



**MOTO GUZZI**

# INSTRUCTIONS

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## INSTRUCTIONS

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CAR WORKSHOP R.E.  
TESTING SECTION - BOLOGNA



*(1929 Sport 14)*

# ANONYMOUS SOCIETY

“MOTO GUZZI”

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Moto Guzzi Factory  
Lake Como, Italy  
c. 1929

## INSTRUCTIONS

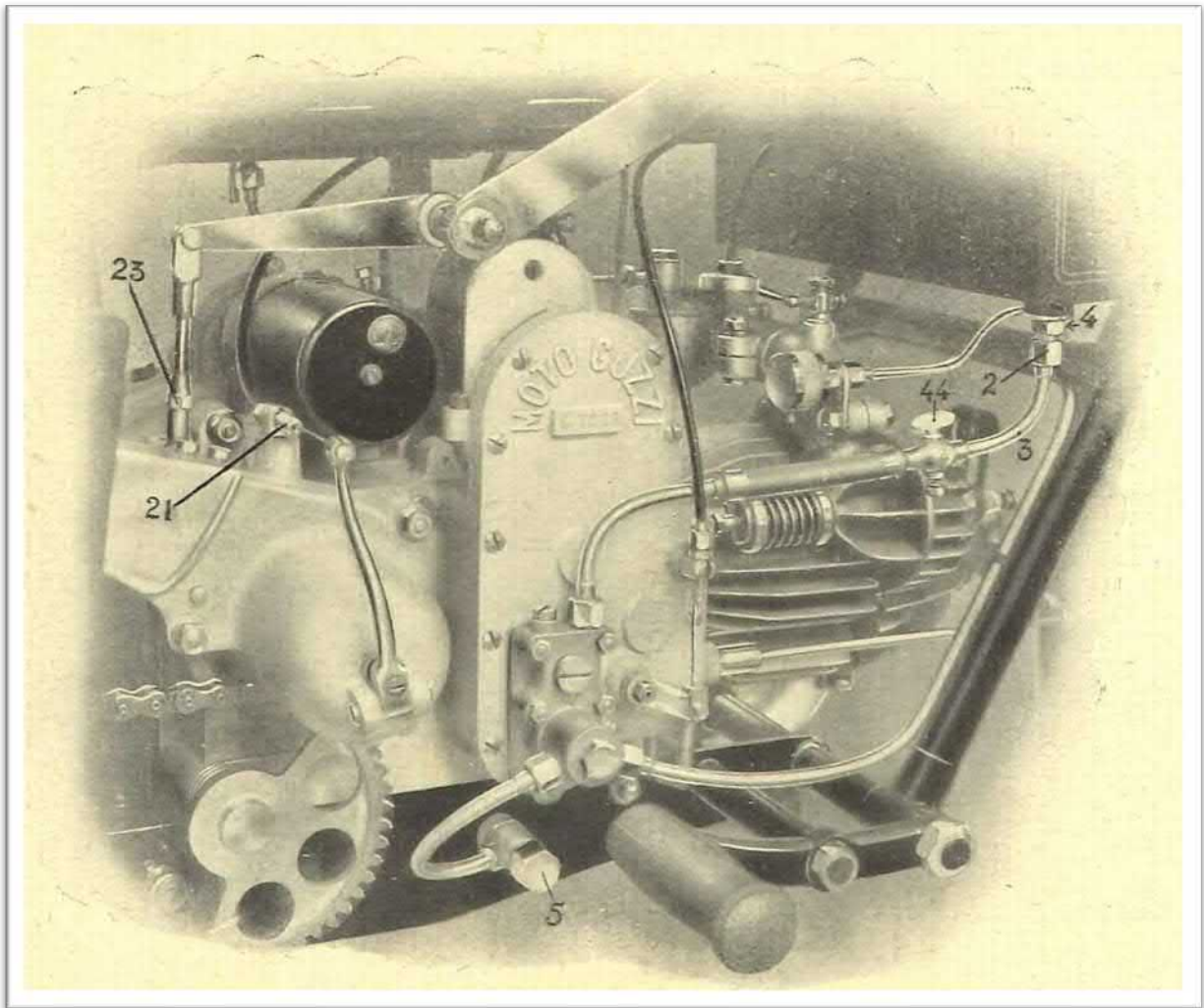
The MOTO GUZZI does not require any special practice for its maintenance. The rules that we give here are those that every good engineer, attentive to his car, must not forget.

### Lubrication of the Engine-Gearbox group.

In the Moto Guzzi engine, oil not only has the function of lubricant as in engines from other factories, but also the very important function of *cooling the engine*, fulfilling the role of water in water circulation engines. This is about 60 liters of oil which, during every hour of driving, passes from the tank to the engine and from the engine to the tank. A gear pump sucks the oil from the tank and injects it into the driveshaft from the distribution side. The oil then runs through the internal ducts of the goose neck and exits from a hole made in it under the big end. After having lubricated the latter, the oil, passing through the small grooves made in the anti-friction metal of the big end, comes out on the sides of this, and, by centrifugal force, is projected on the pin, on the piston and on the cylinder walls, as well as on the gear of the gearbox, lubricating and cooling these parts. The overabundant oil, by means of a special elastic band applied to the piston, is pushed back into the oil sump and collects in the bottom of this. From here, by means of a vane pump coaxial with the first pump, the oil is sucked and pushed into the tank, which, being placed on the front of the machine and being fully invested by the current of air, performs the role of the radiator in water circulation engines.

We also point out that the direction of rotation of the engine, opposite to the direction of travel, combined with the horizontal arrangement of the cylinder, favors the perfect lubrication of the cylinder itself, since the oil droplets are, by centrifugal force, projected onto the upper part of the cylinder, where, by gravity, the oil drops to lubricate the lower part, while if the engine rotated in the same direction as the other engines, only the lower or front part of the cylinder would be perfectly lubricated, since, by centrifugal force, the droplets of oil would be projected only on this one.

The tank contains about 2.5 liters of oil. *The level of this in the tank must not exceed 5 mm below the inlet of the oil coming from the engine, nor be less than 40 mm from the bottom of the tank.*

