B. & B.

MOTOR CYCLE CARBURETTERS 1924

Telegrams:
"Carburet,"
Birmingham.

Phone: 301 East
Codes: As List &
A.B.C. 5th Edition

Motor Cycle CARBURETTERS for 1924

MANUFACTURED BY

Brown & Barlow Ltd.,

Carburet Works, Witton,

Birmingham.

Terms of Business: Trade References or Cash with Order. All Goods Free on Rail, Birmingham only.

Catalogue of Car Carburetters and Float Chambers on Application,

TRADE *B & B* MARK.

1924 Season

Introduction.

We have every confidence in recommending the range of models shown in the following pages. Much progress has been made during the last year in detailed improvements and in rendering the carburetter more adaptable in fitting and more accurate in operation.

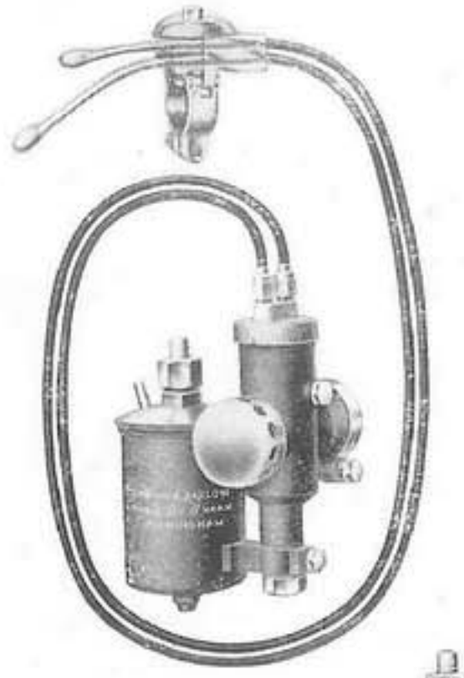
The automatic range in all cases has been considerably increased, and the compensation of the carburetter to varying speeds has been much improved. A wider range of models is now also available, which will meet practically every requirement for small motor engines of every desired size and purpose.

Our Carburetters are manufactured entirely in our own Works, and no attempt is made to cheapen the Carburetter at the expense of durability and workmanship.

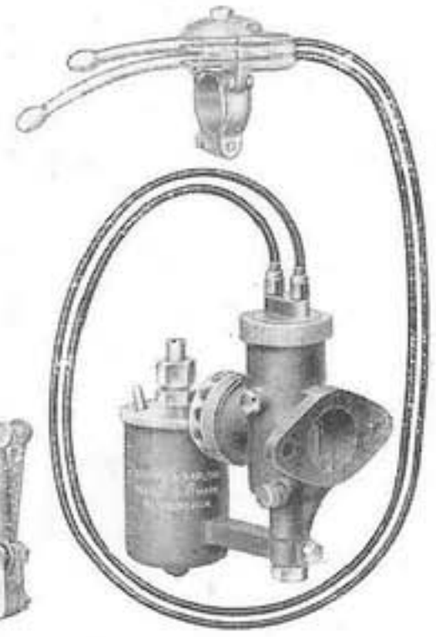
All parts are interchangeable, and our confidence in the articles we manufacture is such that we are prepared to exchange, free of charge, any part which may prove defective (with the exception of the cabling, which is not our make) at any time within twelve months if purchased through our accredited Agents. All parts should be sent to our Works carriage paid, with full particulars of the date and place of purchase, and bearing sender's name and address on the label.

TRADE *B & B* MARK.

The "B & B" Carburetters

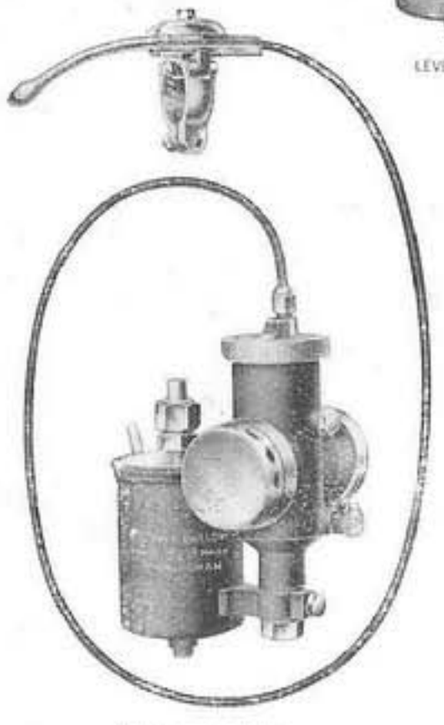


TWO-STROKE MODEL

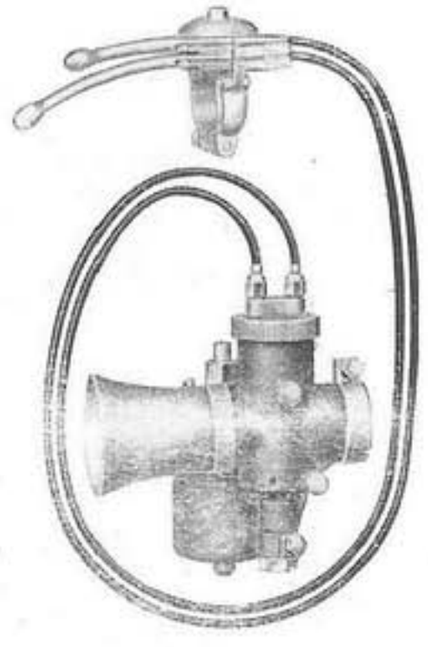


FLANGED MODEL

LEVER CONTROLLED MODEL



SINGLE LEVER MODEL

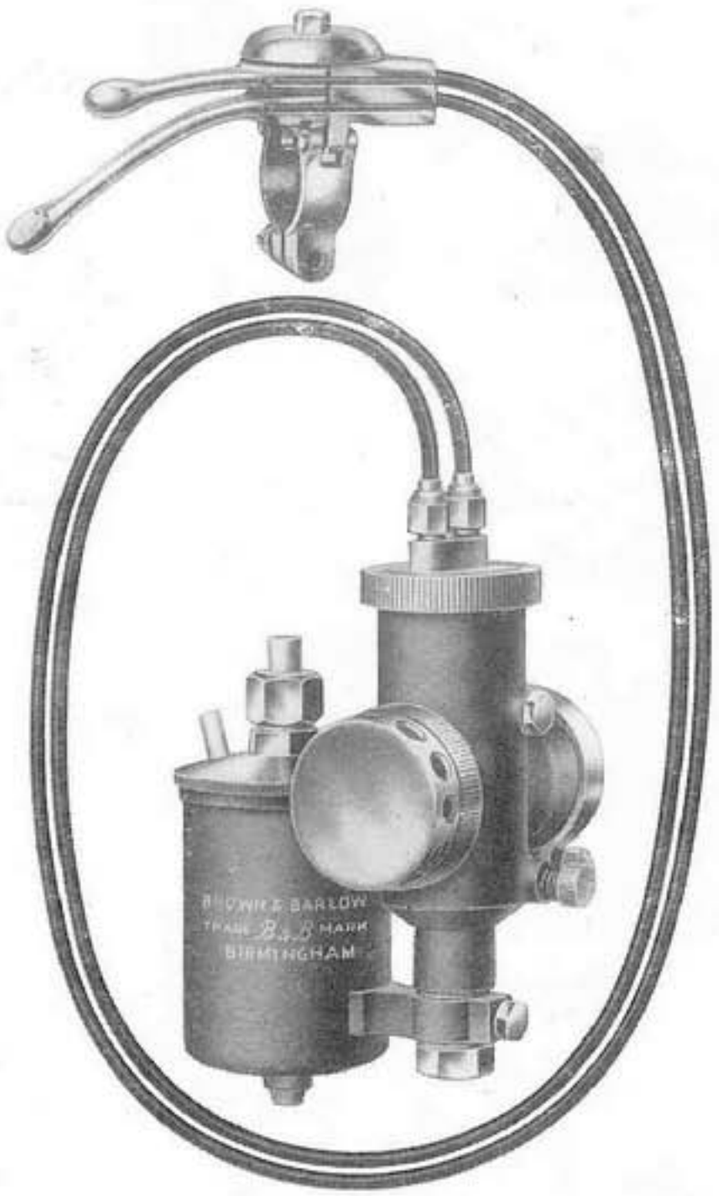


SPORTS MODEL

TRADE *B & B* MARK.

Plain Jet and Variable Jet Models

2 Lever Controls.



Can be supplied with a long platform to enable the float chamber to swing behind the Throttle. (Always supplied for twins unless otherwise ordered.)

For detailed description of Plain Jet Model, see pages 18 & 19.
For detailed description of Variable Jet Model see page 17.
For dimensions of Carburetter see page 24.

Bottom Feed Float Chambers can be supplied in lieu of top feed to order. For details of Float Chamber see pages 14 & 15.

TRADE *B & B* MARK.

Plain Jet Models

						Price with Handle-Bar Control
Type 120-1	1″ bore,	$1\frac{1}{8}$″	outlet,	pilot jet	4-stroke	.. 61/-
,, 120-2	1″ ,,	$1\frac{1}{4}$″	,,	,, ,,	4-stroke	.. 61/-
,, 121-1	.78″ ,,	1″	,,	,, ,,	4-stroke	.. 57/-
,, 121-2	.78″ ,,	$1\frac{1}{8}$″	,,	,, ,,	4-stroke	.. 57/-
,, 122-1	.78″ ,,	1″	,,	no pilot ,,	2-stroke	.. 57/-
,, 122-2	.78″ ,,	$1\frac{1}{8}$″	,,	,, ,,	2-stroke	.. 57/-
,, 123-1	.6″ ,,	1″	,,	,, ,,	2-stroke	.. 51/-

Variable Jet Models

						Price with Handle-Bar Control
Type 120-1-N	1″ bore	$1\frac{1}{8}$″	outlet,	pilot jet	4-stroke	.. 61/-
,, 120-2-N	1″ ,,	$1\frac{1}{4}$″	,,	,, ,,	4-stroke	.. 61/-
,, 121-1-N	.78″ ,,	1″	,,	,, ,,	4-stroke	.. 57/-
,, 121-2-N	.78″ ,,	$1\frac{1}{8}$″	,,	,, ,,	4-stroke	.. 57/-

If fitted with two twist grips 14/- extra.

Liners to reduce outlet from 1″ to 15/16″ or $\frac{7}{8}$″ supplied when required.

Flanged Models. Prefixing the letter "F" in front of the type number, as "F.120-1," converts all the above models to flange fitting. For particulars of the sizes of flange fittings see pages 24 and 36.

