A Watch Company, a Clock Company, and the Father of US Football

by Michael Harrold (MA)

Research into Manhattan Watch Co. and the economic environment that spawned its associated group of inexpensive jeweled watch companies led to several fascinating families and individuals. Inexpensive jeweled watchmakers strived to fill consumers' needs for lower-cost watches, because traditional jeweled watches—temperature compensated, safety pinions, enamel dials, and stem wind and set—were priced higher than the above average consumer could afford. That research was slowly progressing when, behold, passing through Manhattan was the fellow who invented US football and became chief executive officer of a major clock company associated with Manhattan. These two accomplishments were not dissimilar.

Manhattan watches are technically interesting because of their unusual mechanical features. Their outward appearance sports a sweep hand and a pullout knob on either side of the winding stem: one for hand setting and the other for stopping the watch. Like the early Waltham Watch Co. chronodrometer, these stopwatches stop the entire device while it times an event, interrupting the correct time of day (Figure 1). This interruption relegates these watches to lower prices than those for full chronographs that start, stop, and flyback, which keep correct time running while timing an event. Manhattan eventually made chronographs, but as with most of its models, full-plate construction hides the chronograph's internal mechanisms and their operation.

Unfortunately, the full-plate construction hides the large mainspring barrel that extends beyond the center of the watch, as with Roskopf watches and Charles Fasoldt's 6-beat watch.[1] Resulting choices are to either place the hands uniquely off-center, as Fasoldt did, or to place a post in the center for hands to rotate on, as with Roskopf. Manhattan did the latter, which resulted in its gear train rotating backward in an unusual layout. The other obscure feature is Manhattan's D-pallet escapement, similar to those of DeLong and the 21-jewel Timex, which facilitates easier manufacturing. Both pallets are identical and probably could have been patented, because a similar design was later patented by A. M. Lane in 1897[2] for the American clock industry.

Manhattan watches are admittedly not glamorous, although they used some attractive cases and dials over their lifetime. However, the designs are mechanically clever and unusual, and they were about the only company to succeed with stopwatches, Manhattan's primary product. Only a few Manhattan watches were made with either no sweep hand or a sweep hand with no stop feature, and their hunting cases are also relatively scarce.

