

Picture Gallery: Time locks

Text and photos by Mark Frank

Introduction

The strongbox, safe or vault to hold valuables has been engaged in a battle against the safecracker for centuries. Various types of contrivances have been used for over six thousand years to secure the safe against unauthorized entry.

The earliest mechanical locks, first used in ancient Egypt, were made of wood and were a type of pin tumbler. Over time, locks grew in sophistication through to the present day. The combination lock was introduced in the United States in the mid-nineteenth century and soon supplanted the key lock as a more secure way of guarding the safe.

The weakness of these devices is that the safe can be opened by anyone possessing the key or combination. Early combination locks were vulnerable to 'manipulation', the process through which by touch and sound, a skilled safecracker could open the lock. James Sargent invented a device in 1857 he called a micrometer to crack the most sophisticated locks, even those made by his own company, by sensing the interaction of the tumblers with the fence within the lock.

By the 1870s safe fabrication and lock technology had advanced to the point where it became difficult for all but the most experienced safe crackers to open a safe in the requisite amount of time before the owner would arrive for the day. The robbers then simply turned to the method of kidnapping the bank or store proprietor or other personnel who would know the safe combination, take them to the safe and demand upon threat of violence they open it. Somehow a way needed to be found to protect the lives of those who could access the contents of the safe.

The solution: the time lock

In 1874, James Sargent along with Halbert Greenleaf formed the Sargent and Greenleaf Company (S&G) and introduced the first commercially successful time lock, the Model 2. It operated by blocking the safe's bolt work, thereby preventing one from dialing in the correct combination until the time lock went off guard, allowing the boltwork to slide into

the time lock case. Only then could the operator dial in the combination and open the safe. S&G sold over 1800 Model 2 locks produced between 1874 and 1929.

This was the answer to the banker's dilemma. While at first there was some concern about the owner being denied access to his own property, the advantages of safety and reliability soon won the day. Furthermore, sharing the combination with employees was not as great a risk when they could not return at night to open the safe. The tipping point may have been the Northampton National Bank robbery on January 26, 1876 when a gang of robbers kidnapped the bank's cashier and made off with \$1.6 million in cash and securities. It was the largest robbery at the time, worth \$26 million today.

One must remember that this was before the time of effective alarm systems, let alone central alarm systems that automatically notified law enforcement, and this was especially true in the smaller towns. The safe was all that stood between the robber and the contents. The time lock concept proved to be immensely popular and profitable.

