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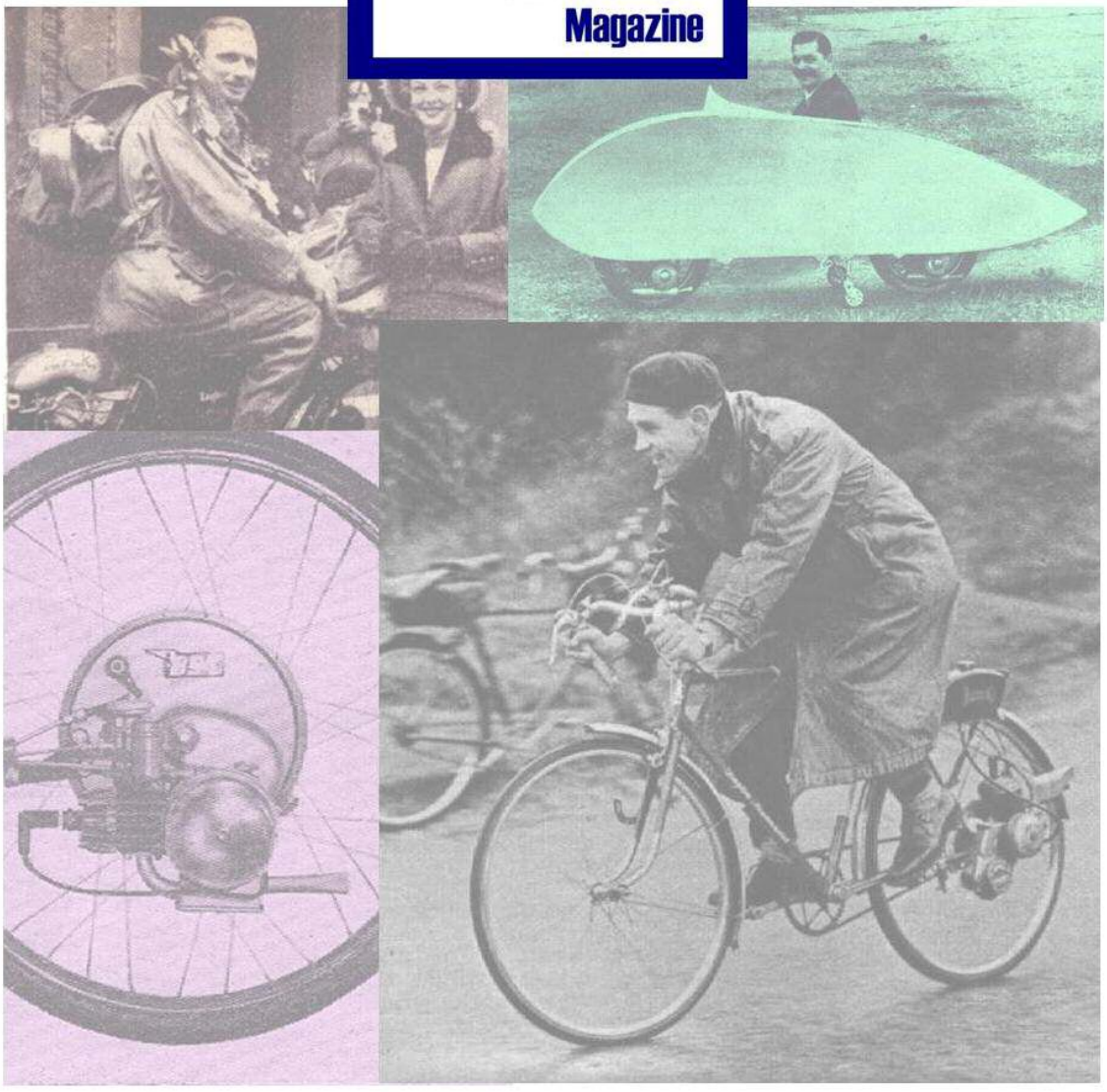

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FITTING INSTRUCTIONS

FOR THE

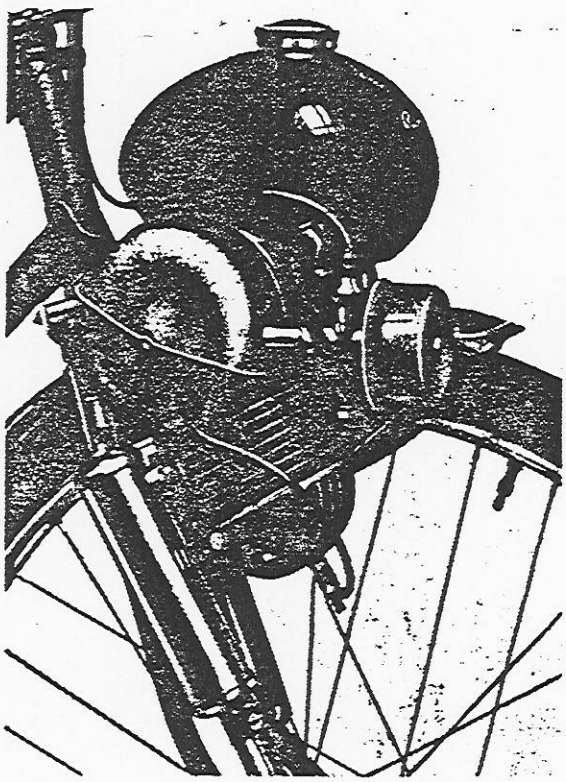
Berini

BICYCLE ENGINE

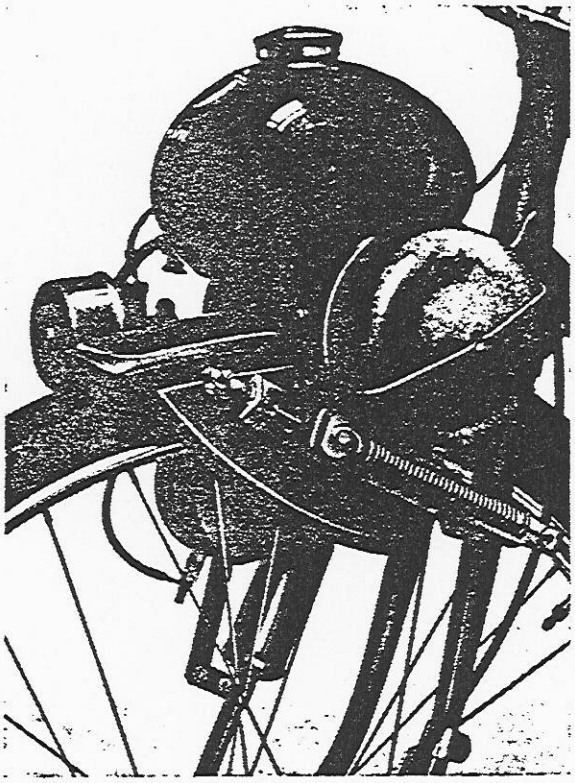
SOLE AGENTS FOR

EDITION NOVEMBER 1950

N.V. MOTORENFABRIEK PLUVIER THE HAGUE HOLLAND



CYLINDER SIDE



MAGNETO SIDE

ill. 1

TECHNICAL DATA

engine	one cylinder, two-stroke.
bore	36 mm.
stroke	32 mm.
capacity	32,5 cc.
maximum rpm	4000.
B.h.p.	0,6.
ignition	flywheel magneto.
Fuel mixture	„petroil" 1 in 25.
petrol consumption	approx. 240 m.p.g. or
(cruising speed)	1,2 litres p. 100 km.
tank capacity	3 pints. (1,4 litres).
max speed	appr. 22 m.p.h. (36 km/h).
cruising speed	15—20 m.p.h. (20—30 km/h).
weight	15½ lbs. (7,2 kilo's).

