



**The American Society of  
Mechanical Engineers**

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## REFRIGERATION RESEARCH HISTORIC MUSEUM

*May a review of the past provide direction for the future*

### Purpose:

To permanently preserve historic refrigeration and air conditioning items such as equipment, systems, components, technical information, books, catalogs, papers and profiles in order to trace, development of refrigeration and air conditioning systems.

To display and operate as many of the historic systems as possible.

**The Collection Continues To Grow As We Seek Out More  
Interesting Items From The Rich Heritage Of Our Industry**

# FORWARD

(Taken from Profile Book)

All agree that the intake of food is an essential element in the life of a human being.

Next of importance, food must be wholesome and must usually be refrigerated from the time it is picked, processed and transported over the highways and oceans and displayed in the marketplace. Most people think of the domestic refrigerator when the term refrigeration is mentioned. However, the home refrigerator is only the tip of the refrigeration iceberg and perhaps could be more properly considered an item of furniture.

A balanced diet year around is assured by refrigerated trucks and ocean going ships to bring "off season" food from remote areas. The great field of refrigeration is commercial which not only pertains to food but water and beverage cooling, ice making and processes used in the medical and chemical field as well as many manufacturing processes.

Air conditioning, another branch of the refrigeration industry, was originally considered of importance only for industrial processes. However, it is now an essential and common home and industrial appliance in hot climates. Without question, the south and its great cities and their businesses and industries could not have been possible without air conditioning. The advent of the Refrigeration/Air Conditioning and energy related industries, is one of the most important technological developments.

There is no more stable and necessary industry than the Refrigeration industry.

E. W. Bottum, Sr.



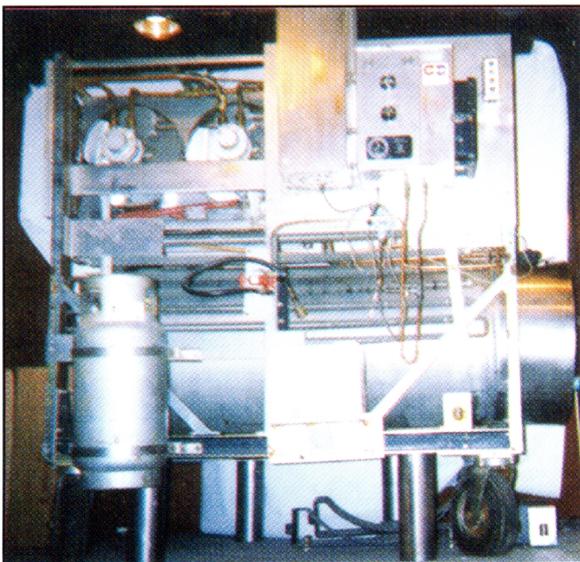
**Early Farm Milk Cooler.  
Chicago Street Lamp c. 1890  
Early Steam Engine**

## **BOOKS AND PAPERS (Examples):**

A 1933 interview with Edmund Copeland by Beckman describes how he persevered after his days as purchasing agent at Buick until he earned the title of "Father of Household Refrigeration". One of his first Automatic controls is on display.

Also, Edmund Copeland gives great credit to Harry Thompson for his help in starting Kelvinator. Many years later, Thompson, as one of the "Four Horsemen" in 1938, helped reconstruct Copeland after it had fallen on hard times in 1932 due to introducing the Polliwog compressor before it had been sufficiently time tested in the field.

The original book "Father of Air-conditioning" by Carrier's secretary included a chronology of air conditioning written by Willis Carrier. Carrier, very humbly, gives first credit to Leonardo da Vinci for his work on measuring relative humidity, air movement and effect on comfort around the year 1500.



