BROOMELL VAPOR SYSTEM of HEATING

The Broomell
Vapor Heating System

distributes heat by means of radiators, such as are used on hot-water systems. Into these radiators vapor is conveyed by pipes, from a regular steam boiler or heater; or from a central heating station. Or exhaust steam may be used.

The term "Vapor," as employed in relation to THE VAPOR SYSTEM, indicates heat in a very familiar form —namely, the vapor arising from hot water and not under pressure.

THE VAPOR SYSTEM has the widest range of usefulness. It is adapted to structures of every class, regardless of size, location or exposure.

THE VAPOR SYSTEM is as readily obtainable in Chicago, in Denver, in Portland—anywhere, as in Philadelphia.

VAPOR HEATING COMPANY

The Broomell Vapor System

THE NORTH AMERICAN BUILDING
PHILADELPHIA

The Broomell Vapor Heating System

The VAPOR specialties, which are essential to the installation of THE VAPOR SYSTEM, and which are exclusively manufactured by the Vapor Heating Company, consist of:

The combined Receiver, Draft-regulator, Gauge and Relief-valve. Which is attached to the boiler and regulates the fire.

The Quintuple Radiator-valve. Which controls the flow of Vapor into the radiators, and regulates the amount of heat.

The Special Union Elbow. Attached to the outlet of each radiator.

Detailed descriptions of these parts and of their offices, will be found farther on.

What Does it Cost to Install The Vapor System?

The cost depends on size of plant; that is, on the number of radiators and amount of heating surface necessary in each individual case. As a rule, the cost to install a medium size VAPOR plant is practically the same as for a first-class hot-water open-tank system of the same size. On large plants the cost of VAPOR should be less than hot-water. The larger the VAPOR plant, the greater the economy.

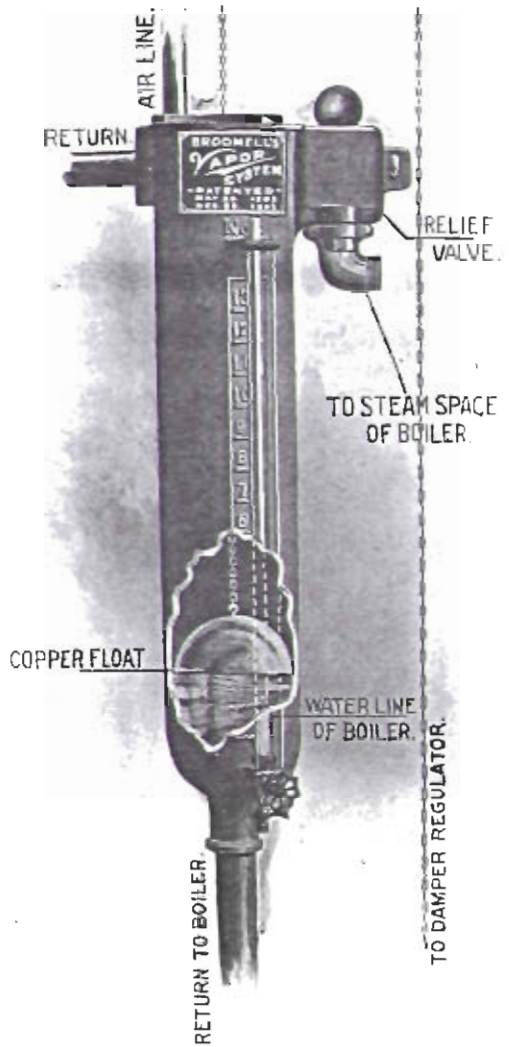
The Vapor Heating Company does not install heating systems. It is the aim of the Company to work through Architects and Heating Contractors. The main office of the Vapor Heating Company is located in The North American Building, Philadelphia, to which all correspondence should be directed. Branch offices are scattered over the country at various points, enabling the Company to come promptly in touch with Architects, Heating Contractors and Prospective Purchasers.

We manufacture all of the VAPOR specialties used in installing the system. We do not manufacture or sell boilers, piping or radiators nor do we recommend any particular make. Any standard steam heating boiler of proper size may be used. The system also works perfectly with exhaust steam, or from central heating stations or high pressure boilers. In new work we prefer to use standard pattern hot-water radiators with inlet at the top and outlet at the bottom on opposite ends.

The piping used on the BROOMEL VAPOR SYSTEM is standard, but smaller than that required for steam or hot water.

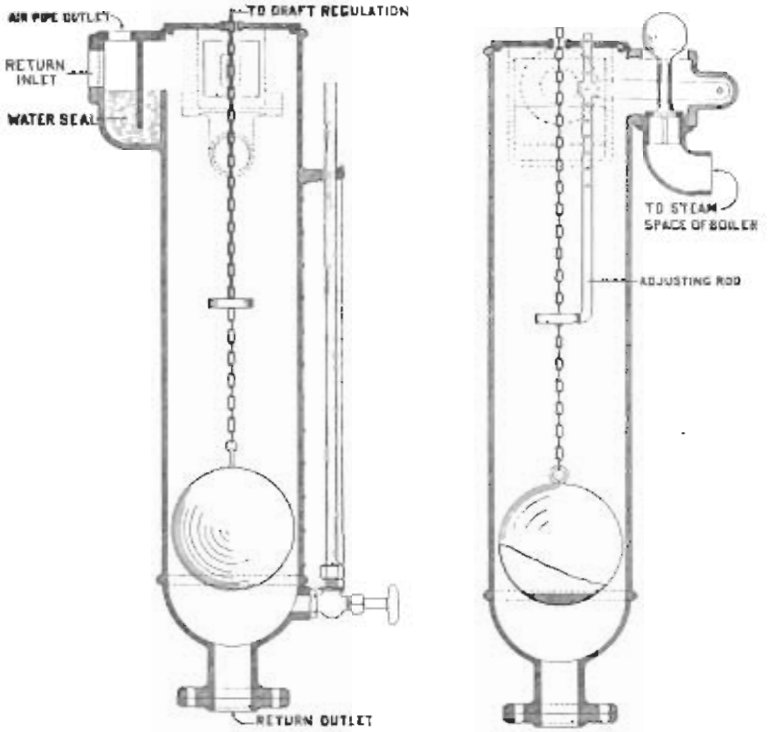
We are prepared to furnish plans and specifications for re-building defective and out-of-date heating systems and can use old radiators.

