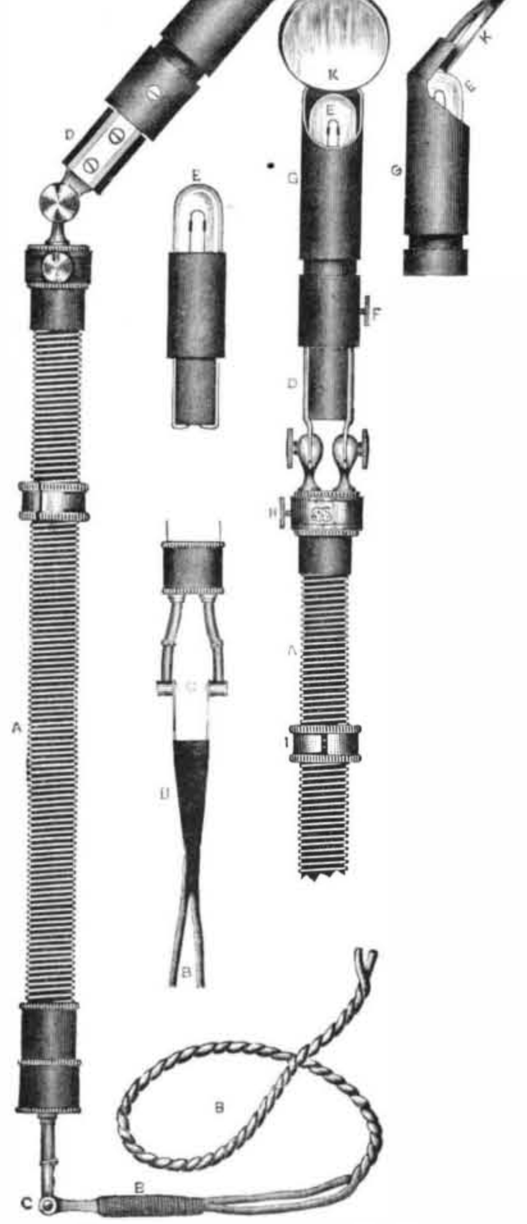
ELECTRIC MOUTH LAMP AND LARYNGOSCOPE.

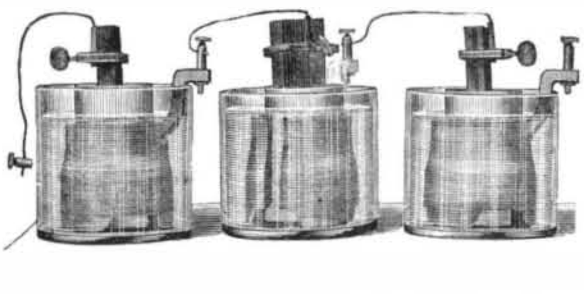
In diagnosing lesions of the teeth and associated parts the small electric lamp shown in the accompanying engraving will be found an invaluable assistant to the dentist, and by its aid the exact location of the disease may be determined. By the use of the appliances heretofore in vogue this could not be accurately ascertained, and as a consequence many sound teeth have been sacrificed in the fruitless search for the seat of neuralgic pains for which, owing to the insufficiency of the means of diagnosis, no satisfactory cause could be established. This lamp illuminates the oral cavity so brilliantly that any departure from normality can be unerringly detected; and as it is placed within the arch, behind the object to be lighted, its rays fall upon the lingual surfaces of the teeth while the eye of the operator is directed to the labial surfaces, and thus every portion of the teeth and gums is thrown into strong relief—the sound teeth appearing translucent and showing no variations in texture, while the unsound teeth have an opaque or dark appearance.

