A

True Benefit to Mankind

'And he gave it for his opinion that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together.'

"Gulliver's Travels"—*Jonathan Swift, 1667-1745*

The HANDBOOK for the A.C. ENGINE

ROTARY HOES LIMITED

HORNDON, ESSEX, ENGLAND

Phone :- HORNDON 361. Cables :- ROTOVATE, BRENTWOOD

SPECIFICATION

ENGINE : Single cylinder, side valve, 4-stroke.

CAPACITY : 163.3 c.c.

BORE & STROKE : 57 m.m. 64 m.m. stroke.

ENGINE SPEED : 2200/2400.

H.P. : $2\frac{1}{8}$.

FUEL TANK CAPACITY : $\frac{1}{2}$ Gall.

OILING : Splash feed from sump.

MAGNETO : Flywheel type (WICO).

SPARKING PLUG : 14 m.m.

CARBURETTOR : AMAL.

STARTING THE A.C. ENGINE

1. Make sure that the oil is up to the level mark on the dipstick. Overfilling can be countered by removing the ¼" drain plug in the sump and draining off the surplus oil.

2. **Turn the choke to the closed position (lever vertical) to ensure a rich mixture.**

3. Turn on the petrol. Flood the carburettor. Then make sure that both the rotor and the travel gears are in neutral.

4. **Open the throttle full. The engine is now ready for starting.**

5. **Start the engine by placing the knotted end of the rope in the notch provided, winding the rope round the starter pulley in a anti-clockwise direction and giving a brisk pull—sufficiently brisk to take the rope clear of the starting pulley.**

6. **When the engine has started, open the choke. This ensures the correct mixture for normal running. (If the engine has been running already and is warm, it can be started again without re-adjustment of the choke.)**

7. When the throttle is closed the engine should tick over steadily. Any necessary adjustment can be made on the carburettor by the air adjusting screw and the main jet needle. When the throttle is opened, the governor takes control of the engine and maintains 2,500 r.p.m. This governor is set correctly before the engine leaves the works and should not be interfered with.

   On no account should the governor arm have its position relative to the governor spindle altered. Rotary Hoes Ltd. can accept no responsibility for breakdowns which are proved beyond doubt to be due to interference with the governor.

8. If the engine runs unsteadily, surges, or fails to maintain an even note, a slight adjustment either way of the main jet on the base of the carburettor should be sufficient to correct this.

FAILURE TO START

9. If the engine will not start after a reasonable number of attempts have been made, find out whether this is due to :

   (*a*) lack of compression, or

   (*b*) inadequate fuel supply, or

   (*c*) faulty ignition.

10. **COMPRESSION**—When starting, this can be felt by resistance to the turning over of the engine. Lack of compression can be due to a number of causes and is most likely to occur after the engine has done a lot of hard work Among the possible causes of lack of compression are : weak valve springs ; valves jammed open or burnt ; valve clearance incorrect ; broken piston rings ; badly worn piston rings or cylinder bore.

11. **FUEL SUPPLY**—Is the petrol turned off ? Is there an air lock in the feed pipe ? Is there water in the petrol ? Is the throttle open too wide ?

12. **IGNITION**—To check the ignition, first remove the plug and lay it on a metal part of the engine with the lead attached. Then rotate the engine with the rope and observe whether a spark is visible at the points. If the ignition is faulty, try a new plug or check that a spark occurs at the end of the ignition cable when this is held an eighth of an inch away from the metal part of the engine. Check also that there is not a perished or broken H.T. lead. Check the contact breaker points (.02") and plug points (.02"). Check the contact breaker and make sure that it is opening and closing properly.

DECARBONISING THE ENGINE

13. Decarbonising will only be necessary after at least 400 hours' running and ideally should be left to the service agent. If this is impossible, the owner himself can decarbonise the engine in the following manner :

14. Remove the cylinder cowling. Remove the cylinder head bolts and sparking plug. Lift off the cylinder head. Turn the engine until the piston is at the top of the stroke, then remove the carbon deposit with a blunt knife.

15. Next remove the valves. Compress the valve springs with a suitable valve spring compressor and remove the split taper cotters. The valves can then be withdrawn through the top.

16. Clean the valve heads and valve pockets. Grind the valves to their seats with FINE grinding paste with an oscillating rotary action. Any burnt or deeply-pitted valves should be replaced by new valves.

