which may be distributed over a considerable territory and in any direction from the power, and to successfully operate them in numbers. A leading object of the invention is to reduce to a minimum the friction between the eccentrics and the pump rod rings, thus adapting the device for the operation of a large number of surrounding pumps at the expenditure of comparatively small amount of engine driving power.

Electrical.

ELECTRICAL APPARATUS FOR CONTROLLING MOTION OF CRANES.—John Augustus Essberger and Alexius Wilhelm Geyer, Berlin, Germany. With the introduction of the method of actuating, raising and lowering apparatus of all kinds by electrical energy, it was felt necessary to effect a simplification not only in the general construction of the apparatus, but also in the appliances for controlling and regulating the working thereof. The present invention has reference to the latter purpose, and consists in two arrangements whereby the movement of a load by means of cranes or travelers can be easily controlled and regulated by electrical energy in a manner capable of ready supervision. With cranes having two separate motors, one for raising the load and the second for turning the crane, there are provided, more particularly in electric cranes, two starting and regulating resistances, and in addition for working the brakes there is a lever for each brake. If now rheostats without automatic reversal of the motion are provided, the engineer will, under certain circumstances, have to work six levers.

Agricultural.

GRAIN SEPARATOR.—John Wesley Woodruff, Wise, West Virginia. The invention relates to improvements in grain separators, and has for its object to provide a separator by means of which grain and the like can be thoroughly separated, cleaned and graded. The invention has also for its object to provide means whereby the several parts can be quickly and readily adjusted to suit different kinds of grain or seed. A still further object of the invention is to provide a very simple, inexpensive and effective machine. In brief, the invention consists of the combination with a vibrating screen frame, a hopper pivoted at its rear end and having an interlocking engagement at its front end with the side bars of the screen frame.

ROTARY HARROW.—James G. Ferrill, Batesville, Ark. This invention is an improvement upon the harrow for which the same inventor has already obtained a patent. This former patent consist essentially of two rotary harrows connected by a rigid coupling. The new improvement consists in the construction of the devices for coupling the harrows and the construction and attachment of the tongue or pole.

Miscellaneous.

BEDSTEAD FASTENING. — Edwin F. Tilley, New York, N. Y. The object of the invention is to provide a superior fastening of that class used in connection with bedstead side rails constructed of angle iron, the purpose being to provide a device which is reversible, whereby the horizontal member of the side rail may be placed at the upper or lower portion of the vertical member. In brief, the invention consists of a bedstead fastening, of the combination of a leg section having two lugs, and a pin held between said lugs, a side rail section having vertically aligned lugs adapted to fit within the space between the lugs on the leg section, and a hook pivotally mounted on the side rail section and adapted to align with the lugs on said section and also adapted for engagement with the pin on the leg section.

PENCIL HOLDER.—Granville Bartlett, Rushville, Indiana. This invention is an improved pencil holder adapted for wear upon the coat, vest, or similar garment. In brief, the invention consists of a pencil holder composed of a main plate having its opposite sides bent, forming jaws hinged to said plate and cooperating with the jaws thereof and means for securing the holder in position for use.

POOL TABLE RACK AND TALLY.—George F. Goss, Wallaceton, Pa. This invention is an improvement in pool tables and especially in the racks therefor, and the invention has for an object to provide certain improvements upon the device shown in a former patent issued to the same inventor. In brief, the invention consists in a pool table of a series of oscillating frames movable one in one direction and the next in the reverse direction, and provided after the first of the series with projecting arms or portions arranged to engage the preceding or next frame in advance, whereby as the frames are successively moved each will return its immediately preceding frame to its original position, and devices controlling the passage of the balls connected with and operated by said frames.

SWEETENING OILS.—Martin H. Smith, New York, N. Y. The object of the invention is to provide certain new and useful improvements in sweetening fixed and essential oils, whereby the general nature of the oil treated is not affected to any perceptible degree. The invention consists of phloroglucin or glucin, $C_6H_3(HO)_3$, forming a solution with the oil. As heretofore practiced, oils were sweetened by dissolving in them by maceration, with or without the aid of heat and by the aid of acids or alcohol, the sweetening agents saccharin or dulcin, or by adding saccharin, dulcin, or sugar to an emulsion of the oils.