The lamp, E, is an incandescent electric light mounted permanently in a non-conducting case of hard rubber, and provided with metal conductors which pass outside of the smaller section of the case. The lamp is carried in another hard rubber cylinder, D, called the lamp holder, which is also supplied with metal conductors fitting those on the case, the two parts when adjusted being clamped together by the set screw, F, thereby holding the lamp firmly in its socket. The conductors of the lamp holder are connected to the handle, A, by hinged joints, so that almost any desired adjustment can be readily secured. This handle is called a resistance handle because it is wrapped with wire of a low conducting power, by which, through the agency of the ring, I, the flow of current is regulated. When the ring is placed at the end of the handle nearest to the battery cord, the resistance is reduced to the minimum, and the current from the battery flows freely to the lamp. Sliding the ring to the opposite end of the handle compels the current to travel through the wire with which the handle is wrapped to the ring and back again, thus forming a resistance. The connection to the battery cord, B, is made by the spring coupling, C. A non-conducting shield, G, is placed over the lamp globe for the double purpose of preventing the radiation of heat and of directing the light to any desired point. At H is a screw for breaking the circuit, which should be broken occasionally during a prolonged examination, and also, whenever the lamp is not in use, to prevent its becoming so hot as to be unbearable in the mouth. In order to admit of the examination of posterior cavities a mirror, set at an angle of forty-five degrees, is attached to the end of the guard. With this attachment the lamp forms a perfect laryngoscope.



ELECTRIC MOUTH LAMP AND LARYNGOSCOPE.

The battery to operate this lamp consists of three improved Bunsen cells having large carbons. The porous cups are filled with the bichromate solution (made in the following proportion: One-half gallon of boiling water, in which is dissolved half a pound of bichromate of potash; when cold, there are added ten fluid ounces of chemically pure sulphuric acid), and the glass jars with water to which two ounces of chemically pure sulphuric acid are added. This battery is



specially adapted for the work required of it, and produces a strong current of great constancy.

This useful device, which the surgeon and physician, as well as the dentist, will find of great value in the examination of the mouth and throat, is made by The S. S. White Dental Manufacturing Company, of Philadelphia, Pa.

Hardening Steel Mill Picks.

When it is desired to harden a piece of steel, it should be known to a certainty for what specific purpose the material is to be used; for instance, it is very reasonable to suppose that a tool that is made to do its work by blows, as a cold chisel, a knife that cuts by means of an even, constant pressure, a tool that must combine strength with cutting qualities, or one intended for soft, another for hard work, must not receive the same treatment in manufacture in order to be good tools for their respective uses.

Take for example the matter of mill picks; these are ordinarily made of cast steel hardened and tempered in an anthracite forge. Double refined cast steel is used, and should be manufactured for this express purpose. In drawing out the steel great need of caution is essential, inasmuch as, if the iron is not worked right, it seems really impossible to temper subsequently. The plan generally followed by the best makers is to draw out the pick with an anvil and hammer, both of which have very smooth faces, and the steel is heated not above a dark cherry red. When it comes to finishing, the best artisans claim the steel should be hammered only on the flat side, and the lighter and more rapid the blows the better the resulting tool, the blows, light and quick, being continued till the steel is quite dark. For tempering, a bath made of two gallons of soft water and two pounds of salt is used; this will last for tempering a dozen picks, but some care is needed not to have the bath too cold, as it tends to chill; hence the workman often dips a hot iron in his bath before he begins to temper his picks. When the pick is at a dark cherry heat, it is dipped just at the point, the rest being cooled in the ordinary way. We suggested mercury to a skilled workman as a good thing with which to temper, but the great trouble is to control this substance for this purpose; it makes the steel so hard that it is brittle, the entire edge often cracking off, so sudden is the reaction.

As to the comparative merits of American chrome and English steel for making picks, opinions vary; though American steel seems to have the most friends. When English steel is used, the tool is heated only moderately in forging—not sufficient to scale—and when the redness leaves it is not hammered; it is hardened by heating to a low red heat, dipping in warm salt water, and tempered to a brown; while with the American steel it is heated to a yellowish color for forging, to a low red for hardening, and at once quenched.

The best weight for a pick seems to be about four pounds, and to be perfect should be ground only with moderate pressure, with plenty of water, down to the edge, but not sharpened on a large stone.—*Midland and Industrial Gazette.*

Value of Hay for Stock.

