TABLE 5. PIPES MAY BE SIZED FOR GIVING ANY DESIRED PRESSURE DROP PER 100 FT. OF RUN

Col. 1 Vertical rise of water to fixture in ft.	Col. 2 Static pressure in lb. per sq. in.	Col. 3 *Pressure in lb. per sq. in. needed for good flow at fixture based upon 15 lb. at top floor.	Col. 4 Friction pressure drop lb. per sq. in. per 100 ft. run.	Pipe Sizes in Inches								
				¾	1	1¼	1½	2	2½	3	3½	4
				Gallons Per Minute								
			5	5.4	11	19	30	62	109	171	252	353
			7	6.4	13	23	36	74	129	203	298	418
			10	7.6	15	27	43	88	154	242	357	499
			20	10.8	22	38	61	125	218	343	504	706
0		15	30	13.2	27	47	76	153	267	420	618	864
10	4.33	20	40	15.	31	54	86	176	308	485	714	998
20	8.66	24	50	17.	35	60	96	197	345	542	800	1115
30	12.99	28										
40	17.32	33										
50	21.65	37	75	21.	43	74	117	242	423	665	978	1365
60	25.99	41										
70	30.32	46										
80	34.65	50	100	24.	49	85	136	278	485	769	1130	1578
90	38.98	54										
100	43.31	59										
110	47.64	63	125	27.	55	96	152	311	544	858	1260	1765
120	51.97	67										
130	56.30	71										
140	60.63	76	150	30.	60	105	166	341	598	939	1380	1930
150	64.96	80										

NOTE: * This pressure as given is based upon a pressure drop of 15 lb. in a run of not more than 50 ft. which will permit the top floor branches to be sized from the table opposite 30 lb. drop per 100 ft. of run.

The pressure drop on the lower floors may be greater, as the static head increases the pressure available for branch connections.

The pressures as given do not include any allowance for friction in the main riser which may be computed for any pressure drop per 100 ft. run from the table above.

The water supply formula herewith makes it possible to accurately compute the flow of water in gallons through any pipe with any friction head and also gives formula for the additional head due to water entering the main, which, if extremely accurate calculations are necessary, should be added to the head required for friction; generally, however, this can be neglected as it is comparatively small.

TABLE 6—SHOWING WATER PRESSURE REQUIRED TO DELIVER WATER TO TOP OF VERTICAL RISER WITH 15 LB. PRESSURE AT THE TOP BRANCH

Vertical rise of water from main to highest fixture branch.	Static head in lb. per sq. in.	Water pressure in lbs. required to deliver water to top of riser with 15 lb. terminal pressure.			
		Pressure drop per 100 ft.			
		5 lb.	7 lb.	10 lb.	20 lb.
0	0	15	15	15	15
10	4.33	20.5	20.7	21	22
20	8.66	25	25.4	26	28
30	12.99	29.5	30.1	31	34
40	17.32	35	35.8	37	41
50	21.65	39.5	40.5	42	47
60	25.99	44	45.2	47	53
70	30.32	49.5	50.9	53	60
80	34.65	54	55.6	58	64
90	38.98	58.5	60.3	63	72
100	43.31	64	66	69	79
110	47.64	68.5	70.7	74	85
120	51.97	73	75.4	79	91
130	56.30	77.5	80.1	84	97
140	60.63	83	85.9	90	104
150	64.96	87.5	90.5	95	110

NOTE: The water pressures given in above table are the pressures at the base of the riser, necessary to deliver water to top of riser with a terminal pressure of 15 lb., when discharging the number of gallons per minute called for in Table 5, at the pressure drop indicated.

The following examples will be given, using Table 5:

Example: What are the sizes required for mains and branches in a building 100 ft. high, supplied with a water pressure of 75 lb. per sq. in. with 100 gal. of water per minute required on each floor?

This is worked out in Table 3 and gives the pipe sizes for the main riser with a 10 lb. drop for 100 ft. of run and shows that a 3 in. main, reduced to 2 in., would be required: branches to the various groups of fixtures can be taken from Table 5 from which it will be seen that on the top floor it will be necessary to use a 1½ in. branch to carry 75 gal. per min. with a pressure drop of 30 lb. but that at 50 ft. vertically from the supply, a 1¼ in. branch pipe will carry 74 gal. per minute, therefore 1¼ in. pipe could be selected for this branch. Assuming that the pressure drop in the main riser is 10 lb. per 100 ft. run and the pressure drop on the top floor in the branch does not exceed 15 lb. in all and the static head for building 100 ft. as given in column 2 of Table 5 is 43.31 lb. making a total of 58.31 lb.; it will be seen that 75 lb. — 58.31 lb., which equals 16.59 lb., is the amount of pressure over and above that required, and that this pressure can be utilized to overcome the friction drop in the main feed line running from the source of supply to the base of the riser.

From Table 3 it is found that 240 gal. per min. will flow at the first floor, and assuming that this water supply is to be brought in a main 300 ft. long; the table of 5 lb. drop of Table 6 may be used, which will show that a 3½ in. supply would be necessary.

Table 2 is a condensed form of Table 1, omitting the number of gallons per fixture, carrying the number of fixtures from 1 to 16.