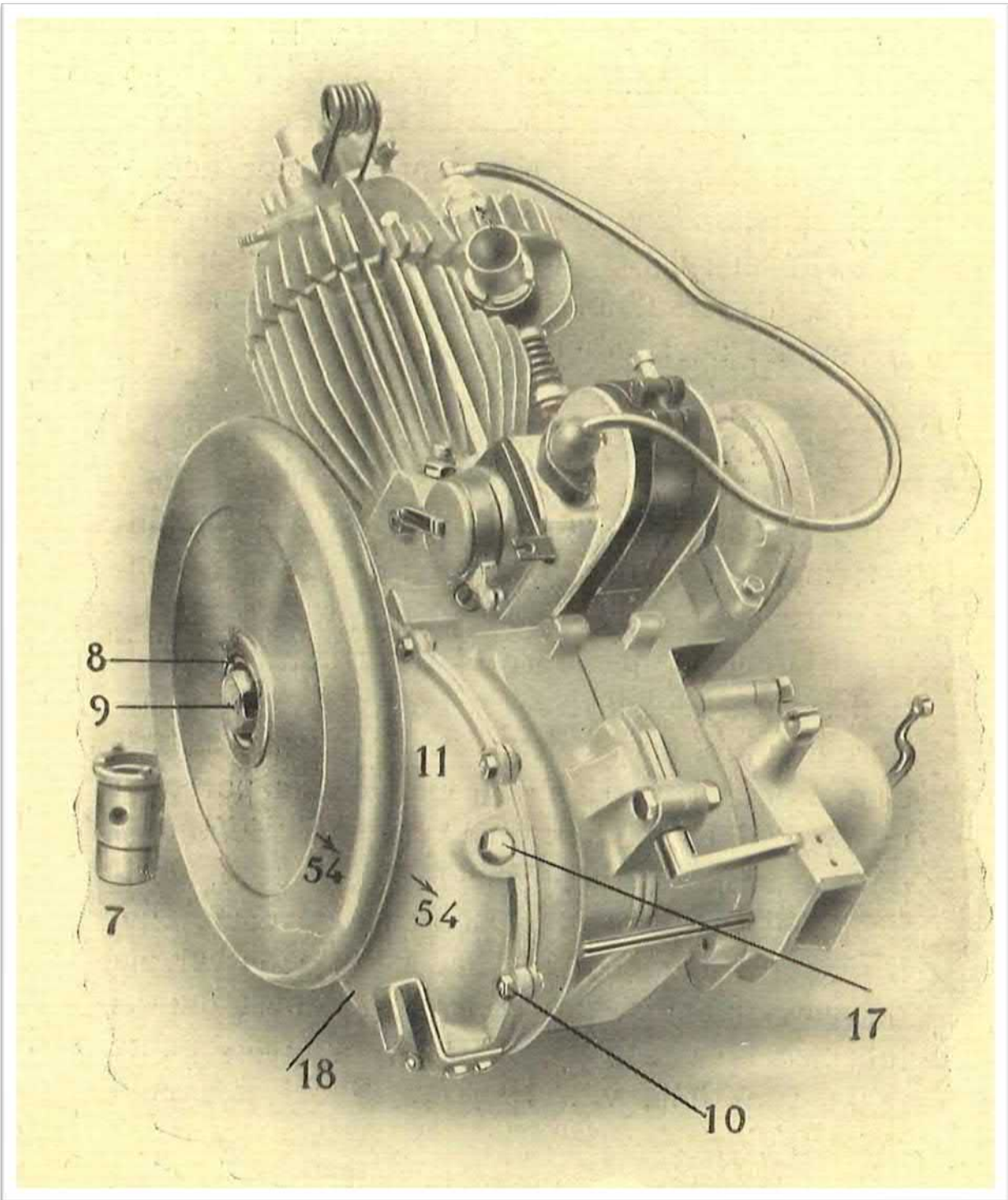


(Figure No. 1)

Approximately every 3000 km of travel, the tank must be emptied, carefully rinsed with petroleum, removing from it, and especially from the filter, all foreign substances that may have deposited there, then filled with fresh oil. To empty the tank or clean the oil filter, unscrew the nut 2 (fig. 1), remove a little the tube 3 (fig. 1), then unscrew the nut 4 (fig. 1) to which the filter is fixed. It is advisable to also clean all the old oil pipes, and also rinse the inside of the engine oil sump with petroleum, first emptying the old oil from the sump with the engine warm by removing the cap 5 (fig. 1).

When the machine is kept inactive for a few weeks, it is advisable to close the oil tap 44 (fig. 1). However, it must be reopened before restarting the engine, otherwise the engine would catch due to lack of oil.

*We recommend always using top quality lubricating oil in our climates,*



(Fig. No. 2)

*fluid in winter, thick in summer.* In cold regions or in the high mountains, semi-thick oil will be used in the summer.

The safest and most practical way to make sure that the engine oil is not defective is to touch the oil recovery pipe near the tank while driving. It must be lukewarm after a few minutes of travel.

### Lubrication of the other organs.

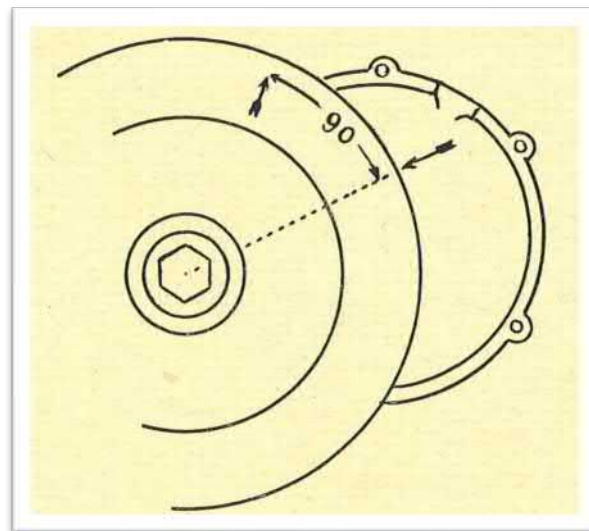
The wheel *hubs* must be cleaned and filled with fresh petroleum jelly every 6000 km of travel.

It is also recommended to keep all the pins of the *elastic fork* well lubricated, and to keep well lubricated, filling the special grease nipple every 1000 km and turning it at the start and every 100 km during the journey, the *rocker arm* of the exhaust valve. Moreover, the clearance between this and the exhaust valve rod must be lubricated from time to time with a drop of oil. Also with grease, the capsule 20 (*fig. 3*) and the tempered tip of the screw 19 (*fig. 3*) must be kept lubricated for the clutch control.

Likewise, from time to time, it will be good to introduce a little grease from the hollow where the spring of the exhaust valve comes out to keep the stem of the latter lubricated as well as the clearance between the spring and the valve.

It is not necessary to lubricate the pair of helical gears or the chain, because these parts are lubricated independently.

The magnet bearings must be lubricated approximately every 3000 km with a few drops of fluid oil.



(Fig. No. 2 bis)

### To remove the Steering wheel.

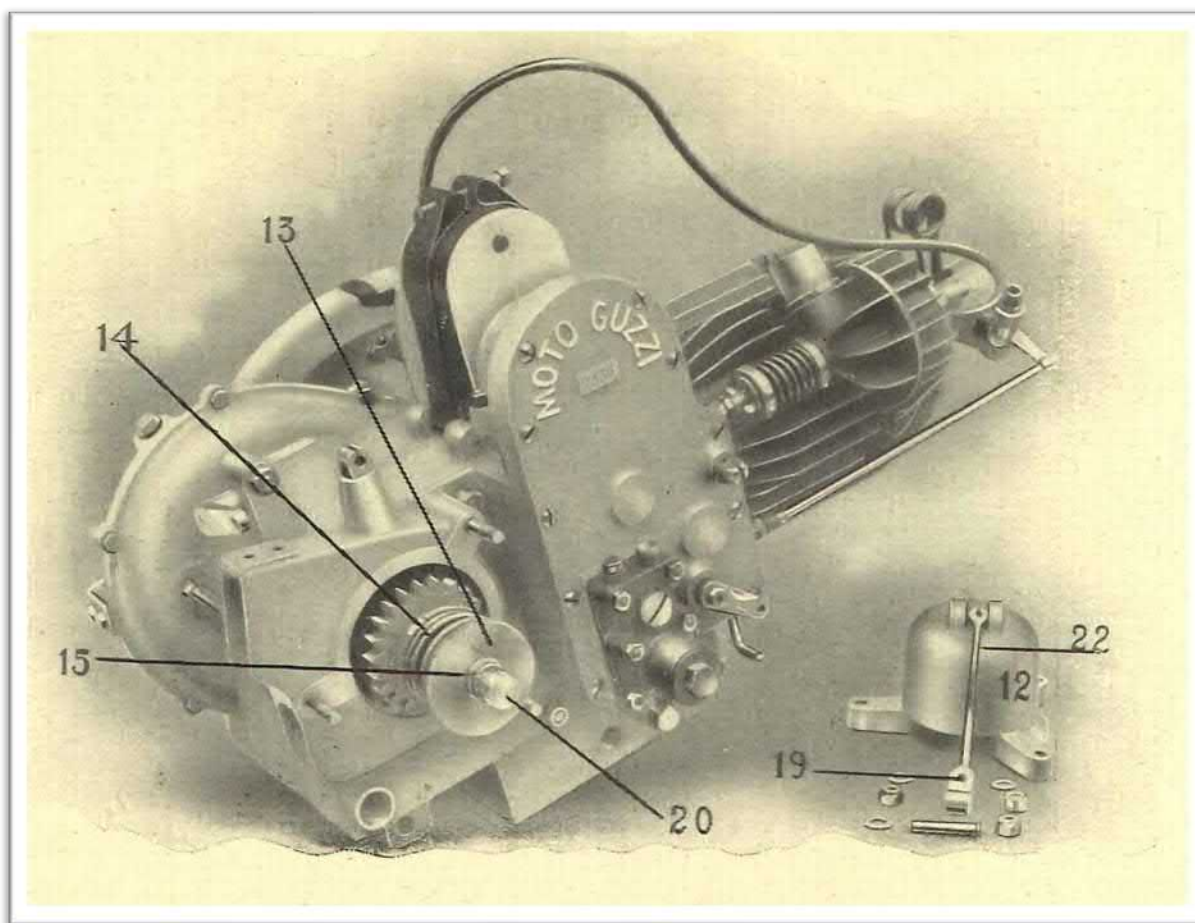
To do this, proceed as follows: with the socket wrench 7 (*fig. 2*) unscrew the ring 8 (*fig. 2*) by about  $\frac{3}{4}$  of a turn, turning in the direction of the hands of the clock since this ring is equipped with a left hand thread, then unscrew the nut 9 (*fig. 2*) (right hand thread) with the same key, but used on the opposite side, applying force if this resists unscrewing. The steering wheel will thus detach from the driveshaft.



