(No Model.)

F. MURGATROYD

BICYCLE BRAKE.

No. 598,530. Patented Feb. 8, 1898.

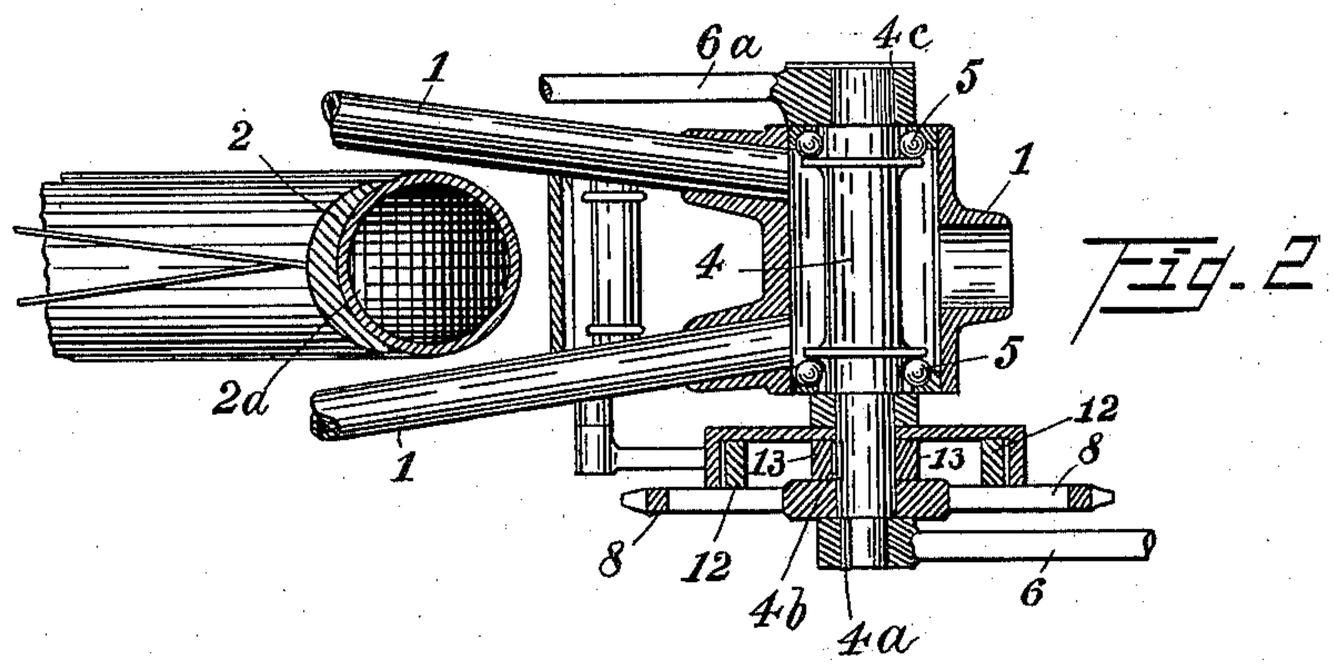

Fig. 2

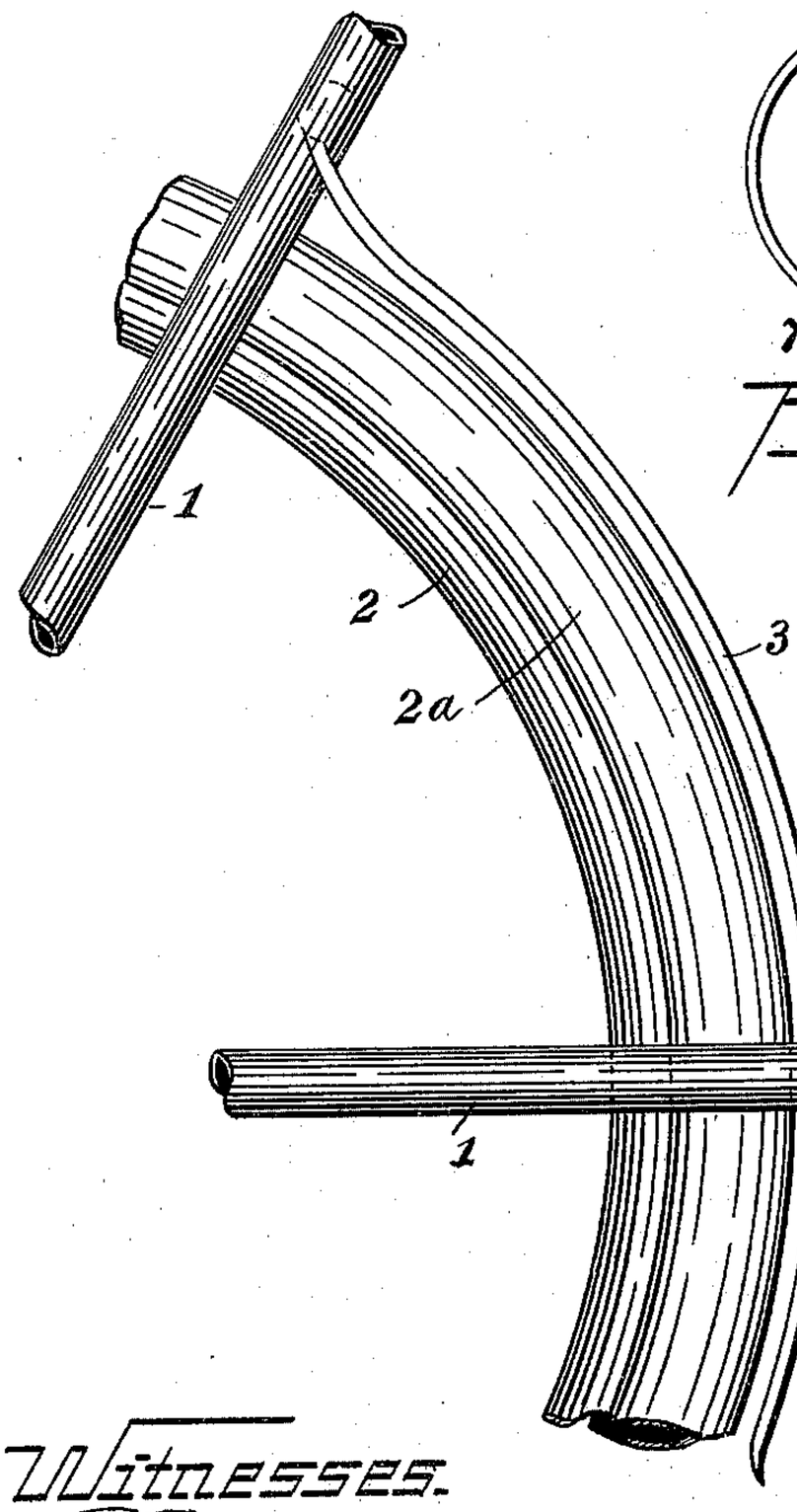

Fig. 1

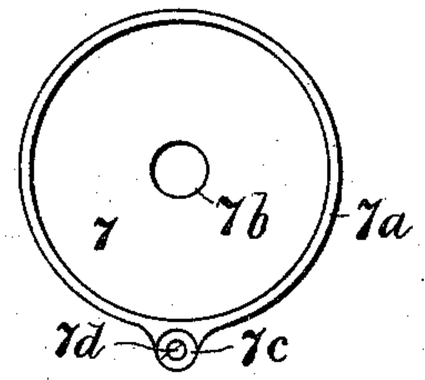

Fig. 3

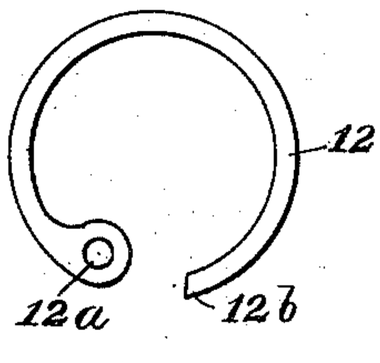

Fig. 4

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UNITED STATES PATENT OFFICE.

FRANK MURGATROYD, OF CLEVELAND, OHIO.

BICYCLE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 598,530, dated February 8, 1898.

Application filed September 23, 1896. Serial No. 606,761. (No model.)

To all whom it may concern:

Be it known that I, FRANK MURGATROYD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Bicycle-Brakes, of which the following, with the accompanying drawings, is a full, clear, and an exact specification.

The object of my invention is a brake for bicycles that is automatically applied to the rear or drive wheel when slowing down the speed of the wheel and is automatically released when the wheel stops and when the speed is being increased or remains practically uniform. This object I accomplish by resistance to the forward rotation of the pedals.

Reference is here made to the claims for a detailed statement of my invention.

In the different figures of the drawings like reference characters refer to like parts.

In the drawings, Figure 1 is a side elevation of my improved brake and illustrates its application to the frame and the rear wheel of a bicycle. Fig. 2 is a horizontal section of the same. Fig. 3 is a side elevation of the clutch-box, and Fig. 4 is an elevation of the spring that works inside the clutch-box.

1 is the machine-frame.

2 is the rear or drive wheel, 2^a its tire, and 3 is the combined mud-guard and brake.

4 is the driving-shaft, journaled in ball-bearings 5 or other bearings in common use. Upon one end of the axle 4 is fixed a pedal-crank 6 and at the opposite end a like pedal-crank 6^a, both alike and corresponding to any in use and secured to the shaft 4 by keys 4^a and 4^c.

