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Surveyors' equipment and the western frontier

BY WILLIAM H. GUTHMAN

SURVEYING INSTRUMENTS have played a significant role in the history of the United States, perhaps more so than in any other country in the world. Partly because of their historical interest, and partly because of their appeal as precise mechanical tools, they have been desirable as collectibles for a long time. The few books and articles about American surveying instruments, however, deal primarily with their scientific aspect, not with their historical associations. One of the few isolated exceptions refers to the surveying compass that belonged to George Washington, who was a surveyor in his youth.

Beginning with the Land Ordinance of 1785, the entire western expansion of the United States relied on the surveyor and his instruments. That ordinance specified that Congress was to appoint one surveyor from each of the thirteen states, all to work under the direction of one man, whose title was geographer of the United States. Each of the thirteen surveyors was to be sent out in a separate party consisting of himself, chain carriers, markers, Indian guides, and soldiers. Except for a handful of explorers, the surveyors, in conjunction with the Federal army, were the first to penetrate the Northwest Territory, dividing and marking the land upon which the frontiersmen later settled. Those men who entered the untamed wilderness to measure out townships on the hunting grounds of hostile Indians were as colorful and brave as any of the legendary heroes of the frontier. In 1790 and 1791 surveyors charted the course through unexplored regions for the first major United States military campaigns against the warring Indians near present-day Fort Wayne, Indiana. These expeditions produced the first accurate maps of that part of the Northwest Territory.

Surveying in America before the Revolution, however, was motivated by a completely different set of political conditions from those that existed after the war. The United States emerged from the struggle as a bankrupt victor. Hopelessly in debt to her European supporters, unable to pay her disillusioned soldiers for their services during the war, and torn by jealousy among the states, the new nation quickly turned toward her one asset that could possibly solve many of her problems: land.

According to the terms of the peace treaty signed in Paris in 1783, Great Britain had ceded to the United States lands bounded on the north by the Great Lakes as far west as Lake of the Woods, on the west by the Mississippi River, on the south by the Florida-Georgia border and the St. Mary's River, and on the east by the Atlantic. Before land could be granted to Revolutionary veterans or sold to prospective settlers, however, a protective force was needed to guard the surveyors and settlers from marauding Indians and to evict squatters from government land that was to be sold. On June 3, 1784, Congress, apprehensive of a large standing army, established a small force of seven

hundred noncommissioned officers and privates. Next, to establish a set of rules for the disposition of the land, Congress passed a land ordinance on May 20, 1785. This ordinance called for surveys dividing the territory into townships six miles square. The townships were to be offered at public auction in units of no less than one square mile, or six hundred and forty acres. The government considered well-regulated order more important than rapid settlement or immediate profit. Therefore, land could go on sale only after the surveyor had finished his work. Settlers could not move out into the wilderness and stake out their own plots. Moreover, lots could be sold only in proportions of entire townships, half townships, or sections of townships. The average citizen was unable to afford pieces of land this large, so speculators formed land companies to



Fig. 1. Surveyor's compass made by Joseph Halsy, Boston, Massachusetts (d. 1762). Frame of apple wood with cherry cover inscribed, *Richard Baxter his compass/bought Marche ye 2d anno 1747*. The engraved compass card has a medallion with a two-masted ship in the center surrounded by the inscription, *Made & Sold by Joseph Halsy in Fish-Street Boston New Eng.* Diameter 5¼ inches. All illustrations are from the collection of Pamela and Scott Guthman.