## Adjusting the clutch.

Having removed the steering wheel, taking out the bolts 10 (fig. 2), remove the cover 11 (fig. 2), after that take off the cover 12 (fig. 3) unscrew the disc 13 (fig. 3), remove the two clutch springs 14 (fig. 3), then push the threaded bush 15 (fig. 3) in and completely unscrew the clutch control rod. Having done this, first remove the plate 75 (fig. 4) which presses on the clutch discs, then the discs themselves, carefully observing the layout in which they are arranged in order to be able to reassemble them exactly.

To *reassemble*, proceed in the reverse order, making sure to put the discs back in the same order in which they were assembled. To mount the steering wheel, pay special attention to that the cone of it fits exactly to the cone of the driveshaft. Once the clutch discs have been removed, they must be carefully cleaned, taking care to clean the inside of the clutch cover and oil sump as well. Before reassembling the discs, grease them with a little fluid oil.



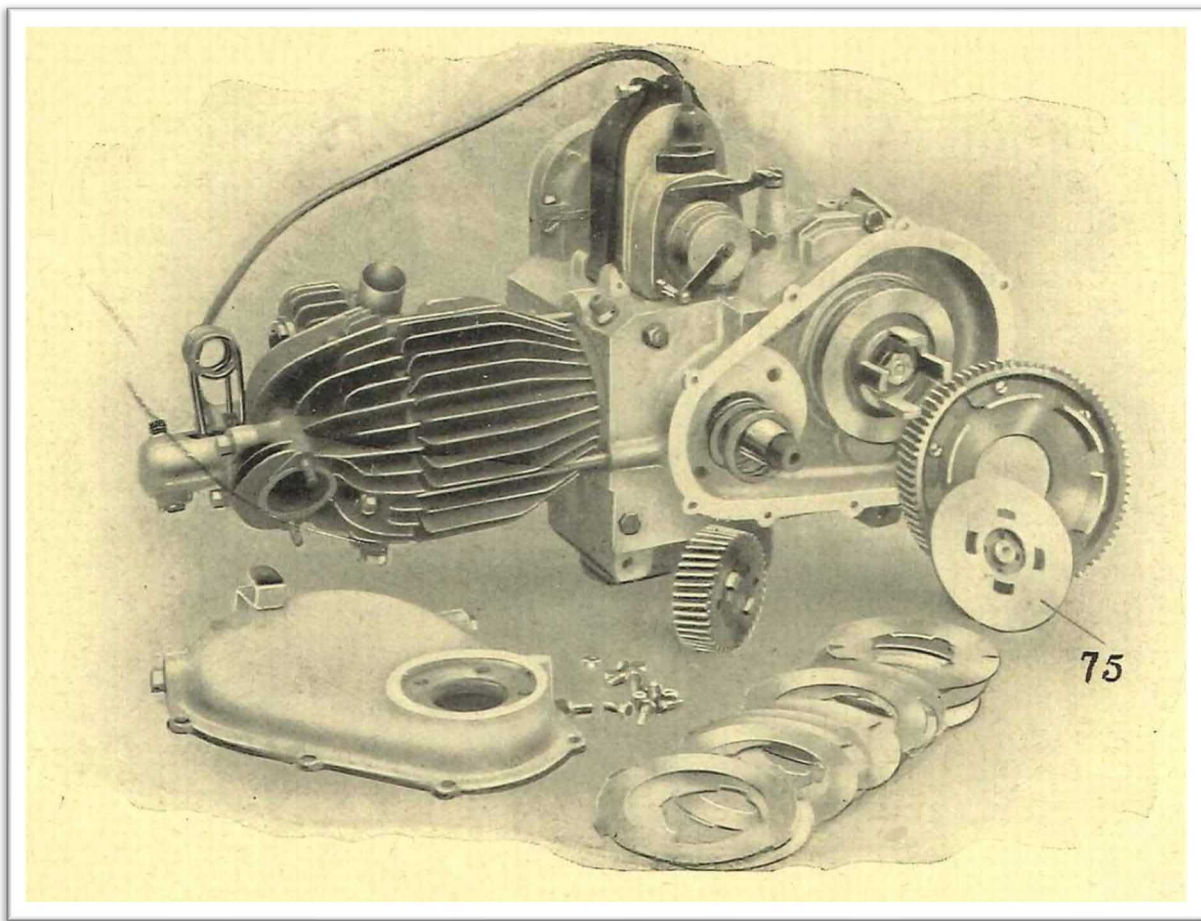
(Fig. No. 3)

*Adjusting the clutch spring.* The clutch springs must have a length of 28 mm when mounted in their normal position. If the *clutch slips*, check if this is due to the fact that the discs are too lubricated. Introduce about half a glass of oil from the cap 17 (fig. 2) by slowly turning the engine by hand, and simultaneously maneuvering the clutch control

lever. Then drain the oil from the plug 18 (*fig. 2*). If, nevertheless, the clutch still slips, this will depend on the fact that the springs do not develop sufficient tension on the control rod. In this case, it is necessary to increase the tension of the spring by turning the disk 13 to the right (*fig. 3*) of the amount needed.

If you find it *difficult to change gears*, first observe whether this does not depend on the fact that it is not possible to disengage sufficiently. This can be immediately observed by the excessive clearance that there will be between the tempered tip of the screw 19 (*fig. 3*) and the tempered capsule 20 (*fig. 3*), which should normally be 2 or 3 tenths of a millimeter.

In this case it is necessary to adjust the control transmissions with the tensioner 21 (*fig. 1*). If, in doing so, it is noticed that, disengaging, the control lever 22 (*fig. 3*) hits the lid before having sufficiently disengaged,



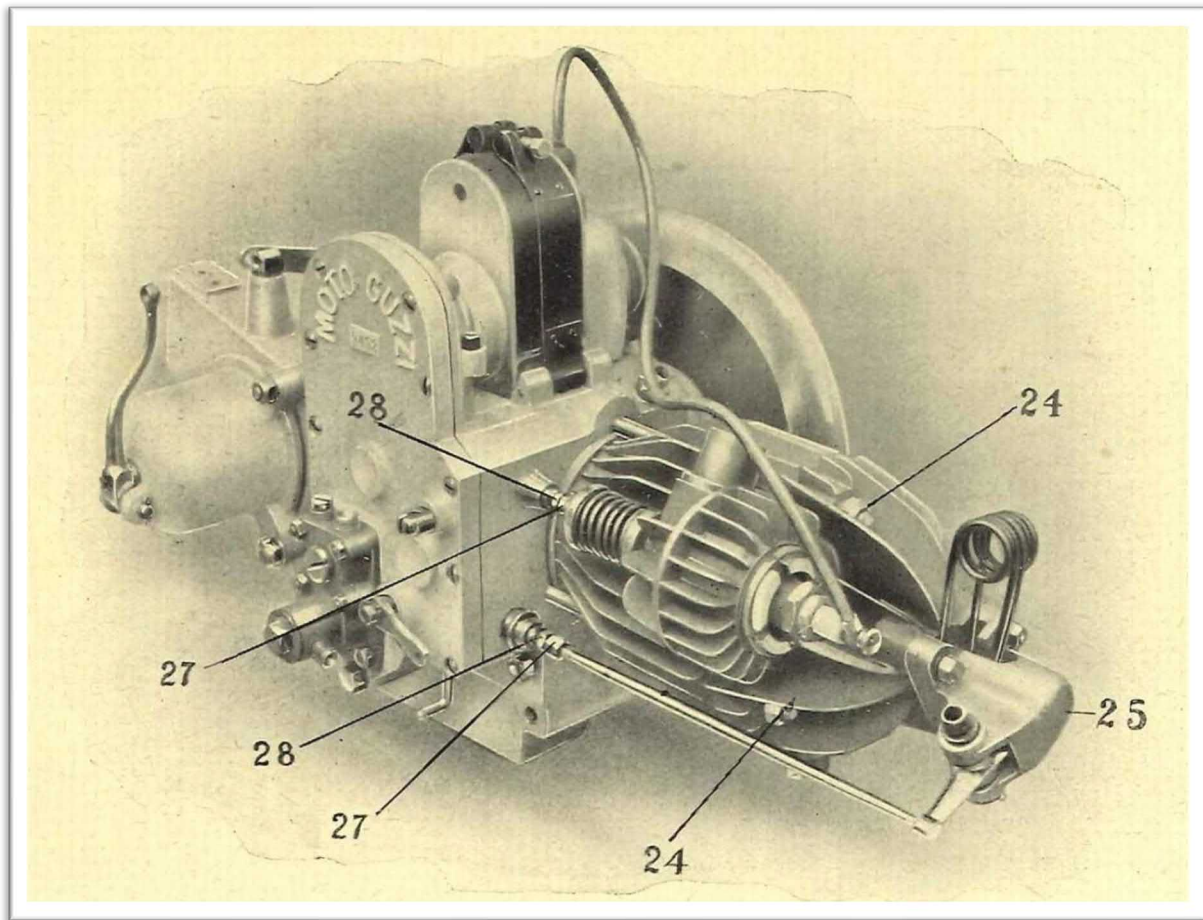
(*Fig. No. 4*)

