

## SECTION IX.

### WIRELESS TELEGRAPHY.

#### INFORMATION REGARDING THE GENERAL WORKING OF THE APPARATUS.

All coherers now issued to the Service, except those for Marconi sets, Coharers, are made by Mr. Sullivan.

Those made by Mr. Hicks have been given an extended trial, but have failed to pass the specified tests.

It is again necessary to emphasise the fact that coherers must be kept Care of. in their metal boxes, which should be earthed, and not in proximity to the coil. It is recommended that those not actually in use be removed altogether from the office and kept elsewhere.

Referring to the method described on p. 102 of A.R., 1901, for Automatic break in inker-circuit. providing an automatic break in the inker-circuit when sending, this has been modified as follows :—

It is effected by two phosphor bronze springs on the base of the key which form a break in the circuit from the two-way switch to the inker, till the key is in the receiving position, when the springs are bridged across by a brass block on the under side of the ebonite arm of the key.

Care must be taken when connecting up the lead from the two-way switch, that the lead covering does not touch the brass block to which the core is secured. This fitting is embodied in new keys, but must not be fitted to keys belonging to Marconi sets.

The present pattern is not satisfactory, as it is found that when switching Two-way switch. to the left the handle is apt to become unscrewed. In the latest pattern the handle does not screw into the socket, but has a square end to fit into a square recess in the socket. A feather and feather way will prevent shipping the handle on the wrong slue. There will be a white arrow mark on the ebonite handle to show the direction of the switch arm.

The 140-foot type is the only one now supplied. Jigger.

When using this instrument care must be taken that the motor is so Isenthal interrupter. joined up as to heave round with the sloping edges of the blades of the interrupter advancing, as otherwise the pump does not heave.

By A.L. C.P. 10971/13957 of 21st August 1902, it is ordered that in Cowtails. future all cowtails are to be delivered from the makers to Portsmouth Dockyard for examination and test.

The lengths now supplied are 30, 20, and 10 feet.

The specific gravity to which the acid should be mixed when cells are Accumulators. given their first charge should be 1.215.

It is found that if acid of lower S.G. is used, the cells will not rise to their full voltage unless subjected to a very prolonged charging.

The trials of Mr. Sullivan's relay have been finally abandoned, as it was Relay. not found to be as efficient as the Siemens' relay.

## Insulators.

A new form of long insulator has been designed with the object of reducing surface leakage in damp weather. Plate XXIX. shows a section.

It consists of an ebonite cylinder with ring on top for suspending it.

The interior is hollowed out, the aperture being cone-shaped, and into the apex of the cone screws a brass rod, to the lower end of which would be attached the short insulator.

It will be seen that the inside is shielded from rain to a considerable extent, and the surface leakage proportionately reduced.

## Insulating bracket.

Complaints having been received from sea-going ships that considerable leakage occurs at the bracket to which the cowtail is usually led after leaving the deck tube, a special form of oil insulator has been designed which it is hoped will overcome the difficulty. It is shown on Plate XXIX.

## NEW SERVICE SETS.

## Orders and delivery.

The 53 sets of last year's order have all been delivered and issued.

In addition, 10 new sets with slight modifications have been delivered and issued.

The list of appropriations for all these sets is given below.

A further order for 20 more sets of similar pattern has been approved by A.L., N.S. 1929/12490 of 16th October 1902.

Of the 12 original Service sets, ordered to be brought up to date, seven have been received and sent to the makers, and have now been returned ready for re-issue. The remaining five will be brought up to date on their stations, the gear for doing so having already been despatched.

The reserve stores are being rapidly delivered, and those for Malta and Hong Kong have been despatched.

