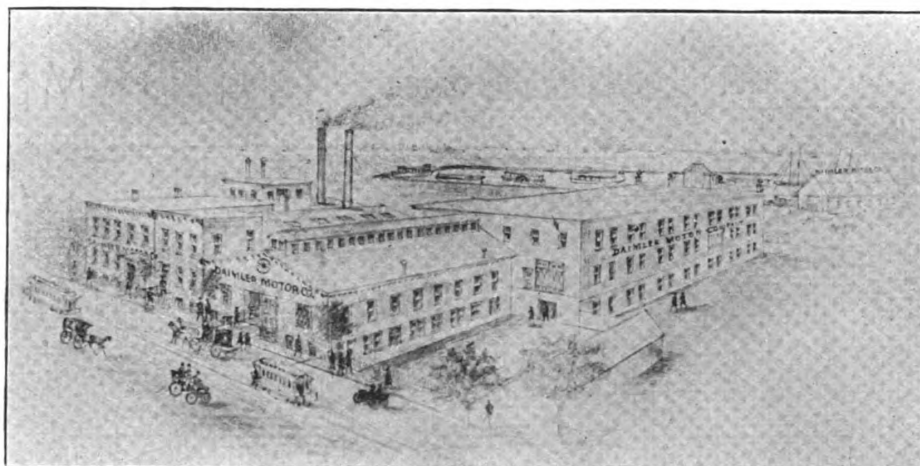


DAIMLER MOTOR COMPANY'S



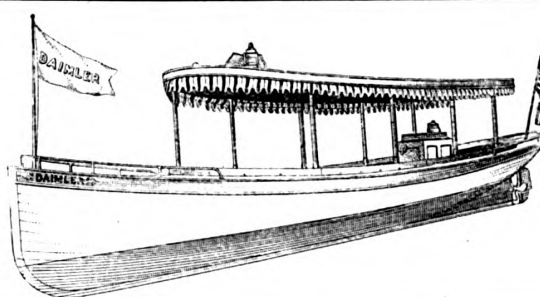
FACTORY AND OFFICES:

STEINWAY, LONG ISLAND CITY, N. Y.

Where the CELEBRATED DAIMLER MOTORS, operated by either GAS, GASOLINE, or KEROSENE, are manufactured.

FOR LAUNCHES,

Triple, Twin, and
Single Screws.
Paddle and
Stern Wheels
of lightest draft.



For Stationary Purposes,

SUCH AS
Hoisting, Pumping,
Electric Lighting, and
Driving all Sorts of
Machinery,
ON LAND OR WATER.

NO LICENSED ENGINEER, PILOT, OR GOVERNMENT INSPECTION REQUIRED.

THE DAIMLER MOTOR CARRIAGES

Were awarded the following Prizes:

1. Grand Prize, 5,000 Francs, at Paris, July, 1894.
2. Gold Medal and First Prize at Turin, May, 1895.
3. First Prize of 40,000 Francs, as well as the Second, Third, and Fourth Prize, at Paris, June, 1895

The Daimler Motor is the most powerful and compact, as well as reliable engine now on the market.

Send for Illustrated Catalogue and Price List.

MOTOR CYCLES

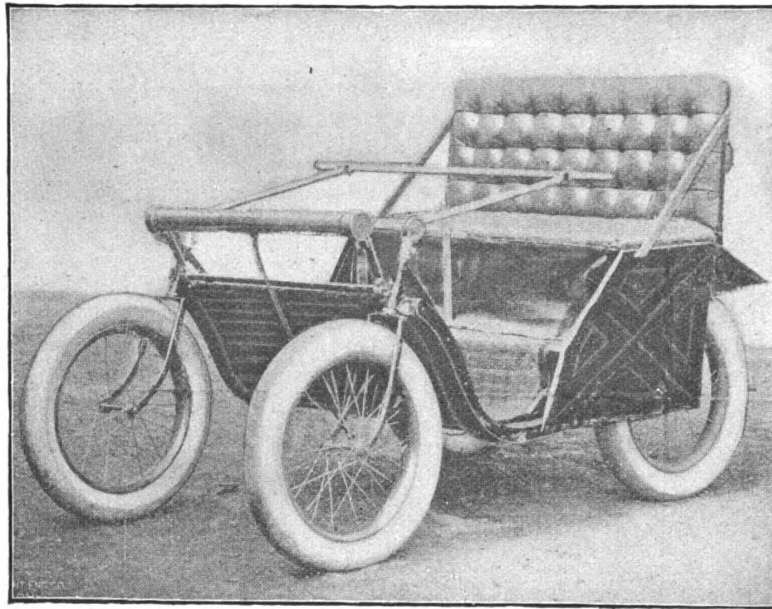
ONE, TWO AND

THREE SEATED.



TANDEMS AND
VICTORIAS.

*Speed, Safety, Comfort and Economy
Combined.*



VICTORIA

With 4 H. P., 4 Cylinder Kane's-Pennington Engine.

Write for Prices and further particulars to

RACINE MOTOR VEHICLE CO.,

RACINE, WISCONSIN.

DURYEA 

MOTOR WAGON

* * **COMPANY,**

SPRINGFIELD, MASS.

MANUFACTURERS OF

Motor Wagons,

Motors, and * * *

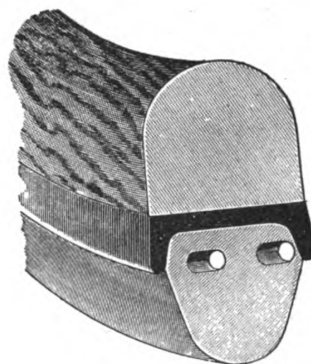
Automobile Vehicles

of all kinds.

THE ONLY SUCCESSFUL

© **RUBBER TIRE** 

YET MADE
... IN THIS COUNTRY...



CROSS SECTION OF TIRE

GUARANTEED NOT TO
ROLL OUT.

*

The only Practical .
and Cheap Tire . . .
now in the Market.



WE PUT THEM ON...

OLD OR NEW WHEELS

RESISTS INJURY FROM THE SEVEREST
TESTS, AND LASTS FOR YEARS.

WE HAVE MORE THAN 12,000 TIRES
NOW IN USE.

— SEND FOR CATALOGUE —

THE RUBBER TIRE WHEEL CO., Springfield, Ohio.

Also: 1784 Broadway, NEW YORK, N. Y., 342 Wabash Ave., CHICAGO, ILL.,
92 Beverly St., BOSTON, MASS. 1204 Girard Ave., PHILADELPHIA, PA., 2320 Olive St., ST. LOUIS, MO.

... THE DE LA VERGNE ...
REFRIGERATING MACHINE COMPANY,

Foot of E. 138th Street, New York,

having established a special

OIL ENGINE DEPARTMENT

is prepared to contract for

WAGON MOTORS OR

===== MOTOR WAGONS

OF EVERY DESCRIPTION.

The Engineering and Patent Offices

— OF —

FRANCIS H. RICHARDS,
HARTFORD, CONN.,

Afford ample facilities for carrying on the development and patenting of inventions.

Mechanical Engineer.

Patent Attorney.

Expert in Patent Cases.

Investigations and Reports.

Opinions on Questions of Validity and Infringement.

Telegraph Address: "Mechanist, Hartford."
Local and Long Distance Telephone.

Offices: 303 Main St. (Phoenix Bank Building.)

CHARLES B. KING,

112 AND 114

ST. ANTOINE STREET,

DETROIT, MICH.

*

MANUFACTURER OF

KING'S † †

PATENT † †

GAS † † †

ENGINES

FOR

VEHICLES,

LAUNCHES,

ETC.

THE HORSELESS AGE.

A MONTHLY JOURNAL

DEVOTED TO MOTOR VEHICLE INTERESTS.

VOL. I.

NEW YORK, DECEMBER, 1895.

No. 2.

THE HORSELESS AGE.

E. P. INGERSOLL, Editor and Proprietor.

PUBLICATION OFFICE:

157-159 WILLIAM STREET, NEW YORK.

WESTERN HEADQUARTERS:

Room 1524, Monadnock Block, CHICAGO, ILL.

W. A. DOUGLASS, MANAGER.

SUBSCRIPTION, FOR THE UNITED STATES AND CANADA, \$2.00 a year, payable in advance. For all foreign countries included in the Postal Union, \$2.50.

ADVERTISEMENTS.—Rates will be made known on application. When change of copy is desired it should be sent in not later than the fifteenth of the month.

COMMUNICATIONS.—The Editor will be pleased to receive communications on trade topics from any authentic source. The correspondent's name should in all cases be given as an evidence of good faith, but will not be published if specially requested.

THE HORSELESS AGE will be sent regularly to advertisers, paid subscribers, and exchanges only

Address all correspondence, and make all checks, drafts, and money orders payable to

THE HORSELESS AGE, 157-159 William Street, New York.

Entered at the New York Post Office as second-class matter.

Comparison Invited.

THE full returns of the sale of the first number of THE HORSELESS AGE are not yet received, but those that are already in warrant the belief that the total sales will exceed those of the first number of any trade journal ever issued in America. Subscriptions have been coming in rapidly from all sections of the United States and Canada, and even foreign countries have thus early been heard from. These subscription returns show an astonishing diversity of interest. Physicians, lawyers, capitalists, bankers, promoters, mechanical and electrical engineers, gas engine manufacturers, machinists, bicycle, carriage, tube, and rubber tire manufacturers, inventors, college professors, intending

purchasers, and manufacturers in lines too numerous to specify, are found upon the subscription lists of THE HORSELESS AGE. An interest so lively and a clientele so varied and so uniformly intelligent, have seldom responded to the slogan of the journalist; proving beyond peradventure that the brains of the American people is with those who are substituting better methods of locomotion for the horse.

It is the editor's intention to treat this great question in all its phases, and thus give to each and every class of subscribers the particular information they desire. The chemical branch of the subject is little understood, and is well worthy of special treatment. The mechanical department is wide enough to embrace nearly the entire Patent Office, while in its social and pleasure aspects the motor vehicle will afford no end of material both entertaining and instructive.

The judicious advertiser who is soliciting this new trade will appreciate the force of the claims advanced above, and remembering that it is the early bird that catches the worm, he will not be the last to utilize a medium which, within thirty days of its first issue, is read by thousands all over the United States.

The Status of the Race.

AS A DESIDERATUM in modern locomotion, speed is of ever-growing importance. The pressure of the age demands it, and in response to that demand, steam cars and street cars now travel at rates of speed unknown a few years ago. Everywhere and in every line of effort, economy is the cry, and it is all for the easier attainment of human objects, and hence for the general amelioration of mankind.

But when we come to consider the motor vehicle in its present stage of development, the element of speed sinks into relative unimportance. Other considerations, such as simplicity, economy of operation, ease of control, etc., are entitled to much greater weight. A motor vehicle may attain great speed, and yet be practically worthless for the ordinary purposes of everyday use.

At some future day, when roads are universally good and motor vehicles are no longer a novelty; when people are accustomed to managing them and taking them into account as a factor of danger in street life, high rates of speed will be permissible, where road conditions are favorable; but for the present it is neither necessary nor desirable. Legal measures, limiting the speed of motor vehicles, are as much needed as measures regulating the speed of bicycles and horse-drawn conveyances, and for the same reason, namely, the public safety.

Hence, while recognizing the great stimulus which such motor vehicle contests as those organized abroad and at Chicago undoubtedly give to the new industry, the editor deems it wise to caution the public against laying too much stress upon mere speed. Races, or their results rather, partake of the vast and the extraordinary, and are surrounded with all the glamour which human admiration for these qualities can lend them. They arouse enthusiasm, prompt men to great exertion, and the million-tongued press recounts the story round the world. All this is helpful and necessary to the rapid growth of any great improvement at the present time. To lead, to educate and stimulate the public for the adoption of better things, is one of the most useful functions of the press.

But it must not be forgotten that the motor vehicle is offered as a substitute for the horse in the ordinary affairs of life, and not on the race track. What is wanted is a motor vehicle as responsive and tractable as a horse, and more economical in its maintenance. In the daily business of the world the speed of the horse cuts a small figure. It is power and docility combined that make him the useful animal he is to-day; and so in the case of the motor vehicle we must have power *and* control. Of the two phases of the question, if one is of more consequence than the other, it is control.

“The Bloodless Revolution.”

SUCH is the bold phrase in which Sir David Salomons, an English savant and motor vehicle enthusiast, recently characterized the coming displacement of the horse. Sir David is himself a lover and breeder of fine horses, and his turnouts are famed throughout the whole of England. Yet to advertise to the world his own belief in “the horseless age,” he organized a motor vehicle show last month at Tunbridge Wells, of which city he is the respected Mayor. The exhibition attracted wide notice from the British and continental press and was so largely attended by our conservative English cousins that those who are skilled in reading the signs of the times see unmistakable evidence of a new fad in upper class society there.

That England, long the mainstay and buttress of conservatism; England, where to-day a motor bicycle is treated on a par with a traction engine in road legislation—should evince so sudden and pronounced an interest in the new vehicle is significant indeed. It affords cumulative proof of the unprecedented rapidity with which this burning question of the day is spreading over the civilized world. The wave is upon us in America to-day, and almost before the public is aware, as by a sweep of Aladdin’s wand, steedless wagons will be gliding through the streets in varied forms, for varied uses.

To in some degree mitigate this surprise and prepare the public for the impending change, is the mission of THE HORSELESS AGE.

Looking for a Name.

ST. PAUL, the apostle, said that the generation of his day sought after a sign, but that no sign should be given them. In like manner the very estimable gentlemen who are organizing the American Motor League are looking for a name, but it is very doubtful whether they will be more successful in their search than the generation of St. Paul was. They are seeking what they already have, if they will but see it.

It is certainly advisable for those who are pioneering a new industry to be careful in the selection of their terms, and thus endeavor to secure the popular adoption of those terms which are best suited to express their ideas. But after all, the naming of things is the prerogative of the people, and before this democratic bar all verbal candidates must finally be tried. The standard by which these words will be judged is fitness—fitness for the everyday business of life.

But in considering the choice of a name for the vehicle without horses, we are confronted at the outset with the fact that this class of vehicle is not new; it is only the interest in them which is new. For thirty-five or forty years past the United States Patent Office has been granting patents on contrivances of this kind. So numerous have the applications been that long ago a distinct classification was adopted for them—“motor vehicles,”—and under this one heading are grouped all the various forms of minor vehicles without horses, using other than man power.

If the objection be raised that this also includes street cars, it may be answered that the tendency for some time past has been to limit the term to trackless vehicles, such as wagons, bicycles, etc., a distinction which is becoming more marked every day, and is likely to be clearly defined within six months.

The examiners of the Patent Office are surely as well qualified to choose the proper terms for mechanical

inventions as anybody, having during the past twenty-five years come directly in contact with hundreds of inventors, and being familiar with all the differences and distinctions observable in this particular class of invention.

Given the term motor vehicle, therefore, as a generic or general term, all the specific terms needed follow easily and naturally from it. We have our motor bicycles, tricycles, buggies, wagons, trucks, traps, phaetons, carriages and what not, and if it is desired to specify the nature of the motor which propels the vehicle, we can subdivide the generic class from this point of view into electric, gasoline, kerosene, acetylene, etc., bicycles, buggies, carriages, wagons, etc.

This method of classification is logical and simple, for by the union of two known terms we proceed to the unknown, or the new, a very easy transition in language as in knowledge.

At present the people seem to be wedded to the name "horseless carriage," but with the growing importance of the motor interests in modern civilization, it seems quite certain that this awkward expression will gradually be discarded in favor of the briefer, more terse and expressive terms above mentioned.

The editor of *THE HORSELESS AGE* has adopted this terminology as the simplest and best, and will continue to employ it, unless forced by popular usage to abandon it.

In the popularization of this comprehensive motor idea, and the substitution of a more sensible terminology for that now in vogue, the American Motor League can lend efficient aid.

Acknowledgments to the Press.

THE editor desires to express his appreciation of the many favorable comments which have been made by the press of the country on the first number of *THE HORSELESS AGE*. The newspapers have as a rule shown a quick perception of the situation, and will doubtless render great assistance to the cause in future by giving to it liberally of their space. It is a subject of great interest to their readers, and its treatment is therefore in line with good journalistic policy, as well as in harmony with the broad tendencies of the age.

A few editors who read the title but not the contents of the book, fell into a skeptical or even satirical frame of mind, and afforded striking illustrations of the old adage that a little knowledge is a dangerous thing. Having denied themselves the abundant evidence offered in its pages, they could not be expected to arrive at correct conclusions. That magnificent progress is recorded in the first issue of *THE HORSELESS AGE*, only candor and a willingness to read are needed to recognize.

It is better to be right than to be funny, and it is impossible to intelligently discuss a great mechanical improvement like the motor vehicle without a clear discernment of that guiding principle of human nature, by which a man goes cross lots when he can, instead of around the corner.

In its tenacity of established things, the world is very much like a child hugging a cherished toy. It strenuously resists anyone who would deprive it of an old custom, but is quickly consoled with a new one.

Thos. A. Edison's Views on Motor Carriages.

THE *New York World* of Sunday, November 17th, contains a lengthy interview with Thomas A. Edison, in which the famous inventor discusses a number of topics now prominently before the public, including motor carriages. The Wizard says:

"Talking of horseless vehicles, by the way, suggests to my mind that the horse is doomed, yet this animal shows a greater economy of force than man, for 70 per cent. of the energy of the horse is available for work. But the horseless vehicle is the coming wonder.