instead adjust the distance between the tempered tip and the capsule by means of the screw 19 (*fig. 3*), then adjusting the tensioner 21 again. If, once this has been done, there will still be difficulty in disengaging, this will depend on the fact that the discs are mixed with thick and cold oil. This can sometimes occur in the cold season. It will then be necessary to wash the discs with petroleum as mentioned above.

Should it be necessary to disassemble the control rod of the clutch discs, without disassembling the latter, take care to insert from the cap 17 (*fig. 2*) and for the length of about 10 cm, a piece of iron or steel wire with a thickness of about 3 mm, pushing it against the clutch. This will prevent the disc retaining plate from falling when reassembling the rod.

### 250 clutch adjustment.

To disassemble the clutch, remove the cover 104 (*fig. 12*), unscrew the 6 snap nuts 101 (*fig. 12*) which hold the springs, then remove the pressure disc 102 (*fig. 12*) with the relative springs, and after these the proper discs, observing the layout in which they are arranged in order to be able to reassemble them exactly. To reassemble the clutch proceed in reverse order. To make sure that each of the 6



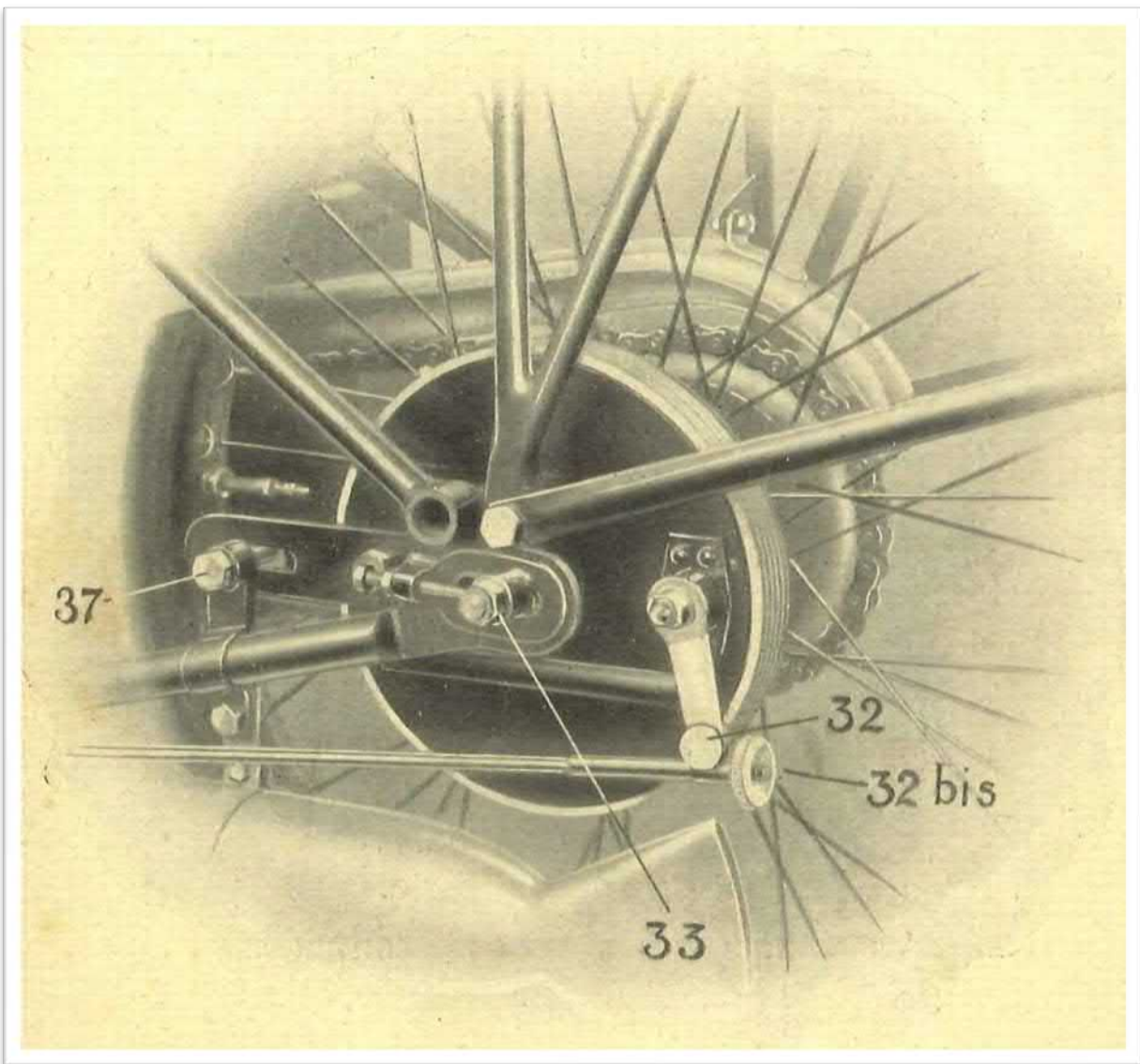
(Fig. No. 5)

springs exerts the same pressure on the disc, screw the snap nuts for an equal number of turns, then actuate the release lever. The plane of the pressure disc must remain parallel to the plane of the helical gear. If this does not happen, it is necessary to turn one or more snap nuts forward or backward  $\frac{1}{2}$  turn at a time until the desired parallelism is obtained.

The pressure of the springs can be adjusted without disassembling the clutch, by introducing the appropriate socket wrench in the hole 103 (*fig. 12*) made on the cover 104, and turning each of the 6 nuts by  $\frac{1}{2}$  turn at a time.

### Adjusting the control lever of the gear.

To make sure that the control lever of the gear, when it is in the different notches of the sector, corresponds exactly with the respective gears of the countershaft, it is necessary that, when putting the lever in third speed, you begin to feel a certain resistance, when the lever control is about 1 mm before it has completely entered the corresponding notch. Otherwise, adjust the length of the control rod of the gear by turning the dropout 23 by the necessary amount (*fig. 1*).



(Fig. No. 6)

## Cleaning the Head, the Cylinder and the Piston.

In order for the engine to always be in full efficiency, and to avoid overheating, it is necessary to remove the encrustations from the piston and head. This must be done approximately every 3000 km of travel.

To remove the head, loosen the three nuts 24 (*fig. 5*) with the appropriate eye wrench, then remove the head by tapping lightly all around on the edge of this (*avoiding hitting the cooling fins*) with a piece of hardwood and a wooden stick.

Once the head has been removed, it must then be completely disassembled by removing the cap 25 (*fig. 5*) and the exhaust and admission valves.

