

# A "HORSELESS" CARRIAGE

The Motive Power Is Supplied by a Compact Gasoline Engine.

CAN TRAVEL TWENTY MILES AN HOUR.

Changes in Speed and Direction Are Easily Made by an Ingenious Arrangement of Levers and Cams.

SPRINGFIELD, Mass., Aug. 24.—A horseless carriage—called so because it has power of locomotion independent of horse or any other beast—is to be seen almost any day in Springfield's streets. That is the practicable and serviceable is shown by the fact that it has made long trips from one city to another. It is the invention of C. E. and J. F. Duryea.

In appearance the vehicle is merely a rather heavy sidebar buggy, with a top and a rounded dashboard, moving automatically along the street at a good rate of speed. The only evidence given of the presence of machinery is the geared wheel and chain, which project somewhat below the body between the rear wheels, and the slight noise made by the movement of the gasoline engine which furnishes power.

While practically only a working model and subject to all the shortcomings of a first machine, the vehicle has operated satisfactorily ever since it has been on the road, never once having failed to complete the trip on which it started, though subjected to hard trials. Recently it made a run of 100 miles in one day.

The carriage is guided and controlled by a single lever running back from the dashboard to the seat, and can be given a ve-

matic three, as is the present one, and will be fitted with ball bearings throughout. The inventors, who are practical bicycle makers, do not think it possible to use a steel-spoked bicycle wheel on such a vehicle, because, although such a wheel is very strong along its own plane, it offers no great resistance to side strains, and would be crushed down at the first street corner being turned.

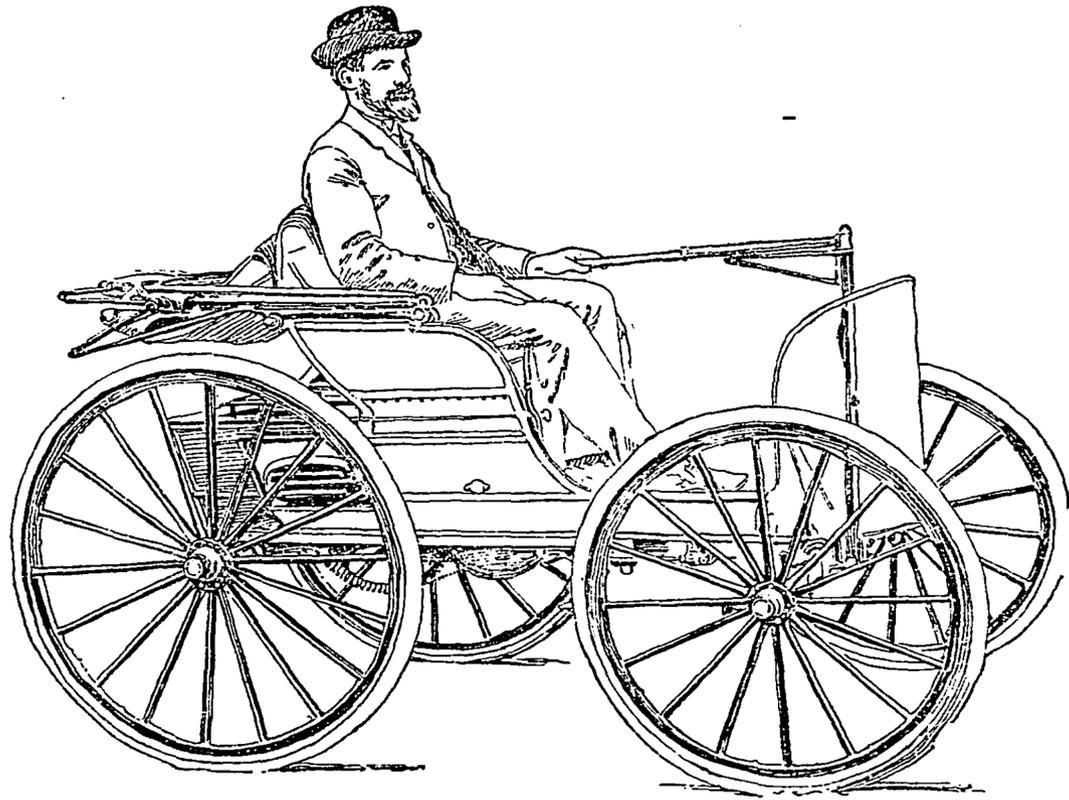
The Messrs. Duryea are confident of getting their machine taken up by capitalists in a short time, and expect in a few days or weeks to consummate a deal by which it will be put on the market in a short time. They think that many machines of the kind will be made in the country before long.

