

The Improved Webster Type "R" System of Steam Heating

Service Bulletin S-650-C

| C O N T E N T S | | <i>Page</i> |
|---------------------------------------|--|-------------|
| What It Is..... | | 3 |
| How It Works..... | | 5 |
| Notes on Operation..... | | 6 |
| Supply and Return Piping..... | | 7 |
| Roughing-In Dimensions | | |
| Drip Traps..... | | 9 |
| Dirt Strainers..... | | 10 |
| Dirt Pockets..... | | 10 |
| Radiator Connections..... | | 11 |
| Installing Nipple-Type Orifices..... | | 11 |
| Installing Sleeve-Type Orifices..... | | 12 |
| Roughing-In Dimensions | | |
| Supply Valves..... | | 17 |
| Return Traps..... | | 20 |
| Boiler Room Piping and Equipment..... | | 22 |
| Roughing-In Dimensions | | |
| Dirt Strainers..... | | 25 |
| Boiler Return Traps..... | | 26 |
| Vent Traps and Vent Valves..... | | 27 |
| Damper Regulators..... | | 29 |
| Check Valves..... | | 30 |
| Operating Without Vent Valve..... | | 28 |
| Boiler Protector..... | | 30 |
| Putting System Into Operation..... | | 31 |
| Testing..... | | 31 |
| Cleaning System..... | | 33 |
| Repairs and Replacements..... | | 35 |

WARREN WEBSTER AND COMPANY

Established 1888

The Pioneers of Vacuum Steam Heating

CAMDEN

NEW JERSEY

3482

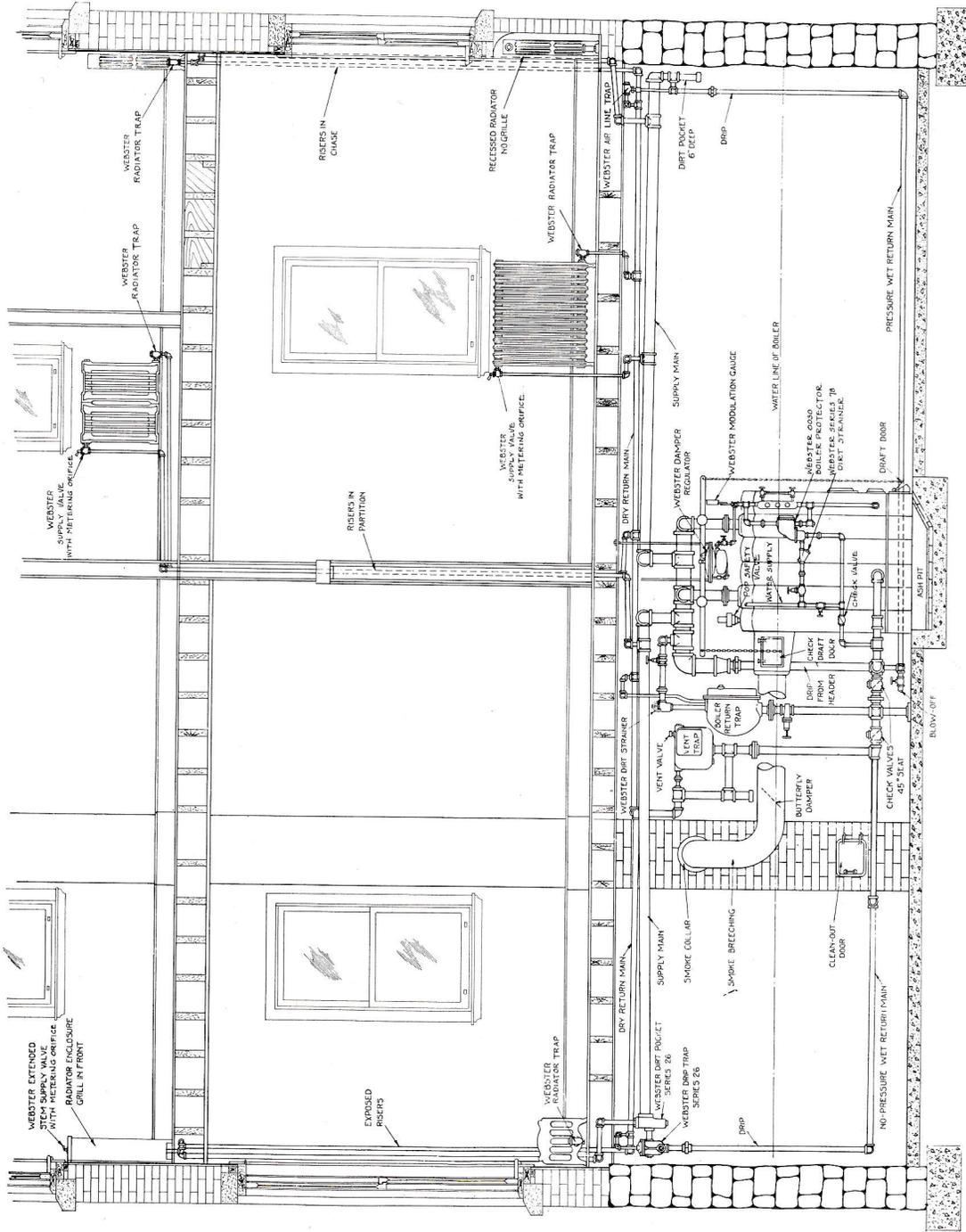


Fig. 1. A Diagrammatic Installation of an Improved Webster Type "R" System of Steam Heating showing location of Webster Equipment.

The Improved Webster Type "R" System of Steam Heating

THE Improved Webster Type "R" System is a two-pipe, gravity return, low pressure steam heating system using the following Webster equipment:

1. Webster Supply Valves including Webster Metering Orifices on radiators.
2. Webster Thermostatic Traps on radiators.
3. Webster Drip Traps and Heavy Duty Traps at drip points of mains, risers, unit heaters, blast radiation, hot water generators, etc.
4. Webster Dirt Strainers and Dirt Pockets.
5. Webster basement equipment including Vent Trap with Vent Valves, Boiler Return Trap, Damper Regulator (on hand-fired, coal burning boilers only), Boiler Protector, Gauges, etc.

The Improved Webster Type "R" System will, of course, include equipment not of Webster manufacture, such as boiler, radiators, piping, fittings, temperature control equipment, etc. It may also be installed in conjunction with automatic oil, gas or coal stoker equipment. For installation of this equipment follow instructions of manufacturer. In general, installation of Webster Type "R" System is handled in the same manner as that of other two-pipe steam systems.

Roughing-in dimensions are given on the following pages for the Webster apparatus most frequently used. For exact location of this information refer to the table of contents on the front cover. Diagrams showing the correct piping arrangement for each item of Webster basement equipment are likewise illustrated. The basement piping arrangements called

for in Figs. 31 and 32 are for Type "R" Systems, having from 1,500 to 16,000 sq. ft. of direct radiation or its equivalent as listed in Table XXIII. This is a result of experiment and research as well as practical experience in hundreds of successful installations of all sizes. It should be followed closely in order to insure best results.

Type "R" Systems for less than 1,500 sq. ft. of direct radiation or equivalent are equipped with Webster 0023 Boiler Return Traps and Vent Traps, which differ but slightly from the larger sizes. The basement piping arrangement for this size system is shown in Figs. 33 and 34.

For Type "R" Systems serving more than 16,000 sq. ft. of direct radiation, two or more Webster Boiler Return Traps and Vent Traps may be used in combination. Special Webster Service Details are provided for these larger installations

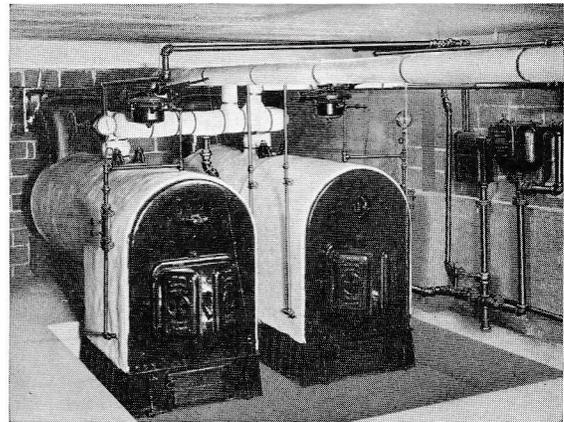


Fig. 2. View of Boiler Room, showing Webster Damper Regulators over each Boiler. Webster Boiler Return Trap and Vent Trap, as installed in Type "R" System, shown at right.

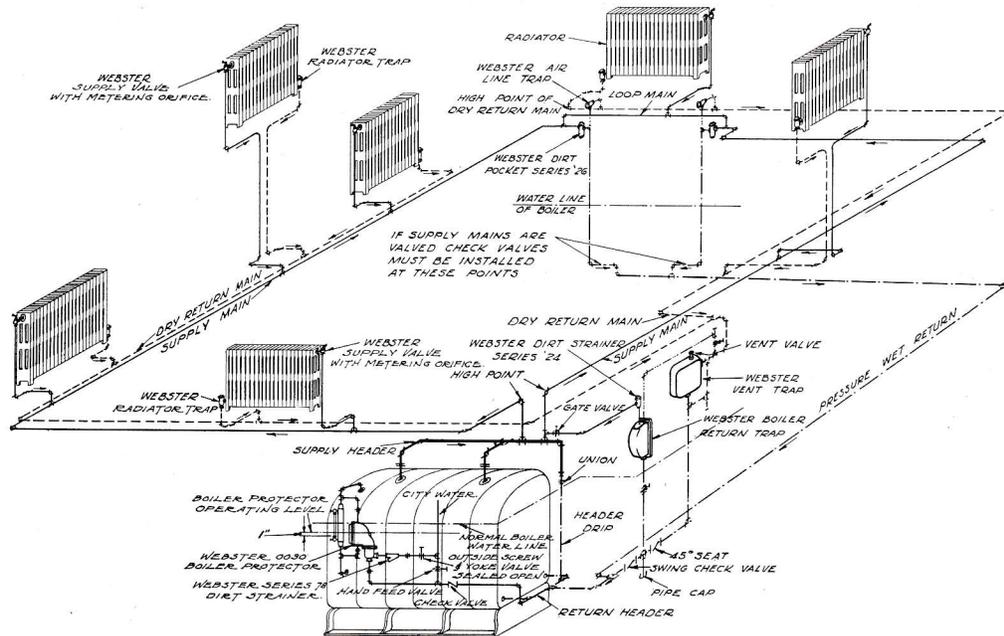


Fig. 3. A typical Webster Type "R" System showing the supply and return mains graded in opposite directions, the supply away from the boiler and the return line toward the boiler. The ends of the mains are dripped through a Webster Dirt Pocket and the air that collects at the ends of the mains is relieved through a Webster Thermostatic Trap. The returns from these drips are carried back to the boiler through a pressure wet return line. Both the Vent Trap and Boiler Return Trap are placed adjacent to the boiler and the connections are made as shown in Figures 31 to 34 incl.

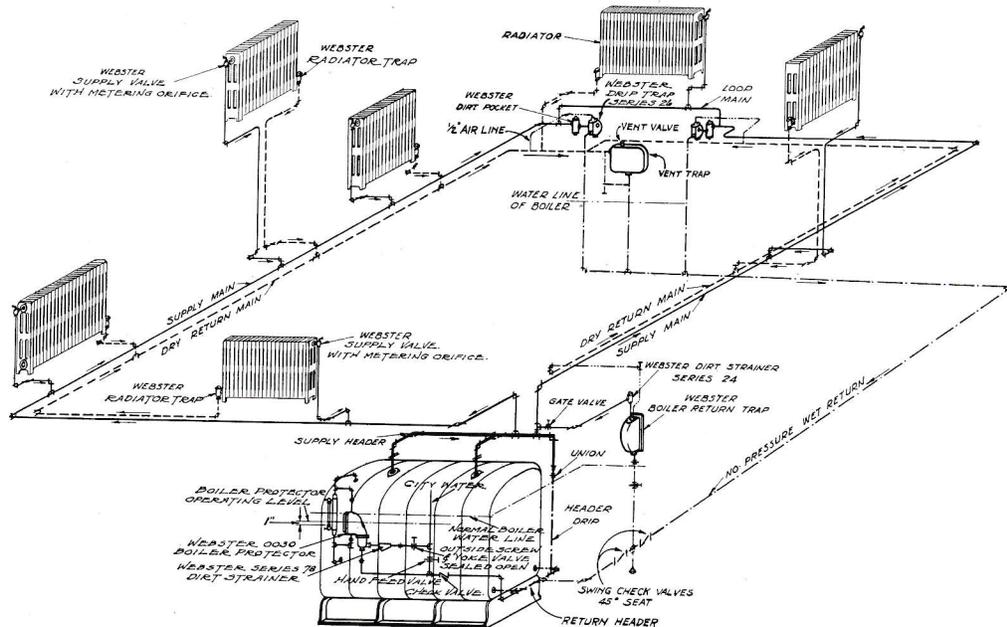


Fig. 4. A typical Webster Type "R" System showing the supply and return mains graded in the same direction and the Webster Vent Trap located at a distance from the boiler. The ends of the mains are dripped through a Webster Drip Trap preceded by a Webster Dirt Pocket. The drip from the end of the main drops to a no-pressure wet return line. The Vent Trap discharges into the no-pressure wet return line at the floor and the return line is carried back to the Boiler Return Trap which is adjacent to the boiler. The arrangement shown in Fig. 3 above is preferred but this layout is satisfactory when it is necessary to grade the supply and return mains in the same direction.

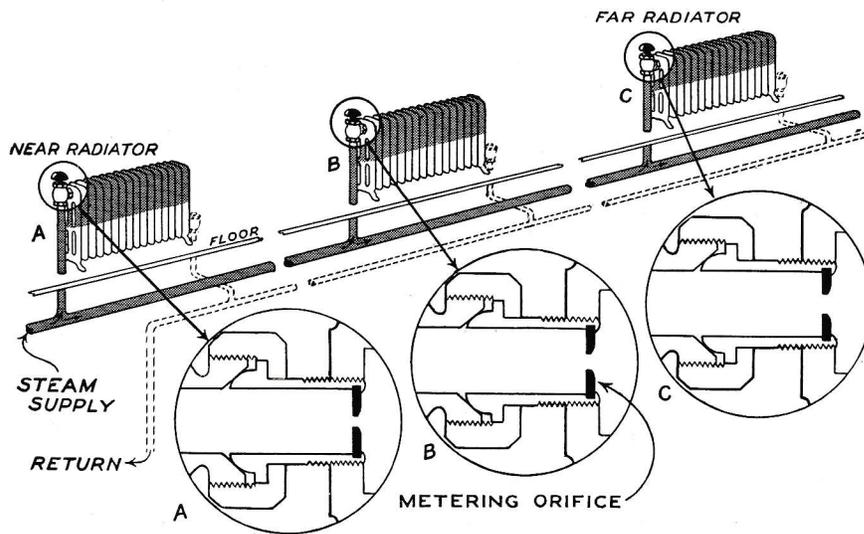


Fig. 5. Diagrammatic sketch of an Improved Webster System showing how "pressure drop" is equalized or balanced by installation of metering orifices of proper size. The metering orifice in radiator A is quite small. When steam reaches it, the amount that can enter is therefore restricted. The remaining steam quickly flows through the piping to radiator B. Here the opening is slightly larger because the pressure of the steam by this time is lower. So it goes, radiator by radiator, each receiving its proper proportion of steam.

to supplement this bulletin. Type "R" System basement equipment is sometimes used in combination with condensation pump or vacuum pump installations. In these cases additional instructions will be furnished by the nearest Webster Branch Office listed on the back cover of this bulletin.

Occasionally other types of damper regulators are used with the Webster Type "R" System. In oil and gas burning and stoker installations the damper regulator is usually omitted.

How It Works

The Improved Webster Type "R" System will be quickly understood by reference to the diagrammatic drawing shown in Fig. 1 on page 2. Steam is produced in either a cast iron or steel boiler, the draft of which is controlled in hand fired coal burning installations by a

Webster Damper Regulator installed as shown.

Steam is delivered to the radiators through the supply piping. Here its entrance is controlled by Webster Supply Valves and Webster Metering Orifices. These may be of the following types:— Type 'W' (modulation) Valve, "Three-Point" Valve, Sylphon Packless Valve, or Type 'B' Valve.

The distinguishing feature of the Improved Webster Type "R" System is the addition of a specially selected metering orifice in each radiator valve. The purpose of the orifice is to equalize or balance steam distribution. In the older type of unorificed system the nearest radiator gets warm first and the farthest radiator does not begin to get warm until the others are filled, whereas in the Improved Webster Type "R" System all radiators get steam at practically the same time and in substantially the proper proportion, regardless of the distance from the boiler.

Webster Metering Orifices are made in a wide range of sizes for all types of valves. The size to

be installed at each radiator is selected by the engineers of the nearest Webster Branch Office, who are equipped with complete data to make possible the proper selection.

Webster Syphon (bellows type) or Series '7' (diaphragm type) Traps are installed at the outlet of the radiators. These thermostatic traps hold the steam in the radiators, preventing its escape while permitting the passage of water and air which flow back by gravity to the Vent Trap and Boiler Return Trap. The Vent Valve allows the air to pass out of the system while the Vent Trap closes automatically to prevent any water following. The Boiler Return Trap provides automatic return of water to the boiler. The arrangement of the Boiler Return Trap with the Vent Trap assures safety in case of sudden building-up of pressure due to any cause. The water will be automatically delivered to the boiler regardless of the pressure up to its maximum working pressure of 15 lbs. per sq. in.

The Vent Valve opens to permit discharge of air from the Vent Trap and closes to prevent its return, thus making possible, under certain conditions, operation of the system below atmospheric pressure.

The Webster Boiler Protector prevents

damage due to low water. When water line of boiler drops to the Protector Operating Level, Protector functions to admit raw water from city supply to boiler. The Protector is not an ordinary "feeder" but primarily an emergency device. Normal water level should be maintained in the boiler by use of the hand valve.

Notes on Operation

It is necessary to carry one pound or more pressure at the boiler in order to fill the radiators initially with steam and to maintain sufficient heat delivery for the coldest weather. The pressure may be reduced to one-quarter pound or less during mild and moderate weather when radiators need be only partially filled. After initial heating-up has been accomplished, the system may work under a vacuum of condensation for long periods.

If some form of inside thermostatic control is used, the system will give better heating results with lower pressure in mild weather and higher in cold weather. This will result in carrying heat on for longer periods than would otherwise be the case and the "off" period will be considerably reduced.

During the heating-up period it may be necessary in some installations to raise the boiler pressure to two pounds or higher in order to fully heat up the radiation in thirty minutes, but it will be found much easier to raise the required pressure than in the older type unorificed system, as the orifices have the effect of reducing the "steaming" space materially.

Supply and Return Piping

General Instructions

The drip points of steam mains are provided with Webster Drip Traps, either thermostatic or combination float and thermostatic, protected by Webster Dirt Strainers or Dirt Pockets. Typical methods of connection using Webster Series 26-T Traps are shown on Fig. 6. The bases of all downfeed risers are dripped through Webster Drip Traps as illustrated in Fig. 8.

It is usually preferable to run laterals from risers to radiators in the floor construction. Dry return mains are connected to return risers, radiators and air lines. Unless otherwise noted on the plans, the dry returns should be run overhead in the basement and connected as illustrated in Figs. 6 and 7.

The supply mains and dry return mains should grade 1 in. in 20 ft. in the direction of flow. Laterals to risers and radiators should be taken from the top of the mains and graded 3 in. in 10 ft. toward the mains.

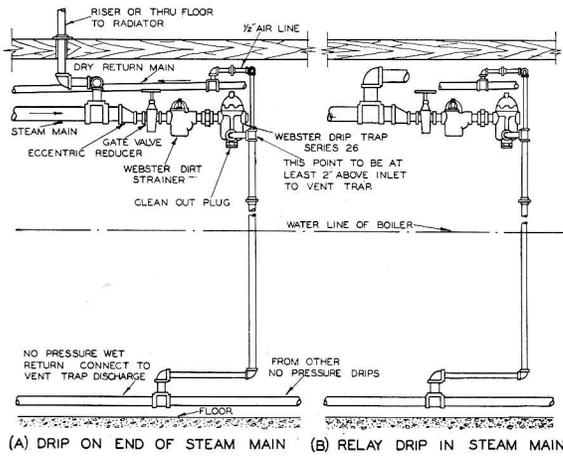


Fig. 6. Method of dripping steam main through Webster Dirt Strainer and Drip Trap discharging condensation into pressure wet return near floor and air into overhead dry return. (In residences and small installations Webster Thermostatic Traps are used for dripping mains.)

