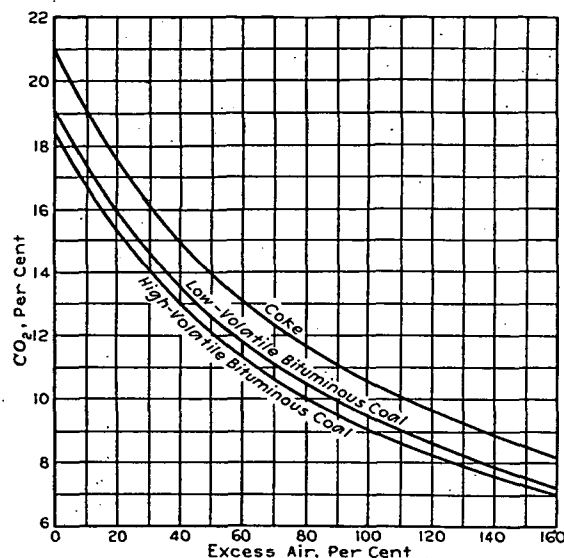


practical purposes the air supply required for different grades of fuel may roughly be taken as follows:

POUNDS OF AIR PER POUND OF FUEL AS FIRED

ANTHRACITE	COKE	SEMI-BITUMINOUS	BITUMINOUS	LIGNITE
9.6	11.2	11.2	10.3	6.2

An excess of about 50 per cent over the theoretical amount is considered good practice under usual operating conditions.

FIG. 1. RELATION BETWEEN CO_2 AND EXCESS AIR IN GASES OF COMBUSTION

The amount of excess air, based upon the laws of combustion, can be determined by its relation to the percentage of CO_2 (carbon dioxide) in the products of combustion. This relationship is shown by the curves (Fig. 1) for high and low volatile coals and for coke.

Combustion of Anthracite Coal

An anthracite coal fire should never be poked, as this serves to bring ash to the surface of the fuel bed, where it melts into clinker.

Grate size anthracite coal is suitable for large grates and for a fuel depth of 20 in. or more. The air spaces are large; the amount of surface in contact with the air is small, and consequently combustion is slow. Lumps of rock or slate, being large, may cause trouble in shaking the grate. On grates 25 in. and under, the fire is likely to go out easily with this fuel, unless mixed with small size coal for reducing the air spaces.

Egg size is suitable for large firepots (grates 25 in. and over) if the fuel can be fired at least 20 in. deep. The air spaces between the pieces of coal are large and normal combustion is slower than with the next smaller size coal. Pieces of rock and slate sometimes may be large enough to cause some trouble in shaking the grate. For best results this coal should be fired deep. The grate should be shaken before every firing.

Stove size coal is the popular size of anthracite fuel for most boilers and furnaces used for heating buildings. It is small enough to burn well on 17 in. grates, but large enough so that the draft loss through the fuel bed is not too great. Practically the only instructions needed for burning this type of fuel are:

The grate should be shaken before each firing; the fire should never be poked from the top; the fuel should be fired deeply and uniformly.

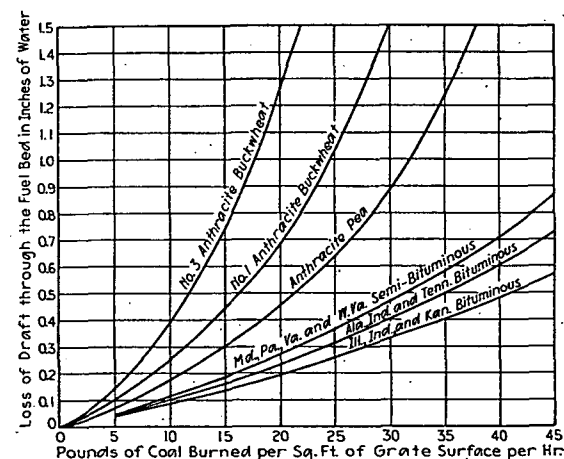


FIG. 2. DRAFT REQUIRED AT DIFFERENT RATES OF COMBUSTION FOR VARIOUS KINDS OF COAL

Chestnut size coal is in demand for firepots up to 20 in. in diameter, especially those in which the fuel cannot be fired over 18 in. deep. The percentage of ash is higher than in stove coal, but the pieces of rock and slate are small and do not interfere with the shaking of the grates.

Pea size coal is often an economical fuel to burn. It is relatively low in price. When fired carefully, pea coal can be burned on standard grates. It is well to have a small amount of a larger fuel on hand when building new fires, or when filling holes in the fuel bed. Care should be taken, to shake the grates only until the first bright coals begin to fall through the grates. The fuel bed, after a new fire has been built, should be increased in thickness by the addition of small charges until at least level with the sill of the fire door. This keeps a bed of ignited coal in readiness against the time when a sudden demand for heat shall be made on the heater. When firing, the bright fuel should either be pulled forward or pushed to the back of the firepot, leaving a hollow in which to