the place of these innutritious substances, and you shall see the tentacular glands gradually bend over, and assisted by the curling up of the leaf itself, enfold the esculent morsel, and cover it with a digestive fluid, which at once dissolves it and adapts it to be assimilated by the insect-eating plant. But it is worthy of note that the instinct of the plant, under certain exceptional circumstances, like the instincts of insects, sometimes goes wrong; for the sundew as eagerly accepts morsels of cheese as it does of any other nitrogenous substance, and cheese is a poison to the Drosera plant. The sundew is not the only plant which exercises choice and discrimination in the selection of its food. In and about the swamps of North Carolina, and indeed in many other parts of the United States, is found the Dionœa, or Venus' fly-trap. It has, as has the Drosera, very small roots, which, like those belonging to the sundew, serve only to give it a foothold, and supply it with moisture; the plant captures the food necessary to its subsistence. The leaf blade is constructed like a steel trap, the two halves snapping together, and the marginal teeth interlocking as do the teeth of a trap. Long, sensitive bristles, generally three in number, arranged in a triangular order, erect themselves upon the upper surface of the trap. Touched ever so slightly by a hovering or flying insect, they transmit an impulse which in an animal would be called a mandate of its will, to the muscles or the machinery that moves the lobes of the trap, and so instantly is this obeyed, that these lobes close upon the insect and capture it. Inorganic bodies placed upon the lobes, unless they touch the sensitive filaments, do not cause them to close; organic bodies when moistened and placed upon the leaf, cause it, after absorption has begun to take place, to close slowly. The lobes may be made to close over either organic or inorganic substances, but with a difference. When an inorganic substance is placed upon the leaf, and one of the sensitive bristles is touched, the leaf indeed shuts up, but in such a manner as to leave a hollow space between the lobes of the trap; it is as if the plant were tasting the substance to see if it were fit for food. When, on the other hand, an organic substance falls upon the leaf, both lobes press against it and against each other with force enough to flatten out a portion of the white of a hard-boiled egg, that they have been made to close upon. Again, when any innutritious substance is caught, the glands are not excited to secrete the digestive fluid, and the lobes soon open, freeing the substance and showing it perfectly dry. If the object caught is too small to make it worth the attention of the plant, it is allowed to escape between the interlocking teeth; but if the quarry be large enough, and of a nutritious character, the lobes will remain flattened together over it for fifteen, twenty-four, or even thirty-five days.

Darwin, speaking of the sensitiveness of root tips, shows that they have developed diverse kinds of sensitiveness, so that "it is," he says, "hardly an exaggeration to say that the tips of the radicle thus endowed, and having the power of directing the movement of the adjoining parts, act like the brain of our lower animals, the brain being seated within the anterior end of the body, and directing the several movements."

The wonderful power of this substitute for a brain, as shown in its leading the parts to which it is attached over, under, or around every intervening obstacle through the dark earth to a more or less distant water supply, or a rich deposit of nitrogenous nutriment in the form of a buried carcass, is it not quite as wonderful as the faculty of the bee in finding its way to its nest, or of a male moth discovering from a great distance the locality where a female of the same species is hidden?

Of course only the merest glimpse at the wonderful reflex action of plants can be here given, but a more extensive investigation of the subject leaves the student impressed with the fact that both plants and insects develop along narrow lines a perfection of power in adapting means to an end that nothing in the plant or in the insect can at all account for, and that as students of Nature are beginning to believe, no series of merely fortuitous, aggregated variations can explain.

As the construction of the Nile reservoir at Assouan involves the unavoidable submersion of a portion of the temple of Philæ, situated upon the island of Philæ, the Egyptian government has decided to take all possible steps to preserve a record of these monuments as they existed prior to the rise in the water levels, and also to lessen any danger which might arise from the annual inundation. The record of these historic monuments has been completed, and now to insure the stability of the structures the foundations of the temples are being underpinned. As the foundations of the temple of Isis were found to descend everywhere to the solid rock, it was decided to limit the operations to the consolidation of the other structures. It is expected that the work will be entirely completed in the course of a few weeks.

MIXING PUMP.

The blending of whisky and the rectification of spirits in general is based on the fact that cheaper qualities can be improved considerably by the addition of comparatively small quantities of higher grade goods, certain essential oils, and other ingredients. To effect such an amelioration, it is a matter of the utmost importance that all constituent parts are not only poured together, but that the mixture is thoroughly stirred and repeatedly agitated, that all particles may mingle freely and every ingredient become distributed most minutely. Only by infinite diffusion and energetic agitation can the different parts of the mixture act upon each other chemically, and effect

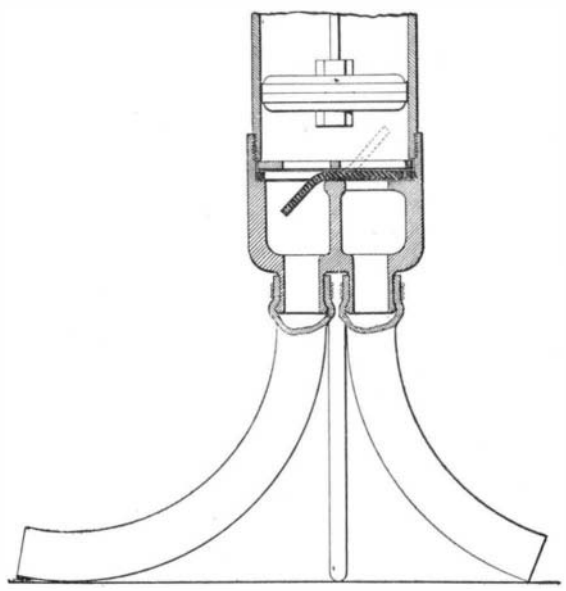

DIAGRAM OF THE MIXING PUMP.

