

Styles No. 33-37 inclusive





# CONDENSATORS

ONE of the greatest difficulties that have been encountered in connection with vapor, or open return line systems of heating, has been that of insuring the positive return of the water of condensation to the boiler at all times.

In any system where the return side is vented to the atmosphere and the water of condensation is returned to the boiler by gravity, the amount of pressure that can be safely carried on the boiler is limited to a few ounces. Pressure in excess of this amount forces the water out of the boiler and causes it to build up in the return piping until a sufficient head has been attained to counterbalance the boiler pressure. Under these conditions the boiler would be burned out and ruined.

The majority of vapor systems depend upon a damper regulator of one type or another to keep the boiler pressure within safe limits, but experience has proven that a more positive regulation than this is necessary. As a result, several devices to meet this requirement have been put upon the market, but the majority of them have proven unsatisfactory.

Any device that seeks to overcome the difficulty by letting boiler pressure into the return side of the system, thus equalizing the pressure in the supply and return piping, at once transforms that system from a vapor system to a low pressure system and eliminates all possibility of control of the heat at the radiator.

Inasmuch as none of these systems have positive closing valves on the return ends of the radiators, it is impossible to shut off the steam from any radiator as long as the return side

of the heating system is under pressure.

Years ago our experience convinced us that there was but one way to solve this problem of returning the water of condensation to the boiler under varying pressure conditions, — and that was by installing a receiving tank to which all water of condensation would be returned and in which the pressure would be automatically equalized with that of the boiler, the water then flowing back to the boiler by gravity.

As a result, B & J engineers developed and perfected the Condensator. Its fundamental purpose is to return the water of condensation to the boiler from open return line systems, independently of the boiler pressure. *It should be understood clearly that this is accomplished without any change in the operating conditions of the system, and without air binding the system, or admitting steam to the return side of the system.*

As will be seen from the illustrations on the pages immediately following, the Condensator is installed near the boiler, as high above the water line as possible. The water of condensation flows into the Condensator and, rising, causes the valve on the steam line between the boiler and the Condensator to open, thus equalizing the pressures in the boiler and the Condensator and allowing the water that has collected in the Condensator to return to the boiler by gravity. As a result of the use of a Barnes & Jones Condensator, the water of condensation will be automatically returned to the boiler, independent of the pressure that may be carried on the boiler, whether that



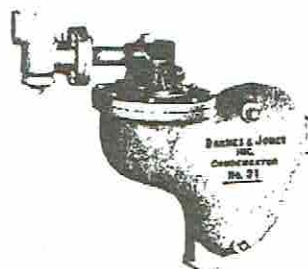
**BARNES & JONES CONDENSATOR**, or Boiler Return Trap is a safety device necessary on Vapor Systems to prevent damage to the boiler as the steam pressure is raised above a few ounces. It returns the water of condensation to the boiler independent of the boiler pressure. This is accomplished without changing any of the operating conditions of the system, and without air binding, or admitting steam to the return side.

The Condensator is installed near the boiler as high above the water line as possible. The Water of Condensation flows into the condensator causing the steam valve to open, thus equalizing the steam pressure in the boiler and condensator, and allowing the water that has collected in the condensator to return to the boiler by gravity.

The Condensator is constructed of Cast Iron in the smaller sizes. The larger sizes are constructed of Steel. Latches and other internal working parts are constructed of material that will withstand years of use.

Each Condensator is equipped with a Barnes & Jones Strainer, which should be located as near the Condensator as possible to protect valves and seats from scale and dirt.

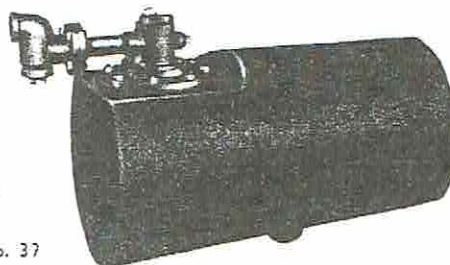
Note:—Bulletins and service prints descriptive of Barnes & Jones Vapor system apparatus will be furnished on application.



