Hailing from Magnolia, Arkansas, Raiford Burton attended Southern State College and later did extension work at the University of Texas. After serving in the U.S. Navy, Burton went to work as a radio operator for Radio Corporation of America (RCA). While employed there, he developed an interest in the blossoming field of geophysics and decided to pursue a career in the subject. He joined Geophysical Research Corporation as an observer in 1929. Soon after, he was hired as a party chief at Amerada Petroleum Corp., heading crews throughout the U.S. Burton’s crew operated under the first permit issued by University of Texas Lands, earning high commendations for their work. While operating under Permit No. 1, Burton was instrumental in compiling the rules and regulations for conducting geophysical explorations on University-owned lands that are still in existence today. He ultimately left Amerada to establish Burton Geophysical Co., a seismograph contracting company. The company made several important petroleum discoveries, including the Headlee Field near Midland-Odessa. Burton Geophysical later expanded their exploration activities into several other states.