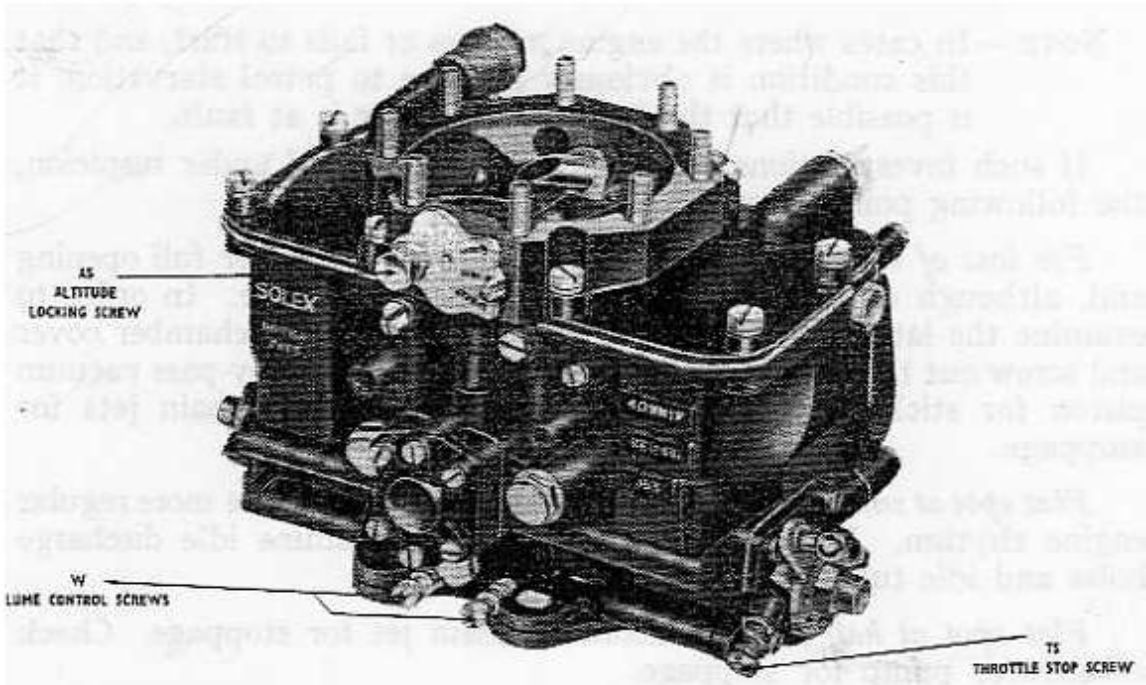

Fig. B.17.—THE "SOLEX" 40 NNIP CARBURETTER.

NOTE.—In cases where the engine misfires or fails to start, and that this condition is obviously not due to petrol starvation, it is possible that the ignition condenser is at fault.

If such investigations leave the carburetter itself under suspicion, the following points should be investigated.

For loss of maximum speed—Check throttle valve for full opening and, although unlikely, check by-pass jet for stoppage. In order to examine the latter, it is necessary to remove the float chamber cover and screw out the by-pass valve complete. Check also by-pass vacuum piston for sticking in the "UP" position. Examine main jets for stoppage.

Flat spot at small throttle opening—Adjust idling to give more regular engine rhythm. If flat spot is still evident, examine idle discharge holes and idle tube for stoppage.

Flat spot at half throttle—Examine main jet for stoppage. Check accelerator pump for stoppage.

High fuel consumption—Check jets and float level for correct setting, which should be $\frac{3}{4}$" from float cover facing. Level should be checked with the engine idling and vehicle on level ground. If setting correct, check for sticking or leaking by-pass valve, which will allow flow of fuel at part throttle to the detriment of economy. Check economiser valve for stoppage, also clean and check ball valve at base of pump cylinder, as, if not seating, petrol will issue from pump jet at all times. Check tightness of vacuum piston plug on float chamber cover.

NOTE.—Important—The external vacuum connection unions must be tight, as leakage at this point, with the consequent partial loss of vacuum, will cause the by-pass valve to open too early.

To remove, dismantle carburetter, and overhaul, see Section C.

THE "SOLEX" CARBURETTER. (40 NNIP.)

The carburetter is a twin throat down-draught model having two float chambers and floats, fed through a single common needle valve, and incorporating the following features:—

(i) Two accelerator pumps which inject extra fuel for acceleration purposes.

(ii) An economy device to provide the most economical cruising speeds.

(iii) A self starting device to allow instant starting from cold, and assist warming up.

(iv) An altitude correction device to compensate for different conditions demanded by varying altitudes, the setting being locked for permanent location with a screw.

