

## ONE MILLIONTH HORSEPOWER MOTOR

Designed and built by by W. R. Smith (1949)



While a junior in mechanical engineering at The University of Tennessee, and doing watch repair part time in my trailer village home, I decided to design and build a miniature electric motor—just for the fun of it. Because of school work, it required several months to find the time for the project. However, it was finally completed in about nine months.

The shunt wound, universal type motor is handmade using watchmaking tools. It is mounted on a 5/8-inch long, black plastic base and has ruby watch jewels for the rotor bearings. The armature uses metal from a nail and the stator is from drill rod. Its construction was delayed for quite some time until I finally located enamel wire small enough for the windings at the Westinghouse Corp. The wire is about the diameter of the human hair. The most difficult problem during the motor construction was the fabrication of the commutator.

To demonstrate its ability to run, two short, sharpened wires were soldered to the terminals of a flashlight C cell. The distance between these was adjusted so the two input terminals riveted through the motor base could be set down on the sharpened ends of the wires. From input current measurements, the motor was calculated to consume slightly over 1/1,000,000 horsepower.

Such a motor would not be very unusual in today's world. However, 57 years ago it was considered quite extraordinary. And I had great fun building and demonstrating it. It has remained in a little metal box in my watchmaker's bench all the years since it was built.

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W. R. Smith  
8049 Camberley Drive  
Powell, Tennessee, 37849  
Phone: 865-947-9671  
E-mail [WRSmith2@AOL.COM](mailto:WRSmith2@AOL.COM)