

Action of Mineral Substances on Milk.

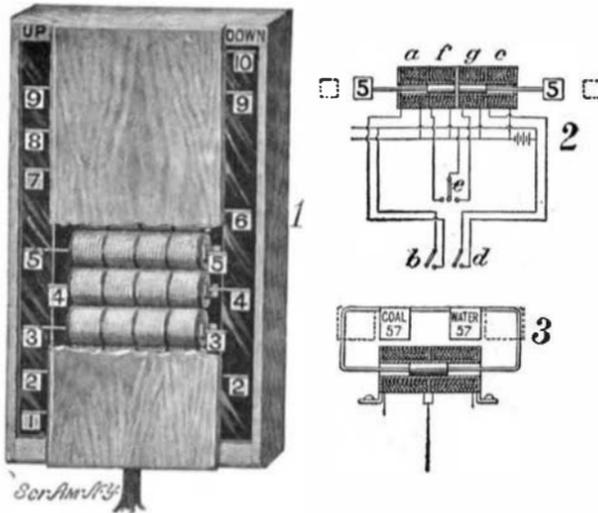
Experiments have been made as follows: (1) On lime in the form of milk of lime; (2) on chlorine, in the form of sea-salt; (3) on phosphoric acid (phosphate of lime); (4) on iron (neutral acetate of iron). The animals received as nourishment green herbage, *ad libitum*, and a daily ration of half a kilogramme of linseed oilcake and half a kilogramme of malt grains.

The results of the tests may be summed up as follows: (1) The mineral substances, lime, chlorine, iron, and phosphoric acid, in combination with the nourishment of the cows, do not sensibly modify the quantity of the milk produced, or its proportion of fatty matters. (2) The total percentage of ash in the milk of the cow is very constant; it is scarcely influenced by the absorption in noticeable quantities of mineral substances. (3) Among the mineral substances experimented on in analysis, lime is that which is found in the most variable proportions in the ash, proportions which may be somewhat influenced by the alimentation. (4) The percentage of lime in the ash may be raised by several centesimal units (3 to 6 per cent) from the fact of the absorption by the animals of important quantities of lime. (5) This absorption may augment, not only the percentage of lime in the ash, but also that of a given quantity of milk. (6) The increase of the percentage of lime in the ash or the milk takes place, not only with the absorption of caustic lime, but also with that of lime phosphate. (7) Nevertheless, the increase in the percentage of lime in the milk consequent upon the alimentation is so slight that it is of no importance in regard to the properties of the milk; besides, it is restricted to narrow limits of the percentage of lime in the produce of different cows. (8) The absorption of sea-salt by the animals does not increase the percentage of chlorine. Even for portions higher than the animals can support, the increase in the percentage is scarcely perceptible. (9) The percentage of chlorine in the milk increases very considerably with the progress of the period of lactation, independently of saline alimentation. (10) The percentage of phosphoric acid, as well of the milk as of its ash, is not at all affected by considerable quantities of this substance, at least in the form of lime phosphate. The question whether the increase of the proportion of phosphoric acid in the milk only fails when this already contains a high proportion of it, has not yet been settled; it is

not impossible that in the case of a milk otherwise poor in phosphoric acid, this proportion may increase as a consequence of a phosphate alimentation. (11) The percentage of iron in the milk is not sensibly affected by alimentation.—Condensed from the French of M. Schulte. Communication to the Fédération Internationale de Laiterie.

AN IMPROVED ANNUNCIATOR.

A recent invention provides an annunciator in which there are no mechanical devices of any kind for moving the signals into view. Instead, a series of solenoids is used and the signals are attached to the floating cores of these solenoids. Each solenoid comprises two coils, one of which is energized to move the signal into view, while the other is used to withdraw the signal. The core is either square or oval in cross section and fits into a bore of similar outline. This holds the signal in an upright position, preventing it from falling over. In Fig. 1 we show the annunciator as applied to an elevator car and a diagram of the electrical connections is shown in Fig. 2. It will be observed that the solenoids are arranged in pairs, those on one side for operating the "up" signals, and those on the opposite side for operating the "down" signals. The outer coils, *a*, of the "up" solenoids are respectively connected to the switches or

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buttons, *b*, on the different floors, and the coils, *c*, of the "down" solenoids are connected to the buttons, *d*. The operator can thus signal his desire to ride up or down from any floor, in the usual manner. The inner coils of the solenoids are all operated by a common switch, *e*. The switch may be thrown to one side to energize the coils, *f*, and thus withdraw all the "up" signals, or to the other side to energize the coils, *g*, and thus withdraw the "down" signals. The absence of any levers or other mechanical devices for moving the signals renders the apparatus very compact. The annunciator illustrated measures but 5 inches by 8½ and is only 1¼ inches thick. It can be used either on a main or a battery current and can be wired to withdraw any single signal on either the "up" or the "down" side or to withdraw all the "up" and "down" signals at a single touch of the push button. In Fig. 3, a modification is shown which may be used in hotels. The solenoids comprise two coils as in the construction just described, but each solenoid is arranged to exhibit either of two signals. When one coil is energized one of the signals is brought into view and when the other is energized the other signal is exhibited. The signals are withdrawn by energizing both coils at once, when the core is moved to the neutral position, as shown in the drawing. Messrs. James and William Patten, 2535 Eighth Avenue, New York city, N. Y., have recently procured a patent on this improved annunciator.