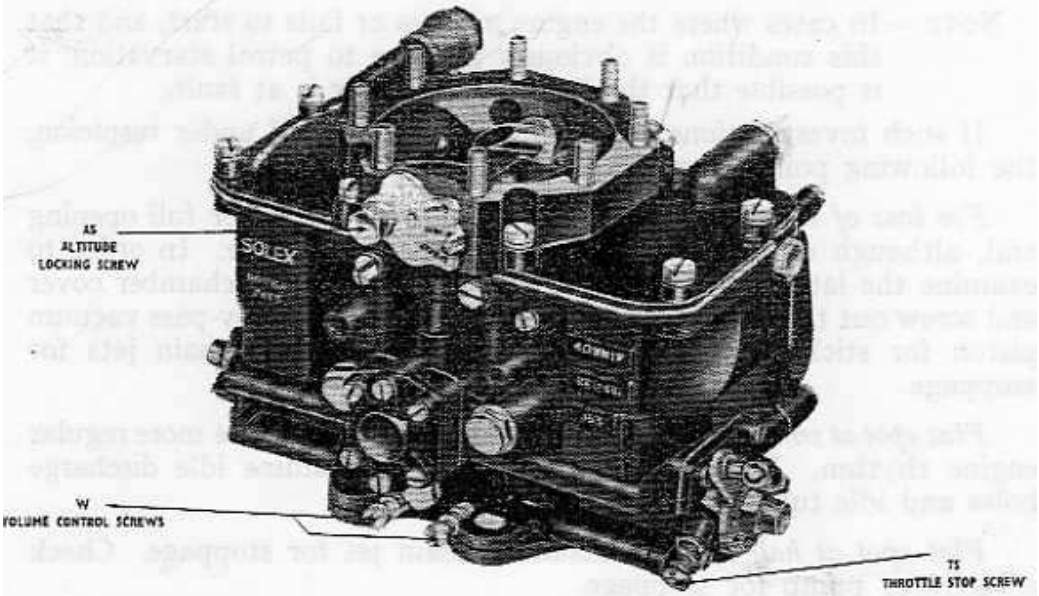

Fig. B.17.—THE "SOLEX" 40 NNIP CARBURETTER.

The fuel enters the carburetter and passes through a gauze filter to a single needle valve and so into the two float chambers, which are connected by a longitudinal passage, the venturi being arranged through the inclined tube into the centre of the air intake. This arrangement avoids flooding under all conditions of operation.

Two sets of metering elements are embodied, each set comprising a main jet metering fuel to a reserve well with an emulsion tube, a correction jet, a pilot idling jet, a pilot air bleed and a choke tube.

The mixture is automatically strengthened when required by the two accelerator pumps, or from the power jet serving both chokes.

Slow Running.

Fuel is drawn from the channel **A** (Fig. **B.18**) through the main jet **G** up to the pilot jet **g** and then emulsified. The size of the pilot orifice is governed by the screw **W**, and the mixture is corrected by the idling air jet **B**.

On opening the throttle, more fuel is drawn through the pilot circuit to provide a sufficient supply until the main spraying assembly can come into operation, while at the same time the accelerator pump comes into action and injects the necessary extra fuel for rapid acceleration.

The Accelerator Pumps.

The two accelerator pumps are connected to the accelerator pedal by levers; consequently, as the throttle is opened, the pump levers push the pump "membrane" inwards, and eject the fuel in the pump chamber through a non-return valve to the pump jets, and so into the

main air flow. The size of the pump jets controls the flow of fuel. A vent leading to the float chamber prevents fuel being drawn up except when the pump is required.

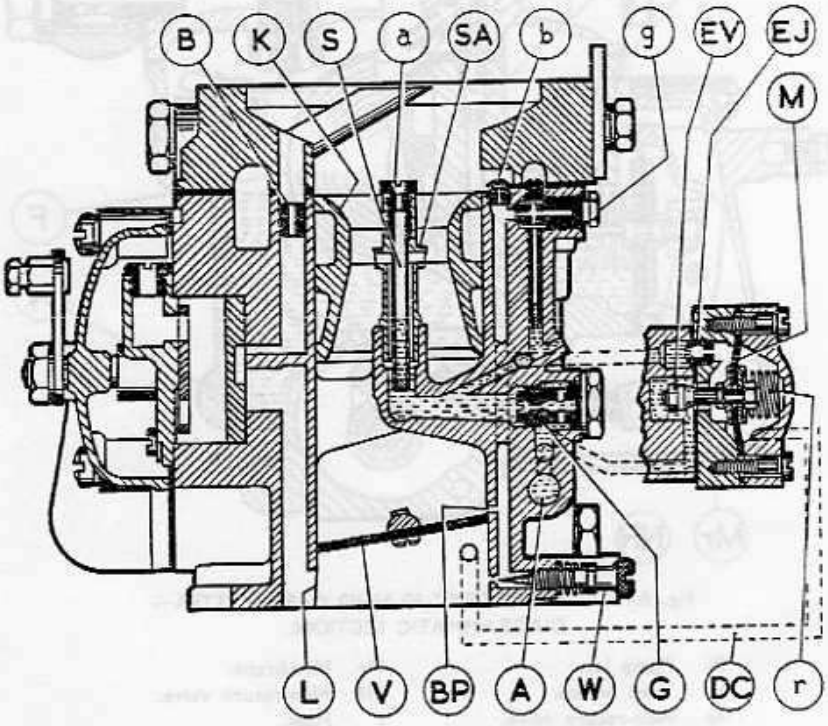

Fig. B.18.—THE "SOLEX" 40 NNIP CARBURETTER—DIAGRAMMATIC SECTION.