VAPOR HEATING COMPANY
PHILADELPHIA



The Receiver

The apparatus illustrated above, and shown in detail on the opposite page, is known as the Receiver. It regulates the boiler drafts and governs the operation of the system.



The Receiver is placed alongside of boiler with the zero mark on the gauge of the Receiver on a level with the water-line of boiler. The connection marked "return to boiler" is carried into the main return inlet of boiler. Since the Receiver is open to the atmosphere, there is free passage of water from Receiver to boiler, and from boiler to Receiver, through the "return to boiler" connection just described.*

The main return of the system is connected into a seal at back of Receiver at top. All condensation is delivered into this seal and is returned to boiler by gravity through the open Receiver and "return to boiler" connection. The seal is shown clearly in the first of the above drawings.

* See illustration of boiler connections on page 12.

The Receiver
(Continued)

An air-line runs from the top of the seal and is carried into the chimney, first passing through a condensing coil.

The Relief-valve, which forms a part of the Receiver, is connected to the steam space of boiler.

A heavy copper float rides on the water in the Receiver and is connected by a chain to the boiler drafts.

It is in this Receiver that one of the most conspicuous points of superiority of THE VAPOR SYSTEM centres; that is, *the practically perfect automatic control of the boiler*. No other device, invention or system approaches it in reliability of boiler regulation.

The operation of the drafts is simple: It should be remembered that there is free passage of water between boiler and Receiver, and that the latter is open to the atmosphere. It will be understood, then, that as long as the system is consuming all of the Vapor generated in the boiler, the water-level in Receiver will remain the same as in boiler. But when the amount of radiation which is turned on throughout the building is fully heated, Vapor will accumulate in the boiler. As a result of the accumulation of unused Vapor, the surface of the water in the boiler will be slightly depressed while the surface of the water in the Receiver will be elevated. When the water is elevated in the Receiver, as described, the float is raised, closing the boiler drafts by the connecting chain.

When it is desired to reduce the amount of heat, and for that purpose the radiator-valves are partially closed, restricting the flow of Vapor into the radiators, the Draft-regulating float is operated automatically in the manner already described and the fire controlled to produce just sufficient Vapor to fill the amount of radiation turned on. This is a practical illustration of the *fuel economy* of THE VAPOR SYSTEM.

On the other hand, when more heat is desired and the radiator-valves are opened, increasing the flow of Vapor into the radiators. The boiler is thus freed of accumulated Vapor, the water returns to

The Receiver
(Continued)

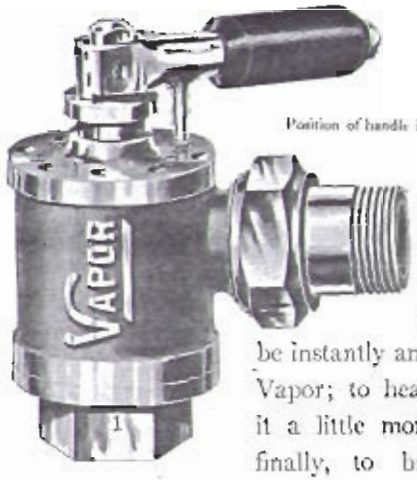
normal level, the float falls in the Receiver, the drafts are opened and the fire stimulated.

The Receiver can be set to close off the draft at any point between zero and 12 ounces. In moderate weather it is usually set to close the draft on 1 to 2 ounces. In extreme weather it can be set to close the draft at 4 to 6 ounces, as may be desirable. Only sufficient boiler pressure to operate the drafts is required by THE VAPOR SYSTEM. The glass gauge on Receiver indicates ounces of vapor in the boiler.

The Relief-valve (see drawings page 5) is provided to prevent any possibility of water overflowing the top of Receiver. If by neglect the ash-pit doors were left open, thus nullifying the automatic draft regulation, the water will continue to rise in the Receiver carrying with it the float which has already closed the draft. The float will presently lift the lever opening the Relief-valve and releasing the vapor from the boiler. The "adjusting rod" is usually set to open the Relief-valve at 7 to 10 ounces.

The fire door and ash-pit door are kept closed. The boiler is regulated entirely by the Receiver.

The Vapor Radiator-valve



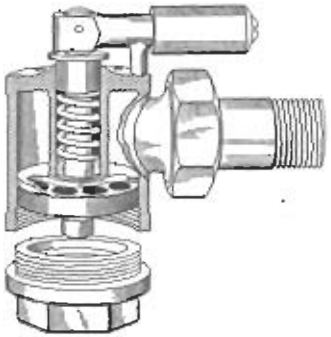
Position of handle indicates ¾ open

The Quintuple Valve regulates the temperature of the radiators. It is the only Radiator-valve with which such regulation is possible. It can be instantly and easily set to admit more or less Vapor; to heat the radiator in part; to heat it a little more; to heat it much more; and finally, to bring the radiator up to the maximum temperature.

This, of course, means that the Quintuple Valve differs altogether from the ordinary radiator-throttle. Experts pronounce it the most perfect valve for the purpose that can be designed.

To deliver Vapor to the radiator the handle is moved around one point; this opens a port in the valve-disc. If more heat is wanted the handle is moved to the next point. Still another move gives a three-fourths opening, as in illustration. To give the valve full opening, the handle is turned half around until it stands toward the radiator; in such position the four delivery ports are open.

Aside from being an excellent example of mechanism, the Quintuple Valve is handsomely finished. Very heavy and substantial, the finished parts all nickel plated, highly polished. The handle finished in ebony. It is perfectly steam tight, is self-packing in the valve stem, and can be set with the thumb and finger. When the valve is connected up, the supply pipe is screwed into the bottom, and the nipple of the valve is screwed into the radiator.



