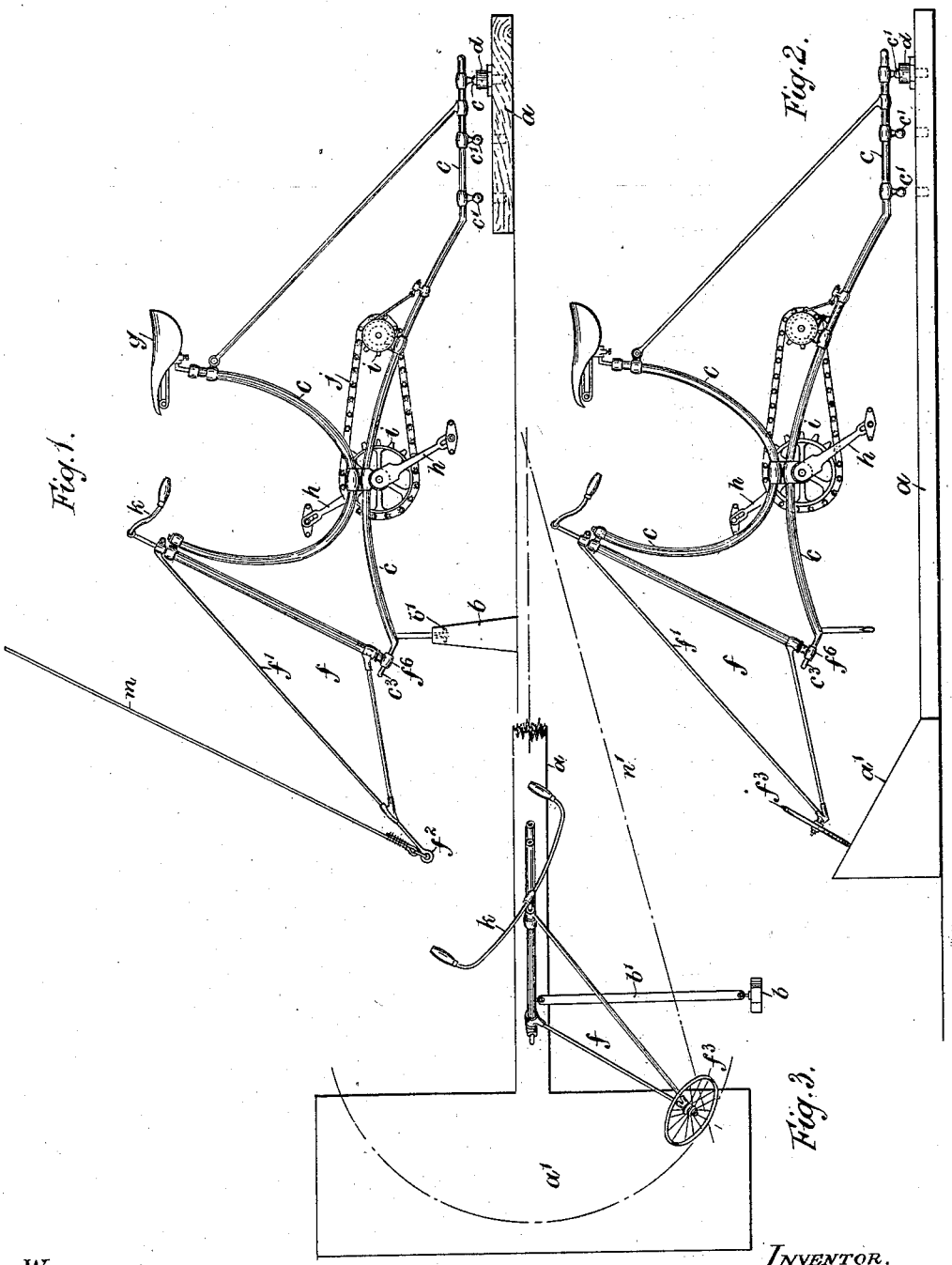
No. 648,551. Patented May 1, 1900.

J. COTTRELL.

BICYCLE TRAINER.

(Application filed Dec. 18, 1897.)

(No Model.) 3 Sheets—Sheet 1.



WITNESSES.