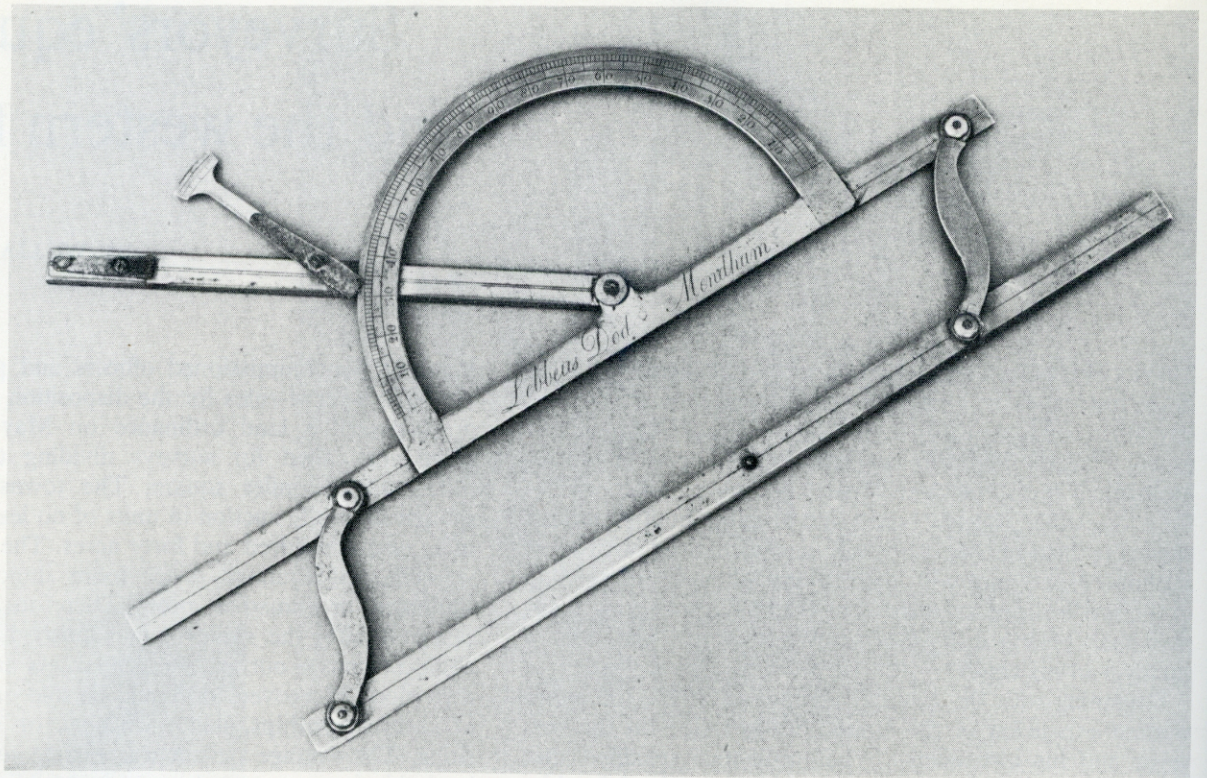


Fig. 2. Surveyor's combination brass parallel rule and protractor, engraved by the maker, *Lebbeus Dod Mendham*; New Jersey, c. 1780. Dod operated an armory for the Continental Army during the Revolution. Length when closed, 12 inches.



Fig. 4. Brass surveyor's compass made by John Avery, Preston, Connecticut. The cover is inscribed *M D F/4th Jany 1787*. Diameter of compass, $5\frac{1}{2}$ inches.

Fig. 3. Brass surveyor's compass by Frederick A. Heisely, Fredericktown, Maryland, c. 1783. Inscribed *F. Heisely Fredk. Town*. Diameter 6 inches.