Condensator No. 31



Condensator No. 32



Condensator No. 33-36, Inclusive

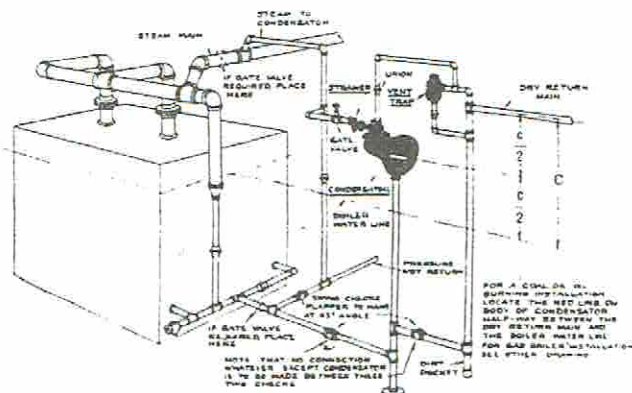


Vent Trap

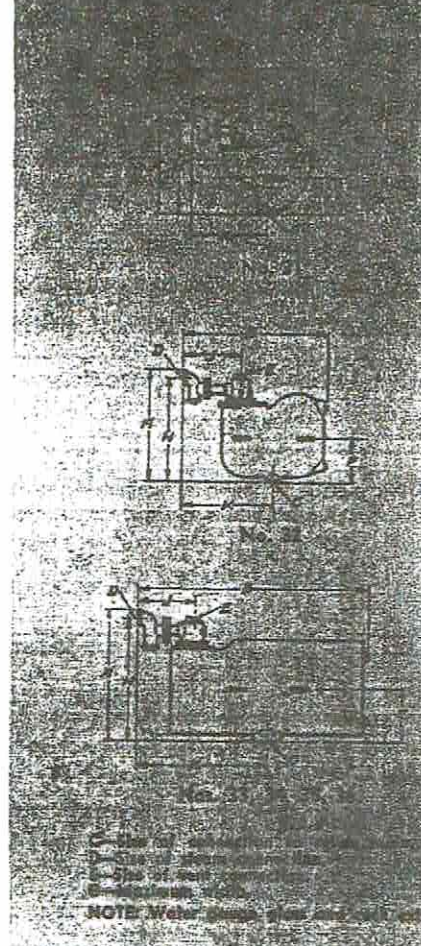
Barnes & Jones No. 37 Vent Trap is used in conjunction with Condensator to allow free and rapid elimination of the air on the return side. It prevents readmission of the air to the system and holds whatever vacuum is formed when the fire is banked, or when the thermostat is satisfied, to stop the oil burner.

Minimum Dimension "C" for Various Size Condensators

Size	31	32	33	34	35	36
Dimension "C"	24"	26"	30"	32"	36"	42"



Method of Connecting Condensator

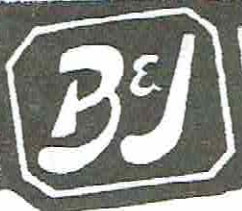


No.	A	B	C	D	E	F	G	H	J	K	Cap. sq. ft. of C.L. Radiation	Net Weight	Shipping Weight
31	18 3/8	22 1/4	1 1/4	1 1/4	3/4	7 1/8	8 1/2	17 1/4	10 3/8	14 1/4	700	60	80
32	18 3/8	23	1 1/4	1 1/4	3/4	7 1/8	8 1/2	17 1/4	10 3/8	14 1/4	1600	75	110
33	19	24	1 1/2	1 1/4	3/4	8	14	17 1/8	10 3/8	13 3/4	3500	100	140
34	21	26	2	1 1/4	3/4	8 1/8	15 1/2	17 1/8	10 3/8	15 3/8	6000	110	150
35	25	30	2 1/2	1 1/2	3/4	10 1/2	18	23 1/2	11 1/2	17	10000	170	220
36	25	40	3	1 1/2	3/4	10 1/2	18	23 1/2	11 1/2	23	16000	200	275

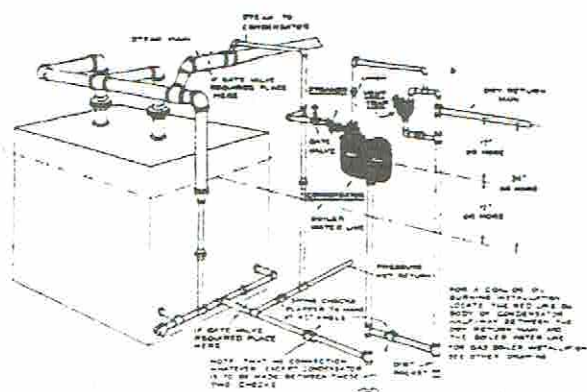
The accompanying illustration shows most clearly the proper method of installing Barnes & Jones Condensator. It will be noted that the Condensator is so installed that the Water of Condensation comes back through dry mains which when near the boiler drop, and become wet. At the point where it drops a Vent Trap is installed to allow discharge of the air from the radiators and Condensator. After the return main becomes wet the Water of Condensation passes through a check valve before it reaches the Condensator and thence to another check valve installed in the return main between the connection to the Condensator and boiler.