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# INTRODUCTION

(Taken from Profile Book)

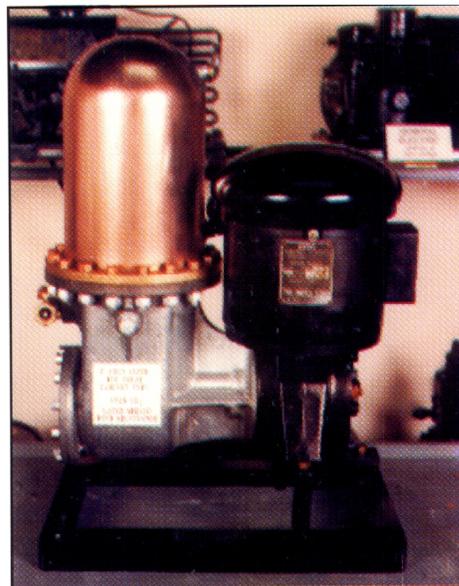
Important as they were, scientists and engineers who became household names could not have built the Refrigeration/Air Conditioning and related energy industries by themselves. The industry grew because of the untiring work and contributions of thousands of dedicated people.

Over a period of 60 years we have known perhaps a few hundred of these hard working people whose entire lives were dedicated to building the industry. Perhaps their contribution was toward research, sales, engineering, finance, education or administration.

Sometimes in conversations with others we have found not only a lack of knowledge but also misinformation as to where these people worked and what they accomplished. Further research has been most interesting and rewarding. We have tried to accurately identify where these people were employed and document their accomplishments.

In the following pages we are happy to offer, as accurately as possible, autobiographies, biographies or profiles where we have been able to obtain them. These are all outstanding people whose contributions and dedication have made our industry possible.

E. W. Bottum, Sr.



**Nizer Compressor and Water Cooled Condenser for Ice Cream Cabinets. (1923 - 1925)**

Nizer merged into Kelvinator after operating for two years. It is surprising how many people who started out at Nizer later were employed at Kelvinator or started other well known companies or became executives in them.



**Left-Frigidaire "Dome Shaped" Compressor (1919-1926)**

**Right -Copeland Isobutane Unit (1926)**



**Savage Arms condensing unit for Ice Cream Cabinets.**



## COPELAND

**Isobutane Unit Polywog Copelametic Hermetic Scroll**

**POLYWOG AND COPELAMETIC**The original "Polywog" cut-away used in early trade shows is displayed. It was so named because its terminals glistened like a polywog's eyes when operating under water in a glass tank. Great public interest caused its release for production too early and one of three problems sometimes developed later when operating in the field. However, these problems were corrected after the "Four Horsemen" took control in 1938 and the "Polywog" became the very successful Copelametic.

This operating SAVAGE ARMS Compressor has no seal, no piston, and no internal moving parts. Instead a mercury column compresses the refrigerant gas as the entire unit rotates. It is the Archimedes screw principle described in a paper presented at an A.S.M.E. meeting in December of 1926. It is also a hermetic due to a unique pancake coil described at another A.S.M.E. meeting. Here is another example of a hermetic in which refrigerant does not come in contact with motor windings which has always been a problem.

# MUSEUM POLICY

It is the policy of Refrigeration Research that all historic items associated with the Museum will be preserved indefinitely. Every effort will be made to make plans so that the Museum will continue even if Refrigeration Research should find it impractical to provide continuity in the future.

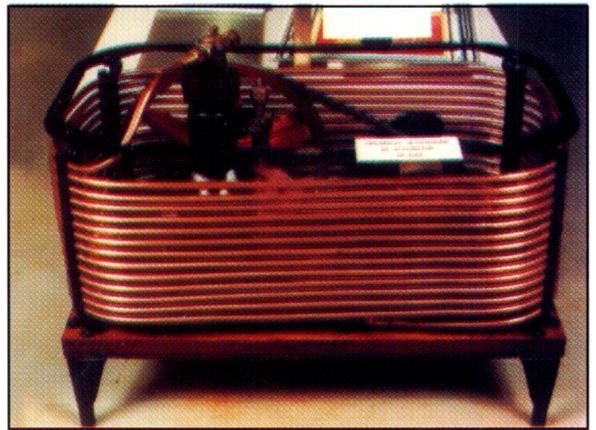
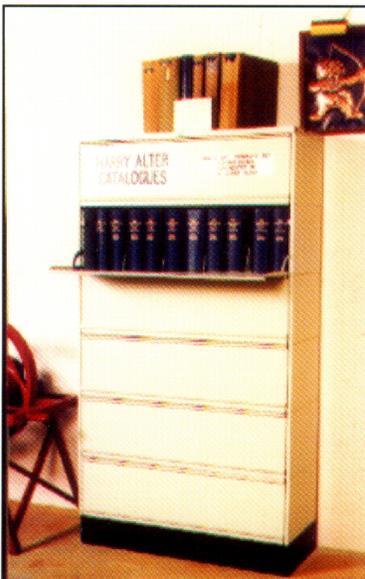
Most items in the Museum are marked to give credit to an individual, whether or not those items have been wholly contributed or whether leads were given as to where the Museum might purchase the item. Museum records provide clarification.