K	Choke tube.	G	Main jet.	L	Starter channel.
a	Correction jet.	A	Float chamber duct.	EJ	Economy jet.
S	Emulsion tube.	W	Volume control screw.	M	Membrane.
SA	Spraying assembly.	B	Idling circuit bleed.	r	Loading spring.
b	Pilot jet air bleed.	BP	By-pass.	EV	Valve head.
g	Pilot jet.	V	Butterfly.	DC	Depression channel.

Normal Cruising Speeds.

For normal cruising, the throttle is held steady with a fairly high velocity through the chokes. The depression caused draws fuel from the reserve well through the main jet and out into the air flow.

During this emulsifying, air is being drawn in through the orifices in the centre emulsion tube from the correction jet. The higher the speed, the lower the fuel falls in the well round the centre tube, uncovering more holes as the level drops. So, progressively, a weaker mixture is obtained, balanced by the main jet and the correction jet.

Full Power and Acceleration.

The economy device, which is introduced to allow the main jets to deliver the least possible fuel needed to maintain normal cruising speed, is used to assist in producing full power when required.

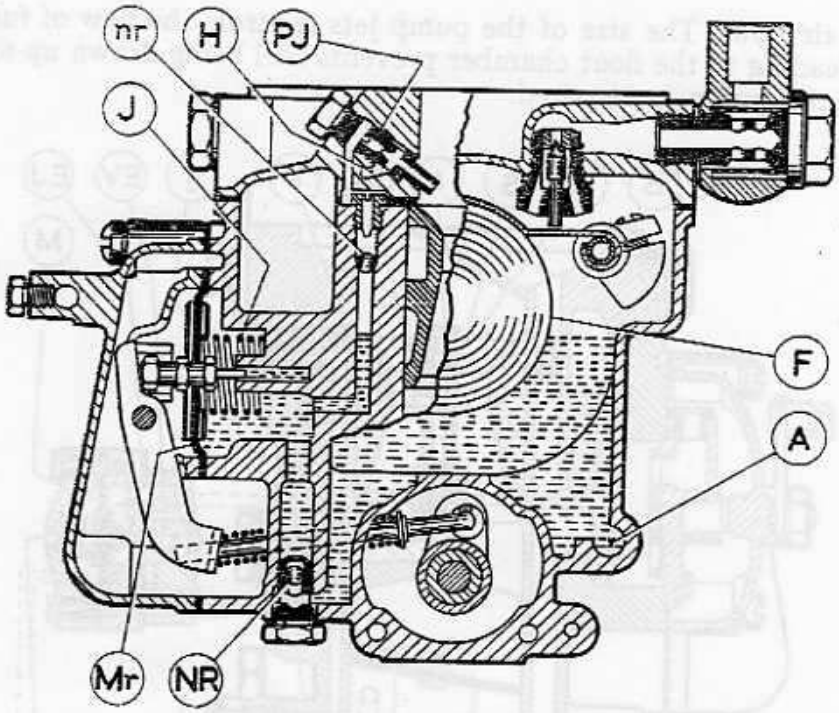

Fig. B.19.—THE "SOLEX" 40 NNIP CARBURETTER—DIAGRAMMATIC SECTION.

PJ	Pump jet.	Mr	Membrane.
H	Vent orifice.	NR	Non-return valve.
nr	Non-return valve.	F	Float.
J	Compression spring.	A	Float chamber duct.

The main jets do not supply all the fuel for acceleration after the pump has discharged the initial injection, for the economy device supplies the extra fuel required for full power.

The high depression that exists in the manifold, due to a partly closed throttle, is transmitted through a channel to the *back* of the membrane of the economy device, pulling it over against the spring, so closing the valve.

When the throttle is opened the depression is reduced, the spring expands, and fuel is drawn from the float chamber duct, passing through the economy jets into the reserve well at the base of each assembly. This supply is calibrated by the economy jet and supplements the main jet.

The Altitude Control.

The altitude control is arranged to provide compensation for atmospheric variations up to 6,000 feet; operated by means of a lever, it corrects the mixture to the required proportions of fuel to the oxygen content of the atmosphere at which the vehicle is operating.

This lever, pivoting round a locking screw, carries an eccentric pin. When this lever is rotated clockwise, the pin moves the altitude needle downwards, restricting the fuel flow to both the main and economy jets.

