India-rubber in Brazil.

In the early morning, men and women come with baskets of clay cups on their backs, and little hatchets to gash the trees. Where the white milk drips down from the gash they stick their cups on the trunk with daubs of clay, moulded so as to catch the whole flow. If the tree is a large one, four or five gashes may be cut in a circle around the trunk. On the next day other gashes are made a little below these, and so on until the rows reach the ground. By eleven o'clock the flow of milk has ceased, and the *seringueiros* come to collect the contents of the cups in calabash jugs. A gill or so is the utmost yield from each tree, and a single gatherer may attend to a hundred and twenty trees or more, wading always through these dark marshes, and paying dearly for his profit in fever and weakness. Our *mameluca* hostess has brought in her day's gathering—a calabash full of the white liquid, in appearance precisely like milk. If left in this condition it coagulates after a while, and forms an inferior whitish gum. To make the black rubber of commerce, the milk must go through a peculiar process of manufacture, for which our guide has been preparing. Over a smouldering fire, fed with hard nuts of the *tucuma* palm, he places a kind of clay chimney, like a wide-mouthed, bottomless jug; through this *boiao* the thick smoke pours in a constant stream. Now he takes his mould—in this case a wooden one, like a round bladed paddle—washes it with the milk, and holds it over the smoke until the liquid coagulates. Then another coat is added, only now, as the wood is heated, the milk coagulates faster. It may take the gatherings of two or three days to cover the mould thickly enough. Then the rubber is still dull white, but in a short time it turns brown, and finally almost black, as it is sent to the market.

The mass is cut from the paddle and sold to traders in the village. Bottles are sometimes made by moulding the rubber over a clay ball, which is then broken up and removed. Our old fashioned rubber shoes used to be made in this way. Twenty million pounds of rubber, valued at 6,000,000 dollars, are annually exported from Para in the dry season; many thousand people are engaged in gathering it. But the business altogether is a ruinous one for the province, as Brazilians themselves are fully aware. The *seringueiro*, who gains two or three dollars for a single day's gathering, has enough, as life goes here, to keep him in idleness for a week; and when his money is spent, he can draw again on his ever ready bank.

The present wasteful system is spoken of as follows: The half wild *seringueiros* will go on submitting to impositions and dying here in the swamps, until Brazilians learn that by purchasing this land from the government and planting it in rubber trees they can insure vastly larger profits, and do away with the evils of the present system. It is what must eventually be done. The rubber gatherers, in their eagerness to secure large harvests, have already killed an immense number of trees about the Para estuary; they have been obliged to penetrate farther and farther into the forest, to the Tocantins, Madeira, Purus, Rio Negro, and eventually even these regions must be exhausted, unless they are protected in some way. The trees, properly planted and cared for, will yield well in fifteen years, and, of course, the cost of gathering would be vastly reduced in a compact plantation; half the present labor of the rubber collector consists in his long tramps through the swampy forest.—*Dominica Dial.*

Swiss Labor Statistics.

The most recent report of the Department of the Interior states that there are in Switzerland 8,642 factories and workshops under legal supervision, 1,472 of which are worked by machine power. Of these, water furnishes the movement to the amount of 41,316 horse power, steam to the amount of 18,064, and gas to the amount of 117. The number of operatives employed is 134,862, of which 70,364 are males and 64,498 females. There are 10,462 children between 14 and 16 years of age, 14,590 between 16 and 18, and 109 810 over the latter age. The textiles, such as cotton, silk, woolen, and linen, occupy 1,619 factories, with 85,705 work people; 68 establishments carry on tanning, leather dressing, hair weaving, etc., with 3,753 hands; there are 6,636 hands employed in 143 food preparing shops; 2,749 in 102 chemical works; 4,950 in 150 printing shops. There are also 111 wood working establishments, occupying 2,913 hands; 353 for clock and jewelry making, with 24,988 work people; and 96 for glass making, etc., with 3,170.