SPOOL WIRE FRAME.—Russell Fraser, of Brooklyn, N. Y. The object of the invention is to provide a frame especially adapted for holding spools of wire, the frame being so constructed that the spools, when full, or partially full, are held firmly in place, and whereby when the spools become empty they can be expeditiously and conveniently removed and full spools substituted. The invention consists in a spool frame or rack for wire, having brackets longitudinally secured to a lock plate near each side thereof, each bracket having circular openings therein, said openings being in horizontal alignment and adapted to receive spindles loosely passed therethrough, on which are mounted spools wound with wire and angular spring plates consisting of a shank member secured to said back plate at the rear of each spool, and a longer tension member adapted to bear firmly against the wire on the spool, whereby a strong frictional engagement between said spindles and said openings is effected.

YARN DYEING MACHINE.—Jonathan William Grant, Fall River, Mass. The object of the invention is to provide a new and improved machine for dyeing random or variegated cotton or other yarn in a very simple and economical manner. In brief, the invention consists in a dyeing machine provided with a revoluble drum comprising a series of longitudinal bars, which support the yarn in hanks, bearings for the said bars provided with a cam surface, a clamping bar for each longitudinal bar and a lever connected with each clamping bar and adapted to engage the cam surface of the bearing for the corresponding longitudinal bar.

WATER GUN.—John Walter Wolff, Winston, North Carolina. The invention is an improved water gun, and the invention has for an object to provide a simple construction of gun or pistol in which, as the gun is fired, a water bulb or ball will be compressed and cause a stream of water to be ejected from the muzzle, furnishing an effective and amusing toy. It consists of a gun or pistol provided with a bulb or ball and a bulb compressor carried by the gun or pistol and operated by the act of firing.

SHOE.—Landlin Rieger, Ottoville, O. The object of the invention is to provide a new and improved shoe, which can be cheaply manufactured, is durable, retains its shape when used, and at the same time is sufficiently flexible to insure comfort. The invention consists principally of a shoe formed of a single piece of flexible material, and having its sides and quarters cramped up from the sole to unite the sides with the side edges of the vamp or tip, likewise cramped up from the front end of the sole.

AUTOMATIC CUTOFF AND FILTER.—Edward C. Fremaux, Rayne, La. This invention relates to devices for discharging rain water from a roof into a cistern or similar receptacle, the object being to provide a device whereby the initial flow of water from a roof, at the beginning of a rain storm, will be directed to the ground outside the cistern, thus preventing dirt and impurities that may have gathered on the roof during a long dryspell from entering the system, and then, after the roof shall have been thoroughly cleaned or washed, to direct the water into the cistern. With this end in view, the invention consists in a receiver attached to the lower end of a water leader, and comprising two legs or members, one of which is extended into the cistern and the other directed to the outside thereof, and having means for automatically changing the direction of the water flow.

HORSE SHOE.—Edward W. Euge, Lebanon, Mo. The object of the invention is to provide a new and improved horse shoe, arranged to permit of readily removing worn-out toe and heel calks and replacing the same by new ones, without weakening the shoe or removing it from the animal's hoof. The invention consists of a toe calk and heel calks, each having an apertured flange, key pins held on the shoe and passing through the apertures in the flanges, and keys for the pins for securely engaging the faces of the flanges and securely fastening the calks in place on the shoe.

Designs.

DESIGN FOR A HANDLE FOR SPOONS.—Austin F. Jackson, Taunton, Mass. The principal features of the front face of the design are a smooth convex panel, a terminal ball with inturned scrolls. Beaded scrolls extend along down toward the swelled portion, which latter has marginal inturned scrolls. A marginal bead extends along the shank portion to the swelled portion of the spoon bowl or fork head and terminates in a scroll displayed along the edge of the latter. The principal features of the back side of the handle is a concave panel, whose end is surmounted with the same terminal ball and symmetrical scrolls that appear on the face. A marginal bead extends along the edge of the wide portion of the handle to the swelled middle part, which latter has a series of inturned shoots or buds. The same marginal bead which appears on the front side also appears on the back side of the shank, while a shell pattern of scrolls is placed on the broad end of the bowl of the spoon or broad head of the fork at the point where the handle joins onto it.

