CHAPTER XI.

DUCTS FOR DIRECT-INDIRECT HEATING

Constructing Wall Ducts

In direct-indirect heating the fresh air from outdoors is taken in below the radiator and heated before it passes into the room. Fig. 161 shows how the duct for the entrance of the air is constructed. The proper

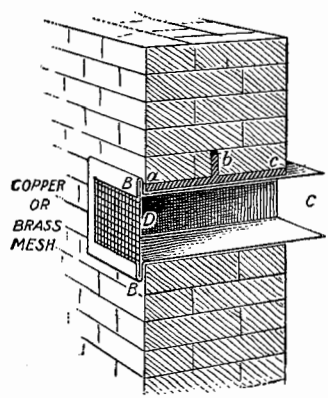

Fig. 161—Method of Constructing Wall Duct in Direct-Indirect Heating

opening is left in the wall, by means of the lintel **a b c**; the duct is then formed as shown by B C, having a lock all around the outer face as shown by B B, into which copper or brass mesh is placed, so as to keep out insects or any other foreign substance. The duct should be of sufficient length at C, the inner end, to allow connection with the radiator beyond the wood

trim as shown. The base of the radiators usually has two dampers, so that by pressing down a treadle it closes the damper towards the room and opens the one which admits fresh air from the outside. When the inner treadle is raised it closes the damper which supplies the outer air, and opens the damper which allows the circulation of the cold air near the floor in the room. If the duct is made of galvanized iron, then number 16 gauge should be used, painting it well with red lead inside and out before setting, to avoid rusting, or if the cost is not to be considered, 24-oz. cold rolled copper can be used.

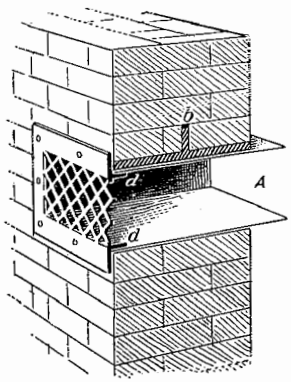

Fig. 162—Construction of Wall Duct, Using a Register Face

When a cast iron register face is used at the outside end of the duct, it is only necessary to employ a tube or duct of the proper length, as indicated by A in Fig. 162. The flanges d d of the register face are allowed to enter the outer end of the duct and the face is fastened to the brick wall by a few brass screws, used in connection with screw anchors as previously described.

Wall Duct with Metal Louvres

When the wall duct is to have metal louvres and mesh frame, this is constructed as shown in Fig. 163. The upper part of the frame is formed as indicated by A B and the lower part as shown by C D, with the lower louvre attached at C, the louvres **e** and **f** being riveted at the ends. The mesh frame is formed as shown by E F, the flanges being riveted to the duct. Into the grooves of this frame the brass or copper mesh G is inserted.

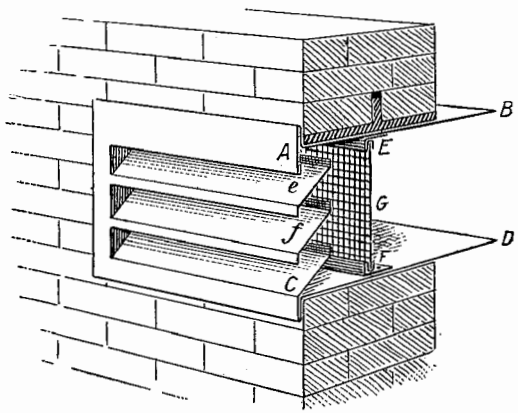

Fig. 163—Construction of Wall Duct with Metal Louvres and Mesh Frame

A cast iron wall box, with louvre slats and netting attached is sometimes employed as shown in Fig. 164. This box is built into the wall by the mason, and if desired, a sheet metal duct can be connected to the same as shown.

Another style of duct, in which the opening is protected by a hood which keeps out the rain and snow, is shown in Fig. 165. The fresh air comes in as shown

