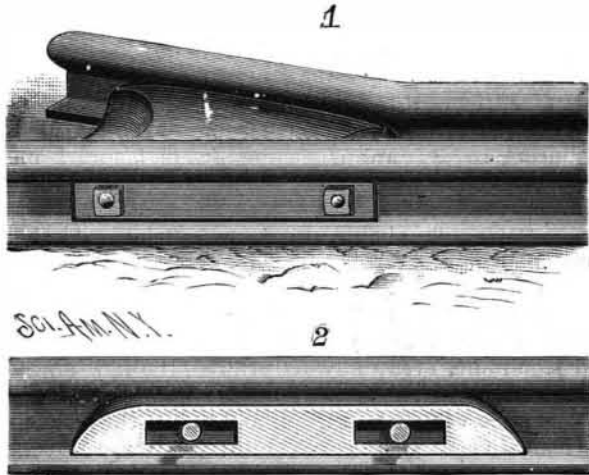


**AN IMPROVED BLOCK FOR GUARD RAILS, ETC.**

A spacing and fastening attachment for guard rails, switch rails, or frogs, designed more especially for use in fastening guard rails to the rails of the main track, has been patented by Messrs. Ethelbert J. Moore and Aaron R. Paulus, of Villisca, Iowa, and is illustrated herewith, Fig. 1 showing the block applied between a main rail and guard rail when the end of the latter is bent to extend at an angle from the main rail, and Fig. 2 showing a longitudinal view of the attachment. The side edges of the block are formed to fit closely against the webs of the rails on either side, and its upper face is concave, while the lower face is of proper contour to

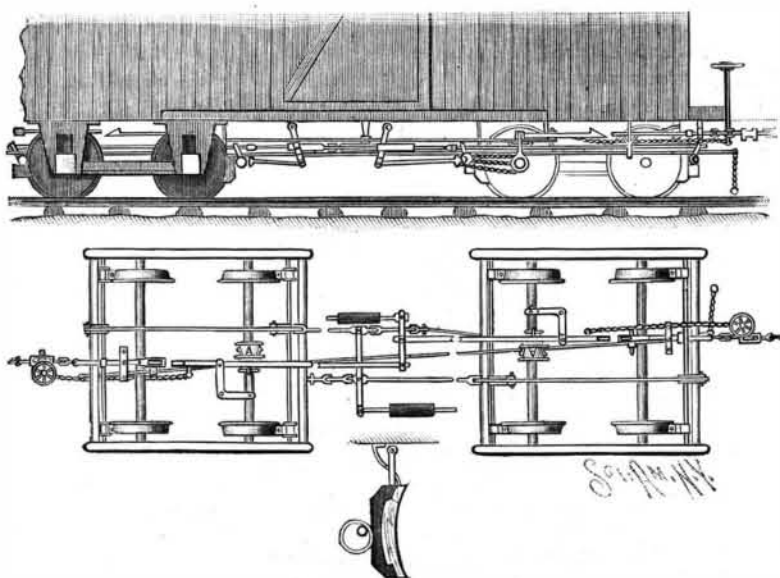


MOORE & PAULUS' FASTENING BLOCK FOR GUARD RAILS, SWITCH RAILS, AND FROGS.

fit snugly upon the upper faces of the rail bases, and each end is rounded off, the block having transverse elongated slots registering with apertures in the rails. The block is held in position by bolts passed through these apertures, fish plates being placed between the outer faces of the rail and the bolt heads and nuts, the guard rail being held firmly to the main line rail. The space between the approaching faces of the rail treads, should the guard rail tread become worn away, may be adjusted by simply loosening the nuts of the bolts and moving the block. By the use of this attachment it will be impossible for pedestrians to catch their feet in the jaw formed by approaching sections of rails, as shown in Fig. 1.

**AN IMPROVED AUTOMATIC CAR BRAKE.**

A brake designed to act automatically as the tension on the drawbar is released, the parts being so arranged that the brakes of each car of the train may be applied at once if desired, or so that any car breaking away from the train would be immediately stopped, is illustrated herewith, and has been patented by Messrs. Thomas De Coar and William Keast, of Russell Gulch, Col. An inclined face wheel is keyed to one of the vehicle axles, and rigidly connected with a sleeve upon which is a chain wheel carrying sockets to hold shoes adapted to be brought into frictional contact with the inclined-faced wheel. The chain wheel has a collar engaged by a lever connected to a bell crank lever connected to a drawbar, the latter having a hook at one end adapted to engage an eye on the inner end of a flat bar mounted at the end of the car, the outer ends



