

substantially as described. 12th. In a magnetic separator, the combination with a magnet and its armatures adapted to be moved over said magnet, of standards for sustaining said magnet, a hopper sustained by the upper ends of said standards, a feed pan, for delivering the ore on to the armatures, and a suitable tappet wheel for imparting an adjustable shaking motion to said feed pan, substantially as described.

No. 41,166. Breast Strap Slide for Harness.

(*Maille pour courroies d'attelées de harnais.*)

James Ansdell Macrae, Regina, North-west Territories, Canada, 10th December, 1892; 6 years.

Claim.—A breast strap slide, consisting of a hollow case through which the breast strap passes, and provided upon one side thereof with a snap hook or other means of attaching it to a neck-yoke or ring thereof, and upon the other side thereof a keeper for attaching or securing the martingale thereto.

No. 41,167. Thill Tug. (*Porte-limonière.*)

The Adjustable Metallic Lug Company, Boston, assignees of Daniel Rupert Porter, Chelsea, both in Massachusetts, U.S.A., 10th December, 1892; 6 years.

Claim.—1st. In a thill tug, the combination of a main or inner section provided with a buckle at the upper portion thereof, and a swinging or outer section hinged to the lower end of said main section and provided on its outer side with a projecting portion adapted to surround a strap, as set forth. 2nd. In a thill tug, the combination of a main or inner section provided with a buckle at its upper portion, a swinging or outer section hinged to the lower end of the said main section and provided on its outer side with a projecting portion adapted to surround a strap, and a strap attached at one end to the upper portion of the main section, and having its free end passed through the projecting portion of the swinging section, as set forth.

No. 41,168. Art of Excavating Shafts.

(*Art de creuser les puits.*)

John D. Long, assignee of David Nathaniel Long, both of Buffalo, New York, U.S.A., 10th December, 1892; 6 years.

Claim. 1st. The herein-described mode of excavating shafts for mines or other purposes, which consists in sinking a test pit to the depth required, then cutting a tunnel to intersect the bottom of the test pit and thereby form an outlet for the debris, then excavating the rock or earth from the bottom of the test pit upward until the shaft is complete, substantially as described. 2nd. The herein-described mode of excavating shafts for mines or other purposes, which consists in sinking a test pit to the depth required, then forming an outlet for the debris at the bottom of the test pit, then lowering an explosive down to the required depth in the test pit by means of a connecting wire, then exploding the same by a current of electricity which removes a sufficient amount of earth or rock to give the required diameter to the shaft, then removing the debris through the outlet, then repeating the operation above the removed portion of the shaft as often as may be required until the shaft is completed, substantially as described. 3rd. The herein-described mode of excavating shafts for mines or other purposes, which consists in sinking a test pit to the depth required, or to a tunnel or outlet for the debris, then lowering the explosive by means of a wire connected thereto to the required depth in a can having a valve of flexible material above the top adapted to fit the diameter of the test pit, then filling the test pit above the valve with water, then exploding the same, then removing the debris through the outlet, and repeating the operation until the shaft is completed, substantially as described.

No. 41,169. Storage Battery. (*Accumulateur.*)

Charles James Hartmann, South Orange, New Jersey, U.S.A., 10th December, 1892; 6 years.

Claim.—1st. In an electrode for storage batteries, the main conducting plate A, constructed with diamonds or pyramidal depressions substantially as specified. 2nd. In an electrode for storage batteries, the central conducting plate A, constructed with serrated or fluted diamond or pyramidal depressions, substantially as specified. 3rd. In an electrode for storage batteries, the central conducting plate A, constructed with diamond or pyramidal depressions, serrated or fluted upon their surfaces and with burred or flanged perforations, substantially as specified. 4th. An electrode for storage batteries, constructed with the lug B, extending from the central portion of the top plate A to its outer edge, substantially as and for the purposes specified. 5th. In an electrode for storage batteries the conducting plate, constructed with the central portion A, the end folds A³, the flaps A¹ and A², and the bottom fold A⁴ arranged as shown, to fold upon the central portion A, so as to leave a space between for active material, and the lug B, substantially as shown and described. 6th. In an electrode for storage batteries, the conducting plate, substantially as shown and described, consisting of the central portion A, and flaps A¹ and A², the end folds A³ and A⁴ and the lug B, the portion A, A¹ and A², being covered with depressed serrated pyramids, a provided with flanged perforations, substantially as and for the purposes hereinbefore specified. 7th.

