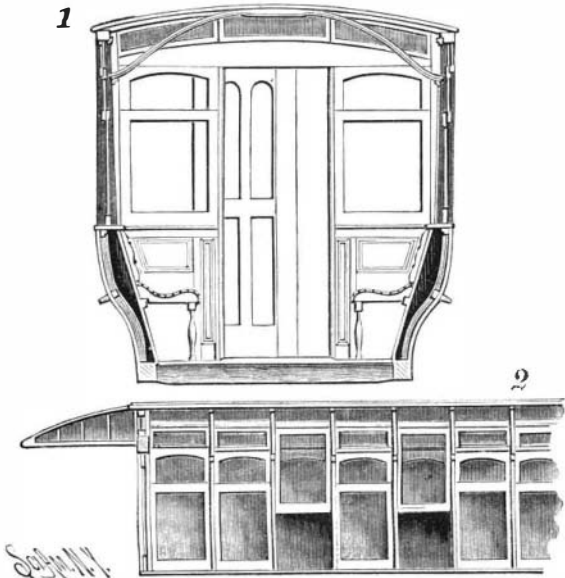


AN IMPROVEMENT IN CAR CONSTRUCTION.

The illustration represents a style of building a car body patented by Mr. John Turner, and especially adapted for horse, cable, and electric cars. Fig. 1 is a transverse section and Fig. 2 a partial side elevation showing the construction. The side pillars of the body are longer than those usually employed, and they are attached at their lower ends to side sill beams, and at their upper ends to plates on which the roof is supported, at very near the height of the car body at its center. The pillars have straight sash grooves,



TURNER'S CAR BODY.

and the sashes are carried upward instead of downward in opening the car windows. A series of permanent upper sashes is provided, behind which the movable ones slide. The car at its central portion is of the standard height, and by thus elevating the roof at the sides more head room than usual is made over the seats, giving ample air space. The roof is also centrally supported by a series of trusses, the ends of which are curved downward and secured to the side pillars. The space between the back of the seats and the sides of the car body is covered by caps, which constitute window sills, effectually preventing any refuse or foreign matter from getting into the pockets which ordinarily exist behind the seats. Beneath the bonnets, in the upper framing at each end of the car, are pivoted sashes forming ventilators. By this manner of construction it is designed that the car body shall be much stronger and capable of being built at materially less cost than has heretofore been the practice.

Further information relative to this invention may be obtained of Mr. John Wimmer, No. 2187 Third Avenue, New York City.

AN IMPROVED PLANTER.

The illustration represents a simple and inexpensive form of planting apparatus, designed to be readily attached to the beam of a double or single plow, and by which any kind of seed may be dropped without portions of the seed adhering to the drop slide. Pivoted to one side of the plow beam is a bar or beam in which is journaled a supporting wheel, and upon one side of the bar is secured a laterally adjustable seed box, having a detachable cover and a central drop opening in its bottom, in which may be placed a drop tube if desired. On the upper face of the bottom of the box a drop slide is held to move beneath a housing within the box around the drop opening, as shown in the sectional view. The slide has near its center an aperture adapted to register with the drop opening on both its forward and rearward movements, thus permitting the seed to drop. By properly arranging holes in the slide relatively to the diameter of the wheel, the planting may thus be done in hills that are 18, 36, or 72 inches apart, or by another arrangement of the slide continuous drill planting may be effected, such change of slide being readily made in two or three minutes. The housing within the seed box consists of a box-like receptacle with guarded side openings through which the slide passes, and a roller is journaled in the housing transversely over the slide, there being arranged around the roller pins adapted to enter recesses in the upper face of the slide, forming a guide therefor which compels the opening of the slide to register properly at all times with the drop opening. The roller also has one or more studs, adapted, as the roller revolves, to enter the drop opening in the drop slide, and force down any seed clinging to the walls of the opening. The housing may be adjusted up or down to cause the roller to contact more or less tightly with the drop slide. The axle of the supporting wheel has a crank arm, to which is pivoted a pitman adjustably connected with the rear end of the drop slide, around the forward end of which is a coiled spring adapted to retain the slide in open

position when the implement is at rest and the wheel elevated. To the cross beam between the plow handles is pivoted a lever connected by a strap with the body beam of the planter, whereby, on pressing down a knob of the lever, the rear end of the attachment is sufficiently raised to remove the drive wheel from the ground.

