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Captain H. H. Doty

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THE SPAKOWSKY MARINE AND ARMY NIGHT TELEGRAPH.

By Captain H. H. Dorr.

THE importance of a reliable and simple means of a speedy communication at night between vessels and military stations, is too well known by the officers of both branches of Her Majesty's service to require comment here.

In presenting the *Spakowsky Signal Light* to your notice, I do not seek, nor do I desire to make any innovations upon the code recently adopted by the Government, but simply to offer a powerful auxiliary to that system of communication.

The instrument which produces the light, weighs about 7lb. avoirdupois weight, is about 3ft. in length, and in shape resembles closely an ordinary civic mace, the resemblance to which is heightened by its being made of brass. Its staff, about 2in. diameter, is a hollow cylinder, inside which is fitted a piston that can be pressed down to two separate distances in the cylinder, but which, when not in use, is kept in the upper portion by a strong spiral spring in the lower part of the cylinder of staff. Immediately over the top of the piston, and at the upper part of the cylinder, is a projecting nozzle pipe through which the air finds entrance on the opening of a valve by drawing the piston downwards. The upper portion of the cylinder is now full of air, which will be driven out on the piston being released by the operator's hand, and being forced upward by the spiral spring underneath. In the upper portion of the instrument is a cotton wick, kept burning by a small spirit-of-wine lamp fixed in the head of the mace-like top. Opposite to the small flame of the spirit-lamp is about an inch of horizontally fixed brass tubing of about the thickness of whip-cord, terminating in a needle point from another piece of the same tubing—one being a continuation of the other—and pointing direct at the spirit flame. A reservoir in the head of the instrument contains a little over half a pint of petroleum, and this reservoir is connected with the two small pieces of tubing, and by means of them subsequently with the air from the cylinder below. The piston being released, is driven upward by the spring underneath, and forces the air through the small tubes in the face of the flame, and with it the petroleum in the form of a vapour. The result of this is, that a column of flame of full $2\frac{1}{2}$ inches in diameter, darts upwards from the point of contact between the petroleum vapour and the flame of the lamp, and this column of light lasts just so long as the piston is moving upwards again to its normal position in the cylinder. The length of time during which the column of light is shown, depends therefore, upon the length to which the piston is pressed downwards in the cylinder. Thus a 2-inch movement of the piston may be said to give a short flash, and a 6-inch movement to give a long flash. A mechanical

catch in the cylinder warns the signalman when he has reached the proper distance for a short or a long flash.

This light may be worked at all times, during high wind and rain, the flame being protected from these elements by a lantern, which covers the top of the lamp.

Permit me to briefly enumerate a few of the many advantages of this light.

1stly. Its ordinary strength and brilliancy, which, without the aid of a reflector or lens, is many times more powerful than any light hitherto known, and which, by the application of oxygen to its flame, may be made more brilliant than the oxy-calcium and other powerful lights which have been put aside, in consequence of the many disadvantages attending their use.

2ndly. It may be flashed from the deck or masthead of a vessel, and seen from all points of the compass at the same instant. For instance, a "general order" from the Commander-in-chief might be telegraphed from the masthead of the flag-ship, or head-quarters in the field, and be simultaneously received by the fleet, or the several divisions of an army.

3rdly. Its simplicity in construction and mode of operation will render it in the hands of any person endowed with ordinary intelligence, a safe and reliable medium of communication between ships, armies, coast-guard stations, and railways.

I have in the press an universal code of night signals for the Mercantile Marine (see Appendix), and I have full confidence that ere long (by means of this light), signals will be made at night, and understood by vessels of all nations.

For an account of a series of trials recently made with this light at Portsmouth, I beg to be permitted to quote from the *London Times*, of the 10th instant, as follows :—

Signal Lights.

A series of experimental trials have been made at Portsmouth during the past week, by order of the Admiralty, with a night signal-lamp which has just been introduced into this country, the results of which appear to promise what has long been wanted to perfect the night telegraphic system of her Majesty's fleets—a certain and reliable, economical, brilliant, and simply working flash-light. The light referred to as having been tried at Portsmouth appears to possess all the desired qualities as a flashing signal light. It has been introduced to the notice of our Admiralty by one of the inventors, a Captain H. H. Doty, and it is so far well known that it is now the signal light of the Imperial Navy of Russia. After submitting the apparatus to the inspection of the Board at Whitehall, Captain Doty proceeded, by their lordships' order, to Portsmouth, and on arrival there placed himself in communication with Admiral Sir Thomas Pasley, Port Admiral and Commander-in-Chief, to make arrangements for a thorough trial of his light. Sir Thomas Pasley appointed Captain Charles Fellowes, her Majesty's ship "Duke of Wellington," and Captain James G. Goodenough, her Majesty's ship "Minotaur," to carry out the trials of "the Spakowsky Marine and Army Night Telegraph," and report officially upon its results. On the first night of the trials, signalling was carried on after nine p.m. between the "Duke of Wellington," in Portsmouth harbour, and the "Minotaur," at Spithead, Captain Fellowes being provided with a Spakowsky lamp on board the "Duke," and Captain Goodenough on board the "Minotaur." The lights read and repeated the signals

made from ship to ship with extraordinary clearness and quickness to the operators, and its success as a "light" simply and without regard to other considerations, which are rightly the province of Captains Fellowes and Goodenough to decide upon, was at once placed beyond a doubt. The second experiments were made for the purpose of examining some of the smaller details connected with the working of the light, and were made in the presence of Admiral Sir Thomas Pasley and other officers, and were also quite satisfactory. On Monday night last the paddle steam-tender "Sprightly," Master-Commander Allen, steamed out of Portsmouth harbour in the midst of a gale of wind and rain until outside the Nab Light-vessel, seven nautical miles from the Spit-buoy, and when there, carried on rapidly and freely a series of signals with the "Minotaur" frigate at Spithead, again proving the value of a good light to the new code. On Tuesday night Captain Fellowes and Captain Doty, by permission of Lieutenant-General Sir George Buller, K.C.B., took up a position on the ramparts of Fort Southwick, the central and most elevated of the Portsdown line of forts, and from there signalled for upwards of an hour with the "Minotaur," lying at Spithead. A dense haze lay on the water and over Portsmouth, between the fort and the frigate, but the petroleum lights penetrated through all, and delivered and received their messages without a check. It is, perhaps, necessary to observe that no night glasses of any kind were allowed to be used, nor were they required in reading a signal. The cost of its working can best be shown by an experiment made with it by Captain Fellowes, who, commencing with its reservoir newly filled with petroleum (a little over half a pint), flashed 1,470 long and 1,160 short flashes before the petroleum gave out. This would average about 400 words telegraphed, at under a shilling cost. This cheapness in working the light, and also in its purchase, would seem to indicate its suitability for a signal light for the mercantile marine. Supposing that two steamships were approaching each other at night, and the commanders of each wished to know the position of the other's helm, the long and short flashes of the signal light could at once ascertain it by spelling the words in the usual manner, or if there should not be time for that, to let the short flash stand for the short word, and the long flash for the long word—the short flash for "port," and the long flash for "starboard."
