

**A SIMPLE AND EFFICIENT BICYCLE BRAKE.**

The accompanying illustration represents a new bicycle brake which is absolutely automatic, requires no effort on the part of the rider to apply or release it, and gives complete control of the wheel either for slackening up or coming to a full stop suddenly in case of danger from obstruction of any sort.

This is accomplished with no conscious effort on the part of the rider, and the braking action is smooth, sure and positive.

It adds practically nothing to the weight of the machine, in no way interferes with the action of the rider and its presence is not noticeable when on the machine.

It is applied to the rear hub, occupying the space between the sprocket and the fork, and consists of two pieces, viz., an expansion ring and an internal friction-faced drum, which are brought into action when the rider ceases to impel the pedals and simply holds back, the retarding of the rear sprocket causing the expansion ring to frictionally engage the inner surface of the drum, the latter being held against rotation.

Fig. 1 shows the hub of the machine with the sprocket screwed off.

Fig. 2 represents a small collar which is screwed on in place of the sprocket, thus fitting the hub to receive the brake.

When the brake is manufactured as part of the machine, the flange and lug on collar (Fig. 2) are formed upon the end of the hub in place of the present screw thread, and all screw threads upon the hub or sprocket are therefore eliminated.

Fig. 3 shows the sprocket with the center cut away to fit over the collar, Fig. 2.

Fig. 4 shows the expansion ring, which is of spring steel, finely tempered, with projection at one end fitting in the slot cut in the sprocket, its other end abutting against the lug on the collar, Fig. 2.

Fig. 5 is a locking ring, which takes the place of and dispenses with the present check nut.

Fig. 6 represents the internal friction-faced drum, which slips over the parts when assembled and is held from turning as shown in the perspective drawing.

From the above description it will be seen that the brake proper consists of but two parts, Figs. 4 and 6, the other pieces being simply to replace similar parts found in the present bicycle construction. The entire weight of the parts added is about three ounces, and in some machines much less.

Figs. 7 and 8 are views in perspective and cross section of the brake assembled on the wheel.

Fig. 9 is the plan of the brake, with the cover of the drum cut away.

The brake has already been adopted by some of the leading manufacturers, who form the hub as above described to receive the brake; but when furnished for application to wheels already in use, the parts are assembled upon an interchangeable rear sprocket, so that all the rider has to do to avail himself of the advantages of this brake is to unscrew the old sprocket and screw on the new one.

In operating there is no back lash whatever of chain or sprocket, and no backward motion is required to set the brake on firmly, this being accomplished by simply holding back on the pedals.

The power of back pedaling is simply increased many times with no conscious effort on the part of the rider, the brake simply operating to hold the machine under control.

It is obvious that resistance may be applied gradually or suddenly, and graduated from zero to absolute rigidity smoothly and with no strain on the working parts of the machine or pressure on the bearings.

When not required, the brake is entirely out of the way, and out of mind. There being no necessity for changing position of the hands or feet in the application, the rider never loses control of the wheel for an instant, the brake simply acting as "material impulse," or a silent assistant in developing muscular power.

The brake is being introduced by the New Departure Bell Company, which owns patents in all parts of the world. Its general selling agents are John H. Graham & Company, 113 Chambers Street, New York City.

**A Prize for a Sun Dial.**

The National Sculpture Society announces that, through the generosity of Mr. T. Kelly, of New York, it is enabled to offer prizes of \$500 and \$250 for the best design for a sun dial. The designs are to be exhibited at the society's exhibition in 1898. It is expected that a large number of designs will be submitted. A sun dial is a very effective ornament to a lawn, and they are scarce in the United States, though very common in England. It is to be hoped that this competition will revive interest in the sun dial.

**The Weapons for Modern War.**

Gen. Dragomiroff, in an article in a Russian journal, lays down the axiom that the simpler and more uniform cannon and rifles are, the better they are. Weapons should be selected which will meet the practical requirements of the battlefield, and at the same time be sufficiently simple in mechanism to allow of the conscript, especially the artilleryman, becoming thoroughly efficient in the handling of his weapons during the comparatively few years that he serves with the colors.

