

Shaw-Perkins Manufacturing Company

RADIATORS

WORKS AT
WEST PITTSBURGH, LAWRENCE CO. PA.

GENERAL OFFICES, OLIVER BUILDING

Pittsburgh, Pennsylvania,

KILNER-MILLS COMPANY
DISTRICT REPRESENTATIVE
PHONE: EMPIRE 1834

3-266 GENERAL MOTORS BUILDING
DETROIT, MICHIGAN
June 11, 1929

Messrs Henry Ford and Edsel Ford
Dearborn, Michigan

Attention: Mr. Charles R. Voorhess

Gentlemen:-

Subject: Museum of American History- Unit K

Superseding previous quotations on the radiators for this building, we quote as follows on the radiators which were described in detail in our letter of May 22nd, and which have been approved by the Architects with respect to their adaptability and their dimensions for this application. We enclose print of Drawing B-2133 showing the dimensions of radiators for column and ceiling installation. The designating numbers of the wall radiators cover radiators as shown in our catalog #25 (copy of which we also enclose) except that the tubes will be of 16 B.W. Gauge Armco Ingot Iron. The headers of the wall radiators will be of 13 B.W. Gauge Armco Ingot Iron. All joints will be welded except air vent tappings.

Designating Symbol	Quantity	Style Radiator	Price Each	Price For Lot
A	1086	10-C-8 Curved Header Rad'rs Per Drawing B-2133, Fig.1	\$39.50	\$42897.00
B	652	10-C-8 Ceiling Rad'rs. Per Drawing B-2133, Fig.2	21.75	14181.00
C	56	12-K-12 Wall Rad'rs.	36.57	2047.92
D	72	14-K-12 Wall Rad'rs.	42.02	3025.44
E	64	14-K-9 Wall Rad'rs.	32.83	2101.12
F	8	12-K-9 Wall Rad'rs.	28.54	228.32
G	12	14-K-11 Wall Rad'rs.	39.06	468.72
H	12	12-K-11 Wall Rad'rs.	33.97	407.64
J	20	14-K-8 Wall Rad'rs.	29.56	591.20
L	4	12-K-8 Wall Rad'rs.	25.71	102.84

Total for 1986 radiators as specified above all primed with our standard gray priming paint and crated, f.o.b. West Pittsburgh, Penna., with freight allowed to Dearborn, Michigan.

SIXTY SIX THOUSAND FIFTY ONE AND 20/100 DOLLARS (\$66051.20)

Terms 1% - 10 days, net thirty days after date of shipment.

6/13
20th prox ok per
Mr Parson Wainsborough
V. Pres.
all set 6/13

DATE ORDER

P. O. NO.

L 61523

Messrs Henry Ford and Edsel Ford

The price above quoted represents our net charge for the radiators and does not include any commission or price protection for the contractor who may install them.

The price quoted for the special curved header radiators for the columns is based on the assumption that the other items offered will be included with your order as we would not be able to furnish the column radiators at the price quoted above if all other items were not included.

Shipments of the material will be made as closely as possible upon dates specified by you except that we are to be allowed, if necessary, until November 1, 1929 to begin shipment and you will accept shipment of all items before December 30, 1929.

Because of the special character of manufacture of all items offered above we believe it to be a reasonable requirement that after order has been issued and prints approved for the various radiators, cancellation of the order or an appreciable change in quantity or specifications cannot be allowed.

In accordance with your expressed desire for a guarantee of the heat emission of these radiators, we are glad to hand you such guarantee enclosed herewith, as executed by the general offices of the company.

Each radiator offered above will be tested at 60# pressure. While it is probable that a working pressure of 60# would not be detrimental to the radiators they are recommended for installation upon a working pressure not to exceed 40#.

Should it develop that the radiators will be subjected to a working pressure of 60# it will be desirable to provide for the increased working pressure in the construction of the radiators for which a reasonable additional charge will be made.

We trust that you can favor us with your order for this material at this time which we will endeavor to handle to your entire satisfaction.

Very truly yours,

SHAW-PERKINS MANUFACTURING COMPANY

R. A. Mills

BY: KILNER-MILLS COMPANY
District Representative

RHM:N

60
30
90

ly

ORDER

Shaw-Perkins Manufacturing Company

RADIATORS

WORKS AT
WEST PITTSBURGH, LAWRENCE CO. PA.

GENERAL OFFICES, OLIVER BUILDING

Pittsburgh, Pennsylvania,

June 11, 1929

Messrs Henry Ford and Edsel Ford
Dearborn, Michigan

Attention: Mr. Charles R. Voorhess

Gentlemen:-

RE: Guarantee of Radiator Heat Emission,
Museum of American History - Unit K

In compliance with your request we are glad to confirm the heat emission of our High Convection radiators as offered you in proposal of this date by our District Representative the Kilner-Mills Company, Detroit, Michigan.

Our radiators are rated upon the heat emission basis in accordance with the Code of The American Society of Heating and Ventilating Engineers as adopted by the Society on January 27, 1927 and published in their March 1927 Transactions.

We guarantee the radiators which are covered by the above mentioned proposal to be capable of emitting the amount of heat stated in the following table, under the operating conditions specified below.

GENERAL The radiators are to be supplied with sufficient water to maintain a temperature difference between inlet and outlet water not exceeding 25°F. The average of these temperatures is to be 215°F. The radiators are to be installed in the positions indicated below with unobstructed air circulation in an ambient air temperature of 70°F.

COLUMN RADIATORS These radiators are to be installed six per column on a recessed column with the tubes in a vertical position, the recesses having an inside diameter of not more than 2'4". Underneath the bottom header there will be the equivalent of 3" height clear air space for air circulation. Likewise above the top header there will be the equivalent of 6" clear air space.

Messrs Henry Ford and Edsel Ford

CEILING RADIATORS The emission of these radiators as specified below occurs when the tubes and headers are in horizontal positions and free air circulation is allowed to and from the radiator.

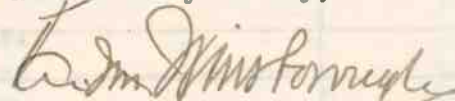
WALL RADIATORS The wall radiators are to be mounted in pairs in front to back arrangement with approximately 2" free air space between the tube groups and between the rear tube group and the wall. The tubes are to be in a horizontal position, the headers in a vertical position and unrestricted air circulation is to be allowed beneath and above the radiators.

HEAT EMISSION
RADIATOR

B.T.U. PER HOUR
PER RADIATOR

10-C-8 Column Radiator	11,904
10-C-8 Ceiling Radiator	15,720
12-K-12 Wall Radiator	25,080
12-K-11 Wall Radiator	22,968
14-K-12 Wall Radiator	29,232
14-K-11 Wall Radiator	26,784
14-K-9 Wall Radiator	21,888
14-K-8 Wall Radiator	19,440
12-K-9 Wall Radiator	18,768
12-K-8 Wall Radiator	16,680

Yours very truly,



Paxson Winsborough
Vice President

PW:F

Shaw-Perkins Manufacturing Company

RADIATORS

WORKS AT
WEST PITTSBURGH, LAWRENCE CO. PA.

GENERAL OFFICES, OLIVER BUILDING

Pittsburgh, Pennsylvania,

KILNER-MILLS COMPANY
DISTRICT REPRESENTATIVE
PHONE: EMPIRE 1834

3-266 GENERAL MOTORS BUILDING
DETROIT, MICHIGAN
May 22, 1929

Messrs. Henry Ford and Edsel Ford
Dearborn, Michigan

Attention: Mr. Charles R. Voorhees
Subj:-Museum of American History
Unit "K" -- Radiation

Gentlemen:-

We give below ratings and other details of the Shaw-Perkins High Convection Radiators offered in our proposal submitted with this letter.

FOR COLUMNS

- (A) --- 1086 Special 10-C-8 curved header radiators as shown on our print B-2124-A attached. This quantity includes 1080 radiators for installation on columns (6 per column - 180 columns) and 6 radiators for spares.

Each radiator has catalog rating of 65.5 sq. ft. As installed on columns per proposed arrangement, the actual heating capacity will be approximately 49.6 sq. ft.

FOR MOUNTING UNDER MONITORS

- (B) --- 652 Standard type 10-C-8 coiling radiators. Rated and actual capacity 65.5 sq. ft. each. Overall length - $92\frac{1}{4}$ inches. Width over headers - $20\frac{3}{4}$ inches.

FOR MOUNTING ON WALLS

EAST WALL

- (C) --- 56 12-K-12 Wall Radiators to be mounted as 28 pairs. Rated and actual capacity each radiator 104.5 sq. ft. Overall length - $140\frac{1}{4}$ inches. Height of headers - $24\frac{1}{2}$ inches. Height of tube bank $21\text{-}5/8$ inches.
- (H) --- 12 12-K-11 Wall Radiators to be mounted as 6 pairs. Rated and actual capacity each radiator 95.7 sq. ft. Overall length - $128\frac{1}{4}$ inches. Height of headers - $24\frac{1}{2}$ inches. Height of tube bank $21\text{-}5/8$ inches.

B. R. BROWN



MAY 28 1929

Messrs. Henry Ford and Edsel Ford.

WEST WALL

D --- 72 14-K-12 Wall Radiators to be mounted as 36 pairs. Rated and actual capacity each radiator 121.8 sq. ft. Overall length - $140\frac{1}{4}$ inches. Height of headers - $28\frac{1}{4}$ inches. Height of tube bank $25\text{-}\frac{3}{8}$ inches.

G --- 12 14-K-11 Wall Radiators to be mounted as 6 pairs. Rated and actual capacity each radiator 111.6 sq. ft. Overall length - $128\frac{1}{4}$ inches. Height of headers - $28\frac{1}{4}$ inches. Height of tube bank $25\text{-}\frac{3}{8}$ inches.

NORTH AND SOUTH WALLS -- On each wall two sizes of radiators as follows:

E --- 32 14-K-9 Wall Radiators to be mounted as 16 pairs. Rated and actual capacity each radiator - 91.2 sq. ft. Overall length - $104\frac{1}{4}$ inches. Height of headers - $28\frac{1}{4}$ inches. Height of tube bank - $25\text{-}\frac{3}{8}$ inches.

F --- 4 12-K-9 Wall Radiators to be mounted as 2 pairs. Rated and actual capacity each radiator - 78.2 sq. ft. Overall length - $104\frac{1}{4}$ inches. Height of headers - $24\frac{1}{4}$ inches. Height of tube bank - $21\text{-}\frac{5}{8}$ inches.

J --- 10 14-K-8 Wall Radiators to be mounted as 5 pairs. Rated and actual capacity each radiator - 81. sq. ft. Overall length - $92\frac{1}{4}$ inches. Height of headers - $24\frac{1}{4}$ inches. Height of tube bank - $21\text{-}\frac{5}{8}$ inches.

L --- 2 12-K-8 Wall Radiators to be mounted as 5 pairs. Rated and actual capacity each radiator - 69.5 sq. ft. Overall length - $92\frac{1}{4}$ inches. Height of headers - $24\frac{1}{4}$ inches. Height of tube bank - $21\text{-}\frac{5}{8}$ inches.

Total number of radiators to be installed --- 1980

Actual capacities given above are based on exact tests of heat omission with radiators located in air at 70°F . and with steam at 215°F . in the radiators, in accordance with requirements of the A.S.H. & V.E.

All radiators for columns are to have one pipe connection in each header of a size and in a location to be definitely agreed upon at a later date.

All radiators for installation under monitors are to have one centrally located $1\text{-}\frac{1}{2}$ " size tapped pipe connection in each header.

All wall radiators are to be supplied with one pipe connection tapped $1\text{-}\frac{1}{2}$ " pipe size located at the top and at the bottom of each header.

Respectfully submitted,

SHAW-PERKINS MANUFACTURING COMPANY

BY: KILNER-MILLS COMPANY
District Representatives

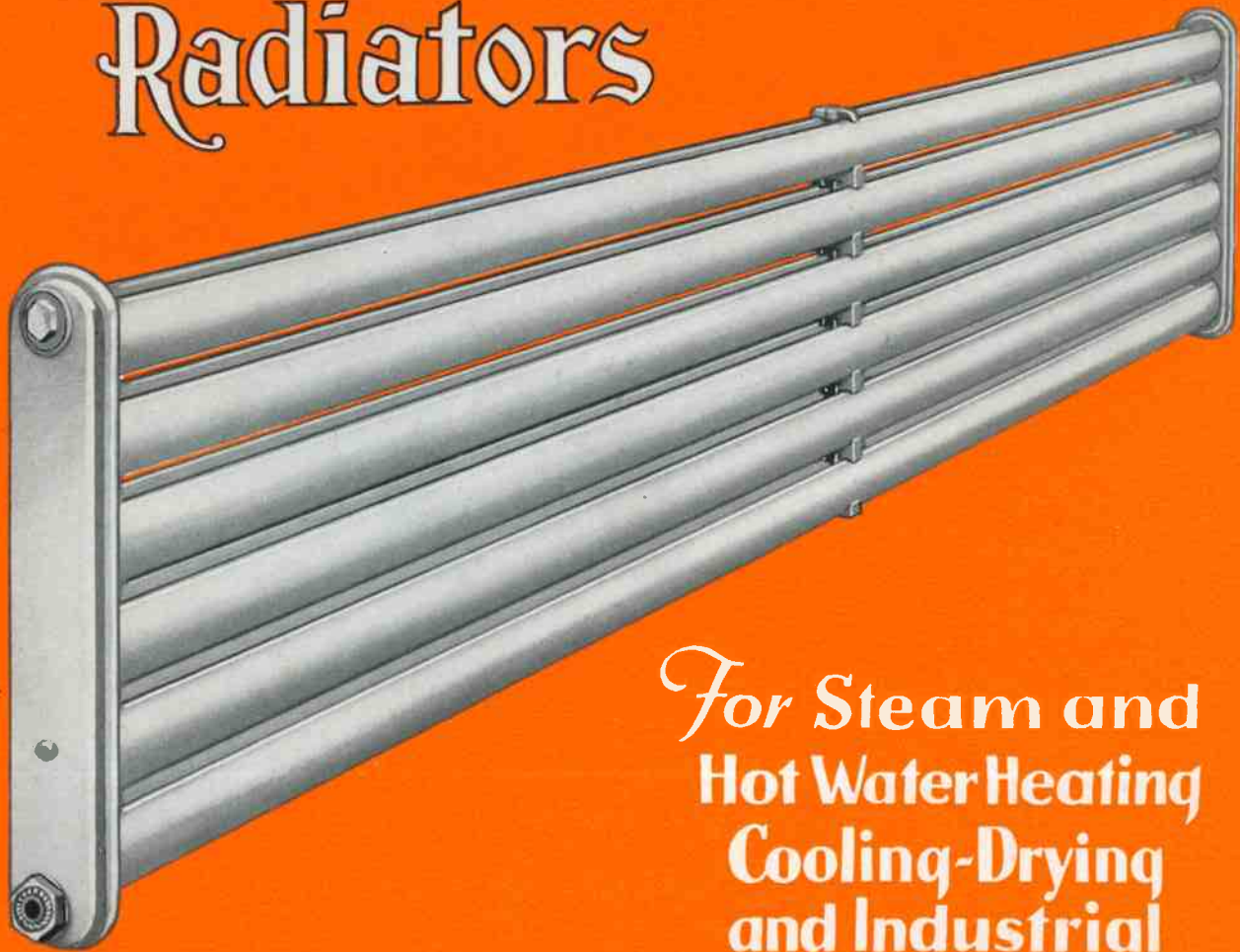


RHM:N

Shaw-Perkins

HIGH CONVECTION

Radiators



*For Steam and
Hot Water Heating
Cooling-Drying
and Industrial
Applications*

Shaw-Perkins Manufacturing Company

Pittsburgh, Pa.