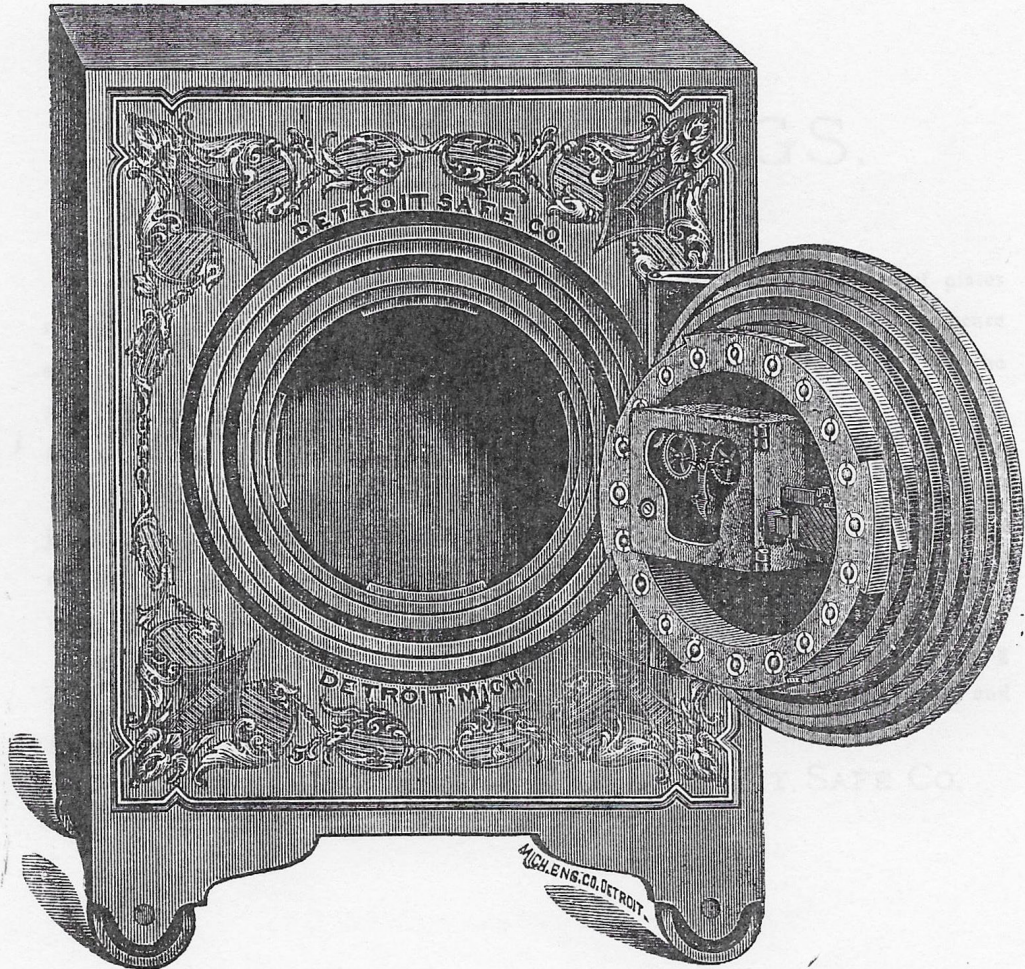
The manufacturers

Three companies were the dominant makers of time locks until the Great Depression in 1929. S&G, Yale and Hall's Safe & Lock, later split off in 1880 into the Consolidated Time Lock Co. The two latter companies started a year after S&G's successful introduction.

These devices were the 'high tech' gadgets of their day and were quickly in great demand. Profits were lucrative, a nine-fold increase from the cost to produce to the end user was common; in the cases of S&G and Yale from about \$50.00 to \$450.00. In addition a yearly contract for maintenance of the lock was required to keep the guarantee of indemnification against a lock-out from a defective time lock in force. Makers attempted to protect themselves from competition through a myriad of patent claims and aggressive litigation. Early on S&G and Yale entered into a patent pooling agreement to fix prices and divide up the market — blatant collusion, which would be wholly illegal today. Litigation was used to crush competitors. Patent litigation is still the largest section of court action in the US today, driven by the

THE BANKERS' MONEY CHEST, WITH CARRIER HINGE.

Surest Protection from the Scientific Burglar. No lock to be picked or tampered with. No hole through the door for lock spindle, or handle arbor. No bolt to be turned in opening; and not the slightest aperture for the introduction of any explosive.



The above represents a Money Chest, which may be made of any size, from 30 to 50 inches square. The door is circular, and say, five inches in thickness; the edge tongued, grooved and packed; the steps ground to make a close joint. The door is swung on a heavy adjustable hinge. A small gear operated by a short lever carries the door in, so that the four sections of the flange on the door enter corresponding openings in the jamb, when the door is revolved by a small crank one-eighth of a revolution, causing the sectional flanges of door and jamb to become interlocked, and each section being inclined, draws the door into a perfect air-tight joint as it comes up to place; when at this point a spring bolt in edge of door enters a socket in jamb, and prevents a reverse motion of the door by any power whatever till the bolt is withdrawn by SARGENT'S TIME LOCK, which stands guard on the inside. Many of these safes are now in use, and are giving excellent satisfaction.

