

Dosing Trees with Medicine.

Referring to the popular idea that sulphur placed in holes bored in the trunks of trees will be dissolved and carried by the sap to the foliage in such quantities as to render it offensive to insects, a recent *Bulletin* of the Massachusetts Agricultural College Experiment Station says that it has been found upon cutting down trees which have been plugged with sulphur that the material remains unchanged for many years. It is added, says *Garden and Forest*, that while we are spending so much effort to prevent injury to our trees from borers we certainly ought not to make holes in them many times larger than those made by any known species of insect. In order to ascertain whether sulphur in soluble form can be introduced into a tree so as to affect the fungus growths causing rusts, blights, and mildews, some large rose bushes, badly mildewed, were treated with saturated solutions of potassium sulphide, hydrogen sulphide, and ammonium sulphide. The liquid was forced into holes bored into the main stem with a small gimlet, and the orifice was plugged with grafting wax. At first a slight improvement in the amount of mildew upon the leaves was noticed, but in September all the bushes but one were dead, presumably from the effect of the holes. Until further trials are made, this experiment indicates that while there may be some promise that antiseptics introduced into the sap circulation may prevent the growth of fungi, some safer means of introducing the solutions must be found. From the nature of the case it is hardly possible that any substance can be introduced into the circulation in sufficient quantities to affect insect life. Professor Maynard, who prepared the *Bulletin*, suggests that an inspection be made next season of the elms in Boston which were bored and filled with chemicals last spring to make the leaves distasteful to beetles. Careful weighing would determine how much of the powder had escaped from the hole, and analysis could detect the presence of any excess of sulphur in the leaves.

Ancient Roman Plank Roads.

The Prussian Minister of Education, Von Gossler, having learned that Professor F. Knoke had lately found traces of old Roman plank roads on the moor between Mehrholz and Bragel, not far from Diepholz, in Lower Hanover, invited that gentleman to fully investigate the matter. He has just completed the task. He was able to trace the lines of two parallel plank roads right across the moor, presenting all those distinctive features which are found in Roman works of this kind. One of them shows evident signs of having been demolished by force, the boards, which were originally fastened with pegs to the bearers, having been violently torn away and buried in the bog to the right and left of the track. The other road seems to have fallen into decay, but there are signs of repairs executed even during the Roman period; for in places boards have been found fastened over the original planks, the fashion of both being the same. Those repairs seem to have been carried out hastily, for in one place a mallet, employed probably to drive home the pegs, was found on the track, forgotten, no doubt, by the workmen. The local archæologists feel assured that they have here the *pontes longi* which were used A. D. 15 by the Roman commander A. Cæcina in his retreat from Germany to the Ems.

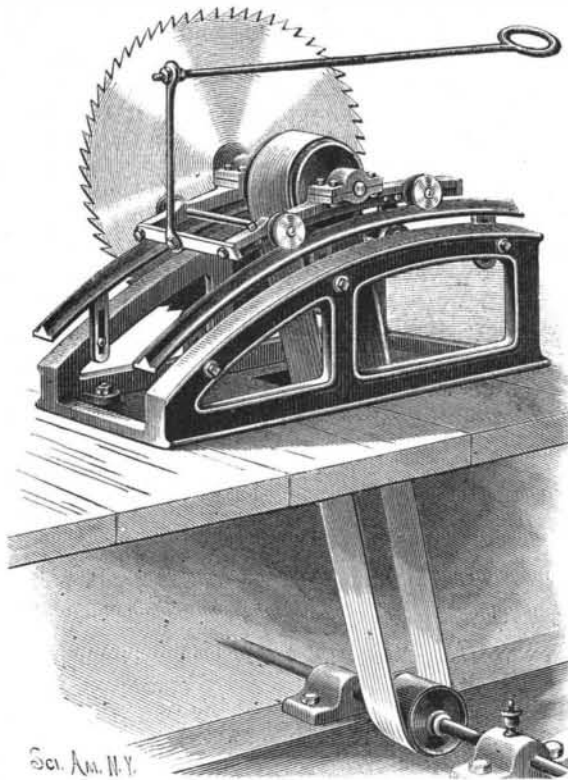
AN IMPROVED ATTACHMENT FOR BICYCLES.

A simple and cheap attachment for bicycles or tricycles, whereby they may be run upon ice or snowy ground, is illustrated herewith, and has been patented by Mr. Herman H. Holtkamp, of New Knoxville, Ohio. A runner or shoe is arranged for connection with the small wheel of the vehicle, the shoe being attached by means of a clip on an adjustable bracket, whereby the runner may be used in connection with wheels of different diameters. To the large wheel are secured as many attachments as may be necessary, each of which consists of a cylindrical metallic plate, lined with leather or other slightly yielding material, and having flanges which extend outward from the side of the cylindrical section. This section is arranged so that it may be passed over the rubber tire and the felly of the large wheel, and on its inside are two projections extending toward the hub of the wheel, adapted to receive a clamping bolt, by which the attachment is clamped to the wheel. The two outward bottom flanges of this cylindrical section are placed at either side of the center of the tire, in order to allow for the regular operation of the ordinary form of bicycle brake, the small wheel being lashed to the backbone of the bicycle. With this attachment the vehicle may be freely used on ice, or heavily packed or frozen snow, while the attachment may be connected to or removed from the bicycle in a very short time. The whole combination, made of steel, may be sharpened for special feats on very smooth ice.

A CHINESE teapot is of white porcelain embedded in a wadding lined bamboo basket, for retaining the heat.

CUT-OFF SAWING MACHINE.

