

Light in the Sky.

Captain Abney lately read a paper before the British Association on the light of the sky at high altitudes, based upon observations made in the Alps on the Riffel, at a height of 8,500 feet. His investigations proved that in high altitudes the light of the sky diminishes very much so as to make photography difficult, and that it is only a tenth or a twentieth of that which is found on the surface of the earth. There was a remarkable absence of the rain band spectrum. On the Riffel he only saw it once, and that was during a shower. The solar spectrum was the same on the Riffel as in London. He did not believe that aqueous vapor was present in the upper regions, at all events in the form in which it exists below. In the red part of the spectrum he found that the benzine and alcohol which had been found to exist in the atmosphere actually increased in strength in the higher regions, and he could only suppose that benzine and alcohol are not of terrestrial formation but come to us from space. Dr. Glaisher said he had never failed up to five miles in getting a deposition of vapor, and there was no part of the earth's atmosphere probably in which there was no aqueous vapor. At a height of seven miles in a balloon he had seen cirrus clouds still higher, and there was a great difference between the state of the atmosphere in a free balloon and on a mountain side. Professor S. P. Langley, of Allegheny, Pennsylvania, in a paper on the distribution of energy in the solar spectrum, stated that he had investigated the infra-red spectrum at a height of 13,000 feet in a very dry region, and found that it extends very much further than had been mapped heretofore. The wave lengths of the visible parts of the red end of the spectrum are only one-fourth of those in the infra-spectrum, so that three-fourths of the energy were invisible. His observations proved the existence of great gaps in the spectrum, and he was inclined to support Abney's conclusions on the existence of benzine and alcohol in space.

Vapors of Metals.

M. Eugene Demarçay has recently obtained volatilization at much lower temperatures by diminishing the pressure of the gas by which they are surrounded. His apparatus consists of a crystal tube 12 centimeters in diameter, containing the metal and closed at its extremities. The heating is effected by vapors of sulphur, mercury, aniline, water, and other substances, giving temperatures ranging from 440° Cent. to 100° Cent. The vacuum is obtained by a Sprengel pump, and the tube is then heated in the vapors mentioned, at the same time that the pump is worked. A fine U tube, which enters the crystal tube until its bend is about two centimeters from the piece of metal, is traversed by a current of cold water and serves to condense the volatilized metal. When the heat is applied a considerable quantity of vapor is given off, and this condenses rapidly on the bend of the cold water pipe forming a dark deposit, which in time acquires a metallic tinge. Cadmium, zinc, antimony, bismuth, lead, and tin have been volatilized in this way, at temperatures of 160° Cent., 184° Cent., 292° (antimony and bismuth), and 360° Cent. (lead and tin) respectively. At higher temperatures the deposits are more abundant; but M. Demarçay has not proved any volatilization at inferior temperatures to these given. He does not doubt, however, that volatilization at lower temperatures does exist; but it is masked by the formation of a thin layer of suboxide of a deep color, which is less volatile than the metal itself. In such cases the metallic sublimation begins after this protective skin is broken.

NEW ALARM REGISTER.

We give herewith an engraving of a novel self-setting alarm register, invented by Mr. C. H. Stoddard, of Kansas City, Mo. This instrument is capable of counting up to 1,000,000, and will give an alarm by ringing the bell at any prescribed number from 1 to 1,000,000. The instrument represented in the engraving has a capacity of 10,000 only.

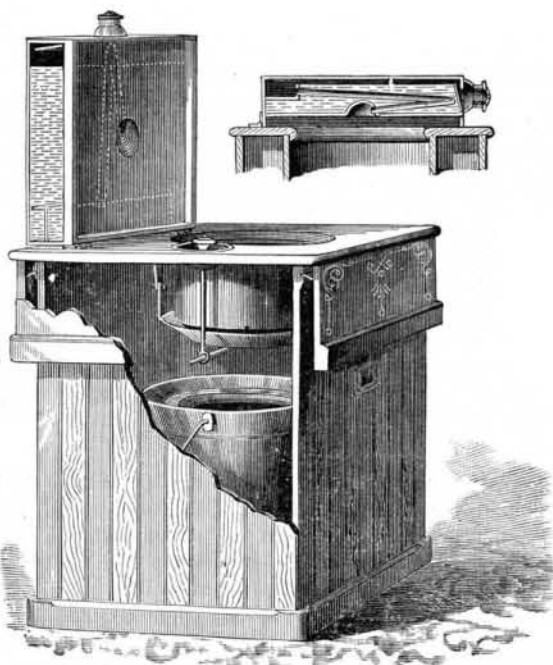
Two sets of register wheels are geared together, an upper and a lower set. The lower wheels are displayed in the face of the register, while the upper set, which is concealed and only seen when the alarm is open, is for setting the alarm. This set is connected to a knob on top of the bell by a rod, by raising which the wheels are raised out of gear with the lower set, and are free to be turned in either direction to the number at which the alarm must be given. In the engraving the top set of wheels have been raised and turned to show 1860. By lowering the knob on top of bell the register is ready for work, and will not give the alarm until 1860 have been counted and registered on the lower set of wheels. When the number has been run the alarm will be given, and will then continue to sound until the press or other machine to which the register is attached is stopped, giving one tap of the bell to each number run over the prescribed number.