KILNER-MILLS COMPANY

DISTRICT REPRESENTATIVE

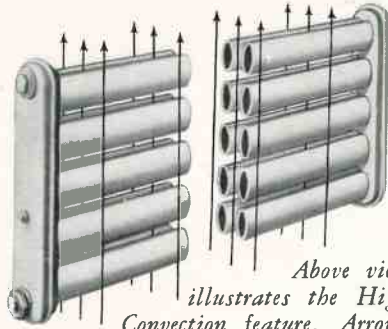
3-266 GENERAL MOTORS BLDG. PHONE: EMPIRE 1834

DETROIT, MICHIGAN

From the collections of The Henry Ford. Acc. 1036 box 5 Radiation

Shaw-Perkins

HIGH CONVECTION Radiators



Above view illustrates the High Convection feature. Arrows indicate air travel. Note the absence of any impediments to free air circulation.

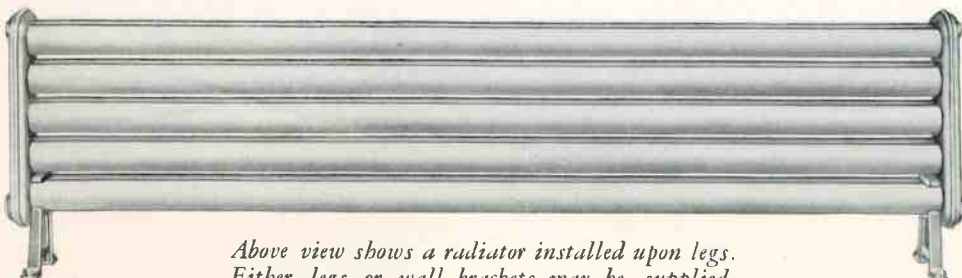
"High Convection"

The Shaw-Perkins High Convection Radiator is all prime heating surface. The ingenious arrangement of the oval tubes allows the air to pass freely over the tubes, unimpeded by fins, plates, or top and bottom hub connections, consequently the radiator has a high heat emission by convection and produces a more uniform temperature throughout the heated space.

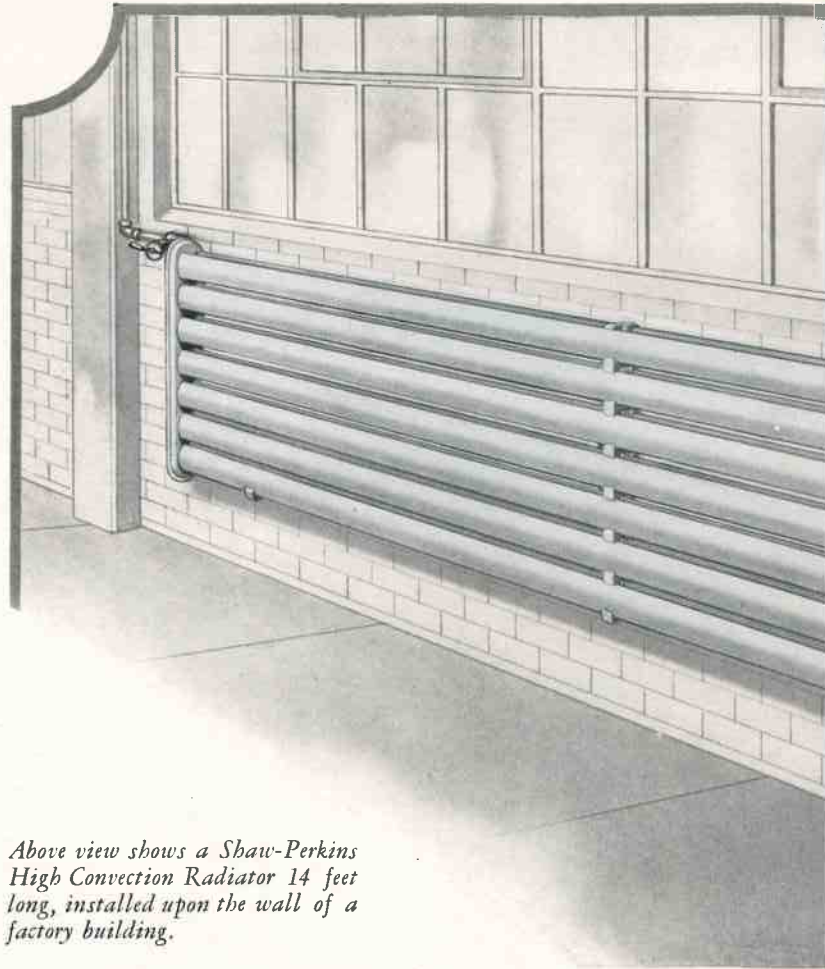
A New Model of an Established Product

Shaw-Perkins High Convection Radiators represent an advanced design in Shaw-Perkins standard oval tube radiation which contains original and valuable features found only in this superior type of heating surface.

The unique advantages offered by these radiators make them especially suitable for steam and hot water heating, many cooling and drying purposes, and various industrial uses.



Above view shows a radiator installed upon legs. Either legs or wall brackets may be supplied.



Above view shows a Shaw-Perkins High Convection Radiator 14 feet long, installed upon the wall of a factory building.

Radiators of Distinct

Light in Weight Shaw-Perkins High Convection Radiators weigh approximately two pounds per square foot about one-third as much as other radiators, which makes them easy to handle and very practical for wall installation.

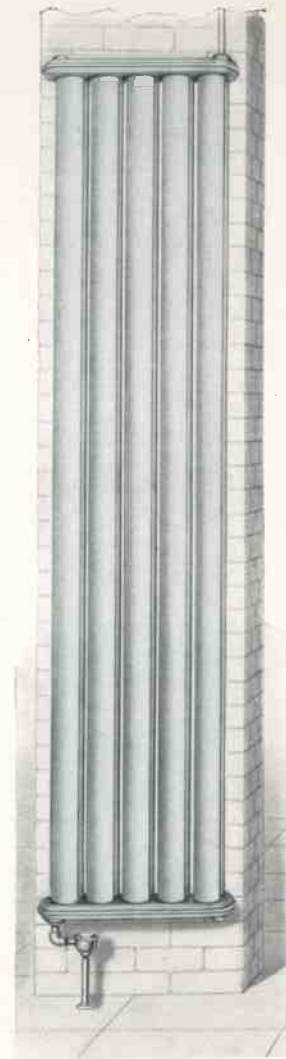
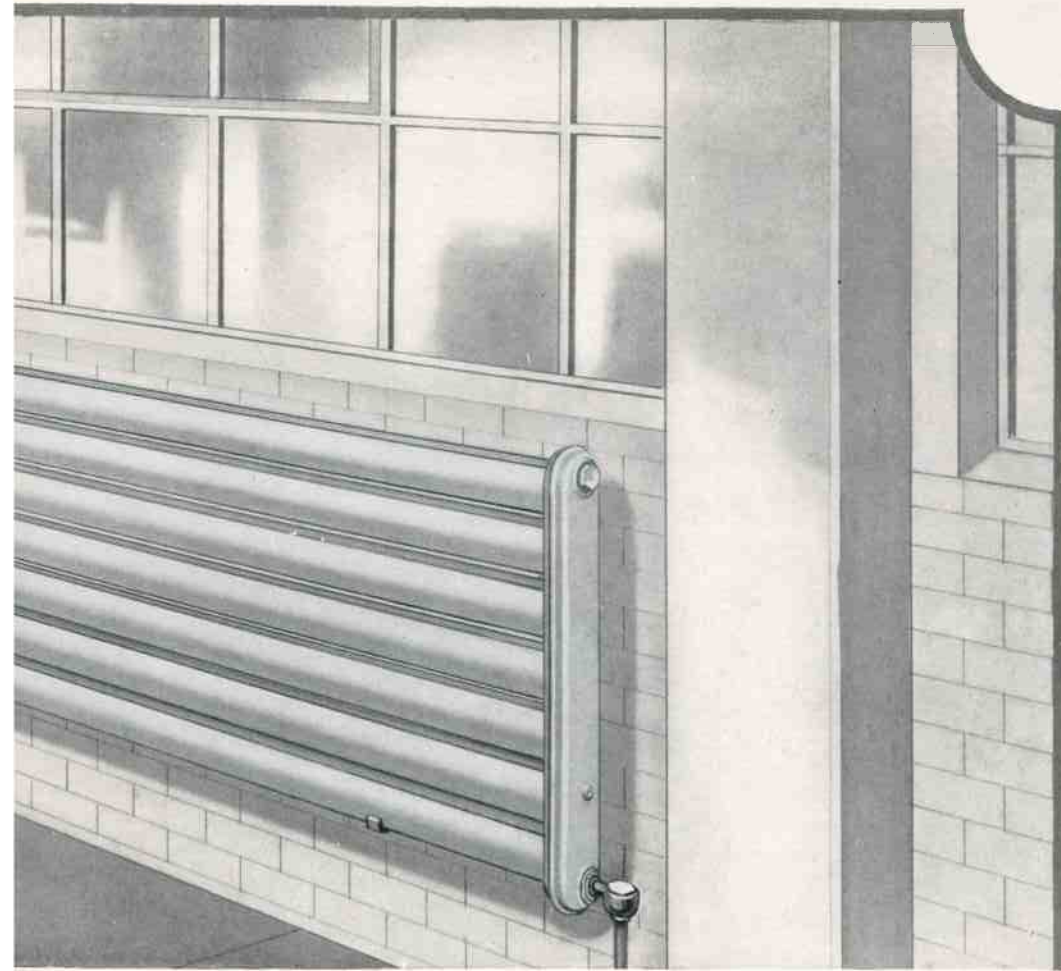
Save Space The radiators occupy about one-third less space than other forms of direct radiators, which saving may occur in length, width or height of the radiator.

Heat and Cool Quickly The radiators, because of their relative light, but uniform and perfect walls, heat and cool quickly upon the turn of the valve, giving positive temperature control.

Remarkably Adaptable

The Radiators are made in single one-piece design and unique dimensions for ceilings, under windows, in cabinets, etc. They are particularly desirable for servatories, Garages, Hospitals, Theatres

Get The Full Story



View of a radiator installed upon a column

ve Design and Construction

Absolutely Sanitary The walls of the radiators are smooth and have no rough or inaccessible dust accumulating surfaces, nor any extended surfaces to act as dust entanglements.

Come in Attractive Finish The radiators are furnished in an attractive dull gray finish. In many cases no other finish is applied after installation.

Made of Armco Ingot Iron The use of this heavy gauge, highly refined iron, the design of the radiator which provides for complete tube drainage, and the welded one-piece construction which eliminates all mechanical joints, are factors which make the radiators extremely durable.

table to Many Requirements

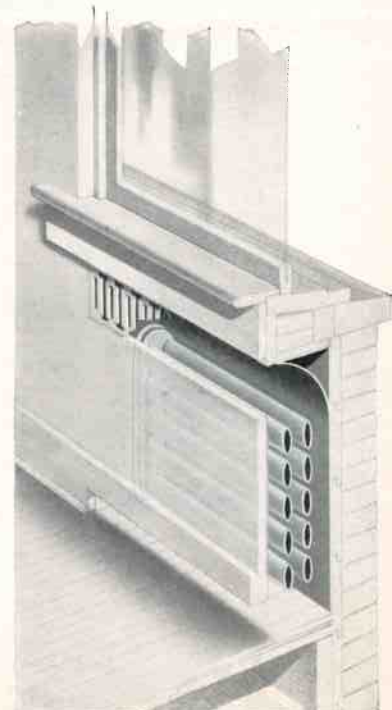
ce units as long as 14 feet and in several models. Their distinctive them especially suitable for installation upon floors, walls, recesses, in monitors, under benches, upon columns, pilasters, eating Factories, Loft Buildings, Warehouses, Greenhouses, Con-Churches, Schools, Stores, Hotels, Apartments, Dwellings, Etc.

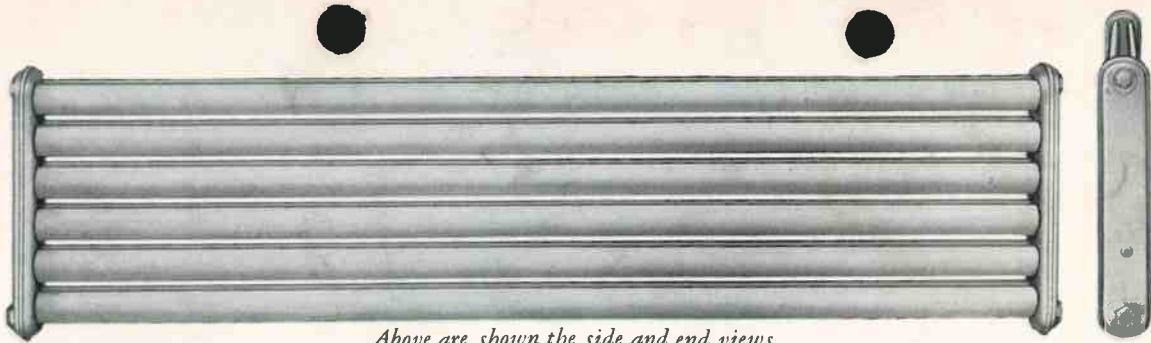
ory Of This Modern Radiator

end For Catalog

The Logical Radiator for Recessed Installation

View to right shows perfect adaptability of radiator to concealed recessed installation. The free air circulation and the radiator's sanitary design are strikingly apparent.





