

# The Development of Wafer Locks

A Four Part Series

Part 1, The Early Years

by

Michael Newman

© 2013

Thomas Hennessy's *"Locks and Lockmakers of America"* provides an interesting look at the history and development of locks in the United States. And, while mentioning the invention of wafer locks, very little is said regarding the development and ultimate popularization of these locks. Wafer locks have also been referred to as disk locks and plate tumbler locks. For this article I will refer to them only as wafer locks.

Most lock collectors are aware of Philo Felter's invention in the 1860s of the wafer-tumbler lock. Felter's padlocks grace the collections of many current day lock collectors. His lock, which used a light-weight double-sided key, was patented in 1868, only three years after Linus Yale, Jr. patented his historic pin-tumbler lock cylinder with its "feather" key. In the era of large, heavy "bit" keys, the smaller and lighter keys proved extremely popular. Felter configured his locks for a variety of purposes. The photo shows three examples of Felter's locks, two padlocks and cylinder from a night latch.

Two years later Hiram Shepardson developed a wafer tumbler lock that used a single-sided key very similar to Yale's feather key. A desk lock made by Shepardson is shown in the photo.

Felter and Shepardson have both been long duly noted by lock historians as having been the originators of wafer locks in the United States, Felter for the double-sided variety and Shepardson for the single-sided. But little has been said about the efforts to make them the ubiquitous product we now recognize. One would think that if the product was as good as advertised, we would be awash with old wafer locks. But that's not the case. Felter's padlocks do occasionally become available to collectors, as does an occasional deadbolt lock. Shepardson's locks seem to be as scarce as hen's teeth. And not until the early 20<sup>th</sup> century do we begin to find wafer locks in any abundance. What happened?

In his book, Hennessy mentions two early 20th century manufacturers of wafer locks, Chicago Lock Company and Junkunc Brothers - American Lock Company. Were they the companies responsible for popularizing the wafer lock?

That question can best be answered when we look at what happened in the intervening fifty years between 1870 and the 1920 acquisition of "a one-year-old cabinet lock company...by W. C. Shinn," mentioned in Hennessy's book.

In August 1878, Yale Lock Manufacturing Company purchased Shepardson's company, The United States Lock Company, including the Shepardson patent. Two months later Yale bought out Felter's American Lock Manufacturing Company, including all of the stock, machinery and patents.

Development of wafer locks was essentially squelched after Yale bought out both Felter and Shepardson. Over the next thirty-five years, only about two dozen patents were issued for locks of the wafer design. Of these, only one was assigned to Yale, for a night-latch which had appeared in their 1884 catalog. In the same catalog, Yale mentioned the buy-outs of Felter and Shepardson, noting that they would only produce those products on request, because Yale's products were superior. Were the buy-outs made to protect Yale's fledgling pin-tumbler mortise cylinder from competition?

Russell and Erwin produced a wafer type mortise cylinder for a door lock in 1886. Screw-in mortise cylinder locks were first introduced by Yale in 1865. The key shown in the photo with it is not original.

Hicks Lock Manufacturing Company of Oshkosh, Wisconsin was organized in May 1887 and appears to have lasted only about three years. The Hicks desk lock in the photo has its original key and was manufactured around 1890. This lock, like Felter's, was not designed to be disassembled.

Four of the wafer lock patents issued in the late 19<sup>th</sup> century, were assigned to Russell and Erwin to be used with mortise locks; one allowing the key to be used on the same lock from either side of the door, in the same fashion as bit keys of the day. Although convenient, the disadvantage was that this would require a key similar in length to bit keys.

In a patent filed in 1891, Henry Voight of Russell and Erwin introduced the concept of master keying a wafer lock by changing the position of the blade from side to side in conjunction with specially cut wafers in addition to the use of sectional keyways. Also produced by Russell and Erwin was a double cylinder mortise lockset configured with wafer locks.

Another patented wafer lock was assigned to Branford Lock Works as part of a night-latch. Yet another was assigned to Hopkins and Dickinson of Brooklyn, N. Y. It is not known if either company actually produced these locks.

Through the turn of the century wafer locks had been used for a variety of applications such as drawer locks, desk locks, padlocks, door locks, and so on. But why were there so few manufactured?

Judging from the few examples available, as well as from information in various patent drawings, the machining required for wafer locks was as much, if not more, than for pin-tumbler locks, resulting in a lock only almost as good at a similar cost. Wafer locks were competing directly with pin-tumbler locks and losing.

The problem with the wafer lock wasn't that it was a bad idea, but that it was competing directly with another good idea, the pin-tumbler lock.

Pin-tumbler locks were proving to be extremely versatile, although somewhat expensive when compared to lever locks and warded locks. Lever locks were less versatile. Warded locks provided minimal security. But wafer locks seemed to offer no clear-cut advantage to justify the similar costs over pin-tumbler locks.

Wafer locks needed to find a better manufacturing process, and a home.

To be continued in Part 2, The King Lock Company.



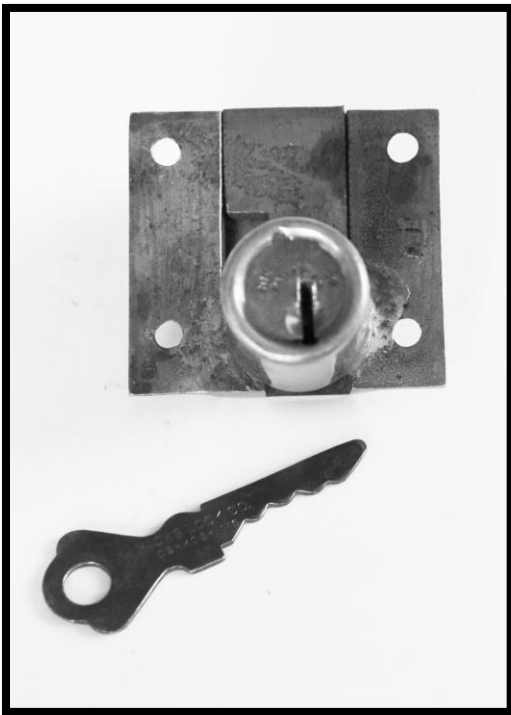
Three different wafer locks from Felter's American Lock Manufacturing Co. of Cazenovia, New York (Patented 1868).



