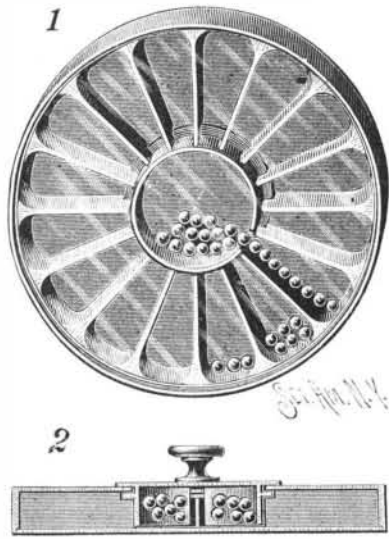


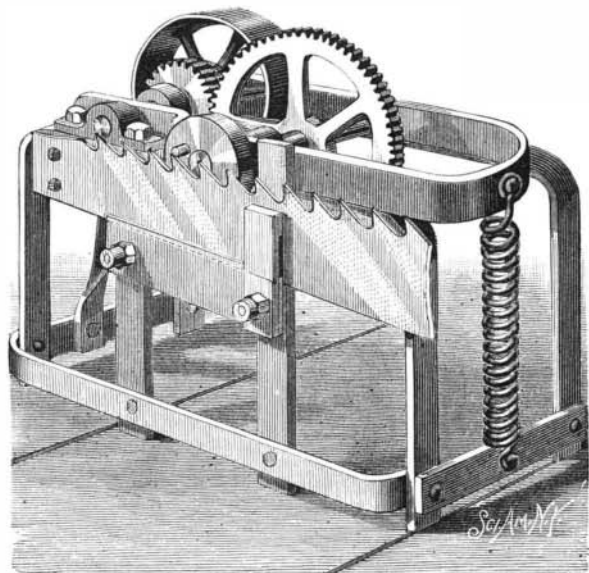
**A KINDERGARTEN TEACHING DEVICE.**

An exceedingly simple educational device, adapted for use in the kindergarten method of instruction, is shown in the illustration, and has been patented by Mr. Jose Gallegos, of Ocos, Guatemala, C. A. A light cylindrical case, with a glass front, is divided by radial ribs into numerous compartments open at their inner ends, where there is a central recess, in which is placed a circular pocket. This pocket is revoluble by means of a knob or handle at the back of the case, as shown in the sectional view, Fig. 2, and has in one side a slot to permit the balls to pass through, one by one, into the several compartments between the ribs. By permitting one or more balls to pass through the slot, as shown in Fig. 1, the pupil may be taught to add and multiply as the balls are distributed, counting being taught as the balls are dropped one by one through the slot. The device is also designed to serve to some extent to amuse small pupils.



GALLEGOS' DEVICE TO TEACH ARITHMETIC.

**A MACHINE FOR FINISHING SAWS.**  
A new method of finishing saws, with a machine adapted to facilitate the work, form the subject of a patent recently issued to Mr. Thomas J. St. Louis, of Cadott, Wis. It is designed by this means to prevent the cracking of the saws by removing their sharp edges, destroying the cross creases, and breaking up and removing the case-hardening made by the emery wheel in grinding the teeth. The saw is held upon an anvil on the front side of the frame of the machine, in such a position that each tooth may be engaged by a die in the shape of a pin projecting from a crank disk, as shown in the illustration, the pin-shaped die having a groove in its working edge which straddles the top edge of the saw tooth. The crank disk is held on a transverse shaft mounted in a slightly swinging frame, which has its fulcrum on the main driving shaft, the shaft frame being yieldingly held on the main frame of the machine by a spring connecting it at one end with the base of the machine. A laterally sliding pinion and clutch on the main driving shaft afford the means of causing the rotation of the crank shaft as desired on moving a shifting lever. With the saw held in position, as shown, the rotation of the crank disk moves the die in contact with the top edge of the saw tooth, the die rolling off thereon and finally engaging and roll-



