

L. I. Yeomans and His Concrete Ideas

Who was Lucien Ingraham Yeomans and why should you care? Because L. I. Yeomans' ideas were a huge factor in the outcome of WWI. More to the point, he was the man who invented the techniques for using concrete in the construction of machine tools.

He was (as far as my research has been able to verify) the first to patent the idea of using concrete to simplify construction, speed construction, reduce costs as compared to cast iron framed machine tools of comparable construction.

In April 1917, the US declared war on Germany. Europe had been in the throes of war for three years. The USA had remained neutral since the onset of war under the influence President Wilson's neutrality platform. A discussion for the reasons why America was dragged into the war would lead us too far astray from the current subject. But a short discussion of the facts surrounding the times is appropriate.

The politics and events preceding, during, and immediately after WWI are fascinating. Actions and decisions taken then effect our lives today. The history reads like a novel with plot twists and conspiracies and espionage aplenty. If you Google phrases about WWI you can find thousands of pages on the subject. I highly recommend you do so for your own enlightenment. However, I will warrant that you will not find Mr. Yeomans mentioned in any document or web page you find about WWI. To my way of thinking, that is a huge oversight on the part of historians.

The United States was ill-prepared for WWI. We had the remnants of the Great White Fleet built by Teddy Roosevelt but little else. The total compliment of the US Army was 250,000 troops. When you declare war, you have to build a war machine. Manpower would not be a problem. The draft was instituted, unnecessarily; more than one million volunteered. But, production facilities for weapons just did not exist. Howitzers and shells, a few tanks, and some trucks had been sent across the Atlantic to England for months. But the production rate was a trickle compared to what was now needed. Only those too few factories producing armaments under contract with the British government had tooling up to the task. Before the building of cannon and shells could commence, machines to produce the weapons had to be built. Weapons production is a machine tool intensive industry.

Conventional cast iron construction of machine tools is a slow and laborious process. The iron must be stress relieved and trued by skilled workers. Shell making lathes and gun planers and borers would take months just to get the machines built. The actual production of bombs, guns, and ammunition would be even longer into the future. The United States needed machine tools immediately.

There were suggestions that rail car shops could be converted to arms manufacturing. If that were done, how do you increase production of rail cars, which were also needed? Some people wanted to build huge machine complexes that would have become excess to needs when the war ended. And, then, what was to become of these very expensive machines after the war? If major capital was invested in mills and lathes, they must produce something to amortize the investment.

Mr. Yeomans understood the problem exactly and knew the solution: concrete.

Production and efficiency were the driving reasons behind his concrete ideas. In the spring of

1917 Mr. Yeomans spoke at a meeting of the American Society of Mechanical Engineers outlining his ideas for his peers. In that speech, entitled, "[Practical Wartime Shell Making](#)", recorded for us in "ASME Transactions", Vol. 39, he presented an entire plan of manufacture, central to which was a convincing argument for multiple uses of concrete.

In the fall of 1917 he filed for a patent for a large planer built on a concrete bed. That was the first patent I found that specifically mentioned concrete. However, it is clear from illustrations in applications made for patents other than lathes and planers that he was building concrete machine tools for his employer, Amalgamated Machinery Company, a full two years prior to the 1917 filing date.

Lucien's method of concrete machine tool construction solved huge problems. Concrete is literally dirt-cheap; costing pennies on the dollar compared to iron and steel. Though concrete never fully cures, it stabilizes within a month. Compared to iron, this is a gain of nearly 180 days in the construction time. Concrete can be worked by semi-skilled laborers, eliminating the need to use experienced journeymen to install the machine bases. Concrete requires no protection from the elements save freezing. Even the effects of freezing weather can be eliminated with air entrainment admixtures.

Amalgamated Machinery Company received contracts to begin construction immediately. Mr. Yeomans was placed in charge of construction. The plants he supervised were producing guns and artillery shells within 60 days of construction start. If the same machines had been built of iron, half a year would have passed before the first guns could have been built. The machines were so cheap to build they were considered disposable after the war. Machines of this design could be built to any scale. In fact, I read of a planer bed over 500 feet long under construction when the armistice was signed. Because his method was so inexpensive, the planer was abandoned unfinished.

It is not too far afield to say that Lucien I. Yeomans' invention of concrete machine tools tipped the balance of power in WWI. At the very least, his tools allowed the USA to have a more effective role in the European war, ending the stalemate of trench warfare.

Lucien Ingraham Yeomans was born April 3, 1878, into an influential family in New York state. His father, grandfather, and great-grandfather were politicians and horticulturists. They were well known and well respected in both circles. Lucien's uncle was President Grover Cleveland. With his pedigree and connections, Mr. Yeomans could have stayed right where he was and lived a productive and happy life, no doubt about it. But he did not.

Sometime around the dawn of the 20th Century, young Lucien followed the advice of Horace Greeley and migrated westward. It appears, following the residences given on patents, that he moved to the Chicago area before his 23rd birthday. Lucien lived in several towns and suburbs of Chicago as a young man, following the available employment, no doubt. Eventually he and his wife, Mary, made their home in Highland Park, Illinois, where they remained for the rest of their lives. Lucien passed away in 1954, at the age of 67. Whether through illness or accident I have not yet learned. I am still investigating and will edit this article as appropriate. I did find an obituary for Mary though; she lived another 31 years.

The couple had at least one son and a daughter. I believe they may have had as many as four children but I have not been able to find names for any save a daughter, Anne.

Searching patents for "Lucien I. Yeomans" is an interesting exercise. It seems no problem Lucien encountered could not be solved. Machine tools, foundry work, power production, refrigeration, automobiles, horticulture, and even the lowly hand held grass clipper were improved or, in some cases, created out of thin air when he put his mind to a problem. Some of his inventions are of a grand scale, expensive and difficult to build. But most are elegantly simple solutions to problems others either did not see at all or could not find an appropriate solution to apply.