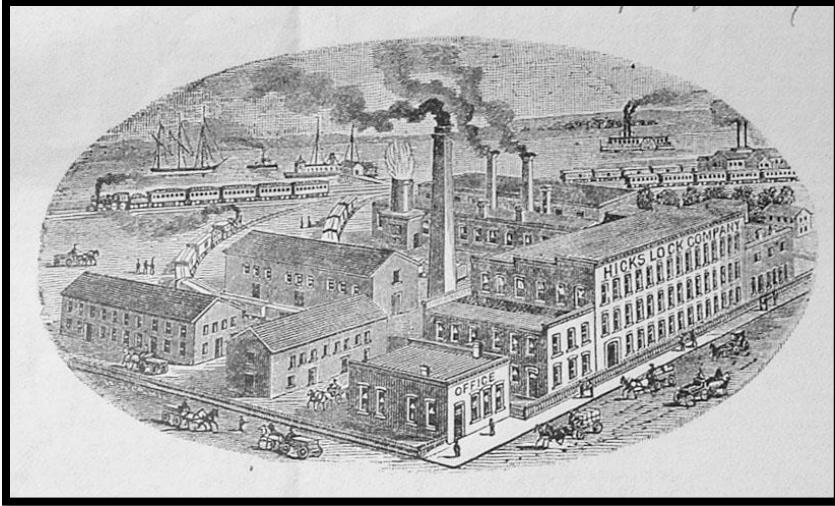
Desk lock with keys from Shepardson's United States Lock Company (Patented 1770).



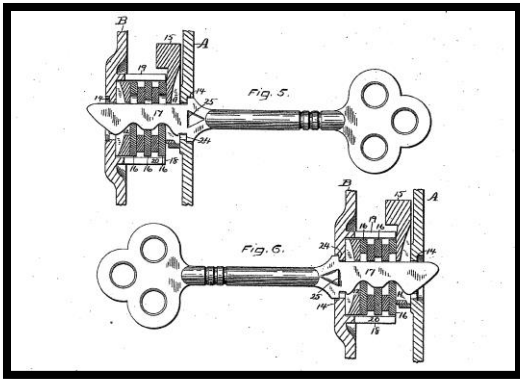
Mortise cylinder lock with working key, from Russell and Erwin. (Patent 335,648, Feb, 1886)



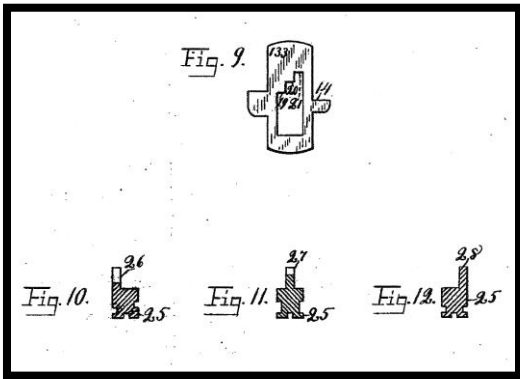
Hicks desk lock and key (circa 1890).  
Note offset keyway.



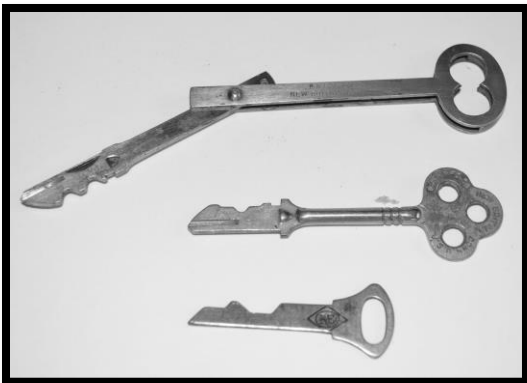
This artist's rendering of the Hicks Lock factory in Oshkosh from a letterhead image was undoubtedly exaggerated. Besides the four principals, president, vice president, secretary and treasurer, the company workforce in 1889 consisted of six people (three machinists, a moulder and two others).



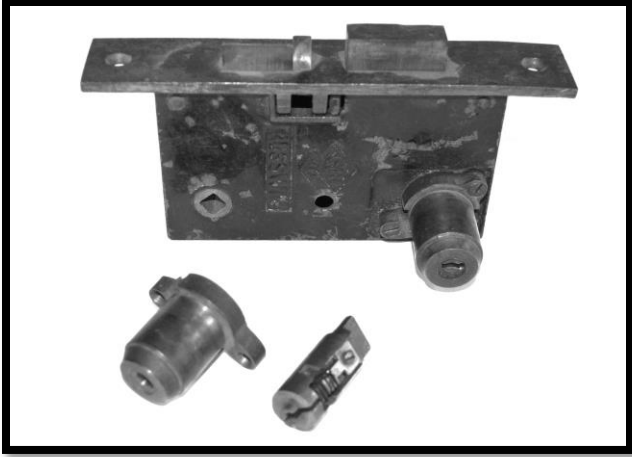
Portion of Russell and Erwin 1891 patent drawing showing operation of wafer lock from either side.



Portion of another 1891 Russell and Erwin patent drawing showing arrangement for master keying a wafer lock by altering blade position of key with modified wafer.



Three original Russell and Erwin keys for wafer locks. The top two are designed to operate the lock from either side of the door.



Russell and Erwin mortise lock with double wafer cylinders. One cylinder is shown partially disassembled. (Wafer cylinder patent 466918, January, 1892)



# The Development of Wafer Locks

A Four Part Series

Part 2, The King Lock Company

by

Michael Newman

© 2013

Wafer locks had been around for almost fifty years when in October of 1913, Emil Christoph filed for a patent for a new wafer lock. The patent was assigned to a heretofore unknown lock company, King Lock Company of Chicago. This lock used a double-bitted key and had about twenty wafers in a pack. In Christoph's patent, the key would first be made, then the lock would be built around the key, filing down the wafers to fit the key once it was inserted into the core. Christoph envisioned an unlimited number of key changes based on very small changes to the pattern of the key. He felt his lock was extremely secure and that the duplication of a key to be so difficult, that if another key was necessary, it would be easier to just have the lock reset to a new key.

