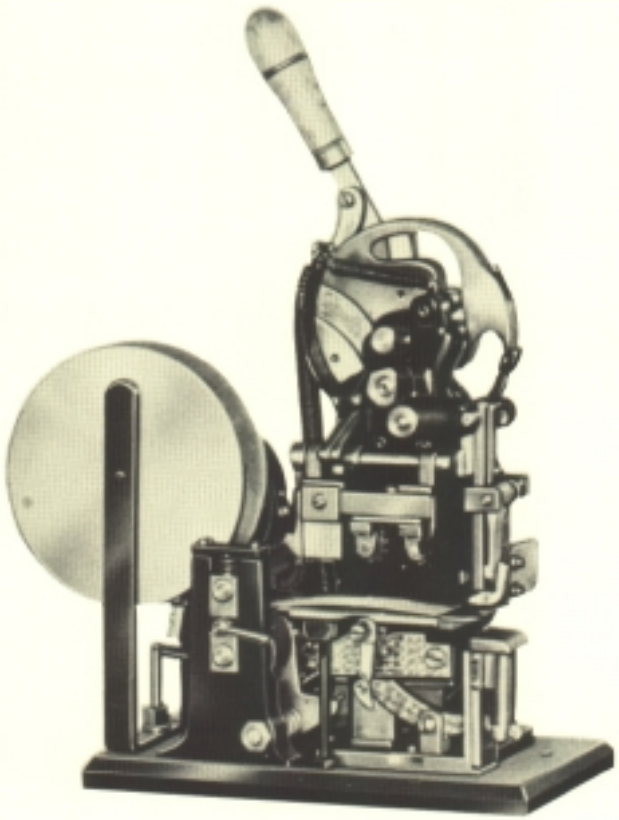
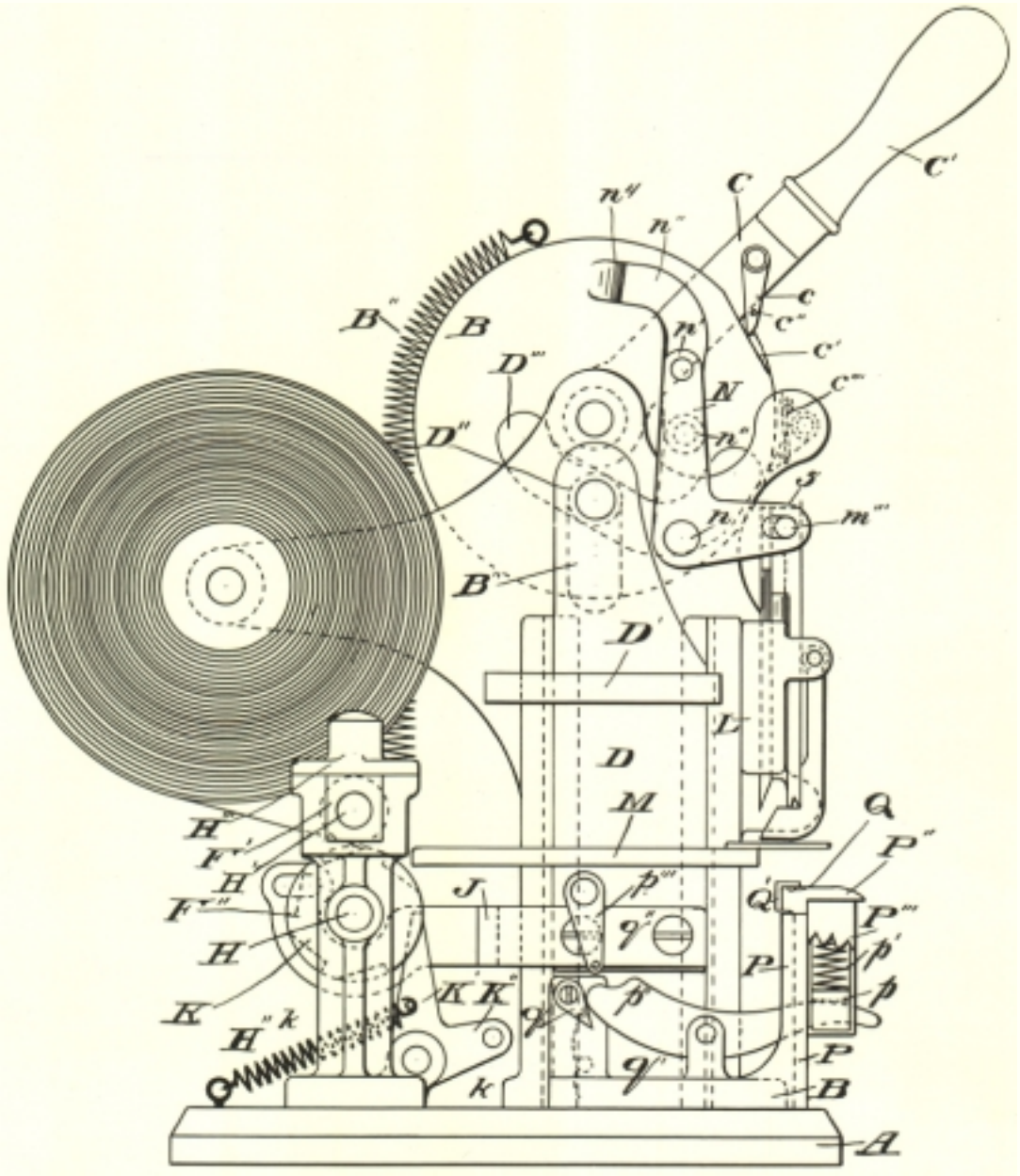
The American Society of Mechanical Engineers

