

paratus. The exact location of the telescope has not yet been determined upon, but it will be at the service of the Exposition, and will probably be placed somewhere where the atmosphere is purer than that of Paris.

We are indebted for most of our engravings and for our particulars to L'Exposition de Paris, 1900, which has had an interesting and scientific series of articles upon the great telescope. The diagrams are from La Nature.

**THE "NEW DEPARTURE" AUTOMATIC COASTER.**

We have, from time to time, published descriptions of novel forms of bicycle devices. We take pleasure in publishing herewith a new form of coaster hub which possesses novelty of construction in several particulars. It will be noticed from the description given below that in going down hill the wheels may be allowed to run freely with the pedals remaining in a stationary position, while the brake may be applied by simply bringing weight to bear upon the rear pedal.

The coaster uses 36 straight spokes, and can be furnished with any size or thickness of sprocket from 7 teeth by  $\frac{1}{8}$  inch up. No fitting or adjusting is necessary; for the hub when it leaves the factory is in perfect order, ready to be placed on the wheel. It has the advantage of being no larger than the regular bicycle hub and has its coasting device assembled compactly and securely within the hub shell. Anyone can apply the coaster in a few moments to any form of wheel.

When the rider desires to coast, the feet are simply held still, thereby releasing the driving mechanism and allowing the wheel to coast freely. By a slight downward pressure on the rear pedal the brake is brought into action and adjusted as required. When it is desired to go ahead, it is necessary simply to pedal forward in the usual manner. There is no back-pedaling; the pedals cannot jump, either forward or backward; and there is no strain or twist whatever upon the machine.

What is probably the greatest advantage, and one peculiar to this device, is the fact that the rider always has a tight pedal under foot, which feature is of itself of paramount importance in any free-wheel device. The best rider will naturally feel nervous and insecure if the pedals hang loosely under foot; but in this improved device there is no point where the pedals are not in thorough contact either with the coasting or driving mechanism.

Second only to this point is the fact that the wheel may be trundled backward or forward, allowing easy racking, whether the coaster be on or off. In walking alongside of the machine the pedals may remain stationary, so that they will not interfere with the limbs or clothing.

The method of obtaining these advantages will be noted by referring to the cuts. Fig. 1 shows the coaster-hub assembled as shipped from the factory. Figs. 2 and 3 show the manner of assembling the interior mechanism.

The chain when pulled forward causes the sprocket, *G*, to rotate. This sprocket being fast upon the driver, *E*, causes it to rotate forward, thereby drawing the cone, *D*, over into contact with the clutch, *F*, which

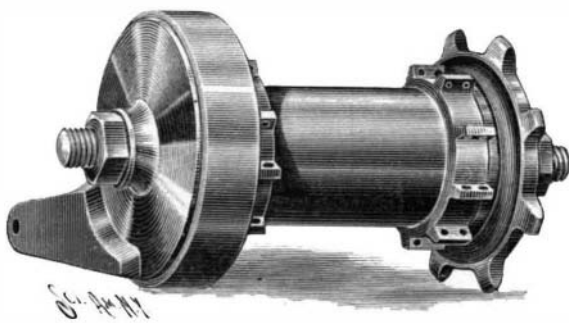


Fig. 1.

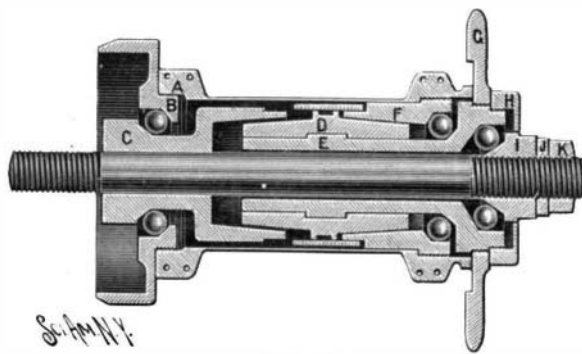


Fig. 2.

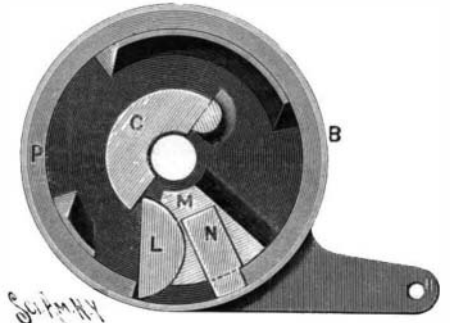


Fig. 3.

**"NEW DEPARTURE" COASTER-HUB.**

being fast in the hub, causes the hub to rotate and the wheel to move forward.

When the rider holds the feet still upon the pedals, the driver, *E*, stops rotating, thus drawing the cone, *D*, out of engagement with the clutch, *F*, and carrying it across into the brake-clutch, *C*. The brake is not yet applied; but the wheel is free to coast with the feet upon the pedals. If it be desired to brake, simply press lightly upon the rear pedal; and the brake is instantly in operation and can be graduated to any degree desired. When it is required to propel the wheel, merely pedal ahead; the mechanism does all the adjusting. There is no "kick-off."

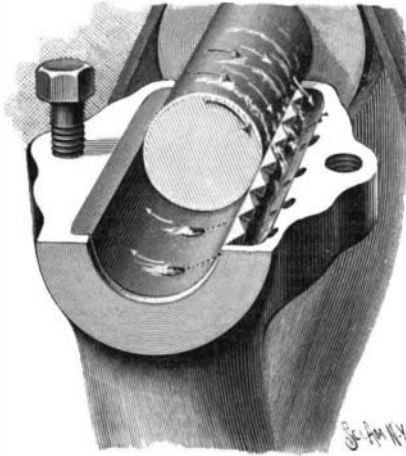
The device is manufactured by the New Departure Bell Company, Bristol, Conn., which is represented by John H. Graham & Company, No. 113 Chambers Street, New York, N. Y.