It will be noted in the illustration that the drips from the supply mains and risers are brought back through a separate wet drip line. Where this is done, care must be taken to see that this wet drip line is connected to the boiler independently or is connected into the return main between the boiler and return inside check valve. A 45 check valve must be installed in the wet drip line also. Steam main may be dripped through traps and separate wet drip main omitted if so desired.

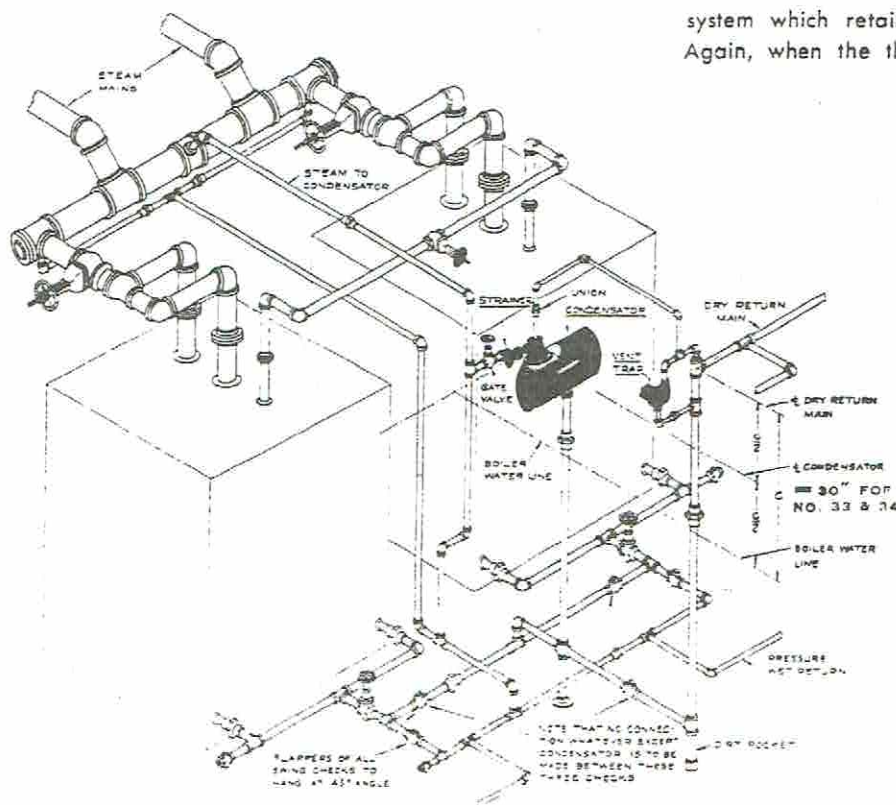




# Barnes & Jones CONDENSATORS



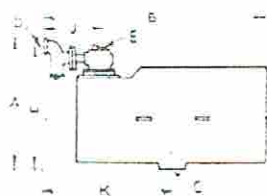
No. 32 CONDENSATOR CONNECTIONS



No. 33 AND 34 CONDENSATOR CONNECTIONS



No. 32



No. 33 and 34

The rapid circulation and quick air venting of a vapor system is due to the fact that the return piping is never above atmospheric pressure, and frequently is below atmosphere.



AIR VENT TRAP

The Barnes & Jones Condensator (sometimes called a Boiler Return Trap or Alternating Receiver) is a safety device to prevent damage to the boiler when the steam pressure is raised above a few ounces. The Vent Trap allows air to escape from the system, and a ball check prevents its re-admission. Thus, when the thermostat is up to temperature and the oil burner is stopped a vacuum is formed in the system which retains heat in the radiators for some time. Again, when the thermostat calls for heat and the burner starts, steam circulation is obtained very quickly due to the vacuum.

The Condensator does not function when a pressure of only a few ounces is on the boiler, as then the water of condensation returns to the boiler by gravity. When the pressure rises, however, the condensate gradually accumulates in the Condensator causing the steam valve to open and equalize the pressure in the Condensator with that in the boiler, and the water flows back into the boiler.

