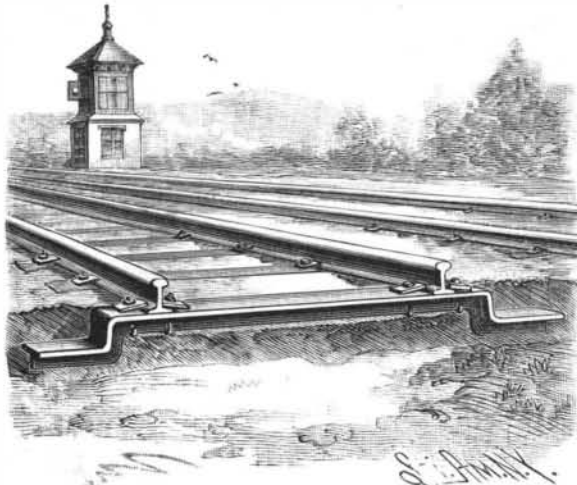


**AN IMPROVED METALLIC RAILROAD TIE.**

A railroad tie designed to be made of iron or steel, which can be inexpensively made, and is calculated to give great stability, is shown herewith, and has been patented by Mr. Charles Netter, of No. 131 Water Street, New York City. It is formed by rolling the iron or steel into the form of a straight bar having a T section, and then bending the bar near its opposite ends, a little beyond the line of the track, to make

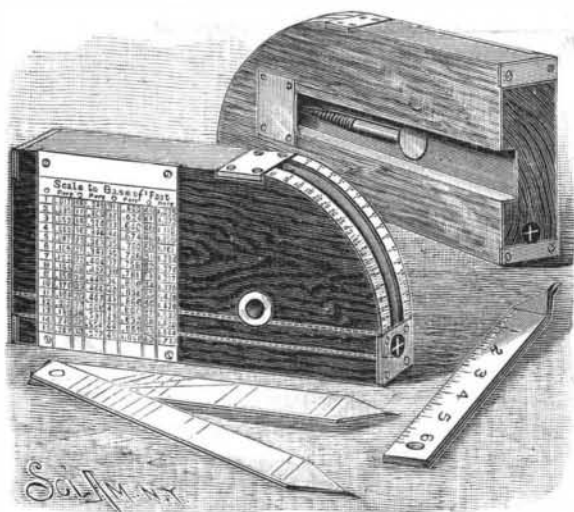


**NETTER'S METALLIC RAILROAD TIE.**

portions depending at right angles and further portions projecting horizontally outward. The tie is buried to bring its top plate on the surface of the track bed, by which it will be anchored to prevent further sinking, the vertical end portions preventing endwise movement, and the horizontal extensions thereof preventing lifting, while the central longitudinal flange resists movement longitudinally and acts as a rib to stiffen the tie. The rail may be fastened by passing a hook bolt through an aperture formed in the top portion of the tie and slipping the hooked end of the bolt over the lower edge of the flange, drawing an ordinary clip plate down upon the base of the rail by means of a nut screwing on the upper end of the bolt.

**A COMBINED LEVEL AND RULE.**

An instrument applicable in many and various ways, as for leveling and obtaining horizontal and vertical



**WICKHAM AND ROACH'S LEVELING INSTRUMENT.**

angles, is illustrated herewith, and has been patented by Messrs. Almeron W. Wickham and James M. Roach, of Burnside, Conn. The block, which constitutes the main body of the level, has in its forward end a tube bent to the form of an arc, and five or ten degrees longer than a quadrant, being divided into degrees from 0° to 90°. In the back of the block is a groove adapted to receive a folding rule, there being also a recess in the groove to hold a screw-pointed pin, to be used for holding the level upon a tree, post, or other proper surface, by passing the pin through an aperture shown in the block, and bringing its screw-threaded end into engagement with the support. A longitudinal bore parallel with the bottom of the block has crossed wires in each end, the bore to be used for sighting, and to the face of the block is secured a plate which gives the scale of perpendicular of any angle up to sixty degrees. The rule is formed in two sections, connected by a pivot pin, one face of the rule being divided into inches, while the other is marked with angle lines, so arranged that when any two lines formed upon the two rule sections are brought together and form a straight line, the numbers placed in connection with the two meeting lines will indicate the angle at which the two lengths of the rule are extended. The free ends of the rule sections are pointed, so that the rule may be used

