

(No Model.)

J. HUTSON.
TRAINING APPLIANCE FOR BICYCLES.

No. 547,168.

Patented Oct. 1, 1895.

FIG. 1.

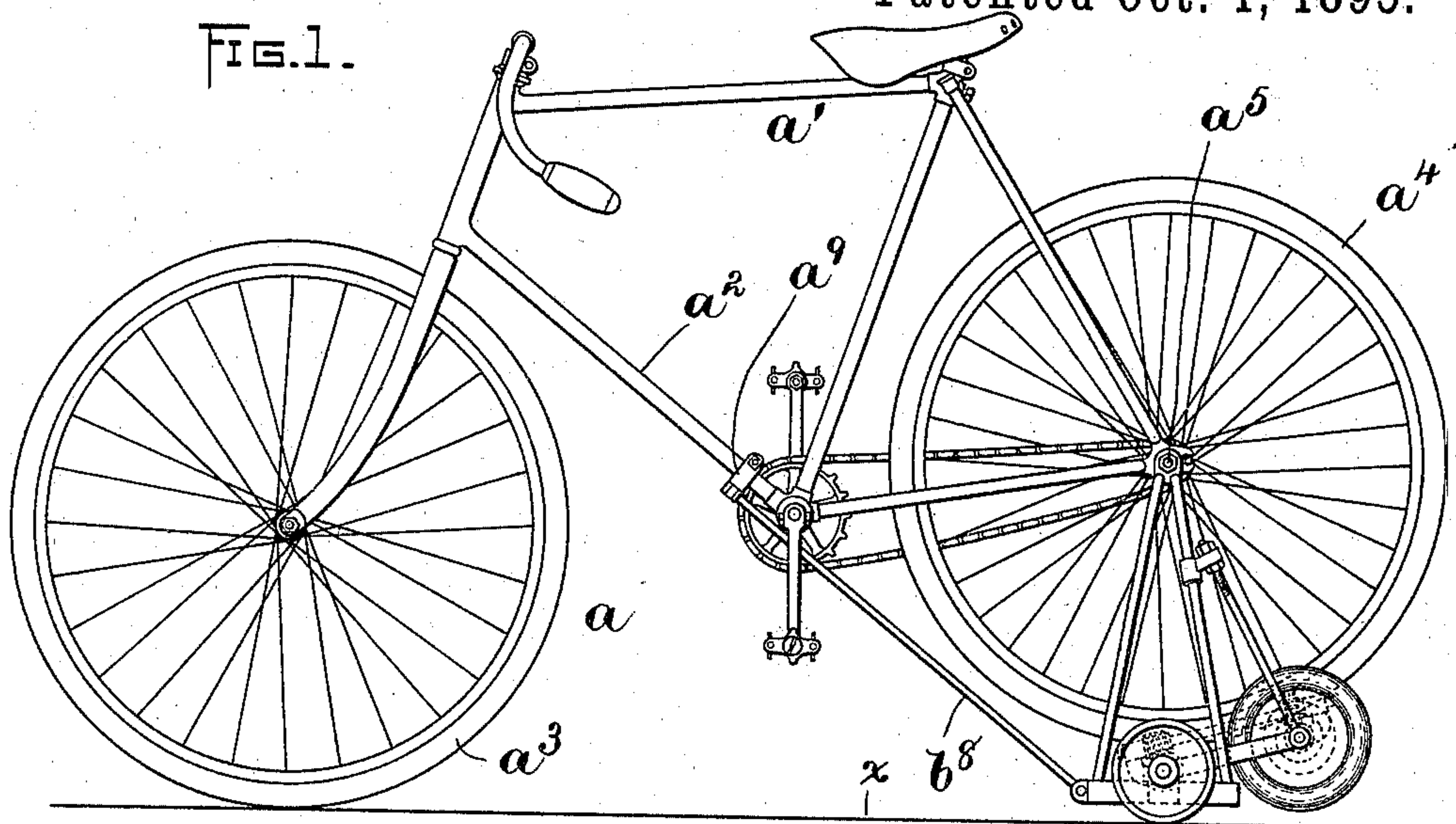


FIG. 2.

