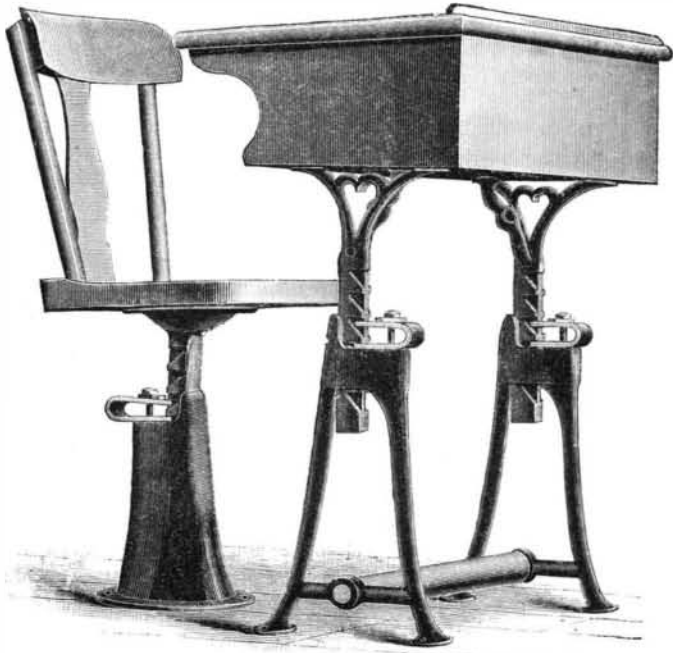


AN IMPROVED SCHOOL CHAIR AND DESK.

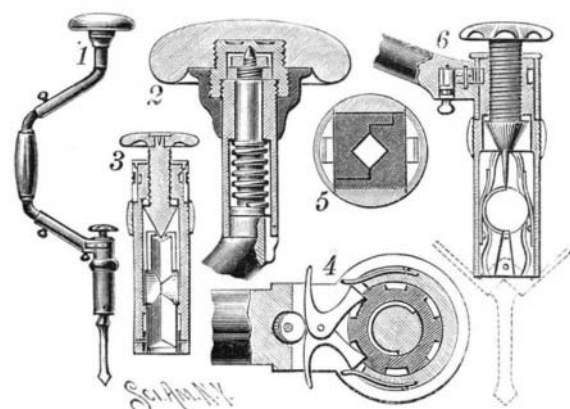
The providing of desks and seats suitable for children of various sizes at school is often quite a troublesome matter, and, with the ordinary styles of school furniture, frequent changes are necessary. An improvement designed to obviate this difficulty is represented in the accompanying illustration. It consists of a desk or seat supporting standard, capable of vertical adjustment, whereby the desk or seat may be readily raised or lowered as desired, to suit the needs of different pupils. The upright portion of the standard

**THE CHANDLER ADJUSTABLE CHAIR AND DESK.**

is provided with a series of grooves or recesses, and slides vertically within a base portion, on which is arranged a horizontally sliding double or U-shaped spring adapted to engage the grooves or recesses in the vertically-sliding upright. The desired adjustment may be quickly and easily effected, when the spring is secured in place by a clamping bolt, the construction preventing any rattling or loose motion from inaccuracy in the fitting of any of the parts. The desk is firmly supported on each side, and the chair, when adjusted to the height required, is practically as substantial as if it were a solid piece of iron, as the clamping bolt cannot be loosened if tampered with by the pupil, being fixed in adjusted position by means of a wrench. This improved chair and desk have already been tested in practical use in the schools at Somerville and Brockton, Mass., and in Port Chester, N. Y., where they are said to have given great satisfaction. Further information relative to the improvement may be obtained of the Chandler Adjustable Chair and Desk Co., No. 7 Temple Place (rooms 43 and 44), Boston, Mass.

AN IMPROVED BIT BRACE.

The brace shown in the illustration has a readily detachable and detachable knob, with an easy bearing and excluding dust and dirt, an extensible and ad-

