

*Broomell System*

## SPECIFICATIONS

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No. 2300

DATE October 6th, 1924.

SAINT AUGUSTINE'S RECTORY

Hartford, Conn.

Whiton & Mc Mahon, Arch't.

### VAPOR HEATING CO.,

Main Office and Works:—YORK, PA.

BRANCHES:--- { Philadelphia, Pa., 215 So. 17th St.  
                  { New York City, 597 Fifth Ave.

Address correspondence referring to these specifications to office  
preparing plans as indicated by serial.

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### GENERAL CONDITIONS.

Heating Contractor to verify all measurements, dimensions, radiator heights and locations at the building before starting work.

These specifications and plans accompanying same contemplate the erection of a heating apparatus complete in every particular. All material furnished must be of the very best of its kind and the work to be done by first-class experienced steam fitters. The work to be done in accordance with the Rules and Regulations of the Board of Fire Underwriters and the Building Laws in force in the locality where the apparatus is to be installed.

Heating Contractor is to furnish all material called for in these specifications and must erect the apparatus complete in every respect. The Heating Contractor must give the work his personal supervision and retain on the job a competent foreman. The Owner, Architect or duly authorized Inspector of the Vapor Heating Co. to have the privilege of stopping any work that is not being properly installed and demand that only competent workmen shall be employed and of sufficient number to complete the work within the time allotted for completion of contract.

Heating Contractor must hold Owner harmless from any damage or expense arising from the fulfillment of the contract and at the completion of his work shall repair any damage done by him and remove all rubbish and waste material connected with his work from building and premises.

Anything called for in the specifications and not shown on the plans or shown on the plans and not called for in the specifications, must be considered as appearing on both plans and in specifications and must be furnished by Heating Contractor.

Plans are furnished by the Vapor Heating Company and are for the general guidance of the Heating Contractor and his employees as well as for the information of Owner and Architect.

Plans are made from data furnished the Vapor Heating Company and are as complete as it is possible to make them from the data furnished. It may occur that conditions exist in the building or buildings which may require certain changes in the details of installation, and in the event of such changes being necessary, same are to be made by the Heating Contractor without expense to the Owner, providing however, that such changes do not require furnishing more material or performing more labor than the true intent and meaning of the

plans and specifications demand. In case any changes from what is shown on plans are required, an estimate of the extra cost or deduction involved must be furnished to the Owner or Architect before changes are made.

It is understood that while the plans must be followed as closely as possible, Heating Contractor is held responsible for the installation according to the true intent and meaning of the plans and specifications.

Anything not entirely clear in the plans and specifications will be explained if application be made to the office of the Vapor Heating Company; should however, conditions arise where, in the judgment of the Heating Contractor changes would be advisable, the Heating Contractor shall communicate with the Vapor Heating Company and secure its approval of these changes before going ahead with the work.

**BOILER.** Cast Iron Sectional Boiler to be used.

The Boiler for this installation should have a rated capacity of 3700 sq. ft. of direct radiating surface. It must be manufactured by a reputable and responsible concern and be fully guaranteed by the Manufacturer and the Heating Contractor to have a capacity, with ordinary and proper firing to supply steam at a pressure of 6 ounces in zero weather for the radiating surface called for on the plans, viz: 2130  $1/3$ sq. ft. direct and no sq. ft. indirect.

A distance of 34 inches between water line of boiler and lowest point of cellar ceiling must be provided for this installation. Heating Contractor must provide pit for Boiler if necessary to obtain this distance.

The full size Supply Outlets must be used on boilers up to where connecting to Lateral Supply Mains or to Supply Header. Supply Header to be provided with suitable drip and Equalizer.

Where Round Boilers are used, they must be provided with large outside circulating pipe or pipes. Top of circulating pipe to be connected to near top of Boiler just below water line and bottom to return inlet at bottom of Boiler. Detailed Blue Prints will be supplied by Office of The Vapor Heating Co. issuing these Plans.

#### **FIXTURES.**

Each boiler must be complete with fixtures as follows:  
Water column complete, with try cock, gauge glass cock, glass water gauge and rods, all polished brass.

Brass lever handle, cold water feed cock.  
 " " " blow off cock.

A free working draft door and a good check draft door.

Complete set of fire tools, consisting of hoe, poker, slice bar and coal scoop.