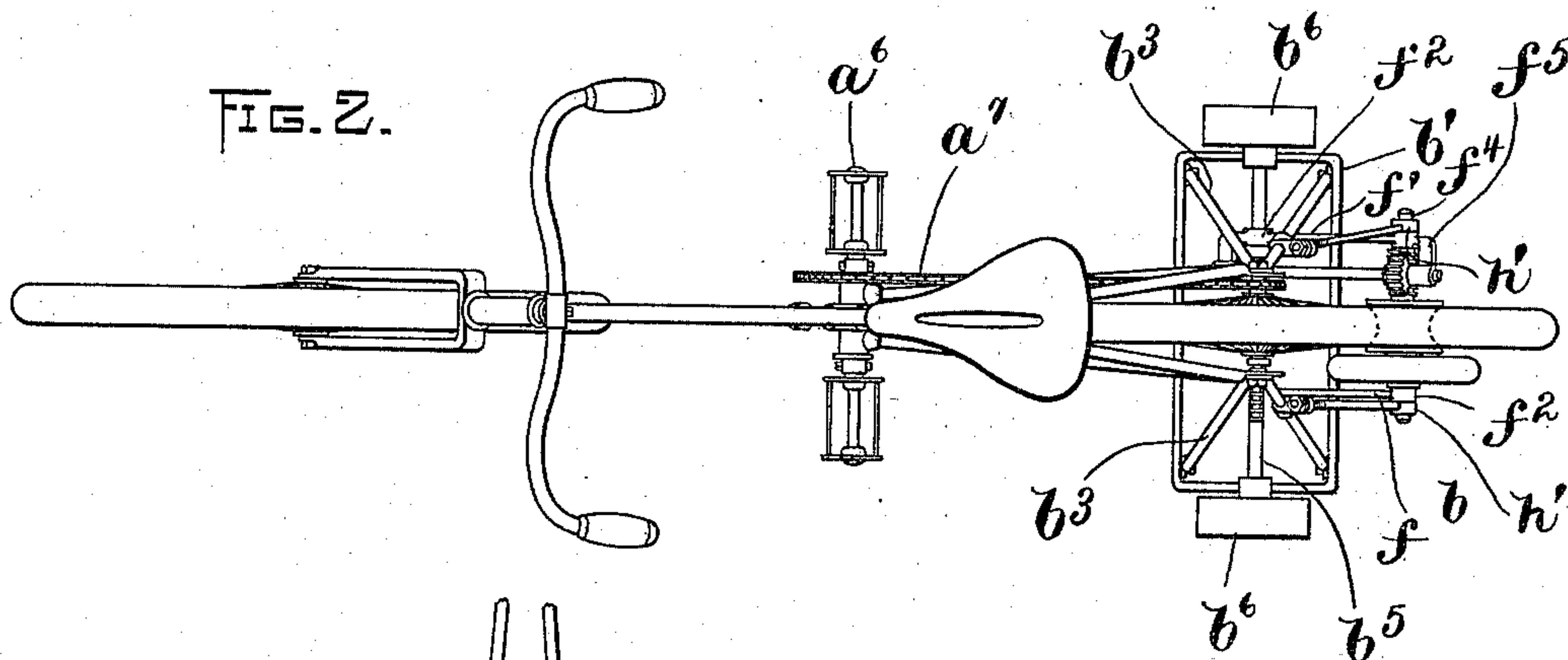


FIG. 3.

