

(No Model.)

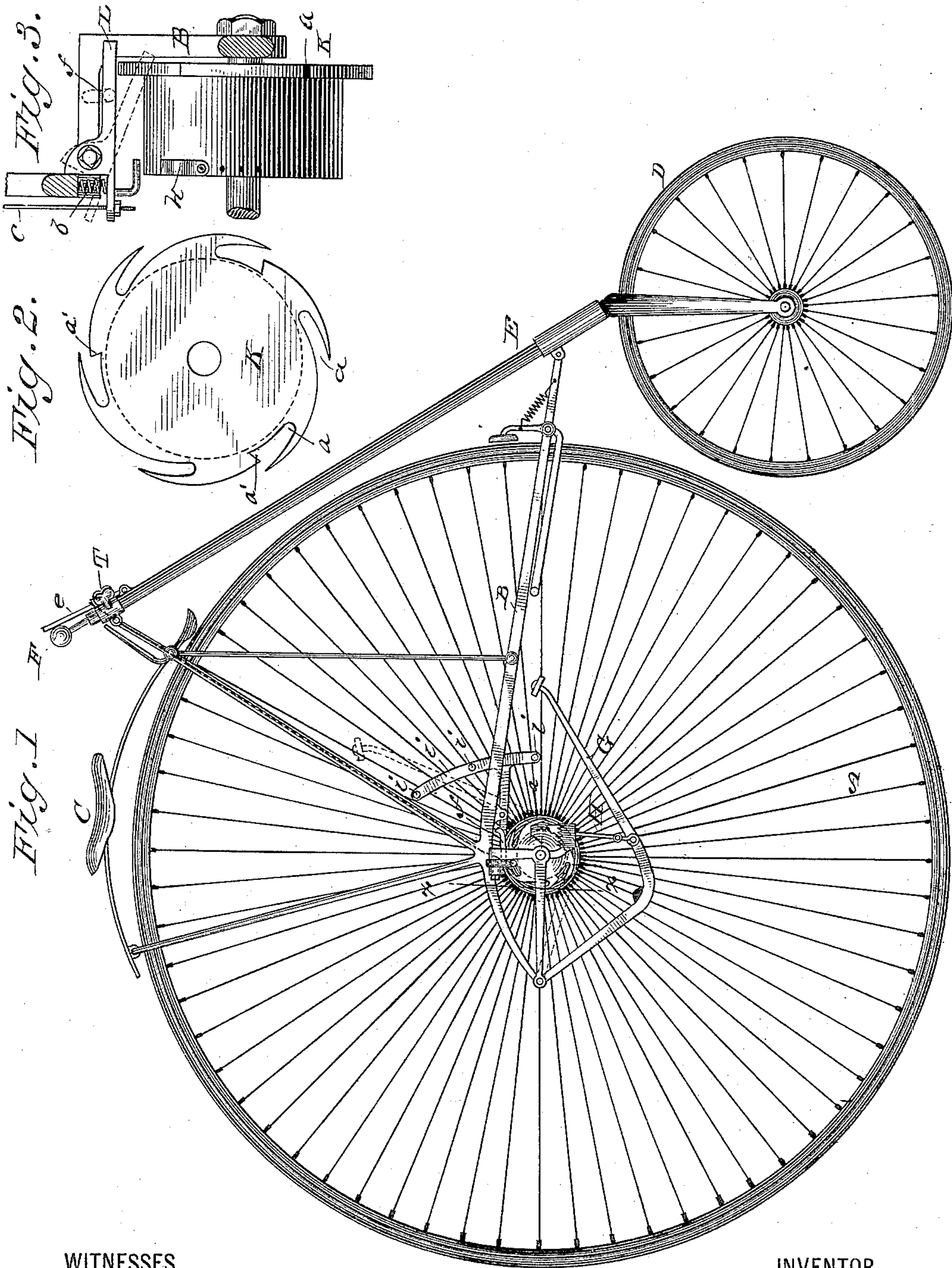
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H. S. OWEN.

VELOCIPEDÉ.

No. 330,346.

Patented Nov. 10, 1885.



WITNESSES

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Al. C. Newman.

