Theoretically, the pipe sizes calculated by this method will be so nearly correct that the friction loss and, therefore, the flow, will be equal at all

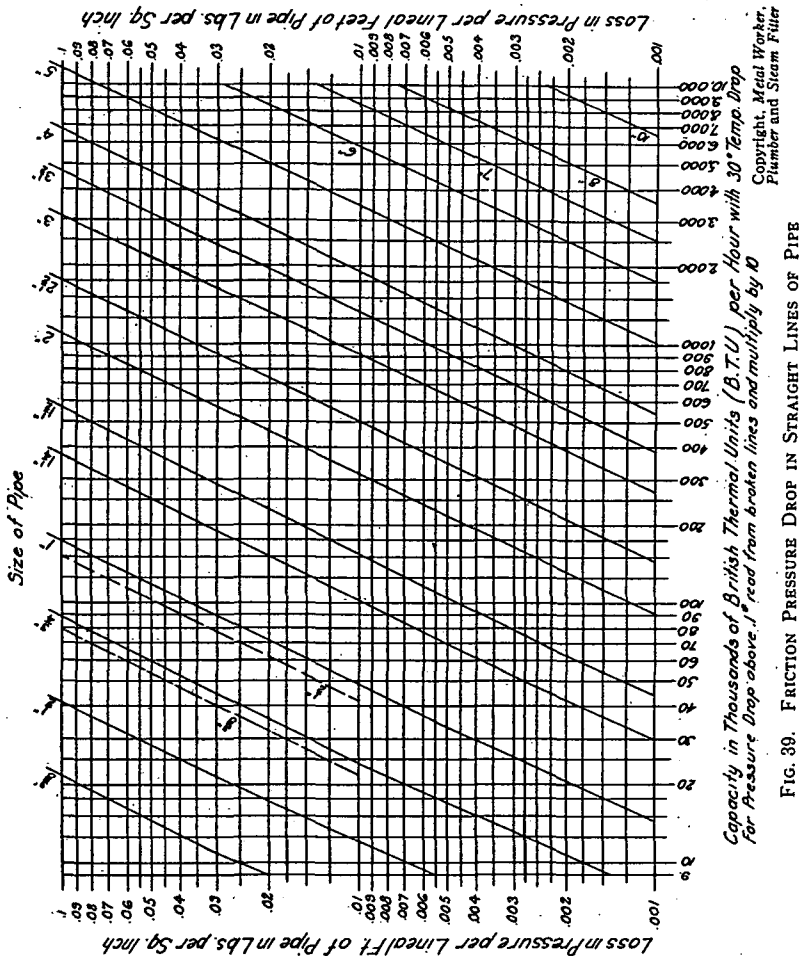

FIG. 39. FRICTION PRESSURE DROP IN STRAIGHT LINES OF PIPE

radiators. In practice, however, this is impossible because of the gaps in pipe sizes and many engineers specify the use of lock shield valves on one connection to each radiator so that the system may be adjusted to work evenly after it is in operation.

A typical arrangement of pumps and heaters such as are used in forced-circulation systems is shown in Fig. 41.

GREENHOUSE HEATING BY HOT WATER

Generally speaking greenhouses are heated by either hot water or steam systems though the former method is the older, simpler and more common method.

Although the same tables, formulae or other data that are used to estimate the heating requirements of systems in the usual type of buildings are applicable to greenhouse heating systems, there are many differences that must be kept in mind so that due allowance may be made in the specification of the plant.

For instance, the highest temperatures are required at night, whereas with residence systems the maximum temperatures are required in the day time. Greenhouse fires are banked during the day and fuel consumption is heaviest at night in contrast to practically all other types of buildings where the fires are banked at night. Greenhouse radiation is almost exclusively made up of piping. The temperatures demanded are almost always below 70 deg. and with lower temperatures and

TABLE 75. TEMPERATURE REQUIRED FOR DIFFERENT PURPOSES

HOUSE	TEMP. REQUIRED, DEG. FAHR.
General Purposes	55 to 60
Cool Greenhouse (Show)	45 " 60
Forcing House	60 " 65
Tropical, or Stove H	65 " 70
Conservatory (General Collection) (Winter Garden)	60 " 65
Palm House	60 " 65
Tropical Palm House	65 " 70
Cool Palm House	50 " 55
Orchid House	65 " 70
Cool Orchid House	50 " 55
Rose House	55 " 60
Carnation House	45 " 55
Violet House	40 " 45
Propagating House	55 " 60
Camelias and Azaleas	45 " 50
Cool Vinery	Cool and Damp
Early Vinery (Start January and February)	65 to 70
Second Vinery (Start February and March)	65 " 70
Late Vinery	65 " 70
Cool Peach House (Cold Damp Weather), Early Peach House (Start January and February)	65 " 70
Second Peach House (Start February and March), Late Peach House (Ripen November and December)	65 " 70
Tomato and Cucumber House	65 " 70
Lettuce House	40 " 45
Mushroom House	55 " 60
Fern House	60 " 65