Illustration from a Detroit Safe Co. catalogue, c. 1875. It shows a Sargent and Greenleaf Model 2 time lock in place, using a rollerbolt with the auxiliary bolt.

tech innovations of Silicon Valley and pharmaceuticals industries. The time lock is a very American story, that of invention, competition and litigation.

The first six photos in this Picture Gallery show the first time lock models of the three dominant makers, these examples are amongst the earliest known to survive.

In 1888 S&G introduced the first successful time lock to have modular, interchangeable movements making servicing easier and cheaper. The rest of the industry followed suit and the look of the locks changed and became a bit more uniform. The final three photos illustrate this.

1. Sargent and Greenleaf Model 2, 1874. 6½ x 7¼ x 2¾ in. (16.5 x 19.7 x 7 cm)

S&G made their own movements and was the only company to make their entire time lock in house. The machined surface design of their cases and interior parts was known as 'jewelling'. The pattern is completely random and it is unknown how this design was achieved. The surface was then mercury gilt. Serial number 40, the earliest known.

2. Sargent and Greenleaf Model 2, 1874, interior.

Many lock makers used the colour seen here and known as 'Security Red', on the interior of their high grade key and combination locks, years before the advent of the time lock. Examples date back to at least to 1830.

3. Yale Model 1, 1875. 7¼ x 6 x 3 in. (18.4 x 15.2 x 7.6 cm)

Yale Model 1 also known as the Double Pin Dial was introduced in 1875; production ran until 1892. It was highly decorated and featured the ability to put the lock on and off guard multiple times throughout the day with the use of twenty four individual push pins located on the twin pin dials. The optional Sunday Dial feature for an additional \$50.00 allowed the lock to skip the days of Saturday and Sunday. It was technologically far advanced to Sargent & Greenleaf's time lock.

4. Yale Model 1, 1875, interior.

5. Hall's Safe & Lock Company, 1875. 5 x 3 x 2¾ in. (12.7 x 7.6 x 7 cm)

Hall's locks were considerably smaller than S&G and Yale because they did not have the bolt blocking mechanism, but instead operated directly upon the combination lock through the small hook seen in the photo. Hall was the leading combination lock maker of the day and his time locks offered a competitive advantage where space was limited in smaller safes and money chests.

6. Hall's Safe & Lock Company, 1875, interior.

7. Sargent and Greenleaf Model Triple D, c. 1896. 6½ x 5 x 2¾ in. (16.5 x 12.7 x 7 cm)

8. Yale Triple K, 1892. 6 ¼ x 4 ¼ x 3⅞ in. (15.9 x 10.8 x 7.9 cm)

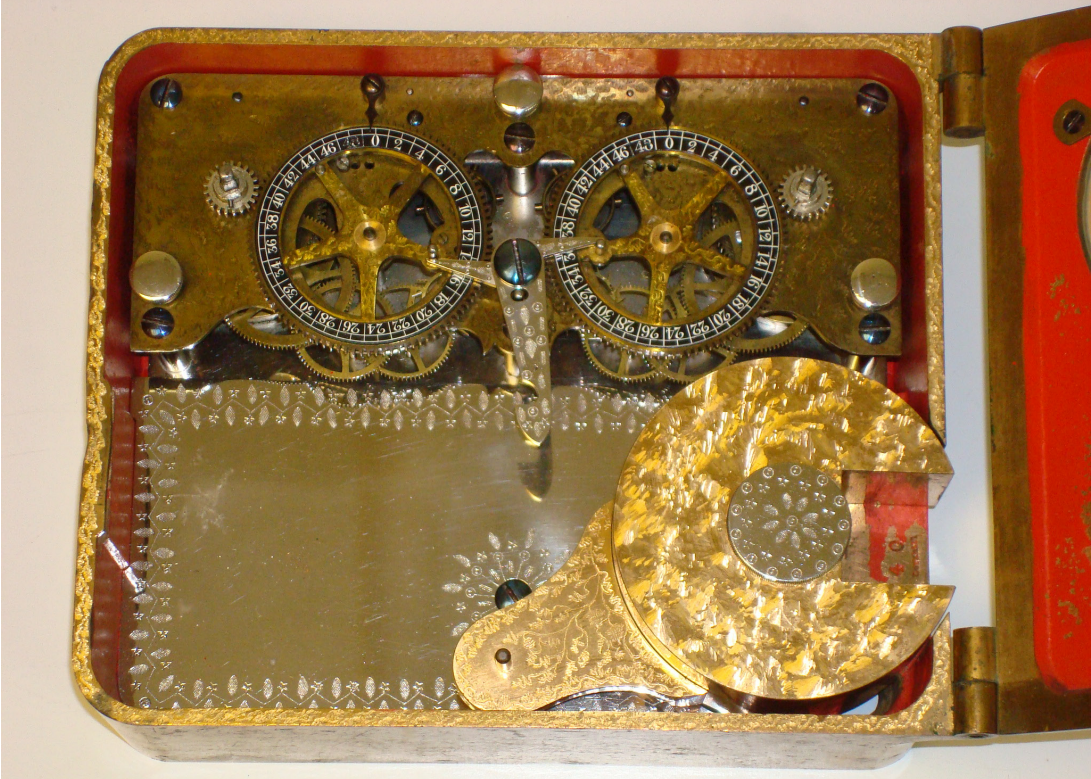
The first year Yale offered interchangeable time lock movements.