By his Attorney

INVENTOR

H. S. Owen.
Phil. T. Dodge.

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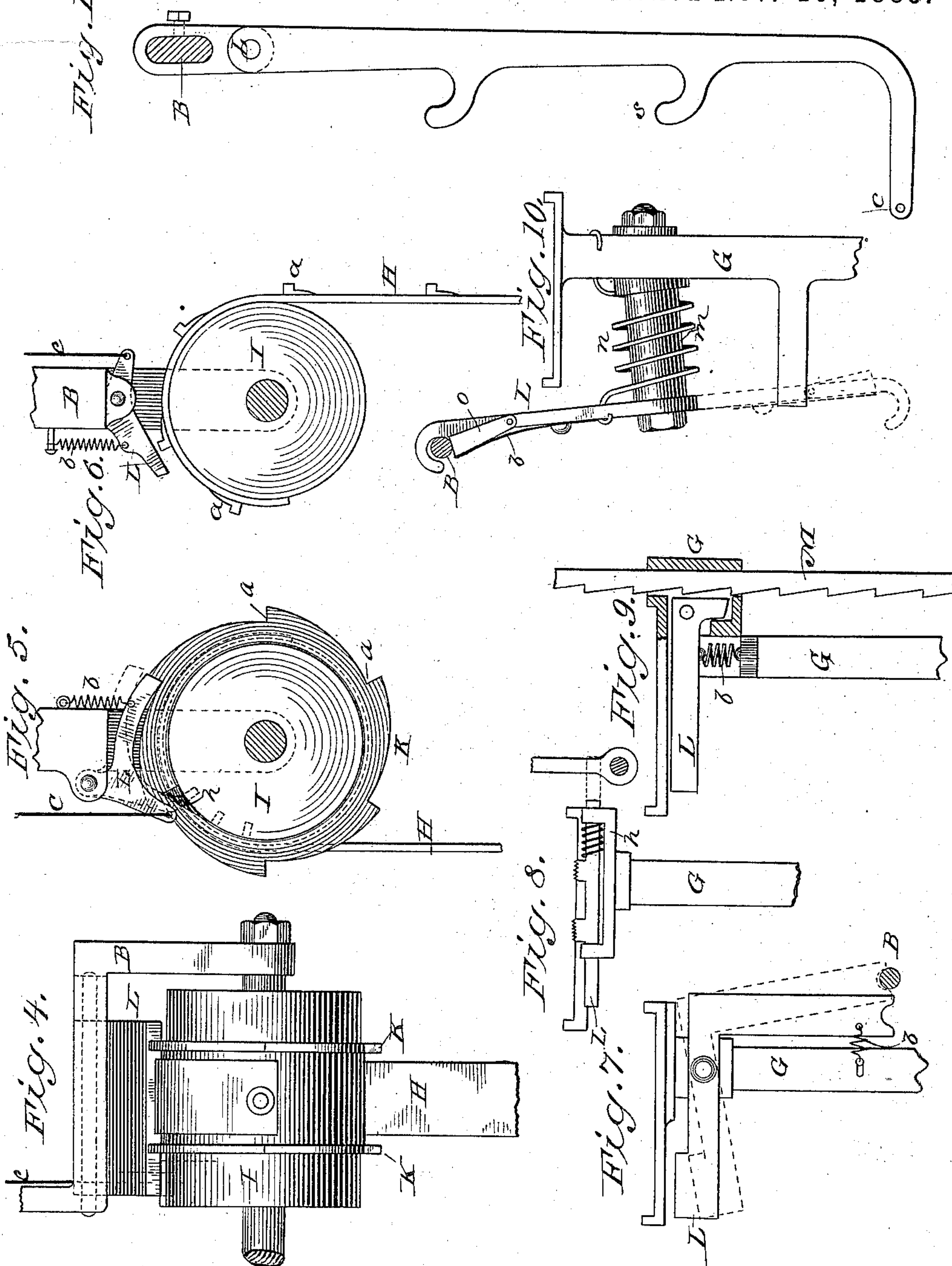
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UNITED STATES PATENT OFFICE.

HERBERT S. OWEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 330,346, dated November 10, 1885.

Application filed March 6, 1885. Serial No. 157,892. (No model.)

To all whom it may concern:

Be it known that I, HERBERT S. OWEN, of Washington, in the District of Columbia, have invented certain Improvements in Bicycles, Tricycles, and like Machines, of which the following is a specification.

This invention relates to those machines which are propelled by the rider operating foot-levers or pedals, which communicate motion through intermediate drums and clutch mechanism to the wheels; and it is the aim of the improvement to provide means whereby the rider may at will lock the levers or pedals in their descent, so that they may be used to carry his weight when coasting or passing over obstacles, and also in mounting the machine.