Above are shown the side and end views of a 12-tube radiator about 7 feet long.

Shaw-Perkins HIGH CONVECTION Radiators

A Correct Ceiling Radiator

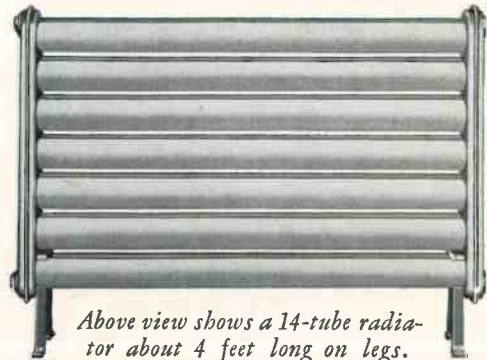
The Ceiling Model represents the first radiator specially designed for ceiling installation. In addition to its proper design for horizontal operation the light weight of the radiator makes the former difficult ceiling installation an easy job and the sanitary features of the radiator are of great value for such inaccessible locations.



The above view shows the header end of the ceiling model. The dotted lines indicate tube positions.

Many Uses in Various Cooling, Drying and Industrial Processes

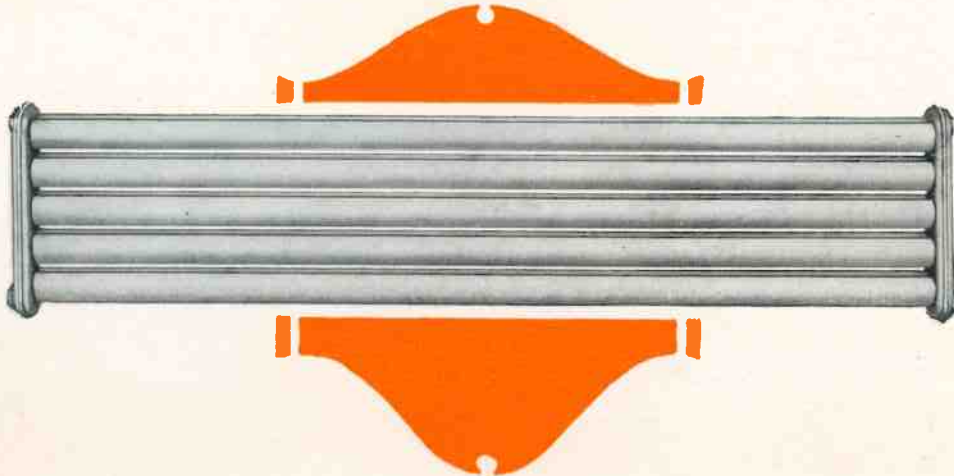
Shaw-Perkins High Convection Radiators, together with the several other models of Shaw-Perkins Radiation which are manufactured, are steam, water, air, gas, and oil tight and are made of material which has great durability under many kinds of service. Freezing does not impair them. They are adapted to many condensing, cooling, and drying purposes, etc. Inquiries are invited in connection with industrial or special uses.



Above view shows a 14-tube radiator about 4 feet long on legs.

Send for Complete Catalog

Shaw-Perkins Manufacturing Company
Pittsburgh, Pa.



Shaw-Perkins

HIGH CONVECTION

Radiators

*For Steam and Hot Water
Heating--Cooling, Drying
and Industrial Applications*



Catalogue No. 25

Manufactured by
Shaw-Perkins Manufacturing Company
Pittsburgh, Pa.

KILNER-MILLS COMPANY

3-266 GENERAL MOTORS BUILDING

TELEPHONE EMPIRE 1834

DETROIT, MICH.

DISTRICT AGENTS

H. R. BROWN



MAY 18 1929

Shaw-Perkins

HIGH CONVECTION

Radiators

*A*_N advanced model of Shaw-Perkins standard oval tube radiation, containing original and valuable features found only in this distinctive type of heating surface.

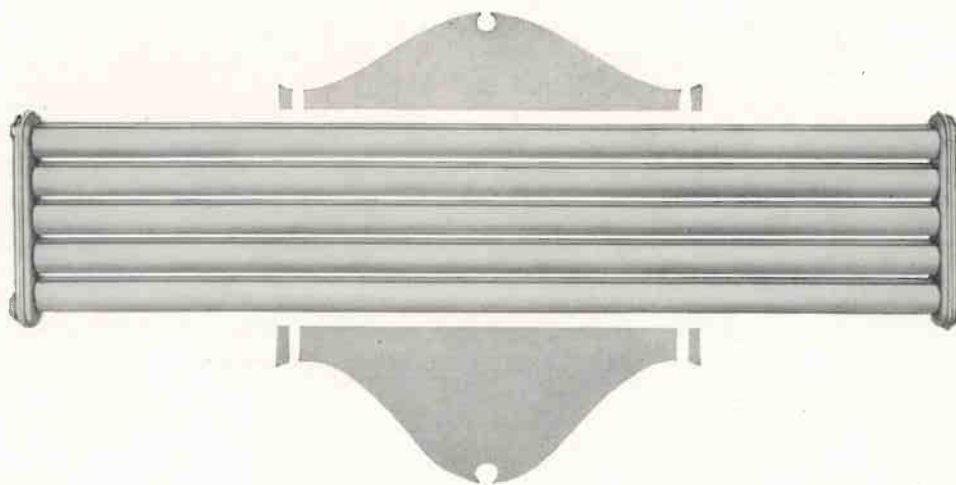
The unique advantages offered by these radiators make them especially suitable for steam and hot water heating, many cooling and drying purposes and various industrial uses.



Catalogue 25

Manufactured by
Shaw-Perkins Manufacturing Company
Pittsburgh, Pa.

Works: West Pittsburgh, Lawrence County, Pa.
Cable Address: Shawper, Pittsburgh.



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BY
SHAW-PERKINS MANUFACTURING COMPANY



All Shaw-Perkins Radiators are fully protected by United States and Foreign patents allowed, and patents pending.



Shaw-Perkins

HIGH CONVECTION

Radiators

SOME twelve years ago the Shaw-Perkins oval tube for heat exchanging purposes was designed and first manufactured. During the succeeding years it has proven unusually successful as heat transfer surface and today large quantities of Shaw-Perkins standard oval tube radiation are giving satisfactory service throughout the United States and many foreign countries.

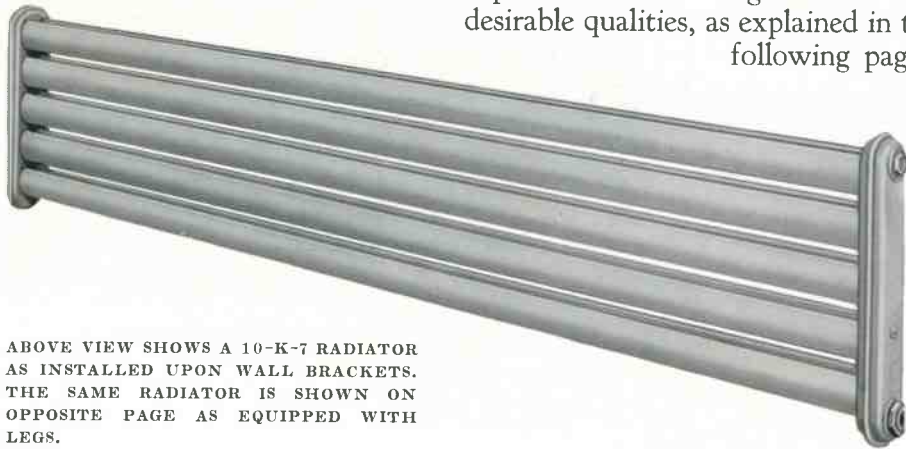
The Shaw-Perkins oval tube is all prime surface. As will be observed, it is built upon two radii. The short radius of the top and bottom arcs and the longer radius of the two side arcs create an oval tube, which presents a large portion of its external surface against the air currents. The bottom curve is of sufficient radius to allow for the easy flow of water or other medium. This large percentage of effective surface, together with the entire absence in the radiator assemblies of any structural impediments to air circulation, such as fins, baffles, top and bottom hub connections, etc., results in the passage of large volumes of air at relatively high velocity over the heating surface, or in what has been termed high convection.

In this catalogue is presented a new model Shaw-Perkins radiator, which incorporates the Shaw-Perkins oval tube in a novel and unique manner. This advanced type is known as Shaw-Perkins High Convection Radiator; because it utilizes to great advantage the air circulation feature of the Shaw-Perkins oval tube. It has a high heat emission by convection which tends to

Photograph of a section of Shaw-Perkins oval tube resting upon a piece of the material used in the radiator header sections. View is actual size. Note the substantial and uniform wall of the tube as well as the extra heavy header wall.

Shaw-Perkins Radiators

break up air stratification and causes a more general and uniform heat distribution. The ingenious design of the Shaw-Perkins High Convection Radiator has produced other original and very desirable qualities, as explained in the following pages.



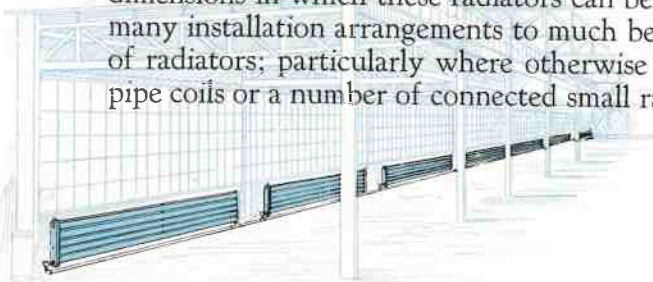
ABOVE VIEW SHOWS A 10-K-7 RADIATOR AS INSTALLED UPON WALL BRACKETS. THE SAME RADIATOR IS SHOWN ON OPPOSITE PAGE AS EQUIPPED WITH LEGS.

Shaw-Perkins High Convection Radiators are One Piece Construction; Low, Narrow and made in Lengths up to 14 Feet

IT has long been recognized that pipe coils offer a most efficient form of radiation. However, pipe coils necessarily contain numerous joints and fittings, are heavy, unwieldy, unattractive in appearance; and there is considerable expense involved in their construction and installation. Shaw-Perkins High Convection Radiators utilize the proven, sound principles of pipe coil design and have eliminated the pipe coil disadvantages. They also contain new, exclusive features of great value, with the result that the radiators are adaptable to almost every radiator requirement as well as to many special uses, and they present distinct advantages in any application for which they are suitable.

Distinctive Design Unusual Dimensions

The Shaw-Perkins standard oval tube, which constitutes the major portion of the radiator, is arranged horizontally in two vertical rows, and connected at both ends into vertical headers. This design produces a radiator that is narrow in width, of low height and allows great flexibility in length; the radiators being made in single one piece, jointless units, as long as 14 feet. Brackets or legs can be supplied for either wall or floor installation. The dimensions in which these radiators can be furnished allow them to fit into many installation arrangements to much better advantage than other forms of radiators; particularly where otherwise it would be necessary to utilize pipe coils or a number of connected small radiators, or sections.

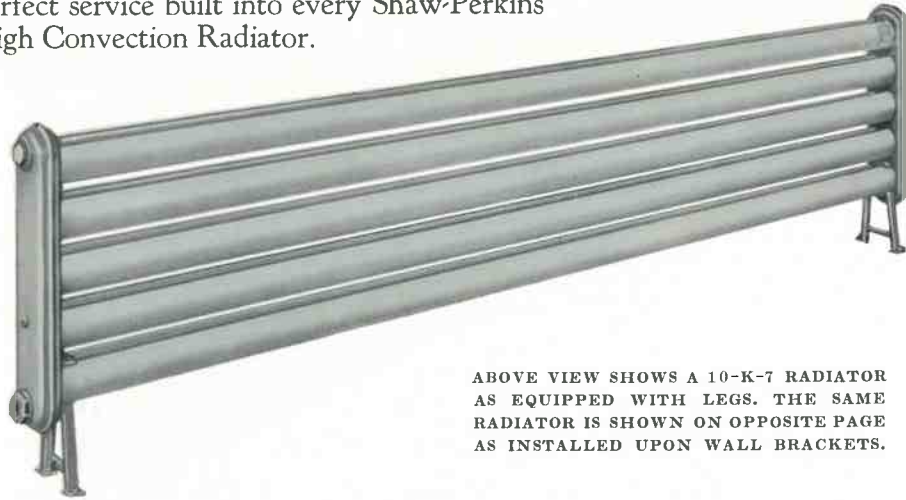


The illustration to the left shows the advantages of installation arrangement and distribution of the radiation in a factory building.

Shaw-Perkins Radiators

Made of Iron Welded

Heavy gauge, commercially pure iron of great durability is used throughout in the construction of the radiators. The use of this highly refined iron; the design of the radiator which provides for complete tube drainage; the welded construction which eliminates all mechanical joints and produces a solid one-piece radiator; are important factors which contribute to the many years of perfect service built into every Shaw-Perkins High Convection Radiator.



ABOVE VIEW SHOWS A 10-K-7 RADIATOR AS EQUIPPED WITH LEGS. THE SAME RADIATOR IS SHOWN ON OPPOSITE PAGE AS INSTALLED UPON WALL BRACKETS.

Light in Weight

Shaw-Perkins High Convection Radiators weigh, uncrated, approximately 2 lbs. per square foot; or about one-third as much as heavier forms of radiation. This absence of useless weight makes the radiators especially practical for installation upon wall brackets. It is easy and convenient to use the radiators for wall installations in many places where wall radiators are more desirable; but where heretofore leg radiators have been used because of the difficulties and extra expense encountered in the suspension of heavier and more bulky forms of radiation.

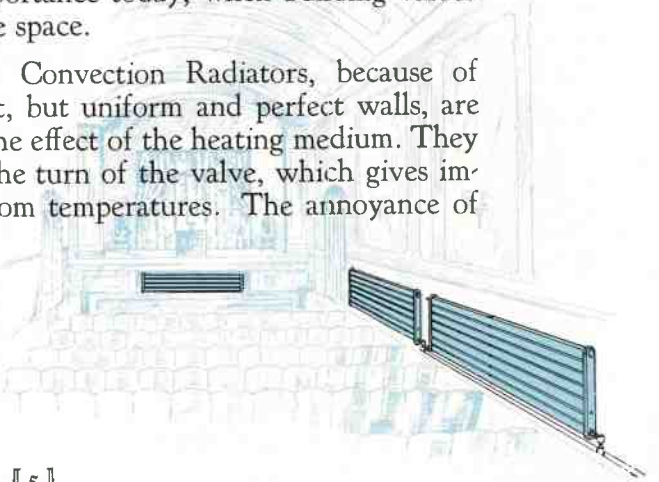
Save Space

Shaw-Perkins High Convection Radiators occupy about one-third less space than other forms of direct radiators, which saving may occur either in length, width, or height of the radiator. This saving in space is of considerable importance today, when building values are computed upon the basis of usable space.

