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Lorenz Meckl How His Invention Impacted the Automobile Industry

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Abstract:
In 1938, Lorenz Meckl invented the Engine Intake Attachment for automobiles, which some 30 years later was used as a basis for other inventions by other inventors that eventually became the Positive Crankcase Ventilation (PCV) system, a control device for vehicle emissions. Meckl conceived an invention that was a means for improvement of the process of the internal combustion engine. One of the objectives of this was to recover a portion of this "combustible fuel from the crank case vapors" and to recycle it back to the cylinders to supplement incoming passage from the engine's carburetor. The use of this device improved the economic and efficient process of internal combustion engines. Meckl's invention improved automobile gas mileage by recycling crankcase gas fumes back into the carburetor, thereby reducing emissions.

Keywords: *Engine intake attachment, Meckl, positive crankcase ventilation (PVC), catalytic converter, smog*

1. Introduction

The year 1938 saw a lot of changes and innovations. That was the year that Hitler marched into Austria, and Orson Welles broadcast his radio adaptation H.G. Wells' War of the Worlds that created a panic nationwide as listeners were fooled into believing that aliens had landed in New Jersey[1]. The first xerographic print was made by Chester Carlson, the ballpoint pen was invented by George and Ladislav Biro, and DuPont's Roy Plunkett introduced Teflon [1].The first occurrence of Federal regulation of the natural gas industry took place with the passing of The Natural Gas Act (NGA) of 1938 to set rates for interstate transmission and sales of natural gas[2].

The year 1938 also was the year that German immigrant Lorenz Meckl invented the Engine Intake Attachment for automobiles [3] (Figure 1). The patent for Meckl's invention expired in the 1960's, but other inventors, such as Alborn and Morrell [3], picked up on it, and over the years, improvements on Meckl's invention evolved in what is today called a device for the "ventilation of the crankcase of an internal combustion engine" (2004)[3], and the "[c]losed crankcase ventilation system" (2007)[3].Based on Meckl's invention, in 1967, Jacque Morrell invented the "treatment of exhaust gases from internal combustion engines"[3], Leroy Krebs (1971) patented a "means to control air pollution from motor vehicles and motor vehicle engines" [3] , Toyo Kogyo Co. (1970)patented a "device for containing and subsequently consuming the fuel vapors escaping to the atmosphere for an internal combustion engine" [3], and Universal Oil Products Company (1972)patented a "vapor control system for an engine to eliminate smog[3]".

Lorenz Meckl married Gertrud Johanna Struckmann in 1912 in Kiel, Germany. In his 1925 patent for a Device for Popular Amusement, Lorenz Meckl was described as a citizen of the German Republic, a work master living in Kiel Garden, State of Prussia, Germany[4]. Leaving his wife and his three sons in Germany, Lorenz Meckl immigrated to the United States with the dream of having his invention of an amusement ride become a reality. As soon as he found a steady job at Dodge Motor Company and bought a house in Allen Park, Michigan, he sent for his wife and three sons (Figure 3).

While working for Dodge Motor Company in Detroit, Michigan, in the 1930's, Lorenz Meckl conceived an invention that was a means for improvement of the process of the internal combustion engine[3]. A patent for the device was granted on February 10, 1940 (Figure 1.) [3][4].This invention led to the "positive crankcase ventilation" (PCV), in one form or another, which is installed on most every engine vehicle today[4]. Meckl's invention improved gas mileage by recycling crankcase gas fumes back into the carburetor [4].

Meckl's invention improved the operation of internal combustion engines, especially engines that had lost
effectiveness due to development of "blow-back," where in a some of the cylinder charge passes by the pistons to the "crank case of the engine and mixes with the oil vapor in the crank case" [4]. One of the objectives of this was to recover a portion of this "combustible fuel from the crank case vapors" and to recycle it back to the cylinders to supplement incoming passage from the engine's carburetor [4]. The use of this device improved the economic and efficient process of internal combustion engines[4]. In essence, the device improved automobile gas mileage and reduced emissions.