PIN TICKETING MACHINE CIRCA 1902



A National Historic Mechanical Engineering Landmark

Monarch Marking Systems
Dayton, Ohio
November 15, 1990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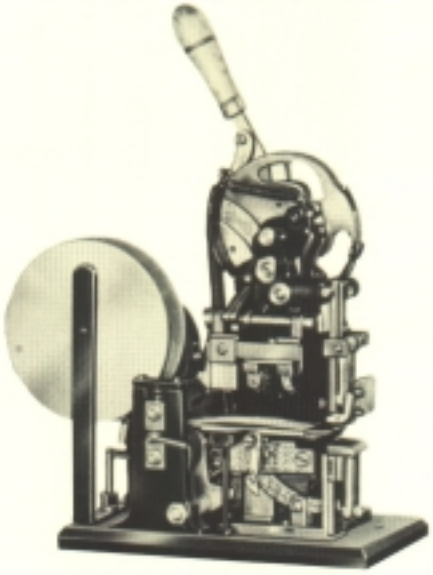
Designated the 98th National Historic Mechanical Engineering Landmark by the American Society of Mechanical Engineers November 15, 1990



Pin Ticketing Machine - Circa 1902

Introduction

Throughout history, people have been faced with the task of labeling or tagging various objects and artifacts to convey information about their name, source, age, destination, use, cost, or other factors pertinent to some particular application. This need is shared in one form or another by museum curators, archeologists, manufacturers, shippers, jobbers, warehousemen, libraries, hospitals, blood banks, photo processors, and others.

The retail store operator, in particular, needs to tag merchandise with information about color, size, style, and price for use by salesclerks and customers. There is a long history of techniques and devices that have been developed for fulfilling this need. The Pin Ticketing Machine, developed in the early twentieth century, was one of the first such mechanical devices designed to meet the specific marking needs of the retailing industry. It performed a number of functions in a single-stroke operation and offered to the merchant a vast improvement in the accuracy and security of the merchandise marking operation.

History of Development

During the nineteenth century, the distribution and sale of merchandise to the retail consumer in the United States evolved from the trading post and general store to retail outlets that were somewhat more specialized in the products they offered and the services they rendered. The development of these more individualized outlets, like the department store, the hardware store, the dry goods store, the grocery store, and others, led to more efficient and cost-effective distribution of consumer products.

As the size of retail outlets grew from the proprietor-operated shop to the larger store staffed by many salesclerks, the need for price marking on each piece of merchandise also grew. Prior to the availability of mechanical devices to perform this function, the retailer's only means for marking goods was by writing price and other information on paper tags or tickets and attaching them with straight pins or strings to the merchandise. This system was burdensome and costly and fraught with frequent and sometimes serious pricing errors. Instances of illegible handwriting, blurred and indistinct figures, and tags insecurely fastened to the merchandise occurred all too often.

Although not personally involved in retail price marking operations, Frederick Kohnle, a resident of Dayton, Ohio, and the founder of the predecessor to Monarch Marking Systems, recognized early that fastening price tags to clothing and other textile articles with straight pins was difficult, time consuming, and in many cases faulty and insecure. In 1890 he invented a paper price tag that had a wire fastening device embedded within its folds. This device enabled unskilled salesclerks to attach tags easily, safely, and securely to garments, yard goods, and other textile products. U.S. Patent #457783 was granted for this invention in 1891.

