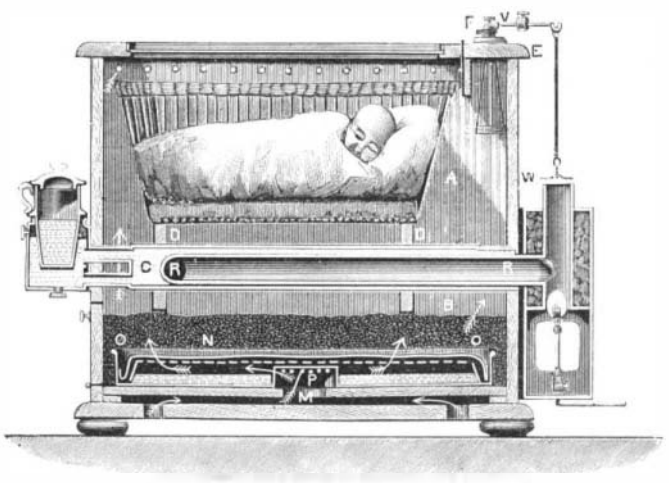
A NURSE THAT WILL NEVER BE CARELESS.

An English inventor has patented what is described as a "thermostatic nurse." Nursemaids may think this a rather high sounding name, and possibly some will feel it an imputation on their class, but the title very well expresses the character of the invention. It is an artificially warmed and thoroughly ventilated box, in which a crib or hamper with a baby in it can be kept at an even temperature, varying only about one degree from the standard decided upon, the air being slightly moistened, and a glass cover permitting all the personal watchfulness that may be desired.

The device is shown in the accompanying engraving, the case being of wood, divided horizontally into upper and lower compartments, A and B, by a shallow inclosed tank of water, C. Above the water tank, and supported on slips of wood, D D, is a cradle for the reception of the infant, which lies under a glass window, E, hinged at the back, and connected with a lever plate, F, the latter also connecting with a thermometer and an alarm bell. Through the hole, M, at the bottom fresh air is regularly admitted, passing through a cap, P, and two layers of coarse canvas, N, the latter dipping into a metal water tray, O, to keep the canvas through which the air passes always moist. To the right is a gas flame, the heat from which passes through a flue, R R, shaped like the letter U, so as to twice traverse the length of the water tank, to heat the water. For the regulation of the temperature a metallic capsule, S, containing a liquid which boils at 90°, is fixed near the head of the cradle, and connected with a light lever, V, pivoted to the lever plate, F. From the free end of this lever hangs a little damper, W, which regulates the heat to be supplied by the gas flame or lamp. If a higher or lower temperature be desired, the device can easily be adjusted therefor. This apparatus differs from the French device for a similar purpose, which was fully described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 434, in that the regulation of the temperature here is entirely automatic. The use of this "thermostatic nurse" and the so-called French "baby incubator" of Dr. Tarnier has been highly recommended by hospital managers, as conducing largely to the saving of life among infants that must be raised in public institutions. Perfect ventilation and even temperature are especially important for infants of low vitality, and by means of such apparatus it is said that in 145 cases at a Paris hospital, where the infants weighed at their birth only about four pounds, the average mortality was reduced from 66 to 38 per cent.



THE THERMOSTATIC NURSE.

POST MORTEM ATTITUDES.

Dr. Brown-Sequard has recently published an interesting paper* upon the post mortem preservation of the attitude that the subject presented at the very moment life ceased. In giving these facts the principal object of the author was to seek the cause of the phenomenon; but he arrived at the conclusion that a solution of the question cannot be reached in the present state of science.

If this delicate problem embarrasses the learned physiologist, I certainly have not the pretension to offer in this place a satisfactory solution. My only object is to point out a few facts of a special nature that Dr. Brown-Sequard did not allude to. As these are capable of throwing light upon certain points of the question, and of thus helping its solution, I have thought it worth while to make them known.

