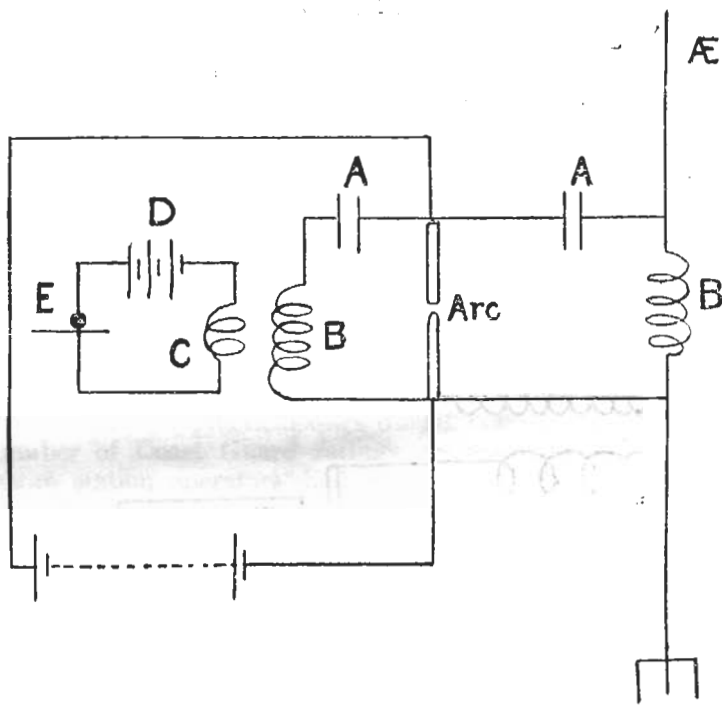


PATENTS RECENTLY TAKEN OUT IN WIRELESS TELEGRAPHY.

The following remarks upon the patents taken out during the year 1906 may be of interest as indicating the general direction of progress outside the Service.

- Transmitting gear.** Nineteen patents were taken out concerning transmitting apparatus.
- Directional.** Both Marconi and De Forest patented a method of transmitting directionally, by means of horizontal aerials. Lodge and Muirhead claim the idea of extending the transmitting earth in the direction in which it is desired to transmit and the transmitting aerial in the opposite direction. Both these ideas have been well known in the Service for some time.
- Poulsen system.** Poulsen took out four additional patents, all modifications of his system as described in the Annual Report of 1906. Two other inventors claim that by using certain metals to form Poulsen's arc, they can obviate the necessity of surrounding the arc with a gaseous atmosphere.
- Several other inventors use some form of direct current arc, instead of the usual form of spark gap.
- Receiving apparatus.** Twenty-one patents were taken out concerning receiving apparatus.
- Detectors.** Five new forms of coherer were patented, and three detectors depending upon the hysteresis variation in soft iron, on much the same principal as Marconi's M.D. Gardner's tuned telephones have, as a diaphragm, a reed tuned to a certain frequency of oscillation, and which will therefore respond to that frequency more readily than any other, in the same manner as the reeds of a frequency meter.
- Receiving circuits.** Several methods for cutting out interference, and which the inventors claimed to be infallible, were patented. Most of them depend upon the ordinary principles of tuning (one inventor claims even these as original), and many of them infringe one another.

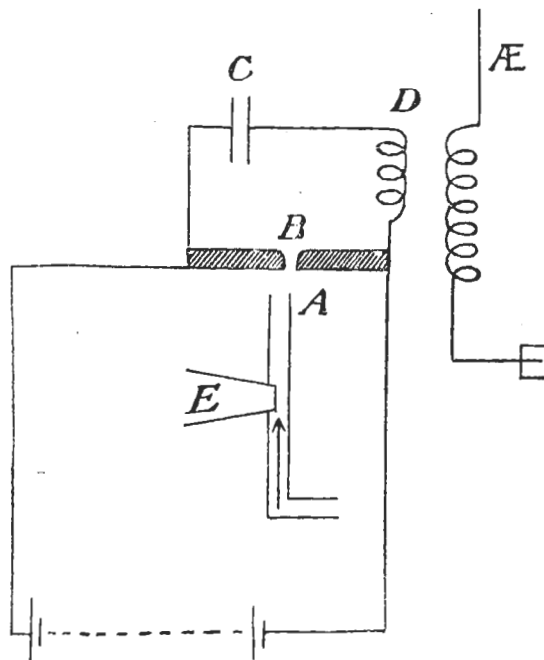


A direct current arc is shunted by a capacity A, in series with an inductance B, in the same manner as Poulsen's method.

