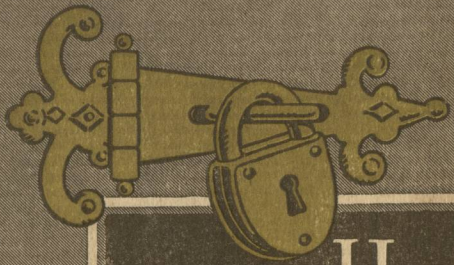

How to LOCK OUT AIR the heat thief

At the back of this book
you will find
several testimonial letters of
great interest to all home owners.
Do not miss reading
them.

How To Lock Out AIR

THE HEAT THIEF

Published by Service Department
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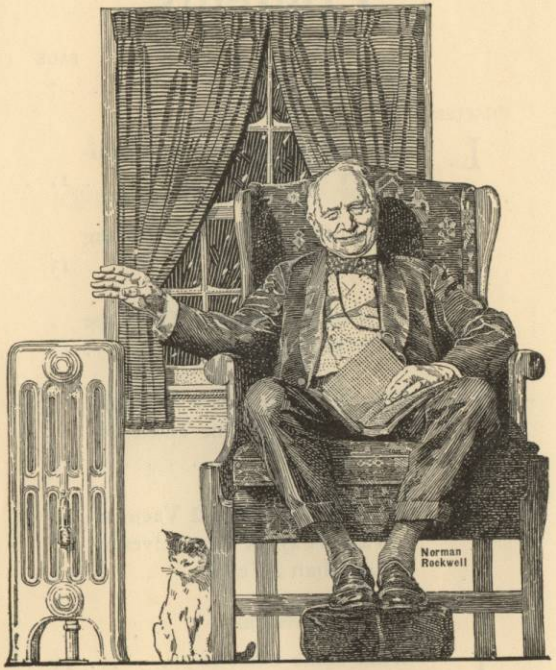
Contents



Introduction

THE history of steam heat is the history of the air-venting valve. Until the automatic air valve was invented (in the latter part of the 19th century) attempts to produce a practical steam heating system were failures.

James Watt, who discovered steam power, attempted to design and build a steam heating system for himself as far back as 1784. Watt's study, a room 20 feet square, was extremely cold and damp. He proposed to heat this room by utilizing his chief hobby—steam. Accordingly, he built a crude radiator, connecting it by a pipe to a small boiler outside. It was a failure. The radiator did not heat.

Others tried, and failed. Finally, long afterward, the air-venting principle was discovered by chance in 1840. The story states that a certain steam system (unlike its earlier brethren) heated very quickly. The great objection to it was the odor of steam and smelly pipes. The designer investigated and found several sand holes in the cast iron. When these holes were plugged to eliminate the steam odor, circulation stopped. The system lost its heating efficiency. The holes had acted as air vents which permitted steam circulation. The principle of air-venting had been discovered.

It was not, however, until 1889 that the automatic air-venting valve was put into operation. Today this is com-

mon on all steam heating radiators, closing when steam or water reaches the radiator, preventing steam or water leakage.

However, this type of air valve does not always work as it should. We know that some hiss and sputter or spit water. That isn't their worst fault. The old type air-valve many times does not let the air out of a radiator even with high steam pressure. Heating engineers call such a condition an "air-bound" radiator. The air can't get out. The steam can't flow in. The radiator stays cold or heats only partially. Nearly every home has one or more such radiators. However, it was the discovery of his air-venting principle, defective as it occasionally is, which made steam heat possible.

It therefore becomes evident that without perfection in air-venting equipment—perfection of service in a steam heating plant is today impossible.

It is important that you know something about the history of recent developments in air-venting equipment. Only so can you hope to secure maximum comfort and convenience (not to mention large economies) in operating your present steam heating system.

The purpose of this book is to give you this needed information.

Geo D Hoffman

How To Lock Out AIR The Heat Thief

With ordinary air-venting valves on radiators, it is necessary if a man desires to sit up late reading, to keep the fire in his steam heating system going brightly until within at least a half hour of the time he desires to retire. Now, by a new method, the fire can be banked three hours before retiring and yet radiators will stay hot. Furthermore steam can be obtained in the morning in 15 minutes instead of an hour. See details in this book.

Chapter I

The one big objection to ordinary steam heat

IT IS well here to quote an impartial authority on the merits of various types of heating systems. By so doing the improvements made possible in your present steam heating system by using the Hoffman No. 2 Vacuum Valve become all the more apparent.

The New International Encyclopedia (in its 1924 edition—pages 62–63 of volume 11) says:—

"Either steam or hot water is the most common medium for heating the better class of residences and large buildings. Either may be conveyed long distances with ease, and both are practically unaffected by the direction or the strength of the wind—freedom from a limitation which is one of the greatest drawbacks to the use of hot-air furnaces."

"Both steam and hot water systems require a boiler or heater, a pipe system, and radiators. As the hot water is circulated at 140° F., against 212° F. for low pressure steam, the radiating surface for hot water must be larger by about 65 per cent than for steam. Hot water fitting requires greater care in design and construction than steam, due to the fact that the circulating force in hot water heating is due to the difference of temperature in the ascending and descending column and is feeble; it is overcome by obstructions in

pipes, bad alignment, etc. The circulation is also inversely as the resistance in a pipe, and hence the distribution of heat is greatly affected by the pipe construction."

"Hot water has this advantage over steam, viz., that it begins to yield heat very soon after the fire is started and continues to do so until the water cools, while there can be no heat from steam plants until a water temperature of 212° F. has been attained, and none after it falls below that point. The hot water system works without noise, while the steam system is likely to be affected by water hammer and to be very noisy when steam is first turned on."

> Therefore, the one big objection to steam heat has been the fact that "*there can be no heat from steam plants until a water temperature of 212° F. has been attained, and none after it falls below that point.*"

Despite this fact, steam heat has (although introduced much later than the other types of heating equipment) become the favorite and dominant type of heating system in better class American homes.