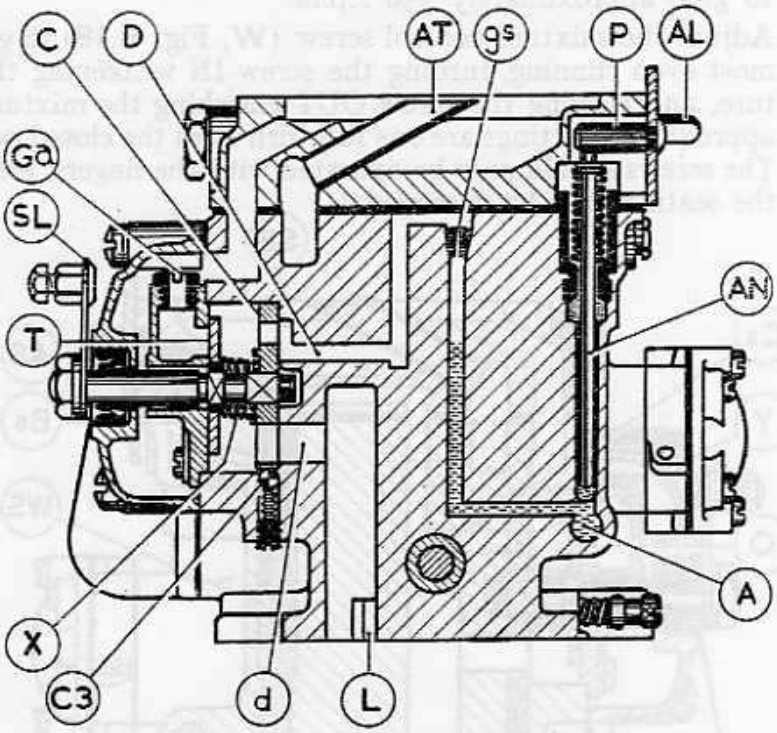

Fig. B.20.—THE "SOLEX" 40 NNIP CARBURETTER—DIAGRAMMATIC SECTION.

L	Starter channel.	SL	Starter lever.	AT	Air vent.
d	Mixture exit duct.	Ga	Starter air jet	AL	Altitude lever.
C3	Valve check ball.	C	Starter valve.	P	Eccentric pin.
X	Compression spring.	D	Starter feed duct.	AN	Altitude needle.
T	Air valve.	gs	Starter jet ("Extra Rich").	A	Float chamber duct.

Maintenance.

There is little to be done except to clean the copper filter in the fuel union to the float chambers, and periodically remove the main jets to drain away any sediment that may have collected. Finally to check that all screws are tight.

Adjustment of Controls.

There should be no necessity for any variation of the adjustments of the carburetter as fixed by the makers. Great care is taken during testing to secure the best settings, and these should not under normal circumstances be altered.

There are certain external adjustments, however, which are dealt with in the following paragraph.

Setting of Idle Adjustments.

The idling adjustments should be reset when the engine is well warmed up, adjustment being made by means of spring-loaded screws.

(i) The throttle stop screw should be adjusted, with a hot engine, to give approximately 350 r.p.m.

(ii) Adjust the mixture control screw (**W**, Fig. **B.18**) to give the most even running, turning the screw IN weakening the mixture, and turning the screw OUT enriching the mixture. The approximate settings are one full turn from the closed position. The screws should only be operated with the fingers, otherwise the seating may be damaged.

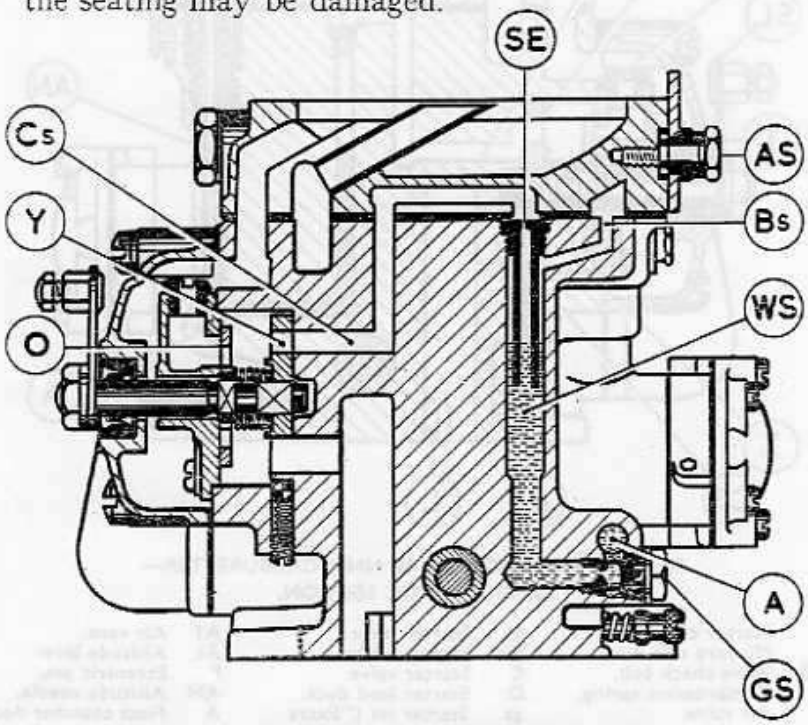

Fig. B.21.—THE "SOLEX" 40 NNIP CARBURETTER—DIAGRAMMATIC SECTION.

