

A Winding Path into the Gear Industry: The Falk Corp.

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Glancing back now, The Falk Corp. looks to have had a straight path toward power transmission when it opened in 1892.

That year, Herman Falk's business started by making couplings for wagons. The couplings joined a horse-drawn wagon's shaft to its axle.

Today, The Falk Corp. makes geared and coupling products for medium- and heavy-duty industrial applications. Moreover, it's a leading manufacturer of gears, especially heavy-duty industrial gears.

Worldwide, Falk employs more than 1,000 people and has more than 1.8 million square feet of manufacturing space in seven factories and four distribution centers.

Far from taking a straight path, though, Herman and his company spent years venturing into various industries to find a profitable place for themselves in the manufacturing world.

Wagon Couplings Not Enough

To start with, the wagon coupling business alone wasn't enough to support Herman's company.

So, in 1894, he expanded his company into a general-purpose machine shop. His new shop led him back to his father's old brewery site in Milwaukee's Menomonee Valley.



Beer Before Gears—Herman Falk founded The Falk Corp. with money from selling his share of the Milwaukee brewery business created by his late father, Franz Falk.



Falk's Uncommon Ability

A ring gear 43 feet in diameter made to AGMA quality level Q10 and used to crush copper ore from a Chilean mine. Fifteen bull gears, with 4.5-meter diameters and tip and root modifications, made to Q12 for 33,000 hp marine drives in U.S. Navy ships.

These are examples of The Falk Corp.'s most significant, uncommon ability: the manufacture of large, high accuracy, modified gears. Falk can hob and grind gears up to four meters in diameter, as well as make lead and profile modifications to gears up to that size. It can also shape gears up to 14 meters in diameter.

Falk's ability comes from its 12 large hoppers, shapers and grinders. The hoppers include a Schiess machine with a 5-meter table and a Pfauter machine with a 3-meter table. Large ring gears are cut with a 14-meter Maag machine and a Maag SH600 shaper. The grinders include a 4-meter Höfler Maxima 4000, a Höfler 1600 and a Pfauter 1250.

The ability also comes from Falk's in-house foundry. Beyond its machines' limits, Falk turns to its foundry, where gears up to 15 meters in diameter can be cast.

Falk's foundry operation takes up about 10% of the Milwaukee factory's 1.1 million square feet, pouring molten metal for Falk's large gears and couplings (hubs).

"We're only pouring the rotating elements," says Craig Danecki, Falk's engineering director.

Still, he estimates about 20% of Falk products start in the foundry and adds about Falk's ability: "Not everyone can do the large pieces."

In 1856, Herman's father, Franz Falk, had co-founded a brewery on the outskirts of Milwaukee, Wisconsin.

Decades later, after Franz's death, Herman and his three brothers sold their interests in their father's brewery to Captain Fred Pabst of Pabst Brewing.

As a Pabst shareholder, Herman probably could have joined his brothers in the larger company, but he decided to use his money and mechanical ability to create his own business.

In 1894, Herman rented an old blacksmith shop, a narrow brick building on the Menomonee River, and opened his new shop. He still worked on wagons, but he also shod horses and made stage machinery for the Pabst Theater (Fred Pabst's performing arts center).

Falk: A Railway Company

Soon, Herman was focusing his business on a new technology, electrified transportation. Specifically, he turned his attention to manufacturing the joints between streetcar rails.

The joints suffered constant pounding from the heavy cars, so the rail ends wore down a lot faster than the rails themselves. Herman and Albert Hoffmann, a Milwaukee electrician and inventor, developed a process called cast welding.

"The heart of their system was, in essence, a foundry on wheels," says John Gurda, a Milwaukee historian who wrote a company history for Falk in 1992 to commemorate its first 100 years.

According to Gurda, no one had previously applied the casting process to rail joints, and the process was soon hailed as a breakthrough.

In 1896, Herman diversified his company by creating a special work department, which manufactured different types of joints for railroads, including switches, crossings, and X-shaped “frogs” to use where rails curved, crossed, or converged.

Herman next tried to turn Falk into a company for building and equipping complete railway systems, including tracks, ties, posts and wires. But giants General Electric and Westinghouse were strengthening their holds on transit technology.

So Herman took his business in another direction.

Falk: An Electric Company

In 1899, his company became involved in power transmission—*electrical* power transmission—and bought Cloos Engineering Co. A small shop, Cloos specialized in electric lighting and power transmission.

Falk also bought a gear cutting shop, Western Gear Co. (not to be confused with Falk’s recent competitor).

Falk: A Gear Company?

In 1899, the Falk business included cast-welding equipment, special track work, street railway construction, oil switches, and motor gears and pinions.

Now the business faced a space shortage, so Herman bought more than four acres in the Menomonee Valley, just north of Falk’s shops.

In 1899, construction started on Falk’s new 70,000-square-foot factory.

The Falk Corp.

