

THE SHEFFIELD MOTOR VELOCIPEDE CAR.

This device is essentially a double gasoline engine, mounted on the Sheffield velocipede car, that is so familiar to all railroad men. To adapt the car to the purpose advantageously, some changes were of course necessary, but the general features of the car are retained.

While the car is light, the weight being under 250 pounds, it is exceedingly powerful, the motor being amply strong to carry a load of two men up any ordinary grade, and will run at a speed of 15 to 20 miles per hour. This, however, is not the limit of speed, as it can easily be run faster than is safe for so light a car.

The engine is a double one and has cylinders of proper size, fitted with trunk pistons, and is so arranged that an impulse or propelling movement is given the axle at every revolution. This impulse comes from the explosion of the proper mixture of air and gasoline vapor in the cylinders by an electric spark.

The gasoline is carried in a sealed copper reservoir, which will contain enough to run 75 miles of average road, though, of course, the conditions of grade or strong head winds may make it necessary to replenish sooner, a supply being carried in additional reservoir for the purpose. Proper mechanism regulates both the admission of gasoline and air to the cylinders, so that the proportion of each can be varied, which is important, and the device is therefore so constructed that the operator can see exactly how much of each is being used and can control them separately by suitable levers within convenient reach.

The spark is supplied by hermetically sealed chemical batteries and increased by suitable developing coil. A hand switch makes the connection, closing the circuit at will. The mechanism operating the sparking or contact points is exceedingly simple, and made of case-hardened steel.

It is, therefore, hardly possible for it to get out of order, and the wear on these parts will be very slight.

In starting, gasoline is turned on, the air valve is opened, and the switch closed. It is necessary to run with the car a few steps to get it under motion, when the mechanism becomes automatic and the operator, stepping aboard, has only to regulate the proper amount of gasoline and air, to bring the speed to any desired point. The valve and other mechanism is carried directly upon the cylinders, thus making the engines and their parts self-contained, which is quite important in point of wear.

The leading and driving wheels are equipped with the Sheffield concave steel tires, which constantly tend to hold the car upon the track, even at high speed, although it should be always remembered that there is comparatively but little weight to hold the car down, and it is, therefore, not advisable to run the car at the top of its speed at any time. All wheels have forged steel hubs, wood centers, and steel tires.

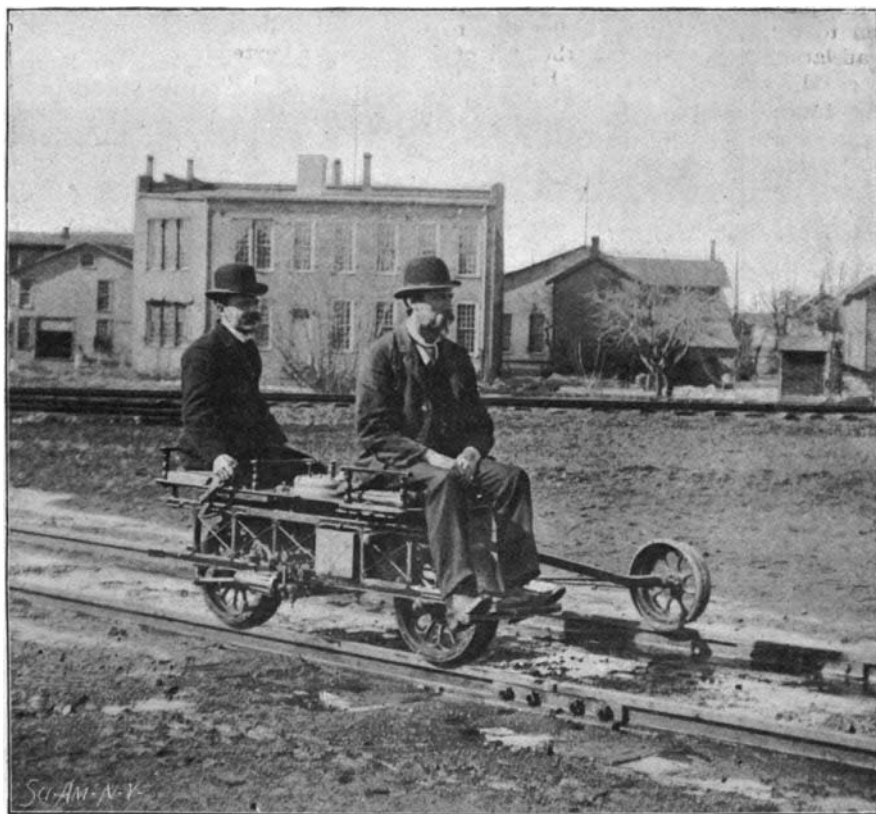
The cars will carry two persons with ease, and can carry three in case of necessity. They are designed for the use of roadmasters, for track inspection, telegraph repair work, and whenever there is need for long trips and frequent stops between stations.

