

air, should not be quite as noiseless, as the passage of any solid body would be through either or both of these media.

The violence of the explosion depends on the volume of electricity set free, and the amount of water decomposed; or, if a volume of electricity pass through a perfectly dry medium, there could be no decomposition of water, and consequently no detonation.

And may not the fact that we can see electricity at all depend upon the combustion of gases evolved in the decomposition of water in the atmosphere? R. S. MERSHON.

#### The Bachelder Extension.—Interesting Letter from the Commissioner of Patents.

MESSRS. EDITORS:—Referring to the communication in relation to the Bachelder extension, copied in your issue of the 16th ult., from the N. Y. Sun, I think it proper to say that, while it may not be expedient for a public officer to attempt to vindicate himself in the newspapers against criticisms upon his official action, the direct charge of this unknown correspondent, that the Commissioner of Patents "is using all his influence to get the Bachelder patent extended for ten years," requires notice.

I desire to say that this statement is absolutely untrue; that until I saw this communication I did not know that an application to extend the Bachelder patent was before Congress; or, if I had ever heard of it, I had forgotten it; that I have never spoken or written to any one concerning said extension, nor has any one, that I remember, ever spoken or written of it to me; that I have never heard or decided, and shall not hear or decide any application for the extension of any patent in which I have ever been retained or have acted as counsel; that my views upon the subject of extensions are set forth in several printed opinions, which speak for themselves; that I do not now own, and never did own any interest whatsoever in any patent or application for a patent, except that, nine years ago, I received a small interest in a patent as security for moneys advanced to a poor inventor to enable him to develop his machine, and, in that case, I lost my money, and the security proved worthless.

I think I may safely add that if, during my administration, any man should so far forget what is due to himself, this office, or the present incumbent as to attempt to influence me corruptly, he will neither be any former client of mine nor any one who comes from that portion of the country in which all the years of my professional life have been spent.

SAMUEL S. FISHER.

Washington, D. C., July 16, 1870.

#### Interesting Patent Decision.

MESSRS. EDITORS:—Inclosed we send you a newspaper notice of the recent decision promulgated by Judge Woodruff at the recent session of the United States Supreme Court, at Canandaigua, relative to our "Soft Tie" patent suit vs. J. M. Hurd Paper Bag Co.

This patent is one of those we have obtained through your house, and although well fought by the defense, seems to have been impregnable. We congratulate you.

Canajoharie, N. Y.

ARKELL & SMITHS.

#### DECISION.

James Arkell et al vs. The J. M. Hurd Paper Bag Company. For infringement of patent. Decision in favor of plaintiffs for amount of damages and injunction. J. C. McClure for plaintiffs; D. Wright for defendants.

The Judge, in his written discourse, says the plaintiffs (Arkell & Smiths) have the sole undoubted right, by any means, for the "soft tie" sack and that the patent given to Hurd was a "mere artifice" to appropriate the right of the plaintiffs.

#### Wanted—Free Trade in Boiler Iron.

MESSRS. EDITORS:—I see in your issue of 9th inst., on page 20, current volume, under the heading, "How to Make a Perfect Boiler," that we are to "use the best American iron." And then says the writer, "Thanks to protection, we can now produce an article equal to the best in the world." If protection don't make the boiler any better, please give us a little "free trade in ours out West, and we will get the best in the world," a great deal cheaper than we now get the "equal."

Champaign, Ill.

THOS. B. GREGORY.

#### The Hartford Steam Boiler Inspection and Insurance Company.

The Hartford Steam Boiler Inspection and Insurance Company makes the following report of its inspections for the month of May, 1870:

During the month, 495 visits of inspection have been made, and 861 boilers examined, 792 externally and 251 internally, and 135 were tested by hydraulic pressure. The number of defects in all discovered, 427; of which 59 were regarded as dangerous. These defects in detail are as follows:

Furnaces out of shape, 27—3 dangerous; fractures in all, 77—11 dangerous; burned plates, 42—6 dangerous. These defects not unfrequently arise from mismanagement in blowing down (or out) boilers.

Our attention has been called to several cases where boilers were leaking badly in the joints about the furnace, and around the ends of the tubes. On inquiry it was found that the boilers were blown down with steam up, fires burning, and the furnace and bridge wall nearly red hot. It will be seen at once that such practice cannot but injure a boiler; for, as the water is blown out, the sheets become very hot, and any sediment that remains in the boiler will become hard and fixed on the sheets. Many boilers are ruined in that way. First, draw the fires, and then open furnace doors and allow a current of air to pass through the flues or tubes of the boiler. Blow off with little or no pressure of steam. Parties who are troubled with leaky boilers, and loose tubes, will doubtless

find, on examination, that the boilers are blown down with steam up, and fires on the grates.