**KNUDSEN'S BIT BRACE.**

justable crank, a convenient and easy handle, an improved ratchet connection between the brace crank and the bit shank, with a new and efficient means of fastening bits of various sizes to the brace, and other novel features. The improvement has been patented by Mr. Andrew Knudsen, of Tucson, Arizona Territory. Fig. 1 shows the device in perspective, Fig. 2 being a sectional view of the knob, Fig. 3 a section of the jaw-holding and adjusting mechanism, Figs. 4 and 5 showing the ratchet mechanism, and Fig. 6 illustrating the bit-holding and adjusting mechanism. The bearing knob is socketed on its inner side and screwed to the reduced end of a screw cup or nipple, which has a socket to receive the bearing cone of the brace stem, extending through a tube. The two crank arms each comprise two members, one adapted to slide within the other, the parts being held together in desired po-

sition by thumb screws, the arrangement being such that by pushing the members well in the brace may be turned in small space, where but little power is required, while by pulling out the members greater leverage is obtained. The crank handle has an inner two-part tube, the parts of the handle being hinged together and having overlapping portions, spring-pressed pins within the handle projecting through the overlapping parts, the pins being pressed inward when the handle is to be removed. The lower end of one of the members of the lower crank arm terminates in a cylinder which turns on the ratchet head formed integral with the bit-holding shank, the rotation of which in either direction is provided for by a simple pawl and ratchet arrangement. A screw extending longitudinally through the ratchet head has at its upper end a turning knob by means of which the outer ends of the jaws may be forced together or allowed to spread apart, enabling the jaws to be clasped firmly to a bit and be very quickly adjusted. Each end of the jaws fits several sizes of bits, and by reversing the jaws they may be made to fit many sizes, several pairs of jaws being preferably provided for each brace.

The invention is designed to improve the entire construction of a bit brace, that it may be easily adjusted, efficiently operated and nicely and strongly finished.

Prevention of Lead Poisoning.

Lead poisoning among glass polishers due to the tin putty employed may, according to M. Gueroult, be entirely abolished by a new plan which has for the last eighteen months been adopted at the Baccarat Glass Works. The old tin putty that was used was a stannate of lead which was manufactured in special furnaces by oxidizing three parts of lead with one part of tin. In the new material two parts of metastannic acid are added for each part of putty, the lead being reduced to about a third of the old proportion. Under the former system numbers of workmen suffered from lead paralysis, and many had to leave the works entirely. Since the introduction of the metastannic acid putty, however, not a single case of lead poisoning has occurred.

AN IMPROVED CONVEYER OR ELEVATOR.

The construction shown in the illustration has buckets arranged for self-loading and self-dumping without breaking the material, which may be safely carried to any desired distance. The improvement has been patented by Mr. George H. Tench, of Pottsville, Pa. Chains moved by sprocket wheels carry buckets, each made in two parts, a body and an end gate, each part being rigidly secured to different links of the chain, so that when the latter passes over the wheels the end gate of each bucket opens and closes, as shown. As arranged for an elevator, one end of each bucket is open, and the lower ratchet wheel on which the chain is carried is inclosed in a casing connected with a chute through which the material to be elevated is fed, the buckets fitting snugly in this casing. As the filled bucket reaches the upper ratchet wheel, as shown in one of the views, the body of the bucket is tipped by the link to which it is attached, disengaging the body from the gate and permitting the contents of the bucket to pass into the delivery chute. The body and gate of the bucket remain separated during the passage of the chain around the wheel, the gate closing on the body when the parts again reach a vertical position on the chain. With the device arranged as a conveyer, as shown in one of the views, the horizontally traveling chains bring the buckets at the receiving end of the casing in contact with material passing down a chute, the end gate closing upon each filled bucket at the time it reaches its lowermost position. The bucket remains thus closed during its horizontal travel, until it reaches the next ratchet wheel, when the body swings into an annular position away from the gate, and the material is dumped into the delivery chute, the body and gate remaining disconnected until they again reach the horizontal position, the buckets then being upside down.

Gelatine Slides for Lantern Projection.

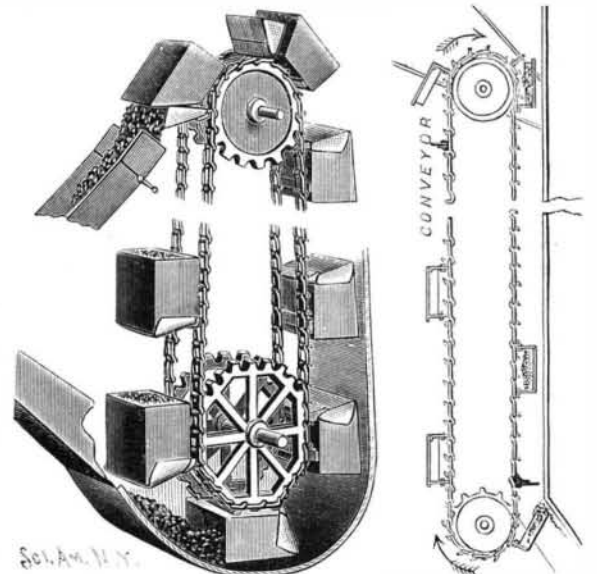
Prof. W. J. Waggner states that he has been very successful in making diagrams and pictures for projection by the magic and the solar lantern by printing the same, with the ordinary printing press and engraved blocks, on sheets of transparent gelatine. By this means excellent lantern slides from diagrams and engravings of nearly if not quite all kinds can be made and multiplied as rapidly and almost as cheaply as paper prints.

