

creased, so that the motion of the pump is accelerated and the steam boiler is supplied with water according to the quantity of steam used.

The inventor of this feed water regulator is Rudolph Berg, of Pittsburg, Pa.

NAGEL'S PROCESS FOR THE MANUFACTURE OF CAMPHOR.—Early in the present century it was known that a product sometimes called "artificial camphor" could be produced in the laboratory, by passing hydrochloric acid through turpentine until the latter was saturated. The product, however, was not camphor, nor artificial camphor, but a hydrochlorinated terpene. It has lately been discovered that camphor can be made from hydrochlorinated terpene, and it is possible to produce camphor artificially on a commercial scale.

Oskar Nagel, of Vienna, Austria-Hungary, has invented a patented process in which hydrochlorinated terpene is converted into true camphor. In carrying out this invention, the inventor employs anhydrous hydrochloric acid and anhydrous turpentine; but a slight departure from the absolutely anhydrous state in either of the materials named does not cause a failure in the process. Hydrochloric acid gas is first produced and dried, and the turpentine, which may be any pure commercial article, is made by adding calcium chloride, which absorbs the water, and which is settled by filtration.

The anhydrous hydrochloric acid gas is passed through the turpentine until the saturation point is reached. During the passage of the gas through the turpentine both are cooled by a refrigerating agent, such as ice and salt. When the point of saturation is reached there is found in the vessel in which the operation has been carried on a crystalline substance and a heavy liquid. The latter is pumped off and filtered to obtain the crystals held in solution. These crystals with the crystalline precipitate are the hydrochlorinated terpene. These crystals are recrystallized with benzine or washed with alcohol; then the inventor mixes the same with lime, using about three parts by weight of crystals to one of lime; then distilling and producing camphene, and first a by-product, calcium chloride. The camphene is then treated with nitric acid under moderate heat, thus freeing the oxygen, which is taken up by the camphene, the product being camphor.

The apparatus by means of which the camphor is made is illustrated by the cut which shows the tank, A, in which is formed the hydrochloric acid gas, the heavy products being deposited in the tank, C. The gas then passes through the worm, D', which is cooled by water. It is then discharged into the closed tank, F. In this tank the moisture is condensed and separated from the gas and the dried gas passes off through the tank, G, containing calcium chloride. The gas is then passed into the tank, H, which is provided with an inner tank containing the turpentine. In this tank the combination of the hydrochloric acid gas with the turpentine is effected. The tank in which the combi-

nation is effected is kept at a low temperature by ice. The gas escaping from the turpentine in this tank is introduced in the same manner into the turpentine contained in the tank, H'. After the crystals are formed in the turpentine and precipitated, they are transferred to a vessel, J (shown in the lower figure), and the lime is added. The mixture is then distilled, the gas passing off through the pipe, K, to the worm in the vessel, M, where it is cooled.

The product at this stage of the process is camphene (C₁₀H₁₆). This camphene is then treated in the vessel, N, by adding thereto nitric acid. Other oxidizers may be employed in place of nitric acid. The result of this process is a body of crystals which may be compressed into a solid, and which is the same as the natural camphor found in commerce.

BROOKE'S CIGAR LIGHTER is designed to act as a shield for the end of a cigar while the match is introduced and the cigar is being lighted.

It consists of two similar halves stamped from sheet metal and fastened together with a rivet to form a chamber, into which the end of the cigar is inserted and which shields the flame of the match so as to prevent it from being extinguished.

This invention is due to Isaac Brooke, of Pottstown, Pa.

MORRIS' BALL PULVERIZER.—The machine shown in the engraving was invented by Mr. William L. Morris, of Cleveland, O., and is designed for pulverizing rock and ores carrying deposits of precious metals. In the upper part of the casing there is a circular channel or track, 9, in which are placed balls, 10, which are caused to roll around on the track by the carrier, mounted loosely on a vertical shaft so that it will not turn on the shaft, while it is capable of adapting itself to the work to be done.

