

**IMPROVED CUTTER BAR FOR REAPERS AND MOWERS.**

The engraving shows a novel cutter bar for reapers and mowers, which is contrived so as to admit of readily attaching or removing the knife sections for grinding or repairs.

Fig. 1 is a perspective view of the cutter bar, showing one of the fastening bolts removed. Fig. 2 is a plan view of a part of the bar, with the upper portion removed to show the studs for fastening the sections. Fig. 3 is a transverse section of the cutter bar, showing the relation of the various parts.

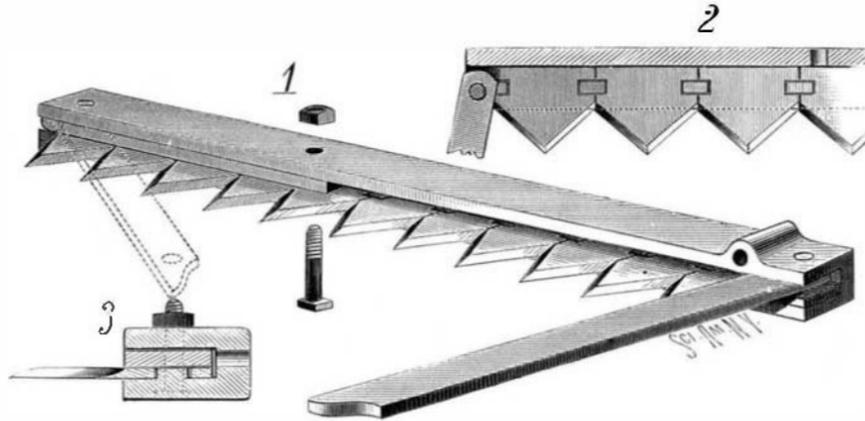
The holder for the knives consists of two bars having at their rear edges ribs or ledges forming bearing surfaces, and in the case of the lower bar the rib assists in supporting the knives.

The lower bar is provided with a series of studs or projections, between and around which the knife sections are fitted, each section being notched at opposite edges to fit around the studs.

Clamping pieces are placed above the knives, and bolts go through all the parts to clamp them securely together.

The advantages of this cutter are briefly as follows: The cutters, or any number of them, can be readily removed, as is often desirable. The cutters can be more rapidly and perfectly ground when removed from the bar. There are no screws liable to become loose by the vibration. Only one bolt has to be loosened in removing the cutters.

This invention was recently patented by Mr. Theodore Taylor, of La Grande, Oregon.



TAYLOR'S CUTTER BAR FOR REAPERS AND MOWERS.

**A Proposed International Gas and Electric Light Exhibition.**

The Crystal Palace Company, London, have determined to prepare for the next autumn and winter season a grand combination exhibition of gas and electric lighting, in which an unexampled opportunity will be accorded for showing what can be done with gas for all possible purposes. The exhibition will be of an international character, and the newest forms of electric lamps and systems of lighting, which were not included in the late show, with the help of some of the late exhibitors, may be relied upon to furnish the electrical part of the enterprise with a sufficiently representative collection.

What is wanted, says the *Journal of Gas Lighting*, to complete the symmetry of the scheme is, therefore, the assurance of hearty support from those interested in the production and utilization of gas, especially for illuminating purposes. It is the most important and satisfactory part of the proposal that lighting by gas, in direct competition with electric lighting, is indicated as the reason for holding the exhibition. It is not desired to have merely a collection of gas stoves or fittings, or even a brilliant show of lamps in stands belonging to different exhibitors. What is desired is an absolutely independent display of gas lighting, not specially designed to advertise the goods of competing gas apparatus makers, but to assert the advantages of gas as a general means of illuminating. The idea conveyed in this suggestion is admirable; it remains now to be seen how it can be carried into effect.

**Condensed Moisture of the Air.**

The author fills a glass funnel, drawn out to a point and closed at the bottom, with ice. The dew which condenses from the air on the cold sides of the funnel collects in drops, which run down over the closed point into a capsule. The quantity of water condensed in a given time may be measured, and the ammonia determined colorimetrically. By this cold distillation, it is possible to concentrate bodies which are decomposed at higher temperatures, e. g., the odors of flowers. In the condensed dew may be found the microbia or parts of such thrown off from the body in disease.—A. H. Smee.

