THE HONEYWELL AIR-SEAL

GENERATOR

THE HONEYWELL
HEATING SPECIALTIES CO
WABASH
INDIANA

A MAN proves himself by his acceptance or rejection of the World's progress. The years bring new benefits. To ignore them is to deprive one's self of the best that life offers.

—D. HERBERT MOORE

Locating Upper Separator

In a one-story building, the upper separator may be located at some convenient place on an inside wall near the ceiling, but BELOW THE TANK (see Fig. 6). This will give sufficient height in the average one-story building to produce 7 pounds pressure, or more, which is quite sufficient to give good service. In a building of two stories or more, the upper separator may be placed in any convenient location on the second floor, near the floor, in a closet or behind a door. See Figs. 5 and 7.

Remember, it is the vertical distance between the separators that produces the generator pressure, regardless of the number of floors in the building or the height of the expansion tank, the bottom of which should always be a few inches, or more, higher than the top of the upper separator.

Figure 8 shows method of taking expansion line from a riser when not convenient to extend expansion pipe from flow main. With this installation the upper separator will receive less air from the circulating water than in the methods previously illustrated. Regardless of this fact, good results can be obtained with this connection, although the others are to be preferred.

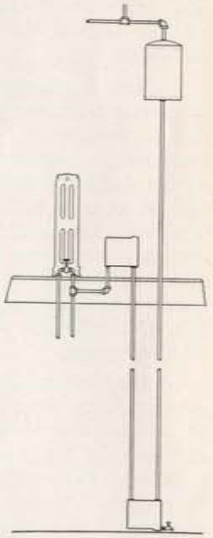

Fig. 8

The Altitude Gauge

Figures 5, 6 and 7 show the altitude gauge connected to pipe G, leading up to the expansion tank. When gauge is attached at this point it registers the height of water in pipe G, and tank H, only. If the gauge is placed on the boiler it will register the height of water in the system, plus the pressure produced by the Generator.

As a fluctuation of the altitude gauge is often confusing to the owner, preference is given to connecting as here shown. However, if desirable to have gauge record the operation of the Generator, and this is explained to the owner, the gauge may be attached direct to the boiler.

Fitters may wish to connect the gauge to the boiler to see how perfectly The Honeywell Air-Seal Generator produces pressure. When this is done, and gauge is left on boiler, it should be explained fully to the owner that when the water heats and expands, the pressure increases and the hand on the gauge passes beyond point at which red hand is set, and when the water cools and contracts the pressure gradually lowers, but it will be found that a pressure is maintained most of the time.

For New or Old Work

Equally good success can be had by placing the Generator on either new or old work. It requires no special tools to install and instructions for connecting are plainly cast on the separators. There is absolutely nothing about the Generator to wear out, stick or corrode. It consists simply of two ordinary castings, chemically treated to prevent air leaks, and will last indefinitely without any attention on the part of the fitter. *In fact it will never be necessary for the fitter to go back on the job to correct Generator trouble of any kind whatever.*

The two separators, a few feet of small pipe and an hour's time to screw the parts together, and you have one of the simplest, safest, cheapest and most dependable and desirable pressure creating devices for hot water heating plants possible to devise—THE HONEYWELL AIR-SEAL GENERATOR.

Sizes, Capacities and List Prices

For Plants Containing 1,500 Square Feet or Less of Radiation:

No. A-1—For one and two stories	$19.00
No. A-2—For three and four stories	27.00

For Plants Containing 1,500 Square Feet or More of Radiation:

No. A-3—For one and two stories	$35.00
No. A-4—For three and four stories	43.00

DISCOUNTS TO THE TRADE

The Honeywell Air-Seal Generator

FOR more than two years our Mr. M. C. Honeywell, inventor of the Honeywell line of heating specialties, has given his attention to the development of an air-seal for hot water heating plants. The result of his labor is The Honeywell Air-Seal Generator, a simple, efficient and dependable device for sealing the water in a hot water heating system from the atmosphere, until a safe and predetermined low pressure has been produced.