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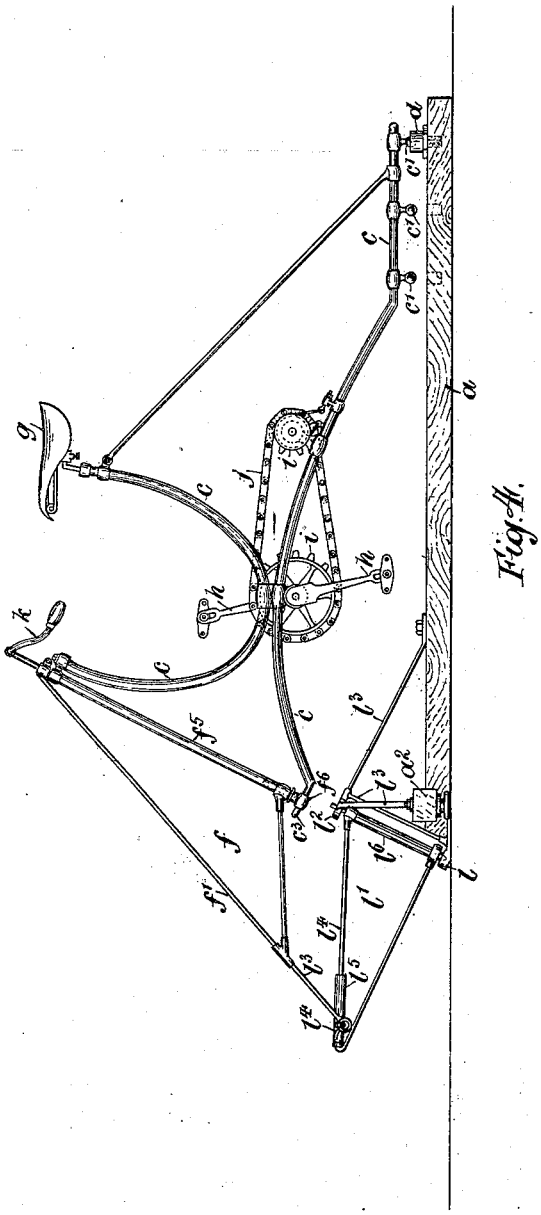

Fig. 4.

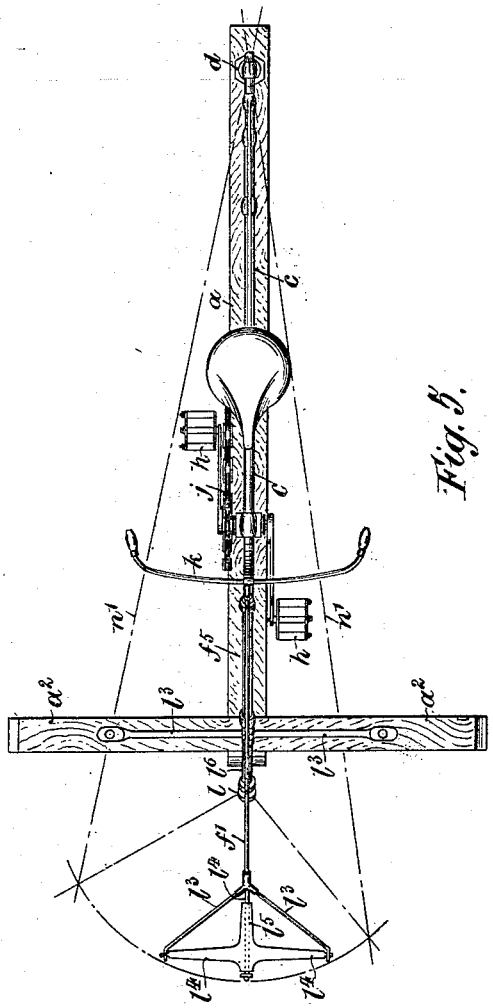

Fig. 5.

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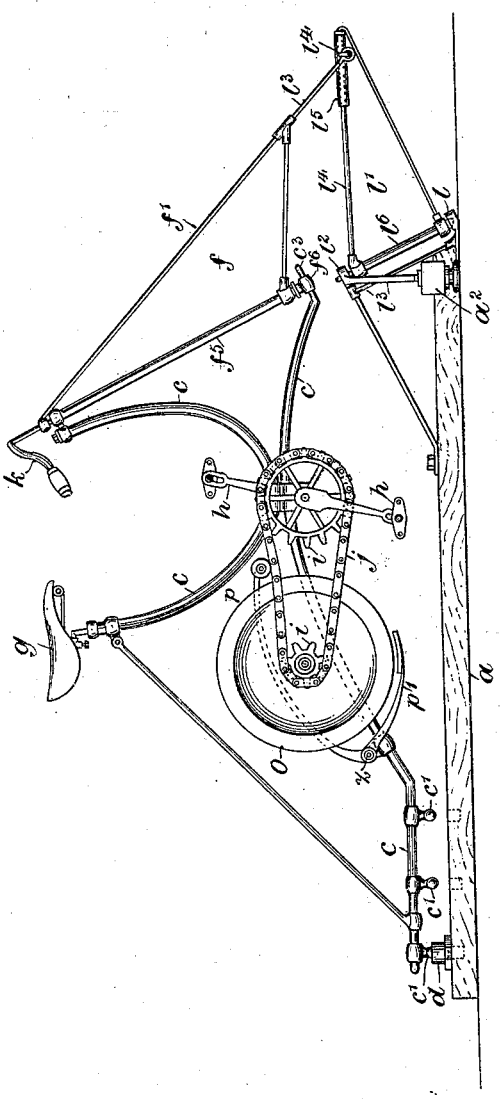

Fig. 6.

