

SAXONETTE The Motorised TORPEDO Hub.

When Fichtel & Sachs put the Sachs engine on the market some 6 years ago, this fact caused some surprise both among trade experts as also with the general public. A number of makers had endeavoured during the post-war years to motorise bicycles, but their efforts failed and the problem of providing an auxiliary bicycle engine had therefore come to be regarded as practically impossible or without prospects. The idea of an auxiliary bicycle engine thus appeared to have been disposed of for all time and thus the SACHS engine also was considered generally made for a brief span of life. However, doubts as to the development of the SACHS engine have been proven unfounded, and those who doubted its success were found wrong. Astounding performances of this small engine were heard of, which have taken part in some of the greatest and most severe international trials, in which it not only held out to the very end, but actually dished up superior victories. Let us but recall the 2000 km trial through Germany in which Kratzer in the 250 ccm class arrived at the goal on his SACHS engine 1½ hours before the time limit. Let us remember the victories gained for 3 years in succession in the "24 hours race for the gold cup of France", during which in fact the SACHS engine actually established a new record. Let us mention also the various winter trials and medium mountain trials accomplished with distinction, and also the Alpine trial, in which a 1000 km long distance comprising 15 high passes was covered by a SACHS engine in 3 days; and finally the 3000 km trip through Germany which was carried out by Hitler youths without stoppage or accident. Apart from these sporting successes, the efficiency of the SACHS engine in general use has become known more and more. Almost a quarter million of SACHS engines are in circulation at the present day throughout the world and it is a significant feature of the design that during the last five years it has called for no change, nor is any required within the near future.

This is how it happened that the 98 ccm SACHS engine on bicycles is at the present time already being considered a "high power" unit which will allow any tasks to be tackled, and which thus greatly exceeds the usual range of requirements of the cyclist.

Fichtel & Sachs have thus been able to examine the problem of developing a **smaller** engine for bicycles, viz. for cycles ordinarily used on short distances,

say, for town traffic. For this smaller cycle unit Fichtel & Sachs have adopted an entirely novel shape, viz. a most obvious course to them, the largest makers of coaster hubs in the world: Fichtel & Sachs have **motorised** their **Torpedo Hub**. "Saxonette" is the name given this motorised Torpedo hub.

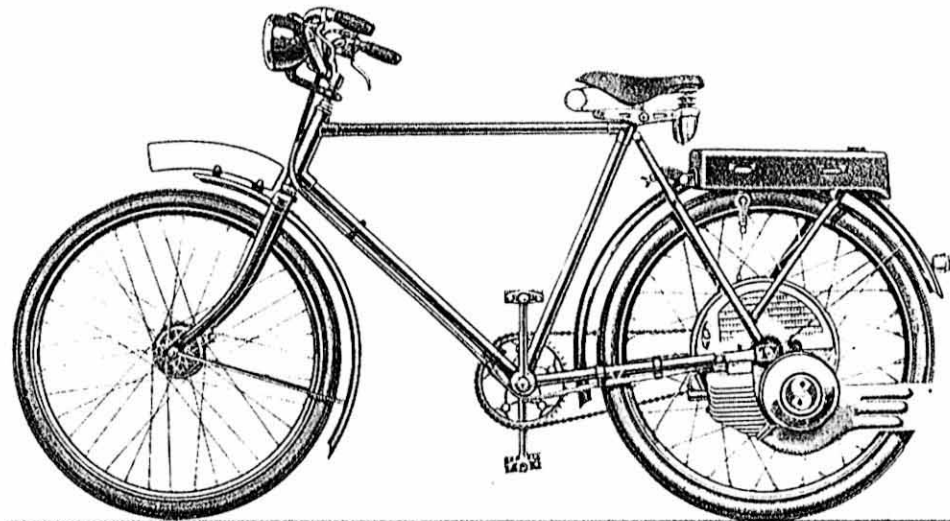
With the Saxonette, the engine is no longer in the middle of the bicycle frame, but rather has been shifted on to the rear wheel, the engine being built up around the hub in such a way that the unit may actually be considered nothing other than an extended hub. The core of the unit is the Torpedo coaster brake hub. Also, the width of the engine between the rearwheel fork and the mudguard stays is no greater than for a standard hub. Outside the rearwheel fork where it is readily feasible the engine exceeds this hub width to a moderate amount, to allow for the cylinder, exhaust silencer and ignition system. The whole engine block is encompassed by a steel sheet drum provided with openings for air cooling and fixed to the wheel rim by means of the spokes. The open part of the drum is covered by a readily detachable guard shield provided, apart from the air apertures, with two openings for the cable leads and one opening for a priming pump for the carburettor accommodated inside the drum.

