ROQED PHYSICS LAB

Comparison of the work of the elastic force with the change in the kinetic energy of the body

Purpose of the work: To verify the validity of the kinetic energy theorem, that is, that the work of the force applied to the body is equal to the change in the kinetic energy of the body, i.e.
$A = Ek_1 - Ek_2 = \Delta Ek$

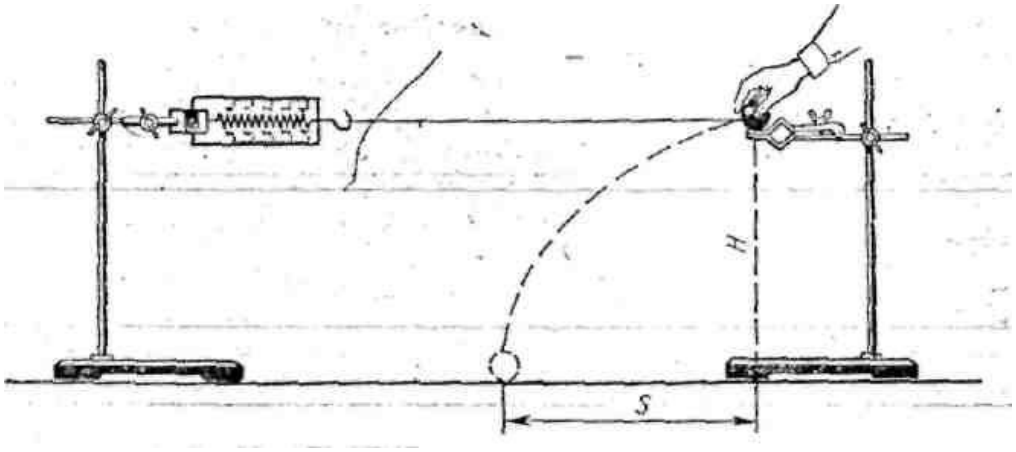
Equipment:
000 - tripod x2,
001 - tripod leg
018 - dynamometer,
096 - ball with an eyelet
070 - electrical scales

Theoretical part:
The kinetic energy theorem states that the work of the force applied to the body , is equal to the change in the kinetic energy of the body:

$$A = E_{k1} - E_{k2} = \Delta E_k$$

For experimental verification of this statement, you can use the setup shown in the figure. The task of this work is to check the equality

$A = \Delta E_k$, i.e. $\frac{1}{2} F_{ynp1} x = \frac{mS^2 g}{4H}$ ...



Work progress

Instead of a dynamometer, a spring with a ruler is used.

1. Based on the image on the board with,select the workplace for the experiment.

2. Start the simulation.

3. Determine the mass of the ball using a balance. Record the result in the table.

4. Connect the spring to the ruler and the ball with a rope.

4. Pull the ball on the rope horizontally at the same height as the spring. Thetensile force should be 2 N, and therefore the value of the elastic force F_{elt}= 2 N in this case.

7. Measure the extension **X of the** dynamometer spring at an elastic force of 2 N.result Enter the in the table.

5. Release the ball and notice where it falls on the table. Under the influence of the elastic force, it acquires a velocity **v**, its kinetic energy will change.

8. Make a formula forthe calculating workss elastic force

$$A = \frac{F\,uprX}{2}\ \ mS^2g$$

9. Make a formula for calculating the variationI of the kinetic energy of the ball under the action of elasticforce:

$$\Delta Ek = \frac{mS2g}{4H}$$

10.Compare the obtained values of the work of the elastic force and the change in the kinetic energy of the ball.

January12 .Povtorite experience at other times the height of fall of the ball

12. Table:

№ experience	kg mass mof the	height Hball,m,	distance S m	Average range $S_{cf.,}$ m	kinetic energy $\Delta Ek = mS^2g / 4H$	force elasticity Fel_1 , N	spring elongation x, m	force work $A = \frac{F Elasticcontrol X}{2}$
1.	...	...	...			2	...	
2.		...	...				...	
3.		.. .	...				...	

Conclusion:

A. verify the validity of the kinetic energy theorem. The work of the elastic force is equal to the change in the kinetic energy of the body.

IN. We have verified the validity of the kinetic energy theorem. The work of the elastic force does not depend on changes in the kinetic energy of the body.

C. The change in the kinetic energy of the body is inversely proportional to the work of the elastic force.