Volcanic jets are fast-moving, coherent stream suspensions of pyroclasts and volcanic gases that are injected in the atmosphere by explosive eruptions. Despite gas-pyroclast coupling and air entrainment in the jet are regarded as prime control factors of eruption evolution, direct measurements are still limited. Here we present field measurements of particle and jet motion in Strombolian explosions. We filmed eruptive jets at Stromboli volcano at 500 frames per second with a resolution of 1.7 cm/pixel in an area of 9x9 m right above the vent. The jets are free of ash, allowing tracking of cm- to m-sized particles, while image processing highlights the motion of the front where air is entrained in the jet. Front velocity ranges 100-200 m/s and decreases step-wise over the field of view. Pyroclast velocity can be as high as 350 m/s. Pyroclast acceleration is strongly negative to almost null, depending on the relative clast-front position. In particular, the velocity of pyroclasts travelling above the front decreases non-linearly, in agreement with theoretical predictions of ballistic motion in still air. Conversely, pyroclasts below the front travel at an almost constant velocity. Pyroclasts travelling across the front experience a strong deceleration starting from about 1 m below it. We conclude that below the air entrainment front gas and cm-sized pyroclasts are mechanically coupled and that inertia-driven decoupling begins below the front. The above field-based parameterization has strong implications for ballistic clasts emplacement, air entrainment dynamics, and overall jet/plume modelling.