

points against one pair of said surfaces, and retained in place by the other pair of surfaces, substantially as described. 9th. A ball bearing, consisting of a ring or annular piece adapted to be secured to a stationary or rotating part, and having an annular projecting rib or collar at surfaces at each end located at right angles to each other, end rings or collars each having surfaces arranged at right angles to each other, and spherical rollers or balls between each end ring and the annular rib or collar, substantially as described.

No. 37,327. Ball Bearings. (*Coussinet à boule.*)

George Frederick Simonds, Fitchburg, Massachusetts, U. S. A., 5th September, 1891; 15 years.

Claim.—1st. A ball bearing, comprising a tubular piece or sleeve, or similar bearing surface rings or annular pieces, concentric surfaces and plane surfaces at right angles to each other, an annular set of spherical rollers or balls serving to resist endwise thrust or pressure, and another annular set of spherical rollers or balls operating to sustain radial pressure or weight, substantially as described. 2nd. A ball bearing, consisting of a tubular piece or sleeve or other bearing surface, having a circumferential projection rib or collar rings or annular pieces concentric with said bearing surface, and having circumferential projections, ribs or collars, and annular sets of spherical rollers or balls arranged between the circumferential projections, ribs or collars, and operating, substantially as described, to resist end thrust or pressure and support or sustain radial pressure or weight, substantially as described. 3rd. A ball bearing, consisting of a bearing surface having a circumferential projection, rib or collar rings or annular pieces concentric with said bearing surface, and having circumferential projections, ribs or collars and spherical rollers or balls arranged between the circumferential projections, the spherical rollers or balls for resisting end thrust or pressure being located in longitudinal planes between those for supporting radial pressure or weight, substantially as described. 4th. A ball bearing, comprising a tubular piece or sleeve having a circumferential projection rib or collar provided with surfaces which are in parallel planes, rings or annular pieces arranged one on each side of the said rib or collar, and each having a surface concentric with the said tubular piece or sleeve, and a plane surface parallel to those of the said rib or collar, and balls which are located between the said rings and the tubular piece or sleeve, and which bear at diametrically opposite points against and roll upon one pair of the said surfaces, and are retained in place by the other pair thereof, substantially as and for the purpose set forth. 5th. In a ball bearing, the combination, with the rotating and non-rotating parts, of a tubular piece or sleeve provided with a circumferential projection rib or collar and detachably secured to one of the said parts, rings or annular pieces detachably secured to the other of the said parts, one on each side of the said rib or collar, the said tubular piece or sleeve having a surface concentric with the rotating part and the rib or collar, having parallel plane surfaces perpendicular to the axis thereof, and each of the said rings having a surface concentric with the said rotating part, and a plane surface parallel to those of the said rib or collar, and balls which are located between the rings and the said tubular piece or sleeve, and which bear at diametrically opposite points against and roll upon one pair of the corresponding surfaces, and are retained in place by the other pair thereof, substantially as and for the purpose set forth. 6th. In a ball bearing, the combination, with the rotating and non-rotating parts, of a tubular piece or sleeve detachably secured to one of the said parts and having a surface concentric therewith, and a circumferential projection rib or collar provided with bearing surfaces in parallel planes at right angles to the said concentric surface, rings or annular pieces arranged one on each side of the said rib or collar, and detachably secured to the other of the said parts, each of the said rings having a surface concentric with the rotating body, and a bearing surface in a plane parallel to those of the said rib or collar, and balls which are located between said rings and the tubular piece or sleeve, and which bear at diametrically opposite points against and roll upon the said parallel plane surfaces, and are retained in place by the said concentric surfaces, substantially as described. 7th. In a ball bearing, the combination, with the rotating and non-rotating parts, of a tubular piece or sleeve detachably secured to one of the said parts and having a surface concentric therewith, and a circumferential projection rib or collar provided with bearing surfaces in parallel planes at right angles to the said concentric surface, rings or annular pieces arranged one on each side of the said rib or collar, and detachably secured to the other of the said parts, each of the said rings having a surface concentric with the rotating body, and a bearing surface in a plane parallel to those of the said rib or collar, and balls which are located between the said rings, and the tubular piece or sleeve, and which bear against and roll upon said concentric surfaces, and are retained in place by the said plane surfaces, and screws for adjusting the said rings relatively to the said rib or collar, substantially as and for the purposes set forth. 8th. A ball bearing wherein some of the balls are arranged to resist thrust or end pressure, and the remainder of the balls are arranged to resist radial pressure, the series or groups of balls for resisting thrust or end pressure being located between those for supporting radial pressure, for the purpose above specified. 10th. A ball bearing wherein the balls are arranged in circular series or groups between rings or

