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.

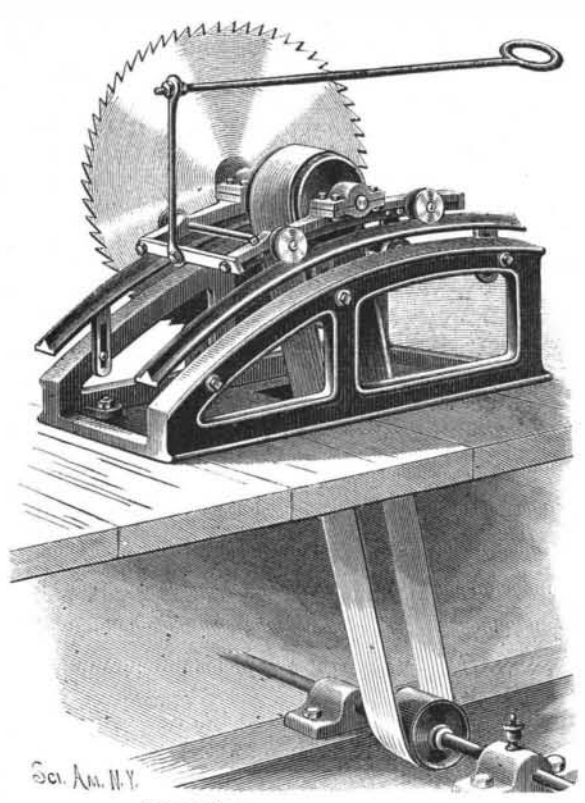
A simple and cheap attachment for bicycles or tricycles, whereby they may be run upon ice or snowy ground, is illustrated herewith, and has been patented by Mr. Herman H. Holtkamp, of New Knoxville, Ohio. A runner or shoe is arranged for connection with the small wheel of the vehicle, the shoe being 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.

HOLTKAMP'S ATTACHMENT FOR BICYCLES.

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 dipensed 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 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.

Murder Culture by the Pictorial Art.

No fact is more patent to science than the direct effect of influences exerted through the medium of the senses upon the brain—that particular part of the organism whose functioning we call "mind." Darwin, Ruskin, and all the great students of development have labored to bring this fact within the cognizance of the general thinking public. That they have failed is only too painfully evidenced by the persistence and surprising ingenuity of the practice of cultivating homicidal propensities, and collaterally murder, by a refined use of the art of mural decoration.

While we empower the police to put down with a strong hand the exhibition in shop windows, and the censor of stage plays and spectacles to interdict the parade in theaters, of pictures and scenes of an "immoral" character, because it is recognized that these have a tendency to corrupt the mind of youth—and age too—nothing whatever is done to restrain the daily increasing evil of pictorial placards displayed on every hoarding, and of highly wrought scenes produced at nearly all the theaters, which not only direct the thoughts, but actively stir the passions, of the people in such way as to familiarize the average mind with murder in all its forms, and to break down that protective sense of "horror" which nature has given us, with the express purpose, doubtless, of opposing an obstacle to the evil influence of the exemplification of homicide. It cannot be disguised that even the most sensitive nature is to some extent brutalized by the display of these pictures.

We are none of us as shocked at the spectacle of a knife driven into the chest of a young woman, and do not recoil as violently from the idea of this form of murder, as before the display on all sides of an elaborate, nearly life size, picture of the deed. Nor do two men grappling together and stabbing each other, or one man shooting another with a revolver, strike us as presenting spectacles of such hideous enormity as they would have done had we not been familiarized with these scenes by impressive placards staring us in the face at every turn. It does seem strange—passing strange—that this murder culture by the educationary use of the pictorial art has not been checked by public authority.

We have no wish to make wild affirmations, but knowing what we do, as observers of development, we can have no hesitation in saying that the increasing frequency of horribly brutal outrages is by no means unaccountable. The viciously inclined are, in a sense, always weak-minded—that is to say, they are especially susceptible of influences moving them in the direction their passions incline them to take; and when the mind (or brain) is impressed through the senses, and particularly the sense of sight, in such manner as to produce mental pictures, either in waking thought or dreams, of homicide, the impulsive organism is, as it were, prepared for the performance of the deeds which form the subjects of the consciousness. We are, of course, writing technically, but the facts are indisputable, and we trust they will be sufficiently plain. It is high time that this ingenious and persistent murder culture should cease.—*Lancet.*

Whisky not an Antidote to Rattlesnake Poison.