Experiments have been made in England as to the comparative value of good hay for stock, with the result that it is estimated that 100 pounds of hay are equal to 275 pounds of green Indian corn, 400 pounds of green clover, 442 pounds of rye straw, 360 pounds of wheat straw, 160 pounds of oat straw, 180 pounds of barley straw, 153 pounds of pea straw, 200 pounds of buckwheat straw, 400 pounds of dried corn stalks, 175 pounds of raw potatoes, 504 pounds of turnips, 300 pounds of carrots, 54 pounds of rye, 46 pounds of wheat, 59 pounds of oats, 45 pounds of mixed peas and beans, 64 pounds of buckwheat, 57 pounds of Indian corn, 68 pounds of acorns, 105 pounds of wheat bran, 167 pounds of wheat, pea, and oat chaff, 179 pounds of mixed rye and barley, 59 pounds of linseed, and 330 pounds of mangel-wurzel.

Acorn Bread.

The Indians scattered along the foot-hills of the Sierra are a quiet, inoffensive people. They do not appear to be governed by any tribal laws, yet adhere to many of their old traditions. One or two men of superior ability and industry form a nucleus around which others less ambitious gather. Hence they fence with brush and logs a tract sufficient for their requirements of hay-making, pasturage, etc. Although they often indulge in the food of civilized nations, the acorn is still a favorite article of diet in every well-regulated wigwam. The process of converting this bitter nut into bread is curious. Under the branches of a grand old pine I found them at work. They had shucked and ground in the usual manner a large mass of the acorn meats. A number of circular vats had been hollowed out of the black soil, much in the shape of a punch-bowl. Into these was put the acorn pulp. At hand stood several large clothes-baskets filled with water, and into these they dropped hot stones, thus heating the water to the required temperature. Upon the mass of crushed bitterness they carefully ladled the hot water, making it about the color and consistency of cream. Not a speck appeared to mix. A buxom *muhala* stood by each vat, and with a small fir bough stirred the mass, skillfully removing any speck that floated upon the surface. The soil gradually absorbed the bitter waters, leaving a firm white substance, of which they made bread. I asked to taste it, at which they said something in their language, and all laughed. I asked again, and after more laughter I was handed a small particle on a fig leaf, and found it sweet and palatable. They began to remove it, and so adroitly was this done that but a small portion adhered to the soil. They spread it upon the rocks, and in a short time it was fit for use. This, I am told, they mix with water, put it into thin cakes, and bake before the fire.—*San Francisco Chronicle.*

HOISTING MACHINE.

The boiler, engine cylinders, the hoisting drum, and all the other parts of the machine are supported upon a truck resting upon wheels. The bed plate carrying the boiler and engines is formed with rear stands on which the cylinders are attached at an inclination of forty-five degrees. The stands are made with guides for the crossheads, and the rods are connected to the same wrist pin on the crank disk of the shaft, so that the engines work at right angles and carry each other over the dead center. The driving shaft carries two eccentrics for operating the valve rods of both engines through the medium of links. (The construction and arrangement of these parts are shown in Fig. 2.) By the movement of a lever the links are simultaneously shifted to reverse the engines.

On the driving shaft is a pinion, attached by a feather, so that it can be moved on the shaft by means of a lever to engage with the internally toothed rim on the end of the drum. The rim is provided with flanges, between which is a brake strap operated by a lever. The drum is in two parts, the larger portion fixed on the shaft and the smaller end portion fitted to slide on the shaft, the two parts being connected by pins in a middle head. A nut holds the sliding part up to place, so that when it is necessary to take up or let out the hoisting rope the nut is screwed back and the part moved on the shaft, and then rotated to wind or unwind the rope. The ropes pass off from opposite sides of the drums over pulleys, and to the platforms, so that in operation one platform is raised as the other is lowered. By this construction and arrangement the machine is rendered very compact, and can be conveniently operated, especially for supplying material to buildings in course of erection, and it can be easily moved from place to place.

VIERNOW'S HOISTING MACHINE.

Further particulars concerning this machine may be obtained by addressing the inventor, Mr. G. M. Viernow, Room 33, S. E. corner Olive and Fifth Streets, St. Louis, Mo.

GOVERNOR BEGOLE, of Michigan, in a late address asserted that he had found, from an accurate study of statistics, that 91 per cent of the crime and pauperism of the State came directly from the use of intoxicating drinks.

Stray Plants.

An interesting botanical lecture was lately delivered by Prof. Rothrock, in Horticultural Hall, Fairmount Park, Philadelphia, on Stray Plants. The lecturer stated that he did not intend confining himself to those larger plants which we can all see, but would embrace also a brief statement of those minuter forms which we never see by the unaided vision, and whose presence was only generally recognized by the evils which they wrought and by the enormous death rates which they induced.

