MEASURING THE RATIO OF OUTPUT AND INPUT ENERGY OF THE TWO-STAGE MECHANICAL OSCILLATOR BY VELJKO MILKOVIĆ

Introduction

This analysis measures output and input energy during operation of the two-stage oscillator by Veljko Milković (www.veljkomilkovic.com). Output energy was measured based on the elevation of the weight at the right arm of the lever of the two-stage mechanical oscillator, whereas input energy was measured based on the height of the initial position of the pendulum when it was out of balance.

Before I measured how many times and to what height did the pendulum weight with mass m_2 rise, I have checked to see to what extent the right arm of the lever (with the weight with mass m_2 attached to it) is influencing the movement of the pendulum.

First, I have stopped the pendulum and moved the right arm up and down with my hand, and noticed that there was no movement of the pendulum.

When I moved the right arm of the lever with my hand, I was looking for small oscillations, i.e. small heights of the weight of up to 1.5 cm in respect to the lower reference point, which is half the maximum height of the mass center of the pendulum.

When I moved the right arm with my hand, I did not notice that it influenced the oscillations of the pendulum at all. Looking with the naked eye, the pendulum oscillated with the same speed and at the same angle as when the right arm was blocked. With higher oscillations of the weight mass center the movement was faster, so I was not able to notice the influence of the lever right arm on the pendulum movement with a naked eye.

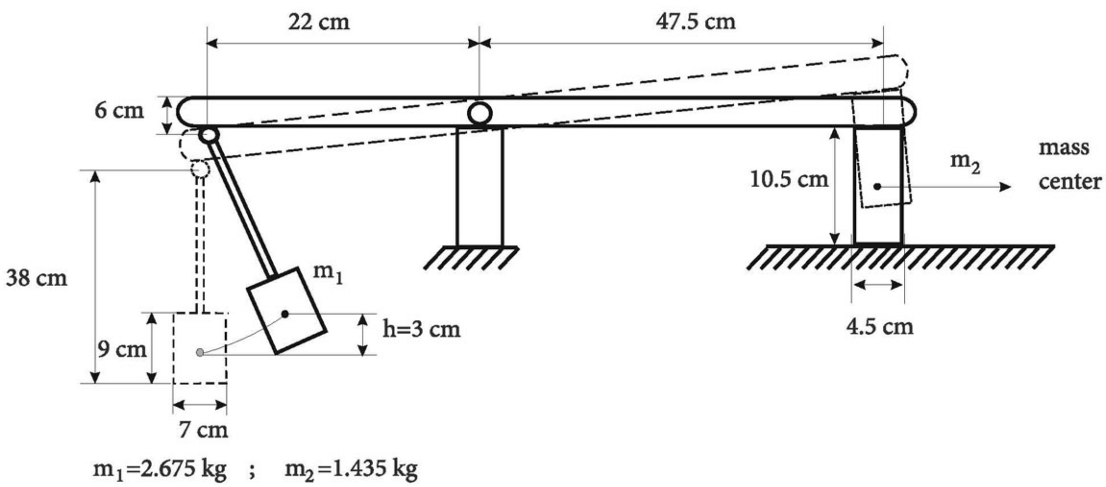
I believe that there was no dependency between the pendulum oscillations and movement of the right arm of the lever.

It is also important to notice that, according to the energy conservation law; total potential energy of the lifted weight is wasted on deforming the surface and heat emitted into the surroundings, when the freefalling weight hits the surface.

Based on the sound which is produced when the freefalling weight with mass m_2 hits the surface from heights of 4, 3, 2 and 1 cm, and when it is compared with the sound of the weight hitting the surface when the two-stage mechanical oscillator described in this experiment is in operation, I can state that there was no difference. All this just confirms that the energy from the output is not returning to input to a major extent.

On the other hand, if total output energy returns to input (the pendulum) when the weight with mass m_2 touches the surface, there would be no sound since its kinetic energy would be zero.

The machine I performed the measurements on is shown below:



When I lifted the pendulum mass center (weight with mass m_1) to 3 cm, as shown above, the pendulum started to swing and centrifugal force, influencing the lever by the pendulum, started to lift the weight with mass m_2 on the other end of the lever. Lifting of the weight on the other side of the lever was periodical and at different heights.

Periodical lifting of the weight was not stable, and amplitudes, i.e. heights to which the weight was rising, were difficult to measure precisely (due to the speed of the weight going up and down), but I measured that the weight with mass m_2 lifted:

- h_1 - 5 (five) times to the height above 4cm;
- h_2 - 6 (six) times to the height between 3 and 4cm;

- h_3 - 32 (thirty two) times to the height between 2 and 3cm;
- h_2 -26 (twenty six) times to the height between 1 and 2cm;

Based on these measurements, I have calculated the total minimal mechanical work of the centrifugal force of the pendulum, lifting the weight with mass m_2 to the measured heights:

$$A_{out} = 5 \cdot m_2 g h_1 + 6 \cdot m_2 g h_2 + 32 \cdot m_2 g h_3 + 26 \cdot m_2 g h_4 =$$

$$= m_2 g \cdot (5 \cdot h_1 + 6 \cdot h_2 + 32 \cdot h_3 + 26 \cdot h_4) =$$

$$= 1.435 \cdot 9.81 \cdot (5 \cdot 4 + 6 \cdot 3 + 32 \cdot 2 + 26 \cdot 1) =$$

$$A_{out} = 18.02\ J$$

Mechanical work needed for lifting the pendulum weight with mass m_1 to the height of 3 cm is:

$$A_{in} = mgh = 0.787\ J$$

Therefore, ratio of energy at the output and energy at the input is 22.89:

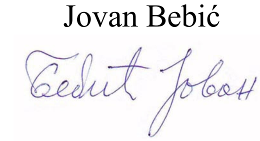
$$\eta = \frac{\text{Aout}}{\text{Ain}} = \frac{18.02}{0.787} = 22.89$$

Conclusion

Based on the results of measurements and observations during this experiment and ten years of insight into the results of experiment involving the two-stage oscillator by Veljko Milković, I can absolutely confirm that this is the biggest invention in the history of science!

In Novi Sad (Serbia),
November 19, 2007

Jovan Bebić



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