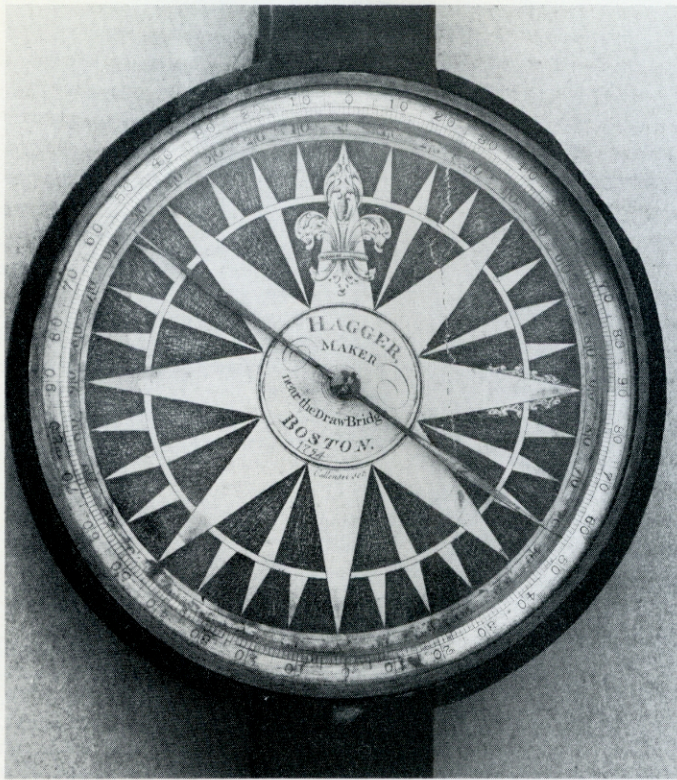


Fig. 7. Brass vernier compass, on wooden tripod, made by Thomas Whitney who worked in Philadelphia from 1798 to 1821. A vernier compass is one with an attachment that shows compensating adjustments for magnetic variations. Diameter 6½ inches.

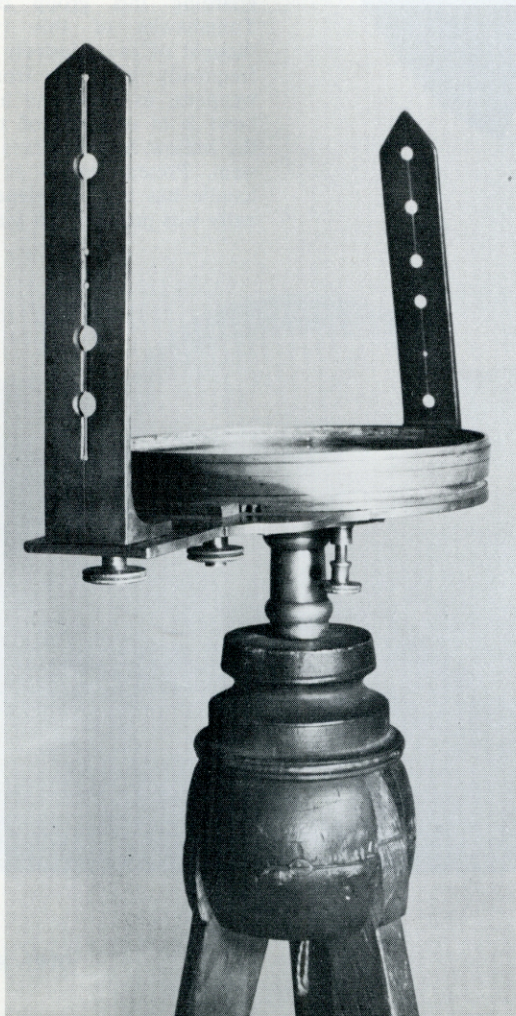
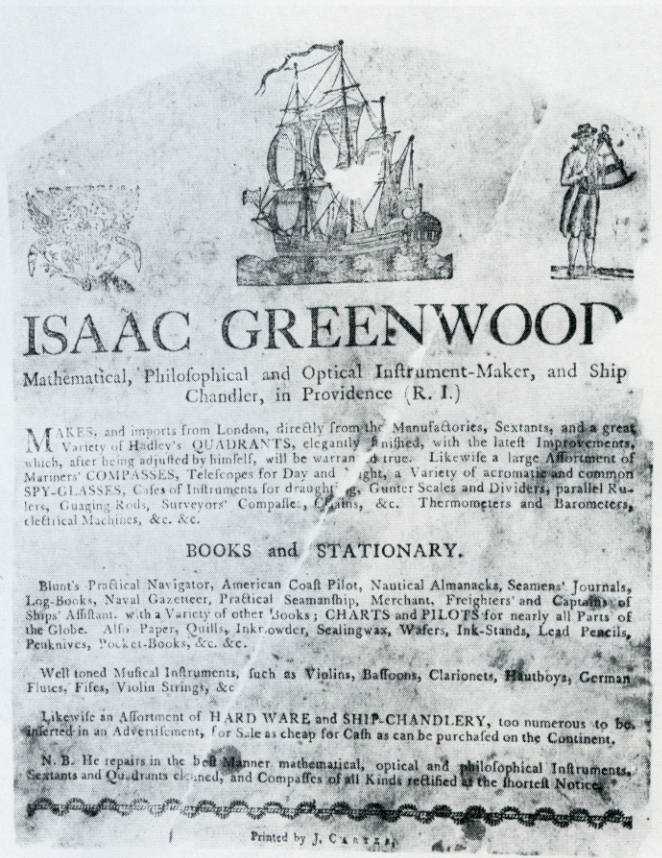