17. Remove all trace of grinding paste and re-assemble. Clean the cylinder head face. Clean the copper gasket and replace. When tightening up the cylinder head bolts, tighten each bolt an equal amount until all are completely tight. Check the tappet clearance with the feelers provided. (Inlet : .004" Exhaust : .006").

18. **VALVE TIMING**—If the engine is dismantled, the valve timing can be reset by aligning the centre pop marks on the timing gear and cam wheel.

19. **IGNITION TIMING**—If the ignition armature plate has been removed replace this plate and fix it in position with two slotted set screws. This plate, it should be noted, will fit only in the correct position. Set the piston $\frac{5}{32}$" before the top of the stroke, then rotate the armature plate until the contact breaker points are just opening. Then tighten the two slotted set screws and replace the flywheel fan.

20. **BURGESS OIL-WASHED AIR CLEANER**—Remove the base and thoroughly clean off all dirt and any foreign matter on the bottom screens of the element. Fill the base with engine oil to just below the three holes on the inner flange.

LUBRICATION

21. The oil filler cap is on the right-hand side of the engine. The following grades of oil are recommended :

UNITED KINGDOM

Summer : S.A.E. 40.
Winter : S.A.E. 30.

OVERSEAS

90°F. and over S.A.E. 50.
32°F. to 90°F. S.A.E. 40.
10°F. to 32°F. S.A.E. 30.

Recommended sparking plugs :

14 m.m. Champion Short Reach L.10.

14 m.m. Lodge H.14.

20. **BURGESS OIL-WASHED AIR CLEANER**—Remove the base and thoroughly clean off all dirt and any foreign matter on the bottom screens of the element. Fill the base with engine oil to just below the three holes on the inner flange.

N.B.—The air cleaner cap has two positions: (i) the "rich mixture" position in which the cap is right down restricting the air passage; (ii) the "normal mixture" position in which the cap is up. Care must be taken not to confuse either of these positions with that in which the stud is riding in the groove only, i.e. in such a way that the cap can be lifted off.

from Publication No. G-R/AC. April, 1951

LIST OF PARTS

for the A.C. Engine

When ordering parts it is necessary to quote the number of the engine. This number will be found on the side of the Crank Case. We cannot guarantee that correct replacements will be supplied unless this number is quoted.

CRANKCASE AND CYLINDER

ILLUST. No.	PART No.	DESCRIPTION	NUMBER OFF
1	A.C.129	Cylinder head bolts (long)	2
2		Spring washer, $\frac{1}{4}$" dia.	2
3		Nut, $\frac{1}{4}$" B.S.F.	2
4	A.C.133	Cylinder head bolts (Short)	4
5		Washers, $\frac{5}{16}$" plain	6
6	A.C.121	Cylinder Head	1
7	A.C.108	Gasket	1
8	A.C.70	Crankcase	1
8A	A.C.79	Valve cover stud	1
9	A.C.144	Oil filler cap	1
10	A.C.104	Fibre washer	1
11	A.C.58	Dipstick	1
12	B.J.8390	Plug (breather)	1
13	G.1394	Fibre washer (breather)	1
14	B.J.8420	Spring (breather)	1
15	B.J.8411	Ball (breather)	1
16	B.J.8380	Body (breather)	1
17	B.J.8400	Tube (breather)	1
18	G.1396	Fibre washer (breather)	2
19	A.C.33	Base plate gasket	1
20	A.C.217	Base plate assembly comprising :	
	A.C.2	Base plate	1
	A.C.3	Dipper trough	1
	A.C.75	Rivet, $\frac{3}{16}$" dia. × $\frac{3}{8}$" R.Hd. copper ...	2
21		Drain plug setscrew, $\frac{1}{4}$" B.S.F. × $\frac{1}{2}$" long	1
22	A.C.102	Washer, $\frac{1}{4}$" dia. plain (aluminium) ...	1
23		Spring washer, $\frac{1}{4}$" dia.	6
24		Setscrew, $\frac{1}{4}$" B.S.F. × $\frac{5}{8}$" long ...	6
25	A.C.72	Gasket (end plate)	1
26	A.C.120	End plate	1
27	A.C.74	Dowel	2
28		Spring washer, $\frac{1}{4}$" dia.	4
		Shakeproof washer $\frac{1}{4}$" dia.	2
29		Setscrew, $\frac{1}{4}$" B.S.F. × $1\frac{1}{4}$" long ...	6