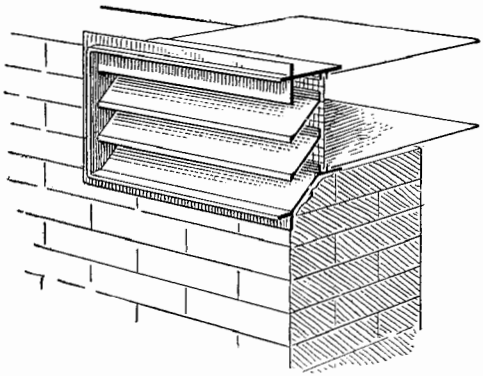

Fig. 164—Cast Iron Wall Box with Louvres and Netting

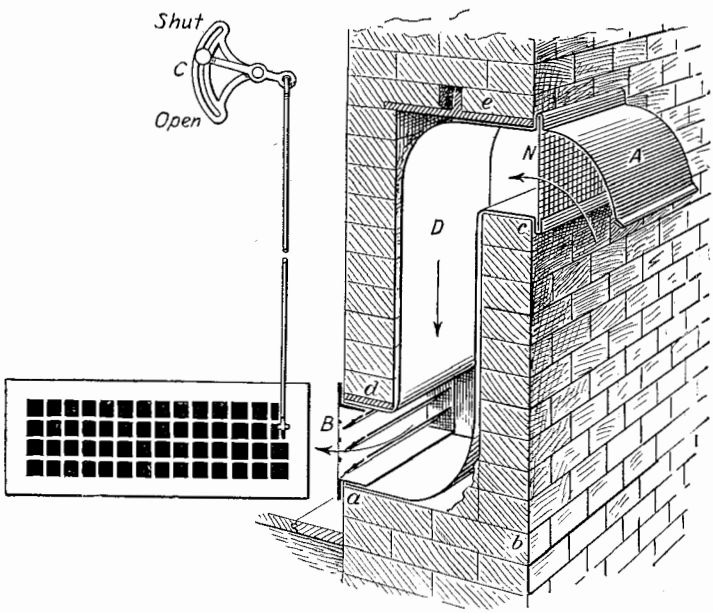

Fig. 165—Method of Constructing Duct for Bringing Outside Air Beneath Radiator in a Direct-Indirect System of Warming

by the arrows, passes down the flue and through an adjustable damper, shown at B. The elevation of this damper is shown at the left. It is operated by the brass rod and quadrant C, by which to open and close the same to suit the amount of fresh air required.

Lining Wall Flue

Sometimes there are objections to a bare brick flue, on account of the dampness which may penetrate through the wall. In that case the entire wall flue should be lined with heavy galvanized iron, painted, or with heavy sheet copper, constructing the duct with rounded corners, as shown. The entire duct or flue D should be made in one piece, with the hood A attached, N indicating the brass netting. Accurate dimensions, as **a b** and **b c**, must be obtained before the duct is made up, and after the wall has been built up as high as **a b**, the duct D is set, and the wall continued, protecting the metal by means of the lintels **d** and **e**. The adjustable damper B can be connected at any time before the radiators are set.

Casings for Indirect Radiation

Where there is an objection to placing radiators in the rooms, an indirect system of warming can be installed, as shown in Figs. 166 and 167, in which the radiator is hung below the cellar or basement ceiling and incased by a portable galvanized sheet iron casing. The top of the radiator should always be hung not less than 10 or 12 inches below the ceiling line, and the bottom of the sheet metal casing should be about 10 or 12 inches below the radiator to allow for circulation of air. The cold outer air enters the sheet metal casing through the duct A at the bottom in Fig. 166,

and is warmed by passing over the radiator before it enters the room above. The cold air can be made to enter the top of the casing, as shown in Fig. 167 by placing a metal partition in the position shown by L, which deflects the cold air to the bottom of the casing and allows it to be warmed, as before, by passing over the radiator. In constructing the casing all joints are locked and bolted so as to allow the casing to be easily

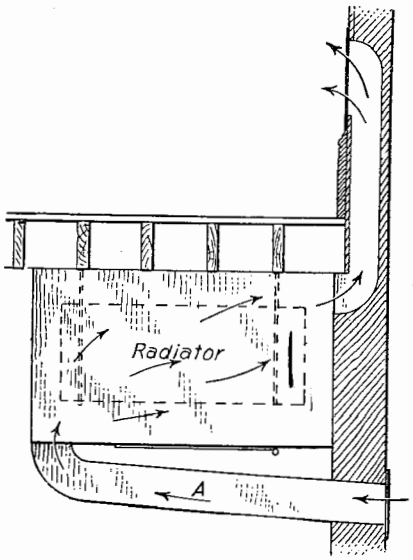

Fig. 166—Method of Indirect Warming by Enclosing Radiator in Sheet Metal Casing, Cold Air Duct Entering at Bottom

taken apart in case repairs are needed to the radiator. Clean out slides are placed in the bottom of the casing, as at **a**, also in the bottom of the cold air flue, as at **b**, which allows the duct and casing to be cleaned from dust and dirt when required.

When it is desired to warm cold air from the outside, as well as the cold air from the hall, the ducts are constructed similar to that shown at the right, in Fig. 167. A floor connection is made to the cold air inlet as shown, in which an adjustable damper is placed, as shown by **c**, operated by a chain from the inside of the hall at **d**. If a rotary circulation of the

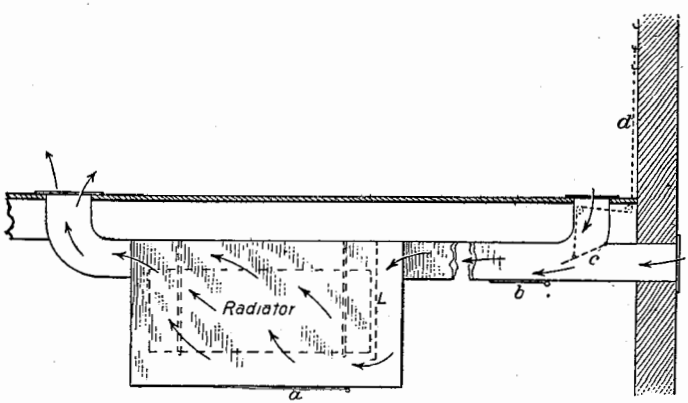

Fig. 167—Another Form of Casing Wherein Air Enters at Top, Showing How Cold Air From Halls as Well as How That From Outside Is Heated

air in the room or hall is desired, the damper is raised to the position shown, whereby circulation of the outer as well as the inner air is obtained, as indicated by the arrows. If only outer air is desired, the damper can be raised until the floor connection is closed, and if the inner cold air alone is to be circulated, the damper **c** can be dropped, thus closing the cold air inlet from the outside.