Heat and Cool Quickly

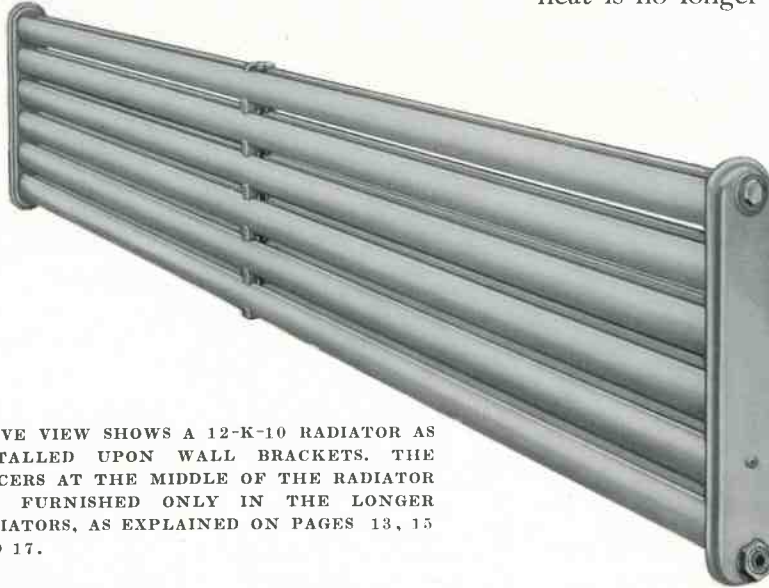
Shaw-Perkins High Convection Radiators, because of their relatively light, but uniform and perfect walls, are very responsive to the effect of the heating medium. They heat quickly and cool quickly upon the turn of the valve, which gives immediate and positive control over room temperatures. The annoyance of

The illustration to the right shows the compact, yet sanitary and efficient installation of the radiators upon the walls in an auditorium. The light weight and high convection features insure quick and uniform temperature distribution as required in buildings of this type which are heated intermittently.



Shaw-Perkins Radiators

waiting for heavier forms of radiation to receive their own charge of heat before beginning to emit heat is avoided. Neither is it necessary to suffer the discomfort and needless expense of the waste heat given off by heavier radiators after the radiator valves are closed and heat is no longer desired.



ABOVE VIEW SHOWS A 12-K-10 RADIATOR AS INSTALLED UPON WALL BRACKETS. THE SPACERS AT THE MIDDLE OF THE RADIATOR ARE FURNISHED ONLY IN THE LONGER RADIATORS, AS EXPLAINED ON PAGES 13, 15 AND 17.

Absolutely Sanitary Shaw-Perkins High Convection Radiators have no rough or inaccessible dust accumulating surfaces. The radiators contain only prime heating surface and have no fins, strips, or other extended surfaces to act as dust entanglements. The smooth, rounded surface of the tubes in Shaw-Perkins High Convection Radiators discourages the accumulation of dust, dirt, etc., and the wide air passages allow ample access for quick easy hand wiping. Every square inch of surface in the radiator may be easily reached by hand with a dust cloth.

Shaw-Perkins High Convection Radiators are Remarkably Adaptable to Many Varied Heating Requirements

THE unique design and construction of the radiators lend them to numerous installation arrangements, into which they fit better and where they perform to greater advantage than other types of radiators. Careful observation of the exclusive features of design, construction and performance of Shaw-Perkins High Convection Radiators will make apparent their decided superiority for installation in steam and hot water heating plants;

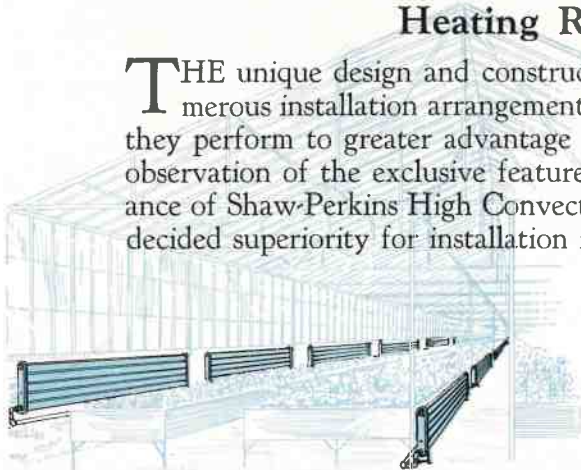
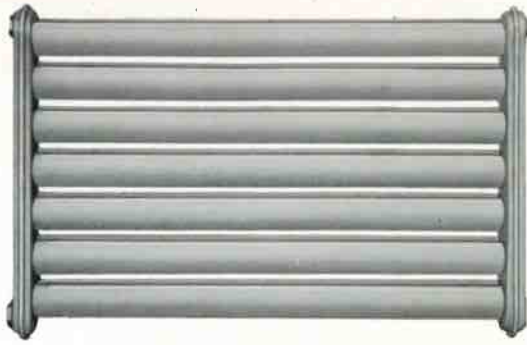


Illustration to the left shows how desirably the radiators fit into greenhouse heating requirements. The radiators will not be damaged if allowed to freeze in some section of the greenhouse not in use. The high convection feature insures the necessary uniformity of temperature so important in greenhouse heating.

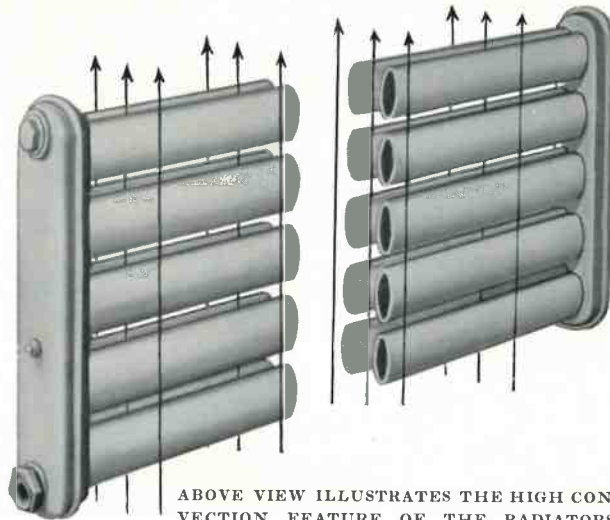


ABOVE VIEW SHOWS A 14-K-4 RADIATOR AS INSTALLED UPON WALL BRACKETS. THE SAME RADIATOR IS SHOWN UPON PAGE 10 WITH LEGS ATTACHED.

upon floors, walls, columns, pilasters, ceilings, under windows, in recesses, etc. They are especially suitable for use in heating factories, mills, shops, warehouses, loft buildings, public and private garages, greenhouses, business buildings, theatres, churches, hotels, apartments, dwellings, boats and ships, etc.

High Convection Means Uniform Heat Distribution

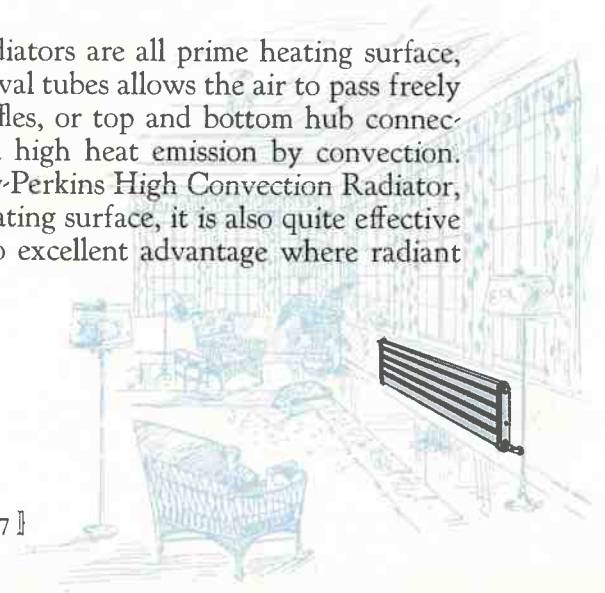
By way of explanation it may be stated that a direct radiator delivers heat into a room by two means; one is heat by radiation and the other is heat by convection. Radiant heat is that carried by heat rays and is the kind of heat given off by a stove. Convection heat is that taken off by the air which passes over the radiator and which is carried and distributed by the air with resulting uniformity in temperature throughout the heated space.



ABOVE VIEW ILLUSTRATES THE HIGH CONVECTION FEATURE OF THE RADIATORS. ARROWS INDICATE AIR TRAVEL. NOTE THE ABSENCE OF ANY IMPEDIMENTS TO FREE AIR CIRCULATION.

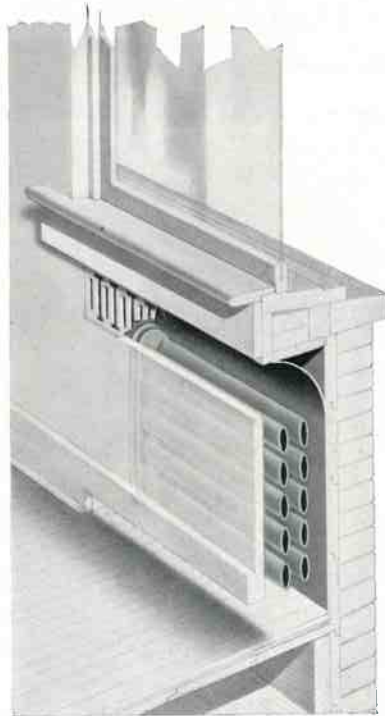
Shaw-Perkins High Convection Radiators are all prime heating surface, and the ingenious arrangement of the oval tubes allows the air to pass freely over the tubes, unimpeded by fins, baffles, or top and bottom hub connections, consequently the radiator has a high heat emission by convection. Due to the superior design of the Shaw-Perkins High Convection Radiator, which exposes a large portion of its heating surface, it is also quite effective as a radiant heater and can be used to excellent advantage where radiant heat may be desired.

Illustration to the right shows the radiator installed upon the wall of a sun room making available the floor space under the radiator which would be lost to use if a floor radiator had been installed.



Shaw-Perkins Radiators

The Logical Radiator for Recessed Installation



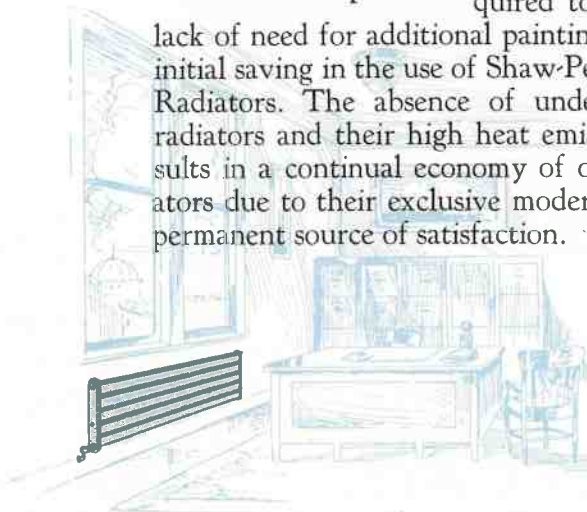
ABOVE CUT ILLUSTRATES THE PERFECT ADAPTABILITY OF RADIATOR TO CONCEALED RECESSED INSTALLATION. THE EASY FREEDOM WITH WHICH THE AIR CAN CIRCULATE AND THE RADIATOR'S SANITARY DESIGN ARE STRIKINGLY APPARENT.

Come in Attractive Finish All Shaw-Perkins High Convection Radiators are finished at the factory in an attractive gray dull gloss lacquer.

This is so satisfactory in appearance and durability that in many cases no other finish is applied after installation.

Easy and Economical to Install and Operate

The cost of the radiators, the saving in material and labor required to install, and the usual lack of need for additional painting, combine to effect an initial saving in the use of Shaw-Perkins High Convection Radiators. The absence of undesirable weight in the radiators and their high heat emission by convection results in a continual economy of operation, and the radiators due to their exclusive modern advantages become a permanent source of satisfaction.



There has developed an inclination to entirely conceal radiators in some cases by installing them in the walls, for which arrangement Shaw-Perkins High Convection Radiators are unexcelled. Any radiator so installed as a semi-indirect radiator, depends entirely upon convection heat for its performance. It is hard to conceive of a radiator that could be more perfectly suited to this manner of installation than the Shaw-Perkins High Convection Radiator, with its high heat emission by convection. Furthermore, the sanitary design of the Shaw-Perkins High Convection radiator is of utmost desirability in recessed installation, in comparison with radiators which contain fins, strips, plates, etc., to act as effectual dust accumulators and which are difficult to clean.



LOOKING DOWN ON RADIATOR INSTALLED A DESIRABLE DISTANCE FROM THE WALL. THE DOTTED LINE SHOWS THE SUBSTANTIAL AIR

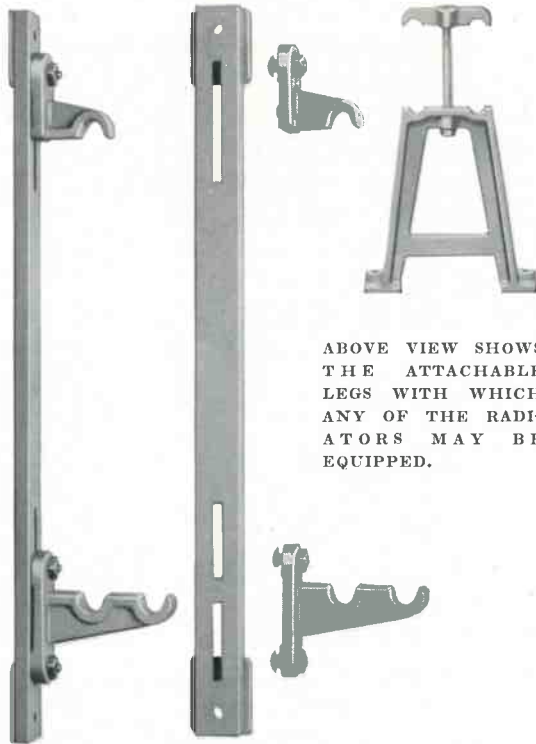
SPACE PRESERVED IF THE RADIATOR IS PLACED AGAINST THE WALL AS IS OFTEN DONE.