FITTING THE BERINI BICYCLE ENGINE

PRELIMINARY ARRANGEMENTS

The BERINI engine can be fitted to the front-wheel fork of any bicycle and drives the front-wheel by means of a roller. By pulling the clutch-lever, the drive can be disengaged.

It is therefore possible to lift the engine and the roller completely free from the tyre.

Before fitting the BERINI engine to a used bicycle, carry out the following inspections of the cycle:

a. Check front-fork and frame for cracks and fractures;

b. Check ballraces of steering-head. Replace if necessary;

c. Check front-wheel and rear-wheel for trueness;

d. Check both wheels for tension;

e. Make sure both wheels run lightly. Replace races if necessary.

Now remove front-wheel from fork.

It is abvisable to fit a BERINI tyre on the front-wheel.

This tyre has a particular tread and is specially designed for this purpose.

The BERINI tyre has a remarkably longer life than the ordinary bicycle-tyre, and is obtainable from the Main Agents in your Country.

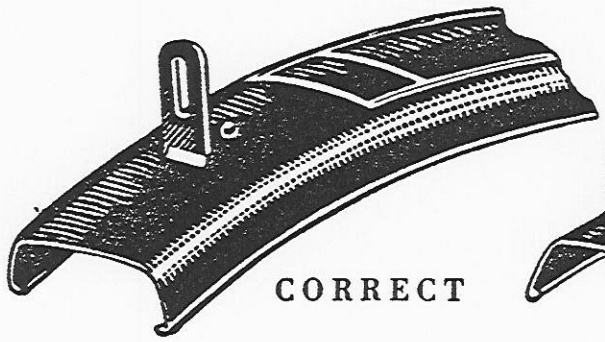
After fitting the BERINI tyre, do not yet fit the front-wheel.

In case the front-wheel is equipped with a rim-brake or a tyre-brake, remove and replace by an internal-expansion brake, or an extra brake on the rear-wheel.

The brakes must be properly adjusted and checked for perfect operation.

The dynamo, if any, should be removed and fitted to the right leg of the front-fork, facing backwards or re-fixed to the rear-wheel.

ill. 2



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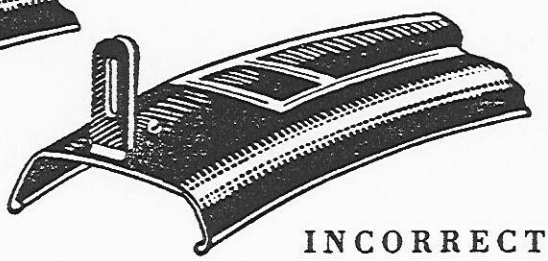

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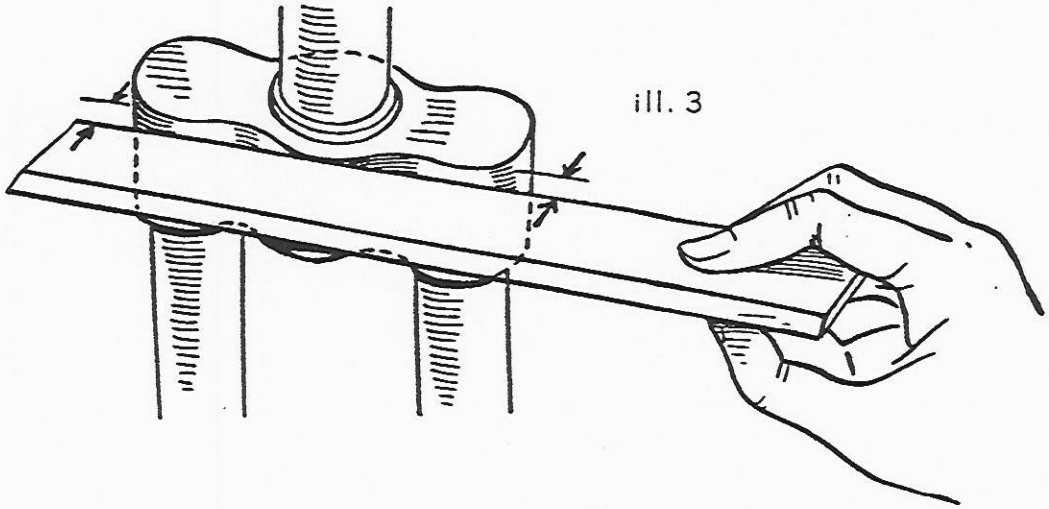
ill. 3



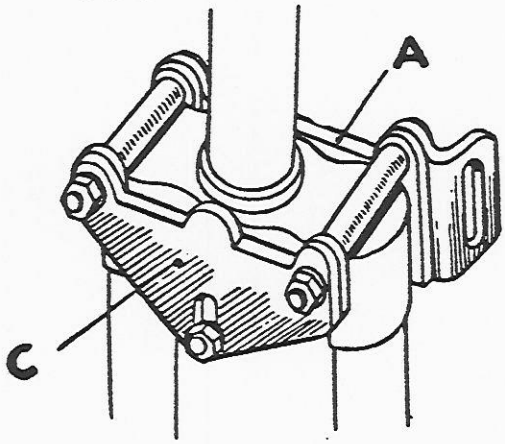
ill. 5

rear of fork

ill. 4

front of fork

ill. 6



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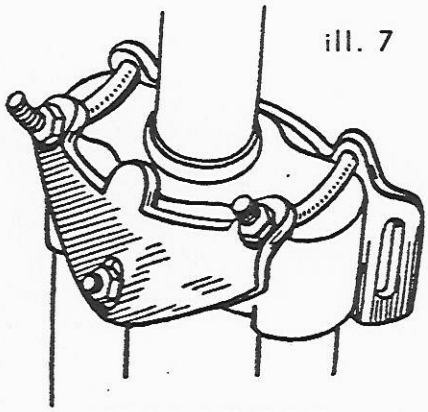
ill. 7



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OPERATION 1.

a. Cutt off front-mudguard where it is **halfway between the fork-legs,** as shown in illustration 2.
Do not yet replace the mudguard, as it will hinder you while carrying out the next operations.

b. Before fitting the engine-bearer plates to the fork, firstly by means of a ruler make sure if fork-crown is thicker in the centre than at the outer ends. (ill. 3).

Should this be the case, proceed as follows:
With the aid of two small strips (ill. 4) the clearance is filled up between the front-plate A (ill. 6) and the front of the fork-crown.
Two small strips (ill. 5) are needed between rear-plate C and the rear of fork-crown.
These four strips can easily be made from a piece of strip-iron, brass or aluminium. Never use cardboard or leather!