## WHITEFISH CAUGHT ON HOOKS

How These Pretty Little Denizens of the Lakes Should Be Captured.

It is popularly believed that the beautiful fork-tailed whitefish of the great lakes cannot be caught on hook and line. They have been tried with all manner of bait in vain, say the informers, and in every sort of weather and at all seasons. This notion is apparently supported by the fact that nearly all our whitefish bought in the markets are taken in pounds or seines. And it is so far true that it is doubtful whether the markets could ever be supplied by hook-and-line angling, although all the net fishers should try it. But whitefish do bite at certain bait under favorable conditions, and bite fast and hard, and give the fishermen lots of fun. When a hungry shoal of them happens along, and your bait takes their epicurean eyes, there is as much pleasure in capturing them as there is afterward in eating them, which is the highest sort of praise. The boys and girls, children of the lake fishermen, all know when and how to go out for whitefish, and they bring in long strings of big fat ones after an hour or two of angling. But a novice might sit and fish day after day in the same place, and never get so much as a nibble. It is all a knack.

Strange baits they are which attract this eccentric fish. On Lake Osego, where this same species is called bass, they catch large numbers with tiny bits of raw beef for bait. Tradition has it that the Indians who haunted the Glimmerglass in the days described in Cooper's "Deerslayer" used



THE "HORSELESS" CARRIAGE.

Capable of Making Twenty Miles an Hour by Means of a Four Horse Power Gasoline Engine, and of Running Ten Hours with One Supply of Fuel.

locity varying from three to twenty miles an hour. It is backed, stopped, and turned by simple movements of the lever, the vertical movements controlling the speed, while the horizontal ones do the guiding.

The weight of this carriage, about 800 pounds, is probably less than half that of successful foreign carriages of the same type. The entire machinery required for driving the carriage occupies a space about 3 feet long, 2 feet wide, and 1 foot deep, and weighs about 300 pounds, divided about equally between the engine, flywheel, and gearing, all of which is stored beneath the seat and in the covered wagon box behind it.

A tank holding five gallons of gasoline, placed beneath the seat, furnishes the fuel.

The engines, of which there are two, entirely distinct from each other, are of the Otto type, the igniting spark being furnished by electricity. Particular stress is laid by the inventors on the "mixer," where the air and gasoline combine, it being claimed that a mixture less liable to explode is obtained than in any other form of engine, while the combustion is better and the engines themselves much lighter than ordinary. The fact also that there are two separate engines makes it possible to use one in case of an accident to the other.

It is on the simplicity of the steering gear and the arrangements for the general management of the machinery, however, that the inventors lay the greatest stress. In the foreign carriages a brake is generally used for steering purposes, while there are separate switches for each change of speed which is to be made. This change of speed is accomplished by throwing in various sets of gears, those employed in this carriage giving a speed of three, six, and twelve miles an hour, and a reverse speed of three miles. In the Duryea vehicle the change of gears, by an ingenious arrangement of cams and levers, is effected by a vertical movement of the lever without an instant's loss of time. A strong brake also adds to the control of the machine.

The principal difficulty of management with a lever comes in the constant possibility that one of the wheels will hit a stone and turn aside the movement of the carriage. In an ordinary carriage, where the wheels turn on a point half way between themselves, it would be impossible to steer with a lever, or almost any other device, because the distance of the wheel from the steering head adds just so much leverage to the force of the impact of a stone on the wheel, which in that case would be considerable. For this reason it has been arranged on nearly all motor carriages to have a steering head for each wheel as near the wheel as possible, some arranging it as near as possible on the axletree, while others have had recourse to the principle of bicycle forks.

In the Duryea machine the heads are placed as close as possible to the wheels, and at the same time are so angled that their line strikes the plane of the wheel at just the point a stone would naturally be encountered. This practically does away with the leverage, which tends to turn the wheel, by bringing the force along the line of the head.

The arrangement by which this is accomplished is very ingenious. The axletrees, which are fixed to the body of the wagon, divide at the ends into vertical forks. Into these are fitted pieces resembling ordinary carriage hubs in shape, which hold the axles. Through these pieces run the bolts of the head in the direction of the contact of the wheel with the ground. The coordination of movement in these separately swung wheels is secured by a connecting rod of iron extending back of the axletree and joined at the centre of the wagon with the steering device.

The engines in use on the present single-seated carriage are of four-horse power, it being calculated that six-horse power will be needed for a two-seated, and eight for a three-seated vehicle. The ordinary maximum of speed of twelve miles can be increased, when the road allows, to nearly twenty by pressing a button below the seat, which takes off the governor from the machine.