Complete set of flue brushes and handle.

No steam gauge, damper regulator or safety valve is to be furnished; these are included in Vapor Specialties.

#### SMOKE CONNECTION.

Furnish and erect smoke pipe of full size of smoke collar on boiler, direct from boiler to chimney, and built of black sheet steel not less than No. 18 gauge. All joints to be riveted gas tight.

Smoke pipe is to be furnished with positive hand damper and a free working check draft door with opening not less than 1/2 the area of smoke pipe; these are to be in addition to any furnished with Boiler. Check draft door to be set in smoke pipe between hand damper and chimney, and to be of type approved by The Vapor Heating Co.

The end of smoke pipe must finish flush with the inside of flue lining and must in no case project into flue. Where pipe passes through the brickwork, the opening around pipe is to be cemented tight.

#### REGULATION AND AUTOMATIC CONTROL OF DRAFT. See Direction Booklet.

There will be furnished with each Vapor Receiver, 4 pulleys, not less than 2½ in. diameter and 20 feet of suitable chain. A register plate will also be provided, same to be placed in chain over draft door of boiler at about four feet above same.

Chains to doors must drop vertically and run free from boiler or piping or other obstructions and entire regulation must be installed in accordance with directions and detailed drawing showing the method of connecting chains and adjusting regulation as shown in direction booklet furnished.

Heating Contractor must provide weights made of lead pipe or other suitable material to slip over or be attached to chain or door if same is required to properly balance check or draft doors. If draft door of boiler is so near vertical that the weight of the float in receiver does not open it properly, Contractor must attach to the door a suitable arm or extension piece to give the float more leverage.

When testing see that dampers will hold pressure at any given point.

Also allow pressure to run to blow-off point and see that safety valve blows dry.

Pressure to be raised slowly.

#### VAPOR RECEIVER.

Heating Contractor will furnish and set 1 No. 1 Combined Receiver, Relief Apparatus and Damper Regulator, on left of front of boiler, where shown on plan, and attach to boiler with Zero mark on "Waterline" level with Waterline of Boiler. Connection from bottom of Receiver to be made full size of tapping, to and below Waterline of Boiler. Detail showing the method of connecting Receiver to the particular type of boiler used, will be furnished by the Vapor Heating Company, if required.

Receiver to be complete with pressure gauge glass, etc.

A connection is to be made to Safety Valve on Receiver from boiler or from a supply upright close to top of boiler, full size of tapping on Safety Valve. This connection to be made with sharp uphill pitch wherever possible, but in all cases, run bleeder from bottom of Safety Valve Pocket to and below Waterline of Boiler.

#### AUXILIARY RELIEF VALVE.

Heating Contractor to furnish 1 No. 1 Broomell Auxiliary Relief Valve, same to be connected full size, to a spare outlet on vapor space of boiler or on main supply pipe near boiler. Do not connect to pipe leading to Safety Valve on the Receiver.

See directions sent with each relief valve.

#### CONDENSING RADIATOR CONNECTIONS.

When shown on drawings, Heating Contractor to furnish and place a Condensing Radiator of 40 sq. ft. radiation surface, and connect bottom tapping of same to air outlet on top of Receiver full size of tapping on Receiver. Same size pipe to be run from top tapping of Radiator into Chimney, with joint cemented tight. When no Condensing Radiator is used, air pipe must be run from top of Receiver to Chimney.

Plugged tee to be placed in this pipe, as shown on drawings, convenient for testing purposes. Condensing Radiator to be of Indirect Type, water pattern, or flat coil or wall radiator of equal capacity as best adapted to conditions.

#### VAPOR SUPPLY VALVES AND RETURN TRAPS.

Heating Contractor to furnish and connect to each unit of radiation the required Broomell Patented Quintuple Radiator Valve, and care must be taken to feed each Radiator with the valve numbered as shown on plans, as delivery ports are of different area in different numbered Valves.

Valve to be placed at top of Radiator. Supply pipe must be connected into body of Quintuple Valve, not into the Union Nipple. (No air valve to be used on Radiator). Return end of Radiator to be connected with  $\frac{1}{2}$ " Vapor Return Elbow Seal or Broomell Thermo Return trap.

All valves must be protected by tying up in Heavy Muslin or other suitable material until the job is entirely complete.