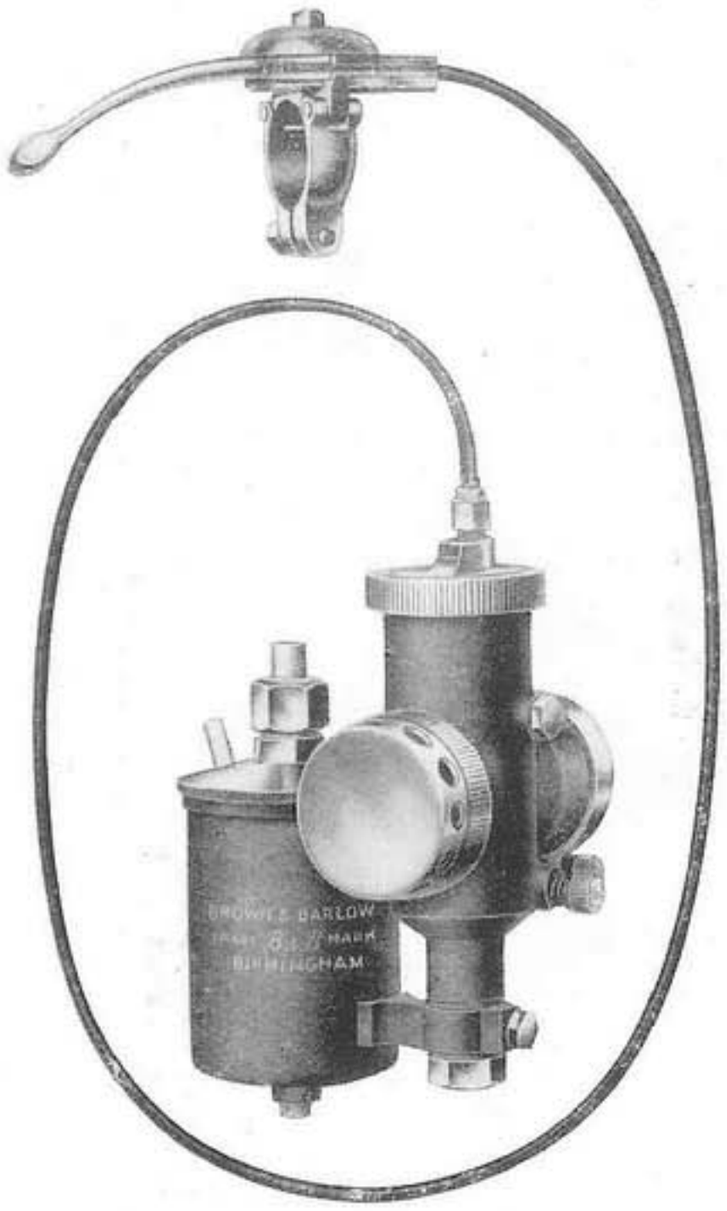
Controls supplied to fit 1″ bar, working inwards (left hand) or outwards (right hand) as desired. Reducing liners supplied when required to reduce from 1″ to $\frac{7}{8}$″.

Standard lengths of Cables for Models 120, 3′ 6″, and for Models 121, 122 and 123, 3′ 3″, or any other length as ordered. Lengths over 4′ 6″ subject to small extra charge.

TRADE *B & B* MARK.

Automatic Carburetter

1 Lever Control.



Can be supplied with a long platform to enable the float chamber to swing behind the Throttle, Always supplied for twins unless otherwise ordered.)

See detailed description of Variable Jet Model on page 17.

For dimensions of this Carburetter see page 24.

Bottom Feed Float Chambers can be supplied in lieu of top feed to order For details of Float Chamber see pages 14 and 15

TRADE *B & B* MARK.

Automatic Carburetters

								Prices with Handle-Bar Controls	
Type	120-1-S	1″	bore,	1⅛″	outlet,	pilot	jet	4-stroke	61/-
,,	120-2-S	1″	,,	1¼″	,,	,,	,,	4-stroke	61/-
,,	121-1-S	.78	,,	1″	,,	,,	,,	4-stroke	57/-
,,	121-2-S	.78″	,,	1⅛″	,,	,,	,,	4-stroke	57/-
,,	122-1-S	.78″	,,	1″	,,	no pilot	,,	2-stroke	57/-
,,	122-2-S	.78″	,,	1⅛″	,,	,,	,,	2-stroke	57/-
,,	123-1-S	.6″	,,	1″	,,	,,	,,	2-stroke	43/-

If fitted with 1 Twist Grip 7/- extra.

Liners to reduce outlet from 1″ to 15/16″ or ⅞″ supplied when required.

Flanged Models. Prefixing the letter "F" in front of the type number, as "F.120-1," converts all the above models to flange fitting. For particulars of the sizes of Flanges see pages 24 and 36.

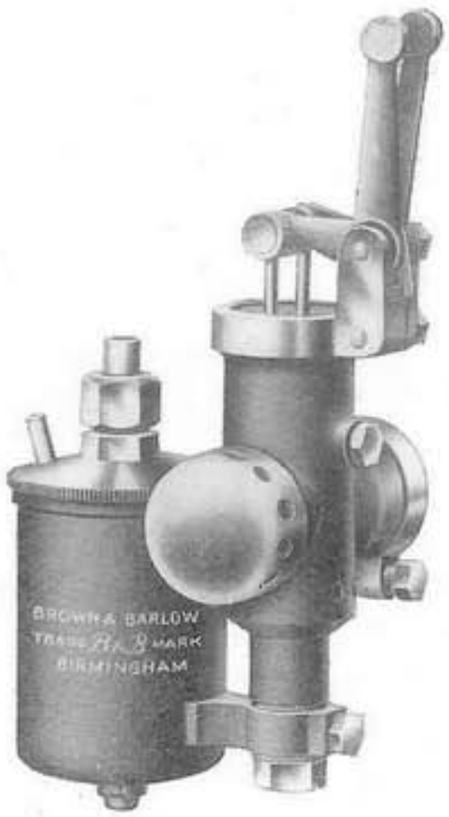
Controls supplied to fit 1″ bar, working inwards (left hand) or outwards (right hand) as desired. Reducing Liners supplied when required, to reduce from 1″ to ⅞″.

Standard lengths of Cables for Models 120, 3′ 6″, and for Models 121 and 123, 3′ 3″, or any other length as ordered. Lengths over 4′ 6″ subject to small extra charge.

TRADE *B & B* MARK.

Lever Controlled Carburetters

For Stationary Engines, Motor Boats, Etc.



Can be supplied with a long platform to enable the float chamber to swing behind the Throttle. (Always supplied for twins unless otherwise ordered.)

The construction of this model, with the exception of the actuating levers, is the same as that of the Plain Jet Model described on pages 18 and 19.

The dimensions of this Carburetter are the same as given on page 24, but the control levers are additional, and add $1\frac{3}{4}''$ to the overall length.

Bottom Feed Float Chambers can be supplied in lieu of top feed to order. For details of Float Chamber see pages 14 & 15.

TRADE *B & B* MARK.

Lever Controlled Carburetters

							Price.
Type	120-1-L	1″ bore,	$1\frac{1}{8}''$	outlet,	pilot jet	4-stroke	48/-
,,	120-2-L	1″ ,,	$1\frac{1}{4}''$	,,	,, ,,	4-stroke	48/-
,,	121-1-L	.78″ ,,	1″	,,	,, ,,	4-stroke	45/-
,,	121-2-L	.78″ ,,	$1\frac{1}{8}''$	,,	,, ,,	4-stroke	45/-
,,	122-1-L	.78″ ,,	1″	,,	no pilot ,,	2-stroke	45/-
,,	122-2-L	.78″ ,,	$1\frac{1}{8}''$	,,	,, ,,	2-stroke	45/-
,,	123-1-L	.6″ ,,	1″	,,	,, ,,	2-stroke	40/-

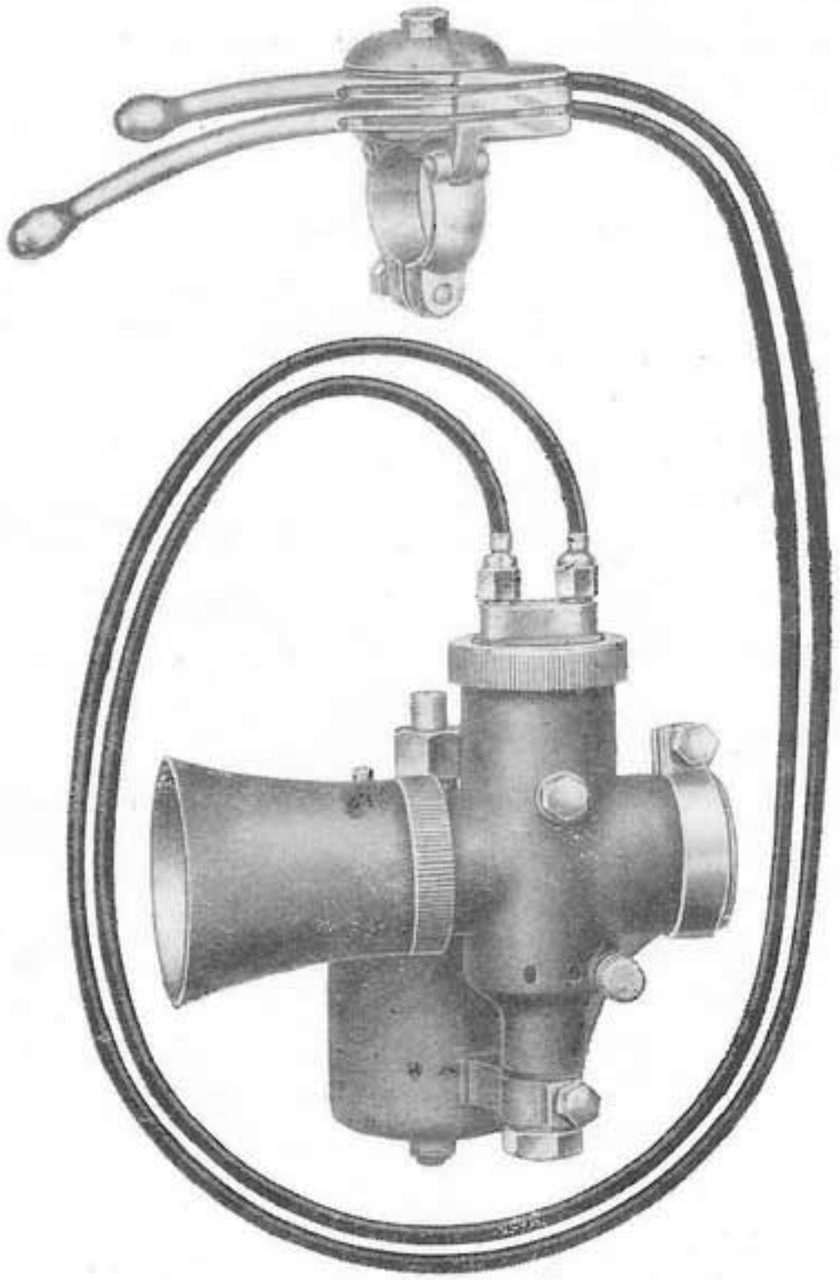
Liners to reduce outlet from 1″ to 15/16″ or $\frac{7}{8}''$ supplied if required.