It will now be shown how this one big objection to steam heat has recently been conquered—along with the minor objection of noise.

As a result one pipe steam systems can now have the uniform radiator temperature and freedom from noise of a hot water system combined with the flexibility and economy (of installation and maintenance) available only in steam systems themselves.

Chapter II

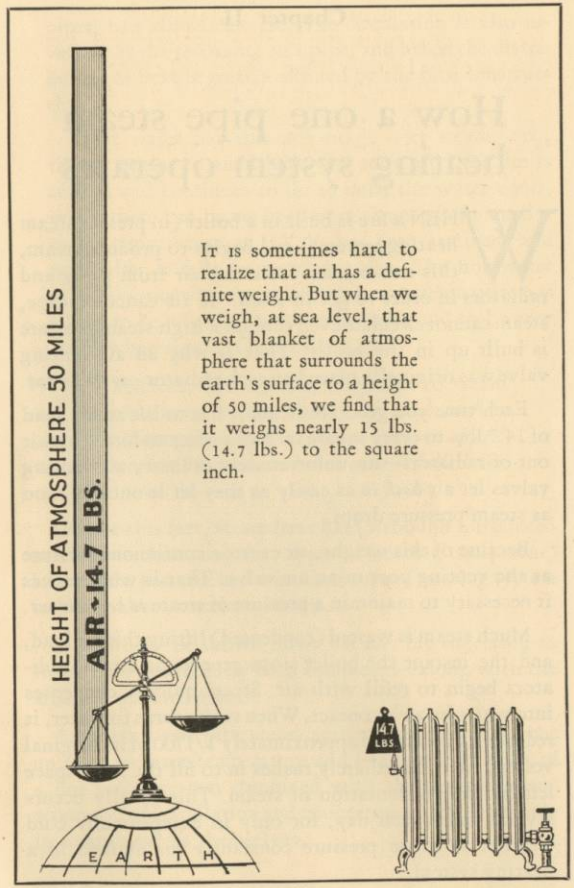
How a one pipe steam heating system operates

WHEN a fire is built in a boiler (in present steam heating systems) and begins to produce steam, this steam must force out air from pipes and radiators in order to get in itself. If air cannot escape, steam cannot circulate even though a high steam pressure is built up in the boiler. That is why an air-venting valve was originally placed on each radiator—*to let air out.*

Each time you generate steam it has to lift an air load of 14.7 lbs. to every square inch of surface to force this air out of radiators—for unfortunately ordinary air-venting valves let air *back in* as easily as they let it out—as soon as steam pressure drops.

Because of this weight, air exerts a continuous pressure at the venting port in an air valve. That is what makes it necessary to maintain a pressure of steam *to keep air out.*

Much steam is wasted (condensed) lifting this air load, and the instant the boiler stops generating steam, radiators begin to refill with air. Steam quickly condenses into water by air's contact. When steam turns to water, it reduces its volume to approximately 1/1700 of its original volume. Air immediately rushes in to fill the large space left by the condensation of steam. This usually occurs several times each day, for only in exceptionally cold weather is steam pressure constantly maintained in a heating system.



It is sometimes hard to realize that air has a definite weight. But when we weigh, at sea level, that vast blanket of atmosphere that surrounds the earth's surface to a height of 50 miles, we find that it weighs nearly 15 lbs. (14.7 lbs.) to the square inch.

This occurs, because in most climates a house requires less heat through the middle of the day, especially during the Spring and Fall. Fires are then checked, and pressure at the boiler drops. At such a time, air re-enters the radiators and pipes and quickly fills the system. *So it is possible to waste more fuel on mild days than when the weather is stinging cold.*

Consequently there is no let up in this battle between steam and air when ordinary air-venting valves are used. It is continuous every hour of the day and night. A cold radiator means a radiator full of air. Steam must constantly exert a pressure to keep air out. Little of the fuel that is used to maintain this necessary pressure and to force air out of radiators furnishes useful heat.

When steam is generated the water in the system reverses the condensing process, expanding to a volume approximately 1700 times as great as the water itself. A tablespoon of water, vaporized, fills a large radiator. It is for this reason that when steam turns back to water, unless air can get back into the radiator, *a vacuum will be created.* The ten year old son of a heating engineer recently described this vacuum in very fitting terms. He said "a vacuum is a place where air isn't and nothing else is."

It is the next and latest step in these historic advances in steam heat (the utilization of this principle of the vacuum) which now becomes important for you to understand in order to increase the comfort and economy of your steam heating system.

ILLUSTRATED above is the famous Hoffman No. 2 Vacuum Valve. When this valve is used to replace ordinary air-venting valves on the radiators in your home, you can get up steam in 15 minutes (not an hour). You can have hot radiators three hours (not 30 minutes) after fires are banked at night, and you save one third of the coal, oil or gas you formerly used.

Chapter III

How to Vacuumize a one pipe steam system

ANY good heating and plumbing shop in a few hours (without tearing out your present steam plant or putting in any new piping) can, by making one simple change vacuumize your present one pipe steam system — enabling you to get up steam in 15 minutes (not an hour); and keep radiators piping hot 3 hours (not 30 minutes) after fires are banked and steam pressure drops. What is more, this one change can save you one-third of any fuel you now use — whether it be coal, oil or gas.

The invention that vacuumizes your steam system—that makes this amazing new comfort and fuel saving possible—is the Hoffman No. 2 Vacuum Valve. The only change required in your system is to take off the air-venting valve on each of your radiators and replace it with a Hoffman No. 2 Vacuum Valve—followed by a general tightening of your system to make it air-tight and the placing of the proper Hoffman Vacuum Valve on the return mains in the basement.

Here is the reason that vacuumizing your steam system makes this great comfort and economy possible.

You will remember that air-venting valves let air out as steam pressure lifts the air load—and that as soon as this pressure stops, air forces its way back—condensing steam and cooling radiators.

