

SCIENTIFIC AMERICAN

[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XLIX.—No. 18.
[NEW SERIES.]

NEW YORK, NOVEMBER 3, 1883.

[\$3.20 per Annum.
POSTAGE PREPAID.]

THREE WHEELED INSPECTION CAR.

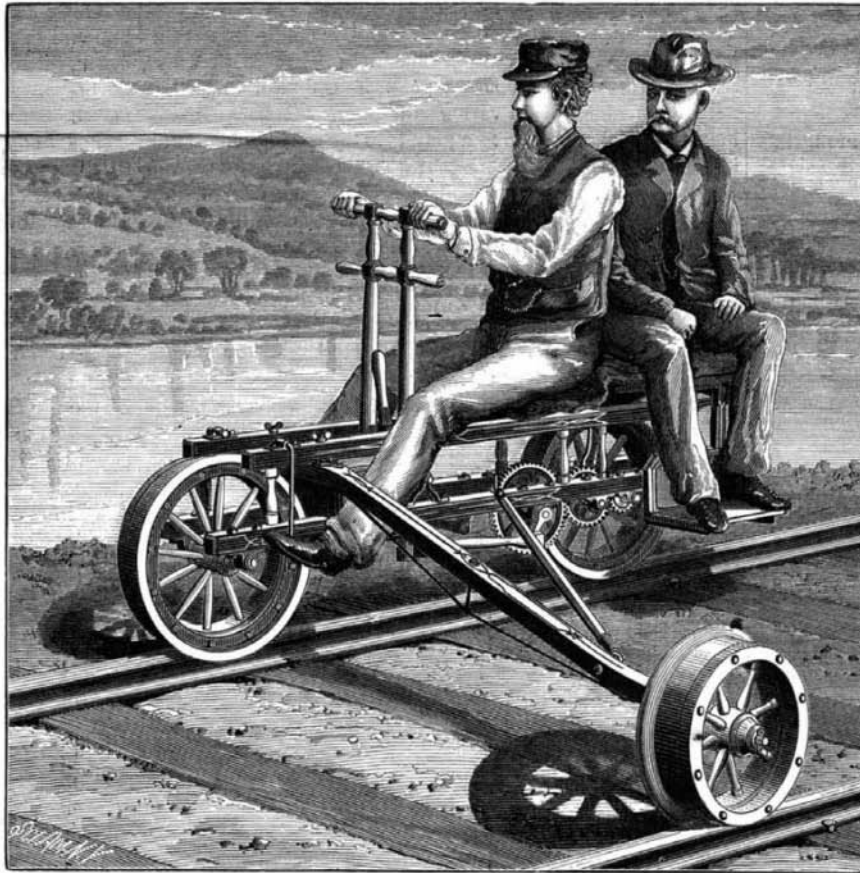
The car herewith illustrated facilitates a close inspection of a railroad, and it is claimed that by no other device can this be done so effectually. It is propelled by one person and has a device for carrying a second, thereby enabling a road master or inspector, when convenient, to avail himself of the services of a spare hand or other man for the purpose of propelling him over the line, he being free to note all defects in alignment or surfacing.

In this way he can visit personally a large portion of the sections under his charge in a single day, stopping wherever the men are at work, giving his directions and calling attention to defects while they are fresh in his mind, and in this way keeping his track at all times in the best possible condition, as it is well known that in this department it is only a close attention to the details of the work that is rewarded with success. The car is propelled by a rowing motion and auxiliary foot power. The frame, wheels, and arm are made of white ash, the frame being firmly held together by bolts. The arm is stiffened by an iron brace. The tires are cast iron, the axles and crank shaft are iron, the crank and stirrups of malleable iron. The arm is adjustable and can be removed at will, thus securing economy of space in transportation. The car weighs about 140 pounds, and is made with either a 17 or 20 inch driver, geared 3 or 4½ times, as may be most expedient. There are some 4,000 of these cars now in use both in this country and Europe.