The inductance B forms the secondary of some form of transformer, the primary C of which is connected to battery D and microphone E.

The aerial and earth are either connected to the two sides of the arc, or to a second oscillatory circuit across the arc as shown in the figure.

(2)

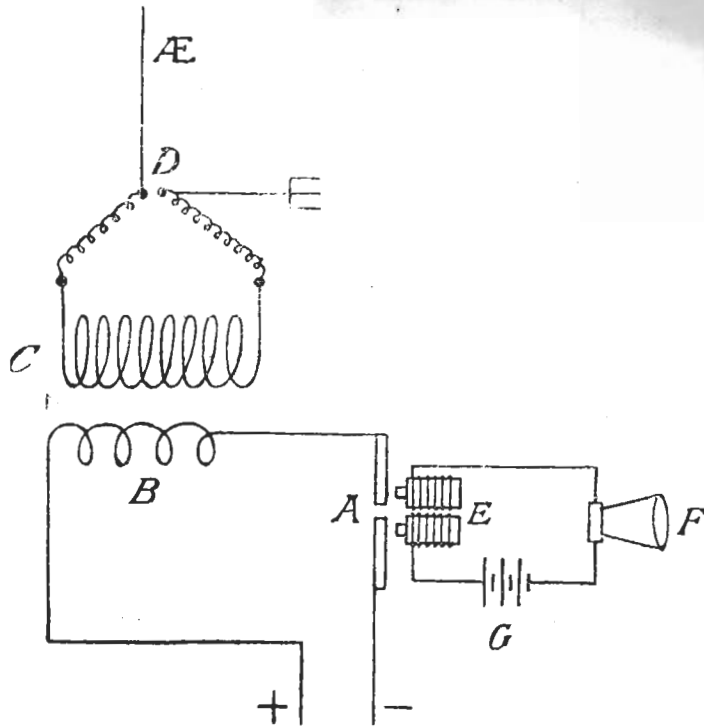


A gas jet A is made to play upon a direct current arc B, shunted by a capacity C in series with an inductance D. The gas jet is varied by the membrane of a microphone E. The inductance D forms the primary of an oscillator, to the secondary of which the aerial and earth are connected.

(3) Using an ordinary W.T. transmitting circuit, with an alternator having a frequency of 750 cycles or more, and placing some form of microphone in the earth lead.

(4) Replacing the make-and-break of an induction coil by some form of microphone.

FIG. (5).



(5) An arc A is placed in series with the primary B of an induction coil, the secondary C of which is connected to the spark gap D of a plain aerial system, or to some other form of oscillatory circuit.

An electro-magnet E acts upon the arc A, the current through the electro-magnet being varied by the microphone F in series with the battery G.

Miscellaneous.

Other patents include systems for transmitting handwriting, transmitting photographs, regulating clocks, signalling to railway trains, and an automatic brake actuated by Hertzian waves, for preventing collisions between railway trains.

INSTRUCTIONAL WORK.

The following numbers of officers and other ratings have been instructed in W.T. during the past year :—

<i>Officers.</i>				
Lieutenants (T) qualifying	-	-	-	24
" R.N.	-	-	-	4
Captains, R.M.A. and R.M.L.I.	-	-	-	4
Lieutenants	-	-	-	26
Sub-Lieutenant, R.N.	-	-	-	1
Warrant Officers	-	-	-	6
Total	-	-	-	65

<i>Other Ratings.</i>				
P.O. Telegraphists	-	-	-	72
Coast Guard ratings	-	-	-	7
Qualifying T.I.'s	-	-	-	73
Requalifying	-	-	-	38
Qualifying Gunners (T)	-	-	-	4
Electricians	-	-	-	17
Armourers	-	-	-	7
R.M.L.I., Sergeant 1	}	-	-	5
" Corporal 1				
" Privates 3				
Total	-	-	-	223
Grand total	-	-	-	288

As regards the P.O. telegraphists, two classes of 16 are always under instruction, a new class being received every six weeks. The course lasts 10 weeks, and, in addition to Wireless Telegraphy, includes 3 weeks' school and 1 week's electric light.

