the vessel a, the casings f^1, f^2 and the bearing v^1, of the vessel v, supply-pipe u, float k^1 and curved pipe w, substantially as specified.

No. 29,055. Apparatus for Supporting and Working Centrifugal Machines, such as Cream Separators, etc., by Hand Power. (*Appareil pour supporter les machines centrifuges tel que les séparateurs de la crême, etc., et les actionner à la main.*)

Carl G. P. deLaval, Stockholm, Sweden, 1st May, 1888: 5 years.

Claim.—1st. In a centrifugal machine for separating substances of different gravities, the combination, with the vertical shaft on which is mounted the separating vessel, of a vertical screw carried in fixed bearings connected to end of such vertical shaft, and rotated by worm wheel mounted on a shaft, and means for rotating same, as described and shown. 2nd. In a centrifugal machine for separating substances of different gravities, the combination, with the vertical spindle carrying the separating vessel, of a centralizing coupling to connect it with a vertical revolving screw carried in fixed bearings, substantially as shown and described. 3rd. In a centrifugal machine for separating substances of different gravities, the casing h forming bearings for, and enclosing vertical screw g, and the casing i enclosing part of separating vessel n, such casings forming part of main framing of machine, as described. 4th. The combination, with the shaft l, adapted to support the centrifugal vessel upon the same, and the bearings for such shaft, of the vertical worm g and its shaft g^1, the coupling o connecting the shaft l to the shaft of the worm, the worm wheel f acting to revolve the worm g, the shaft e, pinion d, gear wheel a, shaft b and crank c for giving rotation to the parts, and the bed plate and stand, and the casing h attached to the bed plate and supporting the worm shaft g and shaft e, substantially as specified.

No. 29,056. Nut Lock. (*Arrête-écrou.*)

John W Parks and Peter G. Roquemore, Marshall, Texas, U. S., 1st May, 1888, 5 years.

Claim.—In a nut lock, the combination, with a bolt and a nut having a notched or serrated face, of a rectangular washer split across one of its sides, the ends thus formed being bent in opposite directions to substantially the same degree, and each end being bevelled from one side to the other to form a knife edge, substantially as specified.

No. 29,057. Apparatus for Heating Railway Cars. (*Appareil de chauffage des chars de chemins de fer.*)

Joseph Shackleton, New York, N. Y., U. S., 1st May, 1888; 5 years.

Claim.—1st. In a heating apparatus, the combination of a steam supply pipe, a water pipe, an auxiliary steam pipe within the water pipe and opening into the same, and a connection between the auxiliary steam pipe and the steam supply pipe, substantially as shown and described. 2nd. In a heating apparatus, the combination of a water pipe having vertical water legs, a steam pipe located within the water pipe and extending into the water leg, and an overflow from one of the water legs, substantially as shown and described. 3rd. The combination, with the steam suppl. pipe and a water pipe, of an auxiliary steam pipe located within the latter and opening into the same, an overflow for the water pipe, an elevated tank connected with the water pipe, and a connection between the steam supply pipe and the auxiliary steam pipe, substantially as shown and described. 4th. A car heating apparatus, consisting of a steam supply pipe, a water pipe, an auxiliary steam pipe within the latter and opening into the same, an overflow for the water pipe, an elevated tank connected with the water pipe and provided with an air cock, and a connection of the tank with the steam supply pipe for creating a vacuum in the former, substantially as shown and described 5th. The combination, in a car-heating apparatus, of a steam supply pipe, a water pipe, an auxiliary steam pipe within the latter and opening into the same, an overflow for the water pipe, a radiator connected with the water and steam pipes, an elevated tank, and means, substantially as set forth, for elevating the water to the tank from the water pipe and radiator, substantially as shown and described. 6th. The combination, with the steam supply pipe and a water pipe, of a radiator connected with both said pipes, substantially as shown and described 7th. The combination, with the steam supply pipe, a water pipe, a tank connected with the latter, means for creating a vacuum in the tank, and a connection between the steam and wate. pipes, substantially as shown and described. 8th. The combination, with the railway cars, of radiators within the cars, and steam pipes passing along the upper parts of the cars, and a flexible coupling connecting the steam pipes of one car with that of the next, said flexible coupling being level, or nearly so, to prevent the accumulation therein of water of condensatson, substantially as set forth. 9th. The combination, with the steam heating pipes in railway cars, of flexible pipes having internal and external wire helices, and metallic coupling connections at the ends, substantially as set forth.

No. 29,058. Vehicle Gearing. (*Train de voiture.*)

Simon S. Fax, Woodstock, Ont., 1st May, 1888, 5 years.

Claim.—1st. A conveyance with pivoted axle or axles, controllable from the rear, while being propelled from the rear, substantially as and for the purpose hereinbefore set forth 2nd. A conveyance with pivoted axle or axles, controllable from the rear while being propelled from the rear, with the handle bars, arranged substantially as and for the purpose hereinbefore set forth. 3rd. A conveyance with pivoted axles, with cross-bars for controlling the same, substantially as and for the purpose hereinbefore set forth.

No. 29,059. Oven Odour Exhaust. (*Aspirateur de fourneau de cuisine.*)

Alfred S. Cox, London, Ont., 1st May, 1888, 5 years.

Claim.—The opening P, in combination with an operating device R and cover D, substa..tially as and for the purpose set forth. .

