

separated from the teeth by knife receiving slots or spaces, a longitudinal rib bearing on the upper side of said finger bar, and an endless chain or series of knives bearing on the upper side of said finger bar and guided by said rib, the knives at the front side of the rib passing through the slots between the teeth and the guards, and co-operating with said teeth as described, and means for impelling said knives, all substantially as set forth. 3rd. An endless chain or series of knives composed of gangs secured to links which are permanently riveted together, and are provided with separable connections at the ends of the gangs, whereby any gang can be removed from the endless chain or series, as set forth. 4th. A gang of knives secured to links which are permanently riveted together end to end, the links at the end of the gang having connecting devices, whereby the gangs may be separably connected with the corresponding ends of similar gangs, as set forth.

No. 29,856. Manufacture of Wrapping or Toilet Paper Rolls. (*Fabrication des rouleaux de papier d'enveloppe ou de latrines.*)

Seth Wheeler, Albany, N.Y., U.S., 13th September, 1888; 5 years.

Claim.—1st. A roll of paper having all its incisions or perforations in the same plane, and adapted, substantially as described, to permit the introduction of a suspensory device through the incisions from the interior outwardly. 2nd. As a new manufacture, a roll of paper having all its incisions or perforations in the same plane, and provided with a suspensory device introduced from the interior of the roll and passing outwardly through the incisions, substantially as described.

No. 29,857. Steam Trap. (*Trappe de vapeur.*)

John Kolb and J. R. Drozeski, (Assignees of Frederick G. Botsford), Erie, Penn., U.S., 14th September, 1888; 5 years.

Claim.—1st. The combination, in a steam trap, of a tubular body adapted to retain steam and water, having an expansion tube secured in one end thereof, with an annular or hollow valve seat secured in the opposite end of said body, against which the open end of said expansion tube operates, so that the air will circulate entirely through said expansion tube and valve seat, substantially as and for the purpose set forth. 2nd. The combination, in a steam trap, of a hollow tubular body having a bushing 2 in one end thereof, into which bushing an expansion pipe 5 is secured, with a bushing 6 having guides 7 therein, and the adjustable valve plug 8, substantially as and for the purpose set forth. 3rd. The combination, in a steam trap for ear heating, of a hollow tubular body having a tubular expansion pipe secured therein, with the hollow adjustable valve plug 8, constructed substantially as shown and for the purpose set forth.

No. 29,858. Water Heater. (*Calorifère à eau.*)

Warden King, (assignee of Archibald Spence), Montreuil, Que., 14th September, 1888; 5 years.

Claim.—1st. The combination, in a heater, of the sections E and O, with section F having projections G, and tap bolts H with furnace A, the whole constructed and arranged substantially as described. 2nd. The combination, in a heater, of the sections E and O, with section F having central opening K and openings P, the whole substantially as described. 3rd. The combination, in a heater, of a number of sections placed one over the other, substantially as shown, the lower section being provided with projections G, tap bolts H, and opening K, the whole substantially as described.

No. 29,859. Duplex Engine. (*Machine double.*)

The Watrous Engine Works Company, Brantford, Ont., (assignee of Harvey F. Gaskill), Lockport, N. Y., U.S., 15th September, 1888; 5 years.

Claim.—1st. The combination in a duplex engine, of the valves, the valve stems, the levers pivoted to the valve stems, the adjusting screws for varying the throws of the valves, and connecting devices connecting one end of each lever with one set of pistons, and the other end of each lever with the other set of pistons, substantially as set forth. 2nd. The method of regulating the motion of a duplex engine having independent pistons, consisting in causing both sets of pistons to act about equally upon both sets of valves, causing the pistons to off set each other in their actions on the valves during one part of the stroke, and to re-inforce each other in their actions on the valves during another part of the stroke, substantially as set forth. 3rd. The method of regulating the motion of a duplex engine having independently moving pistons, consisting in causing both sets of pistons to act about equally on both sets of valves, causing said pistons to off set each other in their actions on the valves during the first parts of the strokes, and to re-inforce each other in their actions on the valves during the latter parts of the strokes, substantially as set forth.

No. 29,860. Watch Case. (*Boîte de montre.*)

Richard Russell, jr., Hamilton, Ont., 15th September, 1888; 5 years.

Claim.—1st. In a watch case A, having projections a, and a bezel b, provided with slots c, and inclined planes D to receive and engage with the same, substantially as and for the purpose hereinbefore set forth. 2nd. In a watch case, the combination of a rim or movement holder E, having pins f, and the case A, substantially as and for the purpose hereinbefore set forth.

No. 29,861. Pump. (*Pompe*)

Hiram J. Wells, Nashville, Tenn., U.S., 15th September, 1888; 5 years.