The manufacturers, the Sheffield Velocipede Car Company, of Three Rivers, Mich., should be addressed for further information.

THE BARNEY AUTOMATIC DUMPING BOAT.

What to do with city refuse has been a question to the health departments of our large cities for years. If it is deposited in the harbor it tends to create bars obstructive to navigation, and if thrown into the sea light and dry from the decks of scows just outside the harbor, much of it drifts to the adjacent shores, making a nuisance if not breeding disease. The only effectual manner and place for its disposal appear to be by sinking it far enough out at sea to prevent it from choking navigable channels or contaminat-



THREE WHEELED INSPECTION CAR.

ing adjacent shores. This is done by the system illustrated in the accompanying engravings, known as "The Barney Automatic Dumping Boat" plan.

The boats built on this system are not flat scows carrying all their load on deck and far above the water line, but are serviceable sea boats, capable of riding the waves without danger, and cannot sink unless wholly destroyed. The load is the ballast of the boat, and insures steadiness until the cargo is emptied, when the natural buoyancy of the boat is its assurance of safety. Each boat is in two longitudinal sections, or consists of two pontoons hinged to bridges above the deck and presenting the appearance of an entire boat, as seen in cross section in Fig. 2. Each pontoon, or half, is air tight, and the load is carried between the two, occupying a V-shaped space shown in the same figure, extending from the outer edge or gunwale to the keel. The bridges con-

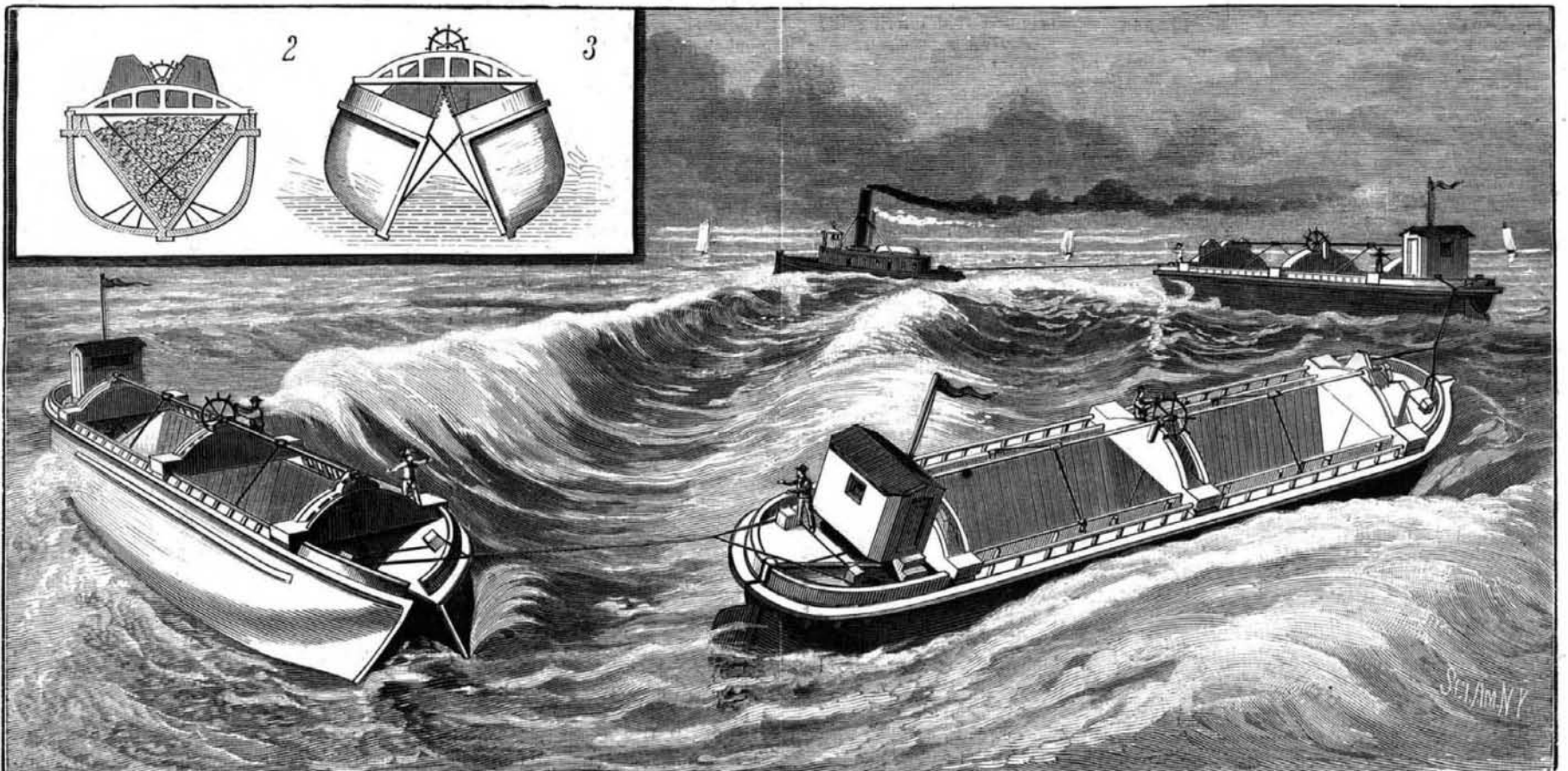
necting the two pontoons are hinged to their outer edges, and are connected by a shaft running the entire distance, by turning which three segments of gears controlling the position of the pontoons are opened, the whole operated simultaneously by one man at the center bridge. This work is simply that of releasing the load, and of securing the two pontoons together after the releasing, as the pontoons work automatically, opening by the gravity of the load, and closing by the displacement, or the force of the water on their outsides. So the mechanism is very simple: the two longitudinal halves of the boat are hinged to three rigid connecting bridges at their upper edges and connected by geared segments of one-eighth of a circle, or 45 degrees. The two halves or sections are held together by connecting rods, or tension rods, as seen in Figs. 2 and 3.

