

RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

**CULTIVATOR.**—THOMAS OLDHAN, Leipsic, Indiana. In this invention devices are combined for plowing, harrowing, dragging and rolling the soil, the devices being so constructed that by certain rearranging and adjusting of the parts the implement may be adapted for all the various phases of cultivating. The implement is supported at the front by a small wheel, and at the rear by a land roller, and is guided by moving the roller to the right or left. A novel arrangement of cultivator frame, drag and adjusting device, is provided, whereby to raise and lower the cultivator frame and drag.

The same inventor has patented a double cultivator embodying the same principles as that referred to above. In the double cultivator for cultivating two or more rows of plants, the two land rollers are mounted in a manner to be simultaneously turned to the right or left and means are provided for simultaneously raising or lowering the several cultivator frames, drags and their appurtenances.

**DEVICES FOR GATHERING PRUNES.**—OLIVER S. HOOVER, of Stanford University, and MORRIS T. HOOVER, Mount View, California. These inventors have produced an apparatus, constructed on radically new lines, for gathering from the ground the prunes which have fallen from the tree. A series of gathering tubes are provided, which are pneumatically controlled in their movements, and a suction is produced to gather up the prunes. The gathering tubes adjust themselves to the irregularities of the ground and the apparatus is rendered automatic in its several operations of gathering, handling and depositing the prunes in a receptacle.

**COMBINED HAY AND STOCK RACK.**—THOMAS A. RAPSON and HERBERT J. FURNESS, Filion, Mich. As indicated by the title, this invention consists of a rack which may be adjusted to a wagon body either to constitute a stock rack, by so arranging it as to form vertical extensions of the wagon body, or folded outward to constitute a hay rack. The novelty lies in the new arrangement of braces and connecting members to strengthen the rack and permit of its quick adjustment to the different positions.

Steam, Gas and Water.

**PISTON VALVE.**—WILLIAM BUCKLEY, Sheffield, England. Having in mind the danger of excessive compression taking place in the cylinder with the risk of bursting the cylinder or breaking of valve rings, the present invention provides in the piston valves themselves a means of relieving any undue pressure as may occur, for instance, when the engine is reversed and the steam ports closed after the cylinder has received a charge of steam. The object is effected by means comprising valve bodies having a novel arrangement of openings and steam passages, in connection with which passages spring-pressed relief valves are provided, the arrangement being such that the relief valves open only when the pressure on their faces from within the cylinder exceeds the boiler pressure, plus the strength of the valve springs.

**GAS-COCK.**—ANDREW J. WIEGAND, Baltimore, Md. A new construction of self-lighting gas burners has been patented by this inventor. A special holder is provided for the lighting substance, such as platinum sponge lighting by contact with the gas, and a spherical valve having main and auxiliary ports, is rocked on its seat by means of a handle extending through the valve casing. The rocking of the valve in one direction directs the gas through the auxiliary port to the igniter and upon releasing the handle a spring pressing thereon returns the valve to close the auxiliary port and open the main passage leading to the burner tip. The devices may be employed in connection with ordinary tips or with incandescent mantles.

**ACETYLENE-GAS-GENERATING APPARATUS.**—CHARLES W. METCALF, El Paso, Texas. The general construction of the apparatus enters into this patent. A prominent and novel feature is the feed devices for regulating the charge of water to the carbide chamber, which is located beneath the gasometer tank and receives water from said tank. The pipe leading to the carbide chamber has two valves, one opening by the falling of the gasometer bell to supply the water and the other to be closed by the continued falling of the bell. Thus, if the carbide is exhausted and the bell continues to fall, the water will be automatically shut off.

**CISTERN-VALVE FOR WATER CLOSETS.**—CHARLES SMITH, New York City, N. Y. A valve and appurtenances have been devised by this inventor, designed to prevent leakage from the tank or cistern into the flushing pipe. The outlet pipe rises above the water level, is open at the top and has a partition and a side opening forming the pipe into a siphon, the partition terminating short of the top. A float valve rests on the upper end of the pipe and a suspended sliding cup surrounds the pipe and is open at its bottom for entrance of water from the tank. By pulling the usual chain the cup rises and its water floats the ball valve and starts the siphon. All valves below the water level are thus done away with.