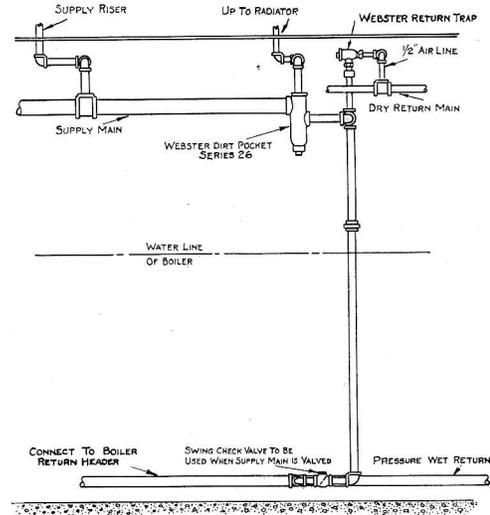


Fig. 7. Method of dripping end of supply main through a Webster Dirt Pocket to pressure wet return near floor and venting to overhead dry return.

Return Piping Grades Toward Vent Trap

The overhead dry return pipes handle air as well as water. These pipes must therefore pitch down toward the Vent Trap so that the water will flow back by gravity. This is shown in Figs. 6 and 7.

At the same time, there should be maintained in the entire run of horizontal piping, an open space above the water for the free passage of the air. Any traps or seals must be avoided as they will cause partial or even complete air binding of the system.

Steam Piping Grades Away from Boiler

The highest point of the steam mains is at the boiler. From here they branch and grade downward. If the mains are relatively short they are dripped at the ends, usually into a wet return through which the water flows back to the boiler. Refer to sketch A, Fig. 6. Where the mains are long, additional relay drips are provided, discharging into the same wet return which is run well below the water line of the boiler. Refer to sketch B, Fig. 6.

As this wet return pipe is connected directly to the steam mains, it is subjected to practically

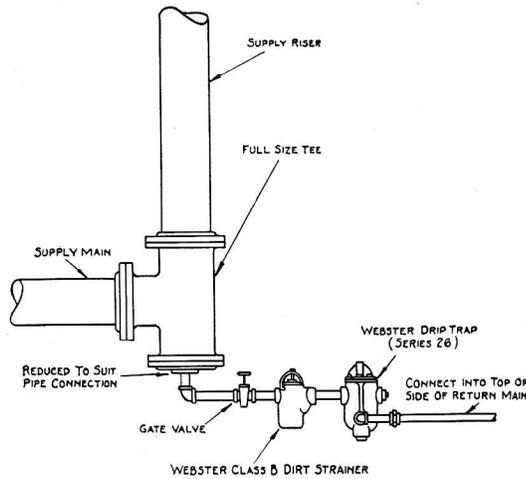


Fig. 8. Method of dripping supply main where it rises to a new level—through a Webster Dirt Strainer and a Webster Drip Trap.

boiler pressure and, therefore, condensate will flow back directly to the boiler by gravity.

In a Type "R" System the sizes of the radiator supply valves and traps, and the sizes and arrangement of piping are selected to secure complete circulation of steam at very low pressures, the exact amount depending upon the size and character of the installation.

Two typical piping arrangements are shown in Figs. 3 and 4 on page 4. Webster Service Details are available showing exactly how the piping should be installed.

NOTE:—In some installations it may be desirable to grade steam piping against flow of steam (toward the boiler). In such cases pipe must be large enough so that water of condensation can return to boiler against flow of steam.

If Intermediate Metering Orifices are Used

In some Improved Type "R" Systems, especially in large buildings, Intermediate Metering Orifices are used where needed in the branch mains to assist in primary distribution. They are placed in pipe lines between union flanges or between companion flange and gate valve. Follow the plans exactly for location of these Intermediate Orifices and use Webster Service Details for method of installation and for drip connections.

If Webster Central Controls are Used

Webster Central Controls such as Moderator Control or Hylo Steam Vari-

ator may be used in the steam supply piping of large Type "R" System installations. The following should be noted if this control equipment is to be installed:

1. Where steam is used to generate hot water, the supply connection to the hot water generator must be taken off ahead of the control equipment.
2. Where steam is used for indirect heating surfaces (unit heaters, hot blast stacks, etc.) it may be necessary to take this off ahead of the control equipment. Consult the nearest Webster Branch Office.

Webster Service Details will be provided by the Webster Branch Office showing methods of installing Webster Control Equipment.

Webster Drip Trap, Series 26

Webster Series 26 Drip Traps are installed to drip the ends of mains and risers, sections of blower coils, pipe manifolds, unit heaters and coils

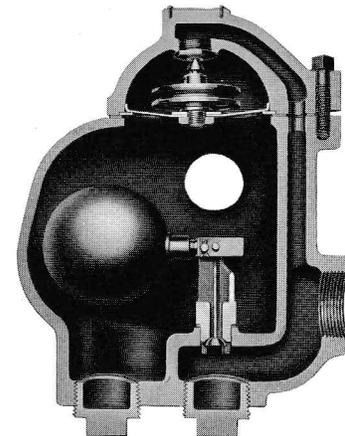


Fig. 9. Webster Drip Trap, Model 026-T.

in hot water generators. The Model 26-T has a thermostatic vent for the release of air. Model 26-O does not have this vent and is preferred for all applications where the elimination of air is not a problem. Construction of both models is shown in Fig. 9 and Fig. 11. Maximum Working Pressure is 15 lb. per sq. in.

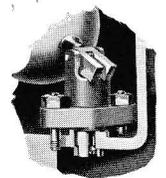


Fig. 10. Valve Assembly of Webster Drip Trap, Size 026.

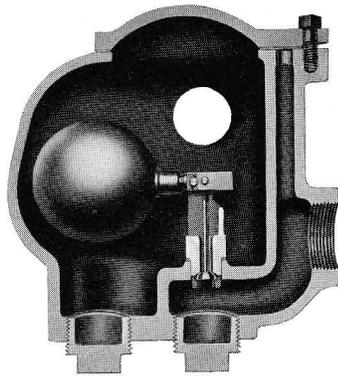


Fig. 11. Webster Drip Trap, Model 026-O.

Cleaning and Flushing—Two cleanout plugs have been placed on the bottom of Webster Drip Traps. These plugs should be removed at least once each heating season and the inside of the trap thoroughly flushed free of dirt and debris which is carried over from the heating system. Systematic cleaning will eliminate most troubles caused by inoperative traps.

Maintenance—Ordinarily this trap will need no attention except periodic cleaning.

The cover is held in place by cap screws. The float-and-valve mechanism is removable as a unit through this opening. Fig. 10 shows the two nuts which hold the entire mechanism in place in size 026 Traps. In size 0026 Traps, a clamp and screw placed on top of the interior mechanism hold it in place.

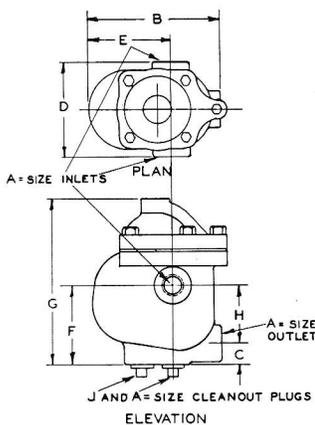


Table I—Roughing-in Dimensions of Webster Series 26-T Drip Traps

NOTE: All drip traps are shipped with one inlet plugged. Plug the inlet which will not be used.

Table I—(continued)

| Size | A | B | C | D | E | F | G | H | J |
|--------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|-------------------------------|
| 0026-T | 1 | 6 ³ / ₈ | 1 ¹ / ₈ | 4 ¹ / ₂ | 3 ⁵ / ₁₆ | 3 ¹⁵ / ₁₆ | 8 ¹ / ₈ | 2 ³ / ₁₆ | 1 |
| 026-T | 1 ¹ / ₂ | 8 ¹ / ₈ | 2 ⁵ / ₈ | 5 ³ / ₈ | 4 ⁷ / ₈ | 5 ⁵ / ₈ | 9 ¹⁵ / ₁₆ | 3 | 1 ¹ / ₄ |

All dimensions are in inches.

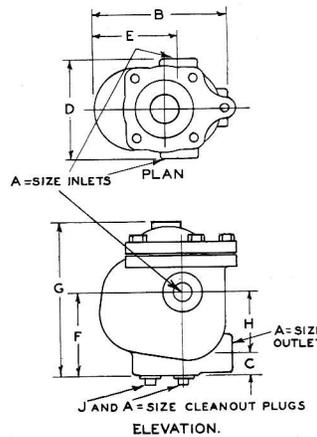


Table II—Roughing-in Dimensions of Webster Series 26-O Drip Traps

NOTE: All drip traps are shipped with one inlet plugged. Plug the inlet which will not be used.

| Size | A | B | C | D | E | F | G | H | J |
|--------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|-------------------------------|
| 0026-O | 1 | 6 ³ / ₈ | 1 ¹ / ₈ | 4 ¹ / ₂ | 3 ⁵ / ₁₆ | 3 ¹⁵ / ₁₆ | 7 ¹ / ₁₆ | 2 ³ / ₁₆ | 1 |
| 026-O | 1 ¹ / ₂ | 8 ¹ / ₈ | 2 ⁵ / ₈ | 5 ³ / ₈ | 4 ⁷ / ₈ | 5 ⁵ / ₈ | 8 ⁷ / ₁₆ | 3 | 1 ¹ / ₄ |

All dimensions are in inches.

Webster Dirt Pockets, Series 26

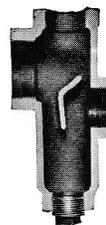


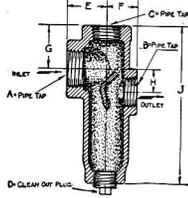
Fig. 12. Webster Dirt Pocket.

Series 26 Dirt Pockets should be used in all cases where "pipe-and-fittings" pockets are ordinarily used —on ends of mains, drips from pipe coils, unit heaters and similar points. They can also be used at the base of downfeed risers by plugging the unused side opening. In the ordinary installation they save the cutting of four threads as well as the cost of six pipe fittings, in addition to providing better protection.

Where the probability of dirt is greater than normal, Series 18 Dirt Strainers should be used in place of Series 26 Dirt Pockets.

Maintenance—Dirt Pockets must be cleaned at least once each heating season. To clean, remove plug from bottom of Dirt Pocket and flush with water.

Table III—Series 26 Dirt Pocket Dimensions



| Symbol | Size | | C | D | E | F | G | H | J |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | A | B | | | | | | | |
| 526 | 1 1/4 | 1 | 1 | 3/4 | 1 3/4 | 1 3/8 | 1 7/8 | 1 | 6 7/8 |
| 826 | 2 | 1 1/4 | 1 1/4 | 1 | 2 1/8 | 1 5/8 | 2 3/8 | 1 1/2 | 7 7/8 |
| 1026 | 2 1/2 | 1 3/4 | 1 1/2 | 1 1/4 | 2 5/8 | 1 3/4 | 2 3/4 | 1 5/8 | 9 1/4 |
| 1226 | 3 | 1 3/4 | 1 1/2 | 1 1/4 | 2 3/4 | 1 3/4 | 3 1/8 | 1 7/8 | 10 5/8 |

Webster Dirt Strainers, Series 18

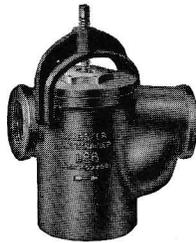


Fig. 13. Webster Dirt Strainer—Exterior View—Straightway Model.

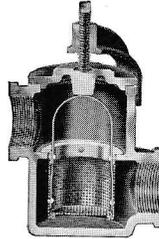


Fig. 14. Webster Dirt Strainer—Series 18—Offset Model.

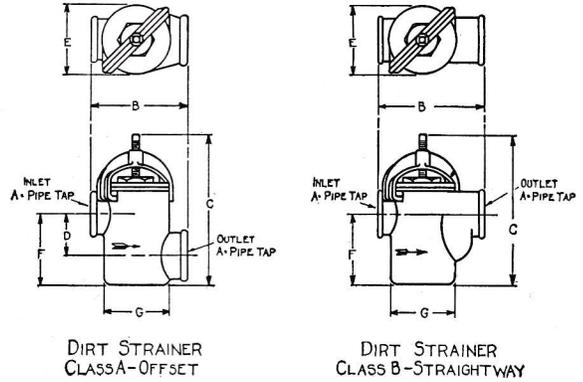
Series 18 Strainers are used in steam heating systems to prevent dirt from entering radiator traps on drip points, mains or blast coils. They catch and retain pipe chips, rust, dirt and foreign matter in a place where they can do no harm and may be easily and permanently removed from the system, thus assuring trouble-free operation of the apparatus protected.

Made in two classes; Class "A" is offset so that

it is automatically self-draining, Class "B" is straightway so that it can be installed in pipe line without changes in level.

Maintenance—Strainers should be cleaned at least once each heating season. Follow instructions given on page 26 for cleaning Strainers.

Table IV—Webster Series 18 Dirt Strainers Dimensions



| Symbol | "A" | B | C | D | E | F | G |
|--------|------------|-------|-------|-------|-------|-------|-------|
| 018-A | 1/2 or 3/4 | 3 1/2 | 6 | 1 3/4 | 2 3/4 | 2 3/4 | 2 1/2 |
| 118-A | 1 or 1 1/4 | 4 3/4 | 7 3/8 | 2 | 3 1/2 | 3 1/2 | 3 1/4 |
| 218-A | 1 1/2 or 2 | 6 | 9 1/4 | 3 | 4 3/4 | 4 3/4 | 4 1/4 |
| 018-B | 1/2 or 3/4 | 4 1/4 | 6 | ... | 2 3/4 | 2 3/4 | 2 1/2 |
| 118-B | 1 or 1 1/4 | 5 1/2 | 7 3/8 | ... | 3 1/2 | 3 1/2 | 3 1/4 |
| 218-B | 1 1/2 or 2 | 7 1/4 | 9 1/4 | ... | 4 3/4 | 4 3/4 | 4 1/4 |

All dimensions in inches and subject to slight variation.

Radiator Connections

In the Webster Type "R" Systems, each radiator is equipped with a Webster Supply Valve and a Webster Thermo-static Return Trap. As previously explained, each Webster Supply Valve in an Improved Webster Type "R" System includes a Webster Metering Orifice, either in the union nipple or in a seat sleeve such as is furnished with the Webster "Three-Point" Valve. In some Webster Type "R" Systems, the metering orifices are omitted. In these systems instructions concerning installation of metering orifices may be ignored.

Typical methods of making supply and return connections to radiators are illustrated in Figs. 15, 16, and 17. Webster Service Details are furnished for all Webster installations and should be requested from the Webster Branch Office especially if radiators are of a different type than those illustrated here.

Installing Webster Supply Valves

When "hot-water-type" cast iron radiators (Fig. 15) are used they should be connected with supply valve at top and return trap at bottom on opposite end. This position of the supply valve permits steam to circulate across and downward

while air and condensate, being heavier, fall to the bottom in advance of steam, giving full efficiency to the part of the radiator heated.

It may be necessary in some instances to use Webster Supply Valves with bottom connected radiators, but this should be avoided if possible. When the valve is placed at the bottom, the inlet and outlet bushings must be eccentric. The Supply Valve bushing must be installed with the eccentric opening *up* and the return trap bushing with the eccentric *down*.

When installing Webster Supply Valves which include metering orifices, it is absolutely essential that the valve nipple be above the water line of the radiator.

Installing Nipple-Type Metering Orifices

In the Improved Type "R" System the supply valve nipples are not shipped with the valves but are packed in separate boxes. These supply valve nipples are exactly like standard valve nipples except that the metering orifices have been inserted in the thread or discharge end of the nipple. This is clearly shown in Fig. 18 and Fig. 21.

Much of the success of an Improved Webster System depends on seeing to it that these nipple orifices are installed in the radiator for which they are intended. Each orifice has been selected to fit a certain radiator, the size depending on the piping, the amount of radiation and the distance of the radiator from the boiler or source of steam supply.

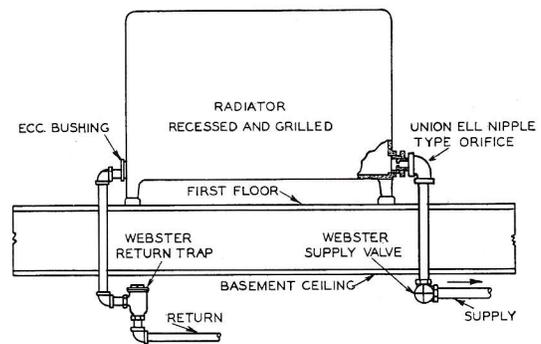
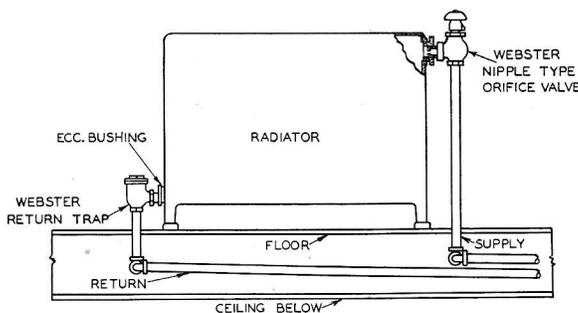


Fig. 15. Method of making supply and return connections to standard radiators using Webster Supply Valve or union ell with standard nipple type orifices and Webster Return Traps.

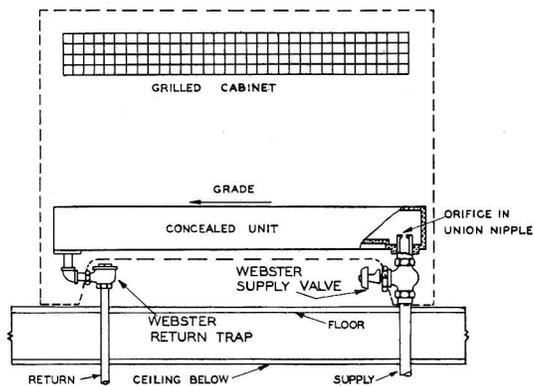


Fig. 16. Method of making supply and return connections to concealed unit using Webster Model GU Supply Valve with special union nipple and Webster Return Trap.

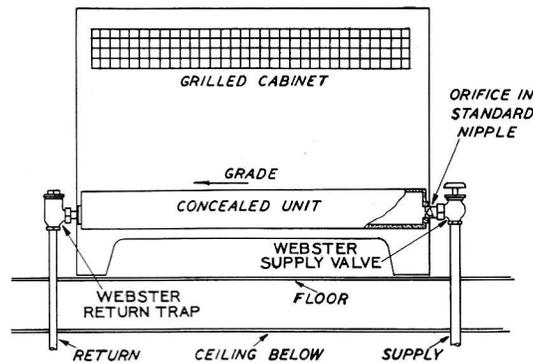


Fig. 17. Method of making supply and return connections to cabinet radiator using Webster Supply Valve with standard nipple-type orifice and Webster Return Trap.

To properly install these orifice nipples you require:

1. A blue print or copy of the heating plan on which either (1) each radiator has been numbered, or (2) the orifice size letter has been noted alongside each radiator.
2. Where the radiators have been numbered on the plan a copy of the *Orifice Sizing Schedule* is required. This should be either attached to the plan or included with the Webster Service Details specially made up for the job. If you do not have clear and complete instructions for properly installing orifices call the nearest Webster Branch Office as listed on the back cover of this book.

The *Orifice Sizing Schedule* (see Fig. 19) lists radiator numbers, floors, valve size and orifice size. First locate the radiator. Note its number. Take from the valves supplied for the job a valve of proper size, $\frac{1}{2}$ ", $\frac{3}{4}$ ", or 1", etc. Next obtain the proper orifice nipple from its box. The end of the box contains a table showing sizes contained therein.

METERING ORIFICE

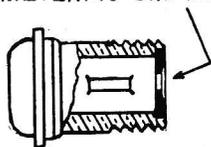


Fig. 18. Showing Metering Orifice in Supply Valve Nipple.

Each nipple is stamped with three marks as shown in Fig. 20—a letter, a number and a letter. The first letter indicates the type of valve for which the nipple is intended. The number indicates the size of the valve and the last letter indicates the size of the orifice. These three marks are shown either on the *Orifice Sizing Schedule* or directly on the plans.