Christoph was issued two additional patents for his wafer locks, filed in 1913 and 1914, also assigned to King Lock Company. Another early contributor to the King Lock Company, with two patents filed in 1914, was Edward Baird. Baird had been no stranger to manufacturing and by 1915 he was listed as Secretary of King Lock Company. He had previously owned several businesses in upstate New York and in Chicago; most involved clocks and telephone timing equipment. Baird is probably best known today as the first designer and manufacturer of advertising clocks for Coca-Cola and for other companies in the late 1800s. His interest in locks may have begun with his work with long distance pay phones, which by their nature required lock boxes.

The timing of Christoph's lock design couldn't have been better. The automobile industry was just beginning to take off, and many were trying to get in on the ground floor. Electric companies such as the Remy Electric Company, Westinghouse, and the John Heinz Electric Company, were supplying ignition

systems that included their own ignition switches. Many of these early ignition switches relied on locking devices\* designed by the electric companies themselves.

In producing his car for the masses, Ford had been able to keep his costs down by providing only the bare necessities for the Model T. Between 1914 and 1918 more than two million model T Fords were produced, all using a simple ignition switch - and all of them used the same key. Other automobile companies used the same practice of using one key for all its models, while not to the same extremes as Ford, only because they made fewer cars.

Among the newcomers entering the burgeoning automobile industry was Stephen Briggs. He and Harold Stratton, his financier, had formed a partnership in 1908 to build automobiles based on an engine Briggs had designed while in college. Their automobile business was not successful, and they soon turned to manufacturing automobile accessories, including ignition coils and switches. Their earliest switch designs had used locks provided by established lock manufacturers, and included pin tumbler, as well as warded and lever locks. It wasn't long before Briggs & Stratton started using wafer locks from the King Lock Company.

These Briggs & Stratton ignition switches used a key series numbered 1 through 25. The photo shows two different styles of keys. The head of the key at left bears a resemblance to that in Christoph's patent drawing and is probably the original design. The key on the right has a more conventional shaped key head. Both examples note only "pat apl'd for."

The introduction of wafer locks by King Lock Company began a move to use them throughout the automobile industry. Following the lead of Briggs and Stratton, Clum Manufacturing introduced its version of the wafer lock ignition switch in 1916, used briefly for Ford and later extensively for Dodge Brothers automobiles and for a host of independent automobile manufacturers.

Caskey Dupree, an ignition switch manufacturer formed in Marietta, Ohio in late 1916, was also supplied with King locks and keys for their switches. Caskey Dupree also supplied King locks to Westinghouse for use in their ignition switches. Locks for Caskey Dupree appear to have been supplied in a substantially smaller total indicated by the scarcity of those locks or keys today. Known Caskey Dupree keys numbered 20, 31 and 40 indicate a series different from that for Briggs and Stratton.

What was it about the new wafer locks that made them such a success this time? Instead of machined brass, the new locks were made of a die-cast zinc alloy that required very little, if any, additional machining. This made them much less

---

\*I use the term locking device loosely. Keys were little more than plugs or levers or spanner wrenches. I suspect that real locks were not widely used for a couple of reasons – pin tumbler locks were relatively expensive, lever locks and warded locks did not seem well suited to the application.

expensive to manufacture. The wafers could be stamped out of sheet metal. Even the keys were stamped from sheet metal. King, Clum, Delco, and even Yale had all produced keys in this manner.

But cost alone may not have been sufficient to ensure success. The burgeoning automobile industry was being prodded by insurance companies to provide better security for the automobiles they produced. The wafer lock filled that need, providing more security than the primitive “lock” used by the electric companies, yet were less expensive than the pin tumbler locks of the established lock companies.

Besides their sales to original equipment manufacturers, King Lock supplied wafer locks to automobile accessory manufacturers such as Eureka Accessories Company and Defender Auto-Lock Company, both of Detroit. These companies, among others, manufactured aftermarket lock assemblies for Model T Fords that provided additional security for existing automobiles and could be easily installed.

In 1919 Model T Fords with electric starters got a new style ignition switch. The switch featured a wafer lock that used a double-bitted key. This style lock was used for Model Ts through the end of production in 1927. Although it is doubtful that King Lock Company was responsible for the design, it was one of five manufacturers which supplied locks and keys for these switches.

But King Lock made more than just locks for ignition switches. Emil Christoph filed for a patent for a padlock in late 1918, which was issued in mid 1922 and assigned to King Lock Company. This was a hinged shackle padlock; it is not known if this lock was ever produced. A standard shackle padlock was designed by King Lock, and judging by the sophistication of its key, was probably manufactured around 1920. King Lock produced several styles of solid, well-constructed padlocks, including one with dual keyways.

By the end of 1923 King Lock Company had disappeared. Without inside information it can be difficult to know now, some eighty-five years later, why a company fails. It may have been that King Lock was undercapitalized. There may have been a marketing problem, or perhaps the lack of succession planning. It would be difficult to believe that it was anything else but a problem in management. All indicators show that most of their products were sold to other manufacturers. Is it possible that these manufacturers felt they could make the same products just as easily, cutting costs just as Briggs & Stratton and Clum Manufacturing had done?

Just what do we know about the personnel at King Lock? Ramon Lozon was the general manager in 1918. Lozon, Baird, and Christoph were the obvious technical leaders of the company, all three having received patents for locks subsequently assigned to King Lock. But who was King?

Actually there were two unrelated men named King in Chicago involved with wafer locks at that time; Roy was from Iowa; James from Maine.

Roy King was an engineer and moved from Iowa to Chicago as a young adult. In 1916 and 1917 he was issued several patents for wafer locks using double-bitted keys. He was also issued a patent for a fairly sophisticated key machine for making original double-bitted keys (1,410,683, filed April 6, 1917). Although his lock patents were assigned to the Coin Controlled Lock Company of Chicago, it would seem at first glance that he may have had an inside edge, possibly with King Lock. His biography in *Manufacturing and Wholesale Industries of Chicago*, Volume 3, of 1918, would seem to belie this notion as his inventions were extremely varied, as was his list of clients. Nothing has yet been found to tie Roy King with King Lock Company.

On the other hand, the president and namesake of King Lock was James King. He does not appear to have been a technical person. During his tenure at King Lock, he maintained a full time job as an accountant at International Harvester in Chicago. Prior to that he had been an insurance salesman. His interest in King Lock Company then, was certainly as a provider of capital. The same could be said of the treasurer, Charles Morrison, who was also employed full time at International Harvester, as an auditor.

