

Alkaline Nitrites and White Lead.

BY H. N. WARREN.

The production of sodium nitrite, which is at present being extensively used as a reducing agent in the arts, and manufactures, has of late become the subject of no small amount of research; in order to obtain a product of uniform percentage, and at the same time possessing marketable appearance.

The history of white lead has also been so extensively dealt with in the previous pages of scientific literature, that in order to deal more fully with the subject, or at least in a beneficial manner, presents at once a problem which can only be solved with difficulty.

Sodium nitrite of 98 per cent. is at the present time realizing £30 per ton and white lead £20, but to manufacture these compounds up to the above percentage, by any of the ordinary methods, entails considerable expenditure as regards the depreciation of plant, etc., leaving little room for profit; and to avoid these difficulties the author has contrived a method by which galena is caused to act as a reducing agent, upon sodium nitrate, yielding at the termination of the reaction sodium nitrite, sodium sulphate, and white lead. The process as briefly detailed is brought about as follows. A sufficiency of commercial nitrate is intimately mixed with a sufficiency of ground galena, to which is added an adequate portion of water, and the whole introduced into a capacious leaden retort, after which is added a sufficiency of vitriol. The reaction which is thus afforded terminates with the production of sulphate of lead which remains in the retort, while at the same time the nitrous gases, freed by the liberated nitric acid coming into contact with the

galena, are ejected from the retort by blowing in a current of air, and conveying them from thence into a solution of soda ash, causing a free evolution of carbonic acid, while sodium nitrite remains in solution, and only requires crystallizing to render it salable. The sulphate of lead remaining is next treated with a mixture of sodium carbonate and sodium hydrate, and boiled in contact with the same until completely converted into white lead; requiring only to be dried. As expected, the first samples of white lead thus produced were entirely useless, presenting no body, and of a very inferior color, but after a considerable lapse of time, the author has had the satisfaction of preparing, by the introduction of certain ingredients not hitherto noted, a compound possessed of properties corresponding to the finest prepared Dutch samples, and rivaling the same as regards color.

Methods by which Obelisks were Moved.

The obelisks of the Pharaohs are made of red granite called syenite. In the quarries at Syene may yet be seen an unfinished obelisk, still adhering to the native rock, with traces of workmen's tools so clearly seen on its surface that one might suppose they had been suddenly called away and intended soon to return and finish their work.

This unfinished obelisk, says the Rev. J. King, in his "Cleopatra's Needle," shows the mode in which the ancients separated these immense monoliths from the native rock. In a sharply cut groove marking the boundary of the stone are holes evidently designed for wooden wedges. After these had been firmly driven into the holes, the groove was filled with water. The

wedges gradually absorbing the water, swelled and cracked the granite throughout the length of the groove. The block, once detached from the rock, was pushed forward upon rollers made of the stems of palm trees, from the quarries to the edge of the Nile, where it was surrounded by a large timber raft.

It lay by the river side until the next inundation of the Nile, when the rising waters floated the raft and conveyed the obelisk down the stream to the city where it was to be set up. Thousands of willing hands pushed it on rollers up an inclined plane to the front of the temple where it was designed to stand. The pedestal had previously been placed in position, and a firm causeway of sand covered with planks led to the top of it. Then by means of rollers, levers, and ropes made of the date palm, the obelisk was gradually hoisted into an upright position.

The Convertibility of Speed and Power.

Starting from the most general and obvious means of conveying power from motor to machine—the common leather belt—Sir R. Ball remarks that a light, fast-running cotton rope may be substituted for the heavy, slow-running belt, when the conditions are favorable to the exchange of speed for weight. Following up the line of reasoning thus presented, Sir R. Ball shows that a rope as light as sewing cotton, running at the speed of a rifle bullet, would carry a horse power. Proceeding to the extreme case of the lightest kind of line known (that of a spider's web) and the highest known velocity of travel (that of light), Sir R. Ball arrives at the astounding conclusion that if a line of spider's web could be driven at the speed of light, it would carry something like 250 horse power.

RECENTLY PATENTED INVENTIONS.

Engineering.

CONDENSER AND FEED WATER HEATER.—Charles Grohman, Carteret, N. J. This is a surface condenser and heater of simple construction, that may be made to perform one or both of the functions for which it is adapted. The main case has openings for steam or water connections at the top and bottom, and the condensing tubes leading through the case have an inlet and outlet independent of the connection openings of the case, while a hollow deflector is supported within the case above the tubes, the deflector being curved upward at a point beneath the top opening of the case and connected with the feed water pipes.

Railway Appliances.