In places where a good many runs are made daily, the man in charge may forget to set the register before starting his machine. In this case the register will immediately

warn him of the fact by giving the alarm. If the register is not properly set it will also sound the alarm.

But this is not all that this register will do. The automatic setting attachment is a most valuable feature. The figures seen on the lower set of wheels may all be instantaneously returned from any number, by simply raising the knob on top of bell. This at the same time raises the upper set of wheels out of gear.

This register may be used at any time without the alarm, and without adjustment, it being put in condition to operate in this way by simply raising the bell hammer until it is held by a catch made for that purpose. It can then be used as any other counter or register, with the advantage of the self-setting arrangement, and will never have to be opened.



PORTABLE WATER CLOSET.

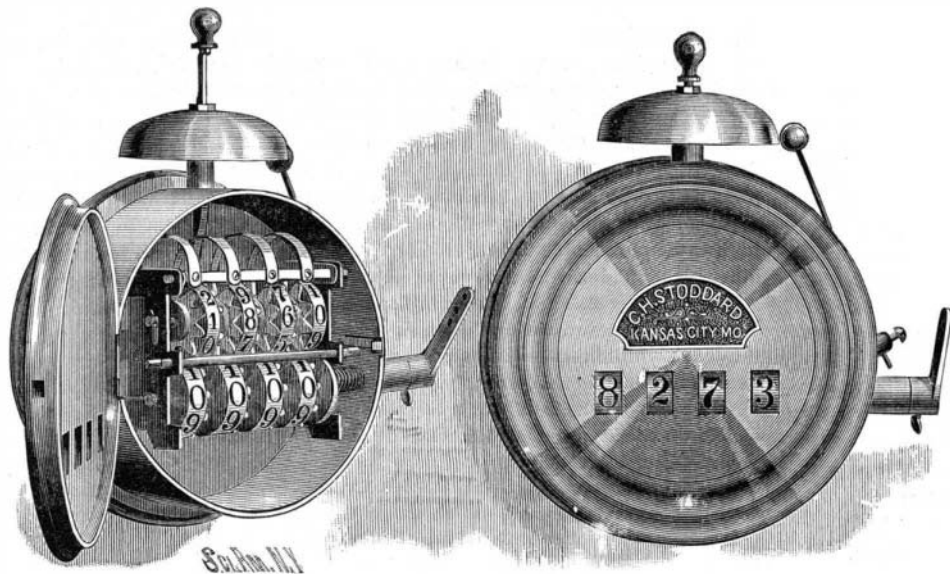
This register can be attached directly to any kind of a machine, or to the wall or post. The crank or lever at the side is held to its shaft by a thumbscrew, and can be worked from above, below, or from the back by a cord or rod.

We are informed that this instrument is now used by some of the largest publishing houses in this country, and has proved itself retirely reliable.

Further information may be obtained by addressing Mr. C. H. Stoddard, Box 1139, Kansas City, Mo.

New Reptile House.

The Zoological Gardens of London are the largest and have the greatest variety and most interesting collection of animals, birds, and other natural history subjects of any public gardens extant. The reptile stock has increased so much that new quarters are about to be built on designs



STODDARD'S ALARM REGISTER.

supposed to suit reptilian needs. The new reptile house will be 120 feet by 60, with a large porch and double entrance at the front and rooms in the rear for the keepers and workmen. It seems that such a house must face due south, and have a roof slated on the north slope and with ample sky lights on the south slope. It is to be of brick, with stone trimmings, and iron work for the roof. Fixed cages will occupy the north, east, and walls, while the south wall, almost entirely of glass, is to be left for some movable cases containing the light weights among the reptilia and batrachia. A large oval pond for crocodiles will occupy the center, and two smaller ponds for other aquatic reptiles. It is to be heated by hot water pipes. The Zoo now owns 57 tortoises, 10 crocodiles, 95 lizards, and 83 snakes, among which latter 10 are large pythons and boas. Almost every issue of *Nature* contains a goodly list of animals bought by, given, or loaned to the Zoological Society.

