MECHANICAL INVENTIONS.

An improved gin saw gummer has been patented by Mr. John B. Clopton, of Elgin, Texas. The object of this invention is to furnish gin saw gummers, so constructed as to shear off the surplus metal in a solid piece from either side of the teeth, and thus bring the teeth to a point, making all the teeth of a uniform shape and size.

Mr. Samuel Potts, of Minneapolis, Minn., has devised an improved apparatus for driving millstone spindles. It is so constructed as to take the side draught of the driving belt off the spindles, and thus make it easier to keep the spindles vertical and the millstones in balance.

Mr. Micheal MacMahon, of Brooklyn, N. Y., has patented an improved compound steam engine, in which, by the arrangement and operation of suitable valves and ports, the exhaust steam is conducted from the one to the other side of the piston, and into a communicating low pressure or vacuum cylinder, for the purpose of equalizing the pressure upon the piston.

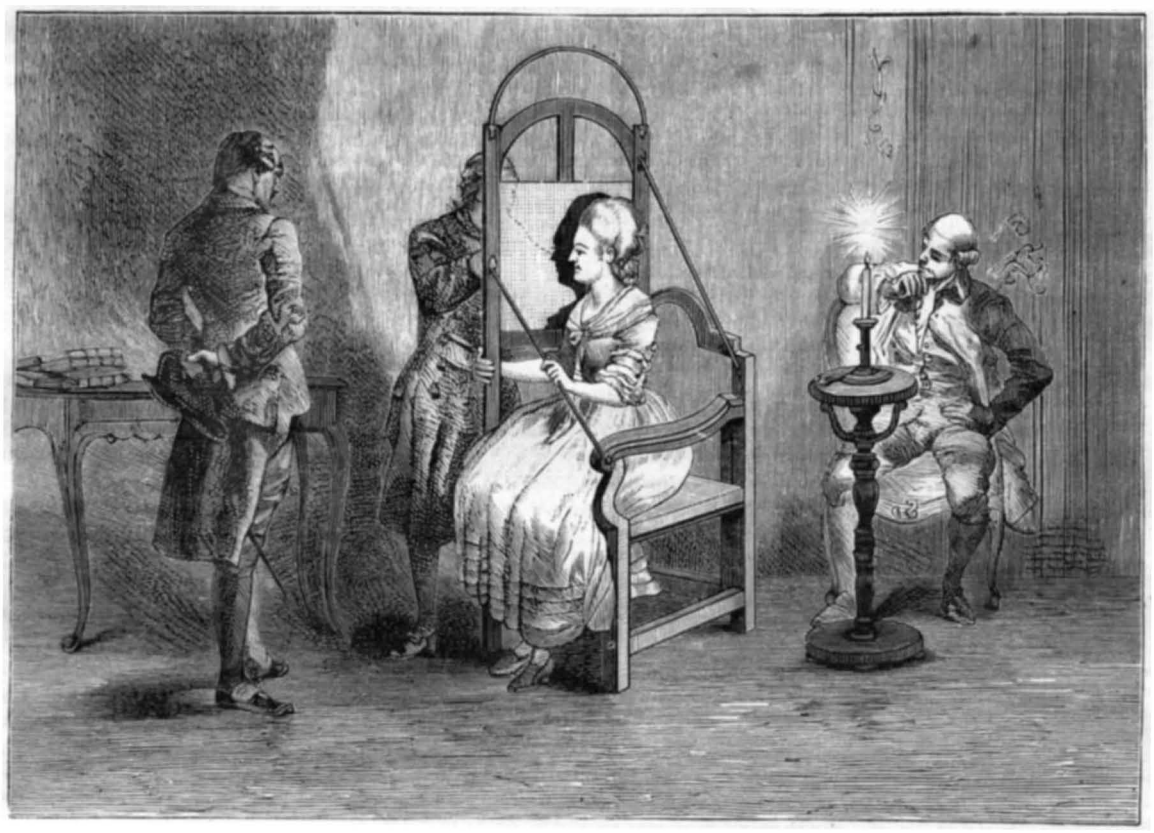
LAVATER'S APPARATUS FOR TAKING SILHOUETTES.

We reproduce, as a historical curiosity, an apparatus which was formerly much talked about, obtained a great success, and attracted the attention of savants and of physiologists, but which is entirely out of use at present.

Lavater, in his celebrated work on Physiognomy, describes it as an accurate and convenient machine for drawing silhouettes. The engraving represents the apparatus so well that it is not necessary to enter into a minute description of it.