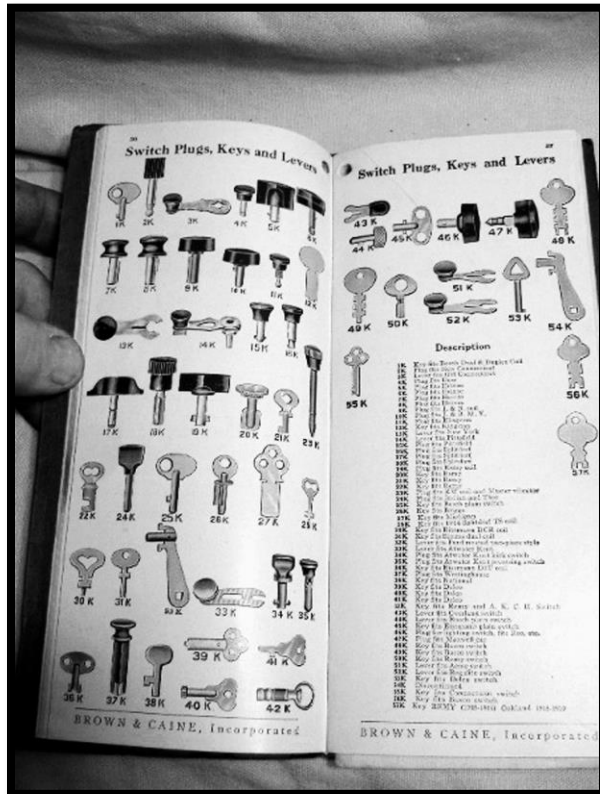
By 1922 James King, a long time resident of Chicago, had moved to California. The 1923 Chicago City Directory entry for King Lock is given in standard typeface; earlier entries had been in bold, indicating that the company was in cost reduction mode, possibly in the process of liquidation. It is quite possible that King's move to California was due to ill health; evidence indicates that he died in late 1926 or early 1927. With his move to California, James King may have begun to liquidate his holdings in King Lock and the company dissolved with little apparent fanfare.

The 1930 census indicates that Ramon Lozon was at that time employed at International Harvester, as was Charles Morrison. The same source indicates that Emil Christoph had moved to a neighboring Illinois county. Edward Baird had established his own lock company, the Chicago Cabinet Lock Company, another manufacturer of wafer locks.

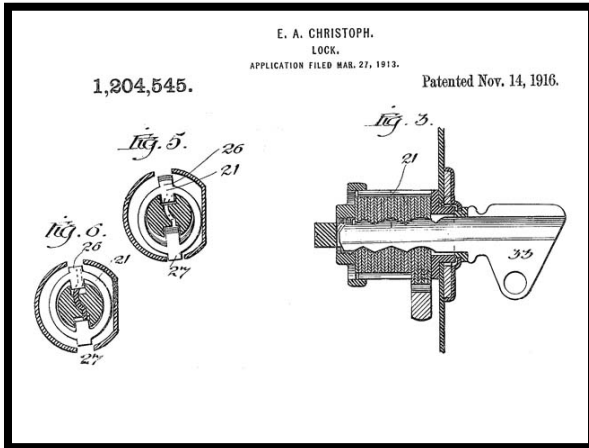
An article by Scott Klemm in the April/May 1983 *Key Collectors Journal* noted a possible connection between King Lock Company and Chicago Lock Company. The basis was a hand written note on an old patent that had been originally assigned to King Lock Company. The note stated that the patent had been reassigned to Chicago Lock Company. In correspondence with Klemm, Lyle B. Shinn, Jr., president of Chicago Lock at the time, said he did not recall ever hearing of the name King Lock. Nor had an old-timer who had been with Chicago Lock since the 1920s.

But both companies were located in Chicago. Both manufactured wafer locks. The demise of the one company at about the same time as the emergence of the other had given rise to speculation that one begat the other. Circumstances seem to indicate it, but Hennessy in his book *“Locks and Lock Makers of America,”* notes that Chicago Lock Company was formed by the acquisition of a cabinet lock company.

Part 3 of this series examines the emergence of wafer lock companies in the Chicago area.



Showing the need for a better lock, this page from an early Brown & Caine catalog shows various early plugs, keys and levers used by electric companies for their automobile ignition switches. These provided minimal security as they were readily available to the general public and one "key" would fit all switches of a particular series.



Drawing from Christophs 1913 patent.



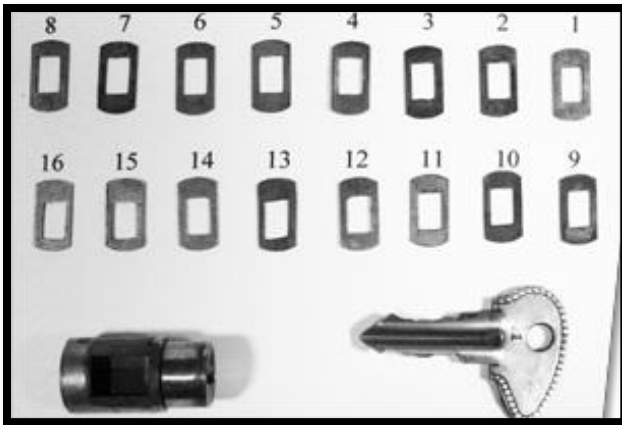
These early double-bitted keys from King Lock Company are pressed steel.



Briggs & Stratton ignition switch with King lock and key



Early King lock plug and key from Briggs & Stratton ignition switch. The wafers are of three different metals of differing thicknesses. The scratch marks across the wafers are probably from the factory. The wafer pack consists of 16 wafers and uses no springs.



Disassembled King wafer lock with key



King key and wafer lock plug made for Caskey Dupree



Later variations of King keys. The two on the left are pressed steel.



This Defender Auto Lock, an aftermarket lock for 1914 - 1918 Ford Model T, used two early King locks, one for the ignition switch, the other locking the coil case.





Although King Lock made several styles of padlocks, their main emphasis was automobile locks.