Quintuple Valves are in six sizes for three-fourth inch pipe. These valves are so made as to deliver the quantity of Vapor necessary to heat the radiators on which they are placed. In other words, the size of the openings in valve corresponds to the size of radiator.

The attractive home of F. A. Dalton, Haddam, Conn.—exposed on all sides, to the rigors of the good old-fashioned New England winters, is kept warm and comfortable, by VAPOR. The contrast between the two scenes emphasizes the range of weather in New England.

Hartford Heating Co., Heating Contractors.

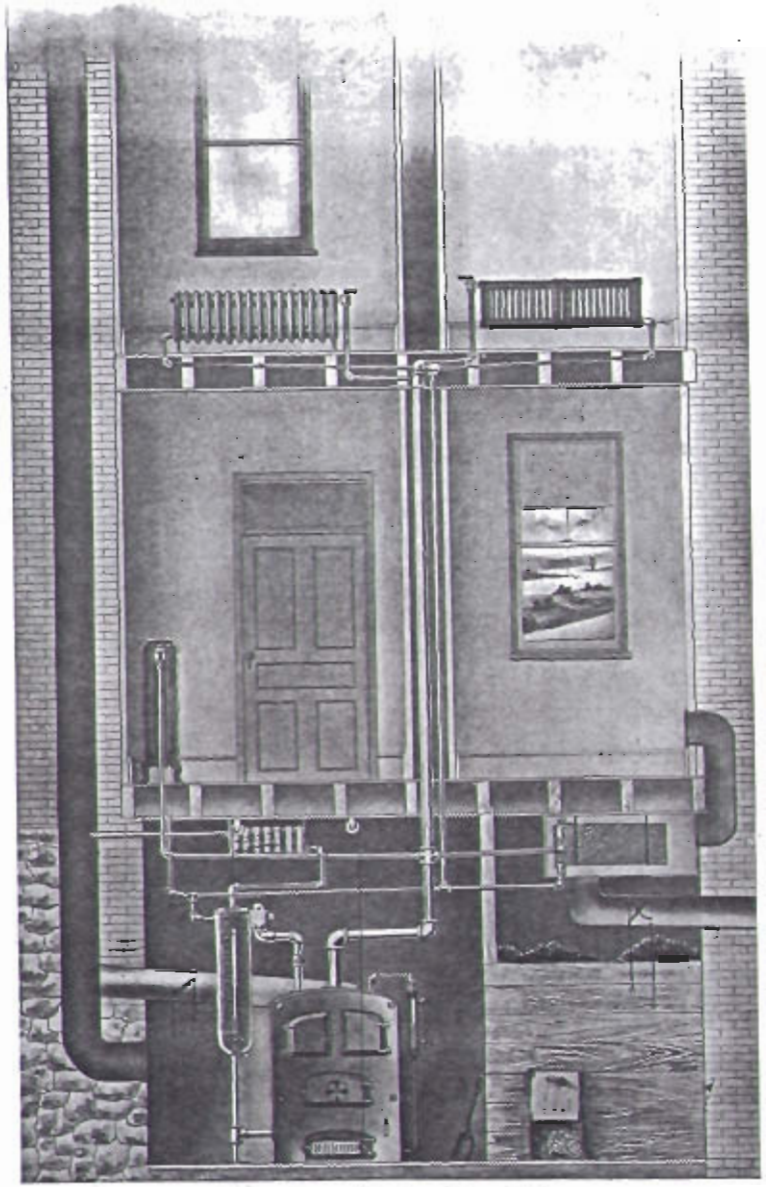
The ordinary Radiator-throttle

The Vapor Radiator-valve

This illustration shows without argument the advantage from a woman's standpoint, of THE VAPOR SYSTEM Radiator-valve. Not only are the radiator-valves on other systems awkward, but they are frequently impossible to operate by one of ordinary strength of hand and arm.

The Vapor System

The return end of all radiators must be connected to the return pipes by the Broomell Improved Union Elbow. This elbow is of special design and is so constructed that condensation is freely discharged from the radiators through the seal in the elbow, the air being exhausted through the outlet above the seal. From this point air and condensation are taken back in the main return pipe to the seal at top of Receiver.



The Vapor System Boiler Connections and Piping

The Vapor System Boiler Connections and Piping

Vapor ascends from the top of boiler through the main supply and through branch supply pipes to the radiators. When it condenses, the water returns to Receiver through the smaller pipes. The air is also removed from the radiators through the return piping. It will be remembered that no air-valves are used on radiators of THE VAPOR SYSTEM.

The illustration shows both direct and indirect radiation: Direct indicating the presence of radiators in the rooms; indirect indicating the arrangement of an encased radiator beneath the floor, from which heated air—the air being first taken from out of doors—is conducted to the room above.

How the Air is Removed

The Condensing Coil will be observed above the Receiver. The air is removed from the radiators by the return piping, delivered into the seal on Receiver, and discharged from the seal into the Condensing Coil. From the top of the Condensing Coil on opposite end from connection to Receiver the air-line is run into the chimney. This creates a pull and a partial vacuum through the entire system, equal to the draft of the chimney, exhausting the air from the radiators and pulling the Vapor into them when radiator-valves are opened.

The Condensing Coil eliminates any possibility of moisture entering the chimney.

The Vapor System; how it works

By considering the illustrations and descriptions of Receiver, Quintuple Valve and Boiler Connections, together with the following explanation, the operation and self-regulation of THE VAPOR SYSTEM should be readily understood.