The method of obtaining pressure by means of alternating columns of water and air confined in vertical tubes, alternately communicating with each other at their tops and bottoms, has been known and used in various forms for more than thirty years.

As long ago as 1886 an air-seal safety device for relieving excess pressure in heating boilers was made and used in Europe, and since that time many similar contrivances have been employed abroad, in connection with heating systems.

The form of device just referred to, however, is not adaptable to the present types of heating systems, as some in this country have discovered; but the principle involved, when properly applied makes one of the most simple, safe and dependable means of producing pressure in a hot water heating plant, possible to conceive.

Generator Construction

By referring to the accompanying sectional outline drawings, Figures 2, 3 and 4, it will be seen that The Honeywell Air-Seal Generator consists of two simple castings, or partitioned chambers, called air separators. One is designed to be placed on the first or second floor and the other in the basement. One opening in the upper separator connects with the circulating system, while from the other opening in the upper separator, a pipe is dropped to an opening in the lower separator. Passing upward from the lower separator is a pipe extending to the expansion tank. See Fig. 1.

The upper separator is placed at some convenient point, usually on the second floor, against an inside wall, behind a door, or in a closet. The lower separator is located in the basement, near the basement floor.

With the pipes and separators connected as above described, the Generator is complete and ready for use. The operation is clearly explained by Figures 2, 3 and 4, and the following description.

How the Generator Operates

When the system is first filled, the cold water passes into the boiler and radiators and when these are full, enters expansion pipe A, Fig. 2, forcing the air from upper separator B, into compartment C, and thence down air pipe D, which joins the two separators. When water fills chamber B, it passes over the top of the web into compartment C, down pipe D, into E. When this action takes place most of the air is forced down into the lower separator E, where it is effectively trapped at its top, due to the position of the web in this separator. As the water continues to flow, it passes into compartment F, up pipe G, and fills tank H, which action compresses the air trapped in lower separator E.

