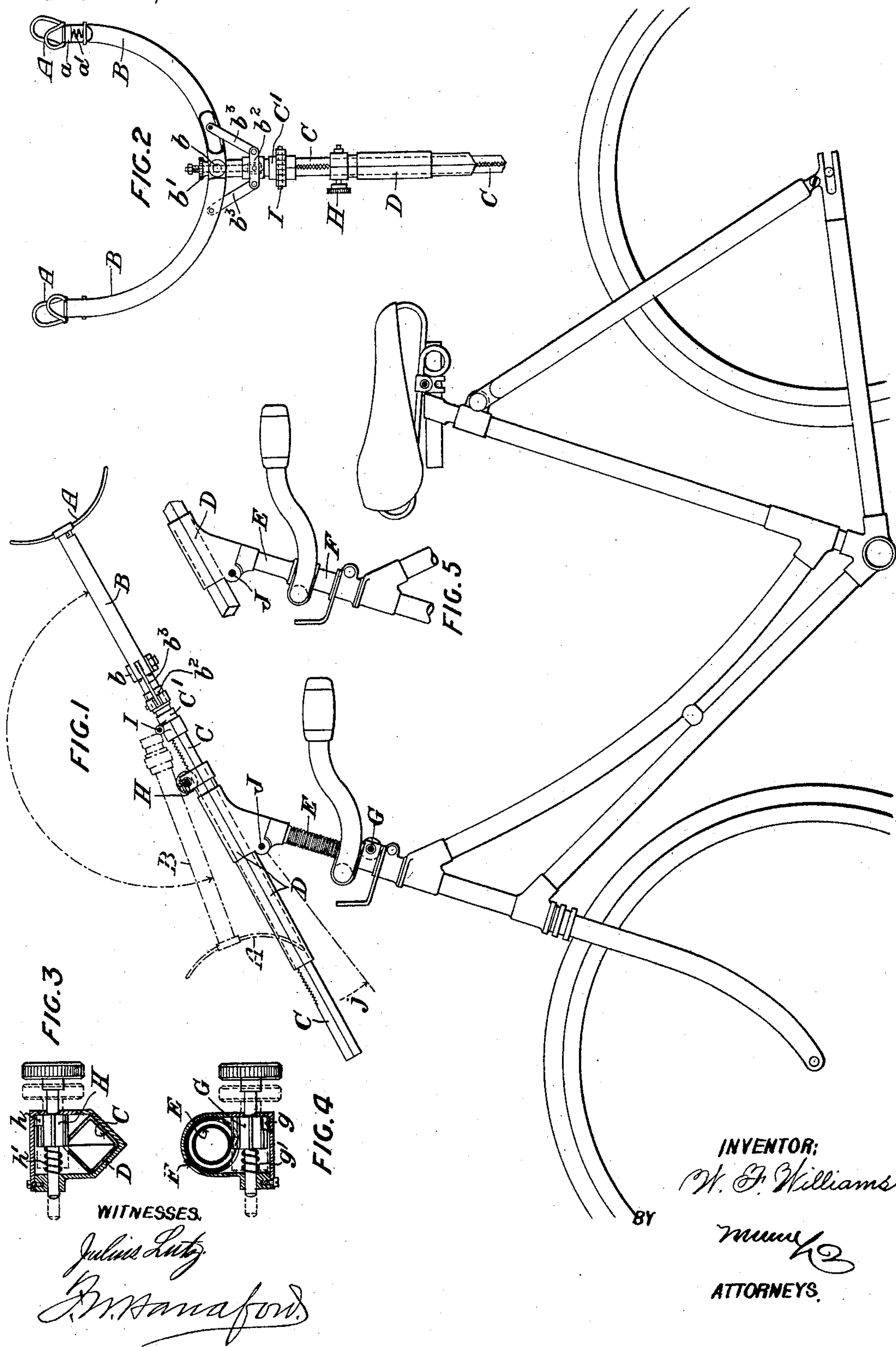


(No Model.)

W. F. WILLIAMS.
BICYCLE OR TRICYCLE.

No. 603,545.

Patented May 3, 1898.



UNITED STATES PATENT OFFICE.

WILLIAM FREDERICK WILLIAMS, OF LONDON, ENGLAND.

BICYCLE OR TRICYCLE.

SPECIFICATION forming part of Letters Patent No. 603,545, dated May 3, 1898.

Application filed December 7, 1896. Serial No. 614,770. (No model.) Patented in England June 12, 1896, No. 12,997.

To all whom it may concern:

Be it known that I, WILLIAM FREDERICK WILLIAMS, gentleman, a subject of the Queen of Great Britain, residing at 32 Shaftesbury avenue, London, England, have invented an Improvement in Bicycles or Tricycles, (for which I have obtained a patent in Great Britain, No. 12,997, bearing date June 12, 1896,) of which the following is a specification.

My invention relates to a cyclist's shoulder-abutment of the kind described in the specification of previous Letters Patent granted to me dated the 28th day of April, 1896, No. 559,244, having for its object to afford a point of resistance for the rider's shoulders to bear against in such a manner as to enable the muscles of the body to be brought more efficiently into play, so as to cooperate with and supplement those of the legs for the purposes of propulsion, the abutment by counteracting the tendency to stoop insuring an erect carriage of the rider's body and promoting the development of the chest muscles and the healthy action of the organs of the body.

The apparatus forming the subject of my former patent was also designed to control the steering of the machine; but in the present example the steering is performed by means of the ordinary handle-bar in the usual way independently of the shoulder-abutment, which does not participate in the steering motion, although it is free to swivel in order to accommodate itself to the inflections of the body in riding and steering.