O	Air valve orifice.	WS	Starter reserve well.
Y	Starter valve orifice (Secondary).	Bs	Starter air bleed.
CS	Secondary feed duct.	AS	Altitude lever locking screw.
SE	Starter emulsion tube.		
GS	Starter jet ("Rich").	A	Float chamber duct.

Internal Specification:—

Type No. 40 *NNIP/S*1592		*Type No.* 40 *NNIP/S*1605	
Main Jet ...	130	Main Jet ...	130
Correction Jet	190	Correction Jet	190
Pilot Jet ...	55	Pilot Jet ...	55
Pump Jet ...	70	Pump Jet ...	70
Economy Jet...	95	Economy Jet ...	95
G.A. (Air) Jet	6 × 2	G.A. (Air) Jet ...	8 × 2 (Fixed)
G.S. (Petrol) Jet	150 (Normal)	G.S. (Petrol) Jet	180 (Normal)
G.S. (Petrol) Jet	80 (Rich Circuit)	G.S. (Petrol) Jet	120 (Rich Circuit)

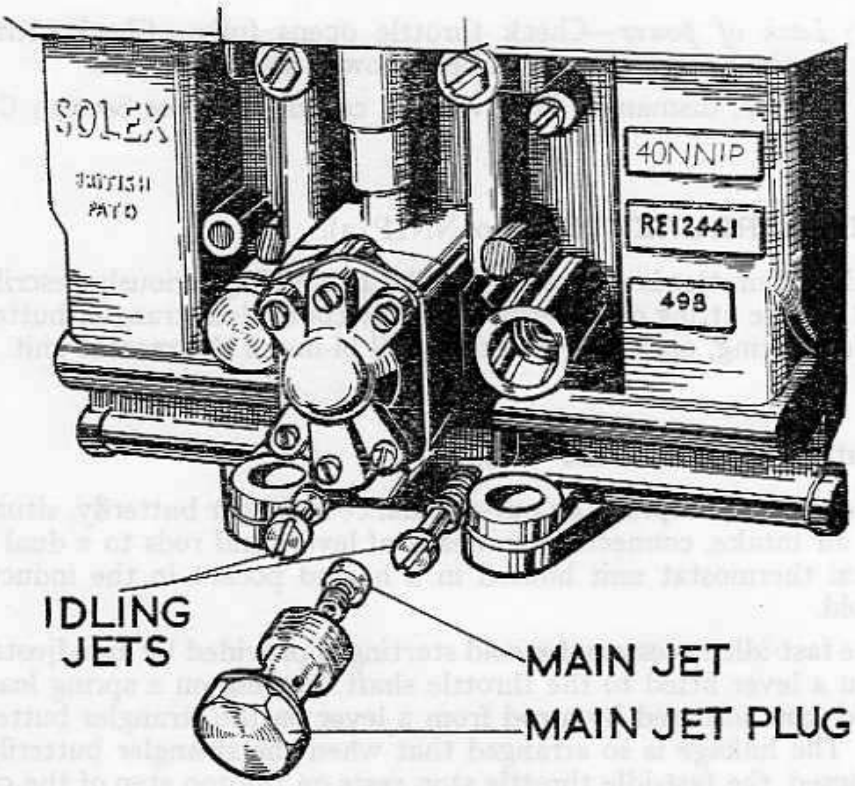

Fig. B.22.—THE "SOLEX" 40 NNIP CARBURETTER—CHANGING MAIN JETS.

Diagnosis of Faults.

In the event of faulty running or misfiring developing, a systematic investigation of possible causes should be made, e.g., the correct functioning of the ignition system, sufficient fuel in the tank, cleanliness of the fuel strainers and correct operation of the fuel pumps.

NOTE.—In cases where the engine misfires or fails to start, and that this trouble is obviously not due to petrol starvation, it is possible that the ignition condenser is at fault.

If such investigations leave the carburetter itself under suspicion, the following points should be investigated:—

(i) *Difficult starting*—Check starter jet; this being situated at almost the lowest point in the fuel system it is liable to become clogged with water or dirt.

Throttle may be opened too wide. Throttle must be in idling position.

(ii) *Poor slow running*—Check both pilot jets, re-adjust idling. Ensure that starter carburetter lever returns fully to the "off" position stop.

(iii) *Poor acceleration or flat-spots*—Check both accelerator pump jets. Check non-return ball valves below pump units, ensure that these are both clean and working freely.