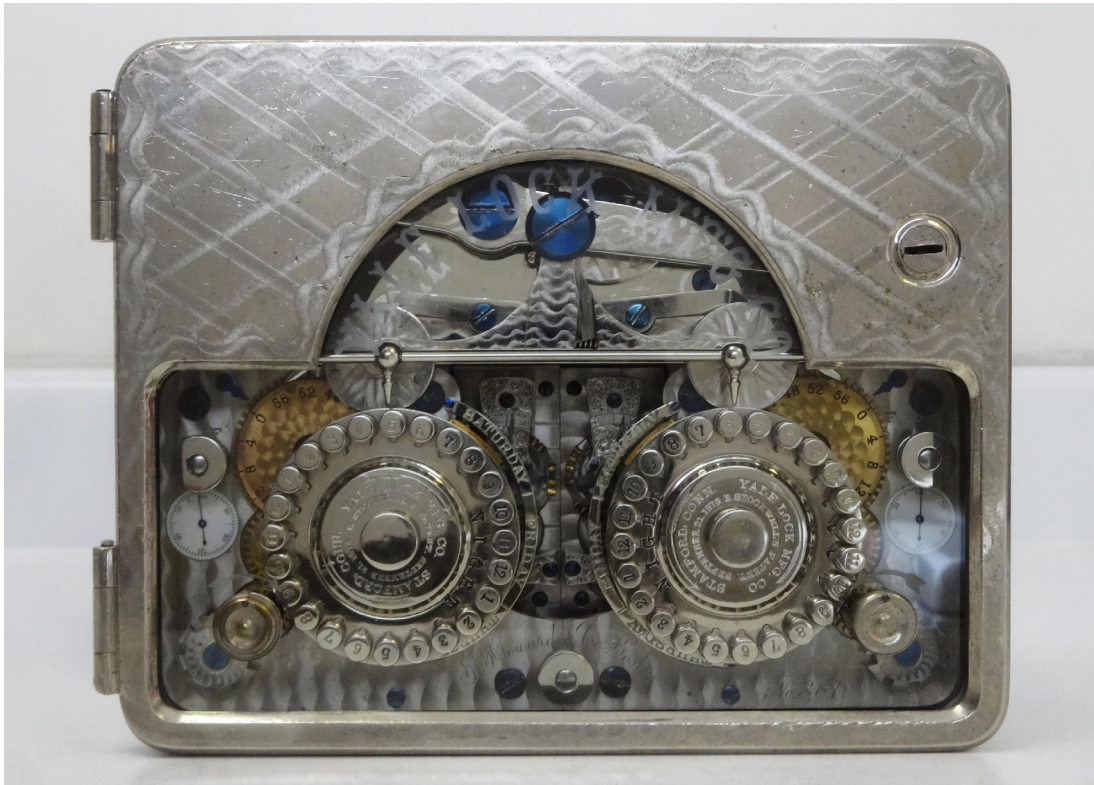
9. Consolidated Time Lock Co. c. 1905. 6¼ x 4½ x 2½ in. (15.9 x 11.4 x 6.3 cm)