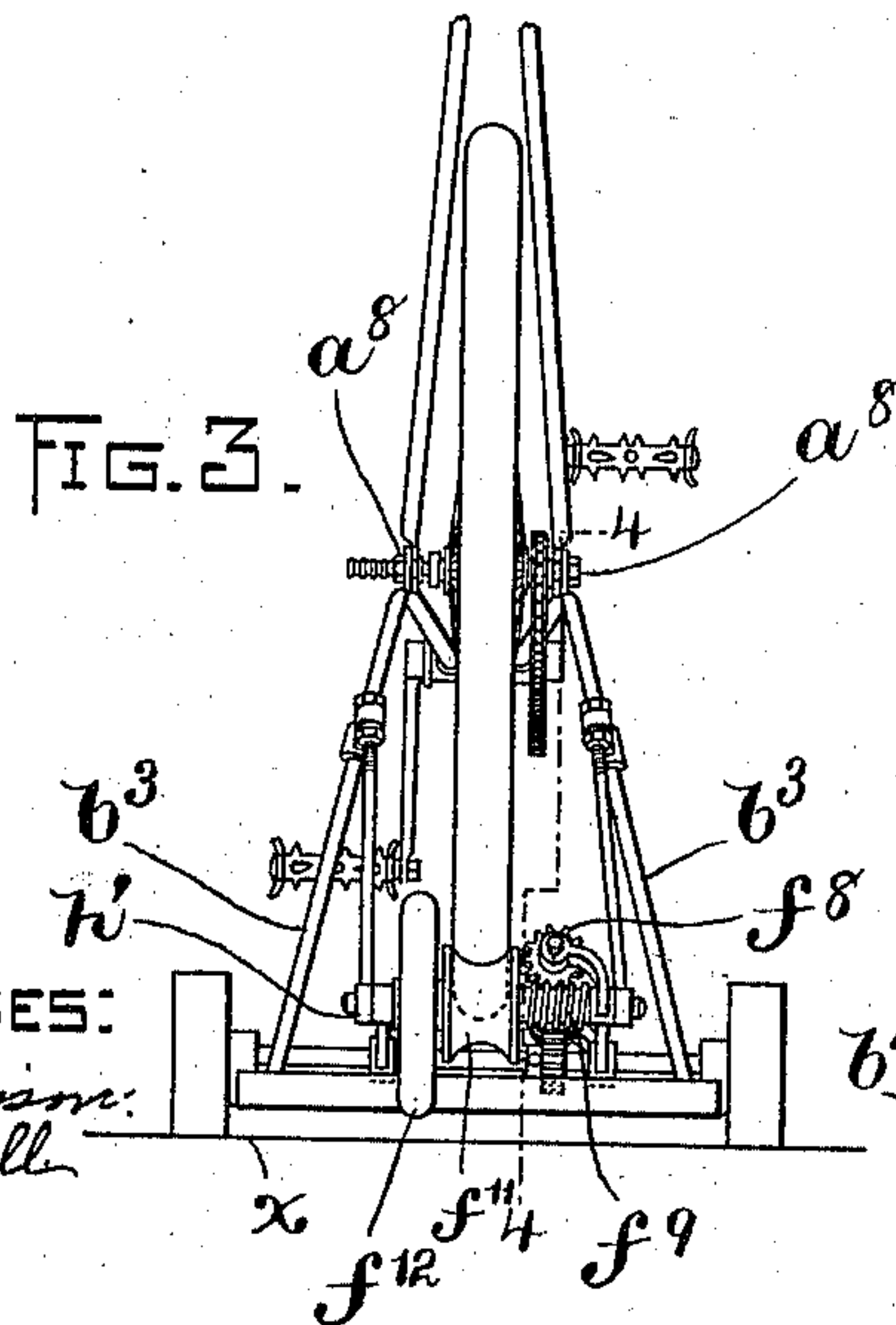