A Lure for Trout and Black Bass

Is suggested by one of the writers to a sporting periodical that is somewhat novel. He says that he has used it for thirty years, and never saw its equal as a bait. The skin of the neck and the head of a fowl, with speckled and red feathers, cut into narrow strips with the feathers on, makes a most enticing bait, and it may be used fresh, or be kept pickled in salt brine from fall till spring. He says:

"When on the hook it is a most enticing bait, and being tough hangs on well and looks bright. I have caught a basket of trout with one bait. Sometimes you may want a bait like a bug or grasshopper, or a large miller; this you can closely imitate by leaving on one or two feathers. Sometimes by cutting from the wattles near the hill, with a feather or two, or a piece of the comb and a piece of the little feathers attached, will lure a trout when nothing else will."

SPRING WHEEL FOR TRACTION ENGINES.

Difficulty has always been experienced in the use of traction engines, on ordinary roads, on account of the rigidity of the wheels and the injury to the machine by jolting, for lack of sufficient elasticity. The general idea of using elastic spokes in wheels is an old one. But the particular form here shown seems to be especially adapted to traction engines, and has proved highly successful in practical operation in England, where traction engines furnished with these wheels have been run for between two and three thousand miles with great satisfaction.

Engines of this construction were shown by J. & H. McLaren, of Leeds, at the recent agricultural show at York. The rim of the wheel is made of strong iron rings and steel cross plates. The wheel hub has wrought iron ribs to which the spring spokes are bolted. The springs are made of the best steel, nine inches wide by half an inch thick. When the weight of the engine comes on these spokes, those nearest

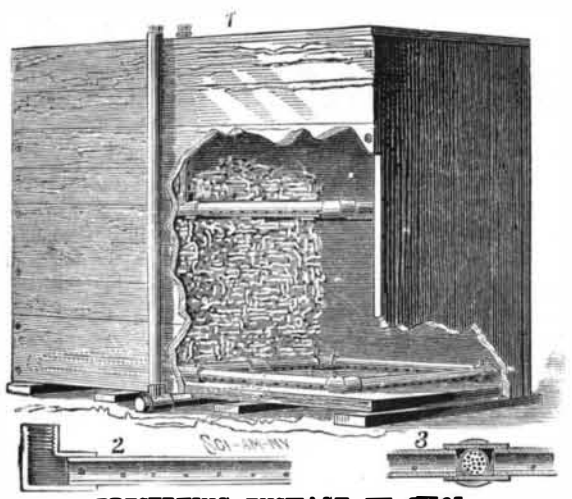
SPRING WHEEL FOR TRACTION ENGINES.

the ground are compressed a little and those at the top elongated. The driving strain is sustained by an arm attached to the rim.

METHOD OF PRESERVING ENSILAGE IN SILOS.

To preserve corn or other vegetable matter in silos it is necessary for its preservation to remove all air before heating or fermentation sets up. This has been done in a very imperfect manner by placing heavy weights on boards covering the top of the ensilage, the air escaping through cracks between and around the boards; but as silos are from twelve to twenty feet deep, a large percentage of air will remain in contact with the ensilage, especially in the central and lower portions, when treated in the ordinary way. The heavy pressure commonly used has a double disadvantage, inasmuch as the walls of the silo must be made very strong, to resist lateral pressure, and ensilage under pressure ferments much more rapidly than it would were the pressure slight, as the juices of the ensilage are expressed, and finding their way to the bottom of the silo are readily attacked by fermentation.

The improvement shown in our engraving has been patented by Mr. Samuel M. Colcord, of Dover, Mass., and is



PRESERVING ENSILAGE IN SILOS.

designed to preserve the ensilage in a sweeter and more wholesome state than is possible by the ordinary method. This improved device not only removes atmospheric air from the silo very speedily and perfectly, and with much less than the usual pressure, but it permits of a ready examination of the contents of the silo, and affords a means of applying chemical preservatives for preventing or arresting fermentation.

By reference to the engraving it will be seen that the silo is provided with a frame of perforated metal pipes at the bottom, connecting with one or more pipes leading out of the silo and upward to the surface. Juice or water accumulating at the bottom of the silo may be removed through the horizontal pipe, and the condition of the ensilage at the bottom of the silo may be determined by the odor rising from the vertical pipes, or by dropping a sensitive thermometer into either of the pipes. Figs. 2 and 3 show the pipes in detail

A second set of pipes is supported upon a skeleton frame half way up the silo. The number of these sets of pipes may be increased, and of course the number of pipes in each set may be varied.