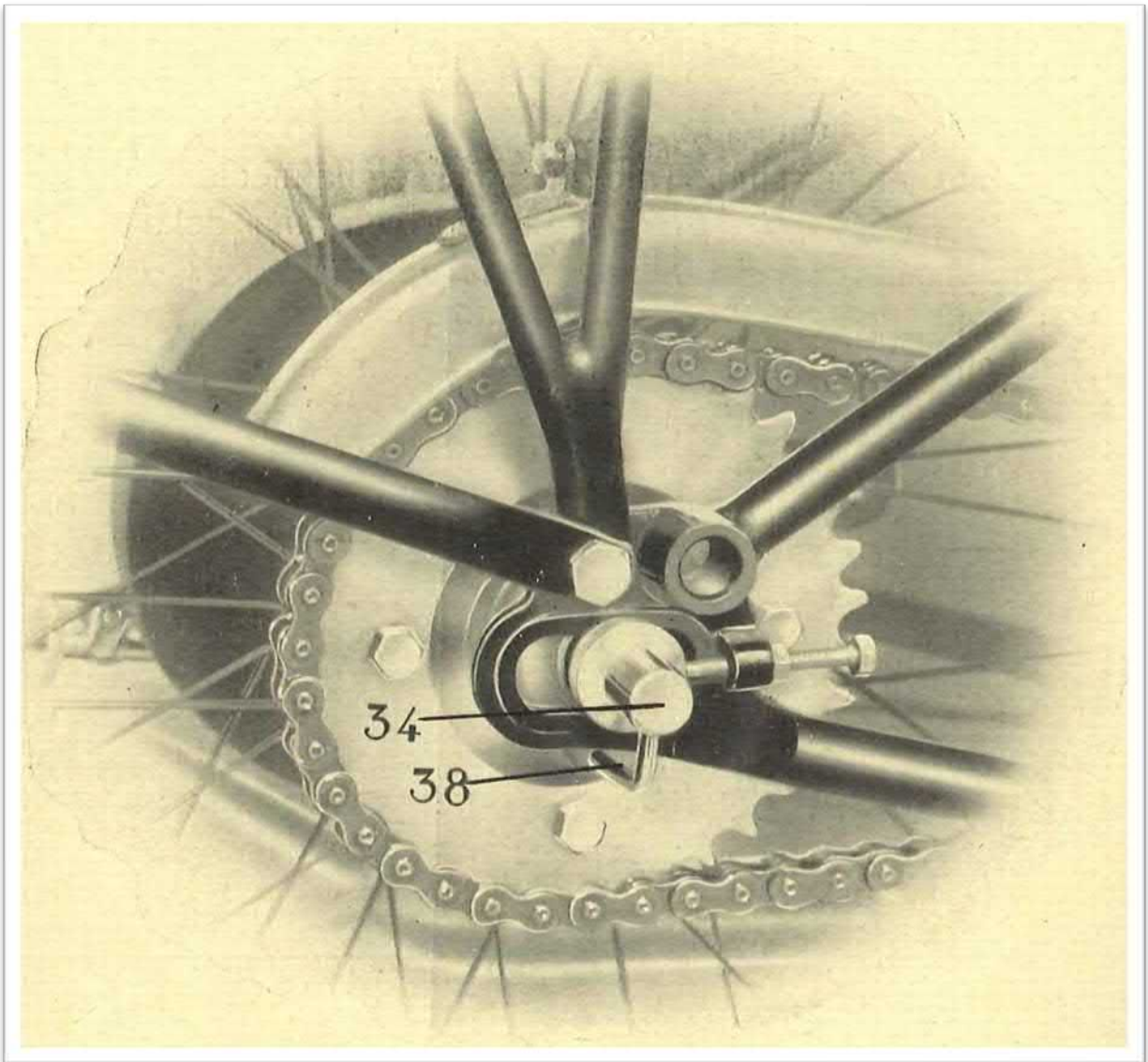
Once the head has been removed, the cylinder is taken out using the same means. Then the piston is removed by taking out the grapple spring that is located in the piston hole on the steering wheel side with a pliers, and pulling out the pin from this side.

Once the head has been cleaned, proceed with a mixture of fine emery dust and oil, to grind the valves. Then refit the pin and the piston.

The cylinder is then reassembled by placing a cardboard gasket with *hermetic* between it and the oil sump. However, take care to first remove all traces of the old gasket from the cylinder and oil sump.

Then reassemble the valves and the cap on the head, then on the cylinder, not forgetting the gasket between the head and the cylinder.

It is recommended to tighten each of the three nuts 24 (*fig. 5*) alternately a little at a time.



(Fig. No. 7)

### Tappet adjustment.

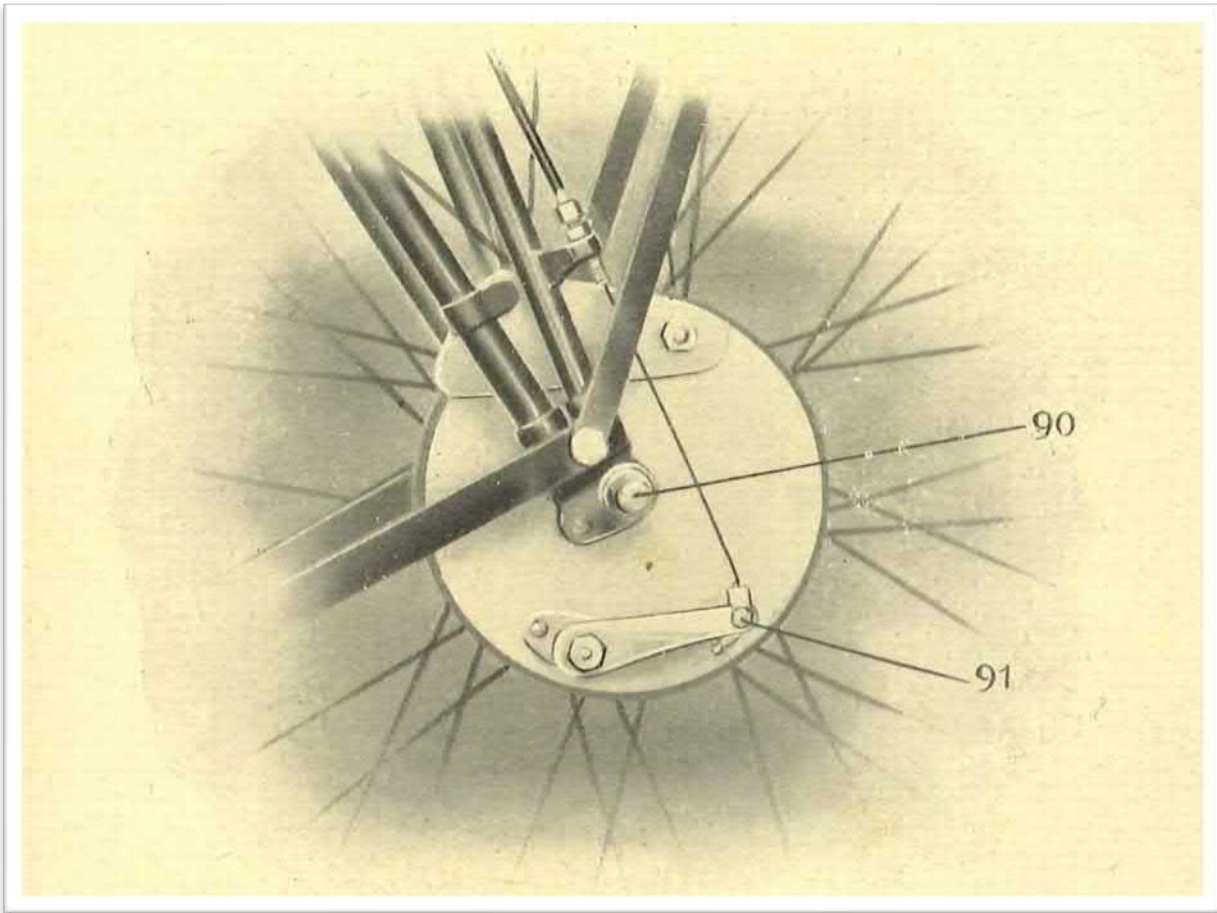
In order for the engine to function properly and the machine to run quietly, the clearance between the valve stems or rods and tappets must be a maximum of  $\frac{5}{100}$  mm in total, when the engine is cold. This clearance is adjusted by means of the screw 27 (fig. 5). To do this, loosen the lock nut 28 (fig. 5) by holding the screw 27 with one of the special wrenches, then adjust this screw while holding the tappet until the desired clearance is obtained, then tighten the lock nut 28, checking if, even after this last operation, the clearance of the tappets is still the desired one.

## Timing.

*Normal engine and 2 V.* - It is not necessary to give special rules for the timing of our engines, as all the distribution gears are marked. However, we believe it is useful to give the following rules:

*Magnet timing.* By placing the magnet control lever in the full advance position, and turning the engine in the direction of movement, the breaker points must detach when the arrow (54) drawn on the steering wheel is still about 90 mm away from the arrow (54) drawn on the clutch cover (*fig. 2 and 2 bis*).

