

The global magazine for valve and actuator users, suppliers, and specifiers

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Valve World

Cover Story

160 years of Crane Values



ORIGINALLY PRINTED IN THE VALVE WORLD MAGAZINE
INTERNATIONAL EDITION, DECEMBER 2014

160 Years of Crane Values

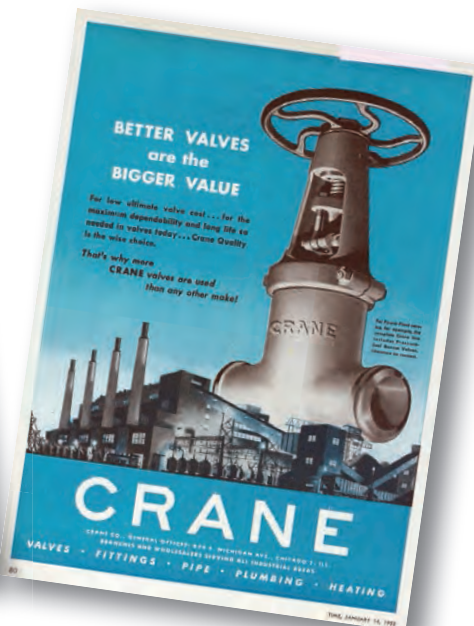
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Time, 1952

Crane's Newsletter "The Valve World"
Circa 1908, Showcasing Bridgeport Works

160 years of Crane Values

What is a valve? The Merriam Webster dictionary defines it as a mechanical device that controls the flow of liquid, gas, etc., by opening and closing. While this may define its mechanical properties, it does not adequately reflect its importance in our lives. A heart valve may fail, resulting in life-critical consequences. In recorded history, it is claimed that the first users of manufactured valves were the Romans, who used a "plug type" valve with metal-to-metal seating surfaces. As in any human endeavor, there were a few pioneers who championed the development of valve technology, using new materials and new principles of operation. One such pioneer was Richard Teller Crane, who started one of the earliest valve manufacturing operations.

Valves (in all their variants) are indispensable for life, and equally, for our advancing civilization. In our technologically modern day, the proper flow and mixing of inputs at the right volumes and timing is of vital importance. Unwanted emissions may damage the environment, or even cause injury or death.

As in any human endeavor, there were a few pioneers who championed the development of valve technology, using new materials and new principles of operation. One such pioneer was Richard Teller Crane, who started one of the earliest valve manufacturing operations in America (in 1855, before the Civil War), and over the course of Crane's (the company's) history, many innovations were introduced and adopted by everyone else in the valve industry.

In its anniversary edition of Crane's history book, there is a quote by Ralph Waldo Emerson: "Every great institution is the lengthened shadow of a single man. His character determines the character of the organization." This sentiment might have been more appropriately conveyed by saying that there must be an idea (which might be introduced by a man or a woman) that fills a need. A concept that is needed by humanity, and the delivery of that solution must be done in an ethical manner (essentially, meaning that the value for customers must warrant their willingness to purchase certain valves – valves must deliver value, while complying with what is "right").

Ethical Value

Decades, if not centuries, ahead of his time, Richard Teller Crane realized that

a successful company must adhere to a set of values. He treated every customer, competitor, supplier and employee with the utmost respect, knowing that his or her commitment would result in a better product.

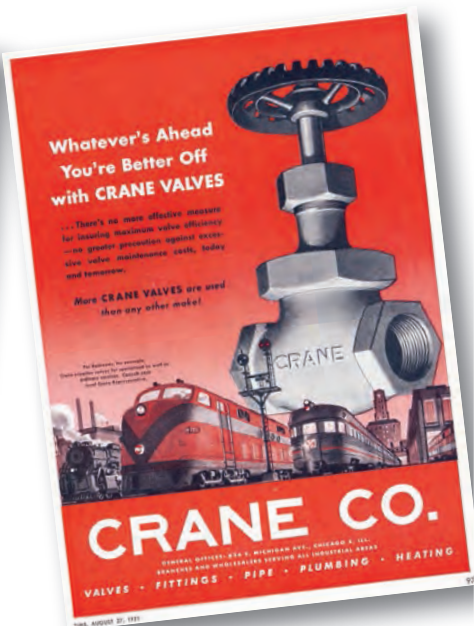
Many decades before companies adopted such practices, R.T. Crane organized a picnic for his employees that required 16 special trains of 10 cars each just to bring them all together along with spouses (that was more than 100 years ago!) to celebrate the company's 50th anniversary. R.T. Crane was a visionary with enlightened ideas that were advanced even by today's standards. It might be unexpected to say that since July 4, 1855, the ethical principles of Richard Teller Crane have held and formed the "backbone" of the company. Today, the ethical principles of R.T. Crane still hold, and continue to inspire a pride