(iv) *Lack of power*—Check throttle opens fully. Check altitude control correctly set. Check power and main jets.

To remove, dismantle and overhaul carburetter, see Section C.

THE "SOLEX" CARBURETTER 40 NNIP.

The carburetter is an easy model to maintain and overhaul; as previously stated, the only maintenance necessary is to periodically remove the main jets to drain any sediment that may have collected, clean the filter in the fuel feed union, and check that all screws are tight.

Dismantling.

To overhaul the carburetter in a case of necessity, disconnect and remove the unit from the engine.

(i) Remove all jets.

(ii) Remove securing screws from top cover and lift off.

Remove the hexagon-headed screws from the spindle bearings and remove floats.

(iii) Remove the altitude control cover and collect spring.

(iv) Remove the nut and lever from the air valve control, and the seven screws from the side plate over the accelerator pumps and air valve chamber.

(v) Remove and dismantle the accelerator pumps, remove the split pin from the end of the lever and the four screws from the pump cover, gently remove the diaphragm and spring.

(vi) Remove the air valve.

(vii) Unscrew the six screws securing the economy device, remove and dismantle.

Clean all jets and drilled passages in the body with compressed air. Clean out float chamber. Examine all diaphragms, and renew where necessary.

Re-assembly.

To re-assemble the Pump Assembly, refer to Fig. C.64.

(i) Check split pins **A** are in position, fit washer **C** and spring **D** over rods.

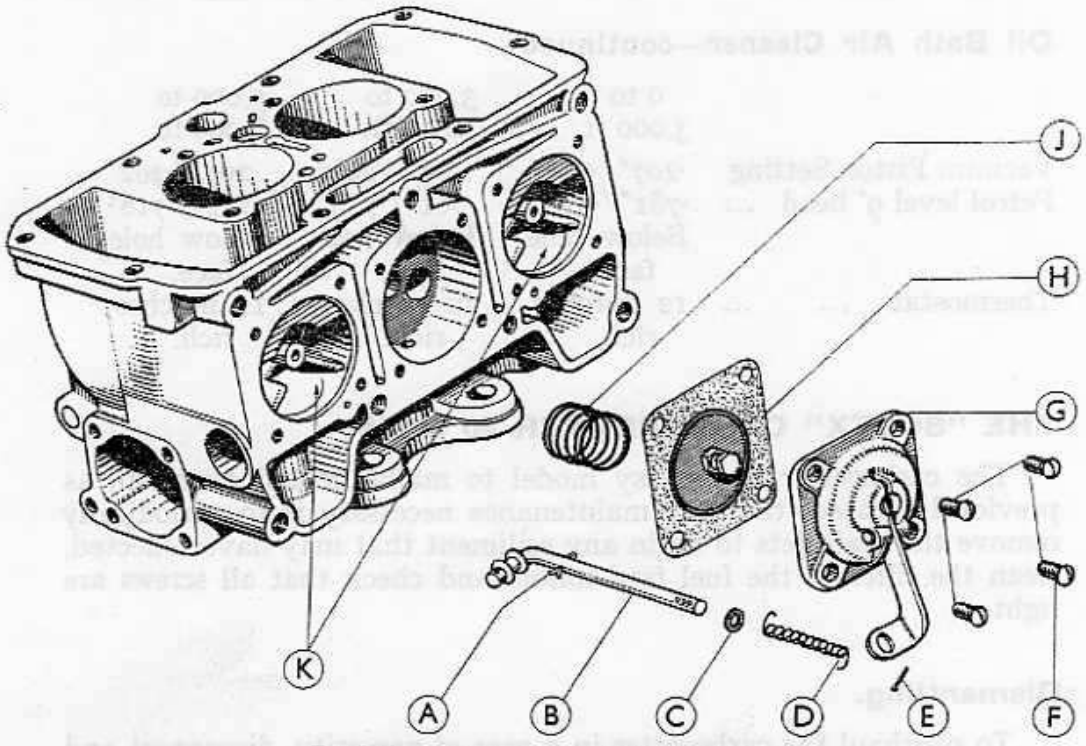

Fig. C.64.—RE-ASSEMBLING PUMP ASSEMBLY.

(ii) Replace pump springs **J** in their cavities and cover with diaphragm **H**, these diaphragms must be fitted with the domed end of their centre spindle outwards.

(iii) Replace the pump covers **G**, making sure in doing so that the elongated hole at the end of the pump cover fits over the end of the control rod **B**.

(iv) Partly screw in the four cover screws **F** and, before finally tightening, flex the diaphragm away from the carburetter body. To do this, depress the pump lever and insert a *blunt* screwdriver blade or similar piece of metal through the slot in the cover and pull the diaphragm membrane away from the body, then push the cover down by hand into position and tighten the four screws in diagonal rotation.

