Features

The principle of "freeing" in engineering mechanics allows forces and moments acting on a body to be made visible. In this process, a body or a system such as a bar are virtually removed from the environment. All forces acting on the body or on the system are replaced by standardized symbols. This results in a simplified model of the body or system, which clearly demonstrates the relationships between forces and moments.

In the experiment with Tesca Equilibrium in a Single Plane Apparatus, we demonstrate the principle of "freeing", which refers to establishing static equilibrium. The experiment uses a model of a ladder with a sliding clamp weight.

The top support is designed as a movable support and the bottom one as a fixed support. The real effective support forces can be fully compensated by applying cable forces in the x and y directions. The ladder is in a state of equilibrium without changing the angular position and without the need for structural support. The ladder is "free". For students, the result is a convincing example for the principle of "freeing" in statics.

The parts of the experiment are clearly laid out and securely housed in a storage system. The entire experimental setup is constructed in the mounting frame.

Specifications

- Development of the static principle of "freeing"
- Full compensation of the support forces by cable forces
- Sliding clamp weight
- Determine the position of the clamp weight via steel rule with millimetre scale 5. 2 supports (1x fixed support, 1x movable support)
- 3 guide pulleys
- Storage system for parts
- Experiment setup in the mounting frame

Technical Specifications

- Ladder
  - Length: 650mm
  - Weight: 2N
  - Built-in rule, graduation: 1mm
- Clamp weight: 20N
- Weights
  - 3x 1N (hanger)
  - 9x 5N
  - 12x 1N
- Supports
  - 2, clamped to mounting frame
- Steel rule
  - Length: 1000mm, graduation: 1mm

Experiments

- Experimental development of the core principle of "freeing" in statics
- Calculation of the support forces for a given position of the clamp weight and for a known angle of inclination
- Application of the 1st and 2nd equilibrium conditions in statics and full compensation of the support forces by cable forces
- How does the clamp weight position affect the support forces
- How the angle of inclination affects the support forces

Note: Specifications are subject to change.

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