅛	44⅞		
[illegible]	[illegible]	59½	68	59	16	49½	66[illegible]	55½	13	53	17½	46	16½	12½	26½	11⅜	28⅛	53¼		
[illegible]	[illegible]	59½	68	59	16	49½	74[illegible]	55½	13	53	17½	46	16½	12½	26½	11⅜	28⅛	44⅞	61⅝	
[illegible]	[illegible]	59½	68	59	16	49½	83[illegible]	55½	13	53	17½	46	16½	12½	26½	11⅜	28⅛	44⅞	70	
[illegible]	[illegible]	59½	68	59	16	49½	91½	55½	13	53	17½	46	16½	12½	26½	11⅜	28⅛	44⅞	61⅝	78⅜

*Tappings [illegible] from front. Measurements from face of front section to center of tappings, in inches.

Sectional Boiler Measurements

53 Series Only



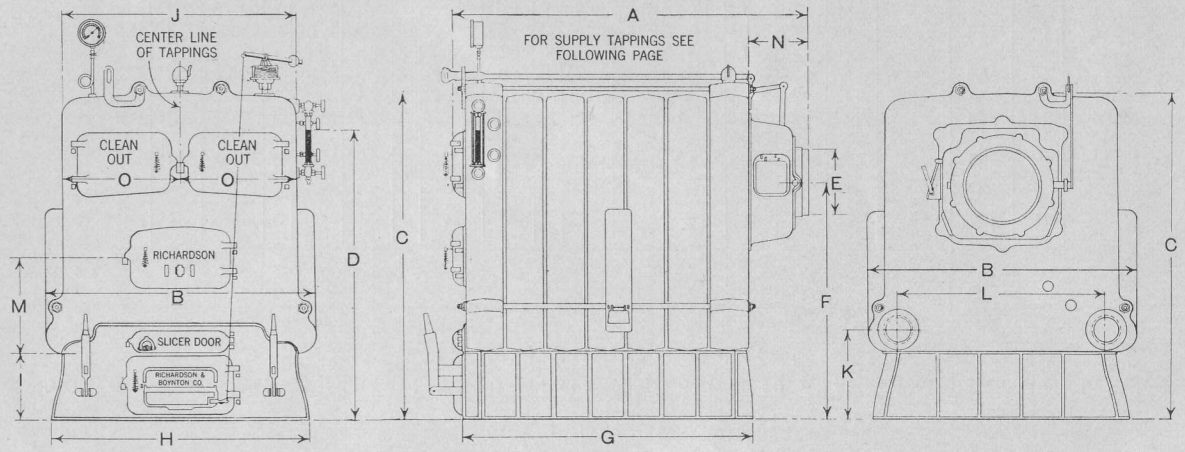
These line drawings represent both steam and water boilers, 53 Series. Measurements are given on Page 71.

Sectional Boiler Measurements

Table of distances between points as indicated on line drawings on page 70. All measurements are given in inches and apply to all sizes 53 series end feed

	Steam and Water												Steam				Water		
No.	A	B	C	D	E	F	H	J	K	N	V	W	G	P	R	S	P	R	S
536	61¾	61¼	82	60⅞	14⅞	17	13x21	20⅝	17	34⅝	69½	78¼	70½	13¾	46	.....	13¾	46	.....
537	61¾	72	82	60⅞	14⅞	17	13x21	20⅝	17	34⅝	69½	89	70½	13¾	56¾	.....	13¾	56¼	.....
538	61¾	82¾	82	60⅞	14⅞	17	13x21	20⅝	19	34⅝	69½	99¾	70½	13¾	46	67½	13¾	46	67½
539	61¾	93½	82	60⅞	14⅞	17	13x21	20⅝	21	34⅝	69½	110½	70½	13¾	46	78¾	13¾	46	78¼
5310	61¾	104¼	82	60⅞	14⅞	17	13x21	20⅝	21	34⅝	69½	121¼	70½	13¾	56¾	89	13¾	56¼	89

Smokeless Boiler Measurements



These line drawings represent smokeless steam and water boilers 32-39-45 Series. Measurements are given on Page 73.