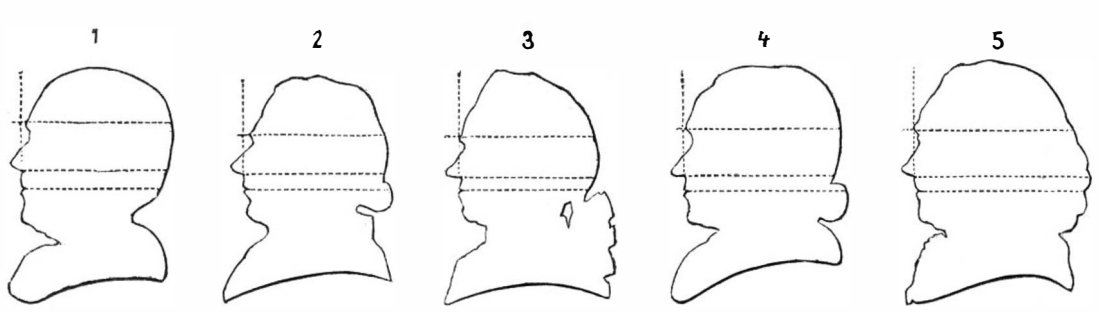
"The shadow," says Lavater, "is projected upon a fine paper, well oiled and dried, and placed behind a piece of plate glass, supported in a frame attached to the back of the chair. Behind this glass the artist is seated; he holds the frame with one hand and draws with the other."

The proportions of a silhouette, on the authority of Lavater, must be judged principally from the length and breadth of the face. "A correct and well proportioned profile should be equal in breadth and height. A horizontal line drawn from the point of the nose to the back of the head (provided the head be erect) should not exceed in length a perpendicular line which extends from the top of the head to the junction of the chin and neck. All of the forms which deviate sensibly from this rule are so many anomalies."



LAVATER'S APPARATUS FOR TAKING SILHOUETTES.—(From an ancient engraving of 1783.)

In support of these observations Lavater gives a number of specimens of silhouettes, and insists upon the conclusions which he deduces from their study. We give five of these specimens. In No. 1 Lavater sees an upright soul, an even temper, taste, and frankness; in No. 2 the contour of the nose carries the infallible mark of a good temper; in No. 3 we have clearness of judgment. This science of physiognomy appears puerile to us. It may have afforded an agreeable recreation, but nothing more, in a scientific point of view. Lavater nevertheless obtained a great success in Europe. A crowd of persons flocked to Zurich to see the celebrated philosopher and demand of him the secrets of their character and even of their destiny. Lavater with uncommon sagacity was seldom deceived in his judgments; it was thus that he divined the characters of Necker, Mirabeau, and Mercier. The impartial historian must acknowledge that if the work of Lavater is vague, undecided, and sometimes errs in the domain of the imagination, Lavater himself was a man of lofty spirit, faithful to the grand principle of morality. With the idea of unmasking character, and opening the human soul, as one would a book, to inquire into its depths, he produced a great sensation among his contemporaries.—*La Nature.*



SPECIMENS OF SILHOUETTES OBTAINED BY LAVATER.

New Passenger Locomotive.

One of the largest passenger locomotives built in this country has lately been completed by the Pennsylvania Railroad Company, at Altoona.

It is of the usual American type, with four driving wheels and a four-wheeled truck. The former are 6 ft. 6 in., and the truck wheels 33 in. in diameter. The total wheel base is 19 ft. 5 in., that of the driving wheel 7 ft. 9 in., and of the truck 6 ft. 6 in. The cylinders are 18 in. in diameter by 24 in. stroke; steam ports, 16¾ x 1½ in.; and exhaust ports, 3¼ in. wide. The maximum travel of valve is 5½ in.