It is not intended that the boat, as a whole, shall be water tight. In fact, the meeting of the two air tight pontoons at the common keel is far enough from being hermetical, that it is intended the sea water shall come up by absorption and capillary attraction and saturate the entire load of refuse. This increases its density and its facility to sink quickly to the bottom. So, after the cargo is dumped into the sea, the pontoons may be held apart by means of friction beams, as in Fig. 3, while the sea washes the load space between them, cleansing the walls with the sea brine. This is seen, also, in the last boat in tow in the principal engraving.

This method of dumping and cleaning has manifest advantages: The load can be instantly emptied and the boat can be cleaned in a few minutes. The load is discharged into the water six feet below the sea level instead of being scattered on the surface of the waves, and being thoroughly saturated is prepared to sink, instead of being light and ready to drift. Two men, instead of twenty, is the complement of these boats. A trip with a tow of these boats from New York city will not occupy half the time required by the old fashioned scow system.

They have been tested by this city for fifteen months, and have proved a great saving of time and expense over the old method. With these boats the danger to the harbor from dumping the city refuse may be placed out of the question.

(Continued on page 276.)



DUMPING CITY REFUSE AT SEA.

THE BARNEY AUTOMATIC DUMPING BOAT.*(Continued from first page.)*

If the various public officers having charge over the waters of our harbor are really in earnest in all they have said and caused to be written about the danger of the channels being blocked up, they will at once acknowledge the advantages of this system and encourage its use.

If the present dumping ground is not sufficiently far at sea to prevent danger to the harbor and the drifting of refuse upon the shore, let it at once be removed to a point where no harm can come from it—where the ocean currents will carry the material beyond the influence of tides.

These boats are perfectly capable and were built for the purpose of going far to sea. One of the great advantages of this boat is that they can be readily changed to carry dredging, garbage, or freight, their carrying capacity being over 500 tons. The office of the Barney Dumping Boat Company is at 346 Broadway, New York city.