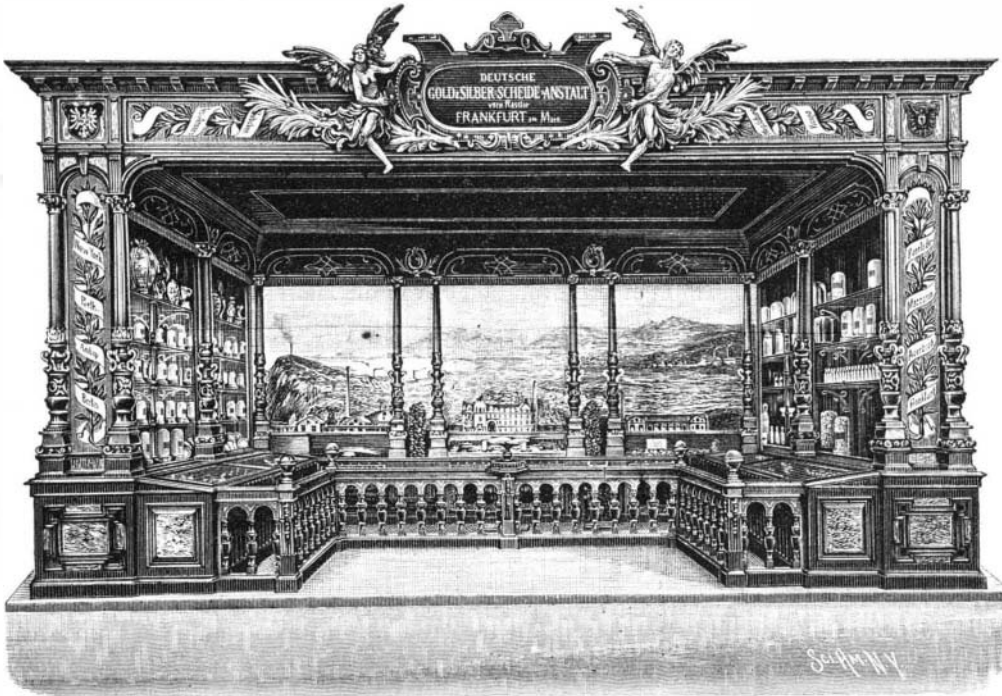
ST. LOUIS' SAW FINISHING MACHINE.

ing in the throat, at the same time pushing the saw forward as the rotation of the disk continues, the yielding frame swinging upward according to the downward movement of the die. The distance of the die from the center of the crank disk is such that at every revolution the saw blade will be moved forward a sufficient distance to cause the die to engage the next tooth on the succeeding revolution, the die in each case exerting a rolling pressure along the top edges of the tooth, in the base of the throat, and up on the forward edge of the succeeding tooth.

**A GOLD AND SILVER REFINING ESTABLISHMENT.**

An exhibit in the German department of the Mining building highly pleasing to the eye, through its refined elegance, is the pavilion of the Deutsche Gold u. Silber Scheide-Anstalt, vorm. Roessler (the German Gold and Silver Refinery, late Roessler), Frankfort-on-the-Main, located on the main aisle dividing the building from east to west. The large showcase is entirely constructed of walnut with gold ornamentations, the chemicals, etc., manufactured by the concern and its branches being shown to the right and left in large glass cases, while the background is formed by a plastic and pictorial representation of the different establishments.

Well executed models of the works and the central office in Frankfort-on-the-Main and of the desilverizing establishment at Hoboken, near Antwerp, are mounted in the foreground. To the left is seen the Mediterranean port of Mazarron, in the Spanish province of Cartagena, with the silver-lead oresmelters of the Compania Metalurgica de Mazarron, the Spanish branch of the concern. To the right, the painting represents the Bergstrasse in Odenwald, with the quinine factory Auerbach and the ruin of the old castle of the same name. The azure blue of the Mediterranean, with its bright sky overhead, the brilliant col-



THE COLUMBIAN EXPOSITION—A GERMAN GOLD AND SILVER REFINERY EXHIBIT.

oring of the southern landscape, and the more somber hues of the Hessian Mountains, all combine to produce a striking effect and to relieve the exhibits, otherwise of a strictly commercial character.

The German gold and silver refinery of the company refines about 9,000,000 ounces gold and silver during a year, and its total sales in 1892 amounted to 10,000,000 ounces silver and 200,000 ounces gold. The chemical works of the concern have a large output of nitrate of silver, chloride of gold, cyanide of potassium, metal oxides, and other chemicals for pharmaceutical and industrial uses. Their ceramic department manufactures liquid bright gold and many hundred shades of overglaze and underglaze colors, the total sales of colors and chemicals being more than 14,000,000 marks per year. The year's production of the quinine factory Auerbach is over 2,000,000 ounces of quinine.

