

Correspondence.

Lead Pierced by Insects.

To the Editor of the Scientific American:

Referring to the article in your issue of this date, under head "Lead Pipe Pierced by an Insect," I have in my possession a lead bullet, that I cut out of the tree under which Grant and Pemberton arranged for the surrender of Vicksburg, Miss. The bullet was lodged just under the bark in the sappy portion of the tree, and has three holes pierced through it by some kind of an insect. One of the holes contained one of these insects at the time I secured the bullet.

These facts can be substantiated by two witnesses now living.

WM. E. SELLECK.

Chicago, June 13, 1891.

The Law of Friction.

To the Editor of the Scientific American:

I notice in a recent issue of your valued journal an article headed "Phenomenal Friction," and after a careful reading I fail to see anything "phenomenal" about it. It only demonstrates the common law of friction in relation to motion, *i. e.*, if it takes a certain number of foot pounds to cause the axle to revolve against the surface of its box a certain number of inches per second, and you wish to increase that motion one inch per second, you will discover that it requires just the same expenditure of power to increase the motion in relation to its circumference one inch per second as it does to move it endways one inch in the same length of time.

If the axle were at rest, it would require much more power to move it, because there is a closer contact of surfaces.

When motion begins, the axle begins to "ride" on the oil, or whatever substance there is to prevent contact.

If I wish to insert a close-fitting plug, I do so with a twisting motion if possible, because I have a lever advantage, and I also lessen the contact, by the additional circular motion.

D. C. GREEN.

Bellevue, O., June 9, 1891.

The Cosmical Telephone.

To the Editor of the Scientific American:

As to the possibilities of the cosmical telephone referred to in the SCIENTIFIC AMERICAN of June 20, by means of which the inventor hopes to hear sounds resulting from solar causes, it may be said that it is pretty well established that sound cannot travel without a medium, either solid, liquid or gaseous. So far as is known there is no medium between the earth and the sun beyond the limits of the terrestrial shallow atmosphere capable of transmitting sound waves, and until it is shown that such medium exists, the theory of inter-solar transmission of sound will not find ready acceptance among physicists. The strange sounds heard by Mr. Edison, as he states, while experimenting with the long distance telephone, if cosmical at all, were, it would seem, much more likely to have been of seismic origin.

Furthermore, judging by present knowledge as to the rate of sound transmission, there was no connection between the sounds heard and the observed sun spots, for if Mr. Edison, as he suspects, really heard sounds from the sun, the cause that produced them must have taken place more than thirteen years before they reached the earth, unless it be proved that sound may be transmitted by radiant electricity or some other equally rapid agent. That Mr. Edison's experiments may result in important discovery is much to be hoped, but at present it seems hardly probable that he will be able to hear the roar and crash of solar tempests, as inviting as the thought may be.

E. B. WHITMORE.

Rochester, N. Y., June 22, 1891.

Jet Propulsion.

To the Editor of the Scientific American:

Thinking that an original idea had come to me, I recently made some investigations relative to the use of air to act as a sort of lubricant between the water and hull of a steamship, and thus increase the speed of a vessel, or lessen the power necessary to propel it. As usual, I found this thing had been gone over years ago, at least so far as patenting the scheme was concerned. It was a mere chance, however, that this old patent was unearthed by the examiner, for it had been indexed under the head of jet propulsion.

It is quite disappointing to have a pet scheme blasted in this way, and besides be told by the best of authority that air is the very thing they are trying to get rid of. Former experiences made disappointment bearable.

As jet propulsion is receiving some attention of late, I would like to add a word on this subject. Of course, the popular verdict of engineers is against the jet method, for patents have been granted both in England and America, and various methods tried. Yet this does not prove that the principle is wrong, or may not yet be made a success.

Although a backwoodsman and poorly qualified to judge of such things, still I would venture to suggest that in order to make the jet effective a large volume of water must be handled and thrust with a relatively low pressure and velocity against that which is to resist its motion. It requires but little calculation to show that the pressure, per square inch, on the paddles of a steamboat wheel is slight, in most cases not more than from two to four pounds. The buckets are moved at a velocity of 80 to 50 feet per second, or only a little more than double the speed of the boat. With these figures as foot-pounds, it is plainly seen that a large volume of water must be moved under like pressure and speed in order that the power may be absorbed which is used for steamship propulsion.

Again, the idea suggests itself, may not the jet water enter at the bow and discharge both at the sides and stern, thus producing a suction at the bow where it may be useful, and preventing it at the stern where hurtful?

I predict that some persistent inventor will hit on the right thing some of these days, great as may seem the innovation on present methods. To have suggested the abolishment of the methods of flour making, as practiced from time immemorial, a few years ago, would have been equally absurd.

Let the jet principle be right or wrong, we are in sympathy with it, and believe that eventually single and twin screws, that so churn up the ocean, will have to go.

QUIRK.

June 5, 1891.

American Inventions and Discoveries in Medicine, Surgery, and Practical Sanitation.*

In connection with this celebration of a century's work of the American patent system, I have been requested by the Advisory Committee to prepare a brief paper upon inventions and discoveries in medicine, surgery, and practical sanitation, with special reference to the progress that has been made in this country in these branches of science and art. It would be impossible to present on this occasion such a summary as would be of any special interest or use of the progress which has been made in medicine and sanitation during the century, either by the world at large or by American physicians and sanitarians in particular; and I shall therefore confine my remarks mainly to the progress which has been made in these branches in connection with mechanical inventions and new chemical combinations, devised by American inventors, which will require much less time.

The application of the patent system to medicine in this country has had its advantages for certain people, has given employment to a considerable amount of capital in production (and to a much larger amount in advertising), has contributed materially to the revenues of the government, and has made a great deal of work for the medical profession.

