Freezing Mixtures.

One of the most familiar is the common freezing mixture, which generally consists of equal parts of pounded ice or snow and salt, which produces a reduction of temperature to about —16° C. (3·2° Fah.), and is often used for making ice creams, etc. If, instead of the salt, we used three parts of crystallized chloride of calcium at 0° (32° Fah.), and two parts of snow, we obtain a far more powerful freezing mixture, the temperature falling to about —45° (—49° Fah), and quite sufficient to freeze mercury. The salt in the first instance melts the ice, the water thus formed in its turn melts the salt: so we have both the solids changing to the liquid state simultaneously, consequently absorbing a large amount of heat. For a similar reason, the solution of most salts in water is accompanied by the absorption of a large amount of heat; nitrate of potash and chloride of potassium both cool the water in which they are dissolved.

A useful machine is now made for freezing water without the use of ice, which cannot always be obtained, by mixing together powdered sulphate of soda and common hydrochloric acid. The apparatus consists of an upper and lower thin metal chamber, the upper one having two inner casings and an interior revolving inner cylinder, capable of being turned by a handle at the top. The freezing mixture is placed in the inner casing, and the water to be frozen in the outer casing and in the revolving cylinder. Several vanes are fixed on the outside of the cylinder, so that, when it is turned by the handle, the acid and sulphate are kept constantly mixed. After sufficient ice has been made, the water is drawn off into the lower chamber, which is prepared for holding a number of bottles of wine to be cooled by this liquid.

Detection of Arsenic in the Air of Rooms.

H. Fleck has shown in a series of interesting and important experiments that there is arseniuretted hydrogen in the air of rooms, the walls or the carpets of which are colored with Schweinfurth green. The dust of arsenic mechanically diffused in the air is therefore not the only cause of chronic arsenical poisoning. We must add the arseniuretted hydrogen gas evolved from the decomposition of the free arsenious acid existing in the green. The experiments of Fleck prove that this gas is liberated under the joint action of organic matter and moist air, and its presence is therefore possible wherever free arsenious acid comes in contact with organic matter.—*Zeitschrift für Biologie.*

THE angular velocity of clouds is determined by M. Hursan de Villeneuve in the following way: He takes a ball of silvered glass, on which he draws with ink an equator and equidistant meridians. He places the sphere so that, the axis being horizontal, the cloud may be seen, by reflection, displaced along the equator traced, and then the time which it takes to go from one meridian to the next gives the angular velocity.

Recent American and Foreign Patents.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED HATCHWAY BRACE.

James Fleming, Buffalo, N. Y.—This invention consists of adjustable braces which strengthen the sheave timbers, through which the rope attached to the grain shovels pass. The braces also serve to hold the elevator in position, and to protect the shovel ropes against chafing.

IMPROVED HANGER FOR SLIDING DOORS.

Leeds A. Cook, Dansville, N. Y.—This is an improvement on the invention patented to same inventor November 1, 1870. The object is to simplify that device, and the arrangement is so modified as to consist of a sliding door hung to a swinging lever sliding in a slot of the main post, and supported centrally by a radius bar pivoted to said post, so as to be opened and closed by a parallel motion.

IMPROVED SLEIGH.

Benjamin F. Sweet, Fond du Lac, Wis.—The knee of the sleigh is so constructed that it has considerable play or movement in the socket formed by the parts by which it is secured to the runner. The runners are hence adapted to yield somewhat to uneven surfaces, so that the bob will sustain heavy loads, and will glide over the snow with less friction than those whose frame is rigid.

NEW HOUSEHOLD ARTICLES.

IMPROVED WOOD SPLITTER.

William Latus, Brooklyn, assignor to T. Karutz, Brooklyn, E. D., N. Y.—This is a portable contrivance for splitting wood for lighting fires without damaging the hearth, or using a hatchet. There is a bed piece supporting a horizontal blade, which is caused to reciprocate by means of a handle connected to it by rack and pinion. The wood, being placed between the blade and stationary bed, is quickly split.

IMPROVED CLOTHES DRYER.

Lorin A. Wait, Riceford, Minn.—The arms on which the clothes are hung are attached to a collar which slides on a vertical post. They pass through slots in a revolving cap on top of the post, so that, when the collar is pushed up toward said cap, the arms extend radially, and when the collar is lowered they fold in compactly. By this arrangement, the device can be stowed away in a small space when not in use.

