

**WE** OFFER this range of Controls with confidence that they are of good quality and easy to manipulate. They are the outcome of long experience in knowing what Motorcyclists require and meeting the demands from manufacturers of Motor Cycles.

Our range of Products is, for the time being, somewhat restricted and whilst this List does not cover all that we normally make it offers a range of useful Controls that are available and will meet most requirements. The usual finish is in chromium plate.

The Controls here described are all for operating flexible transmissions by means of an outer cable with an inner wire where the control lever pulls the wire against a return spring, viz., the control levers are not of the push-pull type.

**AMAL LTD.,**  
BIRMINGHAM,  
ENGLAND.

## TWIST GRIPS

For CARBURETTOR THROTTLES.

These are made in two types:—

One, the Racing type 16, which is easily fitted by anyone provided there is the requisite amount of straight on the end of the Bar and the cable is external.

The other type with internal cable, under types 51 and 108, is a neat fitment but requires some simple workmanship to the end of the Bar and it is, therefore, more suitable for supply as an integral part of a Handlebar.

Both types provide a comfortable grip on the Handlebar and operate with an easy movement of the wrist but the Racing type gives a slightly quicker opening.

## LEVERS (Double and Single)

For THROTTLE-AIR-IGNITION CONTROL

These double levers are of exceedingly good design and are well made. Each lever is independently adjustable for friction to suit the touch of the individual driver and once set to his liking, the movement of one lever does not disturb the setting of the other as they are separated by a plate securely anchored to the base.

These double levers may be used for various combinations of purpose: throttle and air control or—ignition and air when a Twist Grip controls the throttle, etc.

They can be attached to handlebars of 1" and  $\frac{7}{8}$ " diameter as described overleaf or fitted to a plate as illustrated here which can be screwed to the woodwork in a motor launch or of a stationary engine plant.

## LEVERS

For BRAKES, CLUTCHES, EXHAUST VALVE LIFTERS.

We make a useful range of levers for these purposes of substantial design, elegant in appearance and easy and comfortable to operate.

The design permits of a reasonably straight pull on the wire and the size of the wire nipple is adequate to make a secure fastening. Clutch and Brake Levers are made separately or made in combination with Carburettor or ignition levers.

Levers with ratchet device may be available on application.

Trigger levers are made for exhaust valve lifters.

For pedal cycle brakes a suitable lever is made.

