

DESCRIPTION OF VICE-ADMIRAL MAGNAGHI'S SOUNDING MACHINE.

(From the *Manuale di Idrografia* by CAPT. G. ROMAGNA MANOIA).

Vice-Admiral MAGNAGHI's sounding machine (small type) is the type most used by the Italian Navy. It is suitable for soundings normally reaching 100 metres (54 1/2 fms.) and can be used with heavier weights for soundings up to 300 metres (164 fms.). It can be very easily rigged on board; it may be placed anywhere on deck with the plane of its wheel in the fore and aft line of the ship, or even otherwise, though in the latter case it is necessary to have a leading block for the wire outboard. The complete apparatus is illustrated in the photograph (1).

Figure 2 shows the constructional details of the machine. It consists essentially of, a wheel on which is wound the wire; the mounting; the paying-out drum to which is attached the revolution counter; an eccentric hand-brake; the winding cranks; and the lead. There are several models of the latter, both cylindrical and fish-shaped.

In the latest models of the MAGNAGHI sounding machine the wire passes from the principal wheel on to a wheel of less diameter, two revolutions of which correspond exactly to one metre. It is on the axle of this latter that the revolution counter is fixed, indicating exactly the length of wire payed out. This second wheel is carried on a rocker arm which oscillates on a horizontal axis; it is kept raised by an adjustable spring. The rocker acts on a band brake which the above-mentioned spring tends to keep permanently applied. When the lead hangs from the end of the line, the weight is greater than the resistance of the spring, and the rocker arm drops a little, thus releasing the brake and freeing the wheel on which the wire is wound. When the lead reaches the bottom, the tension of the spring prevails and automatically applies the brake again.

A second brake, consisting of an iron block faced with chrome leather, works eccentrically on the inner periphery of the wheel and makes it possible to govern or completely stop the motion of this wheel during the operation of sounding.

The heel of the brake also prevents the wire from jumping out of its groove.

The line is an annealed and galvanised steel wire of 0.9 mm. diameter (0.11 in. circumference) and weighs 6 kgs. per 1,000 m. length (2.4 lbs. per 100 fms.); its breaking strain is about 125 kgs. (275 lbs.).

Iron weights may be used with the apparatus varying from 4 to 13 kgs. (8.8 to 28.6 lbs.) according to the depth and the ship's speed.

The lead is joined to the steel wire by a hemp stray-line intended to prevent the wire from breaking at the instant when the lead is being dragged along the bottom.

The counter wheel is furnished with a weighted pendulous scale, graduated so as to enable the inclination of the line to be read off at any time. Reduction tables, by Prof. DE MARCHI, are provided by the Hydrographic Institute of the Italian Navy for correcting the soundings according to this angle of inclination and to the weight of the lead in use. (See for example the *Manuale di Idrografia* by Captain G. Romagna MANOIA, Leghorn, 1927, p. 425).

The winding cranks are fitted with a system of clutching and declutching controlled by handles on the upper part of the axle of the wheel.

When the apparatus is out of use for some time, the wire is greased with a mixture of equal parts of olive oil and tallow.

Before every sounding, care must be taken to return the revolution indicator to zero. The sounding is taken by holding the handle of the rocker arm with the left hand and the eccentric brake with the right hand; the lead is released by gently removing the left hand, and the speed of paying out the wire can be controlled by working the hand-wheel which governs the tension of the spring.

With each machine is supplied a boxful of material for repairing the wire in case of fracture and for joining the wire to its terminal thimble.