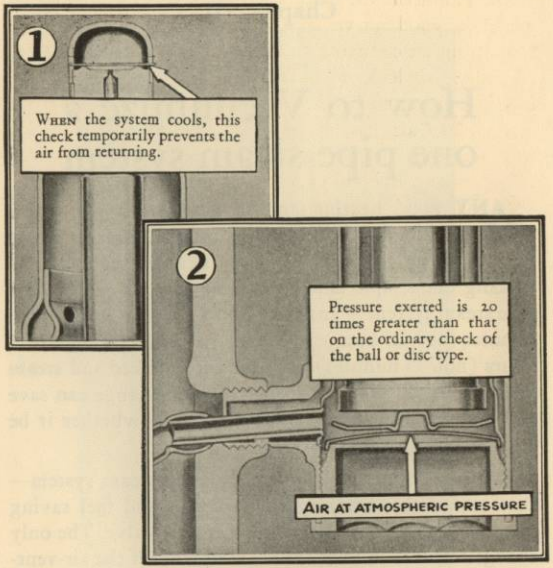


Figure 1 shows temporary check or vacuum starter closed. It momentarily prevents return of air until atmospheric pressure brings large area vacuum diaphragm (see Figure 2) into action. This "double locking" principle accounts for the amazing results Hoffman No. 2 Vacuum Valves achieve.

Figure 2 shows large area vacuum diaphragm in base of No. 2 Valve. Note how atmospheric pressure (exerting a pressure of 14.7 lbs. to the square inch) forces this diaphragm upward raising float and doubly locking vent port; the real reason for the Valve's tightness and efficiency.

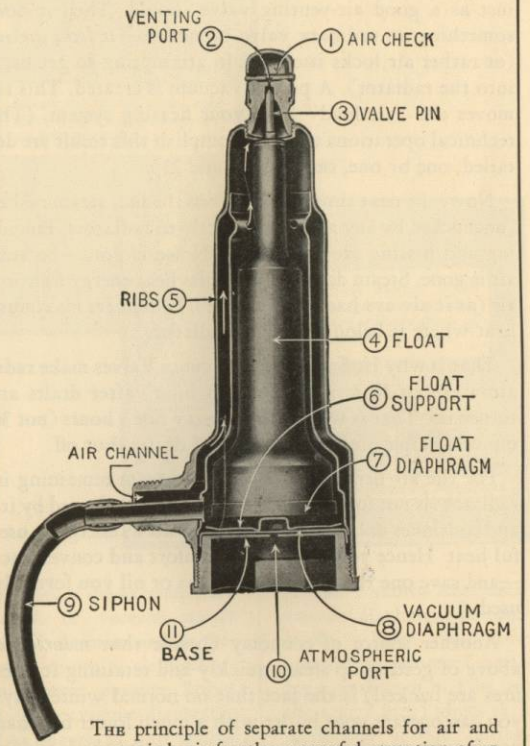
The Hoffman No. 2 Vacuum Valve lets air out *quickly* just as a good air-venting valve should. Then it does something an ordinary valve cannot do—***it locks air out*** (or rather air locks itself out in attempting to get back into the radiator). A partial vacuum is created. This removes the "air load" from your heating system. (The technical operations which accomplish this result are detailed, one by one, on pages 20 and 21).

Now, the next time you brighten the fire, steam rushes (unchecked by any air load) directly to radiators. Pounding and hissing are eliminated. Noise is gone—because air is gone. Steam does not waste its heat energy fighting air (as it always had to do before). It delivers maximum heat where it belongs—in the radiators.

That is why Hoffman No. 2 Vacuum Valves make radiators hot in 15 minutes (not an hour) after drafts are turned on. That is why radiators stay hot 3 hours (not 30 minutes) after fires are banked and drafts shut off.

For the air being locked out, the steam remaining in radiators is not forced to fight air (is not condensed by it) and continues unhampered to give up all its energy in useful heat. Hence you get greater comfort and convenience —and save one third of the coal, gas or oil you formerly used.

Another source of economy (beside that mentioned above of getting up steam quickly and retaining it after fires are banked) is the fact that on normal winter days you can operate your boiler with a much lower fire than you require at present. How this is accomplished, and its value, not only in economy but in health, is explained in the following chapters.



The principle of separate channels for air and water is basic for the successful operation of an air valve. This principle is *patented* and may be used only in the Hoffman No. 2 Vacuum Valve.

Technical Description of The Hoffman No. 2 Vacuum Valve

NORMALLY venting port (2) through which air escapes is wide open until steam comes in contact with the float (4). Then the heat sensitive fluid in the float, the thermostatic member, is changed to gaseous state expanding the flexible diaphragm (7), raising the float and closing vent port. If the radiator is shut off or for any reason steam contact ceases, the float diaphragm (7) contracts, and the float drops, the vacuum diaphragm (8) follows up the contracting float diaphragm and thus maintains the vent port closed and prevents the return of air to the radiator. Now, suppose the radiator is only partially heated, in which case the float diaphragm (7) would not be expanded. Under such a condition, as soon as the pressure in the radiator drops and venting ceases, air check (1) drops and closes the port. The steam on this partially heated radiator condenses and as soon as a 1″ vacuum forms, atmospheric pressure exerted through atmospheric port (10) forces vacuum diaphragm (8) upwards, lifting the float and doubly closing the vent port. After this action has occurred, the check valve (1) has no further function, for the port is tightly sealed and the pressure exerted by the diaphragm (8) for the purpose of holding the port closed is 20 times that exerted on the air check alone, without the use of a vacuum diaphragm. In other words, through the use of a large area vacuum diaphragm the available pressure to seal the port against air intake is from 20 to 50 times that of an ordinary disc or ball check, which if used alone (as in the disc of some so-called "vacuum" valves) cannot be depended on to prevent return of air to the system because of the frequent presence of dust, dirt or scale.