An electrode for storage batteries, consisting of the conducting plate, constructed with side flaps A¹ and A², and arranged to fold around a central portion A, for the purpose of securing active material between their surfaces, and perforated and formed into diamond or pyramidal depressions, substantially as and for the purposes set forth. 8th. An electrode for storage batteries, consisting of a conducting plate constructed with pyramidal or diamond shaped depressions, alternating in direction and arranged to fold one upon the other, so that the apex of one pyramid or diamond coincides with and enters the depressions of another pyramid or diamond opposite it, and retains active material between their surfaces, substantially as and for the purposes set forth. 9th. An electrode for storage batteries, consisting of a central conducting plate A, and the side flaps A¹ and A², constructed with serrations and arranged to fold the one upon the other substantially as and for the purposes specified. 10th. An electrode for storage batteries, consisting of a central conducting plate A, and side flaps A¹ and A², constructed with flanged or burred perforations substantially as and for the purposes specified. 11th. An electrode for storage batteries consisting of the central plate A, side flaps A¹ and A², constructed with serrations or flutes, and flanged perforations, substantially as and for the purposes specified. 12th. The conducting plate A³, constructed with serrations D³, and grooves or pockets E³, combined and arranged to operate, substantially as described. 13th. An electrode for storage batteries, consisting of the doubly serrated or grooved plate A³, substantially as described, and the encasing conducting plates F and G, all combined and arranged to operate, substantially as hereinbefore set forth. 14th. The storage material for batteries, composed of resin or other similar gum, dissolved by alkali and mixed with active material, dried and made porous by neutralizing the alkali with acid, substantially as hereinbefore set forth. 15th. An electrode for storage batteries, consisting of the central conducting plate A³, serrated and grooved on its faces, the serrated encasing and conducting plates F and G, and the active storage material, pressed into the internal serrations D³, and the grooves E³, all combined and arranged to operate, substantially as described. 16th. In an electrode for storage batteries, the plate A³, constructed with serrations D³, grooves E³, and flanged perforations C³, all combined and arranged, substantially as set forth. 17th. In an electrode for storage batteries, the plate A³, constructed with flanged perforations C³, substantially as described. 18th. In an electrode for storage batteries, the encasing plates F and G, constructed with serrations D³, and flanged perforations C³, arranged substantially as described, to encase the conducting plate A³, and to hold storage material between the said conducting plate A³, and the encasing plates F and G, substantially as set forth.

No. 41,170. Heating Apparatus for Railway Carriages. (*Appareil de chauffage pour chars de chemin de fer.*)

Thomas Steward Lapraik, Derby, England, 10th December, 1892; 6 years.

Claim. 1st. The combination of the railway carriage heating apparatus, substantially as herein described, and according to figs. 1 and 2 of the accompanying drawings. 2nd. In a railway carriage heating apparatus, the combination of the cylinder *a*, steam jacket *b*, pressure pump *c*, feed pipe *e*, steam pipe *d*, stop cocks *f*, *g*, *i*, coils *j*, pipe *h*, tank *k*, substantially for the purpose herein specified and according to the accompanying drawings. 3rd. The combination of the railway carriage heating apparatus, constructed of any material, shape, or with any modification of the various parts, substantially as herein described and for the purpose specified.

No. 41,171. Combination Lock. (*Serrure à combinaison.*)

Henry Harris Daniels, Cincinnati, Ohio, U. S. A., 10th December, 1892; 6 years.

Claim.—1st. In a combination lock, the combination of two or more tumblers, each tumbler consisting of tumbler disc N, tumbler ring F, and tumbler support K united together, substantially as described, the tumbler support being provided with the pinion K², arranged to mesh with the notches or teeth F² of the tumbler, and the rod C¹⁶ provided with the projecting teeth C²⁹, and mechanism substantially as described, for enabling the rod C¹⁶ to be longitudinally reciprocated for bringing said teeth C²⁹ into contact with their respective pinions K², and for rotating the rod C¹⁶, substantially as and for the purposes specified. 2nd. In a combination lock, the combination of two or more tumblers, each tumbler consisting of a tumbler disc N, tumbler ring F, and tumbler support K united together, substantially as described, and a tumbler operating column having rod C¹⁶ carrying teeth C²⁹, and the finger disc C¹⁵ arranged to move to and from the tumblers provided with mechanism for enabling the rotation of the said disc when at one end of its reciprocal movement, to rotate a given tumbler, substantially as and for the purposes specified. 3rd. In a combination lock, the combination of two or more tumblers, each consisting of a tumbler disc N, tumbler ring F, and tumbler support K united together, substantially as described, and tumbler operating column having rod C¹⁶ carrying teeth C²⁹, and the finger disc C¹⁵ arranged to move to and from the tumblers, provided with mechanism for enabling the rotation of the said disc when at one end of its reciprocal movement to rotate a given tumbler, and provided with means, substantially as described, for elastically returning the disc after a given tumbler