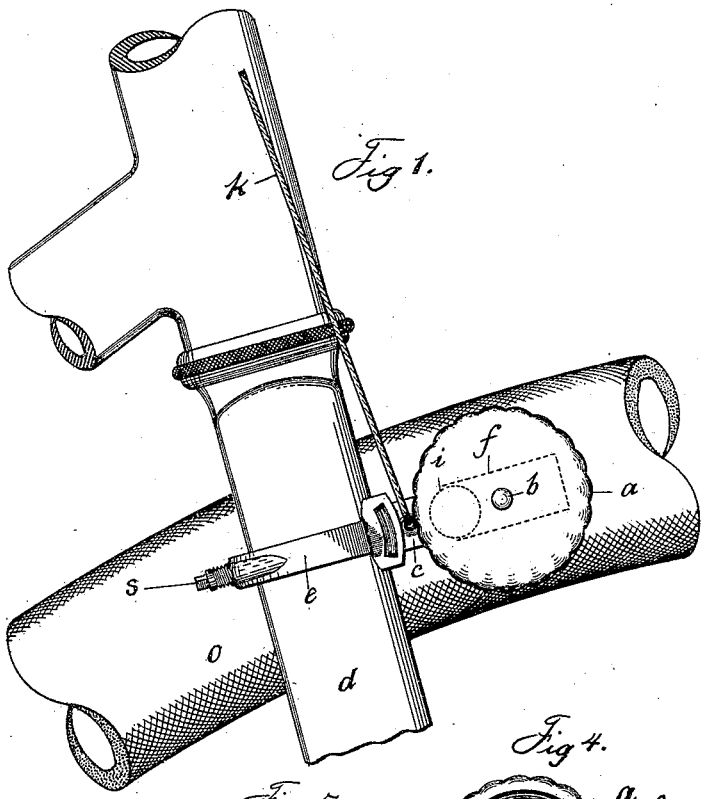
No. 647,909. Patented Apr. 17, 1900.

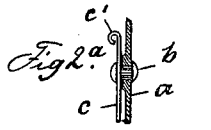
A. W. SMITH.

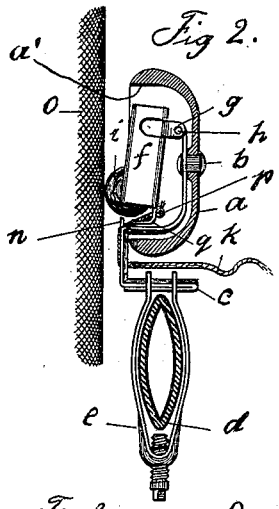
BICYCLE ALARM.

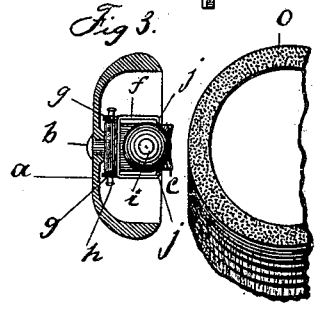
(Application filed Feb. 27, 1900.)

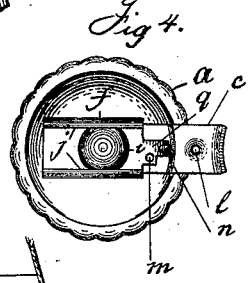
(No Model.)

