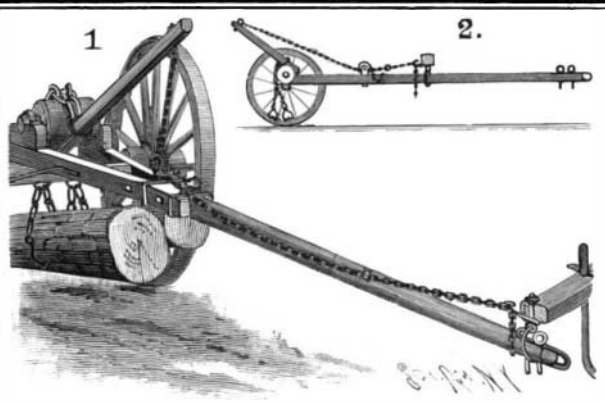
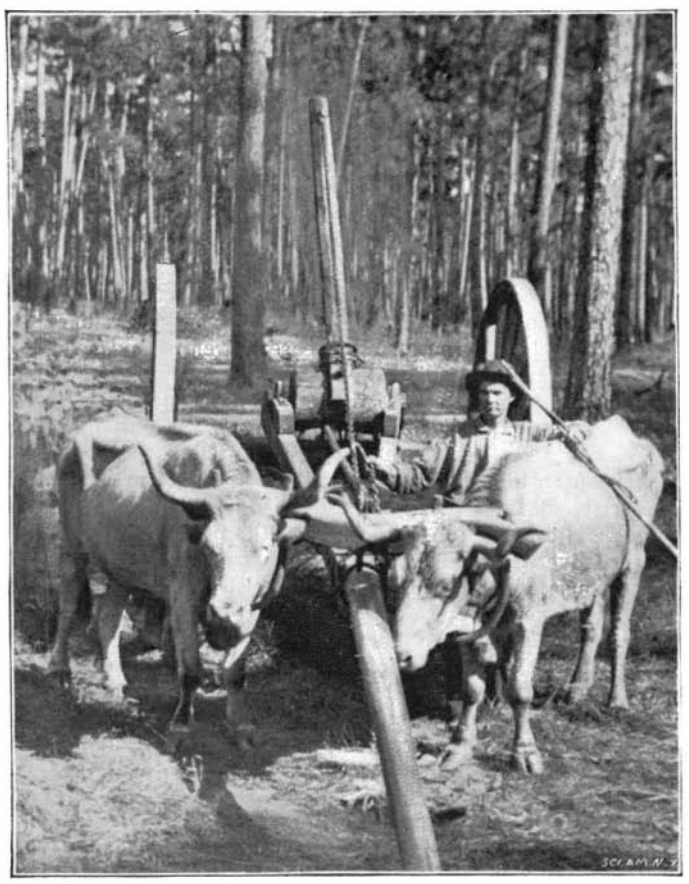
A NEW LOG LOADER.

The illustrations herewith refer to a new contrivance for loading logs on high-wheeled trucks, which is intended to do away with the use of hand windlasses and similar machinery. The device has been invented and patented by Mr. William Brough, Jr., of Warren, Tyler County, Texas. The general plan of the device may be readily understood from the illustrations. In the cut presenting the two views, Fig. 1 shows the position of the device with the log raised in position for hauling and Fig. 2 gives the side elevation of the truck, showing the position before loading. The truck is provided with high wheels and a common form of wagon tongue. Directly over the axis of the wheels is a roller or support which serves as a fulcrum for the sweep. At the lower end of this sweep is attached the chain and grapple used in hoisting. At its upper end another chain is attached and this passes around a revolving wheel fastened to the top of the tongue, as shown in the illustration. The end of this chain is attached to a ring which slides along the tongue and may be fastened to a clip at the end of the tongue or yoke. When the device is to be used, the sweep is turned back and the grapple is made fast to the log to be raised. The team is then hitched to the end of the chain and driven forward, thus pulling the chain and moving the sweep, which in turn moves the roller, winds up the chain on the fulcrum and raises the log into position for hauling. When the team has drawn the chain far enough to raise the log to the desired height, a pin is slipped through a link of the chain just in front of the wheel, which prevents it from slipping back. A rod may be used to operate the sweep in place of the chain, though the chain is generally found preferable. It will be seen that the contrivance is exceedingly simple and durable.



DETAILS OF BROUGH'S LOGGING TRUCK.