The necessity for both the air check (1) often called the automatic vacuum starter, and the major vacuum diaphragm (8)

cannot be emphasized too strongly. The air check (1) is in operation only temporarily. As soon as a 1" vacuum is pulled, the major vacuum diaphragm (8) is operated and *it is this which holds the port closed* and not the air check (1) at the top of the valve. As a matter of fact, if it could be assured that the radiator would fill with steam each time the fire is brightened, the air check would be entirely unnecessary, because the vacuum diaphragm (8) would follow the float diaphragm (7) as it contracts and the port would be kept closed. The combination of a vacuum disc and a vacuum diaphragm is a distinctive Hoffman principle—and fully protected by patents. It insures Hoffman No. 2 Vacuum Valves functioning under all conditions.

One of the great nuisances of the ordinary air-venting valve at present in use on steam heating systems is the fact that after a few months of service it ceases to function properly. We know the familiar hiss and sputter and spitting of water which takes place. This happens because the old type valve will not let the air out of the radiator unless there is high steam pressure to force it out. Heating engineers call such a condition "air-bound" radiator. The air can't get out, the steam cannot flow in. The radiator stays cold or heats only partially. In every home there is one or more such radiators. They are a menace to the health of the family.

Chapter IV

Why Hoffman No. 2 Vacuum Valves save ⅓ of your fuel

Because they lock out air, Hoffman No. 2 Vacuum Valves enable you to run the boiler with a much lower fire—they get up steam in 15 minutes (not an hour)—they keep radiators hot 3 hours (not 30 minutes) after fires are banked—and so save 1/3 of the fuel you formerly used.

The glass teapot test with a Hoffman No. 2 Vacuum Valve makes the reason for this fuel economy clear.

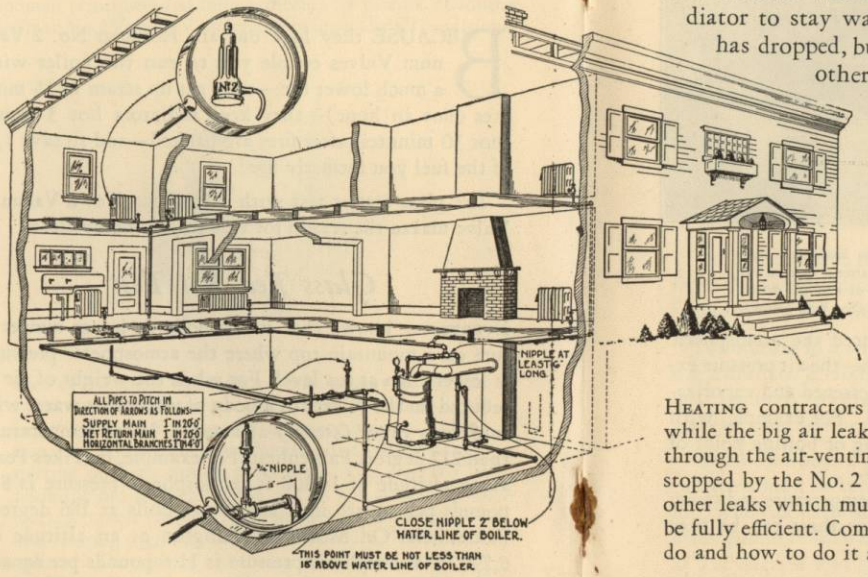
Glass Tea Pot Test

Everybody knows that water boils at lower temperature on a mountain top where the atmospheric pressure is lower than at sea level. For when the weight of air is reduced on the surface of a body of water this water will turn into vapor (steam) at a much lower temperature than 212 degrees Fahrenheit. For example, on Pikes Peak at an altitude of 14,108 ft. atmospheric pressure is 8.6 pounds per square inch and water boils at 186 degrees Fahrenheit. On Mount Washington at an altitude of 6,290 ft. atmospheric pressure is 11.6 pounds per square inch and water boils at 200 degrees Fahrenheit.

When we have expelled air from a radiator and pre-

How to Vacuum-ize your one pipe steam system

To enjoy to the maximum this new heating comfort and economy you have only to equip all radiators with Hoffman No. 2 Vacuum Valves, and if there are one or more air-venting valves on the piping in the cellar, these must also be changed. The No. 6 Hoffman Vacuum Valve is for this purpose. It allows radiators furthest from the boiler to heat up as quickly as those nearest. The testing of even a single No. 2 Hoffman Vacuum Valve on your *worst* radiator will cause that particular radiator to stay warm after steam pressure has dropped, but with air leaking in at other points *you will not secure the last word in heating comfort and economy unless every valve is a Hoffman No. 2 Vacuum Valve.* It will, however, indicate what can be expected with all radiators properly equipped with these amazing valves.



Heating contractors and engineers appreciate that while the big air leak in any steam heating system is through the air-venting valves (this leak is absolutely stopped by the No. 2 Hoffman) there are likely to be other leaks which must be stopped if the system is to be fully efficient. Complete instructions as to what to do and how to do it are sent with the valves.

THE PROPER FUNCTIONING OF HOFFMAN VALVES IS GUARANTEED FOR 5 YEARS

PHOTOGRAPH above shows the famous Hoffman "glass teapot test". Illustration shows how after a vacuum has been originally formed, the lighting of a single match will start the teapot boiling again. (See text below).

vented its return we have reproduced the atmospheric condition on top of a high mountain—the air pressure exerted on the water in the boiler is lessened and vaporization will occur at low temperature. For example, with 15 inches of vacuum, the vaporizing or boiling point of water is approximately 176 degrees.

How the water boils at this low temperature and steam flows into the radiator and remains there can be very readily seen in this tea pot test.

A glass tea pot containing cold water with air tight cover and a No. 2 Hoffman Vacuum Valve attached to the spout is placed on the stove. If the water in the tea

pot is under atmospheric pressure at sea level it must be heated to 212 degrees before it will boil and give off steam. The Hoffman Valve remains open until the water boils and the air in the tea pot is expelled by the steam. As soon as steam comes to the valve the port closes. Then the tea pot is taken off the stove and the water continues to boil for some time thereafter. This is due to the fact that air is not permitted to go back into the tea pot and a vacuum has formed. As the vacuum continues to increase, the boiling temperature of the water lowers and the water continues to vaporize. When boiling eventually ceases a lighted match is applied to the tea pot and instantly boiling is resumed. Compare this with the time required to originally start the water boiling with atmospheric pressure on the water and it will not be difficult to see how and why a No. 2 equipped radiator heats many times faster than one not so equipped and where air has to be expelled before steam can enter the radiator.

