The "D" series Dunham Differential Vacuum System is for the heating of office buildings, hotels, apartment houses, schools and groups of buildings, etc., of more than 3,000 sq. ft. of equivalent direct radiation.

The boiler serves as a heat storage from which steam is supplied according to the demand of the Sub-Atmospheric Pressure Reducing Valve or Temperature Control Valve. The manually controlled system uses two sub-atmospheric pressure reducing valves. The small valve "A" supplies steam in mild weather, valve "B" in cold weather. In extreme weather both valves may be used, if necessary. By shifting the weights of the valve in use, the steam pressure (vacuum) is controlled in accordance with outside weather conditions.

In the automatically controlled system a Temperature Control Valve "C" is substituted for valve "B."

The Dunham Differential Controller starts and stops the pump maintaining, under all steam supply conditions, a greater vacuum in the returns than in the radiators.

This assures complete circulation at all times. In severe weather when steam pressure above atmospheric is required (to maintain the room temperature) the Differential Controller automatically stops the pump until pressure conditions in the system make its operation necessary.

The Dunham Differential Vacuum System and individual parts of the apparatus used in that system are fully protected by United States Patents Nos. 1,644,114 and 1,706,401, and Canadian Patents Nos. 282,193, 282,194 and 282,195. Additional patents in the United States, Canada and foreign countries are now pending.

Central Station Heating

The Dunham Differential Vacuum Heating System is especially adapted to Central Station Steam Supply. It offers great economy of steam consumption and very low condensate temperatures. Another advantage is complete circulation even though the pressure carried on the distributing mains from the boiler plant is low. This system therefore is ideal both from the standpoint of the Central Station Company and the Consumer.

Exhaust Steam

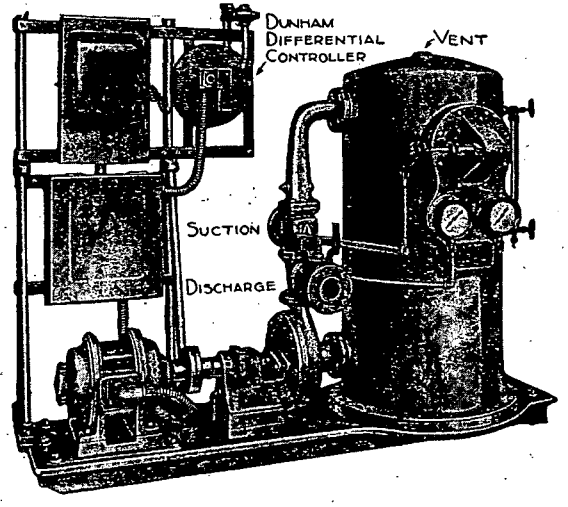
Exhaust steam may be circulated under vacuum, thus saving steam formerly wasted. The application of this system reduces the back pressure to a vacuum and greater power output will be obtained.

In installations where high steam pressures and temperatures are necessary for process work the building heating system can be operated more economically by applying the differential principle to it. By reducing the high steam pressure through reducing valves the heat input may be controlled and the overall economy of the plant improved.

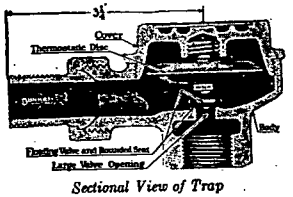
Dunham Differential Vacuum Pump, "D" Series

The Dunham Differential Vacuum Pump operates on the Jet Exhauster principle. The Dunham Exhauster is a special design and has great air and vapor handling capacity. Under high pressures water is supplied from the receiving tank to the exhauster by a motor driven enclosed impeller type centrifugal pump of high efficiency.

The pump exhausts air and water from return piping under very high vacuums and discharges condensate to the boiler. It is a completely assembled compact unit ready for piping and wiring connections.



Dunham Thermostatic Radiator Trap

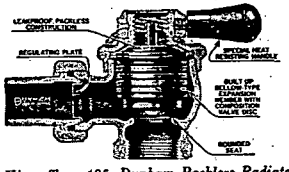


Sectional View of Trap

Sectional view of Dunham Differential Thermostatic Radiator Trap, sizes, styles and specifications, see Dunham Hand Book.

All traps used in connection with the Dunham Differential Vacuum Heating System are known as "D" Series. They function uniformly over a wide range of pressures, and temperatures from 25 in. of vacuum to 25 lb. gauge pressure.

Dunham Packless Radiator Valve

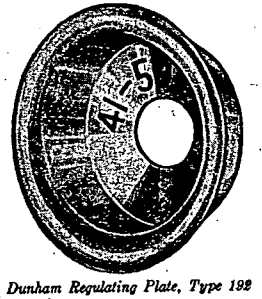


Sectional View, Type 105, Dunham Packless Radiator Valve with Regulating Plate

For sizes, styles and specifications, see Dunham Hand Book.

Dunham Packless Radiator Valves with Regulating Plate must be used on all radiators to secure proper balance. Either Type 105 (lever handle) or Type 145 (wheel handle) may be used.

The valve is made packless by means of the bellows construction. The plate orifice is calibrated to the number of feet of radiation in each radiator.



Dunham Regulating Plate, Type 192

Types of Control

The system of control is arranged so that:

A single valve may be controlled by a single thermostat.

A single valve may be controlled by several thermostats.

Several valves may be controlled each by its own thermostat.

Several valves may be controlled each by several thermostats.

The control panel in each case is centralized in the boiler room.

Where heating systems are divided into complete zones (or for systems where only one thermostat is intended to control one valve) Control Panel Type 391 is used.

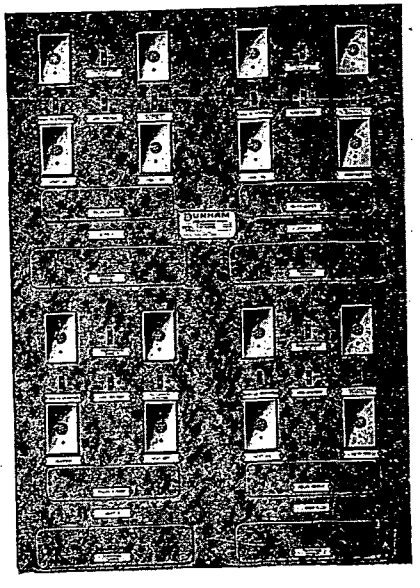
Either control provides the following advantages:

It centralizes control of the entire steam supply.

It permits either automatic or manual operation.

It gives the attendant the information he desires regarding temperature conditions prevailing in various parts of the building, in addition to informing him whether or not the valve is admitting steam to the system.

Each panel is provided with a red and a green light for each thermostat and valve. Switches are provided for transferring the



Type 391