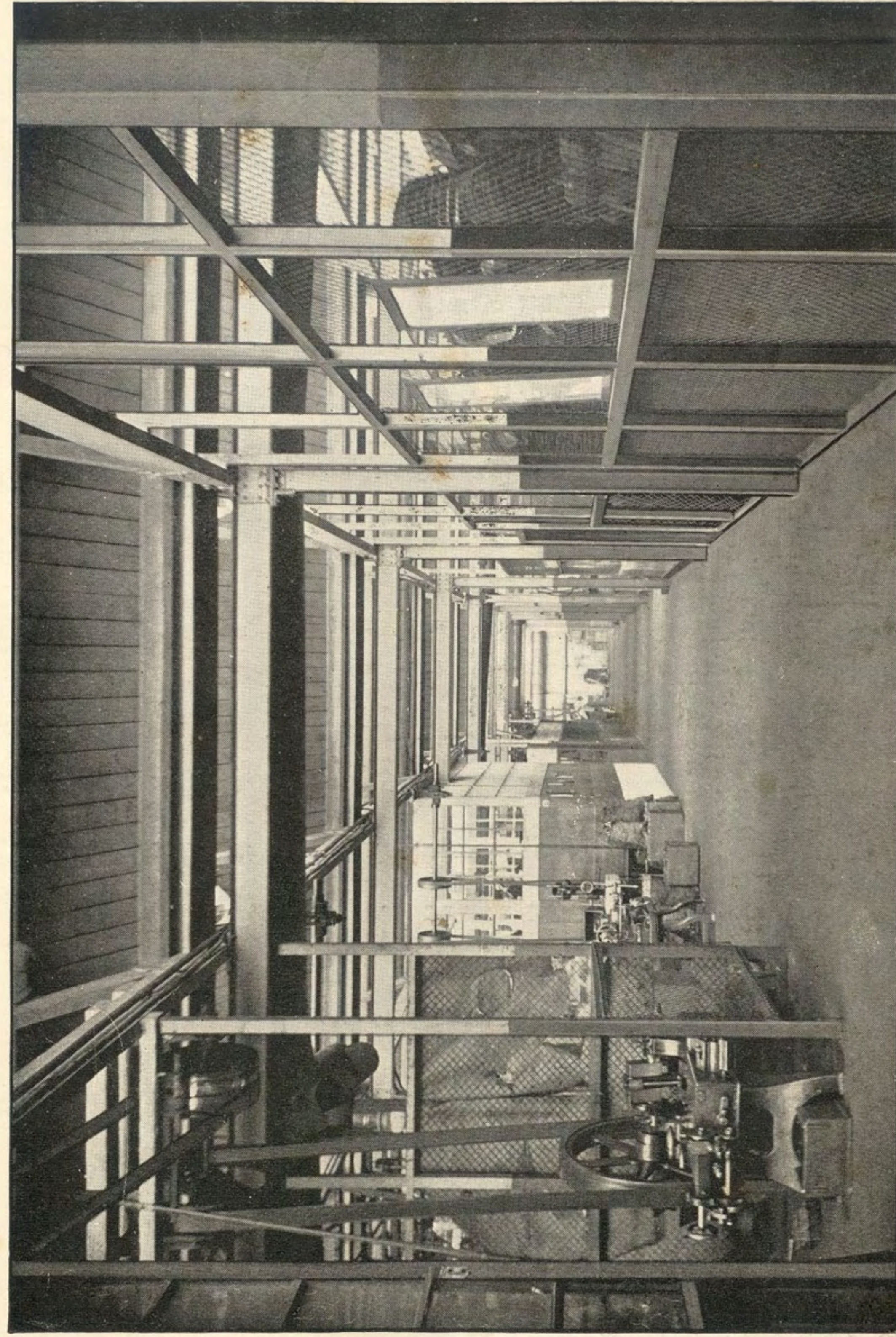


The
SENSPRAY
TRADE MARK
Carburetter



Manufactured by
CHAS. H. PUGH
LIMITED
WHITWORTH WORKS
BIRMINGHAM

WHITWORTH WORKS, WHERE THE "SENSPRAY" CARBURETTOR IS MANUFACTURED



MAIN GANGWAY. VARIOUS DEPARTMENTS TO RIGHT AND LEFT.

These goods are sold on the condition that they must not be exhibited at any Exhibition in the British Isles without our written consent.

Telegrams :
"Accuracy, Birmingham."

Telephone :
No. 161 Victoria (3 lines).

The Adjustable Vaporiser Type

SENSPRAY

(TRADE MARK)

CARBURETTER

Patent Nos. 14805-11, 4084-12 and 136676

Specially designed for
Motor Cycle and
Small Car Engines

"THE ONLY CARBURETTER WHICH PERFECTLY
ATOMISES THE PETROL."

PATENTEES AND MANUFACTURERS—

CHAS. H. PUGH LTD.

WHITWORTH WORKS, TILTON ROAD

BIRMINGHAM

Terms of Business - Cash with Order or Trade Reference
GOODS - - - - - F.O.R. BIRMINGHAM

INTRODUCTION

THE "SENSPRAY" CARBURETTER was first introduced during the late Summer of 1911, and it was evident right from the commencement of its trials that the Senspray principle of spraying the petrol gave maximum power, as proved by comparison with other carburetters on an up-to-date scientific test apparatus, as well as in competitions both on the track and on the road. To arrive, however, at finality in the matter of design, having once established the principle, takes time, and since the introduction in 1911, we have been keenly observing the results obtained, and considering the question of design, with the result that each year sees the "Senspray" nearer to perfection than before.

THE ADJUSTABLE VAPORISER TYPE OF "SENSPRAY" CARBURETTER presents several improvements over all previous models, without sacrificing, however, the well-known main characteristics—that is, the method of securing perfect atomisation of fuel and the "straight-through" way. The important improvement is the introduction of an entirely new Damper principle. The Vaporiser is fitted into a tubular housing and made so that it can be rotated. In the end of the Vaporiser, between the Jet and the Engine, are Air Ports, which can be adjusted by rotating the Vaporiser. The latter is provided with a head which is marked "Petrol-more-less," with an Indicator, and the effect of opening or closing the ports by rotating the Vaporiser is to decrease or increase the suction on the Jet at low speeds. This arrangement being fixed in the centre of the main air supply, results in the Damper principle being proportionately and automatically cut out of action as the Throttle is opened, and in this manner perfect slow running and economy, either on the road or free engine, is obtained to a most wonderful degree. This adjustment is of the simplest type imaginable, and can be done by the novice equally as well as by the expert.

The advantage of such an arrangement is that the instruments, as sent out, can be easily and quickly adjusted by the thumb and finger to act as any one of **three distinct types** of Carburetter ;

- (a) Sensitive, full 2-lever control. (b) Semi-Automatic,
(c) Automatic.

When set to act as an **Automatic** Carburetter, the consumption is better than an absolute novice would, on the average, obtain from a sensitive Carburetter, yet the rider is free from the fear of accidentally "foozling" the mixture at some critical moment, the operation of driving being reduced to a simple "open and shut" one.

In the **fully sensitive** position, the economy of petrol that can be obtained by a skilled driver is very marked.

The **semi-automatic** position, which will, we think, as the skill of the rider increases, be the one to be most usually adopted, gives the rider the best compromise that is possible between the extreme settings, and enables him to drive with confidence and ease, with excellent all-round results.

In brief, we claim for the instrument the following points :—

Simplicity of Construction.

Strong in design.

Sensitive, Semi-automatic, or Automatic as desired,
being fitted with two Levers.

Easy to manipulate and easy to start.

Will give maximum power with minimum petrol.

Will vaporise benzol perfectly. Some engines give better results on benzol if a slightly smaller Jet than the one used with petrol is fitted, and level is raised about $\frac{1}{16}$ "

Will vaporise paraffin (lamp oil), if the Engine is first run on petrol for 20 seconds.

Control Cables can be adjusted from the Handlebar, by means of a small screwdriver, without dismantling anything.

Is very economical and flexible.

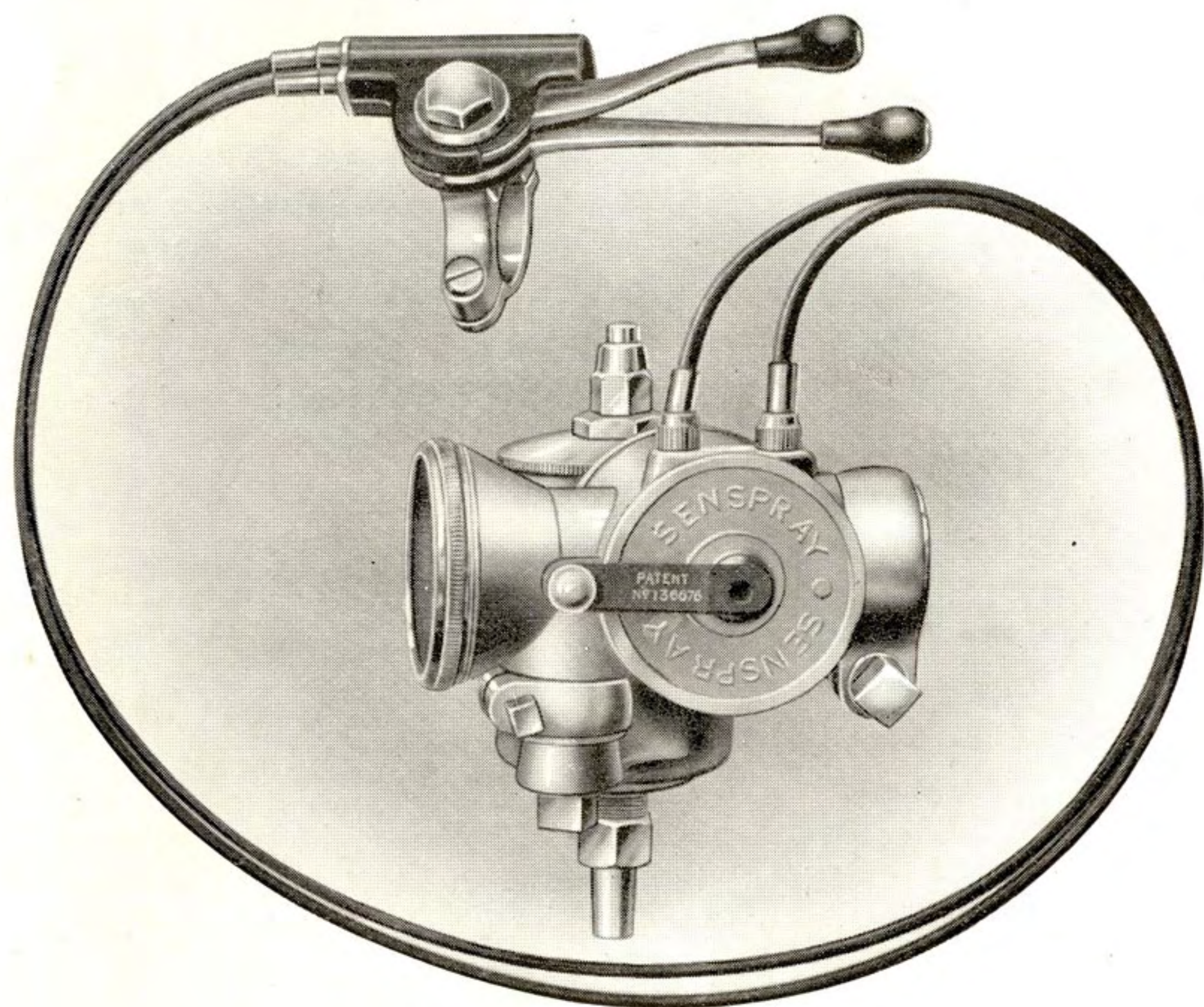
Is a perfect Touring Carburetter and a perfect Racing Carburetter.

