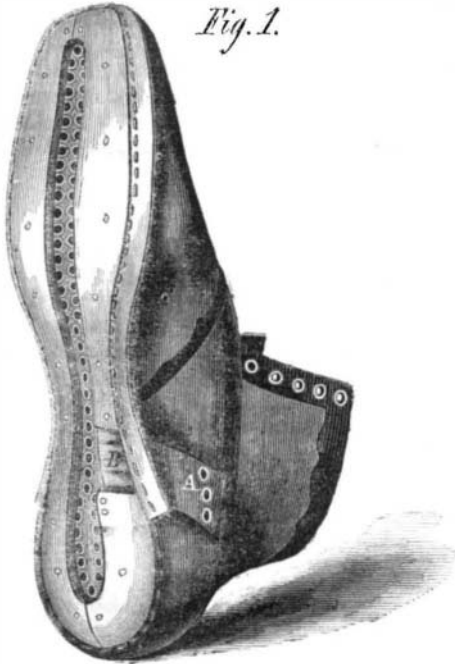
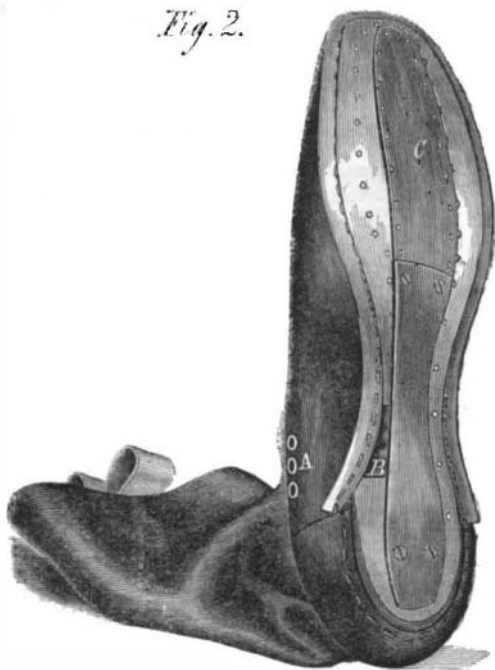


PERRY'S PATENT VENTILATING BOOT.

Half of the fatigue in walking, especially in warm weather, is occasioned by the heating of the feet, which, in the close boots and shoes we wear, are excluded from every particle of the air. There is no reason why the feet should not be allowed to share with the rest of the body the benefits of pure air. The want of ventilation of our extremities is also one provocative of disease, and renders the heated feet sometimes highly offensive. The object of the improvement herewith illustrated is to provide a proper ventilation of the feet and keep them cool in hot weather.



As will be seen, by adverting to Fig. 1, the inner sole is honeycombed with holes made by metallic eyelets to prevent them from becoming closed. The next sole is cut away longitudinally, leaving a channel which, at A, communicates with the external atmosphere by means of a curved, corrugated piece of sheet metal, B, that reaches from the eyelets, A, to the channel at the hollow of the foot. These eyelets, as may be seen in Fig. 3, are high enough to be,

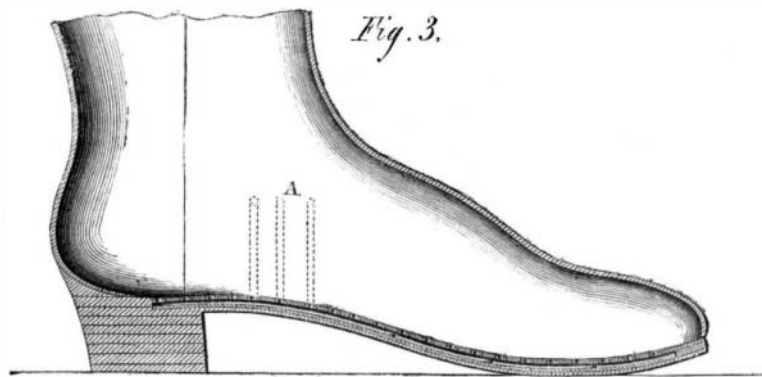


in ordinary weather, above the danger of admitting water, and being situated in the depression under the instep and on the inside of the foot, will not be exposed to the rain in a storm.

The longitudinal channel formed in the sole is covered by a strip of thin sheet steel, C, in Fig. 2, and over all is secured the firm outer sole in the usual way.

Evidently, in hot weather, and particularly on sun-

scorched pavements, this will prove a comfortable improvement in walking gear. It was patented through the Scientific American Patent Agency Aug.



21, 1866, by Samuel Perry, of New York City, whom address for additional information at 219 Sixth Ave.

The Paris Universal Exposition.

