



# Cranky no more: The life and legacy of Charles Franklin Kettering



Heather J.E. Simmons

University of Illinois College of Law, 142J Law Building, MC-594, 504 E. Pennsylvania Avenue, Champaign, IL 61820, USA

## ARTICLE INFO

### Article history:

Received 6 February 2015

Received in revised form

19 October 2015

Accepted 26 October 2015

Available online 13 December 2015

### Keywords:

Charles Franklin Kettering

General motors

Electric starter

Automobiles

National Inventors' Council

National Patent planning commission

## ABSTRACT

Charles Franklin Kettering (1876–1958) was an inventor well-known during his lifetime, earning 186 US patents. His most notable invention was the automobile electric starter which put an end to the difficult and dangerous practice of hand cranking. Some of his later work—leaded gasoline and Freon—was controversial and had unintended environmental consequences. He led both the National Inventors' Council and the National Patent Planning Commission. Kettering characterized himself as “just a plain old inventor,” but he was a shrewd businessman. He is still remembered fondly by scientists and staff at the General Motors R&D Center he founded in 1920.

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## 1. Introduction

Charles Franklin Kettering has been the subject of three biographies. Two of the authors focus on his accomplishments as an innovator rather than the unintended consequences of his work. Thomas A. Boyd [1] a long-time employee, idolized his boss and never wrote anything negative about him. Rosamond McPherson Young [2], a teacher and journalist from Dayton Ohio, wrote an inspirational local-boy-makes-good story to inspire her secondary school audience. Even the third scholarly biography [3], based on author Stuart W. Leslie's Ph.D. thesis, the most objective treatment, mentions controversial issues only briefly. Fig. 1.

In addition to telling his life story, highlighting his most famous patents, and describing the controversy surrounding some of the inventions with which he is closely associated, this article will describe Kettering's contributions to U.S. patent law and policy based on his leadership of the National Patent Planning Commission—an aspect of his life not mentioned in any of the three published biographies, and which is cited only briefly in the legal literature.

## 2. Charles Franklin Kettering (1876–1958) – early automotive innovator

Charles Franklin Kettering (1876–1958) was an inventor well-

E-mail address: [hsimmons@illinois.edu](mailto:hsimmons@illinois.edu).

known during his lifetime, receiving 186 US patents [4]. Today people know him mostly for his philanthropy: he and colleague Alfred P. Sloan established the Sloan Kettering Institute in 1945 to fund and perform cancer research. He is still remembered fondly by the scientists and staff of the General Motors Research and Development Center which he founded in 1920. His single most notable invention was the automobile electric starter which put an end to the difficult and dangerous practice of hand cranking. Kettering characterized himself as “just a plain old inventor,” [5] but in fact he was a shrewd businessman. Some of the inventions with which he is closely associated are controversial and have had serious unintended environmental consequences.

Kettering was famous for his wit and wisdom, called “Ketteringisms” by his staff at General Motors. For many years the librarians at the General Motors R&D Library maintained a file of them. A typical example is, “If I have any success it's due to luck, but I notice the harder I work, the luckier I get.” [6] Others sum up his views on patent drafting by lawyers, “If you can tell what a patent is by reading the language of the patent attorneys, you're better than I am.” [7] “I only speak English, and I don't understand a lot of these patent claims. Some of the pictures I can make out.” [8].

## 3. Early life and education

Kettering was born in a farmhouse in Loudonville, Ohio on August 29, 1876, the youngest son of five children. He was given the middle name of Franklin after an uncle. He was a curious child,



Fig. 1. Charles Franklin Kettering, courtesy of GM Media Archives.

asking such questions as why is grass green, and why can we see through glass? From an early age, he was destined to leave the farm for the world of science and technology. An early indication of his interest is a story told by members of his family. One day Kettering's mother was horrified to find that he had taken apart her brand new sewing machine, the family's single most expensive possession. To her amazement, he cleaned and oiled the parts, and reassembled the machine. When she sat down to use it, the machine ran more smoothly than before. A later scholar [9], suspects that this story is apocryphal, instead crediting the tale of Kettering's quest for a more efficient way to dig potatoes. He went out to the field where hours later many of the tools on the farm were spread out around him, but the potatoes remained in the ground.