Consolidated was the first company to successfully use 'off the shelf' pocket watch movements; in this example, South Bend Watch Co., Indiana, to substitute for purpose-made time lock movements that had previously been made by the E. Howard and the Seth Thomas firms. This was a cost-cutting effort and a way to achieve flexibility of their suppliers.



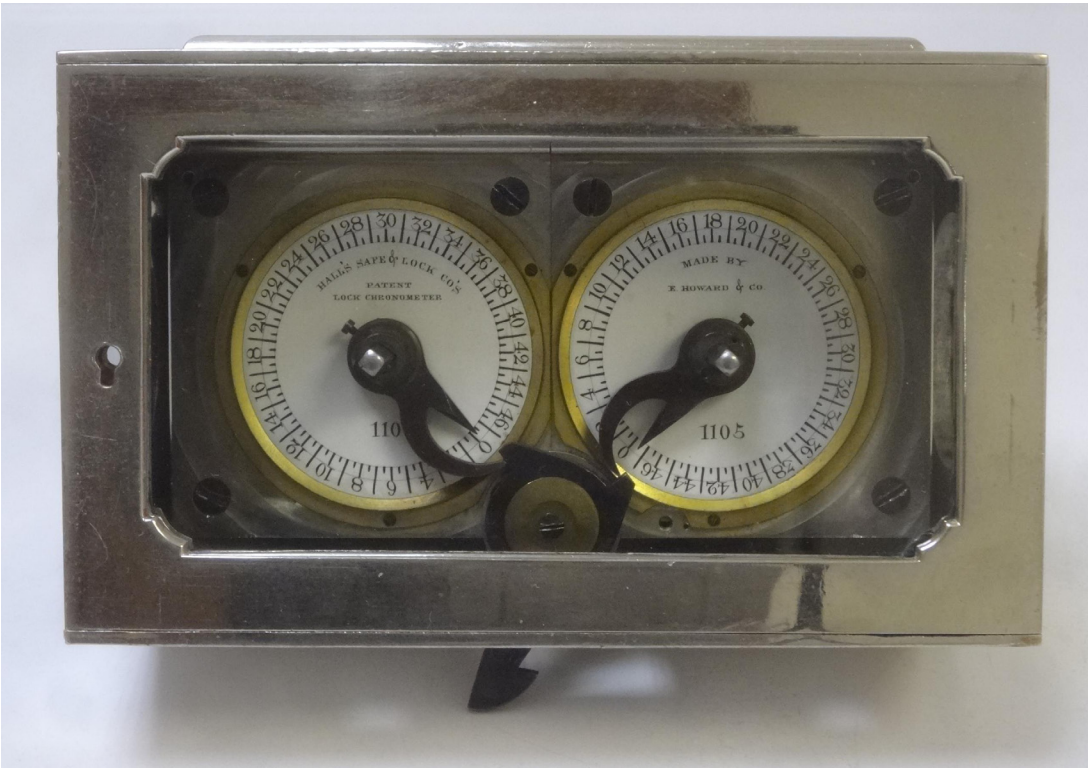
1 and 2. Sargent and Greenleaf Model 2, 1874.