Having selected the proper sizes, the valve and nipple can now be installed. If you have any doubt about your first job, phone the nearest Webster Branch Office for a service engineer to assist you in getting it right.

Types of Nipples

In the installation instructions just described, the metering orifices have been assumed to be in the nipples of the supply valves. Actually these orifices may also be furnished in straight brass nipples or in the nipples of union ells. Applications of these types are shown in Fig. 22. The method of installation is exactly the same as that described for the supply valve nipple.

Installing Sleeve-Type Orifices

Sleeve-type orifices are furnished with the

| RADIATOR NUMBER | FLOOR | SECTION | RADIATION | | VALVE SIZE | ORIFICE SIZE |
|-----------------|-------|---------|-----------|--------|------------|--------------|
| | | | REQ'D | INST'D | | |
| 5 | 1 | A | 57 # | 60 # | 3/4 | W3R |
| 6 | 1 | A | 32 # | 35 # | 1/2 | W2L |

Fig. 19. Portion of Typical Orifice Sizing Schedule.

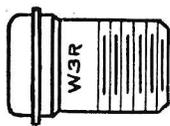


Fig. 20. Showing Where Metering Orifice Size is Stamped.

Webster "Three-Point" Valve. The orifices are generally shipped separately from the valves which are assembled at the Webster factory with the bonnet hand-tight and a temporary sleeve. The valves are connected to radiators as shipped and the orifice sleeves installed later. The correct orifice size is designated on the heating plans and orifice sizing schedule in the same manner as described previously for nipple-type orifices. The size of the individual orifice is marked inside the sleeve. The method of inserting the orifice sleeve is illustrated in Fig. 23.

Where the orifice sleeves are assembled in the "Three-Point" Valves at the factory, each valve will be tagged, the tag indicating the orifice size or radiator number.

To Obtain the "Three-Point" Feature

Webster "Three-Point" Valves are generally shipped from the factory as a standard supply valve having OPEN and SHUT positions only. In order to obtain the three-point feature described on page 14 and in Fig. 24, it is only necessary to remove the handle, reverse the dial plate

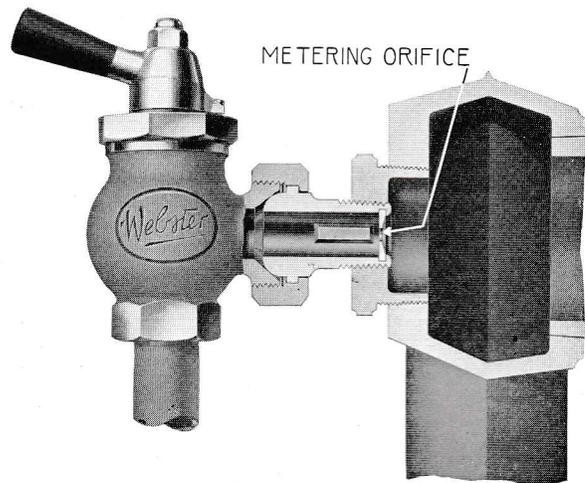


Fig. 21. Standard Monel Metal metering orifice in nipple of Webster Supply Valve.

and replace the handle in the proper position. This is easily accomplished by following the instructions given in Fig. 24.

Maintenance of Orificed Radiators

Orifices are usually omitted from bathroom radiators and occasionally from other radiators where additional heat is desired. If some few radiators fail to heat properly, any one of a number of things may be wrong:

1. The heel of the riser feeding them

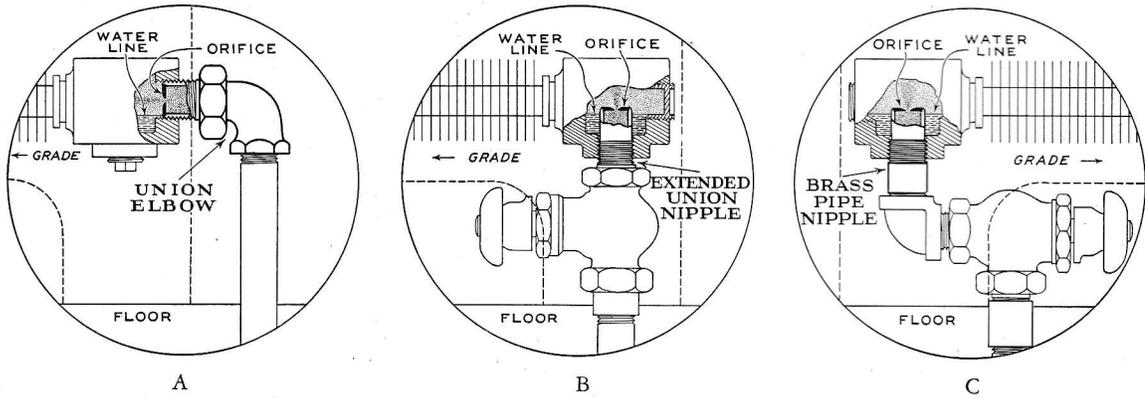


Fig. 22. For light weight radiation applications where it is not practical to use standard nipple-type orifices, these special orificed fittings are available. Sketch A shows an orificed union elbow applied to radiation with end connections when supply valve is located below basement ceiling. Sketch B shows a special orificed valve nipple of extra length used extensively for radiator having bottom connections. Sketch C shows an orificed extra heavy brass pipe nipple also used for certain types of bottom-connected radiators. The dotted lines in the sketch indicate the metal front of panels or cabinets. Note that in all cases the orifice has been installed ABOVE the water line.

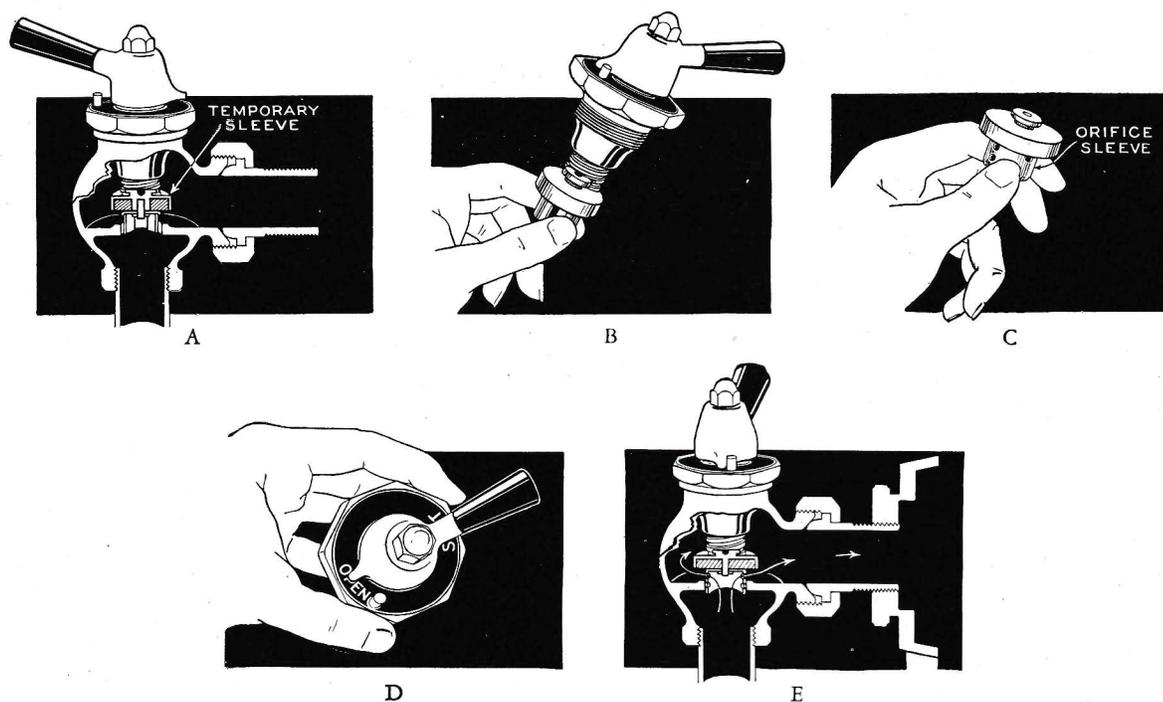


Fig. 23. Installing the Orifice Sleeve in the Webster "Three-Point" Valve is easily accomplished by (1) removing as a unit the interior of valve A as shipped from the factory, (2) withdrawing the temporary sleeve as in B, (3) inserting the correctly sized Orifice Sleeve as in C and (4) replacing the interior unit. The valve is now a standard orificed supply valve with *open* and *shut* positions as in D. In *open* position the top row of orifices is exposed (see E) and enough steam will flow through to provide comfort for the average person.

1. The radiator trap may be trapped with water because of a faulty drip or lateral connection.
2. Either the supply or return laterals to the radiators may be improperly graded so that water obstructs the flow of steam into the radiator or prevents air from leaving it.
3. The dirt strainers and dirt pockets may need cleaning.

4. The radiator trap may be dirty or an obstruction may be lodged in the orifice.

If all the radiators heat uniformly but it is desired to secure more heat in some particular room, the orifices controlling the radiators in that room can either be enlarged or removed entirely without affecting distribution of steam to the remaining radiators in the building.

Webster Supply Valves

Webster "Three-Point" Valves

Webster "Three-Point" Valves are radiator supply valves of highest quality, having two unusual features. First, they include a sleeve-type metering orifice and, secondly, they can be arranged to deliver an *excess* quantity of steam by merely setting the handle in proper position. The "Three-Point" Valve as generally shipped from the Webster factory is not arranged for the *excess*

position. This must be done by the fitter or by the occupant after the valve has been installed. The method is very simple as can be seen by examining Fig. 24.

The "Three-Point" Valve is assembled at the factory with a *temporary* sleeve instead of the *orifice* sleeve. The latter is sent separately and is placed in the valve after installation. By installing the valves as received, it is possible to operate

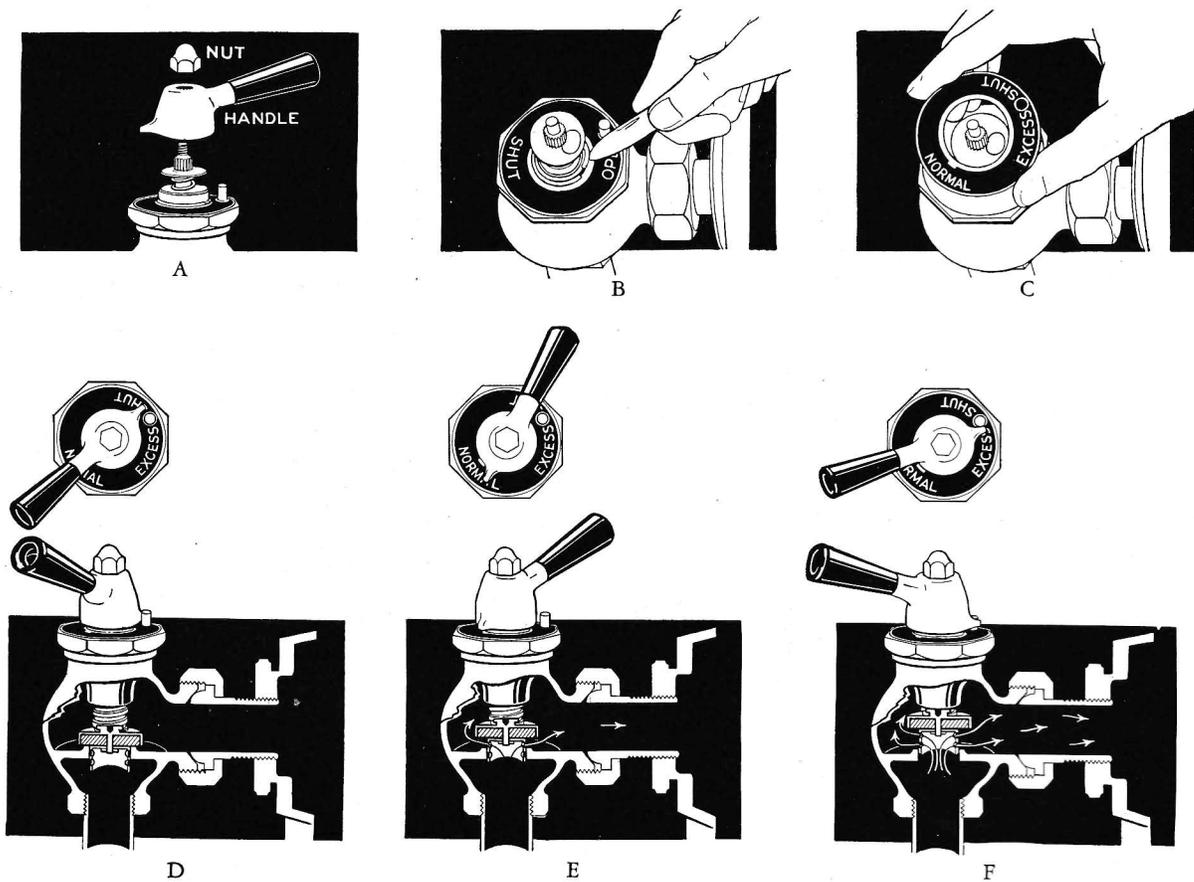


Fig. 24. The Webster "Three-Point" Valve is usually shipped from the factory as a standard supply valve. To utilize the "Three-Point" feature it is necessary to (1) shut the valve, (2) remove nut and handle as in A, (3) pry off spring ring as in B, (4) reverse dial plate as in C and (5) replace spring ring, handle and nut, *making sure* to set handle at new shut position. The "Three-Point" settings now available are as shown in D, E and F. In D the valve is SHUT. In E it is open to NORMAL position, giving enough heat for the comfort of the average person. Note that steam is flowing through the top row of holes only. In F it is at EXCESS to supply added heat when desired. Note that steam now flows through two rows of holes.

the system for temporary heat during construction, and, later to have unrestricted steam flow through the system when the latter is being tested. The method of inserting sleeve orifices in the valve is shown in Fig. 23.

Webster Type 'W' Valves

The Webster Type 'W' Valve is a standard radiator supply valve of highest quality. It includes a seat sleeve with curved slots which provides "modulation" of heat to the radiator if the proper steam pressure is maintained on the

system. In Improved Webster Type "R" Systems this valve is furnished with a metering orifice in the union nipple.

Webster Syphon Packless Valve

This valve is frequently used in connection with Improved Type "R" Systems. It is absolutely packless, having a genuine Syphon bellows completely enclosing the valve stem. This is *not* a modulating valve. Webster Metering Orifices are placed in the union nipples of Webster Syphon Valves.

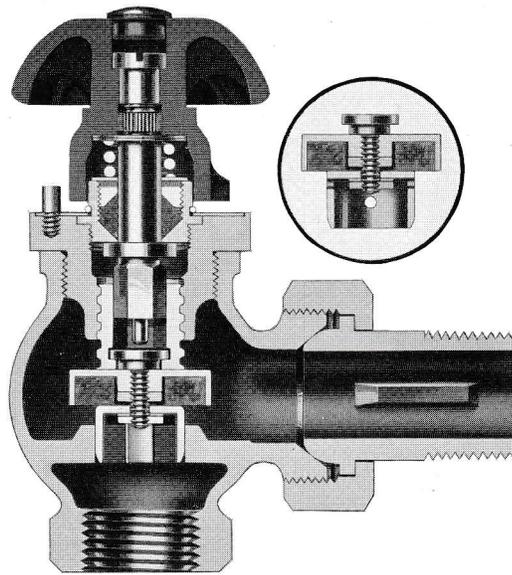


Fig. 25. A cutaway view of the Webster "Three-Point" Valve. The Orifice Sleeve usually inserted in the valve after installation is shown within the circle at the right. A temporary sleeve, giving unrestricted steam flow, is shown assembled in the valve.

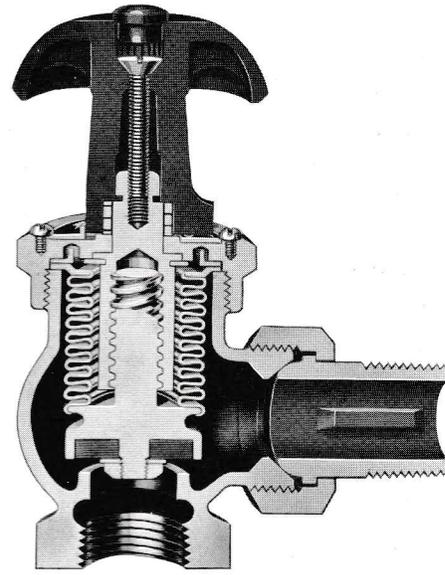


Fig. 27. Webster Syphon Packless Valve in section.

Webster Type 'B' Valves

This is a standard "on-and-off" valve, used wherever a supply valve of simple design meets the requirements. The Type 'B' Valve is *not* a modulating valve. It can be furnished with a metering orifice in the union nipple for use with Improved Webster Type "R" Systems.

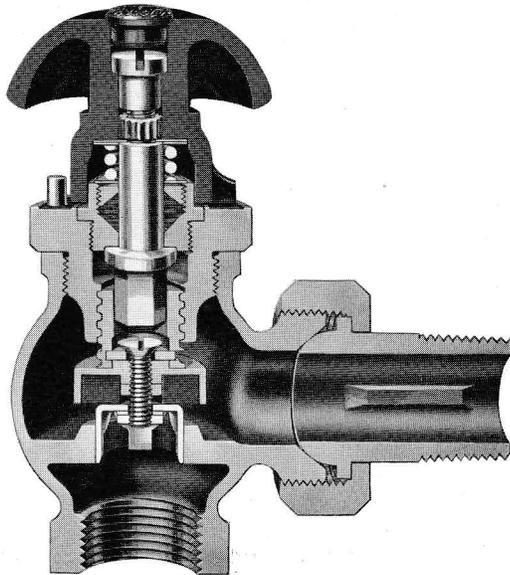


Fig. 26. A sectioned Webster Type 'W' Supply Valve. The curved slot in the seat opening provides "modulation" of steam flow.

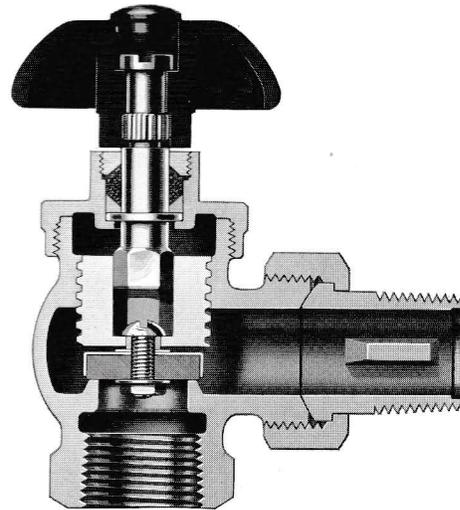
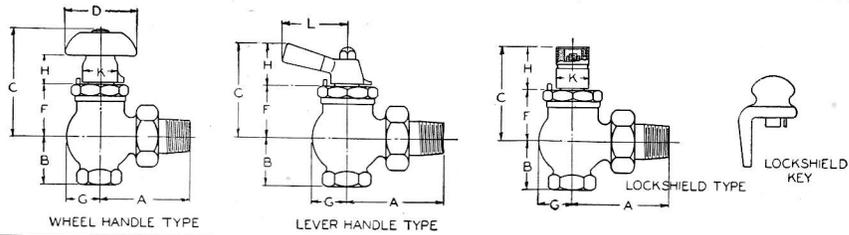


Fig. 28. A sectioned Webster Type 'B' Valve.

Dimensions of Webster Type 'W' and "Three-Point" Valves

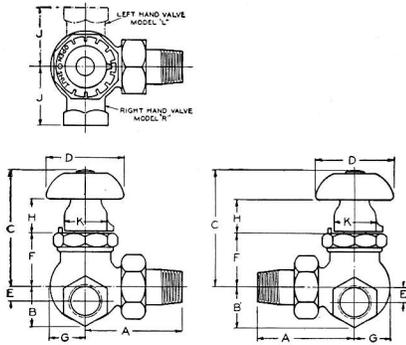
All dimensions in inches and subject to slight variation.