"The bicycle, which ten years ago was a curiosity, is now a necessity. It is found everywhere.

"Ten years from now you will be able to buy a horseless vehicle for what you would have to pay to-day for a wagon and a pair of horses. The money spent in the keep of the horses will be saved, and the danger to life will be much reduced."

"Will these vehicles be run by electricity?"

"I don't think so," said Mr. Edison. "As it looks at present it would seem more likely that they will be run by a gasoline or naphtha motor of some kind. It is quite possible, however, that an electrical storage battery will be discovered which will prove more economical, but at present the gasoline or naphtha motor looks more promising.

"It is only a question of a short time when the carriages and trucks of every large city will be run with motors. The expense of keeping and feeding horses in a great city like New York is very great, and all this will be done away with, just as the cable and trolley cars have dispensed with horses.

"You must remember that every invention of this kind which is made adds to the general wealth by introducing a system of greater economy of force. A great invention which facilitates commerce enriches a country just as much as the discovery of vast hoards of gold."

With the main drift of Mr. Edison's remarks we most heartily coincide, but when he postpones the day when a motor carriage can be bought at a price now paid for a carriage and pair of horses until the next century, he forgets the recent wonderful development of electrical science, in which he himself has played so important a part, and shows that he is not aware of the amount of intellectual energy that is being concentrated upon the motor vehicle problem in America to-day.

Had Mr. Edison read the first number of *THE HORSELESS AGE*, he would have said ten months rather than ten years.

The Policy of the Motor League.

AT THE MEETING held in Chicago, November 1st, the organizers of the American Motor League failed to agree as to the policy the organization should follow in the admission of members, and a committee was accordingly appointed to give the subject more careful consideration and report at the next meeting.

Some were in favor of admitting users of motor vehicles as well as manufacturers and scientific experts, but others wished the membership limited to the latter only.

In the initial stages of a great industrial revolution such as we are about to see, opposition is sure to be encountered from many quarters. The interests arrayed against the reform are always potent for mischief, controlling many public offices and furnishing the animus of many laws directed against the new comer. Their ever-ready argument which gains for them many unthinking adherents, and the truth of which must be admitted, is that the innovation is ruining their business.

Now, it is well known that the only way to successfully meet organized opposition is by organized opposition. The army of the conservatives must be confronted and overawed by an equally numerous and more determined army of progressives. There is immense power in numbers and there is immense power in determination, and both these weapons should be used to the fullest extent.

But it is obvious, at this period of the industry, that the inventors and manufacturers of motor vehicles constitute but a small fraction of those who are or will soon be working against them. Hence the necessity of bringing into the organization all users of motor vehicles in order to swell the ranks and stand shoulder to shoulder in the protective work which will undoubtedly be needed from the start. With respect to loyalty to the cause, it will probably be found that users of motor vehicles do not suffer by comparison with manufacturers or experts. In the pioneer days enthusiasm is rife, interests (many of them) are common, numbers are needed, and the door should be open wide enough for all who are sufficiently interested to enter. A good representation of users will at once demonstrate the practical utility of the invention, and frustrate any claim that "the people" are antagonistic to it.

Organizations, like individuals, change according to their environment and the functions that they perform. In the aggressive period the protective feature naturally assumes great prominence, but as the necessity for protection disappears so the protective feature would quietly lapse and members who had joined solely for this object would sever their connection with the organization or become inactive. Simultaneously with the decay of this

function others that had previously been in abeyance would begin to develop.

The educational value of the Motor League will certainly be great, if it is conducted on broad and liberal lines. In the last issue of the L. A. W. Bulletin, Mr. Sterling Elliott seems to brand this idea as chimerical, and ironically asks us to imagine, if we can, the bicycle manufacturers coming together into convention and revealing their secrets to each other.

Whether it is possible for the bicycle manufacturers to come together for the exchange of ideas it is not necessary to consider here at length, but it is necessary, for a clear understanding of the matter under discussion to point out some radical differences between the bicycle and the motor vehicle trades to-day.

The bicycle trade as compared with the motor trade is old. Its members have passed through the period of enthusiasm. Competition begins to be felt more keenly and the jealousies that spring from it tend to close men's minds and make them uncommunicative. But the motor vehicle inventors are full of hope and buoyancy. They are able to forget themselves in the idea which they represent and which has taken complete possession of them. In this state of mind men are not, as a rule, secretive. They are glad to meet each other and exchange ideas and he must be a dullard indeed who, from a conversation with a knot of fellow inventors, or from a more formal gathering for the same purpose, cannot carry away some suggestion helpful to himself.

And it goes without saying that he who knows most will learn most from such a gathering, and he who knows everything will learn nothing. Neither the bicycle manufactures nor any other class of men however engaged, are too old or too wise to profit by association and interchange of ideas.

Even the social features of trade organizations are not to be minimized. They smooth down the little roughnesses of competition, give men juster views of their fellows, foster a common interest, broaden the minds and quicken the sympathies of their members. These are influences not to be despised, and even if the American Motor League could accomplish no more than this it would have good reason to exist. But it can accomplish more. It has much and varied work to do, work in which all earnest men should be invited to join.

Uniform Spelling.

THERE seems to be no good reason why benzene and gasoline should be spelled with an i, in the termination, as they commonly are to-day, while acetylene and kerosene take the e. Hence the editor of THE HORSELESS AGE has decided hereafter to adopt the uniform phonetic spelling "ene" for all these names of hydrocarbons.

What It Means to the Cripple.

THERE is a class of the community little thought of perhaps in the prevailing excitement, who are looking forward with anxious hope to the final success of the present motor vehicle experiments. These are the cripples and paralytics, who retain the use of their arms, but have no control over their lower members. A light, reliable and safe motor tricycle or quadricycle, which they might operate without change of position, would open up a new world for them. It would not only enable many of them to get about without assistance, but it would afford pleasant and diverting exercise, which could not but have a favorable influence upon their health.

The editor of THE HORSELESS AGE has had inquiries from a number of such sufferers, and hopes the day is not far distant when the manufacturers of motor vehicles will be able to supply their wants.

The Soulless Machine and the Spirited Animal.

THE people who tell us the motor wagon will never displace the horse because the one is a "soulless machine" while the other is a spirited animal, have been reading romances of the days of chivalry or attending Horse Shows, and never opened their eyes on the work-a-day world. Hard work is the lot of most horses, and any spirit they naturally possess is soon subdued. As for pet horses, they are a special and not numerous class, and will not be disturbed.

Aid from the Cartoonists.

ANYTHING new comes as a godsend to the cartoonists, who must be continually feeding the public appetite for the humorous. Hence it is not surprising to see the motor wagon caught up by them with avidity and made the central idea in many of their current sketches.

The past month it was used to good advantage in a two-page cartoon by one of the leading comic papers of the country.

The artists are lending their influence in the right direction and we welcome them as aiders and abettors in the popularizing of a great public improvement.

"Hands Across the Sea."

TO OUR CONFREERE, the editor of *La Locomotion Automobile*, published at Paris, France, we extend the right hand of fellowship, and if we should at any time forget to credit matter taken from his pages, it will not be because it is not worthy of credit.

Motor Convention at London.

SIR DAVID SALOMONS, the English motor vehicle enthusiast, has received such an avalanche of correspondence since he held his exhibition at Tunbridge Wells, that he has decided to call a meeting at London in the near future, to consider the question of self-propelled traffic, and influence legislation in its behalf.

"It Scares Horses."

SUPPOSE it does. So do locomotives, bicycles, street cars, Fourth of July celebrations, and a dozen other things. Horses must get used to it.

The Touring Club of France.

Few Americans are aware of the extent of this fashionable organization, whose headquarters are at Paris, and whose members are found in every province of the Republic. Over 20,000 names are already to be counted in its membership roll, and the enthusiasm for touring in the new automobiles is increasing so fast, that the club bids fair to excel in members and influence all other French societies.

Delightful descriptions come to us across the water of holidays gliding away on wheels, amid the picturesque scenery of Provence, Burgundy, Champagne and other famous provinces of "Sunny France." Its motto seems to be *bon camaraderie*, and it is doing good work for the cause of the automobile.

As though this colossal society were not sufficient, Count de Dion now suggests that an Automobile Club be organized at Paris, one of whose chief objects shall be the establishment in the suburbs and outlying districts of inns or road houses, where all the necessary supplies for man and vehicle can be obtained.

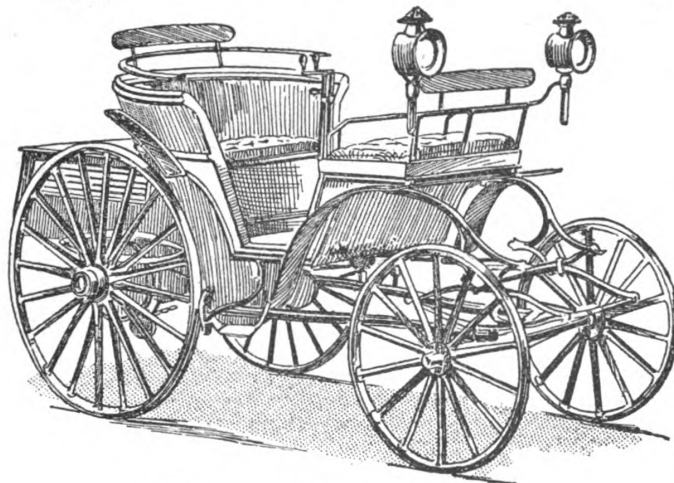
British Columbia to the Front.

It is said that a company is being formed, with \$500,000 capital, to operate a line of motor wagons between Ashcroft and Barkerville, B. C., a distance of some two hundred miles. Ashcroft is on the line of railway, and Barkerville is in the heart of the gold region. There is a fine wagon road the whole length of the route, and at present a big business is being done by horse stage lines. But in the Cariboo country everything the horses eat has to be imported at a heavy expense, and the road runs through such a mountainous region the horses do not last long. The company thinks it can handle the business of both passengers and freight, including the ore output of the mines, by using an oil motor wagon designed for this route, and at a much cheaper rate than by the present horse stages. The Provincial Legislature has been asked to pass a bill granting the company the privilege of operating motor wagons on all the main routes in the Cariboo region. By Government direction the wagons are to be constructed with extra wide tires in order that their use may be beneficial to the roads.

Motor Vehicle Show at Tunbridge Wells, England

English Horses Show no Fright.

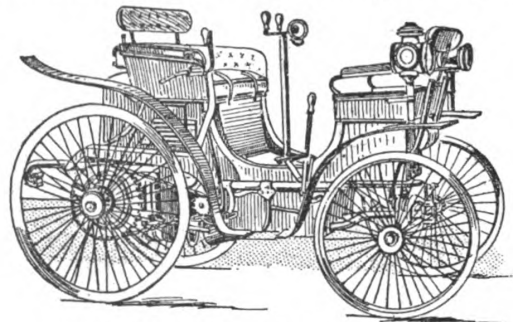
Remarkable evidence of the widespread and growing interest which is felt in the development of mechanical-power carriages and cycles was afforded at the exhibition of horseless carriages organized by Sir David Salomons yesterday at Tunbridge Wells. All the visitors now staying at the bright little inland watering-place appeared to have crowded to the Agricultural Show ground, and in addition the trains had brought shoals of interested spectators from London and all parts of the country. That a good many cyclists are looking forward to the time when they will be able to indulge in their favorite pastime without exercising their muscles, was evidenced by the long row of bicycles which lined the hedge on one side of the ground; and the large number of one-horse and pair-horse carriages which surrounded the meadow seemed to show that in the world of fashion there is no small desire to reduce the expense of living by means of a mechanical substitute for the horse.



PETROLEUM VIS-A-VIS. M. ROGER, PARIS.

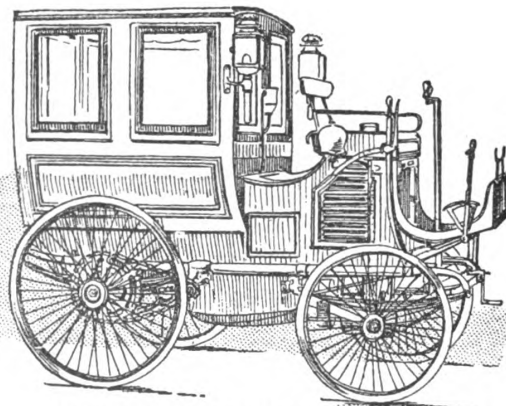
The number of vehicles shown was not large, but Sir David was justified in claiming that it was fairly representative. With one exception all the carriages were of French manufacture and design, and as the only example of British enterprise in this direction was not seen at work, it is impossible to institute a comparison between French and English work; but in appearance at least it justified the hope that when the present absurd legal restrictions are removed, we shall be able to hold our own with our neighbors. The carriages which excited the greatest admiration were a *vis-à-vis* built by Messrs. Peugeot, of Paris, and a tricycle, worked by petroleum motor, with electric spark ignition, shown by Messrs. de Dion & Bouton, of Paris. The *vis-à-vis*, which is worked by a Daimler petroleum engine supplied by Messrs. Panhard & Lavassor, was exhibited by Sir David Salomons. It weighs 13 cwt., and will run from 180 to 200 miles without recharging. It carries four persons, and although to the spectator there appeared to be an unpleasant amount of vibration, those who were privileged to ride in it—including two or three eminent physicians and scientists—expressed themselves exceedingly pleased with

its working. The tricycle, which was built from the design of the Count de Dion & M. Bouton, both of whom were present at the exhibition, appeared to work exceedingly smoothly. It is



DAIMLER CARRIAGE. PEUGEOT FRERES, PARIS.

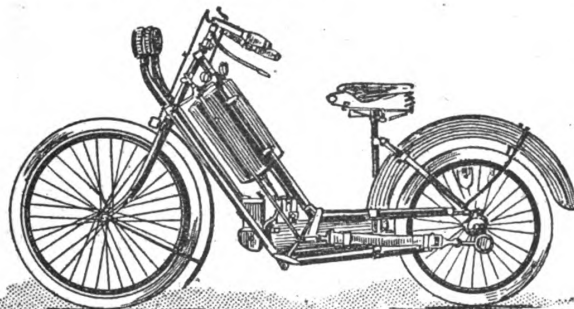
provided with pedals, and it appeared to require a certain amount of assistance from the rider's legs when going up-hill; but this was probably due to the fact that the course consisted of more or less sodden meadow land. Its weight is 95 lbs., and its cost, \$250. A carriage built by Messrs. Panhard & Lavassor, and worked with their Daimler petroleum engine, was shown by the Hon. Evelyn Ellis. Though different in shape, it was precisely the same in principle as Sir David Salomons' exhibit. Very different, however, was the carriage with steam-horse attached, shown by Messrs. de Dion & Bouton. It was undoubtedly the most powerful horseless carriage shown; but although the smoke had been kept in perfect subjection the occasional clouds of steam and the noise rendered it apparently a much less agreeable carriage than those worked by petroleum engines. Mr. Evelyn Ellis also exhibited a fire-engine for a country house fitted with the Daimler engine. It was shown at work, throwing a column of water to a height quite sufficient to reach the top of a three-storied house.



DAIMLER OMNIBUS, PUEGEOT FRERES, PARIS.

Four types of carriages worked by petroleum engines, all of which have already come into pretty extensive use in France, are shown in the accompanying illustrations. Three of them—the omnibus, the brake, and the "*vis-à-vis* à quatre places"—were manufactured by Messrs. Peugeot, the last named being

precisely similar to that shown yesterday by Sir David Salomons. The bicycle made by Messrs. Duncan, Superbie, et Cie., also worked by petroleum, has already won its way into popular favor in France. It was invented by Herr Muller, of Munich, and was first exhibited in this country at the Crystal Palace last December. Another *vis-à-vis*, which is shown, was manufactured by M. Roger, of Paris.



PETROLEUM BICYCLETTE. DUNCAN & SUPERBIE, PARIS.

Sir David, who explained the mechanism of his carriage, stated that the average speed was eight miles an hour, although on good roads he had traveled at the rate of twenty miles an hour. The fuel is benzene, costing 22 cents a gallon, and the cost of running the carriage is about one-third of an English penny per mile. The vehicle cost \$1,350.

Among those present on the ground was Shaw Lefevre, who when president of the local government board in the late parliament, introduced a bill to remove the legal restrictions dealing with steam and other vehicles not propelled by horses. The bill, unfortunately dropped with the defeat of the government, but is certain to be taken up in the near future.

That the horseless carriage for use on ordinary roads is no new idea, may be gathered from a steam vehicle of the kind, invented by Mr. Gouldsworthy Gurney, and shown at work in Regent's Park in the year 1827. It was found however, that when coke and water had been provided sufficient to last for an hour's trip there was very little room left for passengers.

The length of the vehicle was 15 feet, and with the pole and pilot wheels, 20 feet. The diameter of the rear wheels was 5 feet, and of the front wheels 6 feet 9 inches, and of the pilot wheels 3 feet. One curious arrangement was a set of "steppers" which moved like the legs of a horse, and were used in going up-hill.

