Theory of Impact: Initial Fragment

Hyp. 1. **Any body once moved continues to move, if nothing prevents it, at the same constant speed and along a straight line.**

Hyp. 2. **Whatever be the cause of the rebound of hard bodies from mutual contact when they collide with one another, we posit that when two equal bodies with equal speed collide directly with one another from opposite directions each rebounds with the same speed with which it approached.**

Hyp. 3. **When two bodies collide with one another, even if both together are further subject to another uniform motion, they will move each other with respect to a body that is carried by the same common motion no differently than if this motion extraneous to all were absent.**

Props I and II **(contrary to Descartes' Rules 6 and 3)**

Hyp. 4. **If a larger body meets a smaller one at rest, it will give it some of its motion and hence lose something of its own.**

Prop. III. **A body however large is moved by impact by a body however small and moving at any speed.**

Hyp. 5. **When two hard bodies meet each other, if, after impulse, one of them happens to conserve all the motion that it had, then likewise nothing will be taken from or added to the motion of the other.**

Prop. IV. **Whenever two bodies collide with one another, the speed of separation is the same, with respect to each other, as that of approach.**

The Theory Completed

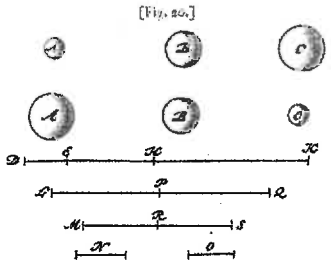
Prop. V. **If two bodies each collide again at the speed at which they rebounded from impulse, after the second impulse each will acquire the same speed at which it was moved toward the first collision.**

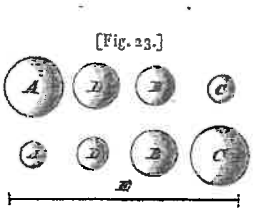
Prop. VI. **When two bodies collide with one another, the same quantity of motion in both taken together does not always remain after impulse what it was before, but can be either increased or decreased.**

Stipulation (Huygens's version of Torricelli's Principle)**: For in mechanics it is a most certain axiom that the common center of gravity of bodies cannot be raised by a motion that arises from their weight.**

Prop. VIII. **If two bodies, the speeds of which correspond inversely to the magnitudes, collide with each other from opposite directions, each will rebound at the same speed at which it approached.**

Proof**: Via reductio, contradicting the stipulation in separate cases with speeds determined in accord with Galileo's sublimity principle, $v^2 \propto$ *height***





"not alien to reason and agrees above all with experiments"