This neat unit with its clean lines, which definitely improves the appearance of the cycle, is a two-stroke engine with normal transverse scavenging. The cylinder volume is 60 ccm, the stroke being 38 mm and the bore 45 mm. The engine will develop approx. 1.2 HP. It works with a transmission ratio of 1:17 through the intermediary of a layshaft with clutch mounted which drives the hub shell of the Torpedo hub. The clutch is a metal plate clutch. The ignition equipment consists of a rotary magdyno producing simultaneously lighting current of 5 watt.

The maximum speed of the cycle is limited to approx. 30 km per hour, that is, a speed which will readily be withstood by a balloon-tyred wheel on a good road without impairing its life. At minimum speed the engine will keep the pace of a pedestrian.

The hill-taking capacity of the engine is such that normal road gradients will be mastered by the one forward speed available without pedalling. On gradients above 9% light pedalling may be necessary.

The elimination of vibrations from the frame is a decisive factor with engines of comparatively high revolutions. On the Saxonette, the German patent of the known Stuttgart engineer Hartmann, which is the property of Messrs. Fichtel & Sachs,



Saxonette

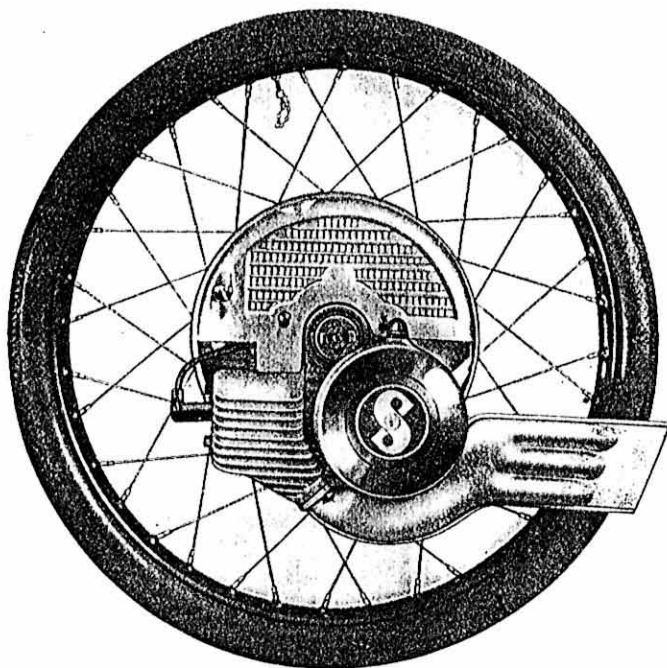
The Motorised Torpedo Hub

The new Miniature Engine for Bicycles

(Numerous Patents and patent applications
in all countries)



FICHEL & SACHS A-G, SCHWEINFURT/M.