The thickness of the strips will be determined by and will be equal to the distance between arrows in ill. 3.
Illustration 7 shows the results of fitting the engine-bearer plates to a fork which ends are thinner than the centre, and without above precautions.
Needless to say that such a result is most unsatisfactory and would give a very bad impression.

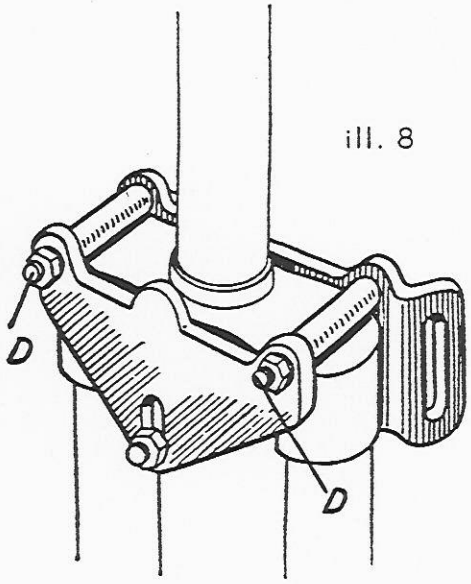
Illustration 8 shows how to fit the strips mentioned and resulting success, if neatly done.

DIRECTION:

Rear-plate C has a notch in the middle, which may be removed, should it touch the bottom-race of the steering-head, or interfere with the steering.

c. Bottom-bolt E in the engine-bearer plates should be in most cases, flat against bottom-side of fork-crown. Only with extraordinary high fork-crowns should it prove necessary to drill a hole right through the crown, to enable the bolt to pass through.
In case the outer ends of the forkcrown are thicker than the centre part, proceed to fit the engine-bearer plates following the rules as described on the next page and shown in the illustrations 8, 9 and 11.

ill. 8



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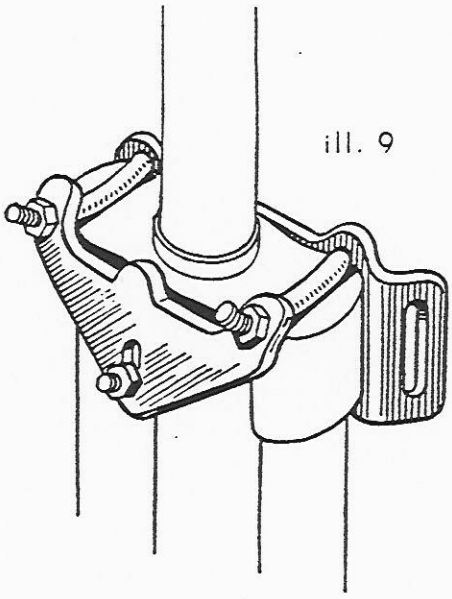
ill. 9



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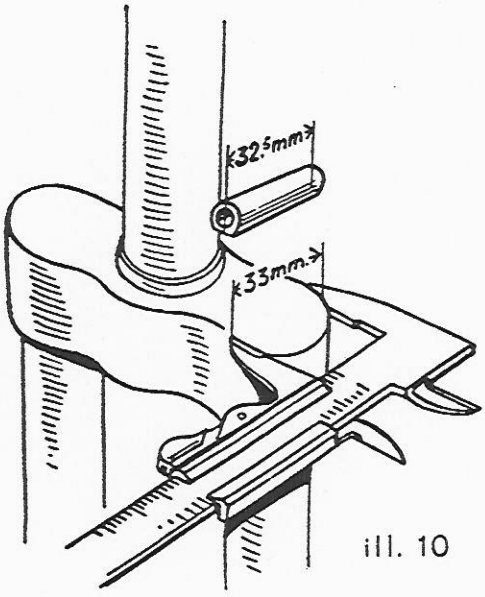
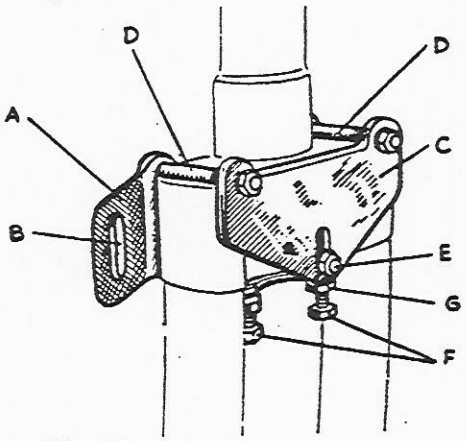
ill. 11



ill. 10



ill. 12

OPERATION 2.

To avoid bending the eyes of the engine-bearer plates while tightening both bolts on top (ill. 9), cut off two lengths from the 3" of tubing, which is supplied with the engine.

a. The correct length of both these pieces can easily be found as follows:

1. With a Columbus gauge the width of the fork-crown ends is measured, as shown in ill. 10.
2. Put the length of tubing in a vise, and cut off 2 pieces with a hacksaw which are .02" less than the distance measured with the gauge.

In case the crown is covered with a chromiumplated cap, keep the pieces .05" shorter than the actual width of the fork-crown, while the cap will be pushed in when the nuts are tightened down.

b. The distance-pieces will be placed over both bolts D and these can now be tightened up, without the risk of bending the eyes of plates A and C. See ill. 8.

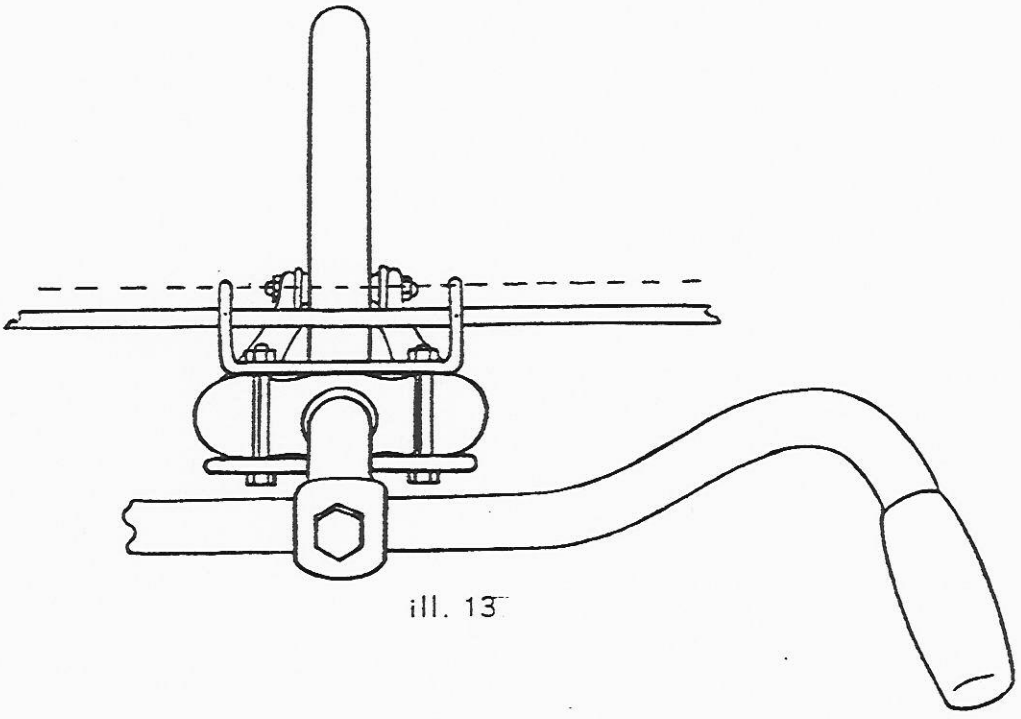
If the crown is too high and therefore not enough room available for the tubes to be used on the bolts, flatten one side with a file till there is enough room. See ill. 11.
If he top of the crown is not square, shape flat side of tubes accordingly.
Illustration 12 shows a completed engine-attachment.

