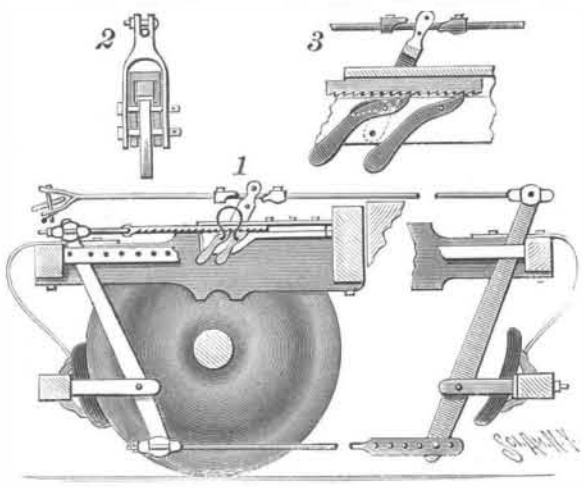
AN AUTOMATIC BRAKE SLACK ADJUSTER.

The illustration represents an improvement designed to automatically take up all the slack in the brake mechanism caused by the wear of brake shoes, permitting a uniform travel of the piston in the brake cylinder and insuring a full and effective pressure in the air brake cylinder at the time the brakes are applied. The

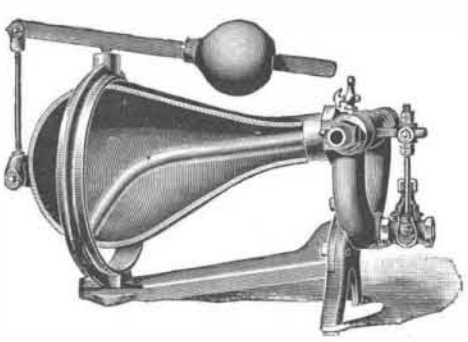


FREESE AND NICHOLSON'S BRAKE SLACK ADJUSTER.

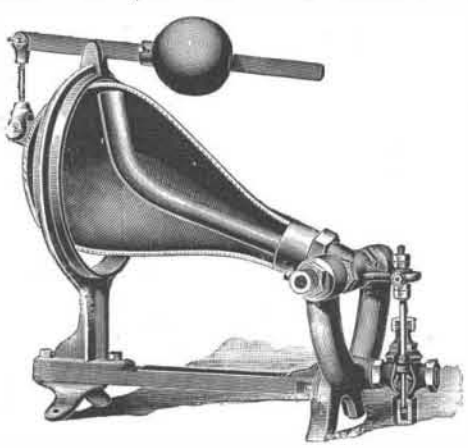
improvement has been patented by Messrs. William De Freese and Thomas E. Nicholson, No. 1296 Topping Street, Hamline, St. Paul, Minn. The brake rod is connected at one end, as usual, with the piston in the brake cylinder, and at its other end with the brake lever, which is connected by a link with the dead brake lever. The latter is pivotally connected, as shown in Fig. 1, with a head in which is held adjustable a rod connected with a longitudinal toothed bar sliding in bearings in a casing, the teeth of the bar being engaged by gravity dogs, of which one has its fulcrum in the casing, while the fulcrum of the other extends through slots into the casing, to engage the forked ends of a lever fulcrumed at its lower end on the casing, as shown in Figs. 2 and 3. Through the upper end of the lever the brake rod passes loosely, lugs being held on the rod at opposite sides of the lever. Near its lower end the lever is pivotally connected with a spring which holds the lever normally in the position shown in Figs. 1 and 3. When from wear of the brake shoes or other cause a slack exists, and the piston in the brake cylinder has to travel beyond its normal stroke, the brake rod is drawn or pulled a greater distance to properly apply the brakes, and one of the lugs on the rod then engages the free end of the lever, swinging it until its dog engages the next tooth on the toothed bar. When the brakes are released and the lever is returned to its normal position, the toothed bar is moved by the dog into engagement with the other dog, which has its fulcrum in the casing, the toothed bar thus taking up any slack in the brake mechanism. The device works automatically and the bar is sufficiently long to take up all slack until the brake shoes are completely worn out.

THE BUNDY STEAM TRAP.