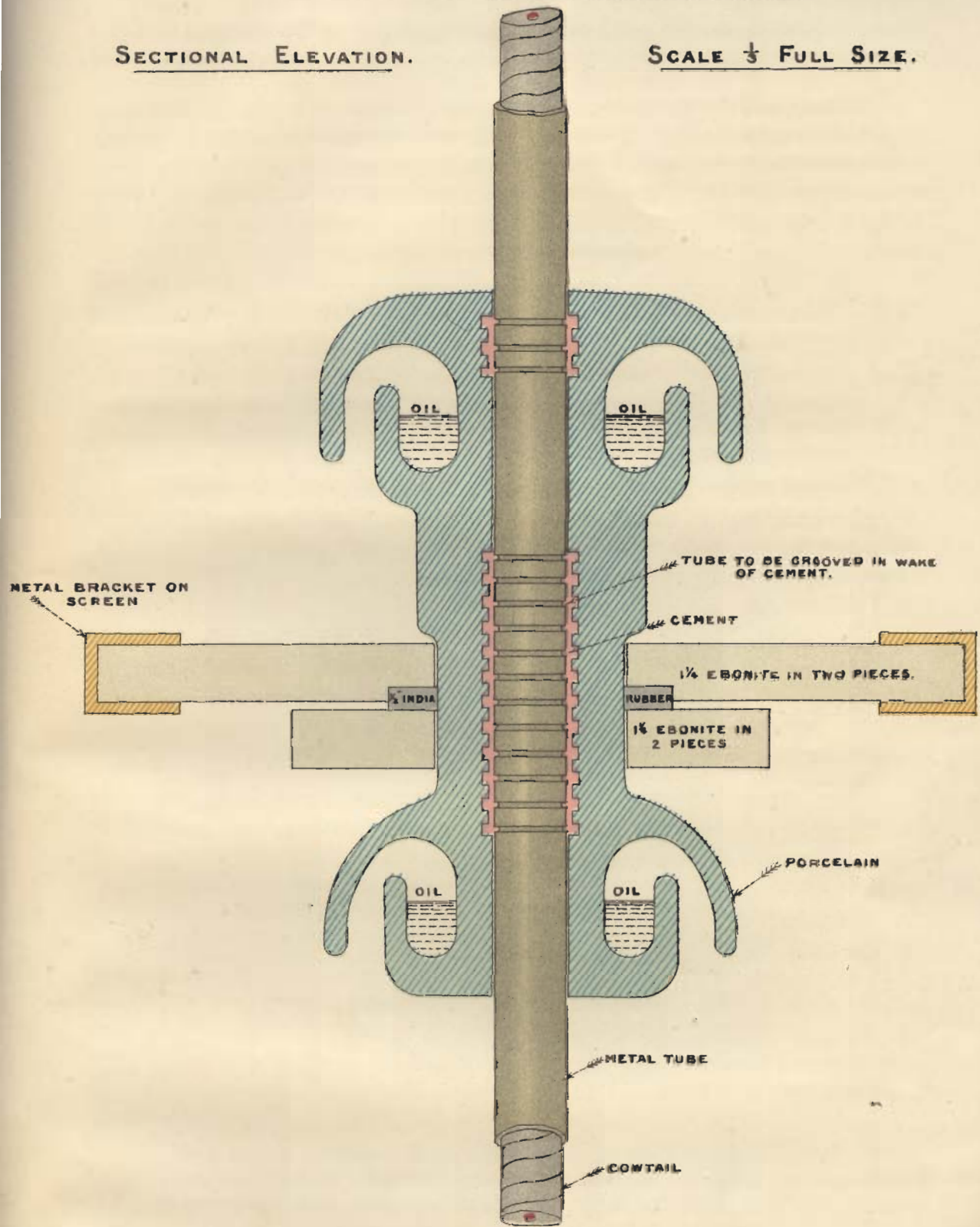
APPROPRIATION OF WIRELESS TELEGRAPHY APPARATUS.  
November 1902.

Squadron, &c.	Ships fitted with		Remarks.
	Marconi Gear.	Service Gear.	
Torpedo Schools -	"Vernon," three sets "Defiance" -	"Vernon," three sets (including one old set brought up to date). "Defiance," three sets (including two old sets brought up to date).	
Special ships -	- - -	"Minotaur," "Hazard" - -	And one submarine boat with special set.
Channel Squadron	"Majestic," "Magnificent," "Niobe," "Furious," "Doris."	"Hannibal," "Jupiter," "Mars," "Prince George," "Pactolus," "Prometheus," "Sutlej."	
Cruiser Squadron -	"Juno," "Minerva," "Hyacinth."	"Good Hope," "Brilliant," "Rainbow."	
Coastguard ships -	"Revenge," "Melampus."	"Anson," "Camperdown," "Collingwood," "Resolution," "Galatea," "Sewann," "Benbow," "Australia."*	* Not yet issued.