Table V—Angle Body with Wheel (standard), Lever, and Lockshield Handles



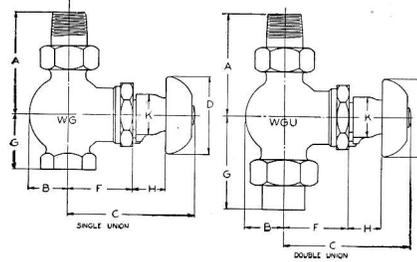
| Size | All Types | | | | Wheel Handle | | | | Lever Handle | | | Lockshield | | |
|--------|-----------|-------|-------|-------|--------------|-------|--------|--------|--------------|-------|--------|------------|---------|-------|
| | A | B | F | G | C | D | H | K | C | H | L | C | H | K |
| 1/2" | 2 13/16 | 1 1/4 | 1 1/2 | 1 | 3 5/16 | 2 1/4 | 1 5/16 | 1 3/16 | 3 | 1 1/2 | 2 3/16 | 2 7/8 | 1 7/16 | 1 |
| 3/4" | 2 15/16 | 1 1/2 | 1 1/2 | 1 1/8 | 3 7/16 | 2 1/4 | 1 5/16 | 1 3/16 | 3 3/16 | 1 7/8 | 2 3/16 | 3 1/16 | 1 7/16 | 1 |
| 1" | 3 3/16 | 1 3/4 | 1 7/8 | 1 1/8 | 4 3/16 | 3 | 1 1/4 | 1 5/16 | 3 3/4 | 1 7/8 | 2 5/16 | 3 1/16 | 1 13/16 | 1 1/8 |
| 1 1/4" | 3 9/16 | 2 | 2 1/8 | 1 1/2 | 4 7/16 | 3 | 1 1/4 | 1 5/16 | 4 | 1 7/8 | 2 5/16 | 3 15/16 | 1 13/16 | 1 1/8 |

Table VI—Right-Corner and Left-Corner Bodies with Wheel Handle



| Size | A | B | C | D | E | F | G | H | J | K |
|------|---------|-------|--------|-------|------|---------|--------|--------|-------|--------|
| 1/2" | 2 13/16 | 1 1/8 | 3 7/16 | 2 1/4 | 3/8 | 1 5/8 | 1 | 1 5/16 | 1 1/2 | 1 3/16 |
| 3/4" | 2 15/16 | 1 1/4 | 3 9/16 | 2 1/4 | 7/16 | 1 13/16 | 1 1/8 | 1 5/16 | 1 1/2 | 1 3/16 |
| 1" | 3 3/16 | 1 1/2 | 4 3/8 | 3 | 1/2 | 2 1/16 | 1 3/16 | 1 1/4 | 2 | 1 5/16 |

Table VII—Straightway Bodies with Wheel Handles
Single and Double Union Types

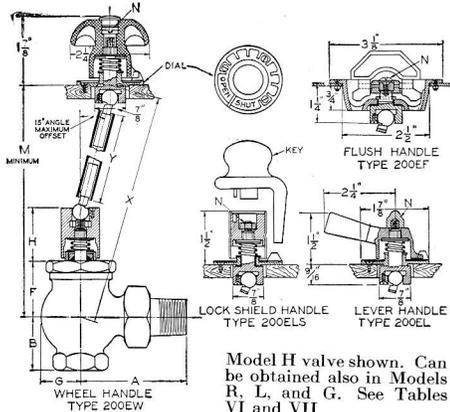


To be installed only as shown above with bodies in vertical position

| SINGLE UNION | | | | | | | | |
|--------------|-------|--------|--------|-------|--------|-------|--------|--------|
| Size | A | B | C | D | F | G | H | K |
| 1/2" | 2 7/8 | 1 5/16 | 3 9/16 | 2 1/4 | 1 3/4 | 1 1/2 | 1 5/16 | 1 3/16 |
| 3/4" | 3 | 1 1/16 | 3 1/16 | 2 1/4 | 1 7/8 | 1 5/8 | 1 5/16 | 1 3/16 |
| 1" | 3 3/8 | 1 5/16 | 4 1/2 | 3 | 2 3/16 | 2 | 1 1/4 | 1 5/16 |

| DOUBLE UNION | | | | | | | | |
|--------------|-------|--------|--------|-------|--------|---------|--------|--------|
| Size | A | B | C | D | F | G | H | K |
| 3/4" | 3 | 1 1/16 | 3 1/16 | 2 1/4 | 1 7/8 | 2 11/16 | 1 5/16 | 1 3/16 |
| 1" | 3 3/8 | 1 5/16 | 4 5/8 | 3 | 2 5/16 | 2 7/8 | 1 1/4 | 1 5/16 |

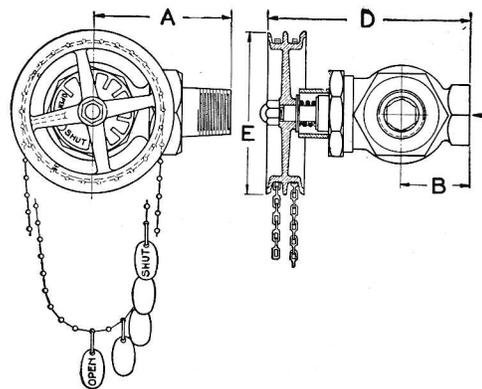
Table VIII—Extended Stem Fixtures with Wheel, Lever, Lockshield, Flush Handles



| Size | A | B | F | G | H | *M |
|--------|---------|-------|-------|-------|-------|-------|
| 1/2" | 2 13/16 | 1 1/4 | 1 1/2 | 1 | 1 5/8 | 6 |
| 3/4" | 2 15/16 | 1 1/2 | 1 1/2 | 1 1/8 | 1 5/8 | 6 1/8 |
| 1" | 3 3/16 | 1 3/4 | 1 7/8 | 1 1/8 | 1 7/8 | 6 3/4 |
| 1 1/4" | 3 9/16 | 2 | 2 1/8 | 1 1/2 | 1 7/8 | 7 |

*Values of M are the minimum.

Table IX—Angle Body and Chain Wheel

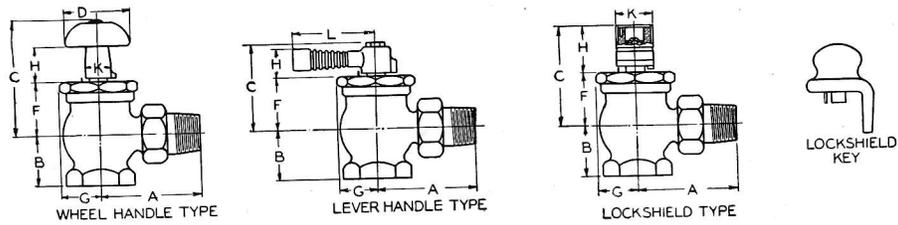


| Size | A | B | D | E |
|--------|---------|-------|--------|--------|
| 1/2" | 2 13/16 | 1 1/4 | 4 1/16 | 3 9/16 |
| 3/4" | 2 15/16 | 1 1/2 | 4 1/2 | 3 9/16 |
| 1" | 3 3/16 | 1 3/4 | 5 3/16 | 3 9/16 |
| 1 1/4" | 3 9/16 | 2 | 5 1/16 | 3 9/16 |

Dimensions of Webster Sylphon Packless Valves

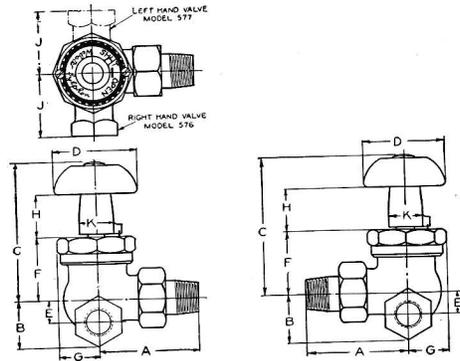
All Dimensions in Inches and Subject to Slight Variation

Table X—Angle Body with Wheel (standard), Lever, and Lockshield Handles



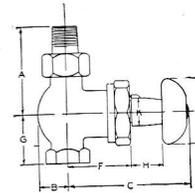
| Size | All Types | | | | Wheel Handle | | | | Lever Handle | | | Lockshield | | |
|--------|-----------|--------|--------|--------|--------------|-------|-------|-----|--------------|-------|--------|------------|-------|--------|
| | A | B | F | G | C | D | H | K | C | H | L | C | H | K |
| 1/2" | 2 5/8 | 1 1/4 | 1 9/16 | 1 | 3 1/2 | 2 1/8 | 1 1/8 | 7/8 | 2 9/16 | 1 3/8 | 2 1/8 | 2 13/16 | 1 1/4 | 1 5/16 |
| 3/4" | 2 3/4 | 1 3/8 | 1 5/8 | 1 | 3 9/16 | 2 1/8 | 1 1/8 | 7/8 | 2 11/16 | 1 3/8 | 2 1/8 | 2 7/8 | 1 1/4 | 1 5/16 |
| 1" | 3 1/8 | 1 3/4 | 2 1/8 | 1 5/16 | 4 5/16 | 2 5/8 | 1 3/8 | 7/8 | 3 3/16 | 1 3/8 | 2 7/16 | 3 3/8 | 1 1/4 | 1 5/16 |
| 1 1/4" | 3 5/8 | 1 7/8 | 2 1/8 | 1 9/16 | 4 5/16 | 2 5/8 | 1 3/8 | 7/8 | 3 3/8 | 1 3/8 | 2 7/16 | 3 3/8 | 1 1/4 | 1 5/16 |
| 1 1/2" | 3 7/8 | 2 3/16 | 2 5/16 | 1 1/2 | 4 7/8 | 3 | 1 1/2 | 7/8 | 3 3/8 | 1 3/8 | 2 7/8 | 3 9/16 | 1 1/4 | 1 5/16 |
| 2" | 4 3/8 | 2 7/16 | 2 5/16 | 1 1/2 | 4 7/8 | 3 | 1 1/2 | 7/8 | 3 3/8 | 1 3/8 | 2 5/8 | 3 9/16 | 1 1/4 | 1 5/16 |

Table XI—Right-Corner and Left-Corner with Wheel Handles



| Size | A | B | C | D | E | F | G | H | J | K |
|------|-------|--------|--------|-------|--------|---------|--------|--------|--------|-----|
| 1/2" | 2 5/8 | 1 1/4 | 3 9/16 | 2 1/8 | 9/16 | 1 5/8 | 1 | 1 1/8 | 1 5/8 | 7/8 |
| 3/4" | 2 3/4 | 1 9/16 | 3 5/8 | 2 1/8 | 1 1/16 | 1 11/16 | 1 | 1 1/8 | 1 3/4 | 7/8 |
| 1" | 3 1/8 | 2 | 4 3/8 | 2 5/8 | 1 1/16 | 2 3/16 | 1 9/16 | 1 3/16 | 2 1/16 | 7/8 |

Table XII—Straightway Bodies with Wheel Handles Single Union Type



To be installed only as shown above with body in vertical position

| Size | A | B | C | D | F | G | H | K |
|------|---------|-------|--------|-------|--------|--------|--------|-----|
| 1/2" | 2 13/16 | 7/8 | 3 7/8 | 2 1/8 | 1 5/16 | 1 9/16 | 1 1/8 | 7/8 |
| 3/4" | 2 7/8 | 1 | 4 1/16 | 2 1/8 | 2 1/8 | 1 3/4 | 1 1/8 | 7/8 |
| 1" | 3 9/16 | 1 1/4 | 5 1/8 | 2 5/8 | 2 5/16 | 2 1/4 | 1 3/16 | 7/8 |

Table XIV—Extended Stem Fixtures with Wheel, Lever, Lockshield, Flush Handles

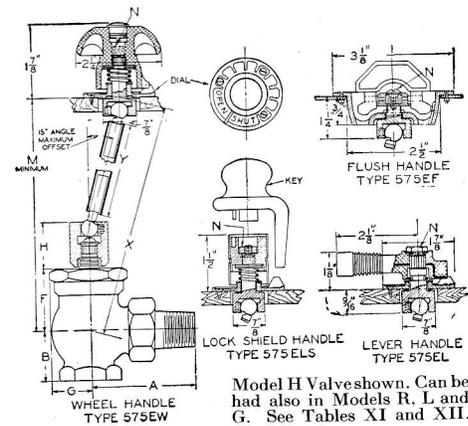
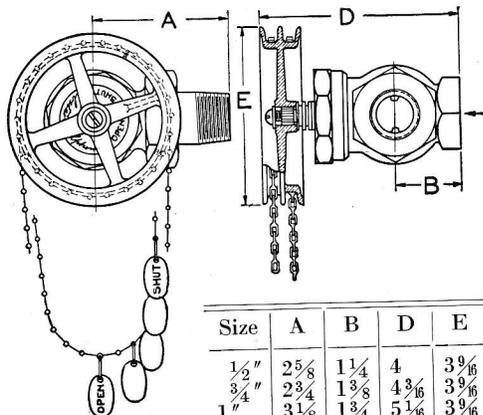


Table XIII—Angle Body and Chain Wheel



| Size | A | B | D | E |
|--------|-------|--------|---------|--------|
| 1/2" | 2 5/8 | 1 1/4 | 4 | 3 9/16 |
| 3/4" | 2 3/4 | 1 3/8 | 4 3/16 | 3 9/16 |
| 1" | 3 1/8 | 1 3/4 | 5 1/16 | 3 9/16 |
| 1 1/4" | 3 5/8 | 1 7/8 | 5 3/16 | 3 9/16 |
| 1 1/2" | 3 7/8 | 2 3/16 | 5 5/8 | 3 9/16 |
| 2" | 4 3/8 | 2 7/16 | 5 15/16 | 3 9/16 |

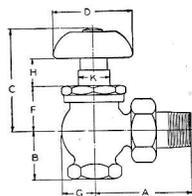
| Size | A | B | F | G | H | *M |
|--------|-------|--------|--------|--------|-------|---------|
| 1/2" | 2 5/8 | 1 1/4 | 1 9/16 | 1 | 1 1/4 | 5 13/16 |
| 3/4" | 2 3/4 | 1 3/8 | 1 5/8 | 1 | 1 1/4 | 5 7/8 |
| 1" | 3 1/8 | 1 3/4 | 2 1/8 | 1 5/16 | 1 1/4 | 6 3/8 |
| 1 1/4" | 3 5/8 | 1 7/8 | 2 1/8 | 1 5/16 | 1 1/4 | 6 3/8 |
| 1 1/2" | 3 7/8 | 2 3/16 | 2 5/16 | 1 1/2 | 1 1/4 | 6 9/16 |
| 2" | 4 3/8 | 2 7/16 | 2 5/16 | 1 1/2 | 1 1/4 | 6 9/16 |

*Values of M are the minimum.

Dimensions of Webster Type 'B' Valves

All Dimensions in Inches and Subject to Slight Variation

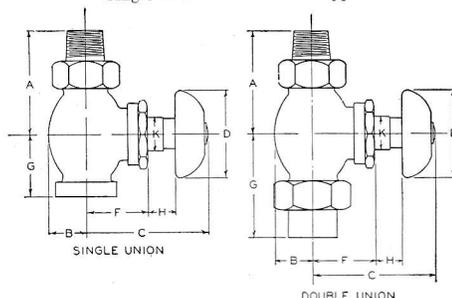
Table XV—Angle Body with Standard Wheel Handle



| Size | | A | B | C | D | F | G | H | K |
|-------|--------|-------|-------|-------|-------|--------|--------|--------|-----|
| Inlet | Outlet | | | | | | | | |
| 3/4 | 1/2 | 2 3/4 | 1 3/8 | 3 | 2 1/4 | 1 5/16 | 1 5/16 | 1 5/16 | 7/8 |
| 1 3/4 | 3/4 | 2 3/4 | 1 3/8 | 3 | 2 1/4 | 1 5/16 | 1 5/16 | 1 5/16 | 7/8 |
| 1 | 1 | 3 1/8 | 1 3/8 | 3 1/4 | 2 1/4 | 1 1/2 | 1 1/16 | 1 1/8 | 7/8 |

Table XVII—Straightway Bodies with Standard Wheel Handle

Single and Double Union Types



To be installed only as shown above with bodies in vertical position

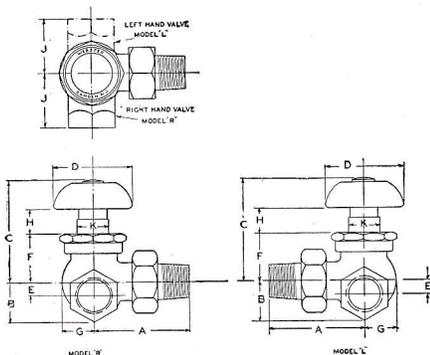
SINGLE UNION—G

| Size | | A | B | C | D | F | G | H | K |
|-------|--------|-------|-------|-------|-------|--------|-------|--------|-----|
| Inlet | Outlet | | | | | | | | |
| 3/4 | 1/2 | 3 | 1 | 3 1/4 | 2 1/4 | 1 9/16 | 1 5/8 | 1 3/16 | 7/8 |
| 3/4 | 3/4 | 3 | 1 | 3 1/4 | 2 1/4 | 1 9/16 | 1 5/8 | 1 3/16 | 7/8 |
| 1 | 1 | 3 1/4 | 1 1/8 | 3 3/8 | 2 1/4 | 1 5/8 | 1 7/8 | 1 3/8 | 7/8 |

DOUBLE UNION—GU

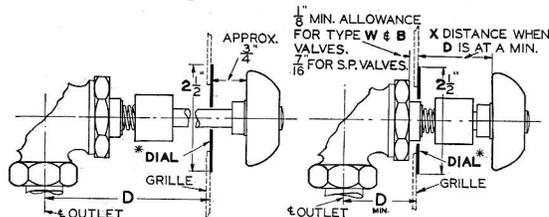
| Size | | A | B | C | D | F | G | H | K |
|-------|--------|-------|-------|-------|-------|--------|--------|--------|-----|
| Inlet | Outlet | | | | | | | | |
| 3/4 | 1/2 | 3 | 1 | 3 1/4 | 2 1/4 | 1 9/16 | 2 1/16 | 1 3/16 | 7/8 |
| 3/4 | 3/4 | 3 | 1 | 3 1/4 | 2 1/4 | 1 9/16 | 2 1/16 | 1 3/16 | 7/8 |
| 1 | 1 | 3 1/4 | 1 1/8 | 3 3/8 | 2 1/4 | 1 5/8 | 2 1/16 | 1 3/8 | 7/8 |

Table XVI—Right-Corner and Left-Corner Bodies with Standard Wheel Handle



| Size | | A | B | C | D | E | F | G | H | J | K |
|-------|--------|-------|--------|---|-------|-----|--------|--------|--------|--------|-----|
| Inlet | Outlet | | | | | | | | | | |
| 3/4 | 1/2 | 2 3/4 | 1 3/16 | 3 | 2 1/4 | 3/8 | 1 5/16 | 1 5/16 | 1 9/16 | 1 9/16 | 7/8 |
| 3/4 | 3/4 | 2 3/4 | 1 3/16 | 3 | 2 1/4 | 3/8 | 1 5/16 | 1 5/16 | 1 9/16 | 1 9/16 | 7/8 |

Table XVIII—Long Stem Handles for all types of Webster Supply Valves



*Plain dial without markings can be cemented to face of grille if desired.

| Size | "W" & Three-Point Valves | | | | | | "B" Valve | | | | | | Sylphon Packless Valve | | | | | |
|-------|--------------------------|--------|--------|----------------------------------|---------|---------|-----------------------|--------|--------|----------------------------------|-------|-------|------------------------|-------|--------|----------------------------------|--------|--------|
| | Min. Distance For "D" | | | "X" Distance When "D" is at Min. | | | Min. Distance For "D" | | | "X" Distance When "D" is at Min. | | | Min. Distance For "D" | | | "X" Distance When "D" is at Min. | | |
| | Model | | | Model | | | Model | | | Model | | | Model | | | | | |
| | H | G | R & L | H | G | R & L | H | G | R & L | H | G | R & L | H | G | R & L | H | G | R & L |
| 1/2 | 1 5/8 | 1 7/8 | 1 3/4 | 1 15/16 | 1 15/16 | 1 15/16 | | | | | | | | | | | | |
| 3/4 | 1 3/4 | 2 | 1 7/8 | 1 15/16 | 1 15/16 | 1 15/16 | 1 7/16 | 1 1/16 | 1 1/16 | 1 3/4 | 1 3/4 | 1 3/4 | 2 1/16 | 2 3/8 | 2 1/16 | 1 5/16 | 1 5/16 | 1 5/16 |
| 1 | 2 | 2 5/16 | 2 3/16 | 2 1/8 | 2 1/8 | 2 1/8 | 1 5/8 | 1 3/4 | 1 1/16 | 1 3/4 | 1 3/4 | 1 3/4 | 2 1/8 | 2 5/8 | 2 1/8 | 1 5/16 | 1 5/16 | 1 5/16 |
| 1 1/4 | 2 1/4 | | | 2 1/8 | | | | | | | | | 2 3/16 | 3 3/8 | 2 5/8 | 1 5/16 | 1 5/16 | 1 5/16 |
| 1 1/2 | | | | | | | | | | | | | 2 5/8 | | | 1 5/16 | 1 5/16 | 1 5/16 |
| 2 | | | | | | | | | | | | | 2 11/16 | | | 1 5/16 | 1 5/16 | 1 5/16 |

Webster Return Traps

A Webster Return Trap should be installed at the outlet end of each radiator, coil or other connection through which air and condensate are discharged into the return piping. By means of a sensitive thermostatic member it permits the passage of air and water and closes to prevent the passage of steam. Return traps or drip traps are also attached to the ends of the steam mains to vent the air into the dry returns.