The cars are manufactured by the Sheffield Car Company, of Three Rivers, Mich.

ANOTHER powerful illustration of the constant tendency of the mountains to take a lower seat was afforded on May 30, when the village of Veinholz, near Brienz, in the Bernese Oberland, was partly destroyed by subsidence and landslips, caused by natural springs. The roads were destroyed, and railway communication has been interrupted.

The Influence of Glass on Wine.

Probably ninety-nine persons out of every hundred, taken at random, would ridicule the idea that the quality of the glass of which a bottle may be made can have any influence on the taste or keeping qualities of its contents. And yet that it does do so we have the best of evidence. We are not alluding to the influence of light shining through the flasks and its action on the substance contained, but the direct



RAILROAD INSPECTION CAR PROPELLED BY GASOLINE.

chemical reaction occurring between the glass and the material within the flask. Very recently the following case occurred in France. A wealthy retired merchant bought a lot of very costly and rare wine in casks, samples of the wine from each cask being given him by the wine merchant. The wine was delivered, and the new owner proceeded to have it racked off and bottled. Some time afterward some of the wine was brought to the table, and on tasting it the host detected a strange, unpleasant taste, which was also noticed by the guests. A fresh bottle was found to be similarly affected, and bottle after bottle was opened

bottles were handed over to a chemist, along with one of the lot purchased for bottling the wine, which had never been used. This is what the chemist found in the glass of the unused bottle: Silicic acid, 52.4; potash and soda, 4.4; lime, 32.1; argillaceous matter, iron, etc., 11.1. In the examination of the bottles that had been used, while the silicic acid and argillaceous material remained constant, or nearly so, the lime, potash, and soda were very much diminished, and it was made evident that they had passed into solution, forming compounds with the acid ingredients of the wine, decomposing the latter and rendering it unfit to drink. There is now a suit pending against the maker of the bottles.—National Druggist.