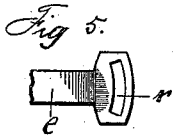


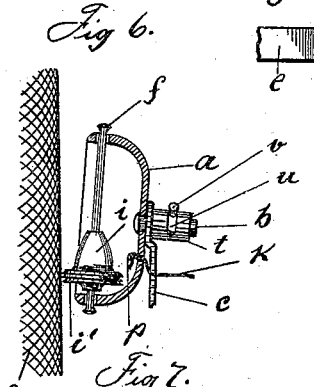


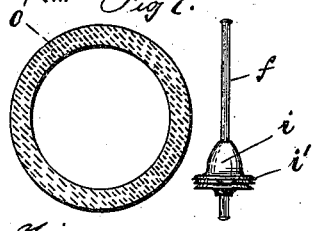


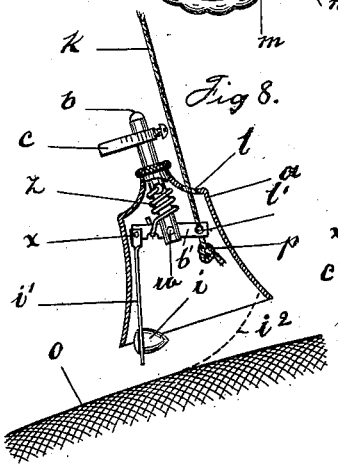


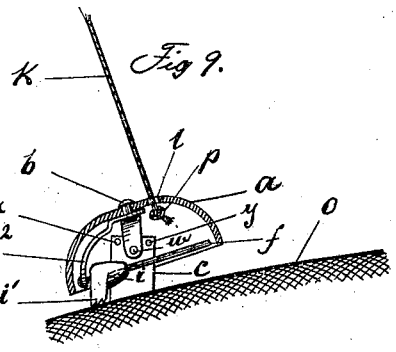












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UNITED STATES PATENT OFFICE.

ALBERT W. SMITH, OF WASHINGTON, DISTRICT OF COLUMBIA.

BICYCLE-ALARM.

SPECIFICATION forming part of Letters Patent No. 647,909, dated April 17, 1900.

Application filed February 27, 1900. Serial No. 6,771. (No model.)

To all whom it may concern:

Be it known that I, ALBERT W. SMITH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a new and useful Improvement in Bicycle-Alarms, of which the following is a specification.

The object of this invention is to provide a wheel-actuated alarm for bicycles and the like.

To this end it consists of a bell or sounding-body supported in proximity to the front tire and a vibrating striker for sounding said bell adapted to be brought into direct engagement with said tire, and thus to receive its motion without the employment of any intermediate mechanism therefrom; and it further consists in means for manually controlling said striker and in means for adjustment and attachment of said alarm to the framework of bicycles.

With the alarms now used it is often impossible to give an adequate warning. Especially is this the case in crowded and noisy streets. Another fault of present alarms is that they give a musical or chime effect rather than a warning sound.

It is obvious that a bicycle-rider should have at his command the means to give an adequate warning of danger for all emergencies—that is to say, in a crowded and noisy street he should be able to produce a loud and startling gong sound that will be louder than street noises. Also the volume of sound should be proportional to the speed of the rider, and thus convey an idea of the relative danger to pedestrians. For all ordinary purposes, however—such as slow riding through residence and suburban districts, &c.—the bell should have the low musical or chime-like sound of the ordinary bicycle-bell. The purpose of my invention is to combine these several qualities in a single apparatus of great simplicity, which I will now proceed to describe.

In the drawings herewith, Figure 1 is a side view of my invention as attached to the steering-fork of a bicycle. Fig. 2 is a top view showing the bell *a* and fork *d* in horizontal section. Fig. 3 is a front view showing the bell *a* and tire *o* in vertical section. Fig. 4 is a view of the mouth of bell *a* and its interior mechanism. Figs. 2ª and 5 are detail views. Figs. 6, 7, 8, and 9 illustrate structural modifications of Fig. 1.

In all the views the same letters refer to like or corresponding parts.

The bell *a* is secured by means of rivet *b* to the bracket *c*, which is clamped against the steering-fork *d* by means of the clasp *e*.

f is a ball-race formed of thin sheet-steel and hinged by means of ears *g g* and pin *h* to the free end of bracket *c*, as shown in Figs. 2 and 3, the free end of bracket *c* being coiled to form a tube *c'* (see Fig. 2ª) for the reception of the hinge-pin *h*. The steel ball *i* is retained in the ball-race *f* by means of the inturned flanges *j j*. The cord *k* passes through the eye *l* and the hole *m* in ball-race *f* (see Fig. 4) and is knotted, as shown at *p*. (See Fig. 2.) The free end of cord *k* is secured to the handle-bar. (Not shown.)

The ball-race *f* has an inclined position, as shown in dotted lines in Fig. 1, and when the cord *k* is slack the ball *i* by its own weight assumes the position shown by the dotted circle *i*, Fig. 1, and by acting against the spur *n* on bracket *c* (see Figs. 2 and 4) is caused to be held away from tire *o*, as shown in Fig. 3.

To sound the bell, the rider pulls the free end of cord *k*, thus moving the ball-race *f* and ball *i* toward tire *o* until the ball comes into contact with the tire, when the ball will be caused to roll between tire *o* and the back wall of the ball-race *f*. The motion of the ball-race *f* is limited by the ear *g* (see Figs. 2 and 4) striking against the spur *n*.