Having secured financial backing for the formation of a company to manufacture this tag, Kohnle and a group of investors formed the Climax Tag Company. The fledgling company experienced a variety of technical and financial problems throughout the 1890s and underwent several reorganizations and name changes.

Meanwhile, William G. Metcalf, another Dayton inventor, had conceived a device that would create a ticket from a supply roll of paper stock, imprint price information on it, and fasten it to a garment by means of a wire staple. In 1898 and 1899 he was granted U.S. Patents #607119 and #619773 for these inventions. Metcalf sold his patents to the Metcalf-Snyder Manufacturing Company of Dayton, Ohio on April 9, 1900. The patents subsequently were sold to the Automatic Pin Ticketing Machine Company of Dayton, Ohio on November 18, 1903. Frederick Kohnle at that time was the superintendent of the Automatic Pin Ticketing Machine Company.

Even before the formal purchase of the patents by his company, Kohnle had begun development of a table-top, hand-operated machine based upon those patents and his own knowledge of merchandise ticketing requirements in the marketplace. An engineering model was completed in 1901-1902 and placed on test at the Elder & Johnson Company, a Dayton department store. Although Monarch company records for identifying the specific machine used are no longer available, it is believed that the test was conducted using today's

landmark device or a companion model built at the same time.

Concurrent with or immediately following the Elder & Johnson Company test, Kohnle developed a floor-mounted, foot-treadle-operated version that performed all of the Pin Ticketing Machine functions while leaving both of the operator's hands free for handling the merchandise being ticketed. He applied for a patent on this device October 26, 1903 and was granted U.S. Patent #762322 on June 14, 1904. The floor-mounted version was then named the Automatic Pin Ticketing Machine.

With the improved productivity provided by the foot treadle operation and based upon the success of the Elder & Johnson Company test, Kohnle and his associates subcontracted production of the first units to a Dayton machine shop, the Weinman & Euchenhofer Company. By mid-March of 1904, nearly 150 units had been completed. (Ref."Never Dies The Dream" by Margaret Ann Ahlers and Esther B. Kohnle, published in 1950 by Charles McLean, Dayton, Ohio, and the Antioch Press, Yellow Springs, Ohio.)

Description of the Landmark

The Pin Ticketing Machine is a hand-operated. table-top machine 6 inches wide by 13 inches deep by 18 inches high. In operation, the device was loaded with a roll of paper ticket stock and a roll of soft wire. The paper roll was 5½ inches in diameter by ¾ inch wide and the paper thickness was about .015 inch. The wire roll was 3 inches in diameter and the wire diameter was .023 inch.

With a single downward stroke of the operating handle, the machine performed the following functions:

1) From two lines of operator-settable print wheels, inked by a felt ink roller, it imprinted up to seven digits of price and other information on the ticket stock.
2) It advanced the imprinted ticket forward toward the operator to a position where the merchandise could be placed beneath it in the attaching position.
3) It severed the one-inch-long ticket from the main supply roll.
4) It fed and cut off a controlled length of wire sufficient to form an attaching staple.
5) The merchandise having been inserted beneath the imprinted and severed ticket, the machine then clamped the merchandise against the ticket, formed the cut-off length of wire into a staple, inserted the legs of the staple through the ticket and the merchandise, and secured it by folding over the legs of the staple on the underside of the merchandise.

Technical Background

The challenge in the development of this device was to automate a process that consisted of several different functions and which theretofore had been performed entirely by hand. As such, it was inefficient, costly, and subject to human errors that sometimes resulted in monetary loss. The inventions cited above provided the background for the development of a pin ticketing machine.

The problem faced in this development was in producing a device that would function reliably with a range of supplies. It had accurately to feed and sever paper ticket stock that varied from roll to roll in stiffness, shear strength, and thickness. It had accurately to feed, sever. and form staple wire that also varied somewhat in diameter and shear strength. It had to accommodate a range of merchandise thicknesses from thin cotton garments to thick woolen blankets. In addition, the machine had to be convenient and relatively non-tiring to operate, since a clerk was expected to operate it continuously for several hours at a time.

Description of Machine Operation

The principal elements of the Pin Ticketing Machine are shown schematically in Figures 1, 2, 3, and 4. The mechanical driving elements (links, levers, cams, bellcranks, etc.) have been omitted for the sake of clarity.

