

when steam piping is too low for gravity return to boiler. No lift connections can be used.

Individual Temperature Control for Sections of Buildings or Groups of Buildings—Different parts of buildings require different quantities of heat at different times due to class of occupancy of various parts of building, sun and wind effect on the different sides, and buoyancy of the heated air as in very tall buildings. All large buildings should therefore be "zoned" to secure maximum conservation of steam and correct heating of all sections.

The Dunham Zone Temperature Control in conjunction with the Dunham Differential Vacuum Heating System provides remote electrical control of the steam supply as required by each zone.

Controlling Factors in Designing a Zoning System—

(1) Buoyancy—Heated air rises within the building due to flue effect. This causes the upper floors of tall buildings to be overheated after the system is full of steam.

(2) Exposure—Sunshine, wind and other weather conditions cause variable heat demands on different sides of buildings.

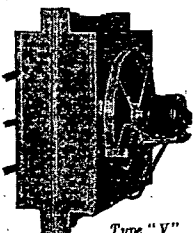
(3) Type of Occupancy—Sections of the same building may require different degrees of heat due to their particular uses, such as storage, manufacturing, office space, etc., or periods of occupancy.

No particular rule can be given for the zoning of a building, as each is an individual problem and should be studied as such. The experience of Dunham engineers is at the service of architects and engineers when heating system layout for a zoned system is being studied. A general description of the problem will enable the Dunham engineering staff to advise you.

DWYER UNIT HEATERS

Dwyer Unit Heaters are manufactured in four distinct types in a range of sizes broad enough to meet all requirements.

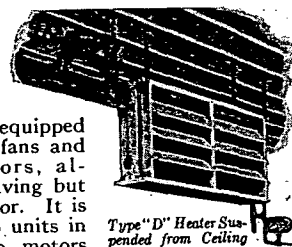
Type "V" is a simple compact design, in sizes up to 1132 square feet of equivalent direct radiation. The all-aluminum fan mounted directly on the motor shaft forces the room air through the radiator, and the warmed air is deflected up or down by individually adjustable louvers.



Type "V"
Suspended Heater

Light in weight, the unit may be hung from the roof joists by ordinary pipe hangers, from the wall with wall brackets, or from a column or post. When equipped with a recirculating duct the heating efficiency is greatly increased. The cooler air near the floor is drawn into the units allowing the warmer air to settle down into the working zone.

Speed control of the electric motors, which is available for all current characteristics, particularly adapts the Type "V" Unit to retail stores, offices, showrooms, etc., in addition to an unlimited application for small factories, garages, and lofts.

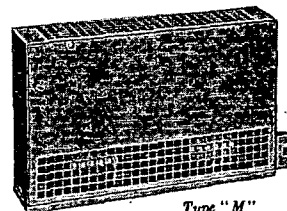


Type "D" Heater Suspended from Ceiling

Type "D" is equipped with two fans and two motors, although having but one radiator. It is really two units in one. The motors may be connected, if so desired, to operate independently instead of simultaneously. With only one motor in operation, the capacity of the unit is approximately 60 per cent of the full rated capacity. Type "D" units are manufactured in sizes up to 2360 square feet of equivalent direct radiation, yet require only one steam supply and one return connection.

Every Dunham-built Dwyer Unit Heater is built around the time-proven Dwyer Radiator, constructed of seamless drawn copper tubes to which continuous helical copper fins are metallically attached. The tubes are assembled into semi-steel cast headers at each end by means of brass clamping nuts, forming screwed ground joints. This feature permits of the removal and replacement of any tube or number of tubes (in the event of damage) without breaking any piping connections.

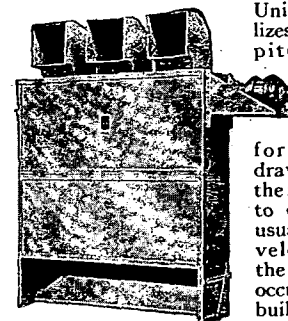
Type "M" is a compact cabinet-type heating unit, quiet in operation, efficient and soundly constructed for lifetime service. Its pleasing appearance and self-contained operating parts, its



Type "M"
Cabinet Unit Heater

silent yet positive action, adapt it to offices, stores, showrooms and basements, where a maximum quantity of heat is required in a minimum amount of space available.

The unit is universal in application, and may be installed on the floor, inverted and attached to the wall, or it may be installed behind the walls, breathing the air through grilles. Type "M" Unit Heaters range in size from 100 to 300 square feet of equivalent direct radiation.



Type "R" Unit Heater

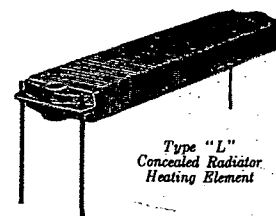
Type "R" Unit Heater utilizes backward pitched, centrifugal housed fans in tandem formation to draw air through the radiator, and to discharge it, usually at a high velocity, over the heads of the occupants of the building.

Ranging in size up to 3350 square feet of equivalent direct radiation, these units are primarily intended for larger industrial buildings. By controlling the speed of fans, they become ideal for ventilating and heating offices, auditoriums, and gymnasiums.

All parts are instantly accessible. The electric motor, self-aligning, dust-proof ball bearings, and flexible coupling, are installed outboard. The radiator slides in and out through either end, like a drawer. The complete fan assembly is removable through the top of the unit.

Discharge cowls are square and may be set in any of the four directions. The unit may be installed on the floor, hung on the wall upright, or inverted, or flat against the ceiling. Only one steam supply and one return connection are required.

TYPE "L" CONCEALED RADIATOR



Type "L"
Concealed Radiator Heating Element

Type "L" Concealed Radiator replaces the bulky, antiquated, cast-iron heater, so unsightly in any room. Installed behind the walls of a home or office building, it allows the space formerly occupied (and made unusable) by the cast-iron radiator to become as utilitarian as the other parts of a room.

The radiators are made in a complete range of sizes, to meet every condition. They are designed throughout along the most advanced scientific lines. A choice of grille designs and radiator enclosures will appeal to the architect and builder.

Orifice regulation of the steam supply is a necessity for the modern circulation system, so a special adjustable regulating fitting is available for the Type "L" Concealed Radiator. This fitting is easily adjusted, and may also be used as a valve to close off the steam supply when the trap is being cleaned.

Pipe connections are greatly simplified, and every precaution has been taken to aid the steam fitter in his work.

The Heating Element is built for lifetime service. It consists of seamless drawn copper tubes and pure copper fin sheets metallically attached. This feature assures permanence of heating capacity as no dirt, dust, or oxidation can insulate the contact between tube and fin. The tubes are airfoil in shape, to offer the least resistance to the convection of air. They are individually brazed into an extra heavy die-pressed copper tube sheet which is swaged and then brazed over a one piece reinforced bronze casting. The result is a homogeneous structure. Each element is given careful inspection and a steam and hydraulic test before shipment from the factory.

Heating elements are removable from the enclosure (in case of necessity) through the air inlet opening.

Enclosures are built of heavy sheet steel, substantially reinforced; and of proper design to offer the least impedance to air flow. Metal panel fronts of highly finished furniture steel, and panels for plaster front are available with or without recess linings. Grilles are of heavy perforated metal welded to one-piece bar frames. Dampers to control the air flow as desired are optional.

The appearance of the complete installation, and the application of the panel for plaster front, with recess lining and damper, are shown in special bulletins, copies of which will be sent on request. An inlet grille may be substituted for the cut-out removable baseboard section shown.