In order that this phenomenon of the preservation of the last attitude may manifest itself, a few peculiar conditions are necessary, the principal of which appears to be a violent, instantaneous, or quick death. But such a condition very often occurs without a preservation of the attitude being observed; and, on another hand, cases are likewise cited where death seems not to have been instantaneous, nor even very quick (relatively at least), such as the case of a wound in the thigh. There has also been invoked, as an active cause, the moral influence exerted upon the subject in cases where death was not instantaneous, or at least in those in which the subject has had a knowledge or quick perception of the danger that menaced him. Without any explanation of the immediate cause—the starting point of this instantaneous action of the nervous system—the thing itself has been designated as *sideration*. Now, in pointing out the causes of death that have given rise to a preservation of the attitude, Dr. Brown-Sequard has omitted to mention the cases in which this expression of *sideration* can be applied in all its fullness, properly and not figuratively, and that is in those cases in which death has been caused by lightning.

Such cases are quite numerous, and some details have been ascertained that may throw a light upon the question. I shall, in the first place, cite the most remarkable observations.

1. One of the oldest facts is related by J. B. Cardan, who published a work upon lightning at Lyons, in 1633. Eight farm hands had taken refuge under an oak, in order to protect themselves from a storm, and to eat their lunch. A peal of thunder was heard, and the eight persons, struck dead by lightning, remained in the position that they were occupying. One of them was holding a glass, and another was putting some bread into his mouth, without any modification of the facial expression having occurred.

2. The preceding fact left some doubts, and there has been a disposition to believe it an exaggeration, but another and identical one was afterward reported by a Protestant pastor, Butler, who was a witness of it. On the 27th of July, 1691, at Everdon, ten harvestmen took refuge under a hedge upon the approach of a storm. Soon afterward a thunderbolt fell and killed four of them, who remained immovable, and as if petrified, in the very attitude that they had at the time. One was holding between his fingers the pinch of snuff that he was about taking. Another was holding on his knees a dead dog which he was caressing with one hand and offering a piece of bread to with the other. A third was sitting with his eyes wide open and his head turned in the direction of the storm.

3. Abbe Richard relates that the proctor of the Seminary of Troyes was returning upon horseback, when he was struck by lightning. A brother, who was following him, not having perceived it, thought he was asleep because he saw him tottering. Upon trying to awaken him he was found to be dead.

DEATH BY LIGHTNING.

4. Another and analogous case is likewise related in the funereal annals of lightning. A priest was struck while upon horseback, without the animal being injured. The latter continued his accustomed route, and reached home with the dead horseman, who still preserved his attitude. The distance thus traversed was about two leagues.

5. On the 9th of May, 1781, at about three o'clock, the lightning struck the door of the chapel of the Commandery of St. John, near which a woman and three children had taken refuge. The woman, who was seated in front, was suffocated without changing attitude, as was also one of the children.

6. On the 14th of August, 1793, a man, surprised by a storm in the environs of Dover, took refuge with four horses in a thicket. A thunderbolt having fallen, the four horses and the man were killed, with the peculiarity that the latter remained seated.

7. On Sunday, July 11, 1819, the church of Chateauneuf (Lower Alps) was struck by lightning during divine service. A large number of persons was struck (82 wounded and 9 killed). The peculiarity to be pointed out is that all the dogs that were in the church were found dead in the attitudes that they previously had.

8. At Vic-sur-Aisne in 1838, three soldiers, in the midst of a violent storm, took shelter under a linden, when, by the same stroke of lightning, all were instantaneously killed. Moreover, all three remained standing in their original position, just as if the electric fluid had not touched them. Their clothing was intact. After the storm, some passers-by who saw them, having spoken to them without getting any answer, approached and touched them, when they all fell into a heap of ashes.

9. In the month of July, 1845, four inhabitants of Heilz-le-Maurupt, near Vitry-le-Francois, took refuge, three of them under a poplar and one of them under a willow. Soon afterward, the one who was under the willow, and leaning against it, was struck by lightning. A bright flame was issuing from his clothing, but he did not appear to see it. "You are burning! Don't you see that you are burning?" cried his companions (see engraving). Upon running to him they found he was a corpse.

