area of the leader, the designer must make allowances for all other conditions. The temperature drop in leaders of various lengths at three different register temperatures is shown in Fig. 49.

Leader sizes should in general be not less than obtained by equations (1) to (3) nor should leaders less than 8 in. in diameter be used. It is not considered good commercial practice to specify diameters except

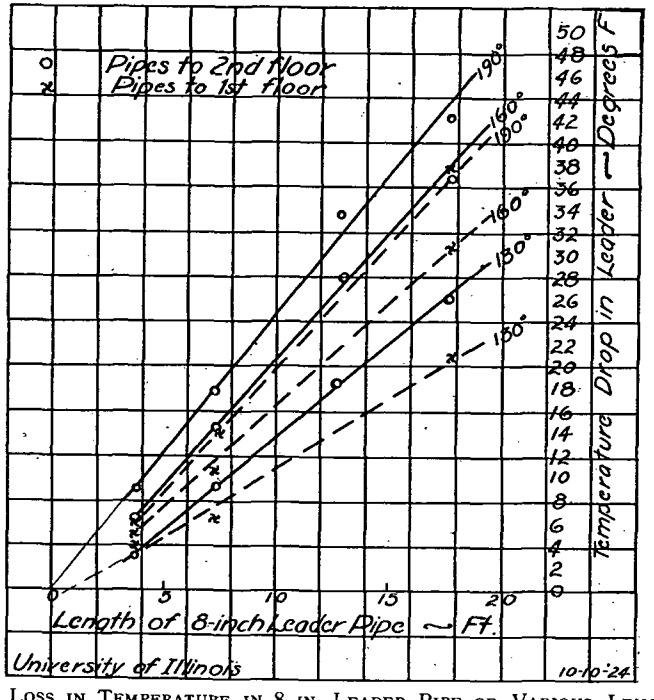

FIG. 49. LOSS IN TEMPERATURE IN 8 IN. LEADER PIPE OF VARIOUS LENGTHS AT DIFFERENT REGISTER TEMPERATURES

Note.—Pipe bare, bright tin except asbestos strips for joints.

in whole inches, although there is no real reason for not using half inches if necessary. The tops of leaders should be at the same elevation as they leave the furnace bonnet, and from this point there should be a uniform up-grade of 1 in. per foot of run in all cases. Leaders over 12 ft. in length are to be avoided or receive very special attention.

WALL STACKS

The wall stack for an upper floor should be made not less than 70 per cent of the area of the leader which has been selected from Fig. 48. So long as the leader is short and straight as was the case for Fig. 48, such a practice is probably justified since the loss (Fig. 50) in capacity occasioned by the smaller stack is not very serious for ratios above 70 per cent. For leaders over 8 ft. in length or for leaders which are not

straight, the ratio of stack area to leader area should be greater than 70 per cent in order to offset the greater temperature losses (Fig. 49) in the longer leader. In gravity circulating systems, this stack to leader

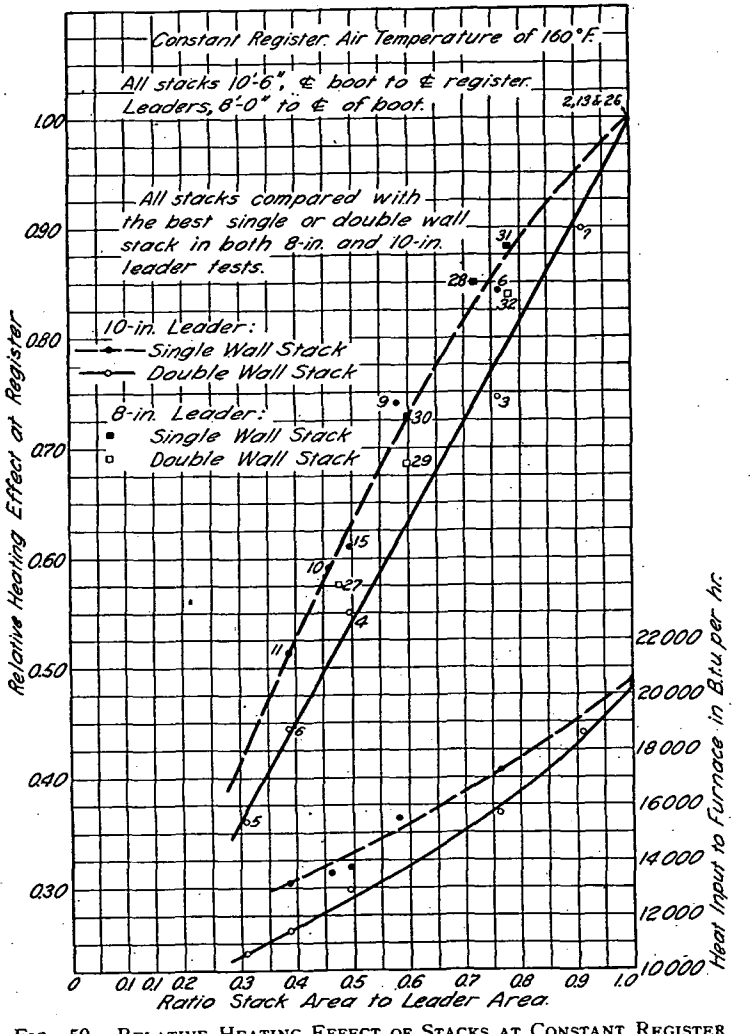

FIG. 50. RELATIVE HEATING EFFECT OF STACKS AT CONSTANT REGISTER AIR TEMPERATURE

area ratio is a very important consideration. Specific data for a great variety of cases are presented in Figs. 51 and 52 and the designer should check his stack to leader combinations with the nearest comparable case as shown in these figures. Any second floor stack supplying heat