When the two arrows match, the machine is *dead center*.



(Fig. 8)

*Valve timing.* When the tappets are adjusted, the intake valve must begin to open a little before the dead center, which is when the arrow on the steering wheel is still 5-10 mm from the arrow on the oil sump. Once the intake has been set up, the exhaust is also in phase.

*4 V engine.* - The ignition advance is 110 mm instead of 90 mm, and the one of the intake opening 15-20 mm.

*Engine 250.* - The ignition advance is 75 mm, the one of the intake opening 12-16 mm.

### To remove the Rear wheel.

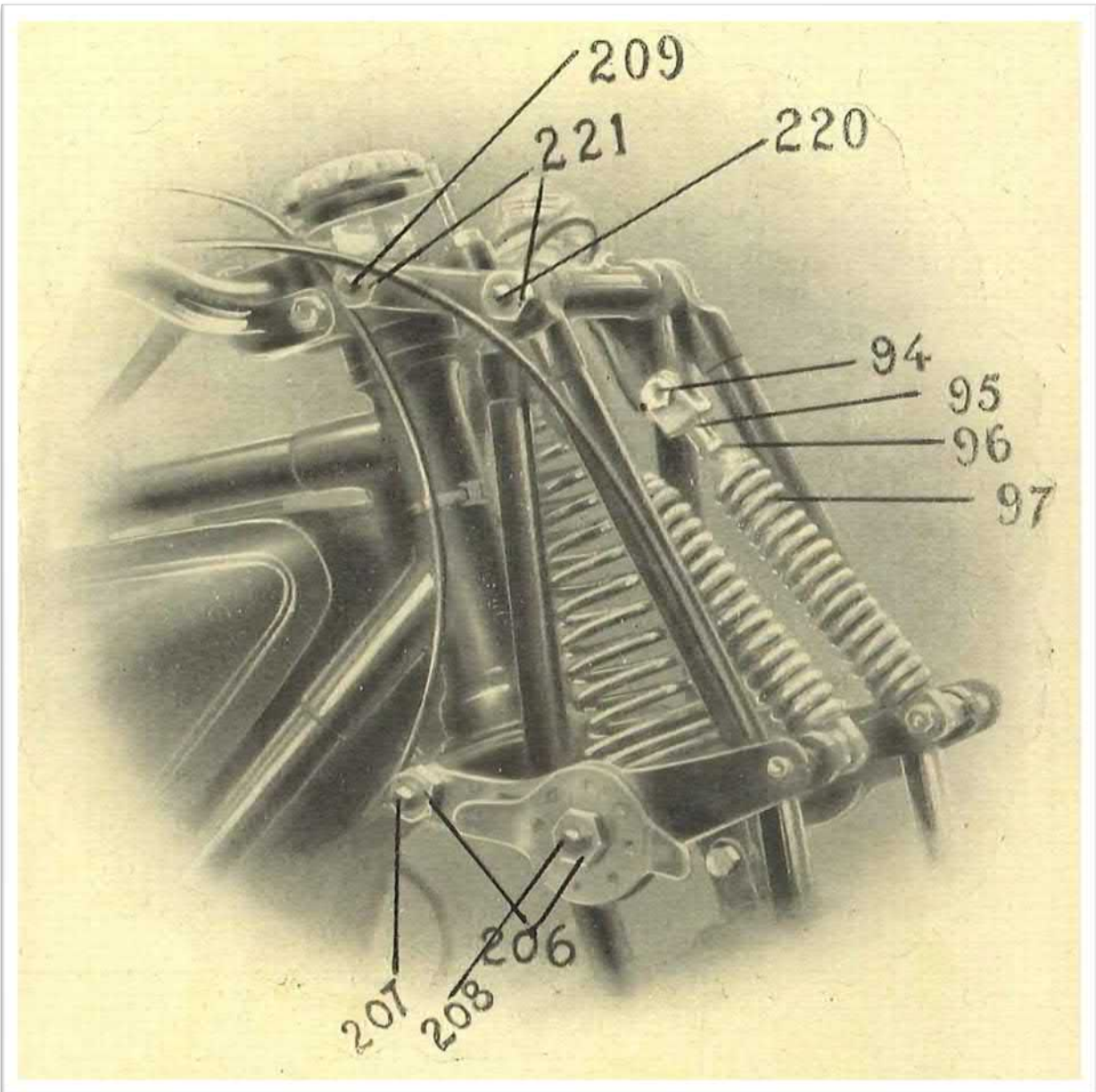
Remove the nut 33 (*fig. 6*) with its washer, remove the pin 34 internally (*fig. 7*) thus releasing the spool and the stump holder disk. Then remove the pin 32 (*fig. 6*).

Once the chain has been removed, the wheel can be taken out by tilting the machine to the right.

### Changing the Rear air chamber during the trip.

We recommend to mount *uninterrupted inner tubes* on our machines, as these are subject to serious problems, and since with our wheels the change of an uninterrupted inner tube, thanks to a special device, can be done in a very short time without removing the wheel from the fork. To replace a perforated inner tube, proceed as follows: from the left of the machine, disassemble the damaged inner tube from the wheel rim.





(Fig. 9)

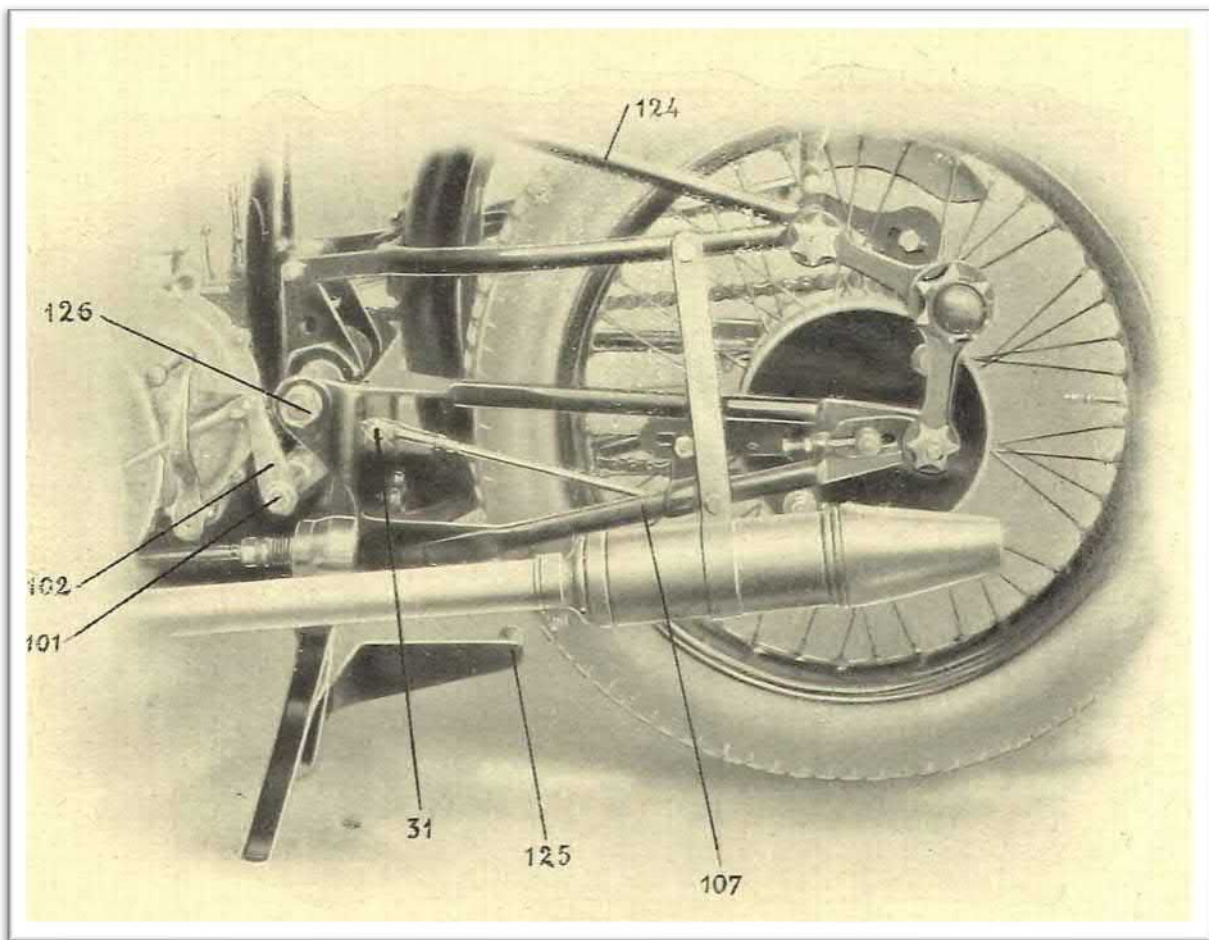
Remove the pin 32 (*fig. 6*) after loosening the handwheel 32 bis (*fig. 6*) a little, unscrew the nut 33 with the eye wrench (*fig. 6*), remove the washer, then moving to the right of the machine, extract the pin 34 by about 8 cm (*fig. 7*). The spool is then removed, then the arm of the stump holder disk falls from the screw 37 (*fig. 6*), the new tube is inserted into the fork, the disassembled parts are put back in place, paying attention to screw the spool 32 bis back on and making sure that the end of the curved arm 38 (*fig. 7*) does not touch the chassis, and the new chamber is mounted on the wheel rim.