DIAGRAM 1

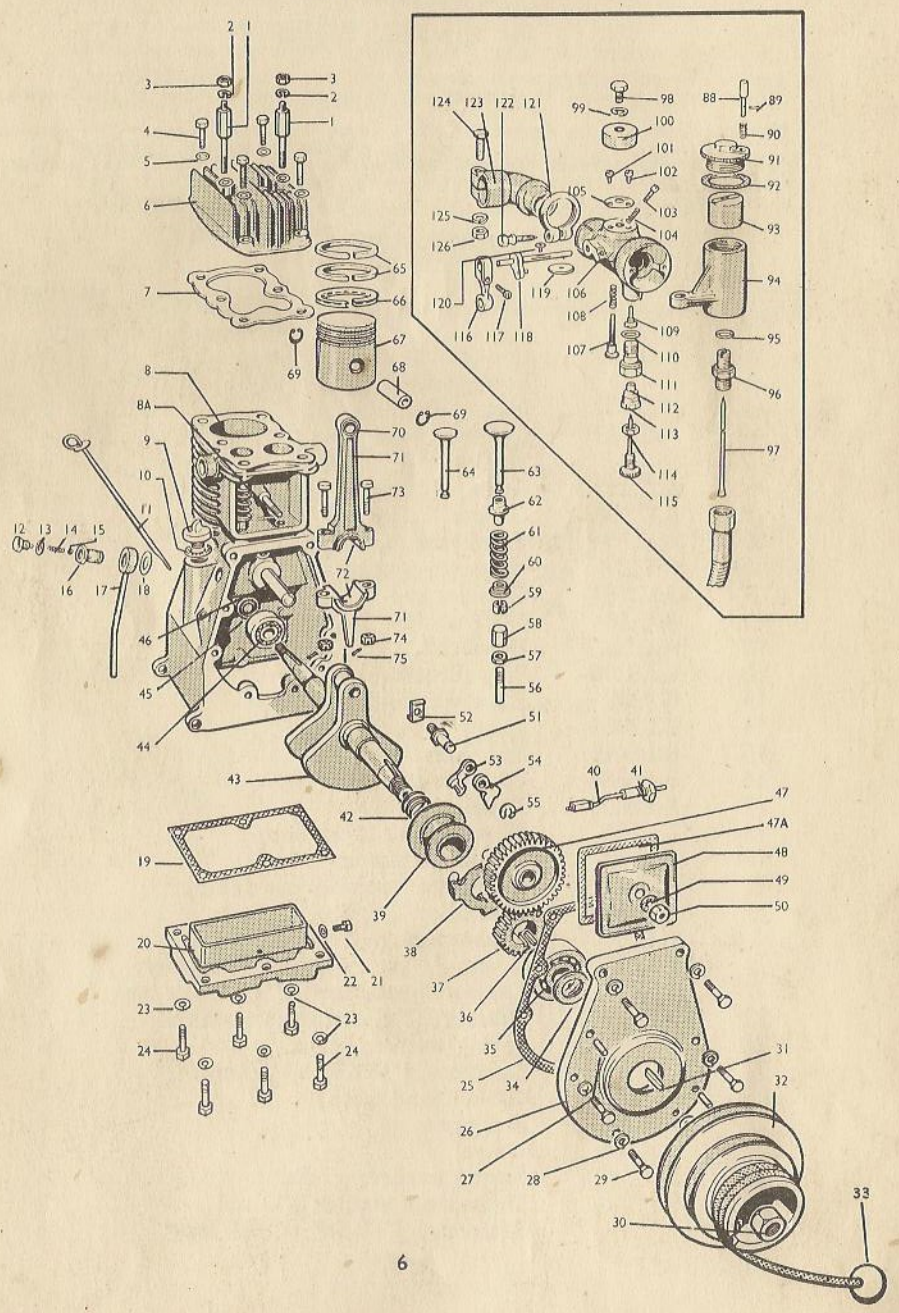
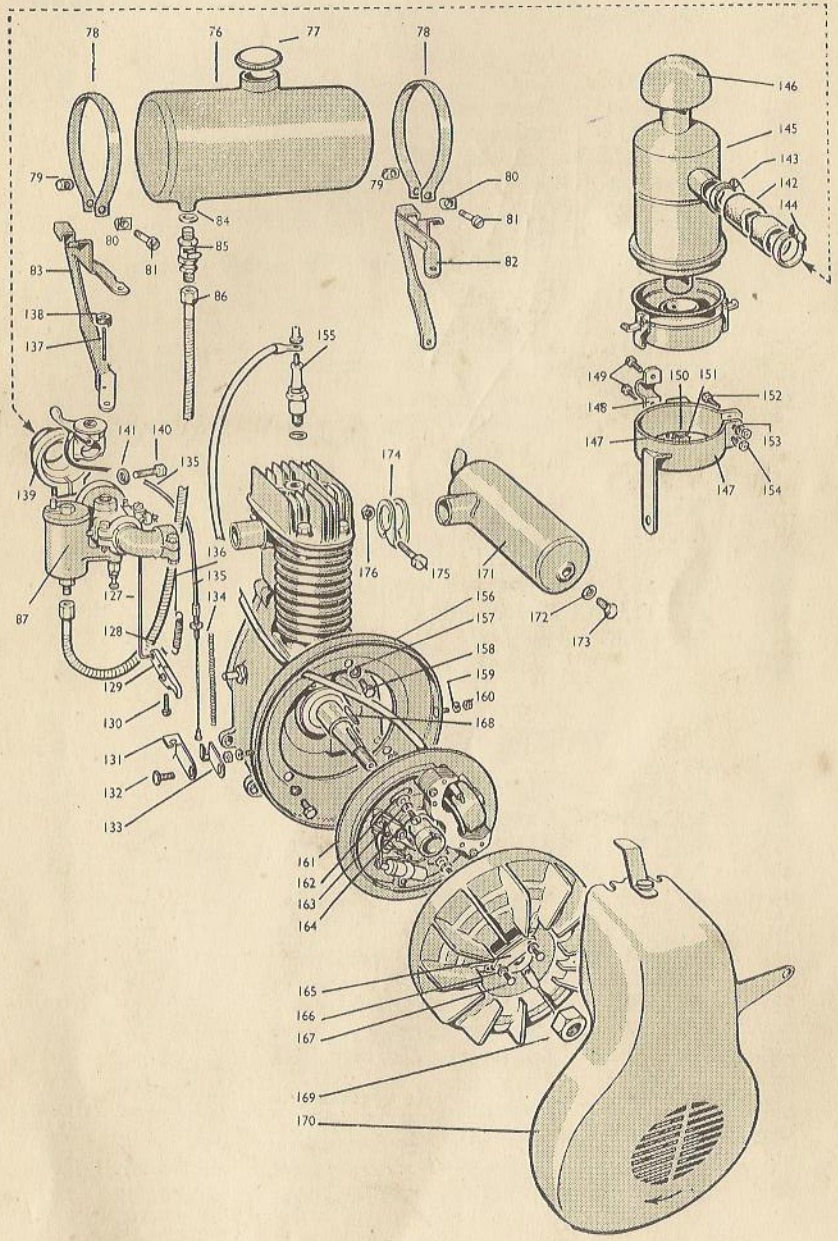