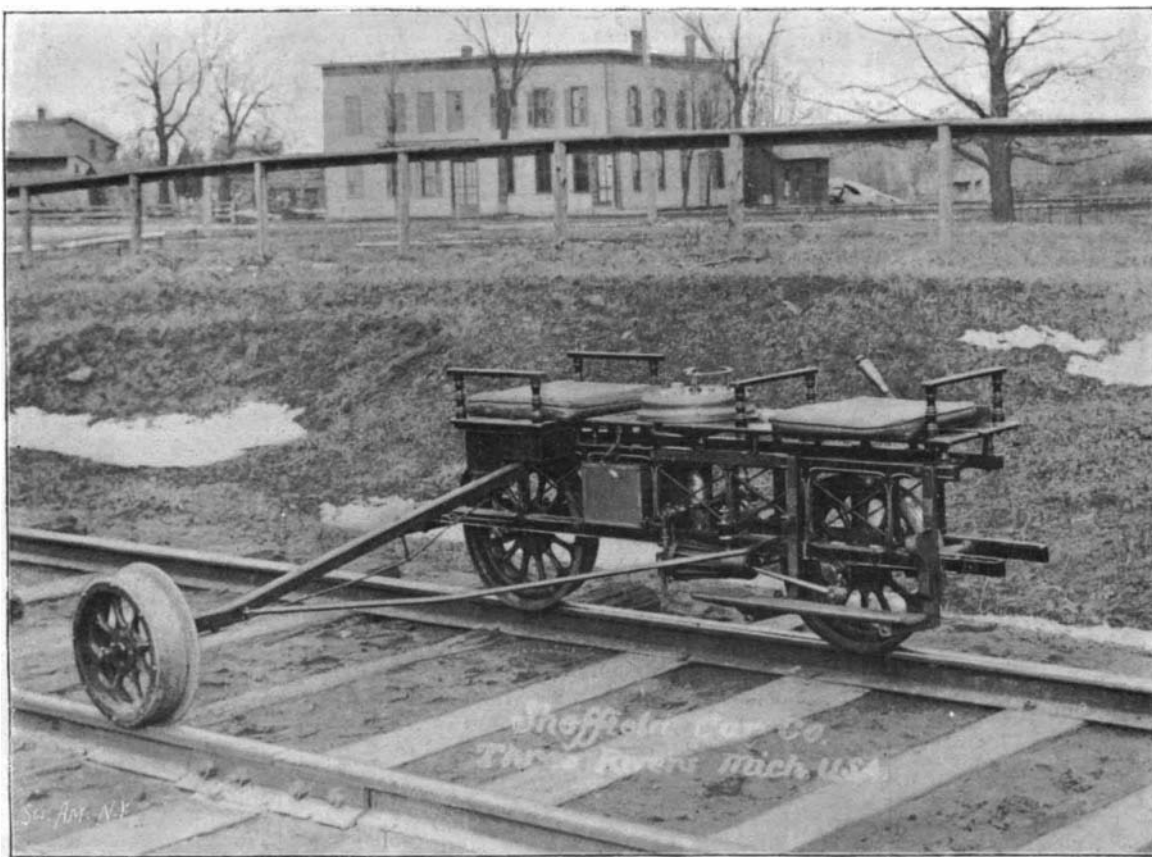
Waterways in Germany.

The interior canal in Germany proposed to connect the rivers Rhine, Weser, and Elbe, according to government investigation, will have a freight traffic of 3,000,000 tons per kilometer (0.625 mile). This insures 3 per cent interest on the investment. The cost of maintenance will be covered by a toll of 1/2 cent per ton-kilometer. Preliminary work has been done on this project for more than thirty years. The construction of the canal is now assured; yet not all opposition has been overcome. The latest protest comes from the Silesian coal mines. Freight on coal from Westphalia to Berlin via canal is figured at 6.96 marks per ton, while the combined rail and water freight from Upper Silesia to Berlin amounts to 9.35 marks, and from Lower Silesia to 7.15 marks per ton. It appears that Berlin consumes 1.5 million tons of coal a year, supplied as follows: By Silesia 1.2 million tons, by England 200,000 tons, Westphalia 90,000 tons, Saxonia 15,000

tons. The first effect of the canal would be the exclusion of English coal, so that an increase of the Westphalian business to 290,000 tons would not affect the Silesians. Again, an increase of 20 per cent in coal consumption is expected at Berlin by the industrial development fostered by the canal, where then the waterways from the industrial west will connect with those from the farming districts of the east. Of this increment of 300,000 tons, 200,000 would likely come from Westphalia and 100,000 tons from Silesia, so that the Westphalian coal importation into Berlin might reach 500,000 tons before it would hurt Silesian interests. On the other hand, the improvements in Silesia of the upper Oder River are now completed, and for the first time, on November 18, 1895, three vessels, carrying 200 tons of coal each, passed the locks at Kosel. It is expected that by the end of 1896 vessels carrying 400 tons will navigate the 40 mile stretch, Kosel-Stettin.—Railroad Gazette.

Thunder Storms at Sea are Nocturnal.