An interesting fact which has been omitted in many reports of this exhibition, is that when these vehicles were afterwards taken out for a short run on the public highways, they did not appear to frighten the staid English equines in the least, although the road was crowded with vehicles of all description. Thus, this protective measure in favor of horses seems to be entirely uncalled for. It is the English men who are frightened, and not the English horses.—*London Daily Graphic*, Oct. 16th.

Signor Brena has arrived at Bologna from Naples in his automobile carriage, having completed 3,000 kilometers of his journey. The carriage is said to be none the worse, though it went over terribly bad and rough roads, and had to pass through the snow which was encountered while crossing over the Apennines, at the Piano delle Cinque Miglia.—*The London Daily News*.

A FEW PRESS COMMENTS

ON

THE HORSELESS AGE.

—O—

We are getting on rapidly. A new monthly publication just started in New York, is styled *The Horseless Age*. It is devoted to the interests of the motor vehicle industry. The numbers and variety of motor vehicles described in the first number of the paper is surprising to one who has not kept up with the recent achievements of inventors. With so many men at work on the problem, and in view of the results already achieved, there can be little doubt that in most of its uses in civilized countries the horse is doomed.—*Indianapolis News*.

Although horseless carriages have only recently attracted public attention, yet the interest in them is already very extensive, and an immense amount of inventive ingenuity is being applied to their construction. On September 1, there were on file at Washington over 500 applications for patents on vehicle motors, and over 300 different types of motor vehicles have been built or are in course of construction. The interest has become so large that it already has its trade organ. The publication has begun in New York of *The Horseless Age*, a monthly journal devoted to the interests of the motor vehicle industry.

It will doubtless be a long time yet before a horse will be as extinct an animal as the dodo, in the streets of a city, as an enthusiast has predicted, but it is at least certain that the practicability of motor vehicles has been demonstrated, and that their introduction into general use is an event of the near future.—*Pittsburg Chronicle Telegraph*.

So great is the attention now being giving to the horseless vehicle that a new paper known as *The Horseless Age*, has been established in New York, and a study of its pages shows an astonishingly large number of vehicles already constructed and ready to seek public favor. The revolution which this industry threatens to work in transportation of people and freight is an interesting study.—*Manufacturer's Record*, Baltimore.

The very latest is Vol. 1, No. 1, of *The Horseless Age*, "a monthly journal devoted to the interests of the motor vehicle industry." It is published by E. P. Ingersoll, 157 William St., New York city, at \$2 a year. The first issue contains pictures of a surprisingly large number of "horseless carriages" already in existence in the United States.—*Homestead*, Springfield, Mass.

The interest in the horseless carriage has developed so gradually that but few folk, outside of those who have followed the subject, fully realize the advance which has been made in the direction of providing means of travel without the aid of horses. The energy of inventors has been directed so vigorously toward finding a substitute for horses and bicycles and steam, that an enterprising publisher in New York City has put in print the first number of a monthly magazine known as *The Horseless Age*. The first number contains many illustrations of designs for horseless vehicles and bicycles run by electricity and other agencies.—*Wilmington (Del.) News*.

The motorcycle now has an advocate and exponent in *The Horseless Age*, an illustrated quarto-magazine issued monthly by E. P. Ingersoll, 157-159 William Street, New York city. No fewer than thirty-six horseless carriages are illustrated, together with several pedalless bicycles and tricycles, plans of the electric or oil engines employed as the propelling power, and other details of the *fin de siècle* vehicle.—*Milwaukee Sentinel*.

Among the new technical magazines published is *The Horseless Age*, which is a revelation in the new modes of locomotion which ignore alike pedestrianism and the patient and faithful friend of man. In it all sorts of devices for covering the maximum of distance in the minimum of time are described and lucidly illustrated. The motor vehicle has come to stay, and so it is to be hoped has its representative magazine. E. P. Ingersoll, publisher, 157 William Street, New York.—*Pittsburg Press*.

The initial number of *The Horseless Age*, a monthly journal devoted to the interests of the motor vehicle industry, published by E. P. Ingersoll, at 157-159 William Street, New York, is a handsomely printed pamphlet of some 50 pages, illustrated with numerous views of the peculiar class of vehicles which are now rapidly coming into use. It will doubtless prove an acceptable periodical to those who are watching the progress of this new development in the modes of travel, and will serve to keep the new inventions in this line before the public in a thoroughly systematic and pleasing manner.—*Waterbury American*.

That motor carriage riding is a pleasure within the possibilities of the present day is forced upon our attention by the appearance of a new trade journal, devoted to the interests of the motor vehicle industry. This is somewhat startling, inasmuch as the motor vehicles have but just made their appearance in this country. The popular mind had scarcely become accustomed to the substitution of electric or other motors for horses on street cars, when it is asked to adjust itself to a new order of things and prepare to see the horse still further deprived of the opportunities of earning an honest livelihood.

But it is difficult to startle the inhabitants of this age by any novelties and the mind is always ready for any new development. There has been a contest of motor vehicles in Chicago recently and now comes this new aspirant for journalistic honor, *The Horseless Age*, with its story of new developments and the message of doom for the horse. The editor of this periodical admits at the outset that the appearance of a journal devoted to a branch of industry that is yet in an embryonic state may strike some as premature. That such an opinion might be generally formed is natural. There is no motor vehicle industry in sight yet, although there are one or two manufactories springing up in this country which have for their object the manufacture of such vehicles. But the editor is a true American and believes in getting upon the ground early. His faith in the possibilities of this horseless age is great and he knows that the first in the field has the best chance. There is a great industry struggling into being here, he thinks, and all signs point to the motor vehicle as the necessary sequence of methods of locomotion already established and approved. The growing needs of our civilization demand it; the public believe in it and await with lively interest its practical application to the daily business of the world. The man who can anticipate this industry and get a trade journal established before the trade itself is on its feet is a hustler and is entitled to distinction in this age of hustlers.—*Rochester (N. Y.) Register*.

The motor vehicle industry has already advanced so far as to call for the publication of an organ, and the first number of volume 1, of *The Horseless Age* has been received. It contains a very large number of photographs and diagrams of various horseless wagons, driven by gasoline, petroleum, steam, and electricity, which are in various stages of perfection, with descriptions of the same. It is shown that the industry of producing motor vehicles is in a much more advanced stage than is generally supposed, and at least one company promises to be ready by the spring of 1896, to supply the market with different styles of horseless wagons. New York: E. P. Ingersoll, No. 157 William Street.—*Buffalo Courier*.

The Horseless Age is the name of a new monthly publication just started in New York, at 157 William Street, by E. P. Ingersoll. As its name indicates, it is devoted to the interests of the motor vehicle industry. The motor vehicle must have good roads. The more people become interested in the one the more they will clamor for the other, hence we hail with earnest joy *The Horseless Age*, and hope it "may live to eat the hen that scratches over its grave."—*L. A. W. Bulletin, Boston*.

The Horseless Age is a new periodical devoted to the interests of the motor vehicle industry, published by E. P. Ingersoll, at 157-159 William Street, New York. Most people will be surprised to learn that this industry has attained proportions entitling it to an organ of this character and much may be learned by studying it.—*Bedford Standard*.

The Horseless Age is the name of a bright, clean looking and interesting monthly, devoted to the motor vehicle industry. Its publisher is Mr. E. P. Ingersoll, a well-known journalist, with headquarters at 157-159 William Street, New York. The first issue, that for November, is full of good matter, and may be regarded as a review of the new art as it stands at this moment. There are 56 pages of text and advertisements, and the large variety of articles is profusely illustrated. Mr. Ingersoll, as the pioneer journalist in this field deserves a handsome reward, and makes a strong bid for it. We shall watch his progress with much interest.—*Electrical Engineer, New York*.

The horseless age has made its advent, although it is too much to say that in the horseless age there will be absolutely no horses. We should deeply regret to think of the extinction of so noble an animal as the horse; so long the companion and friend and useful servitor of man. But that the age in which both freight and pleasure vehicles will be propelled by electricity or some other motive force, is now within sight is very certain. The motorcycle is among us, and has come to stay.—*Newark (N. J.) Advertiser*.

Motor Wagons for the Army.

One of the most interesting of Gen. Mile's recommendations is that a force equal to one full regiment of twelve companies be equipped with bicycles and motor wagons. More than 4,000 officers and men, he says, can use the bicycle, and from them the required twelve companies could be picked and transferred. Such a plan would carry the wheel and the motor wagon to a use in our army far beyond what is known in any other, proportionally to the whole force.

The Trial and Postponement.

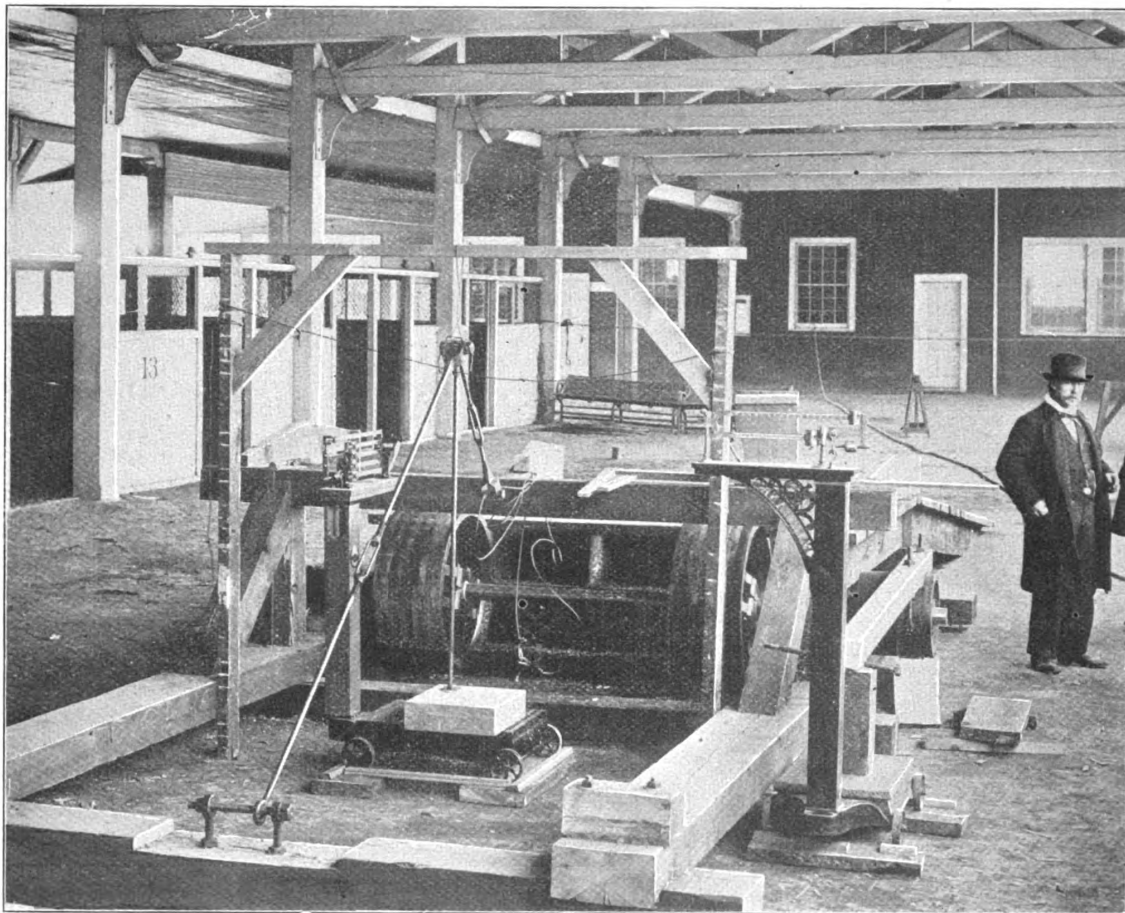
Brief Review of the Preliminary Tests and the Consolation Race.

Owing to a general feeling among those who had entered in the *Times-Herald* Contest that insufficient time had been allowed them for preparation, the judges wisely decided to postpone the event until Thanksgiving Day, November 28th. Only eight vehicles could be mustered on the Washington Driving Park on Friday, the day before the race, and one or two of these were in an unfinished condition. They were:

the track, some of those present having come from remote points to witness the exhibition.

THE TESTING APPARATUS.

A unique testing apparatus had been set up at the Park and it was stipulated in the rules of the contest that each vehicle should be subjected to this test before being allowed to compete in the Race. Three vehicles only were put through the ordeal, the Benz wagon, the Duryea, and one of the victorias of Thomas Kane & Co. The figures of these tests were not given out however, the judges having decided to reserve them until the publication of the complete tests, which are to be made previous to the Thanksgiving Day event.



APPARATUS FOR TESTING MOTOR VEHICLES. L. L. SUMMERS & JOHN LUNDIE, CHICAGO, ILL.

The Benz wagon, imported from Mannheim, Germany, and owned by the H. Mueller Mfg Co., Decatur, Ill.; the Duryea wagon, of the Duryea Motor Wagon Co., Springfield, Mass.; two electric wagons built by Morris & Salom, Philadelphia, Pa.; a motor bicycle and two victorias entered by Thos. Kane & Co., Chicago, Ill., and an unfinished electric wagon exhibited by the Columbia Perambulator Co., Chicago, Ill.

A large crowd of experts and curiosity seekers gathered around these vehicles as they were put through their paces on

The machine adopted consists of a raised platform with an incline leading to it, permitting the motorcycle to be run upon the platform without difficulty. Immediately in the rear of the platform is a shaft containing two revolving drums and a friction brake. The friction brake is a standard dynamometer and registers accurately the power consumed by the revolving drums and shaft. The vehicle is also attached to the platform through a dynamometer, which registers accurately the pull it exerts. Revolution counters are attached to the revolving

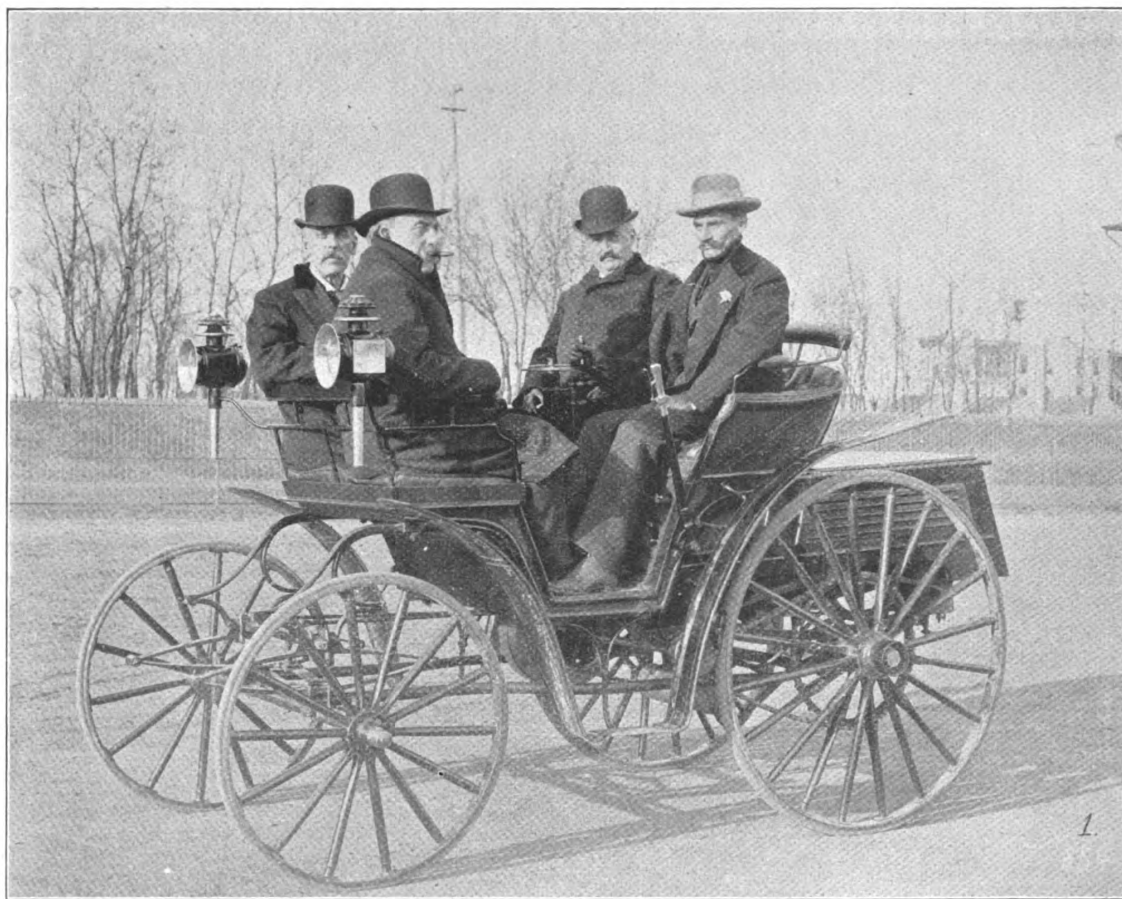
wheels and drums, so that the speed at which the wheels travel is accurately measured at all times.