# The Development of Wafer Locks

A Four Part Series

Part 3, Wafer Lock Companies of Chicago and Environs

by

Michael Newman

© 2013

King Lock Company of Chicago began developing wafer locks in 1913, supplying locks to various manufacturers for use in the automobile industry. Companies using King locks included Briggs & Stratton Corporation and Caskey-Dupree, both of whom manufactured automobile ignition switches. King also supplied locks to automobile aftermarket manufacturers including Eureka Accessories Company and Defender Auto-Lock Company, both of Detroit.

The growth of King Lock had been undoubtedly assisted by the growth of one of its early clients, Briggs & Stratton. But King Lock may also have been a victim of the very success of Briggs & Stratton. Before the end of 1915, Briggs had developed a switch using its improved version of the King lock. And in 1920 Briggs had submitted patents for switches using their own lock designs apparently leaving King Lock without its major client. The growing use of wafer locks for automobiles in the early 1920s opened the door for even more lock manufacturers.

Edward Baird, an entrepreneur of several decades, had been involved with King Lock from its beginnings. He was shown as its Secretary in 1915. But by 1916 he had formed his own lock company, Chicago Cabinet Lock Company.

Baird was not the only entrepreneur from another industry to enter the world of locks. For many years, William Shinn had been a successful manufacturer of lightning rods in Nebraska. By early 1917 he had moved to Chicago where he and his son, Lyle, manufactured lightning rods and copper cable.

In the July 1920 edition of the Automobile Trade Directory, Edward Baird announced the sale of Chicago Cabinet Lock Company, his resignation as president of that company and of the formation of his new company, Baird Lock Company.

A year later, in 1921, William and Lyle Shinn were shown as President and Secretary respectively of Chicago Cabinet Lock Company, Baird's old company. The

name of the Shinn's new lock company was changed in 1924 from Chicago Cabinet Lock Company to Chicago Lock Company.

Baird, having divested himself of Chicago Cabinet Lock, had formed a new company, and one of Baird's engineers at Chicago Cabinet Lock, August Manteufel, became a principal at yet another new wafer lock manufacturer in Chicago, Best Lock Company.

Because the re-birth of wafer locks had occurred in Chicago, it would be understandable that most of the interest in their development would be in that area. While we do not know the details, it would be hard to deny that with the demise of King Lock there would be a movement of experienced lock men to other manufacturers, or possibly in starting up their own company, much like Manteufel after leaving Chicago Cabinet Lock.

Baird Lock and Best Lock both appeared in Chicago by January 1922 along with two more companies, American Lock Manufacturing Company, with its *Grip Tumbler*, and the Coin Controlled Lock Company of Chicago, the company to which Roy King had assigned his patents for wafer locks and associated key machine.

By the mid 1920s almost all wafer locks were still being manufactured in the broad Chicago area, which would include Briggs & Stratton Corporation and Clum Manufacturing, both located in Milwaukee just a little over 100 miles north.

Yale Lock, who by then was making wafer locks for some Model T doors, appears to have been playing catch-up. Electrical manufacturers Remy and Delco of Indiana and Ohio respectively were involved in the manufacture of wafer locks for only a year or two in the mid 20s and join Yale as manufacturers of wafer locks from outside the Chicago area.

Within a year of the formation of Baird Lock, another new lock company was formed in Chicago. This time it was American Lock Manufacturing Company, begun in 1922 with Herman J Rosenberg as president, and located at 1634 #10 South LaSalle Street.

The first listing for American Lock in the Illinois Secretary of State's report was in 1922; there was no mention in 1923. We do know that Junkunc Brothers eventually acquired American Lock Manufacturing Company, but we do not know when.

Although John Junkunc was said to have been manufacturing combination padlocks in Chicago throughout the teens, he is listed in the Chicago City Directory of 1923 merely as a locksmith, with no company affiliation. His brother Stephen, listed as proprietor of General Machinery and Manufacturing Company, was undoubtedly the other brother of "Junkunc Brothers," and probably provided machine shop services for John.

We had asked earlier, “Who was King?” to find that while he was the namesake of King Lock Company, he was primarily an accountant, with no apparent lock expertise. With this in mind, perhaps the better question might be, “Who was Baird?”

Baird was an entrepreneur. He had formed companies in New York, Montreal, and Chicago, succeeding in different industries. He developed and sold advertising clocks to Coca Cola, various tobacco companies, and other manufacturers. From visual timekeeping devices he carried the process a step further, moving to electromechanical devices for timing various processes, most notably for timing long distance phone calls.

In 1900, shortly after his arrival in Chicago, he had established Baird Manufacturing Company for making telephone equipment. Another company he began there was Baird Electric Company about 1910, followed by Baird Equipment Company in 1912.

It may have been a logical move from clocks to time stamps and such, but we are uncertain how he made the leap to locks in the early 1900s. Perhaps it was the need for locking devices for his long distance telephones that piqued his interest. In 1913 Baird Equipment Company had listed time-stamps as its primary product. Just a year later, in 1914, it was associated instead with locks and it was from there that Baird began to build his expertise with locks.

Baird designed and patented wafer locks for James King’s lock company. With his brother Robert Baird as its President in 1914, he was shown as Secretary of Baird Equipment Company whose stated product at that time was locks. A year later he was shown as secretary of King Lock Company. During this period King Lock and Baird Equipment shared the same space at 3233 North Clark Street. Later that year he had formed Chicago Cabinet Lock Company and began designing locks as well as a key machine for his new company.

With the transfer of Chicago Cabinet Lock Company to William Shinn in 1921, Baird had begun yet another company, Baird Lock Company, with James King initially as president. Another listing for that year indicates Baird Lock was located at 1634 #10 South LaSalle Street but with Baird listed as President and Herman J Rosenberg as Secretary. This is interesting as not only was Rosenberg the president of American Lock Manufacturing, but both companies shared the same address on LaSalle Street.

Rosenberg was a businessman with proven talent. Besides his involvement in these two lock companies, Rosenberg was an officer in various automobile dealerships and a department store in the Chicago area. He had earlier operated a grocery store in nearby Evanston and by 1930, a department store in California.

An August 1922 newspaper article about a fire notes that Baird Lock Company and American Lock Manufacturing Company shared the third floor of a building on North Wells Street for the manufacture of locks. Interestingly, both companies had moved from the same address on LaSalle Street to the same address on Wells Street. This was undoubtedly prior to the acquisition of American Lock by Junkunc Brothers.

