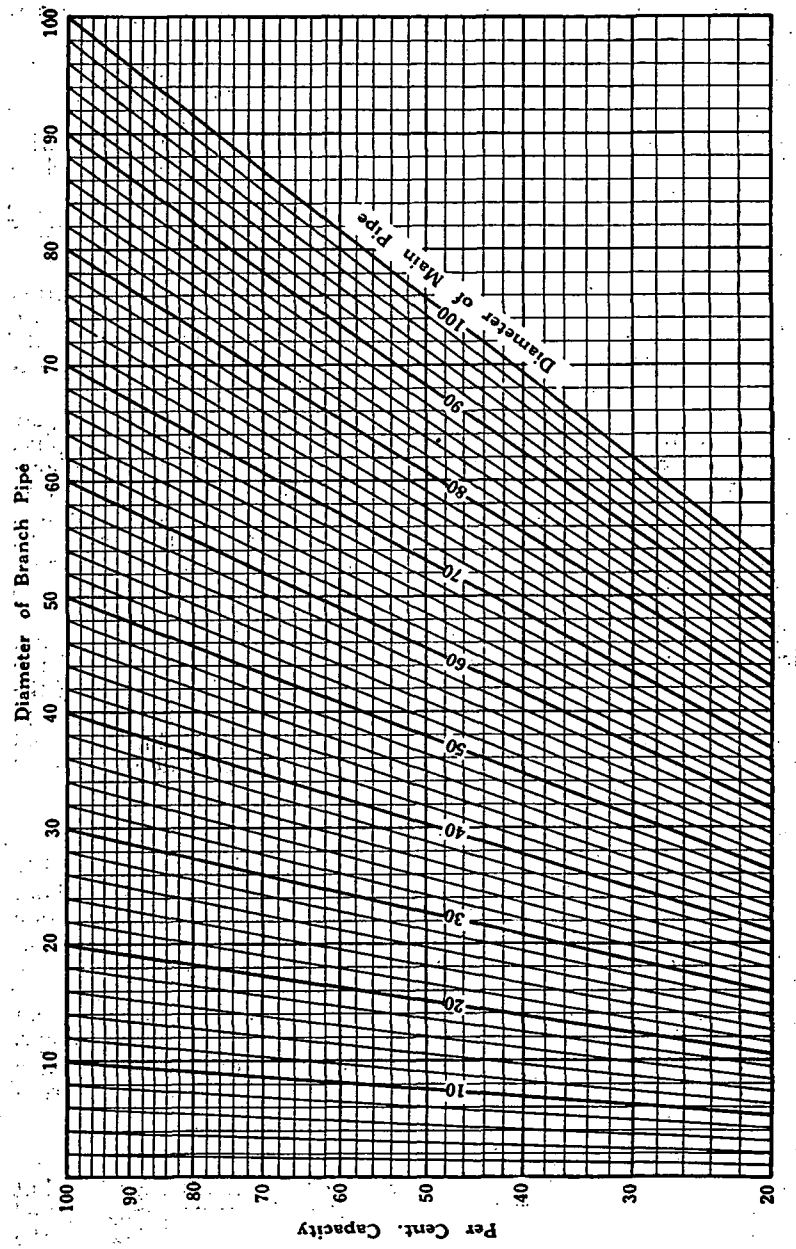

Fig. 3. Main and Branch Pipes for Equal Friction per Foot of Length

calculations are quickly made and a fairly uniform air distribution may be effected. By proper manipulation of charts shown (Figs. 2 and 3) the engineer may determine the diameter of branch pipes, to carry a given per cent of the total air in main pipe with the same friction per foot of length, for instance:

Suppose the main pipe is to be a 60-in., and it is desired to know the size of branch pipe to carry 50 per cent of total air in the main. Find 50 per cent at the left of the chart, move right to 60-in. diagonal line and note directly above at the top of the chart, that the branch pipe will be a 45.5 in. diameter.

Where rectangular ducts are used it is frequently desirable to know the equivalent diameter of round pipe to carry the same capacity and have the same friction per foot of length. The table on pages 425, 426, 427, gives directly the circular equivalent of rectangular ducts for equal friction and capacity.

To obtain the size of rectangular pipes for different capacities and having the same friction per foot of length, first obtain the equivalent round pipe for equal friction. Thus, suppose a branch to carry 30 per cent of a 12 x 36 in. pipe is wanted; from Table 2, it is found that the main is equivalent to a 22.2 diameter round pipe; from page 425, 30 per cent of this is a pipe 13.5 in. in diameter, and referring again to page 425, the rectangular equivalent branch is a 12 x 13 in., 10 x 15 in. or any other combination desirable.

Exhaust Systems

In design of piping for an exhaust system where no dampers are provided, it is considered good practice to make the area of the main pipe approximately 20 per cent greater than the sum of the areas of the branch pipes at that point. This method gives greater uniformity of distribution than where the increase in area is not made.

SOME GENERAL INSTALLATION AND CONSTRUCTION HINTS

1. For heating and ventilating work, ducts 6 x 6 in. represent a minimum size. In any place where other considerations do not outweigh, round pipe for small flues is recommended.

2. Abrupt turns or sharp bends should never be made. Elbows should have a throat radius equal to the depth of the duct.

3. Transformations and offsets should not be made abruptly. Angles greater than 45 deg. should be avoided. In any case, care should be taken not to restrict the true cross-sectional area.

4. Tees or branches from main ducts should make curved connections. Accessible and operative volume dampers should be used. Adjustable dampers should be provided with a means of indicating from the outside, the true position of the damper.

5. Access doors to ducts should be hinged and tightly fastened. Fire dampers in supply and vent ducts should be ⅛ in. steel plate, held by a fusible link for release at 160 deg. fahr.

6. Air intake should be screened with 1 in. mesh or less, at least No. 10 wire galvanized.

7. Final exit for exhaust discharges should be protected from the weather and pointed away from prevailing wind where possible.

8. Underground ducts should be water-proofed, provided with means of access for inspection and cleaning; also a drain connection trapped to sewer.