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Experiment No. 7.

Object: To verify the law of the composition and resolution of forces.

Force is measured by the rate of change of linear momentum and the change of motion takes place in the direction in which the force acts.

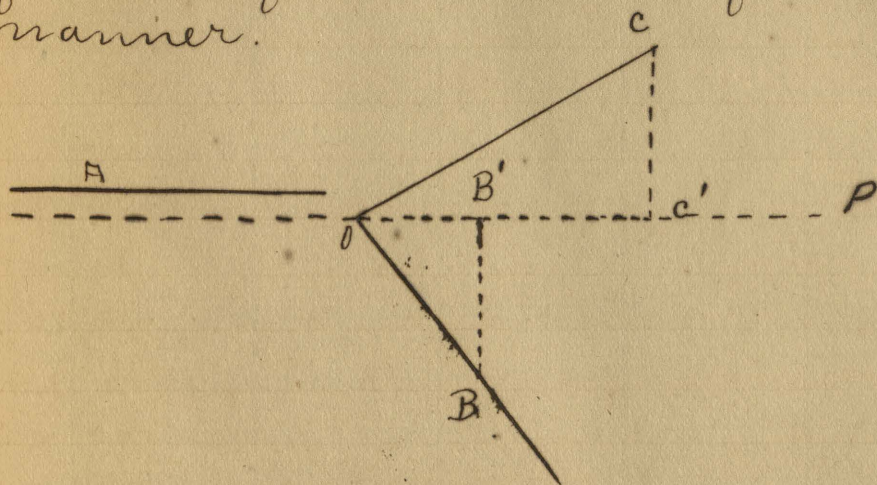
Since it is impossible to verify some general laws by experiment, a deduction from the law is proved to be true. This gives the strongest possible proof of the general law. In the present experiment four forces are acting on each other from a point and the resultant force is zero. Each force acting in turn would produce zero velocity and the displacement would be zero.

Weights are tied to strings, which are tied together at some common point. The strings pass over pulleys, fixed in blocks, to lessen the friction.

The weights are arranged so that the common point of the strings is near the centre of the table care being taken that the cords remain parallel to the faces of the pulley wheels.

When the forces have been carefully balanced, slip a sheet of drawing paper under the cards and with a drawing pencil trace the directions of the cords. Now determine the magnitude of the forces by weighing the weights and being careful to associate each force

with the line on the tracing along which it acts. Choose some convenient scale to represent the forces and draw the diagrams. These diagrams should close and the distance between the first and last vector is the error. This error should be compared with the length of the largest vector and the percentage of error expressed. Make two sets of experiments one with three forces and one with four. Make two sets of tracings one with the four forces and two, with the three forces. Calculate one of the tracings of three forces in the following manner.



Draw OP parallel to A . Then get vectors of the forces B and C and from their ends drop perpendiculars, to the line OP , BB' and CC' . OB' is the component of OB along the line of force as A and OC' is the component of OC along the same line while BB' and CC' are the two components perp. to A . BB' or is equal and opposite to CC' .

Similarly force A is equal and opposite
to the two components $o b'$ and $o c'$.