

To Draw and Paint Magic Lantern Slides.

They are first prepared by having them cut the right size in width and about ten inches in length (they can be bought for a small sum at any glass warehouse); clean them, then lay your picture on a pad of blotting paper, and place your glass over it; the blotting paper will serve as a bed, and the glass will keep the picture in its place ready for tracing the outline, which is done with a camel's hair paint brush, using ivory black, ground up in the best drying oil, made thin with a little spirits of turpentine. The best outlines are funny men and women, animals, birds, and grotesque figures, sheets of characters, clowns, harlequins, etc. When done in outline with the black, they are filled in with the transparent colors, mixed up as the black: only use carmine, gamboge, Prussian blue (the more brilliant the colors, the better effect they produce), the above being for red, crimson, yellow, and blue. To form other transparent colors, mix carmine and Prussian blue for purple, and lavender, gamboge, and Prussian blue for all the shades of green, using for light green more gamboge. Carmine and gamboge make a fine orange color, and for brown shades mix a little ivory black with carmine or lake, with a little gamboge to temper it. Many other tints are made by mixing the primitive colors first named—red, blue, and yellow—by using less of one color with another; and if at any time the colors are too thick, thin with turpentine; it works more easily when not too thick and is more transparent.

When all the colors are finished, mix a nice thin black, and fill in carefully all the ground of the glass round the edges of the figures with the black, leaving no part of the glass slide plain. These slides should be made very well; and to take better care of them, have them put in small wooden frames, with a tongue at one end to move them in the lantern without the finger touching the glass part. Many beautiful designs can be copied from a kaleidoscope, which, when copied and painted on slides, are very beautiful, and show the colors to advantage. Drawing and painting slides is an instructive amusement, and worthy the attention of all persons connected with youth, as it gives them original ideas for combining colors, and thus can be brought into use for many pretty designs in a pleasing manner.

The Kahnweiler Cotton Seed Huller.

Some time ago, we published an engraving of what we considered at the time a very excellent machine for hulling cotton seed, the invention of Mr. David Kahnweiler, of this city. Attracted by the publication, an order was given for one of the machines by a gentleman from near Newbern, N. C. A few days ago, the machine was set in operation; and according to the *Newbernian*, a newspaper published in Newbern, "the cotton-seed huller was quite a curiosity; it did the work finely and thoroughly, the kernels being taken from the hulls and separated from the chaff, which operation prepares the seed for feeding to stock, while the hulls can be utilized for stock bedding. One tun of the cotton seed will furnish 1,000 lbs., or about 20 bushels, of kernels which are said to be better for food for mules, horses, cattle, hogs, and sheep than an equal weight of corn. If this is correct, it will enable the South to feed an unlimited amount of stock, and to raise her own mules and provisions, and literally to eat cotton."

A CORRESPONDENT, Mr. H. McMurtrie, of Boston, Mass., informs us that the Russian system of technical education, recently described by us, has already been adopted by the Massachusetts Institute of Technology, and will soon be in full operation.

NEW BOOKS AND PUBLICATIONS.

THE LEATHER MANUFACTURE IN THE UNITED STATES. By Jackson S. Schultz. Illustrated. New York city: Office of the Shoe and Leather Reporter.

The author of this work already possesses a worldwide reputation as one of the most enterprising and intelligent as well as one of the largest manufacturers in the American leather trade. The series of articles, reprinted from the *Shoe and Leather Reporter*, which compose this volume, could therefore have been written by no higher authority, certainly by none whose opinions and advice will command greater respect. While the whole book is eminently practical and is intended for practical use, it defends no preferred theories, nor enforces any especial views. On the contrary, it presents the merits and demerits of known systems and methods of leather making "as their advocates would state them," leaving all to the candid comparison of intelligent men; and this done, the author suggests his preference, warranted by his own experience. Mr. Schultz, besides, accomplishes the difficult task of writing a technical book without technicalities; and he does it admirably, for the general reader, knowing little or nothing of tanning, can read the work through with interest, and obtain a vast amount of really useful information. The selection and classification of hides is explained in the first chapter, the next takes up the sweating, then liming, then fleshing and trimming; then follows preparing the bark, and so on through all the various topics, including construction of tanneries, cost of tanning, utilization of refuse, tanning processes, and finally a valuable report on the burning of tan in furnaces—on which subject he possesses more knowledge than he communicates—closes the volume. A number of excellent illustrations are provided, and a portrait of the author constitutes the frontispiece.