DIAGRAM 2



CRANKSHAFT

ILLUST. No.	PART No.	DESCRIPTION	NUMBER OFF
30		Nut, $\frac{5}{8}$" B.S.F.	1
31	A.C.230	Key	1
32	A.C.915	Drive pulley	1
33	A.C.190	Starter cord (with knob)	1
34		Oil Seal, $1\frac{1}{2}$" O.D. × $\frac{7}{8}$" B. × $\frac{1}{4}$" W.	1
35	BRM 7/8	Ball race, $2\frac{1}{4}$" O.D. × $\frac{7}{8}$" B × $\frac{11}{16}$" W.	1
36	A.C.118	Key, $\frac{3}{16}$" × $\frac{7}{16}$" long (governor) ...	1
37	A.C.27	Timing gear	1
38	A.C.175	Governor weight assembly — comprising :	
	A.C.110	Weights	12
	A.C.111	Carrier plate	1
	A.C.119	Rivets	3
39	A.C.34	Governor sleeve	1
40	A.C.84	Governor Crank Assembly — comprising :	
	A.C.81	Crank	1
	A.C.82	Block	1
	A.C.83	Washer	3
41	A.C.85	Bush	1
42	A.C.35	Governor spring	1
43	A.C.197	Crankshaft	1
44	BRM 7/8	Ball race, $2\frac{1}{4}$" O.D. × $\frac{7}{8}$" B × $\frac{11}{16}$" W.	1
45		Oil seal, $1\frac{1}{2}$" O.D. × $\frac{7}{8}$" B × $\frac{1}{4}$" W. ...	1