The State Department has published a third supplemental circular respecting the Paris Universal Exposition, from which it appears that Belgium, France, Italy and Switzerland have, by a monetary convention, united to regulate the weight, title, form and circulation of their gold and silver coins. This arrangement is for the purpose of remedying the inconvenience to trade between the respective countries, resulting from the diversity of their small silver coins, and to contribute to the uniformity of weights, measures and coins.

Mr. Beckwith, United States Commissioner General to the Paris Exposition, says, in a letter to the State Department: 'The metallic standards both of the gold and silver coin of the United States, are now in harmony with those of the four countries named; and the standards being in harmony and the system all decimalized, it only remains to harmonize the coin in order to produce a reciprocal circulation. For this purpose a common unit does not appear to me to be necessary. However numerous the systems, if the standards are equal, and the system decimalized, it is only necessary that the unit of each be capable of expression in the multiples or sub-multiples of the others to produce the uniformity of coinage requisite for reciprocal circulation.'

Convention of the American Social Science Association.

The second annual meeting of this Association was held in New Haven on Tuesday and Wednesday, the 9th and 10th inst. In his opening address the President stated the society to have been modeled after the National Association of Great Britain, and like that Society divides the study of the improvement of society into the four sections of Education; Public Health; Economy, Trade and Finance, and Jurisprudence or the Amendment of the Laws.

The opening paper was read by the Rev. C. F. Barnard, of Boston, on "early training as a means of preventing pauperism and crime." Mr. Clarence Cook followed with an article on the "application of design to American manufactures," advocating the education of the common workmen, so as to be able to participate in the feeling and knowledge of art in their respective fields of labor. The necessity for a more practical system, to supersede the present education of women, was presented by Mr. Hartley, of New York, followed by Mr. Jarvis, of Dorchester, and the Vice President. A long and interesting discussion was drawn forth by the labor question. Prof. Perry, of Williams College, spoke at some length, opposing the eight-hour system as tending to the antagonism of capital and labor. The co-operative system, now in operation in some parts of England, whereby the employes participate in the profits, though greatly benefiting the laboring classes of Great Britain, was not adapted to our own country.

The evening session was occupied by Judge Washburne, of Massachusetts, on the relations of common law and statute law; Dr. E. C. Wise, Secretary of the New York Prison Association, on the contract system of prison labor, and by the Hon. David A. Wells, Commissioner of Internal Revenue, on the subject of the wages of labor, affirming that

the great advance during the past two years was having a disastrous effect on the interests of the country, by sending work abroad. The discussion of

Mr. Wells's remarks occupied the remainder of the evening session.

The proceedings of the second day opened with a paper by Dr. Read, city physician of Boston, on cholera, and the means for its prevention, showing that its spread might be prevented, and its isolation secured by a strict system of quarantine, and urging the co-operation of the United States and British

Provinces, so that the entire sea coast could be guarded and made secure.

"The connection of food with, and the responsibility of housekeepers for, the life and health of a family," was presented by Dr. Jarvis, in a short but interesting paper. The Secretary, Mr. Sanborne, read a carefully prepared article on the education of deaf mutes according to the system of Dr. Blanchet, of Paris. This was a comparison between the system of articulation, and that of gesticulation. The speaker preferred the former, and proceeded to give some interesting details of the results achieved in France and Germany, and advocated the education of deaf mutes with other children, maintaining that in this way they could be brought to speak. This view was earnestly opposed by Mr. Stone, of the Hartford Asylum, Professor Day, and Dr. Gallaudet, President of the National Deaf Mute College, Washington, D. C., all of whom regarded Dr. Blanchet's system of articulation with disfavor, and eulogizing the American plan of instruction by means of signs as unsurpassed in any country.

Hon. David A. Wilder, of Boston, made a statement on the subject of tenement houses, favoring the erection of octagonal buildings, as a system of such would require a less amount of material for the same amount of room, and claiming for his plan, on the score of economy, lighting, heating and ventilating, the perfection of a tenement house.

The principal topics of discussion have been thus briefly enumerated. We regret that space will not allow us to dwell at greater length, nor to reproduce the very many valuable thoughts and suggestions presented at the Convention, some of which were of great practical importance.

In closing, resolutions were adopted, thanking the citizens of Connecticut and the Common Council and city authorities of New Haven for courtesies extended, also sending greeting to the British Association for the Promotion of Social Science, which closed its proceedings at Manchester on the same day.

Letter from A "Reb."

One of our old subscribers in Texas writes to renew his subscription and says:—I will try one dollar's worth, and if I find that the SCIENTIFIC AMERICAN has returned to the old landmarks, that is, no politics, no sectionalism, I will return to my place in the ranks of your constant subscribers.

