

2. The lessened steam consumption may not materially change the radiator heating performance.
3. The enclosed radiator may inadequately heat the space.

A comparison between a bare or exposed radiator (A) and the same radiator with a well-designed enclosure (B), with a poorly-designed enclosure (C), and with a cloth cover (D) will illustrate the relative heating effects. In Fig. 4 the curve (B) reveals that the enclosed radiator used less steam than the exposed radiator, but gave a satisfactory heating performance. A well-designed shield placed over a radiator gives about the same heating effect. Curve (C) shows the unsatisfactory effects produced by improperly designed enclosures. Curve (D) shows that the effect of a cloth cover extending downward 6 in. from the top of the radiator was to make the performance unsatisfactory and inadequate.

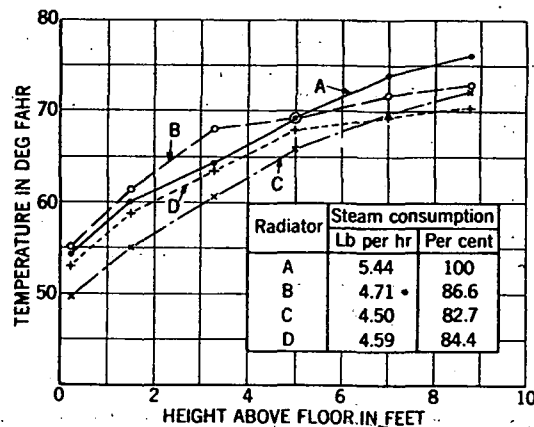


FIG. 4. STEAM CONSUMPTION OF EXPOSED AND CONCEALED RADIATORS

Practically all commercial enclosures and shields for use on direct radiators are equipped with water pans for the purpose of adding moisture to the air in the room. Tests⁶ show that an average evaporative rate of about 0.235 lb per square foot of water surface per hour may be obtained from such pans, when the radiator is steam hot and the relative humidity in the room is between 25 and 40 per cent. This source of supply of moisture alone is not adequate to maintain a relative humidity above 25 per cent on a zero day.

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

⁶University of Illinois Engineering Experiment Station Bulletin No. 230, p. 20.

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. 5 shows a typical built-in cabinet convector.

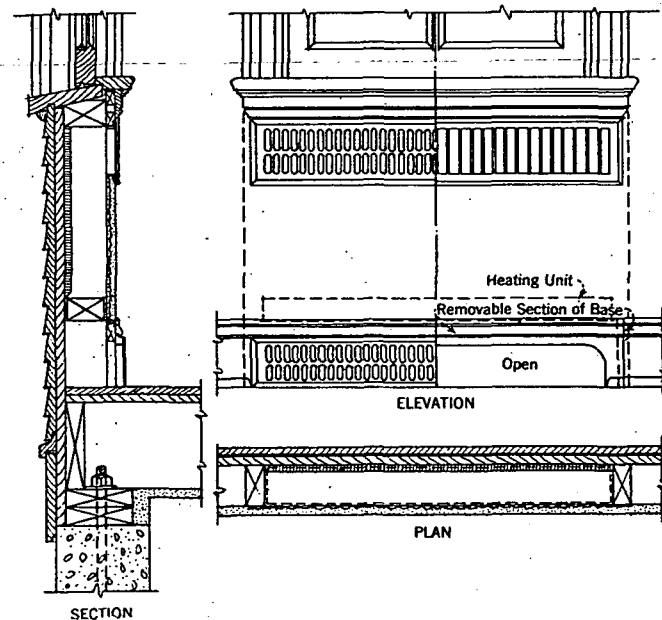


FIG. 5. TYPICAL CONCEALED CONVECTOR USING SPECIALLY DESIGNED HEATING UNIT

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.

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. The *Concealed Heater Manufacturers Association* has decided to use the A.S.H.V.E. Standard⁷ in the formulation of its ratings, but has made a provision that heating effect be included in the ratings in accordance with the following rules:

⁷A.S.H.V.E. Standard Code for Testing and Rating Concealed Gravity Type Radiation (A.S.H.V.E. TRANSACTIONS, Vol. 37, 1931).