Kettering was educated in a one-room school house, and his first job was as the teacher in one. Only a year or two older than many of his students, he developed some innovative teaching methods. One of his students could read only if she held the book upside down. It turned out that she had learned to read by sitting across the hearth from her grandmother while looking at the book on her grandmother's lap. Kettering invented a mechanism which held a book, gradually rotating it a few degrees each day [10]. He soon had his problem student reading right-side up. An engaging and popular teacher, he took his students to see a demonstration of an X-ray machine. He was reprimanded by a local minister who considered it to be an instrument of the devil, but fortunately the school board did not agree.

As the youngest son, Kettering's parents wanted him to train for the ministry, so his first experience with higher education was studying Greek at Wooster College. But he was plagued by headaches and bad eyesight and soon returned home. His next attempt was to enroll in the blacksmithing program at Ohio State

University's (OSU) engineering college in Columbus, Ohio. But the subject which truly interested him was a relatively new discipline, electrical engineering. He had found his life's work, but again his ill-health made reading difficult, and he relied on his classmates to read aloud to him. Kettering made it through freshman year with high marks. He returned to Columbus the next fall after a summer at home on the farm. But his headaches soon returned with a vengeance. He had no choice but to leave the university. He said to his landlady, "If my eyes won't let me finish my schooling, I hope the train runs off the track and kills me." [11].

Kettering took a job as a telephone lineman, digging post holes and stringing wires on poles. He hoped that this regimen of hard work and fresh air would improve his health. Before long he had taught himself how to install telephone exchanges as well, and even designed and made his own system to replace the party line, by making each telephone ring independently. After two years of this work, at the age of 25, he returned to OSU to make another attempt at his sophomore year. His poor eyesight prevented him from taking the required drafting course, but he was allowed to substitute chemistry instead [12]. He earned some repute for his ability to troubleshoot telephone problems. He continued this work to make extra money during college. This led to his senior thesis: *A Study of the Design of Certain Types of Telephone Apparatus* [13]. In order to complete this work, he and his classmate co-authors had to design and build equipment to accurately measure the current and voltage in telephone circuits. Later in life Kettering was presented with honorary advanced degrees from many prestigious institutions, but he only earned an undergraduate degree on his own.

#### 4. Of cash registers and springs

Upon graduating from OSU in 1904, Kettering went to work for the National Cash Register Company (NCR), where he was assigned to a department appropriately called "Inventions." His notable discoveries, and early patent filings, related to a telephonic cash register to process credit sales,<sup>1</sup> and a spring-loaded cash register drawer.<sup>2</sup> During development of this device, an NCR colleague questioned whether a spring could stand up to the stress required. Kettering replied with a question of his own, asking for the time. Thus was the critic forced to admit that the wind-up spring powering his watch was perfectly reliable [14]. Some years later, Kettering used the same spring concept to design a set of file cabinets for his office at General Motors. When one presses a button on a panel, the corresponding file drawer pops open. This remarkable apparatus can still be seen in operation at Kettering University Archives in Flint, Michigan, where it is used today to store a collection of his papers. Figs 2 and 3.

In 1905 Kettering married Olive Williams, a woman he had met while working as a lineman. Whenever he had to test a line, it was an excuse to call and speak to her. It was on their honeymoon trip that he first encountered an automobile. While the newlyweds waited for a train, Kettering helped a man to repair his car's ignition. The grateful driver rewarded Kettering with his first ride in an automobile.

#### 5. The barn gang

Kettering's supervisor at NCR, Edward A. Deeds, while building a car from a kit in 1908, asked Kettering to help install the electrical system. Fascinated by the inner workings of the engine, Kettering and Deeds were soon joined by a few friends with similar interests,

<sup>1</sup> US 939,267.

<sup>2</sup> US1,137,061.

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