It will be seen from Fig. 2 that the ball-race *f* makes an acute angle with the side of tire *o*. By this means the ball *i* after receiving a forward impulse from tire *o* is freed from further contact therewith and is carried forward by its acquired momentum until it strikes the bell *a* at the point *a'*. (See Fig. 2.)

If the rider desires to give but a single stroke, then the cord *k* is simply released after the ball *i* receives its initial impulse, when the ball will rebound and return to its original position. If more than one stroke is desired, the cord *k* is pulled again, &c. If a continuous ringing is desired, the cord *k* is simply held taut, and ball *i* will then rebound against the tire *o*, and the strokes will be repeated with a rapidity depending upon

the speed of the tire *o* and the distance the ball *i* has to travel back and forth.

If no slip occurs between ball *i* and tire *o*, then the ball will be rolled forward with a velocity just one-half that of the tire *o*, and the force with which the ball strikes the bell will then, obviously, be directly proportional to the speed of the tire. If, however, slip is allowed to take place between the ball *i* and tire *o*, then the force of the stroke can be reduced to any desired amount.

It is thus evident that the rider may give either a single stroke, several distinct, but successive, strokes, or he may cause a continuous ringing of the bell, and although riding at a high rate of speed he may produce either a loud stroke proportional in volume to his speed, or by allowing the ball to slip he may reduce the force of the stroke any desired amount by simply varying the tension of cord *k*, and thus enabling an adequate warning to be given for any purpose or emergency.

The clasp *e* is formed from a single piece of thin sheet-steel, bent into the form shown in Figs. 1 and 2, and has its front ends perforated by a slot *r* (see Fig. 5) for the reception of the foot of the bracket *c*, as clearly shown in Figs. 1 and 2. The foot of bracket *c* is adjustable transversely in the slot *r*, while the clasp *e* may be adjusted up or down on the fork *d*, thus enabling the alarm to be adjusted relative to tire *o* and adapting it to be applied to bicycles of widely-differing fork widths. The clasp *e* is adapted to fit any size or section of the usual oval-tube type of fork. The bracket *c* is formed of a single piece of thin sheet-steel and is stiffened by arching it, as shown in Figs. 1 to 4, and the foot or part that rests against fork *d* is reinforced by doubling the metal back upon itself, as shown in Figs. 1, 2, and 4, thus enabling it to resist the strain imposed by the set-screw *s*, which serves to clamp the bell in position.

Fig. 6 is a top view showing the bell *a* in horizontal section and illustrates a modified form of my invention. The bell *a* is secured to the stem *b*, which is capable of angular movement in sleeve *t*, its movement being limited by the pin *v*, secured in stem *f* and working in slot *u* in sleeve *t*, the length of slot *u* being such as to permit an angular movement of stem *b* and bell *a* through about ninety degrees of arc. The sleeve *t* is secured to the bracket *c*, and the latter may be secured to the bicycle-framing in any well-known manner or as shown in Fig. 1. In Fig. 6 the bell is shown in the working position, the cord *k*, secured to the bell by passing it through a hole in the bell and being knotted, as shown at *p*, being supposed to be taut, and thus holding the bell in the working position.

The striker *i* is composed of a conical body having annular ridges or teeth *i'*, adapted to engage with the tire *o*, and slides freely on the rod *f*, which passes through holes in the bell *a* and is headed over at each end to prevent its dropping out, the rod *f* being free, however, to turn and move endwise sufficiently to prevent interference with the free vibration of the bell *a*. It will be seen that the rod *f* makes an acute angle with the side of tire *o*, as also does the ball-race *f* in Fig. 2. The striker *i* is therefore moved forward by tire *o* a certain distance and is then released from further contact therewith, continuing its movement by virtue of its acquired momentum, striking the bell, and then rebounding, thus operating in the same manner as that of ball *i*, Fig. 1. When the cord *k* is released, the weight of the striker *i* causes the bell to turn through the distance permissible by slot *u*, thus causing the rod *f* and striker *i* to assume a perpendicular position relative to the tire *o* and out of contact therewith, as shown in Fig. 7, which is a sectional view of tire *o* and shows the position of striker *i* when the cord *k* is slack.