To provide for setting the brake by resistance to the forward movement of the pedals, I have provided a clutch mechanism between the pedal-cranks and the brake, the preferred form being that here described. A circular clutch-box 7 is loosely mounted upon the shaft 4 at the inner side of the sprocket-wheel 8. The clutch-box consists of a circular metal disk having an annular flange 7^a and a central opening 7^b, in which the shaft 4 turns. On the lower side of the clutch-box is formed a lug 7^c, having a hole 7^d therethrough, into which the pin 10 enters. The mud-guard 3, which serves as a brake, has on its front side a lug 3^a, having a hole therethrough. A brake-bar 9 connects the clutch-box and the mud-guard by pins 10 and 10^a, that pass through holes in the ends of the brake-bar and through holes in the lugs 7^c and 3^a. These pins form pivotal connections. The sprocket-wheel 8 is mounted loosely upon the shaft 4. One of the spokes 8^a of the sprocket-wheel is enlarged and has a hole through it for receiving the pin 11. Inside the clutch-box is a steel spring 12, having an eye 12^a in one end, into which the pin 11 enters. This causes the sprocket-wheel and the clutch-spring to rotate together. Fixed upon the shaft 4 by a key 4^b is an operating-lever 13, that projects outwardly between the ends of the spring in the clutch-box. The shaft, the pedal-cranks, and the operating-lever are rigid relatively to each other, and the clutch-spring 12 and the sprocket-wheel 8 travel together and have a limited movement varying from the rotation of the shaft. The clutch-box has a limited movement independently of the shaft and its rigid attachments.

In the operation of my improvement as the pedal-cranks are driven forward the shaft is rotated and the operating-lever is pushed against the end 12^a of the clutch-spring 12, thus driving the sprocket-wheel 8. When it is desired to slacken speed or to stop, there is necessarily a slowing of the feet of the rider, which gives a resistance to the forward travel of the pedals. This resistance upon the pedals causes the operating-lever to bear against the opposite end 12^b of the clutch-spring, thus spreading it into contact with the inner side of the flange 7^a of the clutch-box. The greater the resistance to the pedals the more the clutch-spring is expanded and the greater the friction between the clutch-spring and the clutch-box. As the clutch-spring and the clutch-box are brought into frictional contact the clutch-box is turned so that the brake 3 is forced against the tire of the rear wheel through the brake-bar 9.

It will be seen that my improvement provides a brake for the rear or drive wheel, the brake being operated by a clutch that is controlled by the unconscious as well as by the

forced resistance of the rider to the forward movement of the pedals, thus causing the brake to operate instantaneously and without any effort on the part of the rider as he attempts to slow down or to stop and releasing the brake instantaneously on starting up without any attention on the part of the rider. In other words, the brake is controlled by an automatically-operated clutch.

The importance of such an improvement as an emergency-brake is realized by riders who have been brought to suddenly face some danger, such as collisions, and who have faced the dangers of going down a grade when the bicycle got beyond control. In all such cases, in the absence of thought what to do and without awaiting action in cases of "presence of mind," the brake is instantly and automatically applied.

Fixed upon the frame is a spring 14, that so engages the lug 3^a that the brake will be held away from the wheel when the brake is not applied.

Aside from the mechanical changes that may be made to adapt my improvement to various makes of bicycles my automatic brake may take on various modifications without departing from the spirit of my invention, and I do not therefore limit myself to the form illustrated and described.

What I claim as my invention is—

1. In combination with the drive-wheel, the pedal-cranks, the drive-shaft, the sprocket and chain of a bicycle, a circular clutch-box loosely mounted upon the drive-shaft at the inner side of the sprocket-wheel, a brake for the drive-wheel, a brake-bar connecting the clutch-box and the brake, a clutch-spring within the clutch-box and fixed to the sprocket-wheel, the sprocket-wheel being loose upon the drive-shaft, and a lever fixed upon the drive-shaft and having engagement with said spring, substantially as described.

2. In combination with the drive-shaft of a bicycle and a sprocket-wheel loosely mounted thereon, a brake, and a clutch to operate the brake, said clutch consisting of a circular disk having an annular flange and a central opening through which the drive-shaft passes, a spring within the annular flange of the disk, the spring being attached to the sprocket-wheel, and a lever fixed to the shaft and having engagement with the spring, whereby the spring is expanded into contact with the annular flange on resistance to the forward movement of the drive-shaft, and a connection between the brake and the clutch, substantially as described.

3. The combination, in a bicycle, of a shaft having pedal-cranks fixed thereto, a sprocket-wheel upon the shaft, a clutch-box concentric with the sprocket-wheel, a clutch-spring within the clutch-box and connected with the sprocket-wheel, an operating-lever fixed to the shaft and having operative engagement with the clutch-spring, a brake, and a brake-bar connecting the clutch-box and the brake, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK MURGATROYD.

Witnesses:

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