Illustration to the left shows a radiator installed in an office. Note the floor space saved. The quick action of the radiator in heating and cooling is of great value in such cases where ventilation necessitates frequent sudden temperature changes, occasioned by opening and closing windows.

Shaw-Perkins High Convection Radiators Have Many Uses in Various Cooling, Drying and Industrial Processes

SEVERAL other models of Shaw-Perkins Radiation which are manufactured, are welded construction throughout and contain no mechanical joints or connections. They are steam, water, air, gas, and oil tight and are made of material which has great durability under many kinds of service. Freezing does not effect their serviceability. They are particularly adapted to many condensing, cooling, and drying purposes as well as various other heat ex-

changing applications. They may be used to advantage in numerous cooling, drying and heating arrangements for the treatment of lumber, leather, paper, soap, textiles, fertilizer, light and heavy chemicals, electro chemical products, coal tar products, dyes, ceramics, food products, oils and other liquids, etc. The radiators are also produced to meet the requirements of makers of apparatus, using heat exchanging surface; to incorporate in equipment of their own manufacture. Full cooperation will be given those interested in the application of Shaw-Perkins Radiation to any industrial or special use and inquiries in this connection are invited.



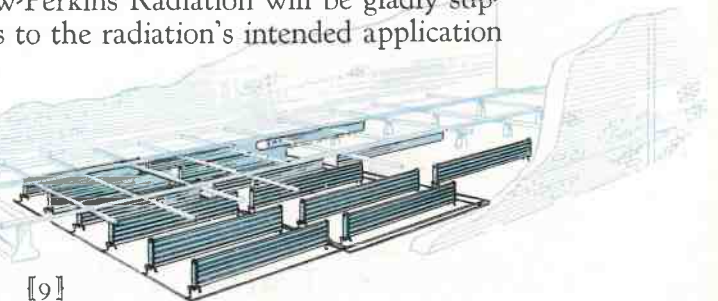
ABOVE VIEW SHOWS THE ATTACHABLE LEGS WITH WHICH ANY OF THE RADIATORS MAY BE EQUIPPED.

ABOVE ARE SHOWN FRONT AND SIDE VIEWS OF THE ADJUSTABLE WALL BRACKETS WITH WHICH ANY OF THE RADIATORS MAY BE SUPPLIED.

Models, Sizes, Ratings, etc.

Specifications upon the three models of Shaw-Perkins High Convection Radiators are given upon pages 12 to 17, inclusive, of this catalogue. Specifications upon other models of Shaw-Perkins Radiation will be gladly supplied upon receipt of information as to the radiation's intended application and the results desired.

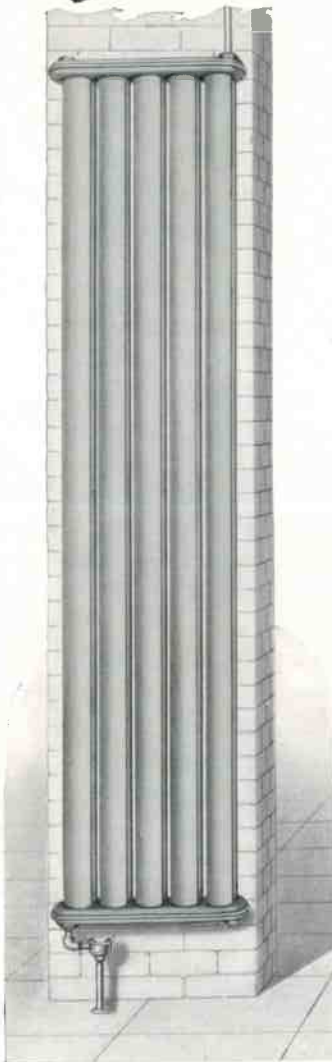
Illustration to the right shows the radiators installed in a lumber dry kiln, one of the many industrial uses to which they are adaptable. The economy of installation and the rapid circulation of large volumes of air make the radiator the natural selection for drying purposes.



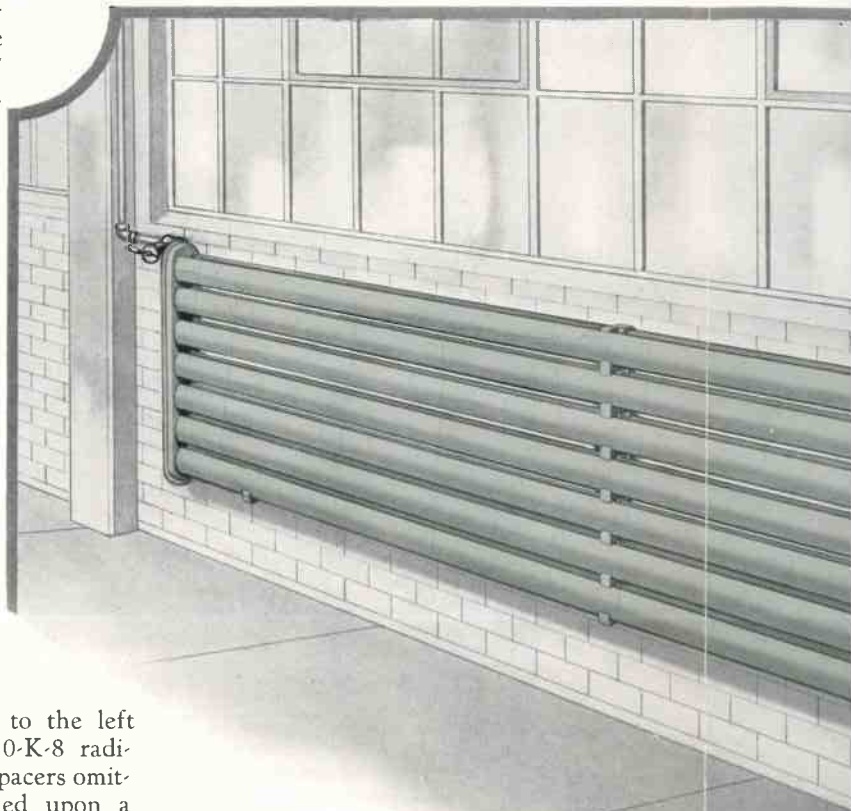
Shaw-Perkins Radiators



Above view shows a 14-K-4 radiator with legs attached. The same radiator is shown upon page 7 as installed upon wall brackets.



The view to the left shows a 10-K-8 radiator with spacers omitted, installed upon a column.

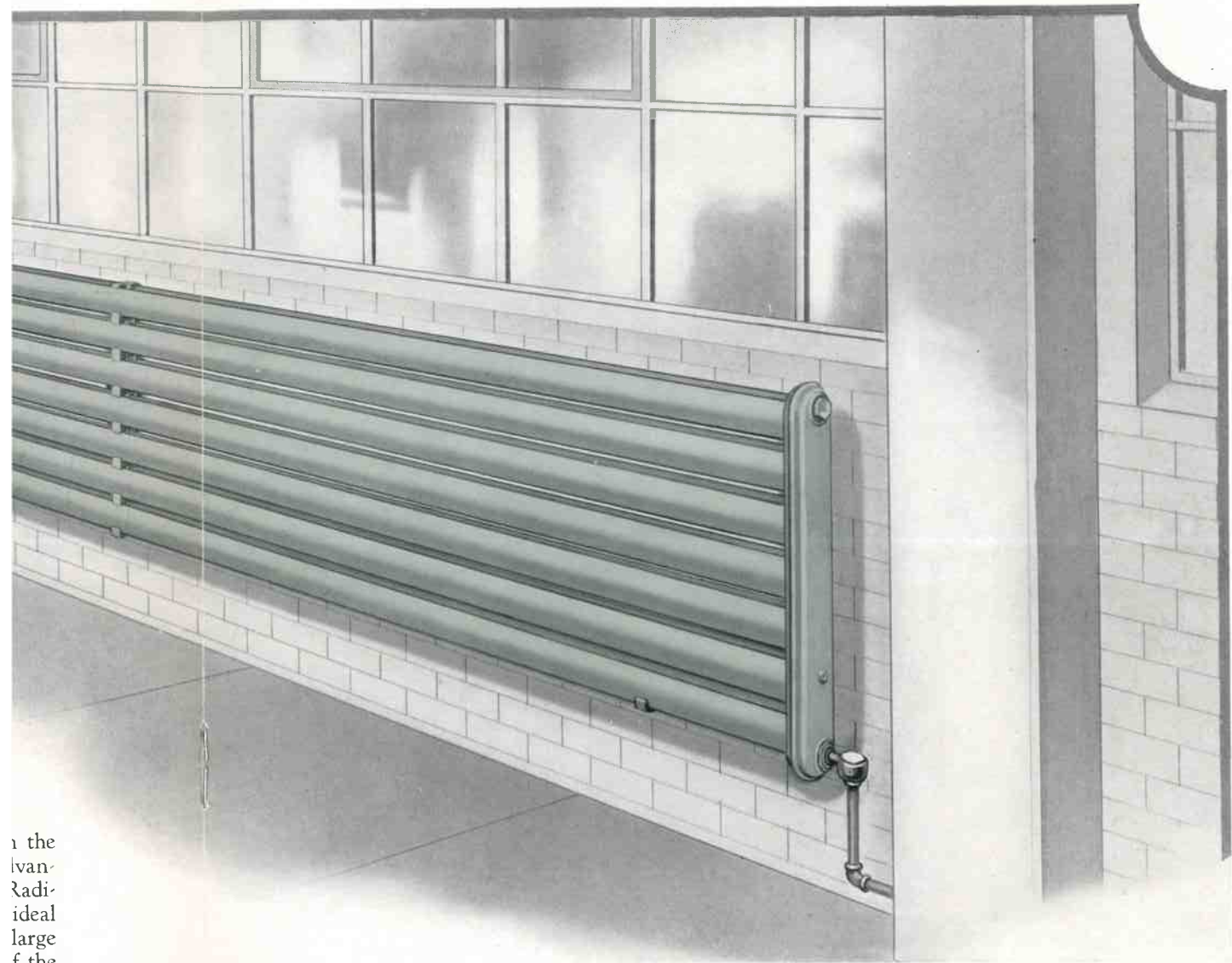


Above view shows a 14-K-14 radiator installed upon the wall of a factory building. The valuable exclusive advantages possessed by Shaw-Perkins High Convection Radiators as explained in the preceding pages and the ideal adaptability of the radiators to use in buildings of large open areas will be readily appreciated from a study of the above installation.

Many Desirable Installation Arrangements Are Possible W

Shaw-Perkins Radiators

The view to the left shows a 10-K-8 radiator with spacers omitted and with legs attached.



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are Possible With Shaw-Perkins High Convection Radiators

Shaw-Perkins Radiators



Shaw-Perkins 10-Tube High Convection Radiator MODEL 10-K

For Wall or Floor

For Steam or Water

RADIATOR NUMBER	END SECTIONS		TUBE GROUP		LENGTH OVERALL INCHES †	HEATING SURFACE SQUARE FEET ‡	HEAT EMISSION PER RADIATOR PER HOUR IN B. T. U. §	APPROX. SHIP'G WEIGHT POUNDS
	HEIGHT INCHES	WIDTH INCHES	HEIGHT INCHES	WIDTH INCHES				
10-K-4*	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	44 $\frac{1}{4}$	28.8	6912	65
10-K-5	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	56 $\frac{1}{4}$	36.1	8664	81
10-K-6*	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	68 $\frac{1}{4}$	43.4	10416	98
10-K-7	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	80 $\frac{1}{4}$	50.7	12168	114
10-K-8*	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	92 $\frac{1}{4}$	58.	13920	130
10-K-9	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	104 $\frac{1}{4}$	65.3	15672	147
10-K-10*	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	116 $\frac{1}{4}$	72.6	17424	163
10-K-11	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	128 $\frac{1}{4}$	79.9	19176	179
10-K-12*	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	140 $\frac{1}{4}$	87.2	20928	196
10-K-13	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	152 $\frac{1}{4}$	94.5	22680	212
10-K-14*	20 $\frac{3}{4}$	4 $\frac{3}{4}$	17 $\frac{7}{8}$	3	164 $\frac{1}{4}$	101.8	24432	229

*Indicates radiators carried in stock.

†Add $\frac{3}{4}$ inch for each bushing or plug. For complete dimensions and roughing in measurements see page 13.

‡Radiators are rated in accordance with the official code of the American Society of Heating & Ventilating Engineers. See page 18 of this catalogue.

§Heat emission above indicated occurs when steam temperature in radiator is 215° F. and temperature of surrounding air is 70° F. For heat emission under different conditions see page 19.

Radiators will be tapped $1\frac{1}{2}$ inches right hand at top and bottom both ends and bushed or plugged as specified. $1\frac{1}{2}$ inch left hand tapping can be furnished when specified. Air vent tapings, $\frac{1}{8}$ inch.

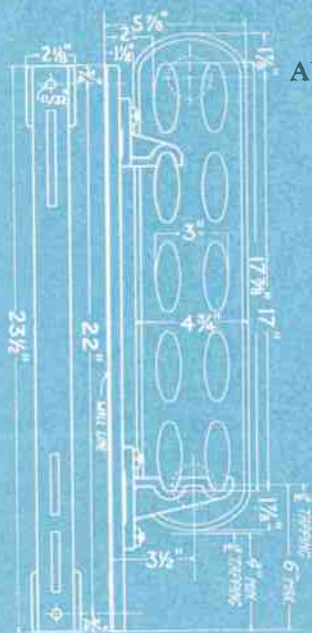
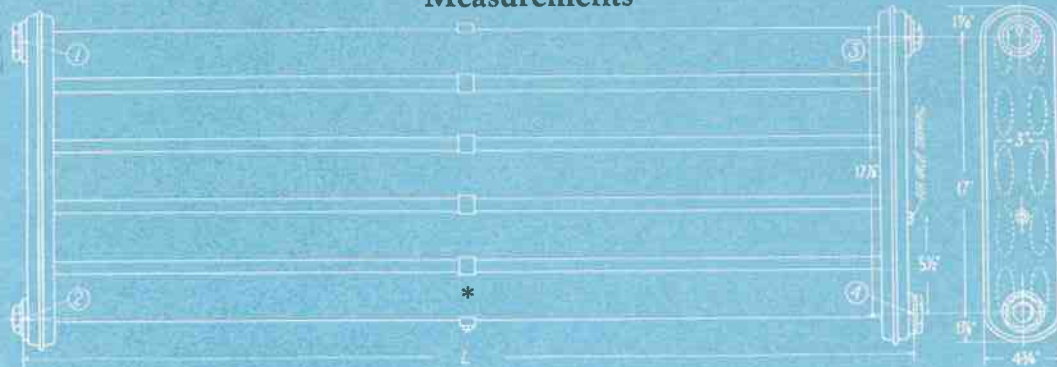
Radiators can be supplied with adjustable wall brackets or attachable legs, as shown on page 13.