Fig. 5. Surveyor's compass with walnut frame and ebony sights, made by William Guyse Hagger. The compass card bears the engraved inscription, *Hagger, / Maker/ near the Draw Bridge/ Boston.* The date 1754 was added years ago but does not correctly identify the year the instrument was made. The card is signed by the engraver, *Callender scp.* Hagger is listed, on Ann Street, in Boston directories for 1789 and 1796. Both Benjamin and Joseph Callender were engravers also working in Boston during that period. Diameter 6¼ inches.

Fig. 6. Printed trade card of Isaac Greenwood, who worked in Providence, Rhode Island, from 1787 to 1810. Among the items he advertised are surveyor's compasses and chains as well as other surveying instruments. 9 by 7 inches.



buy huge tracts from the government and then sell smaller plots to individual settlers at a profit.

The geometrically precise method of rectangular land division has remained as a lasting monument to the ordinance of 1785 and to the surveyors who carried out its terms. This method of surveying was followed through the nineteenth century, and the entire midwestern and far western portions of the United States were surveyed exactly as the first tracts had been in 1785. The result is plainly visible in the rectangular patterns of farms, ranches, and parallel roads that form a continuous grid from the Alleghenies to the Pacific, as well as in the design of towns laid out on a basis of right-angle intersections. Monotonous but efficient, this unimaginative system of town planning and rural development is the trade mark of the West.

This article is adapted from a chapter in Mr. Guthman's forthcoming book, *March to Massacre*, a history of the first seven years of the United States Army, from 1784 to 1791.

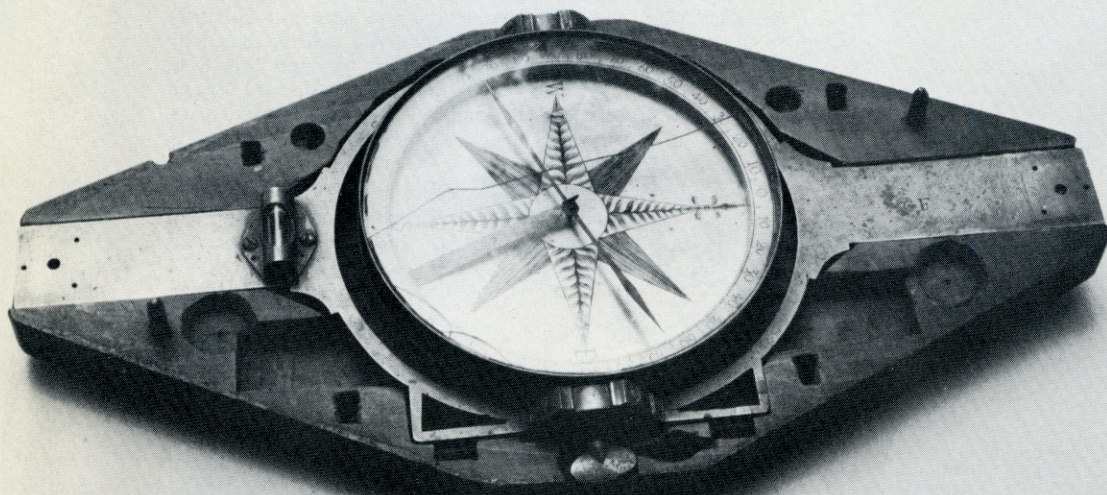
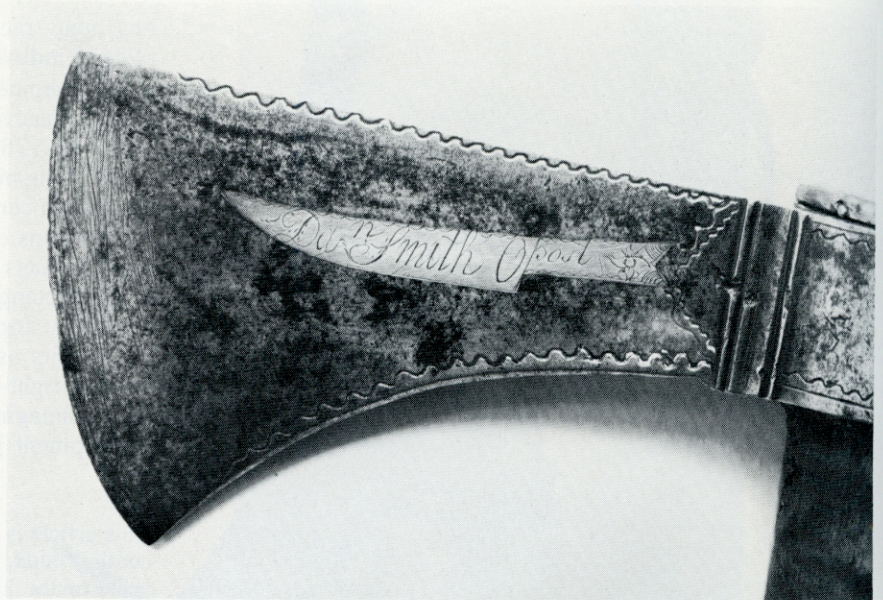