Smokeless Boiler Measurements

Table of distances between points as indicated on line drawings Page 72. All measurements are given in inches and apply to 32-39-45 Series Smokeless Boilers

	For Steam and Water															STEAM AND WATER TAPPINGS Numbered From Front. Measurements From Face of Front Section to Center of Tapping								
No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	1	2	3	4	5	6	7	8	9
3207	64 1/4	46 1/2	55	48	14	38 1/2	51 1/4	42 7/8	11 1/2	39	15 3/4	34	12 3/4	9 5/8	19 1/2	10 3/8	25 1/8	39 7/8						
3208	71 5/8	46 1/2	55	48	14	38 1/2	58 5/8	42 7/8	11 1/2	39	15 3/4	34	12 3/4	9 5/8	19 1/2	10 3/8	32 1/2	47 1/4						
3209	79	46 1/2	55	48	14	38 1/2	66	42 7/8	11 1/2	39	15 3/4	34	12 3/4	9 5/8	19 1/2	10 3/8	25 1/8	39 7/8	54 5/8					
3210	86 3/8	46 1/2	55	48	14	38 1/2	73 3/8	42 7/8	11 1/2	39	15 3/4	34	12 3/4	9 5/8	19 1/2	10 3/8	25 1/8	47 1/4	62					
3907	73	53 1/2	63	56	16	48 1/2	58	49 5/8	13	47	17 1/2	40	15	11 7/8	23 1/2	11 3/8	28 1/8	44 7/8						
3908	81 3/8	53 1/2	63	56	16	48 1/2	66 3/8	49 5/8	13	47	17 1/2	40	15	11 7/8	23 1/2	11 3/8	36 1/2	53 1/4						
3909	89 3/4	53 1/2	63	56	16	48 1/2	74 3/4	49 5/8	13	47	17 1/2	40	15	11 7/8	23 1/2	11 3/8	28 1/8	44 7/8	61 5/8					
3910	97 3/8	53 1/2	63	56	16	48 1/2	83 1/8	49 5/8	13	47	17 1/2	40	15	11 7/8	23 1/2	11 3/8	28 1/8	53 1/4	70					
745	75	59 1/2	68	59	20	49 1/2	58	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8						
845	83 3/8	59 1/2	68	59	20	49 1/2	66 3/8	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	36 1/2	53 1/4						
945	91 3/4	59 1/2	68	59	20	49 1/2	74 3/4	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8					
1045	100 1/8	59 1/2	68	59	20	49 1/2	83 1/8	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	53 1/4	70					
1145	108 1/2	59 1/2	68	59	20	49 1/2	91 1/2	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8				
1245	116 7/8	59 1/2	68	59	20	49 1/2	99 7/8	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	86 3/4				
1345	125 1/4	59 1/2	68	59	20	49 1/2	108 1/4	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	95 1/8			
1445	133 5/8	59 1/2	68	59	20	49 1/2	116 5/8	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	86 3/4	103 1/2			
1545	142	59 1/2	68	59	20	49 1/2	125	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	95 1/8	111 7/8		
1645	150 3/4	59 1/2	68	59	20	49 1/2	133 3/4	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	103 1/2	120 1/4		
1745	158 3/4	59 1/2	68	59	20	49 1/2	141 3/4	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	95 1/8	111 7/8	128 5/8	
1845	167 1/8	59 1/2	68	59	20	49 1/2	150 1/8	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	95 1/8	120 1/4	137	
1945	175 1/2	59 1/2	68	59	20	49 1/2	158 1/2	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	95 1/8	111 7/8	128 5/8	145 3/8
2045	183 7/8	59 1/2	68	59	20	49 1/2	166 7/8	55 1/2	13	53	17 1/2	46	16 1/2	12 1/2	26 1/2	11 3/8	28 1/8	44 7/8	61 5/8	78 3/8	95 1/8	111 7/8	137	153 3/4

SQUARE CASED ROUND BOILERS

NOTE: The schedules following show all series of Square Cased Round Boilers and Numbers of Regular Round Boilers that correspond, together with page references for detailed dimensions:

1-S and 1-W Series

Sq. Cased Boiler No. Steam	Sq. Cased Boiler No. Water	*Round Boiler No. Steam and Water
1-S-1	1-W-1	174
1-S-2	1-W-2	175
1-S-3	1-W-3	204
1-S-4	1-W-4	205
1-S-5	1-W-5	234
1-S-6	1-W-6	235
1-S-7	1-W-7	264
1-S-8	1-W-8	265
1-S-9	1-W-9	294
1-S-10	1-W-10	295

*Detailed dimensions pages 64 and 65.

2-S and 2-W Series

Sq. Cased Boiler No. Steam	Sq. Cased Boiler No. Water	*Round Boiler No. Steam and Water
2-S-5	2-W-5	432
2-S-6	2-W-6	532
2-S-7	2-W-7	462
2-S-8	2-W-8	562
2-S-9	2-W-9	492
2-S-10	2-W-10	592

*Detailed dimensions pages 66 and 67.

RICHARDSON AND BOYNTON CO.