Circa 1940s

in the workmanship that produces its valves and other Crane products. In fact, those values directly contribute to Crane's profitability as a company. Those values, to put it in modern terms, are a part of Crane's value proposition. Crane designs, builds, and tests valves to ensure the utmost quality of each valve, and has done this for over a century.

The critical purpose and nature of valves is why your choice of valve has far-reaching consequences. And one ought to make that choice based on information that has been validated in the field. Astoundingly, Crane has "motion picture" videos of its valve production lines from the 1920s, which will be shown at its upcoming tradeshow. While the production methodology may appear somewhat antiquated (in part owing to limitations of camera technology of the day), you will discover an amazing fact. Already, back then, the production was automated and each valve was tested to ensure it performed as advertised. That was almost 100 years ago! The history of Crane is the history of valves in America. It may not go as far back as the Romans, but it coincides with the history of the Industrial Revolution in America. The ingenuity of America is built into the history of the development of technologies of Crane valves. Crane recognized that there were other brilliant inventors and technologies in other fields, from which Crane could learn. That is



Time, 1951

why Crane adopted the use of Teflon® in its products for corrosive and abrasive applications, among many other inventions. PTFE (polytetrafluoroethylene, Teflon being a commercial brand name owned by E.I. DuPont de Nemours) became a material of choice for many Crane valve components, such as liners and gaskets, etc. Low surface tension (being extremely low for Teflon) also allows for lower viscosity ("stickiness") of fluids passing through it. It should be noted here that Teflon is highly hydrophobic (it does not permit water [or, for that matter, virtually any liquid] to adhere to it).

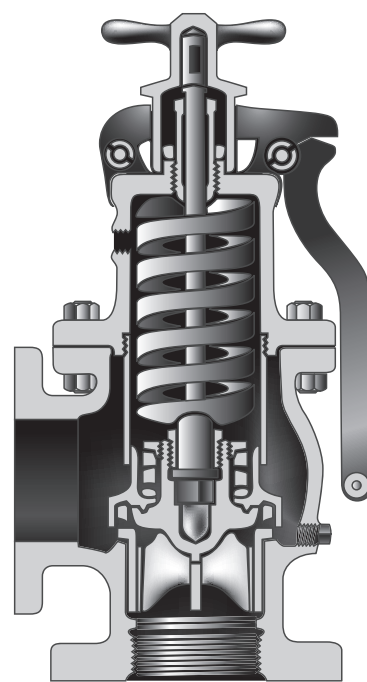
Richard Teller Crane had a short childhood compared to most of us. His father died when he was 9 years old, and Richard had to work in a cotton mill to help support his family, working 12-hour shifts. He got introduced to industries that relied on metallurgy when he became an apprentice at a brass and bell foundry in Brooklyn. In 1854, work had begun on the transcontinental railroad, and Chicago was seen as the link between the East and the West. R.T. Crane launched his one-man business in Chicago on Independence Day in 1855, even firing up his furnace on that day. Richard was 23 years old at the time. Crane's first big break came with its ability to deliver products to freight car manufacturers while others struggled (they were not able to secure copper which Crane managed to do).



Circa 1905

The first large contract

In 1858, Crane landed its first major contract to supply the steam-heating system for the Cook County courthouse in Chicago. The \$6,000 contract was the largest of its kind in the region. Richard had invited his brother to join him in his business, and in 1865, they built a grand factory in Chicago that housed the first malleable iron foundry west of Pittsburgh, and served as the Company headquarters until 1915.



In early 1900s Crane Co. introduced pop safety valves and drainage fittings, and steam and oil separators, among others.



CRANE building in Chicago, early 1900s



CRANE Employee Celebration, 1905

In 1867, Crane added a new line of business: steam-powered elevators. Crane eventually sold that business in 1898, and it merged with others to form the Otis Elevator Company (the one known for its innovation that prevented its elevators from falling even if the cable did not hold). Crane Co. opened its first branch office in Omaha, Nebraska, in 1884. Its success led Crane to open several others throughout the country.

