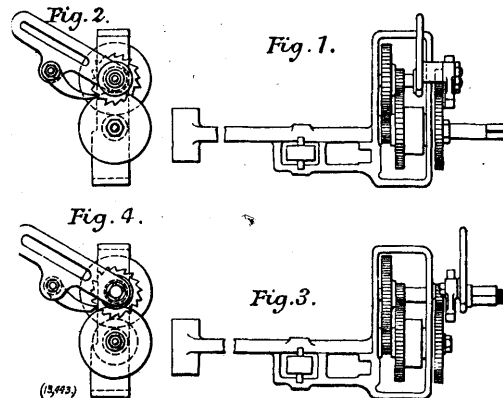


## TEXTILE MACHINERY.

**13,443. J. Harrison, West Gorton, Lancs. Copping Motions.** [4 Figs.] June 28, 1899.—This invention relates to the copping motion of spinning frames for altering the lift of the rail after each traverse or lift to form the cops, and is intended to reduce the movement in a greater ratio than heretofore. The movement is set in the free end of the oscillating copping lever which may be operated by a heart cam. In the casting at the end of the copping lever are two shafts or spindles, one fixed in the casing or frame and the other fitted into bearings to rotate therein. On the end of the fixed shaft outside the casting is fitted rotatably thereon the ratchet wheel by which the motion is actuated, and also a small pinion to rotate therewith, and towards the other end of the same shaft there is a large pinion and a



small one. On the loose shaft is fixed on the end outside the casting a large pinion with which the first small pinion on the other shaft gears and at the other end of the loose shaft and fixed thereto, is a small pinion gearing with the large pinion on the fixed shaft. Loose on the loose shaft and free to rotate independently of it is another large pinion, to the boss of which the lifting chain is attached, this pinion gears with the second small pinion on the fast shaft and is rotated thereby at the desired speed to take up the lifting chain which is wound upon the boss. By this arrangement is obtained the desired movement for shortening the lifting chain and altering the lift or traverse without increasing the size of the pinions. (Accepted July 18, 1900.)