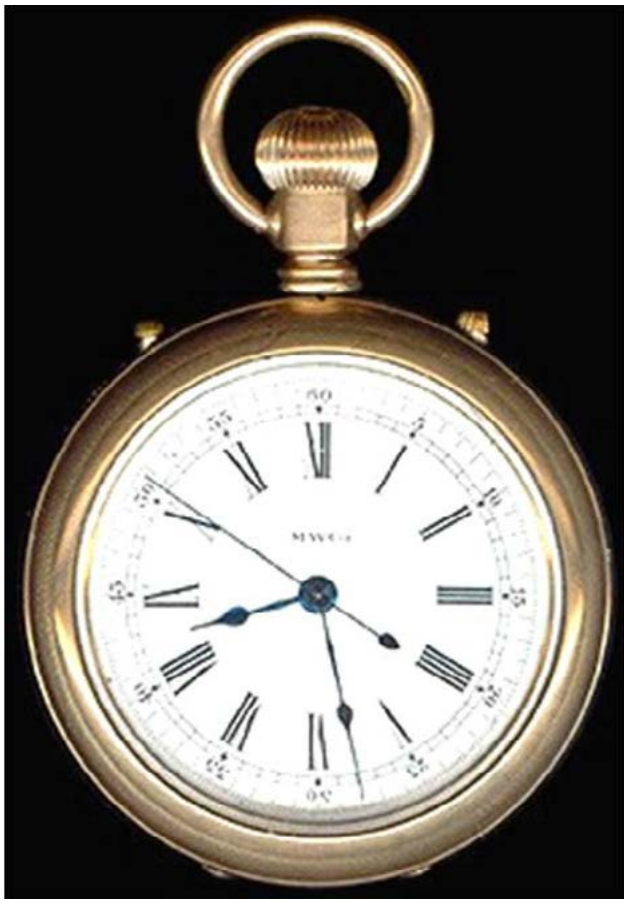
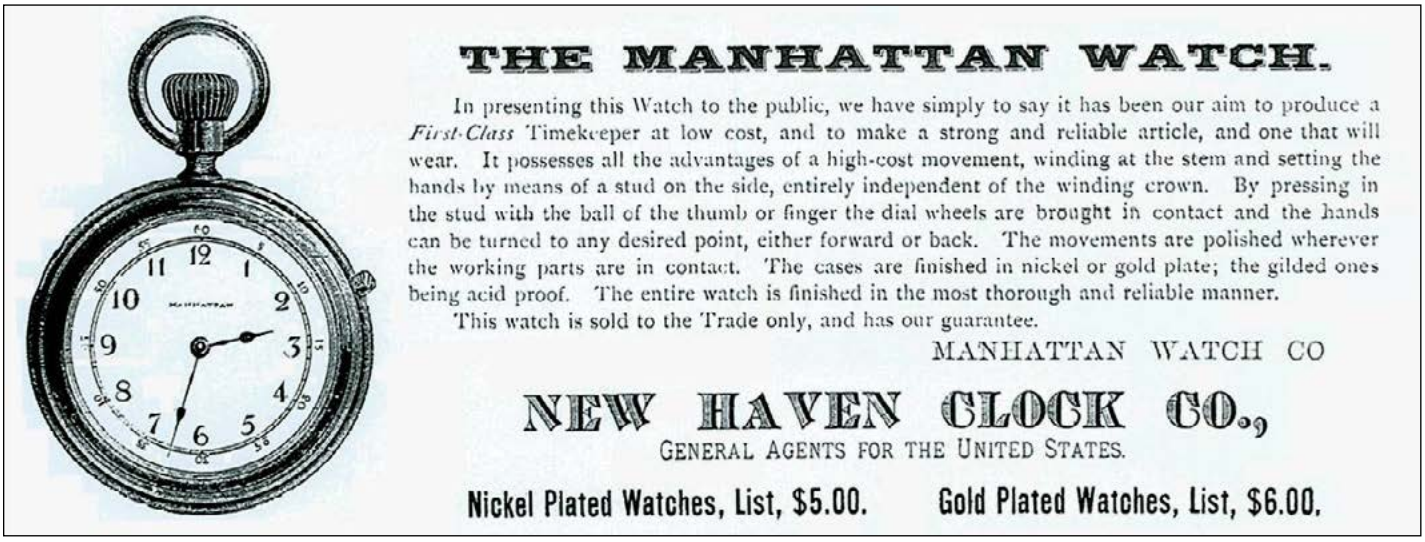


Figure 1. This is a standard Manhattan stopwatch in gold-filled case. Among its features are a pullout button right of winding stem that turns to set hands and a pullout button left of winding stem that stops the movement from running. COURTESY OF THE NATIONAL WATCH AND CLOCK MUSEUM.

Lower-priced watches were the largest market segment, and Waltham and Elgin National Watch Co. dedicated 50 percent of their production to 7-jewel movements. Hampden Watch Co. and Illinois Watch Co., the other two large manufacturers, mostly avoided this segment, because they could



THE MANHATTAN WATCH.

In presenting this Watch to the public, we have simply to say it has been our aim to produce a *First-Class* Timekeeper at low cost, and to make a strong and reliable article, and one that will wear. It possesses all the advantages of a high-cost movement, winding at the stem and setting the hands by means of a stud on the side, entirely independent of the winding crown. By pressing in the stud with the ball of the thumb or finger the dial wheels are brought in contact and the hands can be turned to any desired point, either forward or back. The movements are polished wherever the working parts are in contact. The cases are finished in nickel or gold plate; the gilded ones being acid proof. The entire watch is finished in the most thorough and reliable manner.

This watch is sold to the Trade only, and has our guarantee.

MANHATTAN WATCH CO

NEW HAVEN CLOCK CO.,

GENERAL AGENTS FOR THE UNITED STATES.

Nickel Plated Watches, List, $5.00. Gold Plated Watches, List, $6.00.

