

FIRST PUBLISHED 1965

## Preface

AN ENGINE OUTPUT of 1.5 h.p. might be considered a relatively high performance, if it were to be measured against 1 hay-burning h.p., while 100 h.p. might not qualify in an era of 500 h.p. fire-breathing Grand Prix cars—unless it was extracted from an engine generally considered capable of only 60.

The cars discussed in this book were selected subjectively then, but their details were assembled as objectively as possible—largely from contemporary German, Austrian and Czechoslovakian publications, many of which have here been used for the first time in this field. Obviously some of the figures quoted may contradict traditional notions. On the one hand such traditions often acquire their authority from repetition alone. On the other such early publications as we found are not necessarily infallible either. We have attempted to buttress our choices but we should always be happy to see fresh evidence for either side.

*Heidelberg/Darmstadt, 1965*

J.S.  
H.-H. v. F.

© JERROLD SLONIGER AND HANS-HEINRICH VON FERSEN

1965

MADE AND PRINTED IN GREAT BRITAIN  
FOR THE PUBLISHERS B. T. BATSFORD LTD  
FITZHARDINGE STREET, LONDON W1  
BY WILLIAM CLOWES AND SONS LTD  
LONDON AND BECCLES



Unvollständig!

ocker arms. Each pair of  
were small leaves, one  
stones were matched by  
rings on the 180° offset  
and all six cylinders drew

re to a very short, three-  
aft drove the rear axles  
ing one pair of joints in  
rangement. This same  
transmission brake. A  
ic leaf springs set at an  
they could be attached  
and carried out to the  
rear half-shafts, while  
e was sprung by two  
rely inside the frame.  
ardrop-shaped as well,  
body contours.

narrow body rested on  
e with a track of 53.2"  
of 2,315 pounds. The  
weighed 2,975 pounds.  
at in the nose afforded  
if little sociability.

el 4A 106 retained all  
except for the engine.  
is major concession to  
924 10/50 dropped the  
motor for a relatively  
re "four" of virtually  
(2,595 c.c., 80 × 130  
: 2,400 r.p.m. This still  
wheels through the  
ulti-plate steel clutch  
) speed was quoted at  
anks to a less compact  
at those speeds. The  
four or five to six or

oper bumpers in 1925,  
d even added running  
d. The doctor finally

dropped his rear drive and teardrop crusades, taking up yet another radical  
cudgel somewhat later.

While Rumpel claimed the lion's share of discussion in the earliest  
'twenties, he was not the only designer building a small series of high-  
performance cars. There was the Steiger for instance, which appeared in 1920  
and posted a long list of sports successes before falling victim to the industrial  
crisis in 1926.

This car sprang from the drawing board of Paul Henze, one of Germany's  
more talented engineers. He came to this work after spells with Cudell and  
R.A.F., and the technical director's post with Belgium's Imperia factory. His  
Steiger produced amazing power for its time and type, combining several  
modern ideas with features harking right back to the 1908 Prince Heinrich  
long-stroke class.

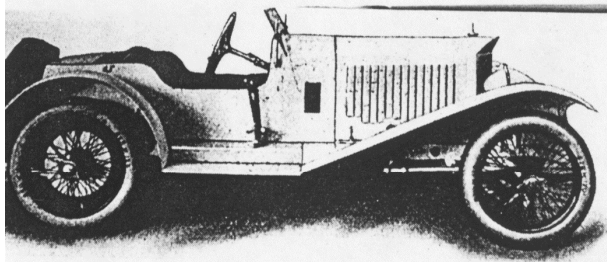
The chief advantage Henze enjoyed at Steiger was a total lack of auto-  
mobile tradition. The south German factory was founded to build stationary  
machinery and first turned to motor-cars after the war, when he joined them,  
because Walter Steiger yearned to produce modern, quality, high-perfor-  
mance automobiles. The first of a limited number which fulfilled these  
demands was delivered in 1920 and hailed by the press, even in England, as a  
major advance for its day. Steiger's 500 workers soon (1921) turned to bodies  
as well as chassis and engines, with most cars going out in open, four-seater  
sports-touring form. All enjoyed a combination of the Swabian love of fine  
craftsmanship and first-class materials.

The truly sporting engine had several features seen previously around  
Germany only in racing machinery. These included the overhead camshaft  
and excellent 50 h.p. at a relatively modest 2,500 r.p.m. The revs had to be  
modest because one of Henze's throwbacks was the extraordinary bore/stroke  
dimensions of 72 × 160 mm. to obtain 2,600 c.c. High piston speeds demanded  
hefty parts which led to a heavy engine as well as a tall one—drawbacks for  
the unitary four-cylinder power unit.

