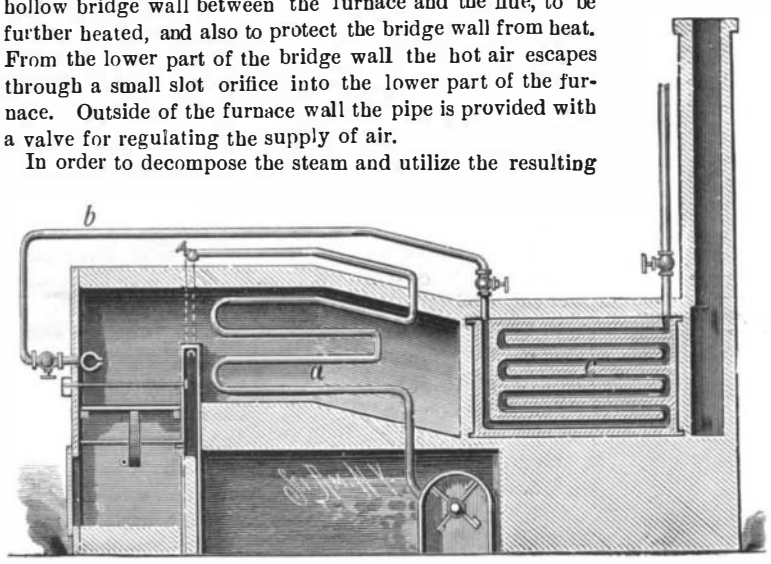
METALLURGIC FURNACE.

Our engraving shows a furnace recently patented by Mr. T. J. Wilson, of 87 Wall Street, Auburn, N. Y., which is designed for heating or reheating blanks. In the left of the cut is shown the furnace, in which coal may be burned on a grate, or a gas burner may be substituted. The hot blast apparatus consists of a fan and the coil of heating pipe, *a*, which is arranged in the flue to be heated by the heat of the furnace passing along it, and which has a discharge pipe passing outside of the wall of the flue and discharging into a hollow bridge wall between the furnace and the flue, to be further heated, and also to protect the bridge wall from heat. From the lower part of the bridge wall the hot air escapes through a small slot orifice into the lower part of the furnace. Outside of the furnace wall the pipe is provided with a valve for regulating the supply of air.

In order to decompose the steam and utilize the resulting



WILSON'S METALLURGIC FURNACE.

gases for fuel, there is arranged a superheating coil of fire clay (called by the inventor a "decomposer"), consisting of a series of horizontal communicating flues, *c*. This coil is placed next to the chimney and is in a fire clay lined metallic case, which has an exterior protecting jacket of similar material. The decomposer is arranged in the center of the flue, so that it will be acted on at both sides and ends by the heat passing along the flue.

The steam enters the decomposer by the pipe shown beside the chimney, and which is connected with the boiler and is furnished with a valve for regulating the supply. In the pipe, *b*, are two other valves, one where the superheated steam leaves the decomposer and the other near where the pipe enters the furnace chamber. By the first mentioned valve the steam may be retained in the decomposer until properly decomposed, and by the other the supply to the furnace may be governed. The steam is discharged into the furnace through numerous jet orifices of a pipe extending from side to side.

Here the oxygen of the steam, uniting with the carbon of the incandescent coal, forms carbonic oxide, leaving the hydrogen free to burn with great intensity in combination with the oxygen of the incoming hot blast. The carbonic oxide, at the same time taking up additional oxygen from the hot blast, burns with great intensity. These changes produce greater heat than the coal alone is capable of. The blanks to be heated are inserted through openings in the chamber above the fire bed. For discharging the ashes without wasting the whole of the fire bed, a temporary grate consisting of bars is shoved in through the front wall and the fire bed into recesses in the bridge wall, whereon the upper portion of the fire will be supported while the rest may be discharged through the lower grate.