Where items have been wholly contributed, the contributors may arrange to borrow them back if they wish to exhibit them for a period, or they may make arrangements to have them back permanently if desired.

It is a strict policy of Refrigeration Research that Museum items will not be sold or auctioned. Every effort will be made so that items including papers will remain permanently with the caretaker organization who will best preserve the true history of the refrigeration industry.

REFRIGERATION RESEARCH, INC.

**HARRY ALTER CATALOGUES** new and leather bound from 1933 through 1987 trace the history of service tools and equipment.



**The First Kelvinator Refrigeration Unit, Introduced in 1916 by Edmund Copeland, Founder of Kelvinator and later Copeland.**



**TECUMSEH** display of early compressors, belt driven commercial condensing unit. catalogs and technical information.



**COMPONENTS AND PAPERS**

## The History and Heritage Program of the A.S.M.E.

The A.S.M.E. History and Heritage Recognition Program began in September 1971. To implement and achieve its goals, A.S.M.E. formed a History and Heritage Committee, initially composed of mechanical engineers, historians of technology, and the curator (now emeritus) of mechanical engineering at the Smithsonian Institution, Washington, DC. The Committee provides a public service by examining, noting, recording, and acknowledging mechanical achievements of particular significance. The History and Heritage Committee is part of the A.S.M.E. Council on Public Affairs and Board Information. For further information please contact Public Information, A.S.M.E. International, Three Park Avenue, New York, NY 10016-5990 (1-212-591-7740).

### Designation

Since the History and Heritage Program began in 1971, 206 landmarks have been designated as historic mechanical engineering landmarks, heritage collections or heritage sites. Each represents a progressive step in the evolution of mechanical engineering and its significance to society in general. Site designations note an event or development of clear historic importance to mechanical engineers. Collections mark the contributions of a number of objects with special significance to the historic development of mechanical engineering.

The landmarks program illuminates our technological heritage and encourages 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 125,000-member A.S.M.E. International is a worldwide engineering society focused on technical, educational, and research issues. A.S.M.E. conducts one of the world's largest publishing operations, holds 30 plus technical conferences and 200 professional development courses each year, and sets many industrial and manufacturing standards.



**Early Kelvinator, Nome, General Electric, and Frigidaire Refrigerators**

## A.S.M.E. International

Robert E. Nickell, President  
Paul D. Plotkowski, Vice President Region V  
Thomas A. Michelhaugh, Region V History And Heritage  
Mulchand S. Rathod, Region V History and Heritage  
Harry Armen, Senior Vice President, Public Affairs  
Victoria A. Rockwell, Vice President, Public Information  
David L. Belden, P.E., Executive Director  
Thomas Wendt, Regional Director, Midwest Office

## The A.S.M.E. History and Heritage Committee

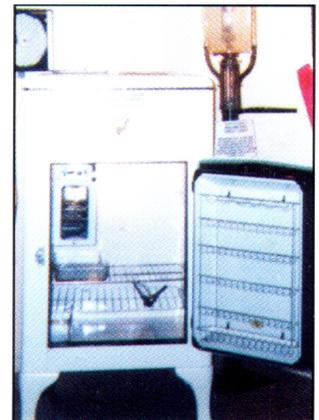
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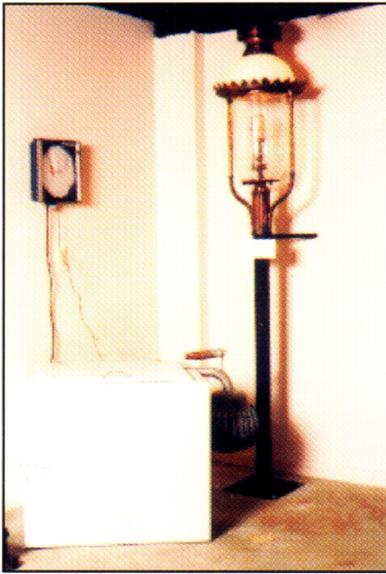
## A.S.M.E. Southeastern Michigan Section

