

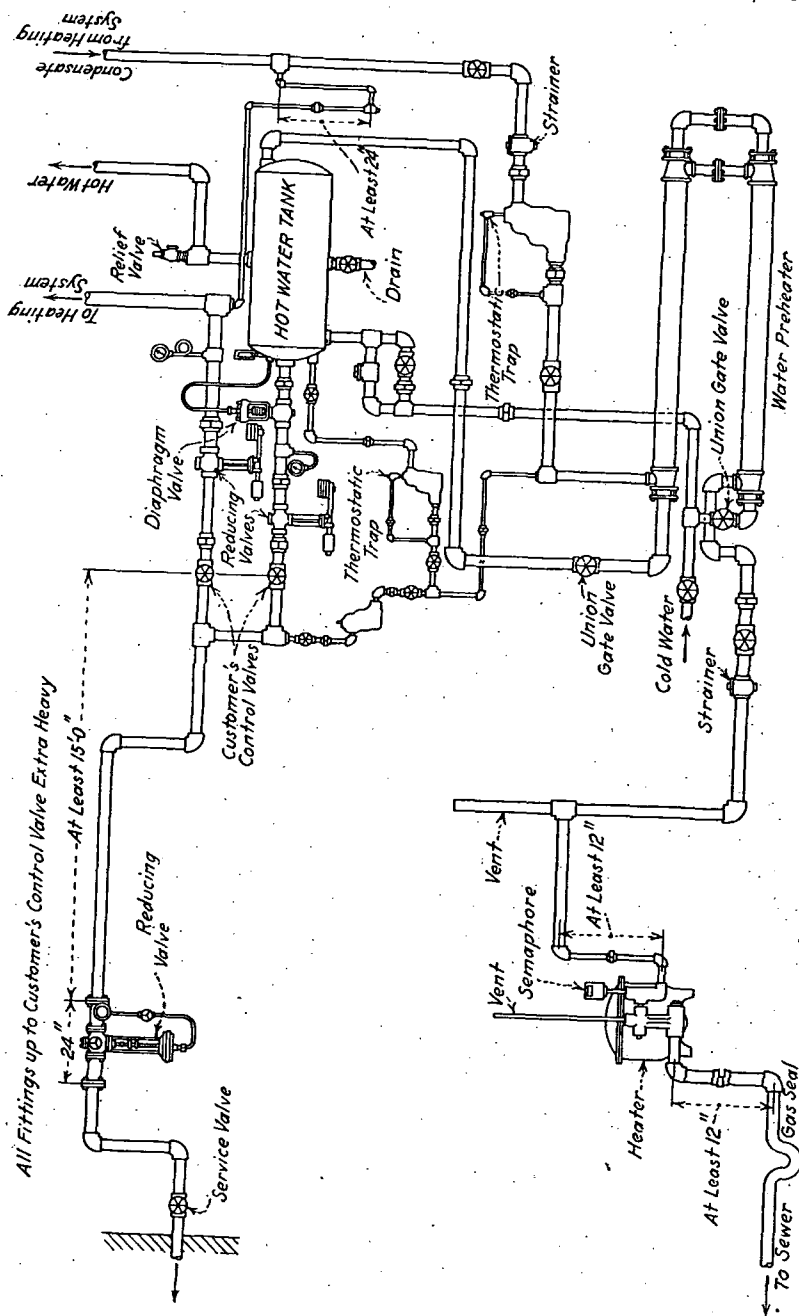


FIG. 2. STEAM SERVICE AND METER CONNECTIONS WITH WATER PREHEATER

CHAPTER 25—DISTRICT HEATING

Table 1 shows the expansion in 100 ft. of pipe at various temperatures. The expansion of any length of pipe is determined by taking the difference

TABLE 1. EXPANSION OF PIPE IN INCHES PER 100 FT.

TEMPERATURE DEG. FAHR.	WROUGHT IRON OR STEEL	CAST IRON	COPPER AND BRASS
0	0.00	0.00	0.00
10	0.08	0.05	0.13
20	0.15	0.10	0.25
30	0.23	0.15	0.35
40	0.30	0.25	0.45
50	0.38	0.36	0.57
100	0.76	0.72	1.14
150	1.15	1.10	1.75
200	1.57	1.50	2.38
250	1.99	1.90	3.02
300	2.47	2.35	3.74
350	2.94	2.80	4.45
400	3.46	3.30	5.24

TABLE 2. LENGTH OF EXPANSION OFFSETS AND BENDS FOR PROPER EXPANSION OF PIPE

TOTAL EXPANSION IN INCHES*	FEET OF PIPE AND OFFSET OR U-BEND FOR DIFFERENT DIAMETERS OF PIPE									
	2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
1	11	13	15	17	19	21	23	25	27	30
2	15	18	21	23	26	29	32	35	38	42
3	18	22	26	29	32	36	40	43	48	52
4	21	26	30	34	37	42	47	50	56	58
5	24	30	34	38	41	47	53	57	63	65
6	27	33	37	41	45	52	58	63	69	71
7	30	36	40	44	48	56	62	68	74	---
8	32	39	43	47	52	60	66	72	---	---

*This column shows the total expansion the offset will take care of without a cold strain. In general these amounts can be increased 40 per cent which increase can be taken up in cold strain of the pipe on being made up.

The length of pipe in the expansion piece should be the same whether in the form of a single right-angle offset or double offset or U-Bend.

The lengths of arms figured for 12,000 lb. per square inch tension for wrought iron pipe. If steel pipe is used this is good for 16,000 lb. per inch so that the arm will take care of $\frac{3}{4}$ more expansion.

in expansion at minimum and maximum temperatures and dividing by 100 to arrive at the expansion per foot, then multiplying by the number of feet of pipe for which expansion is to be figured.

In the installation of transmission lines it is frequently the practice to figure on an installation temperature of 70 deg. fahr. and to compensate for about 40 per cent of the total expansion by means of a cold strain put in the line at the time of installation. This allows for only 60 per cent of all expansion to be taken care of by expansion joints, offsets or bends.

Table 2 gives the length of pipe that should be made up to provide for the expansion. In general the arms should be made up with pipe bends which can be welded into one continuous length.