So far as I know, but one complete system of medicine has been patented in this country, and that was the steam, Cayenne pepper, and lobelia system—commonly known as Thomsonianism—to which a patent was granted in 1836. The right to practice this system, with a book describing the methods, was sold by the patentee for twenty dollars, and perhaps some of you may have some reminiscences of it connected with your boyish days. I am certain I shall never forget the effects of "Composition Powder," or of "Number Six," which was essentially a concentrated tincture of Cayenne pepper, and one dose of which was enough to make a boy willing to go to school for a month.

From a report made by the Commissioner of Patents in 1849, it appears that eighty-six patents for medicines had been granted to that date; for the specifications of most of those issued before 1836 had been lost by fire. The greater number of patents for medicines were issued between 1850 and 1860. The total number of patents granted for medicines during the last decade (1880-1890) is 540. This, however, applies only to "patent medicines," properly so called, the claims for which are, for the most part, presented by simple-minded men who know very little of the ways of the world. A patent requires a full and unreserved disclosure of the recipe, and the mode of compounding the same, for the public benefit when the term of the patent shall have expired; and the Commissioner of Patents may, if he chooses, require the applicant to furnish specimens of the composition and of its ingredients, sufficient in quantity for the purpose of experiment. The law, however, does not require the applicant to furnish patients to be experimented on, and this may be the reason why the Commissioner has never demanded samples of the ingredients. By far the greater number of the owners of panaceas and nostrums are too shrewd to thus publish their secrets, for they can attain their purpose much better under the law for registering trade marks and labels, designs for bottles and packages, and copyrights of printed matter, which are less costly, and do not reveal the arcanum. These proprietary medicines constitute the great bulk of what the public call "patent medicines."

* By Dr. John S. Billings, U. S. A. Abridged from Boston Medical and Surgical Journal by Popular Science News.

The trade in patent and secret remedies has been, and still is, an important one. We are a bitters and pill-taking people; in the fried pork and saleratus biscuit regions the demand for such medicines is unfailing, but everywhere they are found. I suppose the chief consumption of them is by women and children—with a fair allowance of clergymen, if we may judge from the printed testimonials. I sampled a good many of them myself when I was a boy. Of course these remarks do not apply to bitters. One of the latest patents is for a device to wash pills rapidly down the throat.

I am sorry to say that I have been unable to obtain definite information as to the direct benefits which inventions of this kind have conferred on the public in the way of cure of disease or preventing death. Among the questions which were not put in the schedules of the last census were the following, namely: Did you ever take any patent or proprietary medicine? If so, what and how much, and what was the result? Some very remarkable statistics would no doubt have been obtained had this inquiry been made. I can only say that I know of but four secret remedies which have been really valuable additions to the resources of practical medicine, and the composition of all these is now known. These four are all powerful and dangerous, and should only be used on the advice of a skilled physician.

I said in the beginning that I cannot, on this occasion, give any sufficient account of the progress of invention and discovery in medicine and sanitation during the century just gone. The great step forward which has been made has been the establishment of a true scientific foundation for the art upon the discoveries made in physics, chemistry and biology. One hundred years ago the practice of medicine, and measures to preserve health, so far as these were really efficacious, were in the main empirical—that is, certain effects were known to usually follow the giving of certain drugs, or the application of certain measures, but why or how these effects were produced was unknown. They sailed then by dead reckoning, in several senses of this phrase.

Since then, not only have great advances been made by a continuance of these empirical measures in treatment, but we have learned much as to the mechanism and functions of different parts of the body, and as to the nature of the cause of some of the most prevalent and fatal forms of disease; and, as a consequence, can apply means of prevention or treatment in a much more direct and definite way than was formerly the case. For example, a hundred years ago nothing was known of the difference between typhus and typhoid fevers. We have now discovered that the first is a disease propagated largely by aerial contagion and induced or aggravated by overcrowding, the preventive means being isolation, light, and fresh air; while the second is due to a minute vegetable organism, a bacillus, and is propagated mainly by contaminated water, milk, food, and clothing; and that the treatment of the two diseases should be very different.

The most important improvements in practical medicine made in the United States have been chiefly in surgery in its various branches. We have led the way in the ligation of some of the larger arteries, in the removal of abdominal tumors, in the treatment of diseases and injuries peculiar to women, in the treatment of spinal affections, and of the deformities of various kinds. Above all, we were the first to show the use of anesthetics—the most important advance in medicine made during the century. In our late war we taught Europe how to build, organize, and manage military hospitals; and we formed the best museum in existence illustrating modern military medicine and surgery.

As regards preventive public medicine and sanitation, we have not made so many valuable contributions to the world's stock of knowledge, chiefly because, until quite recently, we have not had the stimulus to persistent effort which comes from density of population and its complicated relations to sewage disposal and water supplies; nor have we had information relative to localized causes of diseases and death which is the essential foundation of public hygiene, and which can only be obtained by a proper system of vital statistics. We can, however, show enough and to spare of inventions in the way of sanitary appliances, fixtures, and systems for house drainage, sewerage, etc.; for the ingenuity of inventors has kept pace with the increasing demands for protection from the effects of the decomposition of waste matters, as increase of knowledge has made these known to us. The total number of patents granted for sanitary appliances during the last decade (1880-1890) is about 1,175.

No doubt the greatest progress in medical science during the next few years will be in the direction of prevention, and to this end mechanical and chemical invention and discovery must go hand in hand with increase in biological and medical knowledge. Neither can afford to neglect or despise the other, and both are working for the common good. If the American patent system has not given rise to any specially valuable inventions in practical medicine or in theology, it must be due to the nature of the subjects, and not to fault of the system.