The weight of the vehicle causes the wheels to adhere to the revolving drums, and the friction is sufficient to tend to drive the vehicle forward as it would upon an ordinary road. This friction is adjustable and is measured, so that the vehicle may run at full speed and its forward pull be measured, also the number of miles per hour it would travel. With this device it is possible to measure the load the vehicle will carry, how steep a grade it will climb, the consumption of fuel, the power and the efficiency of the mechanism.

also of hard metal, the rolling friction is small in connection with the bearing friction. It requires from eight to ten pounds pull to move a ton of weight on ordinary roads. This will amount to from forty to 100 pounds, depending on the wheels and on the road. Messrs. Summers and Lundie intend to determine this factor for various roads, and also the friction of the axles, wheels, shafts, etc., of the motor vehicles.

THE CONSOLATION RACE.

The great race was postponed, but in order to afford those who had responded to the muster a chance to win some laurels,



BENZ MOTOR WAGON. OWNED BY H. MUELLER MFG. CO., DECATUR, ILL.

What is termed rolling friction enters largely into the problem. This term simply means the friction the road has for the wheel of the vehicle. The road tends to sink slightly under the weight of the wheel, and in doing so forces the wheel to climb a small hill in order to move forward. This small hill is made at every new position assumed by the vehicle, and consequently there is a continual expenditure of power in forcing the carriage forward. The amount of pull required to draw the vehicle along varies with the depth the wheels sink into the road.

In railway work where the road is steel and the wheels are

the judges announced on Friday, November 1st, a consolation race, to be run over the course the following day, with a prize of \$500. for the winner, or winners, if more than one vehicle covered the course. The time limit was fixed at thirteen hours.

At 8.15 o'clock on November 2nd, four vehicles assembled for the start at the junction of the Midway Plaisance and Jackson Park. These vehicles were the Duryea motor wagon, the Benz wagon—of the H. Mueller Mfg Co., and two Kane-Pennington victorias. The owners of the latter stated however that they had no intention of running over the course, but would merely exhibit their machines on the city boulevard.

Morris & Salom also exhibited their electric wagons at the start.

The Benz wagon was sent off first, followed after a brief interval by the Duryea wagon. Both wagons moved at a moderate speed until the corner of Halsted Street and the Fifty-fifth Street Boulevard was reached, when the race proper began. In the Benz wagon were seated Oscar Mueller, son of the owner, C. G. Reid, of Chicago, and S. F. Gilmore, of Princeton, Ind., who acted as umpire. Charles E. and J. Frank Duryea occupied their own vehicle. The Duryea wagon soon took the lead but lost it through the snapping of the drive chain, which was of too light construction. Forty-eight minutes were occupied in repairing this, the Benz wagon having meanwhile passed on and secured a good lead.

The Duryeas quickened pace in the effort to overtake their competitors and seemed likely to succeed when an unfortunate accident put them out of the race. A few miles out of the city



ELECTRIC WAGON. COLUMBIA PERAMBULATOR CO., CHICAGO.

they overtook a farmer, driving a team in the same direction. In his flurry the farmer turned to the left instead of the right, and to avoid a collision the Duryeas were forced into the ditch. The ditch was considerably deeper than appearances indicated and the shock broke one of the front wheels, completely disabling the wagon, which had to be shipped by train to Chicago.

The Benz wagon proceeded over the course, an object of interest to thousands en route. Supplies of gasoline, and ice for cooling the machinery were taken at the appointed stations on the journey, and at 6.43, nine hours and thirty minutes from the time of starting, the Benz wagon reached the goal at Lincoln Park. The amount of gasoline consumed during the entire trip is said to have been five and a half pounds.

The distance covered was ninety-two miles and allowing for delays the actual time occupied in making the run was only eight hours and forty-four minutes.

The only other machine that attempted to cover the course

having met with an accident, the judges awarded the special prize of \$500 to the H. Mueller Mfg Co., of Decatur, Ill.

Messrs. L. L. Summers and John Lundie of the board of judges, made a rigid examination of the victorious machine as soon as it was brought to a standstill, and as a result made the following official statement:

"We made a careful examination of the motor at the end of its journey. There was no perceptible heating of any of the bearings. The cylinder was not unduly heated. The water jacket was not steaming and the last water which had been taken in was cool. The hard rubber tires were in first-class condition barring the one which had simply been misplaced by an unavoidable accident and which was restored to position without difficulty. The left hand rear wheel was slightly sprung. We found no cutting of the bearings from dust or grit. Although the belts used in connection with the machinery showed dust deposit, this had no injurious effect upon them. In fact, we found the machine in very good condition and it could have repeated the trip at once. It stood the test of the journey, with all of its hardships, in a magnificent manner."

"The number of miles actually run was ninety-two. The gross time taken by the Benz motor in traveling this distance was nine hours and thirty minutes. The start was at 9.13 Saturday morning and the finish at 6.43 in the evening. In making the run the only time delay allowed by the judges under the rules and conditions of the race was for stops at grade railroad crossings, where trains might temporarily block the way. The Benz machine lost seven minutes through this cause. The judges therefore corrected the running time from nine hours and thirty minutes to nine hours and twenty-two and a half minutes. This will be the official record of the length of time occupied, showing an average speed of approximately ten miles an hour.

But the machine lost other time than that at grade crossings. Its total loss of time was forty-six minutes, making its real running time for the entire distance eight hours and forty-four minutes. The time losses enumerated are:

	Time lost.
By sparking machine.....	2:00
By loss of tire.....	7:00
Adjusting tire second time	3:30
By sparking machine.....	2:30
Taking water.....	4:00
By sparking machine.....	3:30
Lost road by fault of bicycle guides.....	4:00
Taking supplies at Winnetka.....	5:00
Taking supplies at Waukegan.....	7:00
Loss at grade crossings.....	7:30
Total.....	46:00

The great race for the \$5,000 prizes is positively announced for Thanksgiving Day, the judges declaring that no climatic conditions or pleas for more time will influence them to postpone it. Should the weather prove too inclement to permit a race over the new sixty mile course, the competition will take place in some suitable enclosure like Tattersall's.

The "Electrobats."

Pedro G. Salom, electrician, and Henry G. Morris, mechanical engineer, of Philadelphia, exhibit three electric vehicles which they have christened "Electrobats," a compound derived from the Greek, and meaning a conveyance or means of locomotion which derives its power from electricity. These vehicles are of widely differing types, and all are models of the carriage builder's art.



"ELECTROBAT." MORRIS & SALOM, PHILADELPHIA, PA.

The largest of the three presents a brilliant appearance, being finished in contrasting red and black, and no machinery being visible anywhere with the exception of the steering lever. It is arranged to seat two persons, but another seat can be attached at the rear, making a total seating capacity of four.

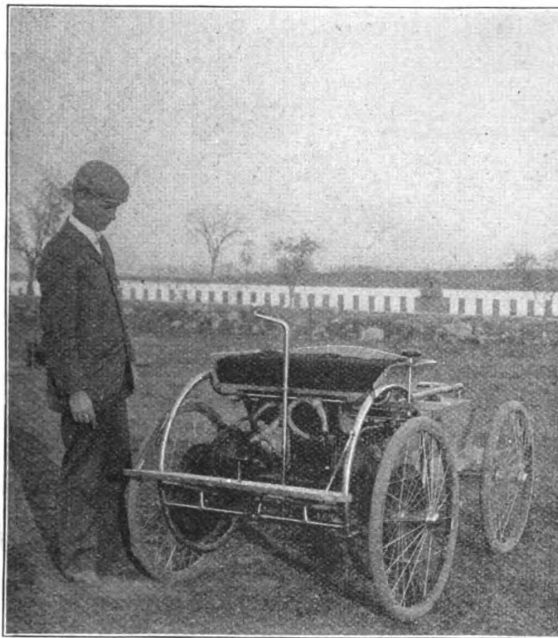
There are two Lundell motors of nominal one and one-half horse power capacity each attached to the front axle, and pinioned on the armature shafts, gearing directly into the driving gears attached to the front wheels. The steering is accomplished by turning the hind wheels parallel with each other from a point about three inches inside of the plane of the wheel, and connected by a rod to a vertical lever of a convenient height to be operated from the front seat of the

carriage. This lever is moved backward and forward in steering. Although at first sight it might be supposed that steering from the rear would be more difficult than steering from the front, yet Morris & Salom state that the carriage can be moved with the slightest effort on the part of the driver and with the greatest certainty in any direction desired, and can be turned completely around in a circle of twenty feet in diameter.

The wheels are of wood and of the usual construction, except that they are fitted with pneumatic tires and ball bearings. The driving or front wheels are forty inches in diameter and the rear or steering wheels twenty-eight inches in diameter. The batteries, furnished by the Electric Storage Battery

Company of Philadelphia, consist of four sets of twelve cells each, having a normal capacity of fifty ampere hours per cell. They are grouped in boxes and so arranged that they can quickly be pushed into place inside the body of the carriage, connection being automatically made with the controller.

The controller is a small instrument standing in a convenient position vertically in front of the seat and is operated by means of a small hand-wheel on top. There are four speeds ahead and one backward, which are obtained by various groupings of the batteries and motors in series and parallel. The carriage has a maximum speed of twenty miles an hour on a good road or street pavement, and the capacity of the battery is sufficient to give twenty-five miles. The weight of the vehicle complete with batteries is 1,650 pounds.



"ELECTROBAT," MORRIS & SALOM, PHILADELPHIA.

The carriage work, which is much admired, was performed by the Chas. S. Caffrey Co., Camden, N. J.

The smaller electrobat, which might be styled an electric road wagon, is of an entirely different construction, being built of tubular steel throughout, and the wheels being like those of a bicycle, pneumatic-tired and ball-bearing throughout. The method of gearing and general operation of the machine is similar to that of the larger electrobat above described. This machine has a maximum speed of about twenty miles an hour and the complete weight with batteries is 1,180 pounds, making it the lightest electrical road machine ever built.

The electric buggy is exactly like the smaller electrobat above described, except in the shape of the frame.

The steam carriage which the Chas. S. Caffrey Co., Camden, N. J., are constructing for a well known Philadelphia physician, is from their own designs, and not from the purchaser's, as may have been gathered from the caption of the cut in our last issue.

R. H. Macy & Co's Roger Carriage Starts for Chicago on its own Wheels.

At 12.15 o'clock on Friday, November 15th, the Roger motor carriage, which R. H. Macy & Co., the New York dry goods house, purchased of M. Roger last summer, started from the corner of 14th Street and 6th Avenue in the attempt to reach Chicago over the public roads in a little more than one week's time.

Frank A. Macpherson, manager of Macy's bicycle department, and J. O'Conner, engineer of the vehicle, were the only occupants.

Forty gallons of gasoline were stored in the supply tanks, an amount sufficient to last for a 200-mile journey.

After leaving the store, the vehicle proceeded up 5th Avenue to 15th Street, and then to 8th Avenue. It ran along 8th Avenue to the Boulevard, thence to 110th Street, to St. Nicholas Avenue to the Kingsbridge Road, and Broadway to Yonkers.

The carriage arrived at Yonkers at 6 o'clock Friday evening, and aroused considerable interest. It stuck in the mud between Fordham Heights and Kingsbridge, and was delayed for some time, while the engineer repaired a slight derangement in the machinery, caused by the terrible state of the roads. The carriage was stored for the night at a livery stable, and at 7.40 A. M. the old post road was taken for Albany. Poughkeepsie was reached at 5 o'clock Saturday afternoon, where it was laid up for the night. Because of the heavy state of the roads the carriage was six hours behind its schedule time at this point.

The carriage left Poughkeepsie at 9.30 A. M., November 18, and reached Albany at 3.30 in the afternoon of the 19th. It was reported at Schenectady at 12.30 P. M., November 20, where it remained until the following morning in consequence of a snow storm.

Owing to the bad condition of the roads the promoters of the expedition decided to change their route and the next morning they loaded the carriage onto a freight train and shipped it to Chicago.

Strong & Gibbons' Motor Vehicle.

Strong & Gibbons, of 181 West Madison Street, Chicago, Ill., are building a motor carriage which has seating capacity for eight persons.

The motor has many cylinders, the pistons working together on one common crank shaft. These cylinders are so arranged that when all are not needed some are allowed to rest and take up the work again as required.

An electric spark produces the explosion and one lever controls all movements of the vehicle, the weight of which is said to be about 800 pounds.

Westinghouse added to the List.

George Westinghouse, the well-known inventor of Pittsburg, Pa., is now at work upon a new form of gas engine, which, it is predicted, will show surprising results in economy and efficiency. Mr. Westinghouse believes the field open for the gas engine in the driving of dynamos alone is sufficient to call forth all his brilliant abilities in the effort to improve the present mode of construction.

Reasons from Mr. Mann.

GLADBROOK, IOWA, Nov. 21, 1895.

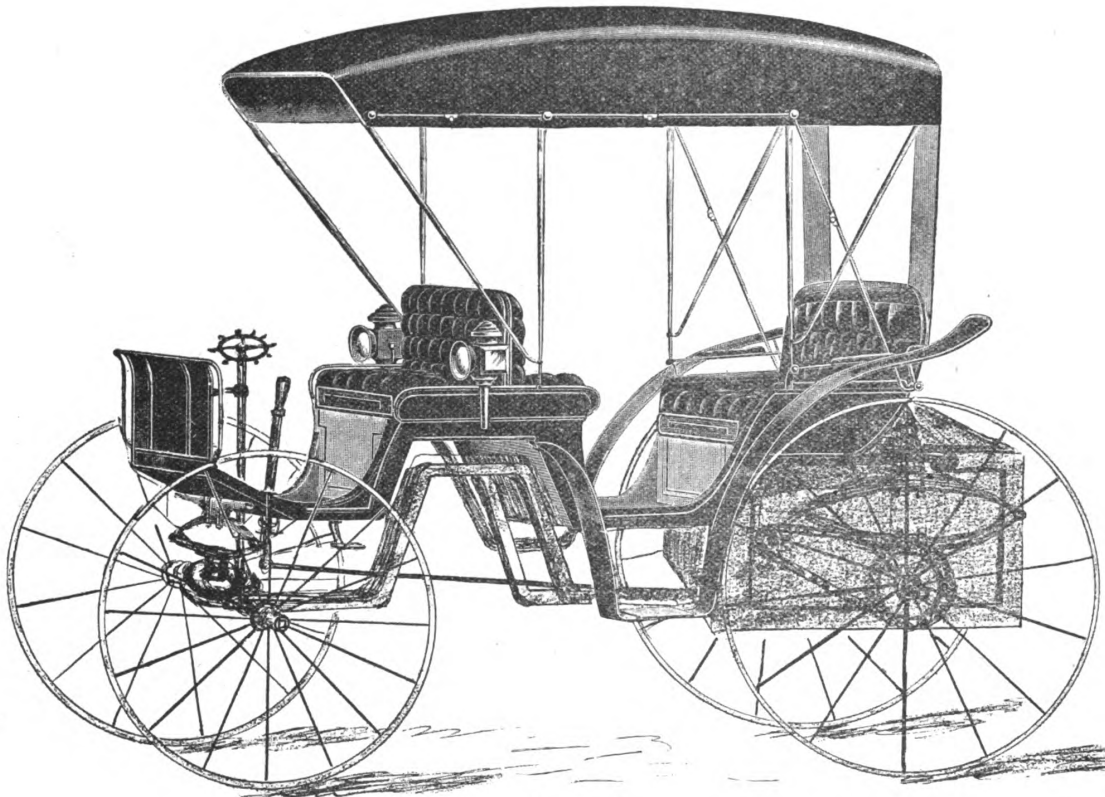
Editor Horseless Age:

In your first issue of the Horseless Age, you have a sketch showing plan of Mann's horseless carriage. I have received some inquiries regarding same, asking why I placed the front gear so far forward. The principal reason is this: The wheel track in most of our country roads is from one to two inches deep, and to follow that wheel track while going at the rate of ten or more miles per hour, requires a sensitive handle movement instead of gear movement. For well traveled roads I pivot the wheel at the hub, but this arrangement will not do for a large portion of the country roads, here in the west. In my guiding arrangement, a lock prevents the handle from

The Macleod Motor Vehicles.

The Alliance Carriage Co., Cincinnati, O., are preparing to apply motors to all descriptions of vehicles at present drawn by horses. As the initial move in this direction they have built for the Chicago Road Race a six-passenger vehicle, described as follows:

The motor, which is capable of 4-horse power, employs kerosene as fuel and is of the automatic type, no flame being required after four or five minutes. It is enclosed in a box at the rear of the vehicle to protect it from the dust which arises even on good roads, and from the interference of thoughtless persons, who might wish to tamper with it. The consumption



MACLEOD MOTOR CARRIAGE. ALLIANCE CARRIAGE CO., CINCINNATI, O.

being moved seriously by deep ruts and obstacles, but is disengaged for sharp curves.

Again, to follow bad roads with ease, it is necessary to have the guide wheels within easy reach of the eye of the operator, so that in noticing the path of the wheel he may at the same time see the road some distance in front of the wheel.

To get the best results, horseless carriages must be built with reference to the roads over which they are to travel.

In my article in your November issue, I should have stated that the cone gears used will not give satisfaction if an ordinary belt is used. The belt must be made expressly for the purpose. I have adopted this method on account of its simplicity, and no liability of getting out of order.

Yours truly, L. C. MANN.

of fuel is about half a gallon of kerosene per hour, while a speed of fifteen miles an hour is maintained and six passengers are carried.