DESIGN FOR A SPOON.—Austin F. Jackson, Taunton, Mass. This design is mainly distinguished by a handle, the cross section of which presents a broad central corrugation and narrower corrugations at the sides. The design also includes certain novel scroll-like ornaments and beaded work.

DESIGN FOR A CULINARY UTENSIL.—Annie Leonard, Lawrence, Kansas. The design in its entirety presents a top of circular form and an inwardly and downwardly projecting circular flange, the said top having a depressed center in which appears a horizontally disposed cylindrical member, and a loop joining with such cylindrical member at the ends of the atter, the top and the flange having numerous openings. The leading feature of the design consists in the utensil having a circular top and the flange projecting inwardly and downwardly from the top at the edge.

DESIGN FOR GARMENT HANGER. — Zephiren Duchemain, Haverhill, Mass. The hanger comprises the wire skeleton top presenting the two oppositely projecting horizontal members, the sides of which have downward extensions, two of which are joined by a crosspiece having a downwardly turned upper end, the forwardly extending member, that is composed of two arms forming continuations of the extensions, the said arms being return bent the vertical skeleton shank, the two members of which are continuations of the forwardly extending member, and the hook-like termination which ranges upward and outward in front of the shank, and the members of which hook have rearward bends which are joined to the shank by downwardly and inwardly curved bends that cross at the bottom of the hanger.

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(6896) T. O. Z. writes: Kindly explain why the days continue to lengthen in the evening to the end of June and December, while they shorten in the morning at the same time. A. The change in the time of the rising and setting of the sun throughout the year is due to the eccentricity of the earth's orbit. The sun being in one of the foci of its elliptic orbit, the earth does not move with the same apparent or angular velocity through its semi-ellipse, which causes the angular position of the sun to vary with the position of the earth in its orbit for every day in the year. The sun being apparently slow or behind clock time from about December 24 to April 15, when sunrise and sunset are at equal times from 6 o'clock. The sun then begins to be slow, and returns again to clock time about June 15, when it again becomes fast and returns to clock time about September 1, then again slow until December 24. Thus four times in a year the solar and mean time correspond; at all other times the sun is ahead or behind the mean time, and as sunrise and sunset is recorded in the almanacs in mean or clock time, the variation of the rising and setting of the sun from 6 o'clock shows the amount of the sun's apparent eccentricity due to the elliptic orbit of the earth, a small part of the variation being also due to the inclination of the earth's axis to the elliptic.

(6897) C. B. A. says: 1. If you deem it of sufficient general interest, I would be pleased to know, through your query column, of some good preparation for applying to pasteboard or celluloid to make an artificial slate. A. Dissolve 4 ounces shellac in 1 quart alcohol; add lampblack, 6 drachms; ultramarine blue, 1 drachm; pumice stone, powdered, 3 ounces; rottenstone, powdered, 2 ounces. Have the board dry and free from grease. Sodium silicate, diluted with water, and colored with lampblack, suspended in a little of the silicate, makes an excellent slating. 2. Formula for luminous paint. A. For formulas for luminous paint see SUPPLEMENT, Nos. 229, 249, 497, 539, 922, 939, price 10 cents each.

(6898) L. B. P. says: Will you please give me through the columns of the SCIENTIFIC AMERICAN a receipt for cleaning wool carpets without removing from the floor? A. Have ready a number of dry coarse cotton or linen cloths, some coarse flannels and one or more large pieces of coarse sponge; two or more hard scrubbing or scouring brushes, some large tubs or pans, and pails, and also a plentiful supply of both hot and cold water. First take out all grease spots; this may be effected in several ways. Well rub the spot with a piece of hard soap and wash out with a brush and cold water, and well dry each spot before leaving it. Or use, instead of the soap, a mixture of fuller's earth, gall and water, well rinsing and drying each spot as before. When this has been done, the carpet may be cleaned by the first method mentioned.

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