

## SINGULAR METHODS OF HEARING.

By universal consent the physical faculties of man have been divided into five senses—hearing, seeing, touching, tasting, and smelling. We become instinctively familiar with the various instruments with which in a normal state we are endowed to affect the various senses; with the eye we see—it is a telescope, microscope, and other philosophical instruments united. With the tongue we taste; with the ears we hear; with the olfactory nerve we smell; and with the nervous membrane diffused over the whole body, we feel by touch. Nevertheless these various instruments are all marvelously connected with one another, so that one will, in some peculiar way, play the part of the other, or without the one the other is useless; and this arises principally from the fact that we do not in reality obtain our knowledge of outward effects by the various organs we employ to ascertain them, but by the brain. Therefore, if the brain can be effected in a proper manner in any other way than through the eye, we shall yet be able to see; or again, if we can effect the brain with sound in any other way than through the ear, we can still hear. Some persons who are quite blind with the eyes do so improve or apply the faculty of touch that they become very familiar with outward objects as much so as some whose eyes are “wide open.” If the nostrils are closed so as to destroy the sense of smelling, then we have no taste, rhubarb senna have then no more flavor than water. If when the eyes are closed we press them at the side, so as to remove the eyeball out of its natural position, we distinctly see, even in a dark room, a ring of light. Having any doubt about the taste of anything, our judgment is decided by the mere smell, and thus the brain is affected aright—but not always through the instrument or organ specially constructed for the purpose; and we are now about to show those who are deaf with the ears, that they may still participate in the sound through the teeth and throat. Hearing is properly effected by the vibration of what is called the tympanum, a nervous fiber stretched out like a drum head. It often happens that the tubes leading to the drum head are diseased. In such instances people are deaf simply from the fact that the sound cannot vibrate the drum membrane in consequence of the tubes being closed, yet the hearing instrument is quite perfect. Now there is a small passage extending from the eardrum into the throat; it is called the eustachian tube, or guttural conduit. Its principal use is to carry away the natural secretion from the lining of the ear cavity, but, under certain circumstances, this tube conveys sound to the drum. Hence among a crowd of listeners eager to catch the voice of a speaker, many will be observed to sit with “open mouth,” or as Sir Walter Scott says, “With locks thrown back and lips apart in listening mood.” There was living recently (near Bury) a young man, the lobes of whose ears were closed; but when spoken to, he opened his mouth, and was then able to hear. Many persons, being deaf from similar causes, may be made to hear by placing the edge of the crown of a hat into the mouth, and holding the hollow part towards a preacher, or singer. Indeed, eustachian trumpets for persons partially deaf ought to be constructed, one end to be held in the mouth, and the other towards the sound desired to be heard. In many cases the eustachian tube will not convey direct sounds. If it did, we should hear ourselves speak as loudly with the ears closed as open, which is not the case. It appears to be more useful to those partially deaf than to those whose hearing is perfect. We can, however, also hear by means of the teeth. Bone is very sonorous, and is an excellent conductor of sound. There is at the Polytechnic Institution a musical instrument resembling a harmonicon, composed of bones, the music of which, extending over four octaves, is very melodious. Nearly all sounds that are harsh and unharmonious set the teeth on edge, indicative of sonorous vibration. Actual experiment proves that the teeth will convey sound to the auditory nerve as the following illustration shows:—Lay a watch upon the table glass side downwards, then stand so far from it that you cannot in the ordinary way here it ticking. Now place one end of a small stick, say about six feet long, upon the back of the watch, and grip the teeth to the other; with the fingers close each ear to exclude all external noise, the beat of the watch will then be as audible as if placed against the ear. All other sounds can be conveyed in the same manner, no matter how long the stick be; for instance, if one end be placed upon a pianoforte in a sit-

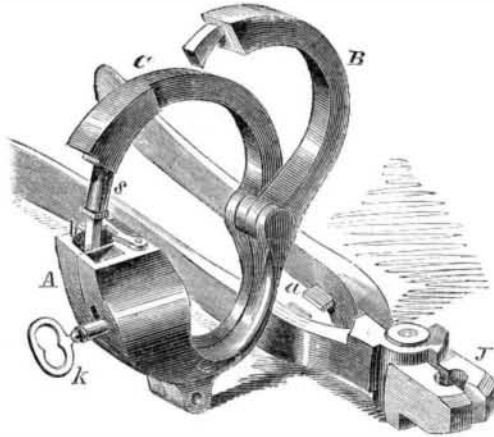
ting-room fronting a garden, and the stick be 30 feet long, extending outside of the window on a lawn, if the instrument be ever so lightly played, the “tune” will be instantly distinguished by any person applying the teeth to the opposite end of the stick. Again, if a light bar of iron or other metal be suspended by a thick string held between the teeth, and then struck with any hard substance, the sound will appear greater than by hearing with the ears.

S. PIESSE.

## LYON'S LOCK AND DETECTOR.

It is said that payment for freight stolen by employes is no inconsiderable item in the disbursements of our railroad companies, and that an effectual check to these depredations would be of great value. We illustrate a device for this purpose, which consists essentially of a lead seal attached to the lock in such a way that the lead must be severed to open the lock, and thus evidence of any fraudulent opening is preserved.