10. An animal forms the subject of this observation, which was made after a winter storm, in January, near Clermont. A goat was struck by lightning and immediately killed. It was found standing upon its hind legs still holding a green branch in its mouth.

11. A young woman, the wife of a miner of Ricamarie, had gone to visit her family at Saint Romain-les-Atheux, taking with her her four months old child. It was on July 16, 1866, and she was alone in the house during a storm. When her parents returned from the field a sad spectacle awaited them, for the young woman had been killed by lightning. She was found on her knees in a corner of the room, with her face concealed in her hands. She bore no trace of a wound. The child, which was lying on the bed in the room, had been but slightly touched by the electric fluid.

12. I have related the preceding observations in chronological order, but I terminate with one, nevertheless, that should have come first. It is narrated by Quintus Curtius (lib. viii., cap. iv.). Alexander the Great was traversing Asia and spreading ruin on his way. When he reached the region now called Bokhara, his army was assailed by a frightful cyclone. This terrible tempest carried off nearly a thousand men—soldiers, sutlers, or valets. It is said that some of these were found leaning against the trunks of trees, and seeming to be still alive and talking with each other, in the same situation in which death had overtaken them.

The observations which precede seem to us to furnish some useful information in regard to some points of the question. Thus a perception of danger is not necessary to explain the influence exerted upon the subject. The case of the soldier observed at Beaumont, near Sedan, seems to be demonstrative. He was not conscious of danger, by reason of the quick and unforeseen action of the bullet. This cause most certainly cannot be invoked in case of death through lightning. It is perfectly demonstrated by numerous observations that the subjects thus struck have not and cannot have any apprehension of their imminent danger. The person who is struck by lightning not only does not hear the noise of the thunder, the propagation of which is relatively slow, but he has not even any perception, any warning, of the flash, whose rapidity is proverbial. Death is instantaneous, and the subject has not experienced the moral influence that results from a perception of danger. We have particularly related the cases that comprise animals (obs. 7 and 10). These could not have had any such apprehension. It is remarkable to see that *all* the dogs were struck, and that all preserved their attitude in the occurrence at Chateauneuf, while the number of human victims was proportionally much less. None of these latter, moreover, preserved the attitude that he had at the moment of death. In obs. 6 a man preserves his position and remains seated near four dead horses that did not maintain *their* attitude. In obs. 1 we see that *all* the individuals exposed to the action were killed, and *all* (to the number of eight) preserved their attitude. In the second case four out of ten were struck, and the six others do not appear to have been influenced by

* SCIENTIFIC AMERICAN, page 23, ante.

the electric fluid. In short, all those that were struck dead preserved the last attitude of life.

Cases of lightning stroke are unfortunately quite numerous, but the number of those in which a preservation of the attitude has been observed is relatively limited. Although there are no comparative figures upon which an exact proportion can be established with certainty, it nevertheless appears that they are more frequent after lightning stroke than after other modes of sudden death.

Let us further remark that in cases of death by lightning, with a preservation of the attitude, it has been found that no external lesion exists (obs. 11) upon the body of the victim, and no autopsy has shown what point was thus influenced without any apparent contact. Perhaps no peculiar alteration could have been found in the essential organs of life; and it is especially in such cases that we may employ the expression *sideration* in all its acceptations.