Referring to Fig. 1, it can be seen that the merchandise (A) to be ticketed already has been positioned over merchandise anvil (B). Furthermore, the ticket stock (C) has been advanced forward (to the right) so that one ticket is in position to be severed by the paper knife (D) and attached to the merchandise.

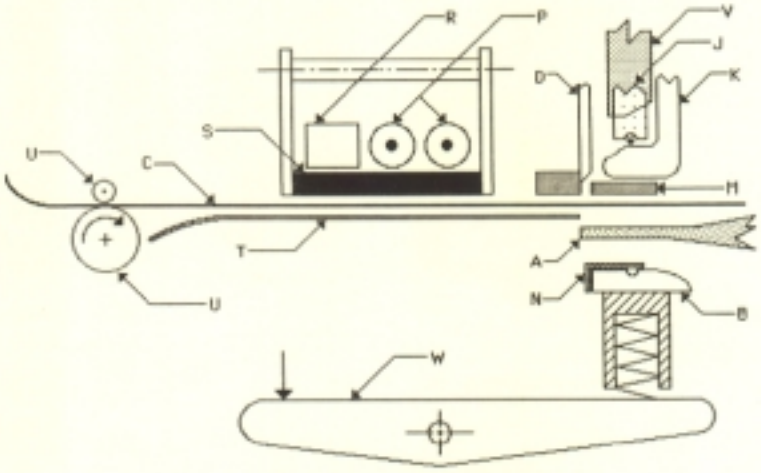


Fig. 1 - Left Side View

A - Merchandise
B - Merchandise Anvil
C - Ticket Stock
D - Paper Knife
J - Wire Knife and Staple Former
K - Staple Anvil
M - Bolster Plate
N - Staple Leg Guides
P - Print Wheels
R - Type Chase
S - Ink Roll
T - Print Platen
U - Ticket Stock Feed Rolls
V - Staple Driver
W - Lever

Referring to Figure 3, it can be seen that the staple wire (E) has been advanced (from the right) through the wire guide tube (F) and the wire guide block(G) so that a length of wire representing an unformed staple (H) is in position to be severed by the wire knife and staple former (J). Fig. 2 shows more clearly how this severing action between the wire knife (J) and the guide block (G) is accomplished.

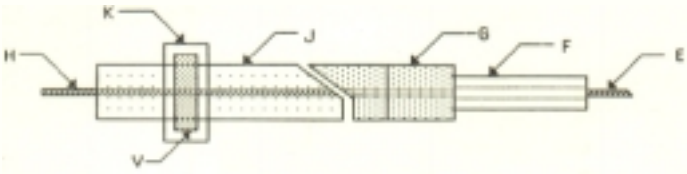


Fig. 2 - Top View

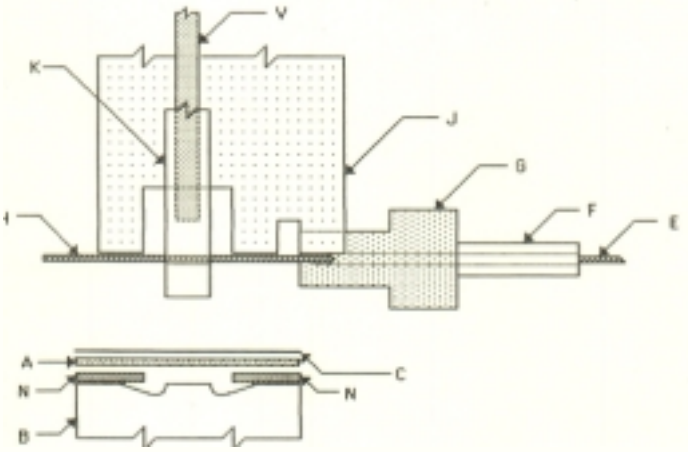


Fig. 3 - Front View

A - Merchandise
B - Merchandise Anvil
C - Ticket Stock
E - Staple Wire
F - Wire Guide Tube
G - Wire Guide Block
H - Unformed Staple
J - Wire Knife and Staple Former
K - Staple Anvil
N - Staple Leg Guides
V - Staple Driver

Returning to Fig. 3, on the downstroke of the operating handle (not shown), the wire knife (J) is driven downward, thereby severing the staple wire (E) where it exits from the wire guide block (G). During this cutting action, the unformed staple (H) is captured between two surfaces of the staple former (J) pressing downward on it and one surface of the staple anvil (K) supporting it. Immediately after the staple wire has been severed, the legs of the staple are formed downward by the staple former(J) as it continues to move toward the ticket and the merchandise. The staple anvil (K) stays in its “up” position until the legs of the staple have been completely formed. It then is driven downward in parallel with the movement of the staple former (J), as shown in Fig. 4. At the same time, the staple driver (V) is lowered into intimate contact with the cross bar of the staple.