When the protection is removed, valves must be thoroughly cleaned with Gasoline and wiped dry with clean soft cloth.

#### BUILDING CONSTRUCTION.

The temperature mentioned hereinafter is based on the building or buildings being as tight as good, first-class construction will admit. Should any parts of the building or buildings be of faulty construction and have unusual exposures, the temperature mentioned hereinafter will be null and void, unless the Vapor Heating Company was fully informed as to the unusual conditions before their plans and specifications were prepared.

#### RADIATING SURFACE.

The different rooms and halls in the building in which radiators are shown are to be heated to 70 degrees Fahrenheit when the outside temperature is at zero degrees Fahrenheit, except where otherwise noted on plans.

Radiators to be of a standard hot water pattern of heating surface and heights as shown on plans and of make and design as approved of by Architect or Owner. Radiators to be tapped at top  $\frac{3}{4}$ " and at bottom  $\frac{1}{2}$ " opposite ends to suit the valves called for on plans.

Radiators shown to have No. 5 and 6 valves are to be tapped 1" at top and  $\frac{1}{2}$ " at bottom opposite ends. Return outlets to be bushed  $\frac{1}{2}$ " eccentric unless radiators are tapped solid. If tapped solid, the  $\frac{1}{2}$ " outlet should be tapped as low as possible to insure perfect drainage. Condensing Radiator is to be tapped to suit connections shown.

When ordering radiators, Heating Contractor must specify that radiators be thoroughly cleaned, and outlets plugged with loose wooden plugs before leaving factory; Heating Contractors will be held responsible for this being done.

No air valve outlets are required on radiators.

#### PIPE AND FITTINGS.

All pipes throughout to be of full weight and best manufacture, and all fittings to be of best quality gray cast-iron with full clean cut threads. No malleable fittings to be used. All unions must be ground joint or right and left nipples and couplings used in place of unions.

#### REAMING PIPES.

All pipes must have their ends reamed out carefully, removing all burrs and fins. All pipes must be turned on end and loose dirt, scale, etc., knocked out.

#### SUPPLY, RETURN AND BLEEDER PIPES.

All supply mains and branches to be run in such manner that they will work dry and be entirely free from water under all conditions and must be given as much pitch as possible. Supply mains may pitch from or toward boiler as best suited to conditions. See plans. At all points where there would be any accumulation of water in supply piping, relief pipes must be taken out of the bottom of supply and connected to boiler below waterline. Downhill runs of supply piping to have a pitch of  $\frac{1}{2}$ " in 10 feet; all uphill runs should be a pitch of not less than  $1\frac{1}{2}$ " in 10 feet.

At reduction of sizes in downhill supply runs, bleeders should be used at point of reduction or an eccentric fitting used to keep bottom of supply line level. No supply main to be less than 2" in size.

Where bleeders are used on low points of supply or return piping, use reducing elbow, looking down, elbow to be of full size of supply line reducing to size of bleeder, all bleeders must be connected below waterline.

The overhead return-air lines are to be run as shown on plans and to have a gradual pitch of  $\frac{1}{2}$ " in 10 feet back to the return inlet near the top of Receiver. The return line must be entirely free from traps or pockets in which water could accumulate and to have as much pitch as possible back to return inlet of Receiver. No return main or branch to be less than  $\frac{1}{4}$ ".

All piping to be suspended from joists or ceiling by approved adjustable pipe hangers, placed not more than 10' 0" apart. Sags in small piping to be relieved by hangers.

#### PROVISIONS FOR DRAINING.

Provide at lowest point of wet piping a hose bib or stop-cock not smaller than 1", so that entire system, both boiler and piping, may be freely drained at any time.

In cases where wet piping is installed below the floor, Heating Contractor must arrange with Building Contractor, if necessary, for pit at lowest point of piping.

#### RISERS AND BRANCHES.

Connections for first floor radiators to be taken directly from main piping or from rising lines to upper floors as shown on plans. If taken separately from mains, supply to be  $\frac{3}{4}$ " connected by 1"x $\frac{3}{4}$ " elbow and 1" branch to supply line, and return to be  $\frac{1}{2}$ " connected by  $\frac{3}{4}$ "x $\frac{1}{2}$ " elbow and  $\frac{3}{4}$ " branch to return line, or of sizes as shown on plans.

