

CONVECTORS OR CONCEALED HEATERS

Although any standard heating unit (*i.e.*, radiator) may be concealed in a cabinet or other enclosure so that the greatest percentage of heat is conveyed to the room by convection, the best results are usually obtained where units of special design are used. Commercially, these specially designed units are built in as part of the enclosing cabinets which are necessary for the proper functioning of these heaters. As distinguished from *radiators*, these gravity convectors have come to be known as concealed heaters. Fig. 6 shows a typical built-in cabinet convector.

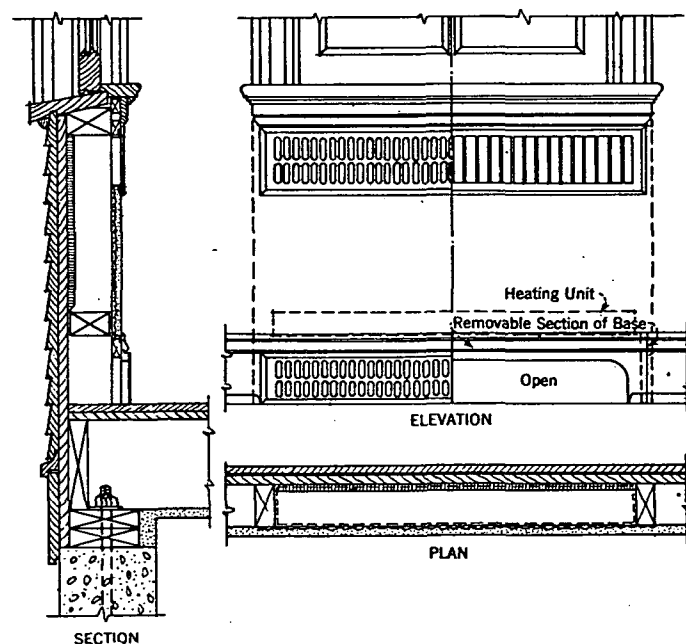


FIG. 6. TYPICAL CONCEALED CONVECTOR USING SPECIALLY DESIGNED HEATING UNIT

The elements or heating units usually consist of a relatively large amount of extended surface which may be integral with the core or assembled over it, making thermal contact by pressure, through solder, or by both pressure and metallic contact. Heating elements may be of cast-iron, cast aluminum, sheet steel, copper, or commercial alloys.

The cross-sections of a number of non-ferrous heating elements are shown in Fig. 7. In these the ratio between the extended surface and the prime surface may be as high as 25 to 1.

Concealed heaters or convectors maintain room temperatures with low steam consumption due, probably, to their performance characteristics which give reduced air temperatures in the upper level of a room with a

directed flow of warm air into the living zone and but little radiant heat to exposed surfaces. In listing the capacities of convectors, manufacturers allow from 10 to 40 per cent for this heating effect. (See A.S.H.V.E. Standard Code for Testing and Rating Concealed Gravity Type Radiation, A.S.H.V.E. TRANSACTIONS, Vol. 37, 1931).

Concealed heaters or convectors are generally sold as completely built-in units. The enclosing cabinet should be designed with suitable air inlet and outlet grilles to give the heating element its best performance. Tables of capacities are catalogued for various lengths, depths and heights, and combinations are available in several styles for installations, such as the wall hanging type, free-standing floor type, recess type set flush with wall or offset, and the completely concealed type. Most of these types may be arranged with a top outlet grille, although the front outlet

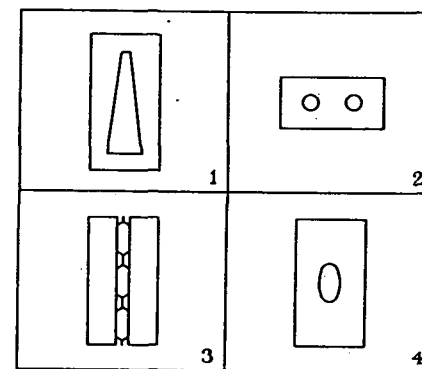


FIG. 7. SECTIONS THROUGH TYPICAL HEATING UNITS OF EXTENDED SURFACE TYPE

is practically standard. In cases where enclosures are to be used but are not furnished by the heater manufacturer, it is important that the proportions of the cabinet and the grilles be so designed that they will not impair the performance of the assembled convector.

The output of a concealed heater, for any given length and depth, is a variable of the height. Published ratings are generally given in terms of equivalent square feet, corrected for heating effect. However, an extended surface heating unit is entirely different structurally and physically from a direct radiator and, since it has no area measurement corresponding to the heating surface of a radiator, many engineers believe that the performance of convectors should be stated in Btu's. For steam convectors, as for radiators, 240 Btu per hour may be taken as an equivalent square foot of radiation.

CODE TESTS FOR RADIATORS AND CONVECTORS

As previously indicated, the output of radiators and convectors is still designated by the terms of older practice, but this is gradually giving place to an engineering method of designating heat emission. The A.S.H.V.E.