IMPROVED KEY FASTENER.

William W. White, New York city.—This is a useful little invention for travelers, inasmuch as it prevents the key of a door being turned by nippers or other instrument inserted in the keyhole from the outside. A bow of metal in form of a staple hangs on the knob shaft, and passes through the key loop; and its ends are secured in a small block by means of a set screw.

IMPROVED NON-EXPLOSIVE LAMP.

George W. Vernon, Bonsacks, Va.—The invention consists in a wick tube enlarged toward its upper end and provided with a divided neck, to form a channel discharging at the top of the tube. This is applied to a lamp having an oil reservoir below and a water chamber above, the wick tube passing down through the latter to the former. By this construction, the wick tube is kept cool while, in case of an overturn, the flame is instantly extinguished.

IMPROVED BEEF STEAK TENDERER.

Theophilus Billington, Weatherford, Tex.—This inventor proposes to pass the steak through studded rollers, mounted one above another on a stand. Said rollers may be adjusted for different thicknesses of meat, and may be pressed together by power easily regulated by the operator.

NEW AGRICULTURAL INVENTIONS.

IMPROVED GRAIN SEPARATOR.

Hermann Mielke, Watertown, Wis.—This machine is so constructed that the current created by the fan acts on the grain in its passage from the hopper, and separates the light grain from the heavier. The lighter falls on a laterally inclined plane, between partitions, and is conveyed to the side of the mill, the chaff and other impurities being conveyed over an outer inclined plane, extending downward from the second partition wall. The machine may be worked for any kind of grain by a simple regulation of the feed opening and current.

IMPROVED HARVESTER.

Christopher Lidren, La Fayette, Ind, assignor to himself and R. Jackson, of same place.—In this invention, the novel features include a rake pivoted to the rake standard to swing backward and forward to discharge the gavels, together with devices which turn the rake or scraper up edgewise preparatory to going back to scrape off the gavel, and turn it down flatwise preparatory to going forward again. Arrangements are provided to pass the scraper forward below the platform and up through it and the grain which falls while a gavel is being discharged. There is also a means of returning the rake to the front without interfering with the grain lying on the platform, and a novel mode of supporting and adjusting levers for the reel, whereby it can be readily raised and lowered by the driver without moving from his seat, and without altering the tension of the belt.

IMPROVED MOWING MACHINE.

David Wolf, Avon, Pa.—This inventor proposes ingenious mechanism for locking the cutter bar of a reaper or mower in different positions to adapt it for various kinds of work, and to enable it to be fastened upright for passing from place to place.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED SAFETY OIL RESERVOIR.

Thomas Scantlin, Evansville, Ind.—This consists of a can or reservoir provided with a pump and with measuring compartments and a filling compartment and tube. The measuring vessels may be of different size, so as to hold the quantities usually called for, as one quart, two quarts, or a gallon. The oil is drawn, as it may be ordered, directly into the customers' vessels, and is not exposed to the air, or to danger from fire.

IMPROVED VARIABLE MEASURE.

Charles P. Sullivan, Jr., Line Creek, S. C.—This inventor has devised an ingenious method of combining several measuring vessels in one. The box has a movable bottom which is shifted up or down in the interior and sustained by pivoted pieces from below, and by pins inserted through perforated hollow vertical tubes on the sides.

IMPROVED BUTTON FASTENING

James H. Harrington, Providence, R. I.—This is a new way of fastening buttons to garments so that they may be attached or detached without sewing. The button has a spring hook eye pivoted in its back in which is inserted a ring.

IMPROVED MEDICAL COMPOUND.

John W. Harvey, Memphis, Mo.—This invention relates to a new medical compound for the cure of catarrh. It is composed of nitrate of potash, chlorate of potash, powdered golden seal, table salt, and gum camphor, to be dissolved in water and used as a bath to the head and nose, or snuffed up the nose and inhaled in the form of a powder.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED COMPRESSION COCK.

James McLaughlin, New York city.—This compression cock is so constructed that it may be fully opened and closed by a half turn of the handle. The inventor states that it is entirely free from leakage, durable when used with both hot and cold water, and not liable to get out of order.

IMPROVED LUBRICATOR.