The continuation of boiling after the tea pot is removed from the stove indicates why it is possible to keep the radiators warm for long periods with a banked fire.

To indicate in a slight degree the fuel economy resulting from No. 2 Hoffman Valves, compare the time and heat required to originally boil the water on the stove and the time and heat required with the wooden match.

When Hoffman No. 2 Vacuum Valves are installed, radiators may be kept warm on mild days with a slight fire, whereas with ordinary air-venting valves, the radiators would remain absolutely cold until sufficient steam at 212 degrees was generated to force out the air.

There is nothing to obstruct the passage of steam in a vacuumized system because there is no air in the pipes. If

we wish greater heat, we simply heat this steam to a higher temperature by increasing the draft in our boiler. We thus have a truly flexible heating plant.

Thus the one big objection to ordinary steam heat, namely that "*there can be no heat from steam plants until a water temperature of 212° F. has been attained, and none after it falls below that point*," has been conquered.

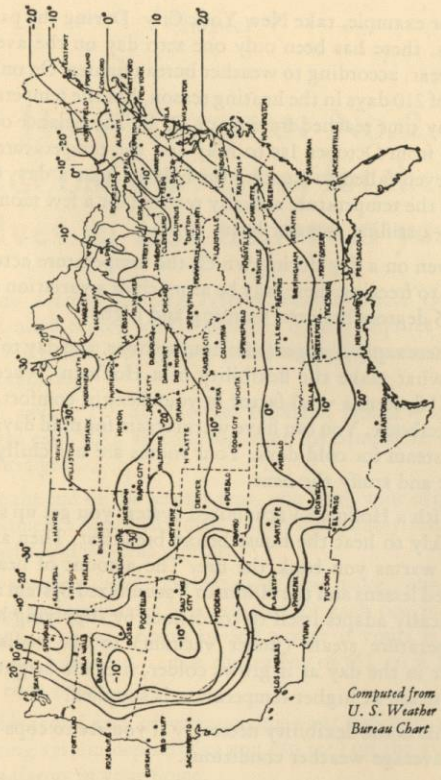
You have a vacuum system—one that combines the best features of the hot water system, uniformity of radiator temperature—and the best of a steam system—speed, flexibility, and economy.

One more thing—and important. When your steam system was installed heating engineers designed it so as to keep your house at 70° at zero outside temperature. (Even lower in certain localities). This means, perhaps, the maintenance of 1 lb. steam pressure continuously.

Yet on the normal or average winter day the morning is cold but at noon the temperature rises to 35° F. or 40° F.

What records of the weather bureau show in typical localities

STATE	CITY	AVERAGE TEMPERATURE OCT. 1st—MAY 1st	LOWEST TEMPERATURE
Col.	Denver	+39.3°	—29°
Conn.	New Haven	+38.0°	—14°
Ind.	Indianapolis	+40.2°	—25°
Md.	Baltimore	+43.6°	— 7°
Mass.	Boston	+37.6°	—13°
Mich.	Detroit	+35.4°	—24°
Minn.	Minneapolis	+29.6°	—33°
Neb.	Lincoln	+37.0°	—29°
N. Y.	Buffalo	+34.7°	—14°
N. Y.	New York	+40.3°	— 6°
Ohio	Cleveland	+36.9°	—17°
Pa.	Philadelphia	+41.9°	— 6°
Pa.	Pittsburgh	+40.8°	—20°



AVERAGE outside temperatures as used by engineers in figuring radiation. *Example:* Knoxville, Tenn., usually figures 0°to desired inside temperature; Portland, Me., —10° to desired inside temperature.

For example, take New York City. During the past 55 years, there has been only one zero day on the average per year, according to weather bureau figures. On only 94 out of 210 days in the heating season, has the temperature at any time reached freezing or 32° F. The balance of 116 days from October 1st to May 1st, the temperature has not even fallen to freezing for half an hour a day. On 6 days the temperature actually reached for a few moments 90°—a stifling summer heat.

Even on a day during which the temperature actually falls to freezing there may be as much of a variation as 20 to 35 degrees between morning and night.

These rapid changes from hour to hour, and day to day, are what make the flexibility of a Hoffman "Vacuumized" System a vital factor in your health, comfort, and pocketbook. You can have warm steam for mild days and hot steam for cold days. Your rooms are not chilly one hour and stuffy the next.

With a Hoffman Vacuumized System you get up steam quickly to heat the house before breakfast. Then as the day warms you bank the fire. The amount of heat required lessens and the Hoffman Vacuumized System automatically adapts itself to conditions by supplying lower temperature steam (under vacuum) to the radiators. Later in the day as it grows colder, fires are brightened and steam at higher temperature is supplied.

This is the flexibility necessary if you are to cope with our average weather conditions.

Chapter V

How HOFFMAN No. 2 VACUUM VALVES pay for themselves in less than two years

THE average heating system located where typical United States winter weather occurs, requires from 1 to 1½ tons of coal (or 190 gallons of oil) per season for each radiator.

By saving 1/3 of this fuel Hoffman No. 2 Vacuum Valves earn 50% to 65% on your investment in them the first year.

At the end of the second year, you have your original investment cost in Hoffman Valves completely returned in fuel savings—plus a profit.

Every year, after the first two, you make yourself a gift of approximately $5 a radiator for each one in your home . . . or a bonus of $60 a year if yours is a 12 radiator house . . . the equivalent of 6% on a $1000 gilt edge bond.

The actual cost of vacuumizing your one pipe steam heating system depends (as you can see) on the number of radiators in your home.

You will find it wise to have a reliable heating and plumbing contractor make the installation.