c. Before fitting the plates, unscrew both pressure-bolts F as far as possible. These plates are located in the bottom part of plate A.
Next put the plates on with the 3 long bolts D (2) and E (1), holding them **provisionally** in position by **lightly** tightening up the nuts. Do the same with the bolts F, locking them with their nuts G.

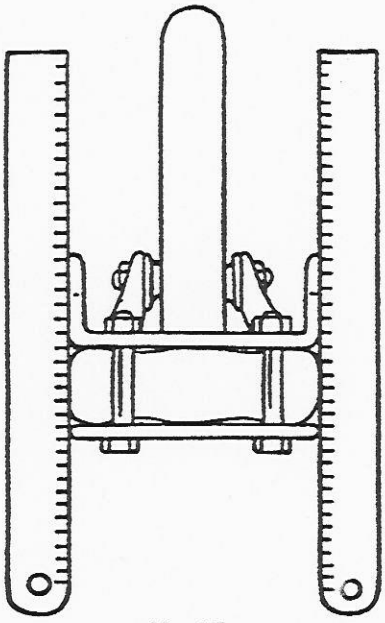
d. The engine-bearer plate A must now be put into alignment with the front-wheel. Replace therefore the front-wheel in the normal way and secure. This alignment should be carried out as follows:

1. Knock both bolts D gently downward, so that they touch the top of the crown.
2. Place a long, **straight** rod through both slots, and check if rod is parallel to front-wheel spindle, seen from handle-bars. See ill. 13 **on next page.**

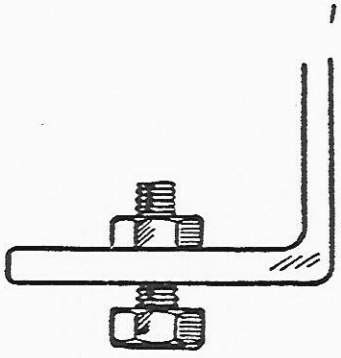
If this is not the case, place on one side a thin strip (ill. 4) in between crown and plate, untill rod is parallel to spindle.



ill. 13



ill. 15



ill. 14

OPERATION 2 (Cont.)

Bolt E, located under the middle of the fork, will be able to hold the lug of the mudguard as well. It may be found necessary to **enlarge the hole in the lug downwards,** in order to make the joint between fork and mudguard as tight as possible.

e. Fit mudguard now, and tighten down all nuts permanently, also the pressure-bolts F and secure these with their lock-nuts G. When pressure-bolts cannot reach the bottom of the crown with lock-nuts on, take them out and re-arrange as shown in illustration 14.

Check again if rod in slots is still parallel with spindle.

It may occur after fitting both engine-bearer plates, that he slotted lugs of the front plate have been bent a little inward. As a result of this it will be impossible to place the engine in between these lugs.
In that case both lugs should be straightened again, which must be done as follows:

f. Place a ruler against the side of one lug (ill. 15) and see if it is parallel to the front-wheel. Now bend lug with the aid of a hand-vise and **NOT WITH AN ADJUSTABLE SPANNER!**

The jaws of an adjustable are too narrow, causing the lug itself to become distorted. Repeat this operation on the other side, as shown.

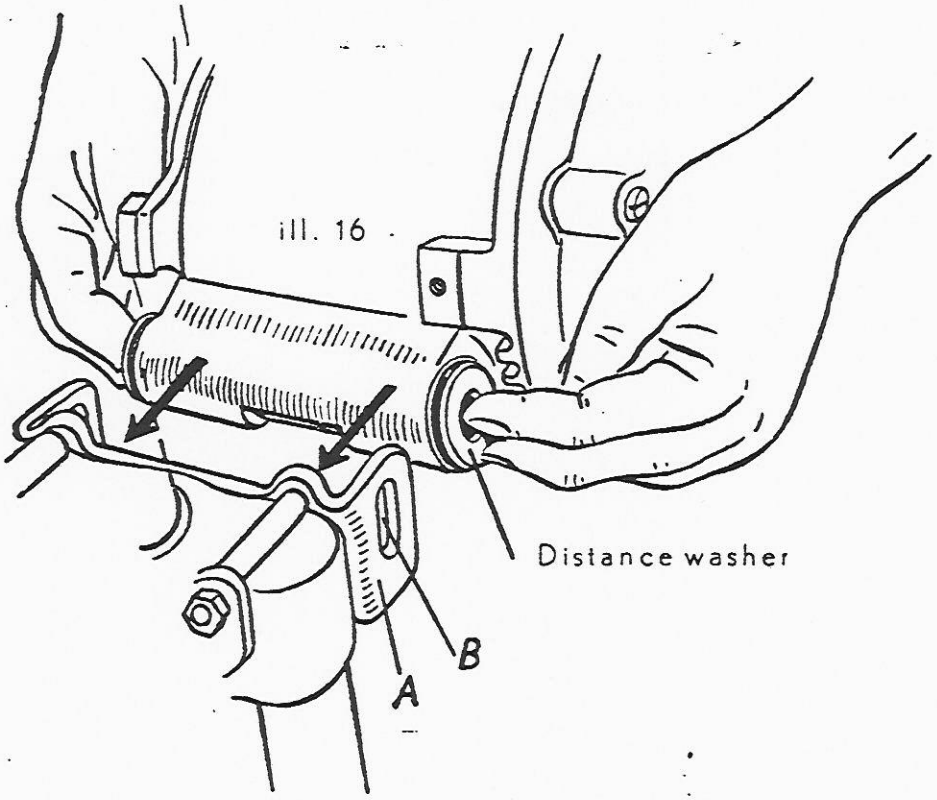
An engine which is not square nor at right angles to its front-wheel "eats" tyres!! (Compare the little wheel of a dynamo).

g. Previous to fitting engine to bicycle, connect the exhaust-pipe to cylinder. This will prove to be an asset while adjusting the clutch.