TO PASS THRO' BRACKET ON SCREEN &c

SECTIONAL ELEVATION.

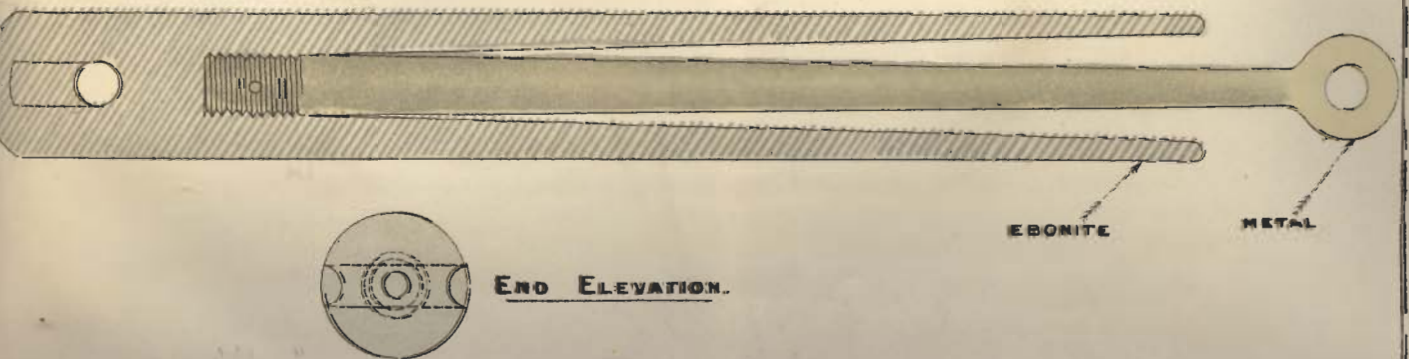
SCALE  $\frac{1}{2}$  FULL SIZE.



PROPOSED  
LONG INSULATOR FOR AERIAL WIRE.

SECTIONAL ELEVATION.

$\frac{1}{2}$  FULL SIZE.



APPROPRIATION OF WIRELESS TELEGRAPHY APPARATUS—continued.

Squadrons, &c.	Ships fitted with		Remarks.
	Marconi Gear.	Service Gear.	
C.-in-C.'s and port guardships.	"Sans Pareil" -	"Royal Sovereign," "Nile," "Empress of India," C.-in-C., Sheerness (two sets), C.-in-C., Devonport (one set).	
Mediterranean -	"Vulcan," "Implacable," "Caesar," "Hood," "Illustrious," "Victorious."	"Vulcan," "Renown," "Ramilies," "Canopus," "Barham," "Pioneer," "Andromeda," "Aboukir," "Diana," "Vindictive," "Pyramus," "Pegasus," "Pandora," "Formidable," "Irresistible," "Bulwark," "Gladiator," "Repulse," "Venerable," "Bacchante."*	* And two old sets brought up to date.
China -	"Glory," "Blenheim" -	"Amphitrite" and 11 other ships not known.*	* And three old sets brought up to date.
North America and West Indies.	- - -	"Ariadne" and one other ship to be selected by C.-in-C.	
Queensland Government.	- - -	Two sets.	
Shore stations -	Gibraltar, Malta, Dover, Culver Cliff, Portland Bill, Rame Head, Scilly, Roches Point.	"Hibernia" (Malta), St. Ann's Head,* Bere Island,* Languard,* Spurn Head.	* Not yet issued.

ALTERATIONS AND IMPROVEMENTS.

A new type of coil has been manufactured and is being issued with Coil. later sets. It is made by Messrs. Newton & Co., and will work with 20 volts and hammer make-and-break, or with 80 to 100 volts and the Isenthal interrupter.

Before being accepted, these coils have to give a 2¼-inch spark with the former and 3¼-inch with the latter, with one ball to earth and the other to a capacity of 700 cms., equivalent in practice to a 160-foot double aerial.

Those coils of this type that have so far been issued have not had Isenthal interrupters supplied with them, as a report of trial of the instrument in sea-going ships is awaited.

POINTS TO BE OBSERVED IN WORKING THIS COIL.