Webster Syphon Trap

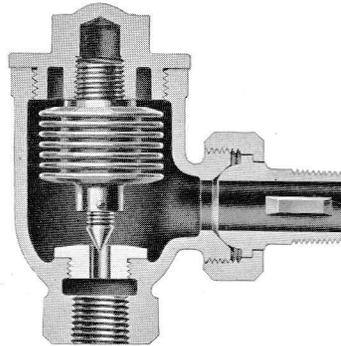


Fig. 29. Webster Syphon Trap

Webster Series 7 Trap

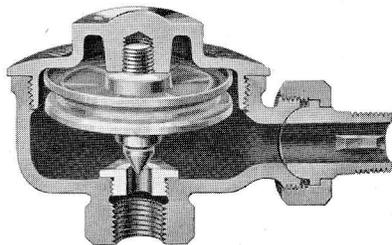


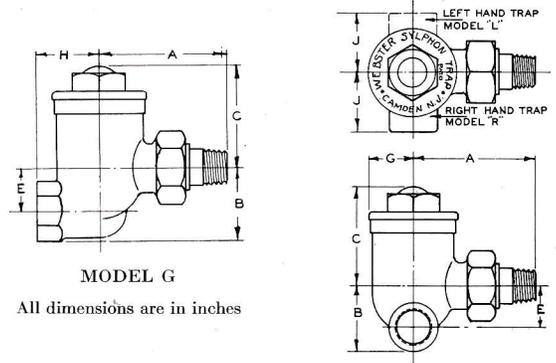
Fig. 30. Webster diaphragm-type Series 7 Trap

Table XIX—Roughing-In Dimensions. Webster Syphon Traps, Model H, Angle Pattern—all sizes

| Size | A | B | C | G |
|------------|-------|-------|-------|-------|
| 1/2" — 502 | 2 3/4 | 1 1/8 | 1 5/8 | 1 3/8 |
| 1/2" — 512 | 3 1/8 | 1 5/8 | 2 3/8 | 1 1/8 |
| 3/4" — 513 | 3 1/8 | 1 3/4 | 2 3/8 | 1 1/8 |
| 3/4" — 523 | 3 5/8 | 1 7/8 | 3 5/8 | 1 5/8 |
| 1" — 534 | 4 | 2 5/8 | 3 1/8 | 1 3/4 |

MODEL H
All dimensions are in inches

Table XX—Roughing-In Dimensions. Webster Syphon Traps. Models G, R and L



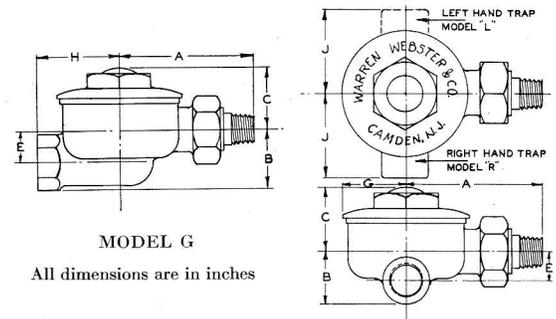
| Size | A | B | C | E | G | H | J |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 1/2" — 502 | 2 3/4 | 1 1/8 | 1 5/8 | 3/4 | 1 3/8 | 1 1/8 | 1 3/8 |
| 1/2" — 512 | 3 1/8 | 1 5/8 | 2 3/8 | 1 | 1 1/8 | 1 1/2 | 1 1/2 |
| 3/4" — 523 | 3 5/8 | 2 3/8 | 2 5/8 | 1 1/4 | 1 3/8 | 1 7/8 | |

Table XXI—Roughing-In Dimensions. Webster Series 7 Diaphragm-Type Traps, Model H, Angle Pattern—all sizes

| Size | A | B | C | G |
|------------|-------|-------|-------|-------|
| 1/2" — 702 | 2 3/4 | 1 1/8 | 1 5/8 | 1 3/8 |
| 1/2" — 712 | 3 5/8 | 1 7/8 | 1 5/8 | 1 3/8 |
| 3/4" — 713 | 3 5/8 | 1 7/8 | 1 5/8 | 1 3/8 |
| 3/4" — 723 | 3 7/8 | 1 5/8 | 2 1/8 | 1 7/8 |
| 1" — 734 | 4 1/2 | 2 | 2 5/8 | 2 1/8 |

MODEL H
All dimensions are in inches

Table XXII—Roughing-In Dimensions. Webster Series 7 Traps. Models G, R and L



| Size | A | B | C | E | G | H | J |
|--------|----|----|----|---|----|----|----|
| ½"–702 | 2¾ | 1½ | 1¾ | ¾ | 1½ | 1½ | 1½ |
| ½"–712 | 3¾ | 1½ | 1½ | ¾ | 1½ | 2½ | 2½ |
| ¾"–723 | 3¾ | 1¾ | 2½ | ¾ | 1½ | 2½ | |

Installing Webster Radiator Traps

The trap should always be in a vertical position, and eccentric bushings (or drip hubs) with openings at the lowest point should be provided at the return end of the radiator. For connection of trap to drip points, blast coils, etc., see approved Webster Service Details.

Before connecting the trap body, burrs, chips or other foreign matter should be cleaned out of the radiator, coil or pipe connection.

Only standard size threaded nipples, free from burrs, should be used, and the end should not be screwed into the trap outlet far enough to strike the removable seat.

In making the joint between the cap and body of the trap, graphite and oil should be applied to the cap only. A large quantity is not desirable, and the mixture should have the consistency of paste rather than that of a liquid.

Maintenance—Keep *working* pressures of trap

within the maximum given below and little or no trouble from excessive pressures will occur:

- Sylphon Trap—5 lb. per sq. in.
- Series 7 Trap—5 lb. per sq. in.
- Series 7M Trap—15 lb. per sq. in.
- Series "78" Trap, Class 2—60 lb. per sq. in.
- Series "78" Trap, Class 3—125 lb. per sq. in.

It will prove worthwhile to examine the traps once each year, preferably between the heating seasons. Dirt and debris can then be removed from the body and new parts installed where necessary. See that the valve seat is clean.

Webster Return Traps are permanently adjusted at the factory and the thermostatic bellows or diaphragm must not be removed from the cap. If the expansion member should be damaged so that it does not function properly, it should be removed together with the cap and a new cap and interior substituted.

The old trap and interior parts which have become inoperative may be sent to the factory to be repaired at a nominal price. As all interior parts are interchangeable a few such attachments should be kept at hand for repairs.

It is very important not to unscrew or remove the cap and interior of the trap while it is hot. After turning off steam sufficient time should elapse to permit the parts to cool.

Boiler Room Piping and Equipment

MOST installations call for one Webster Boiler Return Trap and Vent Trap together with a Dirt Strainer, Check Valves and suitable Vent Valves. These should be installed and piped as shown in Fig. 31 for 023 and larger sizes. The assembly should be located close to the return piping at rear or side of boiler. Instructions will be found in Fig. 31 and the notes and tables following it.

A separate diagram for instructions is shown in Fig. 33 for the 0023 Boiler Return Trap and Vent Trap combinations used on installations having 1500 feet or less of radiation.

For larger installations (more than 16,000 sq. ft.) two or more Webster Vent Traps and Webster Boiler Return Traps are used in combination. In this case special service details showing installations should be obtained.

Some installations are designed with one or more Vent Traps located at extreme points in the system. (See Fig. 4 on page 4.) Where this is the case instructions for installation should be obtained from the nearest Webster Branch Office.

The Safety Valve on the boiler should be set to blow at pressures called for by local regulations, but never more than 15 lbs. Less than 15 lbs. is preferable.

Fig. 1 on page 2 shows the usual arrangement where one boiler is used. For more than one boiler and for other special conditions, special Service Details have been prepared and may be obtained from our nearest branch office. Among these special conditions are the following:

1. *Relaying dry return when low head-room prevents direct connection into Vent Trap.*
2. *Installing drip connections from down*

feed riser or supply main to dry return main.

Operation

When installed as shown in Figs. 31 and 33, the Type "R" System operates in the following manner: air enters the Vent Trap from the dry return and is exhausted through the ball Vent Valve as long as the Vent Trap is not filled with water. When water rises in the Vent Trap the float valve closes and prevents loss of water from the system.

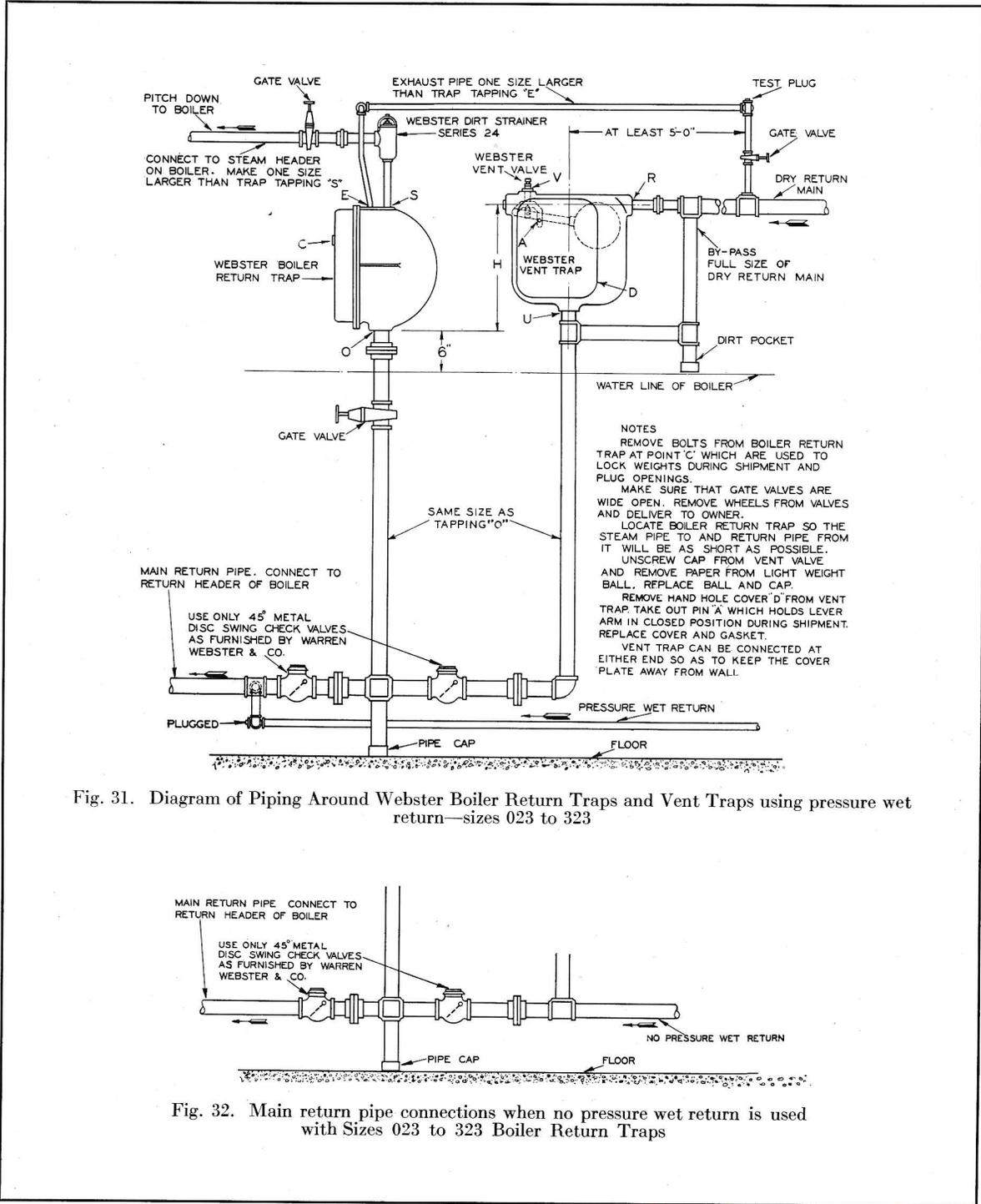
If for some reason the boiler pressure increases and tends to back up water in the system, the Check Valve nearest the boiler will close and water will rise in the Boiler Return Trap. The movement of the float in the trap opens a valve, admitting steam directly from the boiler. This equalizes the pressure in the Boiler Return Trap with the pressure in the boiler, causing water to flow by gravity into the boiler. When the Boiler Return Trap begins to discharge the Check Valve nearest the boiler opens and the Check Valve farthest from the boiler closes, allowing condensation to collect in the Vent Trap. The Vent Trap has water storage capacity with the conical valve at closing point equal to a discharge of the Boiler Return Trap.

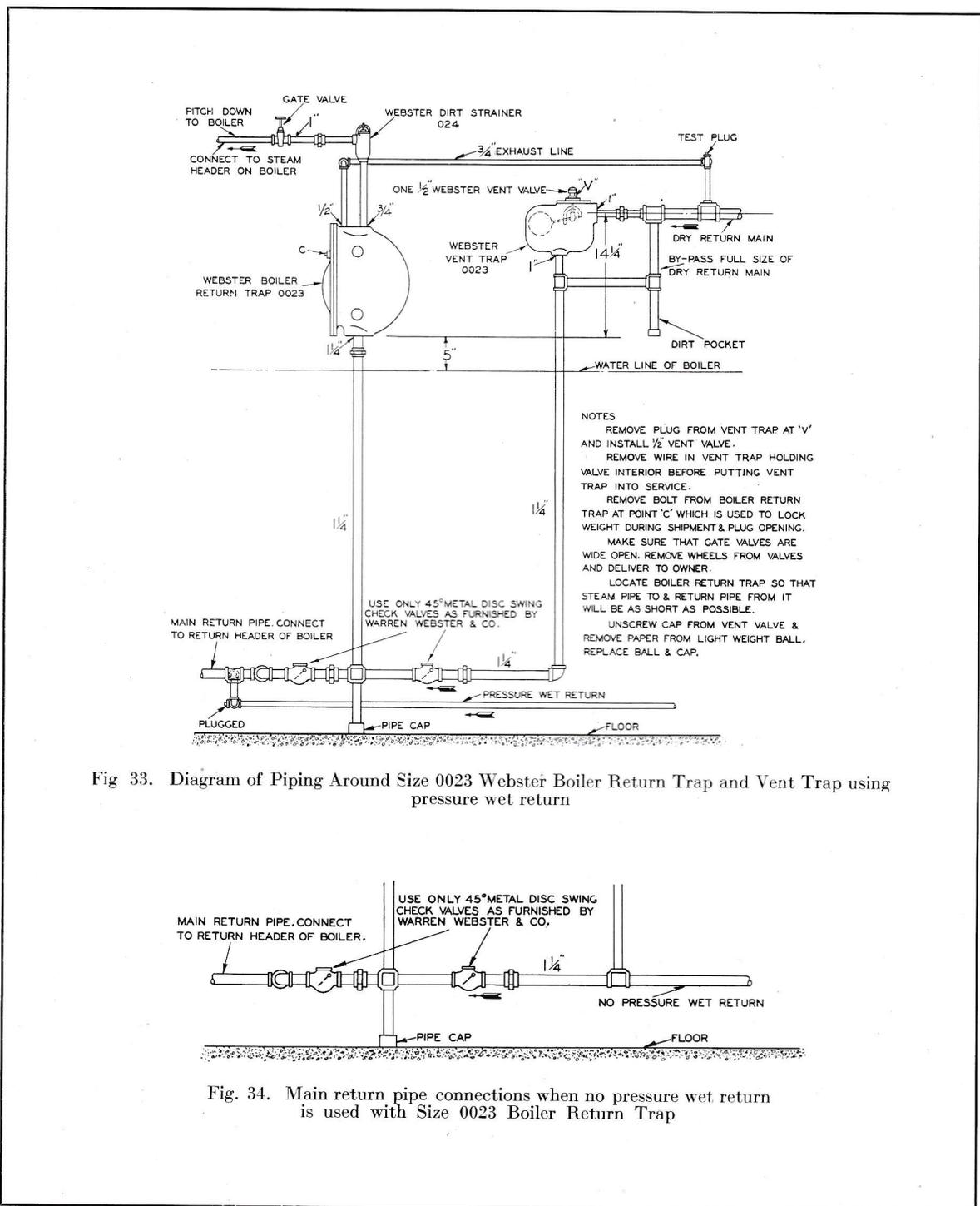
When the water level in the Boiler Return Trap is lowered sufficiently, the movement of the float closes the steam connection and opens an exhaust valve through which any uncondensed steam remaining exhausts back into the dry return. With the boiler pressure at normal water flows by gravity from the return into the boiler. Any rise in boiler pressure above normal will cause the Boiler Return Trap to repeat the action outlined above.

Table XXIII—Dimensions in Fig. 31

| Size Boiler-return Trap | Rating sq. ft. Direct Radiation | Dimensions H | Tappings | | | No. of ½-in. Vent Valves | Size of Vent Trap | Tappings | | | Size Dirt Strainer |
|-------------------------|---------------------------------|-----------------|----------|----|---|--------------------------|-------------------|----------|---------|----|--------------------|
| | | | O | S | E | | | R | U | V | |
| 023 | 2500 | 16¾ | 1½ | 1¼ | ½ | 1 | 023 | 1 | 1½ | ½ | 124 |
| 123 | 4000 | 18¾ | 2 | 1¼ | ½ | 1 | 123 | 1¼ | 2 | 1¼ | 124 |
| 223 | 8000 | 23 | 2½ | 1½ | ¾ | 2 | 223 | 1¼ | 2½ flg. | 1¼ | 224 |
| 323 | 16000 | 26¾ | 3 flg. | 1½ | ¾ | 3 | 323 | 1¼ | 3 flg. | 1¼ | 224 |

All dimensions in inches





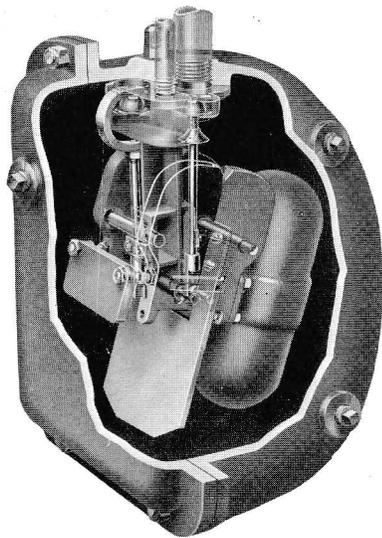


Fig. 35. Interior View, Webster Boiler Return Trap, 0023, 023 and 123 Sizes

Webster Boiler Return Trap

Webster Boiler Return Traps are float type traps, positive in action. In all sizes the entire mechanism operates on a single monel metal shaft and is suspended in the case by studs held by nuts or cap nuts located at the top of the case. The interiors are removable as a unit. The traps are made in five sizes. Sizes 0023, 023 and 123 have

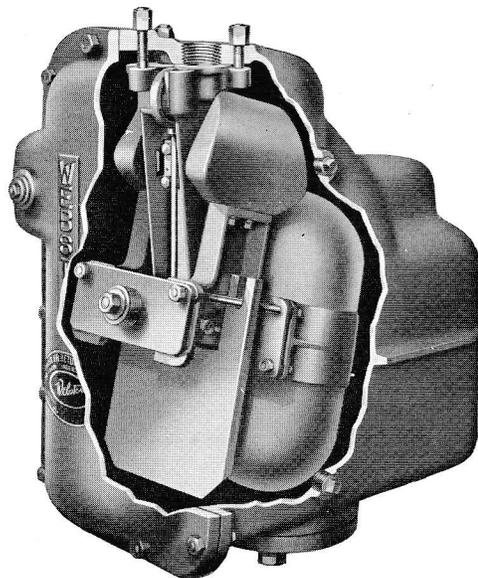


Fig. 36. Interior View, Webster Boiler Return Trap, 223 and 323 Sizes

interior mechanism illustrated in Fig. 35. Sizes 223 and 323 have the interiors shown in Fig. 36.

