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(Illustrated articles are marked with an asterisk.)

THE PATENT OFFICE.

We have received several well-written communications respecting the propriety of discontinuing the present system of examination of applications for patents. The writers, as a general thing, are opposed to any change in this respect, and express themselves willing to pay for the service—if it can be properly and efficiently done. Ah! there's the rub. Now, it appears to us—though it is not a new idea—that the best possible thing to be done would be to establish the Patent Office upon an independent basis, which would enable the Commissioner to control the appointments, and manage its affairs without the interference of Senators and Representatives, who have succeeded in turning all our public departments into places for stowing away political favorites. The Patent Office is now suffering from this evil, and the Commissioner is necessarily much hampered in carrying out reforms in the service.

We notice with much gratification that a bill has been introduced into Congress to allow an increase in the examining force. This looks like business, and we trust that the bill may speedily become a law, and that under the new administration, the business of the Patent Office may be energized into new life. From present appearances, we think that inventors will soon have a more prompt and efficient examination of their cases.

IS A FLYING MACHINE A MECHANICAL POSSIBILITY?

Our readers are well aware that the above question has been answered, theoretically, in the affirmative many times; but it has never been practically answered except in the negative. We mean, of course, an artificial flying machine capable of performing flight independent of ordinary winds and currents, so that under most common circumstances it can be trusted to perform its work as ships do now, and have done for centuries. Man has made himself master of the treacherous sea, can he not also penetrate the aerial depths and control his motions in that element?

Much as has been said, written, and done in the elucidation of this subject, it is astonishing how little has been to the purpose. The inventions which have from time to time been made and tried only to demonstrate their utter absurdity, have been for the most part constructed in apparent ignorance of the true principles involved; and those who have criticised these inventions and ridiculed them have shown, in a majority of instances, almost as much ignorance as those whose work they have condemned.

Notwithstanding the failures which have uniformly attended the attempts to construct a useful flying machine, and the emphatic negative given by a large number of scientific writers to the question which heads our article, the belief in the ultimate accomplishment of flight by means of human devices has never lacked adherents among the learned and the unlearned. The organization of the Aeronautical Society, which gave its first exhibition at London last June, is an evidence that the belief is gaining rather than losing ground. Let us, then, examine the merits of this question.

The report of the above society contains some curious matter in the description of the engines exhibited. Steam engines have usually been considered as quite inapplicable to any possible flying machine, on account of the high relation their weight bears to their power. But what are we to say of an engine weighing only sixteen lbs., and being able to work to one-horse power? The council of the society voted their £100 prize to Mr. Stringfellow for an engine of this description; and whether or not it ever becomes the motive power for flight, it would seem, from its ingenuity, to be well worth the reward. "The cylinder," the report tells us, "is 2 inches in diameter, stroke 3 inches, and works with a boiler pressure of 100 lbs. to the square inch; the engine working 300 revolutions per minute. The time of getting up the steam was noted; in three minutes after lighting the fire the pressure was 30 lbs.; in five minutes, 50 lbs.; and in seven minutes there was the full working pressure of 100 lbs. When started, the engine had a fair amount of duty to perform in driving two four-bladed screw propellers, 3 feet in diameter, at 300 revolutions a minute."

The data for calculating the power are taken as follows: Area of piston, 3 inches; pressure in cylinder, 80 lbs. per square inch; length of stroke, 3 inches; velocity of piston, 150 feet per minute; $3 \times 80 \times 150 = 36{,}000$ foot-pounds. This makes rather more than one-horse power (which is reckoned at 33,000 foot-pounds). The weight of the engine and boiler was only 13 lbs., and it is probably the lightest steam engine that has ever been constructed. The engine, boiler, car, and propeller together were afterwards weighed, but without water and fuel, and were found to be 16 lbs."