As the staple begins to pierce the ticket (C), the staple anvil (K) is retracted from under the cross bar of the staple, and the staple driver (V) continues to drive the staple downward through the ticket (C) and the merchandise (A).

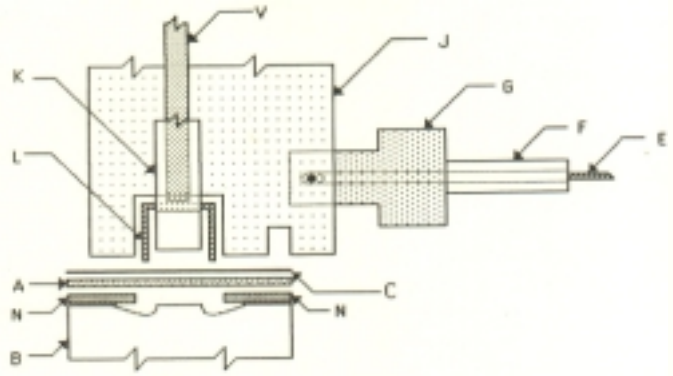


Fig. 4 - Front View

A - Merchandise
B - Merchandise Anvil
C - Ticket Stock
E - Staple Wire
F - Wire Guide Tube
G - Wire Guide Block
J - Wire Knife and Staple Former
K - Staple Anvil
L - Formed Staple
N - Staple Leg Guides
V - Staple Driver

Returning to Fig. 1, the downstroke of the operating handle also causes the merchandise anvil (B) to be lifted by the lever (W) so as to clamp the merchandise (A) and the ticket(C) against the bolster plate (M). In this position, as the staple is driven downward by the driver (V), the two staple legs are folded outward and upward when they encounter the ovoid-shaped recesses (see Fig. 4) in the merchandise anvil. The staple leg guides (N) protect the merchandise (A) from being repierced by the staple legs. At the extremity of the downward stroke of the operating handle, the upward pressure of the merchandise anvil (B) against the bolster plate (M) is released, thereby allowing the operator to remove the merchandise and its attached ticket from the machine.

Again referring to Fig. 1, the print wheels (P) and the type chase (R) are shown being inked by the ink roll (S). This action occurs during the downward stroke of the operating handle. The ink roll swings completely outboard of the imprinting elements, which then are lowered into contact with the ticket stock (C) against the print platen (T). During the ensuing upstroke of the operating handle, the print wheels and type chase are lifted from the ticket stock, the ink roll is returned to its home position, and the imprinted ticket stock is fed forward to the attaching position. The ticket stock feed rolls (U) are timed to advance the ticket stock (C) forward from its supply roll, once the paper knife (D), the merchandise anvil (B), the staple anvil (K), and the staple driver (V) have been retracted out of the way by the upstroke of the handle. Similar feed rolls on the opposite side of the machine advance the staple wire (E) into position for creating the next unformed staple (H), once the wire knife and staple former(J) and the staple driver (V) are out of the way.

Impact of this Development

This machine was the prototype that served as the foundation for an entire line of products used by the retail industry for the identification and price marking of merchandise. Prior to its introduction, the marking of retail soft goods was a cumbersome hand operation. This device and those that followed it automated the marking operation, while at the same time providing substantial improvements in accuracy, legibility, and security.

This machine and the many inventions and improvements that have grown out of it in the past nine decades have contributed immeasurably to the growth of the retail industry in the United States and worldwide as well. Just as the industrial revolution made enormous contributions to the growth of the world economy through the mass production of manufactured products, the ability of the retail industry to deliver those products to the consumer at the lowest possible cost has also been essential to this economic growth. This landmark development and those that followed provided the retail merchant with the tools he needed to reduce cost and eliminate errors, and to enhance accuracy and security in what had been one of his most labor-intensive and error-prone operations.