Aeronautical Note.

In addition to the \$10,000 prize already offered by M. Deutsch for first covering a certain specified course in the air above Paris with a flying machine of the "heavier than air" type, this gentleman has recently given a \$2,000 challenge cup which is to be competed for by all kinds of aeronautical apparatus and which will be held permanently by the club which wins it three years in succession. The airship or flying machine that goes 100 kilometers (62 miles) to a specified point and returns to the starting place in the quickest time will be declared the winner. A cash prize of \$4,000 will be given in 1906, 1907, and 1908 to the man who pilots the winning machine. Capt. Ferber, of the French army, is having built by the Buchet Company a light-weight motor for a motor-driven aeroplane with which he expects to compete for the Deutsch prizes.

RECENTLY PATENTED INVENTIONS.
Electrical Devices.

ELECTRIC SWITCH FOR STREET ARC-LAMPS, ETC.—P. H. F. SPIES, New York, N. Y. The object of the inventor is to provide a switch more especially designed for street arc-lamps, chandeliers, and the like and arranged to keep the main-line circuit completely uninterrupted whenever the lamp is cut or lowered for the insertion of new carbons or for repairs or other purposes, the lamp on being returned to its normal position being immediately and automatically cut in without interruption of the main-line circuit.

Of Interest to Farmers.

SICKLE.—P. E. FLETCHER, Ridge, Ore. This sickle mechanism is designed to be used in connection with a harvester, reaper, or binder, the object being to provide a mechanism that will be of comparatively light draft, thus requiring but little power to run it, and further, to employ a very thin sickle-blade that may be readily sharpened with an emery-wheel without removing the blade from the machine.

COMBINED SEEDING AND MANURE-SPREADING MACHINE.—D. TOSCANI, Rocca Imperiale, Italy. The object of the invention is a machine which opens furrows in the ground to receive the grains or seeds, spreads in said furrows the seeds at equidistant intervals, together with the manure necessary for their successive development, and then covers the seeds and the manure spread in the bottoms of the furrows.

MOTOR-PLOW.—H. J. KYLE, Tipton, Ind. The improvement pertains to plows such as used upon farms for tilling the soil. The object of the invention is to produce a plow which will be advanced by a motor carried on the framework thereof. Special objects are to provide operating mechanism which is of simple construction and which enables the operation of the plow to be easily controlled by a person not skilled in mechanical arts.

BINDER ATTACHMENT.—A. WILLIAMS, Joliet, Mont. In the present patent the invention is an improvement in self-binding harvesters, and it has for an object the provision of a novel construction by which to collect and save the grain and grass-seed which are ordinarily wasted off the deck of the binder.

PLOW.—S. S. WEAVER, Carrollton, Mo. The invention relates particularly to a plow intended for preparing the soil for seed, in which plow means are provided for acting on the subsoil at the bottom of the furrow. The object is to provide a device which may be readily attached to existing plows of this class and by means of which the subsoil may

be effectively cultivated and furrows prepared for the reception of the seed.

BALE BINDER AND TIER.—W. C. MORGANS and T. GILLOON, Dubuque, Iowa. It is intended that the device is to be mounted upon the frame of any power baler or one that has a self-feeding arrangement, and it is so arranged that the power may be taken from any shaft of the baler, according to the style and construction thereof. The invention saves time, increases the capacity of the baler, saves the service of tying, saves in the length of wire and therefore its cost.

DEVICE FOR LOADING SUGAR-CANE.—G. D. LUCE, New Orleans, La. A loading attachment to carts and other vehicles for loading sugar-cane or like material is provided by this invention. The device includes a permanently-attached standard adapted to receive removable cranes, which cranes are provided with grapples and with means for raising and lowering the grapples and operating their trips, together with means for swinging the cranes on their supports, the cranes being independent in their action.

Of General Interest.

STEAM-TRAP.—W. BLETSO, Youngstown, Ohio. This improvement relates to a trap of that class in which the steam and water of condensation are entered into a chamber the outlet of which is sealed by a valve and in which when the water attains a certain height in the chamber the valve is opened and the steam-pressure is permitted to discharge the liquid contents of the chamber. Primarily the object is to improve the general design of the trap and provide means for effectually and rapidly operating the discharge-trap.

EXTENSIBLE HANDLE.—D. LAWSON, New York, N. Y. In the present patent the invention has reference to extensible handles—such, for instance, as are used upon shovels and analogous implements for handling coal, and also admitting of general use in instances where longitudinal cylindrical handles are employed. The length of the handles can be changed by the operator at comparatively short intervals.