IMPROVED LOGGING TRUCK.

THE BATTLE OF THE YALU RIVER.

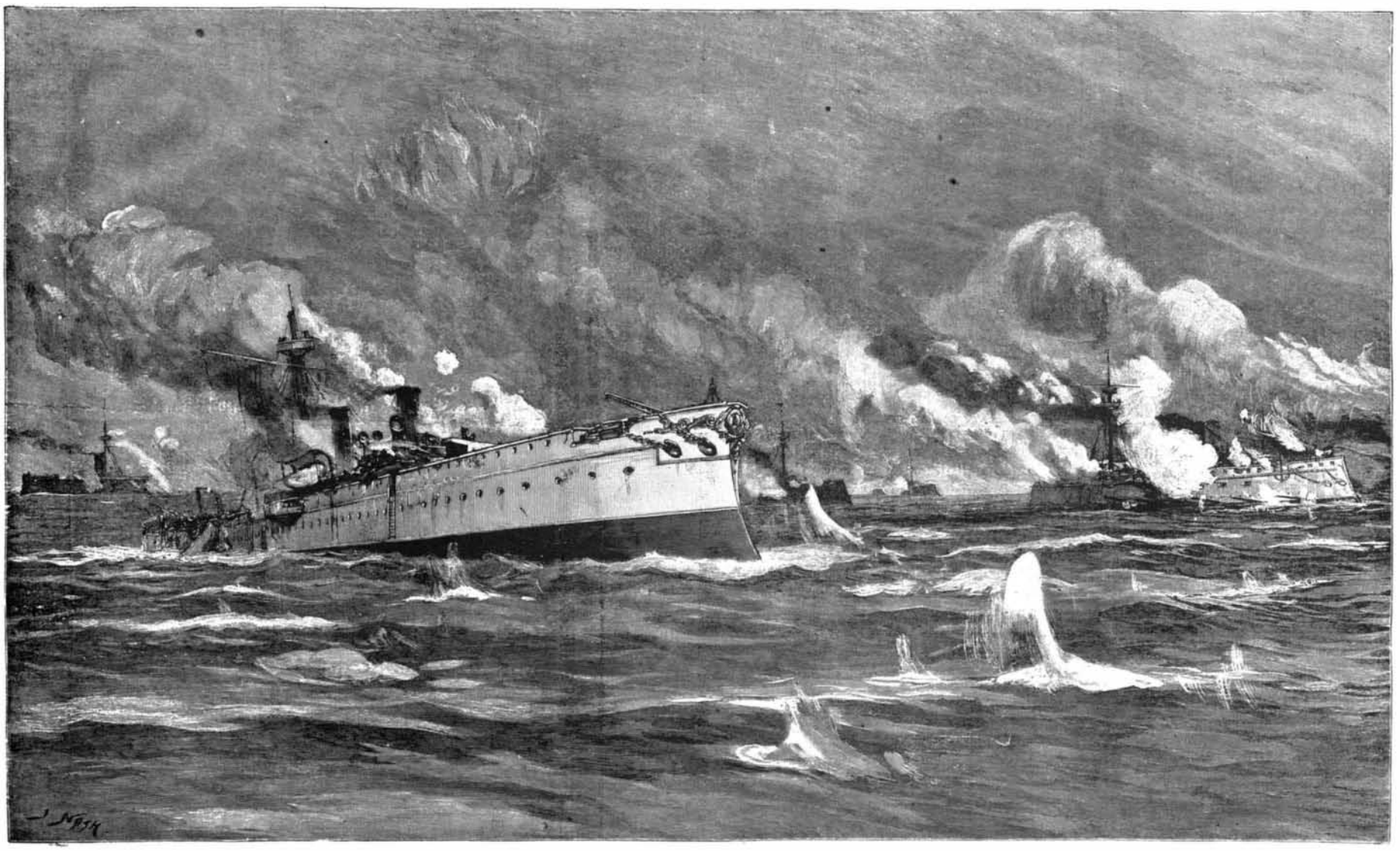
The greatest naval battle of modern times was fought between the fleets of China and Japan on September 17, 1894, while Chinese transports were attempting to land troops at the mouth of the Yalu River. When the Chinese fleet sighted the Japanese fleet it steamed out to meet it. The formation of the Chinese fleet when in the open water was that of an accentuated crescent, while the Japanese were in a single line, with the Matsushima in the center. Admiral Ito, after the first few rounds had been exchanged, signaled the Japanese ships to bring their guns to bear first upon one flank, then upon the other of the enemy. The Chinese fleet then formed in a single line, the distances varying from 7,000 to 12,000 feet. The Chinese aim was bad. The Chinese admiral soon saw that his position was desperate and ordered the formation of the line broken. He sent three ships against the Japanese line at full speed. It was about this time that the Lai-Yuen, the Chih-Yuen and the Chao-Yung were sunk. The Chinese cruiser Chih-Yuen, commanded by Captain Tang, closed with one of the enemy's ships with the intention of ramming, but was herself then attacked by four Japanese ships, which closed around her. The Chih-Yuen, under this combined fire, was ripped up by shots under the water and went down with all on board. This is the feature of the battle we illustrate. The flagship Matsushima had been the object of the Chinese attack throughout the fight. A Chinese shell struck and dismounted a quick-firing gun, and the commander and the first lieutenant were killed, 120 of the crew were also lost. Admiral Ito transferred himself and his staff to the Hoshidote, and in a short time was in the thick of the fight. The total loss of the Chinese, including the cruiser Kwang-Kai, which was blown up while making her escape, was five vessels.