Installation—Make piping connections according to Fig. 31, Fig. 33 or Webster Service Details. After the trap is in place remove bolt or special nipple which is inserted at "C" and replace with plug which is contained in bag attached to the trap. The bolt or nipple is used during shipment to keep the interior from moving and prevent damage to the mechanism. *Be sure to unscrew this bolt or nipple* as the Boiler Return Trap will not function unless it is removed.

Maintenance—The Boiler Return Trap is automatic in operation and should require no attention. At the time of installation, test the tightness of the valves by removing test plug and closing gate valve in exhaust line. See Figs. 31 and 33. Any trouble encountered should be reported to the nearest Webster branch office.

Series 24 Webster Dirt Strainers

This is an angle pattern Dirt Strainer specially designed for use in the Webster Type "R" System to prevent scale, which might be loosened and carried over from the boiler from reaching the trap and interfering with the operating mechanism. Body and cover of the strainer are cast iron with ground joint. The yoke is drop forged steel. The screen basket is made of brass.

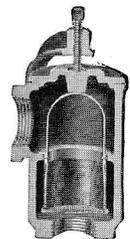


Fig. 37. Webster Series 24 Dirt Strainer

Table XXIV—Roughing-In Dimensions. Webster Series 24 Dirt Strainer

| No. | 024 | 124 | 224 |
|---------------------------------|-------|---------------|------------|
| Size | 1x3/4 | 1 1/2 x 1 1/4 | 2 x 1 1/2 |
| For Use With Boiler Return Trap | 0023 | 023 123 | 223 323 |
| A | 1 | 1 1/2 | 2 |
| A ¹ | 3/4 | 1 1/4 | 1 1/2 |
| B | 3 | 3 3/8 | 4 7/8 |
| B ¹ | 1 3/4 | 2 1/4 | 2 3/4 |
| C | 6 3/8 | 8 | 9 1/2 |
| D | 3 1/4 | 4 | 5 1/4 |
| F | 2 1/2 | 3 1/4 | 4 1/4 |

All dimensions are in inches and subject to slight change

Installation—To be installed in the steam line between the Boiler and Boiler Return Trap as shown in Figs. 31 and 33 or on Webster Service Details.

Maintenance—Strainers should be cleaned occasionally. Do not wait until basket has overflowed with dirt.

To clean strainer, loosen screw on yoke, remove cover and pull out basket. Turn basket with bottom up and flush with water. If greasy scrub with kerosene.

After thoroughly cleaning the basket, replace it in body. Then wipe clean the rim of the body at the ground joint where the cover seats. Also clean the cover. Place cover on body and twist back and forth under slight pressure, then wipe surface clean. Place a few drops of oil on surface and fasten cover in place with clamp.

Webster Vent Trap

023 and larger sizes—Construction of the Webster Vent Trap in 023 and larger sizes is shown in Fig. 40. It is a ball-float type trap using a cone valve and ball check vent valve. Bodies are cast iron. Ball float is copper with levers of cast brass. A hand hole for inspection is provided. Dimensions and tappings of all sizes of Webster Vent Traps are shown in Figs. 42 and 43 with Table XXVI.

0023 Size—While serving the same purposes as other sizes, construction of the 0023 size is somewhat different. See Fig. 41. The entire mechanism is fastened to the cover plate and may be removed when necessary as a unit. This size is made for use only with the 0023 Boiler Return Trap and requires one 1/2" Vent Valve.

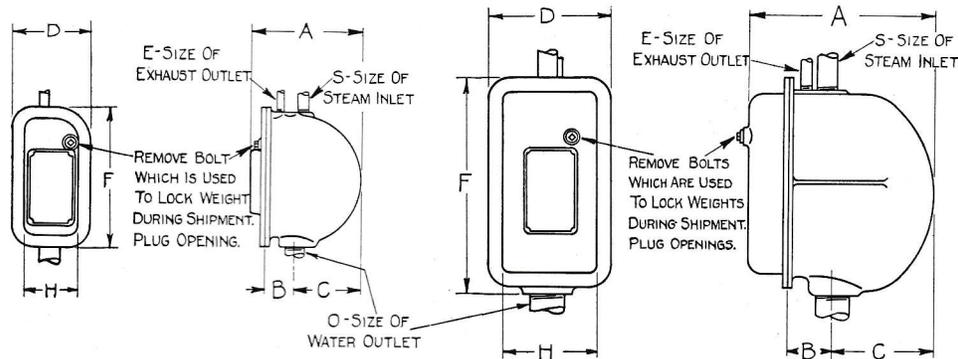


Fig. 38. Size 0023 Boiler-return Trap

Letters in this illustration refer only to the dimensions given in Table XXV

Fig. 39. Boiler-return Traps, Size 023 to 323

Letters in this illustration refer only to the dimensions given in Table XXV

Table XXV—Dimensions of Webster Boiler Return Traps (Figs. 38 and 39)

Maximum working steam pressure—15 lb. per sq. in.

| Size | Rating sq. ft. c. i. direct radiation | Size of Vent Trap | No. of 1/2-in. Vent Valves | Tappings | | | Dimensions | | | | | |
|------|--|-------------------------|-------------------------------------|----------|--------|-------|------------|-------|--------|--------|--------|--------|
| | | | | E | O | S | A | B | C | D | F | H |
| 0023 | 1500 | 0023 | 1 | 1/2 | 1 1/4 | 3/4 | 10 | 2 5/8 | 6 | 7 1/2 | 12 3/4 | 5 |
| 023 | 2500 | 023 | 1 | 1/2 | 1 1/2 | 1 1/4 | 13 1/8 | 2 | 7 7/8 | 8 7/8 | 16 1/4 | 6 1/2 |
| 123 | 4000 | 123 | 1 | 1/2 | 2 | 1 1/4 | 15 1/8 | 3 5/8 | 8 1/4 | 10 | 18 1/4 | 7 1/2 |
| 223 | 8000 | 223 | 2 | 3/4 | 2 1/2 | 1 1/2 | 22 5/8 | 9 | 10 3/8 | 12 1/4 | 23 1/2 | 9 5/8 |
| 323 | 16000 | 323 | 3 | 3/4 | 3 flg. | 1 1/2 | 22 5/8 | 9 | 10 3/8 | 12 1/4 | 23 1/2 | 15 5/8 |

All dimensions are in inches. Opening O is flanged in size 323. Companion flanges and bolts furnished as part of standard equipment

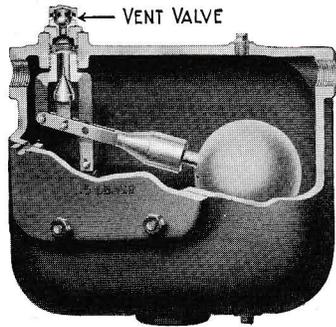


Fig. 40. Sectional View of the Webster Vent Trap—Larger Sizes

Installation—Complete instructions for installing with the Boiler Return Trap are given in Figs. 31 and 33 or on Webster Service Details. During shipment to prevent damage the float size 0023 is held firm by a wire as shown in Fig. 44. *Be sure to cut this wire "A" and withdraw*, otherwise Vent Trap will not operate. It is not necessary to open trap to remove wire.

On all other sizes the float and arm are held in position by pin A as in Fig. 45. Take off hand-hole cover and remove pin. In replacing cover use rubber gasket found inside the trap.

Maintenance—Webster Vent Traps are automatic in operation and require no maintenance. Yoke and valve piece are replaceable when these parts become worn.

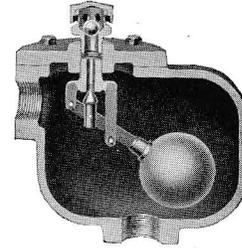


Fig. 41. Sectional View of the Webster Vent Trap—0023 size

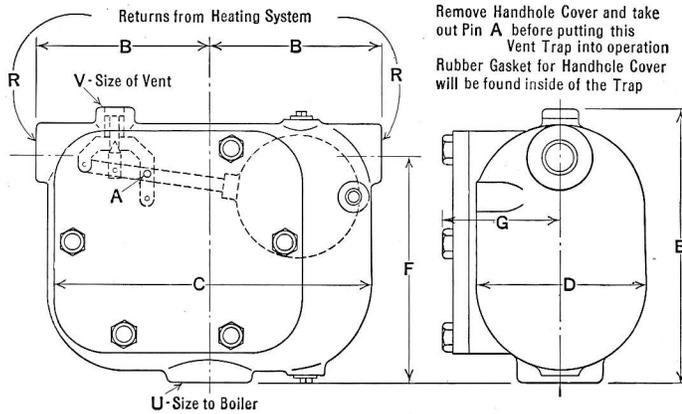


Fig. 42. Vent Traps, Sizes 023 to 323

Allow 6 inches headroom for removal of Cover and Mechanism

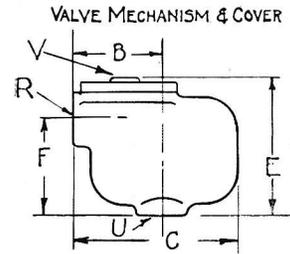
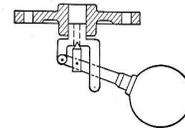


Fig. 43. Size 0023, Vent Trap

Table XXVI—Dimensions of Webster Vent Traps (Figs. 42 and 43)

| Size | Tappings | | | Dimensions | | | | | |
|------|----------|---------------|-------|------------|--------|-------|--------|--------|-------|
| | R | U | V | B | C | D | E | F | G |
| 0023 | 1 | 1 Screwed | 1/2 | 4 1/4 | 7 3/4 | 3 1/2 | 6 1/2 | 4 5/8 | |
| 023 | 1 | 1 1/2 Screwed | 1/2 | 6 7/8 | 13 | 6 3/4 | 11 1/4 | 9 3/8 | 4 7/8 |
| 123 | 1 1/4 | 2 Screwed | 1 1/4 | 9 1/4 | 17 3/8 | 8 | 17 1/8 | 14 7/8 | 5 1/2 |
| 223 | 1 1/4 | 2 1/2 Flanged | 1 1/4 | 9 1/4 | 17 3/8 | 8 | 17 | 14 3/4 | 5 1/2 |
| 323 | 1 1/4 | 3 Flanged | 1 1/4 | 9 1/4 | 17 3/8 | 8 | 17 | 14 3/4 | 5 1/2 |

All dimensions in inches

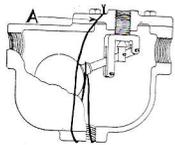


Fig. 44. 0023 Size

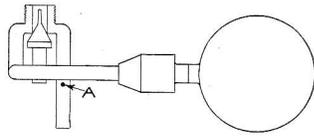


Fig. 45. All other sizes

Webster Vent Valve

The Webster Vent Valve consists of a light-weight ball seating on a sharp edged seat. It is retained by a cage-like cap which allows it free vertical movement.

When seated the ball prevents inflow of air into the system. A pressure of less than 1 oz. per sq. in. will serve to lift the ball from its seat, thus providing for free escape of air from the system. The Webster Vent Valve is made only in $\frac{1}{2}$ " size. For installation requiring more than one valve multiple manifold units are provided as shown in Fig. 46.

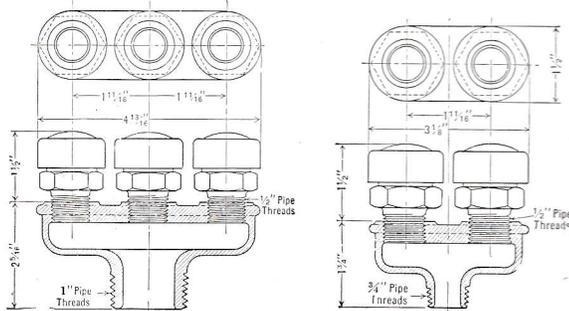


Fig. 46. Dimensions of Multiple-unit Webster Vent Valves

Installation—After the Boiler Return Trap and Vent Trap have been completely piped up, remove the temporary pipe plug from Vent Trap and screw Vent Valve in its place. Then remove the cap and *unwrap the protecting paper from the ball*. Place ball on the seat.

Vent Traps 223 and 323 require respectively two and three Vent Valves.

(CAUTION—Care should be taken to avoid dropping the light-weight ball on the floor as this is likely to dent it.)

Maintenance—If, after the system is put into operation, the Vent Valve does not seat, a light tap on the Vent Trap near the valve will usually be all that is necessary. If this does not suffice, unscrew the cap and clean the ball, and then seat carefully.

Operating Without Vent Valve

In some systems it is desired to operate with atmospheric steam pressure in the returns. When this is the case, the Vent Trap should be operated without the Vent Valve. This is specially true with schools, theatres and industrial plants which use unit or blast heaters. The temperature of steam at vacuum pressures is so low that, with very cold air blowing over the heating surface, water of condensation may sometime freeze before it is able to pass through the trap in the return line. Operation of the Vent Trap without the Vent Valve represents a special condition and will usually be noted on the heating plans. Unless so noted it is inadvisable to remove the Vent Valve unless instructed by a Webster Service Engineer.

Webster Modulation Gauge

The Webster Modulation Gauge (Fig. 47) is made specially for use with the Webster Type "R" System. It is usually installed in place of gauge furnished with boilers as it permits accurate reading of the low pressure under which the system usually operates. From 0 to 1 lb. each division indicates 2 oz. From 1 to 5 lbs. each division indicates 4 oz. From 5 to 30 lbs. each division indicates 1 lb.

Installation—Screw into gauge connection furnished on boiler. See that a small brass pet cock is placed between boiler and gauge.

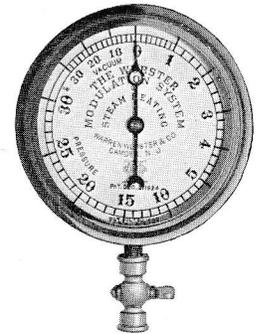


Fig. 47
Webster Modulation
Gauge

Webster Damper Regulator

The large diaphragm of the Webster Damper Regulator (Fig. 48) in combination with an ample supply of water makes the Webster Damper Regulator very sensitive and well suited to controlling extremely low pressures. For this reason it is frequently installed in place of the regulators usually supplied with the boiler.

It is a well-built piece of apparatus with steel level and cast iron well, diaphragm casing and

weights. The diaphragm is heavy rubber. An asbestos insulating disc is placed between the well and lower casing.

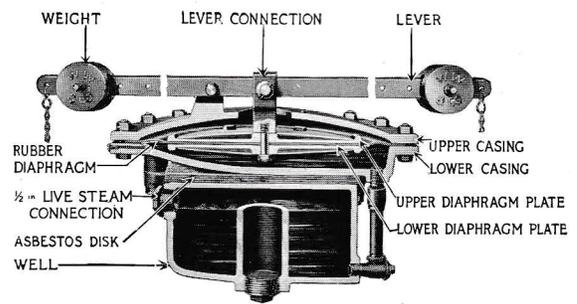


Fig. 48. Section of Webster Damper Regulator

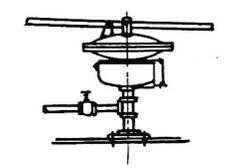


Fig. 49. Alternate mounting of Webster Damper Regulator. Steam connection at bottom

Installation—The Webster Damper Regulator may be installed as shown in Fig. 51, or as shown on Webster Service Details. To support damper regulator use $4\frac{1}{2}$ " rods with pipe separators and make lengths to suit work. Remove any 4 bolts from casing to accommodate rods. An alternate mounting with steam connection at bottom is illustrated in Fig. 49.

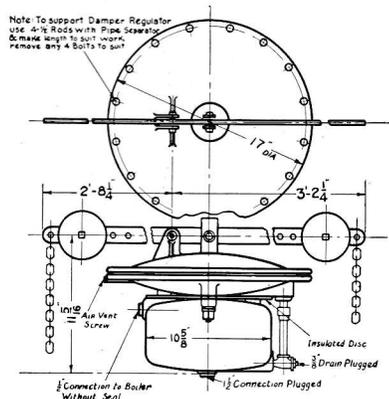


Fig. 50. Dimensions of Webster Damper Regulator

Adjustment—When steam pressure is first raised in the boiler, the air vent screw should be loosened to permit escape of air from the damper regulator shown. At the same time the lever of the regulator should be moved up and down so as to help in expelling the air. When it is certain that

all air is out, tighten the screw and adjust the weights to maintain the desired pressure.

Adjustment of the Webster Damper Regulator will vary for each type of boiler as well as for each system. First place chains and weights about in position shown in Fig. 51, next adjust chains so that damper in lower door and check open wide at extreme positions of lever. The check should close *before* damper begins to open.

With no pressure on boiler adjust one weight inward or outward so that draft is open wide. Then build up pressure on boiler, noting pressure at which dampers are closed. If this occurs too soon move one weight outward to resist the motion and thus keep draft on. Continue to increase pressure, noting point at which draft shuts off with new position of weights. A little experimenting in this way will enable one to determine the proper position of weights. Usually the shut-off should occur at 6 to 8 oz., the opening at 0 to 2 oz., although this is, of course, likely to vary for each system.

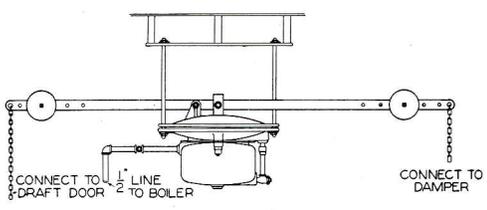


Fig. 51. Method of connecting Webster Damper Regulator to a low-pressure boiler

Sylphon Damper Regulator

On small boilers where the Webster Damper Regulator cannot be used on account of space or head-room limitations the No. 925 Sylphon Regulator may be used. This regulator will operate at boiler pressures from 2 oz. to 1 lb. It may be temporarily subjected to steam pressure as high as 10 lbs. for "blowing off" boiler but must not be subjected to continued use of high pressures.

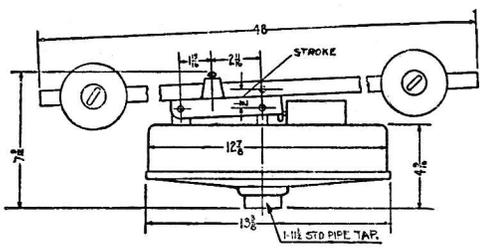
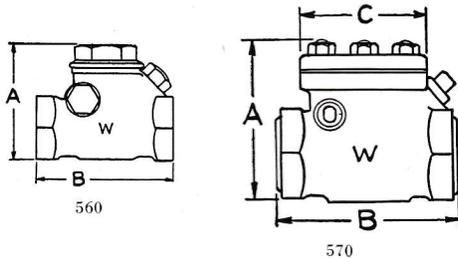


Fig. 52. Dimensions of Webster Sylphon Damper Regulator

Check Valves

The check valves used with the Boiler Return Trap must be Webster Horizontal Swing Type with 45 degree ground metal-to-metal seats. This check valve has been selected by us for use with Type "R" Systems only after experience and careful test. Other types have been a frequent source of service trouble and noise when used in the Type "R" System. *Warren Webster & Company assume no responsibility for complaint of noise if check valves of other makes are used.*

Table XXVII—Dimensions of Webster Check Valves



| Size | Symbol | A | B | C |
|--------|--------|---------|---------|-----------|
| 1/2" | 560 | 2 1/4 | 2 3/4 | Not given |
| 3/4" | 560 | 2 5/8 | 3 | |
| 1" | 560 | 3 | 3 7/8 | |
| 1 1/4" | 560 | 3 1/2 | 4 | |
| 1 1/2" | 560 | 4 | 4 1/2 | |
| 2" | 560 | 4 7/8 | 5 1/2 | |
| 2 1/2" | 570 | 6 3/4 | 7 1/4 | 5 9/16 |
| 3" | 570 | 7 13/16 | 8 3/16 | 6 1/2 |
| 3 1/2" | 570 | 8 15/16 | 9 | 7 7/16 |
| 4" | 570 | 9 7/16 | 9 15/16 | 7 3/4 |
| 5" | 570 | 11 1/16 | 11 1/2 | 9 1/4 |

All Dimensions in Inches and Subject to Slight Variation

Webster Boiler Protector

Protects low-pressure heating boilers from accidental low water line which would result in cracking or burning of boiler. It is an hydraulically operated (pressure actuated) valve which automatically supplies raw water to boiler when water level reaches a set low position.