The improvements are intended more particularly for those machines in which the levers, combined with lifting-springs to raise them when relieved from pressure, are attached to straps winding on drums connected by clutches or ratchet mechanism with the wheel, so that when the levers are depressed they unwind the straps, and thereby turn the drums, which in turn drive the wheel. In machines of this class it has been found necessary to leave the levers free to descend below the point to which they are commonly forced by the foot, not only to relieve the rider from the disagreeable shock which would result from the abrupt stoppage of the lever, but for various other reasons unnecessary to detail at this time. Being free to descend, as stated above, it follows that the levers cannot be used to sustain the weight of the rider in coasting or when traveling over car-tracks and like obstacles, the entire weight being at such times carried in the saddle, greatly to the discomfort and fatigue of the rider. By providing for the stoppage and support of the descending or depressed levers at will I enable the rider to carry his weight on the pedals by standing thereon, thus giving a change of position and avoiding the usual jar and concussion, and at the same time relieving the machine, to a great extent, of the strains to which it is ordinarily subjected. The locking of the lever in its depressed position presents the pedals in such manner that the dismounted

rider may conveniently step thereon and easily and safely assume his position in the saddle. The invention is susceptible of embodiment in various forms, and of application to machines having two, three, or more wheels; but in the accompanying drawings I have represented only those forms which are considered the best, and these only in connection with that peculiar form of two-wheeled machine commonly known as the "Star Bicycle."

In each of its various forms my invention embraces a dog or stop device, which is held normally out of action and automatically disengaged when released.

Figure 1 is a side elevation of a star bicycle having my improvements applied thereto in various forms. Fig. 2 is a side elevation of a toothed disk or flange, which is applied to the drum to engage the locking device. Fig. 3 is a vertical section on the line *x x* of Fig. 1, looking in a forward direction, and illustrating the locking-dog which engages the toothed disk, and different modes of operating said dog. Figs. 4 and 5 are respectively a rear and a side elevation of devices for locking the drum at will. Fig. 6 is a side elevation of an arrangement for locking the descending strap, by which the drum is operated. Fig. 7 is a front elevation showing the locking device applied directly to the lever to engage the main frame. Fig. 8 is a front elevation of another form of the device applied to the lever. Fig. 9 is a sectional elevation showing still another form of locking device applied to the lever. Fig. 10 is a front elevation of the device in another form as applied to the lever to engage the main frame. Fig. 11 is a side elevation of a latch or locking device intended for application to the main frame to engage the descending lever.

Referring to Fig. 1, A represents the rear propelling-wheel, of large diameter, having its axle mounted firmly in the rear end of a rigid main frame, B, to which the saddle C is applied, substantially above the axis of the wheel.

D represents the forward steering-wheel, of relatively small diameter, mounted in the lower forked end of the inclined steering-bar E, which is arranged to turn in bearings in

the main frame and provided at its upper end with the steering-bar, the operation of which serves to deflect the steering-bar to the right or left, as required.

5 G represents the foot-lever or pedal, pivoted at its rear end to the main frame, and attached midway of its length to a strap or other flexible device, H, which is wound in a backward direction around a drum, I, mounted on the
10 main axle and connected with the wheel by means of a ratchet or clutch mechanism so arranged that when the lever is depressed and the strap thereby unwound, so as to turn the drum, the latter will communicate a forward
15 rotation to the main wheel. A spring applied internally serves to revolve the drum in a backward direction when the lever is relieved from the pressure of the foot, thereby unwinding the strap and raising the lever to its original position. There are two levers on opposite sides, each operating independently of the other.

The foregoing parts are all constructed and arranged to operate in the ordinary manner,
25 and are familiar to those skilled in the art.

The aim of my improvement in each of its various forms is to enable the rider to check positively the descent of the two levers G, at will, and this may be accomplished either by
30 devices acting to stop the rotation of the drum, by devices acting to arrest the movement of the strap, or by devices acting directly to limit the movement of the lever. I prefer, as the most simple means, the device acting directly to stop the forward motion of the
35 drum.