He decides, says the Army and Navy Journal, contrary to the German and English practice, in favor of large bores and small guns, the 8 millimeter rifle, the 6 inch or 15 centimeter cannon for sweeping fire, and the 3.42 inch, or 85 millimeter, cannon for plunging fire. These are the only two varieties he would admit into field or horse artillery, treating the field mortars on wheels as a separate corps to be used only in face of an army in position. Six horses can drag a gun as fast as eight and faster than four; therefore, the weight of the gun, carriage and equipage must be precisely that weight which six horses can drag at top speed. The 4 pounder gun (85.5 millimeter) throws a shell that scatters almost as many fragments as the 9 pounder (105 millimeter), while its accuracy for direct fire is infinitely greater, and the amount of ammunition or projectiles that can be carried with it is proportionately greater. The projectile that hurls the

armed with the 8 millimeter rifle, and a magazine of five cartridges, will be more than a match for others equipped with the 3 millimeter and seven cartridges. Lastly, the gun will carry a stouter and more formidable bayonet, which will give the troops possessing it a tremendous advantage at close quarters. Gen. Dragomiroff is one of the commanders who hold that the secret of modern tactics is the necessity of coming to close quarters with infantry as well as cavalry at the earliest possible stage of a pitched encounter. The cost of doing so will, he maintains, be far less than that entailed in the attack on fortified positions, and numbers will then, especially when combined with seasoned troops, always avail to turn the scale. He also contends that the losses entailed in acquiring this tactical superiority can easily be wiped off against an enemy whose formation is broken or who is compelled to retreat. The Russian general believes that the new era of warfare will be marked rather by extensive surrenders on the field of battle than those human butcheries for which the world has been invited to prepare its stoicism and indifference.

**Franklin's House in Passy.**

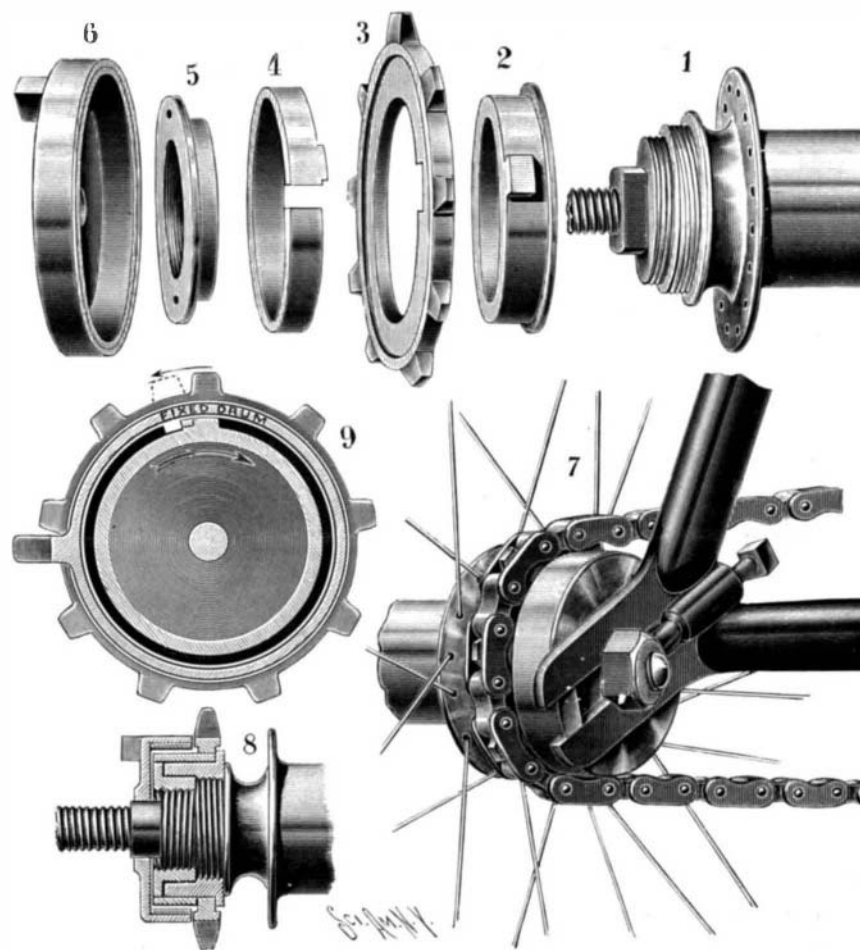
A memorial tablet was unveiled on March 8, 1897, in Passy, Paris, to mark the site of the villa that was occupied by Benjamin Franklin during his mission to France in 1777 to 1785. Several hundred persons were present to take part in the ceremony and to listen to

