

Scarlet for Felts.

The following two processes give shades which bear soaping. The dyeing is done in a well-tinned pan or a wooden cistern the goods are entered, at 115° Fah., in water, to which 1½ lb. white argol is added, and boiled strongly for a long time, turning occasionally. Lift, and add the dissolved coloring matter; re-enter, turn, and add gradually, lifting the goods before each addition of 11 lb. tin composition. The beck is then brought to a boil again, which is kept up for half an hour. Lift, cool, and wash well.

If the argol does not loosen the tissue sufficiently, it is recommended to add a small quantity acetate of soda.

The tin composition is prepared as follows: Muriatic acid, 3 lb., nitric acid, 1 lb.; water, 1 lb.

To every 6 lb. of this mixture 1 lb. of granulated tin is added, with the aid a gentle heat.

Sulphuric acid may be used instead of the tin spirits, but the shades are less pure.

The first method consists in dyeing the goods thus mordanted with the "Ponceau 2 R" of the Aniline Color Company of Berlin. In the second the goods mordanted in the same way are dyed with "Ponceau S extra," made by the same company — *Muster Zeitung für Faerberer*.

CONTINUOUS-SLIDE LANTERN.

The engraving shows a lantern which possesses certain advantages, and is specially adapted for lectures where the subjects follow each other in an unbroken series. Mistakes arising from the insertion of a wrong slide, or an inverted subject, are apt to mar an evening's entertainment. But, as will be seen, errors of this nature are altogether avoided, and by a simple mechanical arrangement, the slides present themselves in perfect order and at their allotted times.

The instrument is fixed to the top of the packing case, B, by the screws, A A; the lid of the case, C, serves to elevate or depress the lantern which may be fixed in position at any angle. Reared above the chimney are two metal uprights, secured to the sides of the lantern. These carry at their apex a wooden cube covered with fine leather; each side of this cube corresponds with the size of the slides. But, by the aid of strong ribbon binding, the slides are so united as to form a flexible band which traverses the cube and descends into the case, B, through slots, D D. The cube turns on its axis, E, to which is attached a milled head. The band is made so that the slides can be detached and replaced by a new series at will.

The advantages of this simple arrangement are so obvious as hardly to require further comment. The operator has only to turn the milled head of the cube in order to bring his subjects, one after the other, into position. This system might be applied also to the dissolving view apparatus. The heat from the chimney is never so intense as to interfere in any way with the slides, while it clears them of surface moisture, by which they might be obscured during cold weather.

An Aluminum Battery.

A curious and novel voltaic cell has been devised by Herr Wöhler, and described in *Liebig's Annalen*. The chief peculiarity is that both plates are of the same metal—aluminum—and a tolerably strong current is supplied. The cell consists of a glass vessel six inches high, filled with very dilute hydrochloric acid, or caustic soda, and containing an inner porous pot filled with concentrated nitric acid. In each compartment is placed a cylinder of aluminum provided with a projecting lug which passes through the cover of the vessel, and acts as a contact piece for the electrodes or conducting wires. As soon as the aluminum cylinders are plunged into the acids, a current is given off sufficiently powerful to heat a platinum wire red hot.

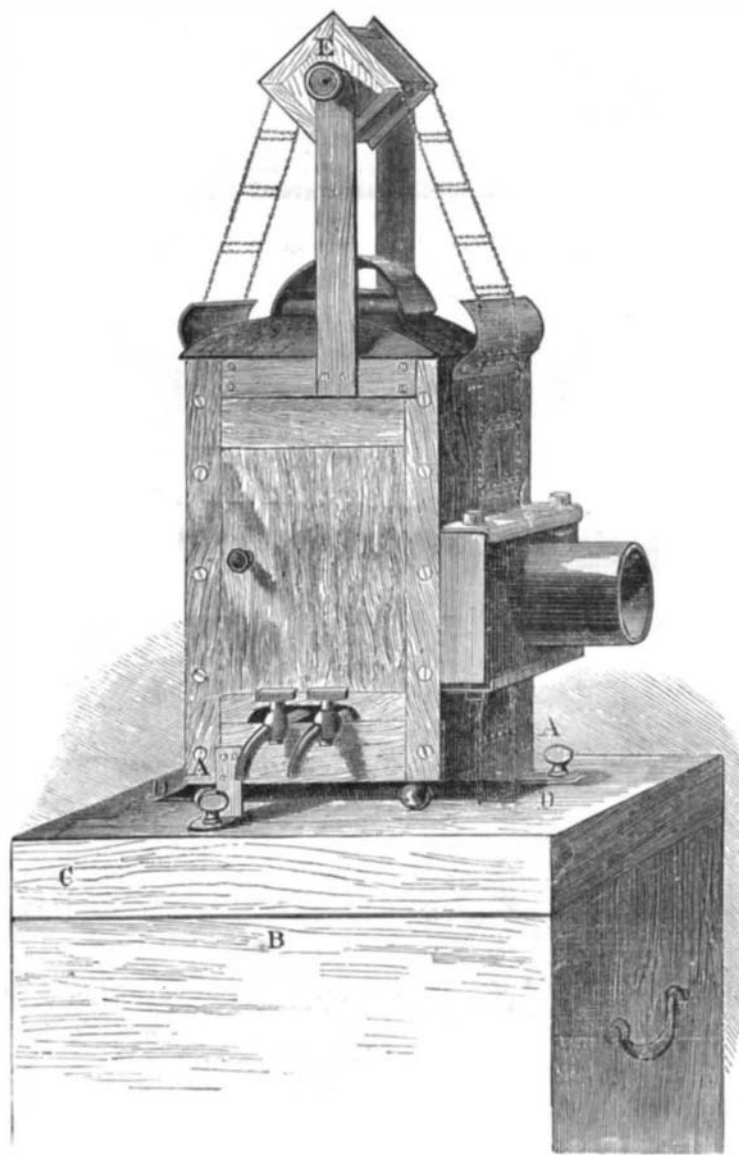
To Make Chloride of Gold and Nitrate of Silver.*