Figure 2. This is the first Manhattan Watch Co. ad, showing a dollar-watch grade timepiece. This watch had a push-in and turn setting button at 2 o'clock on its case. At that point, New Haven Clock Co. is the sales agent for Manhattan Watch Co. COURTESY OF THE NATIONAL WATCH AND CLOCK MUSEUM.

not effectively compete with their smaller-scale output. A full-quality 7-jewel watch retailed for $20 or more in a non-precious metal case during the 1870s, and new competition was unlikely to arrive during this period. Following the transcontinental railroad's Credit Mobilier scandal and the ensuing Panic of 1873, the 1870s saw unemployment and rampant business failures that extended to 1879. Consumer spending and entrepreneurial innovation remained low, but as the period was ending, new enterprises began probing for lower-cost watch designs.

A self-sustaining consumer market, in which workers can afford the goods they manufacture, is achieved through large-scale economies. The main factors are designs amenable to low-cost manufacture and low-cost distribution methods, because distribution can overwhelm retail price. The 1870s jewelry trade distributed nonessentials to the affluent, with manufacturers selling to wholesalers, who sold to retailers, who sold to consumers. It was a low-turnover business in which each layer sought as much as 100 percent markup. Manufacturers could push inexpensive designs, but they could only achieve the needed consumer volume through efficient distribution, which manufacturers did not control.

Retail prices can be assessed in terms of average industrial wages, at about $1 per day during the Civil War, $2 per day approaching 1900, and $200 per day now. Today's common consumer watch sells for under half a day's pay, setting a reasonable objective for the price point that was needed to create a consumer watch market. The basic Waltham or Elgin of the 1870s sold for several weeks' pay, which would have discouraged many above average spenders. There was ample space for lower-priced alternatives, the consumer watch market was several decades away, and the historical jeweled watch industry in the United States was severely challenged to ever reach that market. The latter was technically achievable by 1970, when the daily wage was about $40. Unjeweled Westclox and Timex watches then cost less than $10, while a common no-name 17-jewel Swiss wristwatch was about $20. That Swiss watch was fully machined, shockproof, jeweled, and superior to the old Waltham and Elgin 7-jewel timepiece. More importantly, production volumes and capitalizations were far larger than those of the pocket watch era.

In the 1870s the most efficient means of metal manufacture had been stamping components from flat brass sheet with punch presses. This method had been used since 1837 by Jerome Manufacturing Co. and others to make inexpensive clocks. The Pitkin brothers[3] made similarly constructed watches, avoiding machining as much as possible and using clocklike lantern pinions. Their design was clever, adaptive, and prescient—anticipating eventual dollar watches—but the small enterprise was short-lived. After intervening years of other watch-manufacturing progress, wars, and economic fluctuations, the stamped brass watch was ready to reemerge from multiple sources by 1880.

Benedict & Burnham was the primary domestic source of raw brass stock as an industrial commodity and functioned as venture capitalist and startup incubator for brass-consuming manufacturers. In 1878 or 1879 it received a second, and improved, proposal for a simple stamped brass watch movement and case, with only 58 parts and a long mainspring. After a successful production and marketing pilot project, a joint stock company was formed in 1880 for full-scale manufacture. Outside contractors could provide a well-designed and well-equipped watch factory around a specified product and production rate. Effectively conceived and funded, Waterbury Watch Co. produced a simple normal size dollar watch-type mechanism at an initial retail price of $3.50. As production grew to 1,500 watches per day, the price became low enough

for retailers to give away these watches as inducements for sufficiently large purchases.

New Haven Clock Co. made brass clocks in wood cases for a long time, but it progressed to smaller alarm clocks in stamped cases with a bell on top and a winding handle in the back. In 1880 it marketed a somewhat bulbous back-wind pocket watch, essentially a small clock mechanism. From there, stamped watch development split into two branches. In 1890 Waterbury Clock Co., an older Benedict & Burnham spin-off, introduced a less bulbous back-wind watch that caught the attention of Robert Ingersoll. Over several years he guided Waterbury Clock Co. to streamline and improve the product, which he could sell for less than $1.50 in his mail-order catalog. Mail order was booming, so in 1895 Ingersoll purchased the entire 500,000-piece output of Waterbury Clock Co. back-wind watches to be retailed at a mail-order price of $1. The dollar watch was born, expanding to 1 million units the following year. Ingersoll's huge financial commitment combined America's largest watch manufacturer with his mail-order network. Large volume, efficient distribution, and a low-cost design had created a true consumer watch market, with a product retailing for about half a day's wages.