DE COAR & KEAST'S AUTOMATIC CAR BRAKE.

of such bars being connected with the coupling rods. The inner end of this drawbar is connected to a lever pivotally mounted between the car trucks, a similar construction being employed with each car truck, and this lever is normally held at about right angles by a spring, while chains connect the chain wheel to a perpendicular lever, which is connected with a horizontal lever that operates, through a link, the brake bars. These are provided with eccentric bearings, as shown

in the small figure, with side flanges, between which the blocks carrying the brake shoes rest, the blocks being suspended from the truck frame by links, and normally held from engagement with the wheels by springs. Beneath the drawbar connected to the bell crank lever is arranged a safety rod or chain, connected to lever arms suspended upon shackles, and to these levers are connected expanding fingers bearing against the under side of the bars connected with the coupling rods, and a forward rod or bar connected with the engine or tender, so that the engineer, in case of danger, may draw upon the bars to rock the lever arms, and thus throw the two sections of the friction brake into engagement with the car wheels. The construction is such that, as long as the bars connecting the chain wheel on the car axle with the couplers are under tension, the lever pivoted between the trucks will be held substantially at right angles to the car, but when the tension is slackened a spring forces the parts into position whereby the brakes are applied. These automatic brakes are also designed for application on street cars.

**New Steamers for the New York Trade.**

The Hamburg-American Steamship Company is having two steamships built of 10,000 tons each, and 12,500 horse power, one at Stettin and the other at Birkenhead. These steamers are to be ready for service a year hence. They will have a length of 460 feet and will be 56 feet wide and 38 feet deep. Eleven bulkheads will divide the vessels into watertight compartments. Should two even of the largest compartments be flooded, the vessels will still be safe and navigable. The two engines will be in separate compartments, subdivided by a watertight bulkhead, and each set of machinery will drive a separate screw. The steamers will have double bottoms, and will be made of as light a draught as possible, to enable them to run up the Elbe as far as Hamburg, and to cross Sandy Hook at all tides. The boilers will be in three watertight compartments, cut off from each other.

**Nickel Plating.**

The following solution for electro-plating with nickel is used by several firms in Hainault: 500 grms. of nickel sulphate, 365 grms. of neutral ammonium tartrate, 2.5 grms. of tannin dissolved in ether, and 10 liters of water. One and one-half liters of water are first added, and the mixture boiled for fifteen minutes. The remainder of the water is then added, and the whole filtered. The *Electrician* says: "Solution yields an even white deposit, which is not brittle, and the cost of which is hardly more than that of electro-plating with copper."

Nickel plating is now effected at several works in Belgium with the following bath: Sulphate of nickel, 1 kilog.=2.2 lb.; tartrate of ammonia, 0.725 kilog.; tannic acid with ether, 0.005 kilog.; water, 20 liters=4.4 gallons. With this formula a thick coat is deposited on all metals in a short space of time and by a weak current.

**Levy's Hydroplastic Process.**

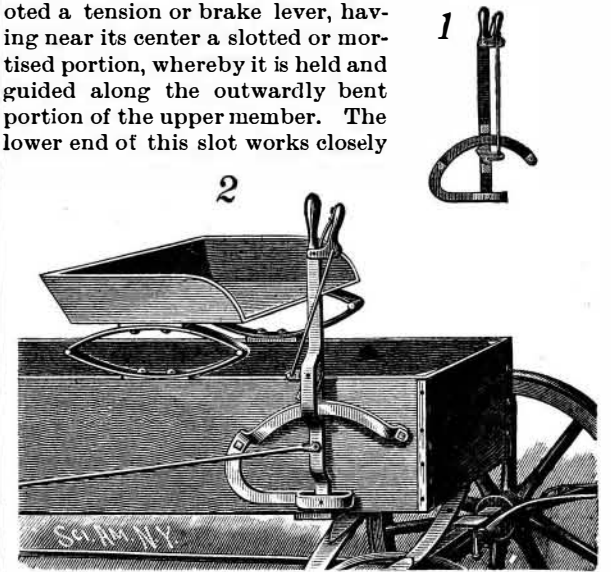
The object of Mr. Abraham Levy's hydroplastic process is the deposition of thin coats of metal upon other metals without having recourse to the use of batteries or dynamos. It is based upon a double decomposition, and permits of the electrolysis of all metals. In order to deposit a layer of nickel, for example, a solution of the simple or double salt of this metal is used. After being scoured, the iron or copper object to be nickel coated is introduced into this bath and is suspended from a zinc wire which partially enters the liquid. The zinc is attacked and the object becomes covered with a regular layer of nickel, which keeps increasing with the attack of the zinc. Iron may be substituted for the zinc. In certain cases, as in copper-coating cast iron, it is preferable to employ an alkaline bath instead of an acidulated chloride.—*Revue Scientifique.*