Maximum boiler pressure must not exceed 15 lb. per sq. in. Maximum cold water pressure should not exceed 150 lb. per sq. in. Minimum water pressure must be not less than 25 lb. per sq. in.

Installation—Standard installation is shown in Fig. 53 for rectangular cast iron boiler and

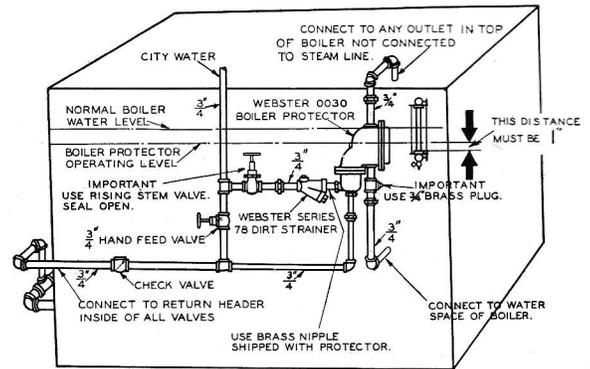


Fig. 53. Standard installation of size 0030 Webster Boiler Protector on Rectangular cast iron boiler. For special conditions and for size 030 see Webster Service Details.

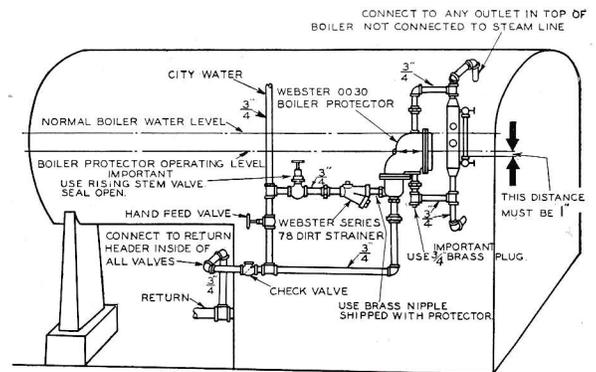


Fig. 54. Standard installation of size 0030 Webster Boiler Protector on steel boiler. For other applications and for size 030 see Webster Service Details.

in Fig. 54 for steel boiler. Note that *Protector Operating Level* is 1 inch above bottom of gauge glass. Be sure rising stem valve is sealed in open position. Water line of boiler is normally maintained by hand feed valve.

To Test—After installation, test as follows: Drain water from boiler until the Webster Boiler Protector operates. It will open automatically and supply water to boiler until safety level in boiler is reached. Then supply additional water up to normal working level by means of the hand feed valve.

Maintenance—Clean strainer at least once a year. If boiler floods, examine hand feed valve. Make sure it is tight. Then examine Protector. To do this shut off sealed water valve ahead of Protector and bank fire. After boiler has cooled sufficiently drain off water below protector line.

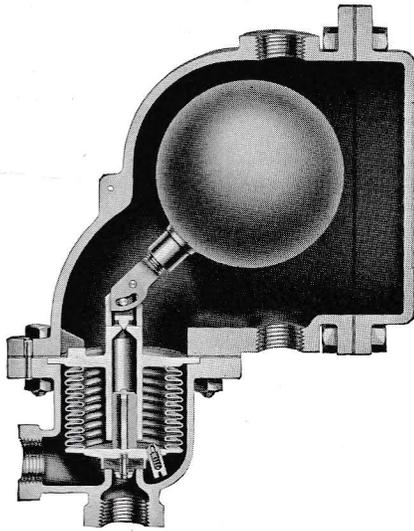


Fig. 55. Size 0030 Webster Boiler Protector

Open Protector and clean thoroughly of dirt or foreign matter. Pay particular attention to all valve seats and to the small screen at the bottom of the Syphon bellows. Re-assemble and repeat test as given above. **Caution**—Do not forget to seal open the water valve ahead of the Protector.

Putting System into Operation

Before attempting to put the Type "R" Webster System into operation it is well to check the following points:

1. See that water shows well up in the gauge glass and use the try cocks frequently to check the gauge glass reading.
2. See that piping agrees with the diagram on page 2.
3. See that bolts have been removed from Boiler Return Trap and holes plugged.
4. See that wire or pin has been removed from float of Vent Trap so that it is free to operate (as called for in Figs. 44 and 45).
5. See that check valves have been properly installed in return piping.
6. See that Vent Valve is properly in place, and paper wrapping removed from ball.
7. See that gate valves in Figs. 31 and 33 are open.

Testing

Each Type "R" System installation should be run for a test period at varying pressures with all radiators open in order to make sure that complete circulation is obtained and that all mechanisms are operating properly.

During the test the following points should be checked up.

1. Is water line steady and boiler steaming without foaming or priming? If not, further cleaning is probably necessary.

2. Is the Damper Regulator properly connected and adjusted? Is it free from air? If not check installation with instructions given on pages 28 and 29.

3. Is Modulation Gauge operating?

NOTE: The gauge furnished with Webster Type "R" Modulation Systems is of the "retard" type. It is a very sensitive and delicately calibrated instrument of the finest quality and should be handled very carefully during the installation. The glass should not be removed until the gauge is in place on the boiler, then remove cotton from behind hand. Do not touch the hand under any circumstances—it is connected with a very delicate hairspring which will break and make the gauge useless if the hand is twisted even slightly.

4. Are Vent Trap and Vent Valve both free to operate? See instructions under this heading.

5. Boiler Return Trap—Test of the Webster Boiler Return Trap should be carried out with the following instructions. The pressure difference (*i. e.* the difference between pressure at boiler and pressure in return) at which the Boiler Return Trap will start operating depends upon the distance at which it has been installed above boiler water level and to a smaller extent on amount of resistance to flow in return piping.

First, disconnect damper regulator and increase pressure to that indicated in Table V. This should be free pressure—in order to make sure that atmospheric pressure exists on the return side of the Boiler Return Trap lift ball from the seat of the Vent Valve until the inrush of air ceases, then read the pressure on the Modulation Gauge. If the Boiler Return Trap does not operate before or approximately at that pressure a careful check of mechanism and piping should be made to determine the cause for non-operation.

NOTE: Operation of the Boiler Return Trap will be indicated by rise and fall of water level in gauge glass where furnished. Where no gauge glass is furnished the slight noise of the float movement is sufficient.

It must not be supposed that the Webster Boiler Return

Trap will be in operation only at relatively high pressures. Occasions will very likely arise where a vacuum of 10 or 12 inches or even more will exist in the return. As each two inches of vacuum equals approximately one pound of pressure, it will be found that under this condition the Boiler Return Trap may operate even with a pressure below atmosphere at the boiler.

Table XXVI

| Distance between Boiler Water Level and bottom of Webster Boiler Return Trap | Pressure at which Trap should start to operate |
|--|--|
| 4 ins. | 2 lbs. |
| 16 ins. | 2½ lbs. |
| 28 ins. | 3 lbs. |

For each additional 12" the boiler pressure must be increased approximately ½ pound.

Important!

Make sure that valves (where installed) below the Boiler Return Trap, on exhaust line from B. R. Trap to the Dry Return and on the line from the boiler to B. R. Trap are wide open during the test and at all times when the system is in operation. Refer to Figs. 31 and 33. Note that Size 0023 Boiler Return Trap arrangement has only one gate valve which is placed in line from boiler. For repair and replacement work, it is necessary to drop boiler pressure to atmospheric and break union below Boiler Return Trap.

Instruction Material for the Owner

An instruction card like that illustrated in Fig. 56 is provided with each Webster Type "R" System of Steam Heating. This is sent to the address of the owner furnished us by the contractor. It is mounted on very heavy cardboard and is 12" x 17" in size. Please make sure that this card is placed as prominently as possible near the boiler. It may save you later service calls. A space is provided for the heating contractor's name and address.

Fastened to the card is an envelope addressed to the owner. This contains a small booklet entitled "How to Get the Best Results From Your Heating System," which has been written for the purpose of explaining in simple language the operation of the system. Please leave this booklet in place in its envelope so that it will reach the owner or the owner's representative who will have charge of the system, or turn it over to the owner yourself.



Fig. 56. Reproduction of Instruction card and Booklet supplied with each Webster Type "R" Modulation System

Actual size 12" x 17", printed on ¼" thick cardboard

This booklet should be read by the principal occupants of the building as it will enable them to most effectively realize the benefits of the modulating control feature of the Type "R" System.

Additional copies of this booklet may be had upon application to the Home Office. Simply write to Warren Webster & Company, Camden, N. J., requesting it.

Instruction Material for the Heating Contractor

Warren Webster & Company provide instructions in several different forms to aid the heating contractor in making a correct installation of Webster System equipment.

On the various items of Webster equipment are name plates which give instructions for installation. In addition, printed cardboard tags are wired to the parts of Webster apparatus which require special attention.

The fitter installing each Webster System should be provided with a set of Webster Service Details

specially prepared by the Webster branch for that job and showing correct methods of piping-up the Webster equipment used in the system. If on starting a job, you do not have these Service Details, ask the nearest Webster branch office to supply you with them. Included with the Web-

ster Service Details is a copy of this Instruction Bulletin.

Webster Instruction Publications are the result of many years of experience in steam heating. Using them to assure correct installation will bring you satisfied customers.

Cleaning System

IT is estimated that almost 96 per cent of the service calls on new installations are due to failure to properly clean the boiler and system. If the suggestions given below are followed when first putting the system into use, future expense and annoyance will be avoided in almost every case.

In cleaning the boiler, "blowing down" is not enough—it may help, but too often it merely changes the water *without removing the dirt and grease.*

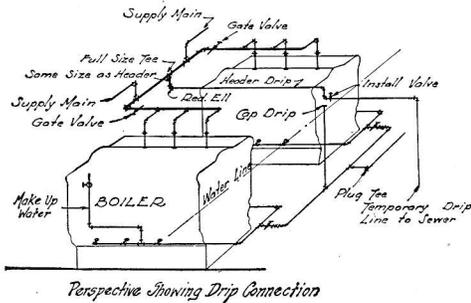


Fig. 57. Method of connecting drip connections when cleaning a two-boiler system

To Clean Boiler With Washing Soda—One of the most effective methods of cleaning the system is to remove the oil, grease and dirt through drip lines run from the boiler header and from the ends of the mains.

When the boiler is installed, the drip line from the boiler header should be provided with a union at a point above the water line of the boiler. At the time of cleaning, disconnect the union, then cap the return header, and provide the drip from the header with a valved temporary drip line to sewer. It is also advisable to disconnect the ends of the steam mains and provide valve drains to waste or sewer as shown by Fig. 58.

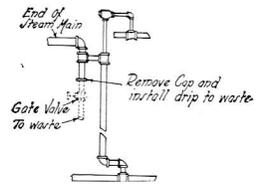


Fig. 58. Method of Drip-ping end of Main

Remove the safety valve and add a quantity of washing soda dissolved in hot water to the boiler and *then replace* the safety valve.

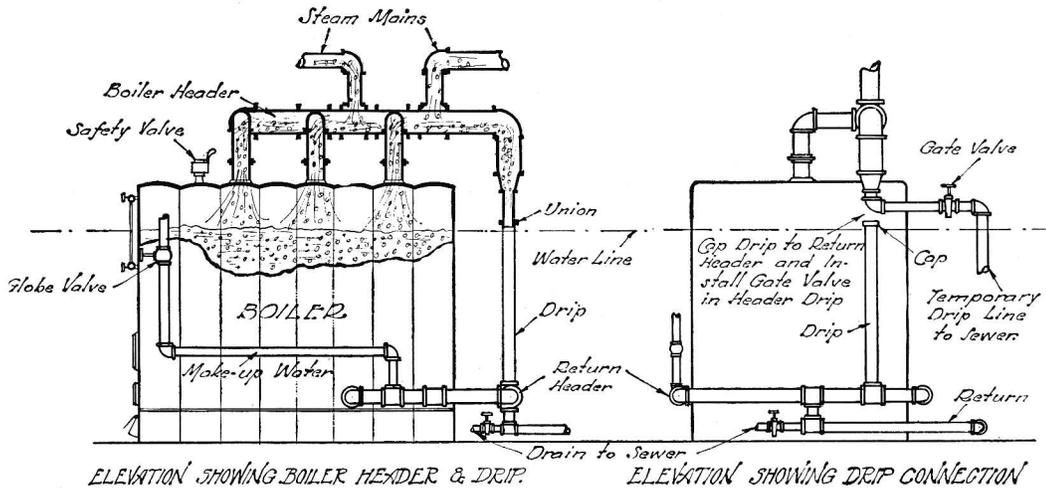


Fig. 59. Method of connecting drip connections when washing and cleaning one boiler

After the drips are provided as instructed and the washing soda added, start a moderate fire. When priming (due to oil, grease and dirt) occurs the water is carried up to the boiler header and through the steam mains. This water, together with the grease and dirt that is carried with it, will be drained from the system through the various drips provided. As the water is carried out of the boiler by priming, make-up water must be fed to the boiler. If water is thrown from the boiler during the boiling-out process so rapidly that the cold water cannot be fed into the boiler without fear of damage, it is advisable to close the drafts and open the check damper. When the drafts are closed and water still leaves the boiler too fast close the valves on the drains at the ends of the mains so that the water can return to the boiler.

A moderate fire will be found best. Be *extremely careful* when feeding cold water to the boiler *in order to prevent strains due to temperature difference*. Carelessness may cause a cast-iron boiler to crack and a steel boiler to spring a leak.

The cleaning-out process should be continued for several hours or longer, depending upon the size of the system and the amount of dirt and grease it contains. When the system is thoroughly

clean, steam instead of water will blow from the drips and steam pressure without fluctuation of water line can then be maintained in the boiler. When these results are accomplished the fire may be banked, the drips removed and the system put into regular operation.

Be sure to remove water containing soda from the boiler after cleaning, otherwise foaming will occur.

The quantity of washing soda—purchasable at any grocery store, should be about as follows:

| Size of Boiler Grate | Amount of Washing Soda |
|----------------------------------|---------------------------|
| 0-5 sq. ft. of grate | 5 lbs. |
| 5-10 sq. ft. of grate | 8 lbs. |
| 10-15 sq. ft. of grate | 12 lbs. |
| 15-20 sq. ft. of grate | 16 lbs. |

For installations having two boilers follow the same general instructions except that the main steam header should be dripped as shown in Fig. 56.

Use of Special Cleaning Compounds

Other cleaning compounds are available and are reported to be effective. Success in their use depends largely on following completely the manufacturer's instructions.

Repairs and Replacements

WHERE parts become necessary they should be ordered directly from the branch office nearest you. Consult your local telephone book or write us at Camden, N. J., for the local address. In ordering parts needed be sure and give the name of the plant, giving, wherever possible, the name of the building at the time it was originally constructed. We maintain at Camden a file record of every Webster System installation. This file is under the original name given at the time of purchase of the equipment. This name is therefore important to assist us in identifying your original equipment and in furnishing the proper repair parts.

Our branch office will gladly furnish all information needed to assist you in obtaining the proper material and wherever practicable they will be glad to go over your installation with you and recommend the necessary repairs.

General Instructions for Ordering Repair Parts

If the installation is of sufficient size it is advisable to keep on hand one or more return trap or supply valve interiors to meet emergencies. The

new interiors can be used while those removed are sent back to the factory for repairs.

For quickest service address your orders for parts to the Webster Branch Office nearest you. When ordering give (1) the size of trap or valve, (2) the name of the part, (3) its symbol as shown on the illustration, (4) the name and location of the plant or building and (5) the number of this bulletin (S-650-C).

Radiator Supply Valves

Webster Radiator Supply Valves are rugged in construction and usually require repair parts only in a few instances. Occasionally mistreatment or accident will make new handles, nipples, or nuts necessary. The composition disc likewise may need renewing. Order these and other parts by symbol following instructions given above.

Radiator Traps

Webster Return Traps are factory adjusted and should not be tampered with. If the mechanism is damaged so that it does not operate properly, remove interior with cap attached and replace with new cap and interior. The old cap and parts should be returned to the factory where they will be repaired at a nominal price.

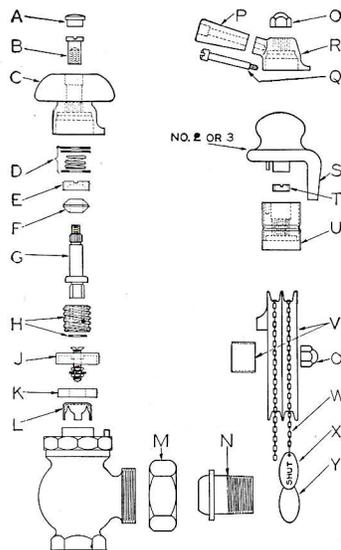


Table 1. List of Parts for Webster Type "W" Valves

| Symbol | Name | Symbol | Name |
|--------|---|--------|---|
| A | Wheel Handle Plug | Q | Lever Handle Screw |
| B | Wheel Handle Nut | R | Lever Handle Cover |
| C | Bakelite Wheel Handle | OPQR | Lever Handle Assembly |
| ABC | Wheel Handle Assembly | S | Key for Lockshield (No. 2 for 1/2" or 3/4" sizes; No. 3 for 1" or 1 1/4" sizes) |
| D | Spring with 3 Washers | T | Lockshield Cover Nut |
| E | Stuffing Box Gland | U | Lockshield Cover |
| F | Moulded Packing Ring | TU | Lockshield Cover Assembly (Keys furnished as separate item only) |
| G | Valve Stem | V | Chain Wheel and Spring Casing |
| H | Valve Stem Nut and Washer | W | Chain (Standard length for 6 ft. drop) |
| J | Valve Piece, screw, 2 nuts and lockwasher | X | "Open" or "Shut" Tags |
| K | Valve Disc—Jenkins Composition | Y | Blank Tags |
| L | Modulation Sleeve | OYW | Chain Wheel and Chain Assembly |
| M | Union Nut | XY | |
| N | Union Nipple | | |
| O | Cover Nut for Lever and Chain-wheel Handles | | |
| P | Composition Lever Handle | | |

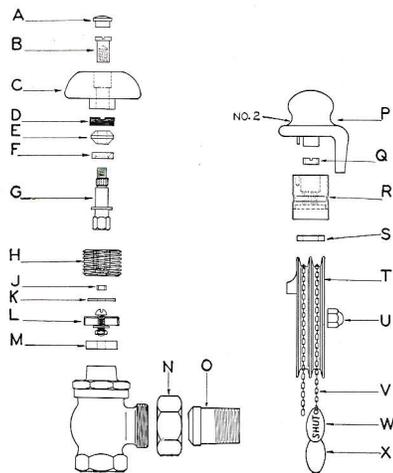
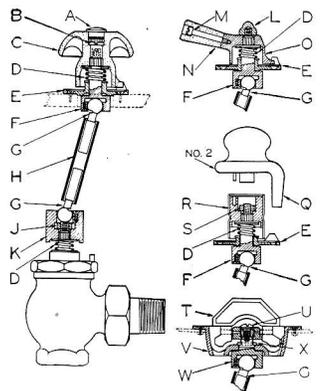


Table 2. List of Parts for Webster Type "B" Valves

| Symbol | Name | Symbol | Name |
|--------|--|--------|---|
| A | Wheel Handle Plug | Q | Lockshield Cover Nut |
| B | Wheel Handle Nut | R | Lockshield Cover |
| C | Bakelite Wheel Handle | S | Shield Spacer (Used on 1/2" and 3/4" sizes only) |
| ABC | Wheel Handle Assembly | QRS | Lockshield Cover Assembly (Key furnished as separate item only) |
| D | Stuffing Box Gland | T | Chain Wheel |
| E | Moulded Packing Ring | U | Cover Nut for Chain Wheel |
| F | Lower Gland | V | Chain (Standard length for 6 ft. drop) |
| G | Valve Stem | W | "Open" or "Shut" Tags |
| H | Valve Stem Nut | X | Blank Tags |
| J | Spacer for Valve Stem Nut | TUV | Chain Wheel and Chain Assembly |
| K | Washer for Valve Stem Nut | WX | |
| L | Valve Piece, screw, nut and lock washer | | |
| M | Valve Disc—Jenkins Composition | | |
| N | Union Nut | | |
| O | Union Nipple | | |
| P | Key for Lockshield (No. 2 for all sizes) | | |