We illustrate in the cut accompanying this article an ingenious mounting for a circular saw. It has been a usual practice when such saws are used for cutting off ends of timber or of boards, and for similar work, to mount them on an arbor at the lower end of a frame, swinging pendulum fashion from the beams of the ceiling of the shop. By the present invention all upper framework is dispensed with. The saw works on an



CUT-OFF SAWING MACHINE.

arbor, journaled on a carriage, that moves on a stationary frame or bed plate resting on the bench, working back and forth through the arc of the circle, being controlled in its reciprocations by the operator. The belt is driven from a pulley underneath the bench, the axis of whose countershaft coincides with the center of the arc or of the main frame. The rails on which the saw carriage moves are adjustable by bolts and slotted lugs. Their curve is also an arc of a circle, but in practice they are set slightly out of center with the driving pulley. As the saw is drawn forward it makes its cut. The rails, therefore, are so set that the belt is tightened as the saw comes forward and is slightly loosened as it recedes. Such loosening of the belt avoids wear of belt and journals. This receding motion is performed principally by gravity, so that the operator has little more to do than to pull the saw forward by its handle; the rest is practically automatic. Holding-down wheels are provided to prevent the carriage from lifting or rising from the rails. This machine is the invention of Messrs. J. W. Surprenant and J. E. Ferguson, of Astoria, Oregon.

The Qualities of a Good Rope.

In an article on rope making credited to a German periodical, but quoted in *Iron*, it is remarked that the appearance of a hemp rope affords to an experienced eye very fair indications of its quality. A good hemp rope is hard but pliant, yellowish or greenish gray in



HOLTKAMP'S ATTACHMENT FOR BICYCLES.

color, with a well defined silvery or pearly luster. A dark or blackish tint indicates that the hemp has suffered from fermentation while curing; and brown spots show that the rope was spun while the fibers were too damp, and is consequently weak and soft in the stained places. Sometimes a rope may be made up of inferior hemp on the inside, while upon this, as a

core, good yarns are overlaid. This fraud may, however, be detected by unlaying a portion of the rope; and it generally betrays itself in use, if not otherwise discovered. Another variety of inferior rope is that made of short fibers, or the strands may be of unequal length or unevenly spun. In the first case the rope has a woolly or rough appearance, on account of the number of projecting ends of fibers; and in the latter case the irregularity in laying is easily perceived upon inspection by any one who knows what a good rope should look like. The combustion test for ascertaining the purity of manila rope has been published, but may be usefully repeated here. It consists in unraveling some of the fiber of the rope to be tested, and forming it into a loose ball, which is to be completely burnt upon a clean surface, such as an iron plate. Pure manila hemp burns to a dull grayish black ash; sisal leaves a whitish gray ash; combinations of manila and sisal show themselves by gradations of the grays.

Fortunes in Patents.

The Commissioner of Patents estimates that "from six to seven eighths of the entire manufacturing capital of the United States, or six hundred millions of dollars, is directly or indirectly based upon patents." A calculation of the same kind in England, according to our English contemporary, the *London Inventor*, reveals a still more surprising result, the capital invested being enormous. It has been computed that Siemens' inventions have produced more than five millions sterling.

"There is," says an eminent authority, "scarcely an article of human convenience or necessity in the market to-day that has not been the subject of a patent in whole or in part. The sale of every such article yields its inventor a profit. If we purchase a box of paper collars, a portion of the price goes to the inventor; if we buy a sewing machine, the chances are that we pay a royalty to as many as a dozen or fifteen inventors at once."

Lord Brougham often said that he would gladly have exchanged his honors and emoluments for the profits and renown of the inventor of the perambulator or sewing machine.

The writer here states the profits annually divided by our several sewing machine manufacturers, which are phenomenal in amount, adding that "more money has been, and always can be, made out of patented inventions than by any other investment or occupation." The telephone, the planing machine, and the rubber patents realized many millions, while the simple idea of heating the blast in iron smelting increased the wealth of the country by hundreds of millions. The patent for making the lower end of candles taper instead of parallel, so as to more easily fit the socket, made the present enormous business of a well known firm of London chandlers. The drive well was an idea of Colonel Green, whose troops, during the war, were in want of water. He conceived the notion of driving a two inch tube into the ground until water was reached, and then attaching a pump. This simple contrivance was patented, and the tens of thousands of farmers who have adopted it paid him a royalty until the recent decision of the Supreme Court, which was adverse to sustaining the patent. A large fortune was realized by the inventor who patented the idea of making umbrellas out of alpaca instead of gingham, and the patentee of the improved "paragon frame" (Samuel Fox) lately left by will £170,000 out of the profits of his invention. The weaving, dyeing, lace and ribbon making trades originated and depend for their existence upon ingenious machinery, the result of an infinity of inventive efforts. Carpet beating, from being an untold nuisance, has become a lucrative trade through the same inventive genius and mechanical contrivance. Even natural curiosity has been turned to account in the number of automatic boxes for the sale of goods of all kinds, and fabulous dividends have been paid by the public companies owning the patents. In fact, any one can be a successful inventor. In proof of this, the most profitable inventions are the improvements in simple devices, things of every day use that everybody wants, and which are in the power of everybody to invent. A lady derived a large income for inventing a moving belt for drying eggs, albumen, etc.

The Power of the Imagination.

We learn from the New Orleans *Picayune* that Dr. Durand, wishing to test the practical effect of mind disease, gave a hundred patients a dose of sweetened water. Fifteen minutes after, entering apparently in great excitement, he announced that he had by mistake given a powerful emetic, and preparations must be made accordingly. Eighty out of the hundred patients became thoroughly ill, and exhibited the usual result of an emetic. Twenty were unaffected. The curious part of it is that, with very few exceptions, the eighty "emeticized" subjects were men, while the strong-minded few who were not to be caught with chaff were women.