First, water is let into the boiler, filling it to the proper level. A fire is started. Soon the water vaporizes. Then vapor ascends in the supply pipes and enters the radiators. It does so in a natural way. The vapor is not forced through the system. There is no pressure, as with other systems. Moreover, it has no air resistance to overcome. Air is removed from all radiators through return piping and delivered into the seal on Receiver, from where it is carried into the chimney, passing through Condensing Coil. The draft in the chimney gives at all times an ample pull to free the entire system of air. And it serves also to pull the vapor rapidly into the radiators. The air being thus exhausted from THE VAPOR SYSTEM no air valves are needed on radiators.

The water of condensation returns by gravity through the small pipes (see illustration page 12) to the Receiver and from Receiver goes back into the boiler. Water cannot accumulate in radiators or pipes.

It will be seen at once that THE VAPOR SYSTEM has a natural, and therefore ideal circulation.

Vapor ascends in the pipes because it is natural for vapor to go up.

Condensation returns because it is natural for water to run down.

The air is exhausted from the system by means of the chimney connection because it is natural for air to be drawn into a chimney.

In self-regulation (boiler control) THE VAPOR SYSTEM is as superior as in its circulation. With the gradual heating up of the radiators is a gradual checking of the fire. Little by little the draft is shut off. When the system is in full operation, the draft-regulating apparatus works continuously,—a little more, a little less fire as is required to produce Vapor in proportion to its consumption.

Now, the radiators becoming thoroughly heated, cease to consume all the Vapor the boiler is producing. Thus follows an increase of the Vapor in boiler, depressing the water there and elevating it in the Receiver, the latter being open to the atmosphere. The draft-regulating float in Receiver is carried upward, operating the draft, checking the fire, and reducing the production of Vapor to an amount necessary to keep the system filled. It should be noted that the Receiver of THE VAPOR SYSTEM constitutes the *most satisfactory and reliable automatic draft-regulator yet devised, opening and closing the draft on change of two ounces of pressure, and at any point between zero to ten ounces on boiler.*

In the event of a continued increase in pressure after the draft is closed, as would result from neglect to close ash-pit door, the rising water in Receiver will carry the draft-regulating float up until it operates the Relief-valve. Escape of the excess Vapor from the boiler will immediately reduce the pressure; then the water in Receiver will drop and Relief-valve will close.

The distance between water-line of boiler and extreme high-water in the Receiver is never more than eighteen inches. The

maximum pressure, therefore, that can ever be on the boiler will equal a column of water eighteen inches high, or less than three-quarters of a pound per square inch.

It should be emphasized that any radiator on THE VAPOR SYSTEM, may be used independently of any, or of all others.

And that the temperature of every radiator may be regulated to meet the necessity of the moment, as explained in the description of Quintuple Valve.

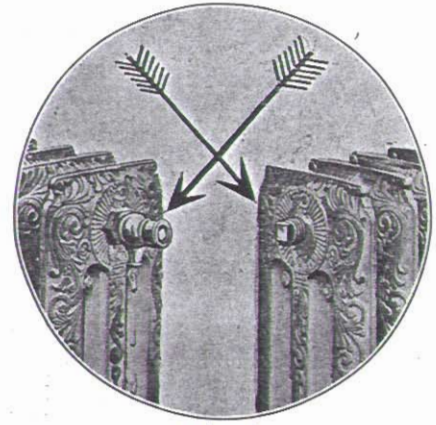
The boiler-regulating apparatus responds as perfectly when Radiator-valves are partly opened as when fully opened. With quarter-open valves, Vapor is produced to heat a fourth (approximately) of the surface of the radiators; then the fire is automatically checked, as has been described. The same applies to half-open valves with half of the radiation heated; and to three-quarters open valves with three-fourths of the surface heated. So sensitive is the regulating apparatus that the opening or closing of an individual Radiator-valve acts on the fire, checking it or stimulating it as the case may be. Thus, there can be no excessive consumption of fuel with THE VAPOR SYSTEM.

With THE VAPOR SYSTEM heat is produced in the exact ratio that heat is consumed. There is no waste. Never too much, yet always plenty. The amount of heat is limited only by the requirements of the weather.

The efficiency and convenience of THE VAPOR SYSTEM is conspicuously demonstrated by extreme requirements. Other systems are usually insufficient in very severe weather, and are rarely temperate enough for mild days.

The advantages of THE VAPOR SYSTEM are appreciated no less in the early fall and late spring than in mid-winter. In the seasons of warm days and cold nights a little heat is needed morning and evening to take off the chill, but none during the day. Neither steam nor hot-water meets this need. With THE VAPOR SYSTEM simply open the boiler door and pipes and radiators become cold; close the door and the system is heated again—in fifteen to twenty minutes.