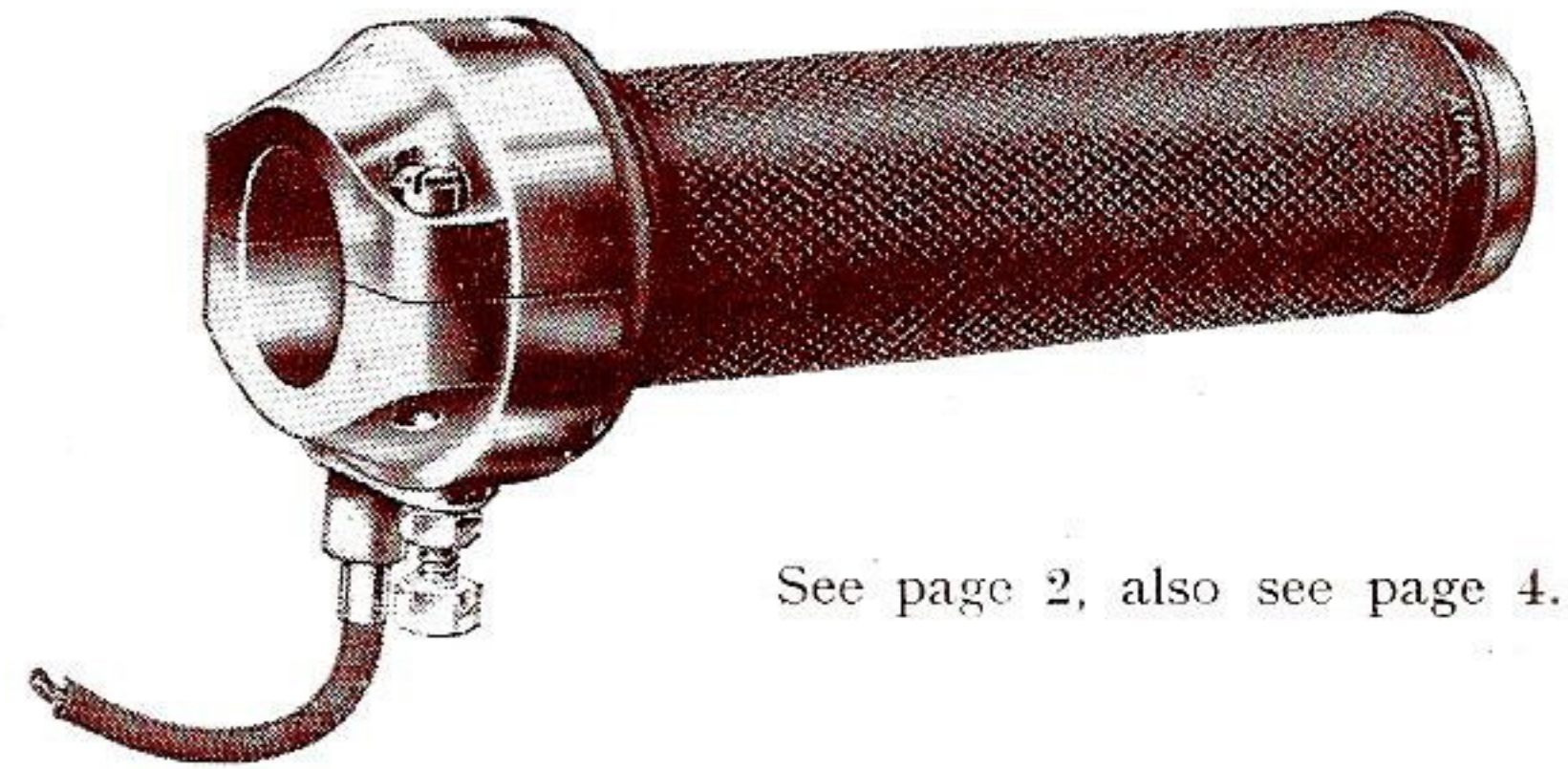
## CABLE and NON-FRAY WIRE



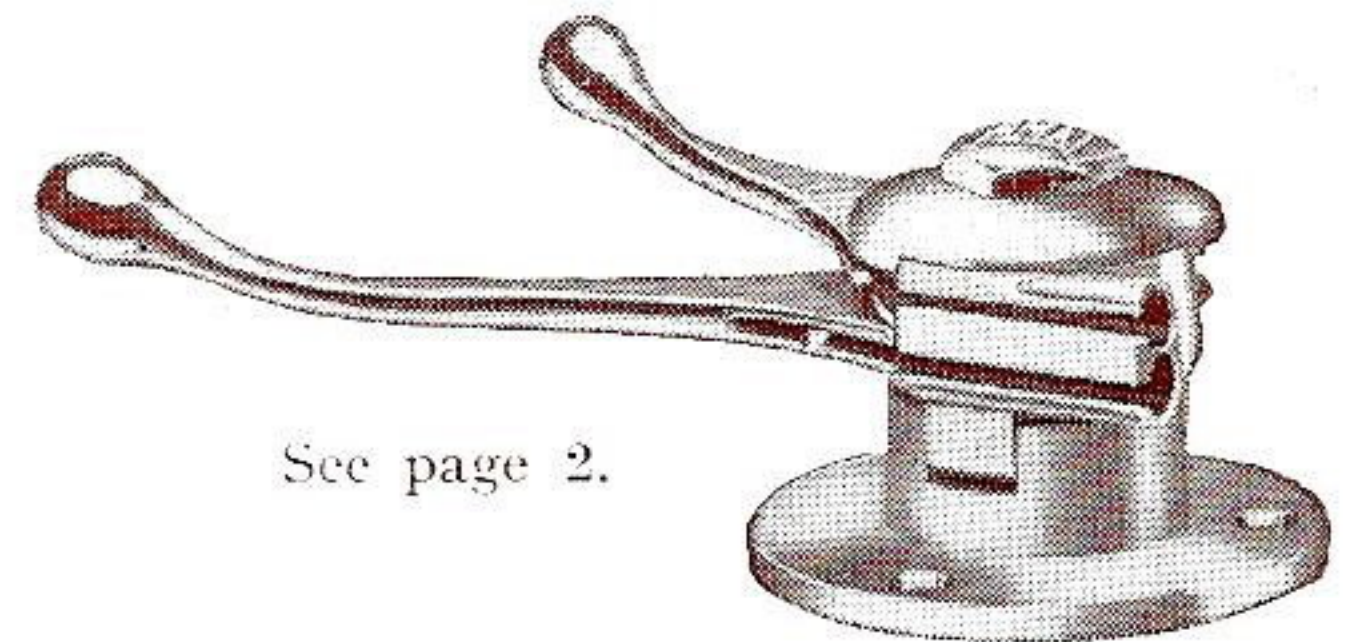
These Cables are very flexible and weather proof. The non-fray wire has every advantage in strength and in handling: it can be cut to length without previous soldering, which is a boon to the owner, the fitter and the stockist alike.

# AMAL CONTROLS

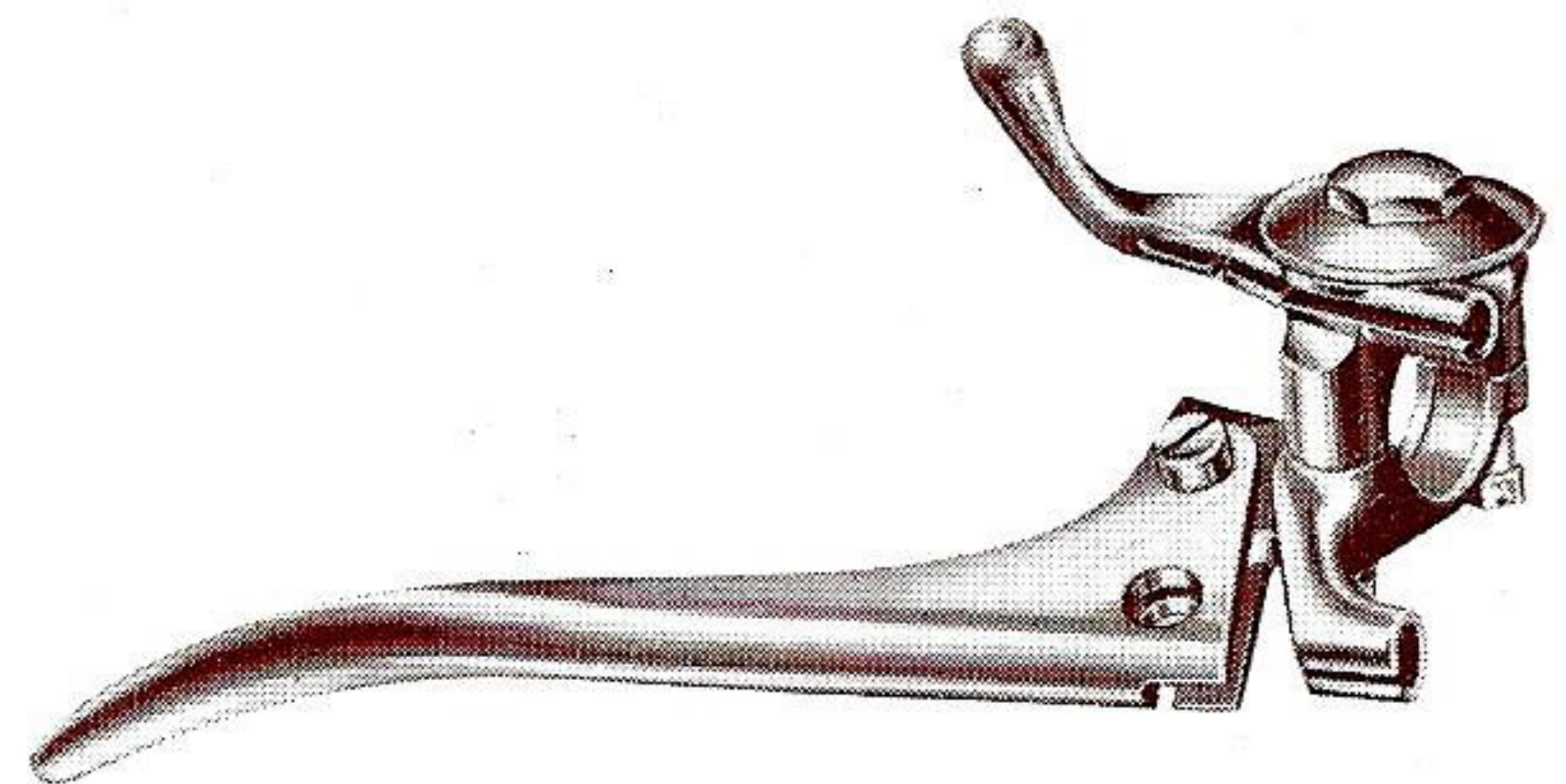
for  
**MOTOR CYCLES, MOTOR  
BOATS, MOTOR MOWERS,  
Pedal Cycles.**



See page 2, also see page 4.



See page 2.



See page 3.

(THIS LIST IS PRINTED IN ENGLAND, AND IS ISSUED SUBJECT TO PRICES RULING AT THE DATE OF DELIVERY)

**AMAL LTD., Holford Works, Perry Barr, BIRMINGHAM, 20**

TELEPHONE: BIRCHFIELDS 4571 (5 lines).

ENGLAND.

TELEGRAMS: AMALCARB, BIRMINGHAM.

