

BY JLC STAFF

Dawn of the Duplex Receptacle

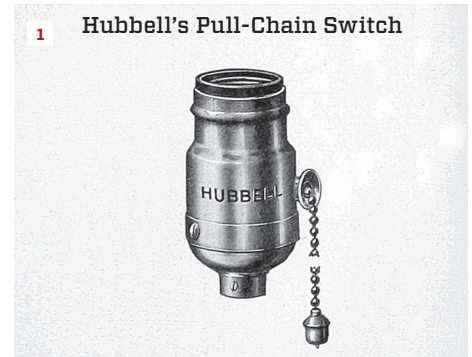
On a long list of small house details we take for granted, the electrical outlet stands out as one for which we owe much gratitude. While the tale of Ben Franklin flying a kite in a thunderstorm suggests that electricity was part of American life from the outset, it wasn't until late into the 1800s that electricity found its way into most homes, and then, mostly just for lighting. (It came well after Thomas Edison's 1879 light bulb, which was initially powered by small kerosene generators, and required companies like Siemens, Westinghouse, Oerlikon, and General Electric to first perfect three-phase AC power generation, which came in the 1890s.) Wires were most often run directly to fixtures, placed where previously there had been a gas lamp—hanging in the center of the room or placed high on a wall—without a switch.

Enter Harvey Hubbell, an avid inventor who had already filed numerous patents, including one for a switch for the Edison bulb in 1891 and ones for improving the production of screw threads and for slotting screw heads. His first runaway success, however, was an 1896 patent for the “pull socket” (essentially the same pull-chain switch used today), which soon became the most common electrical control device in homes (1). Others were inventing a range of ways to connect a vast number of newly invented household appliances, such as electric fans, vacuum cleaners, and clothing irons. But there were no standards, and many early appliances initially needed to be hard-wired or had a variety of plug configurations to fit known proprietary receptacles. Without any standards, though, it soon became apparent to most appliance manufacturers that these early plug options vastly limited market share, and many appliance makers settled on providing screw plugs at the end of the cords that would fit the ubiquitous light socket.

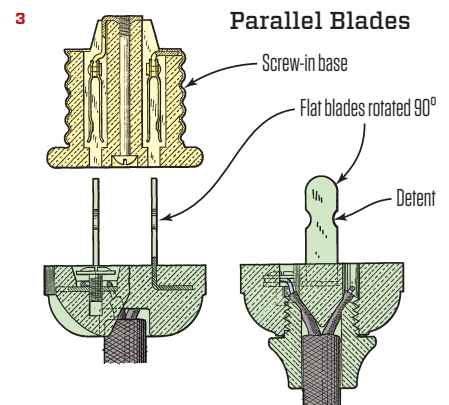
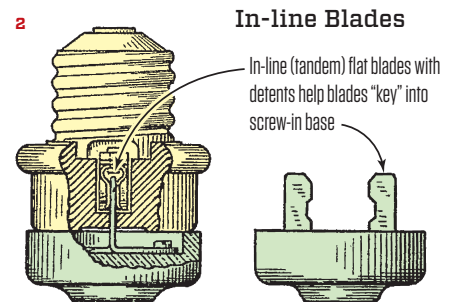
With the market headed this direction, Hubbell saw an opportunity for “separable plugs”—a base that could screw into a light socket and a mating plug on the appliance cord. Hubbell resisted working with the fledgling National Electric Code (first formed in 1897) to set a standard for the plug type. Instead, he set his own standard by the sheer force of controlling market share, aiming first at products that offered practical convenience, and then streamlining production to make them as quickly and inexpensively as possible.

First, he adapted the round-pin plugs common in Europe at the time (as now), patenting one with annular detents on it, similar to a modern headphone jack, so it would stay plugged in to an overhead socket. To win the market, he drove to make more units: He simplified the manufacturing of the pins by making them flat blades with detents on the edges to help them “key” into the screw-in base. The first versions had in-line (tandem) blades (2). In 1912, he submitted a patent for a separable plug with flat blades rotated 90 degrees, which helped streamline production (3).

To ensure he could accommodate all plugs (most of which he had by then sold), he patented a T-slot base to accept both tandem and parallel blades. He patented this as a single plug in 1915, and in 1916, he patented it as a “duplex” (for two plugs), followed by a polarized version the same year. By then, his company had sold more than 15 million separable plugs. When a National Electrical Manufacturing Association (NEMA) eventually formed in 1926, it adopted Hubbell's parallel blade design as the U.S. general service electrical plug standard.



Hubbell's “pull socket” (patented 1896) was the first common electrical switch (1).



Hubbell first made “separable plugs” with tandem blades (2). His parallel-blade (3) version was less expensive to make.

(1) Hubbell Electrical Catalogue, 1906; (2, 3) adapted from US Patent Office, US774251 (1904) and US1064833 (1912)