

(No Model.)

2 Sheets—Sheet 1.

J. A. DUNNING & K. BARROW.

STEERING GUIDE FOR BICYCLES.

No. 606,525.

Patented June 28, 1898.

Fig. 1.

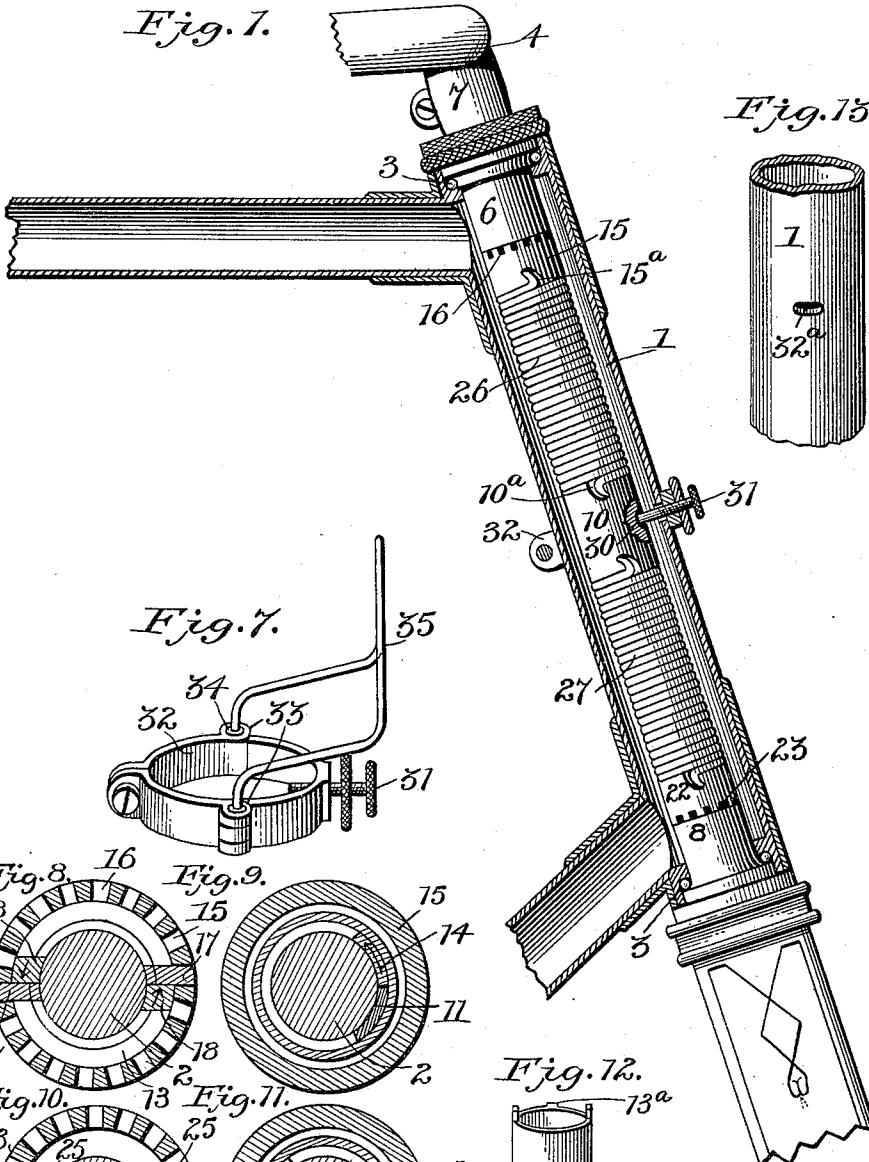


Fig. 15.

Fig. 7.

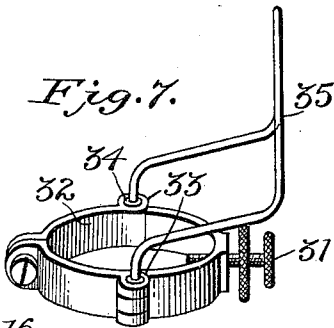


Fig. 8.

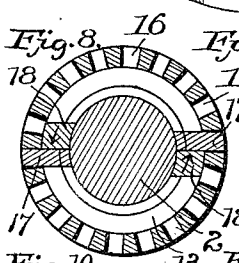


Fig. 9.