Is adaptable to most standard makes of Engine, without additional expense of fitments, and is, indeed, an ideal Instrument for Motor Bicycles.

Chas. H. Pugh Ltd.

THE ADJUSTABLE VAPORISER TYPE OF "SENSPRAY" CARBURETTER

is made in the following models :—



PATENT NOS. 14805—11, 4084—12 and 136676.

MODEL

- B** For standard single-cylinder motor cycle engines of 500 c.c. to 750 c.c. capacity. Also suitable for 1,000 c.c. twins for fast work. Made to clip on to a plain pipe $1\frac{1}{8}$ in. outside diameter.
- C** As model B, but with the control cables coming out from the body of the instrument at an angle instead of vertically, thus neatly fitting overhead valve and other engines where the clearance under the tank is limited. Made to clip on to a plain pipe $1\frac{1}{4}$ in. outside diameter.

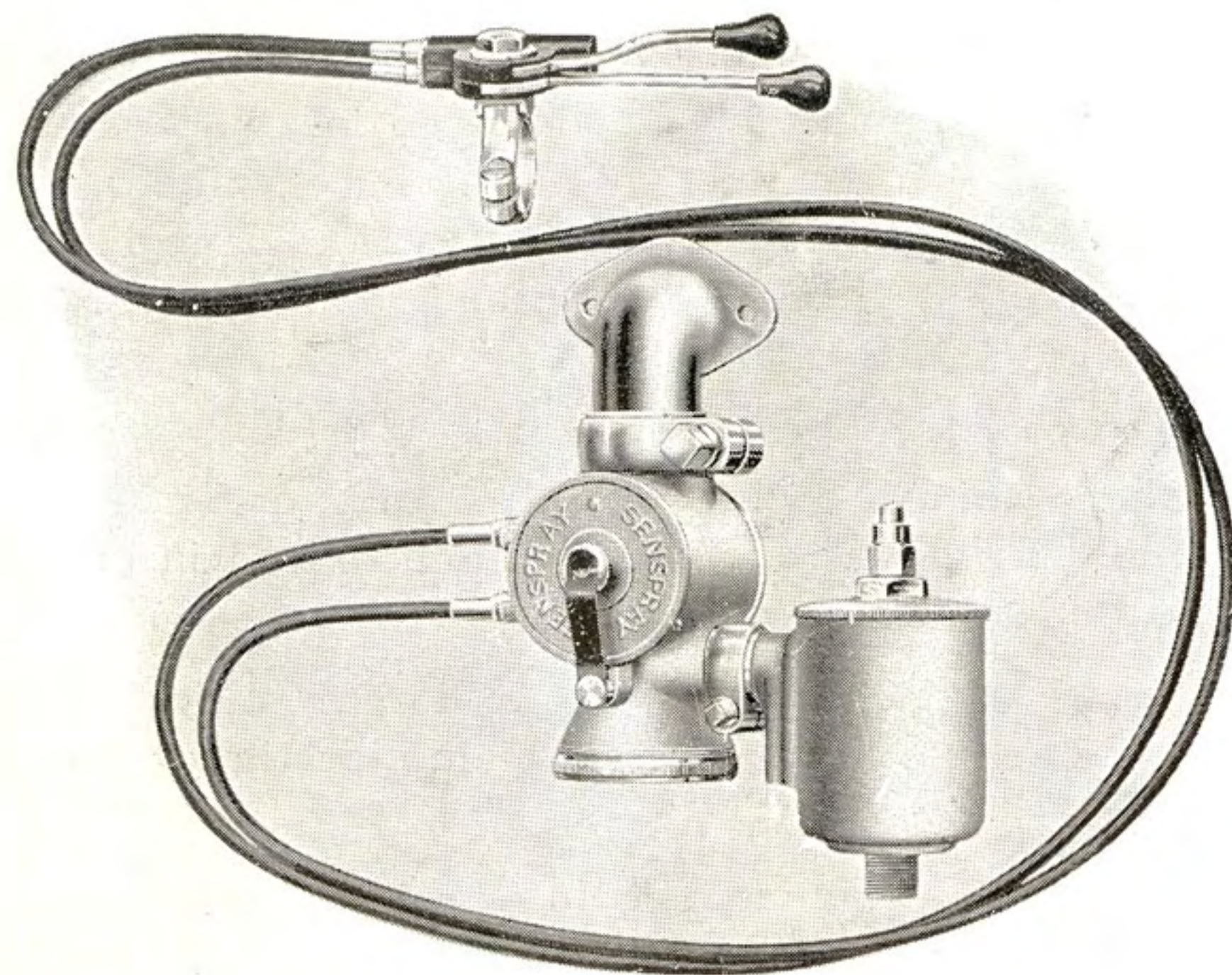
- E** For touring twin-cylinder engines of 650 c.c. to 1,000 c.c. Also for slow running single-cylinder engines, such as the A.C., Rover, De Dion, and for $2\frac{3}{4}$ H.P. single-cylinder machines provided with $1\frac{1}{8}$ in. diameter induction pipes or engine adapter, such as the $2\frac{3}{4}$ H.P. Blackburne and some $2\frac{3}{4}$ H.P. "A.J.S." engines, and to the 30" (1926) **Atco** Lawn Mower Engine. Made to clip on to a plain pipe $1\frac{1}{8}$ in. outside diameter.
- F** For single-cylinder engines of $2\frac{1}{2}$ to 3 H.P., or for fast work on $2\frac{3}{4}$ to $3\frac{1}{2}$ H.P. twins. Made to clip on to a plain pipe 1 in. or $\frac{7}{8}$ in. outside diameter.
- G** For 2 H.P. singles ; also for $2\frac{3}{4}$ to $3\frac{1}{2}$ H.P. twins for touring purposes. Made to clip on to a plain pipe 1 in. or $\frac{7}{8}$ in. outside diameter.
- H** For $2\frac{3}{4}$ H.P. Touring model twin Douglas. Made to clip on to a plain pipe 1 in. or $\frac{7}{8}$ in. outside diameter.
- J** For $2\frac{1}{2}$ H.P. single-cylinder **two-stroke** engines, such as the Connaught, Triumph, Levis, Clyno, Villiers. Also as fitted to the 24 in. (1926) **Atco** Lawn Mower Engine. Made to clip on to a plain pipe 1 in. or $\frac{7}{8}$ in. outside diameter.
- K** As fitted to the 18 in. and 22 in. (1926) **Atco** Lawn Mower Engine.

NOTES.

- (1) Models **B**, **C** and **E** are variations of the Standard instrument. Price, complete with 3ft. 6in. of double cable and fitted with flat disc gauze. **£3 1 0**
- (2) Models **F**, **G**, **H**, **J** and **K** are variations of the Lightweight instrument. Price, complete with 3ft. 3in. double cable and disc gauze. **£2 17 0**
- (3) Model **H** requires a special elbow adapter (which we can supply at an extra cost of $\frac{3}{6}$ net) before it can be fitted.
- (4) Model **F**, when fitted to the "T.T." Model Douglas machine, requires a special straight adapter (which we can supply at an extra cost of $\frac{3}{6}$ net) before it can be fitted.

When Ordering, please state—

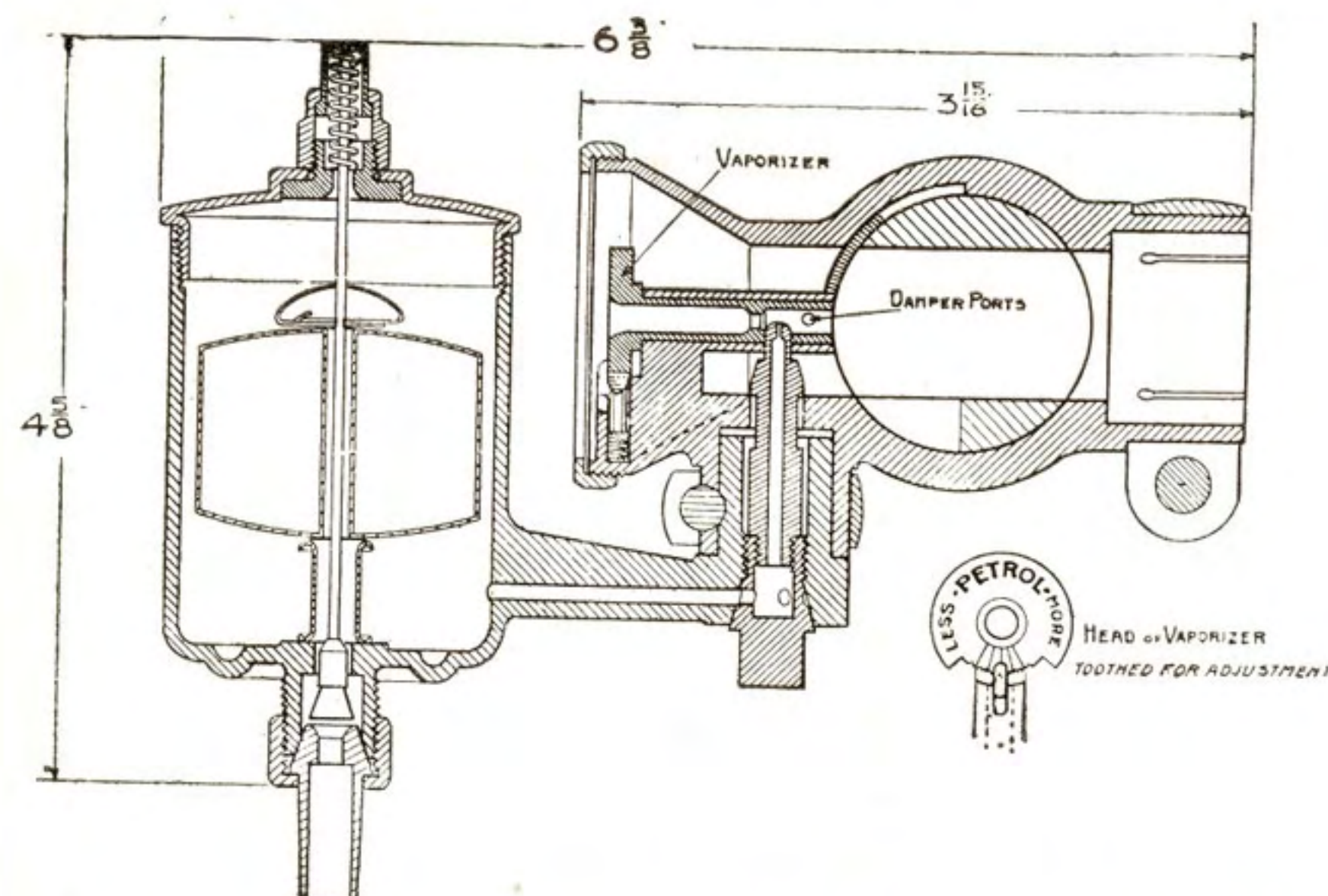
- (a) Outside diameter of engine adapter nozzle.
- (b) Length of cables required, and whether control levers are to open inwards or outwards when clipped to the right hand bar.
- (c) Diameter of handle-bars.
- (d) Make of engine, size of cylinder, etc.



VERTICAL MODEL "H."

