were only a few sales representatives in the field, nearly all of them having the home office as headquarters.

**Frick Company**

It was in the early 50's that George Frick, a young millwright operating near Waynesboro, Pa., began building steam engines. His first engine was made largely by hand and was mounted on wooden sills. By 1856 he was producing engines, in considerable quantities. Twenty years later Frick engines, together with the various kinds of equipment they were used for driving, had gained an international reputation.

When, therefore, an engineer in the nearby city of Baltimore wanted to convert a steam engine into an ammonia compressor, it was natural for him to turn to the Frick Shops in Waynesboro. The work of designing and constructing the ammonia cylinder, piston and valves was completed in 1882.

The following year a complete two-cylinder steam driven refrigerating machine was built upon designs drawn largely by A.O. Frick, one of the sons of the founder of the firm. A wood cut made from an early photograph of this first complete Frick ammonia compressor, together with an outline of the details of the machine, was published in *Refrigerating Engineering* in April, 1932. The article in that issue further told how Edgar Penny came to Waynesboro from the Corliss Steam Engine Works and developed the Frick open type steam driven refrigerating machine, which remained in a sense the standard for the industry until after the opening of the World War. The article also described the largest Frick machine ever built, a gigantic tandem-compound steam engine driven compressor with ammonia cylinders measuring 27 in. dia. by 48 in. stroke, which has been in service in the Armour plant in Kansas City since 1896.

The genius of George Frick was the guiding spirit in the development of Frick Company from its establishment in 1853 until the death of the founder in 1892. In 1904, A.O. Frick became president of the company, later serving as chairman of the board. Ezra Frick was made president in 1924.

The first 100-ton ice plant in America, erected by Frick Company in New Orleans in 1888, made raw water ice by the plate system. The first group lift ice plant was installed at St. Louis in 1897. Thirteen cans—every other one in a row of 26—were handled at a time, each can being connected to an I-beam suspended from an electric crane by two chains with hooks.

Three years earlier the East St. Louis Ice and Cold Storage Company had installed a complete Frick 150-ton ice making system, the plant also including 300,000 ft. of cold storage space. This work represented the largest sum ever invested in an ice-making and refrigerating plant up to that time. Two vertical compressors, each with a 36-in. stroke and driven by a compound condensing engine, were installed. A third engine of the same type supplied power for the auxiliaries through a large jackshaft.

In the 90's many refinements were introduced in the design of the machines. Single-column units, with either one or two cylinders, were now offered, and a compressor with direct connected motor was built early in 1900.

In the period which followed, the distilled water ice making system reached its greatest popularity. By 1910 ice making tanks were being operated on the flooded system of ammonia expansion, and electric drive was beginning to appear. As it became apparent that the day of steam drive was waning, Frick began the arduous development work which finally resulted in the efficient raw water ice making equipment known as the Frick-Pendulum System, which is used in perhaps a sixth of the ice making plants operating today. The early raw water plants used low pressure air and a drop pipe in the center of the can; apparatus was later used for cooling and drying the air. A further step was the placing of the tube in the corner of the can, the air pressure being raised sufficiently to force a passage through the ice as it froze. This developed into the medium pressure air system, which was very generally used up until the season of 1923 and 1924, when the F-P system came into the field.

In 1911 Frick added to its line of machines the horizontal double-acting compressor, and shortly thereafter built some very large machines of this design with duplex ammonia cylinders direct-connected to cross-compound Corliss engines, on an H pattern. Twenty years of improvement in this class of equipment produced the modern Type J horizontal compressor of today.

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**OVERPRODUCTION**

In 1888 a secret meeting was held in New York of the leading six manufacturers of refrigerating machinery. The point of the meeting was to show that the sales of the previous years had gone way beyond the normal demand. One outfit had 72 compressors in New York breweries—and there were no more breweries. The way out, so the charts showed, was to consolidate with one large firm in the West and one in the East. The newly passed Sherman Act meant caution.

The idea was received and accepted. But who should be the one, or the two, to absorb the rest? Who was to be the first? Months of subsequent argument failed to find an answer, but the next winter the ice crop failed utterly and the building of ice plants started on a generation of more of great activity.
The World War threw great responsibilities upon the Frick organization. No less than 69 men left the company to join the U. S. forces, while the urgent demand for refrigerating equipment by explosives and munition manufacturers, hospitals, camps, steamships, and others, added to the already increasing need for refrigeration. More than 60 large compressors were furnished on rush orders for one manufacturer of high explosives alone. Hundreds of small plants were installed on ships, and several large vessels were fully equipped for refrigerated cargo.

The Frick Machine Company

THE Carbondale Machine Company started operation in 1899 in a comparatively small plant located on Dundaff Street in the city of Carbondale, Pa., but in 1906 moved to a newly constructed plant in Simpson, a suburb of that city. The shops were modern in design at that time and equipped with up-to-date machine tools, providing first class facilities. Since then, the shops have been added to and improved, keeping the plant up-to-date.