Vibration is avoided by securing the motor and the entire gear-work, including brake, steering apparatus, and starting and speed-regulating gear, to a strong, angle-steel framework, which also gives the additional strength required for our rough roads.

The steering apparatus consists of a fifth wheel and toothed wheel segment, acted upon by a pinion wheel which is secured on the vertical shaft or spindle, at the head of which is the guide hand wheel.

The side handle shown in the illustration is the regulating lever. With this one lever all the necessary movements of the

vehicle can be effected, including stopping, starting, any forward speed from one-third of a mile an hour up to twenty or twenty-five miles an hour, and any reverse speed from zero up to six miles an hour.

The brake, which is actuated by the foot, acts on the wheels through levers in the usual manner.

The inventor of this motor and method of applying power is Walter Macleod, an English mechanical engineer, who has made a special study of oil engines for a number of years.

The A. C. Ames Motor Cycle.

A. C. Ames, of Chicago, has been hard at work since the 2nd day of October, in the endeavor to complete his motor cycle, as he terms it.

In this vehicle, which shows some marked differences from others already illustrated, power is furnished by two steam engines of the oscillating variety. These engines are mounted on the lower bar of the bicycle frame and are coupled to the pedal shaft by means of ball-bearing crank pins. Though having the same throttle, they are independent of each other.



AMES MOTOR CYCLE. AMES MOTOR CYCLE CO., CHICAGO, ILL.

Ball-bearings are used on all bearings, and the tires are non-puncturable pneumatic. As there is no moving part in the bed of the vehicle, no vibration is experienced. The only moving parts are the pistons, one on each side, and the crank shafts and chains.

The boiler is of the Scotch type, having one 4-inch tube for a fire box, and 44 $\frac{5}{8}$ -inch brass tubes, 20 inches long, for the return. The heat passes under the shell the entire length of the boiler, traveling three times the length of the boiler, and then passes out by forced draught with the exhaust.

The feed water passes through a pressure heater inside of the boiler jacket. The fuel is gasoline, the burner being the result of many careful tests. It is really two burners in one: one, controlled by hand, to heat the generator; the other, controlled by the steam pressure or by hand as desired, for the boiler.

When the vehicle is stopped it is not necessary to touch the burner, for the steam pressure rises a few pounds and the regulating valve is closed by steam, which subdues the fire under the boiler. Then as the pressure drops a few pounds, the fire starts up again automatically.

The engines are $1\frac{3}{4}$ inch bore, 13 inch stroke. The valves are held in their seats by the steam, so that it is impossible for them to get out of order or leak. The trunions are of cast iron, working in brass rings, which also form the packing or glen for the packing around the valve.

The valve is set automatically each stroke, and is cut off at $\frac{5}{8}$ stroke. The weight of the entire rig, with water complete for a run, is only about 400 pounds.

A company, called the Ames Motor Cycle Co., with a capital of \$100,000, has been organized to manufacture the Ames motor vehicles and the Ames traction engines for farm use. They expect to be ready to fill orders about the first of the year.

The Raymond Improved Gas Engines.

We herewith illustrate a 50-horse power (actual) double cylinder Raymond improved gas and oil engine, manufactured by the J. I. Case Threshing Machine Co., Racine, Wisconsin, the chief distinctions of which are as follows:

They are built in three styles, viz: Style S, single cylinder, 1 to 20-horse power (actual). Style D, double cylinder 4 to 50-horse power (actual), and style Q, quadruple cylinder 60, 85, and 100-horse power (actual).

In the single cylinder the impulse or explosion occurs every second revolution, in the double cylinder every revolution, and in the quadruple cylinder every stroke or two to each revolution. The impulses occur in all styles of engines as above described whether running light or under full load, thus assuring steady motion under variation of load.

The Raymond improved gas and oil engine will, when belted or coupled direct to standard dynamos, produce a steady commercial electric light, and in so doing it is unnecessary to say that they will furnish an abundance of steady power for operating any other kind of stationary plant.

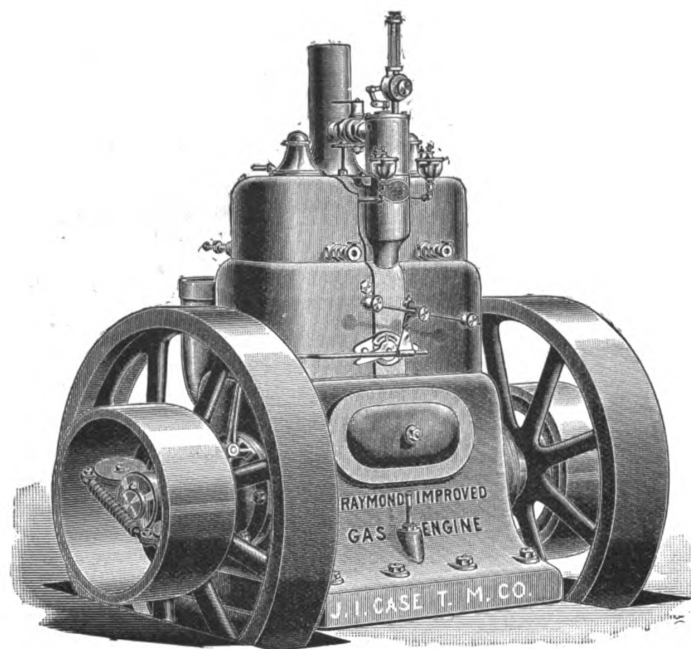
In construction, they are vertical, of symmetrical design, simple, compact, entirely self-contained, and styles S and D are enclosed in an iron casing.

The main frame or base of engine is cast in one piece, strongly ribbed, and contains the bearing for the main crank shaft, the latter being well balanced at the crank, and also provides a reservoir for oil into which the crank dips at every revolution, thus assuring perfect lubrication of the crank and all moving parts.

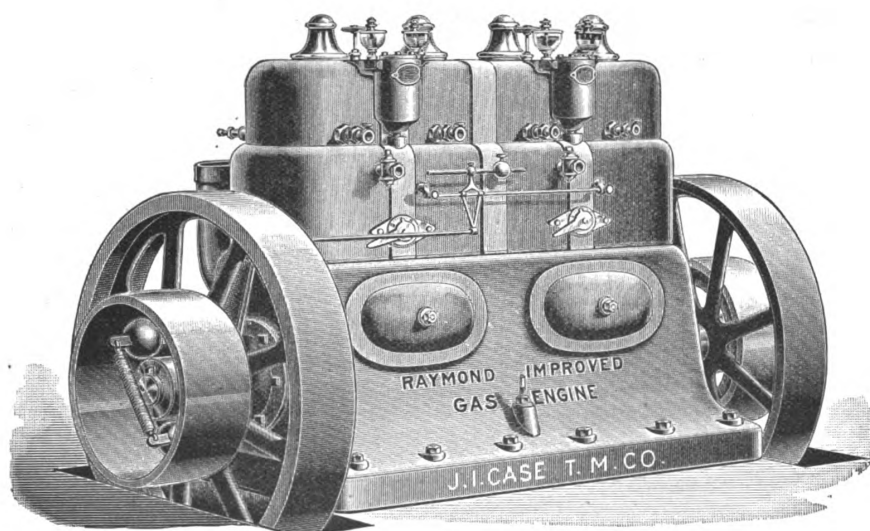
The base is furnished with a large vent pipe in the back to allow cold air to circulate inside.

The rotary valves are lubricated from sight feed oil cups on the outside of the casing, the only oil cups used in connection with the engine.

A special feature with regard to the oiling is the method of oiling the cross head pins in the pistons. This is accomplished with a pump arrangement attached to each connecting rod, which forces the oil on these bearings, keeping them cool and perfectly lubricated.



50 H. P. RAYMOND IMPROVED GAS ENGINE.



100 H. P. RAYMOND IMPROVED GAS ENGINE.

The cylinders are bolted securely to the base, and to the cylinders are bolted the heads which contain the rotary valves and form the explosion chamber.

The rotary valves are one of the principal advantages offered. Being at the top of the cylinder they are held to their seats by spiral springs, are supplied with ball-bearings, and are operated by a set of spur gears direct from the crank shaft. Thus it will be seen that the very action of the valves, when working, has a tendency to keep them perfectly seated, and that they run with very little friction, and are noiseless.

The governing device is of the automatic shaft governor principle, and is supplied with ball-bearings to assure freedom of movement.

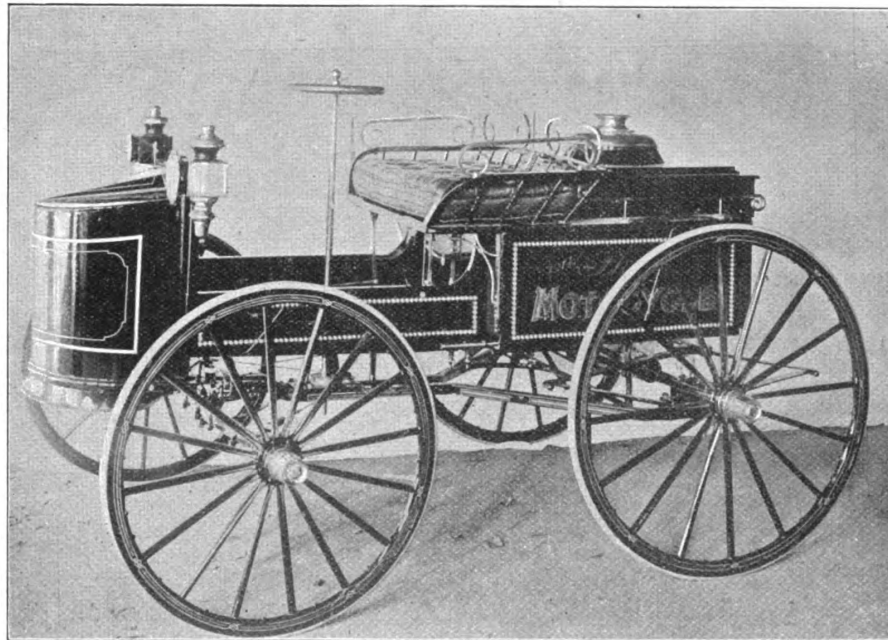
The steadiness with which the Raymond improved engine runs is due to the sensitiveness of this governing device, which regulates the exact amount of gas mixture used for each impulse. So sensitively and accurately does this governing

working can be seen from the outside, and they can also be adjusted from the outside while the engine is running.

Another advantage offered by these engines, is that when connected to both gas and oil they can be changed instantly from one to the other with no perceptible variation in the speed. With the patent starter, electric igniters, automatic shaft governor, and a perfect oiling system, it being only necessary to keep oil in the base and fill the oil cup for the valve, the engine needs very little attention and requires no skilled mechanic.

The power derived from the Raymond improved gas and oil engines is said to be produced at a remarkably low cost.

Every engine is tested thoroughly, being belted to a dynamo which is connected to a bank of 16 candle power incandescent lamps, and given an actual test to develop its rated horse power, and produce a perfectly steady light before leaving the factory.



STEAM BUGGY. JOSEPH SHAVER, MILWAUKEE, WIS.

device work that scarcely 2 per cent. difference in the speed of the engine can be discerned in throwing on or off a full load of electric lights, or any part thereof, the governor and valves regulating instantly the amount of gas mixture necessary to keep a uniform speed and perfectly steady light.

Every moving part is positive in its motion, and the speed is controlled entirely by the shaft governor, which admits the proper amount of gas mixture to maintain an exact speed whether running with full load, part load, or no load.

The patent starting device is another feature on these engines, making it possible to start a 100-horse power engine with as little effort as the 3-horse power, no pumping or crank device being used.

The ignition on all sizes of engines is accomplished entirely by electric igniters, supplied from storage or primary batteries. The electrodes are so placed in the cylinders that their positive

These tests have been inspected by a number of the best electricians in the country, and the engines have been pronounced by them perfect in every detail.

The J. I. Case Co., are applying this engine to wagons, but are not yet prepared to furnish details of their wagon motor.

Joseph Shaver's Steam Buggy.

We present in this issue a picture of the steam buggy of Joseph Shaver, Milwaukee, Wis., which was partially described in the November number.

The fuel used is gasoline, and the boiler is made of one solid piece of steel tested to 500 pounds hydraulic pressure. From 60 to 75 pounds of steam are required to operate the vehicle satisfactorily.

The boiler is automatic and keeps the water at a certain point, and by means of a blow-off valve it can be set at any pressure of steam desired.

The vehicle will run either backwards or forwards, and at any speed desired within reason.

Near the seat is a round wheel from which a bar runs down through the buggy, and is fastened to three small wheels below. From them runs a cable wire to each axle, so that turning the wheel turns the axle in any direction desired.

The speed can be regulated from one mile an hour to forty miles, and the buggy can be stopped at a moment's notice, as it is provided with a fine brake that works directly on the hind hub of one wheel, and brings the wheel to a dead standstill when set.

Mr. Shaver claims that he can turn a shorter corner with this buggy than any other buggy can turn, and that it will run either forwards and backwards, and as fast one way as the other. It is operated by a friction pulley going forward on a reversible clutch.

equally to both hind wheels by means of an equalizing gear. The engine is placed behind the seat, likewise the battery which furnishes the electric spark for igniting the charges of the cylinder.

Mr. Lewis designed all parts of this wagon, even to the wheels which have roller bearings and solid rubber tires. He will enter this vehicle in the *Times-Herald* contest, November 28th, 1895.

The engine will make from 300 to 500 revolutions per minute at the will of the operator. A volume governor is employed so that air and gas is taken in proportion to the amount of work done, and its speed is so steady that a good electric light can be produced by this engine.

Mr. Lewis also employs a patented process of making explosive gas, which he claims produces a better quality of mixture and hence insures even and quick combustion and regular explosions.

An interesting feature of this vehicle is found in the mechanism which transmits the power from the motor. The



TWO-SEATED MOTOCYCLE. GEO. W. LEWIS, CHICAGO, ILL.

The Lewis Motorcycles.

At the risk of some repetition, we reprint a revised description of the two motor vehicles built by Geo. W. Lewis, 32 Willis Court, Chicago, and entered in the *Times-Herald* contest.

Mr. Lewis was one of the first in this country to prove the practicability of the gasolene road vehicle. He is the inventor of the Lewis gas and vapor engine, of which he has about 800 in successful operation.

In December, 1894, after several years' experiments he brought out and operated in the neighborhood of his home the one-seated vehicle illustrated on the next page, weighing about 1,250 lbs., and is propelled by an upright single cylinder Lewis' gas engine of 2-horse power. The power is transmitted

fly wheel of the motor is also a disc from which the power is transmitted to the gear by means of a friction pulley which runs the vehicle forward or backward, and is also used as a brake.

On the bottom of the vehicle in front of the operator, is a shaft upon which the operator places his foot to control the vehicle. Pressure in one direction puts the vehicle in motion, and in the other, stops it.

The speed and power gear is designed for pulling a heavy load or increasing speed as desired. In accomplishing this, the speed of the motor need not necessarily be changed. For example, if the occupant of the vehicle wishes to stop and talk with someone for a time, he can set the motor to a slow speed and thus economize somewhat in consumption of fuel

which under ordinary conditions is about one cent per hour for each horse power.

The tank containing the gasoline holds enough for about a hundred mile run, and is located in the front near the water tank.

The gearing is of raw hide, practically doing away with the noise. Steering is accomplished by a bicycle lever in the center of the axle. Both wheels are operated by means of separate rods connected with the steering lever, and are pivoted at the hub as close in line with the fellow as possible to make the steering easy and prevent the lever from being jerked out of the hand when an obstacle is encountered.

The battery which supplies the electric spark to the cylinder is placed behind the seat, and in connection with it a very small generator is used to keep the battery in perfect working order.

Wooden wheels are used fitted with solid rubber tires of the Rubber Tire Wheel Co., and the Axles have roller bearings of Mr. Lewis' own construction. The front wheels are 32 inches in diameter, and the rear ones 44 inches.



ONE-SEATED MOTORCYCLE. GEO. W. LEWIS, CHICAGO, ILL.

From the hind axle an adjustable connecting rod is fastened to the bearing of each of the driving sprocket wheels, keeping the distance from the center of the sprocket wheels to the hind axle the same under all circumstances so that the chains will have the proper tension.

Many conveniences are provided for in this wagon. Warm water for washing the hands or face is ready at all times. To prevent this from freezing when the wagon is not in use, it is only necessary to open a valve and let it run out.

Mr. Lewis has also constructed a two-seated vehicle, which he will enter in the contest. This vehicle has the same mechanism in every detail as the single-seated vehicle, except it has a double cylinder motor of 4-horse power capacity.

The engine weighs about 450 lbs., and will develop about 6 brake horse power. This vehicle weighs about 1,500 lbs., in running order.

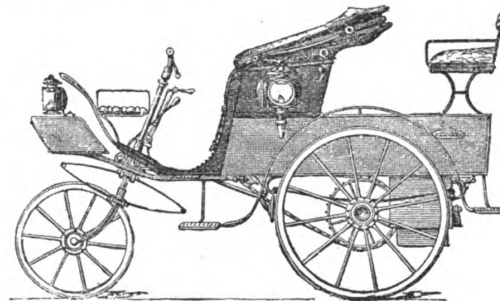
The gasoline and water tanks are placed in the dash board of the vehicle. This is considered the best location, as the

gasolene is not exposed to any heat from the motor. The water tank is covered in front with perforated sheet iron, so that much of the vapor generated by the motor will be condensed in the tank.