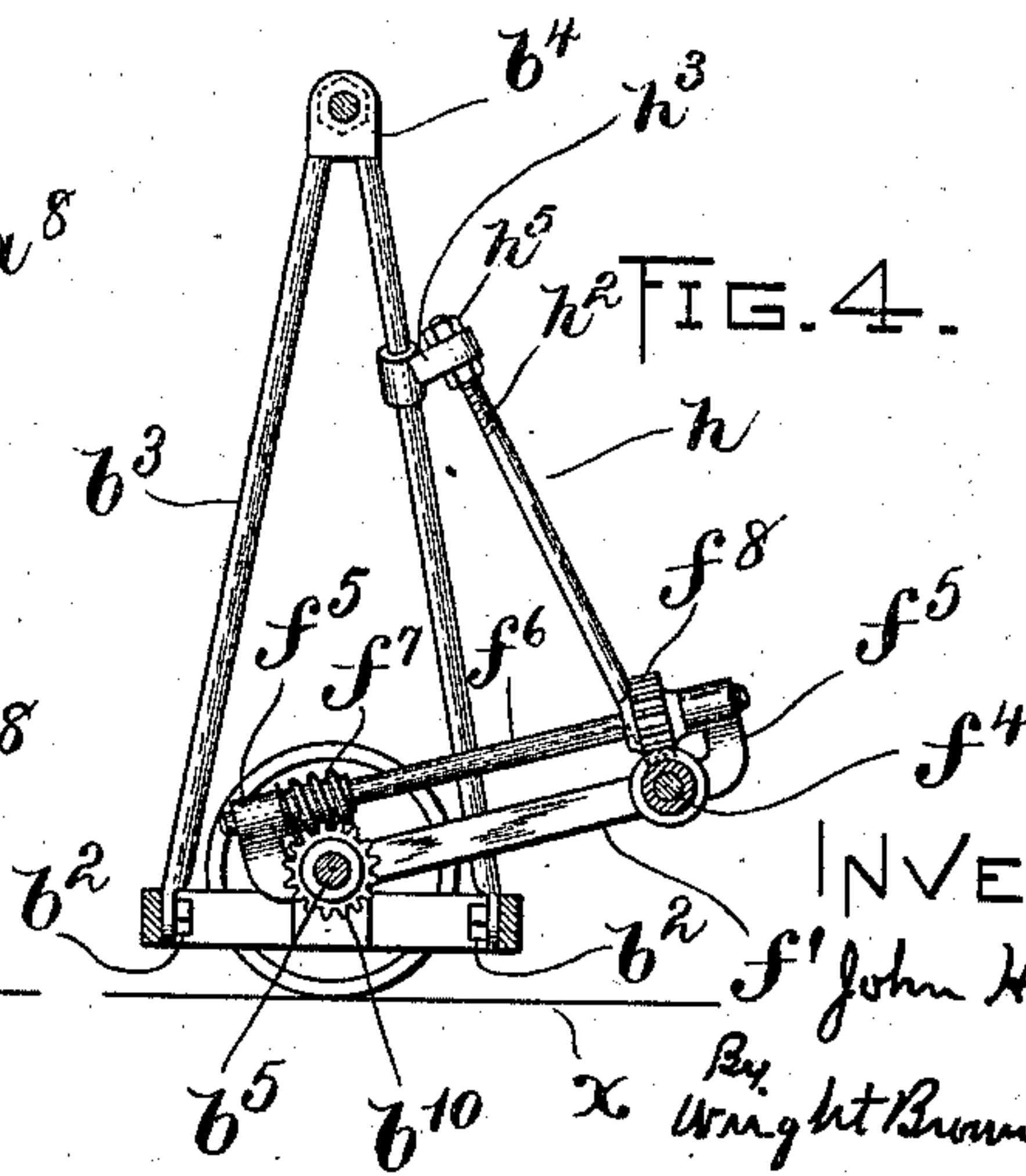