The greater frequency of thunder storms in the winter and at night around the coast of Scotland has been shown by Buchan, says Science. When thunder storms occur in New England in winter they are generally observed along the coast and after nightfall, as has been shown by records of the New England Meteorological Society. Now Meinardus, of the Deutsche Seewarte at Hamburg, finds even the thunder storms of the Bay of Bengal to have a distinct nocturnal



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maximum (Annalen der Hydrog., 1895, 506-511). It has been suggested by Grossmann and others that the cause of this contrast with thunder storms on land probably arises from the dependence of the maritime storms on instability produced by radiation and cooling of the upper surface of cloud sheets, which proceeds best at night, especially in winter nights; while local storms on the land arise from the overheating of lower layers of air close to the hot ground, and this condition has its maximum on summer afternoons.

Notice to Our Readers.

In order to obtain the opinion of the readers of the SCIENTIFIC AMERICAN as to what invention introduced within the last fifty years has conferred the greatest benefit upon mankind, we publish the accompanying card, which please cut out and return to the editor. Those who preserve the paper for binding and do not desire to deface their files, or who read this notice at a library, will please answer by postal card. It is desired to get as full a vote as possible. The result of the vote will be published in the *Special 50th Anniversary Number of the SCIENTIFIC AMERICAN on July 25.*

 * Editor of the SCIENTIFIC AMERICAN. *
 * Dear Sir: *
 * I consider that..... *
 * *
 * invented by..... *
 * has conferred the greatest benefit upon man- *
 * kind. *
 * Name..... *
 * Address..... *

Correspondence.

Barisal Guns and Mist Puffers.

To the Editor of the SCIENTIFIC AMERICAN:

In response to the request of SCIENTIFIC AMERICAN, page 403, June 27, 1896, in the article entitled "Barisal Guns and Mist Puffers," I would say that such phenomena are very common on this coast. My attention was first called to it some twenty or more years ago while acting as engineer of a towboat, it being our custom to lie three or four miles off the mouth of the river (the Piscataqua River), or about half way between Portsmouth light and the Isles of Shoals, and await the appearance of inward bound vessels. At these times I have frequently heard the sounds mentioned occurring at irregular intervals, and so far as my memory serves me, during the prevalence of a light southerly wind or a calm, and in warm, summer weather. They had a dull muffled sound, which appeared much like the report of a cannon at a very long distance.

A former shipmate informs me that he has heard these sounds all along the coast from Cape Ann to the eastern part of Maine, and frequently at the Isles of Shoals, especially a short time before sunset in hot weather; he thinks sometimes as often as three or four reports per minute, but he has never observed it at night or in winter.

The depth of water between the mouth of this river and the Isles of Shoals, a distance of about eight miles, varies, I think, from nine to about eighteen fathoms. LEVI W. LORD.

Portsmouth, N. H., June 28, 1896.

Sleeplessness.

It was once a custom in the more remote parts of Scotland to employ bards to rehearse to great men the verses of distinguished poets as a means of promoting sleep, for, as it has been observed, "anything that catches the attention, such as soft music, or any monotonous sound, as the murmuring of a rivulet, will entice sleep." But, good as many of the experiments may be for driving away wakefulness, experience would prove that what engenders sleep in one person acts in the very opposite direction on another. Thus, on some occasions Boerhaave, in order to procure sleep for his patient, directed water to be placed in such a position that it was continually dropping on a brass pan; a contrivance which, in many cases, had the reverse effect of keeping the person awake. And in adopting such artificial methods, Sir Henry Holland has observed, "These often fail from the cause." When they succeed, it depends on the exhaustion being more complete, or the mind being rapidly carried from one object to another, a desultory state of this kind being apparently one of the conditions more favorable to the effect desired. Sometimes, however, every means thought of for inducing sleep fail—

"And in the calmest and the stillest night,
 With all appliances and means to boot,
 Denies it to a king."