It is said it will cost nearly \$400,000 to bring the great plant of the Schneiders, at Creusot, into working order after the present strike is over.

**OIL-RETAINING JOURNAL.**

The accompanying cut represents an ingenious device which was recently tried by Mr. Herman Dock upon a troublesome journal with great success, and as we think the "wrinkle" may be new to our readers, we publish it herewith. Mr. Dock is of the opinion that the difficulty in keeping journals well supplied with oil is due to the sharp edges at the joints.

As the shaft rotates, the oil is scraped off on these edges and flows away through the joint. This takes place chiefly on the lower half of the journal. Thus, if the shaft is rotating, as shown in the cut, from left to right the oil collects on the right hand lower half of the bearing and oozes away through the joint at that point. To correct this a channel or small collecting trough is cut in the Babbitt metal parallel with the shaft, and



**OIL-RETAINING JOURNAL.**

small oil-holes are drilled through obliquely from this trough to the bottom of the bearing. The oil that collects in the joint is thus made to flow to the underside of the shaft, and a continual lubrication is maintained.

**A New Lethal Agent.**

Prof. Willis G. Johnson, of the Maryland Agricultural Experiment Station, has recently caused some discussion among the governmental scientists at Washington by a brief paper setting forth the claims of hydrocyanic acid gas as a lethal agent, to be used in place of the rope or the electric current in capital punishment. Prof. Johnson's idea is by no means a new one; but some of the arguments, and especially the illustrations, he brings forth are novel. He claims to have been temporarily under the influence of this gas to the extent of a feeling "of pleasant drowsiness, relaxed muscles, a limpness and feeling of indifference as to what happened;" adding that "there was no pain, and the whole sensation was soothing, rather than disagreeable." This description of his experience is far from portraying the experience of the writer, who went to a still further stage toward death, and was with difficulty brought back to life from inhaling these fumes arising from an insect killing jar. Intense intercostal agony, unthinkable mental distress, and a horri-

**Automobile News.**

An automobile omnibus service has been established on the Isle of Man, between the various towns and summer resorts. One vehicle is at present in use seating eight passengers and the driver.

In Texas a wealthy stockman will use an automobile for making inspection trips around the wire fence of his ranch. The country being level and free from brush and other obstructions, it is thought that the automobile will prove practical.

A bicycle factory in Pennsylvania has just completed a number of jinrikshas for China, Japan, South Africa, and the Philippines. The bodies of the carriages are of wood, and some of the wheels are of bicycle finish, with rubber tires. All have tops to protect the riders from the heat of the tropical countries. The American manufacturers have greatly improved the running qualities and appearance of this useful, but queer-looking vehicle.

In Belgium all automobile vehicles must carry, both in front and behind, a number large enough to be seen at a distance, and after sunset each number must be lighted by a lamp. All automobiles and bicycles must be provided with a brake. All self-propelled carriages must also bear the regulation number of the city and also the owner's name and address. Rubber-tired carriages must carry bells, and the maximum speed allowed is 18.64 miles an hour in the open country, and 7.46 miles an hour in town.

According to The Motor Age, Mr. and Mrs. J. D. Davis have reached Chicago with their motor carriage. Very little of the original motor and running gear mechanism with which the couple started from New York was left, the principal remainder being the rear axle, and that broke at the crossing of Seventy-first Street and Bond Avenue, Chicago. After new axles have been fitted, they intend to proceed to San Francisco. Trips of this nature do more harm to the automobile industry than they do good.

**Target Practice with Field Howitzers.**

Recent tests of the new German field howitzer on the proving-grounds of Doberitz, near Spandau, have shown how effective the new piece is against resistible targets. Two batteries, armed with 15-centimeter howitzers, fired both shell and shrapnel at targets set up in trenches. According to the Köln Zeitung, a perfect hail of bullets fell upon the trenches and the protection was completely destroyed, so that a body of troops would have been unable to hold their position. Against artificial obstructions made of branches and wire the shell was equally effective.

**The Current Supplement.**

The current SUPPLEMENT, No. 1244, has a number of articles of great interest. "The Progress of Science and its Results," by Sir Michael Foster, is continued. "Unwatering the Comstock Lode" is a valuable original article by L. P. Gratacap. "The Manufacture of Nitrite of Soda" is by Mr. M. A. Darbon. "Exercises in Horseback Riding Among the Chasseurs of Africa" describes wonderful feats of horsemanship.

ble consciousness of all that was going on, without the power to give any sign of life, was the experience in that case. E. MURRAY-AARON.

**Uses for Skim Milk.**

An interesting process is reported by the Chief of the Dairy Division of the Department of Agriculture, Major Alvord. This is a new composition somewhat resembling celluloid made from skimmed milk. Paper sizing is now made in considerable quantities in the United States; it is the dry caseine from skimmed milk. It requires considerable skimmed milk to make this product, but at the same time vast quantities of skimmed milk are now wasted or fed to stock which can be utilized in making the new material, which is suitable for the manufacture of oilcloth, book coverings, billiard balls, in fact, for many things for which either celluloid or hard rubber is now used, and it has many advantages of its own, including impermeability to water and non-inflammability. It is thought that it can be used in the manufacture of electrical insulators.

"The Olfactory Nerve Track" is a most interesting article. "The Replacements of Fluids into the Track of Moving Bodies" gives an important study by Mr. M. F. Mithoff. Dr. Thurston's "Evolution of Technical Education in Economics, Politics and Statecraft" is concluded.

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