Twenty years ago or more, Bentham and Hooker, the two most distinguished English botanists, began preparation of their great book, the Genera Plantarum. It was intended to bring together in the natural order of their structural affinity all the flowering genera of the existing flora on the globe. What are genera or, as used in the singular, what is a genus? All the species of pine constitute one genus, all the spruces another, all the firs a third, all the cedars a fourth, and all these are grouped in the order of cone-bearing trees. Modern science teaches that all these have descended from a few species of parent plants, and that time and physical surroundings have produced the variations we now see in the vast aggregate of plants representing the order. A study of the Genera Plantarum shows a marked *tendency* in the smaller orders to a localization in a portion of the globe. The larger orders are, as might be expected, more widely spread. The very increase in the number of their genera implies the greater diversity of physical condition which they have encountered in their descent through the ages. Genera are in the main more localized than the orders. This, too, is to be expected. Thus, for example, the genus Crassula, of 120 species, was mainly localized at the Cape of Good Hope. Just in the same way the asters and golden rods found their maximum development in our own region. Sometimes, however, plants would wander off from their birthplaces. Illustrating this, we had the hickory group, of which there are but ten known species. Nine of these grow in the United States and one in Mexico. It is strange that the Mexican species has a four-winged fruit, and stranger still that the Pecan hickory, which, on the whole, is its nearest geographical associate, should also show a marked tendency to the production of fruit of the same kind.

Just, too, as there were in the past vast migrations of men who invaded and took possession of other lands after extirpating the native population, so there had been such migrations among plants. The original forest on the island of Saint Helena had been superseded by European cone-bearing trees. Instances of the same thing on a much larger scale could be named. The strangest examples were where the same species of plant would be found here and in Japan, but nowhere else. Our blue cohosh was such an instance. Hardly less remarkable was it that of the two species of podophyllum (May apple), one grew here and the other in the far-off Himalaya region. We have no reason to doubt that they are blood relatives, but how is it that one or both have strayed from the original birthplace?

It is one of the unexpected things (which Professor Gray has so well shown) that we have more plants here of the Japanese flora than Europe has, and that even the Pacific coast of America has not so many of them as the Atlantic slope has. Europe may have received (by natural means) some few American plants; but, in the main, the line of plant migration has been from the Old World to us—from west to east.

The lecturer then introduced the invisible stray plants, which are only seen clearly by the best powers of the best microscopes, plants that are destitute of the green color which makes our larger and more familiar forms self-sustaining. They (more than the mistletoe) are parasitic. They are the habitual associates of decay, disease, and death; though as yet it would be premature to assert that they are the causes of disease, yet the facts appear to point to that conclusion. Thus we have one supposed to be the cause of diphtheria, another of splenic fever, another of pulmonary tuberculosis, and another of cholera. Take the one last named (comma-shaped), *i. e.*, that of cholera.

First. It is found in persons suffering from cholera.

Second. It is found only in the organs affected by cholera, and, therefore,

Third. It is not found in healthy persons.

Fourth. It diminishes in numbers as the patient convalesces. Hence it is proportionate in number to the gravity of the disease.

Fifth. It has marked powers of locomotion.

Sixth. It lives and multiplies rapidly in the clothing of cholera patients if this be kept damp for twenty-four hours.

Seventh. It will die if kept dry for twenty-four hours.

Eighth. It develops only in substances which have an alkaline reaction.

Ninth. It dies when brought in contact with solutions which contain only a little free acid.

These are substantially the conclusions reached by Koch, who has been the most careful investigator of the subject. Clearly they point to the following cautions in cholera seasons: Cleanliness of the person, of the clothing, and of the surroundings; isolation of cholera patients; destruction by fire of clothing and bedding used by the sufferers; absolute purification and frequent acidulation of drinking water, and the rejection of all water which can in the slightest degree be tainted with sewage from cholera infected districts. All of these conclusions are amply sustained by the experience which epidemics have but too largely furnished. One thing more the importance of this subject teaches. It is, that local, State, and national health boards should be absolutely free from political restraints or from any measure of party expediency; that they should be invested with power which is final; and that they should have the support and active co-operation of every good citizen.