sleeves, and a box or casing surrounding the same, the balls of some of the groups being arranged to bear against and roll upon concentric surfaces on the said rings or sleeves, and box or casing, and the balls of the remaining groups being arranged to bear against and roll upon plane surfaces on the said rings or sleeves, and box or casing, and being located between the groups of balls which bear against and roll upon the concentric surfaces, substantially as and for the purposes set forth. 11th. In a ball bearing, the combination of a box or casing, rings, or sleeves, within the said box or casing, and circular series or groups of balls arranged between the said rings or sleeves and box or casing for supporting or resisting radial pressure, and thrust or end pressure, the groups of balls for resisting thrust or end pressure being located between those for supporting radial pressure, for the purpose above specified. 12th. In a ball bearing, the combination of a tubular piece or sleeve *a*, provided with a circumferential rib or collar *a'*, having plane surfaces at right angles to the concentric surface rings or annular pieces *b*, on both sides of the said rib or collar, having plane surfaces parallel to those on the corresponding rib or collar, balls *c*, arranged in circular series or groups between the said rings and tubular piece or sleeve, and the whole enclosed in a case or box, substantially as described. 13th. In a ball bearing, the combination of a tubular piece or sleeve provided with a circumferential projection rib or collar, rings or annular pieces arranged one on each side of the said rib or collar, balls arranged in circular series or groups between the said rings and the rib or collar, and adjusting screws passed through one or more of the said rings and screwed into another of the same, substantially as and for the purposes above specified. 14th. In a ball bearing, the combination of a tubular piece or sleeve provided with a circumferential projection rib or collar having plane bearing surfaces, rings or annular pieces with corresponding plane bearing surfaces arranged one on each side of the said rib or collar, a ring or annular piece having a bearing surface concentric with the said tubular piece or sleeve, and balls arranged in circular series of groups between the said rings and the tubular piece or sleeve, substantially as and for the purposes above specified. 15th. In a ball bearing, the combination of a tubular piece or sleeve provided with a circumferential projection rib or collar having plane bearing surfaces, rings or annular pieces with corresponding plane bearing surfaces arranged one on each side of the said rib or collar, other rings or annular pieces having bearing surfaces concentric with the said tubular piece or sleeve balls arranged in circular series or groups between the said rings, and the tubular piece or sleeve and screws for adjusting the said rings relatively to the said rib or collar, substantially as and for the purposes above specified. 16th. In a ball bearing, the combination of a tubular piece or sleeve provided with a circumferential projection rib or collar, rings or annular pieces arranged on each side of the said rib or collar, and balls arranged in circular series or groups between the said rib or collar, and the rings or annular pieces and screws holding the parts on the bearing together so that they form a complete device ready for application to a shaft axle of the like, or for insertion into the nave or hub of the wheel pulley or the like, substantially as and for the purposes set forth. 17th. In a ball bearing, the combination of a tubular piece or sleeve provided with a circumferential rib or collar, rings or annular pieces *b*, on both sides of the said rib or collar, balls arranged in circular series or groups between the said rings, and the tubular piece or sleeve and adjusting screws passed through one or more of the said rings and screwed into another of the same, substantially as and for the purposes set forth. 18th. In a ball bearing, the combination of a tubular piece or sleeve having a circumferential rib or collar and fixed upon a shaft or axle, rings or annular pieces secured in the nave or hub of a wheel or pulley, or in a box or casing, balls arranged in circular series or groups between the said rings and the tubular piece or sleeve, and adjusting screws passed through one or more of the said rings and screwed into another of the same, substantially as and for the purpose set forth. 19th. In a ball bearing, the combination, with the rings or annular pieces arranged one on each side of the rib or collar on the tubular piece or sleeve, of a shaft or axle having a transverse slot or groove, a bar or key fitted in the said groove and engaging in notches or recesses in the said rings, and means, substantially as above described, for keeping the said rings in engagement with the said key, substantially as and for the purposes set forth.

No. 37,328. Elevator Brake. (*Frein d'élevateur.*)

William N. Anderson, San Rafael, California, U.S.A., 5th September, 1891; 15 years.

Claim.—1st. In an elevator brake, the combination, with brake shoes adapted to engage shaft posts, and arranged in the elevator carriage, of eccentrics adapted to engage the said brake shoes, a shaft carrying the said eccentrics, and provided with a gear wheel, and a weighted lever fulcrumed on the elevator carriage and provided with a segmental gear wheel in mesh with the said gear wheel, substantially as shown and described. 2nd. In an elevator brake, the combination, with brake shoes adapted to engage shaft posts, and arranged on the elevator carriage, of eccentrics adapted to engage the said brake shoes, a shaft carrying the said eccentrics, and provided with a gear wheel, a weighted lever fulcrumed on the elevator carriage and provided with a segmental gear wheel in mesh with the said gear wheel, a catch adapted to support the free end of the said lever, and a governor connected with the said catch and actuated by the movement of the elevator carriage, so that when the latter exceeds a normal rate of speed, the said governor withdraws the said catch from underneath the said lever, substantially as shown and described. 3rd. In an elevator brake, the combination, with brake shoes adapted to engage shaft posts, and arranged on the elevator carriage, of eccentrics adapted to engage the said brake shoes, a shaft carrying the said eccentrics, and provided with a gear wheel, a weighted lever fulcrumed on the elevator carriage and provided with a segmental gear wheel in mesh with the said gear wheel, a catch adapted to support the free end of the said lever, a governor connected with the said catch and actuated by the movement of the elevator carriage so that when the latter exceeds a normal rate of speed, the said governor withdraws the said catch from underneath