

A NEW TYPE OF BICYCLE.

A curious type of bicycle was recently exhibited at the Crystal Palace Exhibition, London. We present an illustration of this new departure in wheel making. The Illustrated London News, in speaking of this wheel, describes it as follows: The frame is constructed on the cantilever system. It consists of twenty-one perfect triangles, is made entirely of steel, and will take any sort of wheels, spindles or chains; if necessary, the

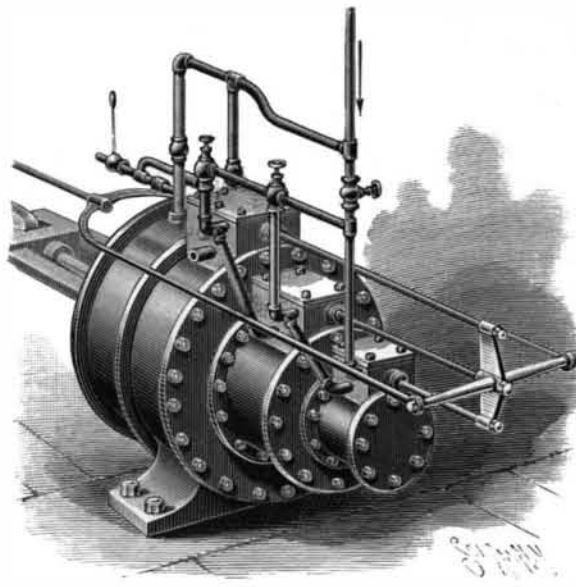
**A NEW TYPE OF BICYCLE.**

machine can be arranged as a chainless cycle. A feature of this machine is the seat—not a hard saddle, but a "hammock" or "network" seat, which can never become hard or too wide at any point, although it gives the rider more space than any other seat can possibly afford.

Whether the construction lends any special strength or advantages over the present type of wheel remains to be seen.

AN IMPROVED AIR MOTOR.

The motor shown in the accompanying illustration is designed to facilitate the application of compressed air for propelling street cars, it being contemplated that compressed air shall be supplied from stand pipes communicating with pipes laid along the car route. The improvement has been patented by George H. Cooper, of New Westminster, B. C., Canada. The invention provides for obtaining a compound effect, using air at the same pressure it has in the reservoir, which is connected by a valved pipe with the valve-controlled inlet ports of a high pressure cylinder. The exhaust port from this cylinder is connected with similar inlet ports of an intermediate cylinder, and the exhaust port from this cylinder is similarly connected with a third or low pres-

**COOPER'S AIR MOTOR.**

sure cylinder, the slide valves of all the cylinders being operated in unison, and the pistons being all secured to a common piston rod connected to the driving mechanism. On this rod is also secured a piston working in an air compressor cylinder, which is connected by pipes with the supply pipe, the compressor being operated only by the excess of power above that required for the work being done. The compressor thus acts as a brake, particularly on a down grade, as well as serving to

partly replenish the supply of compressed air. The motor is designed to effect an economic utilization of the air at the reservoir, dispensing with a reducing valve, affording also an easy control of the speed and a powerful braking action.

A New Illuminant.

The United States consul at Crefeld says: I have the honor to report an important discovery which, it has been claimed, will in time do away with the present system of illuminating public places, etc., with the electric arc light. The details, briefly, are as follows:

Mr. Ernest Salzenberg, director of the gas works of the city of Crefeld, has invented an improvement in incandescent gas burners which relates to the production of incandescent gas light based upon the discovery that, when the pressure of the gas is considerably increased upon the incandescent body, the said body emits a golden yellow light, very agreeable to the eye, displaying objects in their natural colors.

The gas is supplied to the burner at a pressure of about $3\frac{1}{2}$ atmospheres, the burner to withstand this high pressure being of special construction. A single incandescent jet of the ordinary size can emit a light of much more than 1,000 candle power. The light is of such intensity that a person is enabled to read the finest print at a distance of 100 to 150 feet.

The inventor claims that the cost of his incandescent light of 1,500 candle power is only $4\frac{1}{2}$ cents per hour, while that of the ordinary electric light of 400 candle power is (in Germany) 14 cents per hour.

In the apparatus constructed by Salzenberg a hydraulic pressure of 3.5 atmospheres, and even more, may be forced through the improved Auer burner.

The invention is, however, only applicable where waterworks exist. Mr. Salzenberg has already applied for letters patent in the United States.

Plans for the Zoological Gardens.

Complete plans for the Zoological Gardens in Bronx Park have been prepared by Heins & La Farge, the architects, have been laid before the Park Commissioners and approved. The park was found to be admirably adapted for the purposes of the Zoological Gardens. Here and there a small artificial pond has been made, and walks will be laid out over the whole ground, but the arrangement has been such that if the Zoological Gardens should ever be abandoned for any reason, the removal of the animal houses will convert the whole into a well laid out pleasure park. The animal houses are to be handsome structures designed to fit the landscape features of the park. The elephant house will be a high domed structure near the northern end of the ground. In the reptile house there will be a large center pool for alligators and the like, with a sand beach at one end. Looking across the alligator pool from one side of the house, one will see through three great arches a conservatory of growing palmetto and tropical plants, that will give a naturalness to the scene. The lion house will be provided with newly invented appliances for the care and study of these animals. Underneath the row of cages will run a tramway carrying a cage car that can be lifted up through the floor of the cage by turning a crank, so that an animal may be easily driven into it and carted to a special "studio cage" at another end of the building. Drawings from life may be made of the animals in this large cage. Along the wall of the lion house opposite the cages will be raised steps where spectators may stand and watch the feeding of the lions over the heads of the people on the wide floor space below.