The first president of the company was the late A. F. Trautwein, for many years a prominent figure in the industry. He was succeeded by N. H. Hiller, and the president at this time is Henry Torrance. Both of these men did much for the development of the refrigerating machine industry in general, and are, in a large measure, responsible for the important position of Carbondale in the industry today. Both men are members of The American Society of Refrigerating Engineers and have served as presidents of the Society.

Although 1899 is the date of founding of the present company, Carbondale really had its inception when the late E. E. Hendrick purchased the English Pontifex patents and commenced to build absorption refrigerating machines about the year 1882. Many machines were built and installed, but the design remained practically unchanged until 1899, when The Carbondale Machine Company was incorporated and the real development of the absorption refrigerating machine commenced.

Up to this time, practically all the machines were of the high-pressure steam type, but shortly after the formation of Carbondale, the exhaust steam type of machine was developed. This type of machine using steam in the generator coils, at a pressure as low as one pound, or even less, made it possible to utilize exhaust steam for the production of refrigeration that otherwise would be wasted.

The absorption machine lent itself very easily to the production of distilled water ice and, following this, ice plants using the evaporator system were developed. These plants were economical in operation and produced ice of high quality. A great deal of money and effort was spent by Carbondale perfecting this type of machine, and for many years a test plant was maintained where new designs were thoroughly tested and perfected under actual running conditions, practically every part of the machine being improved in some way or other.

Up to the year 1919, The Carbondale Machine Company had installed comparatively few machines of the compression type, but with the development of the large central electric stations and raw water ice, Carbondale decided to enter the compression field actively. It was especially interested in the development of the two-stage compression machine, the high speed machine, making possible the use of direct-connected synchronous motors, integral combustion engines and the more economical types of steam engines, operating at relatively high rotative speeds. Types and designs of machines were constantly improved to keep pace with the progress of the industry.

The heat exchange apparatus in the beginning was largely of the shell and coil type. Among the first machines to use straight tube apparatus were the Carbondale absorbers, generators, coolers and other heat exchange apparatus. The vertical shell and tube ammonia condenser came into use and its many advantages made an unusual appeal to the trade, and the many improvements made by

Between 1915 and 1920 the new enclosed type compressor developed so rapidly that it has since superseded all other designs in popular favor. Three influences, electric drive, the enclosed machine, and automatic control, have done more to broaden the field of application of refrigerating equipment since that time than all the improvements that were made in the 80 years following the invention of Jacob Perkins' first practical machine (1834).

After the rush of the war period Frick took the opportunity to rebuild and enlarge its works, adding a great new foundry, pattern shop, wood shop, and modern departments for automatic machines, crank shafts, grinding, tool making, etc. At the same time the sales and service organization was broadened both in this country and overseas. Today the firm has branch offices, sales representatives, and distributors located in principal cities throughout the United States and Canada, as well as in foreign countries.

Through the years, the company has contributed to the refrigeration fraternity a great deal of research and educational work, both in developing new equipment and in applying it to the needs of particular industries.

Its present line of equipment includes refrigerating, ice making and air conditioning systems, and machines using either ammonia, carbon dioxide, methyl chloride or Freon in a full range of commercial and industrial sizes.
The Frick factory
Massive Frick refrigerating machine at the Armour meat-packing plant in Kansas City, Miss., 1896
Early Frick machine
Plate ice manufacture, undated
Frick ice plant
Frick refrigeration machine at the Reymann Brewing Company, Wheeling, West Virginia, undated
Frick machine, Havana 1892
Frick compressor
Frick compressor
Frick ammonia refrigeration gauges

An early Frick cold storage refrigeration application, 1890
Frick Company, Engineers,
Waynesboro, Franklin Co., Pa.

A GENUINE CORLISS ENGINE. WITH ALL THE LATEST IMPROVEMENTS.

"ECLIPSE" CORLISS TANDEM COMPOUND CONDENSING ENGINE
UP TO 3000 HORSE POWER

We have complete line of patterns and build Corliss Horizontal Stationary Engines, Corliss Vertical Engines, Condensing or Non-Condensing, Single or in Pairs. Corliss Compound Engines, Tandem or Cross Compound. Corliss Engines for any service, 40 to 3000 horse power, in single engine.

SPECIAL NOTICE—With our Corliss Engine we conduct for setting up complete the entire Steam Plants, including Steam Boilers, Feed-Water Heaters, Feed Pumps, Piping, Shafting, and all the appurtenances and belongings peculiar to a first-class job.

SEND FOR SPECIAL PAMPHLET AND LIST OF REFERENCES OF CORLISS ENGINES.

1000 HORSE POWER "ECLIPSE" PLAIN CORLISS ENGINE.

Frick Company, Waynesboro, Pennsylvania [Ice and Refrigeration, March 1893]
Frick steam engine and generators at Armour plant in St Louis
Hielo y Escarcha

Publicado de vez en cuando por la
FRICK COMPANY, WAYNESBORO, PA., E.U.A.