This device in its preferred form is clearly represented in Figs. 1, 2, and 3, in which K represents a disk or flange formed upon or attached firmly to the revolving drum, and provided at its periphery with a series of notches or indentations, *a*, two, three, or more in number, as may be desired, and L a dog or detent pivoted to the main frame above the
40 drum in such position that its outer end may be depressed to engage in one or another of the teeth *a*. A spring, *b*, acting on the inner end of the dog, holds the same normally in an elevated position out of engagement with the drum, and in this position of the parts the machine will operate in the ordinary manner. When, however, the dog is depressed, so as to engage the disk, it will lock the drum firmly against forward rotation, thus causing the
45 strap to sustain the foot-lever firmly in position at a greater or less elevation, according as the dog is engaged in one or another of the teeth. Means of any appropriate character may be provided to enable the operator to throw the dog L into engagement at will. One simple device consists of a wire or rod, *c*, extended from the inner end of the dog upward at the side of the main frame to a thumb-lever or other suitable operating device, *e*, located
50 upon or adjacent to the steering-bar, so that the rider may readily operate the same without changing his position on the machine or

removing his hands from the steering-bar. The thumb-lever may be connected to the dogs on both sides of the machine, so as to
70 lock the two pedals simultaneously.

If it be desired to throw the latch into engagement by means of the foot, instead of by hand, an arm or projection, *f*, may be formed on the dog, as shown in Figs. 1 and 3, in
75 suitable position to be operated by the heel of the rider. This arm is to be so located that it may be actuated without removing the foot from the lever G, but at the same time in such position that it will not be actuated, except
80 when the foot is moved backward from the position which it usually occupies in operating the machine.

In special cases it is desirable to have the locking-dog L thrown into action automatically whenever the foot-lever is depressed to a certain point. For this purpose I propose to provide a drum with a cam or projection of any appropriate form, adapted to act upon the drum whenever the drum reaches the desired limit of rotation. In Fig. 3 this cam is shown at K on the periphery of the drum in
85 suitable position to act on the inner or heel end of the dog.

Still another device for operating the dog
95 L is shown at *i*, Fig. 1. It consists of a lever pivoted to the frame forward of the axle, its rear end acting upon the dog or detent L, and its forward end extended vertically and provided at different heights with a series of
100 studs, *i'*, &c. These studs are so located that the rider may, by shifting his foot inward, engage one or the other of them, and thus throw the locking-dog into action at any desired point in the descent of the foot-lever.
105

Referring to the form of device represented in Figs. 4 and 5, it will be seen that the drum is provided with two toothed flanges or rims, K,—one on each side of the operating-strap—and that both flanges are engaged by means
110 of the dog or detent L, pivoted to the main frame. This dog may be actuated like that represented in Fig. 1, by means of the wires or rods *c*, which will enable the operator to throw the same into engagement at will; or it
115 may be operated by means of a cam, *h*, attached to the drum, to act upon the dog at a definite time. The cam *h* may be secured to or formed upon the drum, or it may be attached thereto by a screw or equivalent device
120 which will admit of its being shifted circumferentially. This movement will admit of the machine being adjusted so as to stop the lever automatically at one height or another, as desired. It is to be understood that this automatic stoppage may be used either as a substitute for or as an auxiliary to the device for stopping the lever at will. The dog represented at Figs. 4 and 5 is combined, like that first described, with a spring, *b*, by which it is
125 held normally out of engagement.

Referring to the device represented in Fig. 6, L represents the dog or detent, pivoted to the frame, and arranged to engage with a se-

ries of studs or teeth, *a*, applied to the operating-strap H at different points in its length. The dog is held normally out of action by the spring *b*, but being depressed it will engage one or another of the studs, and by arresting the descent of the strap will sustain the lever in position. The dog in this device may be operated by a wire extending to the thumb-latch, or by an arm or lever to be operated by the foot in the manner explained in connection with Figs. 1 and 3.

Passing now to those forms of embodiment in which the locking device acts directly in connection with the lever or pedal, attention is directed to Figs. 7, 8, 9, and 10.

In Fig. 7, L represents the locking device, made in the form of an elbow-lever and pivoted to the forward end of the foot-lever near the plate or pedal proper, to which the foot is applied. A spring, *b*, connecting the lower end of the dog with the foot-lever, holds the former normally in the position represented in full lines, so that it may rise and fall with the foot-lever past the side of the main frame without engaging thereon. When it is desired to stop the descending lever, the rider, moving his foot from its normal position, depresses the upper end of the dog L with his toe, as a result of which the dog assumes the position indicated by dotted lines, so that its lower end will engage upon and be supported by the horizontal bar or rod of the main frame. The dog, resting on this bar, will give firm support to the pedal, limiting its further descent, and permitting the rider to place his entire weight, if necessary, thereon.

