England to install the system there. When he returned, he found the sheriff in charge of his shops on Ward Street, ready to sell the establishment because of unpaid bills. He scurried around, borrowed enough money to stave off that action and turned to his notebooks for new inspiration.

Edison always worked on several inventions simultaneously. Once, it was said, he was busy with 45 at the same time. After concentrating on one problem till he tired, he turned to another to relax. He began the task of developing a system for sending several telegraph messages over a single wire at the same time. The successful solution he sold for a total of $35,000 which went to pay off his debts and pay for new experiments. This invention, it has been estimated, was responsible for a saving of $20,000,000 in the cost of stringing telegraph wires across the country.

Edison sold more than one invention that in later years earned millions of dollars. The mimeograph, which was bought by A.B. Dick of Chicago, was designed by Edison. And several patents for wireless telegraphy, based on an electrical principle which he discovered in 1875, the inventor sold to Marconi to be used in the radio.

In 1876 he built a new workshop and laboratory at Menlo Park, in a secluded spot that his father chose for him. Here Edison spent the busiest decade of his life inventing sockets and switches, gummed paper and electric motors, and countless other appliances that contributed immeasurably to the comfort of the world. He was still employed by Western Union and was working on a telephone system for that company. Shortly before he produced a workable model Alexander Graham Bell invented his instrument, which was taken over by the Bell Telephone Co. The carbon transmitter, a small device used in the mouthpiece of all telephones today, was Edison's invention. The Edison device was added to Bell's telephone when the telephone and telegraph companies merged. Western Union bought Edison's telephone for $100,000. The inventor, recognizing the need to protect his wife and growing family, asked that the money be paid him in annual installments for the life of the patent--17 years. He had the same arrangement with the company for his motograph, a device for making a loud-speaking telephone. Thus Edison provided an income of about $12,000 a year for his family and himself.

During the autumn of 1877 a rumor was circulating in scientific circles that Edison was working on a machine that would actually talk. Snickers and ridicule met this report, but on December 24 the inventor applied for a patent on his phonograph. The application was granted February 19, 1878. The first record, which played *Mary Had a Little Lamb*, was a crude, indistinct reproduction of the human voice, but through Edison's patience the phonograph became a smooth and satisfactory medium for reproducing sound. He thought of his invention chiefly as a dictating machine, which he later manufactured commercially. He saw it, too, as a device for teaching elocution and foreign languages, and for bringing literature to the blind.

Then came his greatest invention of all, one of the most exciting chapters in the history of science. In 1877 he began the experiments which ended two years later with the successful operation of the electric light bulb. Most homes were lit in those days by smelly kerosene lamps or candles, though a few had gas lights. Some city streets had the glaring arc lights. Inventing the sealed glass globe with the air removed was the least part of the problem. The greatest difficulty came in his search for workable filaments, the fine wires that glow white hot to make light as electric current passes through them. He tried platinum, iridium and various other metals only to see them melt after they had been lighted only a short while. He tested wood, straw, tissue paper, silk, fishline and cornsilk. There is scarcely a possible substance that he