IMPROVED PORTABLE WATER CLOSET.

We give an engraving of an improved commode or portable water closet recently patented by Mr. John McAuliffe, of Gildersleeve's Landing, Portland, Conn. This commode is cleanly, odorless, and readily taken care of.

The box or case is made of suitable size and shape, and is provided with a loose cover or seat that sets over the upper edges of the box, the latter being provided with a packing strip which renders the joint between the box and cover air tight. The bowl has a pan suspended beneath it by means of jointed links, on which it is made to turn by the knob and connecting rod.

The main cover is hinged upon the seat, and is made hollow to serve as a reservoir for holding water. This cover is filled through an opening in the edge stopped by a screw cap.

Within the cover is a partition which cuts off the water from the cap when the cover is closed, so that the water cannot escape by the air inlet opening in the cap. In the cover is a tube of V form, one end of which passes out through the bottom, while the other end is connected to a small tray or pan, which is fitted in cover near its hinged end. The position of this tray is such that when the cover is raised the tray is filled, as shown in the larger view, and when the cover is closed the tray cuts off a certain quantity of water from the main reservoir, and the water in the tray escapes by the V shaped pipe to the bowl and pan. This ingenious device insures a supply of water to the pan at every opening and closing of the cover.

A pail is placed in the box beneath the pan, in position for receiving the contents of the pan.

Further information in regard to this invention may be obtained by addressing the inventor as above.

A New Food Fish.

During the latter part of September, Captain J. W. Collins, of the United States Fish Commission, renewed, without success, the search for tile fish. But the cruise was rewarded by the discovery of a new food fish which may take the place of the vanished tiles. The new fish is described as very beautiful, with a warm red luster and black and cream colored mottlings. The specimens, a dozen or more in number, weighing from one to four pounds each, were brought up in the trawls from a depth of about 120 fathoms in latitude 40° 2' north, longitude 71° 2' west. The fish was found to be a new member of the family *scorpana*, first described by Jordan in 1880. Two specimens were cooked and pronounced the most delicious of fish, the flesh being firm and crisp, with a delicate crabby flavor.

Making a Dead Man's Heart Beat.

James Tracy was hanged for murder at Chicago, September 15. The neck was broken. One minute after the body was taken from the gallows Drs. Mann and Bluthardt began the experiment of applying electricity with a view to resuscitation. The result is described by the doctors as follows:

"The experiment was begun by applying one pole over the spinal cord and the other over the heart—the latter by means of three needles, one over the apex and two over the base of the heart. The needles were inserted beneath the skin, so as to bring the electric current in direct communication with the heart. On turning on the current the effect was very marked. Muscular contortions began wherever the electric current reached, but especially in the face and neck. The heart began to contract feebly, not regularly. With the ear over the heart we could distinctly hear, or rather feel, the heart's contractions. By removing the electrode we could produce a variety of facial expressions. The arms would contract, the legs move with considerable force, and the muscles of the abdomen contract strongly. The most significant fact, however, was the rhythmic action of the heart, notwithstanding that the neck was broken. It is probable that a considerable proportion of criminals who are hanged in this country are either mechanically strangled—that is, choked to death, or killed by shock—that is, death is the result of the terrible impression made upon the nervous system. In cases

where the neck is not broken and the spinal cord is not lacerated, we are of opinion that resuscitation would not be impossible. It might be accomplished by electricity, friction, artificial respiration, the hot bath, and other well-known means of restoration. In this present case resuscitation was impossible, as the neck was broken."

The Sydney Exhibition Building Burned.

A dispatch from London, dated September 22, announces that the Exhibition Building, at Sydney, New South Wales, has been destroyed by fire with all its contents. The building destroyed we understand to be the handsome main building, styled the Garden Palace, erected for the International Exhibition of 1879-80, and kept for permanent exhibition purposes. Its loss is a grave misfortune to Sydney and to the colony.