Mechanical Devices.

**PROPELLER.**—SYLVANUS C. LITTLEFIELD, JR., Brunswick, Ga. This inventor has designed a propeller having blades of a special form with respect to the edge lines and the lines of curvature given the face of the blade. The object of the invention is stated to be to reduce the suction or "drag," to throw the strain close to the shaft with a view of preventing lateral vibration of the vessel, and also to overcome any tendency of the propeller to settle the vessel deeper when at high speed, and to enable the propeller to work effectively even though not wholly submerged.

**FLOORING-CLAMP.**—ARTHUR L. STOWELL and ARTHUR H. ROUNDS, Gay Mills, Wis. The clamp, designed by these inventors for clamping flooring-boards, siding, or the like where a tight joint is required, is manipulated by one hand, and comprises a base plate adapted to rest on the edge of the board last laid, a short arm having a spur at its end to be pressed into one side of the joist, and a handled bar journaled on the plate in a position parallel with the short arm, the said bar having a dog with a series of teeth which engage the

joist at the side opposite the spur. The rotation of the handle bar exerts the desired pressure on the board.

Miscellaneous Inventions.

**DISINFECTING-BLOCK.**—SAMUEL EDEN, Brooklyn, New York city. The block is composed of mercury bichloride, disinfecting oils, talcum, and Portland cement. It is designed to prevent obnoxious gases from passing into a room through sinks; to produce a healthful, invigorating atmosphere; and to minimize the danger of infection.

**DRILL-TOOL SHAPER.**—LOUIS F. NELL, 2558 W. Thirty-second Avenue, Denver, Colo. The inventor has devised a very simple and ingenious apparatus for enabling prospectors engaged in rock drilling who are unable to make their own bits to produce them quickly without the exercise of skill or to enable those who are skilled to produce the bits in less time and with less labor.

**SHAFT-TUG.**—JAMES O'CONNELL, Mount Sterling, Ky. The O'Connell shaft-tug consists of a shank having a shaft-bearing on its lower end. On the shank a spring-pressed tongue is pivoted, having a cross-piece extending from one member of the bearing to and through the other. The tongue is held against upward movement, when pressure is exerted on it by the shaft, to relieve the pivot of the tongue of undue strain. The cross-piece of the tongue is curved upwardly to give sufficient room for the shaft to play in and to allow an easy disconnection of the tug from the shaft in unhitching. This is done in the ordinary manner by loosening the traces and unbuckling the belly-band and then walking the animal out of the shafts, the closed bearing sliding off the shaft. The shafts disengage readily from the bearing without the tug's hanging back or dragging, as so frequently happens in other tugs. It is not absolutely necessary, however, to unbuckle the belly-band.

**AX.**—SIEVE T. JOHNSON, Trinidad, Cal. This invention relates to axes having the cutting edges formed on parts removable from the ax-head, and the inventor has provided a new form for the mating portions of the head and removable blade and a special arrangement of securing keys.

**SAND SHIELD FOR VEHICLE-AXLES.**—EDWIN H. WILSON, Globe Village, Mass. This inventor provides an effective sand-shield arranged to be thrown upward and away from the hub when removing the wheel. The shield has a shank pivoted on the stock of the axle and a plate-spring is provided to hold the shield in the raised or lowered position. The outer end of the shield is curved to shed the sand, and it extends over a flanged ring which is driven into the end of the hub and revolves with the latter, the shield and ring serving to prevent entrance of sand to the hub-box and spindle.

**EYEGLASSES.**—AUGUSTUS B. CRITZER, San Antonio, Tex. The attachments devised by this inventor are adapted to any make of eyeglasses and provide for holding and steadying the eyeglasses in proper position, by means of arms which effect a bearing above the eyes, against the frontal bone, thus relieving the usual nose-pieces of any pinching action. The arms are adjustable to different positions and will retain a given adjustment, so as to always assume the same position before the eye.