This engine seems to demonstrate the possibility of making engines light and powerful enough for purposes of flight. The American wild goose frequently weighs more than this entire machine, boiler, propeller, and all; and the power exerted by this bird in flight, must be vastly less than that performed by the engine, according to the report referred to. Borelli assumed that a goose exerts in flight a force of 400-horse power, an estimate so wild and extravagant that it is simply ridiculous.

Dr. Fox, of Scarborough, has translated an instructive paper written by M. de Lucy, of Paris, "On the Flight of Birds, of Bats, and of Insects," in reference to the subject of aerial locomotion; in which it is stated, as the result of numerous investigations, that in flying animals the extent of winged surface is always in inverse ratio to the weight of the creature. He compares gnats, dragon-flies large and small, ladybirds, daddy-longlegs, bees, marsh-flies, drones, cockchafers, stag-beetles, and rhinoceros-beetles together, and arrives at the following highly interesting and unexpected results. The gnat, which weighs 460 times less than the stag-beetle, has 14 times more of (proportional) surface. The ladybird weighs 150 times less than the stag-beetle, and possesses 5 times more of surface, etc.; and it is the same with birds. The sparrow weighs about 10 times less than the pigeon, and has twice as much surface. The pigeon weighs about 8 times less than the stork, and has twice as much surface. The sparrow weighs 339 times less than the Australian crane, and possesses 7 times more surface. If we now compare the insects and the birds, the gradation will become even more striking. The gnat, for example, weighs 97,000 times less than the pigeon, and has 40 times more surface; it weighs three million times less than the Australian crane, and possesses 140 times more surface.

Coulomb calculated that in order to support a man it would be necessary to have a surface 12,789 feet and 2 inches in length, by 191 feet and 10 inches in breadth, but it has been since ascertained that a man can descend quite easily from a great elevation, with a supporting surface of 29 square yards, 8 square feet, and 14 square inches. This superfices reduced to a square gives the length of a side 5·3 linear yards, nearly. The length of supporting beams from the center needs therefore to be only about 2·75 yards, provided their own weight is not taken into account.

Precisely here comes in the first difficulty. These arms or beams necessary to sustain a web of silk or other texture, must have strength, rigidity, and lightness. When man can make a structure as strong, as rigid, as elastic, as light in proportion to bulk as a goose quill, the problem of flight will be nearly solved. Compensation for want of power in the muscles of the chest may be made by calling into play those of the thighs and legs as well as the arms, by means of suitable appliances.

What is now required, is a material combining greatest strength with least weight. We know of no such material now available for the purpose. We therefore conclude that until such materials are discovered man will not fly. To use the words of one of the sages of a shop in which many of our youthful days were spent, flying is, at present, "theoretically practicable, but practically impracticable."

APPLICATIONS OF THE GIFFARD INJECTOR.

This anomaly in mechanics is capable of a number of applications, and has been applied to uses not probably contemplated, originally, by the inventor. The main object was to enable a steam boiler to feed its own water by a jet of live steam. In some cases this proves to be an excellent method, but is not capable of general application. Where it can be applied it is economical and effective.

The Morton "Ejector Condenser," invented by Mr. Alexander Morton, of the firm of Neilson Brothers, Glasgow, Scotland, has worked finely in supplying boilers by their exhaust steam. It is a modification of, or rather an improvement on, the Giffard injector. A short time ago the application of the Giffard principle was extended to the raising of water by means of a water jet supplied from a head of considerable hight and was fully tested in France with excellent results. In Sheffield, England, the water is supplied from a head of 240 feet the jet being only one-eighth of an inch in diameter, the throat into which it discharges being three quarters of an inch in diameter. The suction and delivery pipes are two inches diameter, the water being drawn through the suction pipe from a depth of fourteen feet. The efficiency of this apparatus is claimed to be very great; that it delivers 72 per cent of the power expended, a duty considerably greater than that of pumps usually employed.