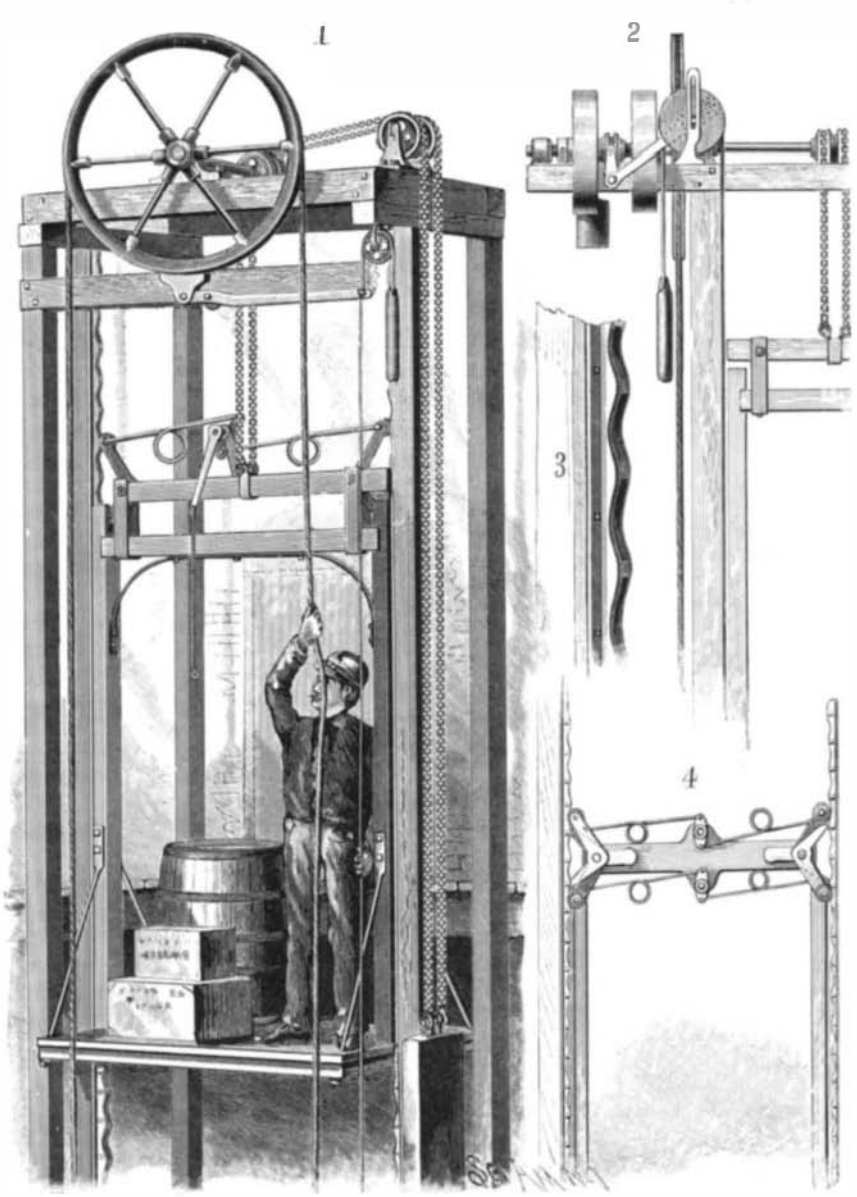
IMPROVED ELEVATOR.

Our engraving shows an elevator provided with safety appliances which are simple in construction, effective in operation, and which combine cheapness, strength, and durability. In Fig. 4 is shown a device for stopping the platform in the upward as well as the downward course, this being necessary, since some platforms are counterbalanced more than the weight of the empty platform, and are liable to damage by ascending rapidly in case they become accidentally disconnected from the motor. In Fig. 1 the device is arranged so as to only prevent the too rapid descent of the platform.