Strongly recommended for Touring Model Douglas Machine.
For the T.T. Douglas we should recommend the ordinary Lightweight Model "Senspray" with straight adapter. Price, fitted with flat disc gauze, £2 17 0
Either straight or elbow adapter, 3/6

**Sectional Drawing of the "Senspray" Carburetter
(Adjustable Vaporiser Type).
HEAVYWEIGHT MODEL.**

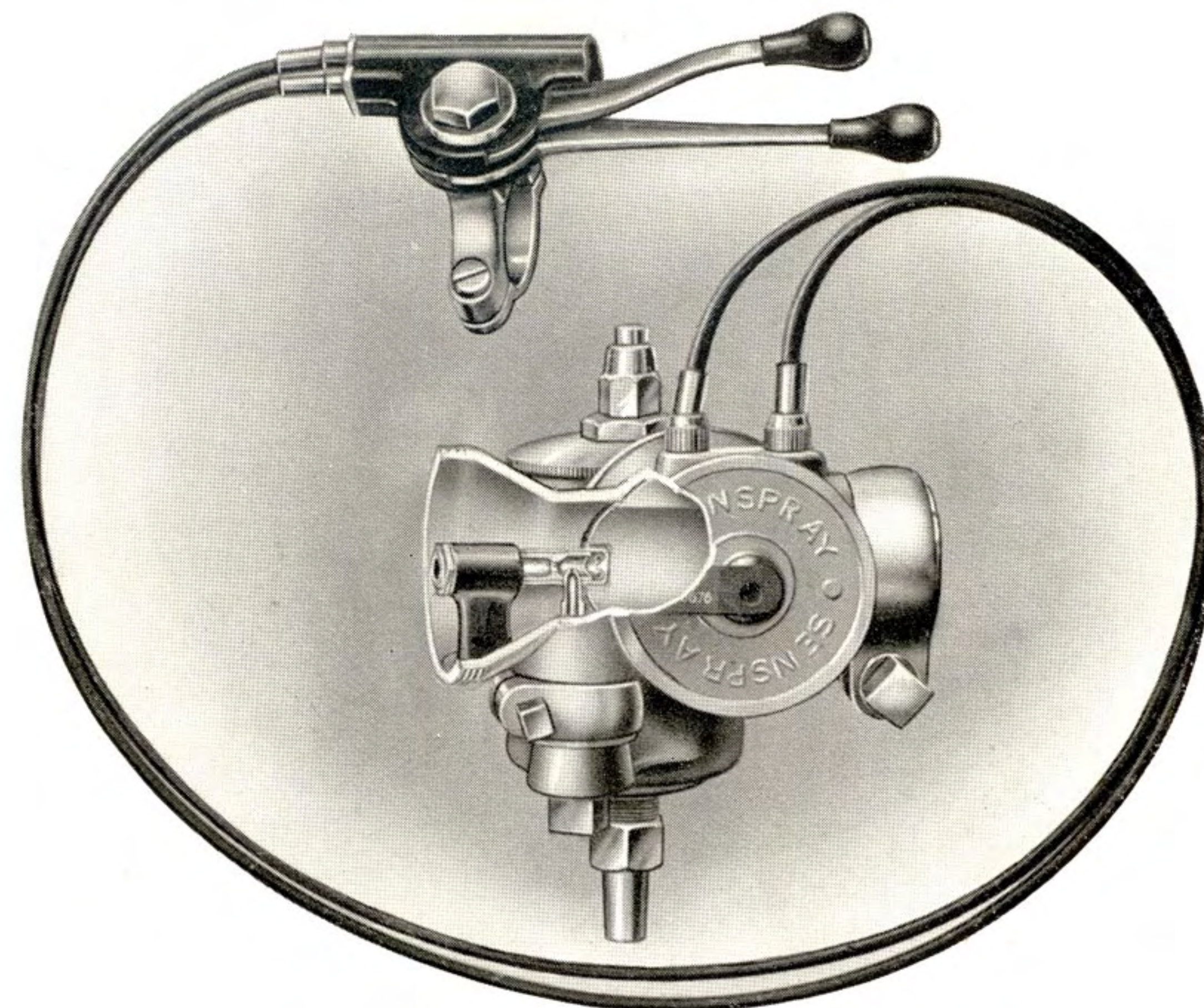


Note the correct position (i.e., resting on the top of the Vaporiser Tube) of the bottom edge of the air valve when air control lever at handlebar is shut and cables are properly adjusted.

Weight, complete with Control and 3ft. 6in. of double cable 2 lbs. 10 ozs,

SPECIAL SPORTS MODEL "SENSPRAY" CARBURETTER

(Fixed Vaporiser Type).



THIS model was introduced in 1925 to meet the demand for an instrument capable of supplying properly atomised fuel to the specially high speed motor cycles of 499 c.c. capacity, which have proved very popular with the Sporting Fraternity. We can recommend them to riders who desire to obtain the last ounce of speed and power from their mounts, but they will not be able to obtain quite the same satisfactory slow running, and tick over in the free engine position, with this instrument, as can be obtained with the adjustable vaporiser type.

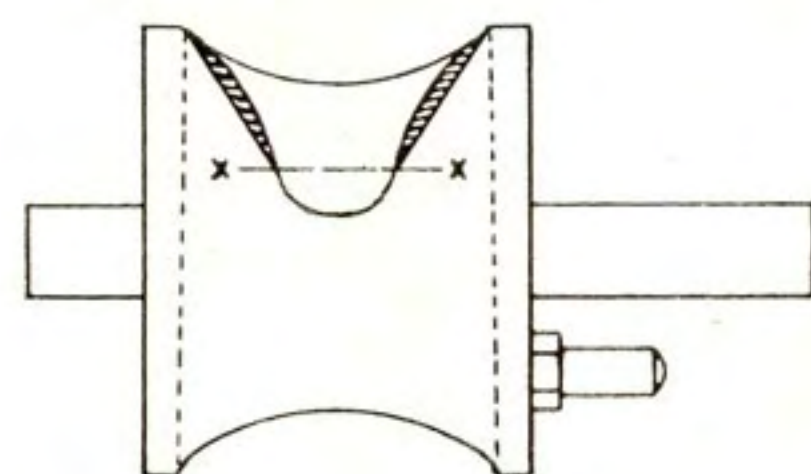
As will be seen from the illustration, the vaporiser consists of an outer hollow member closed at the end nearest the throttle, but a series of small holes are drilled round the circumference of the end, forming a "rose." The well-know "Senspray" type of

Venturi tube is formed in another sleeve which slides into the outer tube, forming a fixture in same. The whole vaporiser, as screwed into position by the Makers, should not be detached, as the hole through the side into the Venturi passage, for the tip of the jet, is drilled in position when the vaporiser itself has been screwed home in the body of the carburetter.

The "Senspray" action is the same as in previous fixed vaporiser models, with the addition that the spray is again sub-divided into as many sprays as there are holes on the rose itself, producing (if possible) a more finely atomised mixture.

In the float chamber there are two slight departures from standard; the needle valve is of a different dimension, and there is another needle valve clip **underneath** the float as well as on top of it, which makes it necessary to first of all withdraw the float altogether to release the lower clip, before the needle valve can be withdrawn from the chamber for any purpose.

The air slot, cut in the throttle to admit air at small throttle openings, is also a different shape, as shown in the illustration herewith. If it is found that there is a "dead spot" at about one-third throttle—



more particularly when closing down—if the rider so desires, he can overcome this tendency by carefully filing away (a bit at a time) the metal where indicated shaded in the illustration of the throttle,

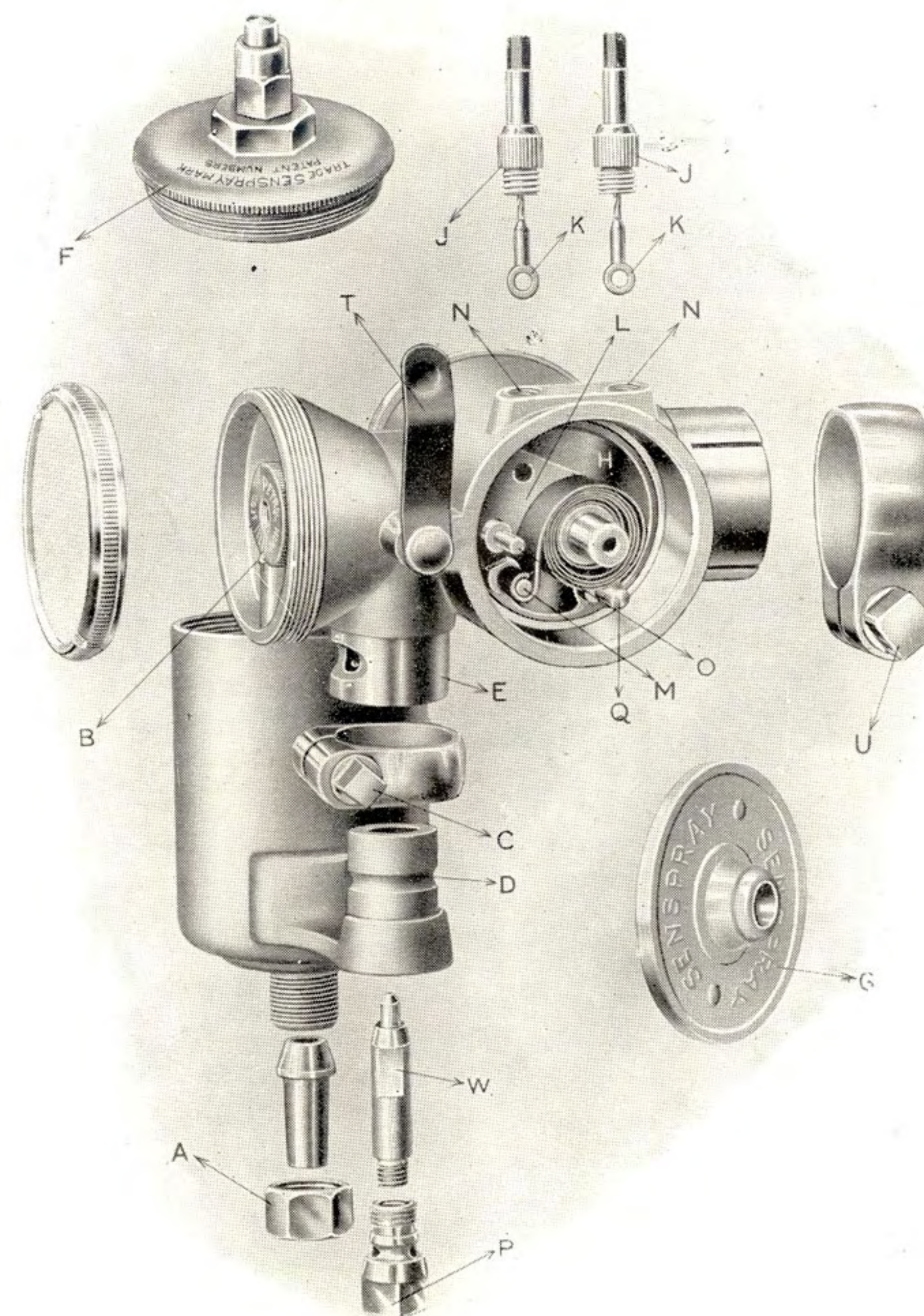
but the filing operation should not be continued below the centre line of the circle, marked X-X.

The jets that should be used with this instrument are $1\frac{1}{4}$ " " specially turned down " type mentioned in column 4 of the list on page 20.

In all other respects the instruments are adjusted and constructed exactly as described in the case of the standard adjustable vaporiser model.