For teaching signalling procedure a buzzer circuit is arranged with 18 separate stations; an interfering buzzer can be introduced when desired for practising over-reading. For teaching the adjustment of receiving instruments and for measuring incoming waves, three automatic transmitting circuits, each with a different wavelength, are used; five independent sets of receiving instruments are all affected by these three waves.

For teaching tuning and wavemeter work, five Service Mark I. and one C tune Mark II. sets are used, all having dummy aerials, so that coupling measurements can be taken.

The classes are divided up into small sections, and taken out in the destroyer attached to the "Vernon" for practical work during one week of the course.

A small number of Coast Guard ratings are now included in each class, in order that the shore station operators shall receive exactly the same training as the P.O. telegraphists afloat.

The length of the course for P.O. telegraphists will be gradually increased to 12 weeks, and will then include mechanical training in addition to the other subjects.

At present it is necessary to train the men as quickly as possible, so as not to take them away from the Fleet for longer than necessary.

LIST OF FIXTURES TO BE SUPPLIED TO SHIPS AND SIGNAL STATIONS ABROAD FITTED WITH SERVICE MARK II. INSTALLATION OF W.T.

Pattern No.	Article.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
2293	Insulators, deck - -	No.	1	1	
2326	Deck fitting for - -	"	1	1	
215	Send and receive switch -	"	1	1	
216	Lever and Bowden wire -	"	1	1	
217	Control pedal and catch -	"	1	1	
2344	Circulator - - -	"	1	1	
2345	Regulating switch for -	"	1	1	
2346	Ventilating hose for -	"	1	1	
2328	Double pole single way telephone switch.	"	1	1	
2332	Arm rest - - -	"	1	1	
459	Magnetic key, Mark II., 80-volt.	"	1	—	For ships with 80-volt machine.
460	Magnetic key, Mark II., 100-volt.	"	1	—	For ships with 100-volt machine.
461	Magnetic key, Mark II., 220-volt.	"	1	1	For ships with 220-volt machine.
462	Key resistance - -	"	1	1	
	Radiator, 220 volt - -	"	1	1	For ships with 220-volt machine.
—	" 100 " - -	"	1	—	For ships with 100-volt machine.
—	" 80 " - -	"	1	—	For ships with 80-volt machine.
435	Motor alternator, 440-volt -	"	—	1	Malta (St. Angelo).
431	" " 220 " - -	"	1	—	For ships with 220-volt machine.
427	" " 100 " - -	"	1	—	For ships with 100-volt machine.
423	" " 80 " - -	"	1	—	For ships with 80-volt machine.

FIXTURES—continued.