The racks for the ways in which the platform works are made with zigzag side flanges, and cross bars with which catch pawls engage when safety demands the stopping of the platform; the flanges confine the pawls laterally when thrust in the rack. The pawls are provided with arms that balance them away from the rack, and have rolls gravitating to contact with the zigzag ways, so that when the speed is not too fast the pawls will not engage the racks. But should the speed overrun the predetermined limit by the breaking of the chains, so that the thrusts of the projections of the ways would be greater on the rolls, or simply preventing the rolls from following in the bottom of the zigzags, then the pawls would come in contact with the cross bars, thereby holding the car. The roll arms of those pawls which stop the descent of the platform are merely made heavier than the pawls; but those in which the roll arms extend downward are provided with counterbalance weights. When the pawls catch on the racks the thrust tends to keep them in contact, so that in case they only catch slightly at first they will be forced into the bottom of the racks and securely engaged by the momentum of the platform. The pawls of the opposite sides are connected together by rods and balance levers, in order that both may engage the racks simultaneously. The rods are made elastic by means of coils in them, as rigidity might cause breakage in case one pawl should strike on top of a cross bar and the other in the notch between the bars.

The elevator platform (Fig. 1) is suspended from chains that pass over sprocket wheels mounted upon a cross shaft; the chains then pass over pulleys on top of the frame, and thence down to the counterbalance weight. Upon one end of the shaft is mounted a large grooved wheel, in which runs an endless rope which hangs down beside the car within easy reach of the operator. Pivoted to a cross bar near the under side of the wheel is a brake lever, the shoe of which presses against the periphery of the wheel. To the other end of the lever two ropes are attached; one of which passes over a grooved pulley and thence to a weight which acts to keep the shoe away from the wheel; the other passes down beside the platform, so that by pulling upon it the car may be stopped at any point.

Fig. 2 shows an arrangement in which power takes the place of the hand rope. A friction clutch placed between two pulleys mounted on the end of the shaft is operated by a rope passing down the well. This construction is shown plainly in the engraving. These devices have been patented by Mr. Volney W. Mason, and are now being manufactured by Volney W. Mason & Co., of Providence, R. I.

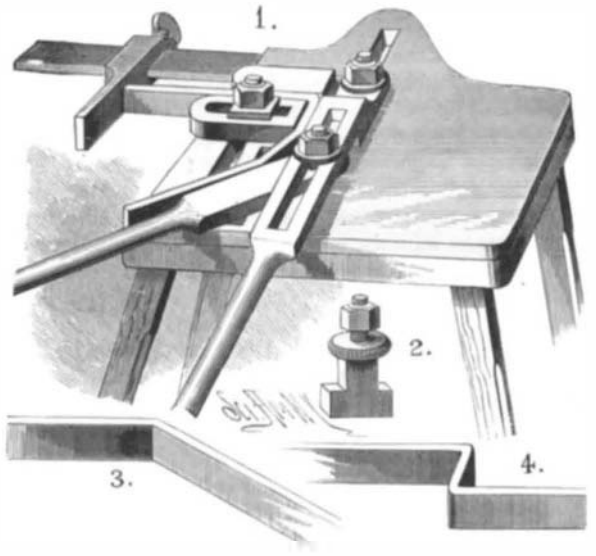


MASON'S IMPROVED ELEVATOR.

A YOUNG INVENTOR.— A California subscriber writes us of a 16-year old inventor, Master Edgar B. Badlam, who has patented an "improved steam boiler," and is perfecting other inventions which promise to be of importance. He has a model shop, costing $2,000, where he has turned out many models, his father thinking that "this is the kind of encouragement the young men of our day should have, keeping them off the streets and making self-supporting men and good citizens."

BENDING MACHINE.

An invention recently patented by Mr. W. W. Stokes, P. O. Box 160, Anna, Illinois, consists of a device for the use of blacksmiths, carriage makers, and other iron workers, for bending stirrup, clip, and other irons by hand. The bed plate is constructed with three parallel slots, and is provided with an anvil block and a gauge bar, both of which are firmly attached; the gauge bar has a shifting stop for gauging the distance of the bends from the ends of the



STOKES' BENDING MACHINE.

bars. Alongside of the anvil block is a former block, having one square end and one half-round end, secured with a bolt, nut, and washer, so as to bind it fast to the bed plate either parallel with, or obliquely to, the anvil block.