Southey's method of insuring a good night's rest was a simple one, for, writing to his friend James White, he said, "Follow my practice of making your latest employment in the day something unconnected with its other pursuits, and you will be able to lay your head upon the pillow like a child," which is much to the same purport as Tissot's recommendation "to solicit sleep by a reasonable dismissal of business and care." In the same way Kent, finding it impossible to procure sleep at his accustomed hour, diverted his attention to some indifferent subject, such as the history and writings of Cicero; whereby he not only got the better of the thoughts which kept him awake, but was

finally overcome by drowsiness—which reminds us of the missionary who, troubled with sleeplessness, repeated the Lord's Prayer till Satan sent him to sleep to get rid of it; and he adds that he never found the receipt to fail. Some have obtained the same result by a recourse to figures, either repeating the multiplication table or working out some simple problem. Much, it is affirmed, may be effected by resolution and firmness of mind. It is related that the Abbe Jaria, who acquired some reputation through his power of inducing sleep, was in the habit of placing his patient in an armchair, and after telling him to shut his eyes and collect his thoughts, he said, in a strong voice, "Dormez," which was invariably successful. Hufeland, too, maintained that by perseverance and firmness of mind great power may be obtained over the thoughts.

Some of the artifices for curing sleeplessness have been equally curious and ingenious. The famous engineer Brindley often saw the experiment tried of a man extending himself across the large stone of a corn mill, and gradually falling asleep by the stone whirling round before it gained its full velocity; and Asclepiades, among his many inventions for improving the art of physic, recommended the plan of pensile or suspended beds, by which the person was rocked asleep. Dr. Franklin was a firm believer in the air bath as a means of procuring refreshing sleep; and in Adair's "Essay on Diet and Regimen" minute directions are given for the use of hot water as an effectual remedy; whereas Struive, in his "Asthenology," speaks of electricity as promoting sleep, and tells of persons who have been cured of insomnia through making use of an electric bath. Among the natives of India it has long been customary to employ a servant to gently tickle the soles of the feet till sleep takes place; and Lord Bacon indirectly refers to the custom, and writes, "It is received and confirmed by daily experience that the soles of the feet have great affinity with the head, and soporiferous medicines applied unto them provoke sleep." Chinese medicine has many curious ways of producing sleep, which would scarcely find acceptance in this country. But rubbing the soles of the feet is recommended, because it is said that "the middle of the sole of the foot is as the outlet and opening of a great many sources of the spirits dispersed all over the body." The Hindoos maintain that to sleep with the head to the north will cause one's days to be shortened, whereas in our own and other countries this position has oftentimes been adopted by persons suffering from sleeplessness. Thus, some years ago, it was announced to the Scottish Curative Mesmeric Association that persons wishing to secure sleep should lie with their heads to the north and not on any account toward the west. It is also stated by an eminent physician in Scotland that when he failed by every other prescription to bring sleep to invalid children he recommended their little beds to be turned due north and south, the head of the child being placed toward the north—a process which had never failed to produce sleep. Some, again, have insisted that a certain amount of cold is a cure for sleeplessness, a notion which was advocated in olden times. Mr. Alfred Snell found the application of cold produced sleep when other remedies failed, and many a time, he tells us, he has obtained for his patient rest by applying a little cold water to the top of the brain when every other means had been of no avail. In short, persons suffering from want of sleep have been compelled to try all kinds of expedients; for, as Haydon once remarked, after a sleepless night, "You get up with a black veil over your fancy, through which you see all things."

Among some of the well known victims of sleeplessness may be mentioned Pope, who, when he was at work on his Iliad, was beside himself with sleeplessness; and both Smollett and Cowper were afflicted with the same malady, as also John Leech. Carlyle, at times, was more or less troubled with insomnia, and on such occasions generally sought relief in his pipe. But, like Leech, Carlyle was acutely sensible to every kind of sound, and the slightest noise would decompose him for the night. In the same way Thackeray was keenly alive to any jangling, inharmonious sounds, and to him, when going to sleep, there was no greater friction than the monotonous noises of street life. Byron was much troubled with sleeplessness, and one night, it is said, "suffered horribly," only allaying his distress by incessant draughts of soda water. Occasionally Charles Dickens could not sleep, and at such times he was in the habit of getting up and taking a long walk—a stringent remedy which he used to say brought him his required sleep. Writing of Chillingworth, Lord Clarendon once remarked that "his only unhappiness proceeded from his sleeping too little and thinking too much," which must be regarded as equally true of only too many brain workers. On the other hand, it has been oftentimes acknowledged a strange paradox that whereas many are resorting to every contrivance to coax and promote sleep, others are employing means to check it. Boerhaave, for instance, it is said, after one of his intense studies did not close his eyes for six weeks, and Descroizilles, according to his own confession, only allowed himself two hours in