The German Population of the United States.

The occurrence lately of the bicentenary of the arrival of the first German immigrants in America has directed attention on both sides of the Atlantic to the numerical strength of the German element in the United States.

The New York *Journal of Commerce* declares that this can be inferred only very inadequately from the last census returns. The only persons reckoned in it as "Germans" are those born within the present German Empire. Austrian and Swiss Germans are credited to their respective States. The last census has this advantage over its predecessors—that it tells us how many native born American citizens are children of German parents (understanding the term "German" in its restricted application to natives of the present German Empire); 4,883,842 had German fathers, and 4,557,625 German mothers. Other tables enable us to form an estimate of the number of those children who have had both parents Germans; and so we may set down the total number of children having one or both parents Germans at about 5,500,000. To this should be added about 400,000 out of the large number of persons of foreign origin whose actual place of birth is not given; the Germans from Austria, Switzerland, and Luxemburg; and those Alsations who, although talking German, are classed as French. All these may be set down at 200,000. We may also fairly throw in the number of those Pennsylvanians, etc., who still use German as the language of ordinary intercourse. If all these items be reckoned up, it will be seen that the German American element cannot fall short of nine millions. Should any one think this estimate too high, let him remember there are thousands of descendants of Germans who speak the German language as their mother tongue, and all whose sympathies and connections are with the German element, although in the census they are returned as pure Americans.

Effect of Metallic Poisons on the Spinal Cord.

The affections of the nervous system produced by contamination with certain metals, as lead and mercury, have been studied more extensively clinically than pathologically, and even yet it may be held to be undetermined whether the action of the poison is upon the peripheral or the central apparatus. Dr. Popow has recently put on record the results of anatomical investigation upon animals (chiefly dogs) poisoned by arsenic, lead, and mercury respectively (*Virchow's Archiv*, 93, Heft 2), and in most cases he was careful to administer the poisons in varying quantities, so as to contrast the effects of acute and chronic poisoning.

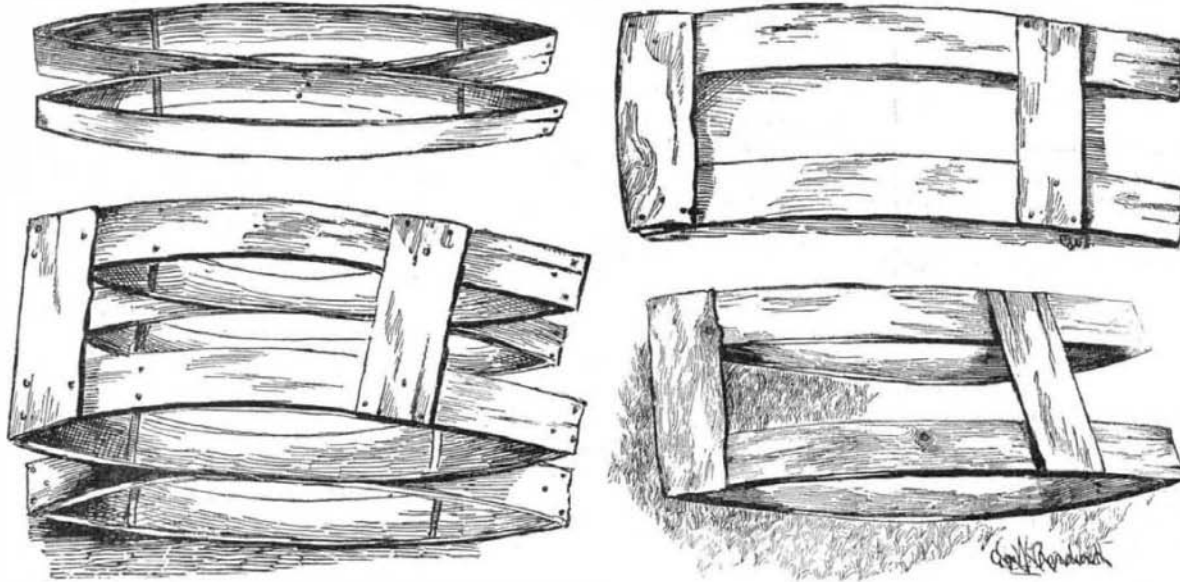
The general result of his inquiry goes to show that marked changes of an inflammatory character occur in the spinal cord, both in the gray and white matter, under all these conditions. In acute arsenical poisoning the spinal cord was softened, the gray matter especially being reddened and swollen; there was proliferation of the nuclei of the blood vessels, and an exudation of a peculiar hyaloid substance. The nerve cells were swollen, their processes dwindled, and their protoplasm granular or vacuolated, while in the white columns the axis cylinders showed irregular thickenings. In chronic poisoning it was difficult to discriminate between the two portions of the cord, the divided surface having a yellowish-red color throughout; the walls of the vessels were thickened, and hyaline masses abounded; the nerve cells vacuolated, or shrunken and pigmented; while free pigment masses, representing traces of hemorrhage, occurred throughout the sections. In other words, there is, in poisoning by arsenic, a central myelitis at first, and later a diffuse myelitis. Very similar changes were found in the spinal cord after poisoning by lead—namely, exudation from blood vessels; a general affection of the nerve cells, beginning as cloudy swelling, and passing into atrophy and pigmentation; and inflammatory swelling of the axis cylinders.

