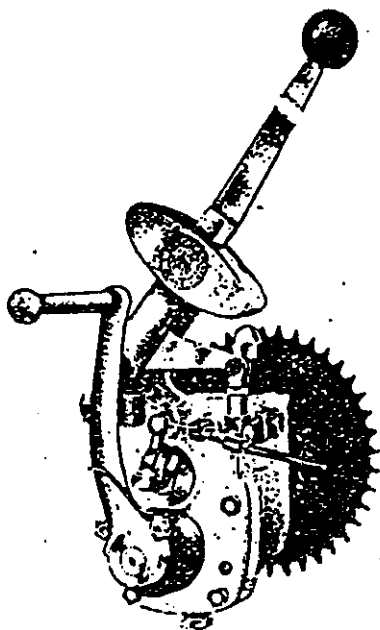


April, 1930.

STURMEY ARCHER COUNTERSHAFT GEAR

B.S. AND B.W. TYPES.



B.S. TYPE.

3-SPEED FOR CHAIN-CUM-BELT
OR ALL-CHAIN DRIVE.

STURMEY-ARCHER GEARS, Ltd.

LENTON — NOTTINGHAM — ENGLAND

Telegrams:—"TRIPLE, NOTTINGHAM."

Telephone: 75134.

Three-Speed Light-weight Gears, B.S. & B.W. TYPES.

These gear boxes have been designed and put on the market to meet the demand of manufacturers of Motor Cycles of the Light Weight Class. With the increasing popularity of this machine, it is essential that it should be provided with a suitable gear box.

The object has been to combine efficiency with simplicity, and to keep the weight down as far as strength and durability would allow.

APPLICABLE TO BOTH B.S. AND B.W. GEARBOXES

GEARS.

Only six pinions are used to provide three speeds and a kickstarter, the kickstarter drive being taken through the low gear members. The gears are constantly in mesh at all times, the changes being effected by sliding dogs, consequently there is no danger of stripping the teeth when changing gear.

CLUTCH.

This is of the cork insert type, large in diameter giving a maximum frictional area, and also securing strength and durability. A shock absorber clutch is also supplied in which the drive is taken through a series of rubber buffers. This device has proved very efficient in action, and effectively damps out the shocks imposed on the transmission in the case of the all-chain drive.

CHANGING GEAR.

When starting from rest, with engine running and gear in neutral, release clutch and pull gear control lever sharply into first or low position, when throttle may be opened to the required amount, and clutch engaged gradually. As sufficient momentum is obtained, clutch and gear control may again be manipulated for second and finally high gear as above.

LUBRICATION.

Use Cargoyle Mobilgrease which is used by us and is specially prepared for Shurmeyster Gearboxes. This lubricant is marketed in 1-lb. collapsible tubes the use of which facilitates filling. A 1/2 lb. is sufficient for a charge; re-charge with half this amount every 1,000 miles. All gears are carefully charged before being sent out, but we advise adding a little more lubricant after the first 500 miles. It is important to see that these instructions are carefully observed. No harm is done by an additional charge, but on the other hand we find that a large percentage of gear trouble can be directly attributed to insufficient lubrication, or by using a lubricant which is not suitable. The various joints in the gear changing mechanism should be kept oiled regularly to ensure freedom of action.

DO NOT lubricate the Clutch as this is designed to run dry.

APPLICABLE TO B.S. BOX ONLY.

GEAR CONTROL.

A gate or disc pattern control can be supplied for this gear. In the case of the latter it is fixed directly on the box. The chief advantage of this is that any adjustments made to the chains do not interfere with the setting of the control. Another valuable feature is also secured in that the gear is correctly adjusted before leaving our works. The hand lever is adjustable and can be set to the most convenient operating position. The gate control can be supplied with a one-piece bracket to fix directly under the tank, or with a sleeve type fixing which is also carried on the tank tube but is adjustable to suit the width of the tank.

GEAR CONTROL ADJUSTMENT.

It is important to see that the gear control is kept properly adjusted and this should be tested occasionally to see that it is correct.

Before proceeding to adjust the control see that the nut on the lever side of the rocking shaft is thoroughly tight. The adjustment of the gear is effected by removing the pin from the top connection and giving the connection one turn or half a turn on the thread up or down to lengthen or shorten the control rod as required. When the gear is properly adjusted the control lever should move an equal amount either side of the neutral notch without engaging the middle or low gear; finally check by pin in top connection being just free to slide when in high gear.

CLUTCH CONTROL ADJUSTMENT.

The clutch worm lever should be examined immediately any sign of clutch slip is suspected, to ensure that it has 3/16 in. idle movement when the clutch is fully engaged. It may be found that the inner cable is too tight, and if so, adjust the wire stop-screw to overcome this. In some cases it will be found necessary to loosen the lever from the worm and move it forward slightly to get the desired result. In cases where the clutch plates have worn, and permanent slip has developed, we would advise removing the end cap and clutch adjuster nut. Both have right-hand thread. If any washers are found behind this nut these should be removed. Use a hammer and punch to remove the end cap and be sure it is tightened up very securely when replacing. The rest of the clutch plates may now be lifted apart without any tools. As an alternative in obstinate cases, a stronger clutch spring may be fitted, but this will call for slightly more exertion to release the clutch at the lever on the handlebar.