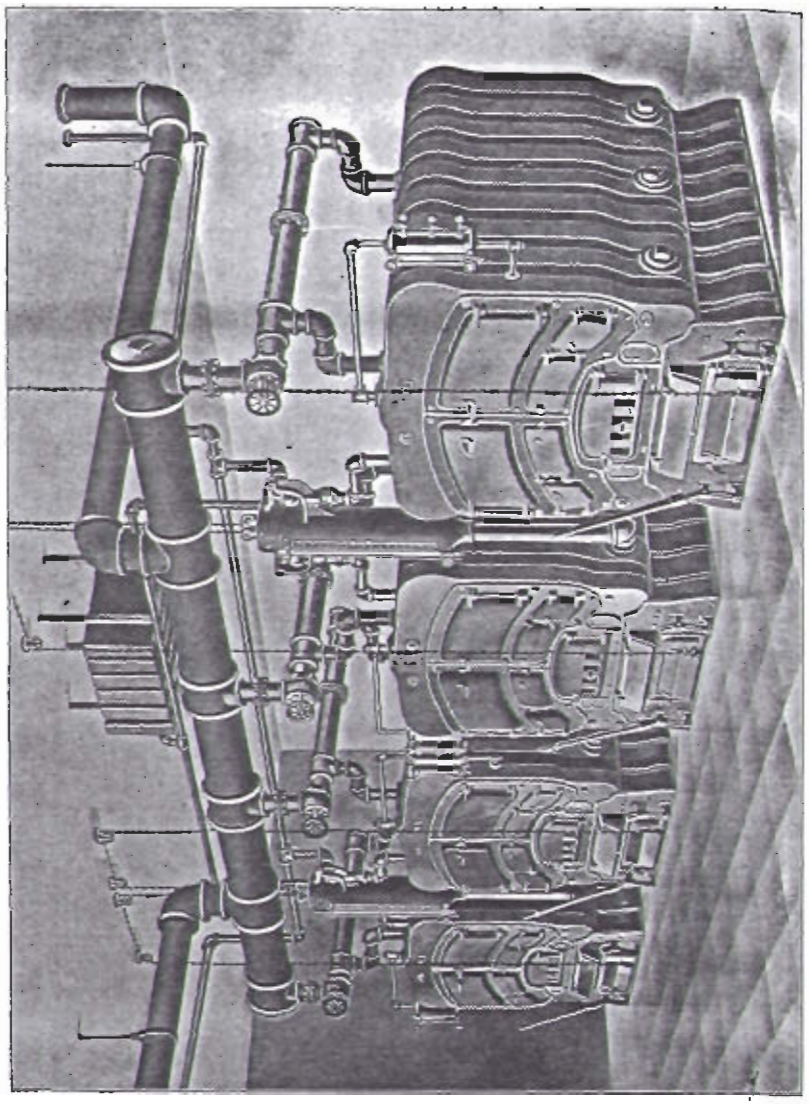
VAPOR HEATING COMPANY
PHILADELPHIA



Which?

No Air-valves with Vapor

A plug takes the place of the air-valve on radiators. No water, no noxious gases can escape from radiators on THE VAPOR SYSTEM, as on steam and hot-water.



BOILER SETTING—CENTRAL PLANT, BROOMELL VAPOR SYSTEM
Arrangement of boilers for large institutions, hotels or buildings requiring a central heating plant capable of heating large areas

The Vapor System Compared

with steam and hot-water systems

THE VAPOR SYSTEM needs only ounces of pressure, and that in the boiler alone—for the purpose of regulating the draft. There is absolutely no pressure on the radiators.

A steam system

requires pounds of pressure, as against ounces with VAPOR. Boiler pressure on a steam system is exerted on pipes and radiators, the system being closed, since both supply and return are connected directly to boiler. And where there is pressure on piping it is very difficult to eliminate the snapping, cracking noises incident to pressure expansion and the subsequent contraction. With THE VAPOR SYSTEM pressure on boiler is limited to the amount necessary to operate drafts, say two to six ounces. The radiators are at all times free of pressure, since the return line is open to the atmosphere.

A hot-water system

first, is required to withstand the great weight of the water with which it is filled. Without warning and without apparent cause, a fitting will break, a radiator loop split, bonnet of valve come off, or one of many things may happen, causing damage to the building and furnishings, and involving costly repairs.

Then, provision must be made for expansion, the water when heated expanding about 1-25 of its volume. Accordingly, hot-water systems are erected with an expansion tank or on the closed system with relief valve. Both plans are open to serious objections.

An expansion tank must be located above all radiators, and often where it is difficult to

prevent freezing. In cold weather care must be taken to maintain circulation throughout the entire system; all radiator valves must be kept open, and air-valves must be opened frequently. Without this precaution, not only expansion tank but radiators and pipes will freeze and burst. Or, should the fire burn up, and the water get too hot, it will boil in expansion tank, and frequently out over the sides of the tank, flooding everything below.

If a relief valve is used, it may fail to work, as these valves often do, throwing too much pressure on the system, with a result that radiators or pipes burst, and a flood follows as a matter of course.

Above all things, a closed hot-water system, running under pressure, is to be avoided.

Accidents usually happen during the coldest weather, involving not only loss by the damage done and expense of repairs, but great personal inconvenience.

Steam systems

THE VAPOR SYSTEM operates *without air valves on radiators.*

with the exception noted below, require every radiator to be provided with an air-valve. Automatic valves, being delicate pieces of mechanism, need adjustment and care by an expert; otherwise they cease to be automatic, and are a source of continual trouble. Not infrequently a room is flooded, and floor-coverings are ruined, by water escaping through an automatic valve. If hand air-valves are used, it is necessary to open them in the morning, or every time steam goes down in

the boiler; otherwise radiators will not heat when steam is again made. Air-valves are also highly objectionable because of the noxious gases they discharge.

With a steam system, in which an air pump is employed, air-valves on radiators are dispensed with, but such a system is only feasible where a professional engineer is employed.

The hot-water system

also requires air-valves. These valves are opened and closed by hand. There is always the chance that an air-valve will be left open by oversight. And it generally happens that the valve so left open is in a place where the most serious damage results.

The steam system

THE VAPOR SYSTEM operates noiselessly.

is capable of producing the most distressing noises imaginable. Everyone is familiar with the nerve-jarring rattle, thump and jump of steam pipes and radiators, caused by contact of cold water and live steam.

The steam system

THE VAPOR SYSTEM operates automatically, requiring attention only to fuel and ashes.

cannot be trusted to automatic control, but—whether double-valve, single-valve, or vacuum—requires constant watching and attention.

The hot-water system

is also without satisfactory automatic control because, thus far, no damper-regulator has been devised that will automatically regulate the draft in a hot-water heater. This is a serious objection,

THE VAPOR SYSTEM admits of regulation of heat in each radiator, by means of its superior radiator valve.

making it necessary for some one to visit the heater several times a day, to properly set dampers and control fire.

The steam system

is universally criticized because it is either "too cold" or "too hot." The theory when heating by steam is to use a radiator of sufficient size to heat the room in coldest weather. It follows, necessarily, that radiator is too large for moderate weather.

It is impossible to regulate the amount of steam delivered to radiators, working on the gravity system. If the supply valve is partially shut, in an attempt to control the temperature of the room by admitting less steam, the radiator will not work properly and in a short time will fill with water. The valves must be wide open, or entirely closed.