VALVES AND VALVE GEAR

46	A.C.29	Timing wheel shaft	1
47	A.C.28	Timing wheel and cam	1
47A	A.C.49	Valve gear cover gasket	1
48	A.C.4	Valve gear cover	1
49	A.C.105	Fibre washer v/c to c/c	1
50		Nut, $\frac{1}{4}$" B.S.F.	1
51	A.C.234	Rocker shaft	1
52	A.C.235	Tab washer	1
53	A.C.138	Exhaust valve lever	1
54	A.C.139	Inlet valve lever	1
55		**Spring clip Terry's 1359**	1
56	A.C.10	Push rod	2
57		Locknut, $\frac{1}{4}$" B.S.F	2
58	A.C.11	Adjuster nut	2
59	A.C.9	Split cotter	2
60	A.C.52	Spring cup	2

ILLUST. No.	PART No.	DESCRIPTION	NUMBER OFF
61	A.C.109	Spring	2
62	A.C.7	Valve guides	2
63	A.C.99	Valve, inlet	1
64	A.C.6	Valve, exhaust	1

CONNECTING ROD AND PISTON

	A.C.120	Piston assembly — comprising :	
65		Piston ring (compression)	2
66		Piston ring (oil control)	1
67		Piston	1
68		Gudgeon pin	1
69		Gudgeon pin circlip	2
70	A.C.19	Small end bush	1
71	A.C.16	Con rod (2 parts)	1
72	A.C.18	Big end bush (2 halves)	1
73	A.C.17	Bolts	2
74	A.C.107	Nuts	2
75		Split pins, $\frac{1}{16}$" dia. × 1" long	2

PETROL SUPPLY

76	A.C.98	Petrol tank	1
77		Cap	1
78	A.C.134	Petrol tank band	2
79	A.C.136	Trunnion	2
80	A.C.137	Trunnion (half type)	2
81	A.C.135	Bolt	2
82	A.C.164	Tank support (left-hand)	1
83	A.C.165	Tank support (right-hand)	1
84		Fibre washer	1
85	A.C.47	Petrol cock	1
86	A.C.150	Petrol pipe	1

CARBURETTOR

87	A.C.149	Carburettor 124/150 — comprising :	
88	B.J.9124	Tickler	1
89	14/033	Tickler cotter	1
90	B.J.9126	Tickler spring	1
91	124/034B	Float chamber cover	1
92	59/023	Gasket	1
* 93	124/036	Float	1
* 94	124/029	Float chamber body	1
95	59/023	Washer	1
96	124/033	Needle seating	1

ILLUST. No.	PART No.	DESCRIPTION	NUMBER OFF
*97	124/031	Float needle	1
98	124/125	Jet cover pin	1
99	97/009	Grover washer	1
100	124/130	Jet cover cap	1
101	124/026	Idling jet	1
102	124/026	Pilot jet	1
103	124/156	Throttle adjusting screw	1
104	124/155	Spring	1
105	124/123	Phibroid washer	1
106	124/151	Mixing chamber	1
107	124/016	Air adjusting screw	1
108	124/015	Air adjusting screw spring	1
109	124/152	Defuser tube	1
110	124/022	**Gland washer**	1
111	124/062	Adjusting main jet body	1
112	124/021	Cork	1
113	124/035	Securing screw	1
114	124/063	Locknut (for adjusting main jet) ...	1
115	124/020	Adjusting main jet needle (complete)	1
116	124/154	Throttle lever	1
117	124/013	Throttle lever clip screw	1
118	124/140	Throttle spindle and stop (complete)	1
119	124/007	Throttle valve	1
120	124/008	Throttle valve screw	1
121	4/207	Outlet clip	1
122	B.J.9115	Outlet clip pin	1
123	A.C.158	Carburettor bend	1
124		Setscrew, $\frac{1}{2}$" B.S.F. × $1\frac{1}{4}$" long ...	1
125		Spring washer, $\frac{1}{4}$" dia.	1
126		Nut, $\frac{1}{4}$" B.S.F.	1

* **Note.**—Later machines have been fitted with a modified type of carburettor, type 333/1 as listed below.