# AMAL

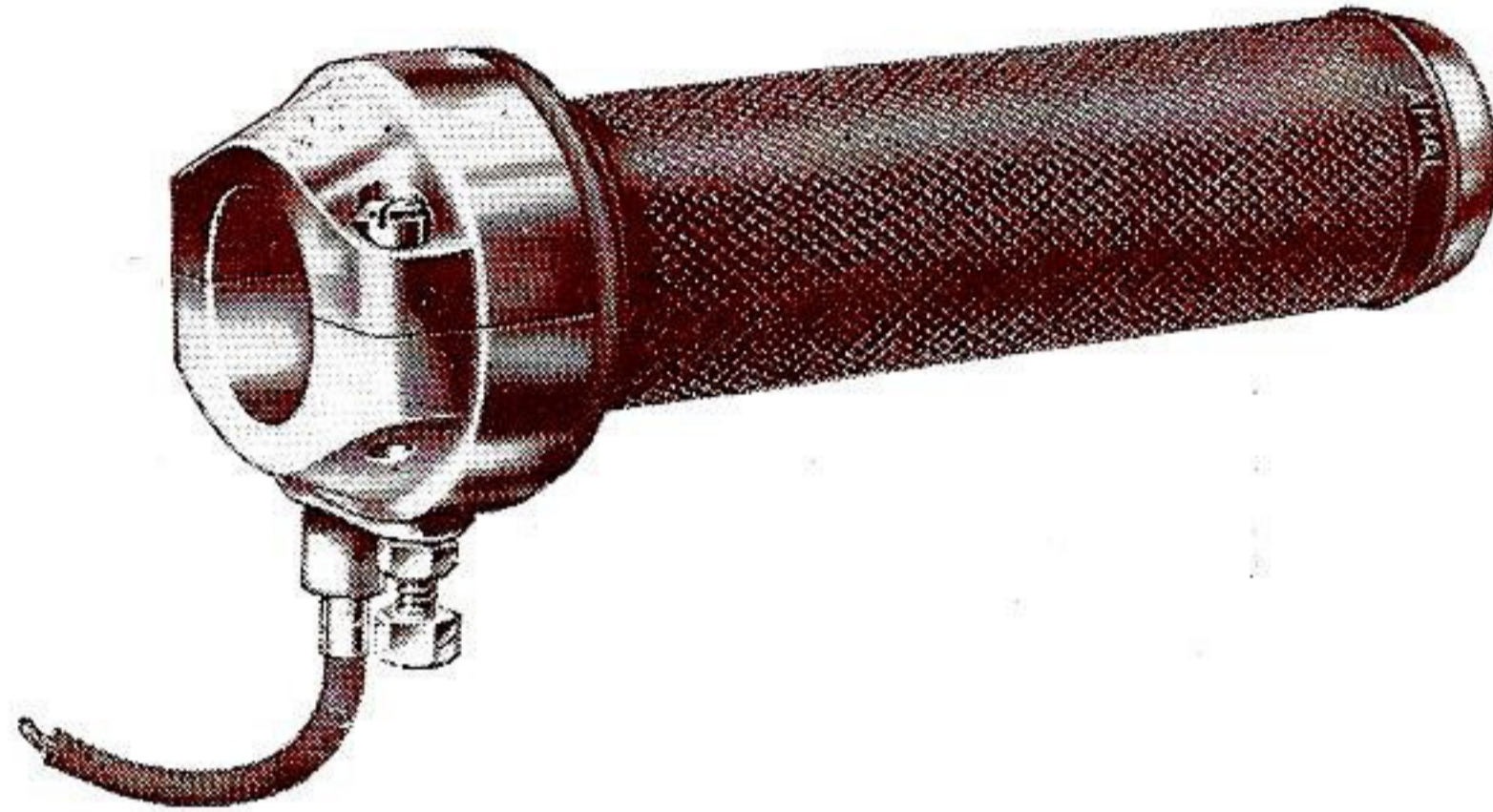
## RACING TWIST GRIPS

WITH EXTERNAL WIRE.

Can be used with an inverted lever on the end of the bar.

PRICE—All Models **11s. 0d.** each.

made to fit bars of 1" or  $\frac{7}{8}$ " dia. and will so fit bars of 25 and 22 mm.



Each size has two lengths:—

LONG, overall length about  $7\frac{3}{8}$ " (187 mm.) and SHORT, 6" (152 mm.), and to fit properly there must be at least those lengths of straight and smooth diameter on the end of the bar.

### TYPE 16.

SPECIFICATION for Handlebars of—	1" dia.	$\frac{7}{8}$ " dia.
Approximate dia. of hand grip .. ..	$1\frac{5}{8}$ "	$1\frac{1}{8}$ "
To open inwards on right hand bar. LONG	16/102CE	16/121CE
SHORT	16/100CE	16/117CE
To open inwards on left hand bar. LONG	16/110CE	16/119CE
SHORT	16/108CE	16/123CE

The rubber grips on the above have closed ends but if open ends are required specify the type numbers without the letters "C.E." See note\*.

These Twist Grips are ideal for operating the throttle of any touring or sports machine. They are easy to fit, simply sliding over the end of the bar and have a smooth direct pull on the throttle.

**The Design** provides a rubber grip mounted on a sleeve that turns on the handle bar. At the end of this sleeve there is a drum around which the cable is pulled. The drum turns freely in the two halves of the housing that clamps on to the bar and holds the Twist Grip in position. A friction device is enclosed in the lower half of the clamp, the tension of which may be regulated by the hexagon headed screw.

The amount of twist to open a throttle is convenient for an easy motion of the Rider's wrist, viz., a  $\frac{1}{4}$  turn through  $90^\circ$ , gives a control wire travel of 1" with a maximum pull of 2" which is the working limit. The wire comes into the Twist Grip at right angles to the bar but it may be neatly looped up. The action of the Grip is to pull the wire only and a spring must be provided in the Carburettor to close the throttle as the hand moves the grip into the closed position. The wire nipple and distance from Cable end is the same for our control levers, so a standard control cable will interchange between these two forms of standard controls. To assemble the wire the top half of the clamp must be removed. Use generally outer cable No. 111 and inner wire .062 and nipple 12/034.

## DUMMY GRIPS TO MATCH RACING TWIST GRIPS.

PRICE—All Models, **2s. 0d.** each.

SPECIFICATION for Handlebars—	1" Dia.	$\frac{7}{8}$ " dia.
LONG TYPE ..	16/039	16/074
SHORT TYPE ..	16/040	16/069

\*The closed end model is standard and available but the end can be cut out if necessary when open ended types are not available on request or to order.