The washer is constructed with a rib as wide as the slot to prevent it from turning with the nut. Forms of different forms and sizes are employed according to the different forms and sizes of bars and the bends to be made in them. When the nut is removed, a keeper prevents the bolt from dropping out. In the outside slot is fitted a pivot bolt for the fulcrum of the main bending lever, the bolt being adjustable along the slot for locating the lever as desired relatively to the anvil, and having a sleeve on the part whereon the lever turns for the nut to jam on in securing the lever, and also for sustaining the wear. At a short distance from the pivot bolt the lever is recessed in the lower side to receive the forming block (Fig. 2), and a second lever between it and the bed plate, and it is formed with a longitudinal slot for inserting the bolts of the block and of the second lever. The forming block is to be set close to the end of the second lever when the latter is set at a distance from the recess shoulder and is used for bending a bar around the former. This former is more particularly employed when a reverse angle is to be made, as indicated in Fig. 4. When the bar is to be bent in the form of a clip (Fig. 1), or into an obtuse angle (Fig. 3), the former is not used.

When the machine is arranged as shown in Fig. 1, the first lever bends the bar around to the end of the former, and then the second lever bends it around to the side of the former for making clips.

Manganese in Animals and Plants.

Recent researches by M. Maumene have shown that the metal manganese exists in wheat, rice, and a great variety of vegetables. Wheat contains from one five-thousandth to one fifteen-thousandth of its weight of the metal, which exists chiefly as a salt of an organic acid. It is also found in potatoes, beetroot, carrots, beans, peas, asparagus, apples, grapes, and so on. The leaves of the young vine are very rich in it; so are the stones of apricots. The proportion in cacao is very great, as it is in coffee, tobacco, and especially tea. In the 50 grammes of ashes left by a kilogramme of tea, there was found 5 grains of metallic manganese. There are vegetables, however, in which no manganese can be found, as, for example, oranges, lemons, onions, etc. Many medicinal plants contain it, as, for example, cinchona, white mustard, and the lichen (*Rocella tinctoria*). Animal blood does not always contain it, but it is found in milk, bones, and even hair. M. Maumene regards its presence in the human body as an accident, and not of vital importance. He also suggests that doctors should cease to employ manganese as a succedaneum for iron, for while the latter is useful to the blood, the former is an intruder which is only tolerated in small traces, and rejected in larger quantities. Tea, coffee, and other vegetables require abundance of manganese in the soil for their proper cultivation, and the absence of it may account for the failure of many plantations.

Bleaching Tallow.

The Oil, Paint and Drug Reporter recommends the following as the best process known to it for bleaching tallow.

About 50 lb. of caustic soda lye are placed into a clean boiler and the steam is turned on. Salt is then added to the lye until it shows 25–28 deg. B. The fat—300 lb.—is now placed in the boiler, and the steam is turned on until the mass is brought to a boil, when the steam is shut off to prevent overflowing. It is allowed to boil up 1–2 inches at the most, and then left to itself for 3–5 hours, so that the fat will clarify. At the end of this time, the upper saponified layer is ladled off; the pure tallow is removed and passed through a hair sieve or linen into a clean vessel, until the lower saponified layer is reached. The residue in the boiler, consisting of sponified fat and lye, is removed and used in the preparation of curd soap, together with the upper layer.

The kettle is thoroughly cleansed, and about 30–35 pounds of water with ¾–1 pound of alum are heated to boiling. To this solution the fat is added, and the mass is allowed to boil for about 15 minutes, until all the filth has disappeared from the fat. The mass is then transferred to another vessel, and left by itself for 3–5 hours.