Manhattan Watch Co. joined this progression in the early 1880s (Figure 2). Its watch was patented in 1883, the company was incorporated in early 1884, and its first ad appeared in the *Jewelers' Circular* in early 1885. The watch was a lightweight stamped plain timekeeper (no sweep hand) with relatively streamlined proportions and was specifically noted to wind by the stem, differentiating it from lowly back-winds. Hand setting was accomplished by pushing in a button at 2 o'clock and turning it with a fingertip. Cheap watches of this period struggled with the complexity of combined winding and setting functions, and their watch stem rarely accomplished both. Back-winds set via a stem, Waterbury's long-wind hands were set by pushing them with a finger, and Manhattan had the separate setting button. Everything about the Manhattan watch, with its typical paper dial, had the look, weight, and feel of a dollar watch. But it was offered directly to retail jewelers at $5, which was more than they would pay for this type of timepiece. Manhattan had two employee days of labor in each watch, which was clearly not going to retail for under one day's pay. Manhattan chose to follow the money and tried to move upscale. Do-

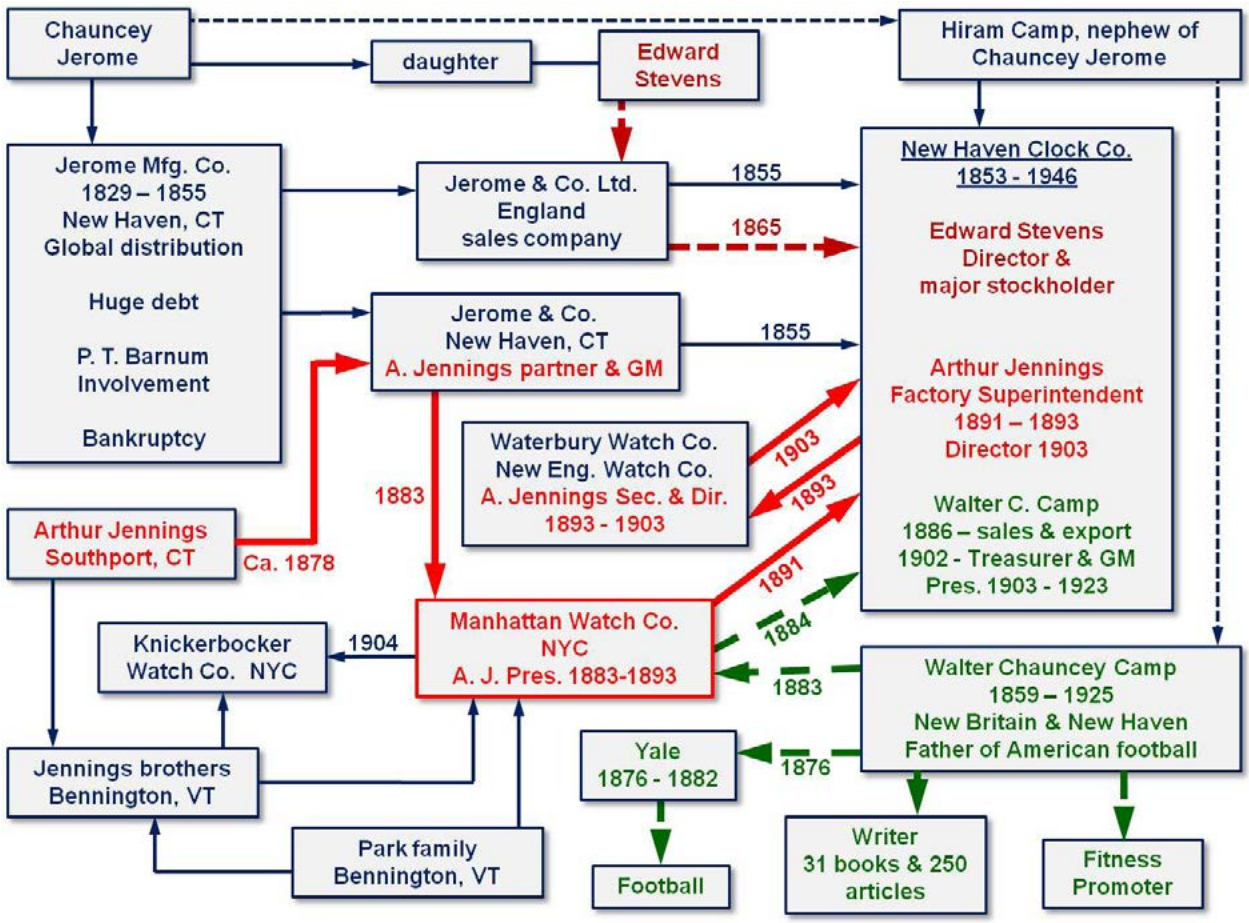


Figure 3. This chart shows the relationship between Manhattan Watch Co. and New Haven Clock Co. principals, including Walter Camp.

ing so elevated them to the second branch of stamped brass watch development—inexpensive jeweled watches.

Manhattan's first ad was part of a full-page spread sharing space with New Haven Clock Co., formed in 1853 by Hiram Camp to make movements for his uncle and stamped brass clock manufacturer, Chauncey Jerome. After the 1856 bankruptcy of Jerome Manufacturing Co., New Haven absorbed Jerome Manufacturing's assets, including an independent sales corporation called Jerome & Co., which had also developed its own products. Former manager of Jerome & Co., Arthur Jennings, formed Manhattan Watch Co.; thus, there were personal and business connections between the Manhattan and New Haven companies. The top half of that first ad described new New Haven products, while the bottom half announced the new Manhattan watch, being distributed by New Haven Clock Co., which still made its back-wind watch. The Manhattan sales office was next door to New Haven's New York City sales office on Park Place, just off Broadway at the top of the jewelry district. During its first years, Manhattan's sales department included Walter Camp, a recent Yale graduate (Figure 3).[4]