## CONTROL LEVERS

PRICE: DOUBLE LEVER **10s. 6d.**

SINGLE LEVER **9s. 0d.**

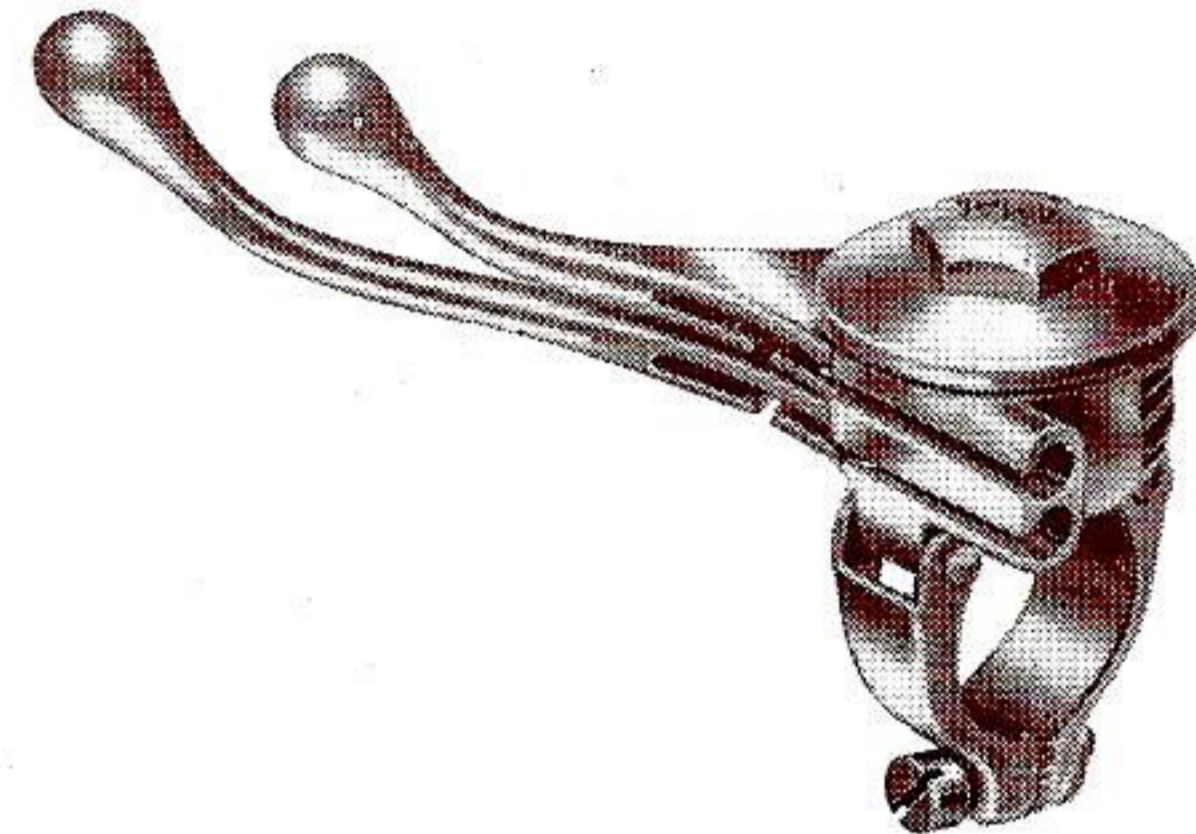
If mounted on a plate as shown on front page, **3s. 9d.** extra.

For 1" 25mm.,  $\frac{7}{8}$ " 22mm. Bars.

**Maximum pull on wire  $1\frac{1}{16}$ " (42.8mm.) where a quarter turn of the lever pulls  $\frac{15}{16}$ " (23.8).**

A single lever for small carburetters is made to reduce the full movement to  $1\frac{1}{4}$ ", where a  $\frac{1}{4}$  turn gives a pull of just under  $\frac{3}{4}$ ".

Levers are made to open inwards and outwards on either side of the bars and are specified below.



Usually made with a clamp fitting instead of clip as shown.

To pull or open inwards on the right hand of a handlebar clamp fitting—	For 1" bar.	$\frac{7}{8}$ " bar.
Bottom lever, 4", and top lever, 3" long ..	12/142	12/140
Bottom lever, 3", and top lever, 2 $\frac{1}{2}$ " long ..	12/143	12/141.

To pull or open inwards on the left hand of a handlebar—	For 1" bar.	$\frac{7}{8}$ " bar.
Bottom lever, 4", and top lever, 3" long ..	12/152	12/150
Bottom lever, 3", and top lever, 2 $\frac{1}{2}$ " long ..	12/153	12/151

If the opposite motion is required on either bar, change the above specification about.

These double levers are of exceedingly practical design as the tension on each lever is independently adjustable. A self contained dividing plate, anchored to the cable stop on the base, makes the top lever independent of the bottom lever. To adjust the tension of the top lever remove the coverplate and take out the washer with a square centre; after adjustment, the nut being finally positioned to allow the washer to fit on the square and the projection to drop into a slot in the castelated nut.

The bottom lever moves between a spring steel washer laying on the base and the dividing plate of the top lever. When all parts are finally assembled, the cover plate rests on the castelated nut and as the central pin is screwed down, the bottom lever is put under the pressure of its spring washer: the tension of the bottom lever is set by the central pin, the head of which presses on the coverplate. The coverplate has a gap in its edge to locate on the cable stop of the base.

### SINGLE LEVERS.

The design is similar to the double lever and a choice of lever lengths is provided:—

To pull or open inward, on a right-hand bar—	For 1" bar.	$\frac{7}{8}$ " bar.
Lever 3" long normal action .. ..	12/162	12/160
Lever 2 $\frac{1}{2}$ " long, normal action .. ..	12/163	12/161
*Lever 2 $\frac{1}{2}$ " long, slower action .. ..	12/526	12/524

To pull or open inward on a left-hand bar—	For 1" bar.	$\frac{7}{8}$ " bar.
Lever 3" long, normal action .. ..	12/172	12/170
Lever 2 $\frac{1}{2}$ " long, normal action .. ..	12/173	12/171

\*This is designed to operate small bore carburetters, to avoid the throttle being opened too quickly.

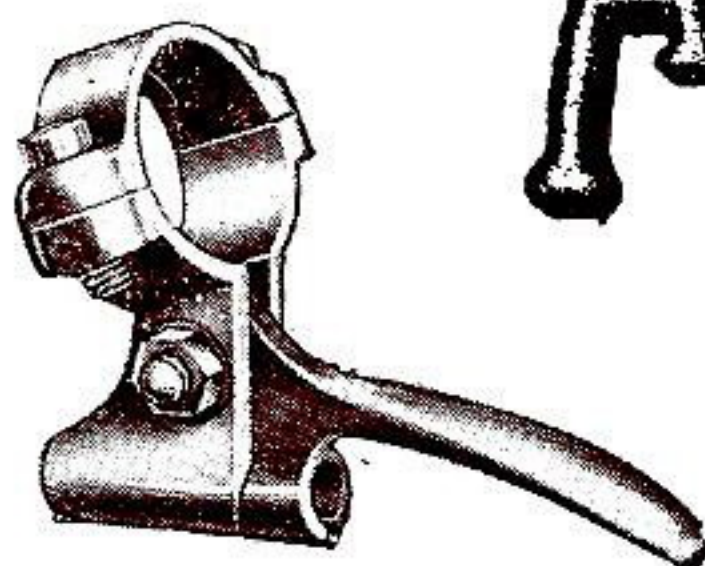
NOTE.—When soldering nipples to the inner wire for all lever control, the inside distance between the nipple and the end of the outer cable should be  $1\frac{1}{4}$ ", viz.,  $1\frac{1}{4}$ " of bare wire to be seen **provided that** the throttle is shut with its cable adjuster down, and the cable fixed in the normal position allowing for free movement of the handlebar.

