levers 12, for the rear face of the front wheels and the brake bar 7, for the front face of the front wheels, and chains 9, connecting the brake bar 7, to the axle, both brake bars moving in unison with the movement of the tongue, as set forth.

No. 35,228. Circulator and Purifier for Steam Boilers. (*Circulateur et epurateur pour chaudières à vapeur.*)

Alexander Grant, Los Angeles, California, U. S. A., 16th October, 1890; 5 years.

Claim.—1st. The combination of a steam boiler, an exterior water circulating conduit connecting the intermediate part of the boiler with the lower part of the same, and a downwardly discharging feed water pipe communicating with said exterior conduit. 2nd. The boiler, consisting of a top section A, and a bottom section C, and an intermediate enlarged section D, in combination, with the exterior conduit communicating with the bottom of the intermediate section and extending, under the grate bars of the furnace, to and communicating with the bottom section of the boiler. 3rd. A steam boiler provided with a conduit which communicates with the intermediate part of the boiler, below the water line, passes thence along the outside of the boiler and into the boiler near the bottom thereof, extends upward therefrom, is enlarged at the top and thence extends downward to surround its upper extension to near the bottom thereof, and there opens to discharge near the bottom of the boiler. 4th. The combination of a steam boiler, a conduit which communicates with the intermediate part of the boiler, below the water line, passes thence along the outside of the boiler and into the boiler near the bottom thereof, extends upward therefrom, is enlarged at the top, and thence extends downward to surround its upper extension to near the bottom thereof, and there opens to discharge near the bottom of the boiler, and a feed water-pipe arranged to discharge downward into such conduit. 5th. The combination of a steam boiler, a purifier located outside of the boiler, a conduit communicating with the intermediate part of the boiler below the water line, and arranged to discharge into one end of the purifier, and a conduit communicating with the other end of the purifier, and arranged to discharge into the lower part of the boiler. 6th. The combination of a steam boiler, a purifier located outside of the boiler, a conduit communicating with the intermediate part of the boiler below the water line, and arranged to discharge into one end of the purifier, a conduit communicating with the other end of the purifier, and arranged to discharge into the lower part of the boiler, and means for distributing the water at the point of discharge. 7th The combination of a vertical steam boiler, a purifier located outside of the boiler, a conduit communicating with the intermediate part of the boiler below the water line, and arranged to discharge into one end of the purifier, a conduit which communicates with the other end of the purifier, passes into the boiler near the bottom thereof, extends upward therefrom, is enlarged at the top, and thence extends downward to surround its upper extension to near the bottom thereof, and there opens to discharge near the bottom of the boiler. 8th. The combination of a steam boiler, a purifier located outside of the boiler, a conduit communicating with the intermediate part of the boiler below the water line, and arranged to discharge into one end of the purifier, a feed water pipe arranged to discharge toward the purifier into such conduit, and a conduit communicating with the other end of the purifier, and arranged to discharge into the lower part of the boiler. 9th. The combination, with a vertical steam boiler, comprising a top section, a bottom section, and an enlarged intermediate section, of a purifier, a conduit communicating with the intermediate part of the boiler below the water line, and arranged to discharge into one end of the purifier, a feed water-pipe arranged to discharge toward the purifier into such conduit, a conduit which communicates with the other end of the purifier, passes into the boiler near the bottom thereof, extends upward therefrom to near the bottom of the enlarged intermediate section, is enlarged at the top and extends thence downward to surround its upward extension and discharge near the bottom of the boiler. 10th. The combination, with a steam boiler, comprising the top and bottom sections, and enlarged intermediate section, of the perforated partition, the purifier located outside of the boiler, the conduit communicating with the intermediate part of the boiler below the water line, and arranged to discharge into one end of the purifier, and the conduit communicating with the other end of the purifier, and arranged to discharge into the lower part of the boiler.

No. 35,229. Axle Bearing. (*Coussinet d'essieu.*)

Walter Bristow, Ottawa, Ontario, Canada, 16th October, 1890; 5 years.

Claim.—1st. An axle bearing in wheel hubs, consisting of the axle sleeve or bearings B, at opposite ends of the hub, and having a raised rim or projection B^1, balls C, traveling around said sleeve or bearings, and a ring D, inserted in both ends of the hub, and having a raised projection or rim D^1, which, with the rim or raised projection B^1, of the bearings B, compel the balls to travel or circuit in a row or rows around the inside of ring D, whereby the hub may turn on the balls independently of the sleeve or bearings B, or the balls and bearings B, move combinedly around the axle spindle, as set forth. 2nd. The combination, with the hub A, of the sleeve or bearings B, having projections B^1, balls C, travelling around said sleeve or bearings, rings D, inserted in the ends of the hub, and having an annular projection D^1, to retain the balls in their circuit, and rings J, secured to the ends of the hub to cover the opening to the balls, whereby the balls and bearings will travel together, or independently, as set forth.

No. 35,230. Shaft Coupling.

(*Armon de limonière.*)

David Boorman, Altoona, Pennsylvania, U.S.A., 16th October, 1890; 5 years.