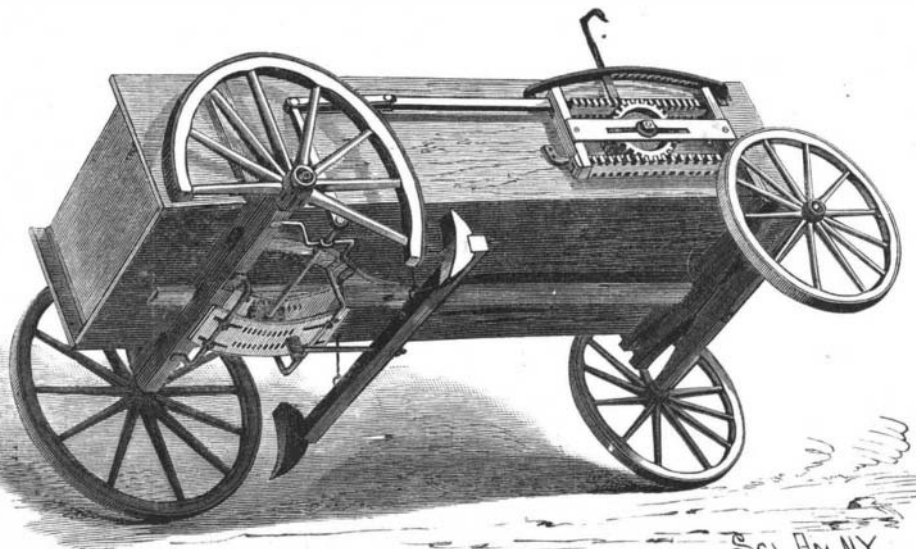
as dividers. By means of this level the heights of trees, houses, etc., from any given level can be found, and the instrument is designed to be a convenience for mechanics and artists as well as for architects, surveyors, and engineers.

**A New Acid—Peculiar Properties.**

Mr. David Hooper, F.C.S., of Ootacamund, India, has extracted a new acid from the leaves of the plant known to botanists as *Gymnemasylvestre*. It is a plant of the family of Asclepiadiæ, which grows in the Decan Peninsula, Assam, and Africa, and it was found that on chewing its leaves, all sense of the sweet taste of sugar disappeared as if by magic. For instance, if gingerbread were eaten, only the taste of the ginger was perceived; if a sweet orange, only the acid flavor of the citric acid, and the orange seemed as sour as a lime or a lemon. But what is still more curious, not only the sweet taste of substances containing sugar is effaced, but bitterness is also destroyed at the same time. Hence if a person takes sulphate of quinine after chewing the leaves of the *Gymnema*, it merely tastes like so much chalk or plaster of Paris. The effect in question lasts, as a rule, for one or two hours, and then the sense of taste returns to its normal condition. The active principle of the leaves of this plant appears to be soluble in water, alcohol, ether, and benzol. The aqueous solution of the substances soluble in alcohol had a decided acid reaction, and the author extracted an acid from it not unlike chrysophanic acid in some respects, but different in others. To this new product he has given the name of *gymnemic acid*, and it possesses the anti-sweet and anti-bitter properties found in the leaves as above described. The pulverized sundried leaves yielded about 6 per cent of their weight of this singular new product, about which we shall, no doubt, hear more in the course of a short time.

**AN IMPROVED VEHICLE BRAKE.**

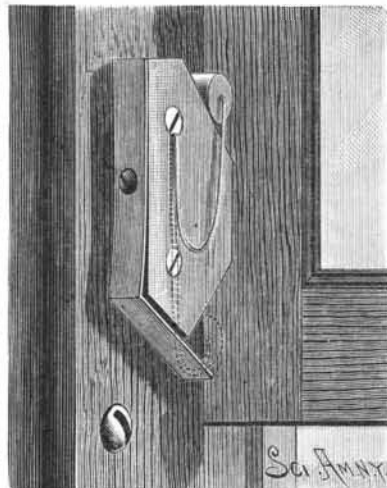
A wagon brake which can be conveniently operated, which need be moved but a slight distance to bring the shoes in contact with the wheels, and wherein the shoes may be normally positioned a much greater distance from the wheels than in the ordinary form of brake, has been patented by Mr. Marshal D. Platner, of Virginia City, Montana Territory. A double frame is secured to the side of the wagon body at the front, the lower bar of the frame having teeth making a fixed rack. Above the fixed rack two parallel plates are secured, a pinion being journaled to slide in slots in the plates, the teeth of the pinion engaging those of the lower fixed rack and of an upper sliding bar carrying a rack, the pinion being operated by a lever extending upward within a yoke, which is also provided with a series of notches whereby the lever may be retained in a locked or half-locked position. Beneath the reach, at the rear, a fixed plate is held horizontally suspended from the hounds and axles, having a double semicircular row of spaced and aligning apertures, and beneath this fixed plate a segmental plate is held to slide in more or less U-shaped brackets, one bracket being attached transversely to the under side of the rear axle, and the other to the hounds parallel with the axle. The sliding plate has at each end concentric slots, through which pass bolts adapted to guide the plate in its reciprocating movement. To the right of the running gear a horizontal bar is attached to the side of the hounds, and also to the under side of the rear axle, a crank shaft being journaled in the bar, whose inner end projects inward between the fixed and sliding plates, and carries a pinion adapted to simultaneously engage the apertures therein. The crank arm of the shaft extends upward outside the wagon body, and is pivotally connected with the sliding rack-carrying rod extending forward. The brake bar, carrying the brake shoes, is held to swing by any approved means, and derives its motion, by means of a connecting bar, from the sliding plate.