Use generally outer cable No. 111, inner wire .062, and wire nipple 12/034.

# AMAL

## TRIGGER LEVER

PRICE—7s. 0d. either type.  
SHORT LEVER.  
LONG LEVER.



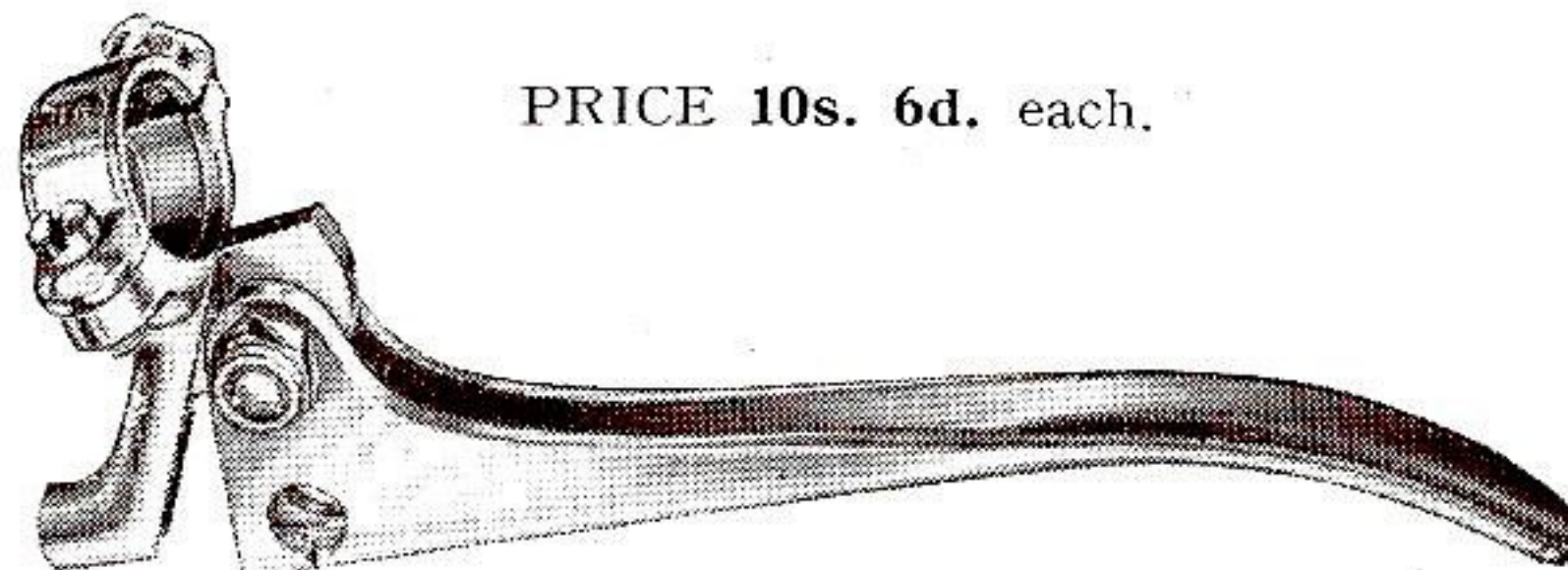
This is intended for light work such as lifting an exhaust valve or operating a decompressor on a two stroke engine, giving maximum movement with minimum effort.

Short Lever, 2½" (Max. pull, ½")	..	For bars	1" dia.	¾" dia.
Long lever, 3¼" (Max. pull, ½")	..	type ..	18/282	18/454
		type ..	18/283	18/453

All levers use wire nipple 40/058 which would normally take inner wire No. 075 and outer cable 212.

## CLUTCH OR BRAKE LEVER

PRICE 10s. 6d. each.



This has a beautifully shaped lever of pressed steel, which gives a maximum pull of ¾" (19 mm.).

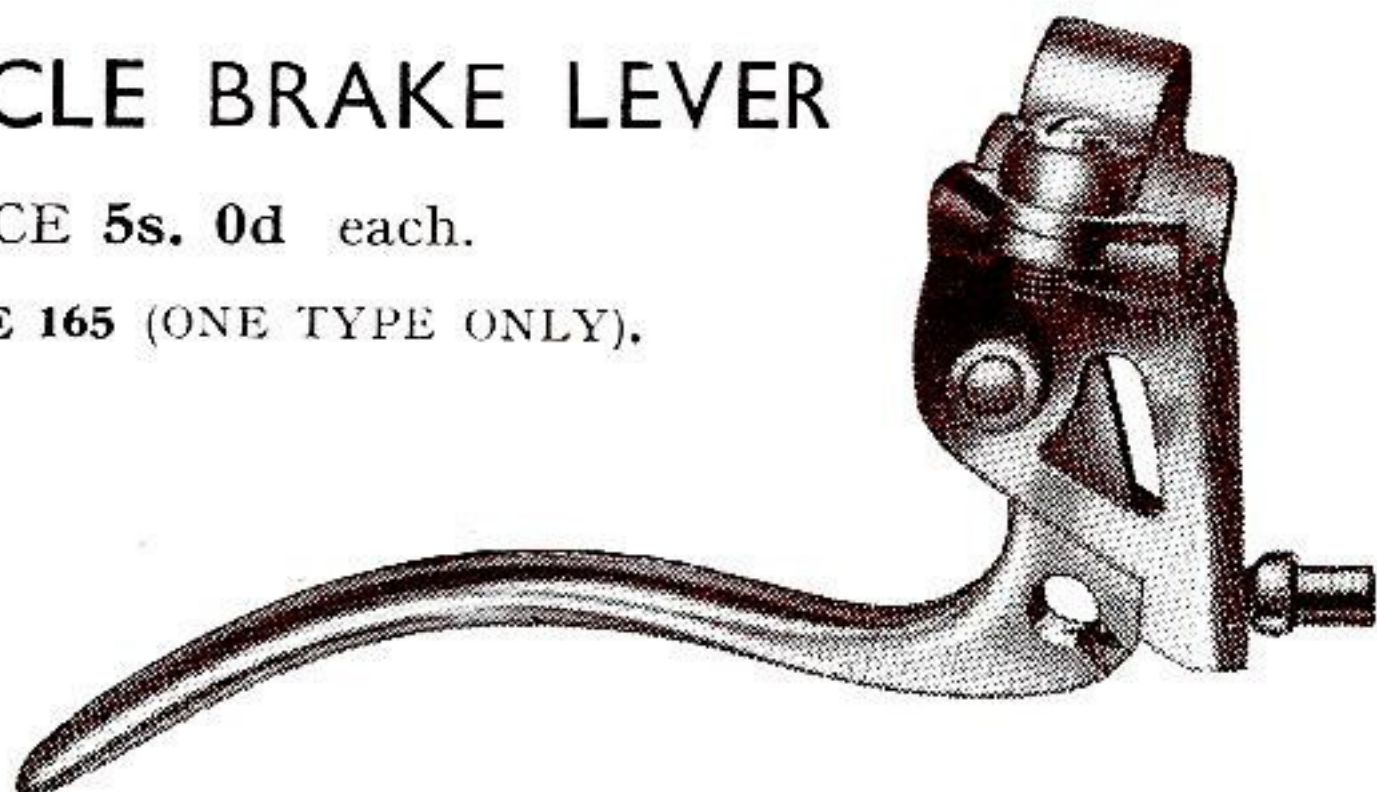
The wire nipple is No. 18/088, but drilled for the wire size to be specified, usually for .075 or .084 wires.