The quick-firing guns gave the Japanese an immense advantage, scattering showers of splinters, occasionally setting the Chinese ships on fire and riddling everything that was not protected by armor. In the course of the action one of the smaller Japanese ships was seen with her propellers out of the water and her bow nearly under. Another was seen to be on fire, enveloped in flames and apparently sinking.

The Yoshino and Matsushima were burning fiercely. The former, after receiving two shots each from the Ting-Yuen and Chen-Yuen, was enveloped in a cloud of white smoke, which lay heavily on the water and completely covered the ships. The Chinese vessels waited for the cloud to clear and got their port guns ready, but before the Yoshino became visible their fire was diverted by a Japanese vessel of the Matsushima type, which came on at a distance of 2,200 yards on the port quarter. The guns laid for the Yoshino were fired at the newcomer, with the result that she began to burn. Whether or not these three Japanese ships received mortal injury was uncertain. In the latter part of the battle the Chinese ironclads ran short of common shell and continued the action with steel shot. This was ineffective, as the Japanese vessels had no armor. The two ironclads fired 197 rounds with 12-inch guns and 268 rounds with 6-inch guns.

About 4 o clock the Ting-Yuen was badly on fire forward, the smoke impeding the working of the fore turret. Before 5 o'clock the Japanese had ceased firing, and the distance between the fleets was rapidly increasing.

In regard to the conclusions to be drawn from the battle, it may be said that the Chinese battleships



THE GREAT BATTLE OF YALU.

proved formidable. The Chinese ironclads stood the battering of the heavy quick-firing guns admirably. Their upper structures were severely damaged, but not a shot penetrated a vital part. The barbette protection of the 12-inch guns was most effective, few men being wounded within the barbettes. Two barbette turrets were intact after the action. This fact, however, coupled with the fact that the 6-inch guns at both ends of the ships, which were only slightly protected, were also undamaged, seems to indicate that the destructive effect was due to the enormous number of projectiles from the quick-firing guns rather than to the skilled direction of the shots. The maneuvering of the Japanese first division excited great admiration. Taking advantage of their speed and the long range of their guns, they always kept at the distance which suited them, maintaining perfect order throughout the fight, attempting nothing sensational and never coming within destructive range of the heaviest guns. For our engraving we are indebted to the London Graphic.

A Frenchman's Views on the Safety Bicycle as it Now is and its Probable Future.

Mr. Henri Desgranges, in the Revue des Revues, gives a very able review of the present state of bicycle riding and bicycle manufacturing in France and also in other countries of Europe and in America, of the evolution which has led to the production of the bicycle of to-day, and the possibilities of further improvement. We reproduce the leading thoughts of his article without comment, and hope it will be interesting to our readers to become acquainted with the views of a Frenchman on this important subject.

Mr. Desgranges first recalls the various steps in the development of cycles preceding the introduction of the safety bicycle, and then speaks of the great difficulties and the intense competition on the part of makers of the old type machine which opposed the progress of the safety in France. The new machine seemed to be a very frail thing, its frame was weak, its appearance rather awkward, and improvements were coming very slowly. Still, every day some material modification was being made. At the time of the races, Bordeaux-Paris and Paris-Brest (in 1891), the task was completed in its main points; the safety bicycle, a beautiful machine at last, was thenceforth ready to fly to the conquest of the world.