Indeed, the run to Hartford the other day, in all a distance of twenty-eight miles, was made in two hours and five minutes, the engine being operated all the time at its highest speed.

It is cheaper to run a mile at a high rate of speed than at a low, paradoxical as it may seem. At a rate of fifteen miles an hour the cost, allowing 10 cents a gallon for gasoline, is about a third of a cent a mile, while at six miles an hour the cost is about half a cent. The average allowance for consumption of gasoline is about half a gallon an hour, the five-gallon tank thus giving a supply for a ten hours' run.

Such are the principal features of the present machine. There are, however, several improvements, which will be made for the two machines that are to be constructed for use in the motor vehicle race. The most important will be a considerable decrease in weight, amounting to nearly a third, and divided between the carriage itself and the machinery. Of the 300 pounds of the latter, nearly half will be cut off, principally by a reduction in the number of gear wheels, the cog wheels in the present form being replaced by friction gearing. This will not only allow the lightening of the wagon, but will do away with the small amount of noise now due to the action of the cogs.

The carriages will be equipped with pneu-

to catch the whitefish on bits of flesh cut from the beaver's tail. This was too laborious a process to be in common use for the line of deer sinew, and the hook of bone was too tedious to construct. Usually, they secured their breakfast by spearing from a canoe by torchlight on the previous night. The "Pioneers," also by Cooper, gives a pretty picture of this entrancing sport, which now is prohibited by law.

But the beef bait is rarely used in Ontario and Erie and the other big ponds. These fish feed on grubs and worms of all sorts, live minnows, grasshoppers, and many kinds of beetles and bugs; and, if very hungry, on strips of salt pork, cut thin. But they have one favorite food that they can never resist. That is a sweet paste made of flour and honey (or molasses) and gum arabic, with chopped yarn stirred in to keep the stuff from washing off the hook. It is carried in a tin can and molded into little pellets about as big as a hazel nut whenever a fresh bait is needed, and one ball at a time is used. It is simply impaled on the barb and does not in the least conceal the hook. But the whitefish never stops to consider that fact. One whiff of that beloved paste will make him forsake home and friends and country for one good taste.

Many fishermen who try to catch these elusive fellows fall, even with the best bait, because of improper tackle. The whitefish has a very small mouth, and one so tender that a big, coarse hook will not go in at all, or will tear the fragile membrane all to pieces, and the injured fish will escape. Too stout a rod will do the same thing, by not yielding sufficiently to the first frightened dash of the fish. A slender, pliant rod, a delicate silk twine line, and a light, fine wire hook will save nearly every fish that so much as nibbles at the bait. The Aberdeens are the best hooks in the world for this purpose, because of their slenderness and keen needle barbs. No danger here of the fish biting the shank in two, as bass or pike will do, so that only objection to these sterling hooks is removed. The size known to dealers as No. 5, or even No. 6, is the proper thing. Unless the fish be critically examined and its surprisingly tiny mouth be noted, these hooks will seem preposterously small.

In some of the outlets of the lakes and canals, where there is a bit of an eddy or a quick current, the whitefish seem to imbibe some game qualities from the turbulent water they inhabit. They attack the bait more ravenously, will follow and seize it while being withdrawn, and will even rise to and take the artificial fly. The fish fancy bright colors, and will greedily swallow a Polka, Lord Baltimore, Green Gnat, Orange Dun, Ibis, or any gaudy fly. They seldom leap for it, and are more easily taken with a sunken than a dry fly. In spite of a brave rush and a deal of fierce splashing these pretty lakelings are tender and short lived when hooked. Their first few struggles decide the battle. They either tear loose and escape to die by slow degrees or be killed by other fish. (For they do not recover from their wounds,) or are exhausted and are led to the net an easy prey. It does not do to try to lift them over a boat's side or upon a dock, for their jaws are too frail and they will drop off. The lakes are so beset with pursenets, traps, weirs, pounds, seines, and driftnets that it is a wonder any fish are let to remind us of days when they were really plenty. Yet in spite of every outrage, of the massacre of spawning females and yearling young, the whitefish still survive in fair numbers. Where once they brought a shilling a pound they now bring but a cent and a half to two cents in market, because of the vast quantities brought in and shipped by the net fishermen. Unless the latter gentry are compelled by law to take a reef in their big nets and give the young and budding fish a chance to live, lake whitefish may soon be more rare in their native waters than salmon in the Hudson.