Procure 8 grammes = 5 dwts. of fine gold, and after rolling out to thin plate, cut into small strips. Get an olive oil flask, and clean it well with a warm and saturated solution of soda and water. Fill the flask half full of water, and set on a sand bath over a heat that will slowly bring the water to boiling, which will both temper and test the flask; if it stands this test it is fit to be used. Put the pieces of gold into the flask, then mix in a small bottle half an ounce of pure nitric and two ounces of muriatic acid, and pour some of this into the flask to cover the pieces of gold, place it in a sand bath over a gentle heat, and put over the mouth of the flask a small piece of glass to prevent the solution from spiriting out while in action. As soon as the acid ceases to act on the gold, and if any remains undissolved, add more of the mixed acid, and continue to add little at the time as often as it stops acting on the gold until all is dissolved; remove then the flask from the sand bath and let it cool, then add to it about its like quantity of water, and boil over a heated sand bath until about half of it is evaporated; remove and pour the solution into a glass or porcelain dish,

and rinse the flask several times with small quantities of warm water, which add to the solution.

Now prepare a filter in a small glass funnel, place it in the flask, and filter the solution back, and before the filtering is nearly completed pour a few drops of water at a time into the filter in order to wash the gold out of it, and until the solution is increased to about a third in bulk, then return it to the sand bath and evaporate again to about half; after this pour the solution into an evaporating dish and rinse the flask with warm water and add the rinsing to the contents in the evaporating dish, then add about 1 gr. 50 centigr. of fine table salt for each gramme or 1½ dwt. for each dwt. of gold dissolved; place it on the sand bath, stir it well with a glass rod until perfectly dry, then allow it to cool, when it will be ready for use, or to be poured into small bottles for sale. The 8 gramme or 5 dwt. of gold used will realize 24 bottles containing 1 gramme or 15 grains of chloride of gold to each bottle and will pay well for the trouble of preparation. The chloride of gold prepared in this manner will answer for making solutions for electro-gilding or for photographic purposes.

To make nitrate of silver, take granulated fine silver and put into a glass flask similar as used for dissolving gold, pour pure nitric acid mixed with about half the quantity of warm water into the flask to cover well the silver, place the flask in a sand bath over a gentle heat or into a vessel of hot water, which must be kept hot by placing over a spirit lamp until the acid ceases acting on the silver; if silver remains undissolved in the flask, remove it from the sand and let it

**CONTINUOUS-SLIDE LANTERN.**

cool; then pour off the liquid into a porcelain dish, add a little more acid to the remaining silver in the flask, and place it again over heat until dissolution of silver ceases, and keep on repeating the decanting and adding until all the silver is dissolved. By this method an excess of acid is avoided. After the solution has cooled add to it about half its quantity of water and filter it through asbestos broken up and placed in the filter in the neck of the funnel; after filtering pour into an evaporating dish and place it on a heated sand bath and evaporate until you perceive a light scum on the surface of the liquid, when it is removed and allowed to cool, and when nearly cold is placed on ice covered over and left undisturbed for twenty four hours, when crystals of nitrate of silver will form; the crystals are removed with a pair of platinum pincers into a glass funnel placed into the neck of a bottle, and as soon as the crystals have given over dripping pour quickly about an ounce of water over the crystals, and after done dripping repeat it twice more; take the crystals out of the funnel and spread them out on a china plate and place on a warm stove to dry. Pour then the washings of the crystals back to the remaining silver solution not yet crystallized, evaporate and filter the same as before and set by to crystallize, and repeat the process until nearly all the silver is disposed of. The small remainder of silver solution may be decomposed into chloride of silver by adding gradually small quantities of salt water.