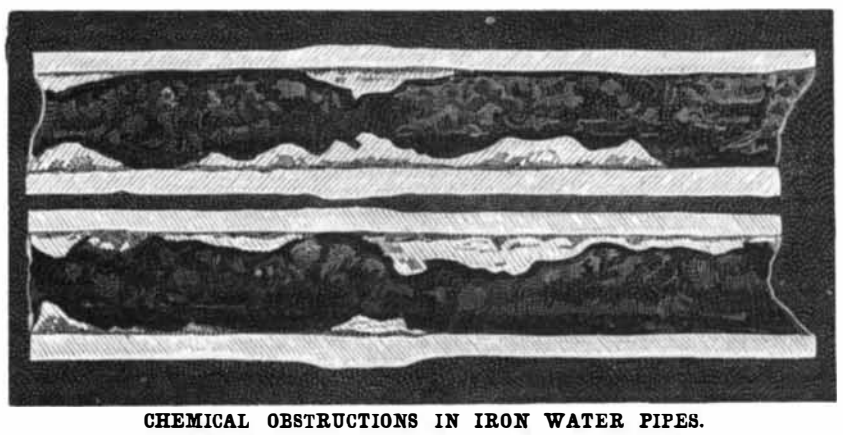
The peculiar circumstances that accompany death by lightning may acquire (as they have done) a certain importance from a medico-legal point of view. But I have not to concern myself with that here, my only object having been to point out a few interesting facts, whence we may draw some useful data for the study and solution of this question of post mortem preservation of the last attitude of life.—*Dr. J. Rouyer, in La Nature.*

Manufacture of Soda.

The Leblanc process of manufacturing soda is carried on at the works of the Newcastle Chemical Company, which have been in operation 50 years, and are so extensive as to cover more than 60 acres of ground. Some idea of the magnitude of the operations of this company is conveyed by the fact that they manufacture upward of 60,000 tons of products per annum, comprising soda ash, soda crystals, refined soda, and bleaching powder. A large number of auxiliary processes are included, such as repairing shops, fire brick works, gas works, and a very extensive cooperage, capable of turning out 1,000 casks per day. Several of Wilson's gas producers have been erected at these works, and yield satisfactory results. The following is an outline of the processes carried on: Sulphuric acid is produced from pyrites smalls (which contain about 50 per cent of sulphur) in the usual lead chambers. The sulphuric acid is used for decomposing common salt; thus producing hydrochloric acid and sulphate of soda. The latter is mixed with a proportion of limestone and small coal, and fluxed into a uniform mass in large revolving cylinders; thus producing "black ash." The liquor obtained by lixiviation of this black ash with water is a solution of carbonate of soda, which is obtained in the dry form by evaporation. This is further refined by resolution, and allowing all soluble impurities to settle out; and the refined liquor when evaporated yields ordinary washing soda. The hydrochloric acid is collected by passing the gas into towers supplied with water, similar to gas works scrubbers, and packed with brickbats. It is used for the manufacture of chloride of lime (bleaching powder).

CHEMICAL OBSTRUCTIONS IN IRON WATER PIPES.

We take the following illustration and notes from a paper read by Col. Wm. Ludlow before the Engineers' Club of Philadelphia. The illustration is of a specimen of water pipe which had been taken up for the improvement of the water supply to certain dwellings in Philadelphia. It is of two inch pipe, about twelve inches long, and had been in the ground twelve to fourteen years, connecting the main in the street with the house fixtures. Upon testing the water pressures with a gauge, it was found that the hydrant in front of the house had a pressure of seventeen pounds, which was reduced in the kitchen of the house to seven pounds, the difference clearly indicating an obstruction in the service pipe. The pipe having been taken up, a piece was sawed longitudinally, when the interior was found to be nearly filled with a deposit composed of the sesquioxide of iron and sedimentary matters, the tortuous channel through the pipe being constricted at several points to about three-eighths of an inch. Another piece of obstructed pipe, originally three inches, which had been in the ground over thirty years, had become almost entirely closed from the same cause.