This was not the first time that Baird shared manufacturing space with a similar company. Baird Equipment Company had shared space earlier with King Lock. It should not be surprising then that a 1921 listing of Illinois corporations showed James King, the president of King Lock Company, was also the president of Baird Equipment Company.

The fact that Baird Lock and American Lock existed simultaneously on the third floor of the same building suggests that Baird had been involved with American Lock Manufacturing as well as his own company, Baird Lock. In fact, it appears that Baird Lock actually spawned American Lock Manufacturing Company.

In 1923, after several decades working first with clocks, Baird, now 63, was in his tenth year in the lock industry. His son Edward Payson Baird, Jr. had been attending Yale University and had replaced Herman Rosenberg as Secretary of Baird Lock Company. With his new company and no fewer than eleven lock related patents under his belt, it appears Baird was on his way to building a legacy in the field of locks.

But Baird's son died unexpectedly that year. The senior Baird died six years later, in 1929. Although Baird locks continued to be sold to the game industry, in January 1932 Chicago Lock Company sued Baird Lock Company for patent infringement. Interestingly, the two patents, 1,352,239 and 1,406,573, were Baird's own original patents from the early 1920s. With apparent insufficient new development, Baird Lock Company slowly disappeared.

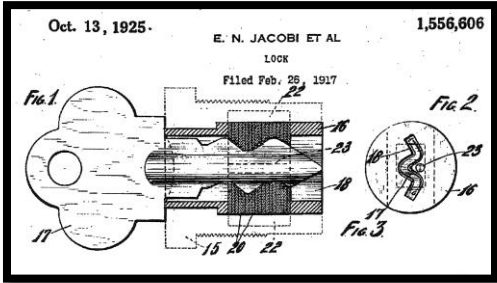
While many of Baird's entities eventually fell by the wayside, Edward Baird, it appears, had been involved in the early formation of two different lock companies that exist to this date: Chicago Lock Company (now CompX) and American Lock Manufacturing Company (now associated with Junkunc Brothers).

We now know that Baird's Chicago Cabinet Lock Company gave rise to Chicago Lock Company. But what happened to King Lock Company? At this point we can only speculate as to the distribution of those assets. It is possible they were acquired by Baird Lock, American Lock, Best Lock, or even Chicago Lock - all engaged in the manufacture of double-bitted wafer locks for the automobile industry. Additional research may provide the answer. Or perhaps not.

Up to this point we have seen the development and rapid rise in the use of double-bitted wafer locks. But we have not yet seen the emergence of the modern

single-bitted wafer lock. The Reed Code Book of the mid 1930s suggests that Miller Lock was one of the first manufacturers of single-bitted wafer locks.

Part 4 of this series will cover the development of that lock.



Part of Briggs & Stratton patent drawing for improvement to King lock.



Briggs & Stratton double-bit keys, series 31 - 54.



These early Yale, Delco and Remy double-bit keys were for 4-wafer automobile locks.



This Chicago Cabinet Lock plug contains nine wafers in three slots. The wafers are steel. A fourth slot would appear to provide space for three additional wafers.



## **Announcement**

Edward P. Baird announces that he has sold his interest in the Chicago Cabinet Lock Company—resigned from its presidency—and has organized the

### ***Baird Lock Company***

of which he is the President and General Manager.

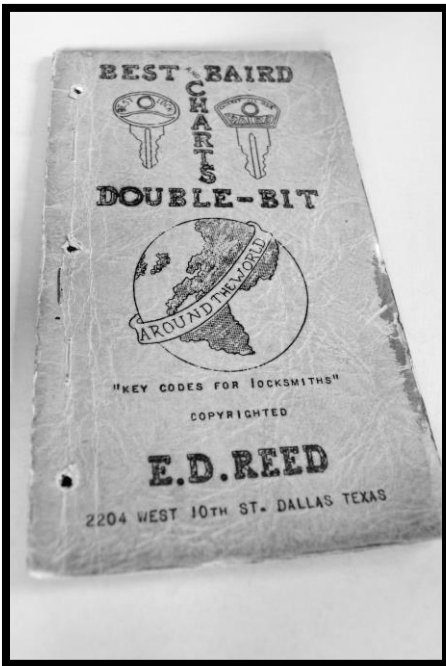
Mr. Baird will give his personal supervision and attention to cylinder locks and complete locking devices made to order—made to fit any peculiar use or difficult situation you may have.

**Baird Lock Company**  
1426-1428 North Wells Street  
CHICAGO

Baird's notice of the sale of Chicago Cabinet Lock Company, July 1920.



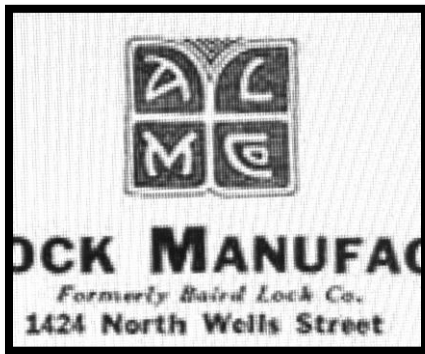
Two different style Baird Lock chain locks for spare tires.



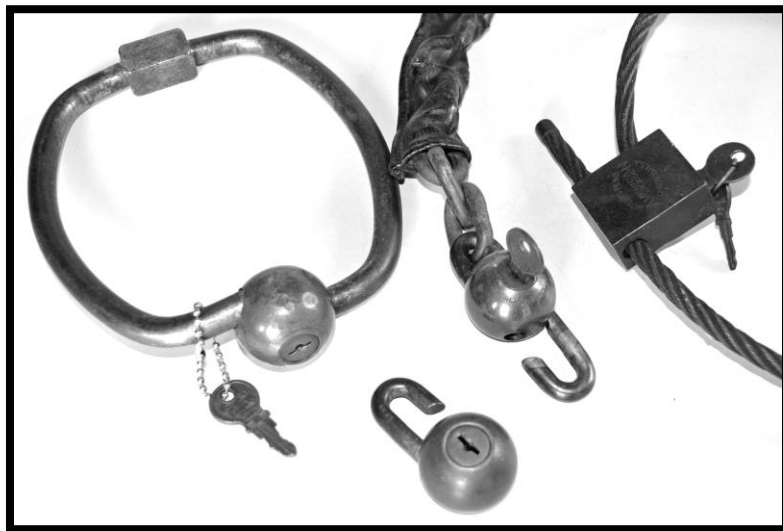
Although obscure today, the Baird and Best lock companies were significant enough at the time to justify this key chart booklet by E D Reed, the codebook publisher.