**A Micro-prismatic Method for Solids.**

The author makes use of the circumstance that particles of a transparent substance, if surrounded by a liquid which possesses a higher refraction index than the solid in question, display under the microscope very characteristic colors, the intensity of which increases with the difference of the refraction indices. If particles of a substance, however minute, are by degrees enveloped in liquids of different refraction indices, it is easy to find a liquid which produces the faintest intimation of these colors, and has consequently almost exactly the same refraction index as the body itself. If this is then determined for the liquid it is known for the body in question. The author uses as liquids, water, amylic alcohol, glycerine, oil of almonds, and oil of cassia. All bodies are of course excluded from this method which are opaque, or possess a refraction index higher than oil of cassia (1.606), or are attacked by the liquids.—O. Maschke.

**Nickel Plating by Boiling.**

Dr. R. Kaizer, according to the *Bavarian Gewerbe Zeitung*, prepares a bath of pure granulated tin, argols, and water, heats it to boiling, and then adds a small quantity of red hot nickel oxide. A portion of the nickel, as is shown by the green color which the solution assumes, that is, above the grains of tin, is immediately dissolved. If a copper or brass article be now immersed in this

solution, it almost immediately becomes covered with a silver-like coating, which consists of almost pure nickel. If a little cobalt carbonate or cobalt tartrate be added to the bath, a bluish tint is produced, which may be made lighter or darker according to the quantity added. When the article is rubbed with dry sawdust or chalk, a very brilliant polish is obtained.—*Wiener Gewerbe Zeitung*, xi., 71.

ELECTRICAL motors have now been introduced at several French collieries. A Gramme machine has been in use for some time past at the Blanzly Mine; and others are at work in the Thibaud mines, belonging to the Terre-Noire Company, and at the Mine de la Péronnière.

**Malaria in New England.**

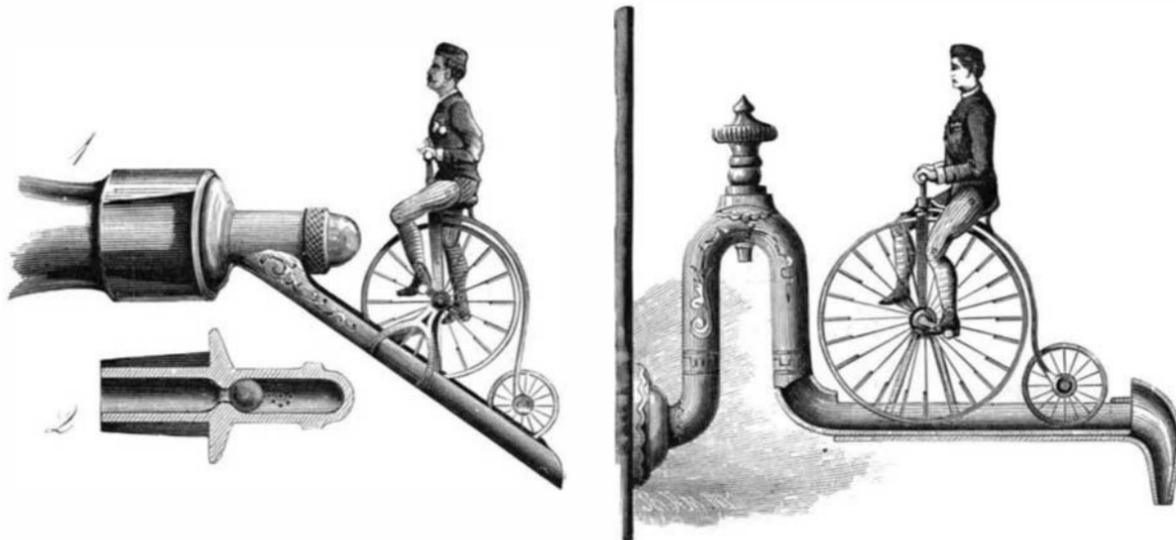
A short time ago the key to the mysterious extension of malarial diseases in New England was supposed to have been found in the damming of the streams for manufacturing purposes. Now the *Boston Advertiser* says that intelligent people living in the districts invaded say that the appearance of malaria in New England dates from the introduction of the cultivation of tobacco on a large scale upon the intervals of the Connecticut, and that its spread has kept even pace with the extended growing of this crop. The most plausible theory of the introduction and propagation of the aerial poison is this: The tobacco crop is a proverbially exhaustive one. To keep up the productiveness of the soil, fertilizers are freely used. The manure is brought from New York city, mostly in scows, which are unloaded on the banks of the river where the cargo is to be

used. All the autumn and winter these heaps of putrid matter are fermenting and breeding disease. The air that comes in contact with these piles of filth is contaminated and rendered unfit for human lungs to inhale, as it is offensive to the senses.