Great care is to be taken to join up the aerial and earth wires to the standards marked A and E. The standard furthest from the make-and-break should be marked A. Points to be observed.

The adjustment of the hammer make-and-break is slightly different to other coils. Press hammer against the core with one hand (there is very little and sometimes no play between them), and with the other hand screw up back stop until the back contact is within 1/16 inch of the

hammer contact. Slight tension has then to be put on the hammer spring by means of the regulating screw to make the contacts meet, the tension varying with the length of spark.

The coil will be found to work better with the reversing switch one way than with the switch the other way. This should be found by trial and noted.

When using the Isenthal interrupter with these coils the hammer make-and-break should be separated by a piece of ebonite.

Relay.

In the 10 new sets recently delivered, and in future orders, the shunt between the tongue and stop of the relay has been increased to 5,000 ohms as a further precaution against the local battery running down. The local battery should be disconnected when leaving the instruments for any length of time.

Flexible internal leads.

Flexible internal wiring has been substituted for the Patt. 733 previously in use, which was found liable to break.

Tapper.

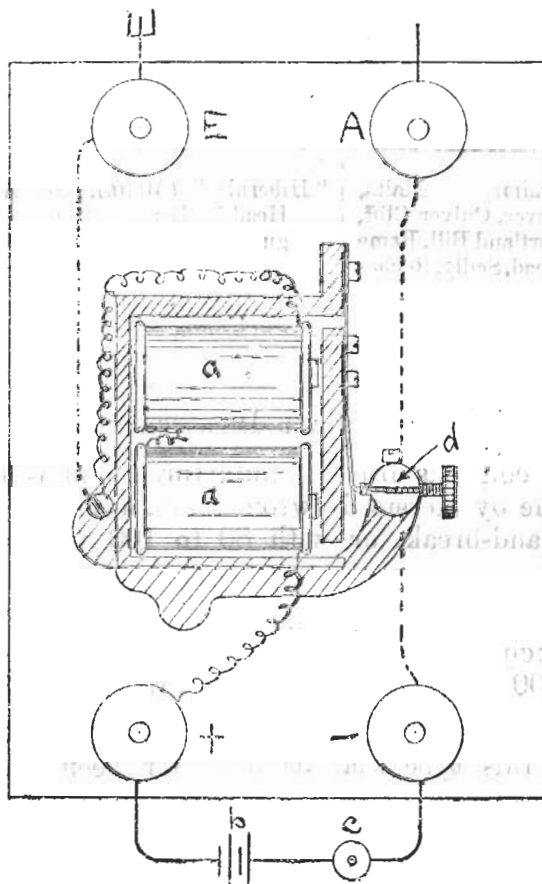
Ivory arms for holding the coherer have been substituted for the brass ones previously in use.

The travel of the magnets has been limited by a brass collar, so that the magnets cannot be raised so far that the armature is beyond their influence.

Buzzer.

A modified pattern of buzzer has been designed with coils of 50 ohms resistance instead of 3 ohms as it was found that the Q type cells working it quickly ran down. After a six months trial of the modified pattern, the voltage of the cells had not appreciably fallen.

Two extra terminals, A and E, have been fitted for the aerial and earth respectively. A sketch of the instrument in its modified form is shown:—



*a* Magnet coils. Resistance 50 ohms.  
*c* Push.

*b* 2 Q type, Obach cells.  
*d* Brass, insulated from iron frame.