The Lewis motors and motor wagons will hereafter be built much lighter, as these here illustrated have been built more especially to prove the practicability of the self-propelled road vehicle.

The Serpollet Steam Vehicles.

The Serpollet steam vehicles are now coming into prominence in France. The peculiarity of these vehicles is the boiler, which is of cylindrical shape and has three horizontal flattened tubes, one above the other. Looking down on a tube, it has the form of an interrogation point, the stem of the interrogation point passing out through the shell of the boiler. The tube is doubled on itself, so that the water passes through the stem and the curved portion to the end, and then back over practically the same course again to the outside of the boiler. Each tube has very heavy steel walls, and is flattened so that the interior passageway is only a thirty-second of an inch wide. The walls are so thick that they form an excellent reservoir for heat, and still greater heat storage is furnished by heavy cast-iron blocks surrounding them. The water goes first into the bottom coil, then into the middle one, and finally to the top, which communicates directly with the engine. There is no storage of water whatever in the boiler. The water is not only evaporated, but is also superheated to a tem-



SERPOLLET STEAM VEHICLE.

perature of 550 to 600 degrees Fahrenheit in passing through the tubes, and is forced into the boiler from a storage tank by a small pump driven from the main shaft of the engine. The supply is pumped in stroke by stroke to make the steam required by the engine, and if the feed pump stops the engine stops at once. In order to start the machine in motion the driver just before starting has only to work a small pump by hand for a few strokes and this forces water into the tubes, where steam is generated instantly, the engine is started, and the ordinary feed pump set in motion. For the sake of simplicity the feed pump has a fixed stroke, and each revolution of the shaft forces along the same quantity of water. As the power of the engine depends entirely on the amount of water delivered to the boiler tubes, some means of regulating the quantity had to be designed. The apparatus adopted consists of a three-way cock, which enables part of the water to be returned to the storage tank. The exact proportion thus returned is regulated by moving the cock, and can be adjusted with great ease by the man who steers the carriage.

The steering is accomplished by moving a front wheel just as in a tricycle, the carriage running on three wheels. The vehicle is stopped by shutting off the water supply of the boiler entirely and applying a brake operated by the foot of the driver.

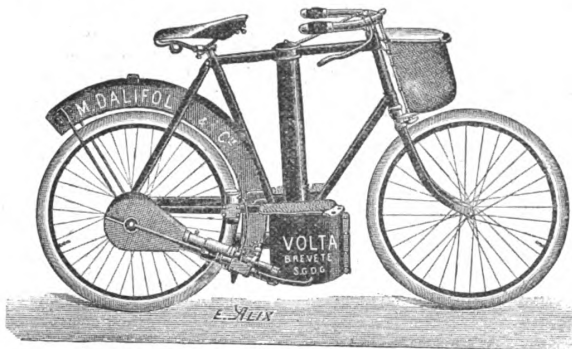
The total weight of the carriage, with fuel and water for a ride of eighteen miles is 2750 pounds, and it will carry six or seven passengers. The rate of speed that can be attained on the best roads is fifteen and five-tenths miles an hour, the exact rate depending on the grades and the condition of the roads.

One type of four-wheel Serpollet carriages has recently been adopted by the French War Department for hauling ammunition.

The Steam Bicycle of M. Dalifol.

The accompanying illustration represents a steam bicycle built by M. Dalifol, of Paris, last summer, and exhibited at the Rapp Gallery just before the race of last June, though not entered in the competition.

The boiler produces steam almost instantaneously. The fuel employed is gasolene, although with slight modifications coke can be used.



The water-tank curves over the wheel, and the water is supplied to the boiler at the will of the rider, by means of a suction pump.

The machine weighs about 155 lbs., and has strong pneumatic tires. It makes no smoke or odor, and is capable of 20 miles an hour.

Mr. Dalifol is building a quadricycle, of the same general plan, but showing some improved features, which will be exhibited at the Salon du Cycle in December.

More About the Elrick Vehicle.

George Elrick, of Joliet, Ill., hopes to compete in the contest of November 28th. His machine has four wheels, and is intended to carry two persons, but by taking out four pins it becomes a motor cycle, to carry one person.

The motor with all its connections weighs only 20 lbs., and the entire weight of the machine is only 80 lbs.

The steering gear is very simple, weighing only $1\frac{1}{2}$ lbs.

The cost of running the vehicle is said to be only 10 cents for each hundred miles, and the maximum speed is 25 miles an hour.

The machine, in Mr. Elrick's opinion, is admirably adapted for delivery, express, postal, and military service.

The motor can be attached to any carriage.

The Bird Motor Wagon.

Henry R. Bird, of 217 Linwood Avenue, Buffalo, N. Y., has just completed a motor wagonette, seating four dos-a-dos, and weighing about 700 lbs. The motor which is of the gasolene explosion type, is encased in a box underneath the seats, where is also placed the gasolene tank. The cylinder of the engine is cooled by water contained in a tank or receptacle, which takes the place of the ordinary dashboard.

The method of applying the power to the running gear is new, and is entirely the invention of Mr. Bird. He has had it patented. The horizontal motion of the piston-rod of the cylinder is changed to circular motion in the ordinary method of the crank attachment. From the crank a simple sprocket wheel joins the running gear.

In the application of power to the motor wagon, the speed and controlling gear is of the utmost importance, in order that the vehicle may always be under the rider's control without stopping the engine.

Mr. Bird uses for this purpose the "Holmes' variable and reversible frictional gearing," invented by Britain Holmes, of the E. & B. Holmes Machinery Co., 59 Chicago Street, Buffalo, N. Y.

By means of this gearing, the operator is said to have the wagon under more perfect control than he could have a horse, for by moving a single lever up or down the wagon is moved backward or forward, fast or slow, or stopped entirely, if desired.

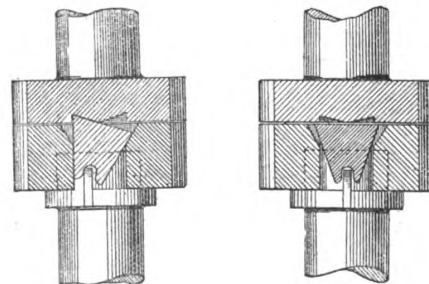
The wagon is said to run noiselessly and without disagreeable vibration, and to be capable of a speed of 30 miles an hour.

The wagon complete weighs 750 pounds, and Mr. Bird is confident it will take several tons up any hill a horse can surmount with a load. He has applied for a patent on the vehicle as a whole, and on special parts of its mechanism.

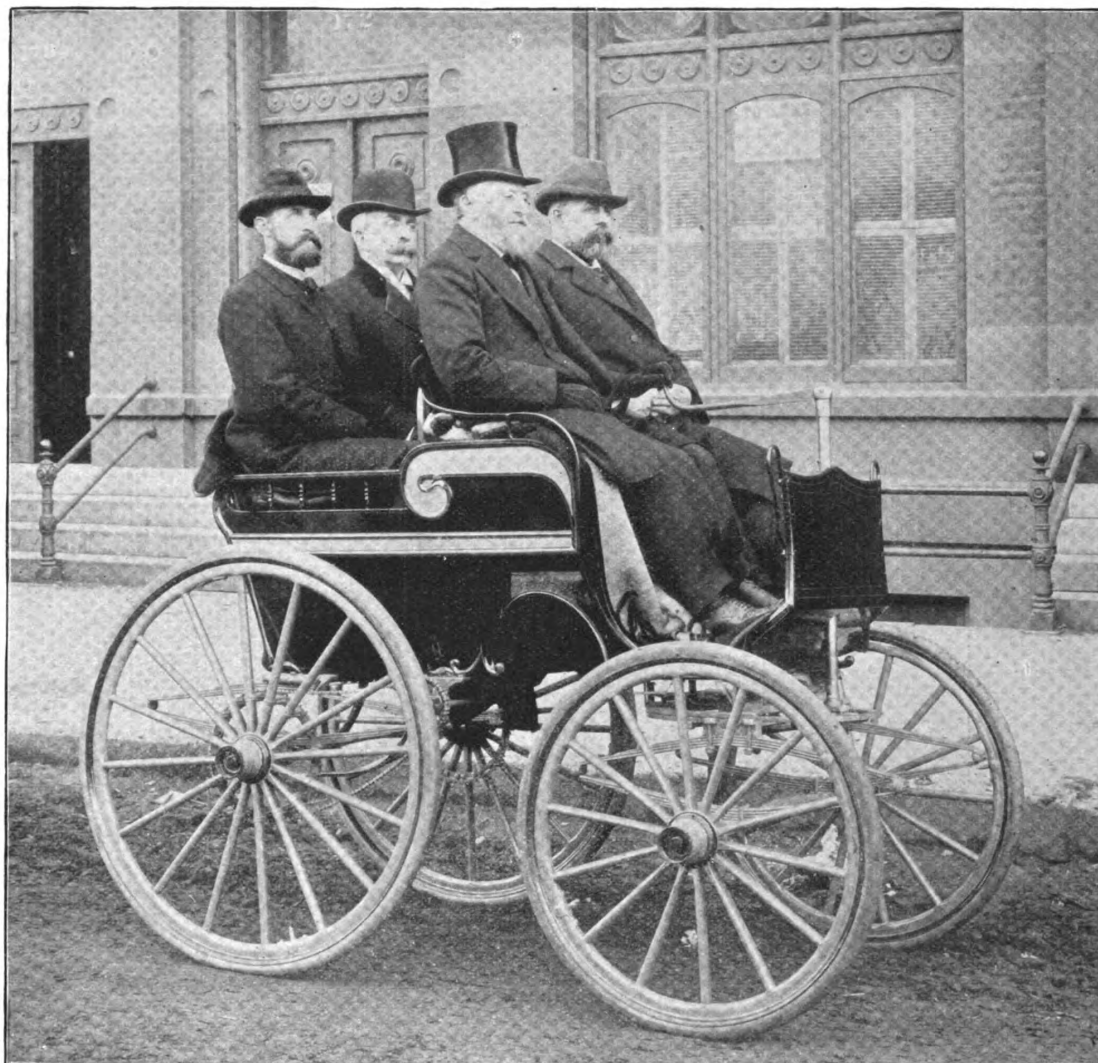
A corporation is to be formed to manufacture the Bird motor wagons.

The Stewart Automatic Clutch.

R. F. Stewart, Pocantico Hills, N. Y., is the inventor of an automatic clutch, which he believes will be found of great value by inventors and builders of motor wagons. It is designed to regulate the drive-wheels in turning corners. By



attaching one clutch to the hub of each drive-wheel the wheels turn independently of each other. The clutch can also be used on the driving shaft, accomplishing the same purpose, and allowing the use of much smaller clutches.



MOTOR TRAP. HARTLEY POWER SUPPLY CO., CHICAGO, ILL.

The Hartley Steam Vehicles.

The stylish trap, which is entered by the Hartley Power Supply Co., Monadnock Building, Chicago, weighs 750 lbs., all told, and is propelled by the Hartley steam engine, a combination of the rotary and automatic cut-off principles, fully described in the November number of *The Horseless Age*.

The seats of the vehicle are so constructed that they can be arranged dos-a-dos, or in the ordinary manner, by changing the rear seat. Pneumatic tires and ball-bearings are used, and each wheel runs independently of the others.

The motor which gives as high as 5-horse power, is capable of 1,500 revolutions a minute, and is easily controlled by a throttle valve. No gearing whatever is required, and no fly-wheels. Reserve power is always at command for rough places or hills either by the use of the throttle or the governor, as

desired. A sudden stop can be made by reversing the engine or applying the brakes, which are very strong and instantaneous in their action.

Steering is managed by a lever running to the fifth wheel, pivoted from the center, and locking automatically in any position. The vehicle can be turned within its own length.

The wheels, which are of substantial construction, are 44 and 36 inches in diameter, respectively.

The fuel employed is gasolene, wood or coal, a small grate being carried along to be substituted for the oil burner should it be impossible to obtain oil.

The Hartley Power Supply Co., will manufacture all kinds of motor vehicles, including delivery wagons, tricycles, bicycles, and heavy trucks. Their vehicle motors, which will range in power from half-horse up to 10 or 12-horse will also be sold separately to the carriage and wagon building trade.

The half-horse motors will weigh about 75 lbs., complete, fuel included.

The engine which they are now applying to a heavy truck for the Englewood Express Co., is geared up 10 to 1, making an actual pull of 10-horse power. On light rigs the gear will be 5 to 1, and on bicycles and tricycles the application of power will be direct.

Lightest Motor Carriage in the world.

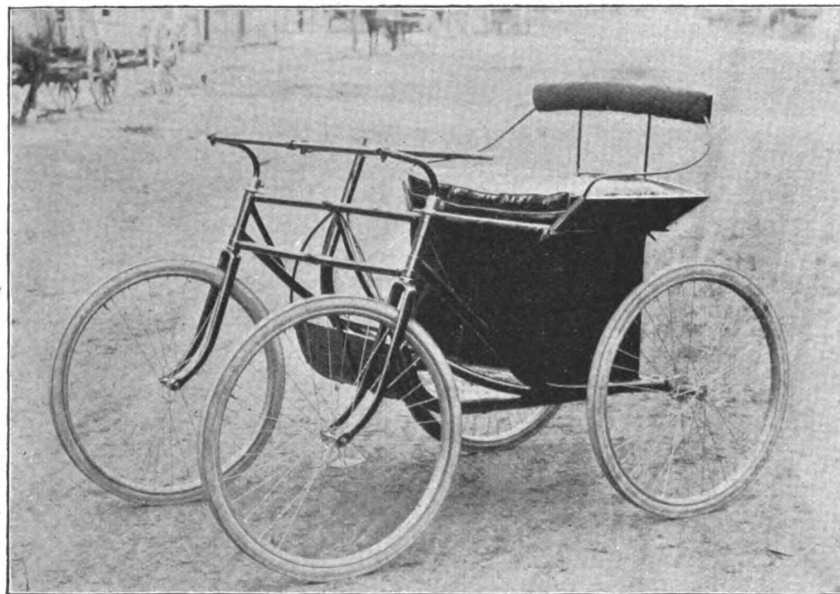
M. H. Daley, Charles City, Iowa, manufacturer of the disc and lever harrows, has just completed a vehicle which he calls a motor carriage, and believes to be the lightest four-wheeled self-propelled vehicle in the world. Including the clutch to attach the motor it weighs only 95 lbs., and with the motor on the total weight is 195 lbs.

Mr. Daley has been studying to get an even stroke every revolution, and is confident he has succeeded. This he does by regulating the stroke of the piston in proportion to the power required, and, at the same time, lessening the space behind the piston to get the proper compression, and diminishing the quantity of oil pumped into the carburetor.

As there are two cylinders, one explodes while the other is compressing, giving an explosion every revolution, whether little or much power is used.

The amount of gasoline consumed is about one gallon per 100 miles. Anyone can operate the vehicle, which is so low that a child can step into it from the ground.

Mr. Daley is organizing a company with a capital of \$100,000 to manufacture this and other sizes of motor vehicles. He has a well appointed factory, which he can utilize for the purpose, and expects to be able to sell the vehicle here illustrated for \$500.



LIGHTEST MOTOR CARRIAGE IN THE WORLD. M. H. DALEY, CHARLES CITY, IOWA.

In going over uneven ground the forward wheels rise or fall a distance of ten or twelve inches, if necessary, and thus relieve the body of the vehicle of all extra strain.

The steering device is quite novel. The wheel on the inside of the curve turns faster than the one on the outside; the difference in the speed of the wheels being in such relation as always to keep each wheel at right angles with its hub to the center of the circle which is being described, or to that point where lines drawn through the center of each hub would cross. This construction, which prevents all side strain on the wheels, cannot be seen in the accompanying illustration.

For some time Mr. Daley experimented with a rotary gasoline motor, but finally abandoned it, and is now using a double-cylinder gasoline motor differing little from others, except in the method of governing the speed.

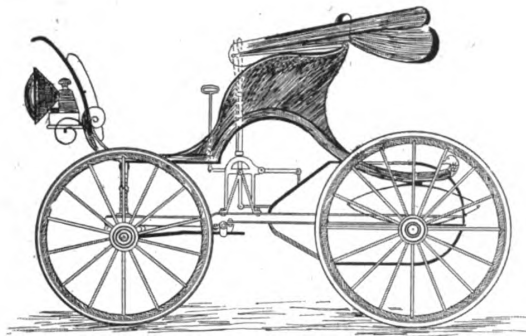
In order to give the best results, a gasoline motor must use a proper proportion of oil and air. In the regulation of speed the prevailing method has been to shut off the oil and air, and allow the engine to run several strokes before renewing the supply. This, it is claimed, gives an unsteady motion.

The Maginn Power Generator Co.

This is the title of a company organized to develop a motor vehicle patent, and having offices in the Masonic Temple, Chicago.

In their machine the products of the explosion, and not the explosion itself, are said to be the operating principle.

