

A Man and His Mania for Antique Machines

Richard Spens has a hobby that leads him onto the Internet, through magazines, to auctions and into farmers' back yards.

It's a hobby that he succeeds at through obsessive-compulsive behavior—his joking description of his persistent interest. He says he looks everywhere and all the time for what he wants, to the limit of what his wallet—and his wife—can stand.

Richard Spens collects antique machinery. About six years ago, his hobby led him to a McDonald's parking lot near Midland, MI, to meet a woman taking her daughter to college in Michigan's upper peninsula. The woman's SUV was carrying Spens' then-latest acquisitions.

One of those acquisitions was a hand-operated gear-cutting machine that may be as many as 116 years old.

That age is based on the company name on the machine: Sloan, Chace and Co. That business was organized in 1886 as a partnership between Charles T. Sloan and George E.O. Chace. Sloan originally founded the business in the 1870s. The 1886 partnership later became Sloan and Chace Mfg. Co. All three versions of the business made small bench lathes, small bench milling machines and small gear-cutting machines.

Spens knows little else about the business, and that much he learned from one of its lathe catalogs and from *American Lathe Builders: 1810-1910*, a history by Kenneth L. Cope.

That day at McDonald's in 1996, Spens used 2 x 6s to slide his new acquisition from the woman's SUV to the back of his pickup truck, along with a second antique machine and some collets and attachments. Spens' total bill: \$350 for two machines and other parts, \$40 for the delivery service.

Now in his basement workshop,

Spens' hand-operated gear-cutting machine can be used to make spur, face and straight bevel gears. The gears can be brass, cast-iron or steel, can have teeth as coarse as 24 DP, and can be as much as 4" in pitch diameter. Also, the teeth can be accurate to 0.002" of tooth-to-tooth error and 0.005" of total composite error on larger gears. According to Spens, the machine is more accurate when cutting smaller gears.

"For its time, that was pretty good," he says of the machine's accuracy, "especially on that larger size gear."

Spens himself has cut a brass spur gear with a 0.920" outside diameter and 24 DP to a quality level that he equated with AGMA Q7.

Spens explains that the machine cuts each type of gear based on the position of its arbor. The arbor can be moved anywhere along an arc radius just below and ahead of the gear-cutting tool. If the arbor is in a horizontal position, the machine cuts spur gears. If in a vertical position or at the arc's bottom, the machine cuts face gears. If at an angle, it cuts straight bevel gears in two or three passes.

The arbor and indexing adjustment can be finely adjusted downward to create gears of different diameters. The depth of cut can be adjusted by placing shim stock under the feed stop.

Also, the machine has a vice that can be placed anywhere along the arc. The vice has a feed adjustment that can be moved in thousandths of an inch.

Spens thinks the vice and feed adjustment were used to make racks, cutting one tooth at a time, then advancing the blank the proper distance and cutting the next tooth.

Spens has more than 40 antique machines of various types in his collection and wants more, including other gear-making machines. Currently, he's looking for what he terms the "elusive"



An antique, hand-operated gear-cutting machine manufactured by Sloan, Chace & Co.

1900-1920s Gleason bevel gear planer.

He explains that the planer's operation is very complex and quite interesting: The planer uses its single cutting tool like a shaper cutter, but it cuts gears by tracing an involute template or other tooth form template. He adds that the planer planes its tooth forms to any pressure angle on any size blank up to the machine's capacity.

Specifically, he's looking for the planer model that can cut blanks with outside diameters up to 24".

Given his interest, Spens' reaction to finding that model or another antique machine that interested him, can be easily predicted: "I'd buy it, if—you know—it was affordable; and I'd probably come out and get it." ☉

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