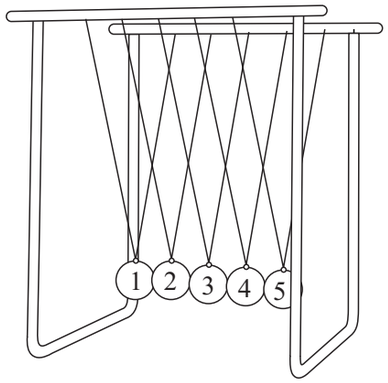
CONSERVATION OF MOMENTUM
(Newton's cradle)

Momentum before collision is same as that after collision provided the collision is perfectly elastic.

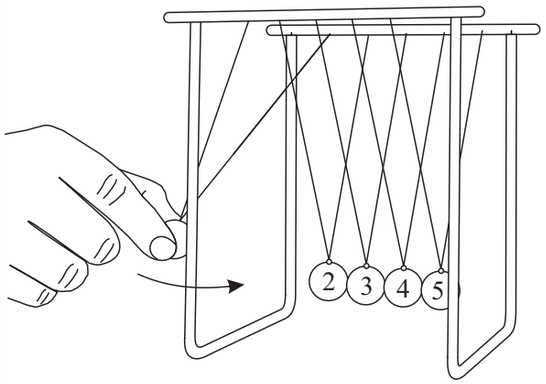
Assembly:

Consists of five steel balls of 20 mm diameter. These balls are suspended from a red painted metal frame by double cord. This reduces lateral motion of balls. All the balls are of the same mass and they are suspended such that they are in physical contact with one another.

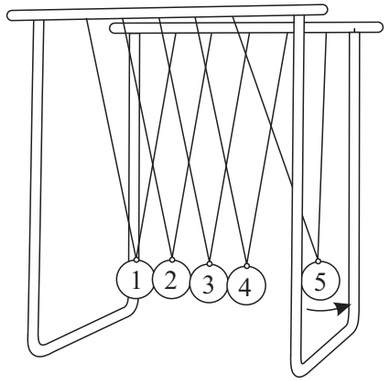


Steel balls at rest

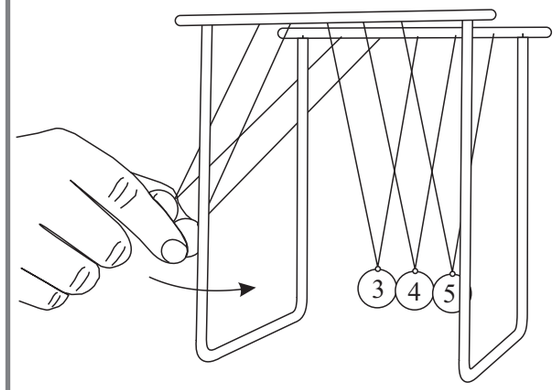
To do and observe :



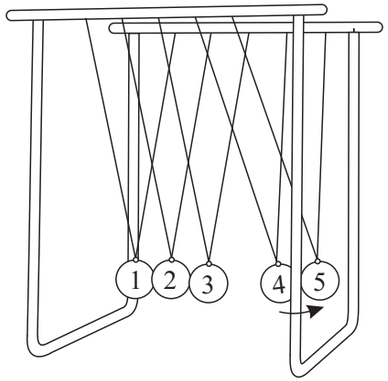
Pull the first ball away



Action after leaving the ball



Pull away two balls simultaneously



Action after leaving two balls

What is going on ?

Momentum of one ball gets transferred as momentum of the last ball. It appears that momentum of two balls will get transferred to momentum of the last two balls and so on,

Followup:

Rocket works on the principle of conservation of momentum.

As the fuel in the Rocket undergoes combustion, the burnt gases leave the body of the rocket with a large velocity in downward direction and thereby provide upthrust to the rocket. If we assume that the fuel is burnt at a constant rate, then the rate of change of momentum of the rocket will be constant. As more and more fuel gets burnt, the mass of rocket goes on decreasing and it leads to increase of the velocity of the rocket more and more rapidly.

It may be pointed out that rocket propulsion is an application of the principle of conservation of momentum to a situation, in which the mass of the system goes on changing.

Sir Isac Newton
(1643-1727)

TARANG SCIENTIFIC INSTRUMENTS

THE WAY TOWARDS PRACTICAL SCIENCE

CONSERVATION OF MOMENTUM

(Newton's Cradle)

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DHARWAD
Phone : 0836–2775204
Cell : 94482 31960