The top of the carrier is provided with a disk, 19, on which the ore is delivered. When the shaft is revolved, the carrier, which rests upon the balls, causes the ball to travel around the ball track, and the material fed to the machine and thrown outwardly by centrifugal force is pulverized by the combined action of gravity and centrifugal force. The material pulverized drops into the chute, 29, and is delivered at the side of the machine. The spiral springs hold the driver down to its work.

FLEISCHER'S ROTARY ENGINE.—In this engine the piston consists of a cylindrical carrier, F, having three radial guides containing pistons, each having a rod extending inward and provided on the inner end with an arm carrying a roller which runs in the cam, E, and serves to keep the pistons in contact with the inner surface of the cylinder throughout the entire revolution of the engine, and to carry the pistons over the abutments which are on diametrically opposite sides of the cylinder. Steam is admitted through ports, I, J, and valves, K and K', in the abutments, and the exhaust passes out through ports, R, S. The pistons are packed and the abutments are provided with packing at H, H'. Steam can be cut off at any desired point

by means of the valves, K and K'. Mr. Richard J. Fleischer, of Milwaukee, Wisconsin, is the inventor of this engine.

BARRETT'S HYDROCARBON BURNER.—In this burner an oil feed pipe, C, is inclosed by the steam pipe, A², and a retort, F, extending outwardly, and is made in the form of a coil, upon the end of which is placed a burner, G, having a flaring mouth reaching under the retort, F. Steam issuing from the pipe, A², atomizes the hydrocarbon and passes it through the retort, the mixture being in condition to burn as it issues from the burner, G. The inventor of this burner is S. A. Barrett, of San Bernardino, Cal.

KERSTEN'S BOTTLE WASHER.—This machine consists of a disk carrying a number of pins projecting from the face thereof at an angle, the disks being mounted on a shaft and arranged to rotate in a tank filled with a cleansing solution. On the front of the tank at one side is arranged a guideboard which engages the butt ends of the bottles as they move downward into the liquid, and the tank is of such a width as to prevent the bottles from sliding off the pins during the time they are traveling through the liquid in the tank. As the bottles descend into the liquid they readily fill, and as they rise upon the opposite side they discharge the cleansing liquid back into the tank. The bottles are removed from the pins as soon as they emerge from the sterilizing liquid.

The engraving shows front and side views of this machine, which has been patented in the United States and several foreign countries by Emil Kersten, of Richmond, Va.

SEUFERT'S CAN WASHING MACHINE.—The rubber feed pipe, C, carries the filled cans forward under the cover, E, while the cans are acted upon by the brushes, F, F', mounted on endless chains and running in opposite directions. By means of this arrangement the cans are turned around several times in their passage through the machine. It is almost unnecessary to say that the cans and brushes are submerged in a cleansing liquid during the operation of washing. Guards are provided for preventing the water from splashing.

This invention was recently patented by F. A. Seufert, of The Dalles, Oregon.

MARCAUT & DORMOY'S VALVE.—The annexed engraving represents an improved valve designed for draining the water of condensation from a steam pipe.

On the end of the steam pipe is secured a thick flange, which receives bolts passing through the flange of the adjacent section. The bottom of the thick flange is formed of an enlargement into which is screwed an outlet or discharge pipe, having at its upper end a valve seat, and in the top of the same flange is a threaded opening above which is arranged a stuffing box. The valve is screwed into the opening, and the valve stem extends across the diameter of the pipe and holds the valve formed on the end thereof in contact with the valve seat. The valve stem is turned by the hand wheel when it is desired to open or close the valve. The inventors of this valve reside in Bordeaux, France.

RECENTLY PATENTED INVENTIONS.

Engineering.