Recent American and Foreign Patents.**NEW MECHANICAL AND ENGINEERING INVENTIONS.****IMPROVED WINDMILL.**

Andrew J. Ball, Mount Vernon, Ohio.—This invention relates to certain improvements in windmills, designed to render the vanes of the same automatically adjustable, together and as a whole, in their position to the wind so as to diminish their areas of resistance in proportion to the strength or force of the wind, and thus equalize its power. The invention consists mainly in the arrangement of an oscillating tail blade with a supplemental tail and a deflector blade, which together effect the desired result in a perfect and sensitive manner.

IMPROVED RATCHET WRENCH.

Robert R. Wilson, New Orleans, La.—This invention contemplates the saving of time and labor in putting on or taking off

nuts from a bolt or axle where they are inaccessible to the ordinary wrench. The invention consists of a compound wrench, provided with a revolving part having several nut sockets or nut holders of different sizes. It is made to turn in either direction with the handle by means of a two-armed pawl lever held by a spring pin. One of the nut holders or sockets is open or cut out at the corners, to adapt it to turn nuts one or more of whose sides may be close to same obstacle.

IMPROVED PAPER PULP ENGINE.

John S. Warren, Cumberland Mills, Me.—In using the machine for beating and grinding, the case is filled or charged through an opening in the screen, and power is applied to give a rotary motion to the cone and tube and their attached knives. This revolution of said parts engenders a centrifugal force, which causes the pulp to flow up through the space between the tubes and cones, the knives operating upon it during its passage. The pulp, as it is thrown out, passes down the sides of the case and establishes a circuit, thus becoming thoroughly intermingled.

IMPROVED WATER METER.

Sebastian Plymale, Portland, Oregon, assignor to himself and Thomas Hutten, of same place.—This is so constructed as not to become choked by sediment or other impurities passing in through the supply pipe. In the case is placed a tank, which is divided into two equal compartments, and balanced upon pivots. When the said tank is tilted, the head of a valve stem strikes upon a stop attached to the bottom of the case to allow the water in said compartment to flow out. When the tank is tilted, the water flows into the upper compartment of said tank until that compartment overbalances the other and reverses the tank. This opens the valve of the full compartment, and allows the water contained in it to flow out, while the other compartment receives water. By this construction, exactly the same quantity of water must flow into each compartment each time to tilt it, and, by registering the number of times the tank tilts, the exact amount of water that has passed through the meter is ascertained.

IMPROVED GEAR PLANER.

Andrew Hanauer, Covington, Ky.—This machine has a radius bar upon which slides a tool rest, provided with two tool holders capable of moving vertically in opposite directions. One travels with the radius bar as it is guided by a form or templet, and the other moves oppositely, receiving its motion through a lever and connecting rod from the tool rest. It also consists in an arrangement of a crank and slotted lever driven by gearing, and connected with the tool rest by a connecting rod. It further consists in the arrangement of the pivot and feeding apparatus for the radius bar. The object of the invention is to accurately plane both sides of the teeth of cast gear wheels at one operation, thereby saving the expense of handwork or of doing it with ordinary planes or sharpeners.

IMPROVED ORE CONCENTRATOR.

Francis E. Mills, Virginia City, Nev.—This invention consists: first, in arranging inclined tables in vertical series, like shelves, one over another, all held in one frame, and sloping in the same direction, but with varying degrees of inclination. The purposes are to enable a concentrator of large working capacity to be constructed at small cost, occupying small ground space, be easily housed and operated in cold weather, and be quickly swept at one operation; also, to insure a proper and easy classification of the sands as they flow upon the respective tables, and thus secure a larger percentage of the ore; secondly, connecting with such vertical arrangement of tables a classifying head box, by means of which the sands naturally grade themselves as they flow out upon the different tables, the coarsest and heaviest flowing over the bottom tables, the finest and lightest over the top table, and grains of intermediate grades of fineness over the intermediate tables, the inclination of each table, respectively, and the volume of current, being adapted to the grade of sand it carries; thirdly, in employing on all stationary tables a traveling water broom, which, consisting of a perforated pipe, extending across the tables and fed with clean water under pressure, is made to traverse the length of the table, close to the surface, and sweep off the deposit in its progress by jets through the perforations.