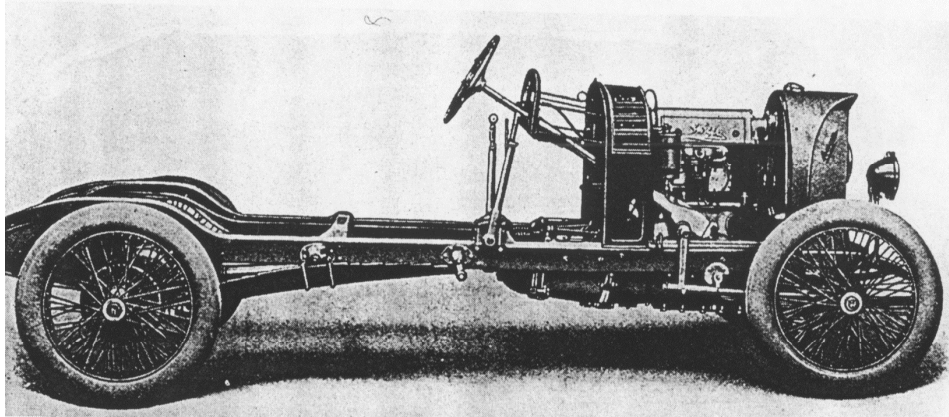
They did make extensive use of light metals, including aluminium pistons  
cast in their own shops, and a barrel crankcase cast with wide flanges which  
reached out to meet the frame side members. Even the light-metal gearbox cas-  
ing served as a frame stiffener, thanks to such stubs. The hollow, tubular con-  
necting rods were highly polished; the crankshaft ran in two ball bearings.

A single overhead camshaft running in five bearings operated the valves  
arranged in a line down the head and served by adjustable followers. The  
kingshaft driven cam and valve gear were enclosed under a light-metal cover.  
Cogwheel take-offs right and left of the front-mounted kingshaft drove  
magneto and water pump while the generator was turned by the rear of the  
camshaft. This accessory was later removed from its position protruding into  
the cockpit and placed at the nose of the crankshaft. A Zenith horizontal  
carburettor completed the picture.



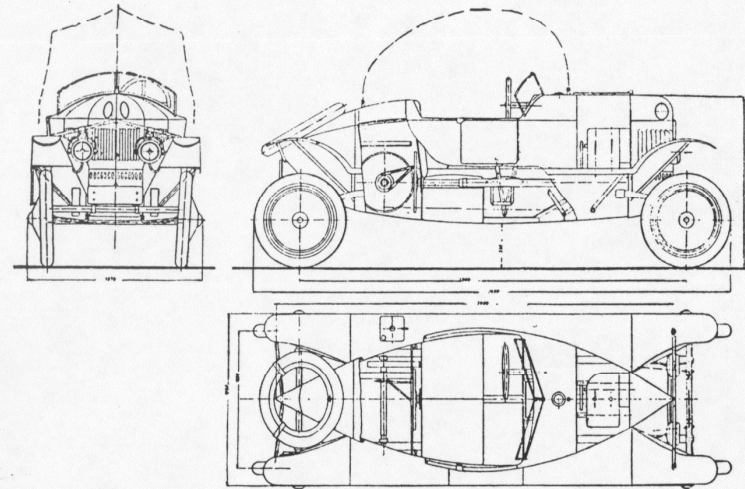


*c. 1923/24, 10/50 h.p.  
Steiger sports 2-seater*



*c. 1920/21, 10/50 h.p. o.h.c. Steiger chassis*

*The little "Berlin-Paris" Grade, 1924*



*Two-stroke, twin-cylinder Grade, 1922/23*

105 mm. stroke for 808 c.c. The two-cycle idea was dictated by simplicity but rough action in the beast soon defeated the purpose and forced them to various complications on the basic theme. For one thing Grade fitted an early species of rotary inlet valve to smooth the path for his mixture, then added separate fresh-oil lubrication for bearing safety. The heavily-ribbed cylinders were enclosed in a jacket and the fully-dimensioned fan had leather belt drive. A silencer was attached directly to the engine. In effect a theoretically simple idea became more complicated than a four-cycle engine might have been.

Gearing was equally primitive. Hans Grade eliminated the clutch and used a friction wheel system of poor efficiency and inherent meanness—but simple construction. An enlarged flywheel, carried on a rear extension of the crankshaft, was met at right angles by an equally large driven wheel with wood friction facing, running on a short transverse shaft. This took the primary engine shaft rotary motion and turned it through 90° so that it corresponded in rotational plane with the wheels.

The secondary wheel could be moved back and forth laterally by the driver—varying the “final drive ratio” by applying it to the perimeter of the driving wheel or, alternatively, applying it close to the driving wheel’s hub point. This gave an infinitely variable ratio. There was no need for a conventional clutch, since one merely separated the two discs to disconnect engine from road wheels. A third pedal (the complication of “simplicity”) allowed the driver instantly to “declutch”. The idea was not unique even for Germany, nor did it work any better than other such attempts.