Now even the most obstinate adversaries have been won over. Those who yesterday were indifferent are enthusiasts to-day. There is scarcely anybody in France, whether rich or less fortunate, and in any position of life, to whom the safety bicycle has not afforded some moments of pleasure, while to many it has been a source of real happiness.

The safety bicycle has completely revolutionized our conceptions of distances. The word mile has lost its prestige; heretofore a man could make about 4 miles an hour, now he can cover 12, 15, 20 miles and more in the same time. This possibility has for tourists an invincible attraction, an irresistible charm To go still quicker and farther, that is the inspiring aim. To produce speed by one's own strength, without anybody's aid, to be one's own motor, these are thoughts which fire our imagination and feed the bicycle passion.

Cycling as a sport is still more interesting, from a moral point of view. Quite a large number of our young men, who formerly were addicted to stupid habits, and the seeking of nonsensical distractions and vulgar pleasures, are now vigorous, healthy, energetic, and for the sake of this extraordinary machine submit themselves to an ascetic rule of life, and, induced by taste and passion, acquire habits of temperance, the imperative desire of quiet and regular living, and, most important of all, the steady exercise of self-control, by resisting their appetites and doing, without hesitation, all that is required for effectual training.

I know there are higher aims in life. One may plan greater things as a programme of one's existence Other contests are nobler and more beautiful than the contest of a race. But whatever may be the motive which actuates you, it is good and refreshing to think that in our country men are able, even for an apparently trifling purpose, to show by their actions that they do not believe the essence of life to consist in merely eating, drinking and sleeping well.

This is a thought which cannot be too much emphasized. The safety bicycle is training for us a generation of strong and healthy men, of vigorous athletes, of energetic strivers for success and improvement; it is a mighty agent in the physical and moral regeneration of our people; there certainly are not many things and ideas which deserve the same praise.

Then look at the important interests and the number of workers connected with this flourishing industry! How many men owe to it a living and prosperity!

Again, what immense progress has been made in the manufacture of cycles! By constant efforts the original type of the machine has been gradually transformed. Assiduous work and indefatigable endeavors have been necessary to bring the safety to the almost absolute perfection which it has now attained. The experience acquired every day formed a basis for the solution of the problems of the day before.

Of the various parts of the machine, the frame, the skeleton of the cycle, is, perhaps, the one which has been modified most radically in the course of several years. The bad machines with a straight body, which may still be seen in some of our provinces, were the first venture. They were, however, lacking in rigidity, and numerous modifications were introduced to remedy this defect. Although some of the "improved" frames were rather strange and ridiculous departures from the original idea, yet a gradual progress was being made toward the present frame, whose characteristic, regular, elegant and logical shape appears to be definitively settled.

To the solid tires succeeded the hollow rubber tires, making bicycle riding more comfortable. The desire of greater speed led to the introduction of pneumatic tires, and this part of the safety also, from its original clumsy and unsatisfactory shape, has developed into a light, practical and reparable tire.

These, however, are only the essential modifications. It may be said that every part of the machine was every year subjected to radical transformations. The hollow rim, the ball bearings, and the tangential spokes are important factors in the history of cycle manufacture. Considerable progress has also been made in the construction of the pedals by reducing the proportions of the parts.

It has been the constant aim of manufacturers to diminish the weight of the machine. Every year there has invariably brought a decrease in weight and a corresponding increase in speed. The normal weight of a machine four years ago was about 45 to 50 pounds, and the owner of a bicycle of 35 pounds always cautiously dismounted when he had to cross a paved road. At present, a bicycle of 35 pounds is a big heavy machine, capable of being used on rough roads and supporting a weight of 125 to 140 pounds without danger or any excessive strain. A rider of average weight can procure a safety weighing 30 pounds with all accessories. A young man may take long rides on a machine of 25 pounds. The racing machines of our sportsmen average from 20 to 23 pounds.

It seems, however, that the weight of the machines remains approximately stationary at the above indicated figures. Is it not necessary that the rider should feel that he is propelling something, and does he not require a certain coefficient of resistance for the effort he is exerting? There certainly will be made changes in the distribution of the weight in the safety; means will be contrived for reducing the weight of the wheels, but the frame, the cranks, the fork, or, in brief, the body of the machine, will remain substantially unaltered.