CONDENSER.—Albert Hoberecht, Ensenada, Mexico. For locomotives and other engines, distilleries, and wherever it is necessary to condense steam or vapors, this inventor has devised a condenser with cold air tube extending centrally through its body and water intake within the flue, around which are cooling chambers having perforated portions, there being lateral air tubes and baffle plates. The condenser is designed to save the water now passing off in the exhaust and permit its use over and over again. The body of the condenser is divided into sections by the baffle plates, with an annular perforated air chamber in each section, the air chambers and baffle plates being preferably arranged in series.

SIGHT FEED LUBRICATOR.—Alexander A. De Witt, New York City. The reservoir forming a portion of this lubricator is connected at its lower end with the lower portion of the sight feed tube, there being a check valve between the feed tube and reservoir and opening toward the feed tube, and a plunger in the reservoir to regulate the height of the liquid in the feed tube. Any desired pressure may be applied upon the column of liquid in the reservoir, to make the feed of the reserve column in a measure automatic, and the liquid may be readily discharged whenever desired from both the reservoir and the sight tube.

Mechanical.

TOOL FOR STONE PLANERS.—Charles A. Thomson, Kearney, N. J. This is a tool for forming a corrugated or tooled surface at right angles to the travel of a planing machine, and is attachable to the ordinary tool head, to which the body of the device is bolted. Its lower portion has recesses to receive a cam-carrying shaft actuated by a flexible shaft connected with any convenient revolving shaft, and the body of the device has guides for the movement of a reciprocating plate to which is bolted the cutting tool, the plate having lugs embracing the cams, whereby the motion of the plate will be positive in both directions. The cutting tool may be of any width necessary to cover the surface of the stone operated upon, and the device may be attached to a tool head adapted to work on the side of the stone as well as on top.

Agricultural.

CORN HARVESTER.—James L. Hart, Grenola, Kansas. This is a machine which may be at-

tached to a lumber wagon or similar vehicle, when its cutting and directing apparatus will be fastened to the under side of the wagon bed in front of the hind wheels, and the dropping mechanism to the lower end of the wagon body. The machine automatically cuts the stalks, which are received on a dumping platform and delivered upon the ground when a sufficient quantity has been cut, the stalks being carried out of the path of the ground wheels. The machine may be accommodated to rows of different widths.

Miscellaneous.

HARDENING RAILS.—Harry C. Clement, New York City. To secure a more thorough and uniform hardening of rails this inventor provides a hardening tank having passage for the rail and a sprinkling device, a cooling tank having an entrance for the rail, which is received by carriages traveling on the tank transversely of the track of the hardening tank. Water is sprinkled against the head only of the heated rail, the rail being inverted so that as the water heated by contact falls away its place is supplied by fresh, cool water, and the hardened rail, while still inverted, having its head immersed in water.

HEATING AND VENTILATING APPARATUS.—William L. White, Princeton, Ind. According to this invention a jacket or casing surrounds a fire box or furnace proper, and is separated from it by a space for the air to be heated and passed into living rooms, the casing being made and supported independent of the fire box, and an outer casing surrounding the inner one, being attached to its cornice and supported at the base independently. The fire box and its casing may be used alone, the outer casing constituting an independent ventilating attachment which may be easily and quickly bolted in place or removed.

RADIATOR.—Augustus Eichhorn, Orange, N. J. To make an easily adjustable hot water radiator, for varying the degree of heat thrown off, this inventor employs a series of radiating loops communicating at each end, excepting one loop which has its lower end shut off from communication with the contiguous loops and its upper end in communication with them. This loop communicates at its lower end with a water feed pipe, and each end loop communicates with a return pipe, the latter pipes being valve-controlled and having air vents. The loops on each side of the feed may be thrown in and out of action by the opening or closing of the valves to the return pipes.

PERMUTATION PADLOCK.—Theodore R. Vincent, Salem, Oregon. This is a lock of simple and durable construction, which permits of many combinations, is inexpensive to manufacture, and is arranged to enable the owner to readily change the combinations to prevent unauthorized persons from tampering with the lock. The lock has a sleeve with longitudinal slot from which lead transverse recesses, tumblers turning on the sleeve having recesses registering with the slot, while a bolt engaging the sleeve has lugs engaging the slot. At the end of the shell is a graduation enabling the owner to bring the several tumblers into proper position for opening the lock.