RAIL FASTENING.—Thornton W. Fay, Philadelphia, Pa. This fastening consists of a plate, preferably of wrought iron, to be attached to the tie, and having surface ribs near its ends adapted to clasp the flanges of the rails, flat surfaces for the rail bases being formed between each pair of ribs, and provided with bolt or spike apertures. This fastening is adapted to hold the rails so they cannot spread or move laterally, holding them also so they cannot flatten under heavy pressure, while forming an efficient joint to do away with the usual fish plates and bolts, and being applicable to the joints of movable switch rails.

CAR COUPLING.—Francis T. Russell, Minneapolis, Minn. According to this invention a shoe is held to slide vertically in the link opening of the drawhead, and there is a lever connection between the shoe and the coupling pin. The coupler may be set to automatically couple with an opposing coupler, the construction of the drawhead being such that the link may be supported in a horizontal position, the mechanism of the link being brought into action immediately upon the lowering of the coupling pin.

CAR COUPLING.—August Schroeder, Weston, N. J. A pair of vertically swinging link-holding jaws is pivoted in the upper and lower portions of the drawhead, a fastening device holding the pin in a raised position, in connection with means for tripping the pin by the movements of the jaws. This coupling is adapted for use on either freight or passenger cars, and may be operated from the top or sides of the car. The ordinary link coupling may be used with a car provided with this improvement, and the coupling is designed to operate positively and automatically, coupling the cars so that they cannot be automatically uncoupled.

CAR HEATING AND VENTILATING.—James A. Healy, Nashville, Tenn. Steam for heating is taken from the locomotive, according to this improvement, the heating apparatus being so arranged that each car has a complete system of its own and may be coupled in any part of the train and be thoroughly heated and ventilated. A train pipe for steam through the upper part of the car is connected by a branch pipe with a coil in a chamber at one end of the car, in front of an air inlet or window, while a blower in the chamber operated from the car axle receives the air after it passes the coil and passes it into the lower portion of the car.

Agricultural.

POTATO DIGGER.—Samuel N. Washburn, Little Falls, Washington. This digger has a wheeled frame, a plow discharging upon a rearwardly extending endless slotted carrier, below the delivery end of which is a concave separator, a lifting wheel having fingers working between the bars of the separator, one series of fingers lifting the potatoes and another series freeing the machine from vines and weeds. When drawn over the field the machine is designed to dig the potatoes, shake the dirt from them, separate them from the vines, and deliver the potatoes into a suitable receptacle.

Miscellaneous.

ELEVATOR.—Harry Hanson and John E. Bergman, Chicago, Ill. This is an elevator for use in excavations, to raise or lower teams, material, etc., one which is of simple construction, and can be readily taken apart for storage or transportation, and easily set up without the aid of skilled labor. The improvement consists of a frame in which slides a cage, a bridge being supported on one end of the frame and projecting from it to form an entrance or exit when the cage is in line with the bridge, to permit the passage of teams directly to and from the cage, the team and load, with the cage, being raised and lowered by operating ropes or cables running over pulleys of the frame.

CASH INDICATOR AND RECORDER.—George R. Burt, Dalton, N. Y. In this machine the sales amounts are printed upon a traveling apron or ribbon in a continuous column, the different amounts being indicated at a single sight opening, in which is a simple springless drawer operating mechanism, and in which the tripping indicator and recording, alarm and drawer mechanisms are all operated by the downward movement of the operating lever. The invention covers a peculiar combination and novel arrangement of parts.

FOLDING BOOK RACK.—William H. Sugg, Tuscaloosa, Ala. The top one of a series of sectional shelves is provided with mortises, and the shelves are secured by rods secured to one and sliding in recesses in the other, the back being provided with apertured links adapted to enter the mortises and be engaged by the rods. The connection is such that the shelves may be easily held in an extended or folded position, being also adjustable as to width and to accommodate themselves to different positions of the apparatus as a whole.

DAMPER.—William H. Packham, Buffalo, N. Y. This is a stovepipe damper in which the damper disk is drawn edgewise by spring pressure into frictional contact with the inner side of the pipe, the damper being held by such spring pressure in any position in which it may be adjusted. A spiral spring on the handle end of the shank is compressed between an outer shoulder and the pipe, the handle being pushed slightly inward when the damper is to be turned.

PIPE HANGER.—Manuel J. Hanna, New York City. This hanger consists of a two-part ring having apertured shanks lying face to face and bolted together, the shanks terminating in a cup forming a socket in which is a freely turning ball, into which screws a lag screw of the supporting section of the hanger. With this hanger the pipe may be inclined laterally in any desired direction, and adjusted vertically in a quick and convenient manner, the hanger being attached to the pipe when the latter is in any position.