A Word to Mail Subscribers.

At the end of every year a great many subscriptions to the various SCIENTIFIC AMERICAN publications expire.

The bills for 1898 for the SCIENTIFIC AMERICAN, the SCIENTIFIC AMERICAN SUPPLEMENT, and the ARCHITECT'S AND BUILDER'S EDITION of the SCIENTIFIC AMERICAN are now being mailed to those whose subscriptions come to an end with the year. Responding promptly to the invitation to renew saves removing the name from our subscription books, and secures without interruption the reception of the paper by the subscriber.

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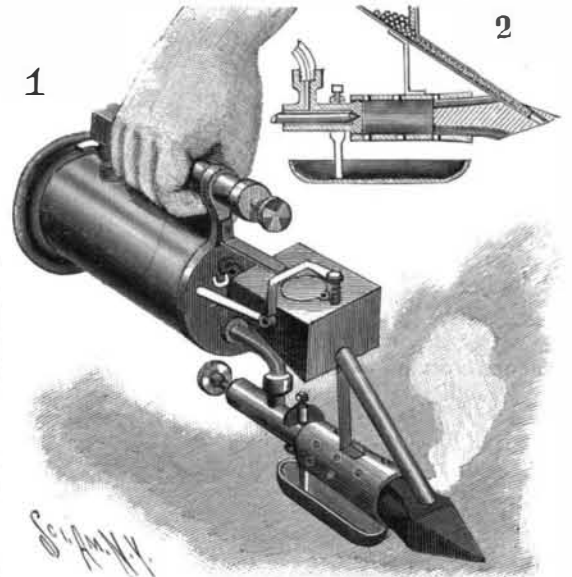
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A SELF-HEATING SOLDERING IRON.

The illustration represents an automatically feeding soldering iron, having simple means of heating and keeping it automatically heated, being thus designed to save considerable time as compared with irons that require heating by outside means. The improvement has been patented by John C. Barber, of No. 89 Howard Street, Phillipsburg, N. J. Connected with the iron is a gasoline tank, mounted on which, and also serving as a handle, is an air pump, having a valve-controlled communication with the interior of the tank, from which a pipe leads into a mixing chamber communicating with a burner. The communication between the burner and the mixing chamber is controlled by a needle-pointed valve, on the rear end of the stem of which is a handwheel, and the burner consists of a tube in which are perforations for the admission of air, while in the forward end of the burner is a soldering iron provided with longitudinal channels through which escapes the burning gas, as shown in the sectional view, Fig. 2. Below the burner is a preliminary heating pan, and above it is a receptacle for shotlike pellets of solder, which are fed by a valve-controlled raceway into a diagonal opening through the front part of the soldering iron. The valve is actuated by a lever extending to within reach of the finger of the operator, as shown in Fig. 1. In operation a sufficient amount of gasoline or a similar liquid is supplied to the tank, and air is then pumped into the tank to afford a certain degree of air pressure, after which the burner is first heated by means of gasoline in the preliminary heating pan. The needle-pointed valve is then opened to allow the gasoline to escape into the burner and mingle with air to form a gas, which escapes through the grooves as it burns and thoroughly heats the iron, the solder pellets being automat-

**BARBER'S SOLDERING IRON.**

ically fed down to the under side of the iron to be spread over the seam to be soldered. By removing the solder receptacle and the soldering iron, the device may be employed to burn paint from wood or other surfaces.

The Consumption of Alcoholic Beverages in France.

A publication issued from the French Ministry of Finance gives some very elaborate statistics as to the quantity of wine, beer, cider and alcohol consumed in the country. From the summary in the London Times we learn that the total quantity is 1,575,000,000 gallons, representing about $1\frac{1}{2}$ liters per diem for the whole population of France. Out of the total quantity consumed 967,000,000 gallons are wine, 395,000,000 gallons cider, 202,500,000 gallons beer, and 36,800,000 gallons alcohol.

It is scarcely necessary to say that, while the greater quantity of the wine is consumed in the large towns, the cider is nearly all drunk in the country, especially in Normandy and Brittany, and the official statistics give a table showing what is the consumption of wine in the forty-seven towns with over 30,000 inhabitants. The figures, as might be expected, vary very much, the annual consumption being largest at Boulogne-sur-Seine (59 gallons), Nice (56 gallons), and St. Etienne (54 gallons), while Paris is only thirteenth on the list with 45 gallons. In none of the large towns in the south of France does the consumption fall below 30 gallons, but in seven large towns in the north (Lille, Boulogne-sur-Mer, Dunkirk, Caen, Calais, Roubaix, and Turcoing) it averages only 6 gallons. Another table gives the consumption of alcohol, and here Rouen, Cherbourg, and Le Havre head the list with an annual total of nearly 4 gallons per head of the population, or more than double the quantity consumed in Paris.

AN exhibition of acetylene gas is to be held at Cannstatt, Württemberg, and will include an exhibition of various generators, lamps, etc. The exhibition promises to be of considerable interest.