CHAPTER XV.

FLAGS AND SIGNALLING.

THE Naval Code, flags and pendants, with their significations, are shown on the following Plates.

Apart from wireless telegraphy, the other principal methods of communicating between ships or between ships and shore stations are :—

The International Code.
The semaphore.
Flashing signals in the Morse Code, or their equivalent made by flag waving or by blasts on a siren, fog horn or whistle.

The International Code flags, shown on the Plate following the Naval Code, are carried by ships of war and merchant vessels of all nationalities. When communicating in this code, the code-pendant is hoisted under the ensign, either at the peak or ensign-staff, and for answering signals the same pendant is used, hoisted where it can be best seen.

The semaphore, which is extensively used in most navies, was first introduced into the British sea service in 1866. It can be used for communication between ships, or between ships and shore stations, provided the distance is not very great. The small horizontal arm, or indicator of the semaphore, indicates from which side the signs shown by the signalling arms are to be read.

The semaphore signs, shown on Plate (p. 373), can also be made with small hand flags held at arm's length, or with the arms alone.

The following additional signs are used with the semaphore.

I. I.	. . .	Full Stop
A. A. A.	. . .	Comma
L. L.	. . .	Underline *
R. R.	. . .	Inverted Commas *
K. K.	. . .	Parenthesis *
G. G.	. . .	Fresh line

* These signs are made before and after the words concerned.

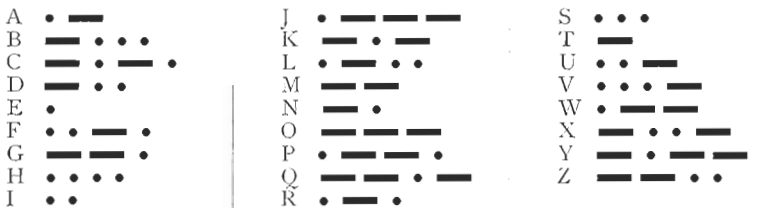
When communicating by semaphore, a short pause is made between each sign, so as to enable them to be formed and read correctly, and at the conclusion of each word or group the arms are closed.

Flashing Signals.

Flashing signals have been adopted in the Royal Navy, after trials extending over many years, as the best visual means of communicating over long distances. The semaphore is quicker, but its range is limited, and flags cannot be distinguished further than a few miles, whereas flashing signals can be made and received in daytime as long as the transmitter is not below the horizon of the receiver, and provided, of course, that the weather is clear.

At night the range of flashing signals is greater than by day, for with a powerful transmitting light, such as a searchlight, the ray can be seen against the sky even when the light itself is below the horizon.

MORSE ALPHABET.



FIGURES.

PENDANTS.

"Pendant" Sign • — — • — (P T as one group).
Alter Course Pendants: Compass — • — • — (C T as one group).
Blue — • • • — (B T as one group).
No. 9 — — — — • — (9 T as one group).
Numeral • • — • • • (F I as one group).
Horary • • • • — — — (H O as one group).
Repeat • • — — • • (I M I as one group).
Interrogative • • — • — (I N T as one group).
Church • • — —
Answering — • — • — • — •, &c.
(Succession of dashes and dots.)

SPECIAL.

Spelling • • — • • • — • (F F as one group).
Affirmative • — • • — • (A F as one group).
Negative — • — — — (N O as one group).
Torpedo — — — — (T O as one group).
(Red Burgee).
Stationing — • • • — • • • (B B as one group).
(Blue Burgee.)
Prepare — — —
Union • • — — • (U N as one group).
Military — • • — — • • —, &c.
(Succession of X's.)
Boat — • • • (B).
General Call • • • • • • • • •, &c.
(Succession of dots.)
General Stop — — — — — —, &c.
(Succession of dashes.)

For short distances, flashing signals are not much used in daytime as the semaphore is more convenient, but the signs can be made by short and long wavings of a flag.