The hot-water system

in respect to the regulation of heat, is an improvement on steam, but not more so than THE VAPOR SYSTEM is on hot-water. In hot-water heating, temperature changes are very slow. When the weather is extremely cold, or the fire is low, and the water-temperature has fallen, it takes the greater part of the day to get up enough heat for comfort. On the other hand, when the house becomes over-heated, as is likely toward evening, it takes about as long to reduce the temperature of the water with which the system is filled. Windows are impatiently thrown open, causing drafts and endangering health. With

THE VAPOR SYSTEM accumulates no water in radiators or pipes.

THE VAPOR SYSTEM you can have as much heat, or as little, as conditions require, and without delay.

The hot-water system

is of course, filled with water. The dangers from the weight of the great volume of water in pipes and radiators, and of the evils of the expansion of this water, have already had comment.

The steam system

constantly accumulates water in radiators and pipes. If automatic air-valves are on radiators the water soon reaches them and escapes; carpets, furniture and ceiling are ruined. After a radiator has filled with water and a valve is opened to again heat it, the water passing from radiator and meeting hot steam in pipes below, makes a dreadful noise.

THE VAPOR SYSTEM is safe and dependable—no pressure to break radiators, crack pipes or strain boiler.

The hot-water system

sustaining, as it does, tremendous pressure, is liable to accident at any moment, as already pointed out.

The steam system

being also under pressure (unless operated by machinery producing a vacuum), is subject to accidents similar to the hot-water system. But the chief source of trouble is the boiler. One radiator filling with water may take out of the boiler sufficient to bring the water line below crown sheet or other exposed surface. If the

boiler is cast-iron it is almost certain to crack. A steel boiler blisters and finally collapses.

The attendant, noticing that the boiler has suddenly lost water, should locate and open the radiators which contain this water. Instead of doing so, however, he is more likely to take the easier way—he fills the boiler to the proper point. Later, someone opens the flooded radiators, all the water returns to the boiler, perhaps filling it above steam outlet, stopping circulation of steam and causing a tremendous pounding in the piping. Or, should the lack of water in boiler remain unnoticed, and a flooded radiator be opened, the water will rush into the boiler over the very hot surfaces, and be instantly converted into steam, at a high and sometimes dangerous pressure. Boiler explosions are caused in this way.

The steam system

THE VAPOR SYSTEM has quick and free circulation; much quicker and freer than either steam or hot-water.

presents engineering difficulties in circulation to which steamfitters are not always equal. Even when perfectly installed, serious interruption to free circulation is caused by the shutting off of radiators in overheated rooms. A closed radiator here and there on a system may stop circulation altogether.

On steam systems

circulation is constantly interrupted by the presence of water and air in pipes and radiators, unless operated by machinery.

With THE VAPOR SYSTEM, simply open the valve and the radiator heats up at once—no

water there, nor even air that can obstruct or interfere with the Vapor. The chimney suction on end of air line exhausts the air and draws the Vapor into radiators.

The steam system

THE VAPOR SYSTEM'S radiator valves are never troublesome. They turn at the touch of the finger.

with two valves, makes it necessary, when a radiator is shut off, to close both throttles. If either one be left open, the radiator will fill with water. The valves, being opened and closed so frequently, soon become defective and leak sufficient steam to fill the radiators with water. This continual opening and closing also wears out the packing around valve stems, making it necessary to have them repacked; otherwise there is a continual leakage of steam into the room.

The single valve system reduces the labor, somewhat, but the same annoyance remains, not the least of which is that, when opened, or closed, the services of someone with an unusually powerful hand and strong arm are required to again move the valve.

A hot-water system

THE VAPOR SYSTEM is more economical, —produces better results in proportion to fuel consumed than either hot-water or steam.

requires the same type of radiator-valve as steam. With both hot-water and steam the valves are placed near the floor, whereas, with VAPOR the valve is at the top of radiator in easy reach. The pressure of a finger is sufficient to turn it.

This is, of course, the logical result of the combined points of superiority.

THE VAPOR SYSTEM compared with steam and hot-water systems

(Continued)

THE VAPOR SYSTEM saves on fuel because it operates without pressure; because of the practically perfect automatic control of boiler; because of the accurate regulation of heat; because no water can accumulate in radiators and pipes; because the circulation is quicker and freer; and, because there is no waste.

THE VAPOR SYSTEM is superior in the quality of heat.

It is always temperate. It does not run to extremes; it is never violent, never deficient. On the bitterest days, there is ample for healthful warmth; in mild weather, there is just enough for comfort. THE VAPOR SYSTEM responds to every change of weather.

"Far less troublesome than ordinary hot-air furnace"

The advantages claimed for THE VAPOR SYSTEM, after thorough investigation of all the up-to-date methods of heating, induced me to adopt it.

The following are some of the many advantages, I think, over all other systems:

1. A perfect control of the temperature in any part of the house by a simple device attached to every radiator.
2. Entire absence of noises in the pipes, such as hissing, rumbling, etc.
3. The impossibility of freezing, leakage or bursting. On the coldest day when the boiler was at its best the pressure did not exceed two ounces at any time.
4. Even distribution of heat throughout the house night and day, insuring a continuously warm house.
5. A slightly moist heat permeates the whole house.
6. Absolute cleanliness.
7. Simplicity of construction and ease of handling—far less troublesome than ordinary hot-air furnace owing to its automatic attachments.

—E. F. Biscoe, M. D., 2311 North 33d Street, Philadelphia

SPECIAL NOTICE

THE Vapor Heating Company is the exclusive owner and manufacturer of the Vapor specialties used with THE BROOMELL VAPOR SYSTEM. It acts as engineer, taking all responsibility in connection with this System, if properly installed according to plans and specifications: Any deficiency in radiation, or any fault due to mistake in plans and specifications that may be discovered in the completed work, will be corrected without charge to the Owner, Heating Contractor or Architect, provided full, complete and correct data has been furnished.