Radiators in lengths other than above shown can be furnished upon special order.

All radiators furnished in gray dull gloss finish, subject to change without notice.

FOR PRICES SEE CURRENT TRADE PRICE SHEET.

Shaw-Perkins Model 10-K Radiators Measurements



Above Dimension "L" is given below:

RADIATOR NUMBER	LENGTH "L" IN INCHES
10-K-4	44 1/4
10-K-5	56 1/4
10-K-6	68 1/4
10-K-7	80 1/4
10-K-8	92 1/4
10-K-9	104 1/4
10-K-10	116 1/4
10-K-11	128 1/4
10-K-12	140 1/4
10-K-13	152 1/4
10-K-14	164 1/4

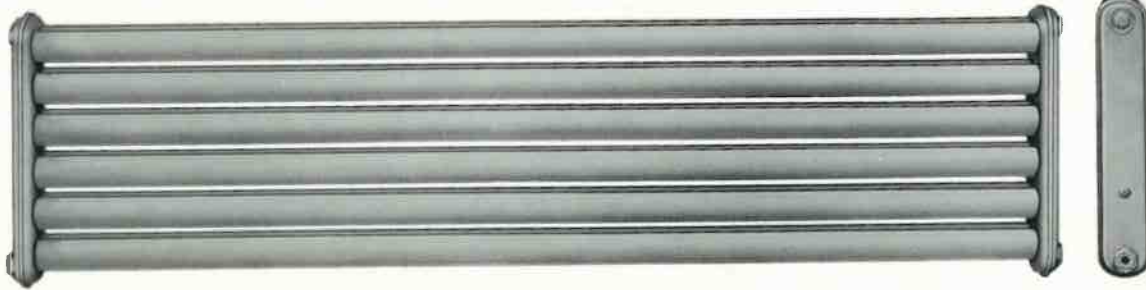


Above measurements apply to all Model 10-K Radiators when installed upon Shaw-Perkins Standard Adjustable Wall Brackets.

Above measurements apply to all Model 10-K Radiators when installed upon Shaw-Perkins Standard Floor Legs.

*Spacers as shown above furnished only in 10-K-8 to 10-K-14 Radiators inclusive.

Shaw-Perkins Radiators



Shaw-Perkins 12-Tube High Convection Radiator MODEL 12-K

For Wall or Floor

For Steam or Water

RADIATOR NUMBER	END SECTIONS		TUBE GROUP		LENGTH OVERALL INCHES †	HEATING SURFACE SQUARE FEET ‡	HEAT EMISSION PER HOUR IN B. T. U. §	APPROX. SHIP'G WEIGHT POUNDS
	HEIGHT INCHES	WIDTH INCHES	HEIGHT INCHES	WIDTH INCHES				
12-K-4*	24½	4¾	21⅝	3	44¼	34.5	8280	78
12-K-5	24½	4¾	21⅝	3	56¼	43.2	10368	97
12-K-6*	24½	4¾	21⅝	3	68¼	52.	12480	117
12-K-7	24½	4¾	21⅝	3	80¼	60.7	14568	137
12-K-8*	24½	4¾	21⅝	3	92¼	69.5	16680	156
12-K-9	24½	4¾	21⅝	3	104¼	78.2	18768	176
12-K-10*	24½	4¾	21⅝	3	116¼	87.	20880	196
12-K-11	24½	4¾	21⅝	3	128¼	95.7	22968	215
12-K-12*	24½	4¾	21⅝	3	140¼	104.5	25080	235
12-K-13	24½	4¾	21⅝	3	152¼	113.2	27168	255
12-K-14*	24½	4¾	21⅝	3	164¼	122.	29280	274

*Indicates radiators carried in stock.

†Add ¾ inch for each bushing or plug. For complete dimensions and roughing in measurements see page 15.

‡Radiators are rated in accordance with the official code of the American Society of Heating & Ventilating Engineers. See page 18 of this catalogue.

§Heat emission above indicated occurs when steam temperature in radiator is 215° F. and temperature of surrounding air is 70° F. For heat emission under different conditions see page 19.

Radiators will be tapped 1½ inches right hand at top and bottom both ends and bushed or plugged as specified. 1½ inch left hand tapping can be furnished when specified. Air vent tapings, ⅛ inch.

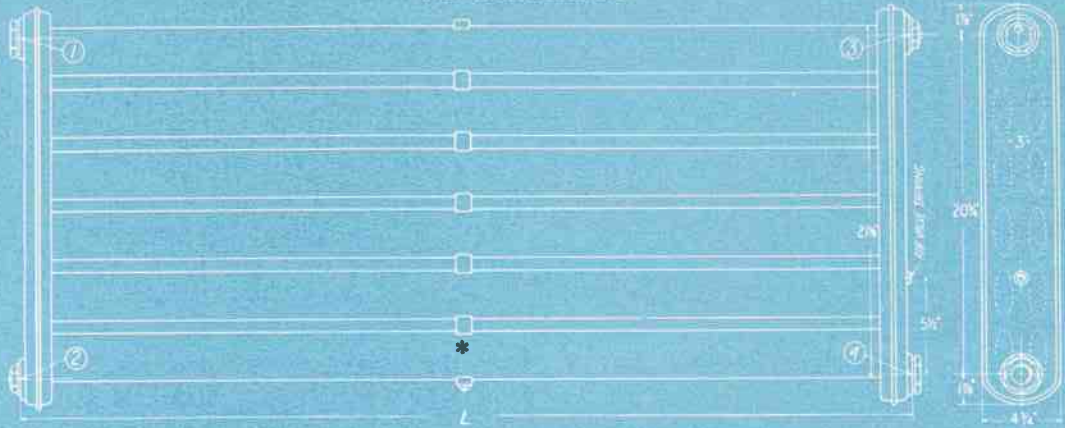
Radiators can be supplied with adjustable wall brackets or attachable legs, as shown on page 15.

Radiators in lengths other than above shown can be furnished upon special order.

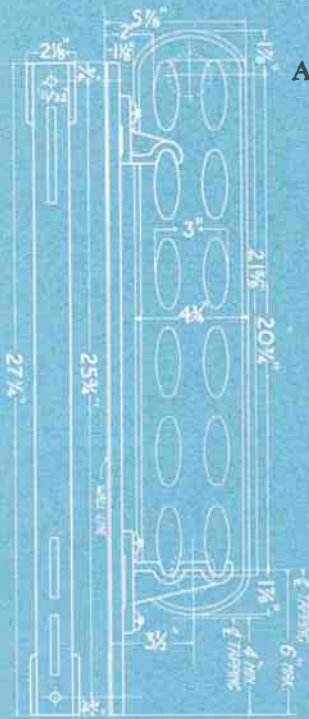
All radiators furnished in gray dull gloss finish, subject to change without notice.

FOR PRICES SEE CURRENT TRADE PRICE SHEET.

Shaw-Perkins Model 12-K Radiators Measurements



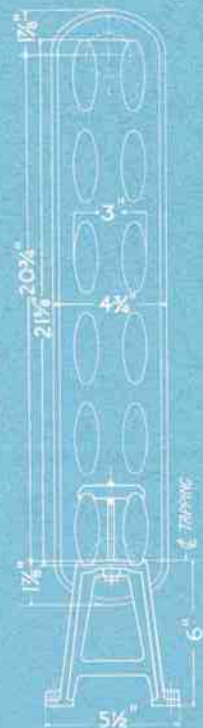
Above Dimension "L" is given below:



RADIATOR
NUMBER

LENGTH "L"
IN INCHES

12-K-4	44 $\frac{1}{4}$
12-K-5	56 $\frac{1}{4}$
12-K-6	68 $\frac{1}{4}$
12-K-7	80 $\frac{1}{4}$
12-K-8	92 $\frac{1}{4}$
12-K-9	104 $\frac{1}{4}$
12-K-10	116 $\frac{1}{4}$
12-K-11	128 $\frac{1}{4}$
12-K-12	140 $\frac{1}{4}$
12-K-13	152 $\frac{1}{4}$
12-K-14	164 $\frac{1}{4}$



Above measurements apply to all Model 12-K Radiators when installed upon Shaw-Perkins Standard Adjustable Wall Brackets.

Above measurements apply to all Model 12-K Radiators when installed upon Shaw-Perkins Standard Floor Legs.

*Spacers as shown above furnished only in 12-K-8 to 12-K-14 Radiators inclusive.

Shaw-Perkins Radiators



Shaw-Perkins 14-Tube High Convection Radiator MODEL 14-K

For Wall or Floor

For Steam or Water

RADIATOR NUMBER	END SECTIONS		TUBE GROUP		LENGTH OVERALL INCHES †	HEATING SURFACE SQUARE FEET ‡	HEAT EMISSION PER RADIATOR PER HOUR IN B. T. U. §	APPROX. SHIP'G WEIGHT POUNDS
	HEIGHT INCHES	WIDTH INCHES	HEIGHT INCHES	WIDTH INCHES				
14-K-4*	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	44 $\frac{1}{4}$	40.2	9648	90
14-K-5	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	56 $\frac{1}{4}$	50.4	12096	113
14-K-6*	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	68 $\frac{1}{4}$	60.6	14544	136
14-K-7	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	80 $\frac{1}{4}$	70.8	16992	159
14-K-8*	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	92 $\frac{1}{4}$	81.	19440	182
14-K-9	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	104 $\frac{1}{4}$	91.2	21888	205
14-K-10*	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	116 $\frac{1}{4}$	101.4	24336	228
14-K-11	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	128 $\frac{1}{4}$	111.6	26784	251
14-K-12*	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	140 $\frac{1}{4}$	121.8	29232	274
14-K-13	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	152 $\frac{1}{4}$	132.	31680	297
14-K-14*	28 $\frac{1}{4}$	4 $\frac{3}{4}$	25 $\frac{3}{8}$	3	164 $\frac{1}{4}$	142.2	34128	320

*Indicates radiators carried in stock.

†Add $\frac{3}{4}$ inch for each bushing or plug. For complete dimensions and roughing in measurements see page 17.

‡Radiators are rated in accordance with the official code of the American Society of Heating & Ventilating Engineers. See page 18 of this catalogue.

§Heat emission above indicated occurs when steam temperature in radiator is 215° F. and temperature of surrounding air is 70° F. For heat emission under different conditions see page 19.

Radiators will be tapped 1 $\frac{1}{2}$ inches right hand at top and bottom both ends and bushed or plugged as specified. 1 $\frac{1}{2}$ inch left hand tapping can be furnished when specified. Air vent tapings, $\frac{1}{8}$ inch.

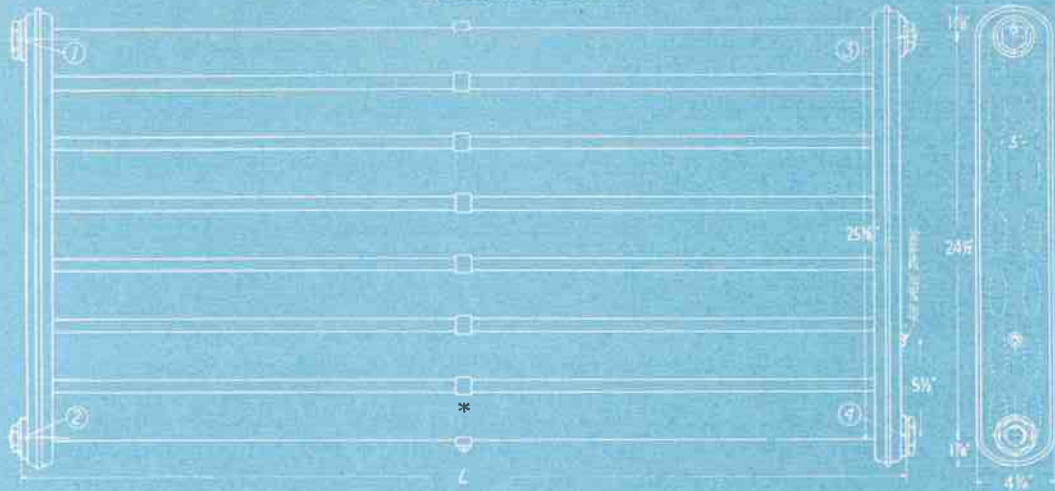
Radiators can be supplied with adjustable wall brackets or attachable legs, as shown on page 17.

Radiators in lengths other than above shown can be furnished upon special order.

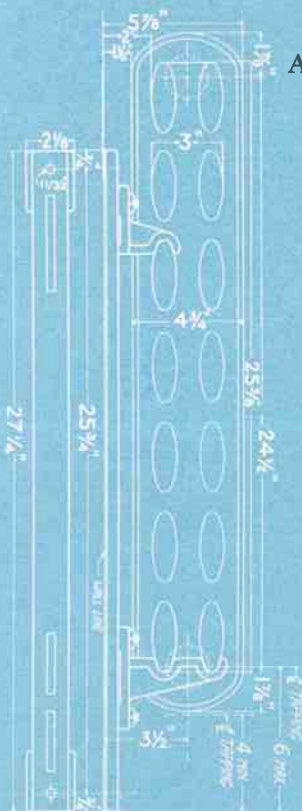
All radiators furnished in gray dull gloss finish, subject to change without notice.

FOR PRICES SEE CURRENT TRADE PRICE SHEET.