**NECKTIE-FASTENER.**—PHILIP N. SCHUYLER, Bellevue, Ohio. This invention relates particularly to neck-bows and string-ties. The fastener, which is made of wire, includes a loop or yoke for engaging the collar-button and ingeniously arranged hooks at the side or sides of the yoke, the hooks serving to be engaged by eyes on the ends of the neckband. The band may or may not be entirely separable from the bow.

**BADGE-PIN.**—GEORGE H. BROOKS, Louisville, Ky. The pin and backing plate, which relate to campaign badges and the like, are given a novel construction to insure a firm and positive fastening of the pin by spring action.

**RIBBON-HOLDER.**—LLOYD E. HAMILTON and JOHN W. MILLER, Hudson, Ind. In this ribbon-holder, in which the ribbon-roll revolves, a spring clamp presses on the free end of the ribbon to prevent a too free unwinding, and the form is such as to permit of moving the spring-clamp bodily toward the center of the roll as the roll becomes smaller, so that the clamp effectively holds the ribbon until the roll is entirely unwound.

**NOTE.**—Copies of any of these patents can be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

NEW BOOKS, ETC.

**VERRES ET EMAUX.** Par L. Coffignal. Paris: J. B. Baillière. 1900. 129 illustrations. Pp. 332. Price \$1.25.

This volume presents in concise form the most important process in the manufacture and enameling of glass. The work discusses the physics and chemistry of glass, its refractive properties, its varieties and their manufacture, and other necessary and valuable information. The latter part of the book discusses enamels.

**THE NAVAL WORDBOOK.** (Die Seemanns-sprache.) Ein systematisches Woerterbuech marine-technischer Ausdruecke in englischer und deutscher Sprache. Von N. W. Thomas, M.A. Second edition, revised and enlarged. Pp. 177. 12mo. Limp cloth. Price \$1.25.

We have used the first edition of Mr. Thomas' dictionary more or less constantly for the last six months and have found it a very serviceable little book. The work has been considerably improved by the correction of a few errors and the addition of an excellently compiled list of English words. Under the heading of "ordnance" slight revisions might still be profitably made. "Laffettenwand" is usually known as a "cheek"; "Wiegelafette," as a "spring-return carriage." The German equivalent for "gravity-return carriage" (Rahmenlafette) should also have been inserted. On the whole, Mr. Thomas has performed a very creditable task which deserves the thanks of all who have to translate naval terms from German into English or English into German.

Business and Personal.

Marine Iron Works. Chicago. Catalogue free. For mining engines. J. S. Mundy, Newark, N. J. "U. S." Metal Polish. Indianapolis. Samples free. Yankee Notions. Waterbury Button Co., Waterbury, Ct. Write Baker Mfg. Co., Racine, Wis., about pushing any new article. Facilities excellent.

Most durable, convenient Metal Workers' Crayon is made by D. M. Steward Mfg. Co., Chattanooga, Tenn. Machine Work of every description. Jobbing and repairing. The Garvin Machine Co., 141 Varick St., N. Y.

Ferracuta Machine Co., Bridgeton, N. J., U. S. A. Full line of Presses, Dies, and other Sheet Metal Machinery. The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable times should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

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(7931) C. M. asks: 1. Can you give me any advice how to vulcanize bicycle tires? A. The process of vulcanizing rubber is described in the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 251, 252, 731 and 895, price 10 cents each by mail. 2. Will a fan motor, having permanent magnetic fields, need the same number of batteries to drive it, as the same motor with electro magnet fields? A. The power is less with permanent magnets by the small amount of current to magnetize the field, of course. 3. Is telephoning allowed during a thunder storm, and why are the lights turned on during the same on a trolley car? A. The telephone exchanges do not cut off subscribers during a thunder storm. They depend upon the lightning arresters for protection. For the same reason the trolley service is not interrupted. Once in a while a burn-out occurs, but very rarely in comparison with the number of telephones and cars. Lamps are only lighted when it is dark enough to require their light.

