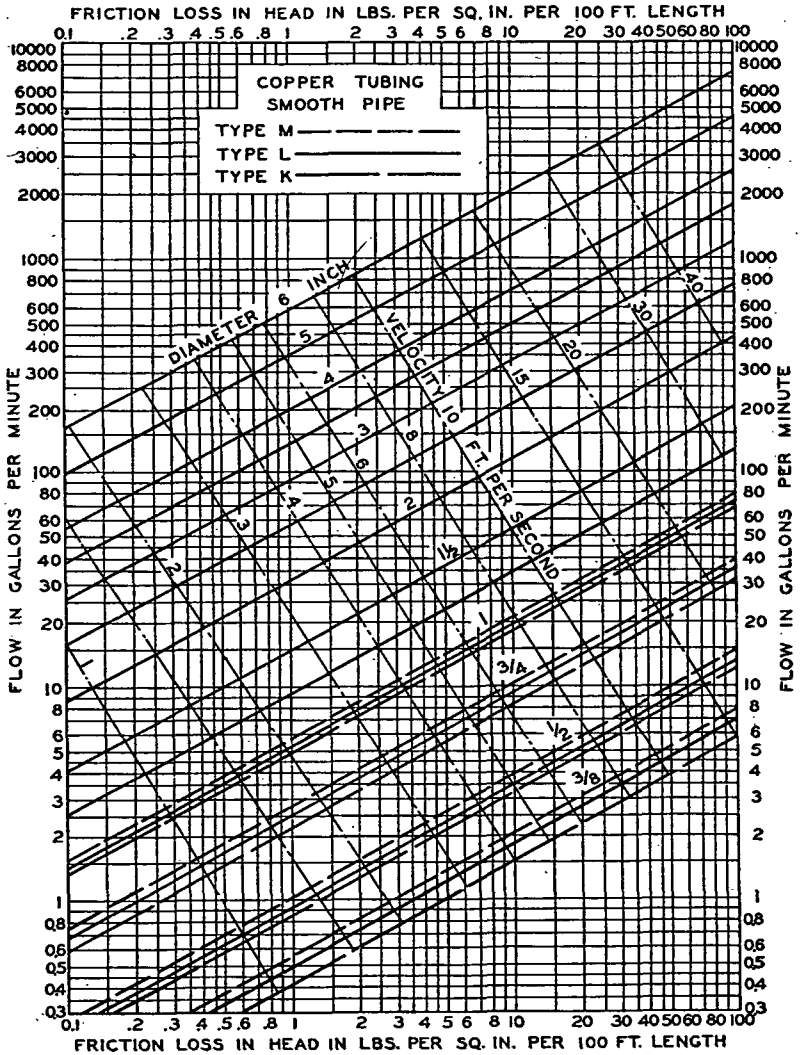

FIG. 5. FLOW CHART FOR COPPER TUBING

If the computed pipe sizes differ from those used in determining the equivalent length of pipe fittings, a recalculation will be necessary, using the computed pipe sizes for the fittings. For the purposes of this example assume that the total equivalent length of the pipe fittings is 50 ft.

Then the permissible pressure loss per 100 ft of equivalent pipe is $12 \times 100/(100 + 50) = 8$ psi.

Assuming that the corrosive and caking properties of the water are such that Fig. 3 for fairly rough pipe is applicable, a 2 in. building main is found adequate.

The sizing of the *branches* of the building main, the *risers*, and *fixture branches* follow the principles outlined. For example, assume that one of the branches of the building main carries the cold water supply for 3 water closets, 2 bath tubs, and 3 lavatories. Using

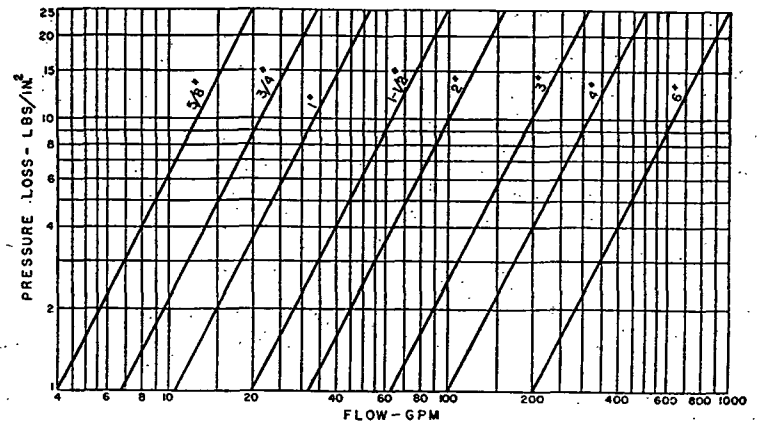

FIG. 6. PRESSURE LOSSES IN WATER METERS

the permissible pressure loss of 8 psi per 100 ft, the size of branch determined from Table 1 and Figs. 1 and 3 is found to be 1½ in. Items entering the computation of pipe size are given in Table 4.

The principles involved in sizing either up-feed or down-feed systems are the same. The principal difference in procedure is that in the down-feed system the difference in elevation between the house tank and the fixtures provides the pressure required to overcome pipe friction.

The water demand for hose bibbs or other large demand fixtures taken off the building main is frequently the cause of inadequate water supply to the upper floor of a building. This robbing of upper floor fixtures of water may be prevented by sizing the distribution system so that the pressure drops from the street main to all fixtures are the same. It is good practice to maintain the building main of ample size (not less than 1 in. where possible) until all branches to hose bibbs have been connected. Where the street main pressure is excessive and a pressure reducing valve is used to prevent water hammer or excessive pressure at the fixtures, it is frequently desirable to connect hose bibbs ahead of the pressure reducing valve.

HOT WATER SUPPLY PIPING

It is common practice to provide circulating piping in all hot water supply systems in which it is desirable to have hot water available continuously at the fixtures. In average sized and small residences and systems, in which the piping from the heater to the fixtures is short, return circulating piping is generally omitted in order to reduce installation cost and to reduce heat loss from the piping, particularly during periods of no water demand.

TABLE 4. COMPUTATION OF BRANCH SIZE IN EXAMPLE 1

FIXTURES NO. AND KIND	FIXTURE UNITS (FROM TABLE 1 AND NOTE C)	DEMAND (FROM FIG. 2) GPM	PIPE SIZE (FROM FIG. 3) IN.
3 flush valves	3 x 6 = 18		
2 bath tubs	¾ (2 x 2) = 3		
3 lavatories	¾ (3 x 1) = 2.25		
Total	23.25	38	1½