IMPROVED SAFETY WHIFFLETREE HOOK.

Adam A. Wise, Belle Plaine, Iowa.—This invention consists in securing a trace to a whiffletree hook so that all liability of escape under any contingency is effectually removed, by making the end hook in two sections, each in the shape of a hook, but having the bend in opposite directions so that one may overlap the other, form an enclosed space for the ring or loop of the trace, and be allowed to rise in order to admit said loop or ring.

NEW HOUSEHOLD INVENTIONS.**IMPROVED LAMP CHIMNEY CLEANER.**

Daniel T. Freese, North Amherst, O.—This consists in the arrangement of two flat bow springs secured to a handle, the bow of the springs being adjustable by a screw at the end of the handle, and also by a coil spring which permits the bow springs to yield more or less for chimneys of different sizes. The flat springs are covered with tufts of yarn.

IMPROVED STOVE PIPE JOINT.

Robert Mainer, Orilla, Ont., Canada, assignor to himself and Charles McInnes, of same place.—This invention consists of rivets at the end of one stovepipe entering into slits of the other stove pipe end, and being locked by pivoted fastening hooks of the same.

IMPROVED WASHING MACHINE.

Collins Fitch, Garnetsville, Ky.—As the rubber is moved back and forth upon the clothes interposed between it and a hurdle, by operating a lever the hinges of the arms attached thereto enable the rubber to adjust itself according to the amount of clothes being washed.

NEW AGRICULTURAL INVENTIONS.**IMPROVED CHURN.**

James M. Roberts, East Monroe, O.—This churn has no metal parts to stain or otherwise affect the milk or butter, and is so constructed that it may be readily repaired at home without its being necessary to take it to a foundry or blacksmith shop. Means are provided to give an oscillating motion to the dasher, which throws the milk toward the center of the churn and gathers the butter; and the cover and its attachments may be readily removed to give access to the interior of the churn body.

IMPROVED ROTARY CHURN.

John R. Bennett, Nunda, N. Y., assignor to James A. Duryea, of same place.—This churn is provided with dashers that revolve in opposite directions; and there is a combination of a floating dasher with a feathered shaft in such a manner that while the dasher floats on the surface of the cream it is carried around by the said shaft. The advantage claimed is that the cream is confined by the floating dasher, so that it is more thoroughly acted upon by the wings of the dashers, producing an increased quantity of butter in a shorter time than when the ordinary dasher is used.

IMPROVED ROTARY CHURN.

Andrew M. Mortimer, Salt Lake City, Utah Ter.—By suitable construction as a shaft and plates revolve, beaters are vibrated to throw the milk into agitation, and the currents thus formed are broken up by the revolving and stationary bars, throwing the milk into violent agitation, and bringing the butter in a very short time. By withdrawing the shaft the entire operating mechanism can be lifted out of the box for convenience in cleaning the churn.

IMPROVED HAY LOADER.

Thomas Elliott, Peterborough, Ontario, Canada.—The hay is elevated by endless belts. The novel feature in the device relates to means whereby the rake teeth may be conveniently adjusted closer to or farther from the ground, as desired.

IMPROVED AGRICULTURAL STEAMER.

Ruliff W. Ruliffson, Stamford, N. Y.—This consists in a fire box made of sheet iron, open at top and bottom, provided with a door a draft opening, a pipe collar, and crossbars, to assist in supporting the cooking vessel. Said vessel is also made of sheet iron, and has a flat bottom to rest and fit upon the upper edge of the fire box and upon the cross bars. Upon the bottom of the vessel is a rack to support the false bottom, which is perforated with numerous holes to allow the steam to pass through. The rack and perforated false bottom support the grain or vegetables above the water, and prevent any possibility of their burning upon the bottom of the vessel; and they also prevent any dirt that may be upon the vegetables to pass through and settle upon the bottom of the vessel.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.**IMPROVED AXLE SET AND GAGE.**

William C. Carlton, Boise City, Idaho Ter.—This is an improved instrument for setting and laying off axles, and getting the gather and dish of wheels. In applying the instrument to use, it is placed upon the axle, and right hand or double clamps are adjusted to the shoulder and end of the right hand spindle, and the left hand or single clamp is adjusted to the shoulder of the left hand spindle. To obtain the dish of the wheel, the instrument is placed across the wheel close to the hub, with the inner prongs of the double clamps against the tread of the tire. A sliding rule is moved to the center of the hub, and is secured with a screw, thus getting the half diameter of the wheel. The instrument, after having been set and an axle made to conform to it, will bring the wheel on a plumb spoke.