Flanged Models. Prefixing the letter "F" in front of the type number, as "F.120-1-L," converts all the above models to flange fitting. For particulars of the sizes of Flanges see pages 24 and 36.

TRADE *B & B* MARK.

Sports Model Carburetter

2 Lever Control



See detailed description of Variable Jet Model, page 17.

The dimensions of this Carburetter are shown on page 24, with the exception of the Bell Mouth Extension.

Bottom Feed Float Chamber can be supplied in lieu of top feed to order. For details of Float Chamber see pages 14 and 15.

TRADE *B & B* MARK.

Sports Model Carburetter

This is a Carburetter specially made for the Sports type of machine, where speed is one of the essential factors. It is a modification of our Type 120-1-N, having the passages rounded out, and all restrictions removed from the back, giving a perfectly free throughway.

It is equally satisfactory for touring at ordinary speeds, as our standard carburetter, but giving maximum power, it consumes slightly more fuel.

Type			Price with Handle Bar Control
Sports 120-1-N.....	1″ bore	1⅛″ outlet	61/-
Sports 120-2-N.....	1″ „	1¼″ „	61/-
Sports 121-1-N.....	.78″ „	1″ „	57/-
Sports 121-2-N.....	.78″ „	1⅛″ „	57/-

If fitted with Two Twist Grips, 14/- extra.

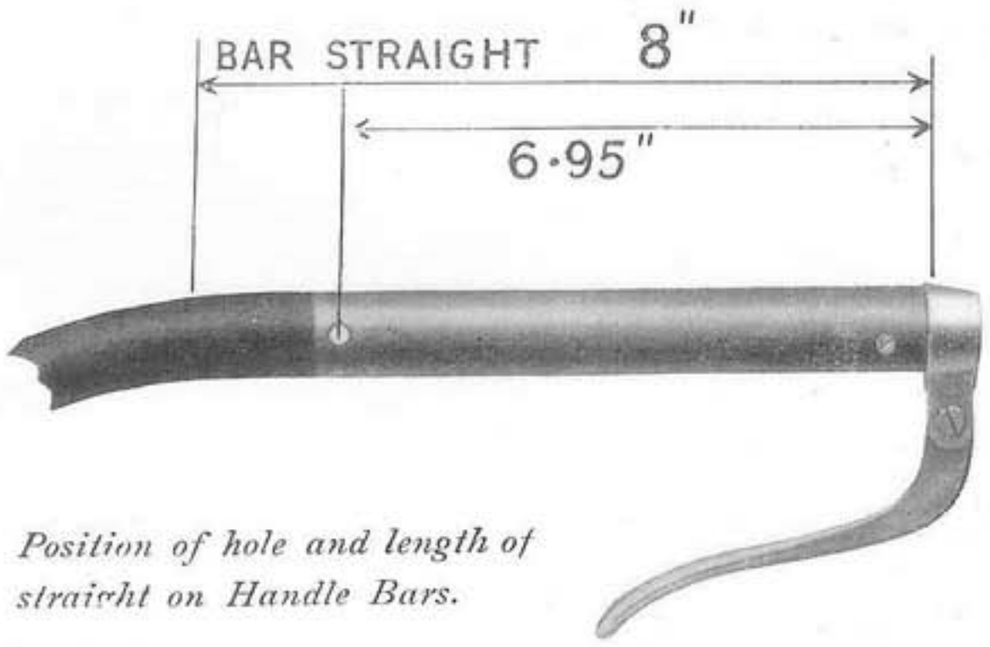
Liners to reduce outlet from 1″ to 15/16″ or ⅞″ supplied when required.

Flanged Models. Prefixing the letter "F" in front of the type number, as "F.120-1", converts all the above models to flange fitting. For particulars of the sizes of Flanges see pages 24 and 36.

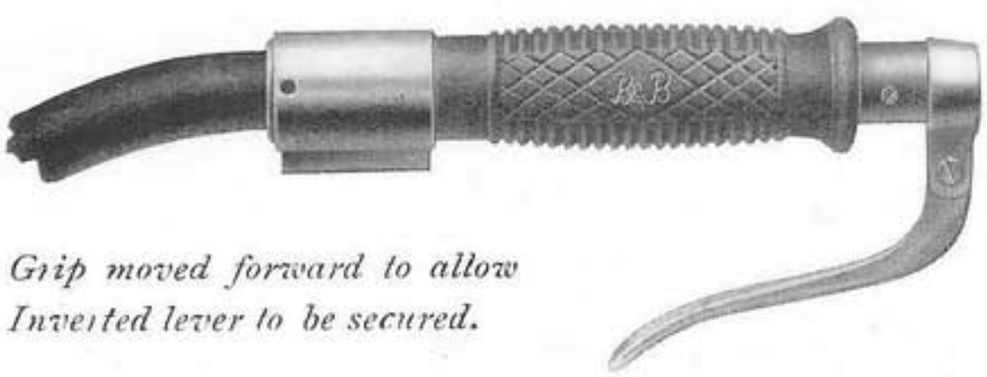
Controls supplied to fit 1″ bar, working inwards (left hand) or outwards (right hand) as desired. Reducing Liners supplied when required, to reduce from 1″ to ⅞″.

Standard lengths of Cables for Models 120, 3′ 6″, and for Models 121 and 123, 3′ 3″, or any other length as ordered. Lengths over 4′ 6″ subject to small extra charge.

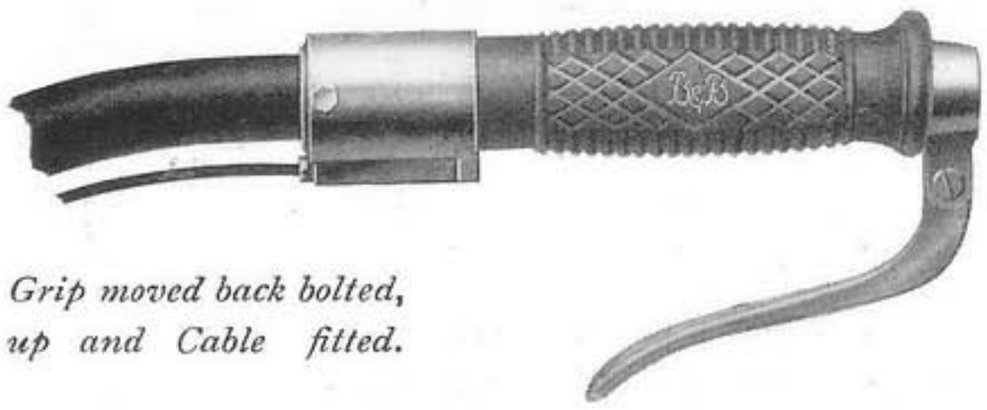
Twist Grip Control.



Position of hole and length of straight on Handle Bars.



Grip moved forward to allow Inverted lever to be secured.



Grip moved back bolted, up and Cable fitted.

Twist Grip Control.

THIS contro has been designed from the experience we have obtained since we put upon the market our first Twist Grip Control in 1922, and it has been modified to meet the demands we have had put forward from time to time. The essential features that have been kept in view in the design of this control are :—

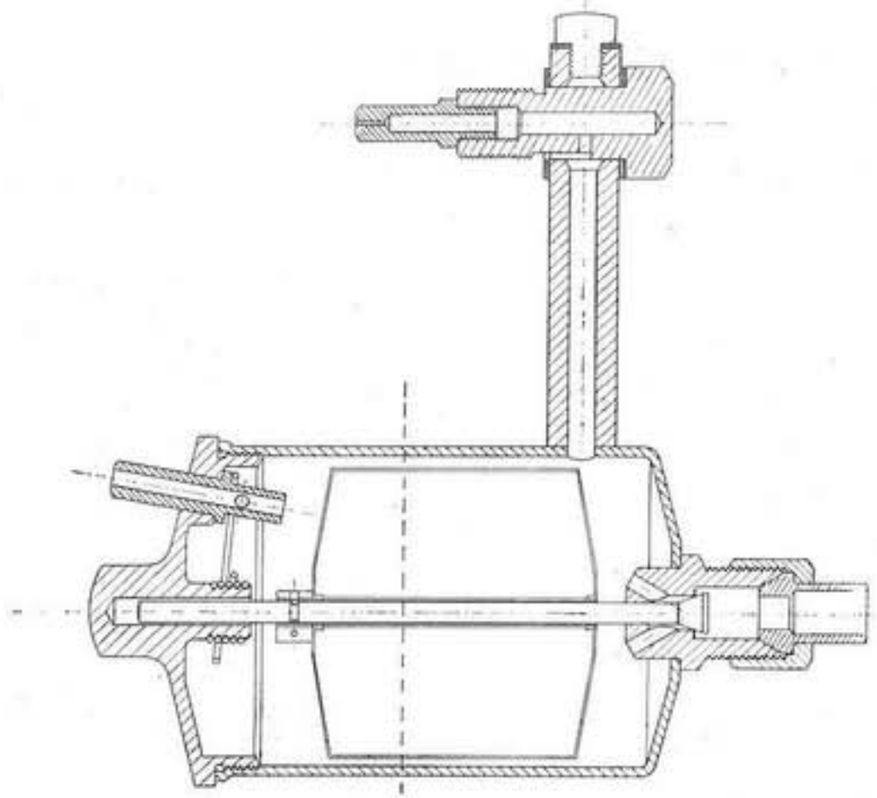
1. Absence of work entailed on the handle bar itself when fitting.
2. No disturbance necessary of the standard inverted levers as generally fitted.
3. No longitudinal movement of the grip itself—rotary action only.
4. Opened to closed position in one-third of a turn.

