IMPROVEMENT IN TEA KETTLES.

The engraving shows a tea kettle embodying novel features which render it very convenient, and obviate the necessity of lifting the kettle whenever it is desired to pour water from it. The kettle has a faucet spout which is closed entirely when in a vertical position, is entirely open when in a horizontal position, as shown in the engraving; and when placed in an inclined position, it is open like the spout of an ordinary tea kettle, but the elevation of the spout prevents the water from flowing out.

Clips are provided for holding the spout in the vertical or inclined position. Fig. 2 of the engraving is a vertical section of the spout, showing the faucet connection closed; Fig. 3 shows the body of the faucet, and Fig. 4 shows the spout with the faucet plug attached.

SCHOENING'S IMPROVED TEA KETTLE.

In addition to these improvements in the spout, the tea kettle has side covers at the top, each provided with a knob of non-conducting material. This arrangement of covers prevents the steam from escaping in such a way as to burn the hand when grasping the bail. The bail when in a horizontal position rests on one or the other of the cover knobs, and is thus prevented from becoming heated. The spout is provided with a knob of non conducting material, by means of which it is raised or lowered.

This improvement is the invention of Mr Charles J. Schoening, of 557 W. Chicago Street, Chicago, Ill.

Effects of the Electric Light on the Air in Theaters as Compared with Gas.

Prof. M. Von Pettenkofer has been making some experiments with regard to the temperature and quality of the air in buildings lighted with electricity and gas respectively. The investigations were made in the Royal Residence Theater in Munich. The increase of temperature was ten times as great in the upper gallery when gas was used to light an empty house as when it was illuminated by electricity. In the former case the temperature rose 16½° Fahr.; in the latter only 1 6°. In the lower part of the house there was naturally less difference. With a full house the difference was 10·8° Fahr. (6° C.); the temperature of the gallery being 84° Fahr. with gas and 73° Fahr. with electricity The temperature was not as high in the third balcony with the electric light as in the first with gas lights

The amount of carbonic acid was also determined. With an empty house, where all the carbonic acid came from the lamps, there was the same difference as in temperature. At the beginning there were 4 parts in 10,000 of air in the auditorium. With gas light this had increased in half an hour to 5 parts in parquette, 11 in first balcony, and 20 in the third. With electricity it was 4 at the start, and in half an hour 5 in parquette, 5 in first balcony, and 6 in third balcony. If, as Edison claims, electricity produces no carbonic acid, this slight increase must have come from the lookers-on and laborers on the stage.

In a full house we might have expected the same difference, but this was not the case. With five or six hundred people in the theater the maximum amount of carbonic acid was 23 parts in 10,000 with gas light, and 18 in 10,000 with electric light.

There are many causes for this apparent contradiction. The changes of scenes and scenery cause uncontrollable changes of air on the stage and in the theater; it also depends on the frequent opening of the box doors, etc. The large amount of carbonic acid present in an occupied theater, even with electric lighting, must be attributed to insufficient ventilation.—*Correspondence of Chem. Zeitung.*

THE whistle of a locomotive is heard 3,300 yards, the noise of a train 2,800 yards, the report of a musket and the bark of a dog 1,800 yards, the roll of a drum 1,600 yards, the croak of a frog 900 yards, and a cricket's chirp 800 yards.

Expert Testimony.

It is questionable how far technical knowledge on the part of a judge is advantageous to the suitor. A judge who is specially informed, or a counsel specially qualified, in any particular branch of scientific or technical knowledge is apt to take for granted a knowledge on the part of others which they do not possess, and to neglect careful investigation where it might be useful in enabling him to arrive at the truth. The skill of the counsel lies more in his power of extracting information from the witnesses than in theuse of any special knowledge of his own with regard to the subject in dispute. The ability of the judge is best seen in the use to which he puts information so placed in possession of the court. Strange though it may appear, a technical knowledge on the part of the judge is rather apt to bias or weaken his judgment than to assist him in arriving at a correct conclusion.

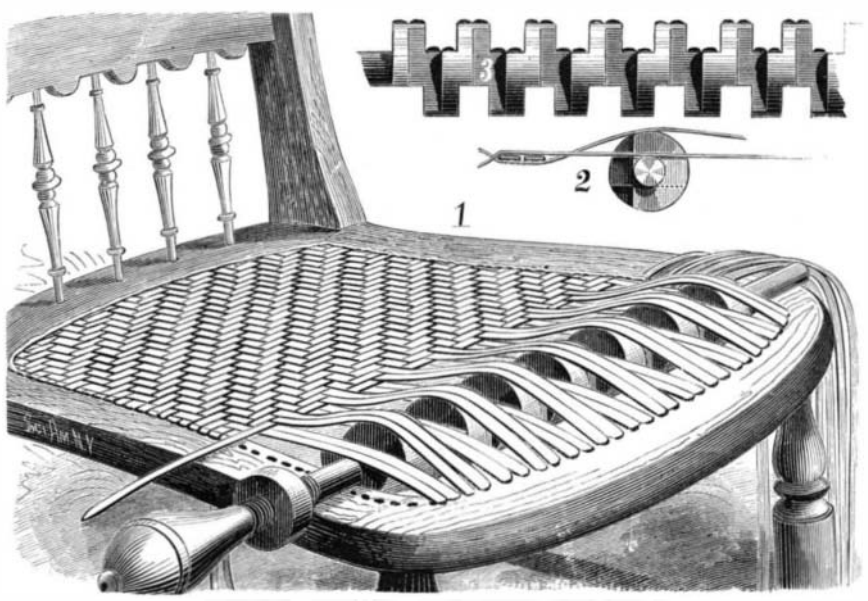
Mr. Justice Stephen appears to prefer the evidence of his own eyesight to the testimony of expert witnesses, and in a 'light and air" case tried in London the other day, which we find reported in the *Architect*, he adjourned to view the premises where the light was alleged to be obstructed. He seems to have personally formed a speedy judgment in the case, and to have given a verdict accordingly for the defendants. The judgment was no doubt sound and the decision right, but if a judge does not rely on the evidence of experts in these matters, the suitor may be spared the expense of calling them. Judges of the Chancery Division have recently adopted a plan of appointing or selecting a skilled witness to report to the court independently of the parties to the action, and the plan has been hitherto successful. We are unaware of the amount of technical knowledge possessed by Mr. Justice Stephen in 'light and air" cases, but it may be doubted, adds our contemporary, whether the learned judge had a proper opportunity for forming a sound judgment during the short adjournment of the court, when he inspected the building Our judges, moreover, will find abundant and varied occupation if this practice of inspecting the *locus in quo* is generally followed.