		Handlebar diameter	1"	¾"
Left hand bar lever types	..	..	18/546	18/556
Right hand bar lever types	..	..	18/547	18/557

## CYCLE BRAKE LEVER

PRICE 5s. 0d each.

TYPE 165 (ONE TYPE ONLY).



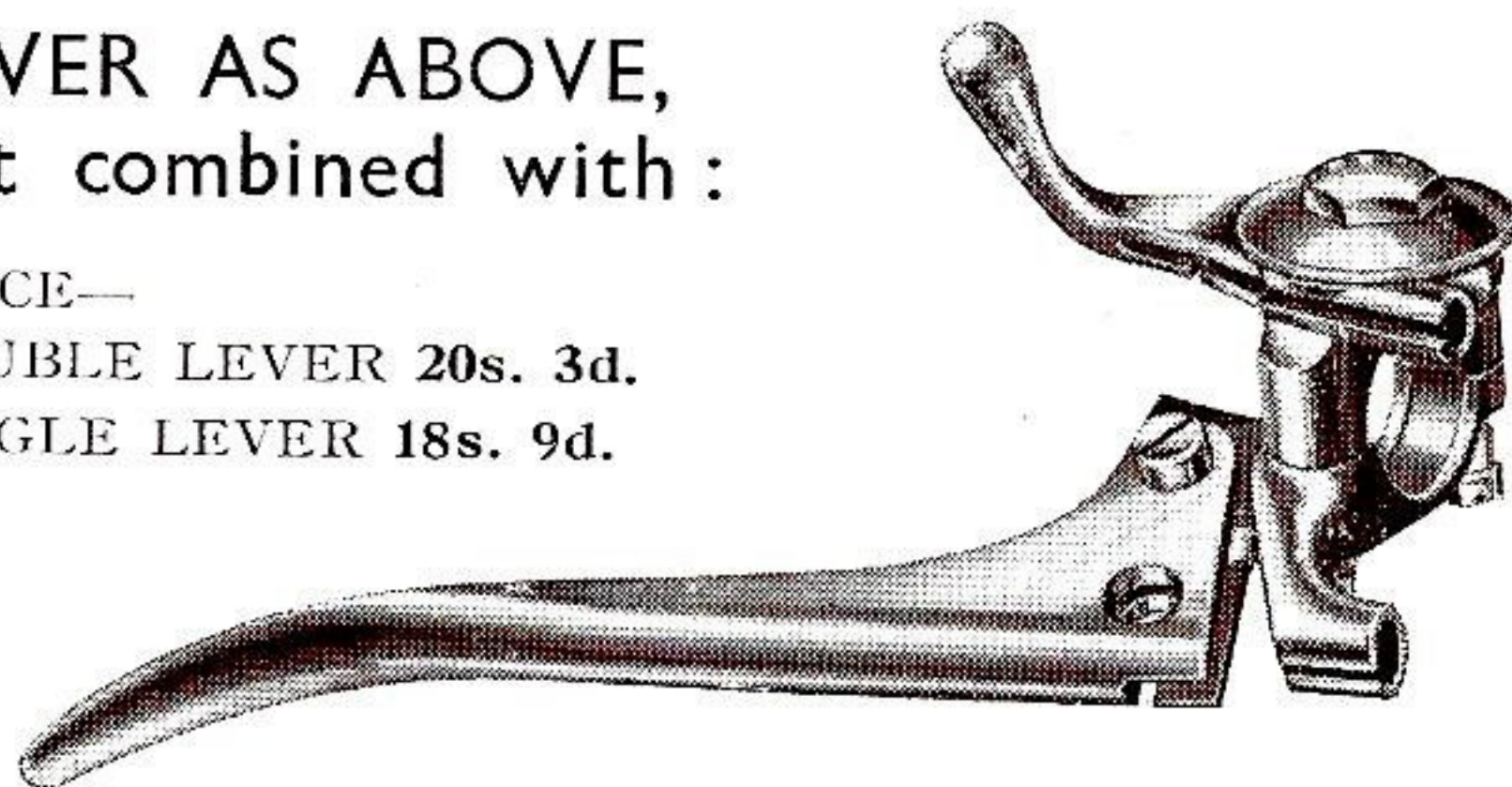
A strong and light lever, weight 5 ozs., giving pull for operating a brake on a pedal cycle.

Lever length, 4½" for handlebars ¾" (22 mm.).

These levers use wire nipple 165/029, which would normally take inner wire No. 062 and outer cable 120.

## LEVER AS ABOVE, but combined with:

PRICE—  
DOUBLE LEVER 20s. 3d.  
SINGLE LEVER 18s. 9d.



This lever is as above, but it has combined with it a single lever that may be used for a carburettor control or ignition advance and retard. The clamp bracket is not the same as above but made so that the standard control lever base forms the clamp to grip the bar.

The wire nipple for the lever is 18/088 but drilled for the wire size to be specified, usually for .075, .084 wires where the pull is about ¾" (19 mm.) when the lever is on a straight bar. See control lever details for wire and nipple.

	Handlebars	..	1" dia.	¾" dia.
2½" Top control Lever pulling inwards—				
On left hand bar	..	18/529	18/544	
On right hand bar	..	18/530	18/548	

A double control lever could be fitted at an extra of 1s. 6d.

## INNER WIRE & OUTER CABLES

The Amal inner wire is made in various diameters and has a particular value because it is so made that it does not require soldering before cutting, which fact greatly facilitates the fixing of nipples in position, also short lengths can be cut from stock coils.

When the nipples are being soldered to the wire, see that the solder runs through the nipple but only just enough to be seen. Hammer the wire ends over to spread them out and put a cap of solder on them so that they cannot close in again under the pull of the wire.

Never file the solder on the wire to make the nipple fit the lever as you may cut a strand of the wire.