Compare the graphics from the 1921 Baird ad with the 1922 American Lock ad, both from Automobile Trade Directory



Enlarged 1922 American Lock ad indicates its formation from Baird Lock, although Baird continued advertising under the Baird Lock name until his death in 1929. His death certificate lists his place of business as Baird Lock Company.



An early *Grip Tumbler* padlock and three different spare tire locks. In its early days American Junkunc appears to have been devoted to the automobile trade.

# The Development of Wafer Locks

## A Four Part Series

### Part 4, Emergence of The Single-Bitted Wafer Lock

by

Michael Newman

© 2013

Although wafer locks were originally developed in the late 1860s, the use and improvement of wafer locks languished in the late 19<sup>th</sup> century, to be revived by King Lock Company of Chicago. By the early 20<sup>th</sup> century, wafer lock development had split along two branches, locks with wafer packs and locks with individually slotted wafers.

Emil Christoph's 1913 patent for a wafer lock using a double-bitted key had called for a pack of wafers consisting of 20 wafers. But various problems had shown up using a wafer pack design, one of which was difficulty getting the key into the lock because of the friction between the wafers. One solution to this problem was a redesign, separating the wafers and placing them into their own individual slots. To accomplish this, the number of wafers would have to be reduced.

Briggs & Stratton, originally formed in 1908, had been making ignition switches for several years using Yale pin-tumbler locks as well as lever locks and warded locks, possibly made by Eagle. It wasn't long before they began using the double-bitted wafer locks produced by King Lock.

By 1915, 24 year old Edward Nicholas Jacobi was designing locking ignition switches for Briggs & Stratton Corporation. Both Stephen Briggs and Edward Jacobi continued designing ignition switches using various locking concepts. In 1916 Briggs & Stratton had begun supplying locking ignition switches using their own double-bitted four-wafer lock. There were twenty-four key changes with keys numbered 31 through 54.

These double-bitted wafer locks were being produced with four wafers, each in its own slot. The first use of these new Briggs & Stratton locks was for the Dixie and Roamer automobiles. The 1916 Republic used Clum wafer locks as did a limited number of 1916 Fords. The entire 1916 use of these locks in automobiles was clearly minimal.

Clum double-bitted wafer keys carry the early patent date 8/15/16 on the reverse. A patent issued on that date would seem to indicate that Clum was a very early innovator in this area. But a review of patents issued shows only one assigned to Clum for that date. That patent (1,194,480) is for a switch and has no connection to a wafer lock or key. A later patent (1,462,684), which does relate, was *filed* in October 1916, but not actually *issued* until 1923.

It was the introduction of electric starters in Model T Fords that would bring widespread use to individually slotted wafer locks and would thus give impetus to further development.

Model T Fords had been produced since 1909 eventually standardizing the ignition switch key in 1914. In the five years between 1914 and 1918, Ford produced over 2 million automobiles and they had one thing in common - they all used the same key.

With the advent of electric starters for the Model T in 1919, a new style ignition switch was specified. The switch used a four-wafer lock with a double-bitted key. Twenty-four different key changes, numbered 51 to 74, were achieved using just four distinct key patterns by reversing the pattern and slotting the keys differently. The shell of the lock was made of sheet metal, as were the wafers. The core was die-cast of zinc alloy. The use of these locks was continued through the end of Model T production in 1927.

In addition to King Lock, ignition switch vendors to Ford included Briggs & Stratton Corporation and Clum Manufacturing, both of Milwaukee. Caskey-Dupree of Marietta, Ohio, and Culver Stearns of Worcester, Massachusetts were the two other vendors specified by Ford.

These five companies, plus four other lock makers in Chicago, American Lock Manufacturing Company, Best Lock Company, Baird Lock Company, and Chicago Lock Company, comprised the majority of wafer lock manufacturers in the United States – albeit double-bitted wafer locks. Only one of these companies seems to have been dedicated to the ongoing development of wafer locks.

Various examples of their locking ignition switches attest to the ongoing research by Briggs & Stratton in the mid teens, as do assigned patents. But Henry Ford seemed to have a distaste for patents, and apparently insisted that the products he purchased from vendors not be patented so that multiple vendors could supply products with the same specifications at minimal cost. It would not surprise us to find that the new Ford locks and keys had been designed by Briggs & Stratton.

In 1924, with eight years experience with their own double-bitted wafer locks, Briggs & Stratton began developing single-bitted wafer locks. In April of that year, Jacobi filed a patent for a five-wafer lock using a single-sided key.

A subsequent Briggs & Stratton patent specified pre-cut wafers of uniform size which would match up with key cuts of a predetermined depth, thus bringing standardization to the wafer lock, just as had been done with the pin-tumbler lock many years earlier.

The 1924 Hupp 8 was the first automobile to use the new Briggs & Stratton single-bitted wafer lock. In 1925 the lock was used for doors on the 1925 Ford sedans as well as for several other automobiles. We have not found any documented evidence to suggest any 20<sup>th</sup> century manufacturer produced single-bitted wafer locks prior to this.

Having now stated that the 20<sup>th</sup> century single-bitted wafer lock was a Briggs & Stratton innovation, it might be appropriate to examine the possibility that some other manufacturer was first. Examination of patents certainly points to Briggs & Stratton.

But many locks were developed without going through the patent process. Manufacturers' catalogs might help although it would probably be necessary to have a complete array from the various lock manufacturers, covering all the appropriate years. Assembling such a collection might prove to be a difficult task.

We know that Yale certainly had the knowledge and had held patents developed more than fifty years earlier. The Reed General Code Book, in its introduction to the Yale Junior codes for wafer locks, notes, "...Miller locks were among the first to use this type of construction..."

But a 1924 Miller Lock catalog of Padlocks for the Automobile Trade presents only warded and lever locks and makes no mention of wafer locks, not even of the double-bitted type. Yale acquired Miller Lock a year later in 1925, but the earliest that we can definitely place wafer lock construction with Miller is 1926. A Clum service catalog of 1928 indicates the earliest use of Miller-Clum style keys was for Chevrolet, Pontiac and Chrysler in 1926.