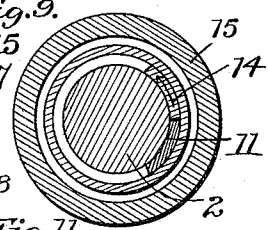


Fig. 10.

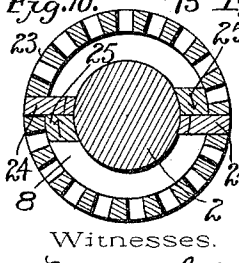


Fig. 11.

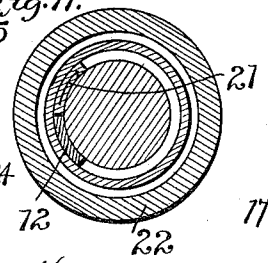
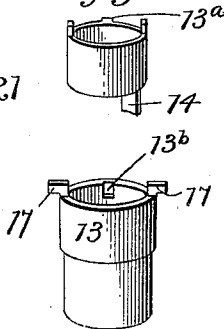


Fig. 12.



Witnesses.

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(No Model.)

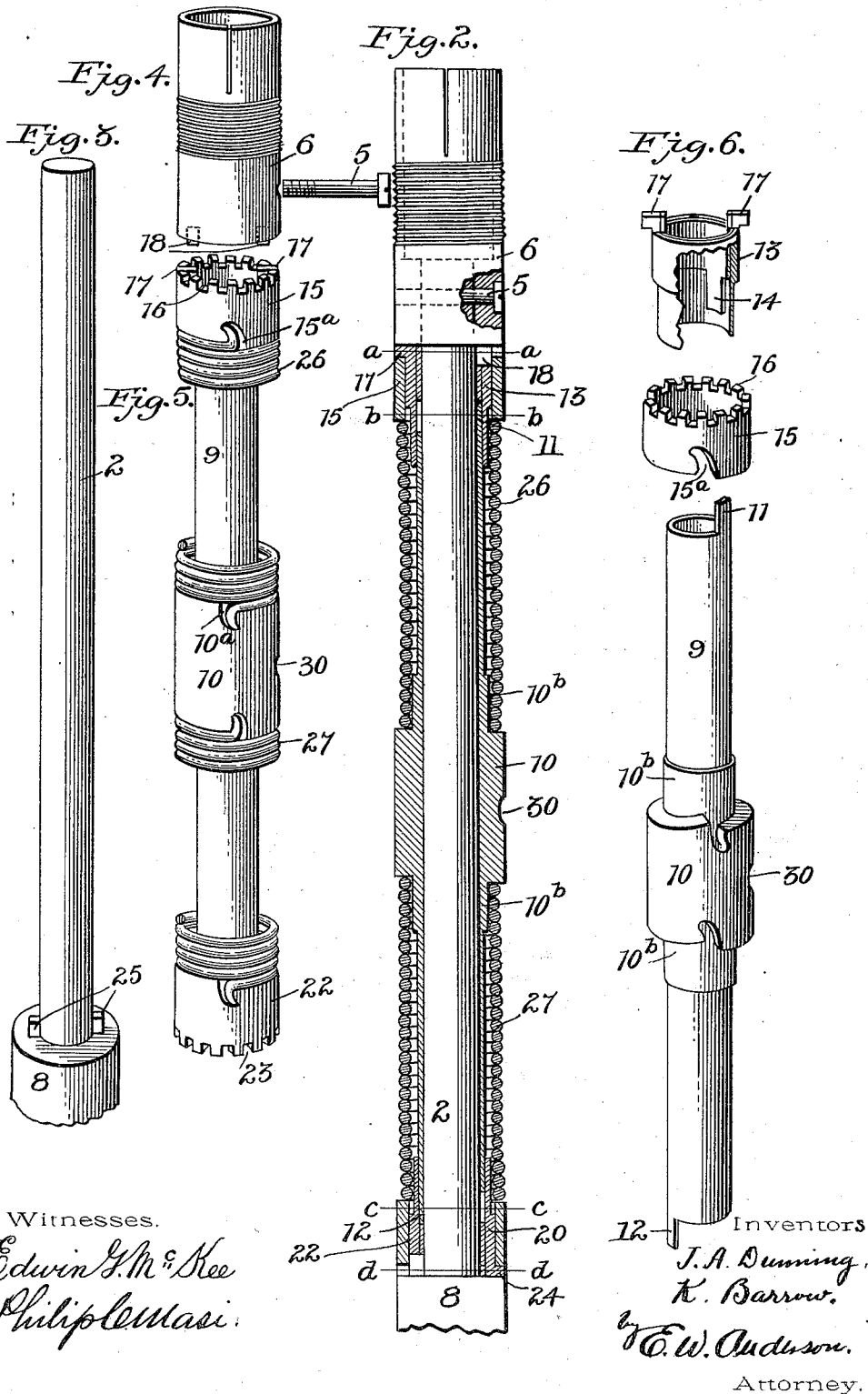
2 Sheets—Sheet 2.

