An American Success Story

Joe Garfien came to America in 1928 to play soccer. He also learned to cut gears and build a business.

Nancy Bartels

"When I came here [to America] I came in on a Friday, and I had to go work on Monday, so I found a job at Perfection Gear . . . and that's how I got started in gears."

Thus begins the story of Joseph M. Garfien, founder of United States Gear Corporation of Chicago. It is a story of real personal success, but it is also an almost mythic tale of an immigrant Horatio Alger making good and a piece of gear history unlikely to be repeated. Both the America and the gear industry that Joe Garfien entered in 1928 are long gone. Nobody could make it the way Joe did in this business anymore. But it's a good story, one worth telling.

In 1928, Joe was just 16 and playing soccer for the Austrian national team. After several matches in England, Joe refused to go back home. Instead his uncle in the U.S. agreed to sponsor both Joe and his mother to come here.

When he arrived in Chicago with his mother, he had no job, no money and no English, but he did have two skills that would get him established here—although he only knew about one of them. He knew he could play soccer. What he didn't know until he went to work at Perfection Gear was that he had an intuitive grasp of gear geometry and manufacturing that would not only be the foundation of a successful business, but also would make him something of a legend in the industry.

1928 was perhaps not the best year to start a new job in America, but Joe persevered. Perfection managed to keep its doors open during the Depression, and Joe stayed on. "1929–1931, that was a very bad time," he says. "You couldn't buy a job. I worked for 35 cents an hour. The first job I had was I put a pinion on a machine and pushed a button. That's all I did."

Joe Garfien at work.

He supplemented his income with his other marketable skill: He played soccer (using borrowed shoes in the beginning because he couldn't afford his own) for a team called The Maccabees. "I played on Sundays," he recalls. "I got $25.00 a week for playing soccer, and I got $15.00 a week from Perfection. That made $40.00 a week."

This tidy arrangement came to an end in 1936. Then his wife of three years made him give up soccer. "She was afraid I'd get hurt, and I couldn't afford that," Joe explains.

But by then he had begun to develop the skills that would serve him throughout his career. Without any formal education in the U.S. besides three years of night school, he was turning into a hands-on gear engineer.

Joe describes his approach to gear design this way: "I used a logarithm book to get some of the figures, and then I would think, if I move the ratio gears, then I can top off an undercut, and so on, and that's how I learned to do some of the gear changes."

This deceptively simple, seat-of-the-pants approach got Joe the attention of some serious players in the gear industry. He still tells with fondness the story of his encounter with the engineering staff at The Gleason Works many years ago.

In 1934, the method for cutting automobile axle gears underwent a change to hypoid to accommodate the 1 3/4" drop in the drive shaft that allowed cars to ride much closer to the ground. Joe was sent to Rochester by Perfection to learn the new techniques.

"I brought 50 gears with me so they could show me how to cut them," Joe recalls. "We worked on them for two weeks, and we couldn't cut them the way we needed to. So I said, 'Let me do it my way.' They asked, 'What are you going to do?' and I said, 'I'm going to move the vertical this much, and I'm going to move the cone that much and the face angle this much, and let's see what I come up with.'"

When asked where he came up with his figures, he explained: "The only thing I know is when I move this, I figure the cutter is the gear, and the pinion is like a set, and I move it accordingly—10 for 3, and 5 for 7 and so on—and that's how I got the figures."

Joe shrugs at this point in the story and says with a twinkle in his eye, "It worked. I went home, and we still cut the gears that way."

By 1941, this intuitive approach to gear engineering brought Joe into consultation with the U.S. Army and with Colonel Rockwell of Rockwell Industries. Concerned with the poor performance of 2 1/2- and 5-ton trucks used in the desert war, the army called for a meeting with the major manufacturers in Detroit. Since Perfection was supplying gears for the trucks, Joe was made part of the consulting team.

When asked for his view on what was wrong, Joe, never a man to pull his punches, said, "Everything. The pressure angle's wrong, the ratio's wrong, everything is wrong on the gear."

From Joe's point of view, the problem was not the difficulty in changing the design, but in overcoming the time lag caused by the war-time shortage of materials. He explained that it would take weeks, perhaps more, to get the necessary blanks and cutters. But there are advantages to working for the army in wartime: Colonel Rockwell had what Joe needed within the week.

"We got the cutters and the blanks," Joe explains. "We tested them in Detroit, and they worked even better than we expected. So then everybody changed to my design, and we made the gears that way all through the war years."

A quarter century later, Joe was again taking apart desert vehicles, but this time for a different army in a different war. In the 1967 Six-Day War between Israel and Egypt, the Israelis captured thousands of Russian-made tanks and trucks. It was a vein of intelligence gold that Joe was asked to mine. The Israeli government asked him to supervise the reverse engineering that would give it clues as to the state of gear manufacturing (and, by implication, the rest of heavy industry) in Russia. Joe made copies of the gears and helped to set up the largest gear plant in Israel, Ashot Ashkelon. He still carries in his wallet a snapshot of him and Golda Meir as a souvenir.

But between jobs for various armies, Joe was building a business of his own. He left Perfection Gear in 1952 to start his own company, U.S. Gear Corporation. Although the company has had its ups and downs over the years, it still operates out of a plant on the far south side of Chicago, employing over 300 people, many of whom joined Joe in 1952, as well as some of their sons, brothers and cousins. U.S. Gear is a major supplier of gears to Ford, GM and other major OEMs. The company has earned the Ford Q1 quality certification award and will be ISO 9000-certified this year.