The Condensator has few moving parts and is reliable in operation. All the working mechanism is attached to the head, which may be easily removed for cleaning or repair.

## CAPACITIES

No. 32=1600 SQ. FT.  
No. 33=3500 SQ. FT.  
No. 34=6000 SQ. FT.

## CONDENSATOR Dimensions, Inches

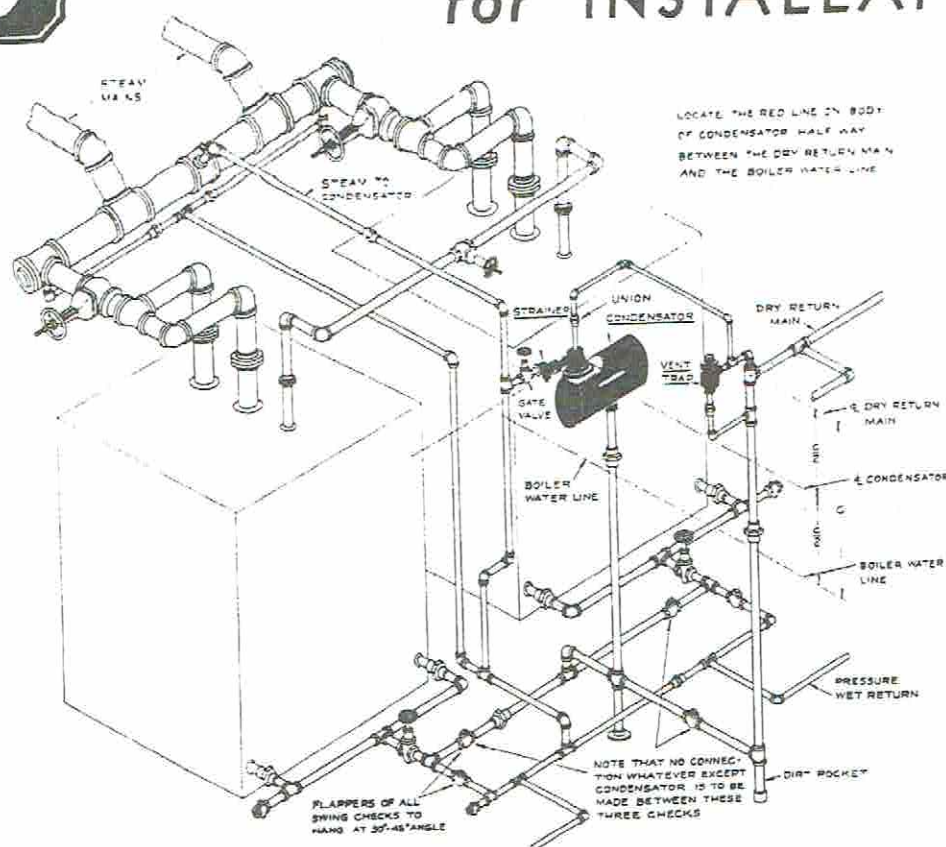
No.	A	B	C	D	E	F	G	H	J	K
32	18 <sup>3</sup> / <sub>8</sub>	23	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>2</sub>
33	19	24	2	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	8	14	17 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>2</sub>
34	21	26	2	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	8 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	19 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>8</sub>

C SIZE OF CONNECTION TO RETURN MAIN  
D SIZE OF STEAM CONNECTION

E SIZE OF VENT CONNECTION  
G MAXIMUM WIDTH



# DIRECTIONS for INSTALLATION



nection always should be taken off the return main to the boiler between the two check valves, and it is equally important that no other connection be taken off this main at this point between these two check valves. Care also should be taken to see that the Condensator is installed at the proper distance above the boiler water line — preferably not less than fifteen to eighteen inches to the center line of the Condensator, and the dry return main always should be brought back about the same distance above the Condensator.

The illustrations show clearly how the Condensator is vented into the dry return main and thence to the atmosphere

through the Barnes & Jones Vent Trap.

The steam equalizing pipe between the supply side of the system and the Condensator should be taken off as near the boiler as possible. It should be well pitched in the direction of flow towards the Condensator and must be dripped into the wet drip line or the return main between the check valve on the discharge side of the Condensator and the boiler.