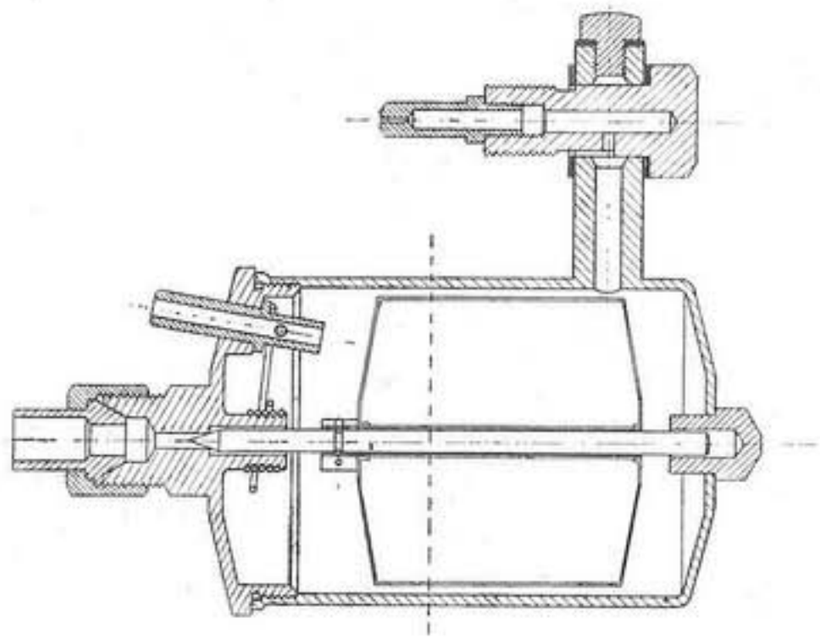
These we have incorporated in the design, and it is only necessary when fitting it that the handle bar shall be straight for a distance of approximately 8ins. from the end. Through the bar is drilled a 7/32in. hole to take a 1 B.A. pin. No other fitting operation, such as slots in the bar or things of this kind, being necessary.

The cabling is detached instantly from the control, without in any way disturbing any of the fittings, and the control is always fitted to the bar without the cable, the cable being readily attached thereto afterwards.

Referring to the illustrations, it will be seen that (1) illustrates a plain handle bar fitted with an inverted lever to which the twist grip control is to be attached. The 7/32in. hole is drilled through the bar at the distance shown from the end. The inverted lever is then removed, and the twist grip is pushed over the bar far enough to allow the screw that secures the inverted lever being screwed home, as shewn in the second illustration. The twist grip is then pulled back to the proper position and the bolt inserted through the hole previously drilled, and the whole lot bolted up together tightly, thus rendering the Twist Grip part and parcel of the handle bar. There is no possibility of any movement taking place other than that of a rotary nature. The whole assembly will be seen in the third view. These controls are supplied to fit either a 1in. or $\frac{7}{8}$in. handle bar, as may be desired, and can be supplied to open inwards or outwards.

PRICE - - 16/6 each.





Sectional View of Float Chambers

The Float Chamber.

ON the next page will be found a Sectional Diagram of our standard Float Chambers, the top feed float chamber having a short platform, and the bottom feed float chamber having a long platform.

Both top and bottom feed chambers are available with either platform. Carburetters for single cylinder engines are fitted with short platform and twins with long platform, unless otherwise ordered. If considerations of space are of no consequence, we always recommend top feed float chambers as being preferable, and always fit this type unless otherwise specified. In the case of the top feed, a head of petrol up to two or three feet may be used. In some cases the lack of space above the carburetter necessitates the use of bottom feed float chambers, and when these are supplied the head of petrol to the float chamber should not exceed 12ins. or 14ins.

In reference to the float chamber, the following points should be noted :—

1. The petrol level should not be altered, as this is set correctly before leaving the works.

2. Flooding may be caused by (a) leaning the machine over so that the float chamber is raised above the level of the jet; (b) by dirt in the petrol tank which has become lodged between the needle valve and its seating; or (c) a punctured float.

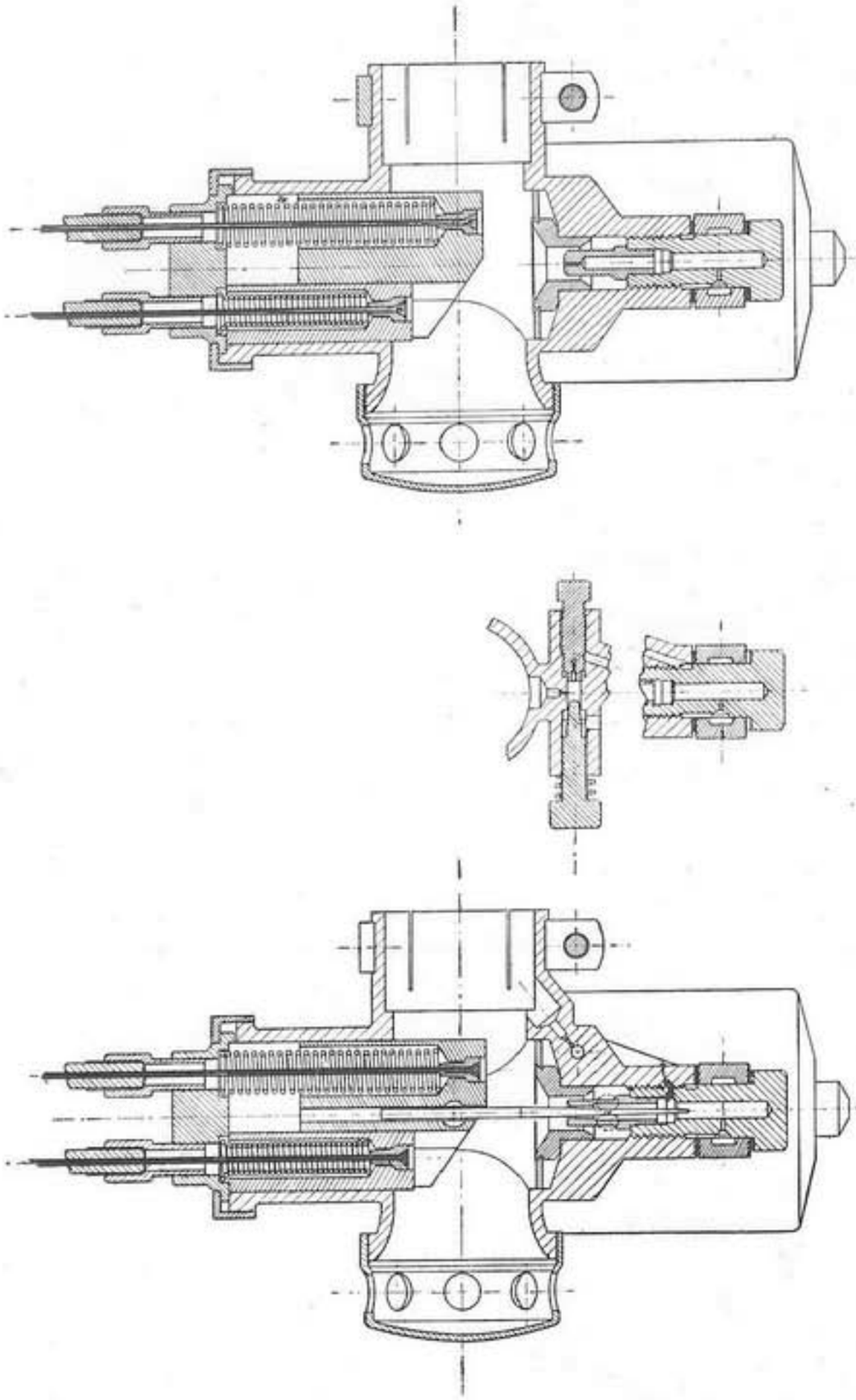
3. Petrol may drip from the junction of the float chamber and the spraying chamber if the bolt is not screwed up tightly or if the fibre washers have become perished or damaged.

4. Flooding will take place if the vent through the tickler becomes accidentally stopped up.

5. The petrol level is approximately .2in. below the level of the jet, but capillary attraction will always cause it to show at the top.

6. Tickling the float chamber will cause the petrol to be raised above the top of the jet, and flooding will take place continually until such time as the petrol level again becomes normal. This is, of course, intentional, and facilitates starting, but customers are sometimes apt to mistake this for flooding. Flooding that is caused by a small particle of dirt lodged between the needle and its seating may frequently be stopped simply by tickling, which allows the petrol to wash the offending particle away.

7. The float chamber should periodically be taken to pieces and cleaned, as it will be found that no matter how carefully filters are fitted, in the course of time small fine particles of dust will accumulate at the bottom of the float chamber, and they are apt to stick together and form one big piece, which may choke up the jets if not removed.



Sectional View of Variable Jet and Plain Jet Carburetters

Variable Jet Model Carburetter

1 and 2 Lever

THIS carburetter in its lay-out partakes of the general characteristics of the Plain Jet model, but has been designed to meet the demand for a carburetter that will, on the one hand, tick over nicely at no load, and on the other hand give the maximum power which the engine is capable of producing when the throttle is fully open.

It will be seen that the carburetter possesses a similarity to our last year's model known as B.S.V. in having a tapered needle working in its jet orifice so that as the throttle valve is opened the jet orifice is opened proportionately with it. The position of the needle in relation to the jet can be adjusted to suit any particular requirements, such as extreme economy, when the needle is well set down, in which case the engine will be prone to knock and will be slow in acceleration. On the other hand, when the needle is moved up the acceleration and power will be improved, with a proportionate increase in the consumption of petrol.

A pilot jet is fitted to this carburetter and to models 120 and 121, which functions only in the idling position and when the throttle is practically closed. Referring to the sectional view of the Pilot system, it will be seen that the Pilot Jet screws in from the right hand side, and opens into a small chamber. This small chamber has a very small communicating hole in connection with the inlet pipe, and it is only when heavy suctions from the engine are available that it has any effect in this small chamber. The amount of suction that is transmitted from the inlet pipe to this small chamber is controlled by the adjusting screw on the opposite side of the hole which can be moved in or out slightly, so as to put a greater or less depression on the pilot jet, as desired. When the adjusting screw is screwed home the pilot jet is giving its maximum supply of petrol in the idling position (this should only be possible when there are air leaks in the induction system). On the other hand when the adjusting screw is screwed outwards three or four turns, the supply from the pilot becomes practically negligible. The setting up of this

Variable Jet Model—*Continued*

pilot to obtain slow running—always assuming that the induction system is quite air tight—is simply a question of closing down the throttle valve to such a point that the minimum charge of air is taken on which the engine will run, and setting the pilot screw to give the correct mixture at this point. For further details on this point see "Hints and Tips" later on in this booklet.

This model carburetter is available in two sizes, having respectively 1in. and .78in. throughway. The carburetter is automatic in action at all ordinary touring speeds, the air valve only being provided to temporarily enrich the mixture whenever it is desired, such as climbing a hill on top gear, when an abnormally rich mixture is required to stop knocking.