Instantly after the water is turned off and the flow stops, the air

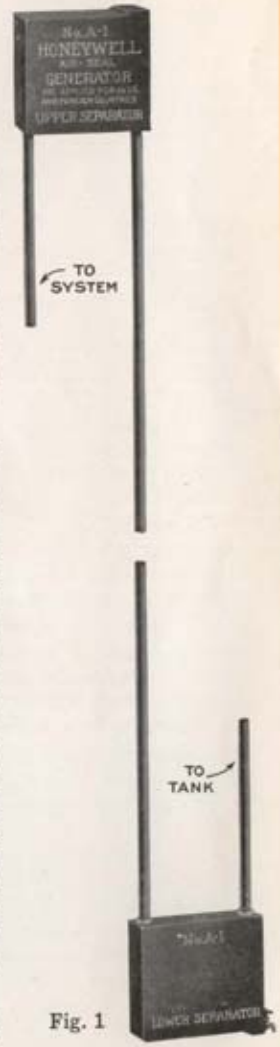

Fig. 1

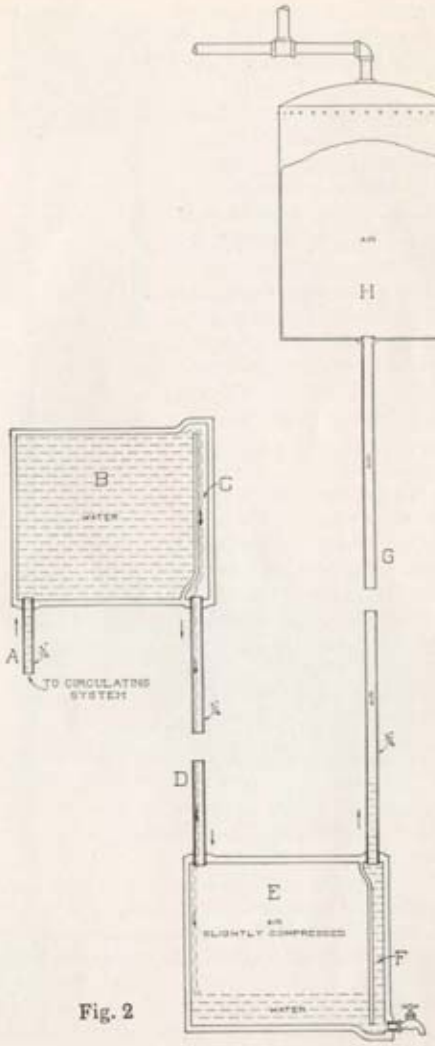

Fig. 2

that is trapped and compressed in lower separator E, enters and fills air pipe D, and compartment C, Fig. 3. Thus is established a differential between the air in pipe D, and the water in pipe G—this difference in weight equaling approximately one-half pound for each foot in height between the two separators.

Trapping and Holding the Air

The action that takes place in the Generator during filling, as above described, applies in like manner to its regular operation under normal conditions. As the water is heated and slowly expands it fills chamber B, spills over the top of the web into compartment C, and flows slowly down the sides of pipe D, into E, Fig. 2. When sufficient water accumulates in E, to reach the lower part of the web, the air is trapped, and as more water passes down pipe D, the air is proportionately compressed, which forces water into F, up pipe G, and into expansion tank H. The lower separator makes it impossible for the passing water to carry any air with it to the expansion tank to become lost, as this separator traps and returns the air under pressure to air pipe D.

It is impossible to dislodge or blow the air out of the Generator under 100 pounds water pressure when filling the system; neither is it possible for air to be drawn from the upper separator into the system, when the water cools and contracts.

Compartment E, of the lower separating chamber, is so proportioned that it contains a sufficient quantity of compressed air to charge the air pipe D a number of times—ample to operate the Generator an entire heating season.

Thus it will be seen that in The Honeywell Air-Seal Generator, means have been provided to conserve the air and prevent its loss either under normal or abnormal conditions.

Pressure at Low Temperatures

When the temperature lowers and the water cools and contracts slightly in pipe A, the compressed air in pipe D, and lower separator E, slowly expands and prolongs the pressure for an indefinite period of time.

If the temperature continues to drop, causing the water to further cool and contract, pressure will be relieved at A,