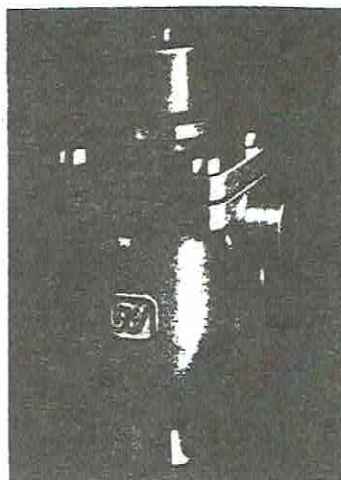
A stop valve and a union always should be installed in the equalizing line. As previously mentioned a Barnes & Jones strainer always is placed in this line near the Condensator and a stop valve and a union should be installed on the supply side of the strainer.



pressure be a few ounces or several pounds.

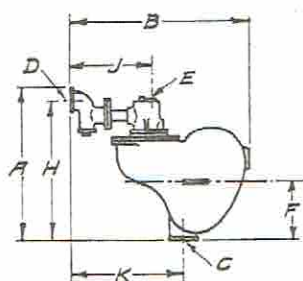
The Condensator is made in various capacities for installations of all sizes.

The steam supply line to the Condensator, or what is termed the equalizing line between the boiler and Condensator, should be provided with a stop valve and strainer. We furnish with each Condensator a Barnes & Jones strainer attached to the Condensator as shown on the first page. This strainer prevents all scale, dirt and core sand from reaching the steam valve in the Condensator. It has a removable screen to permit easy cleaning.

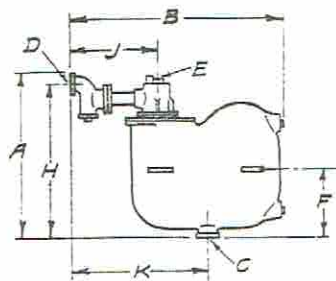


The air vent from the Condensator is connected to the dry return, the air being discharged to the atmosphere through a Barnes & Jones vent trap, installed as shown in drawings on Pages 5 and 6.

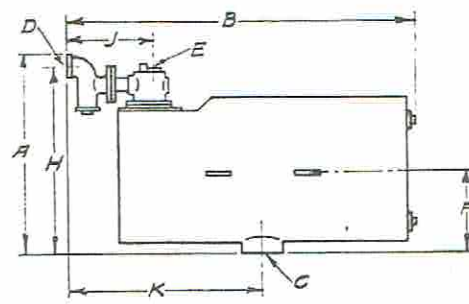
The Condensator is simple in construction and its operation is positive at all times. It has few movable parts and all movable parts are wholly enclosed to prevent any tampering. The connections purposely are made large, to eliminate friction and insure an easy and sensitive working apparatus under all conditions. All working parts are constructed of the best bronze metal.



No. 31.



No. 32.



No. 33, 34, 35, 36, 37.

C = SIZE OF CONNECTION TO RETURN MAIN.  
D = SIZE OF STEAM CONNECTION.

E = SIZE OF VENT CONNECTION.  
G = MAXIMUM WIDTH.

