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NEW YORK, SATURDAY, APRIL 17th, 1909.

The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

THE FULTON AIRSHIP FLIGHT CONTEST.

There is no contest of greater interest or importance for America than that for the $10,000 prize offered by the New York World, through the Aero Club of America, for an airship race from New York to Albany, over the course followed by Fulton in the first steamboat a hundred years ago. The contest derives its importance from several considerations, such as the great distance to be traversed; the fact that the route of the river must be followed—a most trying condition for aeroplanes; the value of the prize; and, lastly, the fact that the great prestige which will attach to the winning of the contest is likely to bring together several of the world's most noted aeronauts. We wish to draw special attention to this contest, among other reasons because we see in it an opportunity for America to win back some of that prestige which she undoubtedly lost when, by her indifference to the claims of the Wright brothers, she drove them to find more appreciative treatment at the hands of people of an alien tongue and race. For there is no denying that our attitude to the new art, or shall we say the lately-developed art, of flying has been altogether unworthy of a country, which claims to be particularly solicitous of the inventor, and ever ready to encourage the man who can present us with a novel and useful idea embodied in practical mechanical form.

It will be a thousand pities if, when the competing airships are sent over the course, it is found that American machines are conspicuous by their absence. In view of the importance of the contest, and the fact that it is held in connection with our great Hudson-Fulton celebration, there should be at least a dozen American entries. But the sport of aeronautics is a costly one, and to build and tune up an airship or aeroplane for such a trying contest as this will necessarily involve considerable expenditure of money. With one notable exception, private experimental work in this country has been done by men of more or less limited means. The SCIENTIFIC AMERICAN knows personally of several men whose unquestionable intelligence, wide reading, and keen enthusiasm render them admirably qualified for experimental work in this field. They are hampered, however, by want of the necessary funds.

Now, there is no country on earth where men of wealth are more ready to spend their money lavishly in the promotion of any sport in which they are interested; and we believe there is no field to-day in which, for the amount of outlay that would be necessary, so much sporting pleasure could be obtained and more world-wide sporting fame achieved, than in promoting the building of a sufficient number of machines to give the United States its proper representation in the forthcoming contest, and insure for this country a reasonable expectation of winning the prize.

The marvelous success of the Wright brothers in awakening the enthusiasm of the sport-loving public in Europe gives reason to believe that flying may become the most popular sport of the future, even to the extent of holding the public attention and interest to the same degree as the automobile has done during the past decade. Nor will the sport be so full of risk as is popularly supposed. Much thought is now being given to the question of automatic equilibrium; and it is probable that in a few months' time a machine will be flying in this country in which the equilibrium will be so perfectly maintained that sudden upsetting will be impossible. It will then remain for someone to give us a motor that is as nearly absolutely reliable as anything manufactured by human hands can be. When that is done, the airship and the aeroplane, and particularly the latter, will present, in the hands of a careful manipulator, no greater risks to life and limb than the perfected automobile.

The present time, then, is opportune for a rapid development of the sport of aeronautics in this country; and we repeat that the Fulton contest over the New York-Albany course offers an enticing opportunity for the wealthy sporting man of this country to supplement the able experimental work of the American inventor.

BRICK ROADS FOR THE AUTOMOBILE.

A correspondent in Cleveland, Ohio, commenting on our recent editorial, "The Highway and the Automobile," calls attention to the fact that there are a great many brick roads being laid in the territory adjacent to Cleveland, and asks our opinion as to their practical value. As far as the automobile is concerned, there is no question but that a properly-constructed brick road affords an excellent surface, in respect of the smoothness of running, the tractive adhesion of the tires, and the limited amount of tire wear and destruction. It is certainly superior to the concrete road as ordinarily laid. Those who have driven their machines at high speed over the Motor Parkway, Long Island, complain bitterly of both the roughness and the inequalities due to the hollows of the surface, the former producing a rapid wear of the tires, and the latter serving to set up, at anything but very moderate speed, excessive vibration. This was so marked at the last Vanderbilt Cup Race that several drivers were quoted as saying that there was a marked increase of speed in the car when they left the concrete surface for the ordinary macadam.

The smooth face of the brick is less destructive of tires than the file-like roughness of the ordinary concrete surface. Moreover, it is possible to lay the brick with a truer surface than is secured by the ordinary contractors' gang engaged in laying a concrete surface. To true up the surface of a continuous bed of concrete with the exactitude which is necessary to give a smoothly riding surface for high-speed or even moderate-speed automobile travel, is a job calling for no little nicety of workmanship.

Provided the brick be of high quality and the foundations of sufficient depth and thoroughly laid, the brick road forms an ideal automobile highway. The foundation should consist of large broken rock followed by smaller stone or a good quality of gravel, and a layer of concrete. Upon this should be a shallow bed of sand for surfacing purposes, upon which the brick should be laid and carefully surfaced, and grouted into place. The sand serves to give a slight cushioning effect between the concrete and the brick, and also permits of the necessary adjustment of level to bring the upper face of the bricks to the true surface. A State road of this character, built with a proper amount of crown for drainage, should be good for many years of service, and would require but little repairs, except in such sections as are subjected to heavy wagon and dray traffic carried on steel-tired wheels. Heavy concentrated wheel loads would tend to fracture the hard face of the bricks; and unless the bricks were at once replaced, the ceaseless hammering of traffic would quickly produce a low spot in the road. Even where traffic is heavy, however, we believe that, as in the case of a macadam road, immediate repairs, made at the first indication of a breakdown, would serve to give the road, as a whole, a long period of life. A good combination for a State highway would be to build it of macadam with a tarred surface in the suburbs and vicinity of towns and cities, and build it of brick through the country districts. Although the first cost would be heavy, the saving in repairs (that is, if the supervision were close and constant) and the enormous saving in the cost of haulage would, in the course of a very few years, constitute such roads a paying, and in many localities a richly-paying, investment.