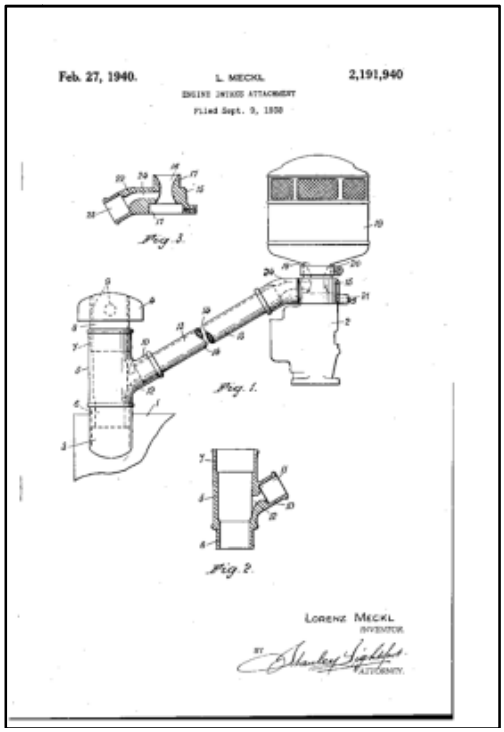

Figure 1: Engine Intake Attachment. Lorenz Meckl, Inventor. Patented February 27, 1940. Patent 2,191,940. [4]

In 1938, gas was plentiful, inexhaustible, and only cost a mere ten to twenty cents a gallon [5][6]. Lorenz Meckl offered his invention to various Detroit automobile manufacturers, but was met with rejection[7]. Michael H. Meckl, Lorenz Meckl's grandson related in a private conversation:

I believe the reason car companies eventually adopted this device (first in California) was to reduce exhaust emissions, not to improve mileage. This was employed soon after Grandpa's patent expired. He actually installed his patent on some of his friends' cars and proved that there was a measurable improvement in gas mileage. The idea never went anywhere because gas was so cheap, and no one was concerned about emissions at that time[7].

Figure 2: View of part of the Los Angeles Civic Center masked by smog in 1948 [8]

Smog, a type of air pollution stemming from vehicular emissions from internal combustion engines, was not a problem in 1938 [9]. By 1948, however, vehicle emissions had truly become a major environmental and health problem, especially in Los Angeles. The automobile was not blamed at first because the clear auto exhaust and the brown smog were not directly linked [9]. Ten years elapsed before there was valid laboratory evidence that, when exposed to sunlight and nitrogen oxides, hydrocarbon tailpipe emissions were converted into photochemical smog[9]. Nevertheless, automobile manufacturers were not concerned about nor influenced by Los Angeles' air quality problem since smog had not yet become a national problem [9]. Smog was simply attributed toLos Angeles' quirky mountainous geography[9]. And besides, since any change to end the smog problem would add higher costs to their vehicles, automakers were slow to respond, taking nearly two decades before the auto industry did anything about it[9].

In 1978, the General Motors Research Laboratory found that the major source of auto hydrocarbon Emissions were the "road draft tube"[10], which is a pipe that runs alongside the crankcase that exhausts vapors beneath a car [11]. A. J. Haagen-Smit, of the California Institute of Technology at Pasadena, in1952, proposed that unburned hydrocarbons were a prime component of smog, and that automobiles powered by gasoline were a foremost source of those hydrocarbons[10]. Thus, the Positive Crankcase Ventilation (PCV) system became the first control device for vehicle emissions [10] because it drew fumes emanating from the oil pan and returned them to the intake manifold where they were burned for a reduction in emissions and for the protection of the engine's interior[14].

The U.S. Environmental Protection Agency passed strict exhaust emissions regulations for gasoline-powered vehicles beginning with the 1975 model year, requiring that all cars be equipped with a catalytic converter[12], which is an apparatus that reduces an internal combustion engine's emissions[14]. A controlled combustion reaction needs to occur within an automobile's internal combustion engine for it to function. However, such a reaction produces harmful burnt gases that extensively add to air pollution[14].To reduce air pollution, vehicles are outfitted with a catalytic converter to decrease emissions of exhaust which include "carbon monoxide, nitrogen oxides, and hydrocarbons "[14].The catalytic converter is usually used primarily in the exhaust system of cars[14]. However, catalytic converters can also be found on "generator sets, forklifts, mining equipment, trucks, buses, trains, and other machines" that have engines, in order to induce chemical reactions wherein unburned hydrocarbons are combusted[13].Many devices for treatment of exhaust gases from internal combustion engines have followed Lorenz Meckl's pioneering invention[3].It took about 30 years for Jacque Morrell to patent an apparatus for treatment of exhaust gases from internal combustion engines, based on Meckl's invention[3]. By this time, air quality had become a priority, and others quickly followed with other inventions and patents[3]. This is how Lorenz Meckl's invention impacted the automobile industry.