One source that might prove of value would be that of a key blank manufacturer such as Ilco, and copies of those catalogs are readily available. Unfortunately it can be difficult to place a date on some of these catalogs.

Ilco catalog number 6 was published in the early 1920s, possibly around 1921. A number of Yale key blanks are shown for Yale auto and transmission locks. These key blanks are all pin-tumbler sectionals of the Ilco 997 series. The name Briggs & Stratton does not appear in the catalog, however a key blank for their double-bitted wafer series is shown in the automobile section.

Ilco catalog number 7 appeared no earlier than 1925 as that date appears on at least one page. The same Yale sectionals are shown for Yale auto and transmission locks as in catalog 6. The supplement to catalog 7, dated January 1,

1926, contains the Briggs & Stratton blanks 1098 (for 1925 Ford sedan doors), 1098DB, 1098L and 1089X. No other key blanks for single-bitted wafer locks appear in the catalog.

It is not until Ilco's catalog number 8 that we see any Yale wafer keys, Ilco 997N and NX, used for Peerless and Reo automobiles. None of the other existing lock manufacturers appear to have blanks for single-bitted wafer locks in that catalog, virtually eliminating all of the other manufacturers.

One of the problems with wafer locks early on, had been the requirement for machining and handwork of the individual units. Briggs & Stratton had been using the die-casting process since the early teens for casings on their earliest ignition switches and were well familiar with its capabilities. Using the same process, they could produce strong and durable locks and achieve uniformity at a low cost.

By October 1926, both Jacobi and Briggs had submitted five additional patents for improvements to the single-bitted lock for use as an automobile lock. During his fifty-three year career with Briggs & Stratton, Edward Jacobi was to receive over 225 patents, a great many of them related to locks.

Briggs & Stratton had developed its niche and by 1929 was the largest producer of automobile locks in the world, supplying by some accounts, between 75 and 90 percent. After 60 years, the wafer lock had finally found a home, as an automobile lock.

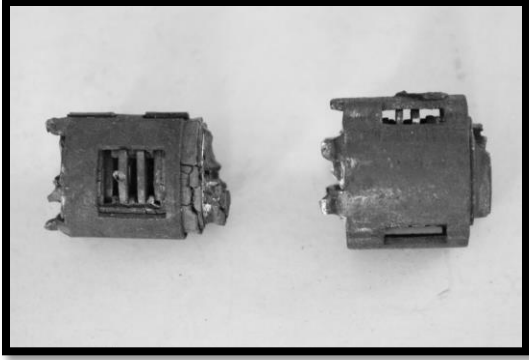


Key for 1914 - 1918 Model T Ford. Over 2 million Model Ts were built during this period and this key would operate all of them.



Note the patent date 8-15-16 on the reverse of this Clum 4-wafer key.





The double-bit Model T wafer lock on the left features open wafers. The wafers on the other lock are enclosed. The cases are sheet metal and subject to rust. The plugs were die cast and many, like the one on the left, suffered from inter-granular corrosion (zinc rot), not uncommon in the teens and 20s.



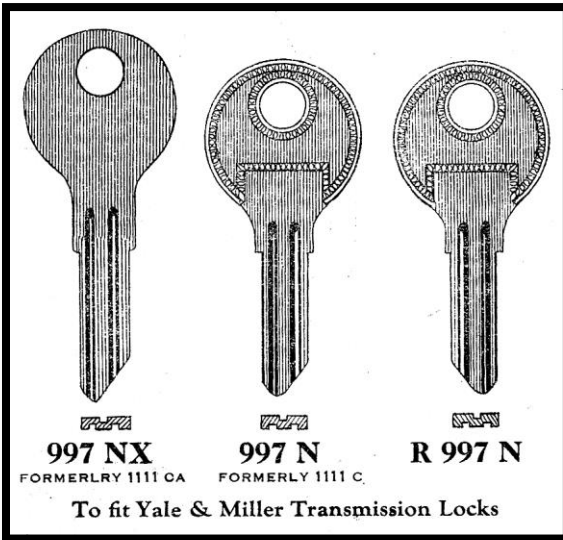
Double-bitted Model T Ford keys made by King Lock Company.



Briggs & Stratton double-bit key and its 4-wafer lock plug. Among improvements made to their locks was the ease of removing them for servicing.



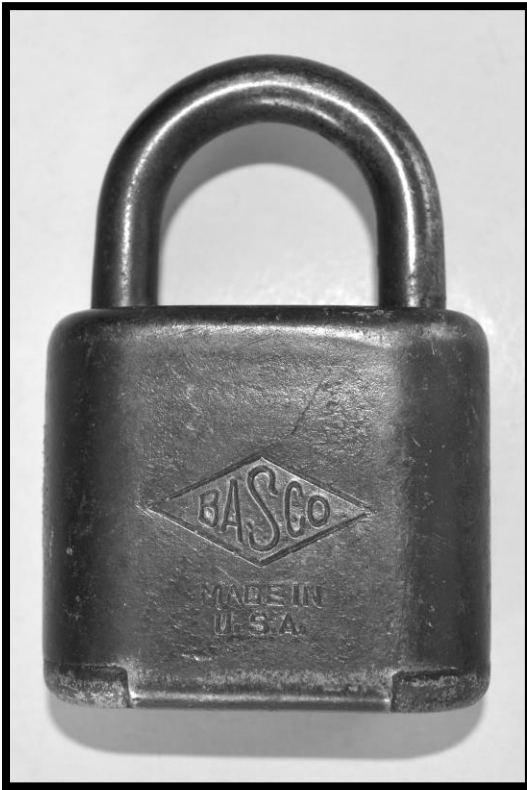
Early Briggs & Stratton single-bitted key for a Ford wafer lock. The early keys had only three depths, later expanded to five.



Ilico 997N series for Yale first appears in their catalog #8 published no earlier than 1927.



The new-old-stock Clum ignition switch above has a single-bitted Miller wafer lock with the Ilco equivalent R997N key. The key code S810 indicates its use for 1926 - 1927 Peerless.



Briggs & Stratton single-bitted wafer padlock.