In order to obtain crystals of large size, the moment of forming the scum on the solution has to be watched during evaporation and advantage taken of by removing it from the sand bath at this point. Another advantage of greatly accelerating the formation of crystals is to put a piece of nitrate of silver into the solution before placing it on the ice. This method will produce nitrate of silver of a better and purer quality than generally bought of dealers.

MISCELLANEOUS INVENTIONS.

An improved end gate for wagon bodies, patented by Mr. Thomas Dwyer, of Kendall, Ill., supplies drop end gates which may be turned down and supported in horizontal positions to serve as platforms for convenience in shoveling oats out of wagons. It may also be turned down in a vertical position out of the way. Quadrantal wings with stop devices enable these adjustments to be easily made, and hold the gate securely when adjusted.

Mr. George T. Hedrick, of Weaverton, Ky., has patented a nozzle and stopper for grain bags. It is metallic, and the bag is gathered and attached to it by a draw string. The stopper is a metallic disk with a spring catch which engages interrupted flanges on the interior of the nozzle.

A lock and latch combined, patented by Mr. Charles F. Batt, of Phoenixville, Pa., is so constructed that the lock cannot be readily picked, and both the bolt and the latch can be operated by the same key. It also allows the latch to be thrown out of or into gear with the spindle.

Mr. Earnest J. Krause, of Carlisle, Pa., has patented a fire escape ladder, which provides means for adapting the hooks of a fire escape ladder to window sills of all widths, and for holding the ladder as firmly on narrow sills as on broad ones.

Mr. Orlando H. Jadwin, of Brooklyn, N. Y., has patented an improved cable traction for street cars. A peculiar clutch attached to the car serves, at the will of the conductor, to attach the car to the traveling cable, which runs in a channel or trough formed in the ground. Devices are also supplied to hold the cable in position at street corners, etc. The clamping of the cable by the clutch is gradual and uniform.

Mr. James Pardee, of Phillipsburg, Montana Territory, has patented an improvement in rotary ore-roasting furnaces, intended to increase the capacity, effectiveness, and working economies of this class of furnaces, and more especially applicable to what is known as the Howell rotary furnace. The improvement consists in a diaphragm or partition placed in the rear of the furnace feed pipe, by which means the crushed ore is given time to become heated and aggregated before dropping through the moving current of air and flame, and in this condition is not carried by the draught into the dust chambers in such quantities as heretofore.

Mr. James M. Totten, of Sharon, Wis., has patented an improved adjustable wrench. The shank has a socketed mortised block at the lower end, and a cross bolt passing through the shank, which holds side sliding plates. By sliding out the side sliding plates from the block and fastening them by the bolt, the wrench may be made to fit various sizes of nuts.

Mr. August W. Klammer, of Cahoka, Mo., has patented a draught equalizer for side reaping machines. A rectangular framework is adjustably secured to the tongue or pole of the vehicle, projecting on one side thereof and carrying the whiffletrees, thereby affording the horses a powerful leverage against the side pull of the machine.

Mr. Charles Steinfelds, of Elizabeth, N. J., has patented a screw polishing machine, which automatically seizes and properly presents the heads of the screws to polishing wheels, the screws be-

ing fed to the machine in mass.

Mr. Heinrich Trenk, of Berlin, Germany, has patented a composition for use in tanning, consisting of a concentrated solution of crude tartar or argol, to which a small quantity of chloride of zinc or analogous chloride has been added. This composition is used after the hides or skins have been treated by the tanning liquor, and its action is to make the finished leather more dense and compact.

A hitching strap, patented by Mr. John D. Stotlemeyer, of Hancock, Md., prevents horses, when hitched, from falling, and assists them in recovering their feet when down. A portion of the strap is made of a strong strip of elastic rubber, provided with a snap hook, and suitably attached to the leather portion of the strap.

In an apparatus for watering stock, patented by Mr. James Ray, of Huntsville, Mo., a trough or receiver is provided with a device whereby water flowing into it from a pipe is automatically prevented from flowing as soon as the water reaches a prescribed level in the trough. The troughs may be arranged in a series, delivering water one to another, in such manner that none shall be wasted by overflow. A novel arrangement of float lever valves and float valves is used to accomplish the end sought.

A cheese cutter, patented by Mr. Lionel J. Smith, of Peshtigo, Wis., is so constructed that cheeses can be easily, accurately, and quickly cut into pieces of any desired size.

*From the *Deutsche Chemiker Zeitung*, by H. Bush, Hull.