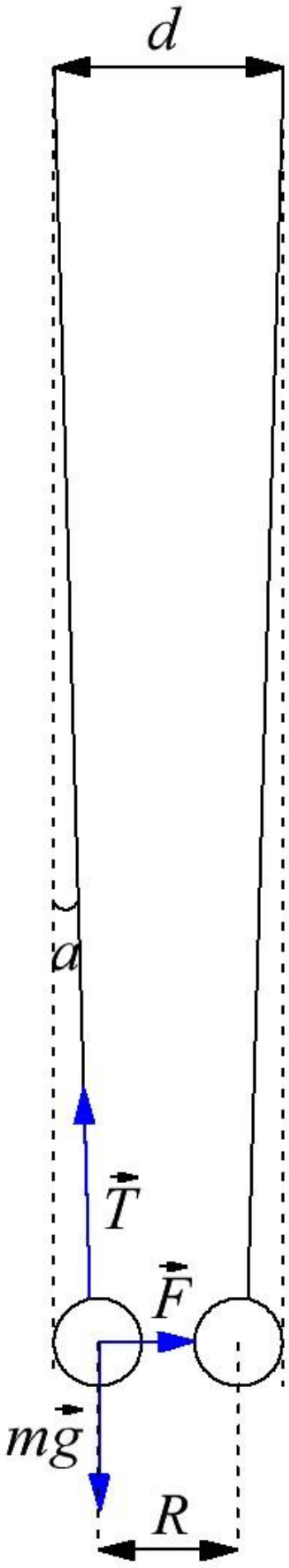

$$\vec{T} + \overrightarrow{mg} + \vec{F} = \vec{0}$$

In projection on horizontal axis:

$$Tsin\alpha = F = G\left(\frac{m}{R}\right)^2$$

In projection on horizontal axis:

$$Tcos\alpha = mg \quad \Longrightarrow \quad T = \frac{mg}{cos\alpha}$$

$$mgtan\alpha = G\left(\frac{m}{R}\right)^2$$

$$tan\alpha \approx sin\alpha$$

$$gsin\alpha = g\frac{d-R}{2l} = G\frac{m}{R^2}$$

$$R^2(d-R) = 2lG\frac{m}{g}$$

$$R \approx d \quad \Longrightarrow \quad R^2 \approx d^2$$

$$d^2(d-R) = 2lG\frac{m}{g}$$

$$R = d - \frac{2lGm}{gd^2}$$

$$R = 1 - \frac{2 * 45 * 6.67 * 10^{-11} * 100}{9.8 * 1^2} = 0.99999994(m)$$
$$\approx 1(m)$$

So, in this experiment it's unreal to measure G