**Queer Fancy of a Collector.**

A man in Denver, Colorado, named Lyon, is said to have a collection of over seven hundred pens, no two alike. Some are of steel, some gold, some amalgam, and so on. There are pens pointed fine enough to make lines of microscopic delicacy, and others intended for men who use the first personal pronoun a great deal in their correspondence. The collection embraces specimens from England, Ireland, Scotland, Germany, and other European countries, besides America and Canada. Some are in shape like shovels, others resemble a section of stove pipe, and others are delicate and diminutive.

**AN IMPROVED CLUTCH FOR WAGON BRAKES.**

A simple and inexpensive device whereby the tension lever of a wagon brake may be held at any point in the arc of a circle without the use of a ratchet has been patented by Mr. Theodore Dilger, of Liberal, Ind., and is illustrated herewith. A curved iron rack bar is attached to the wagon body or box, the bar being laterally bent for a portion of its length at the top to set outward a space from the wagon body, and within a looped lower end of this bar is pivoted a tension or brake lever, having near its center a slotted or mortised portion, whereby it is held and guided along the outwardly bent portion of the upper member. The lower end of this slot works closely

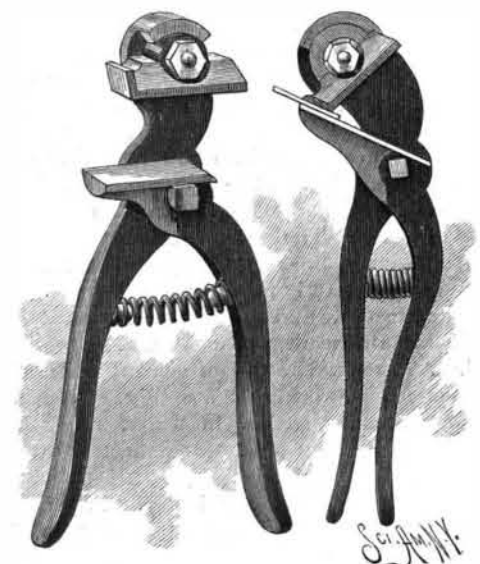


DILGER'S BRAKE LEVER.

to the under side of the rack bar, and within the slot is pivoted a pawl with a short arm extending from one side, connected by a rod with a short spring-actuated angle-grip lever, pivoted to the upper end of the main lever. The bearing surface of the pawl is preferably adapted for engagement with the upper edge of the rack bar, although it may be made to engage its under surface, as shown in the small figure, the pawl clamping the bar firmly, and its eccentric bearing surface adapting itself to wear. In operation it is only necessary to press the tension lever forward, the pawl engaging the rack bar automatically when the lever is released, while by slightly manipulating the grip lever the pawl is disengaged and the lever can be drawn back.

**AN IMPROVED WRENCH.**

A novel form of self-adjusting wrench, wherein the parts are so arranged that the device may be used as a pair of pinchers or pliers, has been patented by Mr. Walter L. Gibson, of Sebastian, Brevard County, Fla., and is illustrated herewith, one figure representing the wrench as the parts appear when adjusted to receive a large-sized nut or bolt, and the other showing the adjustment for use as pinchers or pliers. The object to be held is not clamped directly by the larger fixed jaw of the wrench, but by a swinging block connected to the jaw by a pin, the block having a long and a narrow bearing face, the former much closer to the axis of the pivot pin. The motion of the block is limited by a ridge or projection on the jaw, holding the block from turning completely upon its support; and when the wrench is to be used in connection with large nuts or bolts, the long bearing face of the block is moved to a position to be brought into engagement therewith as the jaws are brought together. When small nuts or



GIBSON'S WRENCH.

bolts are to be operated upon, or small articles are to be grasped, the narrow bearing face of the block is turned down to be substantially parallel with the smaller arm of the jaw. The jaws are normally held open by a spiral spring supported by studs upon the inner approaching faces of the handles.

THE Metropolitan Cattle Market, London, is the largest of its kind, covering 3½ acres and costing \$1,000,000.