Owners, Architects and Heating Contractors are requested to send drawings or blue prints of buildings in which they want to install THE BROOMELL VAPOR HEATING SYSTEM. On receipt of such drawings or prints, the Vapor Heating Company will make complete plans, showing sizes of all radiators, piping, etc.; and will furnish complete specifications setting forth in detail how the work must be installed. These plans and specifications can then be submitted to any number of Heating Contractors and bids obtained for the work.

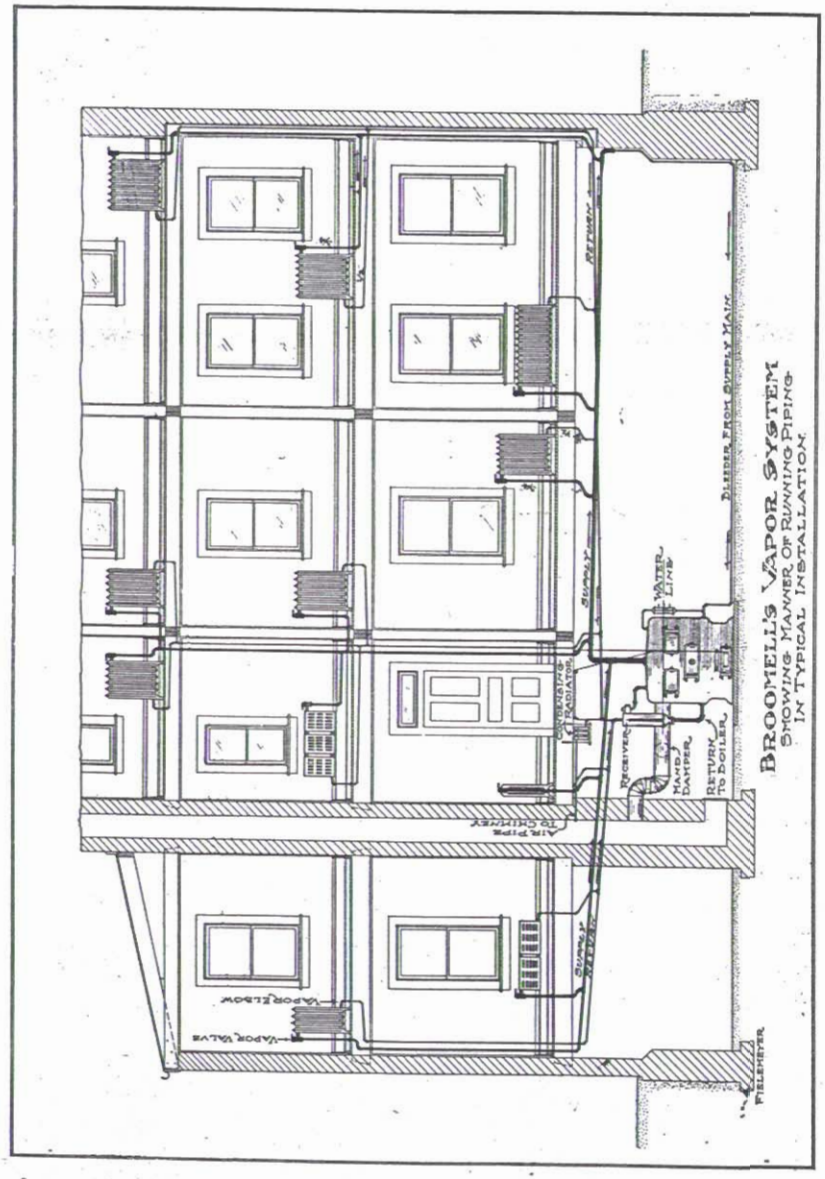
The Architect is thus relieved of the work and responsibility of getting up heating plans and specifications. This method is also to the advantage of the Heating Contractor for the reason that he is called on to put in only what is specified and shown on the plans. If the work is properly done, the responsibility of the Heating Contractor ceases.

By this method the Owner has the advantage of competitive bids—is certain to get a first-class job at a fair price, and is protected from any loss or uncertainty as to the operation of the system, or proper heating of the building, by the Vapor Heating Company, which, as above stated, assumes all responsibility for the operation of the system, if installed in complete accordance with its plans and specifications.

The Vapor Heating Company does not act as superintendent, nor does it assume responsibility for the quality or operation of the different parts supplied other than the VAPOR specialties. The responsibility of the Vapor Heating Company extends only to seeing that the boiler, the radiators, the valves placed on the radiators, and the pipes, are of the size specified, and installed according to plans.

VAPOR HEATING COMPANY

THE NORTH AMERICAN BUILDING, PHILADELPHIA



Typical Installation

In the illustration on opposite page, the supply line from left hand side of boiler pitches up-hill and supply line from right hand side of boiler, pitches down-hill.

Up-hill supply line should pitch not less than two inches in ten feet—more than this, if possible. A pitch of one-half inch in ten feet is sufficient in down-hill supply runs, but more is advisable if it can be obtained.

The return lines furthest from boiler, start as close to over-head joists as possible and pitch back to return inlet, near top of Receiver, on down-hill grade of not less than one-half inch in ten feet. Condensation flows through Receiver and is discharged into boiler, through return pipe which connects with return-inlet below boiler water line. An air pipe from top of seal on back of Receiver connects to bottom outlet of Condensing-Coil and from a top outlet of Condensing-Coil, is connected to chimney.

A bleeder-line is taken from the lowest point of down-hill supply main, connecting to a return-outlet at back of boiler. Bleeder-line to drop below boiler water-line as near to point of connection to supply as possible. If this cannot be done, bleeder may run overhead on down-hill grade toward boiler, and drop, directly at boiler, to the return inlet.