This new model of sounding machine, perfected by the Italian Hydrographic Service, is manufactured in the latter's own workshops at Genoa. It is also made and supplied commercially by the following firms:

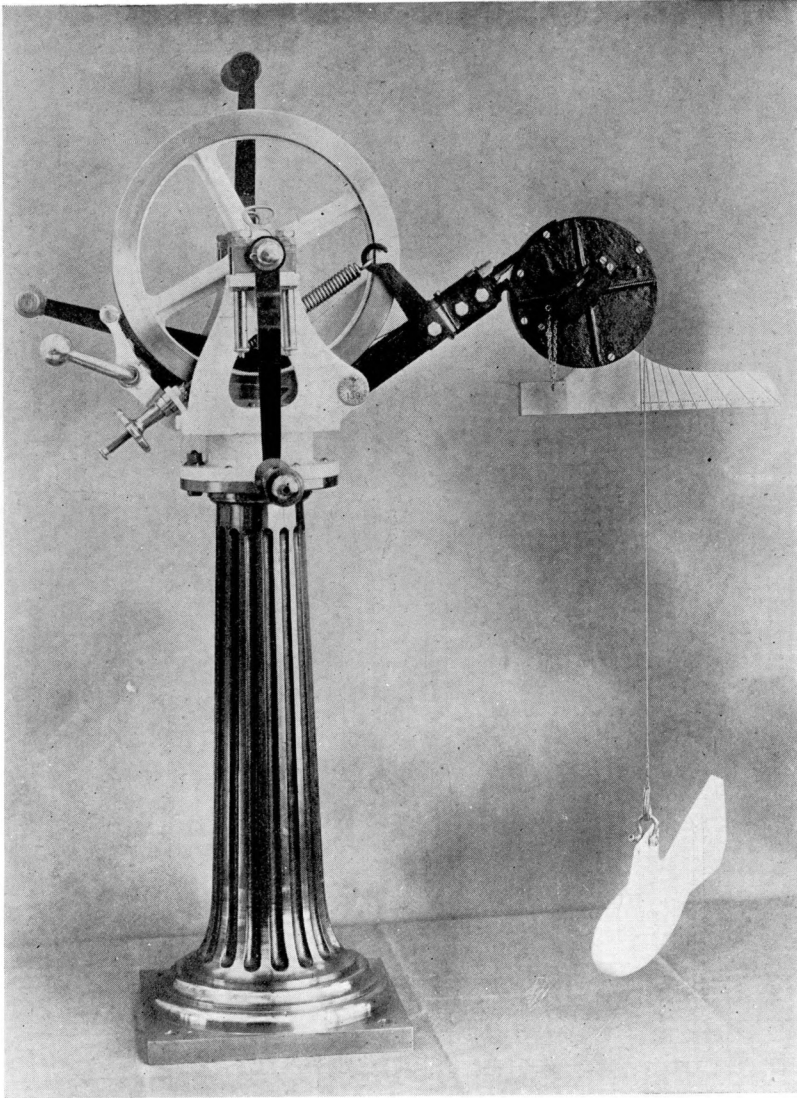


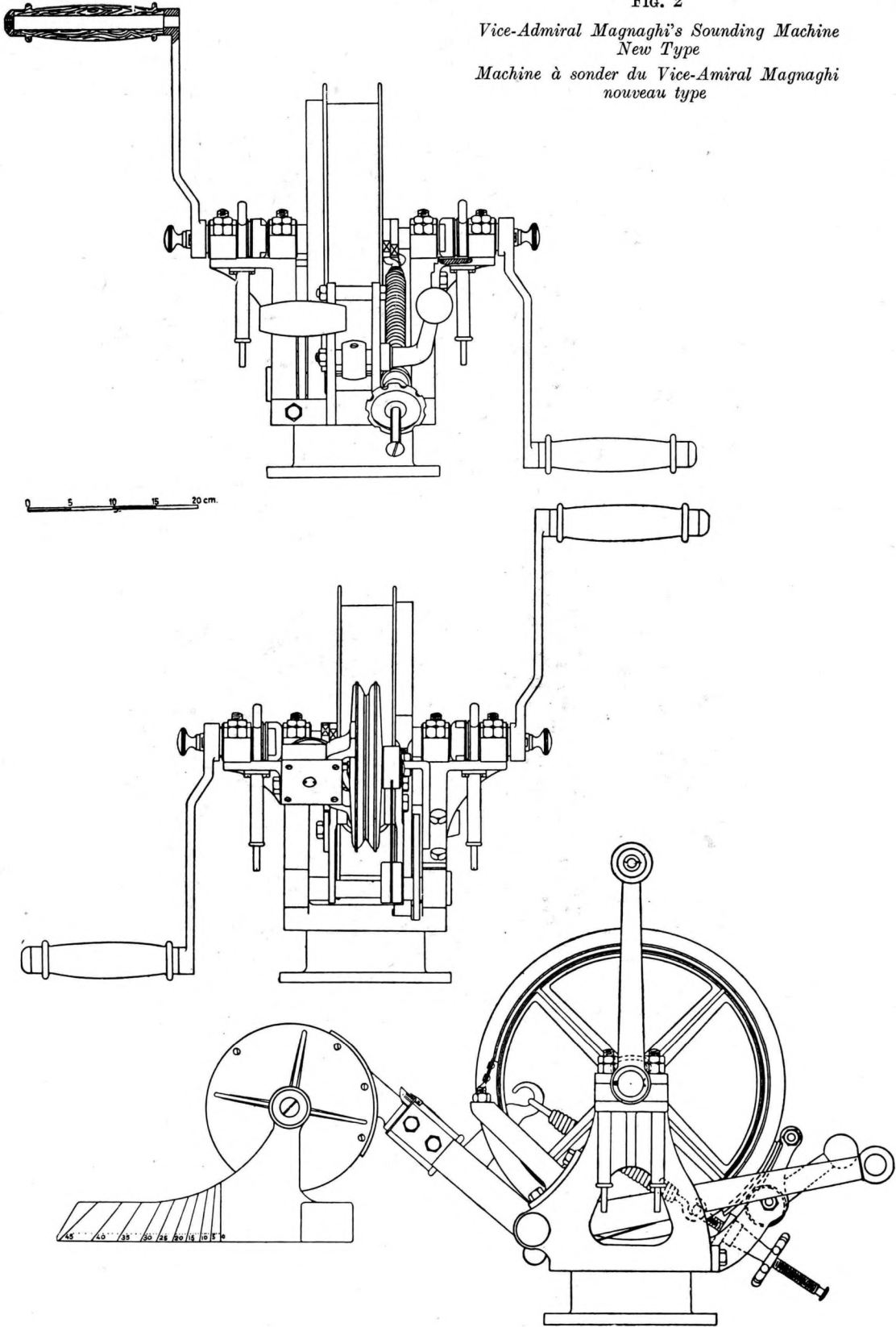
FIG. 1

*Vice-Admiral Magnaghi's Sounding Machine — New Type
Machine à sonder du Vice-Amiral Magnaghi — nouveau modèle*

FIG. 2

*Vice-Admiral Magnaghi's Sounding Machine
New Type*

*Machine à sonder du Vice-Amiral Magnaghi
nouveau type*



Società Anonima Solari Cervari & C. - Stabilimento Meccanico e Fonderia - Piazza del Popolo, 7 - Genova.

G. De Micheli - Officina Meccanica di Precisione - Corso Carbonara - Albergo dei Poveri - Genova.

Riccardo Otelli - Fabbrica Strumenti di Precisione - Via Goffredo Casalis, 6 - Torino.

Compagnia Internazionale Marconi per le Comunicazioni Marittime - Via Cairoli 4-1 - Genova.

This new model has replaced an earlier model a description of which was given in a booklet entitled *Descrizione ed uso del Piccolo Apparecchio a Scandagliare per la R. Marina costruito sui disegni di G. B. Magnaghi, Vice Ammiraglio*, published in 1923 by the *Istituto Idrografico* of Genoa.

It may further be mentioned that as early as 1891 Admiral MAGNAGHI had produced a sounding machine with detachable weight and bottom sampler for use in deep water. For a description of this machine, reference may be made to the *Trattato di Idrografia* by Admiral CATTOLICA, Part 2, Genoa, 1905, pp. 13-36, where a detailed description of the machine is given.