Table 3. List of Parts for Extended Stem Attachments for Webster Type "W" and Type "B" Valves



| Symbol | Name | Symbol | Name |
|--------|--|--------|--|
| A | Wheel Handle Plug | Q | Key for Lockshield (No. 2 for all sizes) |
| B | Wheel Handle Nut | R | Lockshield Cover |
| C | Bakelite Wheel Handle | S | Lockshield Cover Nut |
| ABC | Wheel Handle Assembly | DEF | Lockshield Handle Fixture (Keys furnished as separate item only) |
| D | Spring with 3 washers | RS | |
| E | Outer Dial Stem End | T | Flush Handle Assembly (Includes hub and handle pins) |
| DEF | Wheel Handle Fixture | U | Flush Handle Screw |
| G | Universal Joint Ends | V | Flush Dial Assembly (Includes parts W and X) |
| H | Square Brass Tubing (Standard length is 1 ft.) | W | Stem End (Furnished only assembled with V) |
| J | Lower Cover Nut | X | Lock Collar (Furnished only assembled with V) |
| K | Lower Cover | TUV | Flush Handle Fixture |
| L | Cover Nut for Lever Handle | WX | |
| M | Lever Handle Screw | | |
| N | Composition Lever Handle | | |
| O | Lever Handle Cover | | |
| LMNO | Lever Handle Assembly | | |
| DEF | Lever Handle Fixture | | |
| LMNO | | | |

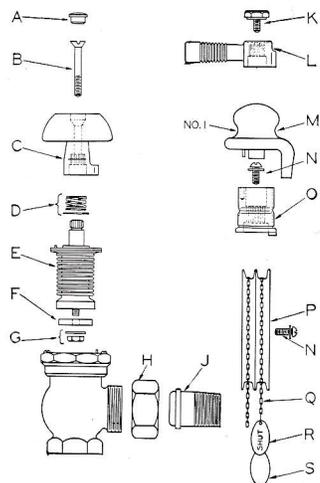
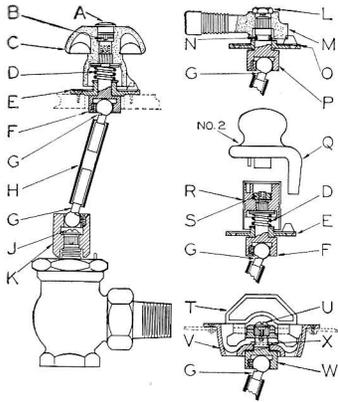


Table 4. List of Parts for Webster Syphon Packless Valves

| Symbol | Name | Symbol | Symbol |
|--------|--|--------|--|
| A | Wheel Handle Plug | M | Key for Lockshield (No. 1 for all sizes) |
| B | Wheel Handle Screw | N | Cover Screw and Washer (For lockshield and chain wheel) |
| C | Bakelite Wheel Handle | O | Lockshield Cover |
| ABC | Wheel Handle Assembly | NO | Lockshield Cover Assembly (Key furnished as separate item) |
| D | Spring with 2 Washers | P | Chain Wheel |
| E | Syphon Bellows Interior (Includes parts F and G) | Q | Chain (Standard length for 6 ft. drop) |
| F | Valve Disc—Jenkins Composition | R | "Open" or "Shut" Tags |
| G | Disc Nut and Washer | S | Blank Tags |
| H | Union Nut | PQRS | Chain Wheel and Chain Assembly |
| J | Union Nipple | | |
| K | Lever Handle Cap | | |
| L | Bakelite Lever Handle | | |
| KL | Lever Handle Assembly | | |

Table 5. List of Parts for Extended Stem Attachments for Webster Sylphon Packless Valves



| Symbol | Name | Symbol | Name |
|--------|---|--------|--|
| A | Wheel Handle Plug | P | Stem End |
| B | Wheel Handle Nut | LM | Lever Handle Fixture |
| C | Bakelite Wheel Handle | NOP | |
| ABC | Wheel Handle Assembly (Cannot interchange with lever handle) | Q | Key for Lockshield (No. 2 for all sizes) |
| D | Spring with 3 Washers | R | Lockshield Cover |
| E | Outer Dial | S | Lockshield Cover Nut |
| F | Stem End | DEF | Lockshield Handle Fixture (Keys furnished as separate item only) |
| ABC | Wheel Handle Fixture | RS | |
| DEF | | T | |
| G | Universal Joint Ends | U | Flush Handle Screw |
| H | Square Brass Tubing (Standard length is 1 foot) | V | Flush Dial Assembly (Includes parts W and X) |
| J | Cover Screw and Washer | W | Stem End (Furnished only assembled with V) |
| K | Lower Cover | X | Lock Collar (Furnished only assembled with V) |
| L | Lever Handle Cap | TUV | Flush Handle Fixture |
| M | Bakelite Lever Handle | WX | |
| LM | Lever Handle Assembly (Cannot interchange with other handles) | | |
| N | Lock Ring | | |
| O | Outer Dial | | |

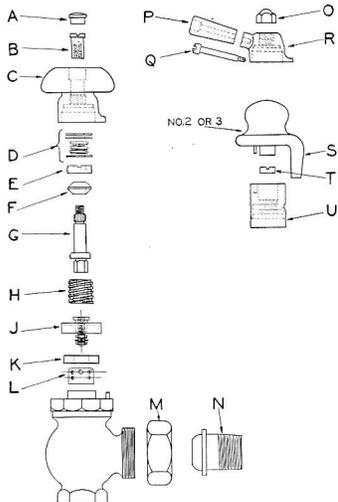
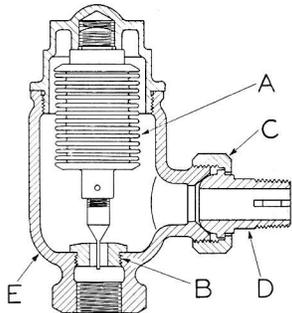


Table 6. List of Parts for Webster "Three-Point" Valves

| Symbol | Name | Symbol | Name |
|--------|---|--------|--|
| A | Wheel Handle Plug | M | Union Nut |
| B | Wheel Handle Nut | N | Union Nipple |
| C | Bakelite Wheel Handle | O | Cover Nut for Lever Handles |
| ABC | Wheel Handle Assembly | P | Composition Lever Handle |
| D | Spring with 3 Washers | Q | Lever Handle Screw |
| E | Stuffing Box Gland | R | Lever Handle Cover |
| F | Moulded Packing Ring | OPQR | Lever Handle Assembly |
| G | Valve Stem | S | Key for Lockshield (No. 2 for 3/4" size; No. 3 for 1" or 1 1/4" sizes) |
| H | Valve Stem Nut | T | Lockshield Cover Nut |
| J | Valve Piece, 2 nuts and lock-washer | U | Lockshield Cover |
| K | Valve Disc—Jenkins Composition | TU | Lockshield Cover Assembly (Key furnished as separate item only) |
| L | Orifice Sleeve (Letter of Orifice size must be specified) | | |
| JKL | Orifice Sleeve Assembly (Specify Orifice letter size) | | |

Table 7. List of Parts for Webster Sylphon Traps



| Sym- bol | Name |
|-------------|---|
| A | Cap with Bellows and Valve Piece (replaceable as a unit only) |
| B | Valve Seat |
| C | Union Nut |
| D | Union Nipple |
| E | Body (state model) |

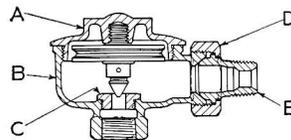


Table 8. List of Parts for Webster Series 7 Traps

| Symbol | Name |
|--------|---|
| A | Cap with Diaphragm and Valve Piece (replaceable as a unit only) |
| B | Body (state model) |
| C | Valve Seat |
| D | Union Nut |
| E | Union Nipple |

| Symbol | Name |
|--------|--|
| A | Composition Wheel Handle |
| G | Packing Ring— $\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ " |
| J | Valve Seat Disc— $\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ " |
| M | Valve Seat— $\frac{3}{4}$ " |
| N | Union Nut— $\frac{3}{4}$ " |
| O | Union Nipple— $\frac{3}{4}$ -1-1 $\frac{1}{4}$ -1 $\frac{1}{2}$ " |
| P | Trap Interior Assembly (includes Seat Q) |

Table 9. List of Parts for Webster Double Service Valves

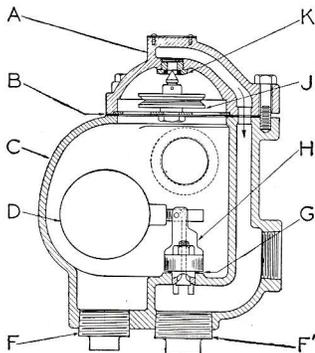
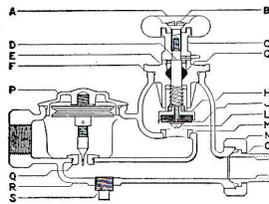


Table 10. Parts for Webster Series 26 Drip Traps

(Use this list for both Model T and Model O Traps)

| Symbol | Name |
|--------|--|
| A | Cover (State Model) |
| B | Cover Gasket |
| C | Body |
| D | Ball Float |
| F & F' | Cleanout Plugs (State pipe size) |
| G | Interior Gasket |
| H | Interior Valve Assembly (Less Float) |
| J | Thermostatic Air Vent Assembly (Not furnished for Model O) Includes Seat K |
| K | Thermostatic Air Vent Seat |

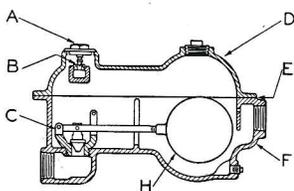


Table 11. Parts for Series 19-T Webster Heavy Duty Traps

(Use this Table also for Series 16 Traps)

| Symbol | Name |
|--------|---|
| A | Thermostatic Air Vent Assembly (includes Cap) (Not furnished for Series 16) Includes Seat B |
| B | Thermostatic Air Vent Seat |
| C | Interior Valve Assembly (Less Float) |
| D | Upper Shell (State Series) |
| E | Gasket |
| F | Lower Shell |
| H | Ball Float |

Boiler Return Trap

Boiler Return Traps are factory adjusted and should not be repaired on the job. If the mechanism fails to operate install a complete new interior as these are interchangeable. Return old interior to factory.

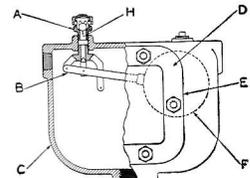
Before removing cover of Boiler Return Trap be sure to close the gate valves on the various lines leading into the trap, *i. e.*, (1) line from boiler to the Trap; (2) exhaust line from Trap to dry return main and (3) valve directly below Trap. On the 0023 sizes Boiler Return Trap where no gate valves are provided the boiler pressure must be dropped so that water is not above water level of the boiler.

If necessary the system may be operated temporarily without the Boiler Return Trap by inserting a blank flange or brass washer in the connection below the trap.

After new interior has been installed in the Boiler Return Trap make sure that this flange is removed and all gate valves opened, otherwise the Return Trap will not operate.

Table 12. List of Parts for Webster Vent Trap

| Symbol | Name |
|--------|----------------------|
| A | Vent Valve less Ball |
| B | Interior less Float |
| C | Body |
| D | Cover |
| E | Cover Gasket |
| F | Float |
| H | Vent Valve Ball |



Vent Trap and Vent Valve

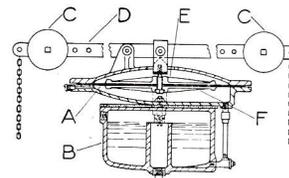
The complete interior assembly less float, or float only, is obtainable.

Additional balls for vent valves are obtainable to replace those lost or damaged. No other repairs required.

Fairbanks Swing Check Valves

Parts for your check valve may be ordered from the nearest Webster branch office.

Table 13. List of Parts for Webster Damper Regulator



| Symbol | Name |
|--------|---|
| A | Diaphragm (15 $\frac{1}{2}$ " diameter) |
| B | Well |
| C | Weights, each |
| D | Lever |
| E | Upper Bearing Plate |
| F | Lower Bearing Plate |
| G | Lever Connection |

Table 14. List of Parts for Webster Series "18" Dirt Strainer

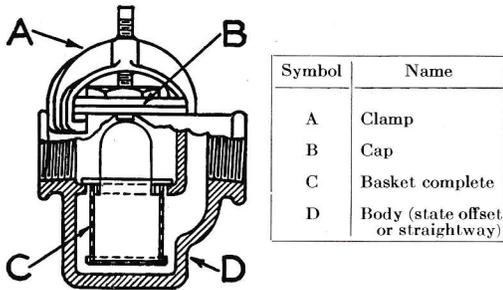
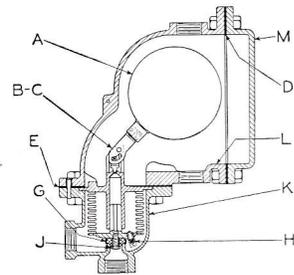


Table 17. List of Parts for Size 0030 Webster Boiler Protector

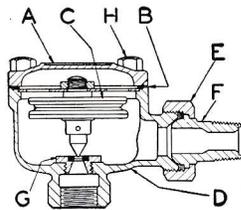


| Symbol | Name |
|--------|---|
| A | Float |
| BC | Complete Interior Assembly less Float (Includes Syphon Bellows) |
| D | Gasket for Float Casing |
| E | Gasket for Valve Body |
| G | Valve Disc—Jenkins Composition |
| H | Bellows Intake Screen |
| J | Special Stud with 2 Washers (for valve disc) |
| K | Valve Body |
| L | Float Casing |
| M | Cover |

Series "78" Thermostatic Traps

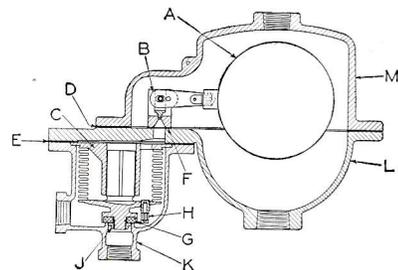
Series "78" Traps are made in two classes: Class 2 for pressures up to 60 lb. per sq. in., and Class 3 for pressures between 60 and 125 lb. per sq. in. State class when ordering parts. This is stamped on cover of trap.

Table 15. List of Parts for Series "78" Thermostatic Traps



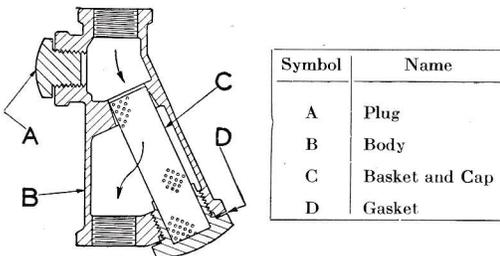
| Symbol | Name |
|--------|--|
| A | Cap |
| B | Cover Gasket |
| C | Diaphragm Assembly |
| D | Body |
| E | Union Nut |
| F | Union Nipple |
| G | Seat (Be sure to state thread diameter) |
| H | Cap Screws ($\frac{3}{8}$ " size has threaded cap and uses no cap screws) |

Table 18. List of Parts for Size 030 Webster Boiler Protector



| Symbol | Name |
|--------|---------------------------------|
| A | Float |
| B | Pilot Valve Assembly less Float |
| C | Syphon Bellows Assembly |
| D | Gasket for Float Casing |
| E | Gasket for Valve Body |
| F | Gasket for Pilot Valve Bracket |
| G | Valve Disc—Jenkins Composition |
| H | Bellows Intake Screen |
| J | Button for Valve Disc |
| K | Valve Body |
| L | Float Casing |
| M | Cover |

Table 16. List of Parts for Series "78" Strainer





WARREN WEBSTER & COMPANY

Factory and Main Office:

17th and Federal Streets, Camden, N. J.

BRANCH OFFICES OR REPRESENTATIVES AT THE FOLLOWING ADDRESSES

LOOK FOR WARREN WEBSTER & COMPANY IN THE LOCAL TELEPHONE BOOK

| | | | |
|---------------------------|------------------------------|----------------------------|----------------------------|
| ALBANY, N. Y. | 91 State Street | MEMPHIS, TENN. | 423 Exchange Bldg. |
| ATLANTA, GA. | 152 Nassau Street, N. W. | MILWAUKEE, WIS. | 6086-92 Plankinton Bldg. |
| ATLANTIC CITY, N. J. | 429 Guarantee Trust Bldg. | MINNEAPOLIS, MINN. | 84 S. Tenth Street |
| BALTIMORE, MD. | 509 Garrett Bldg. | NEW HAVEN, CONN. | 902 Chapel Street |
| BIRMINGHAM, ALA. | 405 Protective Life Bldg. | NEW ORLEANS, LA. | 1007 N. O. Bank Bldg. |
| BOSTON, MASS. | 76 Summer Street | NEW YORK, N. Y. | 470 Fourth Avenue |
| BUFFALO, N. Y. | 308 Jackson Bldg. | OKLAHOMA CITY, OKLA. | 125 W. Second Street |
| BUTTE, MONT. | 910 S. Arizona Street | OMAHA, NEB. | 504-05 Baum Bldg. |
| CHARLOTTE, N. C. | 701 Builders Bldg. | PHILADELPHIA, PA. | 301-6 Stephen Girard Bldg. |
| CHATTANOOGA, TENN. | 1104 James Bldg. | PITTSBURGH, PA. | Empire Bldg. |
| CHICAGO, ILL. | 549 W. Washington Street | PORTLAND, ORE. | 201 Lumbermens Bldg. |
| CINCINNATI, OHIO. | 704 Race Street | RALEIGH, N. C. | 102 W. Hargett Street |
| CLEVELAND, OHIO. | 2341 Carnegie Avenue | RICHMOND, VA. | 302 Carneal Bldg. |
| COLUMBUS, OHIO. | 539-41 Huntington Bank Bldg. | ROANOKE, VA. | 301 Liberty Trust Bldg. |
| DALLAS, TEXAS. | 1117 Mercantile Bank Bldg. | ROCHESTER, N. Y. | 907 Gas and Electric Bldg. |
| DAYTON, OHIO. | 1211 U. B. Bldg. | ROCK ISLAND, ILL. | 2930 Fifth Avenue |
| DENVER, COLORADO. | 1226-1228 California Street | SAGINAW, MICH. | 613 Millard Street |
| DES MOINES, IOWA. | 1003 Hubbell Bldg. | ST. LOUIS, MO. | 2835 Washington Blvd. |
| DETROIT, MICH. | 8316 Woodward Avenue | SALT LAKE CITY, UTAH. | 412-13 Dooly Bldg. |
| EASTON, PA. | 26 North 4th Street | SAN FRANCISCO, CALIF. | 55 New Montgomery Street |
| FARGO, N. D. | 1439 Third Avenue | SEATTLE, WASH. | 326 Columbia Street |
| GRAND RAPIDS, MICH. | 1106 Sherman St., S. E. | SPOKANE, WASH. | 205 Wall Street Bank Bldg. |
| GREENVILLE, S. C. | 207 E. Stone Avenue | SYRACUSE, N. Y. | 716 Hills Bldg. |
| HARRISBURG, PA. | 305 Forster Street | TOLEDO, OHIO. | 415 Thirteenth Street |
| INDIANAPOLIS, IND. | 333 N. Penna. Street | WASHINGTON, D. C. | 814 Union Trust Bldg. |
| JACKSONVILLE, FLA. | 928 Osceola Street | WHEELING, W. VA. | P. O. Box 178 |
| JOHNSTOWN, PA. | 244 Market Street | WICHITA, KANSAS. | 3103 E. English Avenue |
| KANSAS CITY, MO. | 314-318 W. 10th Street | WILKES-BARRE, PA. | 1107 Miners Bank Bldg. |
| LOS ANGELES, CALIF. | 1015 E. 8th Street | YAKIMA, WASH. | 101 W. Yakima Avenue |
| LOUISVILLE, KY. | 901 Realty Bldg. | | |

DARLING BROTHERS, Ltd., P. O. Box 940, MONTREAL, CANADA

Licenses and Manufacturers in Canada

BRANCHES

Toronto Halifax Calgary St. Johns, Nfld. Vancouver Timmins Winnipeg Quebec Ottawa

To protect ourselves in our constant endeavor to make Webster Systems of Steam Heating and Webster System Equipment ever better, we reserve the right to change specifications and prices without notice.