CHAIR SEATING NEEDLE.

This chair seating needle is designed to facilitate the seating of chairs with a plaiting of cane or other material.

The needle has rows of alternating spaces and notches with end journals, either or both of which are provided with a screw collar and with a handle, the object being to make a uniform diagonal plating.

When making double-bottomed seats, the warp or "first-way" is wound around the side bars of the seat-frame by hand, in the ordinary manner. A needle is then passed beneath the warp of the upper part of the seat, and another needle is passed above the warp of the lower part of the seat, the needles being held against the front and rear bars of the seat frame by the warp, and the needles being held from longitudinal movement by turning the screw collars up against the front and rear bars of the seat frame. The upper needle being arranged beneath the warp or first-way of the upper part of the seat, an opening or shed is formed in the strands of this part by some of the warp strands being elevated above the others by the high portions of the body of the needle, and through this shed a strand of the woof or "second-way" is passed, and is then pushed to the other side of the seat frame. The needle is then turned through one-quarter of a revolution, so as to raise other strands, and another woof strand is passed through, and so on until the woof extends to or nearly to the needle, which is then removed, and the remaining space is afterward filled out by hand in the ordinary manner. In this way a uniform diagonal plaiting will be formed, each strand of woof passing over two strands of warp and under two strands alternately.



LONG'S CHAIR SEATING NEEDLE.

A different needle is required for each different width of warp strands, the raised portions and the notches in each case being the width of two strands, except at each end of the needle, where they run out to the width of one strand.

This invention has been patented by Mr. Charles R. Long, of Louisville Ky.

HEADLESS SHELL EXTRACTOR.

This is an implement for extracting broken cartridge shells from the chambers of breech loading small arms. The head of the ordinary metallic cartridge shell frequently bursts or is blown off, and the headless shell is very difficult to extract from the chamber of the gun, and in the attempt to extract it with ordinary tools the gun barrel and connected parts are frequently injured. By means of this tool such broken shells may be readily extracted without injury to the gun.

The invention consists of an extracting screw provided with a ratchet, a handle carrying a spring pawl and pivoted on the shank of the screw, and arranged to turn the screw. The end of the handle is a screw driver.

The inventor furnishes the following directions for operating the extractor:

PRATT'S SHELL EXTRACTOR.

Kneel on the left knee; throw the piece over the right leg, and open the chamber. Insert the end of the tap, at the breech, into the broken shell, pressing it firmly with the *left thumb*, working the handle with the right hand from *right* to *left* until the tap has a firm hold of the shell, and then rising, withdraw the shell from the breech. Lock the ratchet wheel of the extractor by means of the latch, and holding the shell with the *left hand*, turn the extractor to the left, which will loosen the shell from the extractor.

In case the shell should be so firmly fixed in the breech as not to yield to a strong pull, insert the head of the ramrod through the muzzle, and push it against the shell, which will dislodge both shell and extractor.

This invention has been patented by Mr. William Pratt, Regiment Armorer, 7th U. S. Infantry, Fort Laramie, Wyoming Ter., to whom all communications should be addressed.

Autographic Reproductions of Fossils.

Mr. Fayol recently exhibited at the reunion of engineers of Saint Etienne, a number of autographic reproductions of fossils, and explained the process of obtaining them:

(1) By means of an inking roller, printing ink is spread over the object to be copied. (2) Upon the inked object there is laid a sheet of ordinary white paper slightly moistened, and this is then pressed down with the hand or with a small pad. Such is the simple and expeditious process by which were obtained the autographic reproductions of leaves, insects, medals, lace, and fossils represented in the plates shown at the reunion.

These plates were lithographs that had been made in the following way: For the ordinary white paper that is used when merely an impression is desired, there was substituted what is called *autographic paper*. This latter permits the impression to be transferred to stone by a process opposite that which served to take an impression of the fossil. On sending to the printer the impression on autographic paper, which any one can take, the printing costs ten francs per one hundred double plates, or five centimes per single one. As for equipment, all that is necessary is an inking roller, printing ink, and autographic paper, all of which may be procured of the printer. The total expense cannot exceed six francs. Most of the coal fossils could not be inked directly without injuring them, and to preserve them they are previously covered with a layer of silicate of potassa. The sirupy silicate of potassa (water glass) found at drug stores is diluted with water, and the fossil is then soaked in it. The imperceptible layer of silicate preserves and even brings out with greater sharpness the slightest shades and the most delicate lines. After drying, the inking may be done without trouble; and, after the impression has been taken, all traces of the ink may be removed with spirits of turpentine.

A MAN breathes about eighteen times a minute, and uses 3,000 cubic feet of air per hour.