Price, £3 6 0 each.

PARTS OF THE "SENSPRAY" CARBURETTER (Adjustable Vaporiser Type).



INSTRUCTIONS FOR DISMANTLING AND ASSEMBLING THE "SENSPRAY."

To remove Float Chamber bodily, the petrol jet remaining in place.

Unscrew petrol pipe union nut (A). Take out bolt (C), when the float chamber may be easily detached by withdrawing it downwards.

Note.—Before the float chamber can be detached it is essential that the bolt (C) is completely taken out, not merely slackened, as this bolt fits in the groove cut in the boss (D) of the float chamber arm, fixing it in one position and thereby ensuring that the tip of the jet comes exactly to the centre of the vaporising tube (see sectional drawing), when the proper "Senspray" action takes place.

A screw-on cap (F) is fitted as standard. When replacing the cap, see that the needle valve stem goes up the central hole in the cap before starting to screw it up.

To remove Needle Valve.

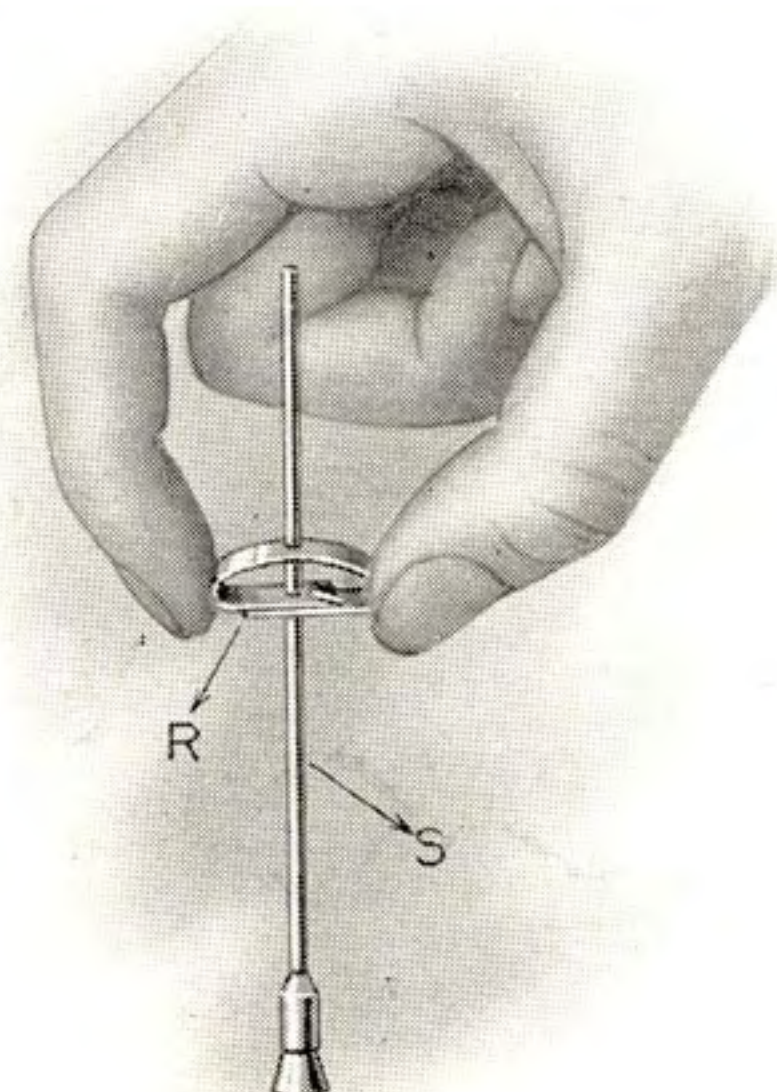
Detach petrol pipe as before, and remove float chamber cap (F). Pinch together the ends of the needle valve spring clip (R), as illustration, when it may easily be drawn off the valve stem. The needle valve (S) may then be slipped out downwards, and the float and the tubular support for same examined. The object of this latter piece is to restrict the travel of the valve, so that (a) the head of the valve does not tend to obstruct the flow of petrol from the petrol pipe union nipple; (b) when the petrol pipe is detached, and the chamber is empty, the needle valve does not project beyond the nipple on the bottom of the float chamber, and so stands less chance of being accidentally damaged, or the stem bent.

When replacing.

Do not forget that, when the Needle Valve Clip has been removed at any time, **great care must be taken when replacing same, to see that it clips properly into the nick cut round the stem of the valve to receive it**, as this fixes the petrol lever at the correct height.

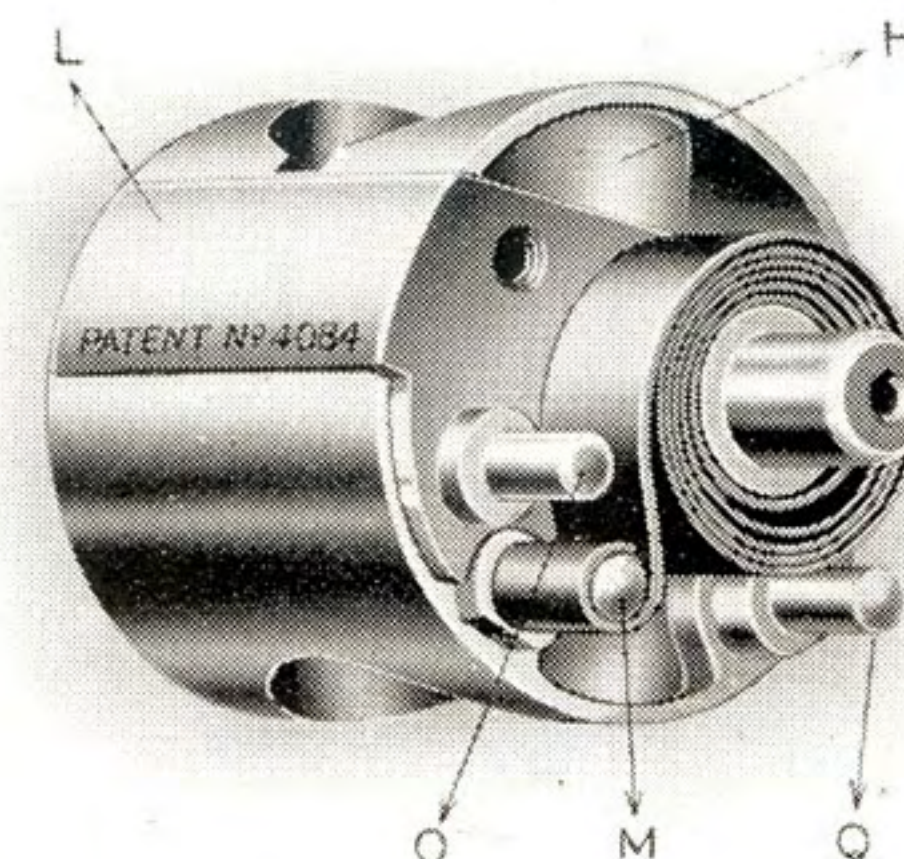
To Remove Jet.

Unscrew the square-headed screw (P) at base of float chamber arm, when the jet (W) comes away complete in its holder or base, from which it can be unscrewed without difficulty.



To remove Throttle and Air Valve, and to detach Control Cables from the body of the Instrument.

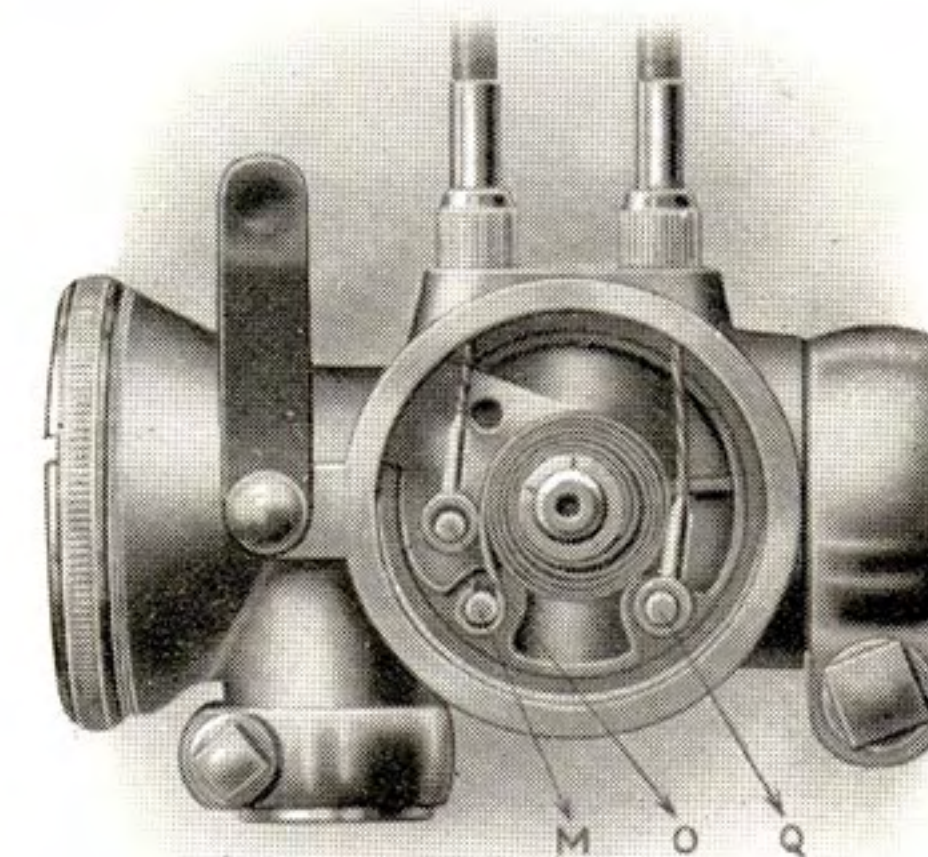
Put levers to closed position. Release spring clip (T) and pull off throttle cap (G) from right-hand side of throttle chamber. This will expose the rotary valve (H). Gently "lever" the nipples (K), soldered to the ends of the control cables, off their studs. Unscrew the knurled nipples (J) and the cables may then be withdrawn altogether from the Carburetter. The complete rotary valve (H), with air valve (L) attached, may then be lifted clear away, and, if necessary, the air valve, with spring attached, may be slid from off the barrel, but do not remove spring from the air shutter. After cleaning, slip air valve back on to throttle valve; then coil the free end of the clock spring up about a quarter of a turn anti-clockwise, passing the loop on the free end over the middle one (M) of the three pegs.



To replace.

Slide throttle complete, with air valve and spring coupled up, into body, into which it slides easily; turn it round to the left, or anti-clockwise, as far as it will go, when a slight push inwards will make it "click" into position. This ensures the radial stop bar on the throttle engaging properly with the stop lugs (N) formed on the inside of the further end cap.

Thread the eyeletted ends (K) of the control cables through the tapped holes (N) in the top of the body; screw up the knurled edge nipples (J) firmly; slip the air control wire (i.e., the wire attached to the shorter lever on the handlebar) nipple over the peg (O) fastened in the air shutter, holding the instrument in the left hand; then, with the thumb pressed against the peg (M), on to which the outer end of the clock spring is anchored, rotate the throttle anti-clockwise till you find that you can slip the eyeletted end of the throttle control wire (i.e., the wire attached to the long lever at handlebar control) over the third or free peg (Q). Replace cap (G) and fasten it by means of spring clip (T).



The corresponding cap at the other side of the chamber need never be removed.