The outer cable is black. It is good quality: viz., incompressible and flexible but use as big bends as possible.

QUANTITY LIST PRICES IN COILS	Inner Wire.		Outer Cables.	
	Dia.	List Price per 100 ft.	No.	List Price per ft.
	.050	7s. 2d.	for 052	2½d.
	.062	7s. 10d.	.. 111 & 120	3d.
	.075	9s. 8d.	.. 212	4d.
	.084	11s. 10d.	.. 313	5d.
	.113	35s. 5d.	.. 414	8d.

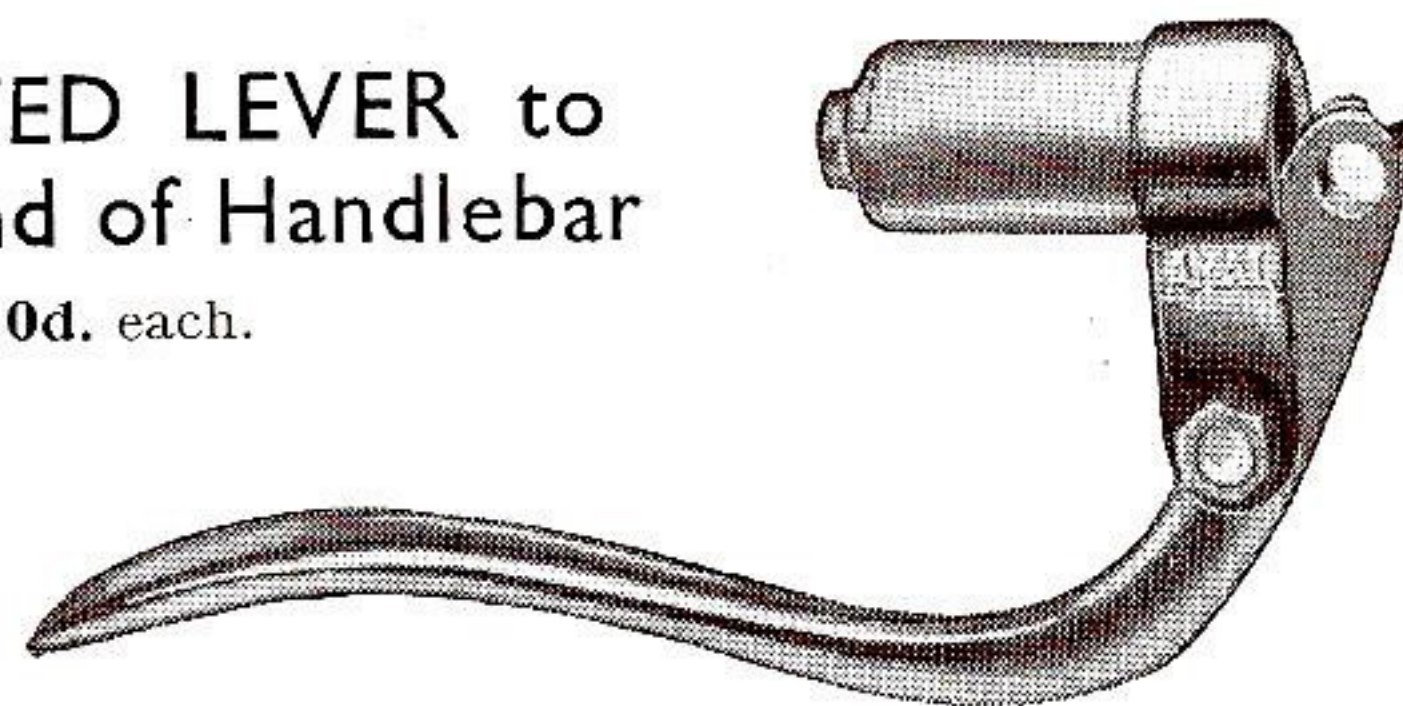
### BUT FOR FULLER INFORMATION:—

- Complete transmissions made up of various lengths of Amal non-fray wire and black outer cable.  
For motor-cycle controls see list 336S.  
For pedal cycle brakes see list 419R.
- Outer cables and inner wires in bulk coils see list 336S.
- Outer cable ferrules and inner wire nipples see list 438R.

NOTE.—AMAL NON-FRAY INNER WIRE IS MORE FLEXIBLE THAN PIANO WIRE BUT IT DOES NOT PUSH: It pulls and there must be a return spring on the mechanism to pull the wire back on the return stroke of the lever.

## INVERTED LEVER to fit in end of Handlebar

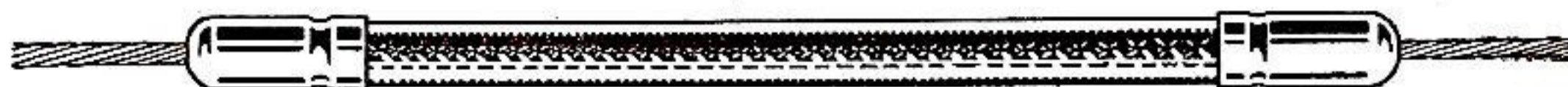
PRICE 9s. 0d. each.



This lever is intended for fitting into the end of a 1" dia. handlebar of 14 gauge, the barrel bracket being .840" diameter. The pull is about ¾", but the fulcrum is longer than the above levers, so the purchase is less.

The wire nipple is 18/170 drilled normally for sizes 075 and 084 wire. To be specified.

Levers type 18/202 for right, and 18/206 for left hand of bar.



# AMAL

## AMAL TWIST GRIPS with Internal Wire and Straight Pull.

**MAXIMUM PULL ON WIRE  $1\frac{7}{16}$ " (36.5 mm.) WHERE A QUARTER TURN OF TWIST GRIP PULLS  $\frac{15}{16}$ " (23.8 mm.). MADE ONLY TO OPEN INWARDS ON RIGHT HAND BAR. IF FITTED TO THE LEFT HAND BAR, WILL OPEN OUTWARDS.**

This type is intended for manufacturers as the handlebar ends require slotting and drilling before the Twist Grips can be fitted. This fitting cannot easily be done by an amateur but requires the skill of a mechanic.

The principle on which the design of both is based is that the inner wire is pulled in one direction and the outer cable is pushed in the other, and the effective pull on the wires is these two movements added together: The outer cable, therefore, has to move and provision has to be made for this by having its entrance a sliding fit into the handlebar at a point chosen for neatness as far away as possible from the Twist Grip to avoid internal bends. The entrance hole  $\frac{9}{32}$ " diameter should be preferably in the outer bend of the bar.

Use Amal Outer Cable No. 111, and Inner Wire 062, and Nipple 12/034, and where the Cable and Wire are in position the distance from the end of the Outer Cable ferrule to the near side of the Wire nipple must be  $\frac{3}{4}$ ", viz.,  $\frac{3}{4}$ " bare wire showing, when the Cable is in its final position allowing for free movement of the bar, the throttle closed with the Cable Adjusting screw right down and the end of the Cable being midway in the slot.