(7932) W. W. S. asks: Does a piece of iron have more or less cubical contents when magnetized? I have tried to find out by using water and hair tubes, but I can see no change whatever. A. We should not expect to demonstrate any change in contents of an iron bar by magnetizing it. The change is of an infinitesimal order at the largest. The question has at most a theoretical interest. According to theory, the molecules are turned with their lengths in the same direction while the magnetizing current flows. They occupy no more space in this condition. We should, therefore, think that the bar as a whole would occupy no more.

(7933) L. C. S. writes: 1. As I understand it the resistance is what makes the field coil get hot. In order to avoid the heating more wire is added; now, if resistance is what heats the coil, how do you account for the coolness of the fields after adding more wire, consequently more resistance? A. Your statement that resistance causes the heating of an electric circuit is less than half right. The exact statement is that the heat developed in a circuit is directly proportional (1) to its resistance in ohms, (2) to the square of the current in amperes, (3) to the time that the current flows in seconds. Now one ampere flowing through one ohm develops 0.24 calories in one second. Putting these facts in a formula we have: Heat in calories = 0.24 C<sup>2</sup>Rt. It can now be seen why the heating of a coil can be remedied by adding more wire. The increase of resistance cuts down the amperes in the same ratio as the increase. But the reduction of the amperes affects the heating power in the ratio of the squares of the amperes. Thus, if the resistance were doubled the amperes would be halved, but the heat produced would be reduced to one-fourth of what it was, since the square of 1/2 is 1/4. 2. What is the cause of the humming in the field coils and pole pieces of an induction motor when the armature does not revolve, but the current is passing through the fields? A. The alternations of an electric current produce vibrations which are heard as sound. These can be heard near an arc light run by an alternating current, or near an alternating electro magnet. 3. What changes are necessary to reverse the running of an induction motor? Crossing the positive and negative wires at the binding posts will not do it. A. Of course, merely reversing the main wires will produce no effect upon the direction of rotation of a motor. If the induction motor is two phase, the direction of rotation will be reversed by changing the two leads of either phase. If it is three phase, it will be reversed by changing any two of the leads. The different phases are a fraction of a period behind each other, and the direction of rotation depends upon the direction in which the phases lag behind around the rotating part of the motor, whether clock-wise or contra-clock-wise. To reverse the motor the direction of the lag in phase must be reversed. 4. Would it be possible to illustrate and explain the induction motor in the SCIENTIFIC

AMERICAN some time in the future? A. The induction motor has been fully treated in several books recently published: Ondin's "Polyphase Apparatus," price \$3 by mail; Thompson's "Polyphase Currents," price \$5 by mail. These, with Thompson's "Elementary Lessons," price \$1.40, will put you in possession of quite a complete library of the subject at present.

(7934) C. B. M. writes: I have a small motor which has a magnet in place of field winding. An electrical engineer told me if I put it on a large machine it would give greater power. I did so, and it does not give any power at all. It will run without a load, but will not run backward when current is reversed as it did before. A. A motor requires the proper current, that is, a current of the number of volts for which its winding was made. It will then develop under this pressure the power it was intended to yield, for the reason that it will take the proper number of amperes from the line. A current less than this will not run the motor up to its limit, one greater than this will overheat its coils. It would appear that you must have put the motor upon an alternating current, when it was intended for a direct current, since it would not reverse nor develop power.

(7935) E. H. W. writes: I read with much interest the article on M. Tommasina's automatic coherer, in your issue of June 16, 1900, page 376, and would like to ask if it is not possible that the decoherence of the carbon particles after the spark has passed may not be due to the return of the iron diaphragm in the telephone receiver to its original position, as there is a perceptible jar due to the vibrations in a receiver on both making and breaking the circuit. A. The vibrations of a telephone diaphragm can hardly have energy enough to effect the decohesion of the particles mechanically. The point could, however, be determined by placing a coherer containing metallic powder in the same position. If it will work as well as the carbon coherer, it would justify the theory of our correspondent.

TO INVENTORS.

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