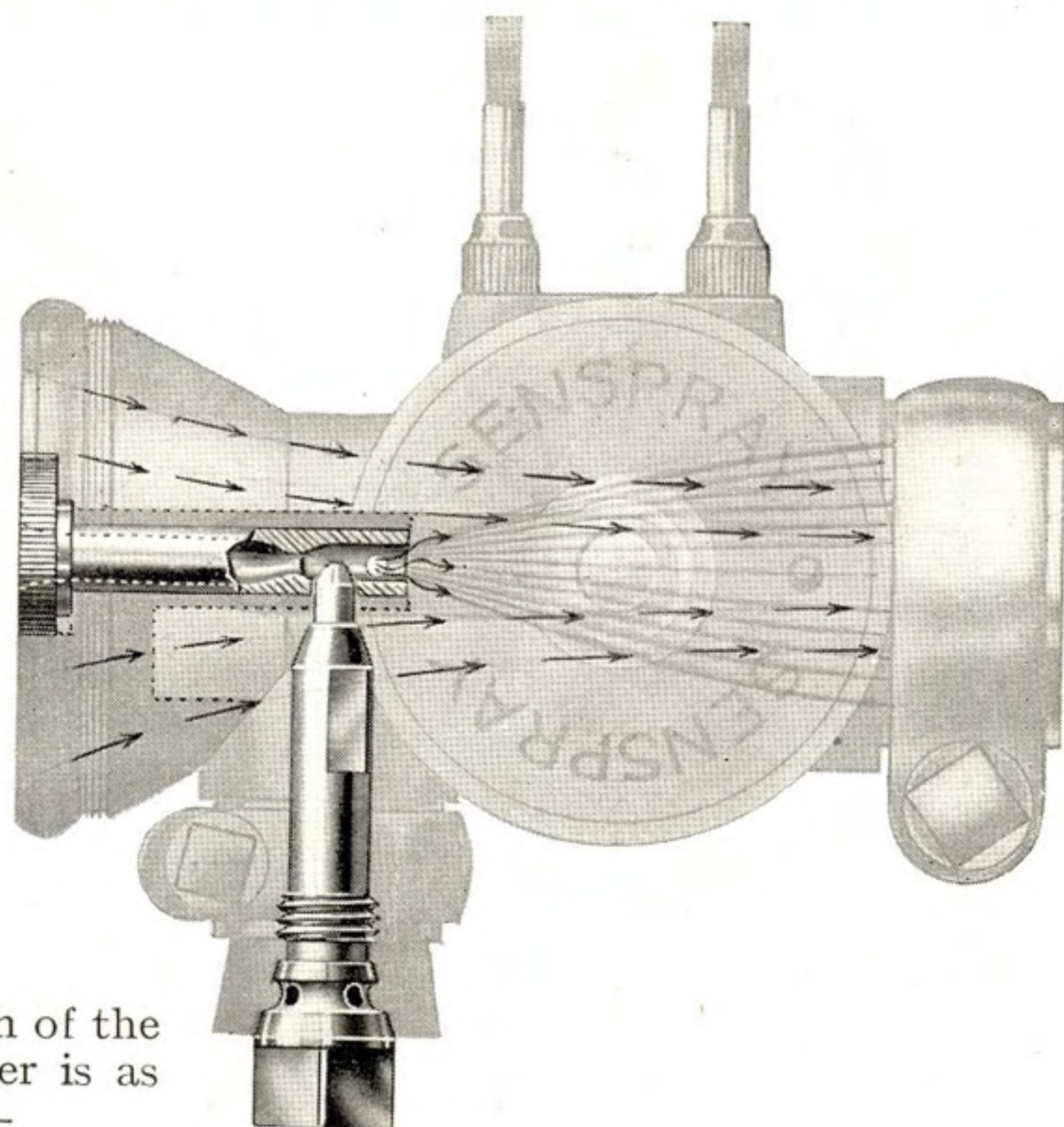
To remove Vaporiser.

It is never necessary to do this. If it is desired to do so, however, then the jet (or the float chamber complete with jet) must first be removed; the pawl (B), which engages with the serrated edge of the head of the vaporiser, must be depressed, by inserting the thumb nail in the notch provided, until it allows the vaporiser to be withdrawn. As there is a "lively" coil spring under the pawl, the latter must be released very gently, as otherwise there is a danger of the parts being lost.

To replace.

Depress pawl and insert vaporiser; see that the projecting tooth of the former comes up **in front** of the dial face; replace jet or float chamber.

Illustration showing the action of the VARIABLE VAPORISER TYPE "SENSPRAY" CARBURETTER.



The action of the Carburetter is as follows :—

A small volume of air is drawn, by the downward movement of the piston, through the Vaporiser or Spraying Nozzle at an extremely high rate of speed (due to the small bore of same) over

the top of the petrol jet, and, acting on the "Injector" principle, forcibly draws the petrol out of the jet and sprays it into the mixing chamber in the form of a fine mist. At the same time, the air necessary to form the explosive mixture is admitted straight in at the back of the Carburetter as illustrated diagrammatically above, and a perfectly atomized firing charge is thus obtained.

An examination of the Rotary Throttle Valve will show that it opens and closes both the throttle and air openings in conjunction, the air valve simply serving to give a fine regulation of the mixture. When the throttle opening is small, there is only a small air inlet opening, and consequently some of the air passing through the carburetter will enter by way of the Damper Holes in the vaporiser, which afford a passage to it.

This means that less air is drawn through the vaporiser direct, and less petrol is sprayed into the mixing chamber in consequence.

The more the throttle is opened, the larger becomes the air inlet, and consequently, less and less air will enter by means of the Damper Holes. Eventually, when the throttle is fully open, there is a clear through passage for the air and all will pass through this way. The result of this is that, the further the throttle is opened, the greater is the volume of air drawn through the vaporiser, and the greater is the amount of petrol sprayed out, so that, at full throttle openings, the engine is getting as much petrol as the jet can deliver. But, as the throttle is closed, the pull on the jet is "damped off" in proportion, preventing waste of fuel. The Damper Holes are capable of very fine adjustment, and a setting can easily be found to give the best mixture for each individual engine, thereby ensuring the minimum petrol consumption with the maximum power.

As all the petrol is thus used to the very best advantage, it might reasonably be expected that an instrument working on these lines should be economical in its petrol consumption, and the "Senspray" Carburetter has proved itself to be the most economical and most efficient. At the same time, it must be borne in mind that, when used for Racing purposes, the object of the rider is to obtain the utmost power and speed possible. Power and speed can only be obtained by the consumption of fuel. The ordinary Carburetter either partially starves a Racing Engine, due to smaller effective cross-sectional area at full throttle, or feeds it with petrol in a more or less liquid state. The "Senspray" Carburetter supplies large quantities of atomized or volatilized petrol, perfectly mixed with air and forming an explosive gas of high power, by using a suitable size jet for the Engine.

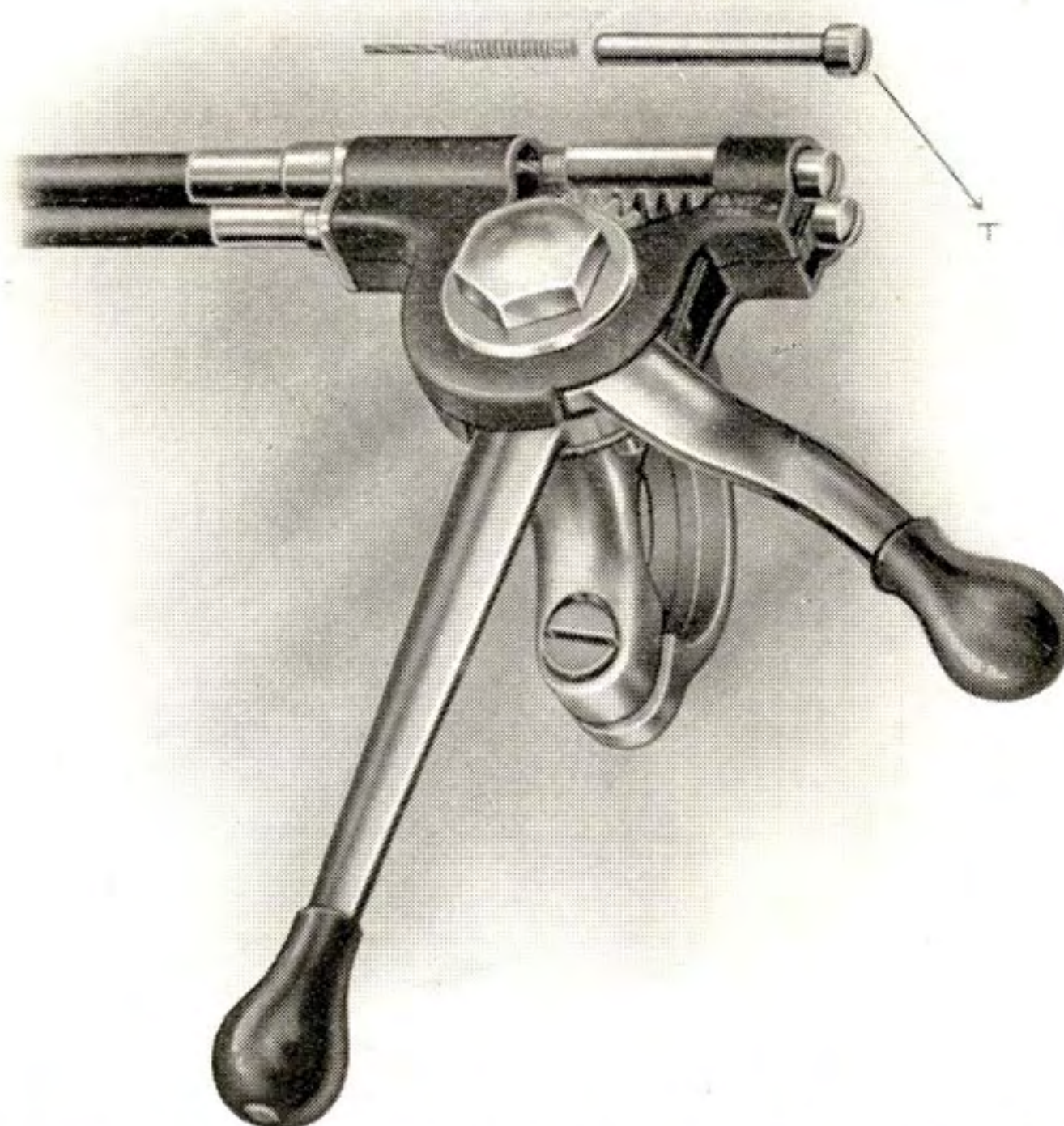
The "SENSPRAY" Handlebar Control

WE believe this to be the most mechanical Control yet made. The wire cables do not have to bend round a drum-shaped lever, but work in a straight line. Continual bending of the cables quickly tends to break them. "Senspray" Controls will not break down.

The Control Box is adjustable to any angle, so as to suit any design of handlebar, by merely slacking back the central hexagon-headed pin, twisting the control round to the desired angle, and tightening up again until the levers can just be moved freely without shaking back under road vibration. Should this trouble arise, turn the screw another half turn in a clockwise direction.

The "Senspray" Control is neat, light and distinctive. The small Cheese-head Pin in the Handlebar Clip cannot fall out should the Carburetter be removed from the machine—a small item, but one which shows how carefully the "Senspray" Carburetter has been designed.

WARNING.—The Control should not be taken to pieces unnecessarily.



NOTE.—We have adopted as standard the "open inwards" (when levers are fixed on the right-hand side of the bar) type of Control. We are, however, prepared to supply the "open outwards" type if specified by our customers.