The very short, four-speed gearbox with its shafts in ball bearings, carried a central shift lever while power ran through a single-plate clutch—unusual for that era—with an adjustable fibre disc.

The sturdy, sheet-steel frame was not unusual, nor was the suspension with semi-elliptics in front and cantilever rear springs which gave way in 1924 to semi-elliptics and friction shock absorbers. Cable operated rear brakes were combined with a foot brake on the gearbox main shaft and it was not until the last Steiger series in 1925 that they fitted four-wheel brakes with the pedal operating both those on the front wheels and the gearbox brake.

This shortage of stopping power was manifest in the 1924 Targa Florio when the factory, encouraged by multiple sports successes through private drivers, entered two works specials for the mountainous Sicilian race. These cars would top 100 m.p.h. but would not stop and only managed to stay with the middle field through bravery. A full 80 h.p. was coaxed from them by means of a racing camshaft, higher compression, larger valves and a 76 mm. bore, giving 3 litres. The hotter engine was fitted to a shorter wheelbase (102" against a normal 118"), with two-seater bodywork.

Both the Targa Florio sports model and the highly sporting open tourers filled their roles with *élan*, enjoying pointed radiators carried to the ultimate stage with forward-jutting "bowsprits" which assured identification. A Steiger was something apart—right down to tool drawers on the bulkhead.

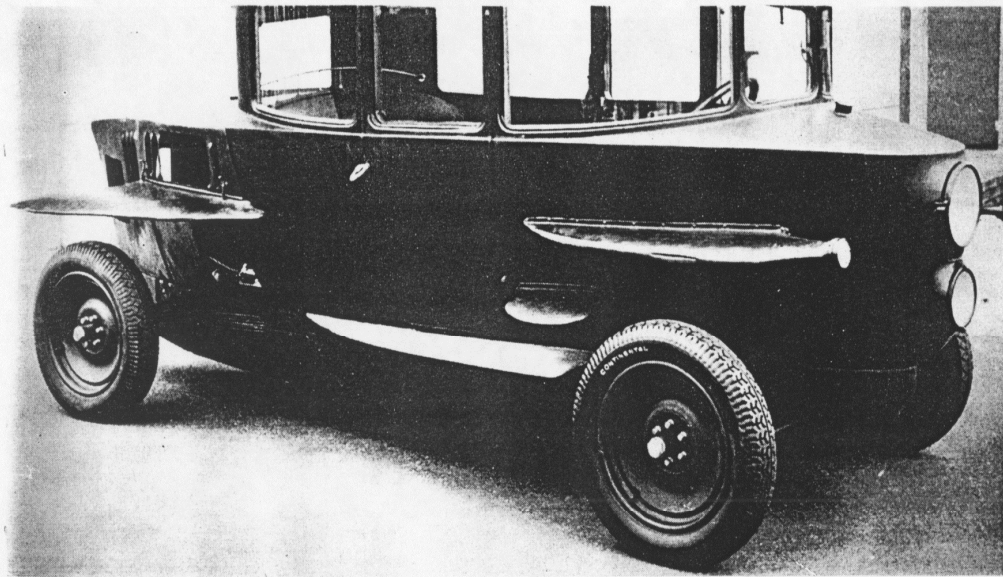
The Grade was a special case too, in its own miniature way, with a body which looked very much as if the famous pilot/aircraft builder Hans Grade had simply cut the wings off his pet fuselage and fitted two sets of oversize landing gear. Construction ran for six years beginning in 1921.

The car, covered by some 30 patents despite its compulsive simplicity—or perhaps because of it—embodied so many advanced concepts it was worth a closer look—quite apart from the fact that it would touch 50 m.p.h. on only 800 c.c.

Grade selected the cyclecar path to a miniature automobile, rather than scaling down a larger model. Never having built automobiles until the ban on aviation forced him to find a new business, he was totally unencumbered by tradition. The goals were simplicity and sturdiness to reduce production and material outlay and thus allow a minimum price.

The car's outstanding advantage over most of its peers was, in fact, durability backed by a wealth of ingenious solutions. To begin with they avoided the separate frame by hooking engine and drive components to a sheet steel bathtub which was then bolted to a similar lid, rather like the top and bottom of an oven roaster, with the driver inside like a Christmas goose. This was, of course, a forerunner of unitary construction, considerably simplified.

Although Grade began with a two-stroke, single-cylinder engine he turned immediately to an in-line, two-stroke, twin with 70 mm. bore and



"TROPFEN" RUMPLER: above Type OA 104, c. 1922/23 and, below, Model 4A 106 limousine, with 10/50 h.p. 4-cylinder o.h.v. in-line engine, 1924