THE SINGLE LEVER automatic model partakes of the same general design, but has no second control. We can thoroughly recommend this model where an automatic carburetter is desired.

The mixture given by this carburetter is automatically regulated at all speeds, and its value can be varied by the setting of the tapered needle. The only point at which the loss of a second lever will be felt is when a motor-cycle is driven on top gear over a gradient which it would be incapable of climbing with a normally economical mixture, whereas it might be induced over the top by giving temporarily an abnormally rich mixture. In other words, when a machine is fitted with an automatic carburetter the machine must be driven in exactly the same way as one drives an ordinary car, as the mixture being constant and the load being a variable, it obviously follows that when the machine is over-loaded you must drop into lower gear in exactly the same way as when driving a motor car.

Plain Jet Model Carburetter

1 and 2 Levers.

THE Carburetter shown in the sectional view on page 16 is our No. 122-1, having a plain jet and no pilot. This particular model is designed for two-stroke engines, and the description

Plain Jet Model Carburetter—*Continued*

will serve for all plain jet models, including Nos. 120 and 121, which are of the same construction but have a pilot jet fitted in addition.

(For a description of the pilot and its working see the description attached to the Variable Jet model.)

It will be seen from the sectional view that the Carburetter is simple in construction, and is designed to be practically a one-lever instrument under all ordinary touring conditions. The second lever is simply provided as a means whereby the mixture can be temporarily enriched when circumstances demand, but for all ordinary purposes it is kept in the fully open position.

It will be seen that the plain jet lies inside a small choke tube, having over it a very fine gauze which serves the purpose of an atomizer breaking the mixture up into a very fine spray as it issues from the gauze. Access to the jet is readily obtained by unscrewing the securing bolt from underneath, from which the jet can be readily removed.

This Carburetter is supplied for small Stationary Sets and Launch Engines, when it is fitted with Lever control instead of the Bowden Control.

This type of Carburetter is supplied in three sizes .having a bore respectively of 1in., .78in. and .6in.

General Notes.

1. We always recommend a plain jet carburetter for engines in doubtful condition, or for old pattern engines.
2. Water-cooled Engines should always have their induction pipes jacketed and heated. Freezing and condensation are certain to occur with any make or type of carburetter unless this is done, and the petrol consumption will also be affected.
3. Air-cooled Engines with long and exposed induction pipes should have these exhaust-jacketed.
4. The pipes which feed the heating jackets should be $\frac{1}{2}$" to $\frac{5}{8}$" bore for water, or $\frac{1}{2}$" for exhaust. Exhaust jackets and pipes must be cleaned out frequently, or they will become choked with soot.

General Notes—*Continued*

5. It is absurd to attempt to cure freezing or condensation by wrapping up the induction pipe, as the cold is produced inside the pipe by the vapourisation of the petrol. It is, in fact, only the heat absorbed from the atmosphere by the induction pipe which prevents freezing in the hot weather, but condensation takes place even then to some extent.

6. We occasionally receive letters from customers who complain that their carburetter gives excessive blowback. Now a carburetter is an inert object and merely responds to the vacuum produced by the engine. Therefore the carburetter cannot blow back of itself, and the cause can always be traced to the late closing of the inlet valve, which may be caused by special late, i.e., racing timing, or sometimes to a weak inlet valve spring, or to the valve sticking in its guide. There is always a slight "blowback" or "rebound" due to the actual closing of the inlet valve, but this is very slight, and of no consequence.

7. Another frequent trouble is the misfiring of one cylinder in Twins. This complaint also cannot be laid upon the unfortunate carburetter, for if there are no air leaks in the induction system it is a physical impossibility for the carburetter to supply anything but the same mixture to each cylinder. Whether the mixture is correct or incorrect, it must be the same for both. The usual causes for this trouble are air leaks, sparking plug points too close or too wide, magneto out of order, or engine valves want grinding in.

8. If the engine is very stiff when cold (usually due to the use of thick lubricating oil) and in consequence difficulty is experienced in operating the kick starter smartly, a very good tip is to inject a few drops of paraffin through the compression tap immediately at the end of a run. The piston will then remain free and easy even when the engine is quite cold, and it is claimed by experts that this operation tends to decarbonise the cylinder head and piston.

9. **Knocking of Engine.** The trouble may be divided into two classes: (a) True Pre-ignition—or overheating—which usually results from carbon deposit, sparking plug points too thin, ignition too advanced, driving with retarded ignition, use of unsuitable lubricating oil, driving too hard, or to the use of too high a gear, the cure for which is obvious.

TRADE B & B MARK.

General Notes—*Continued*

(b) Detonation of the Charge. This is the knocking which results when attempting to pick up round the corner, or when hanging on to a high gear too long on a hill. The cure is to retard the ignition, change gear or throttle down, but it may also be avoided by rendering the mixture less explosive, i.e., by closing the air lever and using an excess of petrol, or by using a slower burning fuel such as benzole. The knocking caused in this manner is not due to overheating, but it is accentuated if the engine is hot.

10. The above paragraph will explain why the drivers of over geared machines are always complaining about their petrol consumption. They do not appreciate the fact that they are continually driving on too rich a mixture to avoid the knocking which would otherwise be inevitable. The worst offenders are the small sidecar machines which are often driven with a gear suitable for solo driving, and as a result their petrol consumption is greater than that of a 6 or 8 h.p. twin.

11. We give below a list of gear ratios which we have always found satisfactory on sidecar machines :—

500 c.c.	Engines	5½ to 1 to 6 to 1
600 c.c.	,,	5 to 1 to 5½ to 1
750 c.c.	,,	4¾ to 1 to 5 to 1
1,000 c.c.	,,	4¼ to 1 to 4¾ to 1

and the petrol consumption one may reasonably expect from sidecar machines properly geared and handled :—

500 c.c.	60 to 80 m.p.g.
600 c.c.	60 to 80 ,,
750 c.c.	60 to 70 ,,
1,000 c.c.	55 to 65 ,,

We can easily obtain higher figures than the maximum given, which must not be accepted as the limit for expert drivers.

General Notes for Fitting.

FOR satisfactory service three things are absolutely essentia : (1) An engine in good condition, i.e., valves and piston rings gas tight, bearings free but no play. (2) A magneto that will give a good spark at low speeds as well as at high speeds. (3) A carburetter that actually delivers the correct proportion of air to petrol under all the varying conditions that are taking place. Given these three conditions, all of which are generally assumed, the following points may be found of nterest :—

1. Always fit the carburetter as near to the cylinder as possible. This prevents condensation taking place in the inlet pipe, and also partial freezing during the cold wintry weather. In the case of Twins, between the cylinders with as short a pipe as possible (we always supply unless otherwise ordered for twin engines, a long float chamber which enables the float chamber and spraying chamber to be lineable to take up the minimum space).

2. See that all the connections to the inlet pipe are gas tight. Any air leakage, either at the joints of the inlet pipe or up the valve guide, if of any magnitude, will render the slow tick over absolutely impossible under any conditions, and will also make the running of the engine very rugged at low throttle openings. See that the carburetter, if of the grip fastening, is a good fit on the pipe, and is pushed right home, otherwise leakage will take place at the joint. One way of testing the induction system is to start the engine up and run it as slow as possible on the stand, or in free engine, then smother thick oil round the induction pipe joints and inlet valve guides, and if any leakage is taking place the oil will be sucked in.

3. The petrol pipe should not be less than ¼in. diameter. A small bore pipe is apt to produce partial airlocks, which gives symptoms that are almost impossible for an amateur to diagnose correctly.

4. A sump, filter or some such device is necessary to prevent dirt being transferred from the petrol tank to the carburetter, as small particles of dirt are apt to get lodged between the needle and its seating, and so cause flooding. The needle and its seating can only function correctly if the petrol is free from grit. Do not depend upon the small gauze when fitted in the top of the float chamber cap to act as a strainer, as this is only intended as a supplementary strainer to stop the very small pieces that may have accidentally passed through the main filter. As a strainer it is quite useless, and it will only cause constant trouble if there is not a proper strainer fitted.

TRADE B & B MARK.

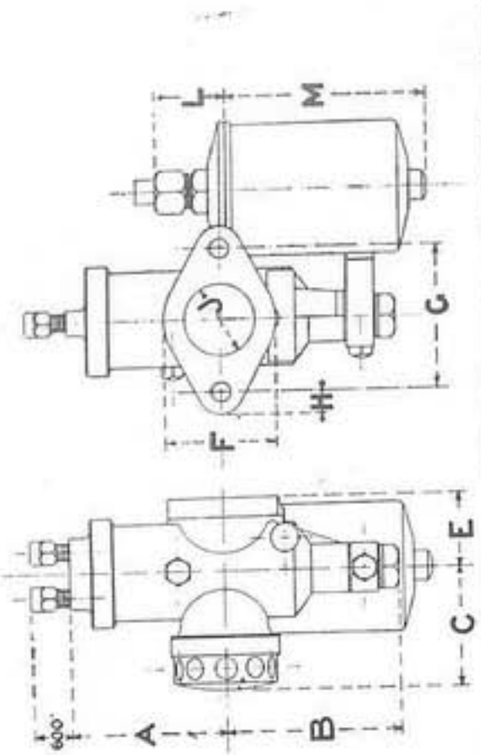
General Notes for Fitting—*Continued*

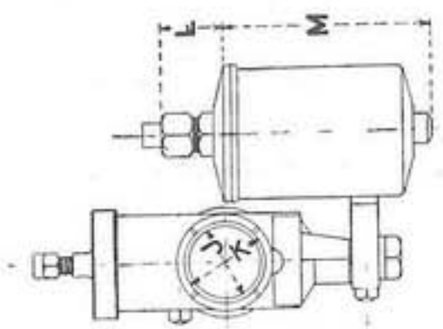
When fitting the handle-bar control, it should be so arranged that there are no sharp bends in the cables at the top of the spraying chamber cap, or at any other part of the cables. Sharp bends are liable to fray the outer members of the cabling, and also render the inner wire stiff in working. These cables are all thoroughly oiled before being sent out, but periodically the cables should be disconnected, say, once in six months, and oil worked between the inner wire and the outer casing. The control cabling should not be any longer than is necessary, as if an excessive length is fitted the loose cable is apt to sway, and so alter the position of the Throttle and Air Valves independent of the movement of the levers. The outer member of the cabling should be clamped to the frame at suitable points to prevent this. When the carburetter has been fitted to the machine and the cables are clamped into their permanent position it should be carefully adjusted by means of the adjusting bushes provided at the top of the spraying chamber. The correct adjustment is dependent upon what is required. In the case of the two-stroke engine, generally speaking the adjustment is such that the valves are allowed to be entirely closed with the levers in the closed position, but in the case of the 4-stroke, if the carburetter is fitted with a pilot jet, the majority of people prefer to have it set so that when the throttle lever is in the closed position the engine will just tick over idly, which means that the throttle valve is very slightly open.