IMPROVED CHIMNEY.

Mercy C. Halsted, St. Louis, Mo.—The smoke is conveyed upward from the furnace at the cellar of the building, between the inner surface of an exterior cylinder and the outer surface of the interior cylinder, by a spiral flue. The interior cylinder is divided by a vertical partition wall into two passages, of which the larger one is designed for supplying fresh heated air to, and the other for carrying off the effete air from, the apartments.

IMPROVED VENTILATOR.

William H. Maxfield, Maysville, Harlan P. O., Ind.—The box fits in a collar, which is set in a hole in the ceiling or wall. From the box a pipe leads to the chimney flue; and in the lower part of the box is a grate formed of two sets of parallel slots, placed the one above the other, and so arranged that the upper set may be slid over the spaces between the bars of the lower set, to close, or partially close, the said spaces. The upper set is moved by a lever.

IMPROVED COMBINED CHIMNEY TOP AND VENTILATOR.

Joseph Harmon, Decorah, Iowa.—This consists of a ventilating tube that surrounds the chimney, and is enlarged at the chimney top, the enlarged part being connected by draft apertures at the bottom of the enlarged part, and at the sides of the base with the outer air, to draw the air drawn up to and out at the exit openings of the top cap piece.

NEW TEXTILE MACHINERY.**IMPROVED FRINGE-TWISTING MACHINE.**

Samuel Mortimer, West Troy, N. Y.—The object of this invention is to improve the mechanical construction of the machine for twisting fringes. There are six novel devices introduced, the nature of which cannot be explained without drawings. The invention consists in sockets attached to the guide rods to receive the stems of the shells; in a spring with the jointed upper twisting finger; and in the spiral spring with the shaft that carries the lower twisting finger. A toothed roller and its spiral springs are combined with the front bar of the carriage; and there is a combination of the spiral springs with the fingers of the inner shell.

NEW MISCELLANEOUS INVENTIONS.**IMPROVED GROCER'S SAMPLE CASE.**

Hans A. Winden, Clermont, Iowa.—This triangular case is provided with an accurately fitting block of corresponding form. Said block rests on spiral springs which keep the cross partitions, inserted in the face of the block, in contact with the under side of the glass cover of the case, and thus prevent the samples from becoming mixed or wasted.

IMPROVED MASONIC BADGE.

James McCoy, Ypsilanti, Mich.—This consists of a masonic badge in which the legs of the compasses are pivoted to be carried above or below the square. There is a spring-acting pin, that slides by a thumb piece in guide projections at the back, to be readily attached to the coat.

IMPROVED PIANOFORTE ACTION.

Martin C. Knabe, Philadelphia, Pa.—This is an improved device for withdrawing the check from the butt nose, to allow the hammer to drop quickly and freely from the string after striking a blow. It may be adjusted to withdraw the check at any desired point.

IMPROVED PASSENGER REGISTER.

William Mehan, Hoboken, N. J., assignor to himself, Hezekiah Butts, and John Egan, of same place.—This consists in the arrangement of a cam and friction roller with a turnstile and movable platform, so constructed that the person passing the turnstile must step upon the movable platform, by the motion of which, under control of the cam, the apparatus is made to register once, and cannot be made to do more or less.

IMPROVED BREST STRAP FENDER.

John C. Look, Bremen, O.—This consists of a wearing plate for the breast strap of a harness, made in two parts, hinged together. On one part is a brace for the joint and support for the neck yoke strap, and on the other forks to throw out the neck yoke ring, so that the latter is locked in the fender when the strap is in position. When it is disconnected the ring is unlocked and thrown out by flexing of the plate on the joint. The fender is attached to the straps by loops, through which straps are passed.