

As a check on the sizes of hot water mains, Table 60 will give safe sizes for gravity systems fed from roof tanks set not less than 20 ft. from the water line in tanks to the highest fixtures.

TABLE 60. SIZES OF HOT WATER MAINS

Gallons per Maximum Hour	Size of Hot Water Main, Inches
500	2
750	2½
1000	2½
1250	3
1500	3
1750	3½
2000	3½
2500	4
3000	4

CHAPTER VII

STEAM AND HOT WATER
HEATING BOILERS

THE boiler is one of the most important parts of any heating system and its selection, as to type, size, rating, capacity, draft requirements, firing periods, kinds of fuel, principles of operation, efficiency and construction, should be made with great care.

TYPES OF BOILERS

Boilers used for heating, may be classified according to their construction as *Sectional*, either round cast-iron or rectangular cast-iron with horizontal or vertical sections respectively; *Fire Tube*, embracing steel firebox, or brick-set return tubular; and *Water Tube*, with either horizontal or vertical tubes and suitable drum arrangements. The most general use for heating falls in the first two of the three classifications given. For the small installations the round pattern cast-iron sectional boiler predominates, although certain designs of small steel boilers with fire-tubes and coil water tubes are also used to some extent. In the larger installations, the rectangular vertical section cast-iron boilers and the steel fire-tube boilers of the firebox pattern are used; the makes of either are numerous, and many detail differentiations in construction are to be noted.

For the small installations, it is customary to choose a design of boiler with such a disposition of flue passages as will give the maximum contact of flue gas with the indirect heating surface without unduly restricting the gas travel. For this the round sectional cast iron boilers are well fitted, and they are largely used for reason of their resistance to corrosion, pitting and other forms of deterioration. They are generally compact, requiring a minimum amount of floor space, low head room (low water line), and have a small water capacity.

On account of their sectional construction and the usual practice of being shipped knocked down and assembled on the job, they are easily handled through small openings at any stage of construction. Their design also facilitates the removal and replacing of damaged parts as well as an increase or decrease in capacity by the addition or removal of sections. Most sectional boilers are comparatively cheap in first cost but the labor of assembling is a factor which must be considered.

There are other forms of the boilers in the smaller sizes well adapted for heating small buildings, which embrace vertical section cast-iron construction, steel vertical tubular, and steel firebox construction, which have merit for particular classes of service. The features that are of

Compiled especially for THE GUIDE by C. W. Obert, New York, E. A. May, Chicago and E. R. Fish, St. Louis, Mo.