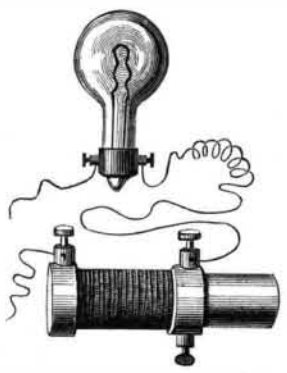
RECENT INVENTIONS.

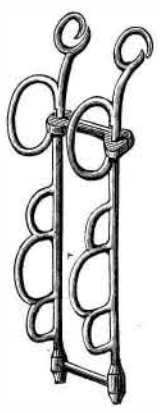
Rheostat for Electric Lamps.

Among recent inventions we find a rheostat that consists of a spiral coil connected in an electric circuit and fitted with an adjusting device, by which a greater or less number of the wires of the coil may be brought into contact, thus varying the resistance. In the annexed engraving A is a coil formed of fine wire, preferably German silver. A support is provided, consisting of a short rod of non-conducting material having a fixed and a loose collar; upon this rod the fine wire is wound in a loose spiral, and it has its ends connected to the fixed and loose collars. The loose collar is fitted with a set screw for securing it in any position in the length of the rod. By moving the loose collar out on the rod the coil is stretched and opened, or by a reverse movement the coil is closed, so that there is contact between the coils. The circuit wires connect to the ends of the coil at the fixed and sliding collars. The resistance offered by the coil depends upon the length of the coiled portion opened by adjustment of the slide. The closed portion is short circuited, and allows the current to pass freely. This regulator may be used for electric currents generally, and is specially adapted for electric lamps. It is the invention of Mr. Patrick H. Fox, of New York city.



Bridle Bit.

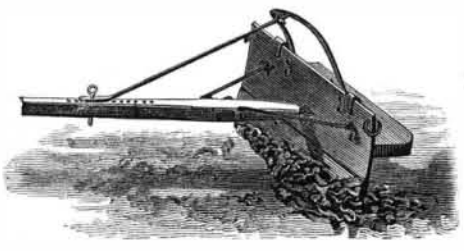
A novelty in the construction of bridle bits, by which the attachment of the cheek strap, curb strap, check strap, and reins to bits, and their detachment therefrom, are greatly facilitated, has been patented by Mr. Ellis Little, of New York city. The mouth-piece is made in two parts, fitted to each other and connected by screws; and in the adjacent sides of the ends of these parts are formed half-round notches to serve as bearings for the journals of the side bars. The journals of the side bars are made longer than the thickness of the ends of the mouth-piece, so that the piece may have a slight up and down movement upon the bars. Upon the upper end of the side bar is formed an open ring, the ends of which are overlapped and beveled on their adjacent sides, and are such a distance apart that an ordinary strap can be slipped between the overlapped ends upon the side bar. At the upper side of the end of the mouth-piece is formed a curved hook, the free end of which is beneath the mouth-piece and is bent upward so as to be parallel with the side bar.



Upon the rear side of each end of the mouth-piece is formed a projection to cover the end of the curved hook, so that a strap cannot come out when the bit is in use. With this construction, by turning the side bar, so as to bring the curved hook into line with the mouth-piece, and slipping the mouth-piece upward, the rein can be readily slipped over the hook and attached or detached, and all the straps may be attached and detached without loosening a buckle.

Road Scraper.

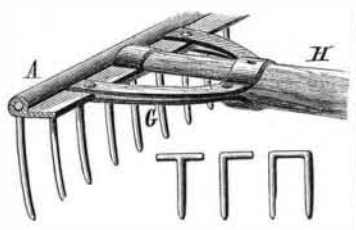
A road scraper that is admirably adapted for its intended purpose has been patented by Messrs. George Gregory and George Austin, of Skaneateles, N.Y. The body of the scraper is made of a plate of boiler iron, and to its lower edge is secured a cutting blade of steel. The tongue is hinged by a hook to a loop in the center of the scraper, and brace rods hinged in the same manner to near the ends of the scraper have at their outer ends hooks that engage with eyes placed



on the side of the tongue, P. By this means the tongue can be turned toward either end of scraper, and held by the rods to give the scraper a slanting position in relation to the tongue. The body of the scraper is held and adjusted vertically by a rod hinged to the top of the handle, and passing down to a pin placed in one of a series of holes in the tongue. The scraper is simple in construction, strong, and durable, and is especially adapted to scraping roads and turnpikes. It is easily taken apart without any tools, and needs but little room for storage.