The pure fat is then again placed into the boiler and heated to boiling, until it shows a temperature of 170–200 deg. C In this last operation the fat becomes snow-white. The steam must be turned off as soon as the slightest trace of vapor of a disagreeable odor is thrown off. The fat may then be directly used or left to cool.

As has already been stated, the steam must be turned off or the fire removed as soon as a trace of disagreeable vapors becomes visible, whether the temperature be 150 deg. C. or 170 deg. C., for if this is not done the fat will again turn dark.

Freshly rendered, sweet fat (not acid or rancid) is most readily bleached, and may be heated quite high. Still the fat used should not be too fresh, or one will take the risk of saponifying the 300 lb. without leaving any to bleach.

Tallow which has been treated in this way, when used in toilet soaps, gives them a white color and agreeable odor. It is also well adapted for candle making, as it becomes exceedingly hard.

Banana Peel as a Lubricator.

A long yellow ice cart, heavily laden, slid the other day into a gutter in Chambers Street, near West Broadway. The rear wheel stuck firmly against the curb. The driver lashed his horses and swung them around, but to no purpose. Ingenious philanthropists offered all kinds of suggestions, patted the trembling, sweating horses, and some put their shoulders to the side of the truck, but without avail. The off rear wheel would not turn. A barefooted little colored boy had watched the proceedings with a child-like look of sympathy for the overstrained animals. He suddenly ran down Chambers Street and returned panting, carrying in his arms a lot of banana peels.

"Say, boss," he called to the driver, "I'll make yer wheel turn with these 'ere, if yer'll let me put 'em down."

"All right, sonny," said the driver.

The little darky sprang under the wheels, and carefully laid down the skins. He pressed some close to the curb, where the wheel was jammed. Then he sprang back and shouted, "Now, boss; pull away."

The crowd laughed; the driver pulled taut his lines and gave his horses a lash. The animals sprang forward, the wheel glided along the layer of banana peels, and the heavy wagon rolled out of the gutter. The onlookers cheered as it drove away.

"Oh," said the little darky, "I've seen pop move barrels and big boxes with oil, and pop tole me a little oil makes hebby dings go round. I seen hebby men fall on banana peel, and I guessed dey'd move dat wheel. My name, boss, am Abraham Lincoln George Brown."—*N. Y. Sun.*

Consumption.

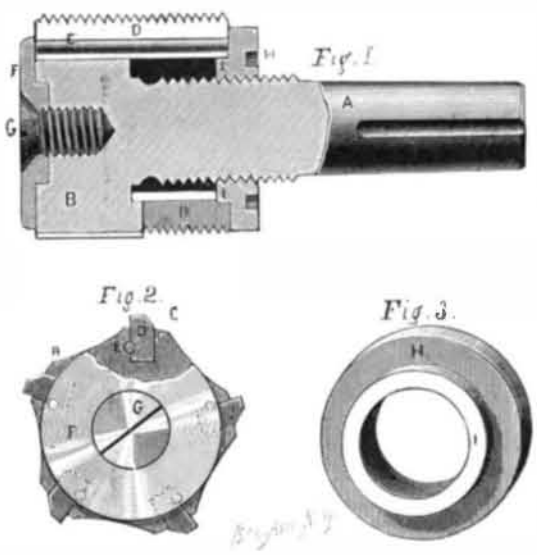
Dr. Edgar Holden, Medical Director of Mutual Benefit Life Insurance Company, Newark, N. J., says: For many years, even among the best informed, the impression has prevailed that consumption exhibits a preference as regards development, for certain ages. Thus, it has been the conviction that those who escape the marasmus and tubercular meningitis of infancy come again into danger at puberty, and that again between thirty-two and thirty-eight a climacteric is reached at which the mortality acquires its maximum of intensity, then diminishing, to declare a wholesale sweep between sixty and sixty-five.

These views have grown out of an experience apparently well founded, since the mortality in every physician's personal field of observation has seemed to be greatest at those periods, but the conclusion is nevertheless a fallacy, and it has been made broader and deeper by statistics of mortality in which the ratio of deaths from consumption to the total number of deaths has been relied upon.