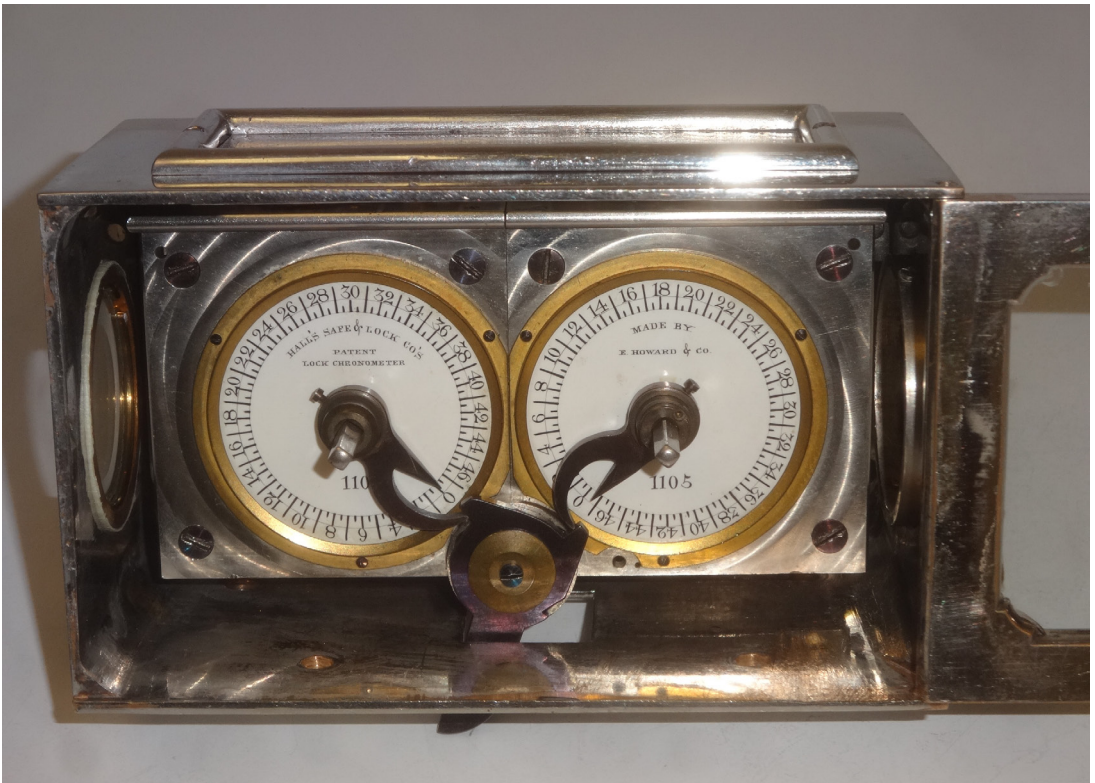


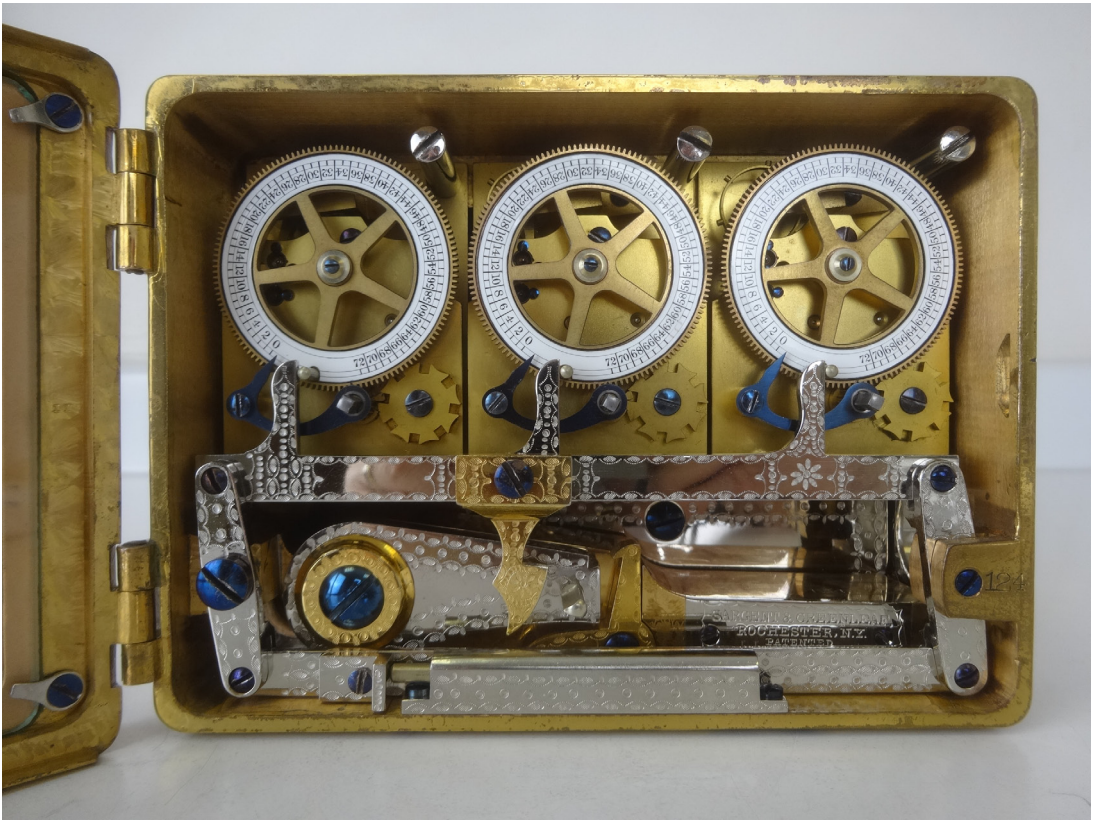
3 and 4. Yale Model 1, 1875.



