

In a gravity circulating system, the ratio of stack to leader area is quite important, although little is gained by providing wall stacks with areas in excess of 75 per cent of their connected leader pipe area. In most cases a 3 1/4 in. X 12 in. stack is the largest which can be installed in normal wall construction. Hence, any room having a heat loss much in excess of 9000 Btu per hour, will require two or more stacks, or one oversized stack built into a 6 in. studding space, providing the design register temperature is to be retained at the value of 175 F as recommended.

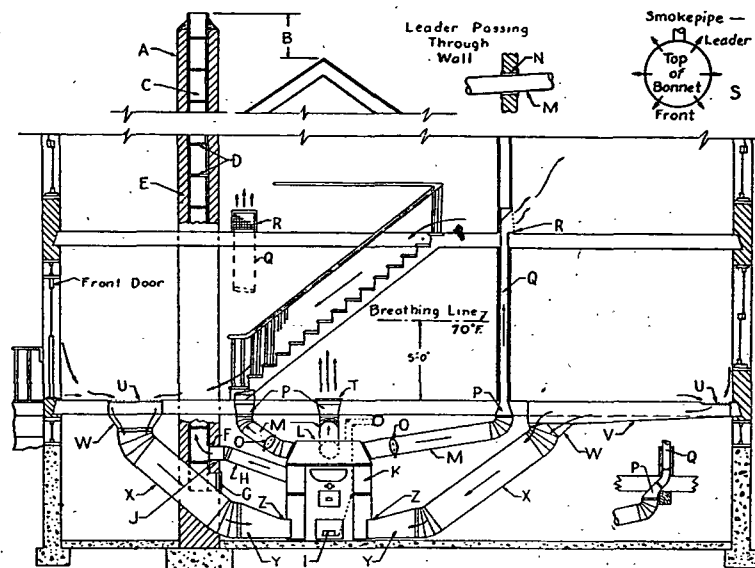


FIG. 1. A SECTIONAL VIEW OF A TYPICAL PLANT SHOWING GOOD INSTALLATION PRACTICES^a

- | | |
|--|--|
| A. House chimney, no bends nor offsets. | N. Sleeve with air space around leader where passing through wall. |
| B. Top of chimney at least 2 feet above ridge of roof. | O. Dampers in all leaders. |
| C. Flue lining, fireclay. | P. Transition fittings. |
| D. All joints air tight. | Q. Rectangular wall stack. |
| E. At least 8 in. brick. | R. Baseboard register. |
| F. No other connection beside that to furnace. | S. Distribute pipes equally around bonnet. |
| G. Cleanout frame and door, air tight. | T. Floor register. |
| H. Smoke pipe, end flush with inner surface of flue. | U. Return air face. |
| I. Draft door. | V. Panning under joist. |
| J. Use flue thimble. | W. Transition collar. |
| L. Casing hood or bonnet, top of all leader collars on same level. | X. Round return pipe. |
| K. Casing body. | Y. Transition shoe. |
| M. Round leader, pitch 1 in. per foot. | Z. Top of shoe at casing not above grate level. |

^aFrom N.W.A.H. & A.C. Assn. Standard Code Application Manual.

Registers used for discharging warm air into rooms should have a net area not less than the area of the leader pipe to which the register is attached. First story registers should be connected through boot and register box extensions having areas at least equal to leader areas. Upper story registers should be of the same width as the wall stack, and should be placed either in the baseboard or sidewall, preferably without offsets.

First story registers may be of the baseboard or floor type, with the former location preferred. High sidewall registers in gravity systems deliver more warm air into the room than do baseboard registers, but most of the additional air merely results in high temperatures at the ceiling.

RETURN AIR DUCTS, GRILLES, AND SHOE CONNECTIONS

The ducts through which air is returned to the furnace should be designed to minimize resistance to air flow. They should be of ample area, in excess of the total area of warm-air pipes, and should be streamlined. Horizontal ducts should pitch at least 1/2 in. per foot downward toward the furnace, avoiding fittings which would require lifting of the return air after the duct has passed under some obstacle.

The return air grilles should have free areas at least equal to the ducts to which they connect and should be installed in the floor, or in the base-

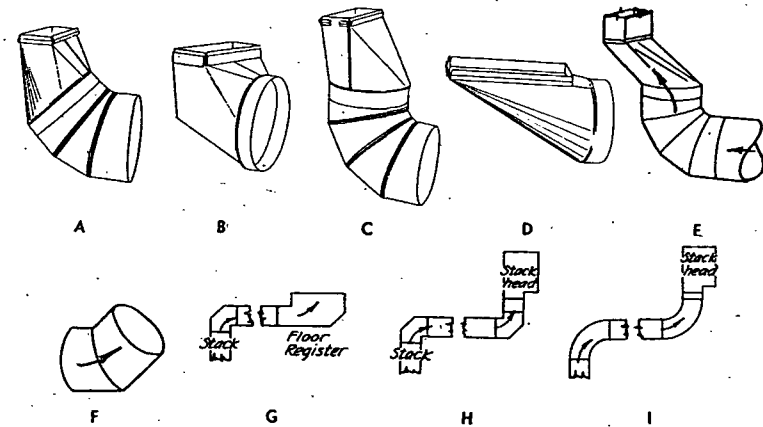


FIG. 2. TYPICAL WARM AIR BOOTS

board with the top edge of the grille not more than about 14 in. above the floor line. Frictional resistance in the return air system is as detrimental as is resistance in the warm-air system, so that care should be exercised in locating return air grilles which require long return ducts.

The placement and number of return grilles will depend upon the size, details, and exposure of the house. Small compactly built houses may be adequately served by a single return grille effectively placed in the central hall. It is usually desirable to have two or more returns, provided that in two-story residences one return is placed to effectively receive the return air at the foot of the stairs. A return air connection must be carried to any room whose floor level is below that of adjacent rooms.

Where a divided system of two or more returns is used, the grilles must be placed to serve the maximum area of cold wall or windows. Thus, in rooms having only small windows the grille can be brought as close to the furnace as possible, but if the room has large window exposure the grille should be located near the exposure. The frictional resistance of the long ducts used in parallel with short return ducts must be reduced to compensate for the length. Return ducts from upstairs rooms may be