The ejector is in use, also, for discharging ashes and scoriæ from the boiler room of ships. A pipe of sufficient capacity, three or four inches diameter, extends from the outside of the ship, above the water line, down to the fire-room floor, ending there in a funnel-shaped mouthpiece, just above which is a pipe leading from the boiler to introduce a steam jet. The discharge pipe is furnished with proper valves not necessary to explain as every engineer understands the use of "flap," or check valves. Even at ten pounds pressure to the square inch the force is sufficient to lift the debris of the boiler furnaces. The quantity of the steam that passes up the pipe is very small compared with the volume induced by its velocity. Of course, this apparatus can be readily adapted to the discharge of ashes from stationary boilers, and also for excavating sand and gravel under water for the purpose of sinking cast-iron foundations. It is evident that, with modifications, the principle of the Giffard injector may be applied to many uses to which it is not now generally applied.

WHY IS MECHANICAL LABOR OBJECTIONABLE?

We copy the following from the Philadelphia *Ledger*:

A few days ago, a gentleman advertised for a clerk. By the close of the first day on which the advertisement appeared there were four hundred and eighteen applicants for the one clerkship. This afforded a very forcible illustration of the extent to which the occupation of clerking and bookkeeping is overstocked. But a few months since the head of a business establishment, who wished some help in the way of writing, but in which some literary ability was required, advertised for an assistant at a moderate salary, and having incidentally mentioned that the position might suit a lawyer or physician not in good practice, got more than a hundred applications, of which fifty-three were from young lawyers and doctors.

Here was another illustration of an over-supply of the professional or "genteel occupations." Another advertiser who wanted a person to take charge of the editorial work of a weekly paper, got fifty-seven applications, not more than half a dozen of the applicants being recognized newspaper writers, but nearly all of them being clerks, bookkeepers, and professional men. Still another advertised for two apprentices in a wheelwright and smith shop, in one of the semi-rural wards of the city, requesting applicants to give their address and age. He got three applications, but in every case the applicant was too old, two of them being over eighteen, and one nearly twenty. Still another advertised for an office boy, about fourteen years old, and had so many applicants that his place was crowded for more than five hours, and the applicants were of all ages, from mere children not more than twelve years old to full grown men of twenty-one.

These are not very cheerful or encouraging signs. The present generation of young men seem to have a strong aversion to every kind of trade, business, calling, or occupation that requires manual labor, and an equally strong tendency toward some so-called "genteel" employment or profession. The result is seen in such lamentable facts as those above stated—a surplus of bookkeepers and clerks of every kind who can get no employment, and are wasting their lives in the vain pursuit of what is not to be had, and a terrible over-stock of lawyers without practice and doctors without patients. The passion on the part of boys and young men to be clerks, office attendants, messengers, any thing, so that it is not work of the kind that will make them mechanics or tradesmen, is a deplorable sight to those who have full opportunities to see the distressing effects of it in the struggle for such employments by those unfortunates who have put it out of their power to do anything else, by neglecting to learn some permanent trade or business in which trained skill can always be turned to account.

The applications for clerkships and similar positions in large establishments, are numerous beyond anything that would be thought of by those who have no chance to witness it. Parents and relatives, as well as the boys and young men themselves, seem to be afflicted with the same infatuation. To all such we say, that the worst advice you can give to your boy is to encourage him to be a clerk or a bookkeeper. At the best it is not a well-paid occupation. Very frequently it is among the poorest. This is the case when a clerk is fortunate enough to be employed, but if he should happen to be out of a place, then comes a weary scarcity, the fearful struggle with thousands of others looking for places; the never-ending disappointments, the hope deferred that makes the heart sick, the humiliations that take all the manhood out of poor souls, the privations of those who depend upon his earnings, and who have no resource when he is earning nothing. No father, no mother, no relative should wish to see their boys or kindred wasting their young lives in striving after the genteel positions that bring such trials and privations upon them in after life.