In order to produce a safety ready for use, special machinery of high quality is required. The leading manufacturing firms of France have invested enormous sums in such machinery, and have found their profit in it.

The value of the machinery in a large factory may be estimated at several hundred thousand francs, and the number of machines necessary for the manufacture of cycles is an imposing one. Each of the parts of the safety bicycle requires several machines for its production. For the frame, which to the uninitiated appears to consist simply of eight tubes, there are machines serving to cut the tubes to the desired length, others to bend the tubes, machines for drawing the tubes, and others for flattening certain parts of the cycle, such as the sockets of the fork. The assembling of the parts of the frame must be made with rigorous exactness, and for this purpose patterns are used for each type of safety. Powerful blow-pipes are employed for brazing the pieces of the frame. In addition to the above mentioned machines, the production of the frame necessitates the use of machines for dressing the outer and inner surfaces of the tubes, for cutting and punching or upsetting the heads of the fork.

The other parts of the safety are equally complicated. The wheels necessitate apparatus for giving the rim the desired cross-sectional shape, for bending the rim, and cutting the sections thereof. These sections are then assembled similarly to those of the frame to form a continuous rim. The spokes are cut to the required length, provided with a screw thread, and flattened at one end where they engage the journal. After all these preliminary operations, the wheel can be completed by assembling the parts. Each of the above operations is performed by means of one or more special machines.

The most important feature is the manufacture of the ball bearings. The automatic machines, which produce all the axles and journals without requiring any attention, are admirable masterpieces of modern genius. The piece roughly dressed is put into the machine, and after a definite time comes out perfectly finished. After the nickel bath, the axle may be used at once.

There is besides a multiplicity of machines for making the balls, for turning the sprocket wheels and cutting their teeth, and lathes for turning the axles, cones and sockets of the ball bearings. The manufacture of the bolts, nuts and parts for putting the sprocket chains under tension necessitates the use of additional machines.

A factory with all these machines in operation is a very interesting sight, suggestive of prodigous life and activity.

The making of each individual part of the machine also is quite a complicated affair.

The tubes of the frame are connected by means of sockets first cast and then turned on a lathe. These sockets are perforated in the exact directions of the axes of the tubes. The bore is then enlarged sufficiently to receive the ends of the tubes. The outer surface of the socket is then dressed with a file and the parts of the frame are assembled upon a support or pattern. Pins are used to hold the tubes on the sockets, and by brazing, the frame is made continuous. The file and emery are then used to clean the frame, after which it is enameled.

Axles and cones are turned in a bar of steel, on engine lathes which automatically bring the various tools into engagement with the bar. The powerful files employed cut steel as if it were wood, and entire carloads of metal shavings are produced every week at the big factories.

In order to avoid delay, the several parts of the machine are manufactured simultaneously in different workshops.

In a large factory almost all the parts of the machine are made upon the premises. Exceptions are the tubes, the balls, the saddles, the chains, for the production of which special machines are required which would be of doubtful advantage in a bicycle factory.

There are other facts connected with the manufacturing of cycles which are of great interest.

The number of workmen employed in a large factory is several hundred, receiving various wages, which sometimes are high. Men having to work on certain delicate parts earn more than sixty dollars a month. Each section or workshop has its own foreman, a former workman, who knows how to deal with his men without offending them. These foremen are skillful workers, and have a fair amount of technical knowledge. Some of them have gone through the government schools.

Our readers (says Mr. Desgranges) will perhaps be surprised that a bicycle factory should turn out more than 15,000 machines annually, and spend more than $20,000 a year for advertising in Paris and in the provinces, and should be a customer capable of enriching the printer who makes its catalogues, posters and pamphlets.

First.—Ten years ago the scale of bicycles did not amount to 2,000 a year; the annual production in England was perhaps 3,000 machines.

In 1893 no less than 5,000 velocipedes have been sold in France, and about an equal number in England.

In 1894 more than 60,000 bicycles have been manufactured in France, and the same in England. In the United States last year nearly 110,000 machines have been sold.

Before the race Paris-Bordeaux, in 1891, the production in France was far under 10,000. The number of 60,000, which has been exceeded this year, includes at least 30,000 machines manufactured by the two largest French factories. About a dozen factories produce about 2,000 to 3,000 machines; a good number is capable of an annual production of 4,000 or 5,000 machines.

We have no information about Germany, and scarcely know the name of the most important firm, Opel.