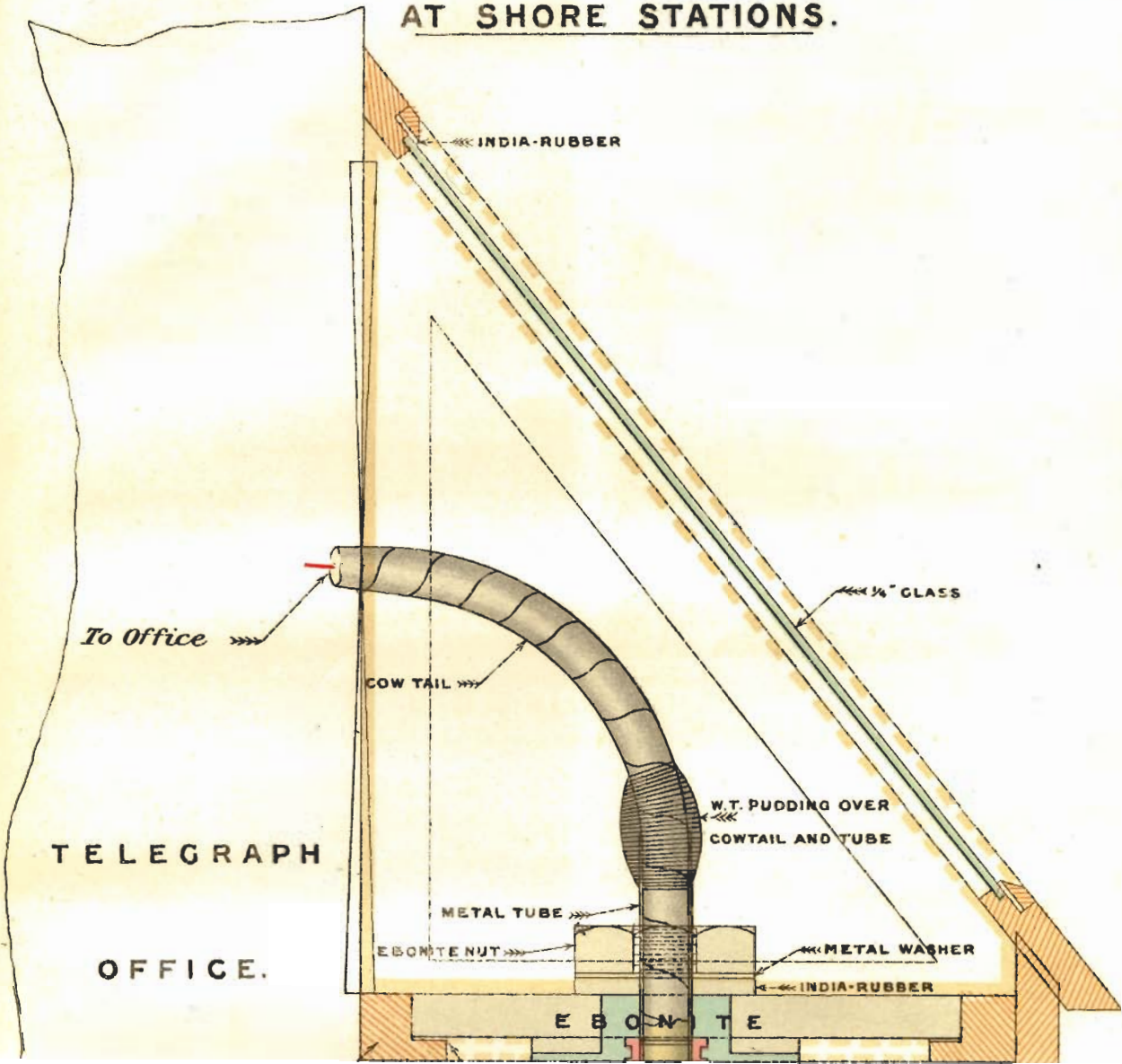
#### INFORMATION CONCERNING SHORE STATIONS.

