AN IMPROVED BICYCLE BRAKE.

The illustration represents a bicycle brake of such construction that the brake may be applied by the rider throwing his weight rearward on the saddle, the dotted lines, as shown in Fig. 1, indicating the movement of the saddle and brake shoe as the brake is applied, while Fig. 2 shows the brake shoe and its attach-

BORGFELDT'S BICYCLE BRAKE.

ing devices partly in section. The improvement has been patented by Heinrich G. Borgfeldt, 850-852 Broadway, Brooklyn, N. Y. The brake shoe is attached to a block connected by a forked link and collar with the king post, and the upwardly extending brake rod is connected with the rear portion of a horizontal saddle support extended through a sleeve on the upper end of a connecting post engaging the king post. The saddle support is pivoted to have a limited rocking movement in the sleeve, and as the center of gravity is normally forward of the rocking point, there is no danger of the rider accidentally setting the brake, which is effected by throwing the weight rearward on the saddle. The saddle support has a series of holes rearward of its pivotal point, for the adjustment of the brake rod to give more or less throw to the shoe, and the lower portion of the rod has notches, as indicated in Fig. 2, to permit of the higher or lower adjustment of the brake shoe, the preferred adjustment being such as will cause the shoe to be applied to the wheel slightly above its axis, causing a wedge-like action between the tire and the shoe.

TESTS OF THE WEARING QUALITIES OF FLOORING MATERIALS.

At the suggestion of Mr. Frank Furness, the well known architect, of Philadelphia, an extremely valuable series of tests has been carried out to determine the relative durability of various flooring materials. The experiments were carried out on May 15, by Messrs. William Gray & Sons, who are the largest contractors for stone work in Philadelphia, and they were made under the careful supervision of Mr. William J. Gray, who has given his affidavit as to the accuracy of the results as herewith published.

The accompanying diagram, in which the results are drawn to scale, was furnished to this office by Mr. Furness, and it certainly forms a very valuable and reliable contribution, which will be welcomed by architects and builders in general.

In carrying out the tests the specimens were cemented to identical blocks of sandstone, each of which weighed twenty-one pounds. The samples presented a surface six inches square, and the thickness of each sample was the same as that commonly used in the various floorings. In the diagram the upper figures represent the specimens attached to the blocks before being tested, the thickness of the specimen being shown to scale. Thus the interlocking rubber tile specimen was ⅜ inch thick, the No. 1 Vermont marble was 1 inch thick, the Oregon pine 2¾ inches thick, and so on.

The samples were all placed face downward upon a horizontal iron rubbing wheel 10 feet in diameter, which was run for a space of one hour at a speed of 75 revolutions per minute. A suitable frame held the blocks loosely in place and prevented them from rotating with the wheel, care being taken to let the full weight of the blocks bear upon the wheel. The face of the wheel was freely supplied during the test with the best sharp rubbing sand and water.

The wear of the various flooring materials is shown in the lower line of diagrams, which represents the lower left hand corner of each specimen drawn on a half size scale. The diagonal shading shows the portion of the materials which remained intact, and the clear space beneath shows the amount that was worn away by the wheel.

The diagram is extremely valuable and we are informed by Mr. Furness that great care was taken to secure reliable results. It is full of surprises. By far the best showing was that made by the interlocking rubber tile, which only lost $\frac{1}{64}$ of an inch as the result of an hour's grinding. On the other hand, the marble mosaic collapsed altogether, the one inch strip being rubbed entirely away within fifteen minutes under a pressure of a little over half a pound to the square inch. The whole slab disappeared in thirty-five minutes under the same pressure.

Next to the rubber, the English earthen tile showed by far the best results, losing only ⅛ of an inch in thickness; and of the stones, the granolithic made the best showing, losing ⅜ of an inch, flagstone coming next, with $\frac{9}{16}$ of an inch wear. The marbles wore away very fast, No. 1 Vermont marble losing ¾ of an inch. Their average resistance, indeed, was not as high as that of the woods.

One of the most curious results is shown in the action of the woods, where teak lost nearly double as much as the softer white pine, the wear being respectively $\frac{13}{16}$ and $\frac{7}{16}$ of an inch. Yellow pine showed the same wear as white pine, and the oak specimen lost the same amount as its great rival Oregon pine, which was reduced by ⅝ of an inch.