This improved planter has been patented by Mr. William W. Jones, of Granada, Col.

The Banana a Developed Lily.

Goldthwait's Geographical Magazine says that the banana belongs to the lily family, and is a developed tropical lily, from which, by ages of cultivation, the seeds have been eliminated and the fruit, for which it was cultivated, greatly expanded. In relation to the bearing qualities of this fruit, Humboldt, who early saw the wonders of the plant, said that the ground that would grow 90 pounds of potatoes would also grow 33 pounds of wheat, but that the same ground would grow 4,000 pounds of bananas, the proportions thus being, to wheat 133 to 1, and to potatoes 44 to 1. The banana possesses all of the essentials to the sustenance of life. The savage of the sea isles and the jungle owes what he has of physical strength to this food.

Wheat alone, potatoes alone, will not do this. When taken as a steady diet it is cooked—baked dry in the green state, pulped, and boiled in water as soup, or cut in slices and fried. I do not know whose beauty I admire the most—the majestic cocoa palm, with its heavy crown of great fringed leaves, or the graceful banana, with its great leaves, which are six feet long and two feet wide.

The leaves of the banana are tender, and the strong winds of the tropics—the hurricanes—soon tear the leaves in strips, thereby adding to their grace and beauty. The banana is a fruit that beast and bird, as well as man, are fond of, and the owner, when he lives in a sparsely settled country, must needs protect his plantation by a fence of some thorn plant.

Motion by Electric Current.

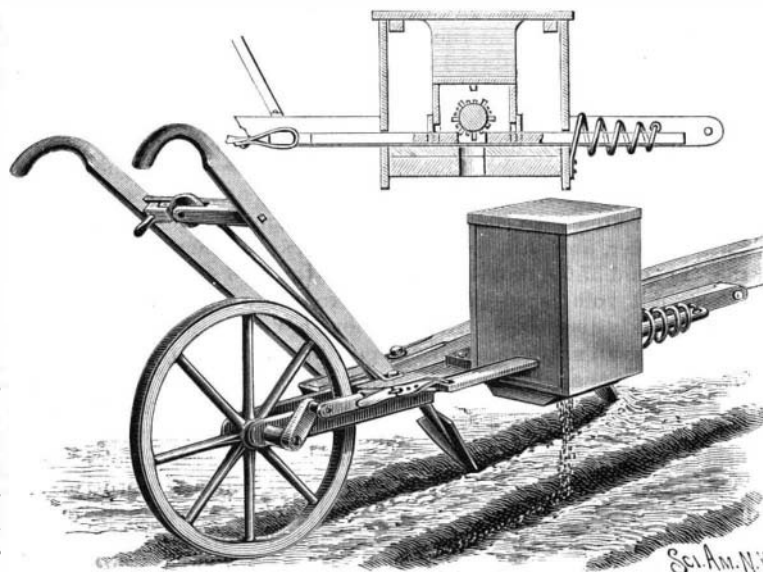
BY M. D. HURMUZESCU.

A fine metal wire stretched between two supports, one of which is provided with a strainer or spring for regulating the tension, on being traversed by a continuous current begins to vibrate.

The amplitude of the vibrations, which is at first very small, increases as the time goes on, and quickly arrives at a maximum, which it maintains as long as the current is passing through, provided that the surrounding atmosphere remains in the same condition, or at any rate does not undergo any sudden change. The vibrations may thus continue indefinitely; they stop in a few seconds when the current is interrupted.

For a given tension, the amplitude of the vibrations seems to depend (according to the experiments which I have made up to the present) on the difference in the temperature of the wire and of the surrounding atmosphere. Now, as it is the intensity of the current which produces this difference of temperature in a given wire, the amplitude should vary according to the intensity.

The explanation of this fact seems to me to lie in the interchange of heat between the wire and the surrounding atmosphere; this constitutes really a *thermic motor*, in which the energy expended is supplied by



JONES' PLANTER.