This is advisable despite the fact that the change from

HAVE that "warm sun feeling" on chilly mornings. All the pleasure of a well heated home 15 minutes (not an hour) after the fire has been brightened for the morning . . . and for ⅓ less fuel . . . and for an investment that pays for itself in less than 2 years.

air-venting valves to Hoffman No. 2 Vacuum Valves can be made almost as quickly as changing a corresponding number of electric light bulbs.

We recommend a reliable contractor despite the simplicity of the actual change itself, for *the entire system must be made air tight*—in order to give the Hoffman No. 2 Vacuum Valves a chance for maximum efficiency.

If you do not know the name of a reliable heating and plumbing shop in your neighborhood that understands the installation of Hoffman equipment, a post card to the Hoffman Specialty Co. Inc., 25 West 45th Street, New York, will bring you the name of such a firm.

* * *

NOTE—*in order that you may know the importance of using a reliable concern, note the following extracts from standard instructions furnished heating and plumbing contractors by the Hoffman Specialty Co. Inc.*—

Installation of new work

TO OBTAIN most satisfactory results the valves should not be installed on new jobs until the system has been operated for several weeks using pet cocks. The purpose of this preliminary operation is to clean out the radiators and pipes of the usual collection of dirt, scale, red lead and all other foreign substances which are always present in new work.

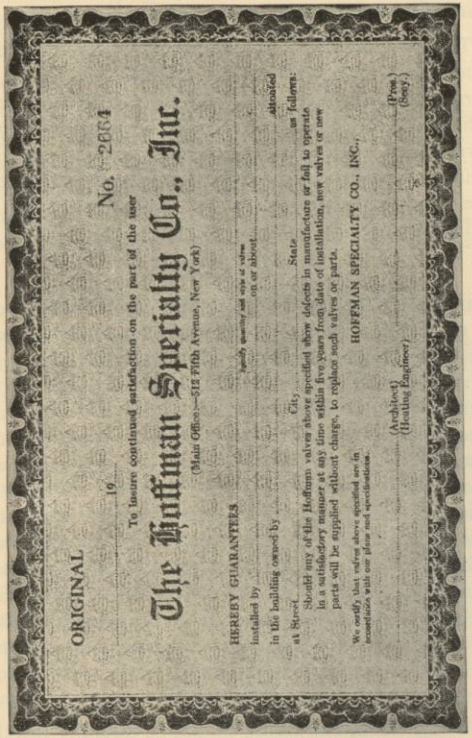
To make an air-tight joint, white lead or some other joint compound should be used, but before applying, insert valve in tapping, giving it two or three turns, then apply the white lead to the thread. This will prevent

HOFFMAN No. 2 Vacuum Valves can be installed in a few hours time by any reliable heating contractor. If you do not know one in your neighborhood who is familiar with the Hoffman No. 2 Vacuum Valve, drop a post card to the Hoffman Specialty Company, Inc., 25 West 45th St., New York City, for his name.

lead from entering the valve through the inlet connection. It is important that *all* of these suggestions be followed.

Radiator Valves

TO OBTAIN most satisfactory results we recommend the use of packless or leak-proof radiator valves, but successful results can be obtained with the use of ordinary radiator valves providing they are properly packed. If new valves of the standard type are installed they should be repacked in order to make certain that all possible air leaks through the stem stuffing box are eliminated. The same applies to old valves. For this purpose we recom-



ORIGINAL

No. 2864

19

To insure continued satisfaction on the part of the user

The Hoffman Specialty Co., Inc.

(Main Office—512 Fifth Avenue, New York)

HEREBY GUARANTEES

(specify quantity and style of valves)

installed by ... on or about ... attached

in the building owned by ... City ... State ... as follows:

at Street.

Should any of the Hoffman valves above specified show defects in manufacture or fail to operate in a satisfactory manner at any time within five years from date of installation, new valves or new parts will be supplied without charge, to replace such valves or parts.

We certify that valves above specified are in accordance with our plans and specifications.

HOFFMAN SPECIALTY CO., INC.,

(Architect) (Heating Engineer) (Pres.) (Secy.)

SHOWN above is the Hoffman 5 year written guarantee certificate. This certificate is given to every home owner who purchases Hoffman No. 2 Vacuum Valves. It is your guarantee of satisfaction.

mend the use of 1/16 inch Valve Stem packing of good standard make.

To repack stuffing boxes, first remove all old packing. Then make one turn of packing about the valve stem, the turn being in the center of the piece of packing, after which wind the packing around the stem in opposite directions, crossing and recrossing until a sufficient amount is used to fill the stuffing box. Next, screw down the packing nut until it requires some effort to turn the valve handle.

Air Leaks

THE usual places for air leaks, aside from stuffing boxes of the radiator valves, are the water gauge, damper regulator diaphragm, gauge or try-cocks and safety valves. It is advisable to remove the old gauge glass washers and replace them with new washers. See that damper regulator does not permit escape of steam or allow air to be drawn into system. Discs and seats of the water column gauge cocks should be carefully examined to make certain that seating surfaces are such as to make an air-tight joint when closed. The try-cocks at the bottom of water column and water gauge should be tightened so that the handles can be turned only with considerable effort. Bubbles rising through the water in the gauge glass show a leak in the lower packing nut or gauge glass try-cock.

Piping

FOR new work, the piping should be carefully installed so as to prevent as far as possible leakage of air at the joints. Before installing fittings, they should be carefully examined for sandholes and defects. One of the most effectual ways of overcoming the small leaks in the pipe

fittings due to the porosity of iron is to paint all pipe lines with a good quality of black asphaltum.

Venting Return Line

TO VENT pipe lines in basement we recommend that each dry return be equipped with a No. 6 Hoffman Quick Vent Float Air and Vacuum Valve; the valve being located where the return drops below the boiler water line. In systems with wet returns, valve should be located approximately 12 inches above the water line in the returns.

Pressure and Vacuum Gauge

IN ORDER to record both pressure and vacuum and keep check on the operation of the system we recommend the use of a Hoffman Ther-Kompo-Gage.