These germs of disease then come fairly under head of Stray Plants. They float in the air we inhale and in the water we drink. And once started in their career of destruction, it is possible for them to incircle the globe with badges of mourning.

TREATMENT OF DEFORMITIES OF THE NOSE.

This is the season of the year when contests at foot ball, base ball, bicycle riding, fox hunting, and kindred outdoor sports are at their height, bringing in their train broken arms, dislocated shoulders, sprained ankles, and not infrequently broken noses. The surgeon's skill is called into requisition more at this time of year than at almost any other, and the cause of this results in casualties of a greater variety than occur to persons in their ordinary pursuits, and hence the doctor and surgeon is sometimes puzzled to determine the best means for treating the peculiar case before him. W. J. Walsham, Assistant Surgeon in charge of the Orthopædic Department at St. Bartholomew's Hospital, London, communicates through the *Lancet* his experience in treating deformities of the nose following injury, which is timely, and will no doubt be found useful to the surgical profession.

"During the last few years," says the distinguished writer, "I have had a considerable number of cases of deformities of

MASK FOR STRAIGHTENING THE NOSE.

the nose due to injury under my care; and as the treatment of such deformities is but lightly touched upon in works on surgery, it may be interesting to some to learn the result of my experience. . . . For convenience of treatment they may be divided into those affecting, first, the lateral cartilages and, second, the nasal bones.

"1. *The Cartilages.*—These may be variously bent or twisted to one or other side, or they may be depressed at the spot where they join the nasal bones, giving the nose in this instance a sunken appearance. In the former case the septum nasi (the central column of support) will as far as I know be always found deflected in a direction opposite to that of the bent lateral cartilage, blocking up more or less completely the correspoding nostril. In the latter case, *i. e.*, when the cartilages are depressed, the septum may not only be deflected, but also, as is unfortunately too often the case, fractured with lateral displacement of the fragments, or else dislocated from the maxillary crest. In addition to the deformity, therefore, there will exist the usual train of symptoms accompanying nasal stenosis from other causes, *i. e.*, a sensation of stuffiness in one or both nostrils, a nasal tone of voice, etc. In neither class of cases will either operative or mechanical treatment alone suffice. The septum must be straightened, and the lateral cartilages at the same time be forced into position, and there retained by mechanical apparatus till the septum has had time to consolidate.

For retaining the septum in position, in my earlier cases, I used Adams' retentive apparatus, modified so as not to injure the columnella. More recently I have had an instrument made of vulcanite, which, however, is open to the objection that the vulcanite is apt to become softened by the heat of the nose, and lose its shape and retaining powers. The advantages of the softer vulcanite may be obtained by having the blades of a steel instrument coated with this material. For solid ivory plugs I have now substituted hollow plugs of vulcanite, which can be worn with greater comfort, as they allow the patient to breathe through them. Many forms of retentive apparatus for holding the lateral cartilages in position were in use before I found one which fulfilled all the indications. At first the ordinary nose truss, which is fastened to the forehead by a band round the head, was tried. This, however, proved of little service, inasmuch as it is liable to shift, and thus give no fixed point to work from. The same objection holds to the spectacle method of fixing the truss. At length this difficulty was overcome by having a mask accurately moulded to the face, as shown in the accompanying wood cut. A plaster of Paris cast is first taken of the face, and in this the leather for the mask is moulded, apertures being left for the mouth, eyes, and nose itself. The mask when thoroughly dry is lined with soft chamois leather, and fits accurately to the irregularities of the face, so that no movement can take place. It is secured by suitably arranged straps around the head. Having thus obtained a fixed point to work from in the mask, it is easy to bring pressure to bear upon the nose in any direction required by means of suitable screws, springs, etc., attached to the mask."

A Telegraphic Contest.

A prize contest for fast telegraphic transmission took place, on August 17, in the Western Union Telegraph Company's building. The prizes were three in number—the first a gold medal, the second a silver medal, and the third a decorated telegraph key. They were given by J. H. Bunnell & Co., of New York, and the only conditions were that the Morse steel lever key should be the one used. The prizes were for "clearness of character and speed combined." The judges of the contest were J. H. Dwight, night force manager; W. B. Waycott, cable manager; and E. F. Howell, chief operator, all of Western Union. The affair was in charge of Mr. F. Catlin, chief operator.

