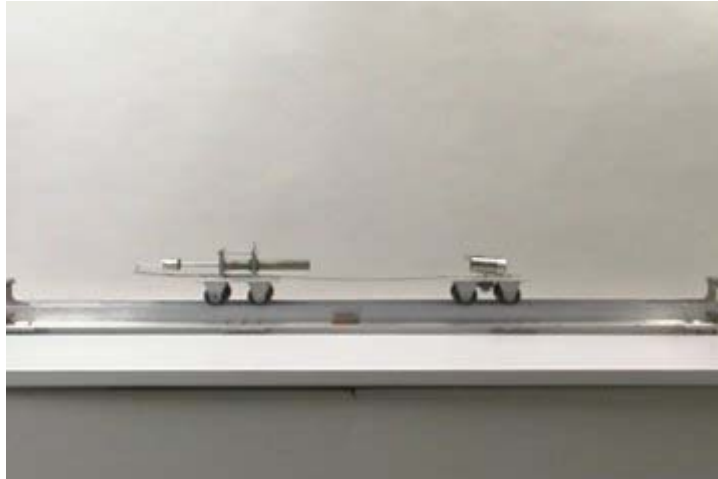# Answer #244

The answer is: well, (c) is a good answer but (d) is perhaps a better answer, as seen in an mpeg video by clicking your mouse on the photograph below.

What happens is that after the projectile is fired, the two carts move apart with equal speeds until they reach the end of the string, which yanks them back toward each other, again with equal speeds. Their ensuing collision is very nearly inelastic, so they remain close together when they stop.

You get a gold star in the middle of your forhead if you notice the detail that has been left out of the discussion until now. If you look carefully you will notice that the two carts are close together, but their geometric center is actually slightly to the left of the arrow - their geometric center before the projectile was shot. When the projectile is shot, the cart at the left actually moves slightly before the projectile strikes its receptacle cart. The center of mass of the carts is not exactly at the arrow before the collision because the projectile is in the left cart rather than the right cart. After the collision, the carts end up centered on a point slightly to the left of the arrow - exactly where the center of mass of the combined carts was before the projectile was fired.

In Question #207 the carts do not reach the ends at exactly the same time, but rather that small distance apart. This time is not noticable on the scale at which the experiment takes place.

For questions and comments regarding the *Question of the Week* contact Dr. Richard E. Berg by e-mail or using phone number or regular mail address given on the Lecture-Demonstration Home Page.