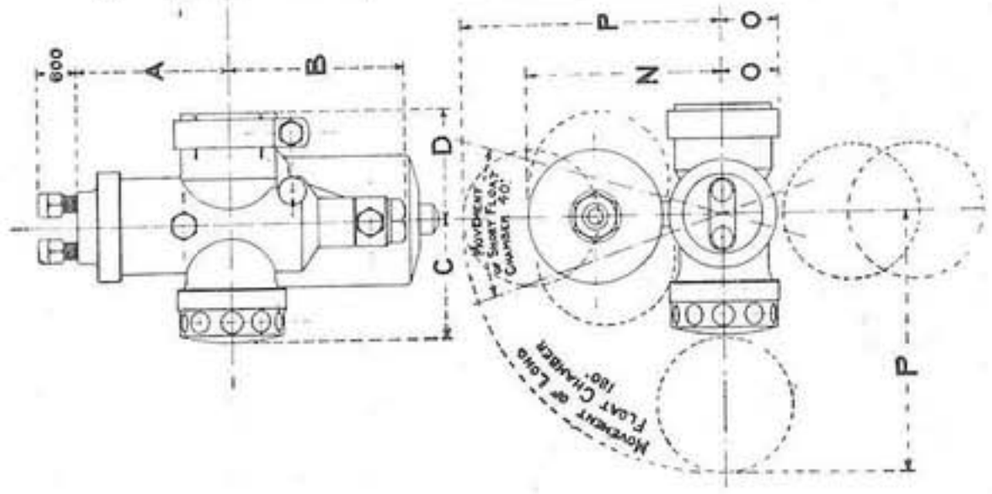
Important.

Our experience is freely placed at the disposa of our customers, and we are always pleased to advise them on all matters relating to our Carburetters. Our advice can be much more definite if full particulars are given, and we would suggest that the following information is always supplied :—

Date, Make and H.P. of Machine.
Date and Type of Carburetter.
Gear Ratio, or Top Gear Ratio if machine is variably geared.
Whether Sidecar is used or not.







Dimensions of Carburetters

MODEL	A	B	C	D	E	F	G	H	J	K	L	M⊕	N	O	P	R
120-1	2·20"	2·50"	1·70"	1·60"					1·00"	1125"	900"	3·00"	2·80"	800"	3·70"	
F120-1	2·20"	2·50"	1·70"		1·00"	1·60"	2·00"	·310"	1·00"		900"	3·00"	2·80"	800"	3·70"	
121-1	1·90"	2·40"	1·50"	1·40"					·780"	1·00⊙"	1·00"	2·90"	2·80"	700"	3·70"	
F121-1	1·90"	2·40"	1·50"		·900"	1·60"	2·00"	·310"	·780"		1·00"	2·90"	2·80"	700"	3·70"	
121-2	1·90"	2·40"	1·50"	1·40"					·790"	1125"	1·00"	2·90"	2·80"	700"	3·70"	
122-1	1·90"	2·40"	1·50"	1·40"					·780"	1·00⊙"	1·00"	2·90"	2·80"	700"	3·70"	
F122-1	1·90"	2·40"	1·50"		·900"	1·60"	2·00"	·310"	·780"		1·00"	2·90"	2·80"	700"	3·70"	
122-2	1·90"	2·40"	1·50"	1·40"					·780"	1125"	1·00"	2·90"	2·80"	700"	3·70"	
123-1	1·70"	2·30"	1·50"	1·40"					·600"	1·00⊙"	1·100"	2·80"	2·80"	700"	3·70"	
F123-1	1·70"	2·30"	1·50"		·900"	1·60"	2·00"	·310"	·600"		1·100"	2·80"	2·80"	700"	3·70"	

⊕ FOR BOTTOM PETROL FEED FLOAT CHAMBER ADD ·400"

⊙ LINERS SUPPLIED TO REDUCE TO 15/16" - 7/8 OR 3/4.

Hints and Tips.

Variable Jet Carburetter.

THIS carburetter is illustrated on pages 4 and 16, and on referring to the illustrations it will be seen that the mixture is controlled by (a) pilot jet for dead slow running, and (b) a tapered needle in the main orifice, which controls the amount of petrol from some point just above the dead slow running up to the almost full out position. The control at the latter position is obtained by the restricted orifice at the bottom of the jet.

The tuning of this carburetter consists in setting the pilot jet to give good tick over, and having a restricted jet of the required size to give the requisite mixture in the all-out position, and setting the position of the tapered needle to control the mixture between these two points.

The advantages that this carburetter possesses over the plain jet model are that at low throttle openings the jet is closed proportionately to the throttle position, and on the other hand the jet can be opened out to any desired extent, and is not limited in any way, which is not the case with any plain jet carburetter. This enables the carburetter to work satisfactorily over a wider range of conditions than is possible with a plain jet.

When the carburetter is fixed to the engine it is generally desirable to set the pilot first, and the following method enables this to be done easily and readily :—

1. The knurled screw on the side at the bottom of the throttle should be screwed into its closed position, so as to put the pilot jet under its maximum richness.

2. The cable adjuster at the top of the throttle should then be unscrewed until the throttle valve does not completely close, but is held open about 1/16in. when the throttle lever is in the closed position.

3. The engine is then started up, and throttled down as low as possible, when if everything is tight the engine will probably start misfiring through being rich

4. The knurled adjusting screw on the side should be unscrewed certain amount until this richness disappears, which will probably be accompanied by an increase in engine revs., when the throttle should be still further closed by screwing down the adjuster, when the rich symptoms will probably be repeated again, but to a lesser degree.

Hints and Tips.

Variable Jet Carburetter—*Continued*

5. The operation should then be repeated until the minimum amount of charge that the engine will run on is reached, but in so doing one will probably overstep the mark of weakening the pilot, in which case the screw should be slightly screwed back again to the required richness.

The point we wish to emphasise is that it should be appreciated that the pilot jet setting and the throttle position are dependent one upon the other, for the final results—one cannot be moved in the slow running position without affecting the other.

It should be borne in mind that if there is a comparatively large air leakage in the induction system the engine can only function on the pilot jet with the throttle fully closed, and this leak should be eliminated if the best possible results are required.

With the carburetter set as above, it should not be possible to stop the engine by the throttle lever, as this has been set for the slow running position, and when brought to the shut-off position there is enough mixture going through the carburetter to carry the engine over at no load. It can, of course, be made to close right off by screwing the cable adjuster down further.

To vary the settings of the main supply from standard, take out the throttle valve and slacken the screw which lies in the hole in the valve. The needle can then be moved up or down, as desired. Moving it up, that is to say, pushing it up the valve, enriches the mixture, and the reverse procedure weakens it. It should be borne in mind, however, that the control obtained by the needle does not affect the all-out position. If it is in the all-out that the mixture wants altering, then the control is obtained by changing the restricted jet.

Restricted jets of various sizes are obtainable, but those fitted as standard will generally be found satisfactory for all ordinary purposes. It is only for speed events that these should ever require altering.

TRADE B & B MARK.

Hints and Tips.

Variable Jet Carburetter—*Continued*

The approximate standard settings for this carburetter are as follows :—

Type 120-N

Engine	Restricted Jet	Length of Needle as measured from the Valve
3½ to 4 h.p. Single Cylinder Solo	43	1½in.
3½ to 4 h.p. Single Cylinder Sidecar	45	1½in.
6 h.p. Twin	43	1½in.
8 h.p. Twin	45	1⅝in.

Type 121-N

Engine	Restricted Jet	Length of Needle as measured from the Valve
5 h.p. Twin Cylinder	33	1½in.
2¼ h.p. Single Cylinder	33	1½in.
2¾ h.p. Single Cylinder	33	1½in.

SPORTS MODELS HAVE LARGER JETS AND SHORTER NEEDLES.

Plain Jet Carburetter

This carburetter is illustrated on pages 4 and 16, and its construction is reduced to the simplest possible form to meet the requirements of absolute simplicity, wherever it is desired.

The tuning of the carburetter consists in having a Back Cap of such a size that will allow both the air and throttle valve to be full open at maximum speed on the level (the back cap will usually be found correct as sent out) and fitting a jet in the carburetter of such a size that under normal conditions on the level the air valve can be kept in the fully open position, and under these conditions giving a mixture a little on the thin side.

Hints and Tips.

Plain Jet Carburetter—*Continued*

It should be noted that if the setting is done in the heat of the summer, and no alteration is made, there will be slight indications of weakness in the cold wintry weather. To keep the same conditions in the extreme maximum summer heat and the maximum winter cold the jets should be changed with the seasons.

All jets are now known by their actual flow when measured by Air Board standards, and for the sake of clearness for those who are used to think of them in sized holes, the approximate equivalent sizes are given below :—

.026in.	55 c.c.	.031in.	80 c.c.
.027in.	60 c.c.	.032in.	85 c.c.
.028in.	65 c.c.	.033in.	90 c.c.
.029in.	70 c.c.	.035in.	100 c.c.
.03in.	75 c.c.	.036in.	110 c.c.

The following are the average settings required for an ordinary engine under average conditions :—

Type 120

		Back Cap	Jet.
3½ to 4 h.p.	Single Cylinder Solo	10 9/32in.	110
3½ to 4 h.p.	,, ,, Sidecar ..	10 9/32in.	120
6 h.p.	Twin Cylinder	11 1/4in.	100
8 h.p.	,, ,, ...	10 9/32in.	120

Type 121

5 h.p.	Twin Cylinder	10 7/32in	70
2¼ h.p.	Single ,, ...	10 7/32in.	70
2¾ h.p.	,, ,, ...	10 7/32in.	75

Type 122

	Back Cap	Jet.
Two-Stroke Engines 250 c.c.....	10 7/32in.	65
,, ,, ,, 350 c.c.....	12 7/32in.	75

Plain Jet Carburetter—*Continued*

Type 123—Motorcyclettes

147 c.c. Engine	12 7/32in.	60

If the Back Cap is removed from the Carburetter probably larger ets would be required, but this should only be necessary for racing purposes, and if so used an extension pipe is advisable.

In reference to the setting of the Pilot, see particulars of this fitment in the description of the variable jet model.

When starting up from cold, the air lever should be shut and the throttle lever about ⅛ open. Flooding the carburetter to facilitate starting should only be necessary when everything is quite cold.

Type 122 and 123 having no Pilot Jet will, when fitted to a 4-stroke engine, run it moderately slowly, but attention is called to the previous remarks concerning leakages in the induction system when at no load.