Test

WHEN work has been done in accordance with above instructions and before pipe covering is put on, a kindling fire should be started and a pressure of approximately ten pounds generated, maintaining this pressure until all radiators are completely vented and the system steam hot from end to end. Carefully examine every joint, looking for steam leaks which may be indicated either by hissing or presence of slight vapor. When it is ascertained that there are no leaks under steam pressure, dump the fire and open all windows in order to quickly create a vacuum.

If all joints are practically tight the vacuum gauge should show a minimum of at least 15 inches when the system is cold and should hold this vacuum with a loss of not over one inch every two hours. When the system is

under vacuum, a second examination of all joints should be made and any air leaks will be denoted by a hissing sound at the point of leakage as air is drawn into the system.

If any conditions arise which are not covered by these instructions, write us, giving full particulars and we will endeavor to give the required information.

The No. 2 Hoffman Siphon Air and Vacuum Valves are absolutely automatic and require no adjustment. If a valve develops any imperfection which makes it inoperative in any way, return the valve to us, explaining wherein satisfactory service was not obtained and a new valve will be supplied without charge. The satisfactory operation of all Hoffman Valves is guaranteed by the manufacturers for a period of five years from the date of installation for the purpose for which they are designed.

Hoffman Specialty Company, Inc.
General Sales Department
25 West 45th Street, New York City, U. S. A.
Main Office and Factory:
Waterbury, Conn.

In Canada: Crane, Limited
Sales Representatives in
All Principal Cities

What some users say—

Dormont Presbyterian Church
U. FRANKLIN SMILEY, D. D.
MINISTER
Dormont, Pittsburgh, Pa.

May 28, 1927

The Hoffman Specialty Co.,
Chicago, Ill.

My Dear Sirs:

May I add my word of praise to the long list of commendations which you have already received for the wonderful work performed by your Vacuum Valves.

We have a one pipe steam system in the Church Manse. We did not get any satisfaction from the heating plant until we installed your No. 2 Valves, and your Damper regulator, with Pressure and Vacuum gauge.

The results have been wonderful, not only in the far better heating of the Manse, but in the saving of fuel.

You are privileged to refer anyone to me concerning your products, and I shall take pleasure in most heartily commending them, for I feel that they are money savers, and givers of comfort.

Very cordially yours,

U. FRANKLIN SMILEY

FRED L. SMITH
T. H. HINCHMAN
H. J. MAXWELL GRYLLS
RALPH COLLAMORE

H. L. WALTON
W. S. MACKENZIE
W. E. KAPP

SMITH, HINCHMAN & GRYLLS
ARCHITECTS & ENGINEERS
MARQUETTE BUILDING
DETROIT, MICHIGAN

August 28, 1925.

Hoffman Specialty Company,
25 West 45th Street,
New York City.

Gentlemen:

I am enclosing a chart off the pressure recording gauge which I have on the heating system in my house. The chart was made March 29th, and the outside temperature ranged from thirty to thirty-five degrees.

The heating system is a single pipe steam installation, and the radiators are equipped with your Number 2 Air Valves. In operating the system, the day the chart was made, the steam pressure was raised in the morning, afternoon and evening, the fire being checked after each time pressure was raised. During the day the radiators remained hot for two-thirds their length, and in the morning after the longer period of checked fire, they were hot for approximately one-third the length.

In milder weather it has not been found necessary to raise pressure during the day, and the system has gone forty-eight hours without doing so, three or four sections of some of the radiators being hot at the end of that period.

The air valves have worked entirely satisfactorily during the year the system has been run, and their use has enabled me to make a simple single pipe installation which I am able to operate from twenty inches vacuum to ten pounds pressure.

Very truly yours,
H. L. WALTON

HLW-BFS
(Encl.)

HENRY D. EIDMAN DANIEL EIDMAN

H. D. EIDMAN & BRO.
DEALERS IN
FLOUR, FEED, GRAIN AND HAY
2201 PENNSYLVANIA AVENUE
TELEPHONE CONNECTIONS

Baltimore, Md.
December 7, 1926.

Walter E. Hill Company,
201 N. Gay Street,
Baltimore, Maryland.

Gentlemen:

It has been my pleasure at the instigation of your Mr. Vernon G. Eisel to install on my heating equipment in my residence at 2304 Garrison Blvd. Hoffman No. 2 Siphon Air & Vacuum Valves on all of my radiators and No. 6 Hoffman Quick Vent Float Air & Vacuum Valves on the mains and a Ther-Kompo Gage on my gas-fired boiler.

I am placing this letter in your hands as an unsolicited expression of appreciation of the performance of these valves.

Prior to the installation of the No. 2 Hoffman Vacuum Valve Equipment, I had great difficulty in keeping my radiators warm unless I maintained a constant pressure on my boiler. Since installing No. 2 Vacuum Valves, my boiler operation has been changed from every half hour to every three hours and I get more comfort with a smaller consumption of gas.

My boiler maintains a vacuum as high as 20 inches after the thermostat shuts off the burners. My radiators stay warm from three to four hours where formerly I lost the heat in approximately 20 minutes. I am able to generate steam with temperature of the water in the boiler as low as 163 degrees.

The No. 2 Hoffman Specialties have my heartiest support and greatest recommendation.

Sincerely yours,
HENRY D. EIDMAN

First Baptist Church

COR. GROVE ST. AND CENTRAL AVE.
D. P. GAINES, PASTOR
14 SECOND AVE.
WATERBURY, CONNECTICUT

Nov. 3rd, 1926.

The Hoffman Specialty Co.,
193 Grand St.,
Waterbury, Conn.

Gentlemen:

At a meeting of our Board of Trustees held last evening a great deal of satisfaction was expressed in connection with the performance of our heating system since equipping it with your vacuum type air valves. It was suggested that I write to you telling you of our appreciation of the comfortable building and the economy accomplished in our fuel bill.

We wish to express our thanks to Mr. W. K. Simpson for his advice and cooperation in this matter.

Yours very truly,

J. R. PUTNAM

Chairman, Property Committee

WRIGHT AERONAUTICAL CORPORATION
PATERSON, N. J
U. S. A.