FIG. 4.



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UNITED STATES PATENT OFFICE.

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TRAINING APPLIANCE FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 547,168, dated October 1, 1895.

Application filed July 11, 1895. Serial No. 555,603. (No model.)

To all whom it may concern:

Be it known that I, JOHN HUTSON, a subject of the Queen of Great Britain, residing at Brighton, England, have invented certain new and useful Improvements in Training Appliances for Bicycles, of which the following is a specification.

This invention relates to an improvement in training appliances for bicycles; and it consists in the novel features of construction and relative arrangement of parts hereinafter fully described in the specification, clearly illustrated in the drawings, and particularly pointed out in the claims.

Reference is to be had to the accompanying sheet of drawings, forming a part of this specification, in which like characters indicate like parts wherever they occur.

In the drawings, Figure 1 represents a side elevation of a training appliance constructed in accordance with my invention. Fig. 2 represents a top plan view thereof. Fig. 3 represents a rear elevation of a portion of the mechanism shown in Fig. 1. Fig. 4 represents in side elevation a detailed sectional view taken on the line 4 4 of Fig. 3.

This invention is particularly applicable to bicycles, although it may be used with devices of this kind having any number of wheels. It is highly desirable that some means be devised whereby invalids or parties desiring exercise may be enabled to use their bicycles within doors in inclement weather or in winter. At present the only means for analogous exercise at their disposal is a stationary standard on which is mounted a shaft carrying pedals and restricted in its movement by certain friction-creating adjustments. This appliance is objectionable for the reason that the only resemblance between this appliance and actual riding is the movement of the feet and legs in connection with the pedals. There is no forward movement of the machine at all. By my invention, however, these objections are overcome. When the appliance is properly connected to the bicycle, the rider is propelled in the same manner as if the bicycle were disconnected from the appliance, and the rider experiences the forward movement of the machine and

appliance as a result of the movement of the pedal-shaft, the speed of the appliance being reduced from that of the rear wheel of the bicycle through certain speed-reducing devices arranged at any ratio. In practice, however, I have found it best to so construct the reducing devices that the appliance shall move at the rate of about fifteen feet while the periphery of the rear wheel of the bicycle is turned a distance corresponding to a mile. Manifestly, any other ratio might be adopted. Moreover, my appliance is so constructed that it may be immediately adjusted to any bicycle without disarranging the parts of the latter, and the appliance is further so constructed that its several members fold upon each other into a compact form for carrying or transportation.

My invention may be carried out in many ways and includes a training appliance to be used in connection with a bicycle which permits a forward movement of the rider corresponding to the movement of the bicycle when separated from the appliance, the only difference being that the rider moves at a different rate of speed in the two cases.

Referring to the drawings, *a* represents a bicycle of any preferred construction, consisting of the framework *a'*, having the usual connecting-bar *a²*, front wheel *a³*, rear wheel *a⁴*, rear-wheel shaft *a⁵*, pedals *a⁶*, and sprocket-chain *a⁷*.

b represents my improved training appliance, consisting of a suitable framework *b'*, here shown as rectangular in shape, although the precise form is immaterial. Connected to each end of said framework by bolts *b²* is a pair of uprights *b³*, connected at their upper ends by a perforated ear *b⁴*, the protruding ends of the axle *a⁵* of the wheel *a⁴* being designed to enter the perforations in the said ears, and the said ears adjustably locked upon the axle by means of suitable nuts *a⁸*. By this means the rear wheel is supported by the framework through the medium of the uprights.

b⁵ represents a shaft suitably journaled in the framework *b'* and provided at its ends with rollers *b⁶*, fast on said shaft, designed to rest upon the floor, represented by a line *x*

in Figs. 1, 3, and 4. As the rear wheel a^4 is turned through the medium of the pedals and sprocket-chain, this movement is communicated to the shaft b^5 , thus turning the rollers b^6 and causing the bicycle and its connected appliance to move forward or backward, as the case may be. b^8 represents a brace-rod pivoted at one end to said framework and at its other end connected to the bar a^2 or any desired part of the bicycle-frame by a suitable clamp a^9 , the purpose of this brace-rod being to steady the appliance and prevent any pivotal movement thereof on the axle a^5 .

$f f'$ represent two arms provided at either end with perforated ears f^2 , in which are loosely arranged, respectively, the shaft b^5 and a shaft f^4 . The arm f' is also provided at either end with a perforated lug f^5 , and in these lugs is loosely journaled a shaft f^6 , with a screw f^7 arranged to engage a spur-gear b^{10} on a shaft b^5 , and at its other end the shaft f^6 is provided with a spur-gear f^8 , fast on said shaft and arranged to engage a worm f^9 on the shaft f^4 . Rigidly mounted upon the shaft f^4 is a friction-pulley f^{11} and a fly-wheel f^{12} . The pulley f^4 is preferably grooved for engagement with the tire of the bicycle, although it may have any other configuration desired, the purpose of the fly-wheel being to create enough momentum in order to overcome dead-centers.

h represents two rods provided at one end with a perforated lug h' and screw-threaded at their other ends, as at h^2 . The perforated ends of these rods h are adapted to fit over the ends of the shaft f^4 , while the screw-threaded ends h^2 of said rods are designed to be arranged in perforations formed in lugs h^3 , that are fast on the rear members of the uprights b^3 , the said rods being retained in these lugs by means of suitable nuts h^5 .