Dr. A. T. Hudson, of Stockton, Cal., writes: "Having often seen the statement made in the public press, and sometimes in medical journals, that whisky and ammonia were the acknowledged antidotes to rattlesnake bite, I feel it a duty to administer a corrective to the above fallacious teaching. About thirty years ago Professor Weir Mitchell, of Philadelphia, spent over two years in carefully experimenting with the virus of snake poisons. Taking a few drops of the pure virus from the sac of the snake, he mixed it consecutively with alcohol, ammonia, iodine, bromine, mercury, and other reputed antidotes, then injected the solution of each into birds, rabbits, dogs, goats, and other animals—when he found that the poison was not altered in its power, but would produce its specific toxic effect just the same as when it was undiluted. He found also that the virus was fatal only to a certain extent, that is, if it took half a drop to kill an animal of thirty pounds weight, it would require one to two drops to kill one of sixty to eighty pounds. Its action is immediate, and it kills only when the animal is too small and weak in resistive vitality. It is rare that an adult person dies from the bite of a rattlesnake. The virus of the cobra is more intense and fatal. Several years ago a prominent minister in Philadelphia died from the bite of a young cobra. As a given quantity of the rattlesnake virus is necessary to overcome a certain amount of physical force, it is seldom that such quantity is ever deposited by the snake bite upon an adult person. If a large snake should bite a goat of fifty pounds weight, and soon after bite two children of about the same weight, the goat might die, but the children would not, for the reason that the goat would receive the largest amount of the virus, when there would be but little left to poison the children. In such a case, whisky being used on the children, their recovery would be attributed to the whisky; so the friends and neighbors would think they have positive proof of a sure antidote in whisky. Here is the fallacy which science alone can demonstrate. If, when whisky is mixed with the poison directly, it is no antidote, how can it become so when taken into the system remotely, the whisky in the stomach and the poison in the goat? Physiologically, whisky is antidotal so far as it will sustain the flagging powers during the time the poison is being eliminated by the excretory organs. In the light of the above scientific demonstrations, how a doctor can gravely or frantically proceed to treat a rattlesnake bite 'by injecting around the wound permanganate of potassa, or any supposed antidotes, or order a chicken split open and applied to the wound, or the anus of the chicken applied over the wound, using a number of different fowls for the purpose,' is a problem hard to understand in this age of reason."—*Medical Record.*

The Institution of Civil Engineers—Subjects for Papers, Session 1888-89.

The Council of the Institution of Civil Engineers, London, invites original communications on the subjects included in the following list, as well as on any other questions of professional interest:

1. The utilization of unused sources of power in nature—such as the tides, the radiant heat of the sun, etc.
2. Standard specifications for the materials used in the construction of engineering works.
3. The influence of sea water upon Portland cement mortar and concrete.
4. The construction, ventilation, and working of railway tunnels of great length.
5. Description of any new or peculiar type of mountain railway for very steep gradients.
6. Recent improvements in cable tramways.
7. The value, with respect to the safety and durability of metallic bridges, of (*a*) increase in the weight of the structure, by the choice of other than the lightest design; (*b*) increase in the dead load, by the adoption of a heavy description of flooring, with or without the addition of concrete or ballast.
8. The painting and preservation of metals, woods, etc.
9. Recent examples of hydraulic lift graving docks.
10. Forms and construction of masonry dams for reservoirs.
11. The cleaning and deepening of drainage and irrigation canals by mechanical means.
12. On the sale of water by measure.
13. Descriptions of mining machinery of improved design.
14. Gold quartz reduction and amalgamation—description of the various machines, and of their method of working.
15. The physical properties of metals under test.
16. The working strength of iron and steel as affected by (*a*) the amplitude, (*b*) the frequency, and (*c*) the time rate of the stress variations.
17. The present position of the manufacture of steel—its defects, and suggestions for its improvement.
18. The effect upon basic steel of (*a*) chromium, (*b*) aluminum, and (*c*) tungsten.
19. The properties of bronzes and other alloys.
20. Researches on the actual working limits of stress in machinery or structures under known conditions of variation of loading.
21. The corrosion of metal structures, and the best means of preserving them.
22. The effect of wind upon structures, as influenced by (*a*) their superficial area, (*b*) the form or position of the exposed surfaces, (*c*) the shelter of adjacent bodies, and (*d*) the dynamic action of sudden gusts.
23. On forging by hydraulic pressure, and casting under the same.
24. The construction of the working parts of steam engines, in relation to the high pressures and temperatures now becoming general.
25. The practical limit to the working pressure of steam in marine boilers.
26. The various systems of forced draught in boilers, with the economical results obtained.
27. The most recent types of (*a*) mail steamers, (*b*) cargo steamers, and (*c*) war ships.
28. On modern experience in screw propulsion, comprising the comparative efficiency of propellers of large diameter, and of smaller ones deeply immersed, and of the influence of form.
29. On the highest speeds attained and attainable on railways, having reference to gradients, curves, and the locomotives employed.
30. The application of the compound principle to locomotive and to portable engines.
31. Mechanical traction on common roads.
32. The petroleum engine and its applications.
33. The distribution of power by compressed air or by vacuum, and the construction of machines to be worked by compressed air or by vacuum.
34. Hydraulic rotative motors for high pressures.
35. The means of governing and economizing high pressure fluid in hydraulic cranes, engines, etc.
36. The construction and working of windmills, suitable for raising water for the supply of villages and isolated houses.
37. The best combined system of warming, ventilating, and lighting large buildings.
38. The transmission of steam underground in the United States, with the results obtained.
39. The plant used in the execution of important engineering works.
40. Tools used in the building of iron and steel ships, and in the construction of boilers.
41. The construction and working of friction brake dynamometers.
42. Steam cultivation by digging and by plowing.
43. The generation of alternating currents in dynamo electric machines, and their utilization for lighting and power purposes.
44. Electric meters for recording the consumption of electrical energy.
45. The construction and maintenance of secondary batteries.
46. Central station electric lighting.
47. The application of electricity to the working of street tramways and of railways.
48. The application of electricity to the working of cranes, pumps, tools, etc.
49. The application of electricity to smelting and metallurgical operations.
50. The application of electricity to the purification of water and of sewage.
51. The purification of copper, and the reduction of copper ores by electrolytic processes.
52. Contributions to the bibliography of special branches of engineering.

Electrical Notes.

Incandescence electrical lights are to take the place of the arc lights which have been used in the great Stampede tunnel on the Northern Pacific Railroad—the second largest in this country. The reasons for this change are interesting. The space to be lighted is, of course, in linear distance rather than in area, and the result, as might have been expected, was the intense illumination of some parts and the deep shade of others. Frequent readjustment was necessary because of the effect of the gases and smoke from the engines, the arc light apparatus corroded quickly, and the strong draughts ate the carbons voraciously.

The incandescence lights, being inclosed in bulbs, do not feel these draughts, and the metal bearings can be protected with gutta percha. The new system comprises a 300 light machine, running at a pressure of 200 volts, the lights being of the 30 candle power variety. The dynamo is worked by water power.

There was, as usual, much interesting discussion at the recent meeting of the American Institute of Electrical Engineers, but what was said as to electromotors may safely be put down as the most important. A practical motor man described the parts least perfect, explained where experimentation is most needed, and how necessary is careful work in construction, especially at the present stage of development. Mr. Sprague, projector of an overhead system of electrical railway, frankly described its drawbacks. "The trolley," he says, "is a clear source of trouble, and difficult to manage properly." Some time ago, when a telephone wire fell across the overhead main of the Richmond electrical railway, every wire touching it was melted, and if the current had not been cut off, "the destruction of the telephone exchange, and possibly the firing of the subscribers' instruments and houses," would have resulted. Mr. Sprague also enumerated the merits of this system, and it has many.

A TARDY DANGER ALARM AT SEA.

Among recent curious inventions is that of the automatic electrical sounding lead, coming from Mexico, and being one of the contrivances made by those of the land for the use of them at sea. It is designed to be put upon the ship's hull, with wire to electrical bell aboard. When the ship is shoaling her water, the bell rings.

New Swiss Patent Law.

The new patent law in Switzerland will come into force on the 15th of November.

Patents are granted for inventions not known in Switzerland, but citizens of those countries living beyond the sea which have joined the international union, of which the United States is one, can get patents there even if the invention is known in Switzerland or patented in the home country, provided they make application within seven months from the time of filing the application in the home country. Citizens of those countries not living beyond the sea have six months.

The patent is granted for 15 years, commencing from date of application. A small tax is payable annually during the life of the patent. The patent must be worked in three years. The law is somewhat similar to the French law.

We shall be pleased to furnish any of our readers who desire to take patents there, such additional information as they may desire.