STEAMSHIP VIBRATION.

When a modern steamship with a length of between 700 and 800 feet is running at a speed of 25 knots, the friction of the wetted surface of the hull against the water tends to overcome the inertia of the film of water lying immediately next the hull, and gradually imparts to it some of its own motion. The action is cumulative; the water at the forward end of the ship partaking but slightly of this motion; that against the amidship portion moving faster; and the film of water against the after part of the hull moving faster yet, and at a speed of several knots. The water immediately against the after hull moves almost as fast as the hull itself; the next layer somewhat slower, until, at a certain distance from the ship, the water remains inert and unaffected by the ship's motion.

In our issue of December 28th, 1907, speaking of the vibration in the after part of the "Lusitania," we stated that it was due to the successive tips of the wing propeller blades sweeping through this film of water swiftly moving forward, and meeting with a temporary resistance greater than that which they encountered throughout the rest of their circle of revolution. This theory was verified by personal observation on the ship, which showed that when the three-bladed propellers were making three revolutions to the second, the vibrations of the ship were at the rate of nine per second, or one to each passage of the blades past the side of the ship.

That the vibration was due to regularly-recurring shocks to the propeller, is suggested by the fact that during the past season both of the wing propellers were disabled by the loss of propeller blades, due to the breaking of the bolts by which the blades were fastened to the hub.

While the "Mauretania" was in drydock during the past winter, four-bladed propellers of less diameter were substituted on the wing shafts, with the result that the vibration was entirely eliminated, and the ship is now traveling with that perfect smoothness which the advent of the steam turbine in marine propulsion had led the ocean traveler to expect. Reducing the length of the blades has withdrawn the blade tips from the belt of forward-moving water adjacent to the hull, and thereby has eliminated the principal cause of vibration. Propellers of the original dimensions are being retained on the inner shafts, since these have never developed any serious vibration effects. The excellent results obtained by making this change on the "Mauretania" suggest that the vibration which is observed on other quadruple-propeller turbine-driven ships, such, for instance, as the "Yale" and the "Harvard," might be considerably reduced, if not eliminated, by decreasing the length and increasing the number of the blades. Experimental work on turbine vessels of this character might prove to be well worth the time and expense that it would involve.

WHY NOT THE ELECTRIC FIRE ENGINE?

The advent of the high-powered high-speed automobile leads Chief Binns of the New York Fire Department to suggest its possible use as a fire-fighting apparatus. The idea is not simply to substitute gasoline motors for horses, but to employ mechanically-propelled vehicles carrying electric pumps, which can be connected with an electric lighting circuit or any suitable source of current, thereby eliminating not only draft animals, but all the inconvenience of steaming up, carrying coal, and replenishing the coal supply at a big fire. Such a plan ought to be carried out, above all, in our rural districts. The fire company of a country village is rarely if ever of any service, either because it cannot reach a fire quickly enough, or because it is unable to cope with any but the smallest fires. Every country village has its electric lights in these days. A high-speed automobile carrying an electric pump could bowl along over ordinary roads at twenty-five miles an hour and reach a burning dwelling almost as quickly as a New York steamer could arrive at the scene of a fire. It would be the work of a minute only for the fire crew to connect the electric pump with the current and play a large stream of water on the blaze. The slipping in of a plug is about the only act required.

Even in those portions of New York city where the high-pressure fire service is not as yet installed, Chief Binns's idea could be carried out with excellent results. There is an abundance of electric power in every quarter of the city. Protected boxes containing electric connections could be installed near fire plugs. An electric pump could be connected with a box as easily as a telephone jack is plugged into a switchboard.

The singeing of the nap of the thread is one of the most unhealthy operations in the process of spinning. The method which has hitherto been in use was to pass the thread at a regulated speed between two spools twenty to thirty inches apart. On its way from one spool to the other the thread passed through two or three gas flames spaced about six inches apart. The rate of travel of the thread was sufficiently rapid to prevent the thread from burning, but the nap was converted into friable carbon and fell off as a grayish dust. On entering the working room in which this operation was conducted, one experienced a feeling of heat and of suffocation. The temperature toward the end of the day would rise to about 95 deg. F. The air was heavy, and charged with the odor of burnt thread. One felt an acrid sensation at the throat, and a stinging under the eyelids. There should have been ample ventilation. Unfortunately the necessity of keeping the flames steady forbade all air currents. Various improvements have gradually been introduced, such as burning gas under pressure, whereby a steadier flame is obtained, which allows ventilation to be provided for. A new electric process for singeing is now being introduced into spinning works. It is due to Mr. Gin, and consists in using the heat radiated from an incandescent electric conductor for burning the nap of the thread. The conductor consists of a long platinum tube, with a slit for admission of the thread. The temperature is readily regulated by means of a rheostat. The dust and the gaseous products of combustion are withdrawn by means of aspirators. The hygienic advantages of the new process are beyond dispute. On the other hand, the results are satisfactory from a financial point of view.