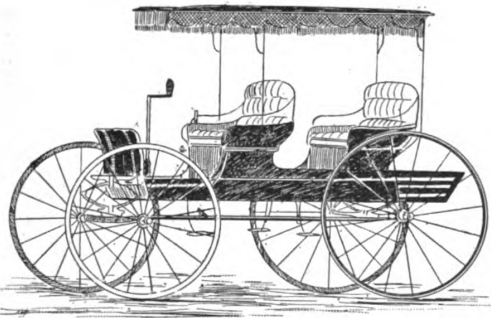
The engines, which are oscillating, have double cylinders, set-quarterming to avoid dead centres. They are reversible, and are geared by chained sprocket-wheels to the axle of the carriage. The rear axle revolves with the wheels and the power is applied direct to this axle. The steering apparatus is connected with the front axle, the wheels of which are loose upon the axle. The operator of the vehicle has but two levers to handle, and with them accomplishes all the movements of starting, stopping, reversing, backing up, steering and controlling the carriage. Within the body of the vehicle, to be operated by the foot, is a slow-starting and hill-climbing device. The entire mechanism of this 4-horse power generator



and engine complete occupies a space of 18 inches square, and is inclosed within a covering. The same covering also incloses the transmission gears, and protects all the working parts from weather, mud and dust.

The A. J. Pierce Motor Carriage.

The Pierce Engine Co., Racine, Wis., manufacturers of the Pierce gas engines, have constructed a very substantial looking vehicle, which is propelled by one of their engines. The vehicle weighs about 1,600 lbs., and may be described as a surry top placed on a common running gear, with the box extended backwards to make room for a water tank.



MOTOR CARRIAGE. PIERCE ENGINE CO., RACINE, WIS.

The motor is placed under the vehicle, and is boxed in to protect it from dust, etc. It has two cylinders, each capable of 3-horse power. The gasoline tank is located under the seat.

No governor is used on the engine, as the speed is controlled by the operator from the front seat. Any speed from two to sixteen miles an hour can be obtained.

On the right hand side of the seat is a lever which is used to start, back up and stop. Another lever in the bottom of the wagon, operated by the foot, is used to throw in a gear for climbing hills.

The steering gear is a worm and gear, geared up for rapid motion, and is very sure and easy to operate.

The vehicle is driven by chains connected from a differential gearing to the rear wheels.

The American Motor League.

On Friday evening November 1st, a meeting was held in the rooms of the School of Electricity, No. 335 Dearborn Street, Chicago, for the purpose of forming under the above name, an organization for the general advancement of the new fledged motor interest of America. The meeting was the result of a suggestion made by Charles B. King, of Detroit, Mich., in a letter published in the last issue of the Horseless Age.

At the appointed hour the meeting was called to order. Dr. J. Allen Hornsby, having been elected chairman by acclamation, made an introductory speech, outlining the purpose of the call which had been issued, and then invited a number of those present to state their views in regard to the general policy of the organization contemplated. Some favored a broad and liberal platform upon which all concerned with motor vehicles, users included, could stand, while others thought the membership should be limited to manufacturers of motor vehicles, and specialists making a study of the scientific problems connected therewith.

Messrs. Chas. E. Duryea, Charles B. King, H. D. Emerson, Elwood Haynes, Henry G. Morris, Sterling Elliott, W. G. Walton, and others spoke on this subject, and such diverse views were brought to light that it was finally deemed best to appoint a committee on organization, which should report at the next meeting of the League, to be held in Chicago about Thanksgiving time. Dr. Hornsby was elected temporary president, and F. U. Adams, of the *Times-Herald*, temporary secretary. The chair appointed Charles E. Duryea, and H. D. Emerson to act with himself on the committee of organization.

The following is a list of those present:—H. D. Emerson, Cincinnati; Henry G. Morris, and Pedro G. Salom, Philadelphia; Sterling Elliott, and C. A. Clarke, Boston; George Henry Hewitt, H. W. Leete, Charles E. and J. Frank Duryea, Springfield, Mass.; W. F. Barnes, and C. M. Giddings, Rockford, Ill.; Elwood Haynes, Kokomo, Ind.; George Richmond, J. Wallace Grant, and E. P. Ingersoll, New York; Charles B. King, Detroit; W. G. Walton, Hamilton, Canada; J. A. Chase, Pasadena, Cal.; A. Taylor, and Edward E. Goff, Chicago; C. F. Karns, Salt Lake City, and Dr. J. Allen Hornsby, chairman.

Before the meeting adjourned, resolutions were passed commending the *Times-Herald* for its enterprise in organizing the motor vehicle contest.

The Lesson of a Runaway.

Carlos C. Booth, M. D., of Youngstown, O., had a terrible runaway last June, in which his wife came near losing her life and the horse was killed. Reading of the Paris Race about this time he at once made a design for a motor carriage, which he is now having constructed.

It is not a racer, but is designed for physicians and everyday business use. He hardly expects to complete it in time to exhibit it at Chicago.

Canada to have a Motor Vehicle Race.

The *Canadian Engineer*, published at Toronto, Can., proposes that an exhibition of motor vehicles be held in Toronto next summer. The proposition is also advanced that a motor vehicle race be held at Hamilton next season, under the auspices of the Hamilton Jockey Club. The Massey-Harris Co., the big agricultural implement manufacturers of the Dominion are taking a lively interest in the subject, and from present indications our Canadian friends will be introduced to a new sport before '96 has grown old.

The Gawley Motor Carriage.

T. R. Gawley, of Aurora, Neb., writes that he is putting the finishing touches on his carriage, and expects to have it in Chicago before Thanksgiving Day. The vehicle he has designed is specially adapted to Western roads.

The motor is a double-cylinder gasolene motor, developing six horse power.

In the diagram, No. 1 is the main shaft of the motor.

No. 2 is a hollow shaft working on the outside of No. 1, with sprocket wheels attached to it.

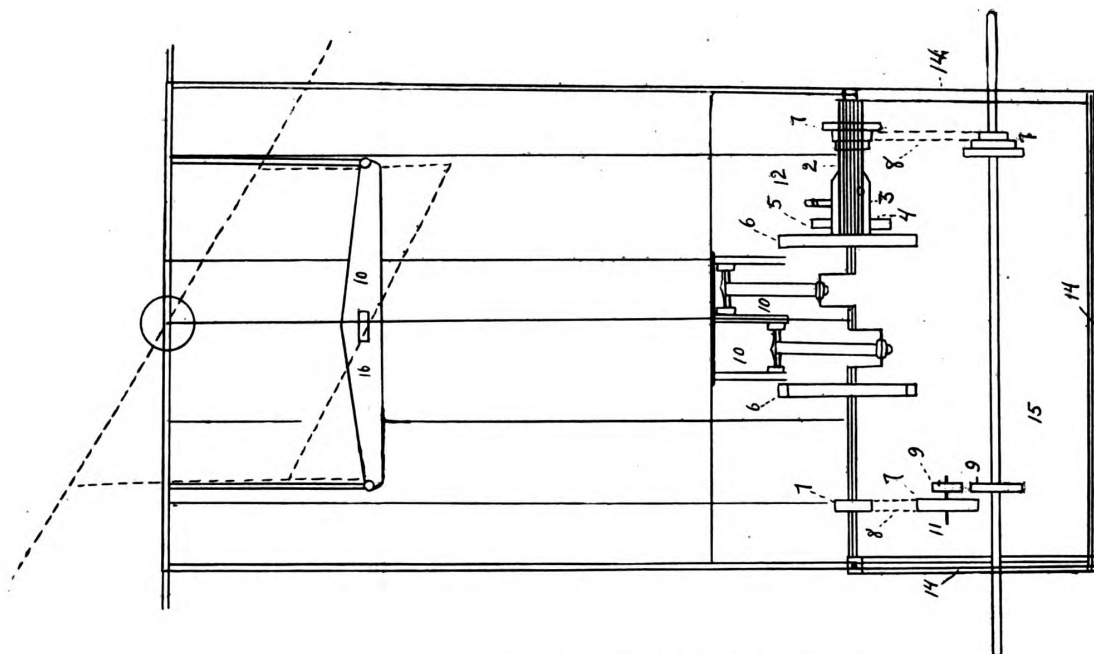
No. 3 is another hollow shaft working on the outside of No. 2, and on which the friction clutch is fastened.

inches in diameter. The back wheels, 42 inches in diameter, are held stiff on the axle by means of ratchets. To enable one wheel to slip back in turning a corner, the hind part is set on roller bearings under the spring blocks.

The carriage is steered from the back seat by means of a lever or teller. It has a seating capacity of from four to six persons, and is said by the inventor to have power enough in reserve to take it anywhere.

The weight of the vehicle is about 900 pounds.

Mr. Gawley wishes to find a capitalist to take hold of his invention. He guarantees to sell fifty machines in his own state of Nebraska, just as soon as they can be put on the market.

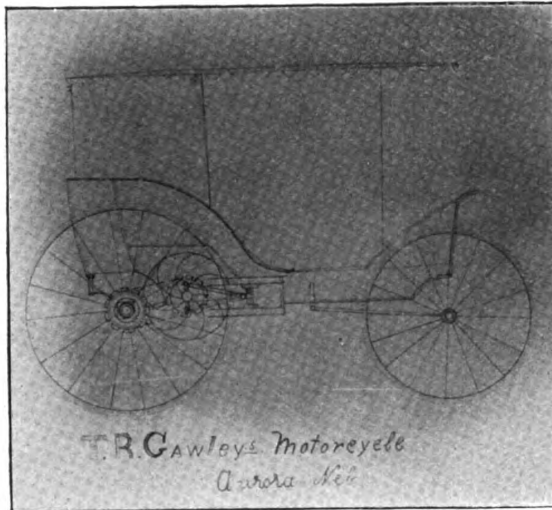


MECHANICAL DIAGRAM OF MOTOR WAGON. T. R. GAWLEY, AURORA, NEB.

- No. 5 is the rim of the fly wheel.
 - No. 6 is the fly wheel.
 - No. 7 is the sprocket wheels.
 - No. 8 is the sprocket chain.
 - No. 9 are friction wheels used for back-up gear.
 - No. 10 is the motor, a twin gasolene motor, working on opposite centres.
 - No. 11 is a little shaft on which the little friction wheel of the back-up gear works.
 - No. 12 is a casting to be used for the purpose of throwing the machinery in and out of gear.
 - No. 14—Springs.
 - No. 15—Space to be used for carrying gasolene and water.
 - No. 16 is the steering apparatus which rests on all round bearings, preventing any binding from vibration.
- The back axle and the carriage bed are made the same distance apart by means of a reach-rod, which extends from the spring block to the corner of the bed on both sides.
- The wheels are of wood and are provided with rubber tires. The front wheels have ball-bearings in the hubs, and are 36

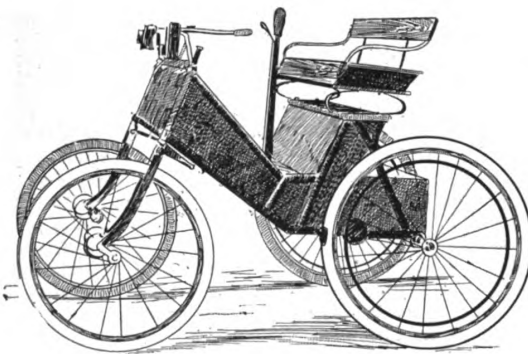


"PYRO-PNEUMATIC" WAGON. P. E. McDONNELL AND W. A. BRENNAN, CHICAGO, ILL.



Max Hertel's Motor Cycle.

The motor vehicle of Max Hertel, Chicago, Ill., is modelled in general outline after the motor bicycles brought out recently in France and Germany. It has four wheels and a seating capacity for two. Power is furnished by a double cylinder gasolene motor.



The wheels run on ball bearings and are fitted with pneumatic tires. The steering is accomplished by means of a simple handle bar, and the vehicle can be turned within a circle of ten feet.

The total weight, including fuel and water, is 220 pounds.

Fred. Kuebler, superintendent of the Daimler Motor Co., Steinway, L. I., left recently for Europe to visit the various continental centres where the motor vehicle question can be advantageously studied. Mr. Kuebler took with him a good supply of THE HORSELESS AGE, Vol. I, No. 1, with which to astonish the European trade.

Thanksgiving Day Route.

Synopsis of the Course and Revised Rules.

On page 31 will be found a map of the revised course which the engineers appointed by the *Times-Herald* have laid out for the Thanksgiving Day contest. As the day is a holiday, the competing vehicles will have a clearer course than would have been possible on an ordinary workday, and are expected to make better time in consequence.

The vehicles will be started at Midway Plaisance and Jackson Park, and will proceed west on the Midway through Washington Park and Fifty-fifth Street Boulevard to Michigan Boulevard, where they will turn north on this broad thoroughfare and sweep past the lake front, the auditorium, the public library, and across the Rush Street bridge.

On the north side the route continues up Rush Street, east on Chicago Avenue, and north along the beautiful Lake Shore drive through Lincoln Park, and by way of the Sheridan Road to Evanston. The return route is by way of North Clark Street, Ashland, Belmont and Milwaukee Avenues to the west park boulevard system, and east on Fifty-fifth Street Boulevard, through Washington Park, and the Midway to the starting point.

The route includes about fifty-five miles of roadway, and contains sections of all grades of pavement and roadway. Nothing but a severe snowstorm can render the route unfit for the test.

The preliminary tests were held at 1557 Wabash Avenue, and L. L. Summers and John Lundie, the committee on tests began their work on Tuesday, Nov. 19. The Studebaker Brothers' Manufacturing Company kindly place this large building at the disposal of General Merritt and other judges, and arrangements have been perfected by which the various motorcycles can be placed on exhibition in this room up to December 4.

RULES FOR THE RACE.

The judges have carefully revised the official rules, which are as follows:

ART. 1. The contest or race will be international in character, and any vehicle complying with the conditions may compete.

The vehicles shall have three or more running wheels, and shall derive their motive power from within themselves. No vehicle will be admitted to the competition which depends in any way upon muscular exertion except for the purpose of guidance.

ART. 2. The vehicles shall be capable of carrying at least two persons, one of whom shall be an umpire selected by the judges, the other or others may be the representatives of the owner of the vehicle. An umpire must accompany each vehicle over the route.

ART. 3. The route will be as follows: Starting at the junction of Midway Plaisance and Jackson Park, west on Midway Plaisance, through Washington Park past the floral trial and refectory, west on Fifty-fifth, north on Michigan Boulevard, over Rush Street bridge, north on Rush Street, on Chicago Avenue, north on the Lake Shore drive, through Lincoln Park and the Sheridan Road to Cornelia Avenue, on Cornelia, north on Pine Grove, east on Grace Avenue, on the Sheridan Road, west on Lawrence Avenue, west on Kenmore Avenue, west on Rosemount Avenue, west on Sheridan Road to the city limits of Evanston, west on Lincoln Avenue, north on Forest Avenue, south on Davis Street, south on Chicago Avenue.

Street (Chicago), west on Lawrence Avenue, south on Ashland Avenue, west on Roscoe Street, south on Western Avenue, west on Belmont Avenue, south-east on Milwaukee Avenue, south on Humboldt Boulevard, through Humboldt, Garfield, and Douglas Parks, south on California Avenue, east on Twenty-sixth Street, south on Western Avenue, east on Thirty-fourth Street, south on Western Boulevard, east on Fifty-fifth Street Boulevard, through Washington Park and the Midway, and finishing at the starting point. Relay stations are established at the following points: The corner of Grace Street and the Sheridan Road, North Clark Street and Devon Avenue, California Avenue and Twenty-sixth Street.

ART. 4. There will be stationed at each relay point a time-keeper, who will report the time of arrival and departure, but stoppage at relay stations will be optional with contestants, and no allowance will be made for delays in replenishing.

ART. 5. It is expected that each contestant will make his own arrangements for replenishing motive power, or taking advantage of the relay facilities.

The umpires will be furnished with a correct statement of supplies furnished at the starting point, at each relay point, and where possible of the amounts remaining after completion of course.

ART. 6. Vehicles will assemble at the junction of the Midway Plaisance and Jackson Park at 8.30 a. m., Nov. 28, 1895, and take such positions as may be assigned them by the judges.

ART. 7. Each vehicle entered shall carry a card conspicuously displayed, this consisting of a white card 12 inches square provided with a black letter 6 inches long. Each contestant shall be designated by number. The numbers and order of starting shall be designated by the judges.

ART. 8. Contestants may change conductors at such points as they may desire. The umpire appointed by the judges will remain with the vehicle until it finishes the contest, either by completion of the course or by withdrawal.

ART. 9. Each vehicle shall be provided with a trumpet, fog-horn or other signal capable of sounding a warning signal of approach.

ART. 10. When two vehicles going at different rates of speed find themselves into proximity, the slower one must keep to the right and leave half of the road available. Any vehicle attempting to prevent by maneuver the passage of any other vehicle will be disqualified. The umpire on the vehicle will be expected to enforce this condition.

ART. 11. The ordinary rules of the road must be observed by all vehicles, and in meeting ordinary vehicles it is expected that care will be exercised to insure proper safety to the ordinary transients.

ART. 12. Any civil or penal responsibilities must rest entirely with the contestants who incur them. The judges, umpires or referees assume no responsibility of any nature whatsoever.

ART. 13. If several vehicles arrive together or successively front of an obstacle which necessitates the stoppage of the vehicle, the other vehicles must stop in their order without attempting to pass each other till a distance beyond the front of one hundred yards has been covered.

The umpire of the first vehicle to reach the obstacle will have the ruling power.