Shaw-Perkins Model 14-K Radiators Measurements



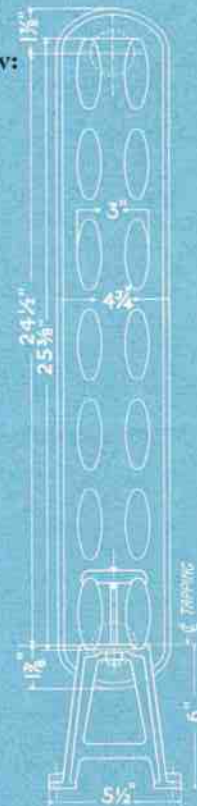
Above Dimension "L" is given below:



RADIATOR
NUMBER

LENGTH "L"
IN INCHES

14-K-4	44 1/4
14-K-5	56 1/4
14-K-6	68 1/4
14-K-7	80 1/4
14-K-8	92 1/4
14-K-9	104 1/4
14-K-10	116 1/4
14-K-11	128 1/4
14-K-12	140 1/4
14-K-13	152 1/4
14-K-14	164 1/4



Above measurements apply to all Model 14-K Radiators when installed upon Shaw-Perkins Standard Adjustable Wall Brackets.

Above measurements apply to all Model 14-K Radiators when installed upon Shaw-Perkins Standard Floor Legs.

*Spacers as shown above furnished only in 14-K-8 to 14-K-14 Radiators inclusive.

Directions for Ordering—Miscellaneous Information

State whether radiators are to be used for steam or hot water heating. If they are to be used for other purposes, give full particulars. Specify tappings desired. For accuracy, tapping locations may be indicated by numbers in circles upon pages 13, 15, and 17, keeping in mind that No. 1 tapping is on supply end of radiator.

Be sure to specify whether legs or brackets are desired, and state number of each. All sizes of radiators shown in this catalogue require either two legs or two brackets per radiator. Radiators with numbers ending in 11 to 14 inclusive require three brackets per radiator when used for water installation upon wall.

All radiators are tapped $1\frac{1}{2}$ inch right hand top and bottom both ends and bushed or plugged as specified. Left hand tapping can be furnished when specified.

Radiators ordered for steam or hot water heating purposes, and for which no tappings are specified, will be bushed as per list below:

STANDARD RADIATOR TAPPINGS

STEAM: One-Pipe Work
Up to 24 Sq. Ft. 1"
25 to 60 Sq. Ft. $1\frac{1}{4}$ "
Above 60 Sq. Ft. $1\frac{1}{2}$ "

STEAM: Two-Pipe Work
Up to 48 Sq. Ft. 1" x $\frac{3}{4}$ "
49 to 96 Sq. Ft. $1\frac{1}{4}$ " x 1"
Above 96 Sq. Ft. $1\frac{1}{2}$ " x $1\frac{1}{4}$ "

WATER: Two-Pipe Work
Up to 40 Sq. Ft. 1" x 1"
41 to 72 Sq. Ft. $1\frac{1}{4}$ " x $1\frac{1}{4}$ "
Above 72 Sq. Ft. $1\frac{1}{2}$ " x $1\frac{1}{4}$ "

Bushed at bottom unless otherwise specified.

All radiators are vented for steam or water. Air valve tappings are $\frac{1}{8}$ inch.

Brackets or legs may be located at any desired points between ends of radiators. Legs may be installed, inverted, upon top of radiator to form shelf brackets.

Legs are drilled so they may be attached to shelf or floor if desired. Reference to one "Shaw-Perkins Adjustable Radiator Bracket" means an entire bracket assembly consisting of one top and one bottom cast iron bracket and steel bearing rail.

All radiators, legs and brackets are furnished in gray dull gloss finish, subject to change without notice.

Shipping weight of radiators crated for domestic shipment is approximately $2\frac{1}{4}$ pounds per sq. ft. Shipping weight of radiators boxed for foreign shipment is approximately 3 pounds per sq. ft.

Brackets and legs are shipped detached from radiators.

Water content of radiators is about .14 gallon per sq. ft.

Radiators are tested for 40 pounds working pressure.

FOR PRICES SEE CURRENT TRADE PRICE SHEET.

Basis of Rating

Shaw-Perkins High Convection Radiators are rated upon the heat emission basis, in accordance with the official code of the American Society of Heating & Ventilating Engineers. The following excerpts are taken from the Code for the Testing of Direct Radiation, as adopted by the Society on January 27th, 1927, and published in the March, 1927, Journal:

"Radiators shall be tested on the basis of B.t.u. transmission, but to comply with common usage an equivalent unit of 240 B.t.u. per sq. ft. of steam radiation, on standard conditions, shall be assumed.

The heating capacity of a radiator shall be determined as follows:

B.t.u. Emission per Hour at

215° Steam and 70° Air Temperatures

————— = Number Square Feet of Radiation."

240

The above formula determines one rated square foot of radiation upon the basis of heat emission. The heat is measured in B.t.u. (meaning British thermal units or heat units). A surface of such an extent that it emits 240 B.t.u. per hour, with heating medium temperature of 215° and room temperature of 70°, is established as one rated square foot of direct radiation. Shaw-Perkins High Convection Radiators are rated upon this basis. The ratings upon the various models and sizes, as given in this catalogue, are the result of tests conducted by recognized authorities and are conservative.

The uncertainties resulting from the indefinite methods of rating as applied to many radiators may be entirely avoided by the use of Shaw-Perkins High Convection Radiators. A square foot of Shaw-Perkins High Convection Radiation represents a definite quantity of emitted heat. One square foot in any size or model has the same heat emission as one square foot in any other size or model operating under the same conditions. Furthermore the heat emission basis upon which Shaw-Perkins High Convection Radiators are rated enables one to easily determine the heat emission of the radiators under many different operating conditions, by the following method—

To Determine How Much Shaw-Perkins High Convection Radiation required to supply a given heat loss:

When the Temperature of Heating Medium is 215° and Room Temperature is 70° (Standard Conditions), the heat loss of the room should be determined in B.t.u. per hour and divided by 240. The result obtained will be the number of square feet of Shaw-Perkins High Convection Radiation required.

When the Temperature of Heating Medium and the Room Temperature are other than above, the heat loss of the room should be determined in B.t.u. per hour and divided by the number of B.t.u. per square foot per hour emitted by the radiator under the intended operating conditions, as shown in the following table. The result obtained will be the number of square feet of Shaw-Perkins High Convection radiation required.

RADIATOR HEAT EMISSION TABLE

The following table gives the heat emission of Shaw-Perkins High Convection Radiators in B.t.u. per square foot per hour, under various heating medium temperature, and room temperature conditions.

WHEN STEAM IS HTG. MEDIUM VACUUM IN. HG.	TEMP. OF HEATING MEDIUM DEGREES F.	TEMPERATURE OF ROOM IN DEGREES F.										
		200°	180°	160°	140°	120°	100°	90°	80°	70°	60°	50°
22.4	150°	.....	.....	.....	.....	51	81	97	109	124	139	153
20.4	160°	.....	.....	.....	.....	66	97	112	126	141	156	170
17.8	170°	.....	.....	.....	52	83	113	128	143	†158	173	186
14.7	180°	.....	.....	38	69	100	130	146	161	176	190	204
11.	190°	.....	.....	57	88	118	149	164	179	194	208	222
6.5	200°	.....	45	96	107	138	168	183	197	212	226	240
PRESSURE LB. GAGE												
.9	215°	.....	73	104	135	165	196	211	226	*240	255	269
2.5	220°	52	83	113	144	175	206	221	236	250	265	278
6.1	230°	71	102	133	163	194	225	240	255	268	283	297
10.3	240°	91	122	153	183	214	245	260	274	287	303	317
20.7	260°	131	162	193	224	255	285	300	315	329	345	358
34.5	280°	175	206	237	267	298	329	344	358	372	387	402
52.3	300°	219	251	282	312	343	373	389	408	417	433	447

*Usual Steam Heating Conditions: Above shown heat emission of 240 B.t.u. per square foot per hour applies for the average steam heating conditions of steam temperature 215° and room temperature 70°.

†Usual Hot Water Heating Conditions: Above shown heat emission of 158 B.t.u. per square foot per hour applies for the average hot water heating conditions of water temperature 170°, and room temperature 70°.

Simple Methods for Figuring Radiation

The several simple methods of calculating radiation requirements which have been commonly used for some time, and which are based upon the above standard of heat emission for radiation, may still be used if desired, to determine the radiation requirements of a job. Shaw-Perkins High Convection Radiators may then be selected and installed at their rated surface.

To Determine Heat Loss of a Room

FIRST: Multiply together the square feet of surface, the coefficient of heat transmission and the greatest expected temperature difference between inside and outside (usually 70° inside and 0° outside, or a difference of 70°) for each type of exposed wall, ceiling, floor, glass, etc.

SECOND: To the sum of the products found in (1) add the air leakage heat loss found by multiplying together the cubical content of the space, the coefficient for the assumed air change and the temperature difference between inside and outside. The last sum is the heat loss from the room in B.t.u. per hour.

COEFFICIENTS OF HEAT TRANSMISSION

Heat transmission coefficients (B.t.u. transfer per sq. ft. per hour, per degree temperature difference, between inside and outside air) for various types of construction, and coefficients for air changes, are given below.

Walls:	THICK- NESS*	COEFFI- CIENT	Walls:	THICK- NESS*	COEFFI- CIENT	Floors: (on ground)	COEFFI- CIENT
Plain Brick	9"	0.358	Terra Cotta or *Hol- low Tile, Stucco, Fur- ring, Lath and Plaster	6"	0.191	Dirt Flooring	0.22
	13"	0.278		8"	0.184	4" Concrete	0.31
	18"	0.218		12"	0.144	4" Concrete on Cinders	0.29
*Brick and Plaster	9"	0.332	Brick, *Hollow Tile and Plaster	4"	0.277	Ceilings:	
	13"	0.263		6"	0.246	Lath and Plaster	0.60
	18"	0.208		8"	0.228	Lath and Plaster, Cold Floor Above	0.26
*Brick, Furring, Lath and Plaster	9"	0.209	4" Brick Veneer, Paper Sheathing, Stud, Lath and Plaster		0.216	Metal on Joists, Cold Floor Above	0.36
	13"	0.179				Roofs:	
	18"	0.152	Lap Siding or Shingles, Paper Sheathing, Stud, Lath and Plaster		0.228	Shingles on Shingle Lath	0.483
Concrete	6"	0.515				Slate and Felt on Tight Sheathing	0.549
	8"	0.481	Doors:			Tile on Tight Sheathing	0.549
	10"	0.431	Single Doors		0.485	Composition Roll on Tight Sheathing	0.518
	12"	0.391	Double Doors		0.300	Corrugated Iron on Sheathing	0.64
	16"	0.329				Corrugated Iron, no Sheathing	1.50
Concrete Blocks	8"	0.377	Glass:			2" Concrete Cinder Fill, Tar Paper, Tar and Gravel	0.80
*Concrete Blocks and Plaster	8"	0.348	Single Glass		1.13	4" Concrete Cinder Fill, Tar Paper, Tar and Gravel	0.60
*Concrete Blocks, Fur- ring, Lath and Plaster	8"	0.215	Double Glass		0.45	Air Changes: (per hour)	
Terra Cotta or *Hol- low Tile and Stucco	6"	0.320	Skylight or Monitor Glass		1.30	One Air Change	0.0181
	8"	0.291				Two Air Changes	0.0362
	12"	0.201	Floors: (above Cold Basement or Unexcavated Space)			Three Air Changes	0.0543
Terra Cotta or *Hol- low Tile, Stucco and Plaster	6"	0.299	Single on Joists		0.440		
	8"	0.273	Double on Joists		0.339		
	12"	0.193	Single on Joists, Lath and Plaster Below		0.234		
			Double on Joists, Lath and Plaster Below		0.202		

Thickness in case of compound walls is that of material marked ().

The foregoing presentations are based upon data taken from the official publications of the American Society of Heating & Ventilating Engineers and from other authoritative sources, but are not guaranteed.

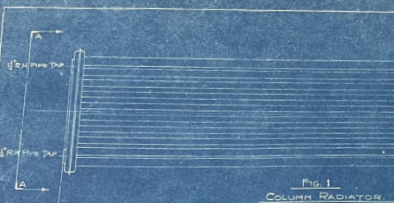
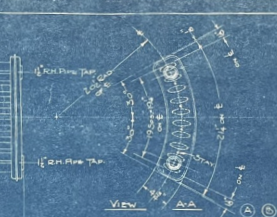


FIG. 1
COLUMN RADIATOR

7'-0 1/2"

7'-0 1/2"

1/2" R.H. Fine Tan
1/2" Air Vent



VIEW A-A

1/2" R.H. Fine Tan
1/2" Air Vent

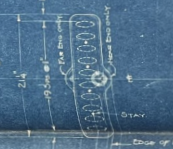
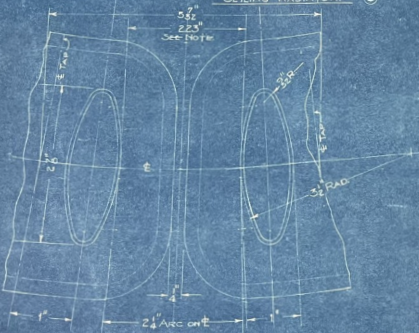


FIG. 2
CEILING RADIATOR



FULL SIZE DETAIL OF CIR. HEADER END CONST.

NOTE: ABOVE SPACING OF END TUBES DEPENDS UPON INSTALLATION OF RADIATORS AS INDICATED ON THIS DRAWING.

EQ. 36 L. F. FORD ORDER NO. 2452

CERTIFIED PRINT
SHAW-PERKINS
MANUFACTURING COMPANY
1118 7-12 W. 42ND

NOTES: (B)
1. SPECIAL TREATMENT TO BE APPLIED TO ALL TUBES.
2. REWORKED TUBES TO BE WELDED EXCEPT AIR VENTS (TAPPING).

SHAW-PERKINS MFG. CO.
PITTSBURGH, PA.

SPECIAL RADIATORS
FOR FORD MUSEUM,
DEARBORN, MICH.

DRAWN BY M.O.N. SCALE: 1/4"=1'-0" DATE: 6-7-59

APPROVED BY
D.N.D. 6-8-59

B-2133 B

REVISION (B)
NOTED ON METAL GATES CORRECTED, STAYS SHOWN, AIR VENTS ON COLUMN RADIATORS CHANGED TO STD. TAPS AND TAP LOCATIONS AND BUSHINGS ADDED.

REVISION (A)
TUBE SPACING CHANGED AND DETAIL OF SPACE BETWEEN TUBES OF ADJACENT CIRCULAR RADIATORS NOTED.

INVOICE

Miss B. Ford,

N^o

Ford Motor Co., Dearborn, Mich.

715.

ATLAS RADIATOR SHIELD COMPANY

6543 SYLVESTER AVENUE

MELROSE 0208

DETROIT, MICHIGAN

DATE Oct. 31st, 1930.