SELF-FASTENING COTTON-MARKER.—G. W. LONG, Lindsay, Ind. Ter. This invention pertains to improvements in cotton markers, its object being to provide a device which will be self-fastening and one which is simple, cheap, and efficient, one which will remain in place when once attached to a bale of cotton, etc.

MARINE VESSEL.—J. E. JOHNSON, Ishpeming, Mich. The object of this invention is to provide means for propelling marine vessels which will at the same time decrease the resist-

ance offered by the hull to this propulsion. The inventor provides peculiarly-arranged propeller-shafts mounted diagonally on the vessel with respect to water-line and carrying propellers at their lower ends, so that upon the rotation of the shafts the propellers exert a combined lifting and propelling force on the hull, causing it to displace less water, and enabling it to be driven with less resistance.

GARMENT-SUPPORTER.—H. F. NILES, Chicago, Ill. In this case the invention pertains to supports for garments, and more particularly to belt-suspenders for trousers. Its principal objects are to provide a concealed support for such garments as hip-trousers which shall be effective, comfortable, and readily adjustable to the wearer and garment.

DISPLAY DEVICE FOR MILLINERY ARTICLES.—H. SILBERMAN, New York, N. Y. The invention has reference more especially to devices for displaying millinery articles, as ladies' hats and the like, in stores and show-windows and other places; and one of the principal objects thereof is to provide a device of this class which is comparatively inexpensive to manufacture, besides being thoroughly reliable for its purpose and possessing the capacity for long and continued service.

RAZOR-BLADE HOLDER.—J. H. HUNT, Massillon, Ohio. The purpose of the improvement is to provide a readily-operated holder for the blades of safety-razors when it is necessary to hone or strop the same, and, furthermore, to so construct the holder that the blade can be quickly and conveniently introduced into the holder or removed and held firmly between the jaws of the holder during the sharpening process without the use of set-screws or their equivalents.

RAZOR-STROP.—G. W. COLLINS, St. Joseph, Mo. Mr. Collins has found in his experience that many persons who use razors constantly injure them by an improper use of the ordinary swinging strop. The object of the invention is to construct a strop in such a manner that this cannot be done. He avoids the disadvantages of those stropps which have been formed of rigidly-connected straps that could not be adjusted with respect to each other or the supporting means employed.

COMBINED CIGAR CUTTER AND LIGHTER.—W. H. CRAWFORD, Cliftonforge, Va. The invention is an improvement in combined cigar cutters and lighters. The device is entirely automatic in its operation, performs its cycle of movements in proper sequence and always returns the burner into position under the extinguishing-hood, thus preventing waste of fuel from failure to extinguish the flame.

DEVICE FOR TEACHING PENMANSHIP.—R. W. MANUM, Minneapolis, Minn. An en-

velop is employed for containing used and unused practice-sheets to be used by pupils, and means for attaching to the back of envelop a plurality of copy-slips having samples to be followed in any order when practicing examples given. Back of envelop is utilized as a writing-base, upon which practice-sheets are placed. As each line of a practice-sheet is filled out the sheet may be pushed forwardly to temporarily conceal such lines and to bring next succeeding line adjacent to lower edge of the copy-sheet being followed, until all lines of the practice-sheet have been utilized, thus preventing mistakes in copying their writing instead of the exercise on the slip.

UMBRELLA ATTACHMENT.—MARGERET A. BRUNNER, New York, N. Y. In using the device the umbrella is stood near the person and a portion of his garment at a convenient point is placed between inwardly-projecting teeth, whereupon the body of a tassel is slid in the direction to lock the claw to the garment. Rising without noticing the umbrella it will tug at the garment as he moves and he will be apprised that the article is forgotten. It has substantially the appearance of an ordinary umbrella tassel.

COMPUTING DEVICE.—G. M. BROWN, Otto, N. Y. The invention refers to a device for rapidly determining the value of a certain line of goods at a given price without mathematical calculation, and has for its object to produce a device of this character which will have a very large range both in respect to the prices and quantities, which will be very compact in structure and which will be so simple as to render mistakes impossible.

PIPE-WRENCH.—L. V. REMION, San Bernardino, Cal. This wrench is designed especially for use in oil-fields, as in the putting down of pipe-lines. The invention is simple in construction yet efficient in operation, and no complicated mechanism forms part of the wrench. The handles are easily detached. Hence the wrench may be used in a limited space, and when the pipes are properly seated and started power may be used to turn it by means of a belt engaging the wheel-sections. The sections are removable.

HOSE-COUPING.—M. L. SCANLON, J. S. SCANLON and A. A. ARNOLD, Gallon, Ohio. In this patent the invention has reference to means for rendering hose and pipe couplings water, air, and steam tight. The object had in view by the inventors is the provision of a coupling of this character which shall not only be adapted for effecting an improved coupling of the parts, but be simple of construction and easy to operate.

LINE-FASTENER.—D. W. ROBBINS, New York, N. Y. This device is an improvement for securing the ends of and taking up the slack