Text of the Pin Ticketing Machine Plaque

NATIONAL HISTORIC

MECHANICAL ENGINEERING LANDMARK

PIN TICKETING MACHINE

MIAMISBURG, OHIO

CA. 1902

This was the first successful machine for mechanizing the identification and price marking of retail merchandise. At a single stroke of the operating handle the machine formed a tag from a roll of stock, imprinted it with price and other information, formed a wire staple, and stapled the tag to the merchandise. This means for dispensing with handmade and written tags amounted to a minor revolution in the then rapidly expanding retail industry.

This machine was developed by Frederick Kohnle, and early examples were produced by the Automatic Pin Ticketing Machine Co., a predecessor of The Monarch Marking System Co.

The American Society of Mechanical Engineers

1990

Frederick Kohnle
1860 - 1944

Frederick Kohnle was born December 7, 1860 in Germantown, Ohio, a small village fifteen miles southwest of Dayton. His formal education ended at age fifteen, when the death of his father made it necessary for him to help support his family. During the ensuing fifteen years he worked as a repair technician, metal polisher, mechanic, and machinist. Following his initial invention in 1890 of the pin ticket, all of Kohnle's time, effort, and intellect were devoted to the development and improvement of marking systems, devices, and supplies. He organized a series of partnerships and small companies to pursue and support these activities, culminating in the establishment of The Monarch Marking System Company in 1920.

Kohnle's ability as an entrepreneur and businessman was more than matched by his technical and inventive genius. During his lifetime, the United States Patent Office granted him 61 patents, followed by two additional ones that issued after his death in 1944. All of his inventions were related to tickets, tags, or labels, the machines for imprinting, applying, or attaching them, and the paper conversion machinery for their manufacture.

Fred Kohnle was a devoted husband and father. Married in 1885, he and his wife Laura were blessed with a daughter, Sarah, and two sons, Robert and Edward, both of whom ultimately joined their father in the operation of his business.

Kohnle was also a generous and public-spirited citizen of his community. A long-time member of the Engineers Club of Dayton, he served as its president in 1930-31. He was a charter member of the Dayton Rotary Club and the Dayton Bicycle Club, a trustee of the Miami Valley Hospital Society, and a member of the Dayton City Plan Board. He was an ardent and active supporter of the Dayton Art Institute, the Boy Scouts of America, and many other community service organizations.

The ASME

The American Society of Mechanical Engineers, founded in 1880, is a worldwide engineering society focused on technical, educational, and research issues. It conducts one of the world's largest technical publishing operations, holds technical conferences, and sets many industrial and manufacturing standards.

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Pitney Bowes Inc., Stamford, Conn., is a multinational business equipment, supplies, and financial services company. Founded in 1920, Pitney Bowes produced the first postage meter to be adopted by the U.S. Post Office, which ASME designated an International Historic Mechanical Engineering Landmark in 1986. Pitney Bowes acquired Monarch Marking Systems in 1968 and operates the company as a subsidiary.

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The History and Heritage Program of the ASME

The ASME History and Heritage Recognition Program began in September 1971. To implement and achieve its goals, ASME formed a History and Heritage Committee, composed of mechanical engineers and historians of technology. The Committee provides a public service by examining, noting, recording, and acknowledging mechanical engineering achievements of particular significance. The History and Heritage Committee is part of the ASME Council on Public Affairs and Board of Public Information. For further information please contact Public Information, American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017, (212) 705-7740.

Designation

The Pin Ticketing Machine is the 98th National Historic Mechanical Engineering Landmark to be designated. Since the ASME Historic Mechanical Engineering Recognition Program began in 1971, 140 Historic Mechanical Engineering Landmarks, five Mechanical Engineering Heritage Sites, and two Mechanical Engineering Heritage Collections have been recognized. Each reflects its influence on society, either in its immediate locale, nationwide, or throughout the world.

An ASME landmark represents a progressive step in the evolution of mechanical engineering. Site designations note an event or development of clear historical importance to mechanical engineers. Collections mark the contributions of a number of objects with special significance to the historical development of mechanical engineering.

The ASME Historic Mechanical Engineering Recognition Program illuminates our technological heritage and serves to encourage the preservation of the physical remains of historically important works. It provides an annotated roster for engineers, students, educators, historians, and travelers. It helps establish persistent reminders of where we have been and where we are going along the divergent paths of discovery.

The Author

Gilbert A. Neubauer, retired Director of Engineering for Monarch Marking Systems, is an active member of the ASME Dayton Section, particularly in the activities of its History and Heritage Committee. This Landmark brochure is the result of his research, which includes investigation of archival records at Monarch, the Dayton Public Library, the Montgomery County Historical Society, and the Archives Section of Wright State University.