Although Walter was related to New Haven Clock founder, Hiram Camp, the relationship was so distant that it is not clear the two knew they were related; in any event, that relationship hardly qualified Walter for a privileged position. It appears that Walter was actually employed by New Haven Clock Co., having started there when he left Yale in 1882. Overall, he worked for the New Haven sales and export department for several decades, where he did very well, but it was not a meteoric rise suggesting nepotism. His football background was not much of a factor, as it might be today. Football was not yet a major pastime; besides, Walter kept his management career so separate from his other endeavors that people in one sphere were not aware of the others.

Origins of US Football

Walter and Hiram were on two separate family branches and lived in different towns and circumstances. Descended from two English brothers who had arrived in America 20 years apart, around 1600, Walter and Hiram were seventh cousins, two generations removed. Walter's family had agricultural and teaching backgrounds, from which he entered Yale in 1876 (Figure 4). That year Harvard and Yale agreed to play an annual rugby match, by Rugby Union rules, rather than soccer. Walter was on the Yale team his freshman year and was captain by his junior year. He was a versatile athlete, good at swimming, tennis, golf, bridge, baseball, track,[5] and crew. He was among the best amateur athletes of his era, a sophisticated athletics thinker with a mind-set for skill, creativity, and innovation that would make sports appealing to participants and spectators.

Walter's focus was rugby, a continuously running game like soccer, in which the ball is run and thrown from player to player, until it can be touched to the ground at the end of the field (touchdown). It is also a game of raw and brute force ("rugby players eat their dead") so that by his junior year Walter began to imagine changes to shift the sport toward strategy and skill. He formulated these ideas in sufficiently convincing form to gain advocates and to convince the rules committee to make the changes. In 1878 he had the number of players reduced from 15 to 11, to reduce mob effect, and the next year he got the "safety" changed to a scoring play. In a fundamental change to the nature of the game, he pushed a rules decision in 1880 to create the scrimmage as a set play with a quarterback and a plan. The continuously running battle became a progression of strategic forays, in something of an athletic chess match.

Walter entered Yale medical school after graduation, and he continued playing for Yale and analyzing and campaigning to evolve his favorite sport. In 1882 he saw enacted the other fundamental change he had lobbied for: ball possession was forfeited if the team failed to advance the ball five yards in three "downs" (obviously, it was altered to ten yards in four downs). Because it was now necessary to measure progress, yard lines were marked on the field, creating a "gridiron" pattern like the iron grate on a brazier. By 1882 he was ready to begin studying surgery under a specific specialist, but that failed to materialize, and he left school and joined nearby New Haven Clock Co.

