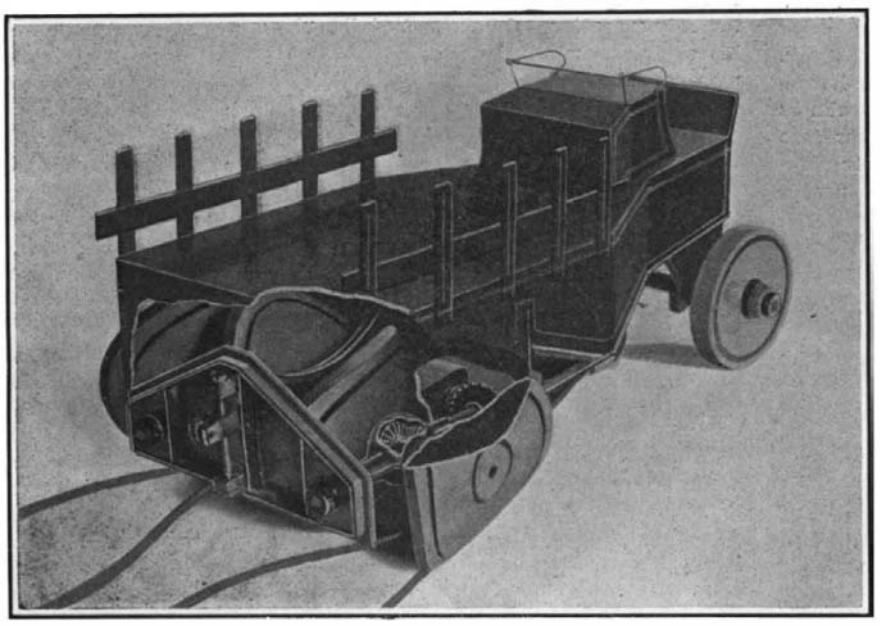
A TRACTION WHEEL WITH SINUSOIDAL TREAD.

A traction wheel has recently been devised which is provided with a perfectly smooth steel tread. The usual cleats or ribs are done away with, and yet the tractive efficiency of the wheel is superior to that of the ordinary construction. This is due to the fact that the tread is laterally curved. It is rather difficult to explain the peculiar formation of this wheel without exhibiting a model of it; but we must content ourselves with a photograph of the model, which is reproduced herewith. Each wheel is virtually a double wheel, consisting of two members bolted on a single hub. It will be observed that each tread is comparatively narrow, and that at all points it is parallel with the axis. The periphery of the wheel forms a perfect circle, as viewed in the direction of its axis; but when viewed in the plane of rotation, it will be seen that without departing from the true circle, the treads of the two wheel sections are oppositely curved, so that when drawn along the ground, the double wheel will trace a double sinusoidal track with the curves of the respective tracks oppositely disposed. Were it not for this opposed disposition, there would be a tendency for the vehicle supported by a set of these wheels to move from side to side of the road, in the event that all the wheels chanced to contact with the ground at the same part of their respective peripheries.



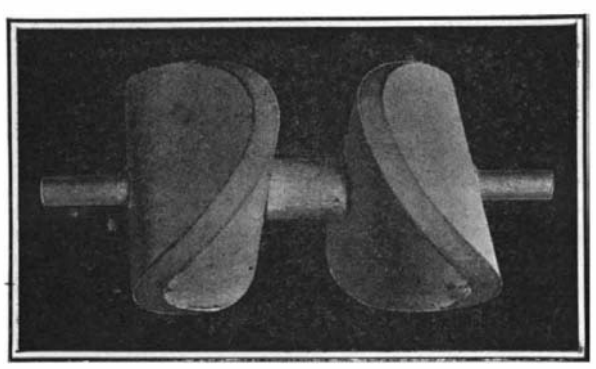
AUTO TRUCK MOUNTED ON SINUSOIDAL TRACTION WHEELS.

The construction of the wheels is quite simple. Each section of the double wheel is composed of two elliptical plates of steel bent or curved on their minor axes. These plates are fitted together, and secured to the hub with the minor axis of one lying at right angles to the minor axis of the other. The edges of the two plates are bent toward each other, parallel with the hub, and the edge of one plate telescopes with that of the other, thus forming the tread of the wheel. This construction makes a remarkably strong yet simple wheel, which is much lighter than the ordinary broad, cleated traction wheel. There is no tendency to distortion, and no lateral strain on the axis, as the point of suspension is always in a straight line.