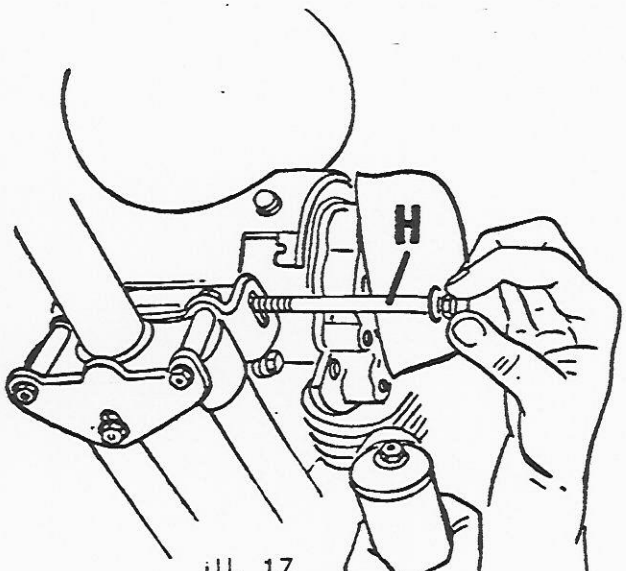
Remove all traces of enamel from silencer-flange and flatten with a file, if necessary. This ensures a tight joint of the copper-asbestos gasket.

VERY IMPORTANT:

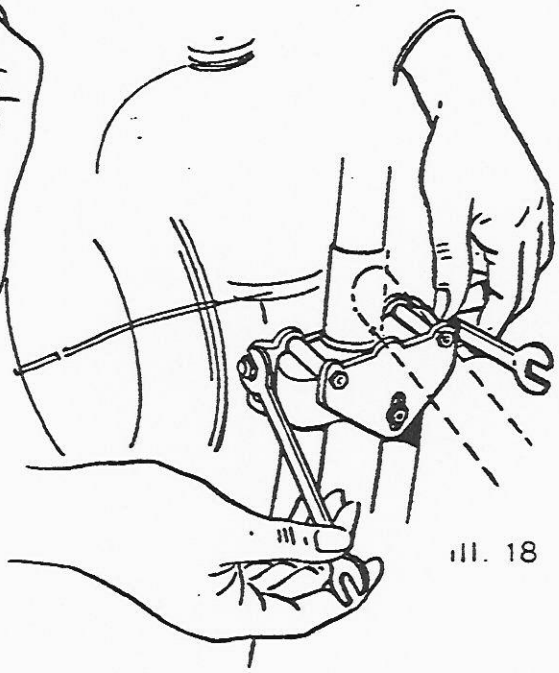
First of all screw tightly both flange-bolts and afterwards the extra bolt, holding the silencer to the cylinder-head. **Make absolutely sure** that this bolt can be **screwed home easily, without using force,** otherwise it may cause **damage to the exhaust and fracture of the flange of cylinder!**



ill. 16



ill. 17



ill. 18

FITTING THE ENGINE

OPERATION 3.

Fitting the engine should be carried out as follows:

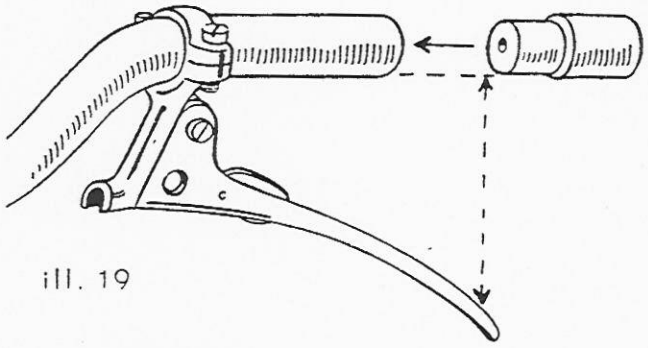
a. At the rear of the engine there are two rubber bushes (silentblocks) and in between these two is a long distance-tube. These three parts are already put into place by the factory.
Now hold the BERINI with its roller on the front tyre, the rubber bushes, just mentioned, pointing towards the upturned, slotted, lugs of plate A. See ill. 16.
Place a distance-washer against each rubber bush and push the whole into place, taking good care that the holes in the bushes and washers correspond with the holes in the slots B in plate A.

Before inserting the long bolt H, insert a tapered pin or a centerpoint in order to bring the holes into line, after which it will be easy to push the bolt H through.

b. Remove the spring from the righthand ornamental cover and lift cover at the rear-end an inch or so, so as to make enough room to enable the long bolt to pass. (ill. 17). **Make sure bolt H has a plain washer under its head.**
This bolt can only be inserted from right to left, as seen from the saddle, and passes the following parts: Right-hand slot in plate A, distance-washer, rubber bush, distance-tube, 2nd rubber bush, 2nd distance-washer and 2nd slot in plate A.

c. Now fit the 2nd plain-washer on the bolt and screw on the nut. Before tightening this nut permanently, find the correct position of bolt H in the slots, by moving this bolt up and down through the slots. By doing so the distance between the tyre and the tip of the BERINI mudguard may be altered.
When the driving-roller rests against the **properly inflated tyre,** the correct distance between tip of the BERINI-mudguard and the tyre should be approx. $1^5/_8$" (40 mm).

d. Check if engine is still square and at right angles to the front-wheel and tighten up nut. See ill. 18. (wherein has been omitted the BERINI mudguard for simplicity's sake, as in illustrations 17 and 21).



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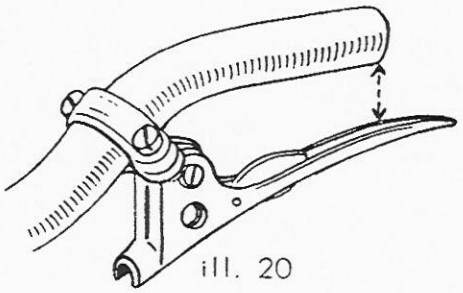