SIPHON HEAD.—Emil Stahl, Hoboken, N. J. In heads to be attached to mineral water bottles or others where the waters are charged with gas, according to this invention, the head is so constructed that an excess of gas in the bottle, rendering it liable to explode, will cause the valve to open sufficiently to discharge the excess, thus rendering the bottle safe. The valve is spring-controlled and is located over and normally closes the outlet. It has a body portion sliding in the upper portion of the head, and is raised by a removable lever provided with a shoulder at the intersection of the head with the body, adapted to engage the valve body.

CABINET FOR BLANKS.—Abram M. Kinsel, George A. Hunter and Seth B. Nolley, Dallas, Texas. For use in hotels, post offices and other public places, this inventor has devised a cabinet for stationery, having a compartment with discharge opening at one end, a false bottom with spring beneath it, and a spring detainer having a pointed free end which presses upon the stationery, thus serving to prevent withdrawal of the sheet underlying the top one. The cabinet also has a similar envelope compartment, permitting the removal of envelopes singly as required.

STORM APRON CASE FOR VEHICLES.—William Fetzner, Sheldon, Iowa. This casing is preferably formed of carpet or similar material, its lower edge secured to a transverse strip upon the floor, which is adapted also to serve as a rest for the heel, while a suitable number of short straps secured to the front body of the vehicle are adapted to buckle with longer straps extending upward from the floor strip to hold the casing in place over the folded apron. The casing may serve as a boot rug when the apron is in service.

LAMP WICK RAISING OR LOWERING DEVICE.—William C. Quiggle, Pine Station, Pa. To enable a person to readily raise or lower a wick with either hand, from either side of a lamp, this inventor

provides a device of which the shaft or spindle extends on both sides of the lamp, there being at each end a head for turning the shaft, and each head having teeth, the teeth of the two heads standing in the same direction. As one places the fingers on the head, the direction of the teeth indicate the way in which the head should be turned to raise or lower the wick.

FIRE KINDLER.—Nicoll MacDonald, Mount Oliver, Pa. This is a kindler designed to produce a strong flame for about fifteen minutes, and then become a glowing mass for about fifteen minutes more, or until entirely consumed. It is made in the form of a hollow brick with detachable base section and transverse partitions, of pulped paper, sawdust and pulverized coal, and, after moulding and baking in an oven, it is saturated with a combustible compound, which preferably consists of a specified mixture of coal tar, crude petroleum and resin. A surface binding solution of flour, resin and water closes the pores and gives the article a glossy surface.

HAT HOLDER.—Julia Egan, Savannah, Ga. To securely hold a hat in a trunk or box, preventing the hat from being crushed or otherwise injured, this inventor provides a holder readily adjustable for hats of different sizes. It consists of a base adapted to be fastened by screws or otherwise to a tray or other fixed part, and on the base is a short post from which extend a series of arms each carrying a slidable spring clamp adapted to engage the hat brim and hold the hat in place. When the device is not in use, the arms may be removed from the post and folded to take up but little room.

ROCKER.—Joseph S. Byrnes, Brooklyn, N. Y. This is a device for use on chairs, bicycle saddles, etc., and consists of a base made in three sections and having a curved top, while a rail curved in an opposite direction to the top of the base is adapted to ride on it. On the under side of the central fixed section of the base is a lug to be screwed on the bicycle saddle post, and each of the two side sections is connected by a hinge to the central section. The rail, connected to the saddle, as it rocks forward on the top surface of the base, draws the rear section upward, swinging on its hinge, and when the rail rocks rearwardly the front section of the base swings upward, the rail being always permanently connected with the base, and the rail and seat readily following the movement of the rider's body.

MEAT HANGER.—Joseph Beaulieu, Hot Springs, Ark. A device especially adapted for