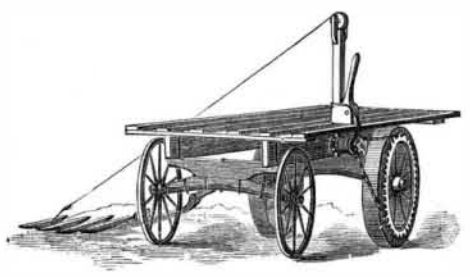
A Novel Rake.

Mr. Olof Bergstrom, of Finshyttan, Sweden, has patented an improved rake for raking hay, earth, etc. A metal plate, A, is provided with a series of apertures through which the teeth are passed, as shown in the engraving. The teeth may be made U, L, or T shaped, the transverse pieces resting on the plate. After the teeth have been inserted in holes in this plate, the outer longitudinal edge of the head plate, A, is turned over the transverse pieces of the teeth, forming a hollow head at the outside of the plate, by which the teeth are held in place and the plate strengthened. The handle socket is formed of two U-shaped braces, G, provided with a bend in the middle. One of these bands is placed on the upper and the other on the under side of the head plate, and riveted, the rivets passing through a metal band bent to form a semicircular socket on the plate for receiving the end of the handle. The U-shaped braces are also riveted on each side of the bends, forming the handle loop, H.



New Hay Loader.

A machine for raising hay from the ground and carrying it to the rack of a wagon to be loaded, has been patented by Mr. Geo. Meader, of Fowler, Ind. A frame is secured on the bolsters of the wagon, and a cross beam secured to the under side of the frame projects a short distance from it, between the front and hind wheels. A rake is pivoted to the end of the beam by curved bars, that allow it to run level with the ground, to be drawn under the bunches of hay. A rope attached to the outer end of the rake passes



over a guide pulley in the top of a standard on the side of the wagon opposite the rake, and down to a winding drum that is put in gear by means of a clutch and lever with a shaft drive by a chain belt from one of the wagon wheels. When the rake has gathered its load, the lever is moved and the winding drum put in gear, and the rake with its load is raised to the wagon. When the clutch lever is shifted to disengage the drum, it binds the winding rope against the standard and acts as a brake to regulate the descent of the rake.

Tiles.

Tiles are thin slabs of baked clay, of whose manufacture we gave a description in these columns some time ago. They are extensively used in Europe for various purposes—roofs, gutters, pavements, drains, house siding, lining flues, furnaces, etc. They assume many forms; some have a local character, others are made in imitation of the antique.

Plain tiles are usually made five-eighths of an inch in thickness, 10½ inches long, and 6¼ inches wide. They weigh from 2 to 2½ pounds each, and expose about one-half to the weather. Seven hundred and forty tiles cover 100 superficial feet. They are hung upon the lath by two oak pins inserted into holes made by the moulder. Plain tiles are now made with grooves and fillets on the edges, so that they are laid without overlapping very far, the grooves leading the water. This is economical of tiles, and saves half of the weight, but is subject to leak in drifting rains, and to injury by hard frosts.

Pan tiles, first used in Flanders, have a wavy surface, lapping under and being overlapped by the adjacent tiles of the same rank. They are made 14½ x 10½; expose 10 inches to the weather; weigh from 5 to 5¼ pounds each; 170 cover 100 square feet of surface.

Crown, ridge, hip, and valley tiles are semi-cylindrical, or segments of cylinders, used for the purposes indicated. A gutter tile has been introduced in England, forming the lower course, being nailed to the lower sheathing board or lath.

Siding tiles are used as a substitute for weather-boarding. Holes are made in them when moulding, and they are secured to the lath by flat-headed nails. The gauge, or exposed face, is sometimes indented to represent courses of brick. Fine mortar is introduced between them when they rest upon each other. Siding tiles are sometimes called weather tiles and mathematical tiles; these names are derived from their exposure or markings. They are variously formed, having curved or crenated edges, and various ornaments, either raised or encaustic.

The glazed tiles are inferior to slate, as they imbibe about one-seventh of their weight of water, and tend to rot the lath on which they are laid. Good roofing slate only imbibes one two-hundredth part of its weight, and is nearly waterproof.