COOKING STOVE.—John Marcee, of the U. S. Army. This invention relates to stoves adapted for use in the field and camp, and to be connected with and get their heat from an adjacent heating stove. Opening from the smokestack of the heater, below its damper, is a pipe controlled by a damper and leading to the cooking stove, the return pipe from which enters the heater stack above the damper of the latter. The circulation of the products of combustion of the heater is thus carried about in channels in the interior of the cooking stove before being finally discharged on the way to the chimney or to the air.

INTRENCHING TOOL.—Martin A. Luther, of the U. S. Army. This tool consists of a longitudinally divided folding blade, to the back of which is secured a strengthening rib, and provided with a handle, a pick being secured to the rib, while a fastening device holds the blade sections in open or folded position. A simple, strong and convenient tool is thus provided, readily carried in a scabbard, by means of which earthworks or intrenchments may be rapidly thrown up.

PROJECTILE.—Joseph J. McIntyre, Brooklyn, N. Y. This is a shell in which one portion of the fuse plug extends within the charge chamber, a

firing tube establishing communication between the outer end of the fuse plug and the base of the shell, the plug passing through the charge chamber but having no communication with it. The improvement thus provides for safely and surely conducting the flame from the base of the projectile to the fuse chamber and insuring perfect ignition.

WIRE STRETCHER.—Lewis W. Stokely, Memphis, Tenn. This is a device designed especially for stretching electric or other wires in buildings, and consists of an extensible standard adapted to be clamped between the ceiling and floor, its upper member having an adjustable bearing, and a windlass being connected with the standard by which the wire may be stretched.

WIRE FENCE TOOL.—Jacob Boatner, Township 1, Range 2, East, Amite County, Miss. One end of this tool has an ordinary claw hammer, but the handle is made tapering and with an outwardly extending curved part terminating in an inwardly extending point. The improved tool is very strong and simple, and may be easily handled to quickly take up the slack in all kinds of barb or smooth wire fences.

BOTTLE STOPPER.—Joseph De Mars, Albuquerque, New Mexico. This is a form of stopper in which a rubber disk or plug is drawn up against the neck of the bottle from the inside and retained there by the pressure of the gas within. The elastic disk has retaining buttons having upwardly projecting divergent shanks bent to form loops at the upper ends, with four sections or legs disposed to bear equally upon the inner periphery of the bottle mouth.

HORSESHOE.—Charles B. Hulbert, Ironia, N. J. This shoe has a recessed toe and heels, with detachable calks having tongues to fit the recesses, and prolonged ends with holes to register with the nail holes of the shoe. A cheap, strong and durable shoe is thus made, with means for quickly changing the calks to any desired style, and securely fastening them, while a simple and sure method is also provided of holding the toe piece of the shoe in place.

SUSPENDERS.—Emry Davis, New York City. The two shoulder straps are united by a cross strip high up at the back, and there is a tubular loop or eye at the rear end of each strap, through which works freely a single cord with button tabs at each end. These suspenders are designed to evenly support the trousers when the wearer is standing, and relieve them of strain when sitting.

WASHSTAND.—August Janzon, Chicago, Ill. The casing of this washstand has a reversible front, with pivots at the top and bottom, and carrying on its inner surface two circular shelves, one to support the bowl and the other the slop pail. The stand may be readily opened into position for use, or closed up to represent a bureau, desk, or other ornamental piece of furniture.

NURSERY BAG.—Mary J. Forshaw, New York City. This bag has a rigid bottom, flexible sides with a stuffing of non-conducting substance, a puckering string at its top, a central inside pocket to hold a heating vessel, and a number of other pockets arranged around the central pocket. The bag is adapted to keep various articles, and especially babies' food, warm for a considerable time without the use of fire, the pockets being particularly designed to keep bottles of milk warm during the night.

BABY TENDER AND CRIB.—Ariette Baird, Riverhead, N. Y. This is a combination device, made of detachable and folding frame sections, in connection with an adjustable hammock, the invention being an improvement upon a former patented invention of the same inventor. The baby tender consists of a latticed compartment in which the child may be placed and kept amused without the need of constant cure, and it may be readily converted into a crib for the child when sleeping.

Designs.

PERFUMERY HOLDER.—Jacob Markell, Brooklyn, N. Y. This design consists of a velocipede

or cycle form of base supporting a holder in the semblance of the upper part of a man riding the wheel.

BOX COVER.—Samuel D. Lux, New York City. This design represents a necktie box having an internal cover in the top surface of which is represented a series of cigars, which the box will appear to contain when the outer cover is raised.

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3. A summer cottage at Asbury Park, N. J. Perspective view and floor plans. Cost \$3,400 complete. C. M. Dissozway, architect, New York.
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