the presentation speech which was made by M. Manuel, president of the Passy Historical Society. The American ambassador, Mr. J. B. Eustis, acknowledged the gift of the memorial by an appropriate speech. M. Faye, a member of the French Academy, spoke of Franklin's scientific researches and called him the greatest example of self-education the world had produced. When Franklin, as a commissioner of the newly established American confederation, arrived in Paris in 1776, France had not as yet recognized the independence of the revolting colony, and that government was forced to carry on intercourse with the American agent with great secrecy, in order not to arouse the suspicions of the British ambassador. Shortly after Franklin's arrival he was waited upon by a gentleman who seemed, in spite of his unofficial character, to be in reality an agent of the court. This gentleman, M. De Chaumont, pressed upon Franklin's acceptance an unoccupied house on his estate in Passy. The house had been purchased only a few months before. It is well known that Franklin was very careful never to place himself under obligations to strangers, and the fact that he readily accepted M. De Chaumont's hospitality seemed to be evidence that the commissioner was well aware that his real host was the king. Passy was an ideal place for him to carry on his communications with the ministry, which were obliged to be carried on with the utmost secrecy. It was in this villa at Passy that Franklin wrote the larger part of his unique autobiography, and

where he wrote those remarkable letters to American friends. Here also he composed important scientific monographs, and here Franklin placed the first lightning rod in Europe. After he left Passy, in 1785, the house remained tenanted. In 1866 nothing but ivy covered walls and fragments of the ornamented façade remained. The ruins were finally demolished by the Germans in 1870. In New York, in 1865, a fair was held for the relief of the sick and wounded in the war. Victor Hugo's contribution to the fair was a sketch of the Passy villa accompanied by an autograph letter. This picture was sold to the late Samuel J. Tilden, and it is still in the collection which he made.

**Intelligence of a Horse.**

Dr. W. H. Watkins, of New Orleans, according to the Times-Democrat, relates that while a student, in a class where it was customary to wear a distinguishing badge, and a number of the students being one day gathered on the campus, a horse came limping toward them. "He came to a stop a dozen or more feet away, and, carefully surveying us, finally made up his mind as to what he wanted to do, and without any hesitation limped directly to my side, whinnied, stuck his nose against my body, and held up his left foreleg. Looking down, I discovered a large nail embedded in the frog of his hoof. This had evidently caused the lameness. I extracted the nail and the horse whinnied with relief and walked away. Rather curious as to why the beast had picked me out to attend to his wound, I glanced at the boys and found the solution to the problem. Not one of the group had his medical badge upon his coat but myself. The horse had recognized the insignia and acted accordingly."

**THE NEW DEPARTURE AUTOMATIC BICYCLE BRAKE.**

greatest number of fragments over the widest possible area from the bursting point is the most efficient. For the greatest possible effect there must be troops at hand to turn to the best account the momentary loss or confusion artillery fire may have produced. For engagements spread over a wide area the influence of cavalry supplementing or supporting artillery is likely to prove decisive. To derive the fullest possible advantage from these circumstances artillery must be mobile, and the faster it can move, the greater will be its merit. Instead of artillery preparing the way for a battle, as in the days of Napoleon, it is destined to take an effective part in the earliest, middle and latest stages of any encounter. The practical difficulty will be to keep up the supply of ammunition, and that will, of course, be simplified by the light shot.

For rifles Gen. Dragomiroff decides in favor of the large bore—that is, comparatively large. Accurate shooting is important, but still more important is the effect of the bullet which is deadly in proportion to its bursting or splintering. The pencil bullet goes clean through a man, and unless it traverses en route the heart or the brain, he comes on almost uninjured; but the large bore crumples up on contact with the human frame, and spreads the injury over a wide surface, or, in other words, completely disables the man struck. The minimum effect of the small bore bullet destroys the firer's confidence in his weapon, and leads him to fire the more rapidly, because he is convinced that two or three shots are required to disable an adversary charging home. The result of this tendency is not greater slaughter, but merely a waste of ammunition. Except for sudden surprise encounters at short distances, which rarely happen, troops