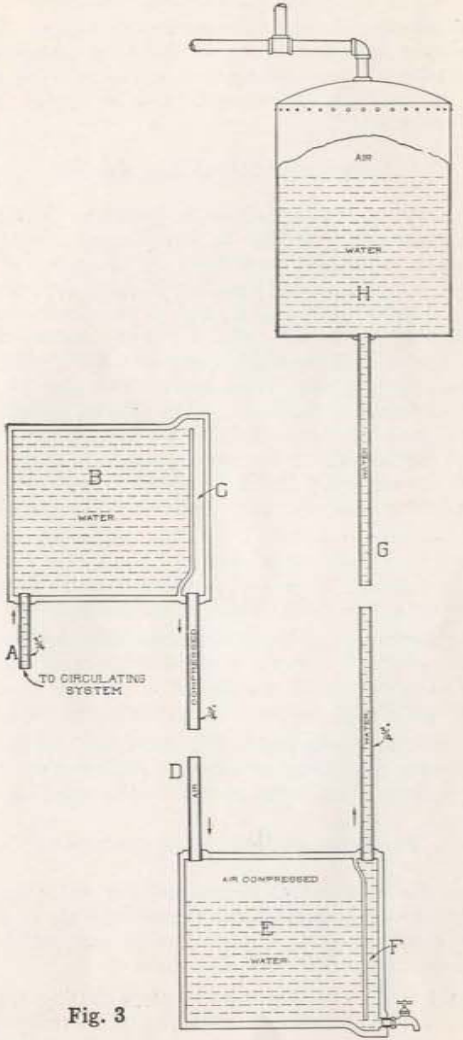
AIR
WATER
H
B
WATER
C
G
A
TO CIRCULATING SYSTEM
D
AIR
AIR COMPRESSED
E
WATER
F

Fig. 3

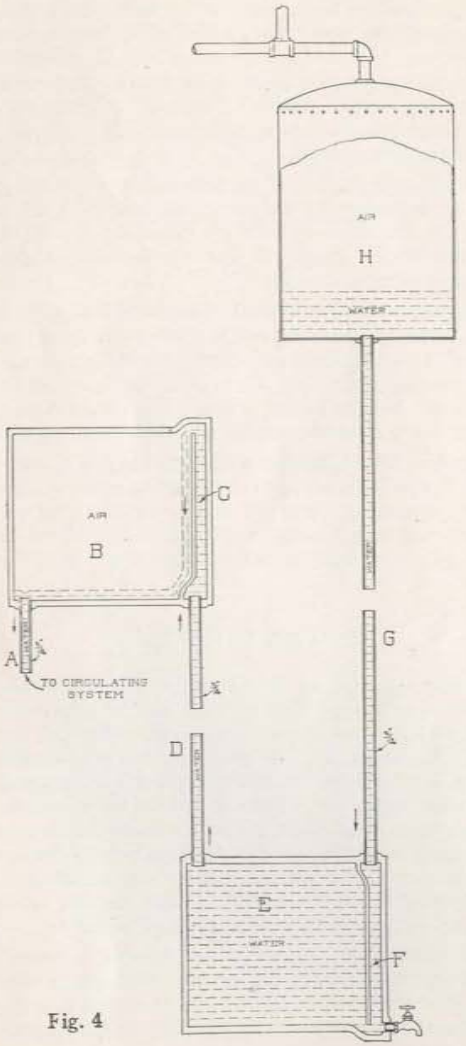
AIR
H
WATER
AIR
B
C
A
TO CIRCULATING SYSTEM
G
D
E
WATER
F

Fig. 4

Fig. 4, allowing water in B, to enter the system. The compressed air that formerly occupied pipe D, and part of E, will now expand and pass up into B, where it will be trapped and prevented from being carried to the system, by the receding water. As the air pressure is gradually relieved in D, water will flow from the expansion tank and find its way back to the system.

During expansion and contraction, the air simply shifts from one separator to the other, and although air is always present in one or both of the separators, the water in the tank will freely return to the system during contraction without creating a vacuum.

The Honeywell Air-Seal Generator is a wonderfully simple, positive operating and trouble-proof device for generating and maintaining a safe predetermined pressure on hot water heating systems. The principle involved is readily understood, and in actual practice the Generator is able to care for every situation arising in a hot water plant.

By taking the expansion pipe from the top of a flow main, Figs. 5, 6 and 7, the air in the circulating water will be carried by the expanding water to the Generator where it will be retained, not only in sufficient quantities to fill the air pipe, but a generous surplus will be stored and held for future use.

Easy to Charge

On one side and at the bottom of the lower separator is a threaded opening. This opening can be fitted either with an ordinary plug or a drain cock—preferably the latter. By opening the drain cock, or removing the plug in this single opening, all the water in the Generator and expansion tank will readily drain out. Thus it will be seen that if, by any unusual cause, at any time, air is lost from the Generator and its efficiency be partially or entirely impaired, by simply opening the drain cock on the lower separator and allowing the water to drain from it and the expansion tank, air will immediately enter and automatically re-charge the Generator.

After closing the drain cock and turning in enough water to partially fill the tank, the system will be ready for operation. This can be done by any one at any time, and about as quickly as it is here explained. It makes no difference whether the system is cold or under heavy fire, as only the water in the expansion tank, lower separator and pipes D and G, is drained.

Connecting the Generator

It will be observed by the enclosed drawings that there are many ways to install the Honeywell Air-Seal Generator.

