

TABLE 50. VOLUME OF AIR REQUIRED FOR COMBUSTION OF DIFFERENT GASES*

GAS	B.T.U. PER CU. FT.	CU. FT. AIR TO BURN CU. FT. GAS	B.T.U. PER CU. FT. OF MIXTURE
Natural Gas.....	1084	10.27	96.2
Coal Gas—Rich.....	580	5.21	93.4
Coal Gas—Lean.....	510	4.43	93.9
Carburetted Water Gas.....	575	5.02	95.5

*Thomson King, *American Gas Journal*, October 22, 1921.

The fact that "more air is burned" with one fuel than another does not necessarily affect the efficiency with those particular fuels; the air required varies almost directly as the B.t.u. content of the combustibles.

FUEL REQUIREMENTS FOR GAS HEATING

It is a fact, based upon experience, that the user of a gas-fired central heating appliance uses more heat during the course of a year than he does when depending upon solid fuel. The pilot light of the gas-fired furnace or boiler is lighted on the first cool day of the season. Thereafter, the system generally operates entirely under thermostatic control; upon many days when very little heat is required to keep the inside temperature at 70 or 72 deg., and when it would be considered impracticable to start a coal fire, the gas-fired appliance will be working. Furthermore, the gas unit can operate at maximum capacity hour after hour, without attention; in the coldest weather, then, premises do not cool below the temperature ordinarily maintained.

Table 51 gives an approximate idea of fuel requirements in various climates, and is based upon a heating season of seven calendar months:

TABLE 51. FUEL REQUIREMENTS FOR RESIDENTIAL BUILDINGS FOR DIFFERENT OUTSIDE TEMPERATURES
GAS OF 500 B.T.U. (GROSS) PER CU. FT.*

TYPE OF SYSTEM	CU. FT. PER SQUARE FOOT OF RADIATION						
	AVERAGE OUTSIDE TEMPERATURE, OCTOBER 1. TO MAY 1						
	25°	30°	35°	40°	45°	50°	55°
Water.....	850	775	700	625	550	475	400
Vapor.....	1080	985	890	795	700	605	510
Steam.....	1380	1260	1140	1020	900	780	650

The figures are based on maintaining a temperature of 70 deg. Fahr. over practically the entire house, for 15-hr. per day.

*(Requirements for gases of other heating values vary inversely as the heating value; e. g., for natural gas of 1000 B.t.u., consumption per square foot is one-half that shown in table.)

The requirements of individual installations may vary considerably from an average of several. Generally, stores, offices, factories or other commercial premises require less heat per season than do residential buildings provided with an equal amount of radiation. This is borne out on investigation of some actual installations.

CONDENSATION IN VENT PIPES

An important point to care for in gas heating work is the ever-present condensation resulting from the combustion of gas. To those who have had experience with gas appliances, it is hardly necessary to mention the *eating out* or deteriorating of the vent pipe, the water dripping from every joint, the scale and the corrosion forming at the joints.

Ordinary galvanized iron vent pipe last from six months to a year and a half at the best, but makes a messy unsatisfactory installation from the start as the water or condensation is apparent from the first day the

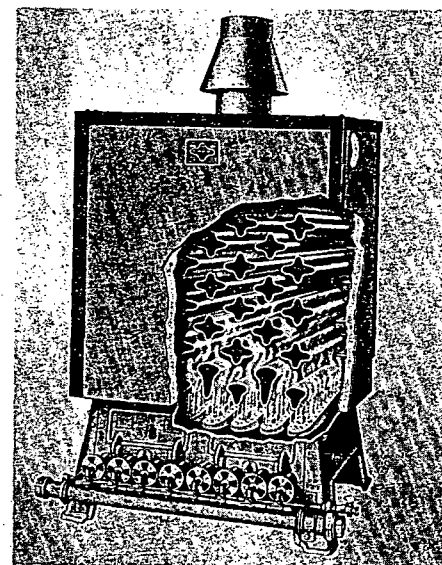


FIG. 49. STEAM HEATING UNIT FOR HOUSE HEATING SERVICE

appliance is put into service. In many cases the interior of this pipe is painted with acid resisting paint, and while this adds somewhat to the life of the pipe, it does not in any way tend to eliminate the condensation. This applies also to copper pipe. Planished iron pipe also used, but is little better than painted galvanized iron pipe.

In some cases the efficiency of the appliance has been dropped from 85 to 60 per cent, to allow for a greater heat or stack loss in an effort to vaporize and carry off the greater part of this condensation. This, however, is a very feeble effort to eliminate this evil—it being entirely at the expense of the consumer.

The solution of the problem is: *First*, to have a minimum of condensation and, *Second*, to carry this off, thereby eliminating practically all of the condensation "on the job." This was accomplished recently