Supply and return rising lines to be run of sizes shown on plans and branches from mains to supply risers to be one size larger than riser with reducing elbow at end, unless otherwise shown. Branches from risers to radiators shall be run under floors unless otherwise marked or shown on plans, as construction of building may demand, and in all cases to have ample uphill pitch to radiators. Supply branches to be 1" in size, unless otherwise shown on plans, with elbow at end of branch reducing to  $\frac{3}{4}$ " for connection to the Vapor Valve. Return branches to be  $\frac{3}{4}$ " to the return risers which are to be  $\frac{3}{4}$ " in size unless shown larger on plans.

Branches from mains to risers or first floor radiators to be taken off top of mains or at an angle of 45°. Where mains are too close to joists or ceiling to allow branches to be taken off top, they may be taken from side of mains with fittings pitched so as to give the required uphill pitch.



## FLOOR AND CEILING PLATES.

At all points where pipes pass through floors, ceilings or partitions, first quality sleeves, floor and ceiling plates must be used and securely fastened. Where Basement pipes pass through walls of Finished Rooms, Metal Sleeves must be used around them, finished flush with walls.

## COVERING.

If boiler is of cast-iron, sectional make or other type requiring covering, it must be covered in best manner with plastic cement, not less than 1 $\frac{1}{2}$ " thick finished outside with smooth hard coat, and applied over wire mesh.

All supply pipes in basement and boiler room must be covered with a good quality sectional pipe covering not less than  $\frac{3}{4}$ " thick, put on with metal bands. Fittings to be carefully covered with sectional fitting coverings, or with plastic asbestos applied while fittings are hot. Return air pipes are not to be covered unless in such exposed locations that they would be liable to freeze. If air cell covering is used, sections must be sealed, while putting on, by butting ends together with cement between.

In unexcavated cellars, or where concealed in or below cellar floor construction, all pipes, Supply, Return, and Bleeders, must be covered.

If rising lines are concealed in outside walls, or partitions, both supply and return must be thoroughly covered with sectional pipe covering  $\frac{3}{4}$ " thick or with other covering as thick as riser chase will admit of and as approved of by Architect and Owner.

Spaces for concealed piping to be provided by Building Contractor, as directed by Heating Contractor, and as shown on plans.

Lateral supply and return runs below roof spaces or between floors must be thoroughly covered  $\frac{3}{4}$ " thick. Bleeders to be covered from supply down to floor line. All under-floor bleeders to be covered. Edges of covering on fittings to have metal bands.

#### PAINTING AND BRONZING.

All iron work in connection with Boiler must be carefully painted after the work is completed. All radiators to be thoroughly cleaned from oil and rust and given priming coat of best quality, and one coat light gold or aluminum bronze. Other finish if selected by Owner or Architect must be provided for in contract. Exposed pipes above basement to be bronzed or finished to match finish of radiators.

#### QUALITY OF WORK.

The Heating Contractor will be required to install the entire system in strict accordance with the plans and specifications and must guarantee first-class materials and the best of workmanship in every detail, and will be held liable for any and all defects that may develop until after one full heating season has passed; all defects that develop within that time which are due to faulty material, bad or careless workmanship, must be made good at Heating Contractor's expense. When the work is completed, Vapor must circulate through every radiator in the building with a pressure not to exceed six (6) ounces at the boiler. The entire system must work absolutely without noise.

#### TESTING APPARATUS.

When the system is completed, a careful test in the presence of Architect or Owner, or their representative, must be made by the Heating Contractor, and Vapor kept in the building at least six hours, maintaining a pressure of 6 ounces at the boiler. All leaks or imperfections that may develop must be repaired at once. The system should not be forced but plenty of time given for radiators to heat.

In testing operation of Safety and Relief Valves bring pressure up slowly. If pressure is brought up suddenly, valves will blow wet.

Before the plant is delivered to Owner, the Boiler or Boilers must be thoroughly blown off under pressure, to remove all oil, sediment or other foreign matter, and refilled with clean water in strict accordance with detailed instructions of the Vapor Heating Company.

## REQUIREMENTS OF OWNER.

The Owner must provide a proper smoke flue for this installation. Owner must furnish water supply near boiler with opening ready for steam fitter's connections. Owner must furnish all fuel for making test of apparatus.

Owner to be responsible for all damage to any part of the apparatus if it is run for his benefit or the benefit of Building Contractor, or any purpose whatever before the Heating Contractor has entirely finished the work and turned it over to the Owner.

