

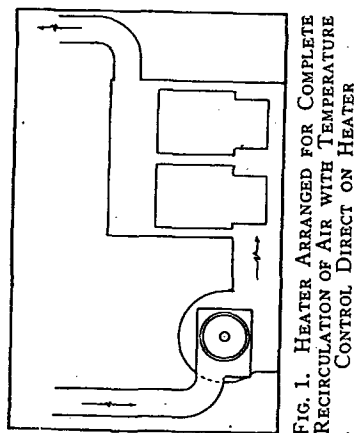


FIG. 1. HEATER ARRANGED FOR COMPLETE RECIRCULATION OF AIR WITH TEMPERATURE CONTROL DIRECT ON HEATER

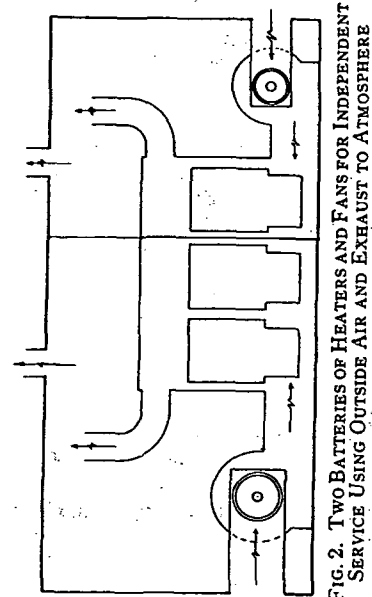


FIG. 2. TWO BATTERIES OF HEATERS AND FANS FOR INDEPENDENT SERVICE USING OUTSIDE AIR AND EXHAUST TO ATMOSPHERE

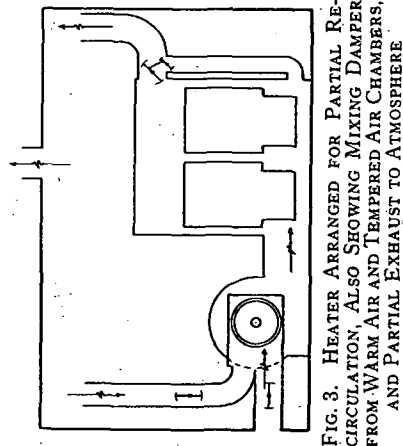


FIG. 3. HEATER ARRANGED FOR PARTIAL RECIRCULATION, ALSO SHOWING MIXING DAMPER FROM WARM AIR AND TEMPERED AIR CHAMBERS, AND PARTIAL EXHAUST TO ATMOSPHERE

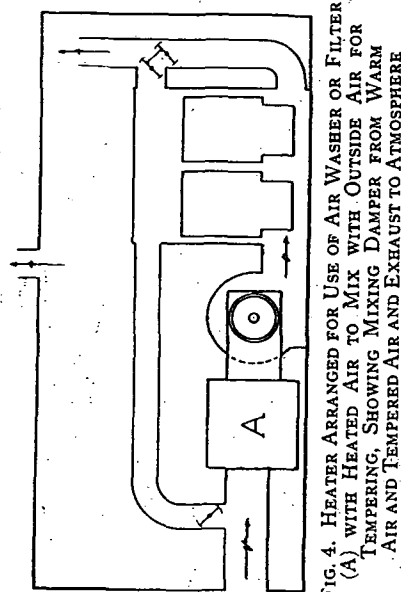


FIG. 4. HEATER ARRANGED FOR USE OF AIR WASHER OR FILTER (A) WITH HEATED AIR TO MIX WITH OUTSIDE AIR FOR TEMPERING, SHOWING MIXING DAMPER FROM WARM AIR AND TEMPERED AIR AND EXHAUST TO ATMOSPHERE

tions of the building only. Remote control of outside air dampers working in unison with ventilator dampers where the exhaust outlets are used, will make the operation of the plant easier.

Automatic control of humidity can be secured by means of sprays or by air washers. When air washers are employed it is necessary to introduce a warm-air supply in front of the air washer or to use heated water to prevent freezing when using outside air. Humidifying pans connected to an outside water supply and regulated by a float-valve mechanism frequently are used for humidification. Water sprays may readily be placed at a central source.

For all plants a warm-air plenum chamber thermometer, of extension type, indicating the temperature of the air leaving the heater, is of great assistance for proper operation.

It is desirable to provide the following controls with any type of fuel or draft in addition to the usual house-temperature regulation:

1. A temperature limit control in the warm-air plenum space to prevent overheating.
2. An automatic fan-motor starter governed by a thermostatic switch in the warm-air plenum chamber so that the fan cannot be started until after the heater is sufficiently warmed and which will cause the fan to start as soon as the heater becomes warm.

A gas-burning installation should be fitted with safety devices, such as safety pilot burners and temperature limit controls in the warm-air plenum space operating in conjunction with automatic snap valves in the gas supply lines. These will function to shut off all gas to the burners in the event the pilot burners should be extinguished or if the temperature in the warm-air plenum chamber exceeds any set degree.

Small Fan Furnace and Air Conditioning Systems

The field of fan-furnace heating has been extended to include residences and other small buildings through the development of equipment which incorporates in single units all devices necessary for filtering, for humidifying, for temperature regulation, for forcing a positive delivery of the air. Some manufacturers enclose the heater, fan, filters and humidifier or sprays in a cabinet casing of neat appearance.

The most important characteristics of the fan-furnace system for small buildings are as follows:

1. The registers may be placed in outside walls, or under windows, or at any location above floor line on inside walls, contrary to practice in gravity work.
2. The heater location need not be central, and its location may be determined by proximity to the chimney.
3. Pipes may be of small size and need not be given a slope to aid the flow.
4. Cold-air returns may be placed with a view to securing the most advantageous collection of return air without sacrificing efficiency.
5. Remote rooms may be heated satisfactorily because the system provides a positive delivery of conditioned air to each room.
6. All air may be filtered to remove dust.
7. The fan may be used for circulating air when no fuel is being burned.

Residence-Type Coal-Fired Fan Furnaces

Small size coal-fired fan-furnaces are available. In general these consist of standard warm air furnace parts to which have been added ap-