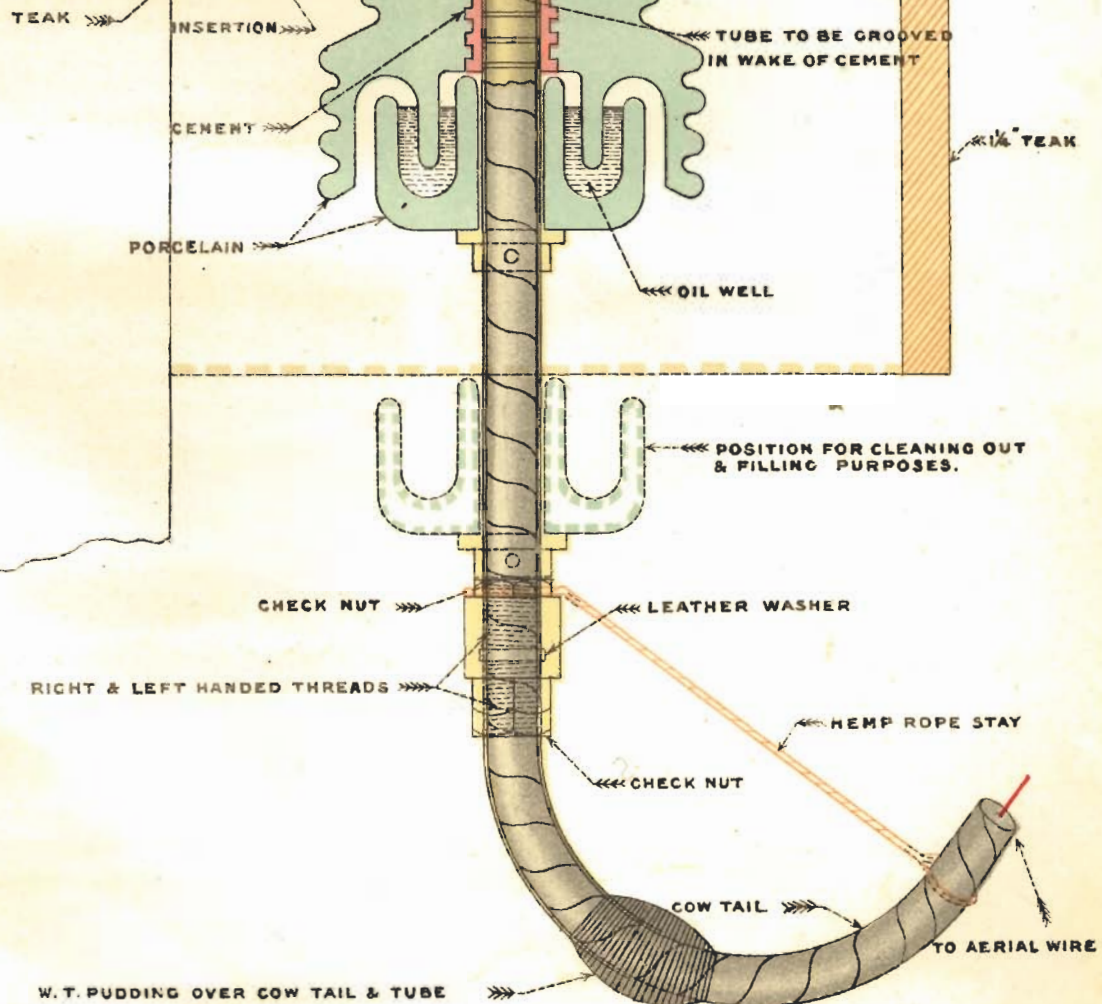
A torpedo lieutenant has been appointed to supervise the working of the shore stations.

New stations.

The four new stations, viz., St. Anne's Head, Bere Island, Languard, and Spurn Head, mentioned in last years A.R. as being in process of construction, have not yet been completed. The instruments appropriated to them have

WINDOW FITTING FOR INSULATING AERIAL WIRE  
AT SHORE STATIONS.