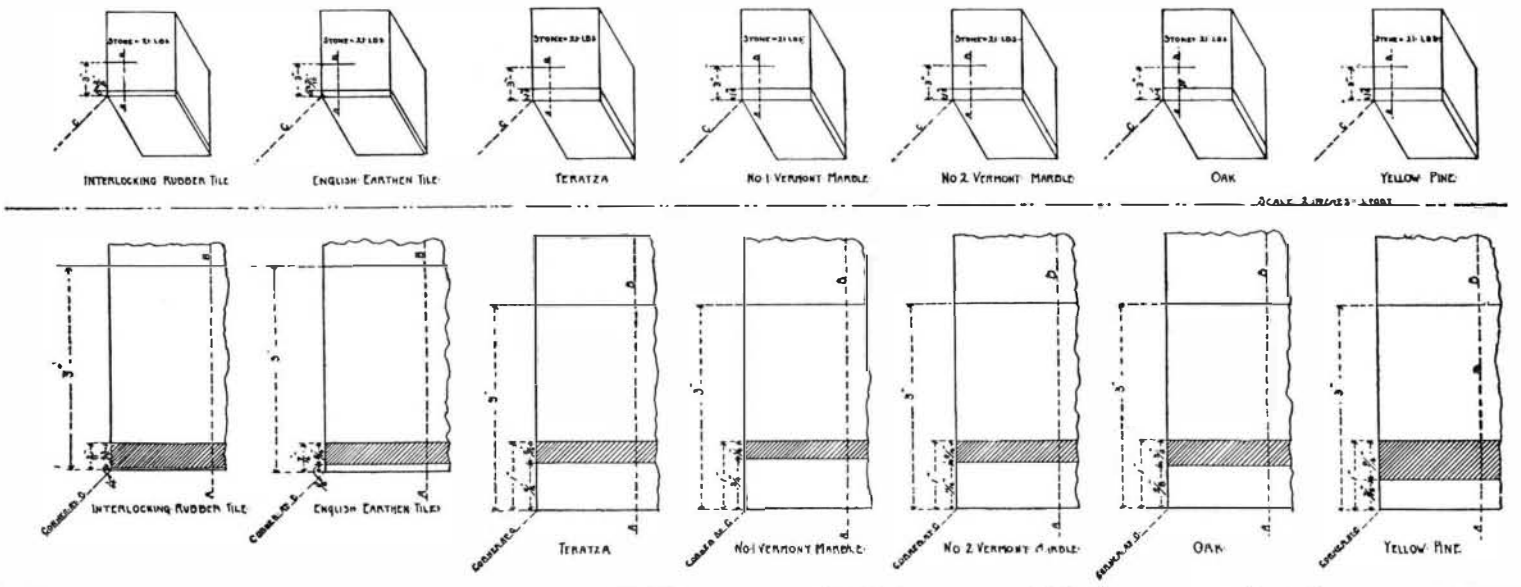
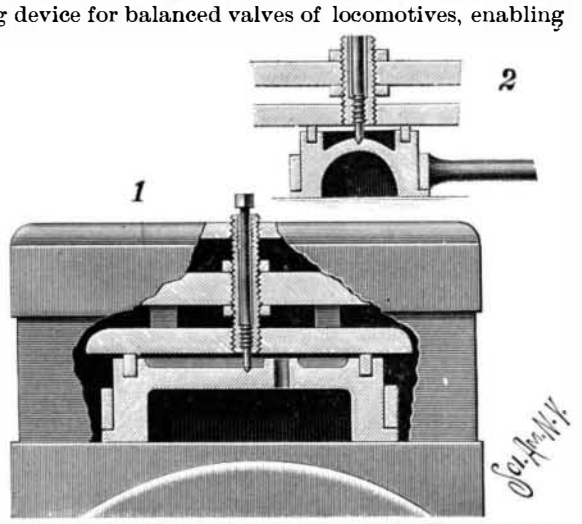


DIAGRAM SHOWING WEARING QUALITIES OF FLOORING MATERIALS.

A VALVE TESTING AND LOCKING DEVICE.

The illustration represents a simple testing and locking device for balanced valves of locomotives, enabling



SADLER'S VALVE TESTING AND LOCKING DEVICE.

the engineer to readily determine whether the valve on one or the other side of the engine is leaking without removing the outer plates or covers, and, when the engine is to be uncoupled on the road, to securely lock its balance valve. The improvement has been patented by James A. Sadler, Clarendon, Texas. Fig. 1 is a sectional view through the valve of a cylinder, the stop pin being in position, and Fig. 2 is a longitudinal section showing the stop pin in locking engagement with the valve. The valve casing is of the usual construction, and within it is the steam chest cover, the balance valve plate and the balance valve, the latter having in its top, at one side of the center, a release opening, and at a central point a V-shaped cavity. An exteriorly threaded sleeve is screwed into suitable openings in the steam chest cover and valve plate, the sleeve being interiorly threaded near its ends and being held in place by jam nuts. A test plug is normally screwed into the upper end of the sleeve, and by its removal the engineer may readily discover at what side of the engine any leakage occurs, as the leakage will pass up from beneath the balance valve through the release opening and thence out through the sleeve. To lock the valve, the reversing lever having been centrally placed and the valve centered, the test plug is removed and the stop pin screwed downward in the sleeve until its lower end firmly locks with the valve, as shown in both views. The sleeve will also be found useful for oiling the valve.