Blistered plates, 39—2 dangerous; cases of incrustation and scale, 78—4 dangerous; cases of external corrosion, 28—5 dangerous; internal corrosion, 6—2 dangerous; water gages out of order, 25—4 dangerous; blow-out apparatus out of order, 9—2 dangerous; safety valves overloaded, 45—6 dangerous; pressure gages out of order, 80—6 dangerous; boilers without gages, 1; broken braces and insufficient staying, 9—3 dangerous; boilers condemned, 3. We are not a little surprised at the gross carelessness found in the management of safety valves. They are often put in most inaccessible places, as though they were of little or no account; they become corroded in their seats, and of no practical value whatever.

We recently found one on a steam pipe directly underneath a second-story floor. The floor had settled, and was resting upon the lever in such a manner that no pressure of steam which the boiler was capable of sustaining, could have raised the valve. This is only one of many similar instances which have come under our notice. Engineers should, for their own credit, and the safety of those who are employed in manufacturing, examine frequently and carefully all the attachments to their boilers, and especially the safety valve.

[For the Scientific American.]

#### EXPERIMENTS WITH HYDRATE OF CHLORAL.

BY DR. F. A. HOWIG.

June 17th, 1870.—Weather clear and warm; temperature of the room, 74° Fah. At precisely 4 o'clock P.M., three hours after a hearty dinner, I dissolved 10 grains of the salt in one ounce of sweetened coffee and drank it. In 6 minutes after I lay down; in twenty minutes experienced a sensation of drowsiness; remained passive and quiet, conversing a moment occasionally, the desire to sleep continuing to become more marked; experienced no unusual feelings except languor, nor became at any time unconscious, but was aware of sounds in the street near and about the house. At 5 o'clock arose and sat up in a chair for a few moments but still feeling drowsy; lay down again for another half hour, when I again arose and went about my usual business.

June 18th.—Weather clear and warm; temperature of the room, 80° Fah. At half-past 4 P.M., three and a half hours after a moderate dinner, I dissolved 16 grains of the salt in about two ounces of sugar and water, and drank it. In ten minutes after I lay down; experienced some drowsiness immediately, and at 5 o'clock was in a sweet sleep and unconscious, remaining so (says the attendant) about 15 minutes—could easily be aroused at any time—the breathing and rest seeming natural. I observed no unusual symptoms except a slight fullness of the veins and arteries in the temporal region; arose at 20 minutes to 6 as if from ordinary sleep, with skin moist and pulse perfectly natural. I had anticipated some nausea, but experienced none.

June 19th.—Weather clear and warm; temperature of the room, 80° Fah. Lunched at 2 P.M.; at 5 o'clock dissolved 20 grains of the salt in 2 ounces of brandy and water sweetened, and drank it; sat up in a chair during the following 20 minutes. The pulse continued gradually to rise from 70 to 94, and the skin was perceptibly moist. No other unusual symptoms whatever. At the end of 20 minutes a perceptible drowsiness coming on I lay down, and in perhaps 40 seconds was asleep. Slept sweetly but not very soundly for fifteen minutes; arose as the clock struck 6, feeling partially refreshed, and pulse nearly natural.

June 21st.—Weather clear; temperature of the room, 71° Fah. At half-past 1 o'clock P.M., five and a half hours after a light breakfast of toast and coffee, I dissolved 26 grains of the salt in about three ounces of brandy and water sweetened, and drank it. In six minutes began to feel its effects by a marked lightness and wildness of the brain. Continued to walk about for twelve minutes until such was the intense desire to sleep that I lay down. I now examined the pulse, and found it rising, and as near as I had power to recollect it was 84. I almost immediately became semi-unconscious, and remember of experiencing an inordinate desire to laugh aloud—the attendant says *did* laugh aloud at intervals—and that much restlessness was exhibited. No disagreeable feelings of any kind were present. The senses were somewhat confused, though consciousness seemed lost as in natural sleep. I had given orders to test the sensibility of the muscles, but other evidence of sensation rendered it unnecessary. I was spoken to three or four times, and rational answers were always obtained, though of this I have only an indistinct recollection; arose of my own accord at 10 minutes past 3 o'clock feeling partially refreshed. I now examined the pupil of the eye, and found it much dilated. No nausea occurred, and as late as 5 o'clock felt no desire to eat although having fasted so long.

July 8th.—Weather cool; temperature of the room, 70° Fah. At half-past 2 o'clock P.M., one and a half hours after a moderate dinner of vegetables and fruit, I dissolved 20 grains of the salt in 1½ ounces of peppermint water (sweetened) and drank it. The pulse now rapidly rose from 73 to 95. I continued walking about the room for fifteen minutes, experiencing no unpleasant sensations whatever, and only a slight drowsiness. At 15 minutes to 3 o'clock I again dissolved 15 grains more of the salt in about the same quantity of mint water (making 35 grains in all), and drank it. I still continued walking about—approached the mirror and found the pupils of each eye strongly contracted, although the room was partially darkened. Feeling an almost overpowering sense of drowsiness coming on, I was now obliged to note the symptoms rapidly while consciousness remained.