Chairman - David Kramer  
Vice Chair - Eric Braun  
Secretary - Prabhu Raman  
Treasurer - Scott Egbert  
History and Heritage - Harry Indig

### 1934 Crosley Shelvador (operating)

Some manufacturers thought it would be undesirable and even "tacky" to put food in the door of a refrigerator. However, the convenience of having "twice as much food up front" provided Crosley with huge sales increases, which convinced others (such as Philco and Fairbanks Morse) to try other designs to get around the Shelvador patent. Now practically all refrigerators provide for food storage in the door.





**The Crosley "Icy Ball" c. 1929**

### **CROSLY ICY BALL (operating):**

Electrification did not come to most rural areas until after the second world war. These refrigerators were available for farms. Ammonia and water charged, and after regeneration over a kerosene burner, an average box temperature of 43°F. could be maintained over a 24 to 30 hour period while making ice cubes. The retail selling price was \$59.95 including the cabinet.

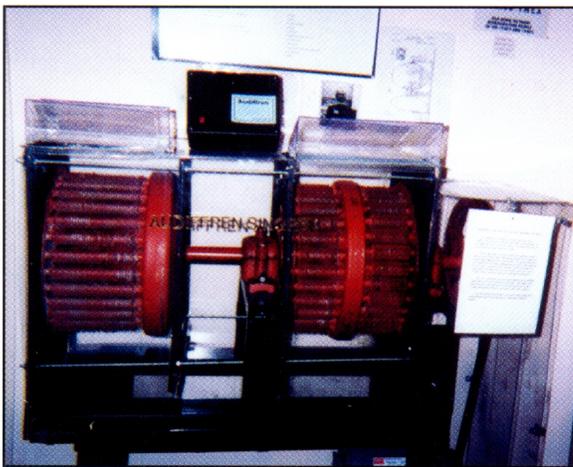
In 1994 we were visited by representatives of the Canadian Government in order for an icy ball tape to be made for their presentation to the United Nations Atmospheric and Environmental meeting in Toronto.

### **THE AUDIFFREN-SINGREN**

The Audiffren was patented by a French Priest, and physicist, Father Marcel Audiffren, over 100 years ago in 1894. Its original design was for cooling liquid, such as wine, for his monks. The French patent stated "It can be cranked by hand or driven by an engine."

This operating model is a slight modification for cooling air instead of liquid. It was constructed about 1932 and may be either an air conditioner or a heat pump depending upon how air is directed. This hermetic differs from conventional hermetic design, originating in the late 1920's, in that refrigerant does not come in contact with the motor windings. The effect of refrigerant on hermetic motor windings has always been a problem and now even more so with the present uncertainty about the new non-time tested refrigerants.

Also, one or perhaps two fan motors can be eliminated by the Audiffren design when used as an air conditioner or heat pump. Valve design is of the rugged scotch-yoke type.



**The Audiffren-Singren**

## **MECHANICAL ENGINEERING HERITAGE COLLECTION REFRIGERATION RESEARCH MUSEUM**

THIS COLLECTION INCLUDES MANY EXAMPLES OF ADVANCES IN MECHANICAL REFRIGERATION FOR RESIDENTIAL AND COMMERCIAL APPLICATIONS. PARTICULARLY NOTABLE DEVICES INCLUDE A SAVAGE ARMS ICE CREAM UNIT, A CROSLY "ICY BALL," SERVEL ABSORPTION REFRIGERATORS, GENERAL ELECTRIC MONITOR-TOP REFRIGERATORS, THE FIRST COPELAND "COPELAMETIC" COMPRESSOR, A SUNBEAM DROP-IN CONDENSING UNIT, AND AN EARLY CROSLY "SHELVADOR" REFRIGERATOR. SUCH DEVICES DRAMATICALLY IMPROVED FOOD STORAGE SAFETY AND CONVENIENCE AND SET HIGH STANDARDS FOR MECHANICAL RELIABILITY.

THE AMERICAN SOCIETY OF  
MECHANICAL ENGINEERS-2000