Positions were shifting by the first 1885 Manhattan ad. The watch company was becoming independent of New Haven Clock, as Manhattan principals purchased a building around the corner on Broadway. Personal relationships remained among individuals, but no subsequent Manhattan ads mentioned New Haven Clock. It is unclear how long Walter was associated with Manhattan, but he was perhaps there into 1886. He returned about then to New Haven and the clock company sales organization, where he rose to near the top of the company hierarchy. This is not surprising. He was certainly a high-energy person, and inventing football was a creative intellectual exercise, not an athletic one. The invention required conceiving, campaigning, and convincing supporters and committees. He was a football lobbyist and legislator, parallel to his executive career in the clock industry. His mind-set was universally one of skill, innovation, and persuasion.

Independent of clock manufacturing, Walter was de facto Yale football coach from 1888 to 1891 and remained involved with Yale University. His wife helped him coach when he could not attend practice.[6] She took notes, and they gathered at home with players and coaches to discuss training and tactics. He was also treasurer of the Yale Financial Union, accumulating a $100,000 fund that helped construct the Yale Bowl. While football was gaining acceptance and was played by only a few colleges, it remained largely unknown and little understood.

Walter subsequently embarked on a writing career.[7] In 1891 *American Foot-Ball with Thirty One Portraits* was dedicated to popularizing the game and sports in general.[8] His book production was divided into three phases, initiated by a series of 11 books focused primarily on football facts, rules, and tactics, interspersed with a few on golf, Yale University, and overall sports.[9] He also began submitting articles to several national periodicals, promoting this new American sport. Through the magazine articles he began selecting "all American" teams of notable players.

Amid a growing depression in 1891 a significant economic downturn ended Manhattan Watch Co. Manhattan Watch founder, Arthur Jennings, consequently joined Walter's New Haven Clock Co. as factory superintendent, where he remained for two years.[10] Meanwhile, Walter's performance at New Haven progressed, and he was elected treasurer and general manager in 1902, and then president in 1903, when he was rejoined by Jennings as a company director. Walter became board chair and CEO sometime thereafter and served until 1923. Among his main tasks was to oversee factory modernization and competitive improvements of an old facility that continued to age through the economic hard times of the 1890s. His durability seemingly attests to prolonged proficiency in one of Connecticut's then-major companies.

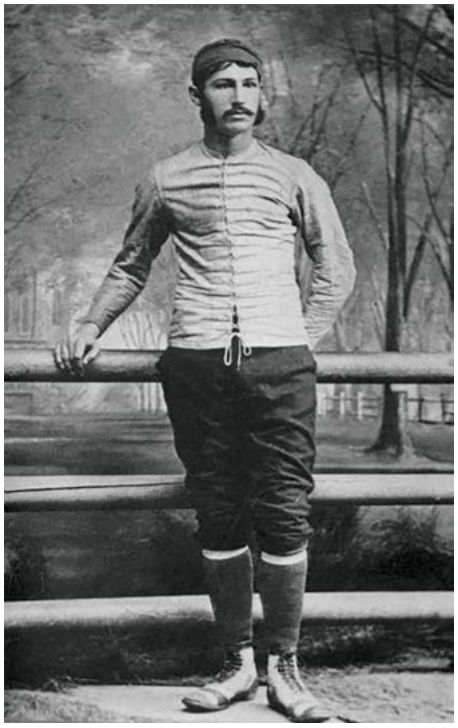


Figure 4. Walter Camp in a Yale University athletics uniform, ca. 1878.

Walter's leadership career in clock manufacture was a significant draw on his physical and mental capacity, which he absorbed in stride. Book publishing continued, along with steering the future of football. He had been on the rules committees since leaving school, which he continued throughout his life. A major test came in 1906, after the 1905 season had seen 19 football deaths.[11] Previous public outcries decried football as too violent, so Walter convened committees to address how to reduce brute force styles of play.