Pattern No.	Article.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
437	Field regulator for motor, 440-volt.	No.	—	1	Malta (St. Angelo).
433	Field regulator for motor, 220-volt.	"	1	—	For ships with 220-volt machine.
429	Field regulator for motor, 100-volt.	"	1	—	For ships with 100-volt machine.
425	Field regulator for motor, 80-volt.	"	1	—	For ships with 80-volt machine.
438	Field regulator for alternator, 440-volt.	"	—	1	Malta (St. Angelo).
434	Field regulator for alternator, 220-volt.	"	1	—	For ships with 220-volt machine.
430	Field regulator for alternator, 100-volt.	"	1	—	For ships with 100-volt machine.
426	Field regulator for alternator, 80-volt.	"	1	—	For ships with 80-volt machine.
436	Starter for motor alternator, 440-volt.	"	—	1	Malta (St. Angelo).
432-	Starter for motor alternator, 220-volt.	"	1	—	For ships with 220-volt machine.
428	Starter for motor alternator, 100-volt.	"	1	—	For ships with 100-volt machine.
424	Starter for motor alternator, 80-volt.	"	1	—	For ships with 80-volt machine.
—	Balancer - - -	"	1	1	
—	Transformer, high frequency	"	1	1	
421	Safety switch for screen -	"	2	2	
422	Fittings for securing above-	Sets	1	1	
442	Switch D.P. relay, 220-volt	No.	1	1	For ships with 220-volt machine.
441	" " 100 "	"	1	—	For ships with 100-volt machine.
440	" " 80 "	"	1	—	For ships with 80-volt machine.
443	Cut-outs, D.P., for concentric cable.	"	1	1	
446	Change-over switch, D.C., 80-volt.	"	1	—	For ships with 80-volt supply.
447	Change-over switch, D.C., 100-volt.	"	—	—	For ships with 100-volt supply.
448	Change-over switch, D.C., 220-volt.	"	—	1	For ships with 220-volt supply.
—	Change-over switch, alternating current.	"	1	1	
450	Voltmeter H.W., 500-volt -	"	1	1	
451	Ammeter H.W., alternating current 0-100 ampères.	"	1	1	
452	Frequency meter, 320-380 cycles.	"	1	1	
456	Ammeter direct current, 100 ampères, 440-volt.	"	—	1	Malta (St. Angelo).
455	Ammeter direct current, 200 ampères, 220-volt.	"	1	—	For ships with 220-volt machine.
454	Ammeter direct current, 400 ampères, 100-volt.	"	1	—	For ships with 100-volt machine.
453	Ammeter direct current, 500 ampères, 80-volt.	"	1	—	For ships with 80-volt machine.
—	Coil impedance - - -	"	1	1	
—	Spark gap, Mark II. -	"	1	1	
—	Stand for - - -	"	1	1	
—	Blower - - - -	"	1	1	
—	Starter for - - -	"	1	1	
—	Condenser, tank for - -	"	1	1	
—	Kicking coils, 80 to 100-volt	"	4	—	For ships with 80-100-volt machine.
—	" " 220-volt	"	4	—	For ships with 220-volt machine.
—	" " 440-volt	"	—	4	

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FIXTURES—continued.

Pattern No.	Article.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
—	Transmission gear for adjusting spark gap, Mark II.	Sets	1	1	
—	Bolts, spring, for securing instrument on board.	No.	20	20	
2327	Aerial and earthing terminals.	"	1	1	

LIST OF PERMANENT STORES TO BE SUPPLIED TO SHIPS AND SIGNAL STATIONS
ABROAD FITTED WITH SERVICE MARK II: INSTALLATION OF WIRELESS
TELEGRAPHY APPARATUS.

Pattern No.	Species of Store.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
49 E	B. 8. Cocks, bib, for oil-tank, (d) ¾-inch.	No.	1	1	
—	Indicator, oil level - (d)	"	1	1	
—	B. 10. Drums, iron galvanised, (d) 4 gallons.	"	13	13	
306	E. 5. Clocks, deck, with (d) second hand, 8-inch face.	"	1	1	Pattern 305 will be issued in lieu until stock is exhausted.
1831	F. 1. Buzzers, terminal - (d)	"	3	3	
1784	Coils, spark, in case - (d)	"	1	1	One in addition when W.T. expert is borne.
—	Coil aerial - (d)	"	1	1	
464	Coils, protecting - (d)	"	2	2	
—	Condensers, trans- (d) mitting.	"	5	5	
2174	Condensers, telephone - (d)	"	1	1	
2282	" No. 1, Mark II. (d)	"	1	1	
2274	" No. 2, Mark II. (d)	"	1	1	
2290	" No. 3 - (d)	"	1	1	
2291	" No. 4 - (d)	"	1	1	
229	Detectors, magnetic, (d) double-wound.	"	2	2	Pattern 2067 to be issued until stock is exhausted. One in addition where W.T. expert is borne.
2340	Earthing clips - (d)	"	1	1	
—	Expansion oil tank - (d)	"	2	2	
444	Fuze holders - (d)	"	2	2	
466	Horns, protecting - (d)	Sets	1	1	
2279	Inductance, adjustable, (d) Mark II.	No.	1	1	
222	Insulators, strain - (d)	"	8	8	
2066A	Leyden jars:— Fittings for - (d)	No.	—	—	30; where W.T. expert is borne.
291	Motor alternator:— Outfit for 80-volt	Sets	2	—	For ships with 80-volt machines.
292	" 100 " -	—	2	—	For ships with 100-volt machines.

PERMANENT STORES—continued.

