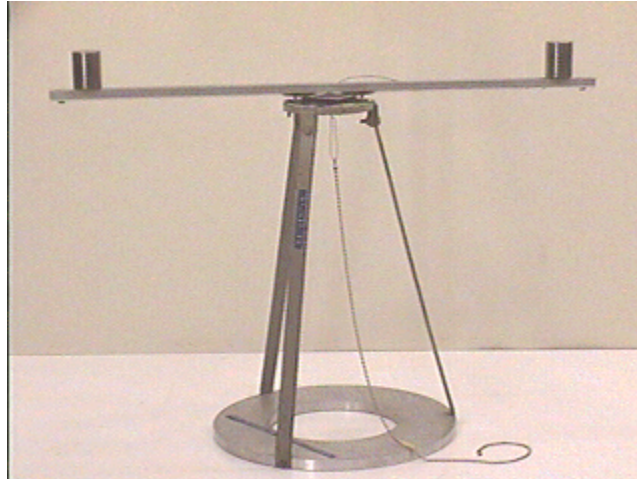


Answer #76

The answer is (a): the angular speed of the crossarm will increase as the weights are pulled inward, as can be seen in an mpeg video by clicking your mouse on the photograph below.



This is due to conservation of angular momentum. The angular momentum of the system $L = mvr$, where m is the mass of the rotating weights, r is their radius, and v is their speed (neglecting the mass of the crossarm). When the wires pull the masses in, no torque is exerted on the system so its angular momentum remains constant. Because the radius of the masses decreases, their speed must increase.

Note that when the string is released the masses return to their original larger radii and the rotational speed decreases (to its original value in the absence of friction).

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