If the clutch is difficult to operate, examine the tongues of the clutch plates and the grooves in which these slide. If any ridges have been worn the part will have to be renewed.

Worn threads on the clutch worm and inside the clutch nut will also produce this effect.

TO TAKE THE GEAR APART.

Disconnect clutch control wire and gear control connection, then remove five cover nuts and gently pull off the cover plate. Do not use a screwdriver or similar tool to part the joint, or the latter will fail to retain oil when re-assembled. If the plate sticks, one or two light blows inside the kickstarter crank will loosen it. This will expose the complete interior to view; the low and middle gear pinions, also layshaft, may now be lifted out. When replacing, take care that the ball bearings are not tilted. No forcing is necessary when replacing the cover plate.

Applicable to B.W. Box only.

This new gear has been added to the Sturmev-Archer range to provide something which could comfortably take a 350 c.c. engine. The design follows standard Sturmev-Archer practice in that only 6 pinions are used to provide 3 speeds and a kickstarter. The gears are constantly in mesh for the full width of the teeth.

The gears and shafts are made from 3% nickel-chrome case-hardening steel, and carefully tempered to toughen the surface of the dog clutch teeth and thus prevent the edges chipping away. The special feature of this gear consists in the design of the control mechanism. The various gear positions are automatically indexed inside the box and the whole mechanism is entirely enclosed. The gear operating spindle is placed on the front of the cover and a short lever is attached to this by serrations. This lever can be set in any convenient position to suit the angle of the control rod. An internal stop is provided for arresting the return stroke of the kickstarter crank, thus dispensing with the external stop spring.

GEAR CONTROL.

A gate pattern control is used for this gear and is fixed by a small bracket to the tank tube. A special gate can also be supplied for fixing directly on the side of the tank. An extra long operating lever is used along with this gate, which allows the control rod to work in a vertical position.

GEAR CONTROL ADJUSTMENT.

Place the gate lever and the short lever on the box, both in the middle gear positions. Adjust the length of the control rod to bring the pin holes exactly into line, and finally secure the connections by the lock-nuts provided.

TO TAKE THE GEAR APART.

Disconnect the clutch control wire and unscrew the five cover nuts. A few light taps behind the kickstarter crank will release the cover from the box. Particular care should be taken to see that the ball which fits in the lever on the face of the cover is not lost, but put away carefully. Before removing the gears unscrew the indexing plunger bush half way.

The layshaft and all the gears with the exception of the main sleeve pinion can now be withdrawn.

When re-assembling, particular care must be taken to see that the ball is in position on the end of the forked lever. The best way to secure this is to fix the box securely in a vice with the open end upwards, and place the arm of the forked lever, which carries the ball, in a vertical position. The lever can be held in this position by the tension of the spring on the indexing plunger. The ball should then be smeared with a little grease and placed in the recess of the short lever inside the cover. The cover should now be put into position on the long stud—carefully guiding the hole in the ball on to the end of the forked lever inside the box. The cover nuts may now be put on the studs and screwed home, as well as the plunger bush.

CLUTCH CONTROL ADJUSTMENT.

The clutch is operated with a lever having a direct pull, which is very easy to handle and sweet in action. It is essential to see that there is 1/32in. of clearance between the end of the push rod and the ball end of the adjusting screw. A screw, B.S.151, and lock-nut, C.S.106X, are provided so that this necessary clearance may be maintained.

STANDARD RATIOS.

1	:	1
1	:	1.51
1	:	2.75

**CLOSE RATIOS
LESS KICKSTARTER.**

1	:	1
1	:	1.27
1	:	1.7

TOP	MIDDLE	LOW
4	6.16	11
4½	6.55	11.69
4¾	6.93	12.38
4¾	7.32	13.06
5	7.7	13.75
5½	8.09	14.44
5½	8.47	15.13
5¾	8.86	15.81
6	9.24	16.5
6½	9.63	17.19
6½	10.01	17.88
6¾	10.4	18.56

TOP	MIDDLE	LOW
4	5.08	6.8
4½	5.39	7.22
4¾	5.71	7.65
4¾	6.03	8.07
5	6.35	8.50
5½	6.67	8.92
5½	6.98	9.35
5¾	7.30	9.77
6	7.62	10.20
6½	7.93	10.62
6½	8.25	11.05
6¾	8.57	11.45

NOTE.—An alternative set of Ratios can be supplied with or without Kickstarter—Ratio 1-1.27-2.46.

PARTICULARS OF GEARS.

ALL CHAINS.	Particulars required when ordering gears.
Engine chain line 3ins.	Make and c/c of engine, also whether 2 or 4 stroke.
Back sprocket 2-3/16	Type of drive—all-chain.
Chain sprockets 40T and 20T or 42T and 20T, 3/16in. or 5/16in. chains.	Number of teeth on sprockets with pitch, and width of chains; also whether shock absorber is required.
Weight :-	Type of control.
All-chain 15 lbs.	Disc on box.
	Gate on box.
	Diameter of handle bars.