It would almost seem that comment on the above facts and accompanying remarks is superfluous, but in daily received correspondence we frequently find inquiries for advice from those who think their talents are not properly appreciated and their efforts not adequately compensated. The state of affairs shown by the instances quoted by our cotemporary, we think, are not only easily explained, but are susceptible of improvement. One cause of it is innate laziness and the other foolish pride. There may be others, but these are the principal ones; the laziness that prevents a man from *learning* his chosen business, and the pride that prevents him from *choosing* one suited to his capacity and education. Yet the lazy often desire the most laborious places, and the proud those where they are the servants of servants.

He who would turn up his nose in scorn at serving an apprenticeship at a trade where his hours of labor would be but ten at most, possibly only eight, out of the twenty-four, and who, at the expiration of three, four, or five years would be a competent workman worth a handsome compensation, possibly capable of acting as foreman, superintendent, or employer, chooses to agonize and struggle for a place in some mercantile business where he is the drudge of his fellow employés, and almost a thrall to his employers for years, only to find himself a clerk for the best part if not the remainder of his life. As a journeyman in almost any mechanical business his pay would be absolutely greater than as a clerk, his hours of labor would, in most cases, be less, his responsibilities less, and the wear and tear on his body and mind less. But—the mechanic labors with his hands, and soils them, and wears overalls, and colored shirts, and rolls up his sleeves, and carries the honorable insignia of toil about with him, while the clerk may sometimes keep clean hands, and dress neatly, and show a white shirt front, and carry only a pencil behind his ear; consequently the choice of the show with its accompanying drudgery, rather than the substance with its independence.

Within two weeks we have had calls from young men who have studied for the "professions;" two had studied law, one medicine. Each wanted advice, and, if possible, aid; but although neither could succeed in his chosen profession, neither was willing to attempt manual or mechanical labor. What each wanted was either an insurance agency, a clerkship, traveling agency, or place as copyist—anything rather than soil the hands. We can point to men who write "M. D." after their names who cannot compose a parseable English sentence. We know of members of the "bar" who do not understand the constitution of their country or the principles underlying it. These might have made good blacksmiths, or machinists, or carpenters, or ship-builders (though we much doubt it), but they might have been usefully employed in shoveling gravel.

But after having chosen a mechanical profession, it is not seldom the case that the apprentice looks upon his term of apprenticeship as so many years of lost or wasted time. He does not care to learn. He seems to suppose that the practical knowledge of his business is, somehow, to grow into his apprehension without effort on his part. To worry through the years of apprenticeship, with the least labor or effort to themselves and the least benefit to their employers, is really the principal study of some apprentices. *They* are not the only ones who look upon the years of apprenticeship in the same light. A letter received from a young man says he wants to become a machinist, but his father objects to his *giving* (?) three years to a trade.

Possibly the time will come when mechanical labor and mechanical skill will be valued at their true worth, as compared with other employment and other aptness; but so long as our young men prefer to preserve soft and clean hands as something more valuable than personal independence and a means of usefulness, we look for no abatement in the number of applications for "genteel" places.

ART OF COLORING MARBLE.

Did the ancients practice the art of coloring marble, or is it a recent American discovery? The New York *Times*, of February 15, 1869, in an editorial headed "Marble Coloring," says: "The art of coloring marble, through the entire mass, is supposed to have been known to the ancients, inasmuch as among the ruins traces of colored marbles and stones are found."

The *Metropolitan Record*, of February 20, 1869, in an article headed, "A New and Important Discovery in the Fine Arts, and its Special Application to Church Architecture," thinks there are plausible reasons why some writers have ranked the art of coloring marble among the lost arts, because "among the ruins of ancient temples and monuments, colored marbles and stones have been found, of whose original sources no trace can be obtained. If they came from quarries, the quarries are unknown in our day."

In Venice and other cities of Lombardy are columns and altars of a translucent white marble, *marmo statuario*, which resembles the Parian, but is not quite so opaque. The quarries of this kind of marble are as yet unknown. Might it not be said with equally plausible reasons that the Italians knew the art of making this marble, but they lost it?