Instructions for fitting the Carburetter to the Machine, Adjusting, and driving same.

- (1) Before tightening up the Induction Pipe Clip Bolt (U), see that the Float Chamber is quite vertical, as otherwise "flooding" may occur.
- (2) Make the final adjustments to the Cables **after** the control has been clipped on to the handlebar, and the cables have been clipped to the frame. Open the levers to their fullest extent. Then, at the open end of the Control Lever Box, you will see two nicked heads (T) appear (see illustration, page 16). With the aid of a small screwdriver, turn to the right or left to shorten or lengthen the cables respectively. It should, however, not be necessary to give more than one or two complete turns one way or the other, as the instruments are sent out properly adjusted, provided that no sharp bends are put in the cable. Take off the Gauze Dust Cap, so that you can see that the Air and Throttle Valves open and shut fully when the levers on the handlebar are moved. Adjust the Air Control Wire first. When the lever on the handlebar is shut, the bottom edge of the Air Valve should rest just on the top of the vaporiser sleeve housing, and should start to move immediately the lever on the handlebar is moved. Then adjust the Throttle Control Wire until the throttle comes up against the stop provided on the throttle chamber cap, on the side remote from the control cables. Immediately the throttle lever on the handlebar is moved, however, the valve should start to rotate, and when the lever is fully open (the air valve being kept fully open as well), there will be a clear round passage through the instrument.
- (3) The Float Chamber Clip Bolt is now made to act as a Positioning Key as well as a Clip Bolt, and before the Float Chamber can be detached from the main body of the instrument, **the square headed Clip Bolt must be removed altogether from the Clip**—and conversely, when re-assembling, the Float Chamber must be pushed right up home into its "Housing Lug" as far as ever it will go, **before the Clip Bolt can be inserted**, taking care to see that the Bolt Hole in the Clip is clear right through.
- (4) Should the Needle Valve Clip be removed at any time, great care must be taken when replacing same, to see that it clips properly into the nick cut round the stem of the valve to receive it, as this fixes the Petrol Level at the correct height.
- (5) **Setting the Vaporiser.**
The Carburetter can be made (a) **Sensitive**; (b) **Semi-Automatic** or (c) **Automatic**, by merely removing the air gauze and adjusting the vaporiser.

- (a) **Sensitive.**—Turn the vaporiser as far as it will go in the “less” direction. In this position an adjustment is obtained that demands the working of the air lever in conjunction with the throttle lever, and which, in the hands of an experienced rider, will give an extraordinary good petrol consumption.

If the instrument is not sensitive enough with this setting, fit a smaller jet.

- (b) **Semi-automatic.**—Turn the vaporiser, one nick at a time, towards “more,” experimenting with each different setting. It will be noticed that each time the mixture is getting richer and that more air can be given, until, eventually, a setting is found where, for all ordinary running on the road, the air lever is kept wide open, but for slow running, free engine, on a hill, etc., the mixture can be improved by shutting off some of the air.

- (c) **Automatic.**—Turn the vaporiser towards “more” until a setting is found when the engine will run at any speed with the air lever fully open. The Carburetter is now an absolute one-lever instrument, the air lever merely being closed for easy starting, and then opened and left open all the time.

N.B.—Do not turn the vaporiser any further than is necessary in the “more” direction, as this would merely give too rich a mixture and so increase the petrol consumption needlessly. If you cannot get the instrument “Automatic” without turning fully to “more,” then fit a size larger jet.

Generally speaking, with a touring size jet fitted, as you open the throttle to its fullest extent, when the air valve is also fully open, it will usually be found necessary to slightly shut off the air, as otherwise, particularly as the engine slows on a hill, the mixture will become too weak and the engine will choke. As the engine begins to knock, gradually close the air altogether, before retarding the spark.

Giving more Air.

We are often asked by riders who have not previously used the “Senspray,” how, if their air lever (and consequently the air valve, assuming their cables are properly adjusted) is fully open, when the throttle is only, say, one-quarter open, the engine gets more air when the throttle is opened further. It is, of course, due to the type of duplex rotary throttle employed. The throttle acts to a very large extent both as the air **and** throttle valve (hence the term “duplex valve”), and, at small throttle openings, although the air valve is wide open, if you look through the instrument from the induction pipe end or engine side of the throttle, it will at once be

seen that only as much air actually passes through to the engine as the throttle itself will permit. As the throttle is opened, more air passes as well as more petrol, until ultimately, as explained above, the mixture may become too weak.



- (6) The Carburetters are sent out adjusted for touring. For maximum power, insert a slightly larger Jet. The Jet consists of two parts, screwed together. The top half only should be changed. It is important to see that the taper seating of the jet-base is clean before screwing it home tightly.
- (7) Do not enlarge the Jets or alter the shape of the end of Jet in any way.
- (8) Smear a little vaseline occasionally on the spindle bearings and cable eyelets **only**. Do not oil the valves.
- (9) In case of difficulty or trouble, do not hesitate to consult the makers.

Notes on Size of Jets.

The question we are most frequently asked is “What is the best size of Jet to use in any machine?” and it is impossible to answer this question without additional information. The cylindrical rotary type of Throttle employed in the “Senspray” Carburetter acts very largely as a variable choke-tube, and the essential difference between our various models is in the variation of the size of the hole through the Throttle. With a smaller bore of Throttle, on the same engine, to obtain the best results, a smaller size of Jet should be fitted, and vice versa; again, if a standard Carburetter is used on a Lightweight Engine, it will usually be necessary to fit a much larger Jet than would be necessary if the Carburetter were used on the size of engine for which it was primarily designed, as the velocity of air through the instrument is less, due to the suction of the smaller piston, and this has to be compensated for by fitting a larger jet. It is essential, therefore, to state:—

- (a) The size and make of Engine, and whether Single or Twin.
- (b) Which model Carburetter is fitted, or failing this, carefully measure the diameter of the hole through the Throttle.
- (c) For Sidecar work, if enough power is not developed with the standard size of jet, it is quite safe to fit a Jet one size larger, and for such an occasion as a hill climb, a larger one still.

We can supply Jets for all models in any size from 24 to 46, No. 22 is the smallest, and No. 46 the largest we usually make.

The Jets we fit, in the absence of special instructions from the makers of the Machines, are :—

Models **B** and **C**—Jet No. 38.

Model **E**—Jet No. 38 for twin; No. 42 for large slow-running single cylinder engine.

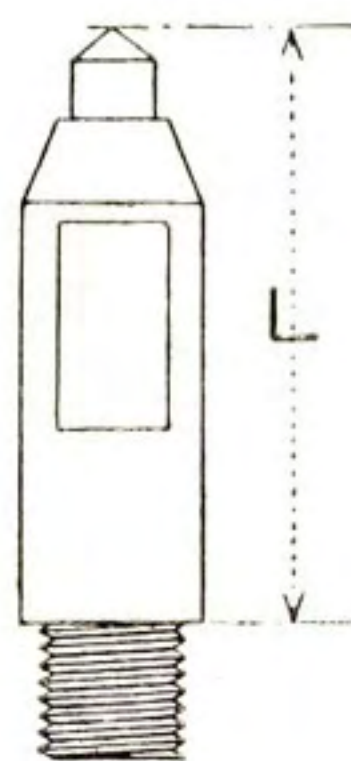
Model **F**—Jet No. 28.

Models **G** and **H**—Jet No. 28.

Model **J**—Jet No. 28.

Model **K**—Jet No. 20.

When ordering Jets, it is very important to see that the correct length of Jet is fitted, as if too short a one is put in, flooding and generally unsatisfactory running results, and if too long, the instrument does not assemble correctly. For the users guidance when ordering, we tabulate below the lengths of jets at present on the market, and the different models and year of Instrument that they fit.



L	MODELS.
$\frac{5}{8}$ in.	H. Horizontal Jet. 1913 and 1914.
$\frac{3}{4}$ in.	H. Horizontal Jet. 1915, 1916, 1920, 1921, 1922 and 1923.
$\frac{15}{16}$ in.	All 1912 Instruments.
1 in.	As fitted to 5 h.p. Rudge Machines, 1913.
$1\frac{1}{8}$ in.	F.G.J. 1913 and 1914.
$1\frac{1}{4}$ in.	F.G.J. 1915, 1916.
$1\frac{1}{2}$ in.	A.B.C.D.E 1913, 1914, 1915, 1916.
$1\frac{3}{4}$ in.	As fitted to 5 h.p. Rudge Machines, 1914, 1915, 1916, and in ALL 1920, 1921, 1922, 1923, 1924, 1925 and 1926 Vertical Jet Models.
Specially turned down.	

Pocket Jet Case



NOTE.—If Spare Jets are carried about loose in the tool bag or pockets, with tools or other metal articles, not only are the screw threads likely to be damaged, but the hole through the top of the Jet becomes “burred up” and finally closed up altogether. The use of a Jet case effectively overcomes these troubles. **When ordering, please state what instrument they are required to fit, as per tabulated list above, Also state what numbers or sizes you already have.**

Price, complete with 3 Jets, 3/6 Postage extra.

Notes on the Calibration of “Senspray” Jets.

The experience gained when manufacturing, in large quantities, the special “R.R.C.H.” type Carburetters for Rolls-Royce Aeroplane Engines, emphasized the necessity of securing a uniform flow of petrol from orifices or Jets of apparently, so far as ordinary methods of gauging used in manufacture showed, the same size—on the face of it a simple proposition, but one that in practice proved to present many difficulties demanding the co-operation of many brains and much scientific, delicate and accurate experimental work, before a satisfactory method of comparing and calibrating Jets was finally arrived at.

As is well known to engineers, the rate of discharge of a liquid from a vessel depends not only on the diameter of the discharge orifice, but on other variables, such as the “head” pressure, the shape of the discharge orifice, and, in the case of a circular parallel orifice, the length of the passage in relation to the bore, etc., so that ordinary methods of gauging fail, and it is only by actually measuring the amount of liquid passed, under certain fixed conditions of temperature, “head” pressure, etc., that the flow from one Jet can be accurately compared with that from another. In practice, the number of cubic centimetres of petrol passed per minute under a pressure due to a convenient standardized “head” of petrol, forms a convenient way of denoting the size of a Jet, and most of the leading carburetter manufacturers have adopted this method as standard for the future.

All “Senspray” Jets are thus treated, and are marked “calibrated.”

On one of the flats of the Jet will be stamped the number of cubic centimetres (denoted by the letters c.c.) of petrol that the Jet will supply under standard conditions, e.g., 118 c.c.

On the other flat, for a convenient reference to users, will be stamped the number the Jet would have been known by under the old system, e.g., 38.

The table below shows our range of Jets, giving the markings on both systems. Intermediate sizes can be made if desired.

OLD SYSTEM MARKING.		NEW SYSTEM MARKING.	OLD SYSTEM MARKING.		NEW SYSTEM MARKING.
No. 20	...	35 c.c.	No. 34	...	88 c.c.
„ 22	...	40 c.c.	„ 35	...	97 c.c.
„ 24	...	45 c.c.	„ 36	...	107 c.c.
„ 26	...	50 c.c.	„ 37	...	112 c.c.
„ 27	...	55 c.c.	„ 38	...	118 c.c.
„ 28	...	60 c.c.	„ 39	...	124 c.c.
„ 29	...	66 c.c.	„ 40	...	129 c.c.
„ 30	...	73 c.c.	„ 42	...	142 c.c.
„ 31	...	76 c.c.	„ 44	...	156 c.c.
„ 32	...	80 c.c.	„ 46	...	172 c.c.

