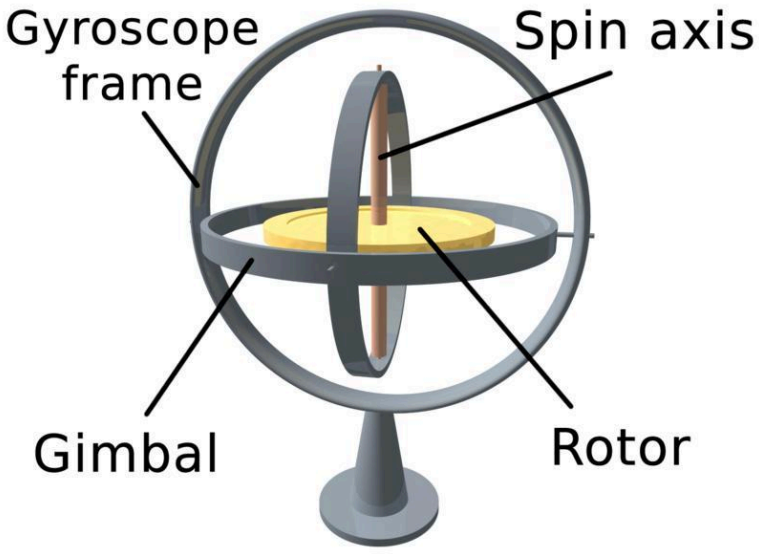
Gyroscopes and Flight Stability

As Dr. Goddard's rockets became more powerful, he faced a serious problem: how to make them go where he wanted them to go. Rather than flying upward to new heights, his rockets sometimes turned and flew horizontally. He couldn't control what they might hit.

But he figured out a way to keep them flying upward. He used a device called a gyroscope. In the middle of a gyroscope, a disk is attached to a long axle. The ends of the axle are attached to a ring that can spin around the disk without touching it. That ring is nested inside two other free-spinning rings so that all three are perpendicular to each other. When the inner disk is made to spin fast, its axis will keep pointing in the same direction no matter how the three rings rotate around it.

Goddard mounted a gyroscope in his rocket so its axis lined up with the rocket's nose and base. If the rocket tried to move away from a vertical direction, the gyroscope would sense a force trying to pull it away from where it was pointing. Goddard used that force to move vanes in the rocket's exhaust stream. The vanes would move so that the exhaust gas pushing against them would move the rocket back to the direction the gyroscope was pointing. The rocket would fly upward, not sideways.



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