A positroid variety is a special class of matroid variety whose defining matroid’s independent sets consist of consecutive elements from the ground set. For an algebraically closed field $K$, let $\mathfrak{B}_{n,r,t} \subset A^n_K$ denote the locally closed set of $n \times n$ rank $r$ matrices whose size $t$ principal minors vanish. We show the irreducible components of $\mathfrak{B}_{n,n-2,n-2}$ are positroidal. It follows, from a theorem of Knutson, Lam, and Speyer, that $\mathfrak{B}_{n,n-2,n-2}$ is normal, Cohen-Macaulay, has rational singularities, and its components’ defining ideals are given by Plücker coordinates. (Received July 30, 2017)