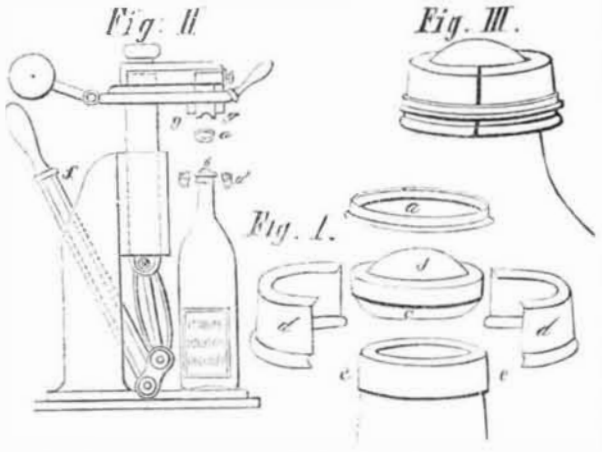
NEW MODE OF SLAUGHTERING CATTLE.

The present mode of killing cattle, by striking the animal with a hatchet or ax, is a cruel operation, as in most cases repeated blows are required to produce the death of the animal. Different methods have been recommended and tested for the purpose of executing the operation with the greatest possible dispatch, so that the animal be not unnecessarily exposed to protracted suffering.

The device represented in the illustration is a French invention, and promises to meet all requirements, being so simple in construction that it may be readily employed anywhere. The head of the animal is covered by a mask of suitable material, which closes the eyes entirely, and is at the center provided with a circular plate of sheet iron, riveted thereto, which guides in a central perforation a strong steel bolt or pin, in a direction vertical to the plate. The inner end of the sliding bolt faces the head of the animal, and is made hollow, while the outer projecting part is provided with a large knob. The masked or blindfolded animal has no idea of his fate, a single blow of the hammer or club on the knob being sufficient to drive the bolt into the brain, and produce the instant dropping of the animal as if struck by lightning. The theory is that the small quantity of air in the hollow end of the bolt is forced with the same into the brain, and, being heated by the compression, exerts a pressure on the brain, and causes thereby almost instantaneous death. The whole operation is completed within half a minute. Several cities of Germany and France have provided by special ordinances for the introduction of this device, which recommends itself to the attention of all humane persons.—*Science Record for* 1875.

IMPROVED BOTTLE STOPPER.

We publish herewith an illustration of a stopper now in use in Europe for corking bottles containing mineral waters, which was exhibited at the recent Vienna Exposition. It is the invention of M. J. de Becker, of Paris, France. It consists of a metallic ring, *a*, two semicircular parts, *d d*, and a cap piece, *b*, which last is provided at the underside with one or more cork disks, *c*. A disk of parchment paper is placed below the cap, *b*, over the mouth of the bottle, the cap and paper being then forced in by suitable pressure, for which purpose the small corking machine, shown in Fig. 2, can be employed. The forcing-in of the cork admits the application of the semicircular sleeve parts, which bind, by their upper flanges, on the cap piece, and by bottom collars on the rim at the mouth of the bottle. The ring, *a*, is then placed over the sleeve parts and carried down by the lever, *g*, of the corking machine, producing thereby a strong and perfectly airtight closure of the bottle. The machine enables three or four bottles per minute to be corked, the stopper being able to resist, according to trials made at the Conservatoire des Arts et Métiers, an interior pressure of thirty atmospheres (450 lbs. to the inch), which makes it applicable to the bottling of aerated waters.