R.T. Crane realized that a successful industrial business would have to rely on automation and standardization (of both manufacturing and other business processes). The Company's engineers devised a steam-powered conveyor system for moving metals and molds and for pouring hot molten metals, and constructed a merry-go-round casting machine, which is believed to be (at the

time) the first significant improvement in the molding process in centuries, and is considered to be the first line production system in the metal-working field. Working with the conviction that there must be principles and processes that would guide humanity's technological endeavors, R.T. Crane published, in 1896, a book with the title "Standard Metals." It detailed where and how metals are found, the way they are produced (extracted and refined), and how they can be used in "mechanics." In mid-1908, Crane published "The Valve World" periodical that showed, on its front page, the Bridgeport plant (which became the "Crane Valve Company"). Every year since its inception in 1855, there were new inventions, new processes, new products, and new acquisitions. The list is rather long, and is best read in Crane's anniversary books where they are described (along

with original historically significant images and drawings).

Having adopted R.T. Crane's values, successive generations of Crane's management continued the drive toward greater automation and standardization of internal processes which eventually became today's Crane Business System.

Guiding the Industry

Crane recognized early that the design of piping systems incorporating valves had to be done based on an understanding of the principles governing the flow of fluids (and other media that can be conveyed via a pipe and controlled by valves). For this purpose, Crane developed its Technical Paper No. 410 (TP-410), which is generally recognized as the quintessential guide to understanding the flow of fluid through valves, pipes and fittings, enabling you to select the correct equipment for your piping system. Originally developed in 1942, the latest edition of Crane TP-410 has been fully updated to reflect the latest knowledge and research in the fluid handling industry. The TP-410 has served as an indispensable technical resource for over 70 years to specifying engineers, designers and engineering students.

It is all part of Crane's never-ending quest for automation and standardization. Simplification might be another principle, for which reason Crane recommends a website that does the calculations (called for in its TP-410 and is a "companion" to it) one needs to make in designing (and especially optimizing) systems utilizing flow of fluids (www.TP410.com).



Circa late 1800s



A strong past leads to a stronger future

Today, Crane Co. is a diversified manufacturer of highly engineered industrial goods and equipment, delivering products and solutions to customers in the chemical, petrochemical, power generation, refining, aerospace, electronics, automated merchandising, transportation and other markets. The Company offers a wide range of products including check valves, sleeved plug valves, lined valves, process ball valves, high performance butterfly valves, bellows sealed globe valves, aseptic and industrial diaphragm valves, multi / quarter-turn valves, actuation, sight glasses, lined pipe, fittings and hoses, and air operated diaphragm and peristaltic pumps. Crane has approximately 11,000 employees across the globe. Crane Co. has been traded on the New York Stock Exchange (NYSE:CR) since 1936.

Crane and its valves encompass many lives and families, and their many endeavors whose results are here with us today. While it may be true that most advances are made by people “standing on the shoulders of giants” – as R.T. Crane was in his field, it is also true that “Crane people” that followed made the company what it has become. In 2015, Crane will have celebrated its 160-year history, which, in a sense, will also be a celebration of all its customers, employees and stakeholders. The knowledge base comprised of the combined experience of Crane employees is likely broader than any other

in the world today. Crane also recognizes, in fairness and with respect, its several competitors who have had a long history as well, and salutes their accomplishments. It is to be expected that at times valve pioneers learn from each other. Valves are here to stay. They play a vital part in our biology and our technology. Perhaps we do not hear about them as much as we might otherwise, because they are taken for granted. We expect them to work, and to never fail. And, if chosen and maintained properly, they keep on doing the jobs they were designed to do.

So what was the primary ethical principle that Richard Teller Crane committed to in writing on July 4th, 1855? – “I am resolved to conduct my business in the strictest honesty and fairness; to avoid all deception and trickery; to deal fairly with both customers and competitors; to be liberal and just toward employees, and to put my whole mind upon the business.”

And so he did.

The recently updated Technical Paper TP-410 (Flow of Fluids) is a technical resource for engineers, designers and engineering students that explains the flow of fluids through valves, pipe and fittings to aid in the appropriate selection of equipment for piping systems. The recent edition marks the introduction of a companion website containing a suite of web-based tools that solve equations found within the paper.

www.TP410.com



R.T. Crane published this text in 1896 on where metals are found, the manner of their production, their character, and their uses in mechanics.