At eleven o'clock, when the contest began, over one hundred leading operators and telegraph managers were present. On a printed slip was the work to be done. This consisted of 500 words, 15 periods, and 4 commas, in all 2,368 characters, as published in the *Operator* of August 15. The messages were sent on a local circuit. There were ten contestants, all of whom did remarkable work, and at one o'clock the contest was finished. Shortly afterward the judges announced their decision, which was as follows: First prize—W. L. Waugh, "superior" work, each letter and character perfect; time, 11 m 27 s. Second prize—W. M. Gibson, "good" work; time, 11 m. 3 s. Third prize—F. J. Kihm, "fair" work; time, 10 m. 32 s. It is notable that not one of the winners is a Western Union man, Waugh belonging to the Commercial Telegram Company Stock Exchange, Gibson to the Bankers and Merchants' Stock Exchange, and Kihm to the United Press Association.

The names of the other contestants, with their time, are as follows: J. W. Roloson, 10 m. 10 s.; L. E. Liddy, 11 m. 58 s.; M. J. Doran, 11 m. 32 s.; W. A. Hennessy, 11 m. 51 s.; E. Delaney, 11 m. 52 s.; Harry Ziegler, 12 m. 29 s.; P. J. Byrne, 13 m. 50 s.

Roloson's time of 10 m. 10 s. is the most remarkable on record, but his work was too indistinct and unreadable to obtain a prize. He is an operator of the Bankers' and Merchants' Company, and with coaching will be a most formidable opponent. The prizes are quite handsome. The gold one is a bar from which hangs a shield-shaped pendant, on which are the name and date of the contest, and in the center the design of a hand holding the lightning. The silver one is a bar to which hangs a round medal, the top of which is cut out, and in its place stands out the same design as the gold one contains.—*Electrical World.*

Great Rafts.

The Cleveland *Press* tells the following: Two of the largest rafts of pine logs ever brought to this port, and the only rafts ever brought from Lake Superior, lie just outside the breakwater. One covers about five and the other eight acres of territory. The largest raft contained about 3,000,000 feet of lumber, and the smallest a little over 2,000,000 feet. There are in both rafts about 16,000 logs, ranging from 12 to 16 feet in length. The rafts left a point on the south shore of Lake Superior, between Grand Marias and Grand Island, about 100 miles west of the Sault, a little more than two weeks ago. They were made up in two sections each, pear-shaped, and inclosed in booms. Through the rivers the sections were towed separately, and they also went through the rapids in the same shape, without loss or damage. The run is about one mile in length, and the fall in the neighborhood of 20 feet. The entire distance from start to destination is about 600 miles. The run from Detour was made in 14 days, the average speed being about $1\frac{1}{2}$ miles an hour.

A Perilous Pathway.

The travels of the native East Indian explorers, their stratagems and their disguises, their hazards and sufferings, their frequent hair-breadth escapes, are teeming with excitement. One of them describes a portion of his track at the back of Mount Everest, as carried for a third of a mile along the face of a precipice at a height of 1,500 feet above the Bhotia-kosi River, upon iron pegs let into the face of the rock, the path being formed by bars of iron and slabs of stone stretching from peg to peg, in no place more than 18 inches, and often not more than 9 inches wide. Nevertheless this path is constantly used by men carrying burdens.

One of the finest feats of mountaineering on record was performed last year by Mr. W. W. Graham, who reached an elevation of 23,500 feet in the Himalayas, about 2,900 feet above the summit of Chimborazo. Mr. Graham was accompanied by an officer of the Swiss army, an experienced mountaineer, and by a professional Swiss guide. They ascended Kabru, a mountain visible from Darjeeling, lying to the west of Kanchinjunga, whose summit still defies the strength of man.

Burnt Umber.

To produce this most important pigment the crude umber is put in iron retorts and subjected to a heat more or less intense. The result is the changing of the tone of the color to a very much deeper and more red brown. The drying property is also increased by burning. Burnt umber, with white and orange chrome yellow, will give a variety of shades of clear warm drabs. Burnt umber, with white and lemon chrome yellow and scarlet lake, will give a rich shade of tan color.