poured into the bottle immediately after the wood has burned in it, the bottle be covered with the hand and shaken, the lime-water will turn milky. We shall see in a little while what this means.

The experiment just described shows, among other things, that oxygen makes burning possible—that it supports combustion; and also that the reaction goes on in the pure oxygen in a much more lively manner than it does in air—that it enlivens combustion. These facts are illustrated still further in the following experiments:

EXPERIMENT.—Set fire to a little sulphur in a deflagrating spoon; notice whether it burns slowly or rapidly in the air. Introduce the burning sulphur into one of the bottles of oxygen, keeping the bottle covered as much as possible. Notice what happens. When combustion becomes slow, remove the spoon, pour a little water into the bottle, close the mouth with the hand and shake. Is the gas produced by the combustion of the sulphur soluble in water? Why do you think so? Test the water solution with blue litmus. What happens?

EXPERIMENT.—Lower a piece of glowing charcoal in a deflagrating spoon into a third bottle of oxygen. What happens? Add a little water and shake as before. Test part of the water with blue litmus, and part with lime-water. Charcoal is a form of the element carbon. What do we now know of the composition of "the gas that turns lime-water milky?"

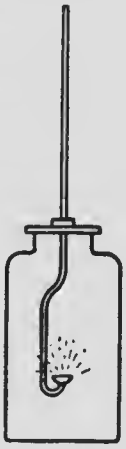

FIG. 5.

Certain substances that will not burn in air, of their own accord, will burn in oxygen. Thus, if a steel watch-spring be straightened out, tipped with sulphur, the latter ignited and the spring lowered into a jar of oxygen (some water being left in the bottom of the jar), the iron will be seen to burn, throwing off brilliant sparks, and the molten product drops into the water in the bottom of the vessel. If we carefully examine this product, we find it is our old friend hammer scale; so we have got at its composition. Iron and oxygen are elements, so the only reaction that can take place between them is one of combination,

$$3Fe + 4O = Fe_3O_4$$