The Cigarette Doomed.

Observation in public places gives satisfactory evidence that the use of cigarettes is rapidly on the decline. Whether this is due to the stringent laws passed in many of the States against selling them to minors, or that smokers have come to their senses and have taken warning from their own experience and the unanimous condemnation of smoking cigarettes by the medical profession, or whether the evil practice has begun to be looked upon as a discreditable vice to be only practiced in secret, we know not; but it is certain that, as compared with the past, very few cigarettes are now smoked in public. Cigar dealers say that the sales of cigarettes have fallen off enormously. The manufacturers of these noxious things have been compelled to advertise largely to prevent the entire destruction of their business, and about the only people who can now be seen smoking the paper abominations are a few moon-faced juveniles who imagine that cigarette smoking gives them a literary aspect, or who ambitiously aim at appearing manly and graceful while poisoning the atmosphere about them, or blowing the offensive smoke through the windows of horse cars until rebuked by the conductors. Employers and business men generally have arrayed themselves in opposition to those who persist in the objectionable practice, and young ladies have learned to understand that the real reason why their young men smoke cigarettes is that they can smoke twenty of them, vile though they are, for the price of a very cheap cigar. It will be well for our youth when the habit becomes wholly extinct. Dr. William L. Dudley, Professor of Chemistry in the Vanderbilt University, gives the results of recent careful analytical experiments made by him in his laboratory with the smoke of an ordinary cigarette. The tests were thoroughly scientific and conclusive. The fact was demonstrated beyond the chance of doubt or question that carbonic oxide is the chief constituent of cigarette smoke, if not all tobacco smoke, and that its inhalation into the air passages and lungs must, of necessity, be exceedingly deleterious. Prof. Dudley refers to published assertions that the adulteration of tobacco with opium and flavoring drugs, and the alleged presence of arsenic in the paper, are the chief causes of the evil effects of cigarette smoking, but pronounces them unsatisfactory and insufficient as explanations. His chemical tests, he insists, have demonstrated positively the actual cause of the mischief, namely, the cigarette smoker's absorption of the carbonic oxide and other gases, causing deoxidation of the blood, and thereby impairing its power to build up the wasting tissues of the body. The cigarette habit has of late years become very common in this country. It is one of those many European importations which do our people more harm than good. Many of our young men, and some of them are neither young nor inexperienced, are literally burning out of themselves the best element of their manhood by sucking into their systems the poison of physical and mental degeneracy through the filthy cigarette. Cigar smoking and pipe smoking are bad enough and pernicious enough in all conscience, but cigarette smoking is absolutely suicidal.—*Amer. Analyst.*

Orbital Motion of Sun and Stars.

Concerning the theory that the sun is revolving as a planet around some star in obedience to the Newtonian law of gravity, it may be pointed out that a star at the distance of the nearest known fixed star, having a mass equal to the sun's, would, basing calculations upon certain masses and distances given in text books of astronomy, attract the sun with a force equal to about $\frac{1}{2872}$ that of the sun's attraction for Neptune. At the average distance of stars of the first magnitude, the controlling star would need to have a diameter equal to thirty-eight times that of the sun, assuming equal densities for both bodies, with a corresponding mass, to enable it to attract the sun with a force equal only to that necessary for the sun to exert to hold Neptune in its orbit. And if we go one step further and multiply this augmented mass by the number by which the sun exceeds Neptune in mass, a proceeding consistent with the theory in question, it would have a diameter approaching that of Jupiter's orbit.

If a spherical shell be conceived concentric with the supposed governing star and passing through the sun, it would probably inclose other stars, all of which together, possibly with some stars without the shell, must also be moving with the sun around the central star, otherwise there would be apparently an entangling of systems dangerous to many suns.

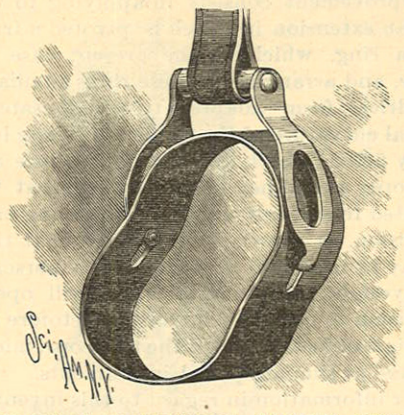
E. B. WHITMORE.