Italians, Spaniards, and the states of South America are as incapable of constructing a safety bicycle as an agricultural machine. They are still infants in such matters.

Second.—Number of workmen.

The firm of Clement employs nearly 500 men during the business season, that is, from March till September. The number of workmen in the entire republic of France certainly reaches 25,000. Taking into account the industries connected with cycle manufacturing (India rubber, nickel, aluminum, saddlery), it is not an exaggerated estimate to assume that 200,000 men would be thrown out of employment in France if the manufacture of safety bicycles was stopped suddenly.

Third.—There are at least 300,000 cyclists in France; the same number was given for England two years ago, at present there probably are at least 400,000 cyclists in England. In the United States there are more than 500 000 bicycle riders.

Many interests are centered in a large factory. The newspaper press is a powerful ally, and catalogues published in several editions are largely circulated.

All sorts of advertising schemes are made use of. One that was most efficacious formerly, but now begins to lose its power, consisted in the races and the racers. What make does So-and-so ride? This used to be the first question, but now common sense and public opinion have done away with that, and if in the provinces this kind of advertisement still meets with success, people in Paris know that a good racer will always ride well on a good machine.

Such is cycle riding and cycle manufacturing consid-

ered along their essential lines. As above stated, the safety bicycle as a whole, with its characteristic features, is a definitely solved problem. In this industry truly French? We must admit that in this as in many other matters we have imitated our English neighbors. If now we are able to fly with our own wings, how many ideas have we had to take from abroad! Our machines are identical with English machines as to shape and general arrangement of parts. It is the same conception of the machine with modifications that are trifling and not sufficient to enable anybody to discern the part which belongs to each nation in this common achievement.

Americans, however, clearly have a different conception of the safety bicycle from ours. It might even be said that the difference between their machines and ours results principally from the want of exchange between the two countries. We have not yet found a practical way of creating a market for our goods in America, and the first American machines arrived in Paris but two or three months ago.

What we have seen indicates, as we have said above, two entirely different, although not opposite, conceptions. The Americans have made their machines as if they had never seen ours, and have impressed upon them the stamp of their national individuality. Our machines clearly prove that we had not known the American bicycles. We find in the latter a particular regard for comfort and practical usefulness, and an undeniable tendency toward a uniform type of machine. Some parts may hurt our æsthetic feelings, and we would almost call them rather heavy, just as we feel inclined to think a negro woman ugly, and as the negroes very likely consider us ugly,

There is no doubt, however, that the introduction of safeties of American make will bear fruit in France. There will be an exchange of ideas and views that will be profitable to all, and doubtless will lead to new modifications of the machines.

Will there be a complete revolution? We do not believe that, and it seems to us that the safety bicycle in future will substantially resemble its present type.

The safety bicycle will always be based on the direct utilization of man's strength, and we believe this is an essential condition of its existence. Obese and lazy people dream of safeties provided with petroleum motors, resembling invalid carriages, and constituting a negation of effort and action. The day the safety bicycle will enter upon this road. it will be doomed to die.

Let us leave to impotent dreamers petroleum cycles, electrical cycles, safeties with which the rider exerts no effort and spends no power, and let us keep for ourselves those adorable little machines which one must needs love with their charms, and particularly with their virtues of invincible attractiveness.

The Anaconda Mines.

The largest copper smelting property in the world is at Anaconda, Montana. During the past eleven years the magnitude of the plant and its results have been steadily increasing, till now the employes are numbered by the thousand, and the business aggregates over a million dollars a month. About 4,000 tons of ore are daily treated at the smelters. which are in continuous operation. The works constitute a little town in themselves, comprising a large number of different divisions, each subdivided into details corresponding with the requirements of the process of taking the ore from the car and turning it out merchantable copper. The concentrator alone is of vast proportions; the smelter and furnaces cover acres of ground; the eighty tank houses, power houses, storerooms, offices, etc., occupy a large area, and, in connection with this, is the proposed greater converting plant, to cost over a million dollors, and intended to be the largest and most complete institution of the kind in the country. The company's thousands of men are also employed in the Anaconda mine, near Butte, and adjacent mines, in their coal mines, fire brick, coke, etc., the payroll exceeding that of any other mine in the United States.

From 1885 to 1892 inclusive the Anaconda Mining Company has extracted from the mines in Butte district over 450,000,000 pounds of copper. Everything is on a gigantic scale and constitutes an important factor in the great industrial interests of the State.