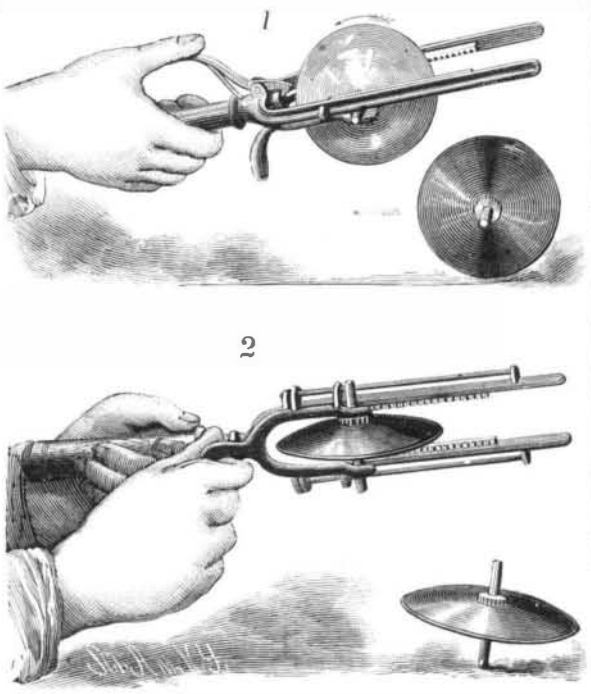


CHEMICAL OBSTRUCTIONS IN IRON WATER PIPES.

'Discoveries of this kind are constantly being made, and pipe that has been in the ground over ten or twelve years cannot be depended upon to convey its full volume. Two methods of obviating this difficulty other than galvanizing, which was not considered advisable for a supply of water for drinking purposes, were known. The one in use by the department (Philadelphia) for its large mains, namely, coating the pipe when newly made with a coal tar pitch prepared and supplied in accordance with certain specifications, apparently protected the pipe for a period of from twenty-five to thirty years. This, however, would be less advantageous in the case of small service pipes, for the reason that it decreased in a considerable proportion the available diameter. The other method was a process known as the 'Bower Barff,' which consisted in coating the pipe with a film of magnetic oxide produced by subjecting the iron to the action of superheated steam or air under certain conditions. This process promised good results."

A NOVEL TOY.

The construction and manner of using this interesting toy are very clearly shown in the accompanying engraving. In the handle of the toy, shown in the upper view, is a spring which is compressed by a rod upon whose outer end is a carrier moving in parallel guide bars whose inner sides are formed with racks, in which engages a pinion on the spindle of the top. The carrier is held in place by a spring catch. In the second view the spring is done away with, the carrier being moved by hand. When the carrier is released—the instrument being held with the trigger toward the right hand—the top will be thrown from ten to twenty feet away and will spin upon its spindle; when held with the trigger toward the left hand, the top will describe a curve in a contrary direction. When the trigger is held upward, as shown in Fig. 1, the top will run away to a distance of about twenty feet, stand still an instant, and then return; but when the position of the toy is reversed, the top will roll away from three to four hundred feet, according to the ground.



VOLKE'S NOVEL TOY.

This invention has been patented by Mr. C. A. Volke, of 53 Canal Street, Stapleton, Staten Island, N. Y., who may be addressed for further particulars.

Small Inventions.

We have had it in mind for a very long time, says the *American Inventor*, to obtain some solution to the question: What are "small inventions"? This and the kindred phrase, "mere mechanical skill," are matters that puzzle us. They constitute the great and annoying unguessed riddles of the present day. We know that the law has not intimated, so much as by expression or impression, that there is to be any scale in estimating the degree of novelty in any given device or process. It seems to be the intent of the law that any improvement, so long as it is a tangible one and expressible in words and by claim or claims, is to have favorable consideration.

But later students in this time of reason and judgment have, as we are informed, come to the sagacious conclusion that too many patents on small inventions are granted, and so the ruling of the Patent Office has been tending somewhat of late, as it appears to us, to establish a policy of exclusion based on the merely chimerical hypotheses suggested above.

We do not say that there never has arisen, or never will arise, an instance where an invention is so merely seeming and not substantial as to lack the real merit of an advance, or that sometimes a so-called invention may not be simply the result of a workman's skill. We grant that very unfrequently such an instance may arise, possibly once where the assertion of the one or the other change is made a hundred times.

But we do allege that the law supposes, takes it for granted, admits, assumes, that an improvement is an advance, and so says it shall be patented. Who so good a judge of the real worth and value of one of this kind of inventions as the man who at the work bench, in the factory, on the farm, or in some other hard, prosaic, and rough school, having solved the problem and made the improvement, pays the costs and charges of obtaining the patent, and is willing to bear all the risk of making anything out of the patent? The mere possession of his letters patent confers no power on the patentee to work havoc on an innocent public. The courts are open to all to show that the improvement is not good, and equally open to the patentee to prove his case. No small boon this last.