No. 29,060. Harness. (*Harnais.*)

Meade Williams, Mount Vernon, Ind., U.S., 1st May, 1888; 5 years.

Claim.—1st. The combination of the keeper on the thills, the sleeves sliding thereon, the rear portions of the traces connected at their ends respectively to the ends of the whiffletree and the said sliding sleeves, the front portions of the traces attached to the harness in the ordinary manner, and the rings at their rear ends connected to the sliding sleeves, substantially as and for the purpose specified. 2nd. The combination of the sliding sleeves on the thills, the snap-hooks connected thereto, the rear portions of the traces attached to the ends of the whiffletree and the said snap-hooks, the front portions of the traces attached to the harness and the rings at their rear ends engaged by the said hooks, substantially as and for the purpose specified. 3rd. The combination of the sliding sleeves, the snap-hooks attached to the sleeves, the rear portions of the traces attached to the whiffletree and the said hooks, the front portions of the traces and the rings attached to their rear ends, and provided with hooks K, K, engaging with said snap-hooks, substantially as and for the purpose specified. 4th. The combination, with the front portion of the traces, and the rings at their rear ends provided with hooks K, of the sliding sleeves on the thills, the snap-hooks having loops at their upper ends attached thereto, the sliding spring actuated bolts in the hooks, the rear portions of the traces attached at their front ends to the loops of the said hooks, and means, substantially as described, whereby the spring actuated bolts may be withdrawn to release the hooks K, substantially as and for the purpose specified. 5th. The combination, with the front portions of the traces having rings at their rear ends, provided with hooks K, of the snap-hooks attached to the thills of the vehicle and having spring actuated bolts, the said snap-hooks being engaged with the hooks K, the rear portions of the traces attached to the snap-hooks, and chains or cords attached to the spring actuated bolts, and extended to within reach of the driver of the vehicle, substantially as and for the purpose specified 6th. The combination, with the thills having sliding sleeves thereon, and snap-hooks loosely mounted thereon, of the ring attached to the harness and adapted to be engaged by the said hook, substantially as specified. 7th. The combination, with the thills and the snap-hooks mounted loosely thereon, and having spring-actuated bolts, of the ring attached to the harness and engaged by the said hook, and the cord or chain connected at one end to the said spring actuated bolt, and disposed at the other end within reach of the driver, substantially as and for the purpose specified.

No. 29,061. Wire Nail Making Machine. (*Machine à clou de fil de fer.*)

Christian C. Hill, Chicago, Ill., U S., 1st May, 1888; 5 years.

Claim.—1st. In a wire nail machine, a pair of revolving opposing nail blank clamping dies, with their operative faces lying lengthwise with their axis of revolution, substantially as specified. 2nd. In a wire nail machine, a pair of revolving opposing nail blank clamping dies, with their operative faces lying lengthwise with their axis of revolution, and a pair of revolving pointing dies coincident with said clamping dies, substantially as described. 3rd. The combination of a pair of revolving clamping dies, with a transversely revolving heading tool, substantially as specified. 4th. The combination, with a pair of revolving clamping dies, of a pair of coincident revolving pointing dies, and a revolving heading tool, substantially as specified. 5th. The combination, with a pair of revolving clamping dies, of a pair of coincident revolving pointing dies, a revolving heading tool and a wire feed device, substantially as specified. 6th. The combination, with a pair of revolving clamping dies, of a pair of coincident revolving pointing dies, a revolving heading tool, a wire feed device and a rotary nail blank cutter, substantially as specified. 7th. The combination, with a pair of revolving clamping dies, a revolving heading tool, a wire feed device and a stop or gauge for the end of the wire, substantially as specified. 8th. The combination, with a pair of revolving clamping dies, of a pair of coincident revolving pointing dies, a revolving heading tool, a wire feed device, a stop or gauge for the end of the wire, and a rotary cutter, substantially as specified. 9th. The combination, with a pair of revolving clamping dies, of a pair of coincident revolving pointing dies, a revolving heading tool, a wire feed device, a stop or gauge for the end of the wire, a rotary cutter and a curved guard concentric with the path of one of said clamping dies for the severed nail blank, substantially as specified. 10th. The combination, with a pair of revolving clamping dies, of a pair of coincident revolving pointing dies, a revolving heading tool, and a rotary swaging die or block interposed between said clamping dies and said rotary heading tool, substantially as specified. 11th. The combination of a pair of revolving clamping dies, with a transversely revolving heading tool, and a revolving swaging die or block interposed between said clamping dies and said rotary heading tool, substantially as specified. 12th The combination, with a pair of rotary die carriers, of a series of opposing clamping dies mounted upon each of said carriers, and with their operative faces lying lengthwise of the axes of revolution, substantially as specified. 13th. The combination, with a pair of rotary die carriers, of a series of opposing clamping dies mounted upon each of said carriers, and with their operative faces lying lengthwise of the axes of revolution, and a series of coincident pointing dies, substantially as specified. 14th. The combination, with a pair of rotary die carriers, of a series of opposing clamping dies mounted upon each of said carriers, and with their operative faces lying lengthwise of the axes of revolution, and a transversely revolving rotary heading tool, substantially as specified. 15th. The combination, with a pair of rotary die carriers, of a series of opposing clamping dies mounted upon each of said carriers, and with their operative faces lying lengthwise of the axes of revolution, a series of