

The operations carried on in the *PORCUPINE* in the Bay of Biscay in the year 1869 at extreme depths were merely slight modifications suited to the different conditions, of the ordinary methods which had long been employed in shallower water; and they worked smoothly and well. When it afterwards became my duty to superintend the more important arrangements for the scientific work on board the *CHALLENGER*, although



FIG. 1.—Ball's Naturalist's Dredge.

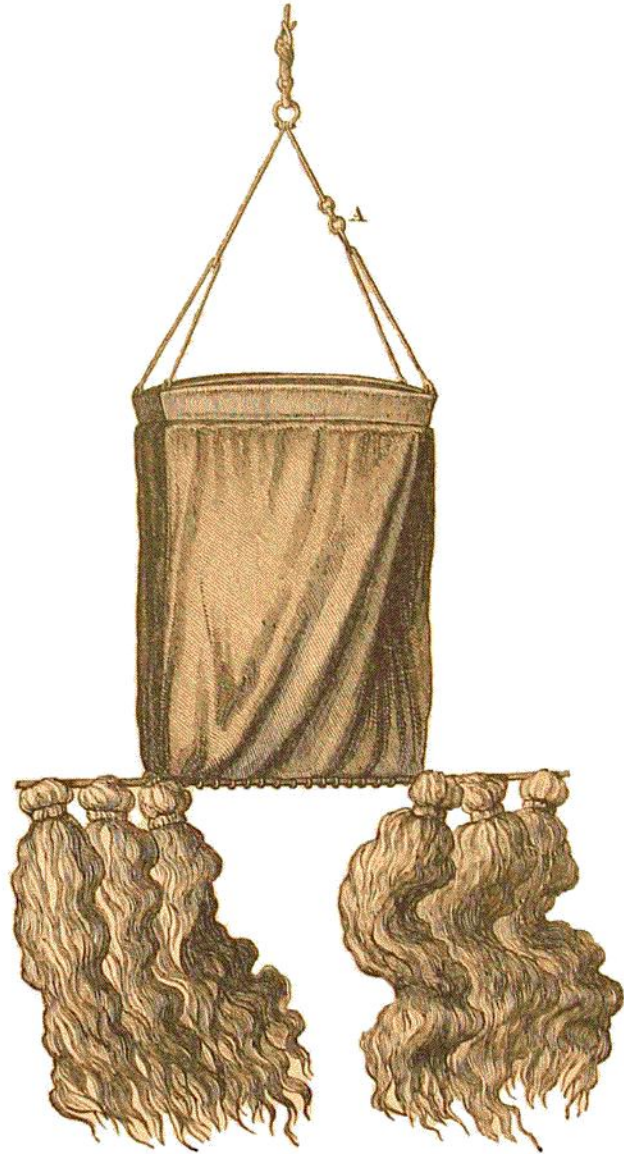


FIG. 2.—Dredge with "hempen tangles."

many changes were suggested, I made it a principle to deviate as little as possible from a plan of working which had been shown to be at all events practicable. During the progress of our voyage many alterations—some of them, such as the use of wire for sounding introduced by Sir William Thomson, and employed with such signal success by Captain Belknap in the U.S. ship *TUSCARORA*, and of wire-rope for dredging adopted by Professor Agassiz, evidently decided improvements—were introduced elsewhere; but as