Established: 1892

No. of Employees:
More than 1,000 worldwide

Size of Factory:
More than 1.8 million square feet of manufacturing space worldwide

Main Industries Served:
Mining, Paper, Power and Cement

Major Products:
Gear drives, Standard shaft and fluid couplings, Service products (replacement parts, repair/rebuild services), Large open gearing, High alloy steel castings

Quality Registration:
ISO 9001-2000

Industry Affiliations:
American Foundry Society (AFS)
American Gear Manufacturers Association (AGMA)
Conveyor Equipment Manufacturers Association (CEMA)
Institute of Electrical and Electronics Engineers Inc./Portland Cement Association (IEEE/PCA)
Power Transmission Distributors Association (PTDA)
Society of Manufacturing Engineers (SME)

Website:
www.falkcorp.com

The Falk Corp.’s history was created from the history section of its website. The section itself was created from The Making of “A Good Name In Industry”: A History of The Falk Corp. 1892–1992, written by Milwaukee historian John Gurda to commemorate Falk’s first 100 years.

It was completed in 1900. After that year, the company moved away from street railways, cast welding and general contracting.

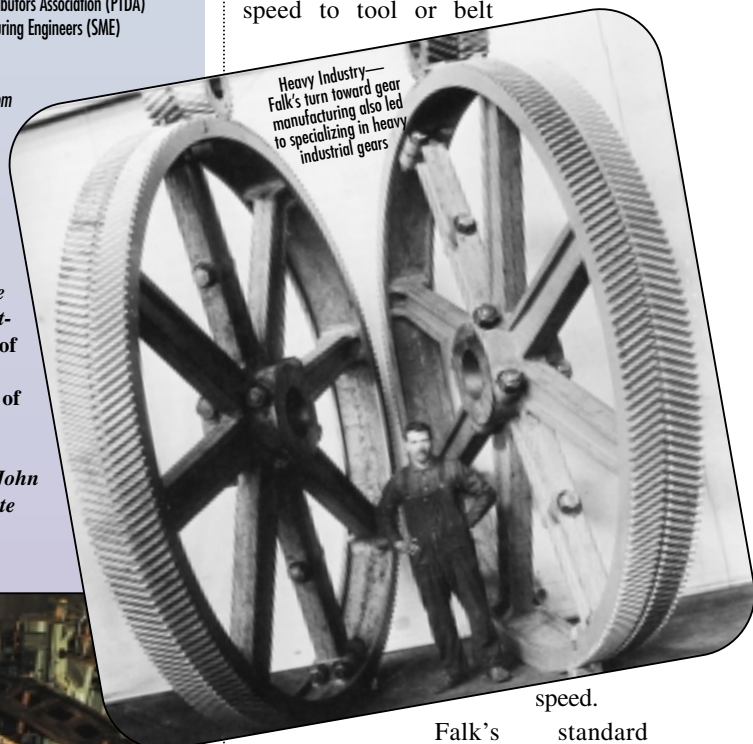
Falk’s gear business was growing rapidly. The company not only made its own gears and pinions, it also supplied them to streetcar manufacturers.

Falk: A Gear Company

The gear industry in general was growing.

According to Gurda, the rise of the electric motor led to the rise of gear-driven machinery in industry.

In the 1890s, factories started to use electric power instead of steam power. But electric motors operated most efficiently at speeds too high to directly drive a machine tool or conveyor belt. Gears, however, could reduce motor speed to tool or belt



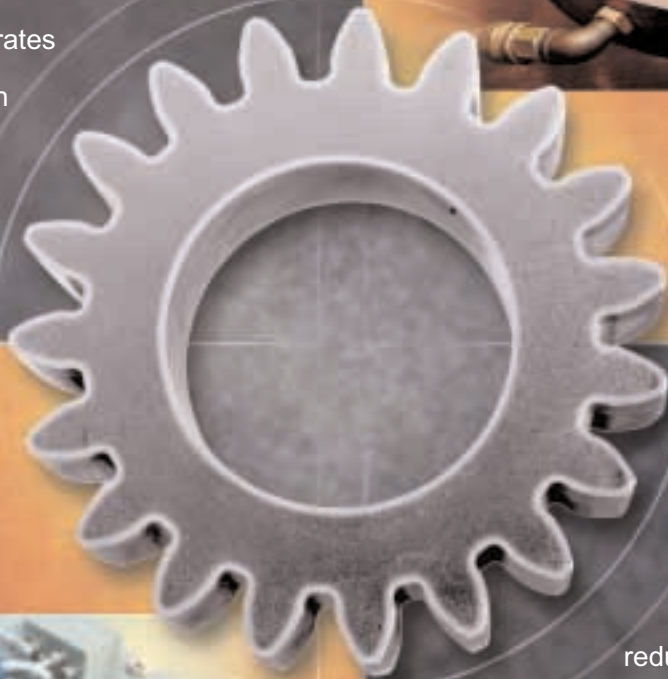
Crushing Copper—Falk employees stand inside a ring gear with a diameter of 43 feet (13.2 meters). After manufacture in Milwaukee, the gear went to a Chilean mine to crush copper ore.

speed.
Falk’s standard product was the spur gear, which was cut by shaping. Most Falk gears ended up in streetcars.