By means of the mechanism just described the shaft f^4 and the friction-pulley f^{11} may be raised and lowered in order to adjust the same to the different-sized wheels and also for the purpose of creating friction, so that the rear wheel may be made to turn with any desired degree of difficulty, thus giving the effect of a hill or permitting the rider to exercise any desired amount of strength or effort.

When it is desired to use the appliance, the ears b^4 are slipped over the end of the axle a^5 and the brace b^8 secured to the bar a^2 . The shaft f^4 is then raised or lowered, as desired, by means of the rods h , in order to bring the friction-pulley f^{11} against the periphery of the wheel a^4 in any desired degree of adjustment. It will thus be seen that the rear wheel is raised from the floor and supported by the rollers b^6 and that any movement imparted to the wheel a^4 will be communicated to the friction-pulley f^{11} ; thence to the shaft f^4 , gear f^8 , shaft f^6 , worm f^7 , gear b^{10} to the shaft b^5 , and thence to the rollers b^6 , the fly-wheel f^{12} creating sufficient mo-

mentum to overcome dead-centers. The speed of the rear wheel is reduced by means of the two sets of worms and their complementary gears, so that the rollers b^6 will carry the appliance and the bicycle along at the rate of fifteen feet, while the periphery of the wheel a^4 is turned through a distance corresponding to a mile, or any other desired ratio may be produced by suitably constructing and arranging the reducing mechanism.

From the foregoing it will be seen that I have invented an exceedingly-simple device for the purpose in hand—one which can be readily applied to any bicycle and which will permit bicycle-riders to use the machines within doors, the same as upon the race-track or a roadway, and one by which the rider can obtain all the advantages of exercise or training possible with a bicycle, since, while the resulting speed of the appliance and bicycle may be slow, yet the rotation of the rear wheel and pedal-shaft may be carried to the limit of the ability of the rider the same as if he were upon the road, and, furthermore, the rider is enabled to lay out as much energy as he desires by means of the adjustment provided by the rods h .

The use of my appliance is not limited to any particular form of exercise and may be used in indoor races or in connection with any matter within which a bicycle is employed.

If desired, the framework of the appliance may be dispensed with and the standards employed to connect the axle of the bicycle and the shaft. I prefer the framework, however, by reason of the rigidity it affords.

Having thus explained the nature of my invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim, and desire to secure by Letters Patent, is—

1. A training appliance comprising in its construction a suitable framework, adapted for adjustment to the rear hub of a bicycle, a shaft mounted upon said framework and provided with supporting rollers, a rotary member connected with said framework, and adapted to be driven by the wheel of said bicycle, and speed reducing means between said rotary member and said shaft, substantially as and for the purpose set forth.

2. A cycle having its driven axle supported in a roller-supported frame or carriage, and connected to the axle of said roller-supported frame or carriage by speed reducing gear, substantially as and for the purpose set forth.

3. In a training appliance, in combination, a frame or carriage adapted to support the rear end of a bicycle, a roller-provided shaft mounted in said framework, arms loosely mounted at one of their ends upon said shaft, a shaft f^4 mounted in the free ends of said arms, means for adjusting the free ends of said arms, a rotary member carried by said

shaft f^4 , and adapted to be driven by some movable part of a bicycle, and speed reducing means including a worm gear, between said shaft f^4 and said first mentioned shaft, substantially as and for the purpose set forth.

5 In testimony whereof I have signed my name to this specification, in the presence of

two subscribing witnesses, this 29th day of June, A. D. 1895.

JNO. HUTSON.

Witnesses:

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W. P. ABELL.