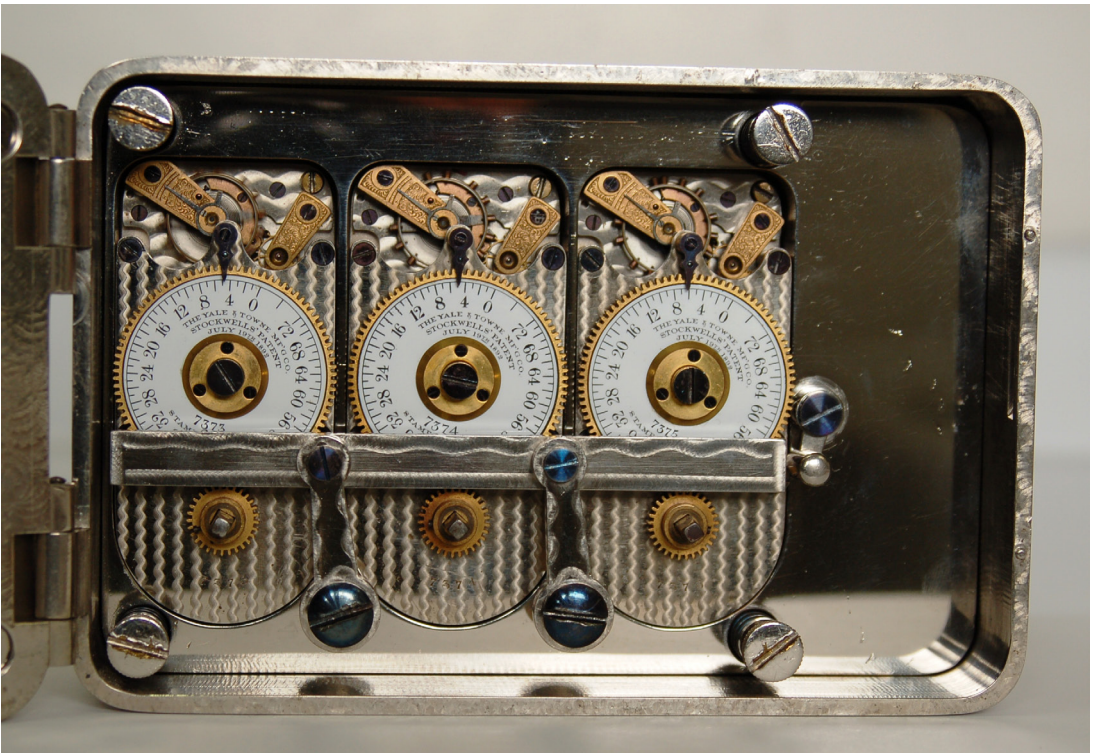


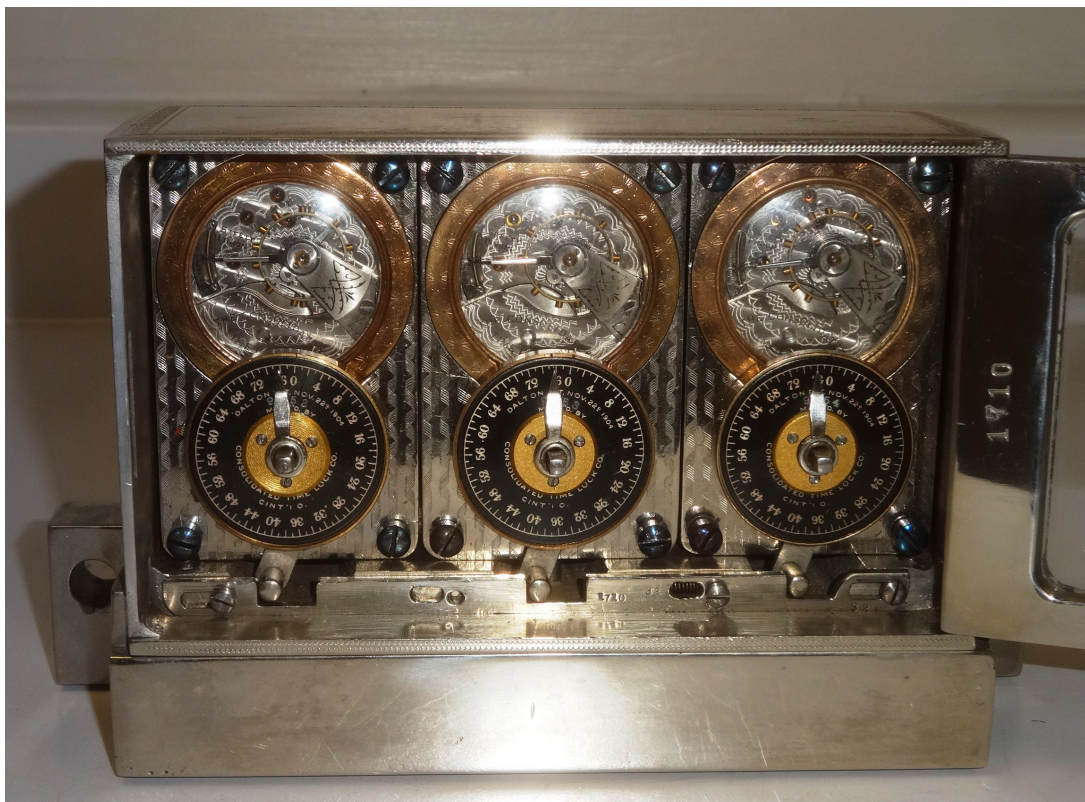
5 and 6. Hall's Safe & Lock Company, 1875





7. Sargent and Greenleaf Model Triple D, c. 1896 (above) and 8. Yale Triple K, 1892 (below).





9. Consolidated Time Lock Co. c. 1905.



Author's collection

Time locks are a largely overlooked part of horology. Many are beautifully constructed and finished. Seen here is a portion of the author's time lock collection containing over 350 examples. The entire collection can be seen in detail with explanatory videos and patent drawings at http://my-time-machines.net/my_time_lock_collection.htm