The inventor of this wheel, Mr. Bernhard Beskow, of this city, claims a large number of advantages for this wheel. As the tread is perfectly smooth, there can be no objection to its use on any highway or street. In fact, the wheels will roll the road rather than cut it. There is no danger of forming ruts, because the track zigzags back and forth across the usual wheel tracks, and it is doubtful if any two vehicles fitted with sinusoidal wheels would ever chance to follow in identically the same tracks. The wheel should, therefore, be an excellent one, not only for traction engines, but for auto trucks as well. One of our engravings illustrates a truck fitted with these wheels, showing the peculiar serpentine form of track they trace. The wheels may be chain-driven from a universally jointed countershaft, or, as shown in the illustration, they may be driven by bevel gears, so that they can swing at right angles to their plane of rotation to adjust themselves to the inequalities of the road.

It may seem odd that a smooth-tired wheel, even of this shape, could obtain a powerful grip on smooth or slippery pavement, such as asphalt. Perhaps the action of the wheels may be more clearly understood if we call to mind that method of skating on ice, which is done without lifting the skates from the ice by merely toeing in and out. The sinusoidal tread behaves in exactly the same way. Its tractive power is explainable on the principle of the inclined plane, as a moment's thought will show.

One of the disadvantages of the ordinary cleated wheel is that the cleats are liable to lose their efficiency by becoming clogged with mud and dirt. But such conditions could not possibly occur with sinusoidal wheels. The inventor has demonstrated with a full-sized machine, equipped with these wheels, that it will operate powerfully in deep mud and even in deep, loose sand. The deeper the wheels sink into the sand or mud, the greater the bearing surface they offer; and even if they should sink in to the hubs, they would still exert a powerful tractive effort, owing to the peculiar curved sides of each wheel. There is no tendency for the wheels to sink themselves into loose or yielding soil when an obstruction to their advance is met. In case an obstacle is encountered by one of the wheels,



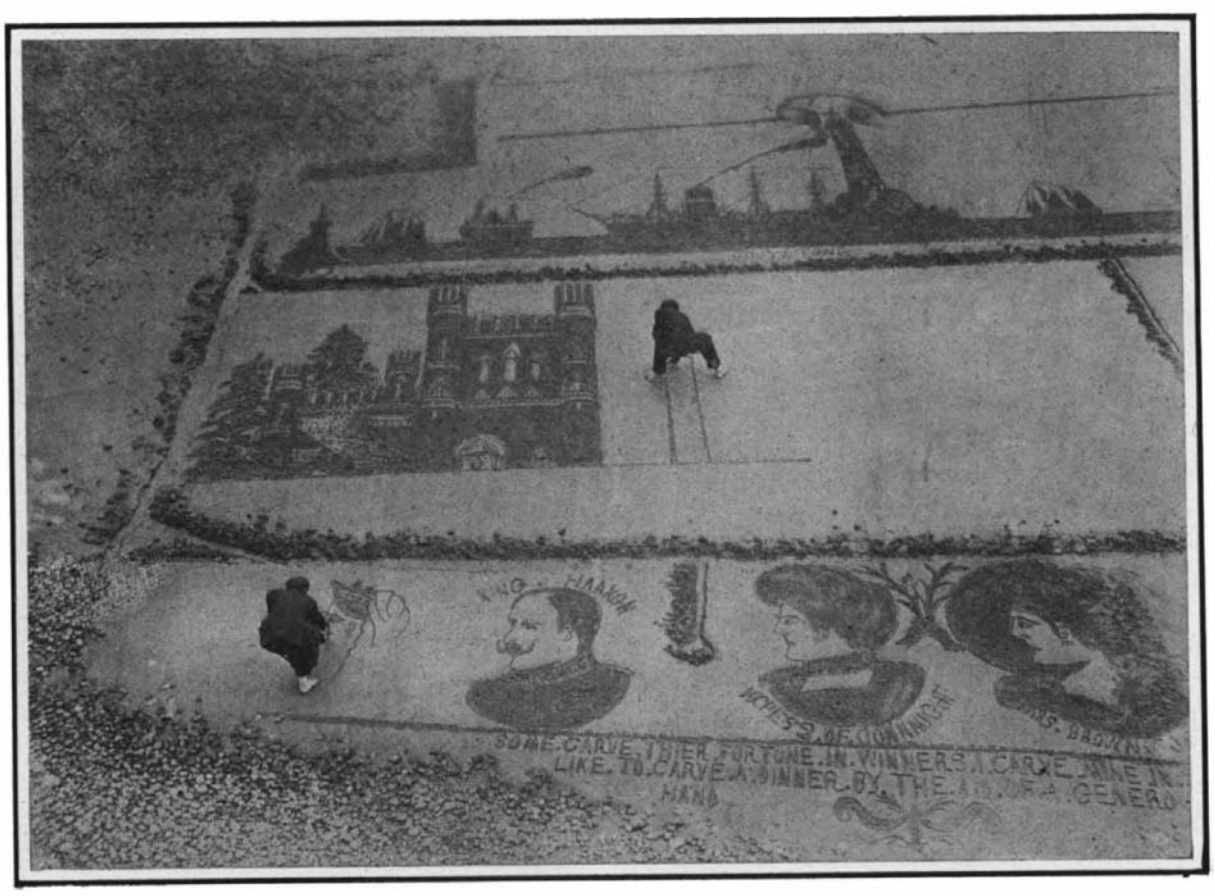
MODEL OF THE WHEEL WITH SINUSOIDAL TREADS.
Each wheel is virtually a double wheel, consisting of two members bolted on a single hub.

