Although traditionally viewed as alternatives for protecting inventions, patents and trade secrets may act as complements. We introduce the concept of “data-generating inventions,” which are inventions involving technologies that generate valuable data by their operation or use. For instance, genetic tests and medical devices produce data about patients. Internet search engines and social networking websites generate data about the interests of consumers. When data-generating inventions are patented, such that the patentee enjoys market power over the invention, by implication, the patentee also effectively enjoys market power over the data generated by the invention. Trade secrecy further protects the patentee’s market power over the data, even where that data is in a market distinct from the patented invention. The patenting of data-generating inventions can provide its inventor market power not only over the invention itself, but also over the data generated by the invention. As a prescriptive matter, we contend that the use of patents and trade secrets as complements in this way may sometimes yield detrimental results of significant magnitude. We identify the situations under which such results can occur, and offer several recommendations to mitigate their consequences.