

# The Spinning Top



A spinning top is governed by the law that the direction of its axis of rotation remains fixed. Therefore, if a globe top is spun at a high rate and installed on a boat, the boat will remain level on the surface of the water even if there are waves. This is the principle of the gyroscopic stabilizers used on passenger ships.

There are things that we think mysterious as a child, but are now unable to ask people about. For example, how do airplanes know which direction to fly? Usually mounted with computers and radar, they cannot be expected to use a compass. The answer to this question is concealed in a simple toy.

“A circular object that rotates at high speed about a single axis employs the same principles as a gyroscope. It has the characteristics of usually moving in a uniform direction while rotating. If its axis of rotation is aligned with north and south, it will continue to indicate these directions. This is used in the autopilot equipment of airplanes, rolling prevention of shipping and control of satellites. This principle came to light from a toy—the spinning top.”

This answer was furnished by Takeshi Kato, president of spinning top manufacturing and marketing company Tiger & CO., LTD. The spinning top was discovered in 1921 by a manager at a clock factory. He was interested in gyroscopic principles and thought it would be of use in new business. On marketing this product, it turned out to be an overwhelming success—but then the world was plunged into World War II. Under a controlled economy, procurement of materials was impossible, with a ban on domestic sales and exports the only possible outlet. Amid this predicament, President Kato himself went off to the war. However, stationed in Bangkok he saw his spinning tops that his company has exported in the lobby of a hotel and resolved to continue with the pursuit of this product.

Fifty years have passed; the design and accuracy are unchanged and its role as a resource in science education is assured. It remains an educational material at universities and training colleges.

“The origin of the Japanese name for a spinning top, an “globe top,” is that it can help to explain the rotation and revolution of the earth. We are selling an educational resource that facilitates comprehension of airplane autopilot and maritime rolling-prevention systems.”

The spinning top, survivor through the hardships of the War years, is what tells us how to make an airplane fly, a ship sail or control a satellite. In that rotation, there is a feeling that unlimited and unknown energy is concealed.