In Fig. 8 the locking device consists simply of a horizontally-sliding bolt mounted on the foot-lever, near its forward end, in such position that the rider may at will move the bolt endwise to the position shown in dotted lines. If this movement be effected before the lever has reached the lower bar of the main frame, the dog or bolt will act upon the bar, and thus stop and support the lever. A spring, *b*, may be applied to throw the bolt outward and hold it normally in an inactive position.

Referring next to Fig. 9, L represents the dog or detent of an angular form, pivoted to the foot-lever G, and arranged to engage a vertical toothed bar, *m*, which will be sustained from the main frame in the position represented by dotted lines in Fig. 1, or in any other suitable position. The spring *b* holds the dog out of engagement with the toothed bar, permitting the pedal to play freely upward and downward upon the bar, which passes through the same, as shown. By depressing the dog with the toe or heel it is caused to engage the bar *m* and to stop the pedal instantly at the height at which it may chance to stand.

Fig. 10 represents a form of device designed mainly to assist the operator in mounting, and which requires him to dismount in order to effect its adjustment. It consists of a swinging arm or dog, L, pivoted to a substantially-

horizontal stud, *m*, on the side of the pedal. The end of the dog is of horizontal form, and, owing to the inclination of its axis from the horizontal, it swings inward when elevated in such position that it will in descending engage the side bar of the frame, as shown in the drawings, and thereby sustain the pedal. When, however, the arm is revolved upon its axis and turned downward, as shown in dotted lines, it swings outward away from the vertical plane of the frame, so as to pass freely upward and downward without engaging thereon. A spiral spring, *n*, tends to turn the dog downward to its inoperative position whenever it is released. In order to hold the dog in engagement with the frame after its adjustment, and until the operator has mounted the machine, the latch *o* is pivoted to its end in position to engage beneath the bar of the frame. The strain of the strap, tending to lift the pedal, holds the dog *o* in forcible contact with the frame B, as shown in the drawings, and thus holds the pedal down in the required position. A spring, *p*, attached to the dog, acts against the latch *o*, and tends to urge the same outward. The operation is as follows: The rider, being dismounted, depresses the foot-lever to the desired point, and turns the dog L outward until it hooks upon the frame, to support the lever when he steps thereon. Having thus engaged the dog, he forces the latch *o* beneath the frame, as shown in the drawings, thereby locking the lever down, so as to prevent it from rising until the proper time. He now steps upon the pedal and assumes his position upon the saddle. The application of his weight to the pedal has the effect of depressing the same sufficiently to relieve the latch *o* from its pressure against the frame, whereupon the latch is instantly thrown backward by the spring *p*, leaving the lever free to rise when relieved from the pressure of the foot. As the lever rises, the dog L is unhooked from the frame and turned by the spring *n* to its operative position, so that at the next depression of the lever it will pass the frame without engaging thereon, leaving the lever free to be operated in the usual manner with a full stroke or movement.

Passing now to Fig. 11, L represents a dog or arm adapted to be pivoted at its upper end to the main frame, and provided on one edge with two or more shoulders, *s*. This arm will hang usually in such position that the lever may vibrate past the same without hinderance; but by swinging the dog inward one or another of its shoulders *s* may be brought in position to engage and stop the descending lever. For the purpose of thus operating the dog, a wire or cord, *c*, may be attached to its lower end and extended thence upward within reach of the rider, or it may be otherwise operated.

Referring again to the construction represented in Figs. 1, 2, and 3, it is to be noted that the teeth or shoulders of the disk are undercut at the forward side, as shown at *a'*. This feature, although not a necessary one, is

highly advantageous, in that it permits the lever to be locked down until the rider has made use of the same in mounting. The winding spring tends to turn the drum backward, and if, therefore, the dog be brought into engagement and the drum allowed to turn slightly backward, the dog will catch beneath the overhanging shoulder a' and be held thereby, so as to prevent the drum from turning backward and raising the lever. The instant, however, that the rider depresses the lever, the drum, turning ahead, disengages the shoulder a' , whereupon the dog is lifted out of action by the spring b . From the foregoing it will be seen that the dog serves, in this case, two purposes—of locking the lever up or locking it down, as may be demanded.