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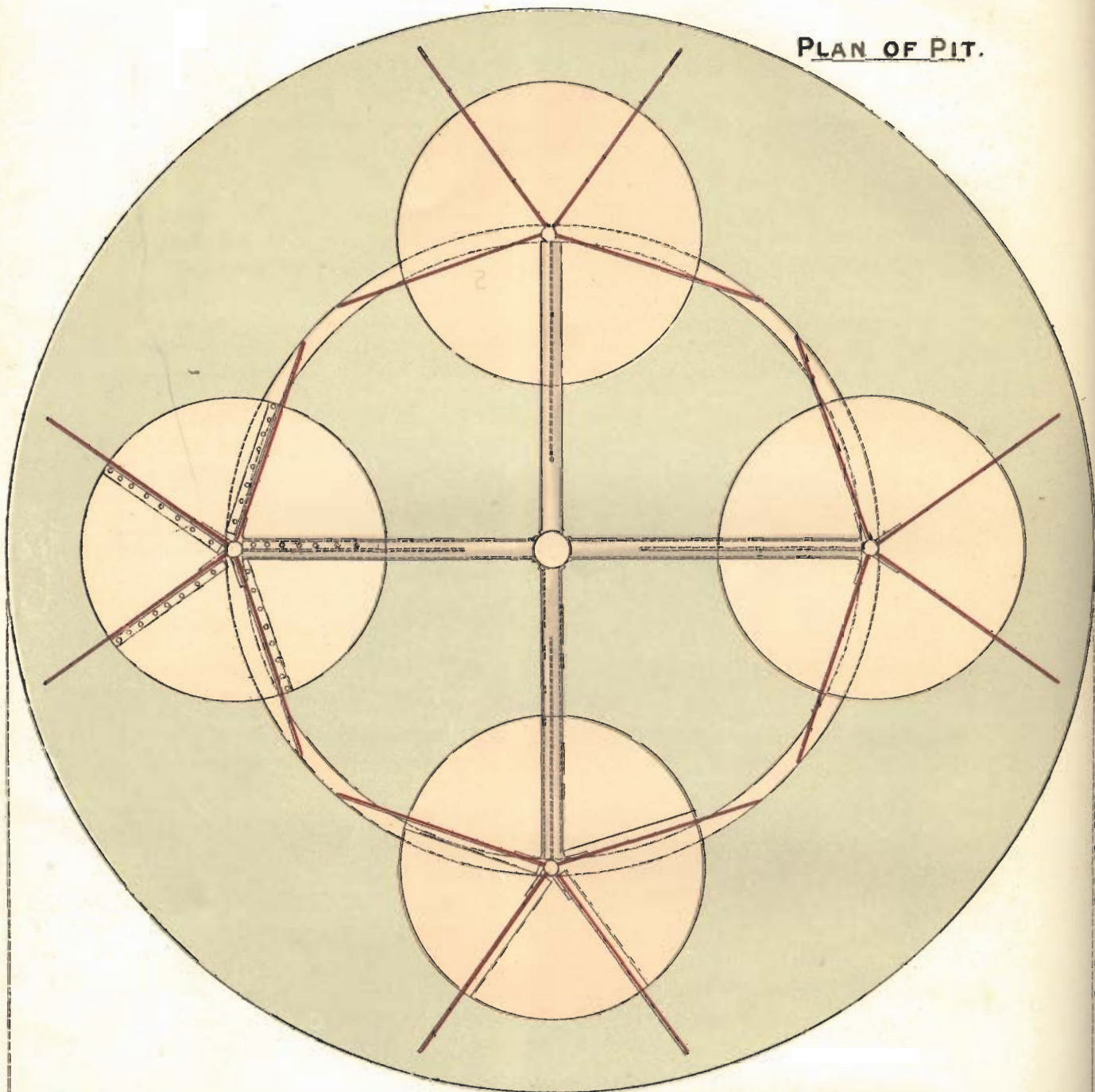
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EXPERIMENTAL EARTH.

FOR SHORE STATIONS.

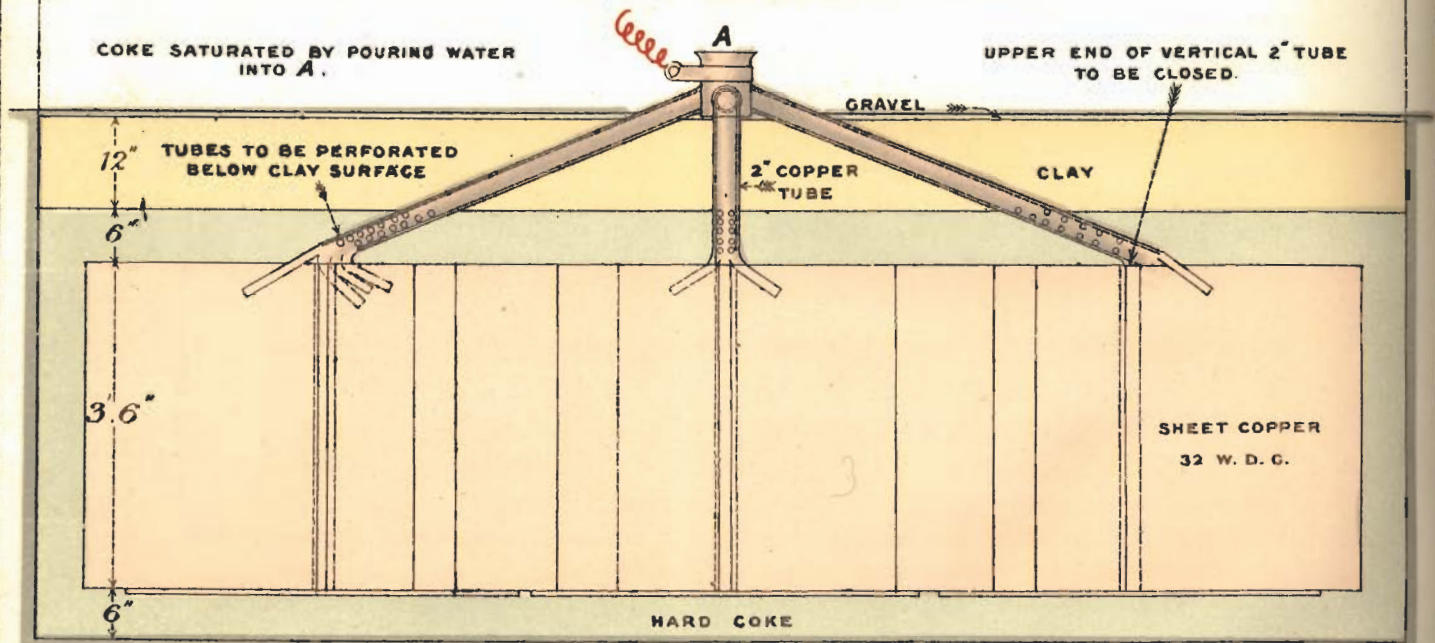
PLAN OF PIT.