Joseph Warren Reed, Kalamazoo, Mich.—This is a hollow plug charged from the holder and discharged into the engine, at the same time cutting off the supply from the holder. The new features include, first, an improved contrivance of venting the hollow plug, by which there is no waste; second, of a valve to shut off steam from the holder to prevent the mixing of water with the oil by the condensation of steam; third, of a ventor wastepipe connecting with the space above the valve, to carry off the condensed steam in case the valve is not perfectly tight, and insure its closing; and, fourth, of a contrivance to regulate the amount of oil delivered.

IMPROVED ROAD ENGINE.

John Henry Bange, Edwardsville, Ill.—This is a new and ingenious form of road engine, to which the name of the "Mountain Runner" has been given by its inventor. Many of the improvements are of a mechanical nature and cannot be clearly described without the aid of drawings. The principal feature, however, consists in the novel construction by which the water in each compartment, when the engine is passing up and down hill, finds its level independent of the water in the other compartments of the boiler, so that it cannot collect at the end of the boiler, but will be distributed through it.

IMPROVED DEVICE FOR TRANSMITTING POWER.

John Wesley Woodruff, Jollytown, Pa.—This invention consists of the connection of a fly wheel by a long crank lever, of which one end is fixed to a point near the circumference of the fly wheel, while the other crank-shaped end turns a large spur wheel that intermeshes with a pinion of a shorter shaft with a transmitting pulley. The transmitting lever turns by a ball journal in socket bearings near the crank end. This enables the power of an engine to be transmitted for some distance and then applied directly to machinery.

IMPROVED CAR WHEEL CHILL.

William Wilmington, Toledo, Ohio.—This invention relates to certain improvements in chills for casting car wheels, and it consists in constructing the metallic annular chill with annular air chambers at the points of the interior surface of the chill where the outer periphery of the flange of the wheel is formed, and also at the points where the outer horizontal surface of the tread is formed, by means of which the central portion of the tread which receives the greatest wear is allowed to harden: but the outer periphery of the flange and the outer surface of the tread are prevented from rapid cooling by the new conducting air chamber, and the metal at these points is molded and preserved in its full strength and tenacity, a result to be greatly desired in view of the fact that, while the process of chilling hardens the iron, it greatly impairs its tenacity and strength.

IMPROVED ELEVATED RAILWAY.

John Westcott, Tocoi, Fla.—The object of this invention is to provide a cheaper construction of railroads and cars than that now in use, and it consists in a single iron rail laid upon and fastened to a continuous beam of wood, which is supported upon the ends of a series of piles driven into the earth so as to constitute an elevated railway. The cars have a single set of wheels, which have two flanges and run upon the rail, the bottom of the car being close to the rail, and the sides of the same extending down by the sides of the piles and engaging with friction rollers upon the same to steady and hold the car in position.

IMPROVED CAR COUPLING.

Hugh F. McKervey, Cheboygan, Mich.—This invention is an improvement in car couplings of the harpoon variety, and it relates, first, to the combination and arrangement whereby the coupling bar is connected with a pivoted counterweight, and by it maintained in such position that lateral arms or shoulders formed on its middle portion will remain engaged with hooks or shoulders formed on the front end of the same drawhead which contains the counterweight. The invention consists, secondly, in the arrangement of a sliding bar in such relation to the counterweight, pivoted within the chamber of the drawhead, that the latter may be thereby raised, or turned on its pivots, and locked, or held in its elevated position by the slide bar projection under it.

IMPROVED DRIVE-WELL PACKING.

Vincent F. Thomacich, Mobile, Ala.—This invention relates to the packing of the drive well or other pumps, and contemplates a prevention of the curling of the hard leather packing. It consists in a metallic ring support, concaved on the inside and bracing the leather packing of the piston.

IMPROVED SPINDLE BOLSTER.

Welcome Jenckes, Manchester, N. H.—This invention relates to what is known as the spindle bolster of spinning frames, and consists of a longitudinal slot in the bolster, in which slot is placed a packing, which is saturated with oil for lubricating the spindle. By this arrangement, the spindle is kept lubricated for weeks continuously, and the trouble of oiling every day, as is usually the case, is obviated.

IMPROVED COTTON PRESS.

Benjamin F. Platt, Vienna, La.—This is a very simple and inexpensive plan for applying hand or horse power to work the press. The press case is arranged on stationary pivots. Each pivot is screw-threaded, and has for its head one of the press followers. The screws are right and left handed, so that they move the followers in opposite directions at the same time, when the power is suitably applied.

