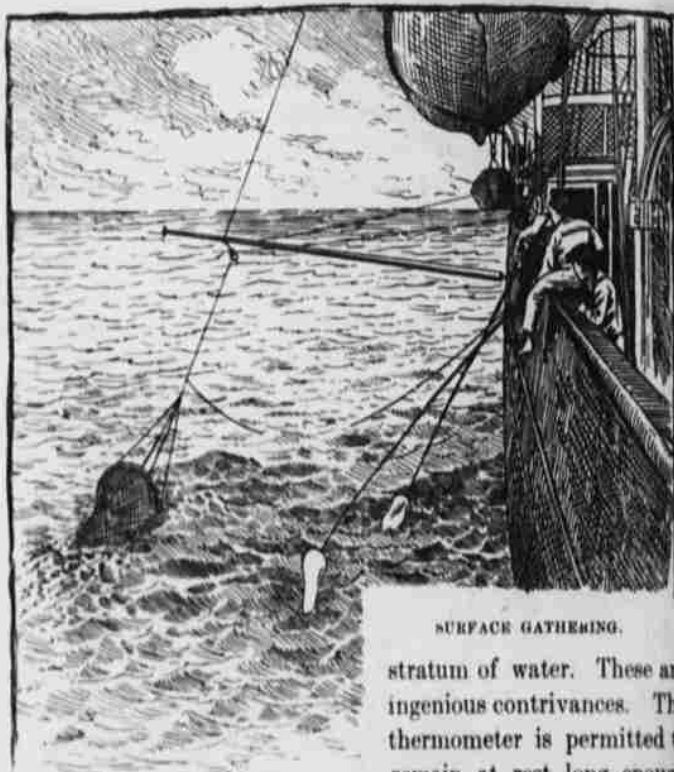


of the ship. The equipment of the vessel was entirely under his direction, and to his practical experience and ingenuity is due a large number of the novel and important devices and improvements adopted.

In general terms, the object of the *Albatross* is to examine the depths of the sea with reference to all the conditions of animal life that may be found there, the habits of fishes—in short, to get all possible information regarding the fauna of the sea. This involves systematic soundings, the observance of the temperature, currents and specific gravity of the different strata of water, the securing of samples of sea bottom, and various other matters of scientific value. Everything pertaining to animal life of the sea and along the shores comes within the scope of the work carried on by this expedition. In order to successfully operate such an enterprise, many appliances used nowhere else are on the *Albatross*. A number of these are shown in the accompanying illustrations.

The sounding machine has a reel on which are wound 5,000 fathoms of steel sounding wire .028 of an inch in diameter. In sounding a sinker weighing thirty-five pounds for moderate depths, or sixty pounds for greater depths, is attached to the sounding cylinder at the end of the wire, in such a manner that when the bottom is struck the sinker drops off and the cylinder returns with perhaps a teacupful of mud. The line goes down about 100 fathoms a minute and is raised at a little greater speed. A deep sea thermometer always is, and a water bottle may be, attached to the line to obtain the temperature and a specimen of the lower

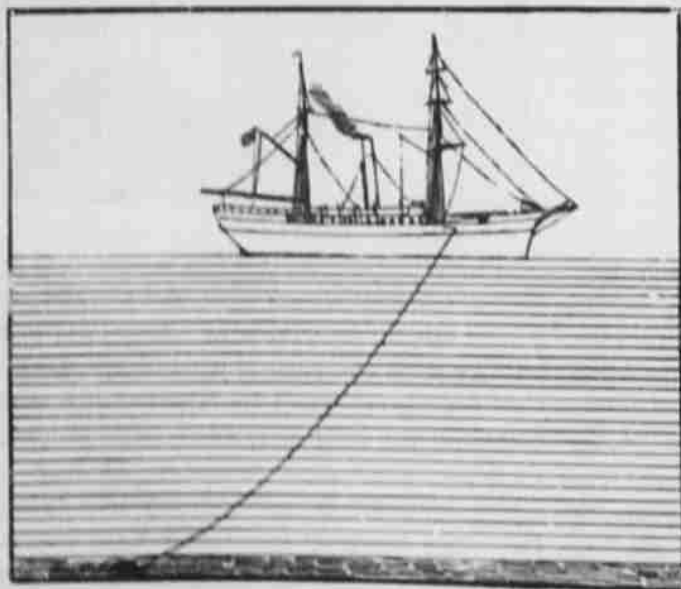


SURFACE GATHERING.

stratum of water. These are ingenious contrivances. The thermometer is permitted to remain at rest long enough

to register the temperature, and then the upward motion starts a screw that breaks the connection between the bulb and the column of mercury so that the register can not be affected by the temperature of the upper strata through which the instrument must pass before reaching the surface. This thermometer is enclosed in a strong glass shield, which prevents the vitiation of the reading or crushing by the great pressure of the water at the bottom of the sea. The bottle for obtaining samples of the water at any depth is a strongly constructed tube, through which the water passes unobstructedly during the descent of the line. When the sounding line begins to return to the surface a propeller on the bottle is set in motion, which closes the valves and keeps secure the contents of the tube. These instruments act at any depth. There are other appliances used on the line, a description of which would be of interest chiefly to the specialist.

The trawl and dredge net are so arranged that in dragging along the bottom they will catch specimens of the fauna, shells, mud, etc. These are best understood from the illustrations. The trawl is lashed at its bottom, and when lifted to the deck with its finny load and suspended over the receiving tray, the lashing is cast off and the contents fall out. The hose is trained on the tray of captured sea fauna until it is thoroughly washed, when the natural-



MANNER OF DREDGING.