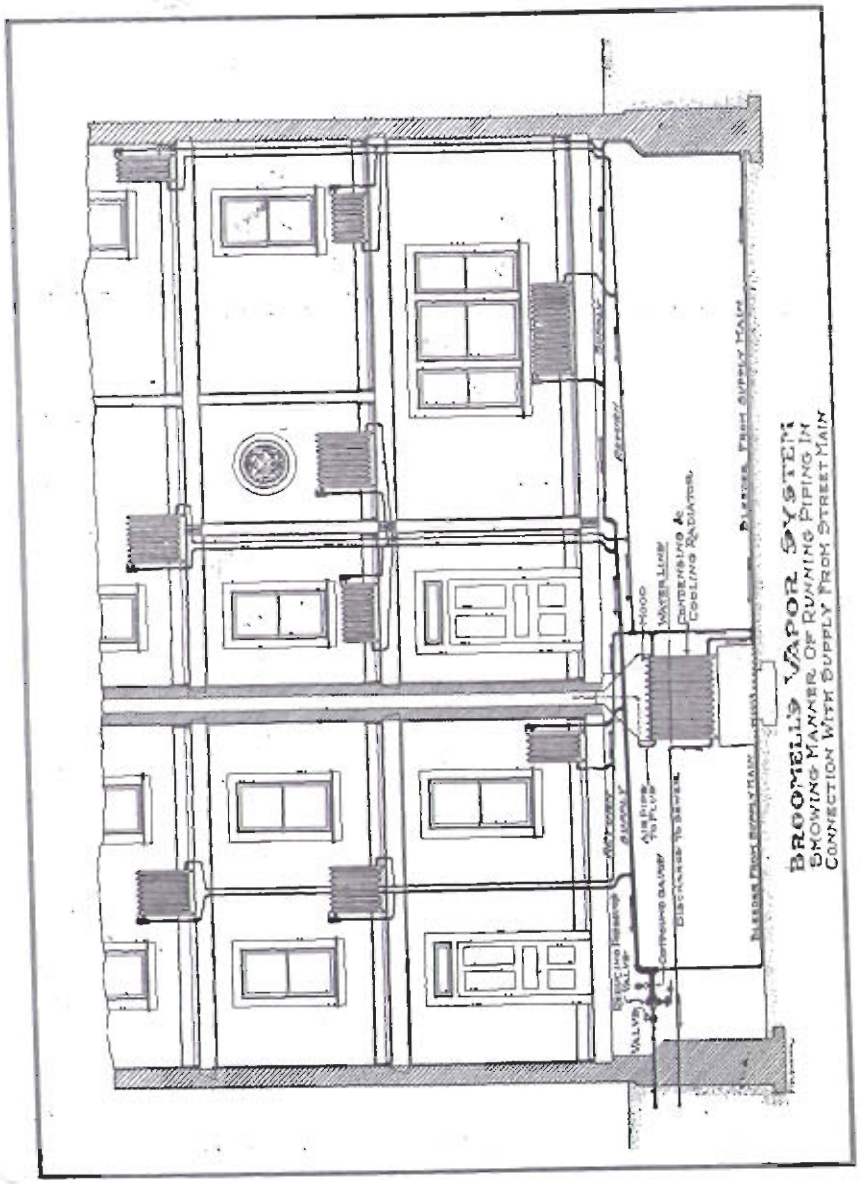
Supply and return connections for first floor radiators to be taken directly from basement mains.

Supply and return rising-lines may be run exposed or concealed in stud partitions or chases.

Lateral supply and return branches from risers may be run either above or below floors, but in all cases must have positive up-hill pitch.

Size of lateral supply-runs depends on size of radiators and their distance from risers; all upright supply pipes from ends of lateral runs are three-quarters inch up to vapor valve. All lateral return branches from union elbows are one-half inch, and return rising lines are not smaller than three-quarters inch.

In basement all lateral supply branches are not less than one size larger than the risers to which they connect.



Piping Connections from Street Main

The illustration on the opposite page shows the connections and piping for plant taking its supply from a street main. Just inside building wall place on supply pipe a controlling-valve and a reducing-pressure valve, for reducing the pressure from that carried on street main, to one pound or less. An accurate compound gauge is placed on the heating main close to the reducing-pressure valve.

From the low pressure side of reducing-valve the supply main runs on up-hill and down-hill grades to connect with risers and first floor radiators.

A condensing and cooling radiator, generally of the two column type, forty-five inches high is used. The upper part for condensing and the lower part for cooling surface. This radiator has four tappings, two on each end, top and bottom.

The returns from radiators are connected to one of the top outlets, and bleeders from supply mains to one of the bottom outlets on same end.

From top outlet of opposite end, an air line is extended to flue for exhausting air from system, and from bottom outlet a discharge pipe is extended to sewer or street return.

This condensing and cooling radiator is placed near to an available flue and the radiator provided with a metal hood, covering entire top of radiator, and connecting tightly to the upright flue. Where there is no flue in basement for air line and hood connections, it can usually be arranged to extend a special metal flue up through building.

Method of running mains, return, bleeders, risers, etc., is the same as described for typical boiler installation.

Connections from High Pressure Boiler Plant

In the illustration on opposite page, BROOMELL'S VAPOR SYSTEM is shown installed in connection with high pressure boiler plant.

The heating supply is taken from high pressure main, and is connected to heating main through reducing-pressure valve. From low pressure side of reducing-valve the heating main is extended on down-hill and up-hill runs as required.

An automatic Receiver-and-Pump is used, and returns from radiators, and bleeders from supply mains, are connected to one of the outlets on top of Receiver-and-Pump.

From the other outlet on top of Receiver, air-line is extended up to Condensing-Coil and from Condensing-Coil to chimney.

All of the exhaust steam from engines and pumps to be utilized, the exhaust to be connected into the heating-main on low pressure side of reducing valve, and to be provided with Grease-extractor and back-pressure valve.

Method of running mains, returns, bleeders, risers, etc., is the same as described for typical low-pressure boiler installation.

NOTE: The illustrations in this catalogue show the distributing supply mains run in basement.

BROOMELL'S VAPOR SYSTEM can be equally as well installed on the over-head system, with distributing mains run in attic space or at ceiling of top floor of building.