IMPROVED LIFTING JACK.

Samuel E. Mosher, Chillicothe, Ohio.—In this device the lifting bar has downwardly-inclined teeth on one side in which teeth on the lifting dog engage. The dog is pivoted to a lever, which in turn is pivoted to swinging bars on top of the stand, so that the dog is drawn into the teeth on the bar when force is applied to the lever.

IMPROVED ADJUSTING FEED ROLLS FOR PLANING MACHINES.

Charles D. Lawrence and Charles E. Ward, Fairfield, Me.—The feed rolls are mounted on a rod by bearings which can slide or be fixed in position as may be preferred. The bearings are moved by a shaft having pinions gearing with station racks. An arm connecting the lower sliding bearing turns it to shift a pinion along the feed roll to keep it in gear.

IMPROVED ADJUSTABLE BUMPER OR FENDER PLATE FOR PILES OF ELEVATED RAILWAYS.

John Westcott, Tocoi, Fla.—The object of this invention is to provide a bumper or fender plate for protecting the piles of elevated railways, in which the track consists of a single rail mounted upon a series of piles, and the car is provided with pendent extensions upon each side of the rail which extend down beside the piles. The invention consists in two symmetrically shaped curved plates faced upon the inside with elastic cushions and provided with flanges which are fastened together by means of screw bolts, so as to cause the said plates to tightly clamp the piles, and having lugs to keep them from turning.

NEW BOOKS AND PUBLICATIONS.

THE HUMAN VOICE, ITS ANATOMY, PHYSIOLOGY, PATHOLOGY, THERAPEUTICS, AND TRAINING. By R. T. Trall, M.D., Principal of the Hygeio-Therapeutic College, etc. New York city: S. R. Wells & Co., 737 Broadway.

This work is intended to be a manual for the use of students of elocution, and to it are appended rules for the management of debating societies, and some selections from popular authors for practice in reading aloud with correct and appropriate expression.

MANUAL FOR THE USE OF THE GLOBES. Illustrated. By Joseph Schedler. New York city: E. Steiger, 22 and 24 Frankfort street.

This is a very readable little pamphlet, containing some excellent remarks on the value and importance of the science of geography. The astronomica information is very concisely and well expressed.

HANDBOOK FOR CHARCOAL BURNERS. By G. Svedlius. Translated from the Swedish by R. B. Anderson, A.M. Edited, with notes, by W. J. L. Nicodemus, A.M., C.E. Illustrated. Price $1.50. New York: John Wiley & Son, 15 Astor Place.

This little manual was originally prepared for the Government of Sweden, chiefly from two meritorious but unsuccessful papers offered in response to an official call for a popular treatise on charcoal burning. It no doubt fairly represents the best practice of Sweden in the matter of charcoal making, and may be found useful to those engaged in pit burning on a small scale. Professor Nicodemus has added a few notes from Percy's "Metallurgy," and from Crookes & Röhrig's treatise on "Fuel," the latter describing briefly some of the older methods of kiln-burning practised in this country. To answer for American charcoal makers, this portion of the work would need to be very much extended.

A TREATISE ON THE RICHARDS STEAM ENGINE INDICATOR, and the Development and Application of Force in the Steam Engine. By Charles T. Porter. New York city: D. Van Nostrand, 23 Murray and 27 Warren streets.

This work is written in a clear, lucid style, showing its author to be a thorough master of his subject. The reader is led, from a clear understanding of the requirements of an indicator and the manner in which the well known Richards indicator fulfils them, to carefully written instructions, first as to how to use the instrument, and then how to compute the results of any given diagram. The laws governing the development and application of force in a steam engine are laid down in a concise manner, giving a complete understanding of their principles. The book contains many excellent and carefully compiled tables, showing an immense amount of work by the author, and will be found useful to the professional engineer as well as the student.

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)

From October 8 to October 12, 1875, inclusive.

CONDENSER.—Ransome Siphon Condenser Co., Buffalo, N. Y.

DOUBLING MACHINE, ETC.—J. F. Wicks, Providence, R. I.

EXCAVATING MACHINE.—P. J. Stryker, New Brunswick, N. J.

LIGHTING GAS, ETC.—M. E. Jones, Pittsfield, Mass.

STILT.—F. Beaumont, Jr., *et al.*, Dallas, Texas.