The object of the present improvements is to permit of this independent swiveling motion of the abutment to provide improved means of adjustment in order to adapt the abutment to suit the requirements of the rider and to enable the abutment to be turned over out of the way when not required.

These improvements will be described with reference to the accompanying drawings, wherein—

Figure 1 is a side elevation representing the abutment in position for use and also (in dotted lines) as turned over out of the way when not required, parts being in section to show details of the adjustments, which are shown separately in Figs. 2, 3, and 4. Fig. 5 shows a modification.

The abutment appliance consists of a pair

of crutch-like supports A, (padded, if desired,) which are adapted by their form and position to receive a forward thrust from the rider's shoulders. These supports A are pivoted at *a* in the tubular ends of a fork B, to which they are connected by springs *a'*, suitably attached, whereby the supports A are held normally in one position, while free to swivel to a limited extent.

The fork B is carried by a rod CC', inclined in the fore-and-aft direction and sliding through a socket D. This socket D is pivoted at J on a spindle E, received in a socket in the handle-bar spindle F or in or attached to the head of the frame, so that the one is free to turn independently of the other. This independence and also the adjustment as to height of the apparatus as a whole when such adjustment is required is provided for by making the spindle E as a cylindrical rack, with which gears an adjusting-pinion G. This pinion is self-locking in order to support the spindle E firmly at any height, and for this purpose the pinion-axis is free to slide longitudinally in its journal-bearings sufficiently to allow of the pinion being moved in and out of endwise engagement with fixed teeth *g*, forming a sort of clutch carried by the adjacent journal-bearing, as shown in Fig. 4, the pinion being of such breadth as to always remain in gear with the rack and being forced into locking engagement with the teeth *g* by a spring *g'*, which must be overcome in order to disengage the pinion and effect the vertical adjustment of the rack-spindle E. In addition to this adjustment for height of the apparatus as a whole the joint J permits of self-adjustment of the shoulder-supports A in the upward direction, while, being in the form of a knee-joint, it maintains them at a minimum height.

The forked frame B may be made to suit the average breadth of the shoulders, or its members may be jointed on a common center *b* to the part C' of the rod C, as shown, and be made adjustable for width by a nut *b'*, screwing on a rod connected to a sliding collar *b²*, which is in turn connected to the fork members by links *b³*. The part C of the inclined fore-and-aft rod is of square or other section adapted to prevent it turning in its socket, and it is formed as a rack, with which

gears a pinion H, so that besides the joint J two separate rack adjustments are provided for the shoulder-supports, one by the pinion G in the direction of height and one by the pinion H in the fore-and-aft direction.

Instead of the rod C being of square section, as shown, it might be of round section with a longitudinal key or feather sliding in a corresponding keyway in the socket to prevent it turning, the feather being cut as a rack for engagement by the pinion H.

The pinion H is self-locking by a clutch-like engagement with fixed teeth *h* in its casing, the pinion being journaled to slide longitudinally and pressed into engagement with the teeth *h* by a spring *h'*. The members C C' of the rack-rod are pivotally jointed at I to enable the forked frame B and shoulder-supports A to be folded over toward the front, as represented in dotted lines, so as to be out of the way when not required to be used, a further forward-folding motion in the direction of the arrow *j* being permitted by the joint J. The joint I, being also in the form of a knee-joint, supports the member C' in line with the member C, and the two act as a rigid rod under compression without needing any means of locking them when the shoulder-support is in the operative position.

The adjustment for height may in some cases be dispensed with, the spindle E then being plain and provided with a shoulder resting on the top of the socket in which it turns, as shown in Fig. 5.

The invention also comprises the application of the herein-described self-locking pinion-and-rack adjustment to the saddle-pillar in lieu of the clamp now used, the pillar and its socket being made of a suitable sectional form or provided with a longitudinal feather to prevent turning of the pillar in the socket, the pillar or its feather being cut as a rack for engagement by the pinion, which is made self-locking, as above described, in respect of the pinions G and H.

I claim—

1. In the herein-described shoulder-abutment, consisting of a shoulder-crutch-carrying fork jointed to an inclined fore-and-aft rod by a knee-joint so that it may fold and yet be supported rigidly in operative position, the rack-rod fitted to slide without turning in a socket, in combination with a self-locking adjusting-pinion mounted in a casing on said socket so as to gear with the rack but free to slide endwise in its journal-bearings and with a fixed clutch at one end adapted to be engaged by the pinion, and a spring at the other end adapted to force the pinion into engagement with the clutch and to permit its disengagement therefrom for the purpose of effecting the fore-and-aft adjustment of the inclined rack-rod, substantially as specified.

2. In the herein-described shoulder-abutment, the vertical spindle of the guide-socket for the inclined fore-and-aft rack-rod free to slide and turn in a socket in the handle-bar spindle and formed as a cylindrical rack, in combination with a self-locking adjusting-pinion mounted in a casing on the handle-bar spindle so as to gear with said cylindrical rack, the pinion being free to slide endwise in its journal-bearings and being combined with a fixed clutch at one end adapted to be engaged by the pinion, and with a spring at the other end adapted to force the pinion into engagement with the clutch and to permit of its disengagement therefrom for the purpose of effecting the vertical adjustment of the rack-rod, substantially as specified.

3. The combination with a bicycle, of a post thereon, a socket pivoted to the post, a rack sliding in the socket, a pinion mounted on the socket and engaging the rack, a forked frame having a knuckle-joint connection with the rack, and a shoulder-support attached to each arm of the forked frame.

WILLIAM FREDERICK WILLIAMS.

In presence of—

C. G. CLARK,

T. W. KENNARD.