The magnetic reversal of magnetite (Fe₃O₄) magnetosome chains from magnetotactic bacteria of various lengths was investigated using magnetic force microscopy (MFM) with \textit{in situ} applied magnetic fields. The magnetosomes contain single crystals of Fe₃O₄ on the order of about 50 nm in size. Chains up to 10 µm in length of single domain magnetic nanoparticles were isolated from an aqueous suspension of magnetospirillum magnetotacticum strain MS-1 cells. For the magnetic reversal studies, a saturation magnetic field of 300 Oe was initially applied and MFM images in reversed magnetic fields were obtained up to the point of reversal. The switching magnetic field distribution was studied as a function of the chain length, which varied from 200 nm to 8 µm. The variation of the coercivity with the angle of the orientation of the chains to the applied magnetic field was also studied for the same chains. Our experimental data, as compared to published calculated results, are consistent with a fanning mechanism reversal process.