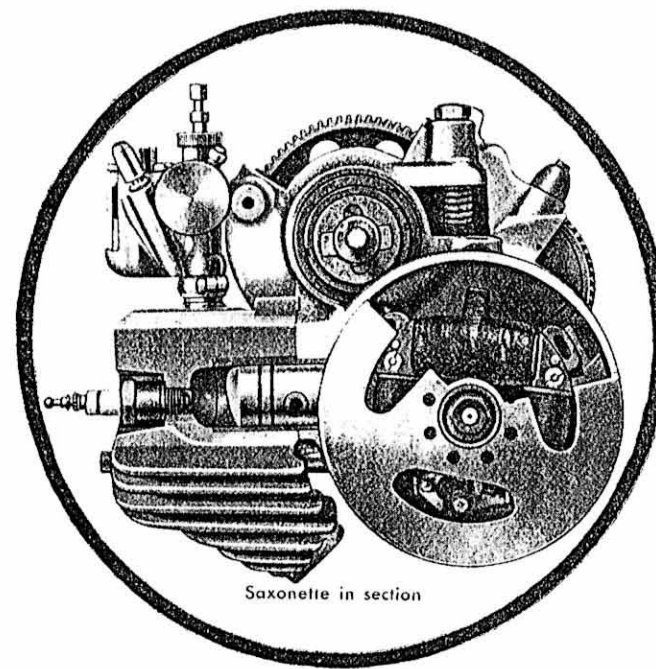


Engine:

„Saxonette“ is a two-stroke engine with a bore of 45 mm and a stroke of 38 mm, thus giving a cubic capacity of 60 ccm. The nucleus of the unit is the TORPEDO coaster brake hub. Its compression ration is 1:6. The engine develops a power of 1.2 HP and permits of reaching a speed of 30 km per hour. Lubrication is ensured automatically by admixing oil to the fuel in the proportion of 1 in 20. The amount of petrol consumed is approx. 1½ litres to every 100 km (approx. 200 m. p. g.). The engine is suspended in rotatable manner about the hub axis. The reaction couple is met by resilient absorption according to the Hartmann patent, thus ensuring practically vibrationless operation of the Saxonette unit.

Casing:

Engine and Gear Casing are incorporated as one integral unit, a light alloy casting. All moving parts are accommodated inside, securely guarded against all dust. The entire block is surrounded by a steel sheet drum, provided with vents or louvres for air cooling, and connected with the wheel rim by the spokes.



Saxonette in section

Cylinder:

The cylinder with its finned body is an aluminium casting with cast-iron liner.

Piston:

The piston with deflector head is made of special aluminium alloy and is provided with 2 piston rings.

Crank-shaft:

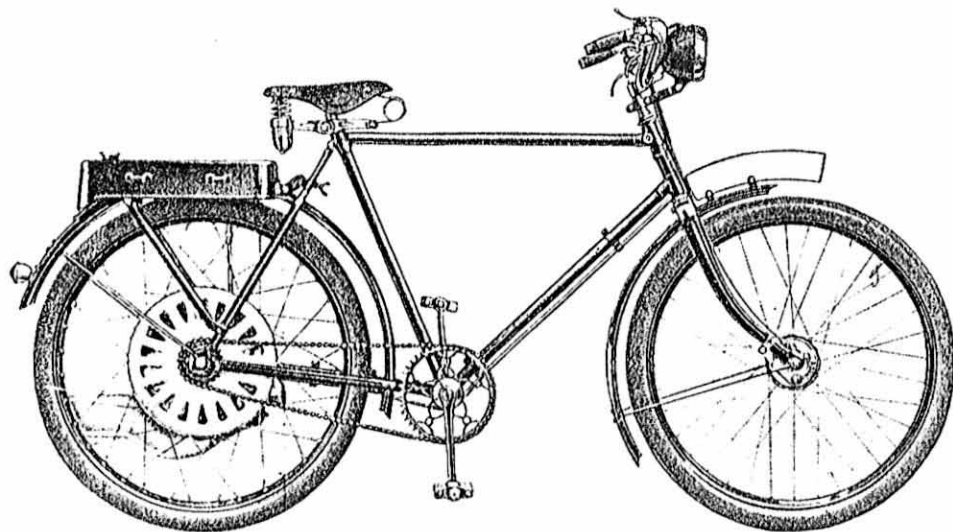
The crankshaft is carefully balanced by counterweights and is supported by ball bearings on both sides.

Clutch:

Between the engine and gears is provided a positively driving clutch, the metal plates of which turn in grease, thus warranting sweet action.

Carburettor:

The carburettor is of the F & S plunger type giving a finely graded effect. Starting up in cold weather is facilitated by a fuel priming pump.