such as a projecting stone which is too large to be overridden, the wheel will turn without advancing until the lateral motion of the point of contact of the tread carries it to one side, and permits it to clear the obstacle. All of these advantages render the wheel particularly valuable for agricultural purposes, or for military use on yielding soil.

The Hissing Point of the Metallic Arc.

There was presented at a recent meeting of the American Physical Society, and reprinted in the April issue of the Physical Review, a preliminary report dealing chiefly with the arc between iron and copper terminals. The report is the work of Mr. H. D. Arnold and Mr. W. G. Cady. It is stated that the so-called iron arc is, in air, an arc between molten globules of magnetic oxide of iron. By letting the arc burn until it has become normal, observations can be made that compare in accuracy with those in the case of the carbon arc. The difficulty encountered in obtaining reliable observations in the neighborhood of one ampere led Mr. Arnold to the detection of an abrupt change in the iron arc analogous to the hissing point of the carbon arc. For currents below one ampere the arc burns quietly, and there is no well-defined spot of light on the globule at the anode. As the external resistance is decreased so that the current increases beyond a value depending largely on the curvature of the globule, the arc suddenly contracts, a bright spot appears on the anode, hissing commences, potential difference drops, and current increases slightly. Experiment showed that the effect is confined mainly to the anode. When the current is decreased, the change back to the quiet stage does not take place until the current has become smaller than it was when hissing commenced, due, doubtless, to the high temperature at the anode. The spectrum of the iron arc shows no further change, at the hissing point, than a general brightening of lines. When the current is increased to about two amperes, the iron arc emits a whistling sound, and the spot at the anode has a tendency to travel around rapidly, describing a circular ring. With copper electrodes, 6 millimeters thick, the hissing point occurs when the current is about 0.5 ampere, with about 110 volts across the arc.

The arc between aluminium electrodes was too unsteady for the detection of the effect. Zinc has thus far shown no hissing point. Something resembling a hissing point was found with an arc in air between a mercury anode and carbon cathode, but this may have been due to disturbing causes. Lecher's assertion that the iron arc is a discontinuous discharge, while the copper arc is perfectly continuous, was put to the test for both the quiet and hissing stages. A bolometer was substituted for the hot wire used by Lecher, but it soon became evident that the capacity and self-induction of the bolometer circuit tended to set up oscillations, causing a "singing" iron arc. Good results were obtained by connecting a self-inductance of low resistance in series with the arc. The conclusions arrived at were briefly as follows: The carbon and iron arcs, when quiet, are continuous; when hissing, they are oscillatory. The copper arc seems always to be oscillatory, and the smaller the current the more is the bolometer heated. This point, as well as bolometric tests with other metals, is soon to be investigated.



TWO SAND PAINTERS AT WORK AT BRIGHTON, ENGLAND.

SAND PAINTING.

At Brighton, the English watering place, two young Englishmen devote their art to what is called sand painting. For this purpose the smooth sand of the dunes is used, and the young men thereby make a satisfactory livelihood for themselves, as the onlookers as a rule are perfectly willing to contribute something in acknowledgment of the artistic pleasure they are allowed to enjoy. Our picture shows the two painters at work. One of them is just on the point of completing Windsor Castle, while the other reproduces in the sand the portrait of the late Queen Victoria. Sand sculpture is probably familiar to most of our readers, but sand painting would certainly seem to be a new art.