In the handling of this class of machines by the dismounted rider, particularly in pushing them up hills and over irregular surfaces, difficulty is encountered, because of the steering-wheel turning out of line and causing the machine to run sidewise. To avoid this trouble, I provide means whereby the wheel may be secured at will against the swiveling action. The most simple device for the purpose consists of a clamping-screw, T , mounted in the frame and bearing on the steering rod or shaft, as represented in Fig. 1.

The employment of both the manual and the pedal devices to control the stop is advantageous, in that circumstances will frequently prevent the operation of either the pedal or the manual devices at the required instant.

It is to be noted as a marked feature of my invention that the spring is applied in each instance to cause the automatic disengagement of the stop, so that no special care or attention is required on the part of the rider.

I am aware that it has been proposed to provide a tricycle, in which the seat is located near the axle, with a dog to lock the rotary drum, in connection with a spring to throw and hold the same into engagement, and with an eccentric to hold it out of engagement, the latter arranged to be reached and directly operated by the rider. I believe myself to be the first to provide a locking device which rides automatically out of action when released, and the first to so organize the parts that a locking-dog could be operated by a rider on a seat above the wheel, as in a bicycle.

Having thus described my invention, what I claim is—

1. In a bicycle or similar machine having a propelling-wheel with a driving-drum, strap, and foot-lever connection, a dog to stop the forward rotation of the drum, and a spring acting to automatically disengage the dog and hold the same normally out of action.

2. In a bicycle having a drum and lever-connection, as described, to drive the propelling-wheel, a rider's seat above the wheel and a steering-bar adjacent to the seat, a stop device to limit the rotation of the drum, and an operating device, substantially such as described, extending from said stop upward to a point

adjacent to the steering-bar, whereby the rider is enabled to throw the stop into action without losing control of the machine.

3. In a bicycle of the type herein described, the combination of the driving-drum, the stop device to limit its rotation, the spring acting to hold the stop device out of action, and the stop-operating device, substantially as described, extending thence upward to a point at or near the top of the wheel, whereby the rider, seated above the wheel, may throw the stop into action at will.

4. In a bicycle or similar machine, the combination of the propelling-wheel, drum, strap, and lever with the dog to limit the rotation of the drum, the spring acting to hold the dog normally out of action, and the rod extending from the dog upward, as described.

5. In a bicycle of the type herein described, having a seat above the wheel, the combination of the wheel-driving drum, the dog to limit its rotation, and the spring to throw the dog out of engagement, the dog being constructed and arranged, as described, to be actuated by the foot of the mounted rider.

6. In a bicycle or similar machine, the combination of the propelling-wheel, drum, strap, and foot-lever with a dog or stop to arrest the descent of the lever located adjacent thereto, as described, so that the stop may be actuated by the foot without removing the latter from the lever.

7. In a bicycle or similar machine having the drums, straps, and levers to actuate the wheel, a stop device to limit the motion of the drum, combined with a cam or projection on the drum to cause the automatic engagement of the dog.

8. In a bicycle or similar machine having the drums, straps, and levers to actuate the wheel, a stop device to limit the rotation of the drum, combined with a cam or projection adjustable circumferentially upon the drum to cause the automatic action of the stop device sooner or later, as may be demanded.

9. The propelling-wheel and the drum connected therewith by the clutch mechanism and urged backward by a spring, in combination with the stop, the lever, the dog to limit the descent of the lever, adapted, as described, to be retained in engagement by the upward pressure of the lever, and the spring to disengage the dog when the lever is depressed, whereby the lever may be locked down as a means of mounting the machine, and automatically released by the pressure of the foot thereon.

10. The propelling-wheel, its drum having notches undercut at the front and rear, the spring to turn the drum backward, the strap, the lever, the dog to engage the drum and limit its rotation, and the spring to disengage the dog, said parts combined for joint operation, substantially as described, whereby the lever may be secured in its depressed position and automatically released by the pressure of the foot thereon.

11. In combination with the steering-wheel hung in the inclined rod or shaft, the clamping-screw acting to prevent the rotation of the rod at will.

5 12. In a bicycle, and in combination with a swiveling shaft or fork provided with a steering-wheel and a steering-handle, a locking device, substantially as described, adapted to confine the fork against rotation or to be
10 thrown wholly and permanently out of action at will, whereby the steering-wheel may be

fastened in position when the rider is dismounted, but left wholly and constantly free from the locking device when the machine is in use.

In testimony whereof I hereunto set my hand
in the presence of two attesting witnesses.

HERBERT S. OWEN.

Witnesses:

JOHN T. ARMS,
GEORGE I. HILL.

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