FLOAT CHAMBER ASSEMBLY — NEW TYPE

124/157	Float chamber body	1
124/036	Float	1
124/031	Float needle	1
52/062	Union nut	1
52/063	Union nipple	1
124/037	Float tube	1
124/033	Needle seating	1
124/032	Float bow	1
352/220	Float chamber cover	1

ILLUST. No.	PART No.	DESCRIPTION	NUMBER OFF
	352/232	Tickler stem	1
	352/203	Tickler head	1
	352/204	Tickler bush	1
	352/207	Tickler spring screw	1
	352/209	Floatchamber cover fixing screw ...	2
	352/208	Tickler screw	1
	352/233	Tickler complete	
	352/339	Cover complete	
	59/023	Seating washer	1

THROTTLE CONTROL

127	A.C.147	Coupling rod	1
128		Split pin, $\frac{1}{16}$" dia. × $\frac{1}{2}$" long	2
129	A.C.126	Governor control lever	1
130	A.C.145	Screw	1
131	A.C.167	Idling lever	1
132	A.C.168	Screw	1
133	A.C.166	Idling bracket	1
134	A.C.170	Cable spring	1
135	A.C.169	Cable (complete)	1
136	A.C.146	Control lever spring	1
137	A.C.163	Spring hook	1
138	A.C.172	Adjusting nut	1

AIR CLEANER

139	A.C.211	Air cleaner adaptor	1
140		Setscrew, $\frac{1}{4}$" B.S.W. × $1\frac{1}{8}$" long ...	1
141		Spring washer, $\frac{1}{4}$" dia.	1
142	A.C.225	Hose connection	1
143	G.276	Jubilee clip, size 1	1
144	B.913	Jubilee clip, size 2A	1
145	A.C.209	Air cleaner	1
146	**A.C.193**	Air cleaner cap	1
147	A.C.212	Air cleaner bracket	1
148	A.C.212/4	" U " strap	1
149		Setscrew, $\frac{1}{4}$" B.S.F. × $\frac{1}{2}$" long ...	2
150		Spring washer, $\frac{1}{4}$" dia.	2
151		Nut, $\frac{1}{4}$" B.S.F.	2
152		Setscrew, $\frac{1}{4}$" B.S.F. × $\frac{3}{4}$" long ...	2
153		Spring washer, $\frac{1}{4}$" dia.	2
154		Nut, $\frac{1}{4}$" B.S.F.	2

MAGNETO

ILLUST. No.	PART No.	DESCRIPTION	NUMBER OFF
		Suppressor, Lucas No. 78105A ...	1
155	A.C.76	Sparking plug, 14 m.m. short reach ...	1
156	A.C.131	End plate (cowling)	1
157		Spring washer, $\frac{1}{4}$" dia.	3
158		Setscrew, $\frac{1}{4}$" B.S.F. $\times$ $\frac{1}{2}$" long ...	3
159		Spring washer, $\frac{1}{4}$" dia.	2
160		Nut, $\frac{1}{4}$" B.S.F.	2
161	A.C.23	Flywheel magneto	1
162		Washer, $\frac{1}{4}$" dia., plain	2
163		Spring washer, $\frac{1}{4}$" dia.	2
164	**A.C.112**	Setscrew special, $\frac{1}{4}$" B.S.F. $\times$ $\frac{1}{2}$" long	2
165		Flywheel inspection cover	1
166		Spring washer, $\frac{3}{16}$" dia.	2
167		Setscrew, $\frac{3}{16}$" B.S.F. $\times$ $\frac{5}{16}$" long, round head	2
168	A.C.117	Key (magneto)	1
169		Nut, $\frac{2}{16}$" B.S.F.	1
170	A.C.219	Cowl	1
171	A.C.91	Exhaust muffler	1
172		Springwasher, $\frac{1}{4}$" dia.	1
173		Setscrew, $\frac{1}{4}$" B.S.F. $\times$ $\frac{1}{2}$" long ...	1
174	A.C.92	Clip	1
175		Bolt, $\frac{5}{16}$" B.S.F. $\times$ 2" long	1
176		Nut, $\frac{5}{16}$" B.S.F.	1

Publication No. GR/AC.R Sept. 52

Printed in England