### To remove the Front wheel.

The pin is removable. Remove the pin 91 (*fig. 8*) then loosen the nut 90 (*fig. 8*) and extract the pin from the side opposite the brake.

### Adjusting the Front wheel bearings.

To adjust the tapered roller bearing of the front hub, loosen the lock nut a little (from the left side) while holding the 2-plane (left) threaded spool. Then, holding the spool on the right, turn the left spool by the necessary amount and then, holding the latter, tighten the lock nut.

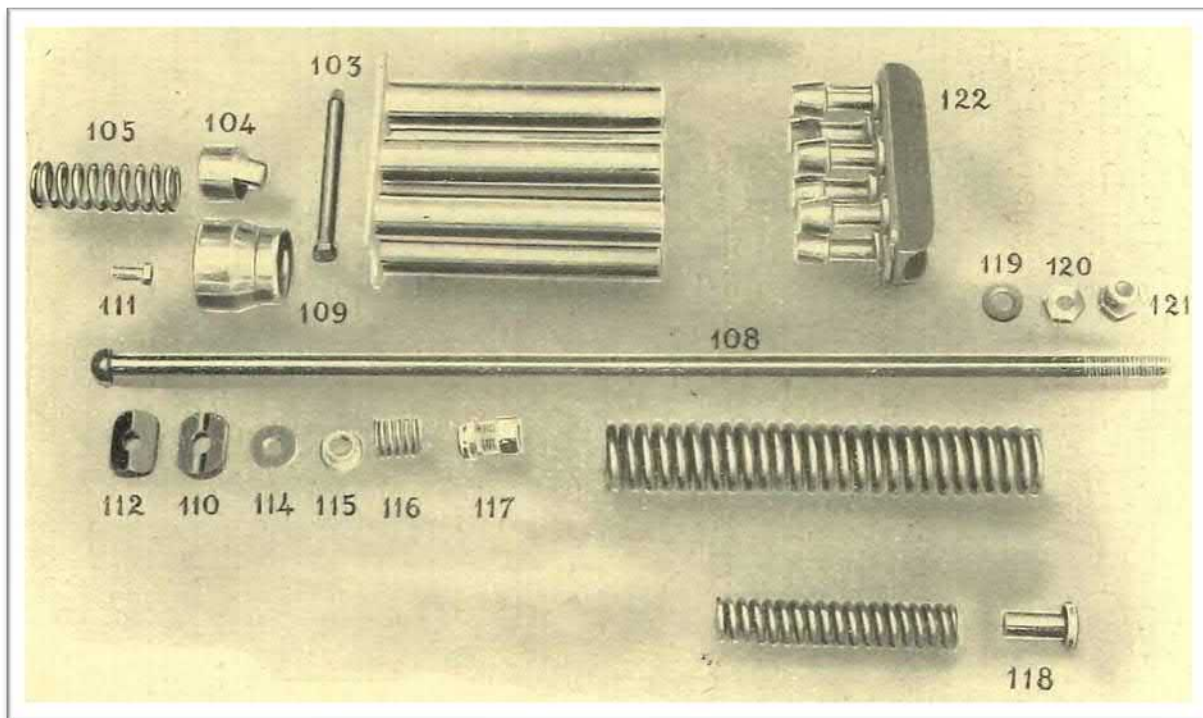


(Fig. No. 10)

## To remove the Front fork.

(See figure No. 9)

It is advisable to first disassemble the 2 lower pins 207 and 208. To do this, remove (holding the pins by means of their square ends) the lock nuts 206 and the opposite nuts on the left side. Then the shock absorbers are removed. Once this is done, screw the two pins a little (by means of the two square ends). Doing so a detachment of the left biscuit is produced, such as to allow the end of a screwdriver to be introduced into the compartment formed, with which, made to act as a lever, the complete removal of the biscuit is obtained. This done, the respective nut is reassembled on the left end of the pin 207 by screwing it completely, and the two locknuts 206 are screwed onto the left end of the pin 208, tightening them against each other. This makes it possible, by turning the pins 207 and 208 in the opposite direction to the clock hands (always being on the left side of the machine) to extract them completely, thus also freeing the biscuit on the right. This done, the pins 209 and 220 are disassembled. To do this, the two locknuts 221 are removed (holding the pins by means of their square ends) and the respective nuts on the left side.



(Fig. No. 11)

Then the two pins are turned (by means of their square ends) in the opposite direction to the clock hands (standing on the right of the machine) thus obtaining the exit of the pins and the consequent removal of the toggle.

### To adjust the Front Fork.

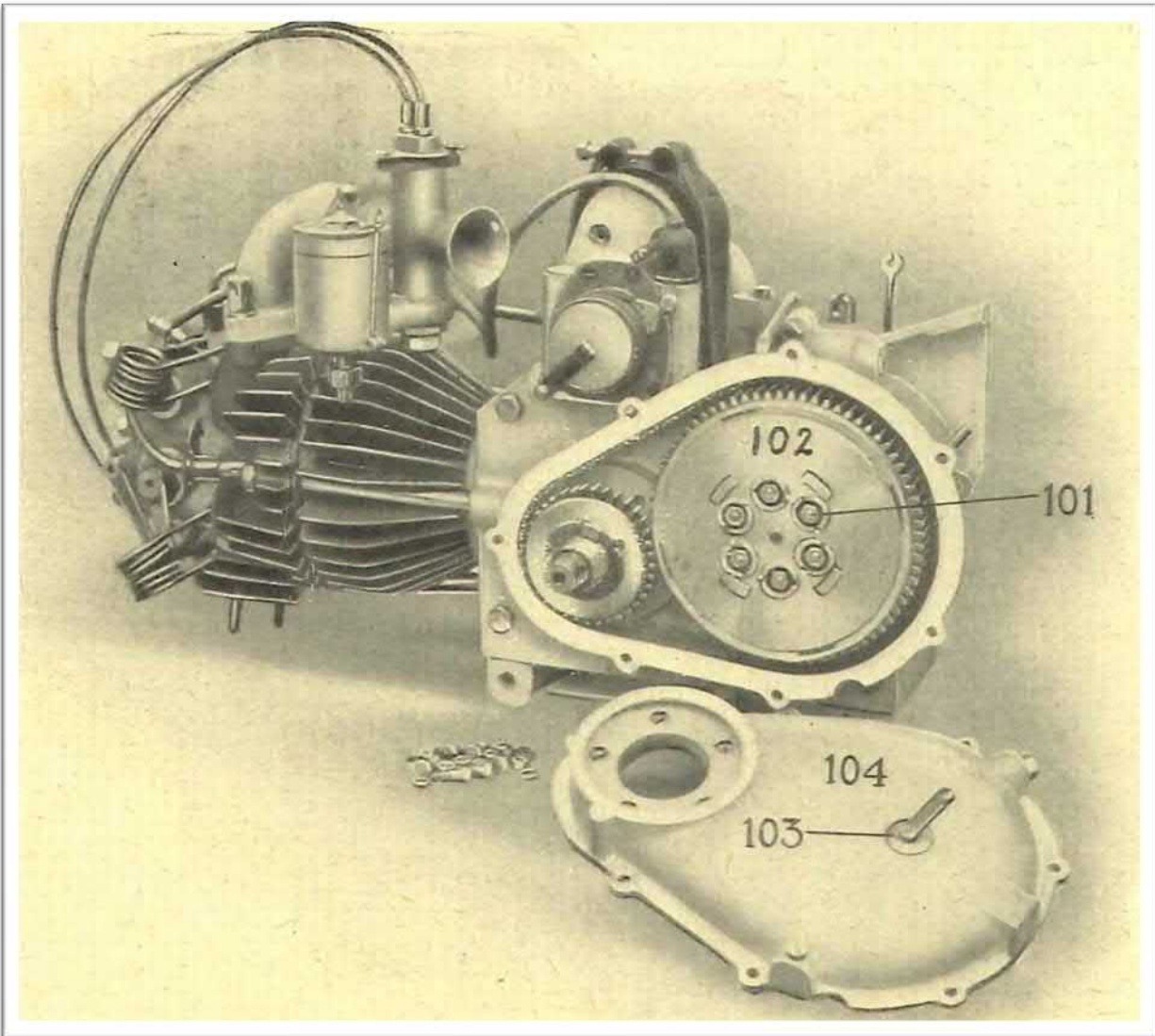
All four of its pins are adjustable so that any lateral clearance can be eliminated. To adjust one of these pins, loosen the corresponding nut on the left of the machine a little, then, by loosening the corresponding lock nut on the right side a little, the pin itself is turned by the necessary amount (on the right to loosen, on the left to tighten) using the square end of the pin itself (on the right). Then tighten the lock nut holding the pin, and finally the nut on the left.