This trap has no interior float. It is operated by the power developed by the weight of the water that collects in the bowl. When the bowl is filled, then the weight of the water, in addition to the weight of the bowl, overbalances the ball weight on the lever, and the bowl settles in the frame, thereby opening the live steam connection from the top of the boiler to the trap. Upon the admission of live steam from the boiler to the trap the check valve in the pipe leading to the trap is immediately closed and temporarily the trap becomes a part of the boiler, subject to the same steam pressure and water line, and hence the water in the trap at once enters the boiler, passing a check valve placed between it and the boiler, on both sides



TANK TRAP.



RETURN TRAP.

THE BUNDY STEAM TRAP.

of which, the steam pressure not being equal, the water of its own weight opens the check and passes in.

After the bowl has emptied itself into the boiler it again becomes sufficiently light so that the ball weight on the lever overbalances it and the bowl is rolled in the frame and the live steam valve is closed, at the same time an air valve underneath the steam valve is opened to allow the escape of any air or vapor that may enter the bowl. A special feature of this trap is the fact that on the air valve pipe a horizontal check valve is used, so that while there is a vacuum in the trap bowl the check remains closed and the vacuum helps to fill it again with water.

The Bundy traps are made in four sizes, holding from five to fifteen gallons of water. They are made by the A. A. Griffing Iron Company, Jersey City, N. J. In the bowl of the return trap there is a bent pipe turned up that is screwed into a diaphragm at the smaller end of the bowl, while the other end terminates near the highest point of the bowl. The live steam upon entering the trap is directed through this bent pipe and so brings the pressure upon the top of the water in the trap. Our illustration shows this feature.

In the Bundy tank trap it will be observed that this bent pipe extends downward from the diaphragm to the lowest part of the bowl, and so, when this trap is discharging, the water is forced up through this pipe and so on out through the discharge valve.

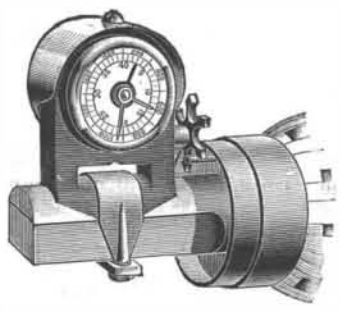
Before all the water is discharged from the tank trap it is so adjusted that the trap bowl will rise in the frame and the discharge valve be closed, so that at no time is the end of this pipe out of water. The water covering the pipe at all times prevents the escape of any steam.

When one takes into consideration the adaptability of steam traps, it is not at all surprising that thousands of these traps are sold, and that so many factories have from one to fifty in use. They may be used as a boiler feed in place of a pump.

THE IMPROVED BELL ODOMETER.

The carriage odometer shown in the engraving accurately registers the distance traveled, and will record and ring a tiny bell as each mile is passed.

It is actuated by a steel pin driven into the hub. This pin engages the spur wheel, shown on the right of engraving, at each revolution of the carriage wheel. The spur wheel is attached to a wormshaft extending through from right to left. Engaging with this shaft is a cut brass gear, termed the unit wheel, mounted on a central shaft extending from the dial plate to the rear. The varying sizes of carriage wheels are compensated by the size of this unit wheel. Keyed to the central shaft is a pawl which sets in motion the internal gears, and these are connected by bushings to indexes on the dial. This pawl is so constructed as not to propel the gears when reversed, thus avoiding all danger of injury when the carriage is backed. With this exception the entire movement is positive and quite accurate, regardless of speed on uneven ground. Attached to the central shaft, back of the case, is a small gong which is struck a smart blow with a spring hammer at each revolution, thus announcing that a mile has been passed.



The dial contains three indexes, each of a different color. The red index registers a mile at each revolution, and, as the dial is divided into forty spaces, each space represents the fortieth of a mile, or eight rods. The yellow index revolves once in forty miles, and each space represents a mile. The blue index revolves once in 1,600 miles, so that each space represents forty miles in relation to this index. The figures inside the ring indicate miles, measured by the yellow index, while the figures outside the ring indicate miles, measured by the blue index. The dial thus constitutes a reliable record of the distance traveled. On starting out, the positions of the indexes may be quickly marked on a dial card—a number of which are furnished with each odometer—and on returning from a drive the distance traveled may be seen at a glance. The dial is protected by a heavy watch crystal, secured by brass bezels screwed in the malleable case. The whole is protected by a neat nickel-plated hood.

