

SPECIMEN PAPER ON COAL AND COMBUSTION.

BITUMINOUS, ANALYSIS :

75½	per cent. of.....	Carbon.
4½	" "	"
16	" "	Hydrogen.
4½	" "	Nitrogen.
—	" "	Ashes.

100 parts of coal.

The coal burns, throwing out light and heavy carburetted hydrogen, carbonic acid gas, carbonic oxide, etc., each of which as it produces heat will combine only with its proper proportion of oxygen; therefore, if more be supplied by introducing too much fresh air, it does injury, not only by cooling the internal surface of the flues, but remembering that a high temperature is necessary to produce combustion, by preventing loss of gas, it has been proved that hydrogen furnishes weight for weight, four times as much heat as carbon, therefore 4½ parts of hydrogen in coal will produce 4½ × 4 = 17 parts of heat to the carbon's 75½.

The 80 pounds (say) of carbon will require 2527 cubic feet of oxygen for its combustion which will be supplied by 12635 cubic feet of atmospheric air. The hydrogen will require 473 cubic feet of oxygen which will be found in 2365 cubic feet of air, making a total of 12635 + 2365 = 15000 cubic feet of air for combustion of 100 pounds of coal.

The foregoing calculation is based on, say in round numbers, we may say, 80 per cent. of coal is carbon and five per cent. (=20 per cent. of heat) is hydrogen in 100 parts.

Out of 100 pounds of coal eighty parts are carbon and five parts are hydrogen,

Then,

Hydrogen $5 \times 4 = \dots\dots\dots$ 20 parts of heat.
80 " carbon.

100