On this occasion, President Theodore Roosevelt, a great promoter of physical activity but whose son was entering the Harvard football team, assembled a special committee that included Walter. This committee formed the National Collegiate Athletic Association (NCAA) and banned the "flying wedge," in which the ball runner was inside a "V" formation where players held onto handles sewn to the uniforms of other players. Modification of uniforms was prohibited, but the main concern was to break up dense high-energy formations. Rugby tradition was that the ball advances only by running, so blocking and tackling were concentrated around runners. Passing could serve to keep the running play going, spreading out the formation, but passing could not advance the ball. The proposed solution was to allow the forward pass, for which play would have to spread out to protect against passing.

Camp was initially opposed to such a major alteration, but eventually he agreed. In the final version of this original rule, the possibility of a large forward passing gain had to be weighed against the risk of a 15-yard penalty if the ball was not caught. This was all moot for several years, because forward passing was deemed risky and undignified in the art of athletic battle. But the practicality gained favor as gradually improving passing ability demonstrated its effectiveness where winning was not the main thing but rather the only thing. The forward pass ultimately met Walter Camp's criterion of increasing skill and strategy over brute force, although the "skill and drill" was a significant challenge and many teams continued to rely on their running game well through mid-century.

Camp then pursued a new publication tactic in 1908, shifting from adult football education with his first football novel aimed at younger readers. The 11 novels were essentially several parallel series following the development and maturing of three young football players as they progressed through secondary school and college. Camp was grooming the next generations. The last of these, in 1915, was illustrated by Norman Rockwell.[12] At that point, writing and other domestic activities were interrupted by impending American entry into World War I.

The war years ushered in a new phase of Camp's life. By some combination of his athletic training background, Yale connections, and his executive capability and credibility, Camp was selected to design and run a practical physical exercise program for President Wilson's overworked cabinet and staff—a shift from athletic performance to an emphasis on whole body conditioning for normal living, using a conveniently brief regimen that people could fit into their daily lives. After that assignment, he was placed in charge of fitness training for Navy and Air Services, which brought him back to more extensive conditioning for hard and sustained physical output. But that experience flipped his attention back to a healthy state for normal citizens when he realized that many draft recruits were being rejected as physically unfit.

After the war, Camp published in 1919 the first of his last nine books, most devoted in some form to personal fitness. The center of his program was the "Daily Dozen" set of exercises that touched on the major muscle groups of the body and could be accomplished in 20-30 minutes. In addition to the books, his system was promoted in magazine articles, and as the 1920s progressed, on the expanding medium of radio. In 1921 he produced the musical health builder record set for home use, because more producible flat pressed recordings—as opposed to cylinder records—had become a growing self-help vehicle after the war.

Public health and fitness became a main focus of Walter's later life, although football was never far from his mind. He had retired from New Haven Clock Co. in 1923 to pursue his other interests, and he died of a heart attack while attending the spring football rules committee meeting of 1925. An unfortunate aspect of his multifaceted life is that Walter Camp's executive career in industrial clock manufacture has excited relatively little research and remains largely unrecorded.

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Notes

1. Not just watches by Roskopf. An entire class of watches have this trait and are collectively known generically as Roskopf watches.

2. Michael Harrold, "Delong, Garbe, and Round Pallet Watch Escapements," *NAWCC Bulletin*, No. 311 (December 1997): 660-672. The description of this patent can be found at www.google.com/patents/US593849 (accessed December 3, 2015).

3. The Pitkin brothers were Hartford, CT, jewelers and silversmiths who attempted industrial watchmaking in the 1840s.

4. Walter Camp was at Manhattan Watch Co. sales department.

5. Walter Camp won swimming races in short and distance events and wrote a golf book and bridge articles. As Yale baseball pitcher and shortstop, he learned the curveball and held league records for fielding and batting. He also invented the hurdle step, rather than jumping steeple-chase style.

6. In 1888 Walter Camp married Alice Sumner, whose brother, William, was a noted Yale professor of political and social science.

7. Walter Camp had won several Yale writing awards during his senior year.

8. With 31 books and hundreds of magazine articles, Walter Camp became a popular and prosperous author.

9. The other two phases were devoted to sports novels and then personal fitness.

10. Arthur Jennings then became secretary and director of Waterbury Watch Co., where he managed its recovery and business for the next decade.

11. Some estimates are higher.

12. Frederick Remington had been on early Yale teams with Walter Camp.