

ANTIQUÉ SURVEYING EQUIPMENT

"GUNTER'S CHAIN"

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Prior to the development of the link chain in the late 1500s, surveyors used wooden poles and rope or cord for the direct measurement of horizontal distances. Aaron Rathborne was the first person to develop a link chain for measurement. In his book, *The Surveyor*, Rathborne describes the principal instruments of his time:

"This Book tendeth chiefly to matter of survey, wherein is first described and declared the several Instruments, fit for that purpose (with their use in practice) as the Theodelite, the Playne Table, and Circumferentor, whereunto I have added an absolute Instrument, which I call the Peractor, together with the making and use of the Decimal Chayne, used only by myself."

Rathborne's chain had ten links to the pole, and each link was marked with ten increments.

In 1620, Edmund Gunter, an English astronomer, developed what became the most widely used chain. Despite its clumsiness, the Gunter's chain remained the surveyor's standard measuring device for nearly 280 years - until the development of the steel tape in the mid-1800s.

The original Gunter's chain was 66' (four poles) in length and was composed of 100 links. A 33' (two poles) version was more commonly used for its ease in handling. Each heavy wire link was connected to the others by two rings that were generally oval, sawed, and well-closed. The ends of the wire forming the hook were filed and bent close to the link to prevent kinking. Brass tally markers of various design identified every tenth link. The accuracy of the chain was enhanced by the length adjustment at the handles, which compensated for the lengthening of the chain through use. Gunter's chain also lessened the possibility of measuring errors because, unlike Rathborne's chain, it could be used with either end forward.

In 1843, one of the larger makers of link chains, Chesterfield of Sheffield, England, patented a cloth tape reinforced with fine wire. The first American patent for a steel tape was issued to Eddy and Company, Brooklyn, New York, in 1867. Chains were quickly replaced by their 100' steel tape, but the term "chaining" continues to be used interchangeably with "taping." There were many variations on the chain, and the fol-

lowing brief descriptions should help in their identification:

Engineers chain	50 or 100' long; 50 or 100 12" links
Spanish vara chain	10 or 20 veras long; 50 or 100 links
French meter chain	10 or 20 meters long' 50 or 100 links
Pennsylvania chain	33 or 66' long' 40 or 80 links
Grumman's Patent chain	The links were formed so that it could be folded, thus eliminating the need for rings.

The Gunter's chain was used extensively for all types of surveying work in the United States, including the public lands survey during the 1700s and 1800s. Chains with brazed links (rather than pressed closed) were required for government work after 1881, and they are generally of later manufacture.

Chains can be found in very limited numbers at auctions or antique shops. Antique instrument dealers advertise chains, but they usually require that you also purchase an antique instrument. Retail prices for chains are currently in the \$175 to \$225 price range. 