In Fig. 9, which is a side view showing the bell *a* in vertical section, is shown a modification of my invention applicable to the top or periphery of the tire *o*. c^2 is a bracket pivoted at *w* to the supporting-arm *c*, which is secured to the steering-fork in any well-known way. *x* and *y* are stops for limiting the motion of bracket c^2 on pivot *w*. The bracket c^2 at its lower end supports the rod *f*, and the bell *a* is secured to its top by means of rivet *b*. The cord *k* passes through the hole *l* and is knotted, as shown at *p*. The striker *i* has the serrated heel *i'*, adapted to engage with tire *o*, and is free to slide to and fro on the rod *f*. It will be seen that the pivot *w* is behind the center of gravity of the structure. Consequently when the cord *k* is slack the bell tilts forward until the bracket c^2 rests against the stop *y*, thus lifting the striker *i* away from tire *o*. When the cord *k* is pulled, the bell is tilted back, as shown in Fig. 9, until bracket c^2 rests against the stop *x*, thus causing the striker *i* to engage with tire *o* and to be set in motion in a manner identical with that of striker *i*, Fig. 6, already described.

In Fig. 8, which is a side view showing the bell *a* in vertical section, is shown another modification of my invention, also adapted to be applied to the top or rim of the tire *o*. The bell *a* is secured on the rod *b*, which is vertically adjustable in the supporting-arm *c*, which may be suitably fastened to the bicycle-frame. The rocker-arm *b'* is pivoted at *w* to the lower end of rod *b*. The striker *i* is secured to the pendant *i'*, which is pivoted at *x* to the rocker-arm *b'*. The retracting-spring *z* serves to hold the clapper *i* away from the tire *o*. The cord *k* passes through hole *l* in bell *a* and hole *l'* in the rocker-arm *b'* and is knotted, as shown at *p*. When the cord *k* is slack, the retracting-spring *z* holds the clapper *i* away from tire *o*. By pulling the cord *k* the clapper *i* is depressed until the end of pendant *i'* touches the tire *o*, thus causing clapper *i* to move in a path represented by the

dotted arc i^2 until it strikes bell a, its operation being substantially identical with the other striking mechanisms already described.

Having now fully described my invention, as well as several of the most obvious modifications thereof, I desire to state that many other structural modifications and functional differentiations thereof are possible and that I do not desire to limit my invention to any specific structure or relationship of its essential elements; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an alarm for bicycles or the like, the combination with a bell or sounding-body, of a to-and-fro movable striker therefor, and means for bringing said striker into direct operative engagement with the bicycle-tire, as set forth.

2. In an alarm for bicycles, or the like, the combination with a bell or sounding-body, of a to-and-fro movable striker therefor, means for bringing said striker into direct operative engagement with the bicycle-tire, and also means for guiding said striker forward in a diverging path from its point of contact with the tire, thus causing said striker during its forward stroke to become disengaged from, and to complete its stroke without further contact with said tire, as set forth.

3. In an alarm for bicycles, or the like, the combination with a bell or sounding-body, of a to-and-fro movable striker therefor, means for bringing said striker into direct operative engagement with the bicycle-tire, and also means for guiding said striker forward in an upwardly-inclined path or plane from its point of contact with the tire, thus causing said striker after the completion of its forward stroke, to automatically return to its original position, by reason of the force of gravitation due to its own mass, acting against said inclined path or plane, as set forth.

4. In an alarm for bicycles or the like, the combination with a bell or sounding-body, of a to-and-fro movable striker therefor, a guide or runway for said striker arranged to form an angle with the contiguous surface of the tire, and means for bringing said striker into direct operative engagement with the bicycle-tire, as set forth.

5. In an alarm for bicycles or the like, the combination with a bell or sounding-body a, of the ball-race f, pivoted at h, the ball i, retained in said race by flanges j, and the controlling-cord k, as set forth.

6. The combination with the bracket or support of a bicycle attachment, of a clasp e engaging or coöperating with a transversely-adjustable portion or part of said bracket or support, and means coöperating with said clasp for clamping said transverse part against the bicycle-frame, as set forth.

7. The combination with the bracket or support of a bicycle attachment, of a clasp e having a perforation through its front ends, adapted to engage or coöperate with a transversely-slidable portion or part of said bracket or support, and means coöperating with said clasp for clamping said transversely-slidable part against the bicycle-frame, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT W. SMITH.

Witnesses:
W. E. WRIGHT,
GEO. M. COPENHAVER.