Redactado por
JACK FROST

Serie A
Número 6

Instalaciones Frigoríficas Pequeñas

LA INSTALADORA FRIGORÍFICA
THE WORLD'S STANDARD

FRICK COMPANY
WAYNESBORO, PA., U. S. A.
SOLE BUILDERS OF THE
ECLIPSE MACHINES
FOR ICE MAKING AND REFRIGERATING USE

Get Our Estimate for New Equipment or for Improving of Present Plant
COMPLETE OUTFITS FOR REFRIGERATION
AND ICE MANUFACTURE

Our Red Book and List of Users Mailed Free on Application

Frick Company, Waynesboro, Pennsylvania [Ice and Refrigeration, 1905]
Seventy-five Years of Progress

Frick Company, Inc.
Wynnewood, Pa., U.S.A.

1853 -- 1928
March 30th, 1973

F. E. Frick & Co.

I have used one of George Frick's Frickery Steam Engines in my business for eighteen years, and it has given me plenty of power to grind 220 tons of wheat and roll about 6000 tons of flour a year, besides milling, baking, pumping, etc. It never required any help, and I consider it one of the most economical working engines I have seen.

Sincerely yours,

A. J. North

Morrisonburg, Franklin County, Pa.

Saw the engine builder

Here it was that Mr. Frick's engineering knowledge came into play, for he was called upon and consulted on all sides. The result was that the dwindling water power was often supplemented with power furnished by one of his engines. Sometimes the power furnished by streams was abandoned completely and the engine did all the work. His machinery having a good reputation and his knowledge of millwrighting being well known, his advice was sought not only throughout Franklin County, but throughout the adjoining counties and states as well. And so his business spread. About this time the farmers were also beginning to look to machinery to perform some of their operations. Among these the most laborious was that of threshing and steel. Frick built for

George Frick

and the Early Days of Frick Company

a seventy-five year ago the first Frick Steam Engine were built. View shows early shops.
The continued recognition given to Frick Refrigerating Equipment by Owners and Engineers is the surest testimony of its lasting value. This holds true in cold storages as well as in ice plants, hotels and other places where first-class machinery is in demand.

Ask any engineer what he thinks of Frick compressors; consult with plant managers as to the overall results obtained with Frick cooling systems; visit some of the successful cold storages that have depended on Frick Refrigeration for generations. The facts will speak for themselves.

Frick Company, Waynesboro, Pennsylvania
[Ice and Refrigeration, February 1928]
1950s

Another
Chain Store
Equipped
with
Air Conditioning

This fine Kresge Store in Elkins, Indiana, featuring 116
1161 is equipped throughout by the Frick
the Frick "ECLIPSE" compressor illustrated. The
refrigerating machines, condensers, and
conditioner were installed by a
purchaser by Harris Brosheim, Inc.,
Frick Distributors of South Bend.

For dependable air conditioning and
refrigeration service, look to
Frick Company. Over 70 years
experience in Frick equipment is
your exact service. Write for literature and
prices. We supply all the machinery, piping direct to you or
through your engineers and
contractors.

1955

World's Largest
Variety Store
Air Conditioned
with
Refrigeration

McCorky's new store at Bend & Livinston Streets
in Brooklyn, N. Y, has 80,000 square feet of
space, and restaurant facilities for 1000 people at a
time.

Complete air conditioning for the L-shaped
building, which extends an entire block in two
directions, was installed by Quinn & Feiner, Inc.,
of New York, who selected five Frick "ECLIPSE"
compressors to carry the cooling load of 350 tons
of refrigeration.

Get your copy of Bulletin 100, which tells the
whole story about "ECLIPSE" refrigerating
machines; they handle either Freon or ammonia, at
high or low temperatures. Write . . .
Frick Company
Waynesboro Pennsylvania

Branch Offices and Distributors in Principal Cities

Ammonia Refrigeration

Capacities up to 1000 tons in one unit. Compressors feature water jacket over cylinder heads, force-feed oiling, and patented Flexo-Seals. Capacity controls, dual-pressure cylinders, etc., supplied on order. "ECLIPSE" compressors for standard ammonia and booster service have 3, 6 or 9 cylinders. Booster compressors save power for low temperature Frick-freezing systems. See Bulletins 100, 104, 112, 147, 516 and 651.

Freon Refrigeration

Units from 1/4 through 15 hp. Air and water cooled, for Freon-12. Bul. 97. Separate machines in sizes 5 1/4" x 4" through 17 3/4" x 12", two and four cylinder. Bul. 80. "ECLIPSE" multi-cylinder compressors give big capacity in small space, have many exclusive features: Flexo-Seals, force-feed oiling, dynamic balancing, capacity controls with water or refrigerant cooled valve plates. For handling the Freons, ammonia, etc., at any temperature. See pictures below. Bul. 100.

Air Conditioning

Complete systems, as well as unit conditioners, also refrigeration for use with equipment built by others. Ask for Bulletins 503, 504, 505 and 522.

Ice-Making Systems

Loose can or group lift; brine race with Vertiflow unit or brine cooler systems; manual or automatic control. One-man systems up to 100 tons. Bulletins 50, 51 and 127.
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