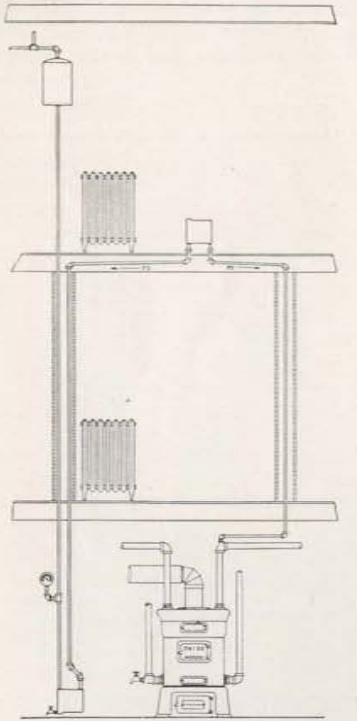

Fig 5

It is not necessary that the vertical pipes be carried parallel, or even near each other (see Fig. 5). The pipe joining the circulating system to the upper separator can be brought

from any location, but preference should be given to taking it from some air collecting point, which will keep the Generator automatically charged at all times.

The air pipe D, leading from the upper to the lower separator, should run as direct as possible. The main objection to offsetting this pipe any great distance, is that it makes necessary more reserve space for compressed air, which would require larger chambers. However, a short offset in pipe D, will in no way affect the successful operation of the Generator, and it will sometimes be necessary to run this horizontal offset the entire width of a room. From the

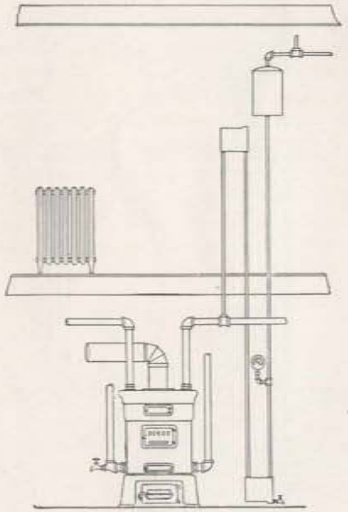

Fig. 6

lower separator to the expansion tank, the pipe can be run in any manner desired.

All pipes can be offset any reasonable number of feet that would be necessary in an ordinary building, BUT MUST NOT BE TRAPPED, and should have a good fall so that they will drain easily.

Not a Mechanical Device

The Honeywell Air-Seal Generator contains no concealed valves, springs, weights, mechanical or moving parts of ANY KIND. Pressure is created solely by the difference in weight between a column of air and a column of water. Both elements are always present in every hot water heating system and are free for the harnessing, which is simply, successfully and cheaply done in The Honeywell Air-Seal Generator.

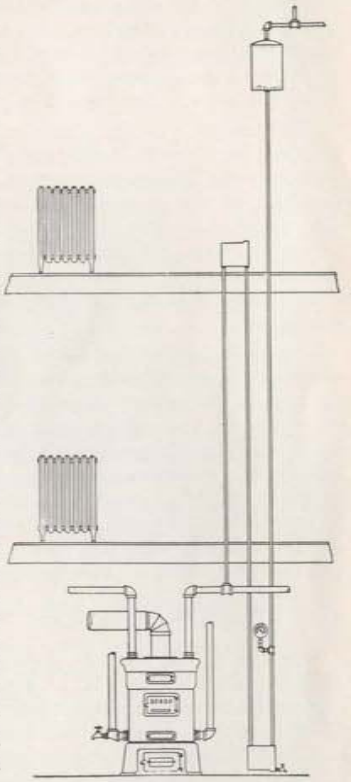

Fig. 7

Figure 3 shows the Generator producing maximum pressure. This pressure is determined by the weight of water in pipe G, as against the air in pipe D, measuring from the top of the upper separator to the top of the lower separator—regardless of the height of the expansion tank.

A predetermined pressure, ranging from 7 to 14 pounds, can be easily obtained in the average building. For every foot of height between the separators approximately one-half pound pressure is generated. Therefore, it may easily be determined just how much pressure a certain location of the separators will produce. We do not advise over 10 pounds pressure for any building, regardless of size or height, as this amount is perfectly safe and is ample to give satisfactory results.