Spare Jets of any particular size can be readily obtained at any time, but when ordering please state clearly the sizes required, in c.c.'s.

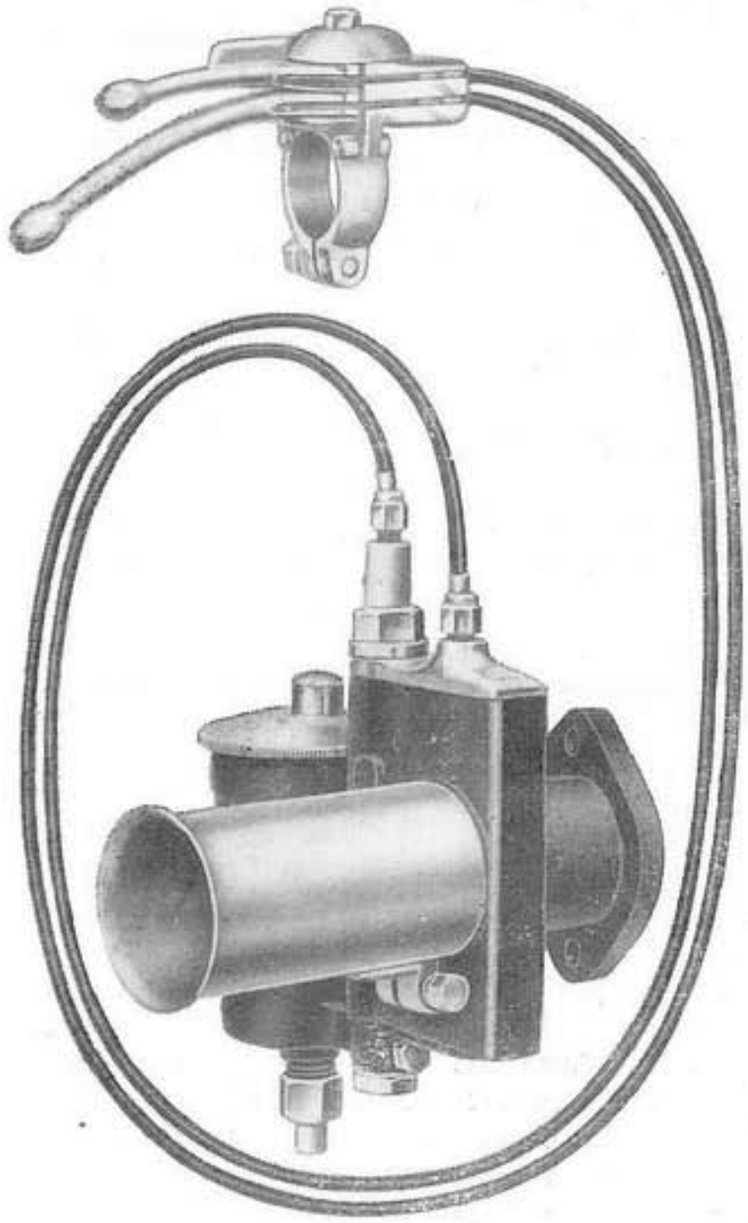
Carburetters suitable for various sized Engines.

			Requires
4-Stroke Engines	8 to 10 h.p. Twins	750 c.c. to 1100 c.c.	Model 120
	4 to 6 h.p. ,,	350 c.c. to 750 c.c.	,, 121
	3½ to 4¼ h.p. Single	350 c.c. to 650 c.c.	,, 120
	2¾ to 2¾ h.p. ,,	200 c.c. to 350 c.c.	,, 121
	2-Stroke Engines	250 c.c. to 350 c.c.	,, 122
	2-Stroke ,,	150 c.c. to 250 c.c.	,, 123

Stationary and Launch Engines—2 and 4 Stroke.—The size of the carburetter depends upon the maximum revs. at which the engine is designed to run, and it is generally considerably less than a similar engine fitted to a motor-cycle. Consequently, as a general rule, one size smaller carburetter will be found suitable for a similar sized engine.

In ordering a carburetter it should be clearly stated (1) the type number of the Model required ; (2) Make and H.P. of the machine ; (3) whether single or twin cylinder ; (4) external diameter of inlet pipe if grip fitting ; (5) diameter of handle bar (6) right or left hand control ; and (7) length of cabling required, together with any other details that are readily available.

Racing Carburetter.



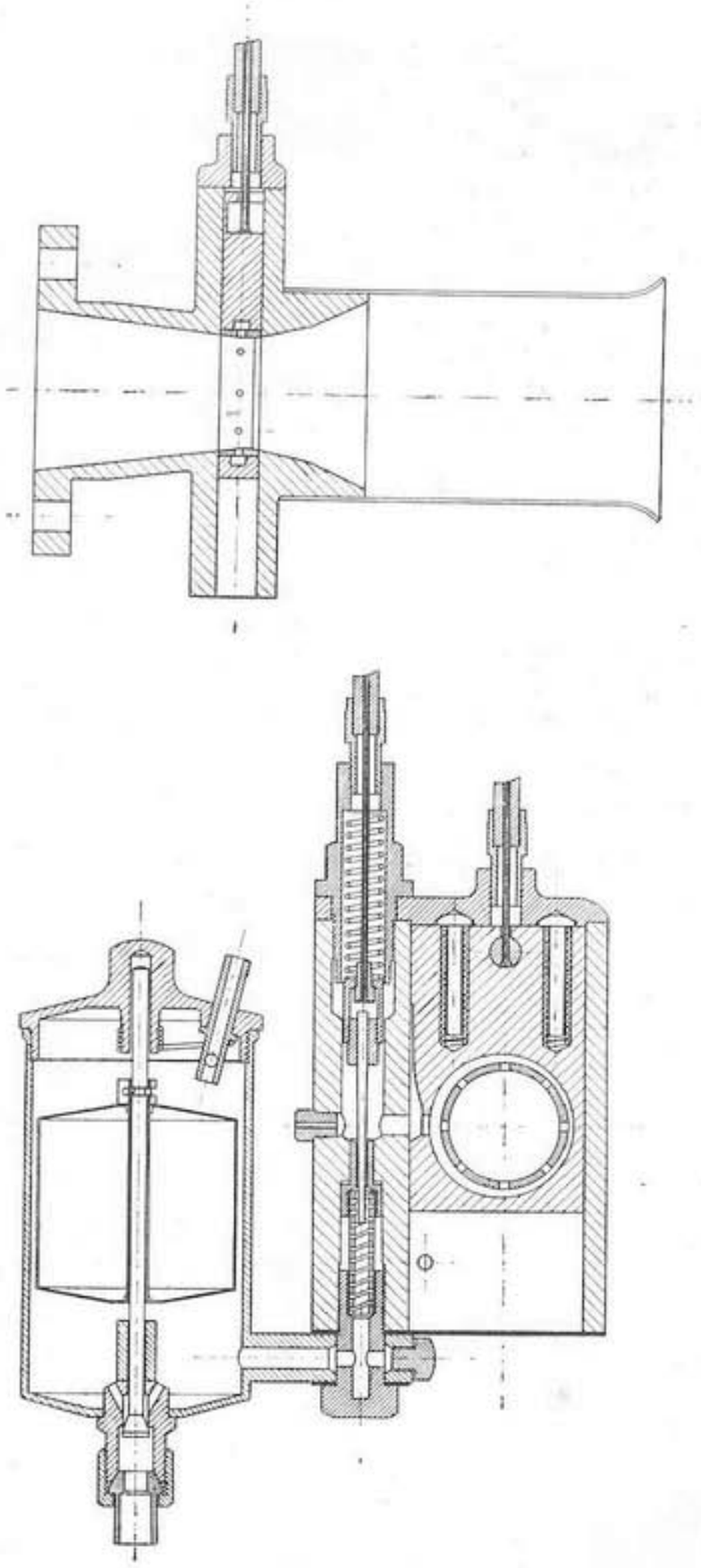
TRADE *B & B* MARK.

Racing Carburetter.

AS there is a demand for a carburetter specially designed for racing purposes, a special racing carburetter will be found illustrated on pages 30 & 32. It will be seen that the whole design has been made subservient to the primary conditions required of obtaining power out of an engine. The big problem so far as power output of an engine is concerned, is the question of getting the maximum charge into the cylinder and at the same time keeping the composition of the charge correct. The carburetter, when fully open (the position at which maximum speed can be obtained) is made in the form of a special venturi orifice, which will at one and the same time give the highest possible velocity past the jets, and the maximum possible recovery between the carburetter and the engine, that is to say, the air can pass through the carburetter at a high rate of speed without the carburetter having any throttling effect. To obtain the maximum results that this carburetter can give, i should be appreciated that considerably larger diameter inlet pipes are an advantage as compared with those fitted for ordinary touring purposes. The maximum bore carburetter made, viz., $\frac{7}{8}$in. at the throat, will require, to get its maximum advantage, an inlet pipe having an internal diameter of about $1\frac{1}{4}$in. This is not always possible to achieve, and the carburetter can be fitted to a smaller bore, but some percentage of the efficiency is lost when the bore is reduced below $1\frac{1}{4}$in.

It will be seen that the petrol is mixed with the air at the choke portion of the carburetter, and is brought in at eight different points, so that a thoroughly homogeneous mixture is obtained. The composition of the mixture is governed by the cam shaped groove on the side when the throttle is in any other position than that of fully open. The carburetter is entirely automatic in its action, and the adjustment of the composition of the charge, i.e., making it richer or poorer, is obtained by a separate control upon the needle valve working in the jet, but the automatic action is in no way interfered with by this adjustment. It will be automatic at practically every point, whether the composition is too poor or too rich, and the amount of richness is controlled by a separate lever on the handle-bar control—that which is generally utilised for operating the air valve.

This carburetter is specially made for racing purposes, and as sent out it is not recommended for ordinary touring if any importance is attached to petrol economy. This is owing to the fact that for racing purposes when the carburetter is running automatically it must give on throttled down positions a mixture on the rich side, so that quick acceleration is always obtained. This, of course, is not so desirable for ordinary touring purposes, where quick acceleration is not of such importance.



Sectional view of Racing Carburetter.

TRADE *B & B* MARK.

Racing Carburetter—*Continued*

This carburetter is usually supplied with bottom feed, and flanged fitting. A grip adaptor which will fit on to the carburetter will be supplied if required, but the flanged fitting is preferable, as a greater amount of heat is taken from the cylinder walls by this means, helping the carburation at high speeds.