I again examined the pulse, and found it 100. It quickly reached 112, and remained from 111 to 112 for six or eight minutes. At 8 minutes to 3 o'clock the pulse was 111, and at this time I had not power to stand erect, but reeled like a drunken man, and therefore lay down at once, and in a few moments was unconscious unless aroused. From that time until 6 o'clock P.M. I have only a faint recollection of what occurred; remember of changing my position from one room to another, and of the attendant pricking my ears, which seemed more annoying than painful. Although consciousness and memory were lost for the time, yet sensation was always present in a great degree, as the attendant says, pricking the hands, feet, or ears invariably aroused me, and that evidences of pain were exhibited. I was called to tea at 7 o'clock; felt very little desire for food, but experienced no unpleasant sensations whatever. The drowsiness had not entirely passed off when I retired for the night at 10 o'clock P.M. I may remark that on being called at 7 o'clock the pupils of the eye were very much dilated, and continued so for some time.

#### Banishing Nitro-Glycerin.

The peculiar danger of using nitro-glycerin, as of gut-cotton and all other nitrate compounds, except gunpowder, are unavoidable, because the sources from which they arise are totally unknown. The characteristics of gunpowder are understood. It is a compound stable and trustworthy enough; never exploding, except under conditions which everybody knows. But nitro-glycerin—to speak in the present connection solely of that article—has tricks wholly beyond the comprehension of the ablest chemists. Though under some circumstances it is less liable to decomposition than gunpowder, under others, which cannot be foreseen and provided against, "it goes off of itself." In a word, it is an "unstable compound," in the language of chemistry, resembling in that respect the powders made from chlorate or picrate of potash, chlorate of nitrogen, and other products in which the nitrogen is not held in a grasp sufficiently firm by the other agents with which it is united. Some of the dreadfully disastrous nitro-glycerin explosions that have occurred may be directly traceable to the carelessness of employes, but the most of them undoubtedly have resulted from causes inherent in the composition of the substance. It is a great misfortune that this should be the case, for if nitro-glycerin could be depended upon with the sense of security as gunpowder, it would entirely supersede the latter in heavy blasting business on land and under water, being far the superior of gunpowder in cheapness and efficiency. Since these mysterious perils accompany the use of nitro-glycerin, we have no hesitation in suggesting that its manufacture and employment should be forbidden by legislation. It chills the blood to read, as we so frequently have to, of men blown to atoms, rows of houses shattered to the ground, and devastation spread far and wide by the explosion of factories by a can of this terrible agent of death. The loss to the world by its banishment will be slight, after all, compared to the dangers resulting from its use, for in gunpowder we shall still possess an agent powerful enough to remove mountains, and do all the gigantic work required by the engineering genius of the age.—N. Y. Journal of Commerce.

#### How to Make Tin Fruit Cans.

In reply to an article on fruit cans, published on page 400, last volume of the SCIENTIFIC AMERICAN, Mr. F. M. Mills, a correspondent who has much experience, writes us as follows:

"I take the best No. 14 tin plate and solder with block tin. I have used some of the cans four years, and they are not rusty inside or out, and they are just as good as when first used. About the fruits being poisoned by the cans, I don't pretend to know, but if they are I would just as soon eat it as that canned in glass with zinc tops. I have used six glass jars, but don't want any more. The fruit canned in good tin cans keeps its flavor one quarter better than in glass. I never lost any fruit canned in tin cans; I have never seen any mold in them as I have in glass cans. I have canned peaches, cherries, tomatoes, blackberries, raspberries, etc., and they keep all right. I don't believe there is any danger if the cans are made of good tin and soldered with tin."

#### A NEW DODGE IN HAIR DYES.

When iodide of potassium is added to a solution of salts of lead under ordinary circumstances a beautiful yellow precipitate of iodide of lead is immediately formed.

A correspondent of the *Journal of Pharmacy* having received a notice, from a party in New York who manufactures hair-dye, containing a caution to those who buy "hair restorers" "to have their druggists first test them for lead and mercury by means of the iodide of potassium, suspected the secretion of a cat beneath the meal, made an examination of the article, and communicated the result to the editor of the journal alluded to. It was found that although the preparation contained lead, the test recommended by its manufacturer would not give any indication of the presence of the poison, the reaction being in some way adroitly masked. A test with sulphuric acid, however, at once revealed its presence by the formation of a heavy, white, insoluble precipitate of sulphate of lead.

TO REMOVE SILVER STAINS.—One of the best ways is to wash the spots with a concentrated solution of sulphate or chloride of zinc and to rub the worst places with metallic zinc. Then rinse in pure water and complete the washing with soap. Ink stains can be removed in the same way.