Rochester, N. Y.

We do not wonder that Mr. Whitmore finds difficulty in accepting the theory of orbits for the sun and stars, which he seems to have thought upon carefully and well, and which is advanced in elementary text books on astronomy. Late astronomy does not sustain that theory. There are no proofs that the motion of the sun or stars is orbital, when independently considered, except in the case of multiple stars, and, possibly, some clusters of stars. Every star attracts every other according to a well-known law, and hence individual stars must obey all these separate forces drawing one another with varying intensities at the same time in all possible directions. Hence the path of any star in space cannot follow the law of any known curve, neither can it be an absolute straight line. The probabilities of the case are that their motions are irregular and widely dissimilar.—*Sidereal Messenger.*

AN IMPROVED REVERSIBLE SAFETY STIRRUP.

A stirrup in which the foot of the user is not liable to catch in case of accident, and the top of the bow or ring will not bear against the ankle of the user, while the ring or bow may be reversed at will, is shown in the accompanying illustration, and has been patented by



WELCOME'S REVERSIBLE SAFETY STIRRUP.

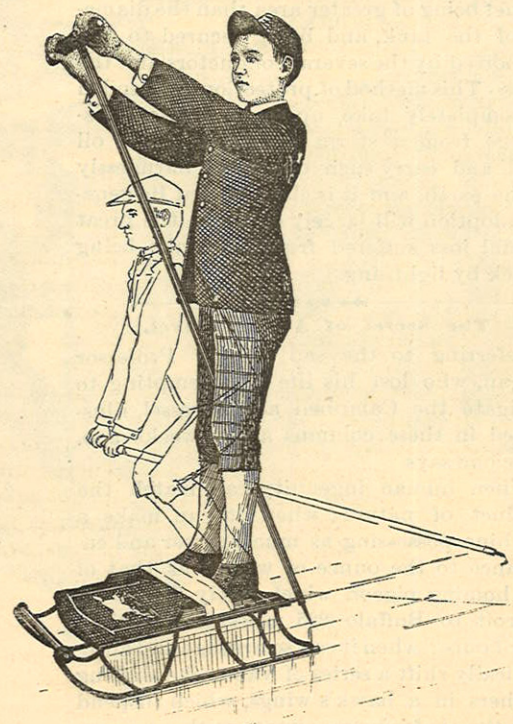
Mr. Jacob C. Welcome, of Burns, Oregon. The upper ends of the arms of the yoke are connected by a bolt, and spaced by a sleeve or washer, through the axis of which the bolt passes, and which is encircled by the stirrup leather. The arms spread outward to receive the bow or ring, which is formed with diagonal slots through which are passed inward projections of the arms, by which the ring is pivotally attached thereto, washers being arranged on the side faces of the ring. The body of the bow or ring extends forward from its tread, and should the rider be thrown, the ring would tilt upon the yoke, so that the foot would be quickly released without catching therein.

Zigang's Telephone.

The principal point in connection with Capt. Zigang's electro-magnetic telephone seems to be his discovery that "when a telephonic membrane is acted upon by an undulating current through the intermediary of an electro-magnet, the currents obtained are, up to a certain limit, more intense and more distinct, as the size of the membrane is limited and its elasticity increased." The apparatus is constructed in conformity with this theory, and is said to possess an advantage over magnetic telephones in that it is less affected by induction currents from neighboring wires.

AN IMPROVED METHOD OF PROPELLING SLEDS.

A novel method of propelling sleds, having for its object healthful exercise as well as providing a rapid method of transportation on ice, forms the subject of a patent issued to Mr. Geo. Gog, Sr., of St. Louis, Mo., and is represented in the accompanying illustration. It con-



AN IMPROVED METHOD OF PROPELLING SLEDS.

sists, first, in the application to the platform of a sled of crossed ropes, chains, or cords, or of a specially shaped stirrup piece for affording a hold and purchase to the feet of the rider; and secondly, in the combination therewith of an adjustable prod or spear, which, on being forced in the ice to the rear of the sled by the rider, propels the sled in the desired direction. See business and personal column.

