

are stalled and fed in side-rooms excavated in the coal and superincumbent rocks. The requisite circulation of pure air is maintained through the mine by the consumption of refuse coal at some suitable place, the smoke and heated air from which ascend through a separate shaft. The escape of heated air through this shaft causes a descent of external air to take place through the main shaft. Communication between the two shafts is effected only through the remote portions of the mine, so that the pure air is made to permeate all the passages. Still there must always be side-rooms through which no circulation can be effected, and here not unfrequently collects that explosive "fire-damp," or light carbide of hydrogen, so often evolved spontaneously from the coal, and so often the cause of fatal accidents to the miners (Fig. 62). When the seam of coal is less than five feet thick, it becomes necessary to remove some of the superincumbent rock, to render the roofs of the main passages sufficiently high for the mules to travel under them.

Thus entire square miles of a coal-seam, hundreds of feet beneath the surface, are perforated in all directions by the hand of the miner (Fig. 63), as ship-timber is riddled by the depredations of the *Teredo*.

By the feeble light of our miner's lamp we enter one of these dusky aisles. The substratum beneath our feet has been ground to dust. The whole thickness of the coal-seam is exposed along the lateral walls. Occasionally it presents gentle undulations instead of lying in a rigidly plane position, and not unfrequently a huge bulge of the underlying rocks completely cuts off the seam. Overhead a black, bituminous shale forms the ceiling. Perhaps here and there the white shell of a univalve or a bivalve projects from the surface—the products of the sea buried in their native sediments, and suspended above our heads.