An agreement is reported concluded between the Anaconda and Calumet and Hecla companies, under the terms of which the former company undertakes to reduce their production to the level of the latter company—say to about 5,500,000 pounds per month. As in the month of October the Anaconda Company produced 9,300,000 pounds, this reduction represents about 1,500 tons per month. The production of the other three leading Montana companies in October was 6,100,000 pounds, and that of the other leading Lake Superior company—the Tamarack—900,000 pounds, these figures about representing the extent of their present capacity. It is believed that the Rio Tinto Company have agreed not to increase their production. Copper shipments to Europe continue on a reduced scale, being about 4,000 tons for November, making the total for eleven months of the year about 69,552 tons, against 70,903 tons in the same period last year. As 22,000 tons less have been shipped in the five months from July to November this year than last, it is evident that the private stocks of American copper held on the Continent must now be less than at this date in 1893, the public stocks in England and France showing an increase of 6,068 tons. Consumption both in this country and in Europe must have been much larger this year than last, and seems likely to improve.

Profitable Fish Farms.

The practice of raising food fish for market has become of late a very profitable industry, and in some parts of the country is being carried out on an extensive scale.

The equipment of a fish farm, as it is called, is a very simple and inexpensive operation. Land which would be valueless for ordinary farming may be used for the purpose, the only requirement being a plentiful supply of good running water. The best site for a fish farm is a hilly or mountainous district where the water runs swiftly and is interrupted by waterfalls, since this serves to aerate and refresh the water. The fish farms are usually provided with three ponds, each of which is reserved for fish of about the same size. As the fish grow, they are changed from one pond to another. The fry is usually bought at the State or other hatchery, and placed in the first pond. The food for the fish is the principal expense. There are a variety of prepared fish foods on the market, but it has been found that the fish fed with prepared food have a decidedly beefy flavor. A plan very generally adopted is that of planting the ponds with an abundance of fresh water shrimp. These grow very quickly and soon provide a plentiful supply of wholesome food.

It will be seen that the fish require little attention, and the consequent income from such a crop is almost clear profit. In the season the product of fish farms sells in the market at $1.00 a pound, and out of season, if the sale be permitted by law, a much higher price may be realized.

The Return of the Columbian Relics.

The steel cruiser Detroit left New York October 18 for Cadiz, Spain. The Detroit carried the precious Columbian relics which had beeu loaned to the United States government for the purpose of exhibition at the Columbian Exposition by Spain and the Pope. These relics were exhibited in the convent of La Rabida and were continuously guarded by United States soldiers. The Detroit was selected as a suitable vessel to return the relics to Spain and Italy. The Detroit arrived at Cadiz, Spain, November 14. Stories were circulated that ill treatment was received by the officers of the Detroit from the Spanish authorities, but they were refuted by United States Minister Charles L. Adams, who, in a dispatch to the Department of State, dated November 17, says: "I take pleasure in reporting the cordial and generous reception tendered the Detroit and her officers by the civil, military and naval authorities at Cadiz. In addition to the customary honors and courtesies extended the vessel on her arrival, the disembarkation of the historic relics was made the occasion of a great public demonstration, in which all of the local authorities took part." From Cadiz the Detroit proceeded to Italy to deliver the exhibits loaned by Pope Leo.

The Detroit was launched October 28, 1891. from the ways of the Columbian Iron Works and Dry Dock Company, of Baltimore. The keel of the Detroit was laid March 16, 1890, the cost being $612,500, exclusive of armament. She is 257 feet long, the extreme breadth is 37 feet, and the mean normal draught is 14½ feet. The main battery consists of 9 five-inch rapid-fire guns. The secondary battery is composed of 6 six-pound rapid-fire, 2 one-pound rapid-fire guns and 2 Gatling guns. There is an open gun deck. There is extended through the principal part of the vessel a center line vertical bulkhead, which not only helps to support the water-tight deck, but adds "backbone" to the vessel.

Especially interesting is the coffer-dam protection along the entire machinery space, which is filled with cellulose made from the fibers of cocoanut husks, which has the property of absorbing eight times its weight of water. There are 500 cubic feet of cellulose in the coffer-dams of the Detroit. The speed of the Detroit is 17 knots an hour.

An Enterprise Deserving Success.