Claim.—1st. In a shaft coupling, the combination, with a pair of shafts having key-seats formed therein, said key-seats increasing in depth from the ends of shaft toward center, of a collar having key-seats therein, keys made to conform to the shape of the openings formed by the key-seats in the shafts and collar, when registering with one another, and devices on the ends of the keys for holding them securely in place, substantially as set forth. 2nd. In a shaft coupling, the combination, with a pair of shafts having key-seats therein, which increase in depth from the ends toward center of shafts, of a collar having straight key-seats therein, keys formed to correspond in shape with the openings formed by the key-seats in the shaft, and collar registering with one another, the ends of the keys protruding out at the ends of the collar, and having threads thereon, nuts for tightening the keys, and flanges on the ends of collar, substantially as set forth.

No. 35,231. Wire Tightening Device.

(*Cric-tendeur des fils de fer.*)

John McDougall, Ernest, Kansas, U.S.A., 16th October, 1890; 5 years.

Claim.—1st. In a wire tightener, the combination, with a supporting upright, of a lever pivoted to said upright, said lever provided at a point near its free end, and upon its upper face, with a notch and at a point near its pivot-point, and on its under face with a pin, and a loop adapted to engage the notch, as and for the purpose set forth. 2nd. In a wire tightener, the combination, with an upright, of a lever *l*, pivoted thereto, said lever provided on its upper face, and at its free end with a notch *n*, and on its under face near its pivot-point with a pin *p*, a loop O, arranged to engage notch *n*, and a loop *e*, arranged to engage pin *p*, as and for the purpose set forth.

No. 35,232. Stand for Carboys.

(*Porte-touque à bascule.*)

James F. Stevenson, Allegheny, Pennsylvania, U.S.A., 16th October, 1890; 5 years.

Claim.—1st. A stand for carboys, consisting of the parallel rockers, having the brace at the lower ends to engage the carboy, and steps or bends at the upper ends to secure the carboy, substantially as described. 2nd. A stand for carboys, consisting of a wire bent to form rockers, and having the lower closed end bent up to engage one of the lower edges of the carboy, and their free ends formed with steps to engage one of the upper edges of the carboy, substantially as described. 3rd. The herein described stand for carboys, consisting of the curved rockers, having their lower ends turned up to form a brace for the carboy, and their upper ends turned inward and formed with step angles for securing the carboy, substantially as described.

No. 35,233. Water Wheel. (*Roue hydraulique.*)

David A. Van Kleek, Pardee, Kansas, U.S.A., 16th October, 1890; 5 years.

Claim.—1st. The combination, in a water-wheel, of an endless chain of buckets mounted on pulleys, so that the buckets with which the water contacts will be downwardly-inclined, bars and links pivotally connecting said buckets to each other, said bars having rollers which contact with guides, together with vertical sides and top forming an inclined chamber, contracted toward its lower end, and in which the upper portion of the endless chain moves, and a supply-gate located at the upper end of said chamber, substantially as shown and for the purpose set forth. 2nd. The combination, in a water-wheel, of a frame work constructed, substantially as shown, and provided with a water-way which converges toward the discharge-opening, of a chain of buckets mounted on sprocket-wheels attached to shafts, so that the buckets with which the water contacts will incline downward y from the inlet to the outlet openings, together with vertical sides and top forming an inclined chamber contracted toward its lower end, and in which the upper portion of the endless chain moves, and a supply-gate located at the upper end of said chamber, substantially as shown and for the purpose set forth. 3rd. In combination, with a water-wheel an endless belt, made up of a series of buckets constructed, substantially as shown supporting-shafts having notched wheels over which the endless chain passes, slotted bars G, G, secured removably to the frame, and provided with bearings for one of the shafts, and wedges for adjusting the bars G, the parts being organized, substantially as shown and for the purpose set forth. 4th. The combination, in a water-wheel, of an inclined endless belt located within an upper casing contracted toward its lower end as described, said belt being composed of a series of transverse boards provided with loops or straps pivotally connected by rods carrying rollers, angular end plates secured to the face of the boards, and transverse inclined plates with which the boards and angle-plates form buckets, substantially as set forth. 5th. In combination, with a water-wheel, constructed substantially as shown, a supporting-frame therefor, made up of sill pieces and vertical beams inclined or wedge-shape side pieces C, C, and a removable top D, whereby a converging water-way above the buckets is provided, the inclined endless chain of buckets being provided with rollers and guides with which said rollers contact, so that the buckets will not be depressed by the weight of the water, substantially as set forth.

No. 35,234. Rotary Engine.

(*Machine rotative.*)

Joseph J. Bentley, Sadorus, Illinois, U.S.A., 16th October, 1890; 5 years.

Claim.—1st. In combination, in a rotary engine, the cylinder, a suitable abutment within the cylinder mounted on a shaft normally in line with the axis of said cylinder, a collar on said shaft at a suitable distance from that end of said shaft which is within the cylinder, and bolts passing through the abutment and through the