NOTE: WATER GAUGE GLASS AND COCK EXTRA

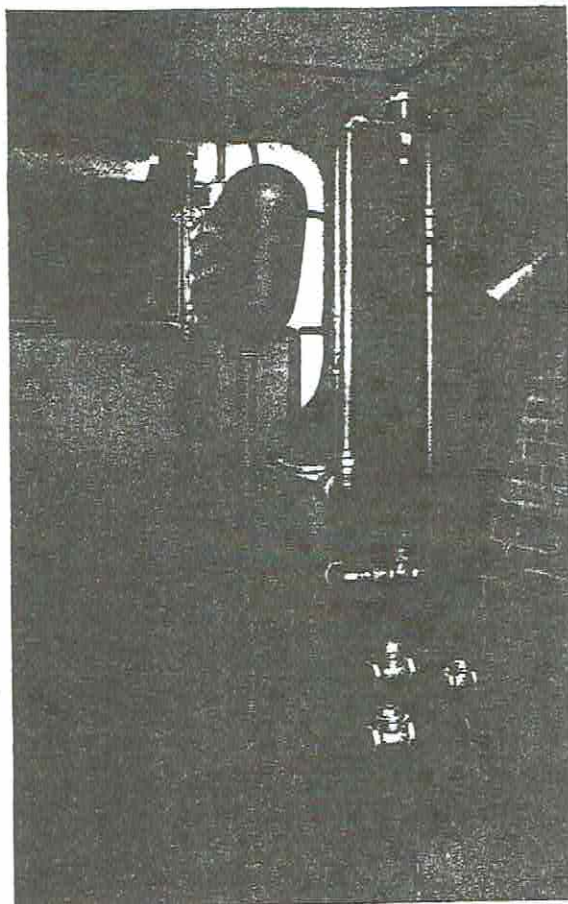
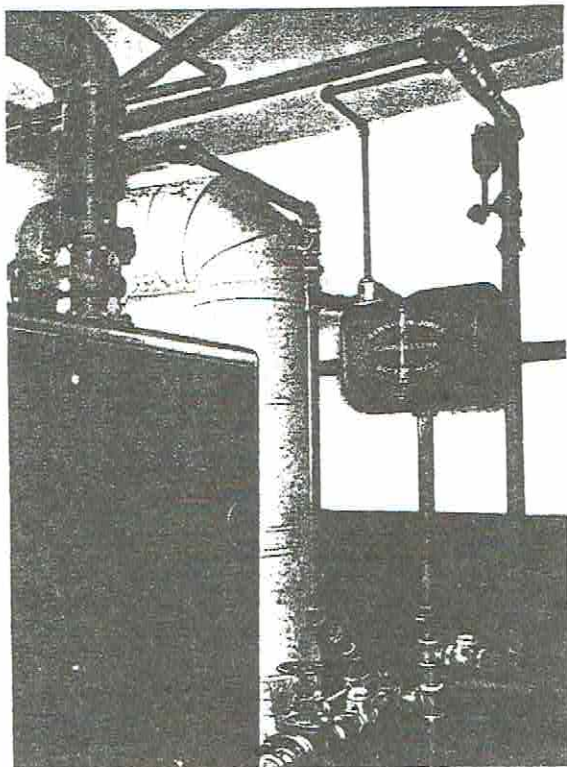
No.	A	B	C	D	E	F	G	H	J	K	CAPACITY SQ. FT. OF C.I. RADIATION	NET WEIGHT	SHIPPING WEIGHT
31	18 $\frac{3}{8}$	22 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{4}$	7 $\frac{1}{8}$	8 $\frac{1}{2}$	17 $\frac{1}{4}$	10 $\frac{3}{8}$	14 $\frac{1}{4}$	700	60	80
32	18 $\frac{3}{8}$	23	1 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{4}$	7 $\frac{1}{8}$	8 $\frac{1}{2}$	17 $\frac{1}{4}$	10 $\frac{3}{8}$	14 $\frac{1}{4}$	1600	75	110
33	19	24	2	1 $\frac{1}{4}$	$\frac{3}{4}$	8	14	17 $\frac{7}{8}$	10 $\frac{3}{8}$	13 $\frac{3}{4}$	3500	100	140
34	21	26	2	1 $\frac{1}{4}$	$\frac{3}{4}$	8 $\frac{7}{8}$	15 $\frac{1}{2}$	19 $\frac{7}{8}$	10 $\frac{3}{8}$	15 $\frac{3}{8}$	6000	110	150
35	25	30	4	1 $\frac{1}{2}$	$\frac{3}{4}$	10 $\frac{1}{2}$	18	23 $\frac{3}{4}$	11 $\frac{1}{2}$	17	10000	170	220
36	25	40	4	1 $\frac{1}{2}$	$\frac{3}{4}$	10 $\frac{1}{2}$	18	23 $\frac{3}{4}$	11 $\frac{1}{2}$	23	16000	200	275
37	30	51	4	2	$\frac{3}{4}$	13 $\frac{1}{2}$	24	28	19	32	32000	275	375

# DIRECTIONS *for* INSTALLATION



THE accompanying illustrations show the proper method of installing Barnes & Jones Condensators. It will be noted in each illustration that the Condensator is so installed that the water of condensation comes back through a dry return main which, when near the boiler, drops and becomes wet. At the point where it drops a Barnes & Jones vent trap is installed to allow the discharge of air from the radiators and the Condensator.

After the return main becomes wet, the water of condensation passes through a check valve before it reaches the connection to the Condensator, and thence through another check valve installed in the return



main between the connection to the Condensator and the boiler.

It will be noted in the illustrations that the drips from the supply mains and risers are brought back through a separate wet drip line. Where this is done, care must be taken to see that this wet drip line is connected to the boiler independently or is connected into the return main between the boiler and the inside check valve. A check valve must be installed in the wet drip line also.

It is important that the Condensator con-