

Answer on Question #39461, Physics, Mechanics | Kinematics | Dynamics

Question:

Explain in terms of the conservation of momentum why the ratio of the masses of a bullet and a gun must be carefully considered.

Answer:

The law of conservation of momentum:

$$m\vec{v} + M\vec{u} = 0$$

where m, M are masses of gun and bullet, \vec{v}, \vec{u} are their velocities.

Or

$$mv = Mu$$

Therefore, speed of gun equals:

$$u = \frac{m}{M}v$$

So, if the ratio of the masses of a bullet and a gun will be large, the recoil of gun will be large too.