Pattern No.	Species of Store.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
293	Motor alternator—cont. F 1—cont. Outfit for 220-volt	—	—	—	For ships with 220-volt machines.
294	„ 440 „	—	—	2	
—	Oil pumping outfit	Sets	1	1	
463	Oscillation, primary	No.	1	1	
—	„ secondary	„	1	1	
2335	Receivers, telephone	Pairs	4	4	2 pairs in addition where W.T. expert is borne. 2 sets in addition where W.T. expert is borne.
2336	Head gear for	Sets	4	4	
—	Repair outfit	„	1	1	
221	Tension springs for aerial	No.	4	4	
465	Terminals, high voltage	„	8	8	
2181	Tuner	„	1	1	
	Transformer high frequency:— Switch for	„	1	1	
	Wavemeters:—				For Flagships only. One in addition to ships of C.-in-C. for use of W.T. expert.
2294	Box A.	„	1	1	
2295	„ B.	„	1	1	
2296	Thermo, galvanometer	„	1	1	
2297	Condenser	„	1	1	
2188	Inductances	Sets	1	1	
1056	Keys, single current P.O., Pattern B.	No.	4	3	
2065A	Key, side lever, Mark II.	„	1	1	
	F. 2.				
1223	Batteries, test, 1 cell	„	1	1	
1918	Pushes, pear-shaped	„	1	1	
	Additional stores to be supplied to shore stations:— B. 11.				
666	Turnscrews, handled, 6-inch	No.	—	1	
468	Pliers, bright, side cutting	Pairs	—	2	
1055	Bits, soldering, copper, with beech handle.	No.	—	1	
1095A	Hammers, chipping steel, not helved, 11-lb.	„	—	1	
326	Files, smooth, half round, taper, 4-inch.	„	—	2	
	E. 4.				
452	Boxes, white deal, torpedo work.	„	—	1	
	E. 12.				
1996	Mallets, heaving L.V. with handle.	„	—	1	If demanded.
1024	Mallets, serving L.V. with handle.	„	—	1	
1025	Mallets, serving L.V. with handle.	„	—	1	

LIST OF CONSUMABLE STORES TO BE SUPPLIED TO SHIPS AND SIGNAL STATIONS
ABROAD FITTED WITH SERVICE MARK II. INSTALLATION OF WIRELESS TELEGRAPHY
APPARATUS.

Pattern No.	Species of Store.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
8A	E. 2. India-rubber, vulcanised (xx) sheet, 2 ft. by 2 ft. by $\frac{1}{8}$ in.	Sheet	1	1	
42A	E. 7. Knotting - - - (x)	Galls.	*	1	*To be obtained from Carpenter, (See page 246, Gunners establish- ment.)
—	Oil, insulating, special (xx)	"	{ 80† 40†	80† 40†	†First supply. †Maintenance.
447	E. 8. Wax, paraffin - - (xx)	Lbs.	4	$\frac{1}{2}$	
7	E. 11. Brushes, painters' tool, (x) sash, No. 2.	No.	1	1	
22	Skins, chamois leather (x)	"	2	2	
981	E. 12. Cloth, emery flour - (x)	Sheets	§	6	§To be obtained from the Gunner. (See page 250, &c., Gunners establish- ment.)
982	" " " - (x)	"	§	6	
1148	Dusters, feather - - (xx)	No.	2	2	
1798	F. 1. Back contact of ham- (xx) mer.	"	1	1	
1799	Screw, adjusting - (xx)	"	1	1	
1899	Hoods, ebonite - -	"	16	16	} 16 in addition where W.T. expert is borne.
1807	Insulators, ebonite, long -	"	16	16	
2082	Felt, white, $\frac{1}{2}$ -inch thick -	Sheets	2	2	
1815	Foil, tin - - - -	Lbs.	6	6	
445	Fuze replacements:— Boxes of - - -	No.	1	1	
2066	Jars, Leyden, without fittings.	"	—	—	30 where W.T. expert is borne.
2286	Springs, spiral, for side lever, Mark II. Spark gap, Mark II.:— Spare plugs for - -	Pairs	6	6	
263	Magnetic detector:— Spare parts for -	Sets	1	1	
	(For component parts, see appendix to rate book.)				
295	Motor alternator:— Brushes, spare, for 80 volts	Sets	2	—	For ships with 80-volt machines.
296	" " 100 "	"	2	—	For ships with 100-volt machines.
297	" " 220 "	"	2	—	For ships with 220-volt machines.
298	" " 440 "	"	—	2	
468	Porcelain high tension insulators.	No.	12	12	
226	Aerial fittings (for com- ponent parts, see appendix to rate book).	Sets	1	1	
726	Cable, electric:— Unarmoured - -	Yards	12	12	
611	Unarmoured - -	"	200	200	300 yards in addition when W.T. expert is borne.