a blend of uniform character that bears the savor of "age," otherwise obtained only as the result of years of careful storage and maturation. This vital point of stirring up and agitating the mixture is too frequently neglected, especially in smaller establishments with limited storage facilities, where ingredients are added to liquor already within the barrels. The shaking of the barrel or package is certainly insufficient to mix the heavy sirup and other sweetening matter with the light spirits, particularly in moderate temperatures. Nor can the oils be properly diffused by the mere rolling of the barrels or stirring with a stick through the narrow bunghole. Stirring in open tanks has the great disadvantage of reducing the strength in alcohol and aroma, by continually exposing new parts of volatile matter to the air. Under certain conditions this renders liquor cloudy through

MIXING PUMP IN OPERATION.

the oxidation of essential oils exposed in this manner. To achieve the best possible results it is necessary that the stirring be done most energetically near the bottom of the vessel, where sirup and other heavy matter will settle; that part of the mixture be forced into the rest with a certain pressure, thus creating a strong current and numerous whirls throughout the tank or barrel; and that the air be excluded as much as possible.

A simple and effective tool, that complies with all these requirements, is a mixing pump just patented by Mr. Herman Soellner, of 842 Bushwick Avenue, Brooklyn, N. Y. One of our views shows the pump in operation, while the construction is clearly indicated in the diagram. The plunger fits snugly in a cylinder, at the bottom of which is a double nozzle controlled by a double valve. Connected to the nozzles are two sections of rubber hose, while a metal spur in the center serves to hold the pump in proper operative position. Now, when the plunger is drawn upward the rubber valve-disk is sucked up, closing the left-hand nozzle, but opening the nozzle at the right, as indicated by dotted lines. The cylinder will thus be filled with the liquid, which on the downward stroke is discharged through the left-hand nozzle. Repetition of this process results in establishing a current through the liquor, which thoroughly mixes all the elements. The discharge pipe, it will be noticed, is longer than the receiver. The purpose of the former is to direct the current in a whirl that embraces the entire contents of the barrel, while the latter pipe receives its supply from the bottom, where the heavier matter is most apt to settle. From a practical point of view this tool fills every want. It can be used in a tank as well as in a barrel of any size. Its simplicity, lightness and easy manipulation appeal to the workman, who can assume a comfortable position, slip the mixer through the narrow bunghole and achieve all that is required within a few seconds. All parts of the mixer are interchangeable, indifferent to alcoholic solutions of any strength and need no cleaning other than rinsing to remove the characteristic flavor of the respective liquors. The utility of this mixing pump is not limited to the rectification business only, as it will mix fluids of the most different chemical nature and specific gravity. It causes a perfect solution and disintegration of salts, oils, chemicals, paints, etc., and also distributes insoluble matter, such as charcoal, boneblack, and other materials.

French Competition for Belt Mounters.

The numerous accidents to workmen in establishments where belts are used has recently brought about the stringent application of a French law, forbidding the removing or replacing of a strap by hand while the machinery is in motion.

In order to obviate the waste of time consequent upon the stopping of the machinery, an association of French manufacturers has announced an open international competition for the best fixed belt mounter.

The invention should be designed for simple and not for conical pulleys, and must comply with the following conditions:

(1) It must be simple, strong, and occupy little space; easy to fix and use.

(2) Not dangerous in working.

(3) Convenient for any speed, width, or position of belt.

(4) Able to throw the belt off or on.

(5) Sufficiently low in price to allow of its wide use.

Competitors are invited to send a full description of their invention, accompanied, if possible, by a model or at least by satisfactory illustrations, to the president de l'Association des Industries de France contre les Accidents du Travail, No. 3 rue Lutèce, Paris, prior to October 1, 1902.

This notice may be of interest to American inventors or to firms dealing in machinery of this character.

The Current Supplement.

The first article in the current Supplement, No. 1381, is a well-illustrated account of rice culture in the United States, by Dr. S. A. Knapp. Of technological interest is an illustrated description of the mechanical manufacture of bottles. A new army pistol used in Switzerland, and called the "Parabellum," is made the subject of an article, accompanied by several engravings. An entertaining essay by Frank Hix Fayant tells how electrical engineers are trained. William A. Del Mar, who has contributed to the Supplement many articles of practical interest, describes graphically how a modern coherer is made, and tells something of its history as well. The use of oxygen in cases of carbon monoxide poisoning may be of value to physicians. H. M. Miller pictures the manners and customs of the people of Southern Borneo. A very full treatise on carbureters will interest some of our automobile readers. The Consular Notes and Selected Formulæ will be found in their usual places.

International Navigation Congress.

From June 29 to July 5, 1902, the Ninth International Navigation Congress will be held at Düsseldorf. The aim of the Congress is the encouragement, promotion and improvement of navigation, as well as the exchange of experiences gained. Technical and economical questions relating to inland and ocean navigation will be discussed.

Oscar McClellan, a printer, inventor and bosom friend of Edgar Allan Poe, died at his home in Philadelphia recently at the age of 82 years. He was an inventor of some note, and three times had placed himself in an independent position through his inventive genius. His last achievement in this line was an improvement on a machine for performing some of the operations of shoe-making, for which improvement he received $80,000 in royalties.