If it is required that radiators shall be temporarily set in place, for the purpose of furnishing temporary heat, the charge for this extra work to be subject to agreement between Heating Contractor and Architect or Owner. See Direction Booklet.

Owner should see that Heating Contractor leaves with him a Direction Booklet for adjusting draft apparatus and operating the system.

GUARANTEE: To apply to Drawings and Specifications. No. 2300

The Vapor Heating Company guarantees that all Vapor Specialties furnished by them shall be perfect in material, workmanship and operation and that the system, if installed according to these specifications and accompanying plans, will operate in every way as specified. Should any of the Vapor Specialties prove defective, or the system not operate as represented and specified, the Vapor Heating Company agrees to replace the defective Vapor Specialties and make at their expense, such changes in the system as is necessary to fulfill the guarantee. See last clause.

Guarantee remains in full force and effect for one year from date of completion of installation, and is given on the understanding that the plant will be operated and fired as called for in the Instruction Book furnished by the Vapor Heating Company.

It is understood that the Vapor Heating Company is in no way responsible for traps or pockets that may develop in the pipes, due to careless workmanship or settling of the building, or for the faulty operation of any part or parts of the system not furnished by the said Vapor Heating Company or for any damage that may result from freezing up of any part of the apparatus.

It is further understood and agreed on the part of the Heating Contractor that in the event of claim being made by the Owner or Architect that the Heating System is not operating properly or that any room or rooms are not sufficiently heated, that no changes, alterations or additions are to be made without first communicating with the Vapor Heating Company and receiving their authorization and directions. No charges of any amount or kind will be allowed or paid by the Vapor Heating Company except for work authorized by the Company.

## BROOMELL VAPOR SPECIALTIES.

The following Specialties, which are covered by Letters Patents, owned by the Vapor Heating Company, are required for this building and can be obtained only from the Vapor Heating Co.

These specialties are sold and furnished with the understanding that payment for the same will be made by the party to whom sold in accordance with the terms set forth in "Quotations" unless otherwise arranged when specialties are ordered, and that plans and specifications are to be used only for installations on which Broomell Vapor Specialties are used, and the Vapor Heating Co. reserves the right to act on any infringement of this understanding.

- 1-No.1 Combined Receiver, draft regulator and safety valve.
- 1-No.1 Auxiliary Relief Valve.
- 46-3/4" Broomell graduating radiator supply valves.
- 1- 1 " " " " " "
- 46-1/2" Broomell return elbow seals.
- 1-1/2" Broomell straight seals.
- 4- Chain pulleys.
- 1- Damper control bar.

All to be used in connection with 2130 1/3 sq.ft.of radiation.

## NOTE TO HEATING CONTRACTORS:

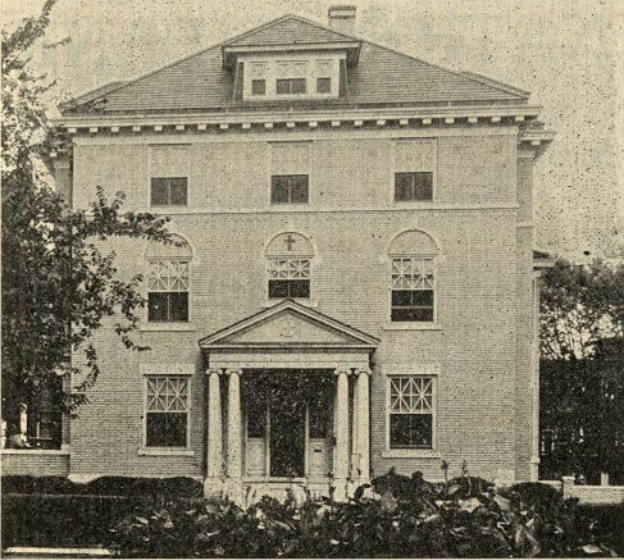
Price on specialties above or other information can be had from the Office of the Vapor Heating Company, preparing these plans as indicated by the serial number on the cover of these specifications, or if more convenient from the nearest office.



REV. A. W. BARRY,  
PASTOR.

WHITON & McMAHON  
ARCHITECTS

ST. AUGUSTINE'S RECTORY, HARTFORD, CONN.



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