That analogues and quarries of ancient colored marbles have not been found, is hardly a sufficient reason for classing the art of coloring marble among "the lost arts," for it may safely be asserted, that in all the countries which constituted the ancient world, Egypt, Asia Minor, Greece, Turkey, Italy, Northern Africa, and the Mediterranean Isles, have been in a state of stagnation since the fall of Rome and Constantinople; and that whenever accurate geologic and mineralogic surveys are made, the quarries may be re-discovered.

A synopsis of what the ancients knew and did as to marble, will conclusively show that the art of coloring marble through the entire mass was neither known to, nor practiced by them.

The word *marmaros* was applied by the earliest Greek writers to any rock, stone, block, or fragment, with the idea of shining, sparkling, bright. B. C. 800 Homer ("Iliad," xii., 380) and Euripides (B. C. 450, in his "Phœnissæ," 678) used the term in that sense. It was evidently derived from *marmarein*, to shine, sparkle, gleam, glitter. B. C. 270, Theocritus first applied *marmaros* to works of art in marble.

The word *marmaron*, marble, also rock crystal, or feldspar, on account of their shining appearance, was of later date. The Latin word *marmor* is formed from it, and is neuter like its original, in spite of its termination *or*. The German, *marmor;* Italian, *marmo;* French, *marbre;* English, *marble*, are but so many Graeco-Latin derivatives. Mineralogists have limited the word to rocks and stones, whose sole or chief ingredient is carbonate of lime, susceptible of polish.

There were at Rome, as early as 493 B. C., two ediles, architectural engineers, whose duty was to superintend the erection, adorning, and repairing of public buildings, streets, markets, etc. B. C. 366, two more were added, styled *curile ediles*. Julius Cæsar joined to them two *ediles cereales*, B. C. 44. The ediles had precedence in the Senate; their office was one of the most honored in the State. Would not one of these distinguished Roman savants and engineers have somewhere alluded to the art of coloring marble if such an art had been known and practiced?

Polygnotus, who was surnamed "The Prometheus of painting," and whose works were so highly esteemed, no doubt knew all the colors and coloring of his epoch, B. C. 469. Yet, in connection with him or his paintings, we find nothing of the art of coloring marble. Neither do we find any mention of such an art in connection with Polycletus, the famous sculptor and architect who built the theater at Epidaurus, which Pausanias pronounces, in symmetry and elegance, superior to every other theater, and not excepting those at Rome.

Vitruvius, the ablest Latin writer on ancient architecture, does not allude to the art of coloring marble through the entire mass in his ten books. Yet he lived under Augustus, who zealously patronized the arts, and was wont to say, "That he found the city built of brick, and left it constructed of marble."

Pausanias (A. D. 120) visited Greece, Macedonia, Asia, Egypt, and even Africa, as far as the temple Jupiter Ammon, then retired to Rome, where he wrote his ten books on the edifices, monuments, and works of art he had examined, and contrasted them with those of Rome. In the work of this author, who is the highest authority on ancient archeology, there is no allusion to any art of coloring marble through the entire mass; yet this erudite writer not only describes the edifices and works of art, but furnishes historical records, anecdotes, and legends connected with them.

Not even Belzoni (A. D. 1818), describing the vivid colors of his "Room of Beauties," "Researches and Operations in Egypt," p. 227, pretended to assert that the ancients knew the art of coloring marble and granite through the entire mass, though he may have thought they could beautifully color and stain it on the surface.

Hence, as neither the ediles from B. C. 493 to A. D. 476, a period of one thousand years, neither the ancient painters, sculptors, and architects, nor the ancient writers on archeology mentions the art of coloring marble through the entire mass, we may fairly conclude that the ancients knew nothing of this art, and that it is simply and purely an American discovery.

No doubt, Winkelman, author of the "History of Art among the Ancients," and Quatremère de Quincy could not help indorsing such a conclusion.