SQUARE CASED ROUND BOILERS

3-S and 3-W Series

Sq. Cased Boiler No. Steam	Sq. Cased Boiler No. Water	*Round Boiler No. Steam and Water
3-S-1	3-W-1	1191
3-S-2	3-W-2	1192
3-S-3	3-W-3	1221
3-S-4	3-W-4	1222
3-S-5	3-W-5	1251
3-S-6	3-W-6	1252
3-S-7	3-W-7	1281
3-S-8	3-W-8	1282

*Detailed dimensions pages 60 and 61.

4-S and 4-W Series

Sq. Cased Boiler No. Steam	Sq. Cased Boiler No. Water	*Round Boiler No. Steam and Water
4-S-5	4-W-5	43
4-S-6	4-W-6	53
4-S-7	4-W-7	46
4-S-8	4-W-8	56
4-S-9	4-W-9	49
4-S-10	4-W-10	59

*Detailed dimensions pages 62 and 63.

Hot Water Supply Boiler Measurements

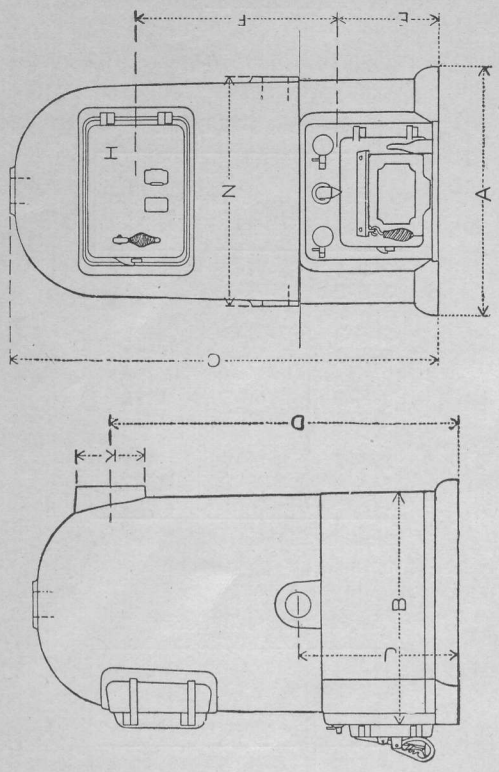


Table of distances between points as indicated on line drawings shown above

All measurements are given in inches

No.	A	B	C	D	E	F	H	J	K	N
110T	17	16½	34¼	28	10	15	7¾x 9¼	13¾	6	15½
112T	20	19½	36½	30¼	11	16	8 x10¾	15	6	17¾
114T	22½	22	38	31¼	11	16	8¼x11¼	15½	6	20

Hot Water Supply Boiler Measurements

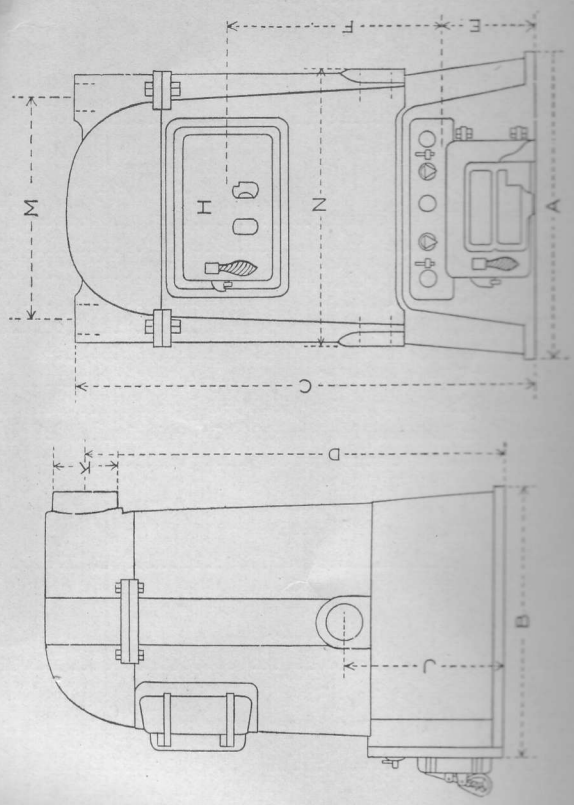


Table of distances between points as indicated on line drawings shown above

All measurements are given in inches

No.	A	B	C	D	E	F	H	J	K	M	N
170	24	25¼	43¼	38	12	16½	9 x11½	14½	7	16	23½
200	27	28½	43¼	39¼	12½	17½	9½x12½	15½	8	18¾	26¾
230	30	31½	48¾	41¾	13½	17½	9½x13½	16½	9	21¾	29¾

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