The boiler shell is 50 in. outside diameter on smallest ring, with 201 1⅞ in. tubes 10 ft. 11¾ in. long. The fire box is placed on top of the frames, and the springs and equalizing levers are hung below the main driving boxes. The fire box can thus be made the full width between the tires, only enough space being left between it and them for clearance. The grate is 10 ft. long by 41¾ in. wide. The height of fire box is 46 in. from bottom of mud ring to under side of crown sheet. As the fire box is intended to burn anthracite coal, it has a water grate. The crown sheet is braced or supported with crown bars and sling stays. Over the crown sheet is a wagon top 7 inches high. The height of center of boiler is 7 ft. 5¼ in. from top of track. The plates in the shell of the boiler are ⅜ in. thick, excepting the outside crown sheet, which is $\frac{7}{16}$. The whole boiler is made of steel, excepting the tubes, rivets, and braces. The chimney is 18 in. in diameter and 15 ft. high from top of track. The heating surface in fire box is 125 square feet, in the tubes 1,080, the total being 1,205 square feet. The cross heads have double instead of the usual quadruple guide bars. One of these is placed above and the other below each cross head. The bars are 4½ in. wide. The engine is worked with a steam reversing gear, having two cylinders 6 in. in diameter by 11½ in. stroke. One of these is a steam cylinder, and the other is filled with oil to hold the valve gear in any position. The operation of this reversing apparatus could not be described so as to be understood without a drawing. The boiler is fed with two No. 8 Sellers injectors, and has no pumps. The dome is covered with a wrought iron casing without any mouldings, after the style of European locomotives. The driving boxes are made of wrought iron The driving axles are 8 in. in diameter, and the journals are 10½ in. long. The coupling rods are fluted, and have solid ends with composition metal bushings pressed into them. The holes which receive these bushings are bored out, and are then slotted, as they would be to receive a key. The bushings are cast in an iron mould of exactly the right size, which is also slotted for a key. A projection corresponding to a key is thus cast on the bushing and fits in the keyway in the rod, the former being pressed into the hole in the rod after its bearing for the crank pin is bored out. The ingredients of the composition are 16 parts by weight of block tin, 1 of copper, and 2 of antimony. The crank pin journals for the coupling rods are 3¼ x 3¼ in., and the main journals are 4⅝ in. in diameter by $3\frac{15}{16}$ in. long. The engine has Westinghouse driving wheel brakes. The driving wheel centers are made of cast iron with steel tires, but a set of wrought iron wheels with steel tires made by Krupp have been imported. The total weight of the locomotive in working order is 92,700 lb., of which 65,300 is on the driving wheels.

If this engine works satisfactorily it is intended to build half a dozen more of them at once. They are intended for service between Philadelphia and New York.—*Railroad Gaz.*

The Stevens Car Brake Decision.

The opinion of Judges Bond and Morris, in the cases of Asahel Emigh against the Baltimore and Ohio Railroad Company, and Francis A. Stevens against the same, for infringement of the patent of Stevens' railroad car brake, was filed in the Clerk's Office of the United States Circuit Court, Baltimore, Md., March 17. The suit has been pending since February, 1864. Some years thereafter a decision was rendered in favor of the complainants, and the matter was referred to a master for examination and report. The report was made and an account stated, to which the respondent filed exceptions. The opinion just filed overrules the exceptions, and decrees in favor of the complainants at the rate of $25 per car per year for the use of the Stevens brake, amounting in the aggregate to $87,775.

RECENT INVENTIONS

Mr. Charles O. Allen, of Grand Rapids, Mich., has patented an improved carpet sweeper. The invention consists in the peculiar construction of the case, in a revolving comb combined with the brush and drive wheel, in the peculiar construction of the comb, and in the construction of an elastic spring bail combined with the handle and the carpet sweeper case.

Mr. John Murphy, of Columbus, Ohio, has patented an improvement in the class of pavements composed of stone blocks laid upon a concrete or other water-tight foundation. The pavement is formed of stone blocks, broken stone, and grout, applied and combined.

Mr. George H. Herrington, of Wichita, Kan., has patented a stilt employing an adjustable spring, which may be used at the will of the operator for leaping great distances and heights, and for walking or running with great rapidity and ease.

Mr. Frank F Parker, of Gardner, Mass., has patented an improved folding chair which may be folded or collapsed so as to occupy less space whenever an economy of space becomes desirable, as in shipment of the goods, etc. The improvement consists in a chair composed of five principal members on each side, of which the back bars and hind legs are arranged on each side of the chair in the same plane and carry the seat, while the front legs and arms are in another plane, and the front and rear legs and the back bars are each jointed to a crossbar, which rests between the plane of the fore legs and hind legs.

Mr. James A. Bonsack, of Bonsack's, Va., has patented a cigarette machine which uniformly feeds and distributes the tobacco upon a continuous paper ribbon, then forms the same into a continuous roll, then pastes the paper around it, and, finally, cuts it off into definite lengths, all in a series of consecutive operations.

Mr. Samuel Bonser, of Dover, N. H., has patented an improved portable force pump for extinguishing fires, washing widows, wetting the roofs of buildings, sprinkling grass plats, plants, and trees, with water or other liquids. It is so constructed that it can be readily moved from place to place.

An improved ornamental bridle buckle has been patented by Mr. Thomas Noble, of Todd's Point, Ill. The object of this invention is to provide a device that, while serving both as buckle and ornament, makes the bridle stronger at the crossing of the brow-band, throat-latch, and bit-strap, by preventing the necessity of making a hole in the throat-latch or brow-band for the engagement of a buckle tongue.

A stock car that can readily be adapted for transporting cattle or other stock, or mixed stock, and can easily be converted into an ordinary freight car, has been patented by Mr. Thomas Noble, of Todd's Point, Ill. The invention consists of an improved folding feed-trough and supporting braces, movable water-trough, adjustable shutter or feeding platform, and adjustable and removable stall gates.