As a synopsis of the finest marbles known to the ancients might throw more light on this subject, and be a guide to American explorers and pioneers, we shall give it in a future issue.

VELOCIPEDE NOTES.

There are some who think, or pretend to think velocipedes are a frivolous invention, only calculated to subserve purposes of amusement, and soon to be superseded by some other ephemeral claimant for popularity. To such it perhaps seems a waste of time and space to record the progress of this most prominent mechanical invention of the time. We, on the contrary, have avowed and still avow our belief that the velocipede, as now improved, is destined to mark an era in the history of vehicles, an era that will last long after present cavillers and devotees have passed off the stage. We therefore continue our notes on the progress of this invention, and are confident from the many letters of approval we receive, they prove very acceptable to a large number of our readers.

A young mechanic in Dubuque, Iowa, has invented and constructed a vehicle which he terms the "velocycle," and which he claims will supersede the velocipede. A local paper describes it:

"The reader must disabuse his mind of all the forms common to the velocipede, and imagine a wheel 5 feet 10 inches in diameter. Nay, the imagination must go further and comprehend this wheel to be, as it were, two wheels of this diameter, and of a proportion not unlike a driving sulky's—that the two are made a unit by a light rim twelve inches wide, running around and within two inches of the outer circumference of the two supposed wheels. This comprehension will enable the reader to understand that this wheel is in reality a rim 5 feet 10 inches in diameter and about 14 inches wide, with two flanges, of two inches depth, projecting over the edges. Having entertained this form, we proceed further. Inside of this rim or wheel, a light but strong frame is hung, by a novel device, which keeps it independent, so far as not to obstruct its (the wheel's) motion. From the bottom of the frame, which is square, and running to the top of it, at an angle of nearly ninety degrees, is a band that may be properly called an endless ladder. The band, it will be understood, passes over a pulley below and a pulley above. On the edges of this endless ladder, in close proximity and parallel to each other, like strings of great beads, are a series of friction pulleys. These pulleys are so arranged as to unhinge on similar peculiarly contrived pulleys on the inner circumference of the main wheel or rim, near to the intersections of the flanges. The revolution of this band or endless ladder, through the medium of these pulleys, causes the main wheel or rim to revolve."

While the velocipede is still having its run in Paris, the other cities and towns of France are putting spokes in its wheels in the way of municipal restrictions. At Lyons no one can appear in the public streets or highways on a velocipede, and at Bordeaux, if a velocipedist goes out after sunset, he must carry a lantern, lighted.

A velocipede race took place at Worcester, Mass., a day or two ago. There were eighteen competitors, eight of whom were thrown. The remaining ten finished a course, of a little less than half a mile, in various periods of time; the fastest rider making the course in seventy-two seconds.

It is said that the first velocipede made its appearance in Minneapolis, Minnesota, on Tuesday, Feb. 16, and created a great excitement.

There are at the present time some twelve or fifteen schools in Boston where the use of the velocipede is taught, and they are increasing in number every day. At these halls from four to twelve machines are kept, and the arrangements whereby one pays for learning differ at the several places.

Some charge so much for a series of ten lessons, while others charge a small admittance fee and a certain price per hour for using the machine, as is the case in playing billiards. In either case they all made money, and a machine pays for itself in a very short time.

The hall velocipedes are for the most part slim built affairs, not suitable for roads, where a strong machine will be required to withstand the jar of uneven roads. It is estimated that upwards of one thousand young Bostonians are taking lessons in riding, with a view of going on the road when the spring opens.

Mr. Nat Perkins, of Riverside Park, will offer prizes for a series of velocipede races to come off on his race track early in the spring.

Walter Brown has opened the velocipede rink, number 10, in Boston, on Court street, near the Revere House.