Rare facilities for prosecuting an investigation to obtain a correct result have led me with considerable labor to a conclusion as startling as I trust it will be found conclusive, namely, that death from consumption, instead of being, as is almost universally supposed, most prevalent in early adult life in this country, is in reality not so, but grows relatively more frequent as life advances. This is true in the community at large, and among selected lives is actually less at the ages hitherto deemed most susceptible.

SCREW TAP.

The stock, A, is formed with a head, B, provided in its rim with a series of longitudinal grooves, C, that receive the cutters, D, the outer ends of which are held flush with the end of the head. The grooves, C, are formed with side grooves, E, and the corresponding surfaces of the cutters are similarly grooved. The cutters are prevented from being lifted out of the grooves by locking wires which are passed into the aperture formed by the two small grooves. A disk, F, held on the end of the head by a screw, partly overlaps the outer ends of the cutters and prevents them sliding out of the grooves. Mounted on the screw threaded portion of the stock is a nut, H, formed with an annular ridge, I, on which the inner ends of the cutters rest. The cutting teeth at the front ends of the cutters wear off more rapidly than the rear parts, and if they become too dull to cut, the disk



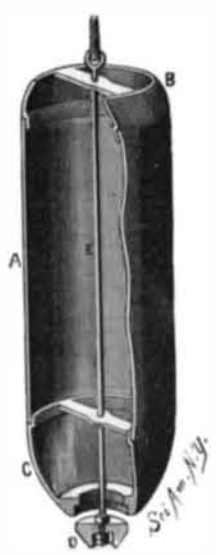
EDDY'S SCREW TAP.

is removed, and the cutters are moved forward to project from the head by turning the nut; the ends of the cutters are then ground off flush with the end of the head.

This inventiou has been patented by Mr. H. W. Eddy, whose address is corner Euclyd and Waite Avenues, Toledo, Ohio.

WELL BUCKET.

An invention recently patented by Mr. R. H. Foat, of Weatherford, Texas, is illustrated in the accompanying engraving. The top ring of the bucket has a cross bar having a central aperture, through which the valve rod passes. The lower edge of the ring is formed with an annular rabbet for receiving the upper edge of the cylindrical casing, A, that is made of sheet iron. The lower edge of this casing rests in a rabbet made at the upper edge of a cup, C, forming the bottom of the bucket. In the bottom of the cup is an aperture, in the edge of which is formed a rabbet for receiving the edge of the valve, D, held by nuts on the lower end of the valve rod. At the top of the cup is an apertured bar through which the valve rod passes.



FOAT'S WELL BUCKET.

The upper ring, B, the cup, and the valve are made of malleable iron. The rope is attached to an eye formed at the upper end of the valve rod. By this means a simple, strong, and durable bucket is constructed.

Destruction of Fish by Dynamite.

Thousands of dead fish have been floating down Niagara River of late; among them have been large sturgeon, handsome muscalonge, black bass, and cat fish. On the beach, also, from Bay View to Dunkirk, the dead bodies of fish have been washed ashore. All appeared to have died within a short time. This wanton destruction is believed to have been caused by a party of reckless young men who sailed about in a steam yacht and now and then lowered into the water dynamite cartridges, which were exploded by electricity.

Rattle Snake Bite.