The extreme of cheapness in the production of pictures can be reached by assembling many engraved blocks together and printing all at once on large sheets of gelatine or celluloid, which can be afterward cut into pieces of suitable size.—*Amer. Jour.*

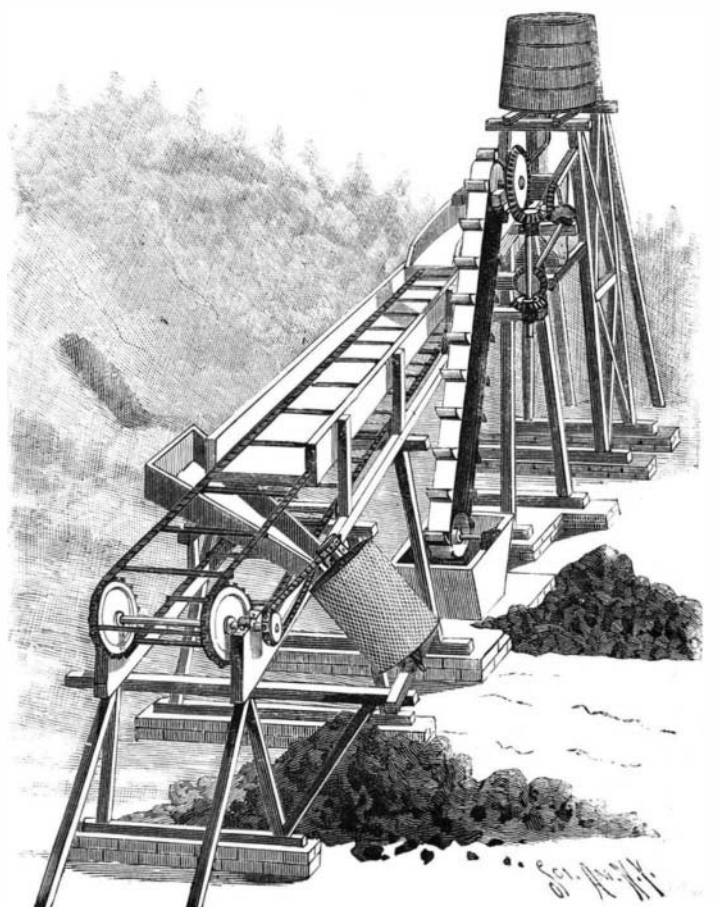
[The printing of engravings for lantern slides on sheet gelatine has been practiced for more than twenty years.—ED. SCI. AM.]

A MACHINE TO WASH AND SCREEN COAL.

The machine shown in the illustration is designed to thoroughly wash and screen coal with the use of a small amount of water, effectively separating the dirt and refuse from the coal. The improvement has been patented by Messrs. James Gallacher and George Lang, of Chickasaw, Ala. The open-ended trough at the top of the inclined framework has slots or grooves in its sides and bottom, in which run chains on rollers, the chains being carried by sprocket wheels and provided with transverse scrapers moving upward on the trough bottom, carrying the dirt and finer particles settling to the bottom of the trough as the coal is car-

**TENCH'S CONVEYER OR ELEVATOR.**

ried downward over the scrapers by the water. Connected by bevel gears with the shaft operating the upper sprocket wheel is an elevator, at the lower end of which is a hopper to receive the coal as it comes from the mine, and deliver it into a chute leading into the trough near its upper end. A valved water pipe leading from a tank above lets water into the chute with the coal, and a branch pipe discharges water into the extreme upper end of the trough above the chute, thus washing back any coal which may be carried above this point. At the lower end of the trough is an inclined rotary screen, driven from the lower sprocket wheel shaft, by which the coal may be screened, and the pea coal separated from the fine slack. The dirt and refuse carried to the upper end of the trough by the scrapers is delivered into a conveyer arranged at right angles and leading off to a suitable dumping place. The whole construction is comparatively inexpensive, and the machine has a large capacity and may be operated at small cost.

**GALLACHER AND LANG'S COAL WASHER.**