I have not seen the SCIENTIFIC AMERICAN since my time was out, in 1861, but others have told me that you were awful on the "Rebs" during the war, for which I have no ill feeling against you now. But as a "Reb," my back is very sore from the thrashing we have had, and while it is sore I do not wish to place it under the lash of an editor. But my good opinion of you leads me to believe that, now that the excitement is over, and the war at an end, I shall get the good old SCIENTIFIC AMERICAN again. Please excuse my rough remarks, I am now in a very good humor and only lack the good old paper to throw me into ecstasies. I have not yet abandoned those two inventions you encouraged me in—the cotton picker and the calorific engine—and if fortune smiles on me you may hear from me again on their case. With many regrets for the past and hopes for the future, I subscribe myself the old friend of the SCIENTIFIC AMERICAN. M. B. R.

Persistence of the Different Colors on the Retina.

Light has been hitherto considered as divisible only into the various colored rays by single, and into polarized rays, by double refraction; a new distinction has been discovered, founded on the varied persistence of the impressions made by the different rays on the retina.

It has long been known that the impression made by light does not cease with the cause that produces it. And it has been found that luminous impressions repeated at intervals of time appear to the eye continuous. It is on account of such apparent continuity, that a stick lighted at one end and made to revolve rapidly round the other as a center, seems to describe a circle of fire. The apparent continuity of sensations which are in reality intermitting, is not confined to those connected with vision; sounds repeated at very short intervals appear to be uninterrupted. In fact, every sound, however sharp, is but a series of different vibrations.

The consideration of these facts leads to practical conclusions. If, in ornamentation and music, the sensation of a second color, or sound, may be produced before that of the first has disappeared, the co-existence of colors or sounds, which are primarily intended to act only in succession, must be kept in view; and the sound or the colors must be such as to produce in the one case musical, and in the other pictorial harmony.

M. Laborde has lately communicated to the Academy of Sciences researches on this subject in connection with colors; and the conclusions to which they lead are very curious. He has found that the retina decomposes the rays of light in a manner different from that either of the prism or the double-refracting crystal. These disperse the rays with reference to different points of space, the retina disperses them with reference to different points of time.

In the experiments which were made, the light of the sun was received on a mirror which reflected it horizontally through a chink formed in the shutter of a darkened chamber. This chink was about the tenth of an inch wide, and the fifth of an inch high. Very near it, and within the chamber, was placed a metallic disk, around the edge of which were formed openings corresponding with, and of nearly the same dimensions as that in the darkened chamber. These openings were at considerable intervals; the disk was made to revolve by clockwork; and a means by which the operator, though at a distance, could moderate, accelerate, or arrest the revolution of the disk, was provided. Across the path of the luminous ray, and at the distance of about three feet, was fixed a plate of roughened glass, behind which the experimentalist observed the modifications of the light. The disk being set in motion, the luminous ray reappeared at certain known intervals. When it was made to reappear slowly, it seemed of a uniform white color; but when it reappeared at shorter intervals the edges began to be colored; and as the velocity of rotation was increased, the image passed successively through the following tints—blue, green, rose-color, white, green, blue. After the latter blue no increase of velocity produced anything but white.

It thus appears that some of the colored rays cause a more lasting impression on the retina than others.—*The Scientific Review.*

The Channel Tunnel.

A writer in a late number of *Chambers's Journal* enumerates no less than eight different projects for uniting England and France by uninterrupted communication. The first was proposed by a Frenchman named Mathieu, at the commencement of the century. His was a tunnel for a line of diligences. A few years later the plan, which had been lost sight of in the hostilities between the two countries, was revived by MM. Franchot and De Mottray, who proposed a cast-iron tube on the bed of the sea. M. Payerne suggested an improvement in a tunnel of brick masonry and concrete. After the introduction of railways a French engineer named Favre, proposed a tunnel for steam carriages. Two Englishmen followed with a proposition for a triple tunnel. In 1857 Thome de Gamond advocated a series of shafts, lighthouses, quays, etc., in connection with a tunnel. Five years ago, J. F. Smith, an English-

man, planned a wrought-iron tube to be suspended by piers some forty feet beneath the surface, a gigantic Victoria or Britannia bridge, or tunnel, sub-aqueous. At present Mr. Hawkshaw, the eminent London engineer, is boring to ascertain the character of the strata beneath the channel, to demonstrate the feasibility of a tunnel; while Mr. Fowler, the engineer of the Metropolitan Underground Railway, of London, proposes immense ferry boats sufficient to take a whole train on board.

This last appears to be the most feasible and practicable scheme. The difficulties to be surmounted in the excavation of a tunnel, its cost, the danger of injury to the structure, and the popular opposition to travel by such a route, are obstacles which are almost insurmountable.

