

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 ugly, 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 dollars, 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 been 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 succession, 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.