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UNITED STATES PATENT OFFICE.

JAMES COTTRELL, OF LONDON, ENGLAND.

BICYCLE-TRAINER.

SPECIFICATION forming part of Letters Patent No. 648,551, dated May 1, 1900.

Application filed December 18, 1897. Serial No. 662,477. (No model.)

To all whom it may concern:

Be it known that I, JAMES COTTRELL, a subject of the Queen of the United Kingdom of Great Britain and Ireland, residing at No. 168 Upper Kennington Lane, London, in the county of Surrey, England, have invented certain new and useful Improvements in Apparatus for Use in Learning Bicycle-Riding, (for which I have obtained the following patent: Great Britain and Ireland, No. 3,480, dated February 15, 1896;) and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being made to the accompanying drawings, which are to be taken as part of this specification and read therewith, and one which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for use in learning bicycle-riding; and the object of it is to teach the art of keeping one's balance on the machine when in motion.

It consists, broadly, in means by which the learner is enabled to shift the base-line of the machine by turning the front end of the said line to the side toward which the rider is falling.

In carrying the said invention into effect I provide a stationary base which contains the major portion of the base-line above mentioned. A frame, which represents the frame of the machine, is in part supported on this base by a suitable device, such as a stud, at the tail of the frame standing in an open cup on the base. The supporting device is adjustable along the frame and base for the purpose of shortening or lengthening the base-line.

The steering-head of the machine is represented by a frame pivoted at the usual angle to the front of the frame above mentioned.

The pivoted steering-frame just described may be supported in front from above or from below.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a side elevation of the apparatus constructed according to the present invention, the brake mechanism being omitted. Fig. 2 is a side elevation of a modified form of apparatus constructed according to the present invention. Fig. 3 is a part plan corresponding with Fig. 2. Fig. 4 is a side elevation of a modified form of the apparatus constructed according to the present invention. Fig. 5 is a plan corresponding with Fig. 4. Fig. 6 is a side elevation of the modified form of the apparatus shown in Fig. 2 with the addition of the brake mechanism.

Referring to Fig. 1, the stationary base consists of a short beam *a*, alined with the base-line, and of a low post *b*, standing to one side of the front portion of the base-line.

c is a suitably-braced frame capable of being, for the purpose of this invention, the equivalent of the frame of the machine.

d is a cup adjustable at various points along the beam *a*. Three possible positions are illustrated. The end of the rear frame *c* is supported by one of as many studs *c'* *c'* *c'* as there are positions for the cup *d*, the one in question engaging in the latter. These studs depend from the rear end of the frame, to which they are made fast in a line parallel with and vertically over the base-line and at a distance thereon corresponding with the distances separating the possible positions of the cup *d*. The object of the above-described variability of the position of the back support of the frame *c* is to shorten or lengthen the base-line. The engagement of one of the studs *c'* in the cup *d* is the functional equivalent of the bearing of the rear wheel of the machine upon the road. The front end of the frame *c*, which is off the base-line, is held to the post *b* by a link *b'*. There is a little play permitted between the said front end and post in order that the frame *c* may be free to rock on the cup *d*.

f is a second frame. It is, for the purpose of this invention, the equivalent of the steering-head of the machine and is for that reason pivoted upon the front of the frame *c*, both the said front, as well as the axis of the frame *f*, being at the usual angle.

g, *h*, *h*, *i*, *i*, *j*, and *k* are the functional equivalents of the usual saddle, pedals, sprocket-wheels, chain, and handle-bar.

For the purpose of supporting the frame *f* from above the lower end or foot f^2 of its front member *f'* is held by a line *m* to an overhead beam or its equivalent. The above-mentioned

bottom end or foot f^2, supported from above, as described, is the equivalent, for the purpose of the present invention, of the bearing of the front wheel of the machine on the road.

Figs. 2 and 3 illustrate a means by which the frame f may be supported from below. The beam a is prolonged in front beyond the frame c and terminates in an incline a'. The horizontal direction of this incline is at right angles to the base; but the direction of the inclined surface is sloped upward from the latter. The foot f^2 above described is replaced by a wheel f^3, pivoted upon the lowest part of the frame f to revolve in a plane at right angles, or thereabout, with that in which the front wheel of the machine revolves.

