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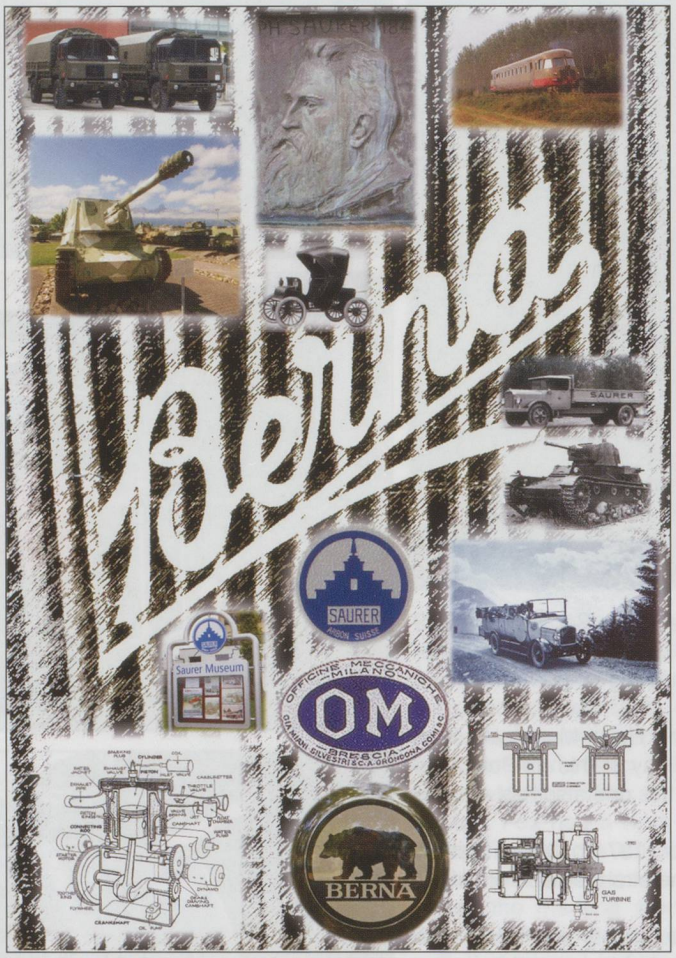
# Saurer – a Swiss Success Story

## Boyd Misstear takes a brief look at lesser-known innovations of Adolph Saurer AG




The latter half of the 19th century saw many notable inventions. Apart from the telephone by Alexander Graham Bell (1876) and Thomas Edison's phonograph (1877), a number of perhaps less well known developments were taking place, not least the electric dental drill by George Green (1875). Switzerland was not bereft of new activity! Following the opening of the first Swiss railway line in 1847 between Zurich and Baden ('*Spanisch-Brötli-Bahn*'), and the appearance of the first asphalt road in Val de Travers (1849), from 1863 Thomas Cook's "all included" tour participants from the British Isles were introduced to the first appearance of artificial baby food (based on milk, sweeteners and flour - Henri Nestlé 1867), "Riggenbach" type cog-wheel railway (Niklaus Riggenbach, Rigi 1871 – as distinct from the first "toothed" railway being the Middleton Railway, West Yorkshire in 1811 and first mountain rack railway being Mt Washington in New Hampshire in 1869), fast food (soup powder in bags 1883 and cubes 1886 – Julius Maggi), milk chocolate (Daniel Peter, Vevey 1875), "melt in the mouth" chocolate (Rodolphe Lindt, Bern 1879), along came the start of car (1896) and truck production (1903) from the well known former Saurer manufacturing company, famous for their alpine buses, military and commercial vehicles. Much has been written about the broad range of Saurer transport products manufactured during nearly a century of prolific production, and loved by many enthusiasts long after production ceased in 1985. How Adolph Saurer AG came into existence, and what are their perhaps less well known technological achievements, used under license agreement by other companies in both the automotive and railway industries, is less known? To uncover this, it helps to recount how Saurer evolved and the persons responsible.

In 1896 Adolph Saurer (1841-1920), the eldest surviving son of 6 boys, and his son Hippolytus (1878–1936) took over the family business of F. Saurer & Söhne (named after Adolph's father, the industrialist founder Franz Saurer 1806-1882), which had been producing textile manufacturing equipment since 1863 in Arbon, Canton Thurgau. But from as early as 1888, Saurer had also manufactured kerosene fuelled internal combustion engines (ICE), the first ICEs being used in stationary applications. The ICE had developed over time, when in 1876 a German Nicolaus August Otto patented a four-stroke called the "Otto Cycle". Many other developments followed with Gottlieb Daimler credited with the petrol engine and Karl Benz the first car in 1885.

Adolph and Hippolytus, right from their start in 1896, set about and built their first kerosene engine for automobiles and the next year produced a phaeton body automobile with a one-cylinder opposed-piston engine. The term phaeton, in automotive terms, refers to a light, open four-wheeled carriage. The actual term originates from a character in Greek mythology that set the earth on fire while attempting to drive the chariot of the sun! In the period we refer too, this was probably an appropriate description!