ill. 20

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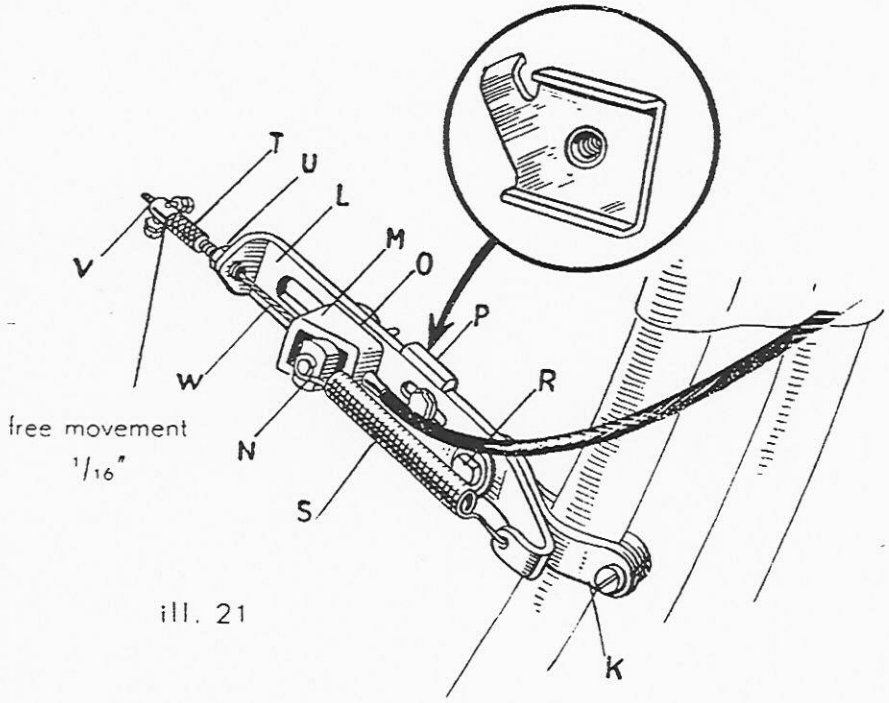
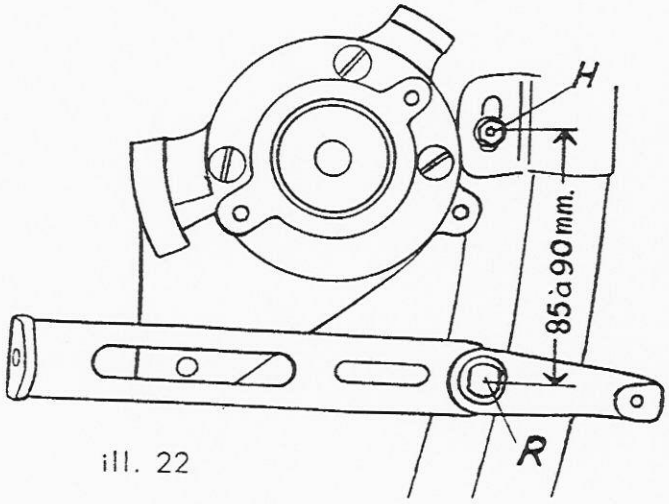


ill. 21



ill. 22

FITTING THE CLUTCH

OPERATION 4.

a. When fitting the clutch-lever on to the left-side of the handle-bars, great care should be taken that the fixing-clip is **ON THE STRAIGHT SECTION** of the bar, in front of the grip.
Should this section not be long enough, proceed as follows:

b. Lengthen the left-hand side of handle-bar (with the aid of a wooden peg or a piece of tubing) till total straight length is approx. 4½" (11 cm). See ill. 19 and 20.

Make sure that in **disengaged** position, lever is **well free from handle bars,** while clipped down by catch inside lever.

c. Next disconnect the pulling-spring S (ill. 21) from the spring-bolt N.

Should it be necessary to remove the clutch-cable, pay careful attention to the little spring beween end-nipple V and adjuster-screw T.

Remove spring-bolt N, together with slide M, from guiding-bracket L.

d. The clutch is now ready to be attached to the left fork-leg by means of clamp K.
Do not tighten screws down, however.

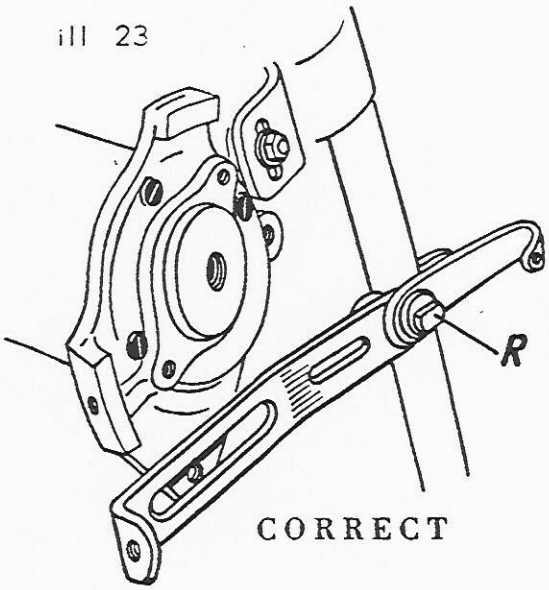
Move inner-cable from clutch-cable up and down several times, so as to make sure it is sufficiently lubricated.

IF NOT: Put on some thin grease.

The distance between the fulcrum R of the clutch and fulcrum H of the engine, located above it, should measure approx. 3½—4" (85—90 mm). See ill. 22.

Should during further operations, the pulling-spring S touch the bottom of the fly-wheel cover, move fork-clamp K downward till the spring is just free of the cover. After this alteration, the adjustment (OP. 3-c) must be repeated.

ill 23



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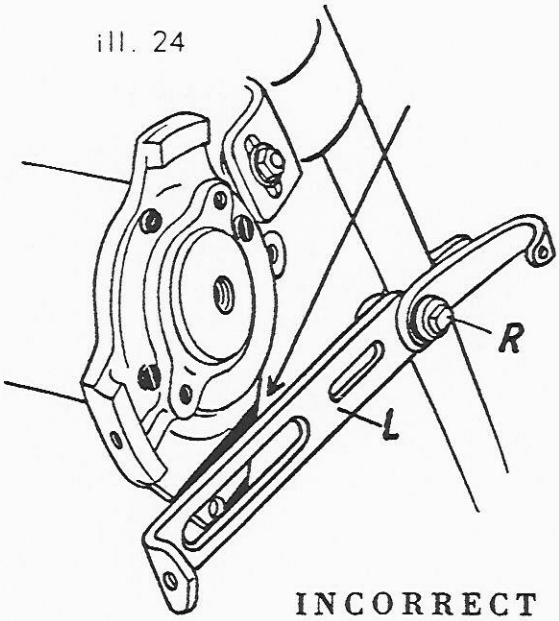
ill. 24



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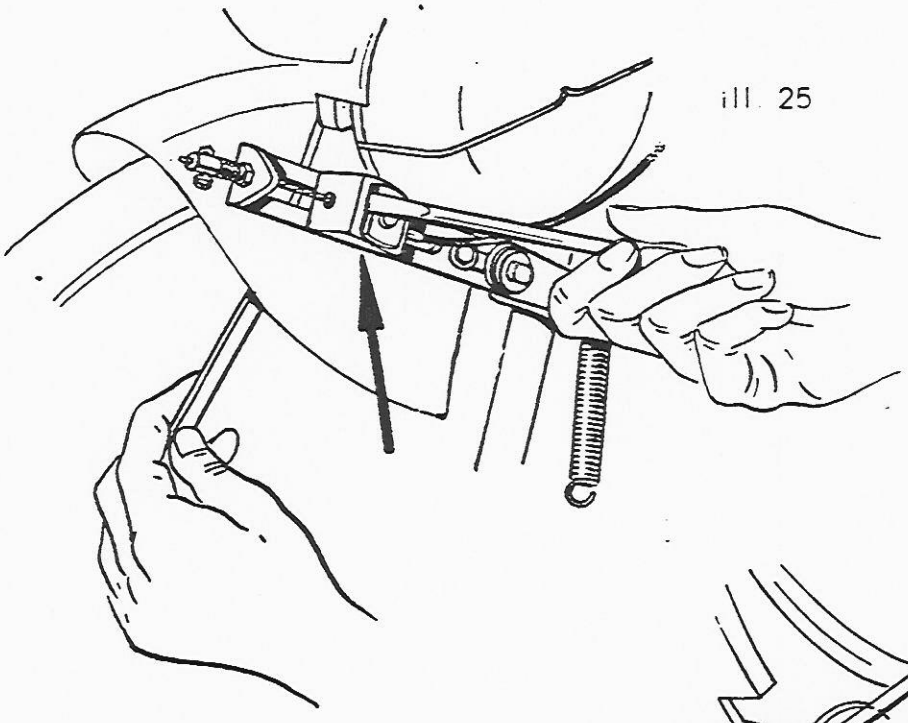
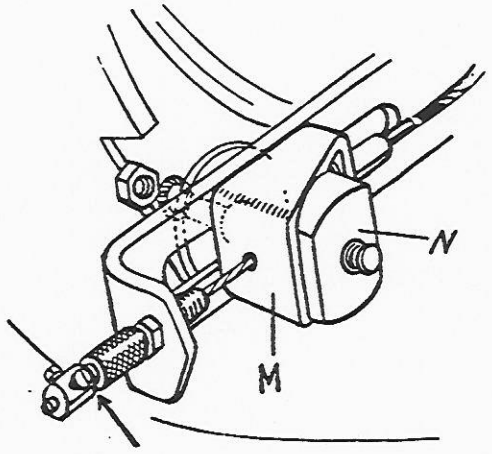