A few evenings since, Mr. Hiram Henlin, of 720 Broadway, New York, and Mr. Samuel Keeler, the well-known and popular treasurer of the New York Theater, while at the velocipede school of Mr. C. Witty, engaged on a tilt at riding, which ended in rather a novel wager, Mr. Henlin agreeing to ride a velocipede against Mr. Keeler, from New York to Chicago, in less time than Mr. Keeler could, for the sum of $1,500 a side. Articles of agreement were drawn up, and a forfeit of $250 each placed in the hands of Mr. Charles H. Bladen, the final deposit was made at the house of Mr. Henlin, 720 Broadway, on the evening of Thursday, February 16, 1869—umpires and starting day then named. We suppose this will be the forerunner of several matches of the same kind, as the velocipede mania is on the increase. The affair is creating considerable excitement in sporting circles, and a large amount of money is already staked upon the result.

A new style of bicycle—the first specimen of which was completed about a fortnight since, and several of which have since been manufactured, and subjected to a variety of tests as to strength and susceptibility of easy propulsion and control—is, we are informed, the recipient of many encomiums from those who have learned to ride it. It is called the Improved American Velocipede, invented by A. T. Demarest, of this city. It differs from the styles best known to the public, in important respects. The iron arms, between which the front wheel is held, are inclined back at an angle of forty-five degrees from the perpendicular, which inclination brings the seat in such a relative position to the fore wheel that a man of medium hight can with his feet reach the treadles of one of these velocipedes, the front wheel of which is forty-five inches in diameter, with as much ease as he can those of the ordinary velocipede, the fore wheel of which is of a diameter seven or eight inches smaller. This peculiarity gives likewise great facility in describing sharp curves and circles of small diameter, the body being inclined in the direction in which the rider wishes to propel himself, and in the direction in which the driving wheel is inclined. Those who have become expert in the use of this new machine, claim that the movement of the body in propelling and guiding it is more nearly analogous to that in skating than is that employed in controlling the ordinary bicycle. Indeed, they claim that it can be guided by the mere inclination of the body without perceptibly varying the pressure upon the handles to the one side or the other. It is also claimed that by the peculiar rakish arrangement referred to, three obvious advantages are secured—that the driving wheel never touches the pantaloons to soil them; that however formidable an obstruction may be encountered, whether it be a curb-stone or anything else of equal hight, the arms holding the driving wheel will never be bent back in such a way that the wheels will lap each other (as those of the other styles of velocipede sometimes will), for the reason that those arms point directly toward such obstruction, the sole effect of striking it being to lift the front wheel and the rider; and that the hind wheel—whether a straight line be followed or a circle described—remains in an upright or nearly upright position.

The *Milwaukee Sentinel*, of the 18th February, says that "Mr. Cubberley, the inventor of the new velocipede, gave an exhibition of its speed and mode of operation at the Chamber of Commerce yesterday. The 'new-comer' made a favorable impression, and will doubtless supersede the treacherous 'bicycles.'" This machine is described as a tricycle, the rider sitting over and between the main wheels, as upon a sulky. These are about the size of the hind wheels of an ordinary carriage. The third, or guide wheel, is of small size, and serves merely to support the forward part of the machine.

Its most striking peculiarity is the ingenious contrivance whereby the weight of the rider is made to contribute to the propelling power, thus materially relieving the strain upon the muscles of the arms and legs. The apparatus for guiding, in addition to its main purpose, is so connected that the arms may assist in imparting motion to the wheels when not engaged in giving direction. The movements of the body in riding are very similar to the gentle rise and fall of a person riding on horseback, the rapidity of the motions increasing with the velocity.

The following remarks upon learning the velocipede are based upon practical experience and will be found of use to those who have not yet "broken their colt:"

"To learn the velocipede, where possible, it is advisable to use a velocipede not too elevated, so that the soles of the feet touch the earth. To start with the velocipede it suffices to run with the machine, so as to master well in the mind the action of the fore wheel, for all depends on this wheel. Half an hour of this is all that is requisite. Then one *only* of the feet is placed on the pedal, keeping the other leg on the ground, and one guides oneself in pushing this pedal a few moments. When one has by this acquired the notion of gov-