11' 0"



17.0  
ELEVATION.



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been received, but pending their completion, will be issued to ships if required. The instruments for the four stations would then be issued from the reserve stores.

In addition, a site for a shore station has been selected at Fort Essex, Alderney, and estimates have been forwarded for the work of fitting. By A.L. G. 8410/10937 of 25.9.02., this will be considered in the estimates of 1903-4.

Owing to the unsatisfactory nature of the earths at various shore stations, a new form has been designed and fitted at Dover for trial. It is hoped that it will solve the difficulties previously experienced. Drawings of the earth are shown on Plate XXXI. It will be seen that it consists of groups of copper plates with a total surface of 640 square feet embedded in coke in a large pit in the ground. An arrangement of copper pipes connecting with a central funnel above the surface ensures that water poured down it thoroughly saturates the coke in the vicinity of each plate. Dover.

This form of earth close to the station is considered preferable to wire hawsers to the sea at a greater distance.

The wire hawsers used as an earth at this station not proving satisfactory, an earth of copper plates buried in the vicinity of the station was fitted in addition in July 1901, since which time no trouble has been experienced. Culver Cliff.

A new form of insulating window, mentioned in A.R., 1901, p. 110, has been fitted at this station, and gives great satisfaction. A drawing is given on Plate XXX.

It will be seen that insulation is obtained by means of a resinous oil contained in a porcelain cup. Any film of moisture which might form on the surface of the oil would at once sink to the bottom and leave the surface still a perfect insulator and as the only means by which surface leakage could take place is across the surface of the oil, this arrangement should prove very efficient.

The experimental staff at the Portland Bill station have been transferred to the "Minotaur," which has been fitted with the latest service installation, and all testing and instructional work is now done between "Hector" and "Minotaur." Portland.

The Marconi instruments at Portland Bill station still remain there in charge of the Coastguard.

In view of the fact that at the war signal stations at Dover, Culver, Portland, Rame Head, Scilly Island, and Roche's Point, the instruments have been there for over a year it is considered that the Coastguard men have had sufficient experience in their management to be able to take charge of them. It has therefore been decided that, at these stations, the senior commissioned boatmen who have passed the higher signalling standard, and who have been through a wireless course in the "Vernon," shall be given a further course of 10 days and be examined as to their fitness to take charge, thus releasing the active service T.I.'s who are at these stations at present.

The results obtained with this station have not been satisfactory, 30 miles being about the maximum distance obtainable. Scilly Isles.

The station has been visited by officers from the "Defiance," and experiments carried out with a view to improving the earth.

The report from the "Defiance" states that the fault is considered to lie chiefly in a bad earth, and that owing to the position of the station it is necessary to employ nearly 400 yards of horizontal wire hawsers before reaching the sea.

Peninnis point, 109 feet high and steep-to, is suggested as an alternative site.