ill. 25



free movement $^{1}/_{16}$"

ill. 26

ADJUSTING THE CLUTCH

OPERATION 5.

IMPORTANT:

Check and make sure guiding-bracket L lies **absolutely flat** against the engine-support. See ill. 23 and 24. **IF NOT,** turn to operation 7a and b. In case a bicycle is equipped with an extra wide front-fork, follow the instructions as described in operation 7a and b.

a. Tre spring-holder N may be put into position by pushing it subsequently through guiding-bracket, steel distance-washer, hole in aluminium crank-case cover and hole in the BERINI mudguard. Spring-washer and nut are located inside mudguard.

Make sure **slide M** is fitted with its **large end facing forward,** as shown in illustration 26, and **NEVER THE OTHER WAY ROUND!!**

IMPORTANT:

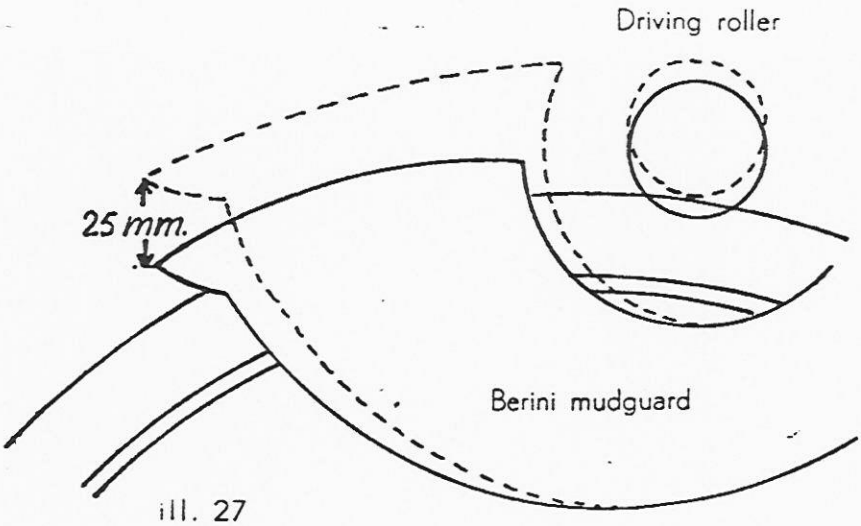
The contact surfaces of bracket and slide must never be lubricated. To maintain perfect working order, it is **essential that these parts should remain dry!**

b. Before tightening up the spring-holder nut on inside of mudguard, insert a screwdriver between spring-holder and slide. (ill. 25). Next wedge the slide to the left and away from the spring-holder as far as possible, and keep it there. This prevents the spring-holder from turning while tightening up its nut and makes the fitting easier.
While doing this, be sure slide M is not jammed under the protruding edges of the spring-holder, otherwise it can not be properly secured.

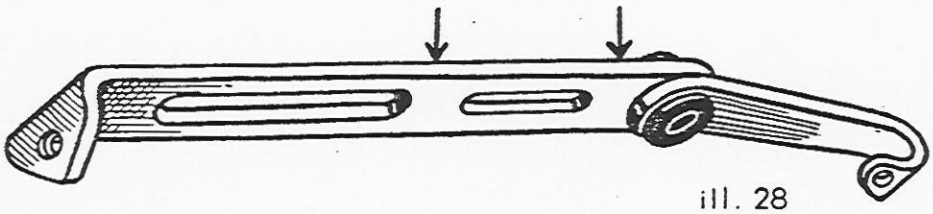
IMPORTANT:

Take good care that the top of slide M is even with the top of guiding-bracket L, otherwise the inner-cable will ride against the edge of the hole in slide M.

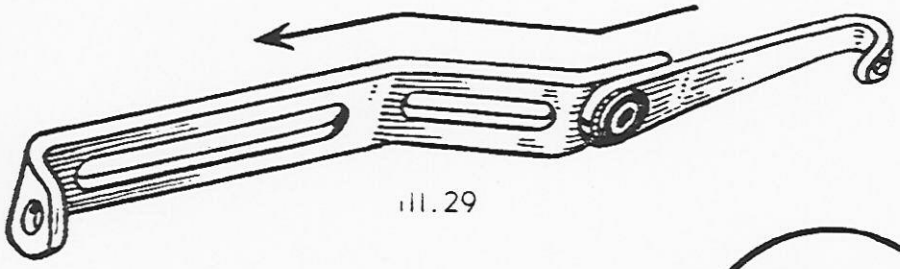
The correct operation of the clutch is as follows:
When engaged, the tension of the outer Bowden-cable against slide M ceases, thus enabling the pressure-spring to push the slide backwards. The result being, that the slide is wedged tightly between guiding-bracket and protruding edges of the spring-holder. The engine is now pinned down in this position and remains there, even whilst riding on the bumpiest roads. Should this locking-principle not function correctly, thans the engine will "jump", causing heavy tyre wear.