But, around 1909, Herman learned about a Swiss version of the hobbing machine. This version was designed to manufacture double helical, or herringbone, gears. The herringbone gear had been patented in 1901 and the hobbing machine in 1904. The Falk Co. pur-

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chased the American rights to the Swiss patents in 1909. In 1911, Falk brought its herringbone gears to market.

"Herman's decision to enter the precision gearing field was undoubtedly the pivotal event in the company's history," Gurda says.

Once committed to gears, Falk started to make the type of gears it still makes today: large industrial gears.

The company's early sales were heavy-duty units that transmitted the

power to crush ore, roll red-hot steel, grind raw rubber, tilt blast furnaces, generate electricity, and pump water to cities.

Falk's initial customers included Carnegie Steel, Anaconda Copper, Allis-Chalmers, Firestone, Goodyear and General Electric.

By 1914, Falk was manufacturing gears for naval and other oceangoing ships. In these ships, the steam engine was being replaced by the steam turbine. The turbine's higher speeds

required reduction gears.

Falk has manufactured more than 1,200 reverse reduction drives for tugboats and towboats and more than 1,800 special reduction gears for cruise ships, aircraft carriers, tenders, ore carriers and other marine vessels.

Falk Parents: Sundstrand, UTC

Since opening in 1892, Falk had been an independent company, owned by no other company. In 1968, Falk was bought by Sundstrand Corp., an American aerospace and industrial company based in Rockford, Illinois.

In 1999, Sundstrand was bought for \$4.3 billion by United Technologies Corp. Based in Hartford, Connecticut, UTC is one of the 30 industrial companies used in the Dow Jones index, with businesses in the aerospace, elevator, air conditioning and security systems industries.

The purchase improved UTC's aerospace business, expanding its range of products. Sundstrand's aerospace business was combined with UTC's aerospace unit, the Hamilton Standard division, and started operating under the name Hamilton Sundstrand.

The two aerospace units complemented each other.

But Falk and its fellow Sundstrand industrial subsidiaries—The Milton Roy Co., Sullair Corp. and Sundyne Corp.—didn't seem to fit as well with UTC operations.

"UTC did not have any other major industrial manufacturing operation at the time," says H. Peter Davis, Falk's vice president—marketing.

So, when UTC bought Sundstrand, some people wondered: What would happen to Falk? Would UTC sell it?

"We really didn't know," Davis says. Now a 36-year Falk employee, Davis was director of business development when UTC bought Sundstrand.

But he could see a reason for UTC keeping Falk: "Our profitability levels were strong."

UTC's strategy included aggressive growth in industrial manufacturing, so

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Flying Over Falk—In America, Falk's main factory consists of 1.1 million square feet and is the bulk of Falk's worldwide manufacturing space, about 1.8 million square feet.

Falk and its sister subsidiaries were placed in the new Hamilton Sundstrand industrial division.

"UTC has decided that these industrial units have a good foundation that can be built upon," Davis says. "We're fully confident and comfortable that we're a part of UTC's future."

Falk Today

Now, Falk is a long way from its days of making wagon couplings.

Today, Falk's standard and custom-engineered products are used by many industries, including paper, mining, cement, power generation, steel, coal, grain, marine transportation, food

processing and chemicals.

Of these industries, 60 percent of Falk sales are to the paper, mining, cement and power

industries. Also, 75 percent of its products are standard products, such as gear drives, shaft and fluid couplings, and low-speed backstops. The remaining 25 percent are custom-engineered products and include special gear drives, open gears, marine drives and steel castings.

And 80 percent of Falk sales are in North and South America.

Falk is also international in its manufacturing base. Besides its Milwaukee plant, it has factories in Australia, Brazil, Canada, China and Mexico.

Falk Tomorrow

Falk's international customer base is aiding it now as businesses continue to

weather the still somewhat sluggish global economy.

"Overall, we're seeing the recovery of our industry, primarily driven by the infrastructure growth in Asia," says Dave Doerr, Falk's president.

Doerr became president Oct. 1. Before the UTC purchase, he worked in Sundstrand's aerospace and industrial operations. An employee for more than 30 years, he's held positions in manufacturing, sales, and operations at Falk and with Hamilton Sundstrand.

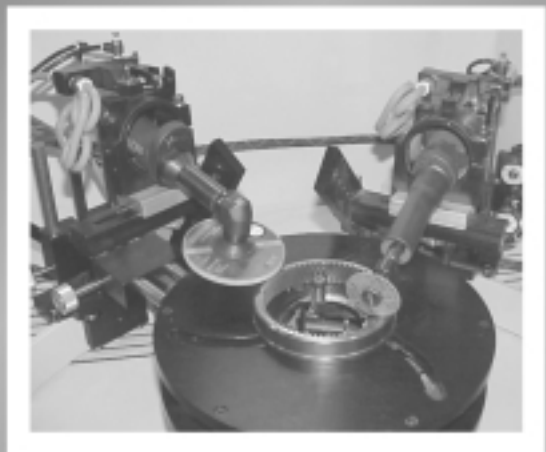
As for Falk's future—new products, services, markets, Doerr says: "Our strategy is not unlike many manufacturers. We have to address global manufacture, global competition, and position ourselves to take advantage of it." ⚙

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