In mercurial poisoning, the early changes consist of hyperæmia of membranes and of the cord, followed by hemorrhages, inflammatory exudation, and changes in the nerve substance hardly differing from those seen in the other two cases. In each instance the peripheral nerves and the nerve roots showed no alteration; so that the conclusion is that the paralysis, spasms, etc., characteristic of the toxic effects of these metals, depend upon a central rather than a peripheral disturbance, all the degenerative changes described as occurring in nerves and muscles being strictly deuteropathic.—*Lancet*.

COASTING WITHOUT SNOW.

Most boys are very fond of coasting, but there are very few who have ever had an opportunity of coasting in summer. Many boys have looked longingly at steep, grassy hills, and have wished that Jack Frost would hasten on, so that they might enjoy the winter sport. They would like to learn how to slide downhill in summer on the grass without getting wet feet, frost-bitten fingers, and other discomforts of cold weather.

While on my vacation in the Berkshire Hills I made a sled

**SLEDS FOR COASTING WITHOUT SNOW.**

on which I could slide down a tolerably steep hill on the grass as nicely and swiftly as on the snow in winter. I will describe it, so that others can enjoy the sport, and fine sport it is. It is in many respects superior to real coasting.

My sled is a very simple affair, being composed entirely of barrel staves. I made two kinds of grass sleds, single spring and double spring. The single spring is much the simpler, and requires only five staves, while the double spring requires nine.

In selecting the staves take those which are the widest and curve the most; also take those which will bend the least. If very strong staves cannot be had, a brace must be placed at the end of each runner, between the upper and lower staves. It is better to do without this block, if possible, as it interferes with the springiness of the sled. In making

**COASTING WITHOUT SNOW.**

the single spring sled this block should be nailed on to the lower stave of the runner before the lower stave is fastened to the upper. Care should be taken in nailing the staves together not to get the nails too close to one another, as this is liable to split the wood. After being driven through, the nails should be clinched. For this purpose wrought nails are the best. The seat and board on which the feet are placed should be nailed to the upper staves before these staves are fastened to the lower.

In making the double spring sled the advantage is that it is much more springy, and therefore rides more easily. The seats should be fastened on as on the single spring sled. Each stave should be nailed to another before the couples of staves are fastened together. In fastening the seats a solid support introduced between the staves as they are nailed to-

gether will prevent them from springing under the hammer.

In sliding down the hill, in order to steer, a short stick should be taken in each hand and dug into the ground on the side toward which you wish to go.