Fig. 8. Brass surveyor's compass mounted on gimbals; shown here in original pine carrying box with cover removed; c. 1780-1815, maker unknown. The compass is of primitive construction, and bears the initials *GF* stamped on one limb of the main plate. Length over all, 15¾ inches.



Fig. 9. Tomahawk owned by Daniel Smith while surveying the Tennessee-North Carolina boundary in 1779. Haft of curly maple with silver inlays. On the obverse of the steel blade, an inset piece of silver in the shape of a scalping knife is engraved, *Dan. Smith Opost*. Opost was the eighteenth-century English corruption of the French designation *Au Poste* for Poste Vincennes, Indiana, an early French trading post and fort. According to his diary, Smith lost the weapon on the 1779 expedition. The reverse side of the blade bears the crudely scratched inscription *James Stephenson*, the name of one of the Kentucky riflemen guarding this group of surveyors. Tomahawks of this type, usually thought of as exclusively Indian, were frequently used by frontiersmen as weapons, as axes, and as pipes. The bowl is at one end of the head and the hollow handle serves as the pipe-stem. Present length 11 inches: the handle has been shortened and originally was probably 20 inches long.



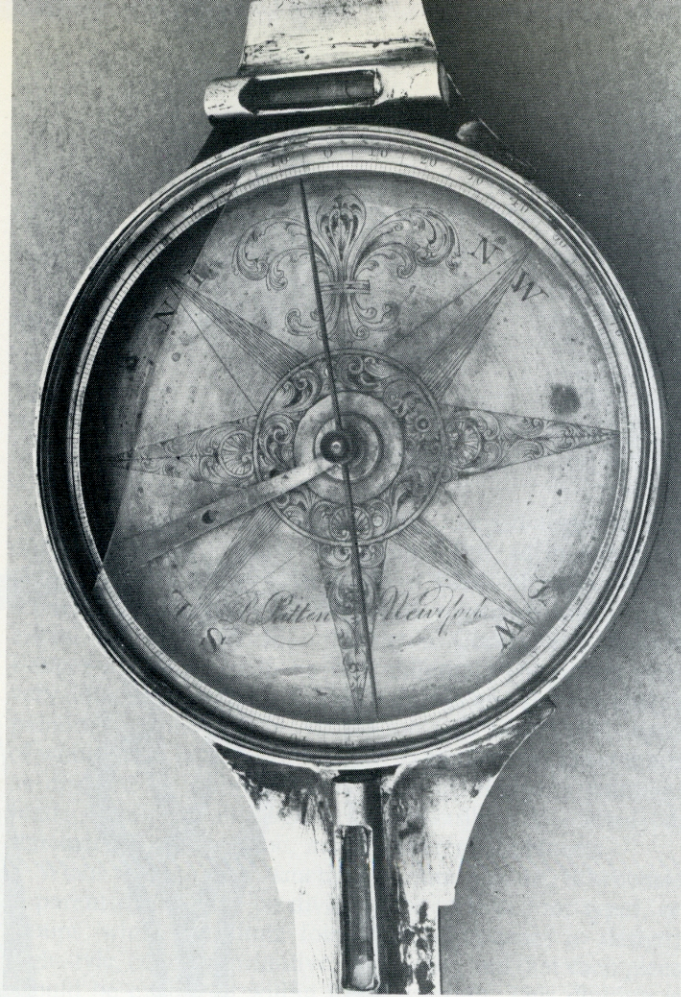


Fig. 10. Brass surveyor's compass, made by Richard Patten of New York City, c. 1815 (see *ANTIQUES*, July 1959, p. 56). The compass card is inscribed, *R. Patten, New York*. Diameter $5\frac{3}{4}$ inches.



Fig. 11. Brass vernier compass, elaborately made and engraved by Goldsmith Chandlee, Winchester, Virginia (d. 1821), probably near the end of his life. The compass card is inscribed, *G * Chandlee Winchester*. The name *A. Stowell Jr.* is engraved on the brass cover. Diameter $7\frac{1}{8}$ inches.

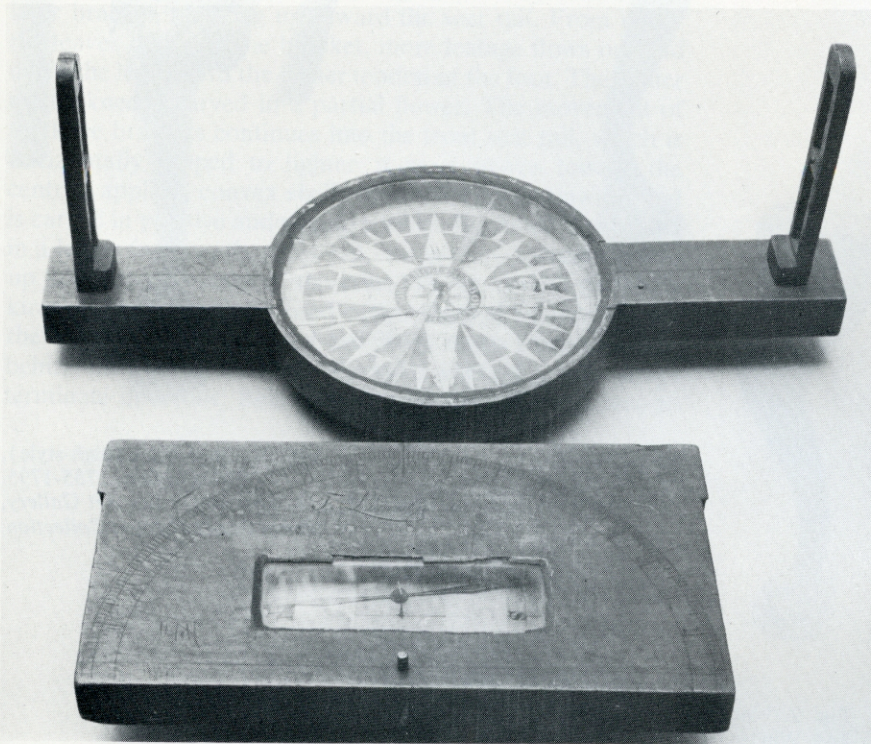


Fig. 12. *Top*, surveyor's compass, in cherry frame, made by Thomas Salter Bowles of Portsmouth, New Hampshire. The engraved compass card is inscribed *Callender sep*. The instrument is stained red, like country furniture of the period, and was probably made before 1820. *Bottom*, semicircumferentor. The maple frame is inscribed *T. Lincoln 1803*, for either the maker (unrecorded) or the owner; $5\frac{1}{4}$ by $9\frac{3}{8}$ inches.