April 27th, 1926.

Hoffman Specialy Company,
25 West 45th Street,
New York City.

Gentlemen:

Attention of Mr. Guy Hutchinson

I thought you would be interested in knowing that I had considerable difficulty in keeping my house warm the fore part of last winter. It was necessary to keep pressure on the boiler at all times in order to get heat to the radiators farthest away from the unit. On your recommendation I made a complete installation of Hoffman No. 2 Vacuum Valves. The result was really quite remarkable. The fire has never been forced since the installation of the valves and it is a simple matter, without even boiling the water in the unit, to heat the house at 70 degrees fahrenheit or better. The shift was made in the middle of the winter and a direct comparison was possible. It is impossible for me to measure the saving in fuel, but it is noticeable in that, the furnace does not have to be coaled as often and the house is kept in a more uniformally comfortable condition.

Yours very truly,

G. W. VAUGHAN,

Vice-President.

GWV/w.

THE TIMKEN-DETROIT AXLE CO.

GENERAL OFFICES
100-400 CLARK AVENUE

DETROIT, MICHIGAN

OFFICE OF PRESIDENT

August 14, 1925.

Hoffman Specialty Co. Inc.,
25 West 45th Street,
New York City.

Gentlemen:

The No. 2 Vacuum Valves which you installed on the radiators in my home last fall have given me excellent satisfaction and I take great pleasure in so advising you.

While I have had no accurate methods of measuring the fuel used I feel very certain that there has been a considerable saving since attaching your valves. A gauge shows as much as 18 inches of vacuum a good deal of the time and, quite naturally, the heat is noticeable in the radiators much sooner after the fire starts up than formerly. None of the valves have been adjusted in any way since installation.

Very truly yours,

FRED GLOVER

President.

OFFICES:
BOULDER, COLORADO
SANTA FE, NEW MEXICO
PHONE 701

PLUMBING AND HEATING
CONTRACTOR
107 WASHINGTON AVE.

Joe McCabe
Sanitary Engineer
Santa Fe, New Mexico

March 9th, 1926.

Hoffman Specialty Co.,
New York City, N. Y.

Gentlemen:

Last fall one of our large buildings which has a one pipe system of steam was giving very poor satisfaction, and we were called to look over this system and put same in better working shape.

We installed twenty-six Hoffman No. 2 Vacuum Valves on the radiators and four Hoffman No. 6 Valves on the return mains, packed all radiator valves and repaired all leaks on the steam system. During the past four months that this system has been in use, the system is giving good satisfaction and the coal bill has been cut one-third. I certainly am strong for the Hoffman Specialties.

Very truly yours,

JOE McCABE

C. S. ROBBINS, PRESIDENT — E. W. GARRISON, TREASURER — GEO. W. DODSON, SECRETARY

SHICKSHINNY PUBLIC SCHOOLS

FRED W. HOSLER
SUPERVISING PRINCIPAL

SHICKSHINNY, PA.

March 8, 1927.

Hoffman Specialty Company,
New York City, N. Y.

Gentlemen:

An old adage goes something like this: "PRAISE THE BRIDGE THAT CARRIES YOU SAFE ACROSS!" And that is the reason for writing this testimonial regarding Hoffman air vents in our fifteen room high school building.

In 1924 when I took charge of the building we had to use two five thousand foot Richardson low pressure heating boilers, using number five (nut) coal and carrying from eight to eleven pounds steam pressure, but could not properly heat the building.

Our radiators, (cold blast and direct) were equipped with air vents (NOT HOFFMAN'S).

I appealed to the Board of Education, and they purchased twelve number four Hoffman air vents for thirty dollars, and the result was a saving of four hundred sixty dollars worth of fuel the first year, using but one of our boilers, and burning nothing but number six (pea) coal.

This winter we equipped all our radiators with number two Hoffman's and all returns with number six Hoffman's, and the amount of coal will be very materially reduced.

ALL HAIL TO HOFFMAN AIR VENTS

Very truly yours,

WILL R. RUSTAY
Chief Janitor

WR:MT.

206 Oak Street,
Indian Orchard,
Hampden Co., Mass.

Hoffman Specialty Co.,
Waterbury, Conn.

Gentlemen:

Ever since the writer reached the age where he had to help bear "the white man's burden", two problems have especially interested him -- increased efficiency in the barbarous operation of shaving, and the still more important problem of heating a house. Your booklet "Locking the Door against the Heat Thief" interested me so much that I decided to give your valves a trial, so I took the matter up with Geo. H. Estabrook, a heating contractor of Springfield. An expert delivered the goods, adjusted the compound gauge, and put on the two air valves for cellar pipes.

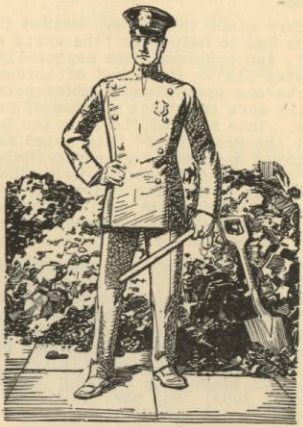
The vacuum gauge has shown 15" with the boiler still hot, and of course the the system is working fine. I have not only had much more heat from the fuel consumed, but have burned 100 lbs. less in the 30 days. It looks as if I had solved the old problem of eating my cake and having it too. The dining room 10-section radiator never functioned 100%. But now, it throws off more heat than any radiator in the house ever did before.

The job cost me $53.00, but if someone came along and offered me $100 cash, with the understanding that I was to return to the old system with air bound, waterlogged radiators, and air valves that hiss and sputter and spit steam and hot water on the floor to the disgust of the careful housewife, I would regard such an offer as an insult to my intelligence.

If I had this system attached nine years ago, when the house was built, I should have saved some tons of coal and the same amount of worry.

Cordially yours,

GEORGE W. BANISTER



HOFFMAN VALVES—

Watchmen of the Coal Pile

Printed in U. S. A

HS 6866