The system is to supply 12,500,000 B.t.u. per hour to a group of eleven buildings with a temperature drop of 40 deg. The system is provided with a reversed return. The pipe sizes are selected so that the friction heads in the eleven circuits are practically equal. The velocity of the water varies from 3⅓ to 7½ ft. per second. The theretical horsepower required to circulate the water through the main is

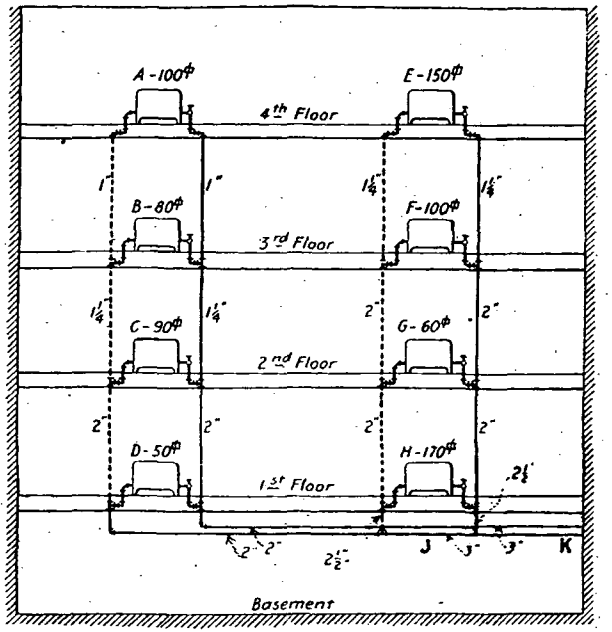

FIG. 38. LAYOUT FOR SIZING HOT WATER MAINS

11.9. The table in Fig. 37 shows the calculations for one of the eleven circuits.

If the circulation within the buildings is maintained by the pump, the power required therefore must be added to that already calculated. Each flow and return pipe, connecting a building and the mains, should be provided with a gate valve and a thermometer and the gate valves should be adjusted so that the temperature drop in each of the eleven buildings is 40 deg.

SIMPLE RULE FOR SMALL GRAVITY SYSTEMS

In designing a hot-water system for a residence or other small buildings the following simplified method by N. S. Thompson and C. A. Fuller gives good results for the usual two-pipe basement main system.

Determine the size of radiator tapping and connection from Table 49 and the size of riser and main from Table 50.

To illustrate assume the layout in Fig. 38. The radiator connections determined from Table 49 are as follows:

$A = 1$ in.	$E = 1\frac{1}{4}$ in.
$B = 1$ in.	$F = 1\frac{1}{4}$ in.
$C = 1\frac{1}{4}$ in.	$G = 1$ in.
$D = 1$ in.	$H = 1\frac{1}{2}$ in.

Where one radiator only is supplied the riser and mains are sized the same as the radiator connection. Where more than one radiator is supplied the pipe size is determined from Tables 49 and 50 as follows:

$A = 1$ in. $= 10$ Equivalent carrying capacity
$B = 1$ in. $= 10$ " "

$20 = 1\frac{1}{4}$ in. pipe between D and C
$C = 1\frac{1}{4}$ in. $= 20$ Equivalent carrying capacity

$40 = 2$ in. pipe between D and C
$D = 1$ in. $= 10$

$50 = 2$ in. pipe between J and D

Proceeding in like manner the other sections of pipe are found to be as follows:

E to $F = 1\frac{1}{4}$ in.	H to Mains $= 2\frac{1}{2}$ in.
F to $G = 2$ in.	J to $K = 3$ in.
G to $H = 2$ in.	

TABLE 49. HOT WATER SYSTEM PIPE SIZES AND CONNECTIONS

PIPE SIZE	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	FOURTH FLOOR
¾"	40	50	60	70
1"	70	80	90	100
1¼"	110	120	135	150
1½"	180	195	210	230
2"	300	350	400	500

In connection with Table 49, the following equalizing Table 50, should be used to determine the size of risers and basement mains.

TABLE 50. EQUALIZING TABLE FOR SIZING RISERS AND MAINS

SIZE OF PIPE	EQUIVALENT CARRYING CAPACITY	SIZE OF PIPE	EQUIVALENT CARRYING CAPACITY
½"	2	3"	175
¾"	5	3½"	260
1"	10	4"	380
1¼"	20	5"	650
1½"	30	6"	1050
2"	60	7"	1600
2½"	110	8"	2250