In the early years, Saurer was at the forefront of technological development. In 1902 it is reported they produced the first T-Head engine (early ICE where the intake valves are on one side of the engine block and the exhaust valves on the other), powering both a touring car (open car seating 4 or more) and a sedan chassis (3 box configuration engine/passenger/cargo which we are familiar with in today's automobiles). The T-head ICE became obsolete after WWI by the arrival of the more efficient L-Head, described as a type of four-stroke cycle ICE having both inlet and exhaust valves on one side of the engine block which are operated by pushrods actuated by a single camshaft. From 1903 on and now Adolph Saurer AG, concentrated on commercial vehicles, initially petrol driven then in 1908 their first diesel. A prolific range of products followed over the years, including aero engines under license. But staying on terra firma, Saurer trucks developed in four basic ranges known as A Type (1918), B Type (1926), C Type (1934) & D Type (1959) and are well documented and will be familiar to many readers.To achieve this production, a

number of partnerships were formed and acquisitions made. These acquisitions included Olten's Motorwerke Berna AG (Berna) 1929 which resulted in some Saurer trucks and buses then being badged Berna and sold in competition! As an aside, although Berna had been taken over, it wasn't until 1971 that the Saurer and Berna sales forces were united under one organization.

Returning to the lesser known but important achievements, in 1928/9 Hippolytus is credited with producing the first Saurer production diesel engine and patenting in 1934 a direct injection version into the combustion chamber with cross-flow system (swirled in two directions!) known as 'Doppelwirbelung'. This provided significant reductions in smoke emissions due to optimized combustion and resulting fuel savings and has been reported as contributing to the success of Saurer commercial vehicles and diesel engines in general. Saurer also entered into agreements with other manufacturers. For instance, to the south in Italy, OM (Officine Meccaniche founded in 1899), who originally manufactured railway stock, started car production in 1918 and their light and medium weight OM ranges used Saurer engines that were sold also in Switzerland as Saurer-OM or Berna-OM. After 1938 OM became a commercial vehicle and train part manufacturer. Perhaps their best known product in railway terms was their FS ALn 772 Railcar– some 327 were built between 1937 and 1957 powered by OM-Saurer BXD traction motors. To the north and east in Poland, the state owned National Engineering Works, PZInż was a pre WWII arms industry and the main manufacturer of vehicles, both military and civilian. Under license they built Saurer engines powering tanks as well as buses. The single-turret 7TP (and its planned successor 9TP) was a development of the British Vickers 6-ton Mark E. The 7TP designation meant '7 Tonne Polish'! The 7TP had a PZInż.235 (Saurer VBLDd) liquid-cooled inverted inline 6-cylinder 4-stroke direct injection diesel 110 hp (80 kW).

During WWII Saurer engines found their way into Swiss armament manufacturing, including in 1943/4, the Saurer CT1D 6 cylinder in-line four-stroke engine of 123 hp to power the "Nahkampfkanone 1", mounting a 75mm field howitzer on a makeshift prototype construction Berna chassis. The vehicle, which never went into production, along with a number of other Saurer items, is now on display at the Swiss Army Museum Society (VSAM) in Thun. The Society aims are to record all aspects of Swiss military history. Probably one of the most unique products from Saurer was a gas turbine called the GT15 with a 15 BHP and 85,000rpm. It is reputed to have been one of the smallest production gas turbines during the 1960s. It had even been suggested at the time that very small engines of this type were impossible to produce and this engine disproved this. The innovative power plant used the fuel supply to also lubricate and so had no oil lubricants! One version had another unique feature, being started with a pull cord! Alas only some 20 were delivered for use as stationary auxiliary power units and while reported that none are known to have survived, there is a claim two have. If this proves correct, they will be collectors' items.

In the 1980s following the opening of the Swiss commercial vehicle market to outside competitors and with declining sales came the merger of Saurer with Franz Brozincevic & Cie of Wetzikon (FBW) to form Nutzfahrzeuggesellschaft Arbon & Wetzikon (NAW) producing motorbuses and trolleybuses. In 1982 Daimler-Benz acquired a major shareholding, shortly after dropping the Saurer, Berna and FBW brands. The last major development was the 10DM truck delivered to the Swiss Army up to 1985. By 2003, NAW was in liquidation. But this is not the end of the Saurer name as a manufacturing company. Last year the new 'Saurer Group'was re- established, focusing on their origins once more, and producing products to meet the demands of the many different stages of modern 21st century textile production. **www.saurer.com** Anyone interested in the automotive history of Saurer, might like to visit the Saurer Museum in Arbon **www.saurermuseum.ch** which includes the textile loom manufacturing origins of Saurer from the mid 1800s. Further sources of information are the Saurer Old Timers Club (OCS) **www.saurerold-timer.ch** and the Saurer Club **www.saurer-club.ch,** with links to other related clubs and institutions.


*TOP:* A Saurer D330B dump truck.
*Photo:* Roger Dirks, Wikipedia
*BOTTOM:* Historic bus 31 belonging to Salzburger Stadtwerke. *Photo:* Gudrun Meyer, Wikimedia