The pipes and the skeleton frame supporting them may be readily removed when reached in the operation of discharging the silo.

This apparatus may be readily applied to silos of the old style already in existence.

This useful invention will be readily understood without further explanation, and further particulars may be obtained by addressing the inventor as above.

A Study of Leprosy.

Dr. G. H. Fox, the lecturer on cutaneous diseases at the College of Physicians and Surgeons, New York city, has recently made a trip to a leprosy lazaretto at Tracadie, Province of New Brunswick. In an interview with a representative of the New York *Sun*, Dr. Fox gave some interesting information about this disease, which is less understood than its terrible character seems to demand. Dr. Fox says that leprosy is not absolutely and always incurable, and suggests that a wealthy man who would endow a bed in the Skin and Cancer Hospital, so that lepers would come there, would be greatly facilitating the study of this disease. Nearly all the patients at Tracadie are descendants of two sisters, who, about 100 years ago, are said to have contracted the disease by washing clothes for sailors. In the beginning of the century there were about 100 cases in the neighborhood of Tracadie. A hospital was built on Sheldrake Island, not far from Tracadie, especially for lepers. Dr. Fox found a woman 80 years old in the lazaretto, who came there as a leper when a child. She was discharged as cured thirty years ago, but subsequently returned with fresh symptoms of the disease; but, in the doctor's opinion, she will die of old age rather than of leprosy.

Many of the patients have the worst form of leprosy—tubercular leprosy or leontiasis—so called because large bunches often form over the eyes, giving the patient a lion-like, brutal expression. It is frightful to be in a room surrounded by such lepers. The macular lepers merely have bronze patches over the body. The disease is hereditary, but not contagious, except by inoculation. To illustrate this phase of the disease the doctor said:

"A priest who visited the lazaretto caught the disease; but I heard from Babineau that this priest, in a spirit of bravado, would take a pipe from a leper's mouth and smoke it. So he caught the disease from inoculation."

Dr. Fox does not think that the disease is infectious. If he is correct, the story of the origin of it in Tracadie must be rejected, and the infection of the women by washing the clothing of diseased sailors be treated as a myth. But the most important portion of the doctor's revelations must be that he knows of "six cases of leprosy in this city," and believes that "cases of leprosy exist in the Chinese quarter of New York, housed with other people and perhaps intermarrying."

Extreme Minuteness.

When vision is not aided by any magnifying process, there is a point of minuteness, as all know, when an object will make no impression upon the retina, and will not be seen by the unaided eye. But when the object is viewed by means of a microscope, it becomes visible. There is a question, however, that remains unanswered, which is, whether any object may become so attenuated that it cannot be made visible by any means. Not many years ago, less probably than twenty-five, there were lines that could not be resolved by any microscopic lenses then in existence, which can be exhibited now without any difficulty; but, at that time, makers of lenses had not attained to the skill of making them with large angles of aperture, but now they are made with the highest angle that is possible, and consequently the capacity of such objectives can only be increased by greater skill in their manufacture. But the limit of angle of aperture having been reached—no opportunity remaining of increasing capacity in that direction—is it not reasonable to suppose that, with present appliances, no greater skill in manufacture can be expected? Sir Royston Pigott, recently, at a meeting of the R. M. S., stated that he had seen globules of mercury, made by smashing a minute particle of mercury with a watch spring, less than $\frac{1}{100}$ of $\frac{1}{10000}$ of an inch, or less than the millionth of an inch. Another member replied that he was not aware that there is any limit of visibility in the microscope other than that imposed by the sensibility of the observer's retina, the correction of the objective, and the illumination.—*The Microscope.*

Coated Tongues.

Among the various substances which have been found on the human tongue, as shown by the microscope, are the following: Fibers of wool, linen, and cotton; fibers of spiral vessels; fibers of muscle, in one case eight hours after eating; starch grains; cheese mould; portions of potato skin; scales, moths, etc.; hairs from legs of bees; hairs from legs of spiders; pollen of various flowers; stamens of various flowers; hairs of cats, quite common; hairs of mouse once only; hairs from various leaves; wing of mosquito once; fragments of the leaves of tobacco, of chamomile flowers, etc.