At night, the Morse flashing system is the only one used. Some years ago a trial was made of a system of signalling by means of different groupings of coloured lights, but the objections to it were so numerous that it was discarded.

Trial was also made of a proposal that the short and long flashes of the Morse Code should be made by different coloured lights, but this was foredoomed to failure, as no coloured light can be seen as far as a white light.

The white light, therefore, was decided on for use with the Morse Code in the Royal Navy.

The apparata supplied for making flashing signals are :—

a. Multiple fibre truck flashing lamp.
b. Large hand flashing lamp for coastguard stations.
c. Small hand flashing lamp
d. Spring balance flashing lamp.
e. Cruiser arc flashing lamp.
f. Scott's flashing shutter for use with a searchlight.
g. Heliograph.

a. **The multiple fibre truck flashing lamp** consists of a nest of sixteen 6-c.p. incandescent electric finger lamps. It is operated by a key on the signal bridge. When the key is pressed, the current illuminates the sixteen lamps, which cease to glow as soon as the key is eased. This lamp gives an "all round" flash.

b. **The large hand flashing lamp** (Fig. 357) is made of copper and is somewhat similar in construction to the ordinary steaming light. It is fitted with a powerful lens which gives it a range of about six miles, and burns an oil lamp. The flashes are made by pressing and releasing the spring key (marked A), which operates a small Scott's shutter between the lens and the lamp. This lamp is used when it is desired to make a signal in one direction only.

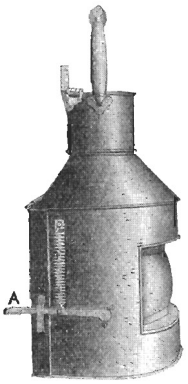


Fig. 357.—Large Hand Flashing Lamp.

c. **The small hand flashing lamp** is supplied for boats' use and burns a candle. It is fitted with an ordinary bull's-eye lens, and the spring key by which it is operated simply raises and lowers a metal shade, thus exposing or eclipsing the light.

d. **The spring balance flashing lamp** (Fig. 358) consists of a single electric incandescent lamp inside a brass framework surrounded by a spring mounted cylindrical shade. The lamp is fixed on the end of a spar about 12 feet long which can be clamped in an upright position against the hand-rails of the signal bridge.

When in use, the lamp is switched on and signals are made by pulling down and releasing the cylindrical shade. The shade is actuated by a line; when the line is pulled the shade is lowered against the pressure of the springs by which it is kept up, and returns to its place when the line is released.

This lamp is not a powerful one, and is only intended for use over short distances.

The older pattern of this lamp is worked by the weight of the shutter instead of the springs, and is called the gravity flashing lamp.

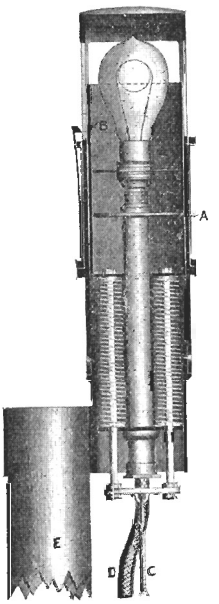


Fig. 358.—Spring Balance Flashing Lamp.

A. Outer sliding cover.
B. Inner sliding cover.
C. Cord for working inner cover.
D. Electric lead to lamp.
E. Pole for fixing lamp on.

e. **The cruiser arc flashing lamp** (Fig 359) is simply a small and cheap reproduction of the searchlight. The lantern is cubical in shape, and inside it two carbons are mounted, which can be made to approach or recede from each other by means of a small milled wheel which projects through the back of the lantern. Two terminals in rear are in connection with the

upper and lower carbons respectively, and to these a circuit is led from a terminal box fixed in the nearest convenient position to the signal bridge.

The arc obtained when the carbons are closed is a brilliant one, and the range of the light on a clear night is from 12 to 15 miles.