The umpire of each vehicle will take the time of its removal from the obstruction and the time of its removal. This time will be reported to the judges.

In case may two vehicles move along abreast at equal or unequal rates of speed. A vehicle wishing to maintain its position must do so before proximity necessitates the stoppage as per article 12.

ART. 17. No vehicle will be admitted to the competition unless the safety of occupants, spectators, and users of the public highway will be insured.

ART. 18. The judges reserve the right at their discretion to debar any vehicle which may contain elements either of danger or from its construction an evidence of weakness or general impracticability.

ART. 19. For the purpose of eliminating from the competition any impractical or unsafe vehicle, and for the further purpose of securing exact and authoritative data on which to base decisions and make awards, all contesting motorcycles must be submitted for preliminary tests to be held at 1557 Wabash Avenue, under the supervision of the judges. These tests will be held on Nov. 19, 20, 21, 22, 23, and 25, and the committee on tests will notify each contestant of the data on which he shall appear for the preliminary test.

ART. 20. The judges will base their awards on the showings made in the preliminary tests and in the road contest of Nov. 28. In making their awards the judges will consider and weigh the general utility and adaptability, ease of control, speed, economy of operation, cost, general appearance and excellence of design of each contesting motorcycle.

ART. 21. Any vehicle which shall compete in the contest shall be placed at the disposal of the judges for tests subsequent to the road race of Nov. 28, should the judges so desire.

ART. 22. The time limit is fixed at seven hours, corrected time. Any vehicle failing to complete the official course in seven hours will be disqualified, and no prize will be awarded to it. In computing the corrected time from the time of starting and of finishing, the reports of umpires will be taken as to legitimate delays experienced upon the route.

ART. 23. Unavoidable obstacles, such as railroad trains at road crossings and other unusual obstructions in the roads, will constitute the only grounds for an allowance of time by the judges.

ART. 24. Delays experienced from imperfection of mechanism, break-downs, difficulties in starting, or similar causes, will not constitute grounds for time allowances.

ART. 25. Any repairs which may be required along the road must be executed by the occupants of the vehicle. Outside assistance will not be allowed, the umpires excepted.

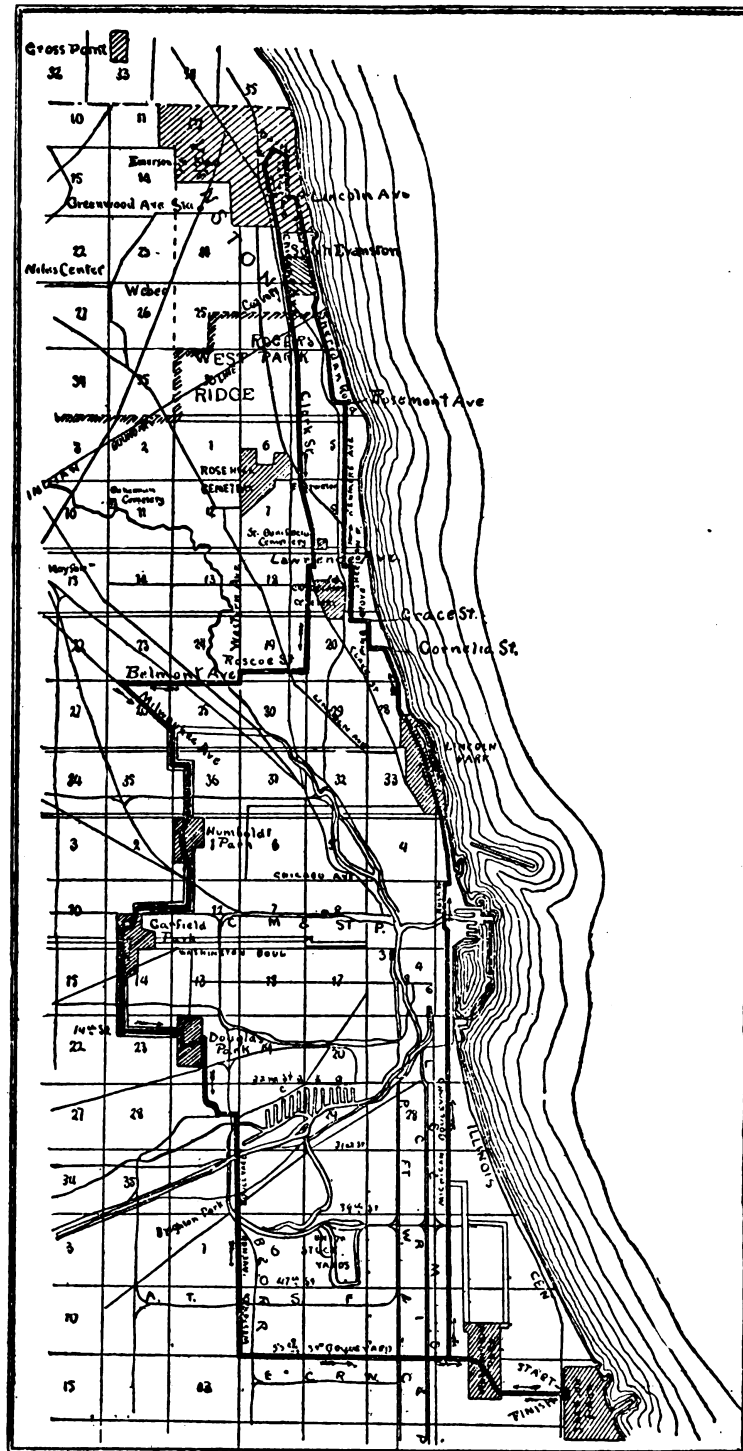
ART. 26. Every effort has been made by the judges to define the route, and direction posts have been placed to aid the conductors of vehicles. The conductor of the vehicle will be responsible for not following the route, and no claims will be allowed on account of delays or inconveniences experienced on account of mistaking the route. Conductors will be expected to familiarize themselves in advance and thus avoid any trouble from these causes.

ART. 27. Any infraction of these rules may disqualify a vehicle at the option of the judges. The judges also reserve the right to modify or amend these rules.

LENGTH OF COURSE AND NATURE OF ROADS.

Lieutenant Samuel Rodman made a careful measurement of the course, and found it to be 54.31 miles in length. On the nature of the roads he made the following report:

"From the starting point, along the Midway, through Washington Park, and along Michigan Avenue to Congress Street, the route is a level boulevard. Then one block of asphalt, then one block of brick pavement, then eight blocks of stone pavement to Rush Street Bridge; thence wooden block pavement along Rush Street and Chicago Avenue to the Lake Shore Drive. The four blocks north of Rush Street Bridge are in very bad condition; the remainder is somewhat rough, except on Chicago Avenue, which is smooth.



THANKSGIVING DAY COURSE.—(Chicago Times-Herald.)

Thence the route is a comparatively level boulevard along Lake Shore Drive, through Lincoln Park, Cornelia Street, Pine Grove Avenue, Grace Street, Sheridan Road, Lawrence Avenue and Kenmore Avenue to Rosemont Avenue. Thence along Rosemont Avenue the road is heavy sand for two blocks; thence along Sheridan Road it is sandy for about a mile, and then sandy gravel to Lincoln Avenue, Evanston. Lincoln Avenue and Forest Avenue are good boulevard roads, except about five blocks on Forest Avenue south of Davis Street, Evanston, and Davis Street to Chicago Avenue, Evanston, which are soft and heavy traveling in wet weather. From Davis Street and Chicago Avenue, Evanston, south along Chicago Avenue to Devon Avenue, a distance of three and one-half miles, the route is good, smooth wooden block pavement.

Thence south along North Clark Street to Lawrence Avenue the route is rough and extremely muddy in wet weather. Thence along Lawrence Avenue and Ashland Avenue to Montrose Boulevard, good, hard macadam; thence along Ashland Avenue, Roscoe Street, Western Avenue, Belmont Avenue, Milwaukee Avenue and Humboldt Boulevard to Kedzie Avenue, good, smooth wooden block pavement. Thence to Colorado Avenue, Humboldt and Douglas Boulevards are good, hard macadam. Thence Douglas Boulevard is asphalt to the west end of Douglas Park. Thence through Douglas Park to Ogden and California Avenues the route is macadam. Thence along California Avenue the route is good block pavement to Twenty-fourth Street, and then Boulevard to California Avenue and Twenty-sixth Street. Thence Twenty-sixth Street and Western Avenue is good block pavement to the near vicinity of the drainage canal. From the latter point and across the Western Avenue Bridge the road is very bad. The soil being clay it becomes almost impassable in wet weather, and in its present condition is the one blot in the boulevard system. Across the bridge at Thirty-fourth Street the route is taken up along Western Avenue Boulevard, Garfield Boulevard, through Washington Park and along the Midway to the starting point at Jackson Park, a good, hard macadam route."

TRACKS ALONG THE ROUTE.

"Following the motorcycle route I note the feature of street car tracks, taken in order, which are found along the route. These are as follows:

On Michigan avenue, from Adams to Randolph street.

On Chicago avenue, Evanston and North Clark street, Chicago, from Dempster street to Lawrence avenue.

On Ashland avenue, from Graceland avenue to Roscoe street.

On Roscoe street, from North Robey street to Western avenue.

On Belmont avenue, from Western avenue to Milwaukee avenue.

On Milwaukee avenue, from Belmont avenue to Humboldt boulevard.

On Twenty-sixth street, from California avenue to Western avenue.

Taken in order from the starting point, the railroad crossings are as follows:

Michigan avenue at Fortieth street.

Michigan avenue at Fifteenth street.

Rush street, just north of Rush street bridge.

Rosemont avenue, one block west of Kenmore avenue.

Sheridan road, one block north of Rosemont avenue.

Chicago avenue, south of Calvary Cemetery.

Belmont avenue at Kedzie avenue.

Humboldt boulevard, two blocks north of Humboldt Park.

Douglas boulevard, two blocks south of Polk street.

California avenue at West Nineteenth street.

Twenty-sixth street, near Western avenue.

Western avenue boulevard, near Thirty-sixth street.

Western avenue boulevard, near Thirty-ninth street.

Western avenue boulevard, near Forty-ninth street.

Garfield boulevard, one-quarter mile east of Western avenue boulevard.

Garfield boulevard at Desplaines street.

Garfield boulevard at Stewart avenue.

Garfield boulevard, near LaSalle street.

The entire route is generally level. There are few points where grades of any sharpness are experienced, and these are at the bridge over the Chicago, Milwaukee and St. Paul Railroad tracks on Humboldt boulevard, and at the Western avenue bridge, south of the drainage canal. There is a slight rise at the Rush street bridge and at the head of Lincoln Park.

The route is admirably adapted for speeding. The turns are not sharp, the roads are wide, and of the entire distance only about five miles will afford difficulty even in wet weather."



THE PRIZE MEDAL.

Between Heats.

The Overman Wheel Co., Chicopee Falls, Mass., now have in course of construction a light motor vehicle of the bicycle variety, and will enter largely into the manufacture of them as soon as the experimental work is done. The vehicle, which will be ready to test about December 1st, has four wheels, is propelled by a gasoline motor, and is built low to make it easy of access and lessen the danger of accident. Three two-horse power motors will be employed.

L. B. Packard, wheel and carriage manufacturer, of Salem, Mass., is about to place a light motor carriage on the market, and wishes to correspond with makers of two-horse power motors suited to his purpose.

G. A. Kennedy, bicycle repairer and locksmith, Blissfield, Mich., is engaged upon a motor vehicle, which he will not complete before April next.

The New London Specialty Co., New London, O., are making a new model for a motor cycle, which they think is a great improvement over that mentioned in our last issue.

Among the inventors who cannot be ready for the event of November 28th is Geo. W. Robertson, Mt. Vernon, Ind.

The Buckeye Manufacturing Co., Anderson, Ind., write that they will not be ready to enter the competition of November 28, but they expect to have their motor carriage in constant use inside of thirty days.

A. W. McArthur, Rockford, Ill., will not have his vehicle completed for the competition of November 28th.

The Roger American Mechanical Carriage Co., New York, recently received one of the latest improved Roger carriages from Paris, which they have been running about the city nearly every day to the delectation of the ubiquitous small boy, and the education of those of larger growth. During one of its outings, the carriage easily surmounted a 15% grade with two occupants, one of whom was the editor of the Horseless Age. The company expect soon to receive a vehicle carrying an 8-horse motor, and provided with a reversing mechanism.

The La Porte Carriage Co., La Porte, Ind., state that they are endeavoring to have one of their Duryea motor wagons finished for them in time for the Thanksgiving Day competition, but regard it as very doubtful whether they will get it.

During the last ninety days they have had fully one hundred inquiries for motor wagons.

The Sintz Gas Engine Co., of Grand Rapids, Mich., write that the extended time is still too short for them to make an appearance at Chicago on November 28th. They are hard at work upon their vehicle, but are unwilling to exhibit their machine before it has been thoroughly tested and approved.

The Pierce-Crouch Engine Co., New Brighton, Pa., were unable to complete their vehicle in time for the Thanksgiving Day competition, but they will soon have something for publication.

L. S. Nichols, West Concord, Minn., inventor of the vehicles which the Owatonna Manufacturing Co., Owatonna, Minn., are about to put upon the market, writes that they will not be on hand Thanksgiving Day. They wish to produce a vehicle that will be perfectly practical in all respects, and find that it takes more time than they anticipated. They will employ a rotary gasoline engine if on further tests it proves satisfactory.

Haynes & Apperson, Kokomo, Ind., will have two carriages at Chicago, on Thanksgiving Day, the one represented in the last issue of The Horseless Age, and one of later and improved construction.

Reuben H. Plass, Brooklyn, N. Y., is building one of his "duplex air-gas reciprocating motors" for a surry, and expects to have it in operation in three or four weeks.

The J. I. Case Threshing Machine Co., Racine, Wis., have just issued an elegant catalogue, illustrating and describing their new Raymond improved gas engines.

The Duryea Motor Wagon Co., Springfield, Mass., have doubts of their ability to complete their new wagons in season for the event of November 28th.

John A. Barrett and Frank Perret, the two New York electrical engineers spoken of in the last issue as working jointly on an electric system of propelling and controlling vehicles, are going to the bottom of the subject. They have not commenced their shop work yet but are taking up every difficulty and solving it as they proceed.

The Riotte & Hadden Mfg. Co., 462 East 136th Street, New York, have not yet completed the kerosene motor carriage referred to in the last issue.

Samuel Lawson, of Welch & Lawson, 205 Centre Street, New York, is at work upon a steering device for motor wagons, which is radically different from anything now seen. It gives remarkable leverage, and positive in its action.

S. F. Alberger, Orchard Park, N. Y., is building a motor vehicle to be propelled by a gasoline motor, but the motor is not quite in running shape yet.

A carriage to be operated by an acetylene motor is now in course of construction at Philadelphia. As soon as the vehicle has been tested the full details will be laid before the readers of The Horseless Age.

E. V. Machette, Secretary of the Ernst Power Vehicle Co., 17 Broadway, New York, states that Victor Ernst, one of the inventors of the company, has completed the working drawings for his steam motor, and regards it as beyond doubt the greatest success of his life. Mr. Ernst is convinced that he has evolved an entirely new principle in steam engineering, which will enable him to furnish an engine more simple, economical and cheaper in construction than any ever before produced. He has also finished the conception of his generator, and is engaged on the drawings for it. The Ernst Co., expect to have a perfectly practical motor carriage ready for exhibition in the early spring.

Over 1,000 motor wagons are now in use in and around Paris.

KEROSENE MOTORS

FOR WAGONS



AND CARRIAGES.

FOUR-HORSE AND TWO-HORSE POWER.

WELCH & LAWSON,
203, 205 & 207 Centre Street, NEW YORK.

Kane-Pennington Electro Oil Engine,

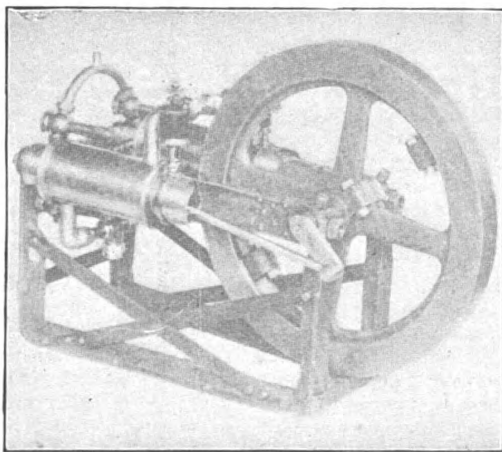
For VEHICLES, STATIONARY POWER and LAUNCHES

MANUFACTURED BY

THOMAS KANE & CO.,

137 & 139 Wabash Avenue, CHICAGO, ILL.

Send for Catalogue.



Two Cylinder, Two Horse Power Vehicle Engine.

Floor Space, 20 x 11 inches. Size of Balance Wheel, 20 inches.
Height to Top of Balance Wheel, 22 ins. Weight, complete, 120 pounds.

L. J. WING & COMPANY,

MANUFACTURERS OF

MARINE GAS ENGINES,

— FOR —

Launches, Business Boats, etc.

EXPECT TO HAVE A LINE OF

MOTOR WAGONS

READY BY JANUARY FIRST, 1896.

WE HAVE THE BEST MOTOR.

109 Liberty St., New York, U. S. A.