Magdyno:

The Bosch Magneto produces current both for engine ignition as also for lighting requirements. The sparking plug provided is Bosch type W 175 T 1.

Lighting Equipment:

The Bosch head-light fed by current of 5 watt at 6-8 volt will provide adequate illumination. The head-light is fitted with a double filament „Bilux“ bulb for 6 volt and 5/5 watt.

Starting up:

The engine is started up simply by starting to pedal the cycle. To facilitate firing, the priming injector should be operated a few times prior to starting off.

Weight of „Saxonette“ unit:
(rear wheel complete with engine) approx. 16 kilos

Weight of complete bicycle: approx. 33 kilos



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was taken advantage of and elaborated: The engine which itself remains stationary and does therefore not revolve, is suspended in such a manner as to rotate about the hub axis, and the reaction turning moment is absorbed in flexible manner. At the same time the brake resistance lever on the hub forms the point of support for the engine, while the springing through the intermediary of which the engine bears upon the lever, is accommodated in the engine casing.

Although the engine already operates with little noise as it is, due to spiral-cut teeth of the gears, large exhaust volume, etc., riding is practically noiseless for the cyclist, because the engine located in the rear wheel is in the shade, so to speak, of the rider's ear. Similarly, the vibrations will not be felt by the cyclist, since it is not the frame that carries the engine in this case, but the rear wheel. A large part of the engine vibrations will therefore be absorbed by the pneumatic tyre.

The fuel tank is directly above the rear wheel in the form of a saddle tank, while at the same time it is adapted to form a luggage carrier. At the back of it is fixed the number plate.

The fuel consumption is approx 1.5 litres per 100 km (approx. 200 m. p. g.). The control leads to the engine, such as clutch, throttle and decompressor cable are carried down, combined with the lighting cable to a single bundle. When removing the rear wheel, this "bundle of cables" remains firmly connected to the frame at the control head. The detached wheel may be moved sufficiently far away from the frame to permit of changing tyres.

The 5-watt head-light may be dimmed, the lighting current being so adjusted that even at the lowest speeds adequate lighting of the track will be obtained with the Bosch headlight. The clutch may be locked in declutched position by means of a pawl, so that the cycle may equally be propelled like any ordinary push-cycle. The carburettor is fitted with a priming injector which, in order to facilitate starting up, will inject a very definite amount of fuel. An air filter is provided in front of the carburettor, in order to guard against premature wear and tear of the moving parts due to dirt. The fuel cock is provided with a fuel reserve position.

When developing the engine, a high peak performance was intentionally forgone in favour of a high torque in slow running. Apart from the consideration of premature wear of the engine, moreover, a standard bicycle frame would not stand such high speeds.

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OUR REF. RM/MLJ

YOUR REF.

DATE

7th October, 1937.

Mr. George Whitworth,
Wainwright Ward,
Oldham Royal Infirmary,
Union Street West,
OLDHAM

Dear Sir,

RE: "SAXONETTE" CYCLE ENGINE

We thank you for your enquiry for the "SAXONETTE" Motorised Torpedo Coaster Hub which was shown at the Earls Court Cycle Show where it created a great sensation. An illustrated leaflet is enclosed herewith.

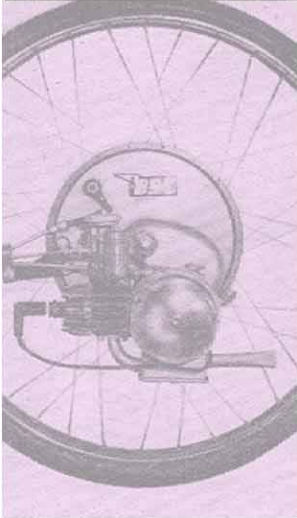
In view of the immense interest which this new model has aroused in this and other countries the Works are preparing for large scale production which you will readily understand requires considerable time.

We regret therefore that we are not yet in a position to quote prices and do not expect being able to market the engine before the Spring of 1938. In the meantime we are keeping your enquiry before us and as soon as further particulars are available we shall have pleasure in communicating with you.

Yours faithfully,
TORMO LIMITED



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