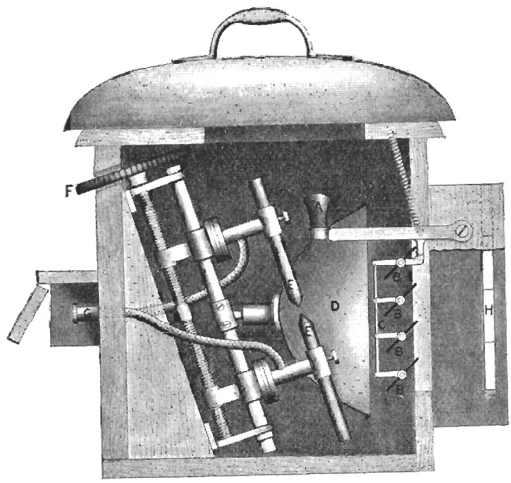


Fig. 359.—Cruiser Arc Flashing Lamp.

A. Spring key for working shutter.
B. Pivoted shutter vanes.
C. Connecting rod.
D. Reflector.
E. Carbons.
F. Hand wheel for adjusting arc.
G. Terminals.
H. Glass front.

The front of the lantern is fitted with a small Scott's shutter worked by a spring handle or key on the right, by means of which the flashing signs are made.

f. **Scott's flashing shutter.**—Mention has already been made of Scott's flashing shutter in connection with the large hand lamp and cruiser arc lamp, but in its original form it was designed for attachment to a search-light. It was devised in 1897 by Rear-Admiral Sir Percy Scott, then in command of the *Scylla* for purposes of communication by night over long distances even with hills intervening, and its utility has been proved not only in peace time but also under war conditions, as it was used during the South African War for keeping up communication with the beleaguered garrison of Ladysmith.

It consists of a rectangular wooden frame across which copper vanes or louvres are pivoted (Fig. 360). By means of a lever at one side of the frame, the louvres can be turned simultaneously about

their longer axis, through an angle of 90°, thus either completely obscuring the light or, when their edges are parallel to the ray, exposing it fully.

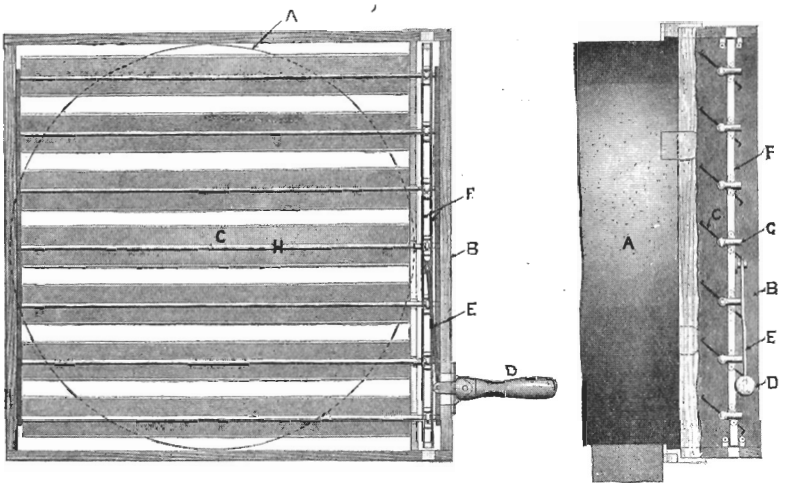


Fig. 360.—Scott's Flashing Shutter.

A. Search-light.
B. Wooden frame.
C. Pivoted copper vanes.
D. Key for operating vanes.
E. Link from key to connecting rod.
F. Connecting rod.
G. Cranks for rotating vanes.
H. Pivot bars secured to vanes.

The apparatus is fitted with four clips by means of which it can be fixed to the front face of a search-light projector.

A search-light fitted with a flashing shutter is a most efficient means of signalling over long distances **by day.** If the search-light is switched on and the projector kept trained accurately on the receiver, signals made with the flashing shutter can be read easily at a distance of fifteen miles, and in the Royal Navy all other systems of long-distance signalling have now been practically discarded.