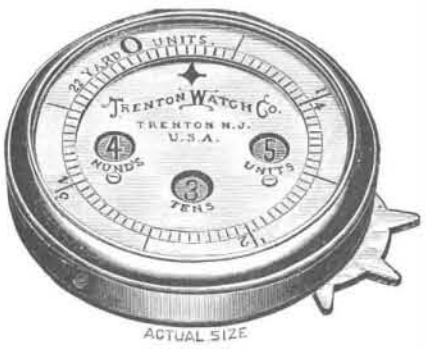
It is now less than two years since this instrument was placed on the market by Messrs. Davis, Stebbins & Company, 33 Sudbury Street, Boston, and the result has been very gratifying to its introducers, numbers of them having been sent to nearly every State and Territory, to the Provinces and to Mexico.

Meteorological Balloons.

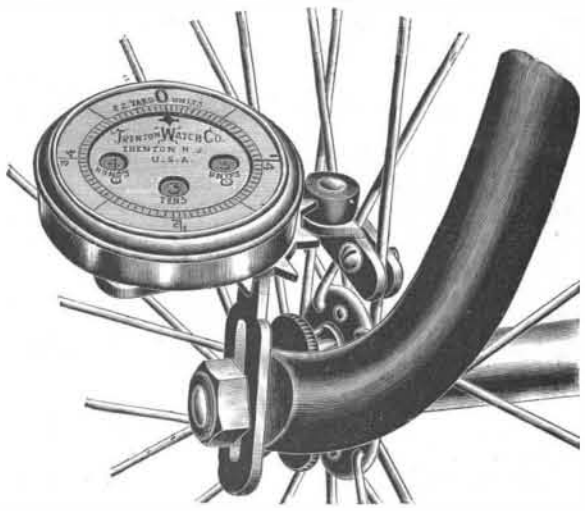
A balloon equipped with self-registering instruments to measure the temperature and pressure of the atmosphere at high altitudes was recently experimented with in Berlin and came down with the instruments in good condition in Bosnia. The instruments showed that the balloon had reached an elevation of 53,872 feet, over 10 miles; the thermometer had fallen to 52 degrees below zero—the lowest it could record. Another balloon sent up later is stated to have reached an elevation of 72,000 feet above the earth, or 13½ miles.

A BICYCLER'S DISTANCE RECORDER.

This compact little measurer of distance traveled by a wheelman, shown herewith detached and applied to a wheel, weighs only 2¼ oz., and registers up to 1,000 miles and repeats. It is made of aluminum, with a satin finished dial which presents a handsome appearance and will not break or crack. It is manufactured by the Trenton Watch Co., of Trenton, N. J., who have admirable facilities for the production of such work in a manner which shall insure absolute accuracy. This cyclometer is noiseless and positive in action, while being also dustproof and waterproof. It can be run backward and forward at the highest rates of speed without the possibility of injury. All instruments before being sent out are tested in a lathe running at many times the speed they will ever be called upon to record on a wheel. One instrument was thus run over one hundred and thirty thousand miles, recording at the average rate of a mile in four seconds, without showing the slightest evidence of wear, and the same instrument was run backward at equal speed. As will be seen from the illustration,



THE "TRENTON" CYCLOMETER.



THE "TRENTON" CYCLOMETER.

it is but a matter of a moment to apply the instrument to a wheel, and its dial can be read at a glance from the saddle.

The New York Botanical Garden.

Under the act of incorporation, the citizens forming the society known as the "New York Botanical Garden" have subscribed $250,000 as an endowment fund, and the Department of Public Parks is authorized to set apart a portion of Bronx Park, not to exceed 250 acres, for the purposes of the botanical garden. The city will also appropriate $500,000 for the construction and equipment of buildings. Bronx Park is about two miles in length and half a mile in width and contains 653 acres; it extends along both sides of the Bronx River, in the northern part of the city. In the botanical museum will be collected specimens of the products of plants. This building will contain laboratories, lecture rooms and an herbarium, which, it is hoped, will ultimately contain specimens of all known plants. There will be a large number of greenhouses of various sizes, which will contain a great variety of growing plants from tropical countries. In the outdoor department will be as large a variety of plants as will grow in this climate; also an arboretum, in which all the trees that can endure our climate will be grown.

THE average speed made on the recent 1000 mile relay bicycle race, Chicago to New York, was 15⅓ miles per hour. Michael, a young Englishman, on May 19, at Paris, made 100 miles in 4h. 2m. 45⅘sec.