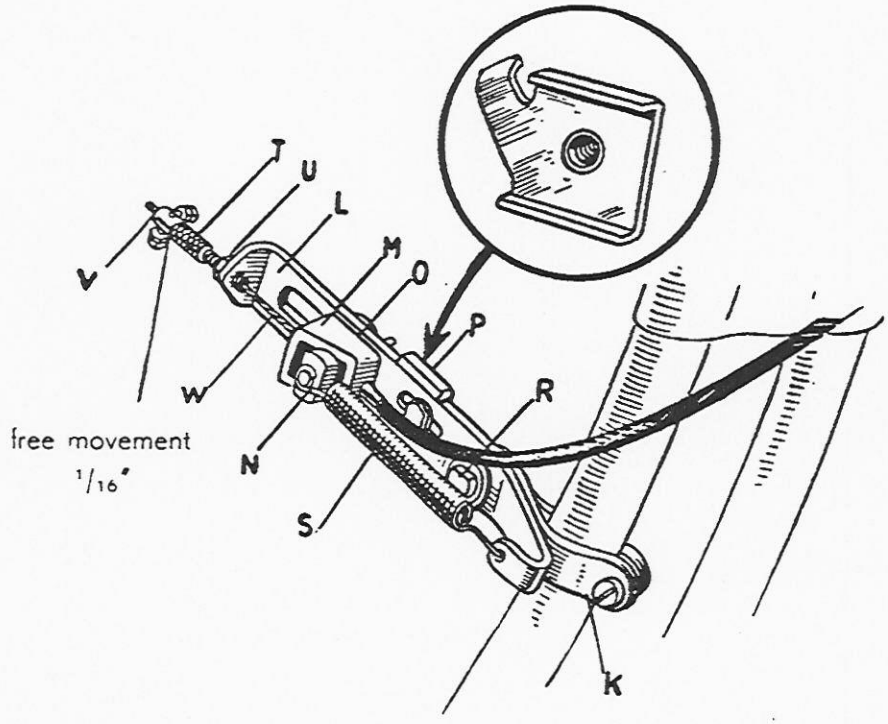
ill. 27



ill. 28



ill. 29



ill. 30

ADJUSTING ROLLER

OPERATION 6.

a. Having finished operation 5a, the driving-roller will just touch the **properly inflated front tyde,** the foremost tip of the BERINI-mudguard being approx. $1^5/_8$" (40 mm) away from the tyre. Measure the exact distance, after which the adjustable catch P (ill. 30) is moved forward against the engine, and its screw done up hand-tight.
Press engine downward, untill the mudguard-tip has been moved 1" (25 mm) nearer to the tyre. See illustration 27. The adjustable catch P. having been moved by the engine, must be tightly secured in this position. Clutch and de-clutch the engine several times in quick succession, and check abovementioned adjustment once again.
With the engine **engaged,** the carburettor **must be absolutely horizontal.** Is this not so, then engine-fulcrum H has to be moved either upward or downward in slots B, and **the adjusting operation repeated.**

OPERATION 7.

a. In case a bicycle is equipped with an extra wide front fork, the guiding-bracket will touch the engine-support as shown in ill. 24 on page 13.

THIS IS POSITIVELY FAULTY!!

If spring-bolt and slide are fitted under such circumstances, it will be impossible for the clutch to operate smoothly. In order to obtain proper results in circumstances as mentioned above, he following instructions should be carried out:

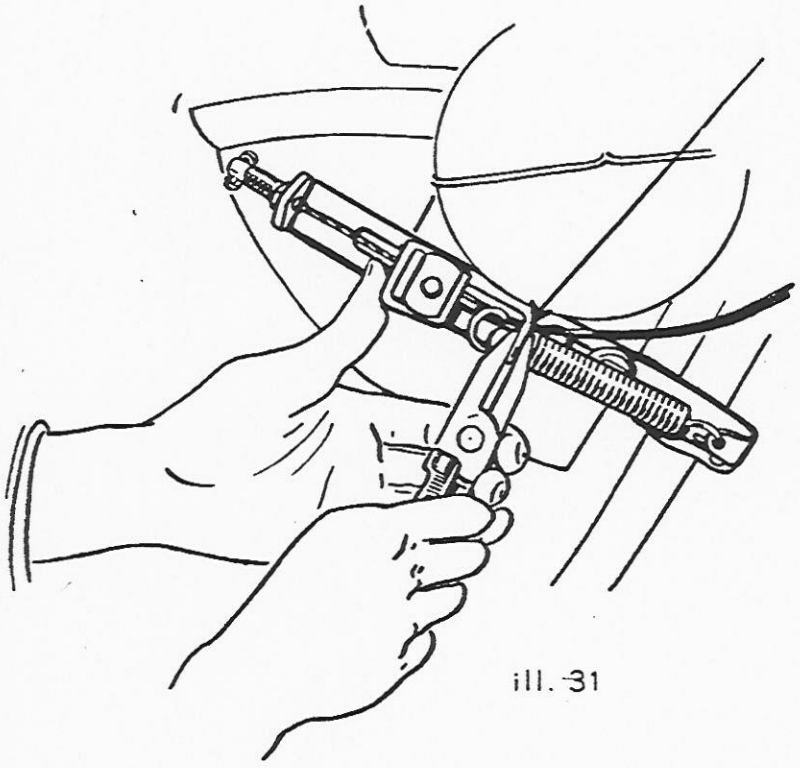
b. Disconnect guiding-bracket L at its fulcrum R on the fork-clamp, bend guiding-bracket in the spots as indicated by the two arrows in ill. 28 and shape it to such an extent that bracket is flat against the engine-support as depicted in illustrations 29 and 23.

OPERATION 8.

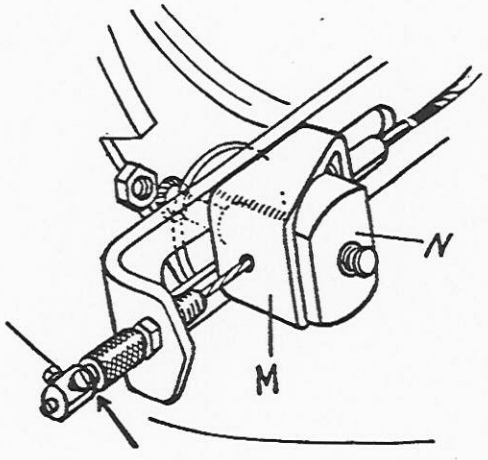
a. Clutch- and throttle-cable can mostly be led through the lamp-hook, to be out of the way. It is advisable to hold them together with a rubber strap, to prevent rubbing and subsequent damage to the outer-cables.

The throttle-cable, with its lever mounted on the right-hand side of the handle-bars, may be shortened if desired, by re-soldering its top end-nipple. The difference in length between outer- and inner-cable must be 1¼" (32 mm).

b. Shorten clutch-cable at bottom-end only.



ill. 31



ill. 32

free movement $^{1}/_{16}$"

OPERATION 9.

a. Next fit pulling-spring S as shown in ill. 31. When engine rests against catch P, adjust end-nipple V with $^1/_{16}$" play, indicated in ill. 31.
This play is very important, otherwise the engine while operating, hangs on the clutch-cable and locking-principle of clutch-mechanism is completely lost.

b. When disengaged, the clearance between roller and tyre should be at least $^1/_{16}$" (1.5 mm). If this result is not attained after having followed the previous directions, the clamp on left fork-leg should be slightly moved upwards, taking care, however, that pulling-spring S will not touch ornamental cover.

ENGINE LUBRICATION

The mixture of petrol and oil should be 1 part lubricating oil, against 25 parts of petrol (1 : 25). Use a mineral oil of a well known make, viscosity S.A.E. 40.
Petrol-tank capacity is 3 pints (1,4 liter), while the small cup, incorporated in the filler-cap, holds the required amount of oil, sufficient for 1 quart of petrol.

In case of difficulties, information, advice or suggestions, we will be pleased to hear from you, and any letters will receive immediate attention.
Our adress is

n.v. **MOTORENFABRIEK PLUVIER**
17 Oranjestraat
the Hague
Holland.
Cable adress: **PLUVIER.**

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