It is most important, however, that the ray shall be kept trained accurately on the receiving ship or station, otherwise the light will not be seen. In order to ensure a signal being received, a telescope is fixed to the search-light, parallel to the axis of the projector, so that while the signal is being made, an independent person looking through the telescope may manipulate the projector and keep the image of the receiving ship or station in the field of the telescope. If a ship is rolling this is not an easy matter, but it is greatly facilitated by fitting a shoulder-piece to the projector.

When making a long-distance signal by day with the flashing shutter the ship's course should be altered so as to reduce rolling

to a minimum if great difficulty is experienced in keeping the receiving ship in the field of the telescope.

Rear-Admiral Sir Percy Scott subsequently applied the principle of the flashing shutter to an all-round truck lamp (Fig. 361). A number of vertically pivoted vanes or louvres encircle a constantly burning lamp, and are worked by a couple of electro-magnets. The armature of the magnets is connected to a flat metal ring, which is capable of a limited circular movement. Small cranks on the lower ends of the louvres fit into slots in the flat ring, so that when the operating key is pressed and the armature is attracted by the

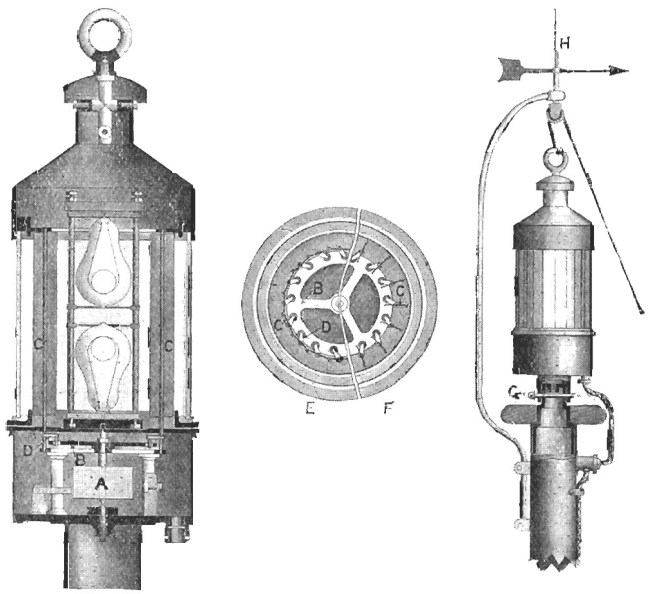


Fig. 361.—Shutter Pattern Truck Lamp.

A. Armature.
B. Disc rotating through a small angle.
C. Pivoted vanes.
D. Cranks for rotating vanes.
E. Section ; vanes closed.
F. Section ; vanes open.
G. Attachment to masthead.
H. Lightning conductor.

electro-magnets, the movement of the ring turns the louvres through an arc of 90°, and exposes the light.

g. **The heliograph.**—This instrument was devised originally for the purpose of signalling in the Morse code over long distances on land by means of the sun's rays reflected from a mirror, but it was also adapted for use on board ship. However, since the adoption of Scott's flashing shutter in connection with search-lights, its use at sea has, to a great extent, been given up.

In land warfare, however, the heliograph is the only means of

signalling over long distances, where there is no telegraph, provided the sun is shining, and the following account of the manner in which a heliograph was extemporised by naval signalmen on one occasion in South Africa during the Zulu War is instructive.

A rifle barrel was fixed in alignment on the station with which it was desired to communicate, accurate alignment being obtained by sighting through the bore. A small disc of white paper was then fixed just in front of the muzzle, and an ordinary hand mirror was used to reflect the sun's rays towards the receiving station. The successful transmission of messages depended on each flash being accurately directed towards the receiver, and this was ensured by the disc of white paper at the end of the muzzle of the rifle barrel; for if rays of light from the flat hand mirror passed through the bore the annular shadow of the rifle barrel could be seen on the disc, and all other rays were therefore bound to travel in the same direction.