NOTE.—When fitting new diaphragm membranes to either of the accelerator pumps or the economy device, the greatest care must be taken to ensure that there is sufficient "slack" or movement in the centre of the diaphragm. If these are too tight, neither the pumps nor the economy device will work efficiently.

The method of obtaining the correct "slack" for the economy device, is to stretch the two membranes on the centre position of the device and place it on the bench with the screws in position. Press the membranes gently in the centre with the thumb, turn it over and press gently on the other side.

When dealing with the accelerator pumps, it is advisable that during the process of tightening the screws of the pump cover with the new diaphragm in position, the toggle should be operated several times to give the required "slack", then the screws should be removed and the membrane examined. If in order, replace cover and reconnect toggle to its lever with a new split pin.

(v) Fit the split pin **E** in the end hole, i.e., the hole farthest away from the carburetter body, the end of the control rod **B** being of course through the hole in the pump cover lever **G**.

To re-assemble the Air Valves and Starter Assembly, refer to Fig. **C.65**.

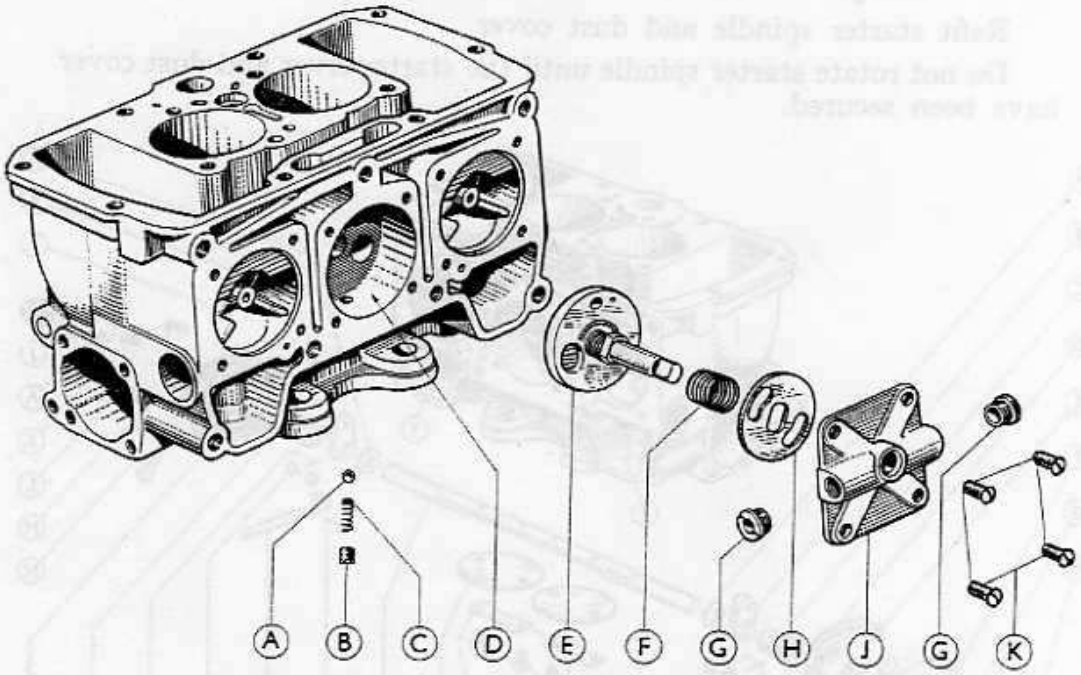

Fig. C.65.—RE-ASSEMBLING AIR VALVES AND STARTER ASSEMBLY.

(i) Place the air valve spring **F** on the assembled starter spindle **E**, holding spindle vertical in the left hand, so that end of spring registers in the recess on the top side of the valve **E**.

Take the air valve **H** and, with its finished face upwards, press it down on to the spring **F** until the flats on the spindle pass through the slots in the centre.

(ii) Holding the valve in position with the fingers of the left hand, fit the cover **J** over the threaded end of the spindle and slide down as far as it will go. Hold cover in position, releasing air valve to sit on inner flat face of cover. Hold projecting end of spindle with right hand and *check that valve* **H** *remains engaged with flats on spindle.*

(iii) Holding assembly together, insert into cavity **D** in the carburetter body, *making sure the two large orifices in the starter valve* **E** *line up with the two large holes* at the bottom of the cavity.

(iv) Rotate the cover to align the ridge for the starter jets **G** horizontal, i.e., parallel to the main throttle spindle. Secure the cover in position, tightening the screws progressively to avoid warping cover.

(v) *Do not rotate the starter spindle yet,* hold the main carburetter body upside down and drop location ball **A** into its cavity between two of the fixing bolt holes. (This ball touches the edge of the valve **E**.) Follow up with spring **C** and secure with grub screw **B**; screw in till flush with mounting face.

Refit starter spindle and dust cover.

Do not rotate starter spindle until the starter lever and dust cover have been secured.