FLOODING

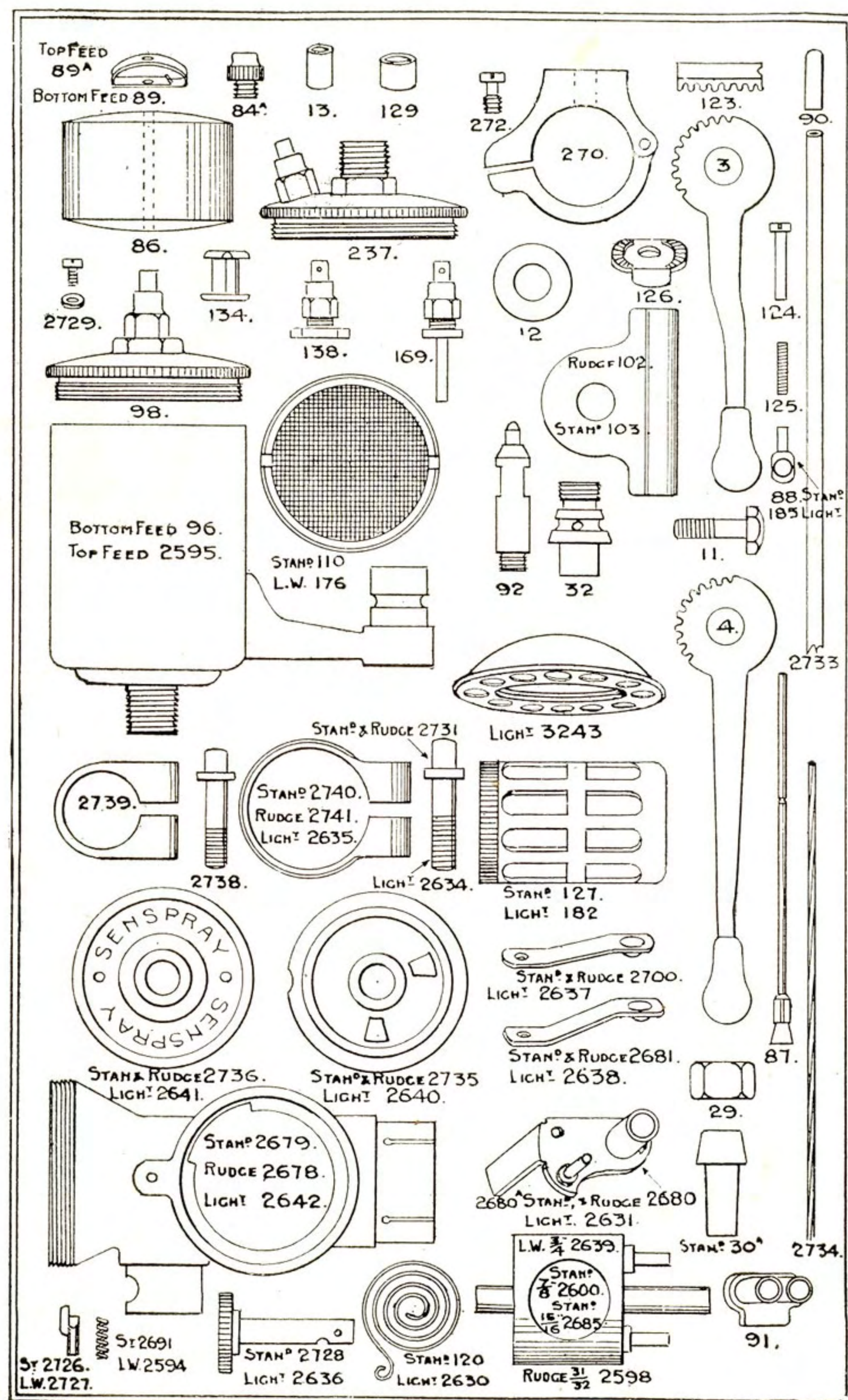
Its Causes and Remedies.

Flooding is perhaps one of the most common faults in a carburetter, and below we give a list of the causes and their cure.

It is a good thing to examine periodically for flooding, as detailed, as slight flooding may be taking place, which, although not very noticeable, means all the difference between good petrol consumption and bad.

- (1) Float Chamber not set vertical before the induction pipe clip is tightened up.—Set it vertical.
- (2) The Needle Valve Clip does not register properly in the notch made in the stem of the valve to receive it.—See that it does.
- (3) The Air Vent Hole in the edge of the float chamber cap, or in the tickler-push-button has become stopped up with dirt.—Clean it out with a pin.
- (4) The Float may be punctured. Hold it to the ear and shake it, when, if punctured, the petrol will be heard to rattle about.—A new float should be obtained. Do not attempt to mend the old one.
- (5) Sand and Dirt in the bottom of the Float Chamber.—Clean it out thoroughly from time to time.
- (6) Worn Needle Valve.—Send the Float Chamber complete to the makers to have a new needle valve fitted.
- (7) The Needle Valve Stem may have become bent.—Gently straighten it. Also see that it is quite free in its guides at both top and bottom. If there are any bright spots, showing that excessive rubbing is taking place, smooth them down gently with a dead smooth file or fine emery paper.
- (8) The Float Chamber Cap may have accidentally received a blow severe enough to distort it and throw the tickler portion out of truth with the rest of the cap. This, of course, means that the guide for the end of the needle valve stem will be out of truth, and a sticking needle valve will result.—Fit a new Float Chamber Cap.

Illustration of Spare Parts



Price List of Spare Parts for Adjustable Vaporiser Type "SENSPRAY" CARBURETTORS

Part No.	Description	Each	Part No.	Description	Each
3	AIR LEVER with Tip . . .	1/9	2630	SPRING for Throttle, L.W. . .	10d.
4	THROTTLE LEVER with Tip . . .	1/9	2631	AIR SHUTTER, L.W. . .	1/9
11	HEX. SCREW PIN . . .	3d.	2634	BOLT for Induction Pipe Clip, 1½in. long, L.W. . .	3d.
12	WASHER for Hex. Pin . . .	2d.	2635	INDUCTION PIPE CLIP, L.W., 1⅞ in. dia. . .	2/-
13	INNER BUSH (Control Box) . . .	2d.	2636	VAPORISER, L.W., 1⅝in. long . . .	9d.
29	NUT for Petrol Pipe Nipple . . .	6d.	2637	CAP SPRING (Stop End), L.W., 1⅝¼ in. long . . .	3d.
30	PETROL PIPE NIPPLE . . .	4d.	2638	CAP SPRING (Control End), L.W., 1⅝¼ in. long . . .	3d.
32	JET BASE . . .	10d.	2639	THROTTLE VALVE, L.W., . . .	4/-
84	KNURLED HOUSING NIPPLE . . .	2d.	2640	THROTTLE CAP (Stop End), L.W., 1⅞in. dia. . .	2/-
86	FLOAT . . .	2/6	2641	THROTTLE CAP(Control End),L.W., 1½in. dia. . .	2/-
87	NEEDLE VALVE . . .	10d.	2642	BODY, Lightweight . . .	7/6
88	CABLE EYELET NIPPLE (S. & I.C.) . . .	3d.	2678	BODY, Inclined Cable . . .	8/6
89	NEEDLEVALVESPRINGCLIP(bot.feed)	3d.	2679	BODY, Standard . . .	8/6
89A	DITTO (top feed)	3d.	2680	AIR SHUTTER, I.C. . .	1/9
90	FERRULE (Outer Cable) . . .	1d.	2680A	AIR SHUTTER, S. . .	1/9
91	PLAIN HOUSING NIPPLES . . .	4d.	2681	CAP SPRING (Control End) S. & I.C., 1⅝in. long . . .	3d.
92	JET (see page 20) . . .	7d.	2685	THROTTLE VALVE, 1⅞ in., S. . .	5/-
96	FLOAT CHAMBER BODY(bottom feed)	8/6	2691	SPRING for Index Pawl, S. & I.C. . .	1d.
98	FLOAT CHAMBER CAP (bottom feed)	4/3	2700	CAP SPRING (Stop End), S. & I.C., 1⅞in. long . . .	3d.
102	CONTROL CASE SHELL (I.C.) . . .	10d.	2726	INDEX PAWL, S. . .	3d.
103	" " " (S.) . . .	10d.	2727	INDEX PAWL, L.W. . .	3d.
110	DUST CAP DISC, S.&I.C. 1⅞in. dia.	1/9	2728	VAPORISER, S & I.C., 1⅞¼ in. long . . .	8d.
120	SPRING for Throttle (S.& I.C.) . . .	10d.	2731	BOLT for Induction Pipe Clip, S. & I.C., 1½in. long . . .	3d.
123	RACK for Levers . . .	4d.	2733 }	INNER AND OUTER CABLES, complete with all Nipples, per pair . . .	5/9
124	CHEESE-HEAD ADJUSTING SCREW . . .	4d.	2734 }		
125	SCREWED ADJUSTING NIPPLE . . .	2d.	2735	THROTTLE CAP(Stop End),S.& I.C., 1½in. dia. . .	2/6
126	TOOTHED SADDLE PIECE . . .	2d.	2736	THROTTLE CAP (Control End), S. & I.C., 1⅞in. dia. . .	2/6
127	LONG DUST CAP, S. & I.C., 1⅞in. dia.	4/-	2738	BOLT for Float Chamber Clip . . .	5d.
129	OUTER BUSH (Control Box) . . .	2d.	2739	FLOAT CHAMBER CLIP . . .	1/9
134	FLOAT SUPPORT . . .	2d.	2740	INDUCTION PIPE CLIP, S., 1⅞ in. dia.	2/-
138A	BOTTOM FEED HEX.TICKLER, NUT, SPRING AND PUSH CAP . . .	10d.	2741	INDUCTION PIPE CLIP, I.C., 1⅞in. dia. . .	2/-
138	TICKLER (bottom feed) . . .	1/9	3243	DOMED DUST CAP, L.W. . .	1/9
169	TICKLER (top feed) . . .	1/9			
176	DUST CAP DISC. L.W.; 1⅞in. dia. . .	1/9			
182	LONG DUST CAP, L.W., 1⅞in. dia.	4/-			
185	CABLE EYELET NIPPLE, L.W. . .	2d.			
237	FLOAT CHAMBER CAP (top feed) . . .	4/3			
270	HANDLEBAR CLIP . . .	2/-			
272	CHEESE-HEAD SCREW forHandleClip	2d.			
2594	SPRING for Index Plunger, L.W. . .	1d.			
2595	FLOAT CHAMBER BODY (top feed) . . .	8/6			
2598	THROTTLE VALVE, 31/32 in. (I.C.) . . .	5/-			
2600	THROTTLE VALVE, 7/8 in. (S.) . . .	5/-			

NOTE. S.=STANDARD.
L.W.=LIGHTWEIGHT. I.C.=INCLINED CABLE OR RUDGE MODEL.

NOTE. S.=STANDARD.

L.W.=LIGHTWEIGHT. I.C.=INCLINED CABLE OR RUDGE MODEL.

PRICES SUBJECT TO ALTERATION. POSTAGE EXTRA.

N.B.—With the exception of Ledger Accounts, CASH must accompany all orders for Spare Parts.

TESTIMONIALS.

Mr. H. A. T.

8 h.p. Twin Humber.

"I am glad to be able to inform you that the "Senspray" Carburetter I bought from you has done what I hoped it would do. I gave it a fair test this morning, and on a measured $\frac{1}{2}$ gallon of petrol, the Car did just over 20 miles. This is a good improvement on the old rate of 24 to the gallon. This was with the adjustment a notch or two on the "less" side, and I think it is as economical as I can get—"

I am quite satisfied, and I can also get slow running."