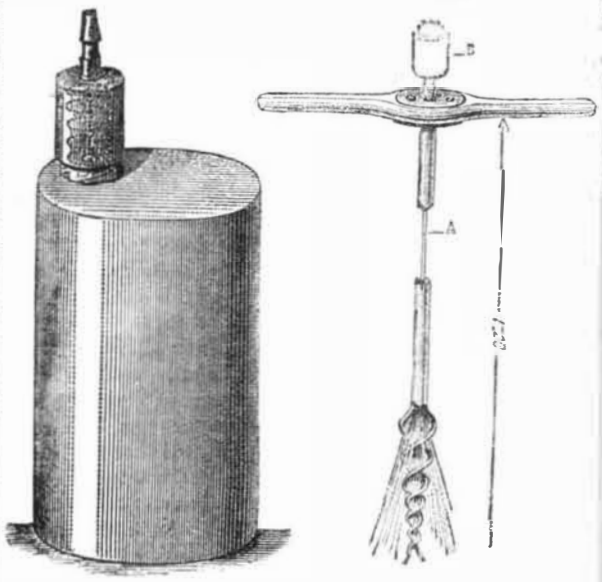
The opening of the bottle is accomplished by simply placing the thumb on the cap piece, and pulling the binding ring, in an upward direction, with the forefingers. The sleeve parts and cap piece are then taken off, and the bottle is open. For sparkling wines and other carbonic acid beverages, the cork is driven in far enough to produce a report on opening.

The advantages of this stopper are that it requires no corkscrew, and allows the utilization of smaller pieces of cork, as only one tenth part of a common cork is necessary for the cap piece. The bottle is closed in about one third of the time required for corking, wiring, and tin foiling, as in the present style; and the device gives a neat and ornamental appearance without adding to the expense. It may be used over again by applying it to the bottle by hand, the parchment paper preventing the contents from taking up any taste of metal or cork, which is of importance in the bottling of liquid beverages.

EXTERMINATION OF THE PHYLLOXERA.

The best results thus far gained, in the repeated efforts made in France to rid the vineyards of the phylloxera, have been obtained by the use of alkaline sulphurets, and more especially the sulpho-carbonate of potassium. The latter substance decomposes slowly, giving off hydro-sulphuric acid and sulphide of carbon.

Fig. 2. Fig. 1.



It has been proved that the earth, in the vicinity of the infected roots, must be thoroughly poisoned. Solid poisons, however, are of no avail, and liquids are apparently shed from the covering of the insect, which seems to be waterproof. The action of water and carbonic acid in the soil is sufficient to disengage gases, from the materials named above, which exterminate insects, while the potash acts as an excellent fertilizer for the injured vine.

Fig. 3. Fig. 4.

Root of vine, covered with phylloxera, in an advanced stage.

Swollen roots of vine, caused by phylloxera.

Fig. 5.

Swellings of root fibers of vine—commencement of the disease.

The instruments used for introducing liquids, from which poisonous gas is to be developed, are represented in Figs. 1 and 2. Fig. 1 shows an auger, having a hollow shank and perforated just above the cutting portion. This is provided with handles, above which is placed a small cylindrical vessel, shown separately, enlarged, which serves as a measure into which the liquid is poured in determined quantities. These last are measured by means of the vessel shown in Fig. 2. The insecticide is placed in the large receptacle, and thence, by tilting, the latter is allowed to fill the smaller can above. The orifice between the two is then closed, and the smaller can removed, and its contents turned into the hollow portion of the auger, as represented at B, dotted lines.

The effect of the ravages of the phylloxera upon the roots of the vine is represented in Figs. 3, 4, and 5. At the beginning of the attack, the radicles swell, as shown in Fig. 5, and also enlarged in Fig. 4. When the disease is far advanced, the roots appear as shown in Fig. 3.

Phylloxera Prize.

It will be remembered that several months since we published the text of the law passed by the French Assembly, decreeing a prize of $60,000 to any person who should invent a means of effectually exterminating the phylloxera. To this large sum, various vine growers, corporations, and municipalities throughout France added other amounts, forming a total, the aggregate of which, though not definitely known to us, might certainly be placed as a very handsome fortune for the lucky discoverer. The report of the committee, to whom the descriptions of the various plans have been sent for adjudication, has recently appeared; and although some six hundred schemes have been considered, no one is awarded the prize. The offer, however, remains open, and for this reason the advice of the committee is valuable to intending future competitors. The report says that "the Commission is authorized to conclude that the communications which have been submitted to it have in no instance been accompanied with the record of sufficient experiment and application to the soil over a long enough period," and therefore the prize cannot be decreed. The document then calls particular attention to the following, from the observations made by M. Dumas, President of the Commission, when the offer of the award was first announced:

