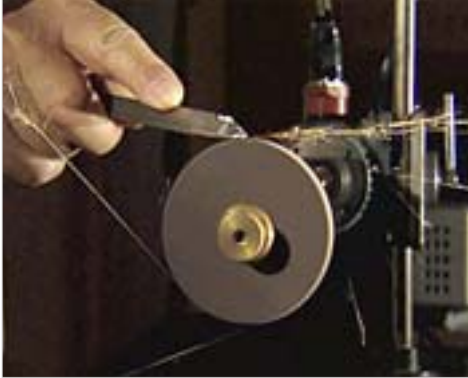


The Physics Experiments of Robert Wichard Pohl (1884–1976)

For decades, Robert Wichard Pohl taught his famous lectures of introductory physics in the old lecture hall of the Physics Institute at Goettingen University. These lectures became the foundation for three volumes entitled „Introduction into Physics“. Now, using Professor Pohl's original instruments in the same lecture hall in which he taught, this set of videos captures his extraordinary ingenuity and once more brings to life Pohl's great experimental skills.



Supple shaft as stable axis of rotation

Video title: Supple shaft as stable axis of rotation

Signature: C 14847

Series title: The Physics Experiments of Robert Wichard Pohl (1884-1976)

Abstract: An object rotates stably around its axis of maximum moment of inertia, even if it is attached to a bent supple shaft. The experiment also shows that particles leave a rotating object by flying off in a tangential direction.

Source: Pohl's Einführung in die Physik - Mechanik, Akustik und Wärmelehre. Lüders, Klaus; Pohl, Robert Otto (Hrsg.) 19. Aufl., 2005, Springer Berlin Heidelberg New York; p. 31, 75

Key words: Mechanics, grinding wheel, stable rotation, free axis, maximum moment of inertia

Goal of the experiment: An object rotates stably around its axis of maximum moment of inertia, even if it is attached to a bent supple shaft. This is an example of a stable rotation around an axis of maximum moment of inertia. The experiment also shows that particles leave a rotating object by flying off in a tangential direction.

Experimental setup: A grinding wheel is attached to one end of a rather supple, 20 cm long and only a few mm thick steel rod, which is driven by an electric motor. As a test of the stability of the rotation around the axis of maximum moment of inertia, a tool bit is pushed (gently) against the rotating wheel.

Experiment: With the motor at rest, the grinding wheel is seen to bend the rod downward. This suppleness is further demonstrated by pushing the wheel up. The axis remains curved even as the motor is spinning, with the wheel rotating stably around its axis of maximum moment of inertia. The stability is further demonstrated by pushing a tool bit against the wheel. As an additional observation, notice the sparks flying off the grinding wheel in a tangential direction.

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