### SPECIAL RULES

for the assembly and maintenance of the MOTORCYCLE type GRAN TURISMO.

*(See figures No. 10 and No. 11)*

*Assembly.* - Before anything else, the pin (101) of the intermediate rocker arm of the foot brake must be mounted on the left motor plate.



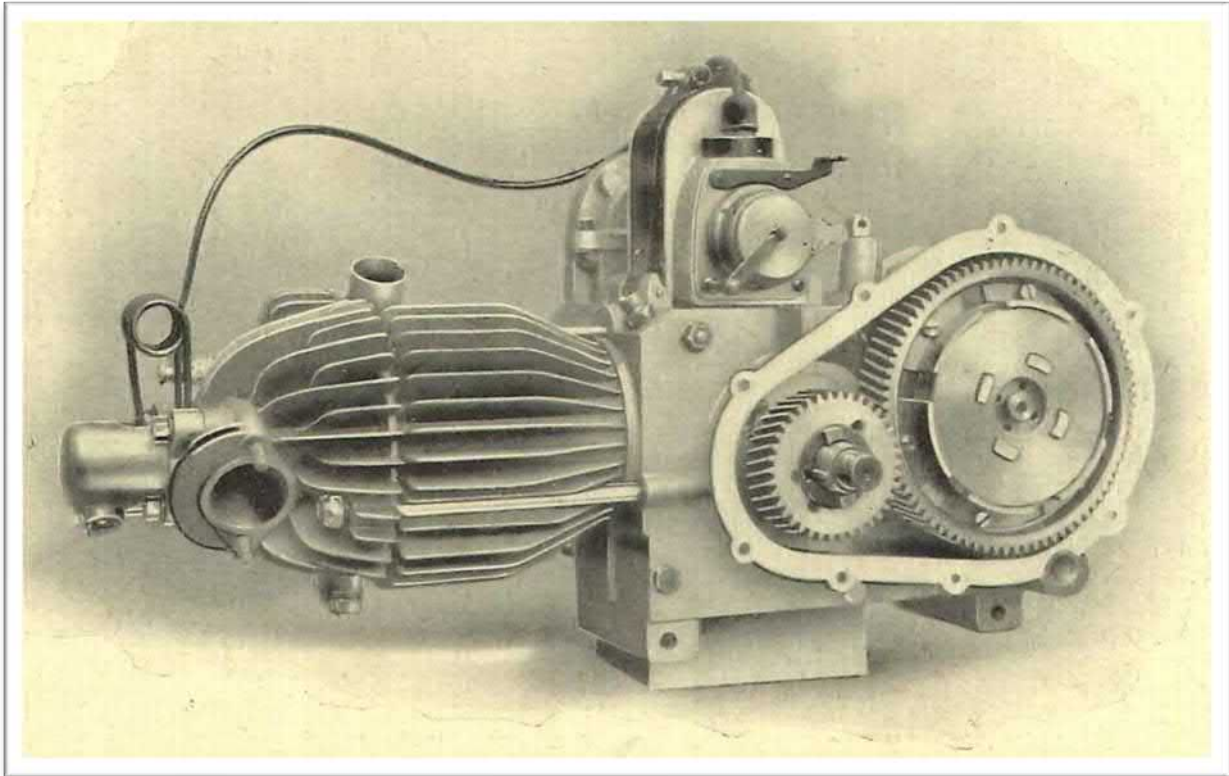
(Fig. No. 12)

Then mount the rocker arm itself (102) and, after this, the pivot of the counter springs (103) with relative joints (104) and thick tubes, then the counter springs themselves (105) and finally the swingarm (107), on which the tie rods with their respective joints will have already been previously applied. The pin is mounted by introducing it into the hole on the right side and screwing it into the right ear of the swinging plate until it reaches the end, then tighten the lock nut on the right and the nut (126) on the left.

To assemble the joints, proceed as follows:

the grooved disc (110) is first applied to the bottom of the joint housing (109), so that the dowel enters the corresponding hole. Then the six bolts (111) are applied with the head inside, keeping, for ease of assembly, the joint box with the six-hole face facing downwards. Then connect the six bolts with an elastic band, so that you can put the box with the six-hole face upwards again without the bolts falling out. The half-hexagon marked with D (112) is then introduced into the box if it is the right box, so that the letter D remains on the *inside*, that is towards the center of the machine; if, on the contrary, it

is the left box, the semi-hexagon marked with S (112) is introduced with the letter S facing inwards. Then the tie rod (108) is introduced into the semi-hexagon. The leather dust washer (114), the respective plate (115), the spring (116) and the clamp (117) are then inserted on the tie rod.



(Fig. No. 13)

Check that the wire of the half-hexagon corresponds exactly with the groove of the disc, then tighten the clamp by pressing it against the spring so that it is a little compressed, making sure that, during this operation, the wire of the half-hexagon always matches the groove of the disc.

In this way, once the danger of the half-hexagon turning on the disc has been eliminated, the boxes are assembled on the swingarm (the greasers go on the outer part) after having filled them with grease or extra-thick oil.

Once the swingarm has been assembled, proceed with the assembly of the spring pack, not forgetting to apply the withdrawal sleeves (118) to the head of the short springs.

At the top of the tie rods, above the pressure plate (122), the lock nut (120) must be mounted first *with the convex part facing the plate itself*, and finally the nut (121).

The springs must be tightened so that, when the wheel rests on the ground and the motorcyclist is riding, there is approximately 9 cm of useful travel between the chain puller dropout and the upper fixed fork tube.

For the springs to be in place, the pressure plate on the springs must be exactly parallel to the edge of the spring box.

This is the only way to be sure that all the springs are equally compressed.

*Lifting pedal.* - The Gran Turismo machines are all mounted with the *lifting pedal* (125) applied to the stand. When you want to lift the machine on the stand using this pedal, it is necessary to make sure that *both ends of the stand rest on the ground, then you can make the machine move back by pressing moderately on the pedal.*

*Chain adjustment.* - The chain tension must be adjusted when the swingarm is halfway.

*Lubrication.* - The springs must be lubricated once a year by filling the box with grease. The *pin* is lubricated approximately every 1000 km by means of the Técalémit device, using extra-thick oil. When assembling the pin, the empty space between the two bushings must be filled with extra-thick oil.

The joints must be lubricated approximately every 2000 km by means of the Técalémit device, using extra-thick oil. When the joints are mounted, they must be filled with grease.

### GENERAL WARNING.

Many breakdowns, some even very serious, originate from the loosening of a simple nut. It is therefore advisable to periodically check, and in any case every time the machine is cleaned, if all the nuts are well tightened, not forgetting those in an inaccessible position, such as the two nuts of the bolts for fixing the engine to the side members, the three head nuts, and the four nuts crosswise under the cylinder.

Form 23 - 2000 - 12-1929 - Publishing Printing House GIUSEPPE CORTI - LECCO

The image shows the Pirelli logo, which consists of a thick, black horizontal bar with a white horizontal line running through its center. Below this bar, the word "PIRELLI" is written in a bold, black, sans-serif font.