Copying Drawings by the Aid of a Camera.

BY THOMAS SCOTTON.

Mechanical drawings are sometimes required to be reduced by the aid of photography with the camera. I may say the best results are to be obtained by the wet or collodion process, but very good negatives can be secured with a dry plate, if properly managed. The greatest drawback with the dry plate is the probability of the fine lines on the drawing becoming clogged or veiled over during development.

But I have seen an excellent developer mentioned in the *British Journal of Photography* a few months ago which I have tried with excellent results. It may not, perhaps, be out of place to give it here for the benefit of those who, like myself, have sometimes line subjects to copy:

Carbonate of potassium	360 grs.
Sulphite of sodium	360 "
Water	6 oz.

To each ounce of developer, two drachms of this solution, together with thirty or forty minims of the ordinary ten per cent solution of pyro (and sulphite), are added. The mode of development found to answer best is to soak the plate first of all in gallic acid solution (two grains to the ounce) for half a minute or so, and then transfer it direct to the developer, where, in about another half minute, the image begins to appear. Watch carefully, and when the details in the darkest part of the picture acquire tolerable strength, add five minims of a sixty-grain bromide solution, and proceed until sufficient density is acquired. Should matters hang fire at all, a few drops of the ordinary dilute ammonia solution may be added to freshen up the developer, but this is rarely needed if the exposure has been correct.

On the latter point a word may be said. Though the use of gallic acid does not necessarily lengthen the exposure required, it has been found better to give more than is absolutely necessary. Thus, if five seconds be sufficient to produce a perfect image under ordinary circumstances, give ten or even fifteen. The result will be quicker development and less necessity for forcing, and hence less chance of fog, stain, or filling up the lines. Six times the normal exposure has not produced any signs of the plate being overdone, indeed it seems next to impossible to produce such a result when the gallic acid is employed in the manner described.

The Milwaukee Garbage Consumer.

On invitation of Health Commissioner Martin, a large number of city officials and prominent citizens lately visited the garbage consumer in the southern part of the city, and witnessed the destruction of garbage and refuse by the Merz process, which is believed by some, says the *Sanitary News*, to be the most economical and effective method of disposing of garbage and refuse known at the present time.

About thirty-five tons of garbage—"good, clean garbage," free from ashes—is delivered at the works every day at this time of year. The wagons drive up an incline and unload upon the second floor, where it is immediately thrown into the driers. The driers are tanks about 14 feet long and 5 feet in diameter, having a double cylinder—a small one inside of a larger. Between the shells, or the cylinders, is a steam space of two inches, which has a boiler pressure of eighty-five pounds on constantly. The cylinders have cast iron heads, and a large hollow shaft running through the center of the inner cylinder. This is also filled with steam, and revolves by means of gear wheels, keeping the contents in circulation until thoroughly dried.

The moisture is drawn off by means of a large exhaust fan through a 12 inch pipe and forced into a spray condenser. When the material is thoroughly dried it is discharged from the drier into a conveyor, which deposits it into square tanks called extractors. After being sealed and made air-tight, benzine is introduced into the extractors and the grease is dissolved with a solution of hot benzine. After all the grease has been dissolved and washed out, the material is sold for fertilizer.

The benzine is distilled out of the grease over again and used. The grease is sold to soap and candle makers.

THE queer antics caused by electricity, which is coming into common use everywhere, is a daily occurrence. One of the latest happened recently at Evansville, Ind. During a heavy storm, a number of electric light and other overhead wires were blown down and crossed, and the electric fluid started out to make things lively about the streets. Sparks were hissing and sputtering in all directions; the fire department was called out, and, unaware of the exact state of things, a number of firemen, civilians, and horses were knocked over by electric shocks. Finally a messenger ran to the electric light station, which promptly shut down, when over a dozen persons were found lying about unconscious and were restored with difficulty, two of the firemen at last accounts remaining in a precarious condition. It is such little occurrences as these which make the firemen and the general public alike distrustful of the overhead wires, look they ever so innocent.