GEO. BARDWELL.

The Deepest Well in the World.

The McGuigan gas well, the light from which can be plainly seen from the top of Wheeling Hill, is the pioneer gas well of this vicinity. It led to all of the others now making such a turmoil in this valley. It was sunk for oil, not gas, and the great gaseous reservoir was tapped unawares. Just three miles nearer us the Buchanan well was sunk, and is now the deepest well in the world, having reached 4,300 feet, and is still going down. When a depth of about 3,000 feet was reached the tools broke and were left there, and for some time the well was deserted. Then a new concern took hold of it, and is now vigorously drilling for the greasy fluid. The rope broke in March, and the cable, between 4,000 and 5,000 feet in length, and weighing several tons, parted seven hundred feet from the top, and all efforts to catch hold of it and draw it out with the great iron shaft or drill at the lower end failed. The workmen were then discharged and the public supposed the well abandoned. Superintendent Crocker had no thought of quitting the work. Additional tools were procured, and at a recent date work was resumed. The well, which was dry, was filled with water to assist in floating the cable, a proper instrument was inserted, and the rope was caught and lifted out. It was supposed that after getting the rope taut, a "sucker rod" would have to be sent down to loosen it from the drill at the bottom, as that was fast and could not be lifted with the weakened rope. Fortunately the rope out itself off where it

was attached to the shaft, and thus saved a great deal of trouble. The next thing to do was to remove the water from the well, and pumping was resorted to, when nearly a barrel of very fine crude oil was obtained. The well is cased to the depth of 1,200 or 1,400 feet and is dry. When the water is removed, which will be done in a day or two, a "spear" will be sent down after the drill, and no difficulty is anticipated in bringing it to the surface. When this is accomplished the work of deepening the well will be recommenced. Mr. Crocker states that the machinery he has on the ground will enable him to go 500 feet deeper, and by increasing its power he could go to the depth of 7,000 feet, but he hopes to reach oil in paying quantities at a small additional depth.—*Wheeling (W. Va.) Register*.

Croton Chloral in the Treatment of Whooping Cough.

W. C. Webb, M.D., of Bryantsville, Ky. (*American Practitioner*, August, 1883), has come to the conclusion, from the treatment of nearly two hundred cases of whooping cough, that croton chloral is by far the most valuable single remedy for its relief. He has found that it is well borne by children. To affect the disease it must be given in decided doses. A child twelve months old will bear one grain of the medicine every four hours throughout the twenty-four. During the first week not less than this should be given. Thereafter, the cough is usually so much relieved that few if any doses are required at night. If the drug be thus pushed to its full effect, there are few cases that may not be entirely controlled in a fortnight. The dose for children ten years old should be two grains every four hours; adults will bear only about four grain doses. The drug thus used does not derange digestion or affect the vital nervous centers. The first few doses may cause some irritation about the throat and fauces, but this soon ceases. The relief is so marked in some cases that patients fall asleep in their chairs.

Croton chloral, if pulverized, will dissolve readily in compound tincture of cardamom. The following is a good prescription: R. Croton chloral, ʒi.; tinct. cardamom., glycerine, ʒiij. M. Sig. One-half teaspoonful every four hours, for a child two years old and under. A less expensive and very useful mixture is as follows: R. Croton chloral, ʒi.; tinct. belladonnae, ʒij.; tinct. cardam. co., ʒij.; glycerine, ʒiij. M. Sig. Dose, one-half teaspoonful. If the paroxysms of cough are exceedingly severe, and if there is extreme gastric irritability, the croton chloral should be preceded by a few whiffs of chloroform. The anæsthetic thus used produces the happiest effects, and it need not be repeated more than two or three times. The combination of bromides with the croton chloral is of doubtful utility. If any of them are to be used, the bromide of quinine should be preferred. Watchfulness should, of course, be exercised during the use of croton chloral, lest toxic symptoms should be manifested.