CONSUMABLE STORES SERVICE MARK II.—continued.

Pattern No.	Species of Store.	Denomination of Quantity.	Ships.	St. Angelo, Malta.	Remarks.
1972	Wire, copper :— Double cotton covered, 13 L.S.G.	Lbs.	3	3	
2007A	Aerial for Wireless Tele- graphy apparatus, 14 L.S.G.	Yards	3,000	3,000	Old wire to be returned to store as copper, old. 1,000 yards in addition where W.T. expert is borne.
2111	Bare soft 20 L.S.G. on 1-lb. reels.	Reels	2	2	
282	Condensers for wave- meters :— Containers, glass, for -	No.	1	1	If supplied with a wave- meter set.
264	Telephone receivers :— Receivers, diaphragm for.	"	8	8	
—	Blower, spare parts for (xx)	Sets	1	1	
—	Tank for condensers :— Insulators, porcelain, (xx) for terminals.	No.	4	4	
—	Insulators, internal - (xx)	"	4	4	
—	Washers, leather, large -	"	1	4	
—	" small, and (xx)	Sets	1	1	
—	" Belleville type -	"	2	2	
—	F. 2. Cells, Delafon - -	"	5	5	Pattern 2146 to be issued until stock is exhausted.
2292	Compound, Chatterton's -	Lbs.	1	1	
—	Ebonite :— Sheet, unpolished, 1 inch thick.	Square Feet	2	2	2 square feet in addition where W.T. expert is borne.
—	Sheet, unpolished, 1 foot 6 inches by 1 foot 6 inches by $\frac{1}{2}$ inch.	Sheets	2	2	
1737	Rod, 2 inches diameter, 24 inches long.	No.	2	2	2 in addition where W.T. expert is borne.
1812	Wire :— Platinum, $\frac{1}{4}$ inch dia- meter, in $\frac{1}{4}$ -oz. pieces.	Ozs.	—	—	If required to be specially demanded.
—	Additional stores to be sup- plied to shore stations :—				
—	A. 2. Sawdust, pine - - (xx)	Lbs.	—	$\frac{1}{2}$	
—	B. 7. Solder, tinman's - (xx)	"	—	1	
—	K. Oil, olive - - (x)	Pints	—	1	
81	D. 3. Fearnought, white - (x)	Yards	—	$\frac{1}{4}$	
256	E. 2. Tape, I.R., $\frac{1}{2}$ -inch, (xx) 2-oz. cylinders.	Cylinders	—	1	
248	Solution, I.R., in 3-oz. (x) collapsible tubes.	Tubes	—	2	
154	E. 6. Copper sulphate - (xx)	Lbs.	—	$\frac{1}{2}$	
48	E. 10. Tape, white, $\frac{1}{2}$ -inch wide (x)	Yards	—	60	
317A	E. 12. Helves, ash, hammer (xx) rivetting.	No.	—	1	
249	Solution, soldering, (xx) chloride of zinc (in 8-oz. bottles).	Bottles	—	2	

LIST OF PERMANENT STORES FOR DESTROYERS.