**PLATNER'S VEHICLE BRAKE.**

**AN IMPROVED SASH HOLDER.**

A simple form of sash support and lock, in which a plate having two oppositely inclined surfaces is secured to the window casing adjacent to the sash, and adapted to receive a roller between either of its inclines and the sash to support or lock the latter in position, is represented in the accompanying illustration, and has been patented by Mr. Joseph F. Ham-

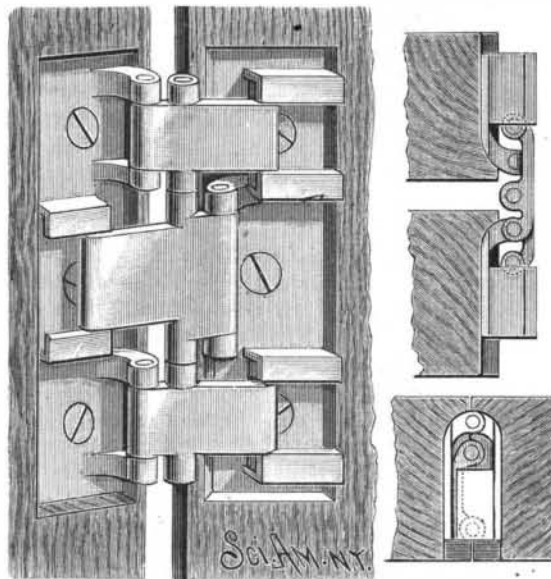


**HAMBITZER'S SASH SUPPORT AND LOCK.**

bitzer, of Houghton, Mich. To and against the inner face of the casing, adjacent to the face of the sash, a thick flat plate is held by screws, the inner edge near the top of the plate being inclined downwardly toward the sash, and its inner edge near the bottom being inclined downwardly away from the sash. A roller is suspended from a cord attached to the plate, so that when the roller is removed from its seat it will leave both hands of the operator at liberty for adjusting the sash, but by placing the roller between either of the inclines, the sash will be firmly supported and locked in the ordinary way, against an upward movement by placing the roller at the top, and against a downward movement by placing it at the bottom.

**AN IMPROVED HINGE.**

A hinge designed particularly for use in fine cabinet work, and which may be applied so as to be invisible from outside the joint formed thereby when closed, is illustrated herewith, and has been patented by Messrs. Ferdinand L. Scheidemann, of No. 3958 Girard Avenue,



**SCHEIDEMANN AND BENDER'S HINGE.**

and Frederick W. Bender, of No. 4048 Girard Avenue, Philadelphia, Pa. The hinge leaves are combined with links having one end pivoted to either hinge leaf and the other end adapted to travel on a guide on the opposite leaf, the links being connected pivotally together on a medial line nearer their pivotal than their traveling ends, as shown in the main view and sectional figure. The smaller figure represents the joint closed. When the joint is opened, the action of the scissors-like links is to automatically separate the two joint sections, while allowing them to fold outward, so that the crushing of the edges of the joint, which would ordinarily occur if the hinge pin directly connected the two sections on a line within the joint, as in this case, is prevented. A mortise is formed in each joint section to receive the respective hinge leaves and attachments, the mortise terminating at a short distance from the outside joint edge.

A STEAM catamaran, intended for whale and walrus hunting in the Arctic regions, is being built at Montreal, Canada. It has two steel cigar-shaped hulls, each sixty-five feet long, and built in two compartments, one for water ballast, and the other to carry petroleum for fuel. The catamaran is constructed so that it may be taken apart for transportation on the deck of a whaler.