SCHNEIDER'S ARTIFICIAL LEG.

The casualties of the war have created a great demand for artificial limbs, which has directed invention toward their improvement. The annexed engraving gives a view of a light and apparently successful substitute for the natural leg where the amputation has been performed below the knee joint



The sheaths, A, envelop the leg and stump, and are secured by lacings or some equivalent device. Attached to their sides are supports of iron or steel, jointed at B, to give the proper movement at the knee. The lower supports are attached to the sides of a foot, C, having a swell to compare with that of the ankle joint on the natural limb. This foot is intended to be worn in a boot or shoe. The movements of the foot are governed by strips of shirred rubber, D, one attached to the instep and two others to the heel. They can be adjusted by means of buckles, as shown.

This improvement was patented by Jacob Schneider, Aug. 15, 1865. State and county rights and further particulars can be obtained by applying to Jacob Fricke, 110 East Pearl street, Cincinnati, Ohio.

J. NORTON writes to the editor of *Saunders's News Letter*, Dublin, Ireland, that he used an ogival-headed iron shot, in a trial at Woolwich Arsenal, more than thirty years ago, and the flat-headed steel shot at the same time. Specimens of these projectiles he deposited in the museum of the Royal United Service Institution. He says he cast iron shot in iron molds in 1826, thereby antedating Palliser twenty years.

THE British Admiralty have adopted zinc as a sheathing for the bottoms of the new iron ships now building.

THE Census Bureau estimates the present population of this country at 35,000,000.



American Iron and Steel.

MESSRS. EDITORS:—I notice in your issue of Oct. 6th an article on "Steel from American Iron," ascribing the deficiency in quality of American steel to the quality of iron used. Of the Cranberry ore, of North Carolina and East Tennessee, you may have heard. This ore will make an iron as tough as the best Swede, but it is very far from market. In the good, slow, old State of North Carolina there are ores from which can be made an article of iron that may be converted into a steel as good as any English, and these ores are easily accessible. I have now in my possession samples of such ores and will be pleased to give them to any one who may send their address to me. The wrought iron made from the ore in the ordinary Catalan forge, stood a test, in Washington City, of 72,000 lbs. to the cubic inch. The mine is located convenient to transportation, and one-third of the ore bed with 15,000 acres of well-timbered land, is offered for sale. My opinion is that the pig might easily be delivered in New York for \$30 per ton, including all expenses.

Further east, on the Cape Fear River, is an immense deposit of iron ore, pronounced to be the largest east of the Missouri Iron Mountain. It was worked by two companies during the war; both making pig metal. It is immediately on the Cape Fear River, with two or three locations of great water power near it; navigation to Egypt, where connection by railroad to Fayetteville is perfect and cheap. The ore is specular oxide of iron.

One of the furnaces which worked this ore is worthy of mention from its peculiar construction. It was designed and constructed by two practical Scotch iron makers, part owners. The boshes were lined with agalmatolite, silicate of alumina, and were built up their height of stone. Above was a mere pen of logs strongly dovetailed, the inner lining of the furnace brick, and between the logs brick clay was packed. This furnace cost about \$100,000 in Confederate money, including houses, opening, canal boats, water wheel, etc. Its capacity was about four tons a day. The iron was pronounced the best for car wheels ever obtained from American ore.

The other furnace was located twenty miles from the bed, was worked by steam power, but for some reason never made quite so good iron. It is still in operation. The first was burned after Lee's surrender. H. E. C.

Preservation of Wood.

MESSRS. EDITORS:—I notice in your last paper that the remarks I furnished you have called forth a lengthy communication from a correspondent, who partially agrees with me concerning the effects of charring the wood, but feels himself justified—by reference to weighty authorities—in being skeptical as to my other assertions. I will not occupy your valuable space by controverting such authorities as Ure and others, but will endeavor to show your correspondent how he can convince himself, by experiment, of the fact that living organisms (fungi or animaculæ) are the originators of all fermentation and putrefaction, and that where these germs have been destroyed, and the access of fresh germs is shut off, no putrefaction or fermentation will take place.

Take two glass bottles and fill them partially with a fluid that will easily ferment or decompose, carefully cork each bottle and insert in each a glass tube about six inches long, drawn out to a point. Bring the contents of both bottles to the boiling point, and after the steam has blown off, close the tubes by a blow-pipe quickly.

Now, having hermetically sealed up your bottles, the fluid contained will remain good for any length of time, because, first, the germs are all destroyed, by boiling, and, secondly a vacuum has been formed. If, after some time, the glass tube is broken so as to admit a quantity of air as before, so that it may be come thoroughly heated by slowly passing through the red hot tube close the opening and let this also remain for any length of time. On examina-