This carburetter is normally supplied with a modified type of lever control, in which the top lever controlling the needle valve has attached to it a spring plunger engaging ina groove in the control cap which can be set to engage in a definite position. It is obvious that with the various fuels in use the setting of the needle valve will vary with the different types of fuel, and n setting up the carburetter the correct position of the needle valve should be found by experiment, and then the top cap in the control can be loosened and the cap turned round until the groove and plunger engage one with the other, and the top cap then locked into position. You then have a position of needle valve setting which can be felt on the control without looking, but it does not in any way prevent the needle valve opening to a greater or lesser degree than this if required.

Or, if preferred, Twist Grips can be supplied, but attention is drawn to the requirements as regards the shape of the handle bar.

There is supplied with each carburetter two spare air jets which can be changed as required. The effect of changing these jets is exactly the same as if in the ordinary carburetter you change the petrol jet, but in the reverse way, that is, if the largest of these air jets is fitted, the effect is to reduce the amount of petrol ; if the smallest air jet is fitted, the effect is to increase the amount of petrol. The variable range of the taper needle will not be in any way affected, except that it will start on the minimum opening at either a higher or lower value, and the consequence is that the Carburetter can be adapted without modification to suit a large range of different fuels.

Type	220-1	Dia. at Throat,	875 in.	Dia. at Outlet,	1.27in.
,,	220-2	,,	.785in.	,,	1.18in.
,,	220-3	,,	.7in.	,,	1.1in.

Price either with two lever control or two twist grips - 100/-

TRADE *B & B* MARK.

SPARE PARTS.

1916-23 Models	1924 Models	Description	Price
			s. d.
01	101	Float Chamber Body	10 3
02	102	Float Chamber Cap and Tickler	7 8
03	103	Tickler Plunger	0 5
04	104	Float	2 6
06	106	Needle for Float Chamber	0 10
06A	105	Collar for Needle	0 4
012	112	Petrol Union Nut	0 6
013	113	Petrol Union	0 3
014	114	Stop Screw and Washer 1B.A.	0 3
015	115	Rivet (or Pin) for Throttle	0 2
016	116	Lock Pin 1 B.A.	0 3
017	117	Adjusting Bushes for Cap ..... per pr.	0 8
	118	Holding Bolt plain or restricted)	1 3
020 021 022 023	120 121 122 123	Spraying Chamber Body	8 6
026	126	Valves ..... per pr.	6 9
028	128	Spraying Chamber Cap	1 8
029	129	Spraying Chamber Cap Ring	1 3
030	130	Clip Ring and Bolt, 1¼in., 1 1/10in., 1 1/16in., or ⅞in.	1 8
031A	131	Back Cap, with 9, 10, 12 or 14 holes	1 8
031B		Gauze Dust Screen	0 5
033	133	Extension Pipe	2 1
034-1		Jet for Single Jet Model	1 0
	134-1	Jet for Plain Jet Model	0 6
034-2		Jet for Taper Needle Model	1 0
	134-2	Jet for Taper Needle Model	0 6
035	135	Taper Needle	1 9
038A	138	Pilot Jet, with Fibre Washer	0 10
038B		Flat Spring for Pilot	0 3
038C		Pilot Jet Sleeve, with Handle	1 9
038D		Rubber Washer for Pilot Jet	0 2
039	139	Knurled Pilot Adjusting Screw	0 5
040	140	Vapourizing Cap or Choke	1 8
044	144	Nipples ..... per pr.	0 3
045	145	Valve Spring	0 7
047	147	Tickler Spring	0 3
048	148	Coil Spring for Pilot	0 2
	149	Spring for Needle Collar	0 2
057	157	Spring Guides ..... per pr.	0 5
058-1	158-1	Fibre Washer for Bolt or Jets, Large and Small	0 1
059	159	Inner Wires for Control, 3ft. 6in. .. per pr.	2 4
060	160	Outer Cable for Control, 3ft. 6in. .. per pr.	3 5
061	161	⅜in. or 15/16in. Reducing Bush for Outlet	0 3
070	170	Control Body, with Clips and Bolts	5 6
072	172	Control Clips ..... per pr.	1 6
073	173	Air Lever, R.H. or L.H.	2 11
074	174	Throttle Lever, R.H. or L.H.	2 11
075	175	Control Cap	1 0
076	176	Control Spring Washer	0 5
077	177	Division Plate	0 3
078	178	Centre Screw	0 3
079	179	Bolt for Clips	0 3
080	180	Rivets for Clips ..... per pr.	0 3
081	181	Control Bushes, ⅜in. or 15/16in. .. per pr.	0 5
083	183	Roller ..... per pr.	0 3

TRADE *B & B* MARK.

APPROXIMATE ENGINE REVOLUTIONS

at different speeds—miles per hour.

Diameter of Driving Wheels .... 26in.

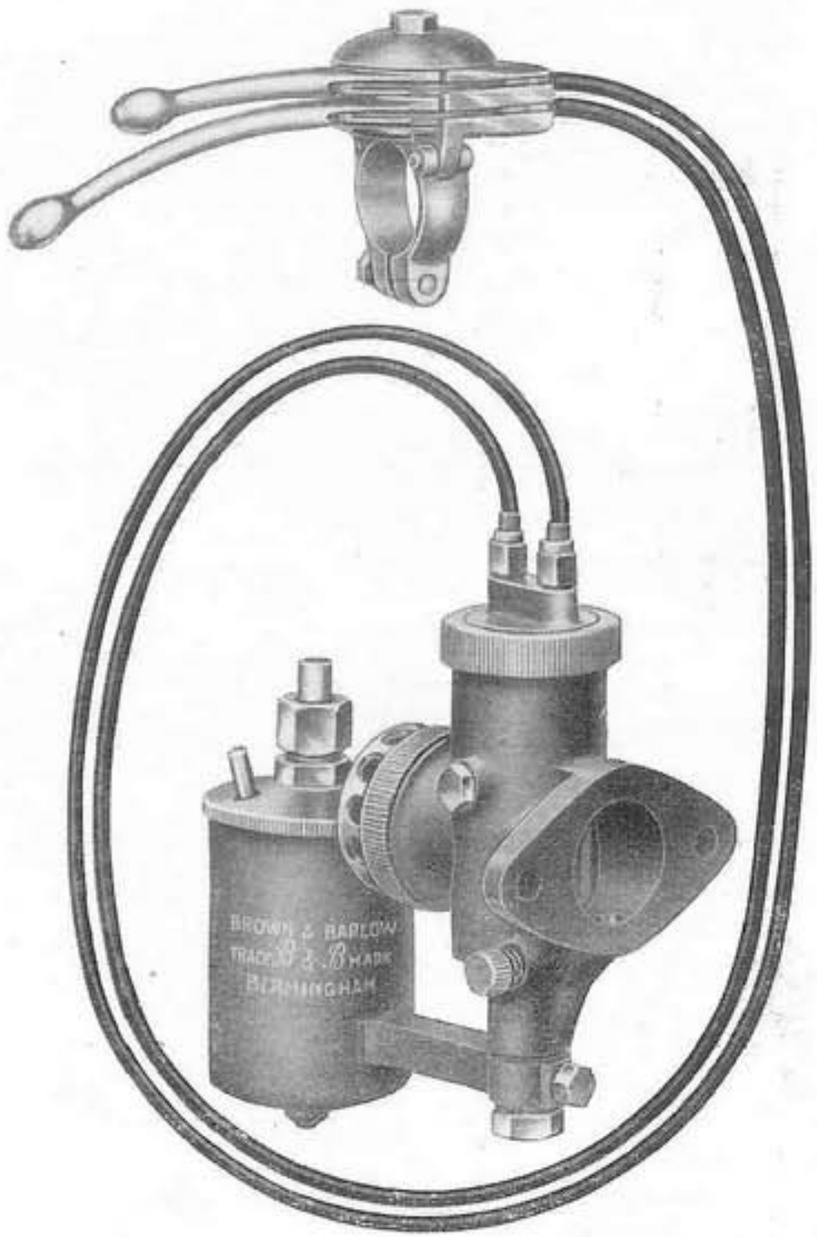
Gear Ratio	4	4¼	4½	4¾	5	5¼	5½	5¾	6	6¼	6½	6¾	7
Speed in Miles hr.													
5	260	276	292	309	325	346	358	374	388	404	420	437	453
10	520	552	584	618	650	692	716	748	775	808	840	875	905
15	780	828	876	927	975	1038	1074	1122	1160	1210	1260	1310	1360
20	1040	1104	1168	1236	1300	1384	1432	1496	1550	1615	1680	1750	1810
25	1300	1380	1460	1545	1625	1730	1790	1870	1940	2020	2100	2180	2265
30	1560	1656	1752	1854	1950	2076	2148	2244	2320	2420	2520	2620	2720
35	1820	1932	2044	2163	2275	2422	2506	2618	2710	2830	2950	3060	3170
40	2080	2208	2336	2472	2600	2768	2864	2992	3100	3230	3370	3490	3620
45	2340	2484	2628	2781	2925	3114	3222	3366	3490	3640	3790	3940	4070
50	2600	2760	2920	3090	3250	3460	3580	3740	3880	4040	4210	4370	4530
55	2860	3036	3212	3399	3575	3806	3938	4114	4270	4440	4630	4800	4980
60	3120	3312	3504	3708	3900	4152	4296	4488	4650	4850	5040	5240	5440

For 24in. Wheels, multiply Revolutions by 1.08

For 28in. Wheels, multiply by 0.93.

TRADE *B & B* MARK.

Flanged Model Carburetter.



For Dimensions of Flange see page 24.

JET EQUIVALENTS LIST.

1930 AMAL and BINKS Jet Numbers—Flow in C.C.'s.

All Jets are now known by their actual flow when measured by B.E.S.A. standards, and for the sake of clearness for those who are used to think of them in sized holes, the approximate equivalent sizes are given below :

AMAL, B. & B. AMAL, BINKS, Flow in C.C.'s.	Jet Dia.	AMAC No.	OLD BINKS No.
15	—	—	0
20	.015″	—	1
25	—	16	2
30	.018″	18	3
35	—	19	4
40	.021″	20	—
45	—	21	—
50	.024″	23	5
55	—	24	—
60	.026″	25	6
65	—	26	—
70	.028″	27	7
75	—	28	—
80	.030″	29	8
85	—	—	—
90	.032″	30	9
95	—	31	—
100	.034″	32	11
110	.035″	33	13
120	.037″	35	14
130	.038″	36	15
140	.040″	38	16
150	.041″	39	17
160	.043″	40	18
170	.044″	41	19
180	.045″	43	20
200	.048″	45	21
220	.050″	47	22
240	.052″	49	23
260	.055″	51	24
280	.057″	53	25
300	.059″	55	26
32	—	57	—
350	—	59	—

NOTE.—1929 and 1930 AMAL and BINKS Jets are not interchangeable with those of other years' manufacture.