Joe is still very much a hands-on gear manufacturer. Although his son, Mark, and son-in-law, Don Garfield, handle the day-to-day administration of U.S. Gear, Joe is still on-site every day. At a time in his life when most men would have retired to warmer climates years ago, he's still out on the shop floor before 7:00 a.m., watching, supervising, offering advice in any one of the several languages spoken at the plant.

While his personal history has been exciting enough, the changes he's seen in the industry are of note as well.

When we asked him what changes he had seen over the nearly 70 years he's been cutting gears, he zeroed in on three.

"There's accuracy," he says. "When I first started at Perfection, nobody cared whether a gear was noisy or not. All we cared about was whether or not it could turn. Now the industry has changed in terms of tolerances and quietness. People used to take a part and hold it up to the next one, and if they matched, that was it. Now we work in ten thousandths of an inch. Today when you buy a car, you hear a little noise, you say, 'Take it back. I don't want it.'"

FOR ALL JOE HAS SEEN IN SIX EVENTFUL DECADES, HE STILL SEES SOME EXCITEMENT IN THE FUTURE. HIS FIRST PREDICTION: ELECTRIC CARS.

And speed. "When I was at Perfection, it took us a long time to cut gears. Pinions would take three or four hours. Now we get one tooth in 35 seconds. On a nine-toothed gear, that's 35 times 9 or 5 1/4 minutes."

The globalization of the industry and the resulting competitiveness is another change Joe has seen over the years. "Years ago, the U.S. was number one," he says. "We made automobiles. England made Rolls-Royce. Italy made a car. Nobody else made them. Today everybody's making cars.

"In 1952, the government sent me to Japan to teach the Japanese how to shave gears. Now they make cars all over the world. The whole world is making cars now."

And if everyone is making cars, they're also cutting gears. "India's making gears," says Joe. "Korea, Brazil. They're all making gears, and some of them can pay a dollar a day in labor. It's very, very competitive."

But Joe also sees the U.S. as having a key competitive advantage: quality. "The reputation of U.S. products is still very good. That's why we get more money for our gears and stamp a flag and 'made in the U.S.A.' on our products.

"Now the automobile industry comes to you and says, 'I want QS-9000.' They don't give you the work unless you meet their standards. If you've got Q1, they'll talk to you, but if you don't, they don't want you."

All of this adds up to a major cost pressure on gear manufacturers, another change Joe has seen in the industry.

"There are all these new machines out there," he observes. "Gleason has this new Phoenix that does everything . . . but they're a million dollars a piece. A person who starts up a gear plant and buys four, five machines, cutters, testers and stuff, it runs to millions. How can anybody afford that?

"When I started U.S. Gear, the machines were cheap. I had three or four and that was enough. It's not like that anymore."

For all Joe has seen in six eventful decades, he still sees some excitment in the future. His first prediction: electric cars.

"I think there'll come a time when we're all riding on batteries. Oh, you'll still need gears, but far fewer of them. This is long-term, of course. Right now they [electric cars] can't ride too long without charging the battery, but the engineers will find a way around that. They [the cars] won't need much gasoline anymore. Maybe for trucks, but that's all.

"In the short term, the industry's not shrinking. The reason is, how many automobiles in your family? Three? Four? Years ago, you had one and thought you were lucky to have it. Now everybody's making automobiles.

"The long-term picture is a different story, but for now, everybody's building cars, and they all need gears."

Manufacturing techniques will be different too. "I think some time in the future, the gear industry won't cut gears.

We'll forge them. We're doing it now on some items.

"Why? Because it's cheaper. What costs in forging is the die. If you have the volume, you can afford to do it. Then the cutting will be a thing of the past.

"And you can get better quality from a forged gear. You press the metal; you don't weaken it by cutting it, and you can cut out all the post-processing like grinding. The only problem still is that the die costs so much that when you're doing a short run, it doesn't pay."

As we wrapped up our interview with Joe, we asked him the one question that is perhaps inevitable when talking to a man who can bring nearly seventy years of perspective to an industry: What advice do you have for young people starting out in gearing?

His answer is both predictable and surprising. "Get an education," he says. "But when you get this education, know what you want. Don't come to me and say, 'I got a college education.' So what? What do you know? I don't need anybody with a college education. I need somebody who specializes in something. If a kid has a high school or a college education, it's the same thing. It doesn't mean anything. I would advise young people to go for a trade. Learn to be a metallurgist or an engineer or something."

When asked about what accomplishment he was proudest of, Joe surprised us again. He talked about his work with Gleason, his ideas that were turned into workable designs, his jobs with and for various governments. Then he grew thoughtful and related the haunting experience of returning to his home in Austria, knowing that much of his family and many of his friends and neighbors had disappeared into the maelstrom of the Holocaust.

"Sometimes I wonder why I got out and they didn't," he says softly.

Then he returns to the pictures in his wallet. This time, he shows us those of his nine grandchildren and tells us about their careers as doctors, sportscasters, businesswomen.

He smiles and says, "This is what I can brag on. My grandchildren. This here. Yeah, I got money. A lot of people got money, but very few people have what I got." ○