

tation to the various uses of accumulators, dynamometer, brake, correct register, and governor."

Lucas
sounding
machine.

On board the "Michael Sars" we employed the sounding machine constructed by Lucas. It was selected originally because it had been extensively used by the telegraph cable ships, and because it was the smallest and the cheapest. Weights used as brakes in Thomson's machine are replaced by spiral springs, which can be tightened or slackened with a screw, and can at the same time be relied upon in a high sea as accumulators (see Fig. 7, which explains the construction).

During the winter of 1877-78 the United States Coast Survey steamer "Blake" undertook a cruise in the Gulf of

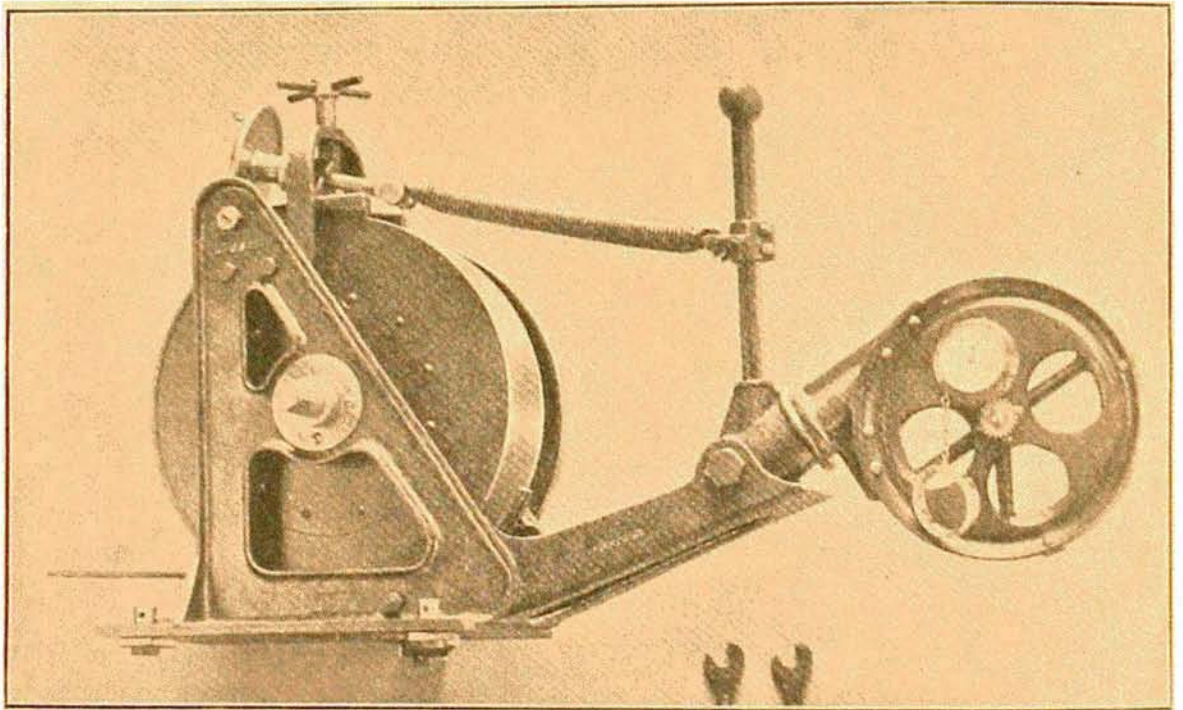


FIG. 7.—LUCAS SOUNDING MACHINE.

Wire rope for
dredging.

Mexico, under the command of Captain Sigsbee and under the personal supervision of the late Alexander Agassiz. As it was proposed to carry out investigations with the dredge and trawl along the bottom, Agassiz suggested the use of a wire rope instead of hemp ropes. Thanks to Sigsbee's inventive genius and practical methods, this plan was successfully adopted, and has since been adhered to by every expedition of any importance.

Fig. 8 shows sections of the "Challenger" hemp lines, 3 inches, $2\frac{1}{2}$ inches, and 2 inches in circumference (*a*, *b*, *c*), and of the wire rope, $1\frac{1}{8}$ inch in circumference, used by the "Blake" (*d*).