MOMENT OF INERTIA

Assembly :

Consists of two ⊥ shaped MS pipe assemblies with thick washers of metal welded at different positions. The first one is having washers near central position and second one having washers at the extreme position of the assembly (Fig. a & b)

(I) (II)

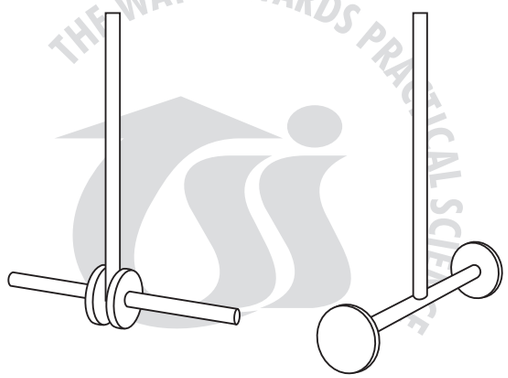
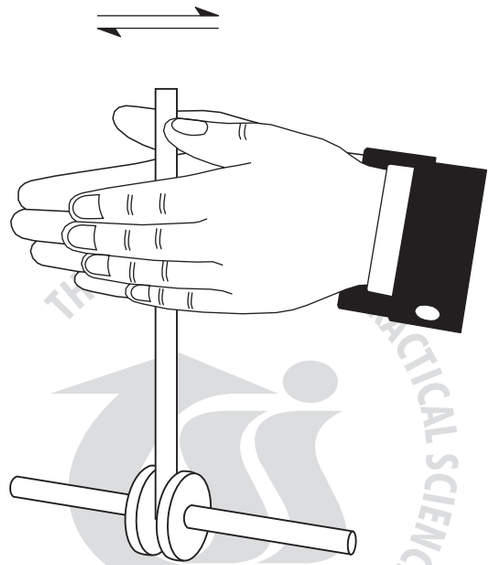


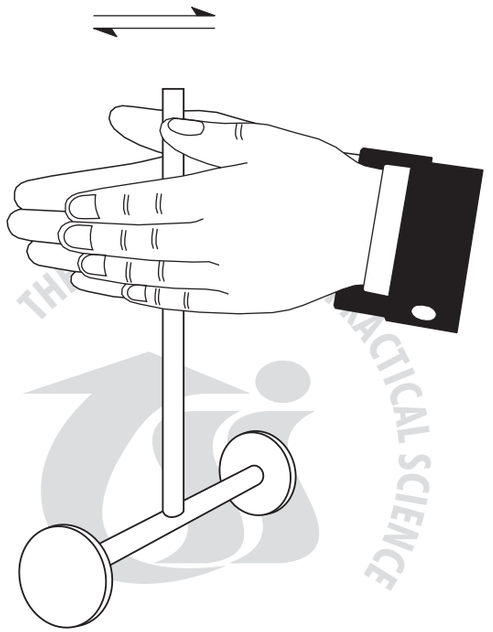
Fig. a Fig. b

To do and observe



Step 1 :

Hold the first assembly in your hands as shown in diagram. And churn the assembly (as shown in diagram).



Step 2 :

Now take the 2nd assembly and repeat the step 1.

What do you feel now? which assembly requires more torque (Rotational Force)? and why?

What is going on ?

Inertia depends on the mass of the body. Greater the mass, more is the inertia. In case of rotational motion the inertia not only depends upon the mass but also on the distribution of mass about the axis of rotation. This inertia in case of rotating body is called moment of inertia about that axis.

Here both the assemblies are having the same mass but having different mass distribution about their vertical axis.

In the first case the distribution of mass is more nearer to the axis of rotation. In the second case it is more away from the axis of rotation.

Followup :

1. Observe the difference in moving the door initially by holding it at the edge and then nearer to the hinge. Here the axis of rotation lies along the hinges.
2. Observe the same in case of gate.

TARANG SCIENTIFIC INSTRUMENTS

MOMENT OF INERTIA

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