"Processes imagined but not tried are no longer of interest, since it would be very difficult to indicate, at the present time, any method not already suggested. The fact of tobacco, sulphur, ammoniacal gas water, coal tar, petroleum, sea water, etc., being urged as sovereign remedies, twenty times or more, adds nothing to the confidence in such means. Experience alone can teach us their value, and unhappily the occasion for inventors to try their processes is anything but wanting. In order to compete with a chance of success, it is necessary that the experiments be repeated, prolonged, and authentic, and they must prove, beyond doubt, that the means tends either to cause the phylloxera to disappear from the vines by an economical process, or to preserve healthy vines against the ravages of the pest, or to check its inroads while insuring the life and fructifying the attacked plant.

"The prize cannot be awarded until after an absolute demonstration, sufficiently prolonged, of the reality of the discovery."

About Spiders.

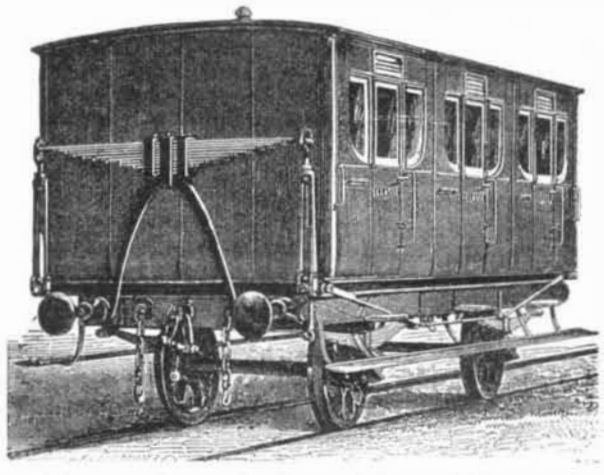
Professor E. S. Morse says: Only the female spiders spin webs. They own all the real estate, and the males have to live a vagabond life under stones and in other obscure hiding places. If they come about the house so often as to bore the ruling sex, they are mercilessly killed and eaten. The spiders skin is unyielding as the shells of lobsters and crabs, and is shed from time to time in the same way, to accommodate the animal's growth. If you poke over the rubbish in a female spider's back yard, among her cast-off corsets you will find the jackets of the males who have paid for their sociality with their lives—trophies of her barbarism as truly as scalps show the savage nature of the red man.

Water Ditches.

The ditches of California are the great arteries which bring life to the mines. Their even and constant flow secures a healthy and vigorous state of industry, while the dearth of water in the mines throws a pall over the business world of California, money becomes tight, and hard times are the consequence. The engineering skill displayed in the construction of ditches in this State is of the highest character, accomplishing the most daring feats, hanging flumes on steep, rocky bluffs, and crossing gorges of a thousand feet in depth, and it must seem almost a presumption to inquire whether any improvements can be suggested.

GIFFARD'S RAILWAY CAR.

M. Henri Giffard, inventor of the celebrated Giffard injector, has succeeded in constructing a railway car, the body of which is so supported on springs that all oscillation and jarring is entirely obviated, and the passengers within are enabled to read, write, and otherwise employ themselves with as much facility as if not in motion. Our engraving is prepared from a photograph of one of these vehicles, now in use on the railway between Paris and Lille, France. The platform is supported on heavy springs of its own, and carries at each extremity standards, which, in turn, are surmounted by ponderous leaf springs, to the ends of which the body of the car is suspended. It was found, on a first trial, that the peculiar horizontal oscillation which is so very fatiguing to the traveler was entirely suppressed, and that a light vertical elastic movement which remained was easily obviated by adjusting the suspending rods.



The weight of the car is somewhat more than that of those ordinarily employed on European railroads, and its cost is higher.—*Science Record for* 1875