Claim.—1st. In a pump, the combination, with the cylinder provided with an air-valved outlet at its lower end, of the cover provided with a valved tube or cylinder at its upper end, and the plunger having a tubular rod provided at its upper end with a series of air-

inlets, and at its lower end with a valve, substantially as and for the purpose set forth. 2nd. In a pump, the combination, with the cylinder provided at its lower end with a valved outlet, and at its upper end with a cover having a central valved passage, and a filter at one side of said passage, a tube or cylinder applied to the said cover, and adapted for connection to a pump barrel, and the plunger having a tube adapted for connection to the pump handle, and provided at its upper end with a series of air inlets and with an air-valved outlet at its lower end, substantially as set forth. 3rd. In a pump, the combination, with the cylinder provided at its lower end with a valved outlet, and at its upper end with a cover having a central valved passage, and at one side of said passage a filter having a valved lower end, a tube or cylinder applied to said cover and adapted for connection to a pump barrel, and the plunger having a tube adapted for connection to the pump handle, and provided in its upper end with a series of air inlets, and at its lower end with an air-valved outlet, substantially as set forth.

No. 29,862. Washing Machine.

(*Machine à blanchir.*)

Josiah Shepherd, Jeffersonville, Ohio, U.S., 14th September, 1888; 5 years.

Claim.—1st. The combination, with the suds box, of the lid the rotatable circular turn table mounted in the lid, and forming in connection with the same a complete cover for the suds box, the lever mounted on the turn table, and the plunger connected to the lever and extending through the turn table into the suds box, as specified. 2nd. The combination, with the suds box and the cover making a steam tight joint therewith, of the turn table attached to the cover, the shaft journaled thereupon, the legs rising from said turn table, the lever handle pivoted on said shaft, the transverse bars secured to said lever above its pivot point, the plunger rods and the plungers, substantially as specified. 3rd. The combination, with the suds box and the lid, of the turn table comprising the upper plate b, and the lower plate c, secured together by bolts, and the lever mounted on the turn table and the plungers connected to the lever, as set forth. 4th. In a washing machine, a suds box having the door a, provided with a circular opening having the bevelled recess b₁, the turn table B comprising the outer plate b, having the bevelled edge b₂ to rest in the recess b₁, and the inner plate c connected to the outer plate by pins and bolts, and engaging under the lid or cover a around the opening therein, and the plunger and operating connections mounted on the turn table, as set forth.

No. 29,863. Machine for Sawing and Drilling Railway Rails. (*Machine à scier et percer les rails de chemins de fer.*)

Eben N. Higley, Somersworth, N. H., U.S., 15th September, 1888; 5 years.

Claim.—1st. In a rail sawing machine, a circular saw mounted in a suitable frame or holder, and provided with apertures in its side, near its periphery, in combination with a driving wheel having pins or projections adapted to enter said apertures, whereby the saw is rotated positively by the driving wheel, substantially as set forth. 2nd. In a rail sawing machine, the combination, with the main frame and a movable or swinging frame attached thereto, of a circular saw mounted in said movable frame, and provided with side apertures near its periphery, a pair of driving wheels applied to the said saw on opposite sides of the frame, and having pins or projections adapted to enter said apertures, and the mechanism for feeding the saw, all operating substantially in the manner and for the purpose described. 3rd. In a rail sawing machine, the combination, with a saw D provided with side apertures e near its periphery, of a pair of driving wheels N, N, arranged upon opposite sides of the saw, and each provided with pins t and recesses u alternating with each other, the driving wheels being so arranged with respect to each other that the pins of each wheel, after passing through the apertures in the saw will engage the recesses in the opposite wheel, substantially as set forth. 4th. In a rail sawing machine, the combination of the main frame adapted to be secured to the rail, a swinging frame C pivoted thereto, a circular saw D mounted in said movable frame and having apertures e in its side near the periphery, a pair of horizontal driving wheels N, N, connected with and driven by the main shaft, and provided with pins or projections t adapted to enter the apertures e in the saw, and positively rotate the same, and a device for feeding the saw, all operating substantially as described. 5th. In a rail sawing machine, the combination of the main frame, a swinging frame C pivoted thereto, a circular saw D mounted in said movable frame and having apertures e in its side near the periphery, the horizontal driving wheels N, N, provided with pins or projections t adapted to enter said apertures e, and the feeding device for the saw consisting of the yoke G joined to the frame C and carrying the feed screw H, the worm gear K and feed nut g carried thereby, the pulleys or chain wheels m, p, r, chains n, g, and the driving shaft M, all operating substantially in the manner and for the purpose set forth. 6th. In a rail sawing machine, the combination, with the saw D, its pivoted supporting frame C and the yoke G, of the feed screw H, worm gear K with its box or recess f and cap A, and the feed nut g placed within said recess f and made convex at its opposite ends, whereby it is permitted to adjust itself within said recess to the varying inclination of the feed screw produced by the movement of the saw, g frame, substantially as described. 7th. The combination, with the frame A, of the rotating sleeve w, the crank shaft v, a train of gearing between the crank shaft v and the sleeve w, whereby the latter is operated, the drill T sliding with a spline or key within the sleeve w and rotated thereby, a sleeve q provided with an external screw thread and sliding upon the rear end of the sleeve w, and having a pin or plug k fitting within the sleeve w, and bearing against the rear end of the drill to feed the same, the ratchet wheel k having an internal thread fitting over the thread of the sleeve q, whereby the latter is moved in the direction of its length to feed the drill, and the pawl M and its actuating lever n, all operating substantially in the manner and for the purpose set forth. 8th. The combination, with the drill T and its operating mechanism, substantially