At the recent Cincinnati Convention one of the inventors in attendance told us a tale which disprovesscores of the fine spun decisions of the Patent Office on the grounds named above. This party a few years ago was as poor as poverty, had a large family, was blind in one eye, had no friends to help him, and was about to call his game of life a dead loss to all interested. One day, while fixing up, as best he could, the miserable apology for a rail fence that inclosed the few thin and worn mortgaged acres about his home, he hit on a plan of saving one rail in each panel. It was a revelation to him, so he jobbed out around the country, mending his neighbors' fences on this saving plan. After a while and by exertions, the narrative of which would moisten any hearer's eye, he scraped enough money together to enable him to apply for a patent. As a matter of course, in those days his case was rejected over and over by the examiner. Finally he appealed, and by good luck got the ghost of a claim. In a few months, by sales of patent rights, he had paid the large costs and interests on the money borrowed to get the patent, and cleared some three thousand dollars besides. This patent was simply a starter, for he invented many improvements in fencing, farm gates, etc., till now he has more than a dozen patents. He is said to be worth upward of $30,000 to-day, and to be held in great esteem by his neighbors as a driving, steady, honest business man.

We do not intend to convey the impression that every so-called small invention can be made a like bonanza. We do insist that under the law every improvement is patentable, and no man or men in the Patent Office have the right to say how much this improvement shall be before the patent can be granted.

Progress of the Russian Petroleum Industry.

It is claimed by an English writer that although the photometer indicates that the ordinary American oil is capable of yielding in the best lamp a greater amount of light, irrespective of the quantity of oil burned (especially when the lamp has been recently filled and trimmed) than the Russian oil affords in the same lamp, yet the latter gives what the consumer would call a good light, not only at first, but after several hours' burning, and actually furnishes more light per gallon of oil burned than is afforded in the combustion, under similar circumstances, of three out of five samples of ordinary American oil examined, and but little less light is yielded by an equal quantity of the American water-white oil tested.

The experiments made at the instance of the German Government have proved a like result, and European testimony is very clear on the question of quality. The crude naphtha does not give so large a quantity of burning oil as the American naphtha—only 25 to 30 per cent—but the low cost of the crude naphtha is so trifling, and the value of the 70 per cent of residue for the manufacture of other oils is so great, that the compensation is quite sufficient for the lesser quality of kerosene.

The conclusions arrived at are easily summed up thus: Russian kerosene (petroleum burning oil) will, without doubt, before long drive out the American oil from all parts of Eastern Germany—it has already done so from the towns near the Russian frontier. Gradually the same result will arrive throughout Austria and all the countries bordering on the Danube. Later, but also surely, American oil will be driven from central Germany, and from the countries near the Mediterranean Sea, while the lubricating oils and other products have already taken a firm stand in all the capitals of Europe—London included. One of the men who has done much to introduce naphtha products into Europe, M. Ragosine, is even sanguine enough to declare that he will sell machinery oils of Russian manufacture in America, and many of our burning oil makers are looking to London and Bremen as the future markets for large quantities of their products. They will not be contented with supplying Turkey, the East, China, Japan, etc., but want the larger and nearer markets of Europe. They couple with this the use of masouta, or liquid fuel, as something which will give Russia a large export trade and enrich the country by thus disposing of the large supplies nature has given her.

Permeability of Silver for Oxygen Gas.

BY L. TROOST.

THE author proves that pure oxygen and the oxygen of atmospheric air are capable of passing through the sides of a heated tube of silver, while a mere trace of nitogen penetrated the metal. Carbonic monoxide and dinoxide also permeate silver, though more slowly than does oxygen. The author suggests that pure oxygen may be obtained from the air on this principle. The temperature of the metal must not exceed 800°.