Pattern No.	Species of Store.	Denomination of Quantity.	Quantity allowed.	Remarks.
1070	B. 10. Pulleys - - - (d)	No.	4	
13	Drums, iron, galvanised, (d) 4 gallons.	"	1	
—	E. 5. Watch, with second-hand - (d)	"	1	
1831	F. 1. Buzzers, terminal - - - (d)	"	2	
238	Coil impedance for 100 volts (d)	"	1	For ships with 100-volt machines.
239	" " 80 " (d)	"	1	For ships with 80-volt machines.
283	Coil, protecting, for 1-K.W. (d) transformer.	"	1	
256	Condensers, transmitting - (d)	"	1	
257	Containers for - - - (d)	"	1	
2282	Condenser, No. 1, Mark II. - (d)	"	1	
2274	" 2 " - (d)	"	1	
2291	" 4 " - (d)	"	1	
232	Converter, rotary, 1 K.W., (d) 100-volt.	"	1	For ships with 100-volt machines.
233	Starter and field regulator - (d)	"	1	For ships with 100-volt machines.
234	Frequency meter, 95 to 100 cycles.	"	1	Box for 2 lbs.
235	Converter, rotary, 1 K.W., (d) 80-volt.	"	1	For ships with 80-volt machines.
236	Starter and field regulator (d) for.	"	1	For ships with 80-volt machines.
237	Frequency meter, 95 to 100 (d) cycles.	"	1	
2208	Detector, magnetic, Mark II. (d)	"	1	
2279	Inductance, adjustable, (d) Mark II.	"	1	
290	Inductance shunt - - - (d)	"	1	
2065A	Key, side lever, Mark II. - (d)	"	1	
1056	Keys, single current, P.O., (d) Pattern B.	"	2	
258	Oscillator and spark gap (d) combined.	"	1	
284	Send and receive switch, (d) destroyer type.	"	1	Box for 4½ lbs.
2335	Receivers, telephone - - - (d)	Pairs	2	
2336	Head gear for - - - (d)	Sets	2	
260	Transformers, 1 K.W., (d) 100-volt.	No.	1	For ships with 100-volt machines.
261	Transformers, 1 K.W., (d) 80-volt.	"	1	For ships with 80-volt machines.

CONSUMABLE STORES—continued.

—	D. 5. Signal halyards, 1½-inch - (xx)	Fathoms	122	
—	Oakum, black - - - (x)	Lbs.	6	
—	E. 7. Oil, insulating, special - (xx)	Gallons	5	
1148	E. 10. Dusters, feather - - - (xx)	No.	1	

LIST OF CONSUMABLE STORES FOR DESTROYERS.

Pattern No.	Species of Store.	Denomination of Quantity.	Quantity allowed.	Remarks.
	E 10— <i>continued</i> . Seccotine in tubes - (x)	Tubes	1	
7	E. 11. Brushes, painters' tool, sash, (x) No. 2.	No.	1	
22	Skins, chamois - (x)	"	2	
981	E. 12. Cloth, emery flour - (x)	Sheets	3	
982	" " " - (x)	"	3	
103	Handles for brooms - (x)	No.	4	
289	F 1. Spreaders for feeders - (xx)	No.	18	
276	Converter, rotary, 1-K.W. :— Brushes, spare, for - (xx)	Sets	1	
269	Condenser transmitting :— Tubes, oil expansion for - (xx)	No.	1	
1807	Insulators, ebonite, long (xx)	"	16	
1899	Hoods, ebonite - (xx)	"	16	
263	Detector, magnetic :— Spare parts for - (xx)	Sets	1	Consisting of :— Box, empty, for, 1. Primary and secondary windings, complete, 2. Tubes, glass, for primary, 6. Bands driving 2. Springs, main, 1. Key for winding, 1. Wire copper, 38 L.S.G., lbs. 4.
264	Receivers, telephone :— Receivers, diaphragm for (xx)	No.	4	
2300	Oscillator and spark gap combined :— Spark plugs for - (xx)	No.	4	
	Washers, leather - (xx)	Sets	2	
2286	Springs, spiral, for key, side lever, Mark II. (xx)	No.	2	
265	Send and receive switch :— Insulators, ebonite, switch arm (xx)	"	1	
267	Springs, steel, spare (xx)	Pairs	1	
268	" phosphor bronze (xx)	"	1	
300	Flexible steel wire (xx)	Length	1	
611	Cable, electric, unarmoured (xx)	Yards	50	
726	" " " (xx)	"	12	
2007A	Wire, copper, aerial, for W.T. 14 L.S.G. (xx)	"	600	Old wire to be returned to store as copper old.
—	F. 2. Cells, Delafon (xx)	No.	5	
2292	Compound, Chatterton's (xx)	Lbs.	1	
1803	Wire, copper, cotton-covered, 18 L.S.G. (xx)	"	1/2	