Perhaps there is no place on this continent where rattle snakes do congregate in greater numbers than along the Tioga River, in Pennsylvania. The mountains through which that crooked stream finds a passage are the home of the rattle snake, and in the warm summer months they leave their dens by thousands for the narrow valley, where they bask in the sun for a few weeks, and those that do not get their heads bruised by the heel of man, or get cut in pieces by lying nights on the warm rails of the Corning and Blossburg railroad, as thousands of them are, crawl back to their dens in the rocky ledges. In midsummer it is an almost daily occurrence for some one to be bitten by these reptiles in the Tioga Valley, and domestic animals are frequently bitten. But the residents of this region do not look upon the bite of these reptiles as anything serious. When a person is bitten, a handful of mud or wet clay is applied to the wound, and fresh applications are made every ten or fifteen minutes until the poison is all drawn out. The first thing a native of that locality does after being bitten is to seek a place where hogs wallow, where soft mud or wet clay is always found. He binds on a quantity, and is soon cured. The same is applied to domestic animals when they exhibit symptoms of snake bite, and this treatment is always successful if the application is made before the poison has gone too far. It is well known that hogs are not harmed by snake bites, and this is accounted for by the porkers' habit of cooling off by lying in a mud hole.

A farmer on the line of the Corning and Blossburg railroad had a small cur dog that made it his business to kill rattle snakes. In his encounters with large ones he would be bitten several times, but as soon as the fight was over he would hasten to the farm yard and lay himself in a "hog wallow" for several hours, when he would come out entirely free from poison.

It is well to fortify the system with stimulants, then apply the clay mud, and a cure is certain. The clay must be moist, or of the consistency of dough.

WM. S. HUNTINGTON.

We are inclined to think that the snakes referred to by our correspondent were of a different breed, or age, or condition from some of those whose bite is fatal. On the 13th inst., in this city, James Reilly, a snake charmer, who was exhibiting rattle snakes, and had taken one of them out of its box, according to custom, was bitten in the right hand by the reptile. The man returned the snake to the box, and began at once to suck the poison from the wound with his mouth, then swallowed a quart of whisky and went to the hospital. Here he was treated with hypodermic injections of whisky and sedatives; other remedies were also tried, but it was of no avail. After lingering for over twenty-four hours in agony, the unfortunate man died. Reilly himself declared his belief that the bite of that particular kind of rattle snake—diamond back—was always fatal.

A few hours before Reilly died a Westchester County farmer named Purdy appeared, bringing what he claimed to be a sure cure, as it had saved the lives of at least fifty persons. He was allowed to try the remedy upon the sick man. It consisted of a decoction of herbs. The only effect was to produce a short sleep.

New Apparatus for the Relief of Deafness.

Professor Politzer describes in the *Wiener Medizinische Wochenschrift* a little instrument invented by himself to aid those whose power of hearing is impaired. The principle is to transmit the vibrations from the pinna to the membrana tympani. Politzer opposes Voltolini's opinion that the cartilage of the ear is a poor conductor of sound, and on the contrary believes that the pinna, by means of its vibrations, is of great importance in the mechanism of hearing. His apparatus consists of a small elastic drainage tube, one end of which is beveled off so as to rest evenly against the drum membrane, while the other end is curved slightly, and by its elasticity presses gently against the anti-helix. Near its outer extremity the tube is attached to a small concavo-convex rubber plate. This plate is fitted so that its concave side lies in apposition with the concavity of the concha. The idea of this attachment is to increase the conducting power of the instrument and to transmit with greater facility the vibrations of the pinna. In a large number of experiments made to test the value of this instrument, the inventor found that in most cases the hearing distance for the voice was considerably increased, in some instances from two feet without to fifteen or twenty feet with the apparatus. In many cases the hearing distance for the watch was also increased, though in no such striking degree as that for the voice. In cases in which the drum membrane was partially or entirely destroyed, it was found necessary to attach an artificial drum to the inner extremity of the tube. In deafness due to anchylosis of the ossicles or to disease of the labyrinth, little or no improvement was obtained by the employment of the tube.

Crushed Ice for Burns.

The value of crushed ice as a dressing for burns and scalds, first pointed out by Sir James Earle, is confirmed by Dr. Richardson (*Asclepiad*, 164). The ice, after being reduced by crushing or scraping to a fine state of division as dry as possible, is mixed with fresh lard into a paste, which is placed in a thin cambric bag and laid upon the burn. This is said to banish all pain until the mixture has so far melted that a fresh dressing is necessary.