twenty-four. And we may mention that indefatigable worker Michael Angelo, who, after passing the greater part of the day in his studio, would often rise at night to resume his labors, fixing a lamp on the top of his pasteboard cap "to supply the light which guided his marvelous chisel." But, in only too many instances, by such means, habitual sleeplessness has been the penalty, as happened to Claude Bordelieu. Unable to get rest, he resorted to opium; and it is related of Goldoni that, after writing as many as sixteen plays in a single year, "he paid the penalty during the rest of his life." Although men like Jeremy Taylor and Richard Baxter were content with three or four hours' sleep, few persons can dispense with the requisite amount, being more or less inclined to agree with old Dr. Fowler, of Salisbury, who used to say that to live a long life one must "lie abed in the morning until you are done enough."—London Standard.

From What Countries do the Illiterates Come?

The nations that will be affected by probable legislation are those from which the undesirable immigration comes. The following table, compiled by Congressman Bartholdt, will give a clear idea of the effect of a bill now before Congress if it should become a law:

Nationalities.	Percentage of Illiterates.
Portugal.....	67.35
Italy.....	52.93
Galicia and Bukowina.....	45.68
Poland.....	39.82
Hungary.....	37.69
Russia (proper).....	36.42
Other Austria.....	32.70
Greece.....	25.18
Roumania.....	17.75
Belgium.....	15.22
Turkey in Europe.....	14.79
Wales.....	10.43
Bohemia and Moravia.....	8.98
Spain.....	8.71
Ireland.....	7.27
Finland.....	3.58
France (including Corsica).....	3.50
England.....	3.49
Netherlands.....	3.38
Scotland.....	2.83
Germany.....	2.49
Norway.....	1.02
Sweden.....	0.74
Switzerland.....	0.60
Denmark.....	0.49

Many sections of this country need immigration, and it would be wise to encourage it if the people are desirable, that is, of a kind that can be assimilated. If the immigrants could be induced to locate and stay where they are wanted and to keep away from the sections where they are not wanted, the problem would solve itself. Unfortunately, this is not possible. If they are admitted to the country, they will go where they want to go and not where the people want them. This being the fact, repression seems the only relief for the sections that are oversupplied. If repression must be had, this bill seems to offer the best plan yet proposed for eliminating the undesirable classes.

Fiftieth Anniversary of the Telegraph in Belgium.

S. F. B. Morse, one of the best known electrical men in Chicago, often receives letters and verbal inquiries relating to his famous grandfather of the same name, who first put into practice the art of electric telegraphy. A late letter from Belgium shows that at the approaching celebration of the first half century of telegraphic service in that country the name and fame of Morse will be appropriately honored. This interesting communication is from J. Banneux, the engineer-in-chief and director of the state telegraphs of Belgium, and is dated at Brussels, May 20, 1896. It is as follows, says the Western Electrician:

The administration of telegraphs of Belgium will celebrate on September 9 next the fiftieth anniversary of the establishment of telegraphic service in the country. On that occasion I would be pleased to exhibit to those familiar with his apparatus an authentic portrait of the illustrious American inventor Morse.

Again, one of the noted painters of the day, charged by the government with the production of an historical composition to ornament the walls of the postal and telegraph stations in Brussels, has pictured Prof. Morse among his principal figures, and to this end he seeks to obtain as faithful a likeness as possible. We will therefore be very grateful to you if you can find it within your power to send us two good photographs of your illustrious grandfather, especially those which represent him in the last years of his life.

BUSINESS says: An owner of a process or invention for manufacturing an article, which was kept from all but confidential employes, may restrain former employes from disclosing, or using in a rival establishment, their knowledge of same; and it is immaterial that there was no written contract between them, or that at the commencement of their employment the employes were minors, and performed comparatively unimportant duties.