A represents a padlock provided with an ordinary shackle, B, which may be locked and unlocked by means of the key, K. The shackle, C, has a round projection at its end, somewhat similar to the square on the shackle, B, and on this projection a screw thread is cut. This is not shown in the engraving as it is hidden by the lead tube or seal, S. A curved bar, b, also having a screw thread cut at its end, slides to and fro in the lock, but is prevented from coming entirely out by a lip on its inner end and a corresponding projection made in the



lock. The lead tube or seal is used to join together this curved bar and projection and the end of the shackle, C. For this purpose the tube is cast of such size that it may slip freely upon the screws at the end of the bar, b, and of the shackle, C. Both shackles are passed through the staple, and before they are locked, the leaden tube, S, is slipped upon the screws and compressed closely into their threads by means of the tool, T; thus fastening together the curved bar, b, and the shackle, C, so that the lock cannot be removed without cutting in two parts the leaden tube, S. The tool, T, is provided with steel shears, a, for cutting the tube when it is desired to open the lock. Each depot-master is to be furnished with a swaging-tool and a supply of lead tubes or seals, one seal to be expended every time the lock is opened. If any dishonest employe picks this lock, the severed seal preserves an evidence of crime which cannot be obliterated.

The patent for this invention was granted, Sept. 13, 1859, to John H. Lyon, of this city, to whom inquiries for further information may be addressed, directed to the care of Spaulding's Express Co., 240 Broadway, New York.

WOOL.—The history of the growth of wool is very curious. Fifty years ago not a pound of fine wool was raised in the United States, in Great Britain, or in any other country except Spain. In the latter country, the flocks were owned exclusively by the nobility or by the crown. In 1794, a small flock was sent to the Elector of Saxony as a present from the King of Spain, whence the entire product of Saxony wool, now of such immense value. In 1809, during the second invasion of Spain by the French, some of the valuable crown flocks were sold to raise money. The American Consul at Lisbon, Mr. Jarvis, purchased fourteen hundred head, and sent them to this country. A portion of the pure unmixed Merino blood of these flocks is to be found in Vermont at this time. Such was the origin of the immense flocks of fine woolled sheep in the United States.

## BONE MANURE.

In a communication to the Germantown (Pa.) *Telegraph*, J. S. Keller gives the following very useful information regarding the value of bones for fertilizing purposes:—

“No subject on the farm is less generally understood than the properties of manure as regards the different soils and crops. As to what kinds of manure is best adapted for any particular soil, to produce the best result at the least expense, is an important question, which some might answer by saying that all manures will answer on all soils, and so they will; but the question is not answered. That some fertilizers will be better suited for some soils and some particular crops, must be evident to all observing farmers.

“That guanos and super-phosphates will stimulate the poorest soils to bring a crop, we need no more proof; but I doubt whether they can be applied to any advantage to the farmer on land already in tolerably good condition; and at the prices they are offered, it is questionable to warrant the purchase of any: they are one-third too high in price to put on any land. If farmers relied more on their own resources for fertilizers, they could save many dollars that they are paying, while their animals are left to lose all their droppings where they produce nothing.

“As a permanent manure, bones are, I believe, acknowledged by all practical and scientific men to be the most lasting. I have tested the value of bones to my entire satisfaction. Raw bones ground, moistened with diluted sulphuric acid, and mixed with Peruvian guano, applied on wheat and rye, have given me excellent results. Mediterranean wheat, weighing 6½ lbs. to the bushel, I can boast of last year's produce on bone-manured land. The same land now is well set in grass, better than it ever was before.

“Not every farmer can have his own bone-mill, but a number can purchase one on joint stock, attach it to a power, and grind all the bones they could procure, thus enabling them to manufacture one of the most permanent manures we know of, superior and at a less cost than they can purchase fertilizers.

“By a careful system of soiling, in connection with bone and leather manure, most of our farmers could make a sufficiency of superior manurial matters for all purposes, without paying from \$50 to \$60 per tun for guanos and phosphates.”

SORGHO DYE.—A. Winter, of Austria, has discovered a carmine-coloring matter in most parts of the Chinese sorgho, especially in the expressed stems, and has obtained a patent in Austria, Baden and other States. The process is as follows: The sorgho is pressed in the usual manner, and the empty cane piled up under cover in regular heaps, several feet high, and the fermentation which immediately sets in is so directed by more or less access of air as to prevent it from becoming putrid. After two weeks the whole mass is of a reddish brown or red color, when the fermentation is interrupted by drying. When dry, the mass is ground sufficiently fine, for the extraction of the coloring matter. It is covered in the proper vessels with cold soft water, and allowed to stand for 12 hours; but little of the pigment dissolves during that time. It is then drained and afterwards treated with a weak caustic soda or potash ley until this no longer extracts anything. This solution is carefully neutralized with sulphuric acid, thus precipitating the coloring matter in red flakes, which after settling is washed with water, collected on filters, and dried. This color dissolves in alcohol, alkaline leys, dilute acids, &c., and is employed for the dyeing of silks and woolsens with the common tin mordants. The colors produced from it are said to be unchanged by light or by washing with warm soap-suds.—*Druggist's Circular*.

OUR COMMERCE.—Goods to the value of \$14,895,000 were entered at the port of New York, as imports during the past month. Of this amount \$1,970,000 were withdrawn for re-shipment, making altogether the sum of \$12,925,000. This exceeds the amount received during the same period of time last year by \$2,659,000. Our exports during the same time amounted to the sum of \$10,523,000, of which \$4,383,000 consisted of bullion and specie, leaving a balance against us of more than \$2,000,000 in one month.