There is in progress at St. James Hall, in this city, a series of lectures on the Alps, by Mr. Garrett P. Serviss, the astronomer, well known to our readers as an entertaining writer on astronomical subjects.

The lecturer not only eloquently describes and beautifully illustrates what he has really seen and experienced. but he also gives much scientific information as he proceeds. Many of the views are artistically colored.

Mr. W. T. Gregg, who has undertaken to furnish New Yorkers with popular lectures on scientific and other subjects. has shown commendable wisdom in choosing Mr. Serviss as the first lecturer of the season.

Correspondence.

"The Position of Women in Germany."

To the Editor of the SCIENTIFIC AMERICAN:

Every two or three years news is making its rounds in the English press that in Germany "two women are used for dragging a plow through the fields;" also "of a woman being there harnessed to a vehicle alongside of ox, ass, or cow." If it were considered that a woman at best represents but a tenth or twelfth of a horse power, and that it takes a strong horse, or perhaps two, to drag a plow through the ground, such reports would not be published. I for many years traveled on foot throughout Germany and up and down the Rhine Valley, but never either saw or heard of the like published by "Humanitarian," who can never have seen Germany, as shown by his ignorance of its geography.

Bloomington, Ill. LOUIS MATERN.

The Russian Thistle.

It is along roadsides and in neglected fields that Canada thistles flourish. In the untilled plains of Dakota or over the leagues of tilled land where wheat follows wheat, yielding in endless succesion, year after year, eight or nine bushels to the acre, the conditions are just such as invite such a sturdy intruder as this Russian weed. There are more weeds in the West than in the East because there is more waste ground.

New countries always suffer more from weeds than old ones do, because the felling of the woods and the breaking up of the prairies disturb the equilibrium of things, and every plant begins to make a fight to occupy and possess the land. Agriculture in these recently settled regions is usually one-sided, and this makes an easier conquest for the invading army. The Russian thistle will never get any dangerous lodgment in a well-tilled farm, and where it now exists proper agricultural practice will quickly subdue it. Indeed, the only way to subdue any weed is to keep profitable crops growing. Taking this view of the case, what sort of a warfare could the government wage against this Russian thistle with a million dollars? If it should hire men to pull up and burn every weed they found there would be some seed left, and in a year or two the crop would be as abundant as ever. The only way to rout the weeds is to revolutionize the prevailing agriculture, and since government is not conducting the farms of the West, it is hard to see how the owners of these lands can be compelled to practice a rotation of crops that would secure them from evil. The fact is that this trouble, like the plague of rabbits in Australia and the cardoons on the pampas, is one of those evils which always come to a new country where established conditions are overturned. It comes to remind settlers of the weak points in their agricultural systems, and although the lesson is pretty painful in the outset, it will, perhaps, for this reason be remembered longer, But, after all, the settlers in new countries take these chances, and they must help themselves. No doubt, government can do something in the way of instructing farmers how to improve their farm methods; but, in the terse words with which Professor Bailey concluded his paper, "Weeds are beyond the reach of the sheriff; laws cannot control a vacancy in nature."—Forest and Garden.

Destruction of Food Fish.

In view of the careful precautions taken by the Fish Commission to protect the fish in local waters, it is strange that so little is being done to stop the destruction of our salt water fishing interests. A gradual diminution of salt water food fish is reported all along the coast. This destruction is caused in most cases by willful violation of game laws. The fish phosphate factories, for instance, cause the disappearance of immense quantities of bluefish, bass, and scup. The gill nets at the entrance to bays and harbors have almost exterminated the striped bass, which once was very plentiful, while early every spring pound nets are set for alewives, flatfish, smelts, and flounders, and these are caught by the ton and spread upon the land as a fertilizer. The most destructive nets probably are the pounds, since they are made of fine meshed netting and cover an immense area. In some instances these nets are 4,000 feet in length and naturally catch immense quantities of canners, killies, butterfish, white perch, and young fry of the blackfish and sea bass which frequent our waters. It is to be hoped that stringent game laws will be adopted and that they will be rigidly enforced.

The Centrifugal Speed Indicator.

A liquid, partially filling a glass tube, is employed to denote the speed. The centrifugal force, when the tube is revolved, causes the surface of the liquid to change from its level position when at rest. rising on the sides of the tube and being depressed in the center. For each velocity there will be one state of equilibrium and by graduating the tube empirically the speed can be read. The device is claimed to be accurate and sensitive to rapid changes of velocity.