OUR ORDER NO. _____

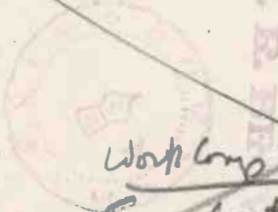
YOUR ORDER NO. #2473.

Terms:

QUANTITY	DESCRIPTION	AMOUNT	TOTAL
360	Grilles to cover Radiator fittings Unit "K" Ford Museum	26,620.00	
	By check	<u>4,525.40</u>	
			18,094.60
	Grilles 26620.00		
	Paint 964.00		
	<u>27584.00</u>		
	Work Comp 100%	27584.00	
	Terms Cont. (less 15%)	4137.60	
	<u>23446.40</u>		
	Less pre-payment	4525.40	
	<u>18921.00</u>		
	OK for 18921.00		

*for Mr. Lepore
for
11/5/30*

Copy



WEST 8 AM

OK for 18921.00

INVOICE

B. Ford,

Nº



718.

Ford Motor Co., Dearborn, Mich.

ATLAS RADIATOR SHIELD COMPANY

6543 SYLVESTER AVENUE MELROSE 0206

DETROIT, MICHIGAN

DATE Oct. 31st, 1930.

OUR ORDER NO. _____

YOUR ORDER NO. Bulletin #237.

Terms:

Bloom
11 3

QUANTITY

DESCRIPTION

AMOUNT

TOTAL

Painting Grilles covering Radiator Fittings Unit

" K " Ford Museum

964.00

NOV 9 1930



B. R. BROWN

Make up for Dept 737

Edsel B. Ford

No. 2473

PURCHASE ORDER

DETROIT, MICH., June 10, 1930 192

To Atlas Radiator Shield Company,
6543 Sylvester Ave.,

Detroit, Mich.

PLEASE DELIVER THE FOLLOWING TO Dearborn Museum, Dearborn, Michigan

NOTICE:
PUT ORDER NUMBER ON INVOICE AT Dearborn Museum, Unit "K" F. O. B. Museum, Dearborn

Furnish, deliver and erect complete the necessary top and bottom grilles for circular columns in Unit "K" of the Ford Museum located north side of East Oakwood Boulevard, adjoining west end of Ford Airport, in the city of Dearborn, Michigan.

All shall be in strict accordance with drawings as submitted by you dated May 28, 1930, and approved by R.O. Derrick, Inc. Architects, under date of June 4, 1930.

All mouldings shall be chrome plated, balance of grilles shall be Parker Rust proofed, ready to receive paint by others.

Mouldings shall be true, free from warps and all imperfections. Units shall be assembled and erected in place to hang the radiators on the columns, top grille to be plumb with base sections. All cutting and fitting shall be neatly done in connection with switch and telephone plugs. Nuts to be spot welded to receptacle clips to receive cover plates and drill all necessary holes, all as shown on drawing.

All materials shall be of the very best, suitable for the place and purpose for which they are intended and installed in a firstclass, workmanlike and satisfactory manner. You shall strictly comply with all State & Local Laws and Ordinances governing this class of work and shall consult our representative as to the best method of carrying on this work with a view of obtaining the best results and the least interference with our and other contractor's operations.


PRICE \$26,620.00

ORDERED FOR

(OVER)

CHARGE TO Edsel B. Ford

Dearborn Museum

 Secretary

ck. S. G. Schir 6-16-30.

and erect during the continuance of work under this order, including extra work in connection therewith. All insurance policies are to be issued by companies acceptable to the First Party and authorized to do business under the laws of the state in which the work is to be done. Copies of said policies, together with certificates of insurance, are to be filed with the First Party before work is started.

LABOR POLICY:

It is understood and agreed that in carrying out this order on our premises, there shall be no distinctions made between union and non-union men, or, in other words, the work shall be done under what is known as an Open Shop Policy. Any violation of this policy permits the Ford Motor Company at their option to see that both union and non-union men are properly considered in their application for work.

CHANGES IN PLANS AND EXTRAS:

No change in plans or specifications that involve changes in the price on this order will be permitted unless the same shall have been ordered in writing by an officer or the Purchasing Agent of the Ford Motor Company. No extras will be allowed the Second Party unless previously ordered as aforesaid as extra work, and the compensation therefor agreed upon and set forth in writing at the time. No extras will be allowed on account of delays caused by the interference of the regular manufacturing operations of the Ford Motor Company.

CANCELLATION:

The Ford Motor Company reserves the right to cancel this order in its entirety or any portion of their obligations hereunder for the purchase of equipment, materials, workmanship or services, for causes due to any act or demands of the United States Government, or to fires, strikes, or other causes beyond the Ford Motor Company's control, or the Second Party shall, upon the Ford Motor Company's written instructions, suspend shipment and delivery of material and all work and operations hereunder for such period or periods of time as the Ford Motor Company may deem advisable or necessary by reason of any of the aforementioned contingencies.

INVOICES:

Invoices covering final payment of contract order must be accompanied by a contractor's affidavit certifying that all bills for material and labor have been paid for in full.

P. O. Derrick Inc. Plans Nos. 381 & 343

ATLAS RADIATOR SHIELD COMPANY

6543 SYLVESTER AVENUE

MELROSE 0208

DETROIT, MICHIGAN

April 15th, 1930.

Ford Motor Co.,
Dearborn, Mich.

Att. Mr. B. R. Brown

Gentlemen;-

We are pleased to quote you the sum of \$ 30,413.20 for 180 Radiator Enclosure units for the new museum. These Enclosures will be two rings per unit, one to rest on the floor, and to be 18" high, the other to extend 15" above the top of the radiator. The rings are to be made of a top and bottom moulding, design as selected by you, with vertical 5/8" rods between the rings, separated by ball spacers. The rings are to be chrome plated.

The above price includes cartage, from our factory to the museum, and complete installation charges.

We cannot promise delivery under about sixteen weeks from date of order, due to the fact that it will take about twelve weeks for some of our raw materials to reach us, as it will be necessary to make special dies for the moulding.

Assuring you of a workmanlike job if awarded this contract, and thanking you for many past favors, we are,

Very truly yours,

Atlas Radiator Shield Co.,

David W. Rust

DWR:S

Pres.

DEPARTMENTAL COMMUNICATION

To Mr. C. Vcorness Dept. Dearborn Date 1-30-30 1930

RE: CIRCLE RADIATORS: UNIT "K": MUSEUM

The following is a copy of a communication which we have received from Mr. Griffith;

"Please refer to drawings M-504-505. There has been no provision made for hose connections to 1" brass drain plugs at the bottom of radiator connection. If necessary to drain, the water will flow over the finished floor. Note that change in radiator design throws the sleeves approximately 3" off center. Unless a change is made in the 1 1/2" riser from main feed, it will raise top connection at an angle that will be very noticeable"

Will you kindly look into this and advise Derrick's office direct or thru our office what means to take to prevent the conditions herein mentioned?

A. Johnston
Office of B.R. Brown

AJ:G

Hold for final decision after now!

DD

Signed _____ Dept. _____

DEPARTMENTAL COMMUNICATION

R. Brown

Dept. Const. & Engr

Date Jan. 17, 1930

RE: HEATING OF UNIT "K"

Please refer to Drawings M-504-505. There has been no provision made for hose connections to 1" brass drain plugs at the bottom of radiator connection. If necessary to drain, the water will flow over the finished floor. Note that change in radiator design throws the sleeves approximately 3" off center. Unless a change is made in the 1½" riser from main feed, it will raise top connection at an angle that will be very noticeable.

A

CD;AJB

M. J. ...
Ford Museum

Signed _____

Dept. _____

ROBERT O. DERRICK, INC.

ARCHITECTS

UNION TRUST BUILDING
DETROIT

ROBERT O. DERRICK, A. I. A.
ASSOCIATE:
BRANSON V. GAMBER, A. I. A.

PONTIAC OFFICE
PONTIAC BANK BUILDING
W. C. ZIMMERMANN, MGR.

January 9, 1930.

SUBJECT Ford Museum.

Mr. B. R. Brown,
c/o Ford Motor Co.,
Rouge Plant,
Dearborn, Michigan.

Dear Sir:

In order to assist further in the selection of the circular grilles for the column radiation in Unit K we offer the following outline of procedure to date with suggestions which may lead to a satisfactory decision.

1. The cast grille is the only form of grille which harmonizes with the massive columns, arches, and roof construction of Unit K.
2. The grille being of cast metal, aluminum and iron were considered. The lighter weight, equal price, and ease of obtaining suitable finish of aluminum led to its choice.
3. Aluminum does not require protection from atmosphere therefore we wished to make the most of its appearance as a metal.
4. It is now desirable to submit some kind of model to the Owners for approval. Any picture of it would prove to be unsatisfactory. A plaster model can be made but cannot be given a true metallic surface. If the material selected has your approval we would recommend that these grilles be ordered on the basis of the natural casting. The foundry awarded this contract could furnish castings in four finishes to set up in the building for inspection.

To this end we have obtained from the low bidder comparative prices on four finishes the choice of which should be with the Owners, and any of which will produce a fine appearance.

1 - Natural cast -	\$ 26,204.00
2 - Wire brushed -	30,761.00
3 - Bright buffed-	32,961.00
4 - Satin finish -	34,101.00



JAN 13 1930

Allowing sixty days for manufacture added to thirty days for contract shop drawings and Owner's approval of finish the decision on this portion of the work is becoming quite urgent.

Yours very truly,

MRW:EM
Copy to Mr. Voorhess.

ROBERT O. DERRICK, INC.

W. R. Williams

Bloom
10/4/29

October 8, 1929
LGL:AC

SPECIFICATION
FOR
TOP GRILLES & BASES
FOR
CIRCULAR COLUMNS IN UNIT "K"

Job No. 436

OWNER: Henry Ford and Edsel B. Ford

BUILDING: Ford Museum

LOCATION: North side of East Oakwood Boulevard adjoining West end of Ford Airport in the City of Dearborn, Wayne County, Michigan.

1. INSTRUCTIONS TO BIDDERS & GENERAL CONDITIONS:

All work included under this heading is to be subject to the Instructions to Bidders and General Conditions hereinbefore written or referred to for the entire work.

2. WORK INCLUDED:

This branch of the work shall include the furnishing and installing of the top Grilles and Bases in all circular columns in Unit "K" as shown on the drawings and detailed Sheet 343, and as called for hereinafter.

3. MATERIAL:

The top grilles and bases shall be constructed of cast aluminum; bolts and pins shall be machine steel. Castings shall be true, free from warps and all imperfections. PA

4. FINISH:

All surfaces in contact between sections shall be machined to perfect line and fit. All perforations and exposed edges shall be dressed and smoothed and all burrs and fins shall be removed. All exposed surfaces shall be finished so as to remove all sand mould marks, fire skin and imperfections and shall be polished all over to a high mirror-like surface.

5. CONSTRUCTION:

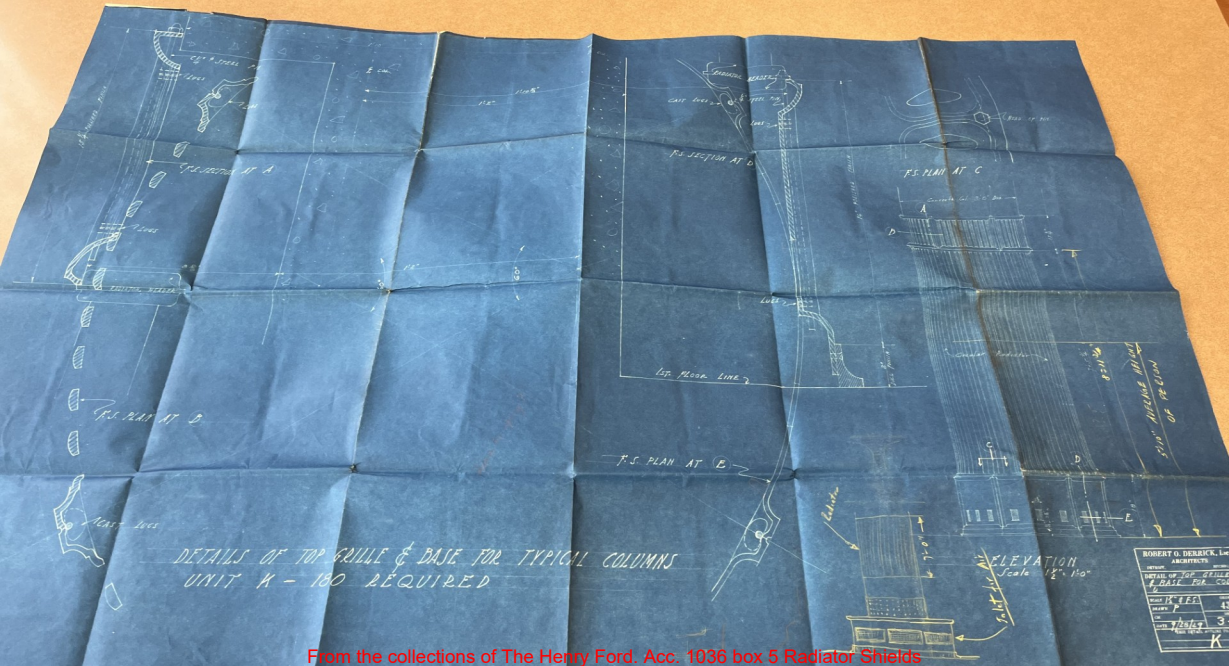
(a) The grilles and bases shall be constructed in interlocking units, 68 sections to a column, and adjacent sections shall be joined together by means of a steel pin extended thru holes in the lugs cast on the sections as shown.



(b) The top grille will be carried on the upper flange of the radiator.

(c) The base shall be made with a separate shoe which shall be left loose from the base to provide for variation in the required height of the base. Shoe shall be attached in the field using hard aluminum tap screws with countersunk head. Tapping of the base to be done as required to fit the shoe tight to the floor with the upper edge of the base in contact with the radiator flange.

(d) Units shall be assembled and erected in place so as to be concentric with the columns, plumb and square, top grille in plumb line with base section.



From the collections of The Henry Ford. Acc. 1036 box 5 Radiator Shields

ON
" = 1-0"

ROBERT O. DERRICK, Inc.	
ARCHITECTS	
DETROIT,	MICHIGAN
DETAIL OF TOP GRILLES & BASE FOR COLS.	
U	
SCALE 1/2" & F.S.	ORDER
DRAWN P	436
CN.	SHEET
DATE 9/28/29	343
THIS DETAIL APPLIES TO UNITS	
K	