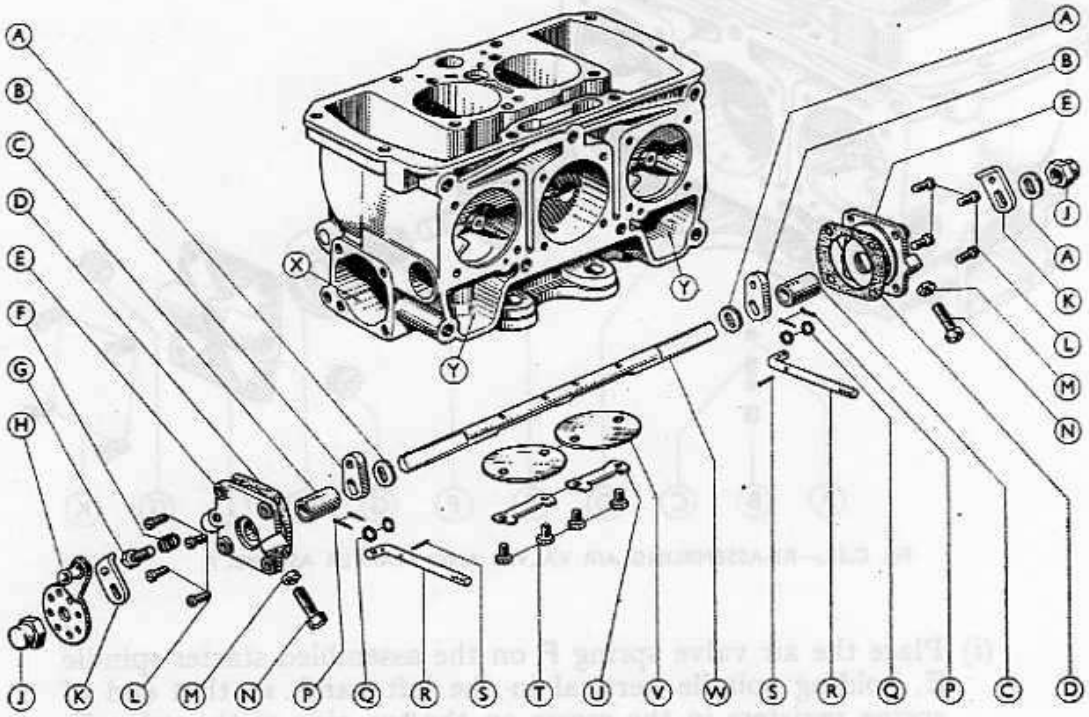

Fig. C.66.—RE-ASSEMBLING THROTTLE SPINDLE.

To re-assemble the Throttle Spindle, etc., refer to Fig. **C.66.**

(i) Insert the throttle spindle **W** into its bearings at **R** and position the two control flats downwards, i.e., towards the oval mounting flanges on the carburetter base.

(ii) Invert the carburetter and drop the butterflies **V** into position and secure loosely, using screws and tab washers (**T** and **U**).

Check that the slope of the butterflies is, with the carburetter inverted, downwards, i.e., towards the thicker web in each throttle tube.

Also check that the *bevelled edges of the butterflies are laying flat* against the walls of the throttle tube.

(iii) Without tightening screws **T**, assemble inner washers **A** and levers **B**—taking care that, *butterflies being closed*, these levers when assembled are almost vertical, with the small end pointing towards the top of the carburetter. Do not press these levers fully home until the control rods **R** have been assembled to them.

(iv) Next, assemble rods **R**, fit the split pins **S**, as shown in Fig. **C.66**. Fit the first of the split pins into the hole nearest the bend, slide the first washer **Q** on to the hook of the rod. Holding each rod in turn, with its hook pointing away from the carburetter body, insert in cavity **Y** and pass the point of the hook through the hole in the lever **B**. Fit second washer and split pin, and then press levers fully home.

(v) Next, fit the sleeves **C**, the gaskets **D**, the cover plates **E**, and the abutment plates **K** over each end of the spindle.

Add at one end the throttle lever **H**, pointing upwards, as illustrated; add washer **A** at the other end, and screw on the nuts **J** at either end.

(vi) Rotate the throttle spindle to ensure that it is not binding, and position butterflies in the throttle bores.

A check on this is, with the choke tubes removed, to look through the throttle bores against the light to check the amount of light round the butterflies, which should be a minimum.

Holding the spindle in the closed position, tighten firmly the screws **T** and lock in position.

(vii) Secure the cover plates **E**. Fit the slow running adjustment screw **G** with locking spring **F**. This is fitted in the lug on the cover nearest the screw's abutment platform when the butterflies are closed.

(viii) Fit the "full-open" stop screw **N** with locknut **M** in the other cover plate lug. Open butterflies fully and screw in **N** until its point touches the abutment on **K**. Complete the assembly by fitting the second stop screw to the other end of the assembly.

(ix) Refit the floats and secure spindle bearings.

Replace top cover.

Replace all jets.