Figs. 4 and 5 illustrate another means by which the frame f is supported from below. The beam a is prolonged along the base-line as far as the front end of the frame c, where there is made fast to it a transverse beam a^2, projecting from either side thereof. l is a step-bearing fixed in the base-line in front of the prolonged beam a. l' is a frame pivoted in the step-bearing l and in a supplementary bearing l^2, supported by four struts l^3 above the former at a suitable height. The axis of the frame l' is inclined to the horizontal. The front end or nose of the frame l' projects forward far enough to be alinable with the front member f' of the frame f, which member is continued downward till its foot rests upon the front end or nose of the frame l'. The two (foot and front end) may be connected together by any suitable means. The one illustrated consists of struts l^3, pivotally connected to the outer ends of a pair of arms l^4, projecting right and left from a sleeve l^5, adapted to rock upon the top member l^4 of the frame l'.

It is preferred that the backstays f^5 l^6 of the frames f and l, respectively, should not be alined with each other, and, further, that the stay f^5 be more to the front than the stay l^6. This arrangement requires the presence of a self-adjusting device between the frame f and the frame c. The device in question may be of any suitable type. The one illustrated consists of a nose c^3, being a part of the frame c, fitting into a socket f^6 on the bottom end of the backstay f^5.

Obviously either the wheel f^3 and the incline a^2 between them or the struts l^3, together with the arms l^4, constitute, respectively, the functional equivalent of the bearing between the front wheel and the road.

The beam a in any of the lengths described above may be dispensed with, the cup d being fixed to the floor direct.

The apparatus is used, as far as mounting and dismounting, sitting, and pedaling, in the same way as heretofore.

Figs. 3 and 5 indicate how the present invention works. As soon as the rider feels any loss of balance he turns the frame f to the side toward which he is falling. This has the effect of turning the base-line on its rear end as a pivot and of thereby shifting it. It does not matter by which of the three described means the frame f is supported or whether it is supported by any other. The result is the same. The base-line is shifted, with the necessary result that the equilibrium is restored. The dot-and-dash line n from the broken-off end of the beam a in Fig. 3 represents the normal base-line. The one n' in the same figure represents its new position when shifted, produced by turning the frame f to the left. The dot-and-dash lines in Fig. 5 further illustrate the turning of the normal base-line or the establishment of new ones.

In Fig. 6 the apparatus is the same as that shown in Fig. 2, with the exception that it has in addition a device intended as the equivalent of or substitute for the momentum of the machine on the road in order that the learner will have as nearly as possible the same conditions and experience. The device in question consists of a heavy fly-wheel o, loosely mounted on the axle of and fitted to the back sprocket-wheel i. A brake formed of two arms or members p p', mounted on the bottom stay c, the member p being longer and consequently heavier than the other member p', causes a small roller on its end to bear on the driving-chain j. The two members of this brake-lever may be connected to enable them to be adjusted and to move in one rigid piece, having its fulcrum at z. When the chain is in tension, the arm p is raised by it, and the other arm p' consequently brought into contact with the periphery of the fly-wheel, producing the required friction, and consequently having a retarding effect on the motion of the crank-spindle, as desired.

I claim—

1. An apparatus for use in learning bicycle-riding, consisting of the combination of two frames hinged together, and supported at the extremities only, in such manner as to be free to fall sidewise to either side, means for seating the user and handle-bar for turning the front frame so as to deflect the base-line, substantially as described.

2. An apparatus for use in learning bicycle-riding consisting of the combination of two frames hinged together and supported at the extremities only, in such manner as to be free to fall sidewise to either side, means for seating the user, handle-bar for turning the front frame so as to deflect the base-line, and pedaling-gear and wheel-brake, carried by the frame, all as and for the purposes described and set forth.

3. In an apparatus for learning bicycle-riding the combination with pedaling-gear, the two hinged or pivoted frames, and means for seating the user, of a brake pivotally connected to said frame so as to be capable of movement in the vertical plane only, composed of two members or arms, one of which is longer than the other, jointed together at

one end, their other or free extremities bearing, the longer arm a roller and the shorter one a brake-shoe, the said roller resting continually on the top of the driving-chain, and the brake-shoe resting near to the periphery of the fly-wheel, so that tension of driving chain or band automatically applies the brake to a more or less degree to retard the motion, but never so hard as to stop the fly-wheel dead, substantially as described and illustrated.

4. In an apparatus for learning bicycle-riding the combination with the driving-gear and the frame of a brake pivotally connected to said frame so as to be capable of free movement in the vertical plane only, composed of two members or arms one of which is longer than the other loosely jointed together at one end, their other or free extremities bearing, the longer arm a roller and the shorter one a brake-shoe, the said roller resting continually on the top of the driving-chain, and the brake-shoe resting near to the periphery of the fly-wheel, so that tension of driving chain or band automatically applies the brake to a more or less degree to retard the motion, but never so hard as to stop the fly-wheel dead, substantially as described and illustrated.

In witness whereof I have hereunto affixed my signature, in presence of two witnesses, this 1st day of December, 1897.

JAMES COTTRELL.

Witnesses:
R. A. BLAKE,
FRED C. HARRIS.