Figure 3: First row: Gertrud Johanna Struckmann Meckl, Lorenz Meckl
Second row L to R: Sons Verner Meckl, Walter Meckl, Herbert Meckl[15]

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Appendix A

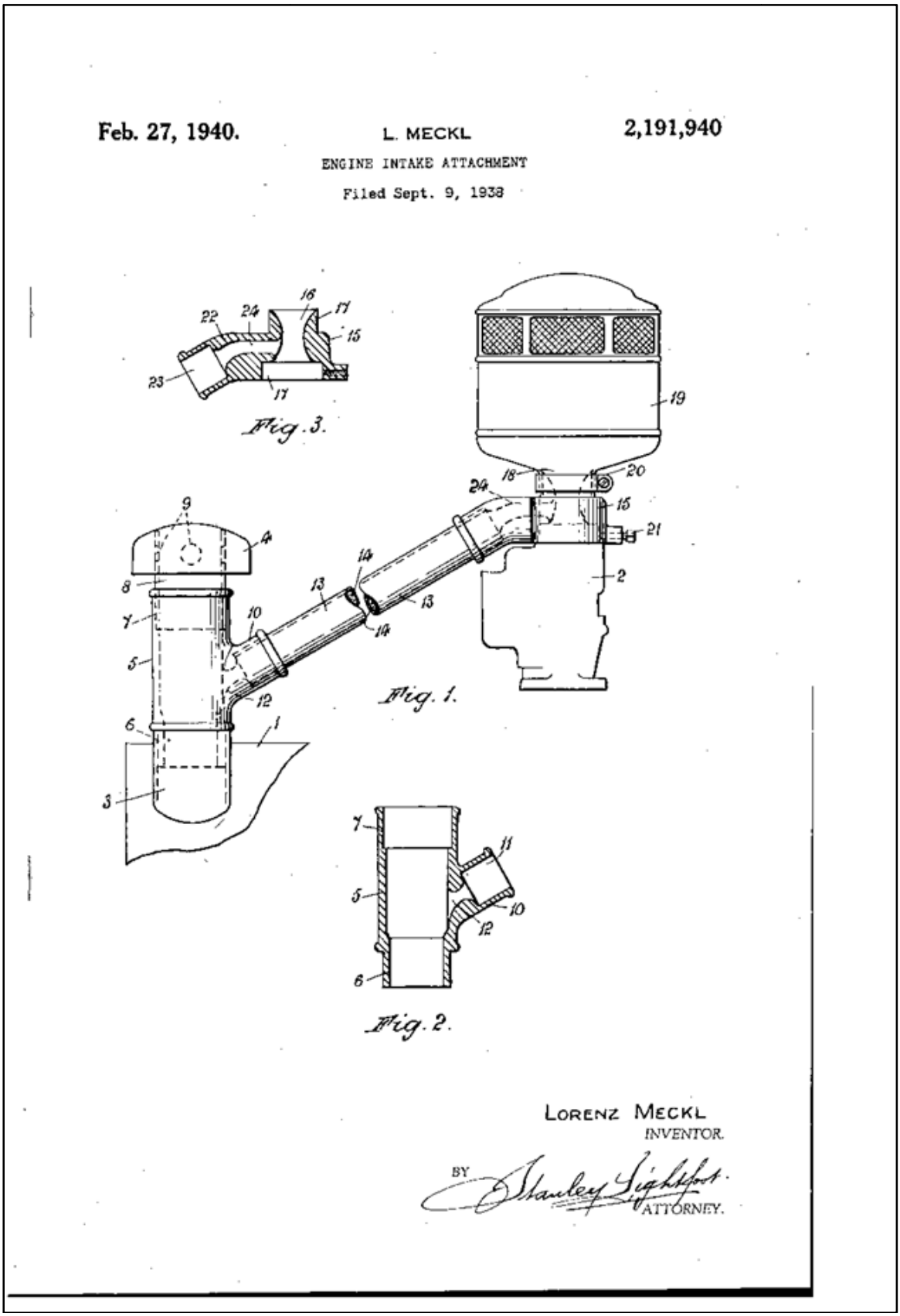

Figure 4: Engine Intake Attachment. Filed Sept. 9, 1938. Lorenz Meckl. Inventor. Patented Feb. 27, 1940 United States Patent Office. Patent 2,191,940. [4]