Lucien's first patent (No. 710,390) was applied for in 1901. The patent was for a "Feeding Apparatus for Fruit-Parers". That makes sense, fruit orchards were the family business.

In Patent No. 812,318, filed with the Patent Office September 19, 1904, by Mr. William B. Yates, Mr. Yeomans is listed first as "Attorney" and at the end of the document as "Witness". The patent is for a reversing mechanism for machines driven by a source (belt) that rotates in only one direction. At the time of application Mr. Yeomans would have been in Chicago for just a short period of time. My guess is that Lucien worked in Mr. Yates' shop (Link-Belt Corporation?). Perhaps Lucien only signed the document at the direction of his employer. But, I think the young genius had actually implemented the improvements in the shop and his employer patented the idea as his own. I have no way to know or prove that statement but it certainly fits with the facts: I found four patents for "William B. Yates". I found ten times that number for "Lucien I. Yeomans".

The same patent gives us another bit of information. Sometime between his 21st and 23rd birthday, Lucien moved from New York state to the mid-west.

Curriculum Vitae for Lucien I. Yeomans

Lucien Ingraham Yeomans, b: April 3, 1878, Walworth, NY., d: August 16, 1954. Married to Mary Edna O'Hara before the 1900 census. The couple may have had as many as four children, though I could find only one by name; Anne, who may yet live. If so, she would be quite elderly.

Education?

Still digging. Lucien's family was well-to-do. I assume he had access to very good schools, all the way up to and including a college of his choice. I have yet to find this information. I will update this information as I get it.

Career

As a boy Lucien spent much of his free time frequenting the shops of the machinists and coopers that served the farmers in the fruit district of New York State. That information was gained directly from the man for an article that appeared in 1920. Apparently he knew from the start what he wanted to do with his life.

He served an official apprenticeship at Browne & Sharpe, Boston. He also worked at several shops in New England spending time in every department in shops of all sizes. He returned to Browne & Sharpe for a short time in 1900. After that:

Governor Goodell Co., New Hampshire, Machinist (c. 1901 – 1902?), where he filed for his first patents on Fruit-Parers. These machines are said to be the first fully successful paring and sorting machines of their type.

Heald Machine, Worcester, Massachusetts, Superintendent (c. 1902? - 1904?) Lucien supervised a move to new quarters for the company where he implemented the first shop planned from the start to improve productivity and efficiency.

Fuller & Johnson Manufacturing, Madison, Wisconsin, Superintendent of Gasoline Engines Plant (c. 1904)

Link-Belt, Inc., Chicago, Assistant Superintendent, (c. 1905)

Sears, Roebuck & Co., 416 E. 48th Pl., Chicago, Ill. -- Production Engineer, Dept. 213 (c. 1910?)

David Bradley Manufacturing Company -- Production Manager (c. 1913)

Amalgamated Machine Tool Company -- Chief Engineer and VP (1915?-1920)

"Amalgamated Machinery Corporation, 72 W. Adams St., Chicago, 111., at Its annual meeting of the board" of directors, elected the following officers for the ensuing year: President, T. K. Webster; vice-president, L. I. Yeomans; secretary, Walter A. Strong; treasurer, O. M. Moderwell"¹

Yeomans, Inc., 205 W. Wacker Dr., Chicago 6, Illinois. (1915? - ?)

Lucien maintained an office as a consulting engineer from about 1915 until his untimely passing.

In 1922 Lucien and a few other principals filed the papers for a new company, American Metal Products, based in Chicago, to produce parts for the automobile industry. This company was either stillborn as a result of the Great Depression or was sold off to another concern; I have found no other information about it.

Lucien I. Yeomans, Inc., 53 West Jackson Boulevard, Chicago, Illinois, President. (? – 1954)

As an independent consultant Lucien was quite successful. Though I think we can assume he had difficulty during the Great Depression, as did everyone, he was fully self-employed from 1920 until he passed away in 1954. He worked with or for many companies and individuals during that time.

One patent, filed during WWII, for a concrete tool design was assigned to Hardinge Corporation. Ever hear of Harcrete?

Mention must be made of DeWitt Clausen, an associate and apparently a close friend. Several patents were co-authored with DeWitt Clausen. It appears that Mr. Clausen first worked for Mr. Yeomans at Lucien I. Yeomans, Inc., and later started his own company, Clausen Machine Tools, Inc., Akron, Ohio. The split in business relations appears to have not come between the two however. Yeomans and Clausen shared dual authorship on some patents (besides their individual patents) for at least two decades.

YEOMANS, Mary Edna (O'Hara); b. (not given); d. 15 Jun 1985, Highland Park, IL; Bu.: Mt. Sterling Cem., Mt. Sterling, IL; a former resident of Mt. Sterling; M. Lucien I. Yeomans (date & place not given), he preceded her in death: Fa.: Edward O'Hara; Mo.: Anne Murphy; The last member of her generation of two of Mt. Sterling's oldest families: Murphy and O'Hara, being among the earliest

1 "Machinery", Vol. 24, February, 1918, pg. 582

residents of Mt. Sterling and two of the founding families of St. Mary's Catholic Church; survived by a daughter: Anne; and four grandchildren; Preceded by a brother: Gene O'Hara; two sisters: Agnes O'Hara Mears and Loretta O'Hara Mallowney; and a nephew: Dr. J. P. Mallowney.

I do not yet have an obituary for Lucien. I may have to subscribe to the Chicago newspapers to gain access to their archives.

If you have stumbled upon this article and have information about Lucien Ingraham Yeomans, please contact me: sdewolfe-at-cricketlady-dot-com.