Encaustic tiles are ornamental tiles, having several colors. A mould is prepared which has a raised device on its face, so as to leave an impression on the face of the tile cast therein. This intaglio recess is then filled by a trowel with clay compounds, in the liquid or slip stage, and which retain or acquire the required colors in baking. The tile is then scraped, smoothed, baked, and glazed. This tile is common in ancient and modern structures. The glazing came from the Arabs, who derived it from India, and primarily from China.

Drain tiles are either moulded flat and bent around a former to the proper shape, or are made at once of a curved form by pressing the clay through a dod or mould of the required form. The latter plan is now generally used.

Various machines are used in the manufacture of tiles. One of these has two iron cylinders, around which webs of cloth revolve, whereby the clay is pressed into a slab of proper thickness without adhering to the cylinders. It is then carried between two vertical rollers, which impart a semi-cylindrical or other required shape, after which the tiles are polished and finished by passing through three iron moulds of horseshoe form, being at the same time moistened by the dripping of water from a tank above, and finally conducted off upon an endless web.

In more recent machines the tiles are generally formed at one operation, by pressing. A charge of clay sufficient to form a number of tiles is placed in a cylinder and subjected to the action of a piston, which forces it out as a continuous tube, after which it is cut in lengths by a wire. The most modern machines generally employ a screw, which serves at the same time to mix the clay and force it through the mould; the process of feeding and moulding is thus rendered continuous, no time being lost in charging the cylinder.

One of the most improved of modern machines consists of a vertical pug mill, containing rotary curved knives and a screw follower for forcing the clay through the dies. The pipe, on issuing from the dies, is carried forward by a series of rollers having hollowed surfaces, and is cut into lengths by a rocking frame provided with cross wires. In another machine the clay is forced through the ties by two plungers working in boxes at the base of the pug mill, and reciprocated by cranks set at right angles to each other on the same shaft; two sets of dies are employed; one plunger being retracted to allow its box to receive a supply of clay, while the other is engaged in forcing the clay through its die.

Tiles are usually placed in the kilns in bunches of twelve, and laid alternately cross and length wise. The spacing of the tiles allows the circulation of the heat between them, and the circular form of oven is found well adapted to secure uniformity of heat. The kiln is protected on the windward side to prevent uneven urging of the fires. The oven being set, the doorway is bricked up and daubed, the fires kindled and kept burning, moderately at first, and then more freely. The usual time for firing is thirty-eight hours. Three days are then allowed for cooling, and they are afterward taken out of the kiln. Those tiles that are to be made of a grayish color are thus treated: It having been ascertained that the tiles are burnt enough, and while still red-hot, a quantity of small fagots of green alder with the leaves on is introduced into each flue. The flue holes are then well secured, and the holes in the roof each stopped with a paving tile, and the whole surface is covered with four or five inches of sand, on which a quantity of water is thrown, to prevent the smoke from escaping anywhere. It is this smoke which gives the gray color to the tiles, both internally and externally. The kiln is then left closed for a week, when the sand is taken off the top, the door and roof holes are opened, as also the flue holes, and the charcoal produced by the fagots taken out. Forty-eight hours after the kiln is cool enough to allow the tiles being taken out and the kiln charged again. Whenever any of the tiles are to be glazed they are varnished after they are baked; the glaze being put on, the tiles are put in a potter's oven till the composition begins to run. The glaze is generally made from what are called lead ashes, being melted and stirred with a ladle till it is reduced to ashes or dross, which is then sifted and the refuse ground on a stone and resifted. This is mixed with pounded calcined flints. A glaze of manganese is also sometimes employed, which gives a smoke-brown color. Iron filings produce black; copper slag, green; smalts, blue. The tile being wetted, the composition is laid on with a sieve, and the tile subjected to the heat necessary to vitrify the application.—*Pottery and Glassware Reporter.*

Malarial Germs.

The cause of malarial diseases is said to have been discovered by Prof. Laveran, a French physician of Val-de-Grace. It is a very minute organism, named by him *Oscillaria malariæ*. M. Richard, who announced the discovery in the French Academy of Science, has found these microbes in all the fever patients of the Philippeville hospital in Algeria. These are located in the red blood-corpuscles, and completely destroy their contents. They can easily be rendered visible by treatment with acetic acid, but otherwise it is difficult to detect them in the corpuscles. They look like a necklace of black beads, with one or more projections, which penetrate the cell of the corpuscle, and oscillate or move like whips.