Mr. A. C. W.

Zenith (1920), 5 h.p. Twin Jap.

"I bought yesterday one of your Variable Vaporiser Type "Senspray" Carburetters. I took off the one originally fitted, and fixed on the "Senspray"; I set it to the sensitive-two-lever-control as per instructions, and then went for a test run. My reasons for scrapping the old carburetter were lack of engine "liveliness," no reasonable speed, no power. The undesirable features disappeared after the "Senspray" had been fitted. It's a beauty; added 11 miles an hour to my speed without fully opening throttle, and the results are already quite satisfactory."

Mr. A. J. C.

"I have found the "Senspray" the best Carburetter on the market for speed, easy starting, and acceleration, also for economy; it leaves nothing to be desired."

Mr. F. C. P.

"I have much pleasure in informing you that the Carburetter you supplied to me has proved most satisfactory."

With all due respect to my old carburetter, which has done good service, I must say that the "Senspray" has given new life to the old bus; she goes much faster and slower, the acceleration is glorious, and the petrol consumption appreciably lower.

Altogether I am delighted with the transformation your product has made."

Mr. I. G. N.

3 $\frac{1}{2}$ h.p. Sports Douglas.

"It may interest you to know that on Saturday last in the M.C. and A.C. Team Trial, over a course of 72 miles, which include several steep hills, I averaged 109 miles per gallon on a 3 $\frac{1}{2}$ h.p. Sports Douglas, fitted with your Carburetter, to which no adjustment had been made since the machine was delivered to me in June last. The indicator was half-way between 'more' and 'less' petrol."

Mr. M. P.

"I have never had occasion to touch the instrument during the past two years and two months, during which period I have covered many thousands of miles in England, Scotland and Wales."

Mr. ALLEN O.

3 $\frac{1}{2}$ h.p. Rudge.

"May I add that I have found your instrument most economical and satisfactory. I have just done 800 miles in Devon, including the northern coast, on my Rudge, and the consumption was over 95 m.p.g., and that as the Carburetter was sent out by the makers. This is much better than any previous carburetter that I have used."

Mr. C. D. W.

"I may say that after trying Motor Cycles fitted with other makes of Carburetter, the ease of control of my present Rudge-Multi, fitted with a "Senspray," completely surprised me, and I attribute this flexibility to the excellent manner in which the "Senspray" does its work."

Mr. H. H. C.

1920 Rudge-Multi.

"I wish to express my satisfaction and admiration for one of your Carburetters fitted to a Rudge-Multi."

After exhaustive bench and road tests, which a friend and I have been making, I can only describe it as a perfect instrument, which combines power with economy, and my advice to anyone who is experiencing trouble traceable to the Carburetter, is—fit a "Senspray" and learn the joys of Motor Cycling."

Mr. J. B.

3 $\frac{1}{2}$ h.p. Sports Douglas.

"I am really charmed with the instrument you supplied me with last week; the acceleration is much better than with the previous model, and the speed and pulling power is immensely improved; also the petrol consumption is much better."

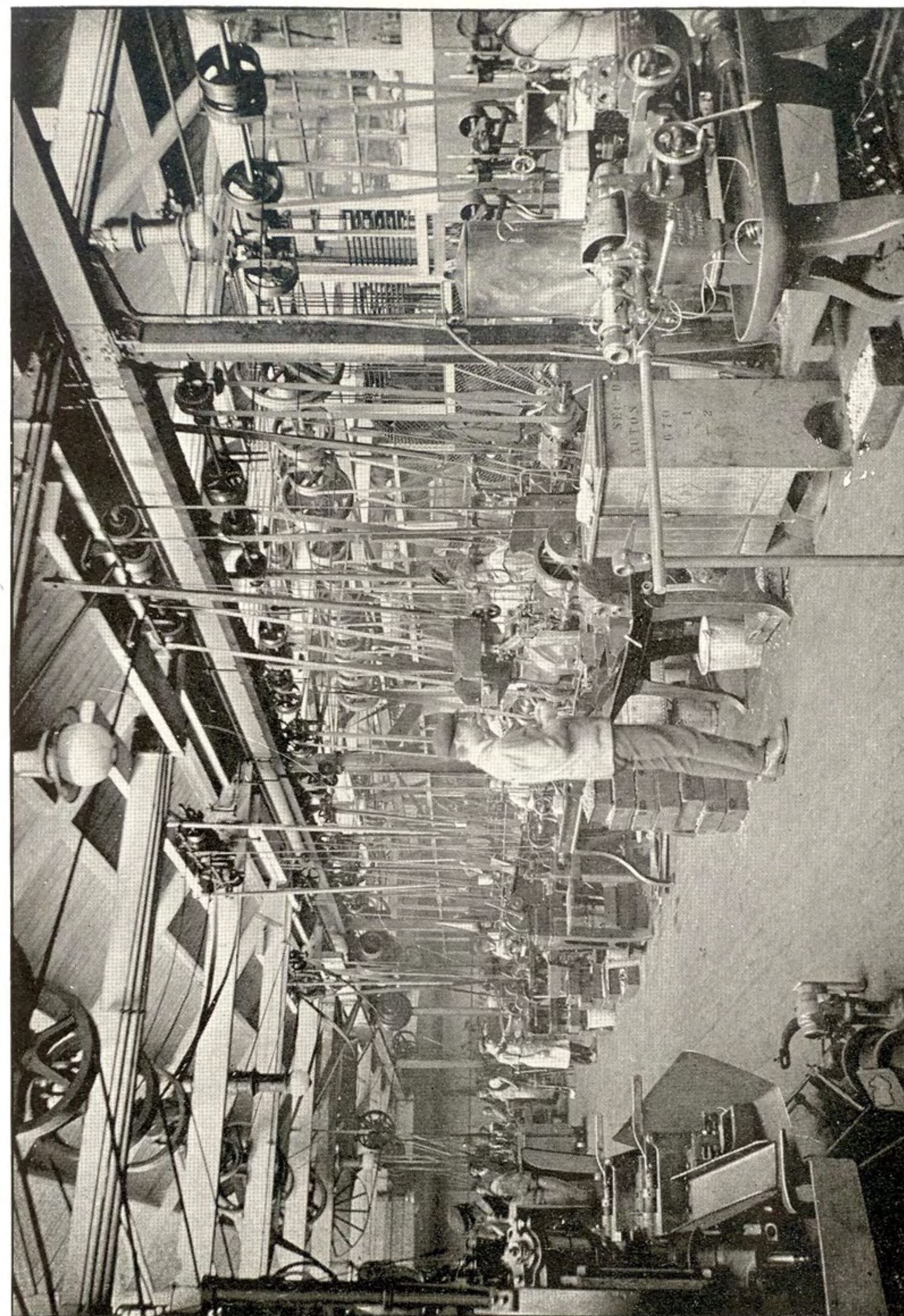
Mr. C. C. P.

2 $\frac{3}{4}$ h.p. Villiers.

"You will be interested to know that the "Senspray" Carburetter, about which I wrote you, is working magnificently. I am getting 92 miles per gallon, as against my best of 74, with the model originally fitted, and the pulling is beyond all comparison better. It has eliminated four stroking, and I get perfect firing at all speeds from 5 to 35 m.p.h. Hills which used to bring me down to second I now do comfortably on top gear."

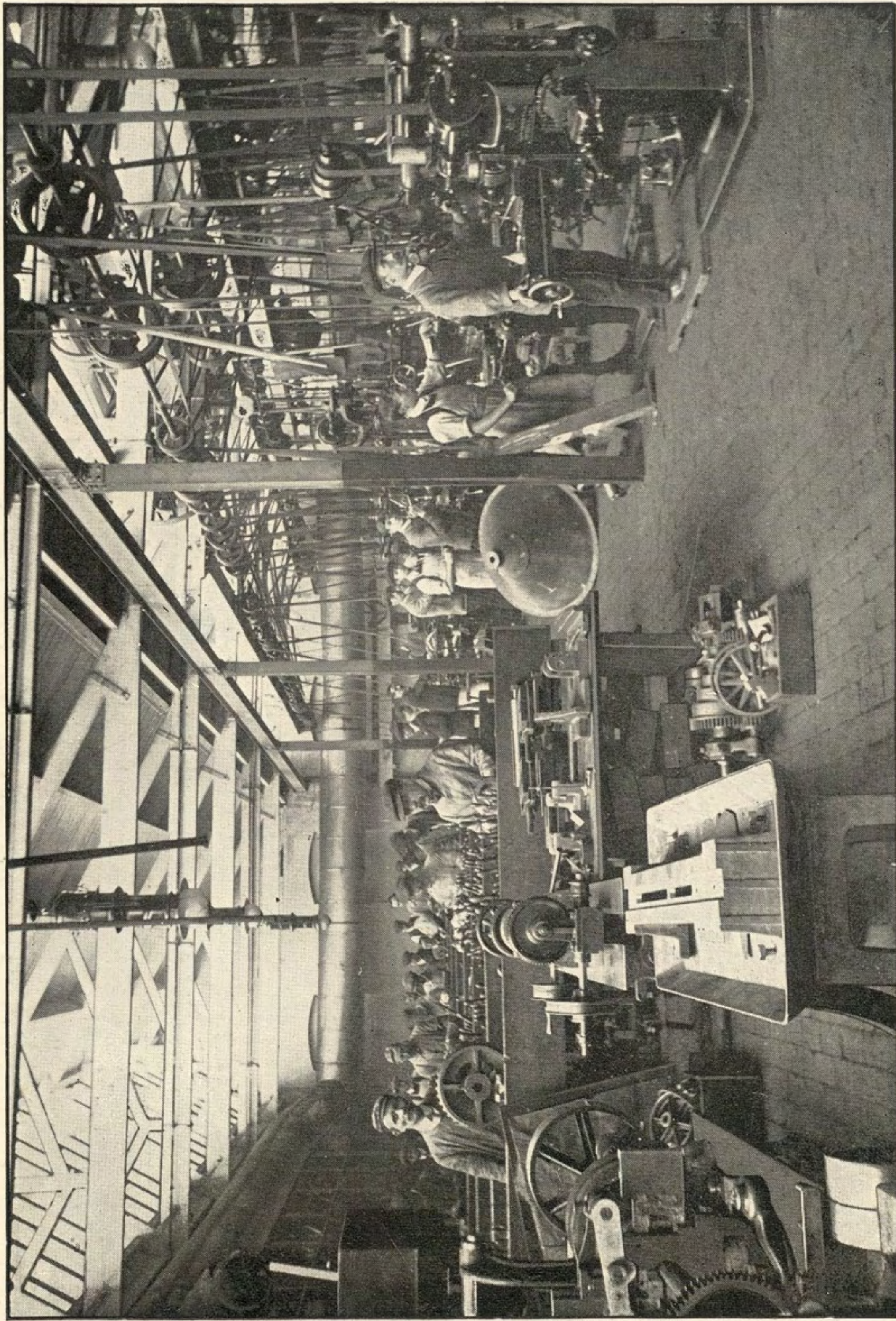
It is clearly a perfect instrument for two stroke engine, it has revolutionised mine."

WHITWORTH WORKS, WHERE THE "SENSPRAY" CARBURETTER IS MANUFACTURED



AUTOMATIC DEPARTMENT.

WHITWORTH WORKS, WHERE THE "SENSPRAY" CARBURETTER IS MANUFACTURED



TOOL ROOM.