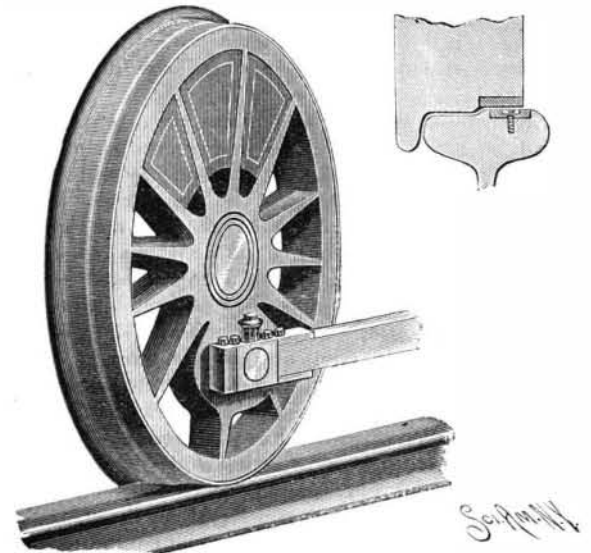
the current, and the principle of the conservation of energy can be applied to it.

Any cause producing a change, in any manner whatever, in the mode in which this interchange of heat takes place will modify the phenomenon in some way or other. We can foresee that the finer the wire, the more rapid will the vibrations be; this is confirmed by experiment. I repeated the experiment with wires of different natures, and found that the phenomenon always preserves the same character. If we put the

wire in a large glass tube the movement is regular, because the wire is sheltered from the movements of the air. On closing the two ends of the tube, I observed no change in the rapidity of the vibrations.

A CAR WHEEL AND RAIL TO INCREASE TRACTION.

According to the invention forming the subject of the accompanying illustration, it is designed that where a railroad track is built at a grade or is curved, or at switches, the rail shall be provided with a strip of soft, tough metal, held to the rail by countersunk



CHOATE'S CAR WHEEL AND RAIL.

screws, as shown in the sectional view, the outer edge of the rail being raised and a channel made therein for the purpose. The outer edge of the driving wheels is also smaller than it is near the flange, so that when running on the ordinary rail only the inner portion of the tread will come in contact with the rail, but the outer portion of the wheel is provided with a band of hard metal, roughened on its outer surface, adapted to come in contact with the strip of the rail at places where increased tractive power is required. When the wheels thus made reach the rails provided with the strips, the roughened band on the wheel is designed to take a firm hold on the softer metal of the strip, so that the motor will be able to haul a very large load. The bands and strips are intended to be renewed at small cost when they become worn.

This invention has been patented by Mr. Franklin W. Choate, of San Diego, Cal.

A Gigantic Relief Map of the United States.

A geographical novelty has been produced by Prof. Edwin E. Howell, of Washington, D. C., namely, a large relief map of the United States and Gulf of Mexico, with portions of the Atlantic and Pacific oceans, between the 67th and 127th meridians, modeled on the section of a globe 133 feet in diameter. This great work is prepared from data furnished by the United States geological survey, the United States coast and geodetic survey, and the United States Hydrographic Office. The horizontal scale is 1 inch equal to 50 miles; and vertically 1 inch equals 5 miles. The dimensions of the map are 6 feet 6 inches by 4 feet, and it is about 15 inches in its greatest thickness. The first copy of this important and artistic work has been secured by Mr. David Pell Secor, for the Bridgeport Scientific Society.

In this connection it may be added that Mr. Secor's previous gifts to the Society include more than 18,000 specimens, worth at least \$10,000, and extremely rich in aboriginal relics, especially spear and arrow tips, fully 2,000 of the latter being made from various precious stones.

Mr. Secor has likewise purchased for the Leland Stanford, Jr., University, California, the large and celebrated herbarium of the late distinguished botanist, Prof. William Henry Hervey, of Trinity College, Dublin, which has been received and acknowledged by the University with thanks. This immense collection is in six cases, containing 360 bundles of standard sized botanical paper, with 16,977 species from all parts of the world. As there are usually as many as four or five specimens of each species, the grand total amounts to fully 70,000 specimens. The naming of these specimens has been carefully revised according to the most approved classification, and it may safely be affirmed that there are less than half a dozen herbaria in America that rival the Hervey herbarium in size, or in authentic accuracy. The enterprise and liberality of the donor are worthy of especial commendation. Mr. Secor's residence is in Bridgeport, Conn., where he devotes most of his time to gratuitous scientific pursuits.

To make cloth that is used in lining shoes waterproof, use oiled silk or heat the linings in melted paraffin.