In the last five decades, new varieties of English in a postcolonial context have been the focus of a vast number of studies aiming at an investigation of their characteristic linguistic features. The complex cultures as well as the numerous indigenous languages have provided the English language with a local colour and therefore created unique and distinctive varieties. Still, there are only a few studies that consider the phonology of Ghanaian English; most of them give a rather superficial overview of Ghana’s linguistic situation. This study tries to close the research gap that exists for the analysis of the phonology of English spoken in Ghana. Furthermore, it endeavours to prove that Ghanaian English is a distinctive variety. The corpus-based synchronic and comparative analysis of Ghanaian English and British English determines features of Ghanaian English segmental phonology. In order to give a better overview of Ghana’s linguistic situation West African varieties of English as well as the three major indigenous languages Akan, Ewe and Ga are also considered in the analysis. The data consist of broadcast discussions from local radio stations provided by the International Corpus of English. The results of the analysis show that specific RP vowels are non-existent in Ghanaian English and that these vowels are restructured in a specific pattern. The vowel system of Ghanaian English and therefore the pronunciation in general differs from British English in many ways while there are many similarities to the vowel inventory of the three indigenous languages. In contrast, several features concerning the consonant system were comparable to other West African varieties of English. The English variety spoken in Ghana was strongly influenced by British English but also the indigenous languages and has thus developed various distinctive features. It can therefore be considered as a variety of its own.