The Cable end and the Wire Nipple each fit into a sliding piece; both these pieces slide in a channel provided with the Twist Grip to fit in the slot in the bar. Each sliding piece has a helical tooth projecting outwards and these teeth enter a V shaped helical slot cut inside the Twist Grip. When the Twist Grip is rotated inwards the V of the helical slot acts like a wedge and so the slides are forced apart, the V shape of the helix widening the distance between the outer cable end and the nipple. When rotating the other way, the slides come nearer together and the return spring in the Carburettor closes the throttle, keeping the inner wire in tension.

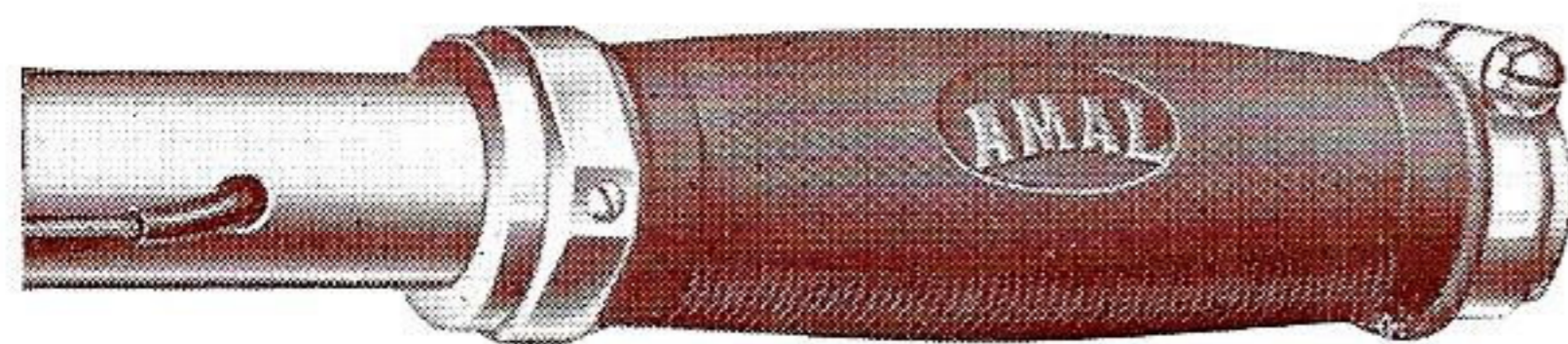
When all is fitted any back lash in the Cable, with the throttle shut, can be taken up by the adjusting screw in the Carburettor.

### TYPE 108 for 1 in. BARS

Diameter of grip  $1\frac{7}{16}$ ", overall length  $5\frac{9}{16}$ ", requiring a minimum length of 6" of absolute straight on end of bar.

PRICE 16s. 0d. each.

INVERTED LEVER AT END OF BAR CAN BE USED



*This illustration shows how NOT to bring the Cable into the bar as the cable is bent sharply too near to the Twist Grip and its free movement would be prevented.*

To prevent the return spring in the Carburettor (or other) from shutting off by itself, a friction device is incorporated, the tension of which is adjusted by the grub screw in the boss on the left.

At the end of the bar on the right is a split collar which fits over the extreme end of the slotted bar and tightens up on to an inverted lever or a plug as shown. This collar has a projection on it which fits into the slot to locate it and also acts as a stop to limit the amount of rotation of the Twist Grip by operating in a cut-away portion at the end of the tube that turns on the bar.

To fit the Twist Grip one slot should be cut in the end of the bar on the top only, the slot being  $\frac{3}{8}$ " wide and 5" long, leaving a gap at the bar end (see blueprint 108/111).

A  $\frac{9}{32}$ " hole also has to be drilled in the bar to admit the Cable which should now be inserted.

To assemble: slide the friction collar over the bar, pull the cable and wire up out of the slot, insert the channel with the slide guide in the slot, with the cable in the slide guide. Fix the slides—the long one over outer cable and the short one over the wire nipple and place in the guide each side of the stop in the middle of the channel. Grease all well and push on the grip with the bare tube end first so that its long internal slot goes over the projecting teeth of the slides, then twist till the teeth engage in the V helix cut in the twist grip.

Now fit the split collar at the bar end, insert the plug or inverted lever and tighten up. Then slide the friction collar over the bare end of the twist grip and secure with the two grub screws opposite one another.

### TYPE 51 for $\frac{7}{8}$ in. BARS

Diameter of grip  $1\frac{3}{8}$ " and overall length  $5\frac{1}{2}$ ", requiring a minimum length of 6" absolute straight on end of bar.

PRICE 11s. 0d. each.

INVERTED LEVER AT END OF BAR CANNOT BE USED



*This illustration shows how NOT to bring the Cable into the bar as the cable is bent sharply too near the Twist Grip and its free movement would be prevented.*

To prevent the return spring of the Carburettor (or other) from shutting off by itself a friction device is incorporated. The collar held by a pin through the bar as seen on the right is conical inside and takes the conical end of the tube on which the rubber is mounted. The pressure on the cone is adjusted by the hexagon nut at the end of the bar on the left which presses the end plug towards the grip through a spring washer. When the correct pressure is found tighten up the grub screw in the plug.

To fit the Twist Grip one slot on the top of the bar has to be cut  $\frac{3}{8}$ " wide, 4" long, starting  $\frac{5}{16}$ " from the end of the bar. Two holes have now to be drilled through the centre of the bar, at right angles to the slot, one 0.161" dia (No. 20 drill) for the friction ring, 4.81" from the end and on the centre line of bar, and one 0.154" dia. (No. 23 drill) for hinging cantilever 3.56" from bar end and .012" above the centre line of the handlebar (upwards towards the slot). See blueprint 51/307.

To assemble fix the friction collar on the bar and pass the cable end into and out of the slot in the bar, now hinge the slide cantilever on a pin through the bar with the channel upwards, fit the long slide over the cable and the short one over the wire, and place them in the channel, teeth upwards, close up to each side of the dividing stud, and grease well.

Drop the cantilever and slide the twist grip on the bar conical end first, into the friction collar, press up firmly the projecting screwed end of the cantilever and twist the grip round slowly till the cantilever jumps up and engages the teeth on the slides into the V helix cut inside the Twist Grip, slide the plug into the bar end over the cantilever thread and put the hexagon nut on the thread, adjust the tension and lock with the grub screw.

*All prices are subject to alteration without notice.*

## DUMMY RUBBER GRIPS to match above.

PRICE 2s. 0d. each.

1" Bar, short ( $4\frac{3}{4}$ "), type 98/011,  $\frac{7}{8}$ " bar, short ( $4\frac{3}{4}$ "), type 91/011.  
1" Bar, long ( $5\frac{5}{8}$ "), type 98/010,  $\frac{7}{8}$ " bar, long ( $5\frac{5}{8}$ "), type 91/010.