**NOVEL ATTACHMENT TO FOUNTAINS AND BOTTLE STOPPERS.**

The engravings show two novel attachments which are set in motion by the passage of a fluid along a conductor with which they are connected. Figures 1 and 2 of the engravings show a bottle stopper with a spout connected therewith, arranged at an angle about 45 degrees with the axial line of the bottle; over this spout is placed a miniature bicyclist with the wheels of the bicycle extending down into the spout, where they may be acted upon by the discharge of liquid from the bottle. The spokes of the bicycle wheel are each provided with a float or paddle to afford an extended surface for the action of the fluid. When the fluid is poured from the bottle, the wheel revolves and drives the automaton figure, giving it an animated appearance.

The other device shown in the engraving is designed to be attached to soda and other drinking fountains, and operates in exactly the same way as the attachment to the bottle stopper shown in Figures 1 and 2, that is, the wheel revolves and moves the figure whenever the fluid is drawn. In both



ZANETTI'S COMBINED TOY AND BOTTLE STOPPER.

COMBINED FAUCET AND TOY.

cases the spout which conveys the fluid is U-shaped in cross section, and the bicycle wheel extends down into it, where it can be acted upon by the fluid.

This novel device was recently patented by Mr. Fortunato C. Zanetti, of Bryan, Texas.

THE most ancient monuments of Mesopotamia and Egypt contained no mention of the horse, while the creature represented in Assyrian monuments had the tail of an ass. The first literary mention of the horse in Egypt belonged to a period of about eighteen centuries before Christ. From that time notices of horses in Egypt were frequent and common.

**Nitrite Solution of Potassium Iodide and Starch Mixture.**

The author has examined this mixture as regards its behavior with acid liquids. He used a very dilute potassium iodide starch paste, to which he added so much potassium nitrite that the liquid was colored deeply blue by a few drops of acetic acid. It was colored a deep blue by dropping in moderately dilute solutions of most inorganic and organic acids and acid salts, while weak and sparingly soluble acids, such as the carbonic, boracic, arsenious, uric, carbolic, tannic, had no action.—A. Vogel.

**Metallic Copper as an Absorbent for Oxygen Gas.**

The author has for some time been engaged with experiments on the use of metals at common temperatures as absorbents for oxygen in presence of ammoniacal vapors. This absorption proceeds with rapidity as long as bright metallic surfaces are exposed to a gaseous mixture containing oxygen, but ceases or becomes very slow as soon as appreciable quantities of oxide are formed. He has, therefore, examined if it is possible to effect complete absorption by using ammonium carbonate as a solvent for the oxides formed. Experiments proved that oxygen was quickly and completely absorbed in contact with copper and a solution of commercial ammonium carbonate, but that appreciable quantities of carbonic acid were evolved. Complete absorption of oxygen without the development of any gas was effected if it was exposed to metallic copper and a solution consisting of equal parts of a saturated solution of commercial ammonium sesquicarbonate, and a dilute solution of ammonia at 0.93. Such a liquid has a tension which may in most cases be disregarded, and if the apparatus contains sufficient quantities of metallic copper it is able to take up 24 vols. of oxygen.—W. Hempel.

**Mellogen.**

Mellogen, the new substance obtained by Signors Bartogli and Papisogli in their recent remarkable experiments of electrolyzing distilled water about six weeks—first with strong, then with weaker batteries and carbon electrodes—is a solid, dark, very shiny matter, soluble in hot water and in alkalies, insoluble in most mineral acids and in ordinary solvents, such as alcohols or benzine. It does not fuse, is not crystallizable, burns difficultly, and has strong coloring power. Its most salient property is its combining easily with oxygen, and giving rise to acids of the benzo-carbonic series. The best oxidant is hypochlorite of soda. The formula of mellogen is C<sub>11</sub>H<sub>2</sub>O<sub>4</sub>. If alkaline solutions be used as electrolytes in place of distilled water, mellic acid and its congeners are largely formed, but very little mellogen; on the other hand, with an acid electrolyte, the mellogen is abundant, and the former products are almost wholly wanting.