[8] American Standard Requirements for Installation of Domestic Gas Conversion Burners (A.S.A. Z21.8-1948 American Standard Association).

[9] Gas Floor Furnaces, Gravity Circulating Type (*U. S. Department of Commerce, National Bureau of Standards*, (Commercial Standard No. CS99-42).

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CHAPTER 15

HEATING BOILERS, FURNACES, SPACE HEATERS

BOILERS: Construction, Types, Design Considerations, Testing and Rating Codes, Efficiency, Rating, Selection, Space Limitations, Connections and Fittings, Erection, Operation and Maintenance. FURNACES: Types, Materials and Construction, Ratings, Testing and Rating Codes, Efficiency, Design Considerations, Humidification Equipment. SPACE HEATERS: Types: Solid Fuel, Oil, Gas; Materials and Construction, Testing and Rating, Design Considerations, Installation

IN presenting the subject of Boilers, Furnaces and Space Heaters this chapter is divided into three parts; the first dealing with boilers, the second treating warm air furnaces, and the third covering space heaters.

HEATING BOILERS

Steam and hot water boilers for low pressure heating are built of steel or cast-iron in a wide variety of types and sizes, many of which are illustrated in the *Catalog Data Section.*

CONSTRUCTION

The nationally recognized code governing the construction of low-pressure steel and cast-iron heating boilers is the *ASME* Boiler Construction Code for Low Pressure Heating Boilers. Some states and municipalities have their own codes which apply locally, but these are usually patterned after the *ASME* Code.

The maximum allowable working pressures are limited by the *ASME* Code to 15 psi for steam and 30 psi for hot water heating boilers. Hot water boilers may be used for higher working pressures, for heating purposes or for hot water supply, when designed and tested for the higher pressure.

TYPES OF HEATING BOILERS

Heating boilers are classified in a number of different ways, such as:

1. According to materials of construction. These are steel and cast-iron. Very few non-ferrous boilers are made.
2. According to the fuels for which the boilers are designed. These are coal, hand-fired or stoker-fired; oil; gas; or wood. Some boilers are designed specifically for one fuel, but many boilers are designed for more than one fuel.
3. According to the specific purpose or application for which the boiler is used, such as space heating or domestic hot water supply.
4. According to the design or construction of the boiler such as sectional, round, fire-tube, water-tube, magazine feed, Scotch, etc.

Cast-Iron Boilers

Cast-iron boilers are generally classified as:

1. Square or rectangular boilers with vertical sections and rectangular grates, commonly known as sectional boilers.
2. Round boilers with horizontal pancake sections and circular grates.