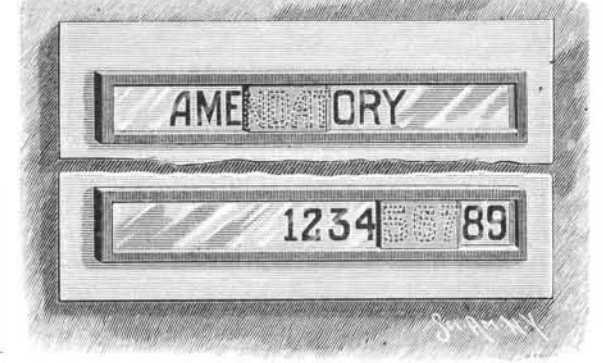
A flat showcase in front of the models contains refined gold in ribbons and grain silver to the value of many thousand dollars. In another case the Roessler & Edelmann's new desilverizing process is demonstrated by a series of products. This patented process, which introduces the aid of aluminum in the old zinc desilverizing process, is for the first time exhibited in any world's exposition. A pamphlet describing fully the process points out as its principal merits the saving of time and material. It is in use in the above named desilverizing works in Hoboken, near Antwerp, where about 67,000,000 pounds of lead, 4,000,000 ounces of silver, and 5,000 ounces of gold are yearly produced.

The Roessler & Hasslacher Chemical Company, an independent New York corporation, with works in Perth Amboy, N. J., whose products were described in a recent issue, is the American branch of the Frankfort concern. Bernhard Roessler & Co. and Louis Roessler & Co. are the branches of the concern in Ber-

lin and Vienna. All these establishments are named on the border of the showcases.

**A DEVICE TO TEACH SPELLING.**

This is a cheap and simple device, which may be easily carried in the pocket. It consists of a small and light frame, flush with the back side of which is inserted a glass, while its top or outer portion has flanged



GALLEGOS' DEVICE TO TEACH SPELLING.

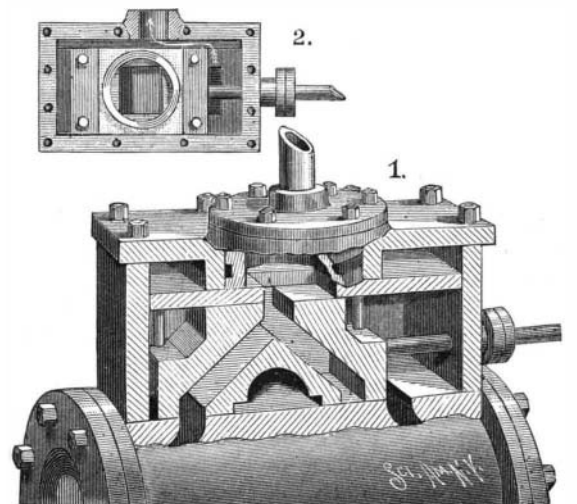
edges adapted to inclose a slide block designed to be moved along over the glass. The device may be applied to words or numbers upon a book or any other surface, so as to cover a portion and expose other portions, dividing the word into syllables and letters, as may be desirable in teaching small children, or exposing successive figures as may be advantageous in teaching the reading of numbers. The improvement has been patented by Mr. Jose Gallegos, Ocos, Guatemala, Central America.

**An Adhesive Cement.**

Equal proportions of gum tragacanth and tapioca are ground together and heated with water at about 70° Fah., after which there are added about 50 per cent of gum hog and an equal amount of starch, and the whole mixture heated at from 70°—120° Fah. The cement thus produced is said to be superior to any hitherto known for the requirement of silk and cotton manufacturers, calico printers, book binders, hat and boot makers, etc.

**AN IMPROVED BALANCED SLIDE VALVE.**

The valve shown in the illustration, recently patented by Mr. George S. Neeley, of Pacific, Mo., is of very simple and durable construction, and is designed to reduce the friction to a minimum and utilize the steam to the greatest advantage. Fig. 1 is a sectional view showing the valve in position on a steam chest, Fig. 2 being a plan view. The ports of the valve are moved by the valve stem to alternately connect with the ports at either end of the cylinder, the valve ports diverging from a common port registering at all times with a port in a plate held loosely on the top of the valve. On this plate is a hollow piston fitting steam tight in a cylinder in the cover of the steam chest, the upper end of the cylinder being closed by a cover through which extends the steam supply pipe, while on the under side of the cover is a spring pressing on the hollow piston, to hold it in contact with the plate. The area of the piston is about one-fifth more than that of the port in the plate, and, while all the steam passages are very direct, it is designed that, by the interposition of the plate between the hollow piston and the slide valve, the latter will be sufficiently counterbalanced to insure easy running, with the least possible friction.



NEELEY'S BALANCED SLIDE VALVE.