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STEERING GUIDE FOR BICYCLES.

No. 606,525.

Patented June 28, 1898.



UNITED STATES PATENT OFFICE.

JAMES A. DUNNING, OF AULANDER, NORTH CAROLINA, AND KENNETH BARROW, OF NORFOLK, VIRGINIA.

STEERING-GUIDE FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 606,525, dated June 28, 1898.

Application filed November 20, 1897. Serial No. 659,265. (No model.)

To all whom it may concern:

Be it known that we, JAMES A. DUNNING, of Aulander, county of Bertie, and State of North Carolina, and KENNETH BARROW, of Norfolk, in the county of Norfolk and State of Virginia, citizens of the United States, have invented certain new and useful Improvements in Steering-Guides for Bicycles; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

Figure 1 is a sectional view of the front portion of a bicycle-frame, showing the invention applied thereto. Fig. 2 is a view, partly in section, showing the fork-spindle removed from the head, with the invention applied. Fig. 3 is a perspective view of the fork-spindle. Fig. 4 is a detail perspective view of the sleeve 6. Fig. 5 is a perspective view of the spring-carrying sleeve and its adjuncts removed from the fork-spindle and with portions of the springs broken away. Fig. 6 is a perspective view of the spring-carrying sleeve and upper clutch, the latter being shown as separated and removed from the sleeve. Fig. 7 is a detail perspective view of the clip and lamp-bracket. Figs. 8, 9, 10, and 11 are cross-section views taken, respectively, on the lines *a a*, *b b*, *c c*, and *d d*, Fig. 2. Figs. 12 and 13 are detail perspective views of the upper clutch-sleeve.

This invention is designed to provide a steering-guide of improved character for bicycles which will operate to give the front wheel a decided tendency to keep in the line of movement of the machine and also to return the wheel to such position after lateral deflection thereof in either direction, while at the same time it does not materially interfere with or diminish the full control thereof by the rider.

Other and more particular objects and advantages of the invention will hereinafter appear.

With these objects in view the invention consists in the novel construction and com-

bination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, the numeral 1 designates the head of a bicycle-frame. 2 is the fork-spindle, which is journaled in the said head upon the usual upper and lower ball-bearings 3, and 4 is the handle-bar stem. The fork-spindle 2 is of reduced diameter within the head, (see Fig. 3,) and detachably secured to its upper portion by a screw 5 or by other suitable means is a split sleeve or tube 6, into which the handle-bar stem telescopes and in which it is secured by the usual clamp 7 or by any other suitable means.

9 is a sleeve which is slipped loosely upon the reduced portion of the spindle, between the lower end of the sleeve 6 and a shoulder 8 of the spindle a short distance above the lower ball-bearing 3. This sleeve has an enlarged central portion 10 and at each end has a longitudinal lug extension 11 or 12. Seated loosely upon the upper end portion of the said sleeve 9 is a clutch-sleeve 13, having an internal clutch-lug 14, which is designed to engage the extension or projection 11. Seated upon the clutch-sleeve 13 is a clutch-ring 15, having in its upper edge a series of teeth or notches 16, any two opposite ones of which are designed to be engaged by opposite laterally-projecting lugs 17 at the upper end of the sleeve 13. Said lugs 17 are also designed to be engaged by corresponding lugs 18 of the part 6, above referred to.

Upon the lower end portion of the sleeve 9 is a clutch device which is a duplicate of that at its upper end portion and which consists of a clutch-sleeve 20, having an internal lug or projection 21, which is designed to engage with the projection 12 of the said sleeve 9, a clutch-ring 22, having in its lower edge a series of teeth or notches 23, which are designed to be engaged by lugs 24 on the sleeve 20, said lugs 24 being also arranged to be engaged by lugs 25 on the fork-spindle just above the shoulder 8 thereof.

The clutch-sleeves 13 and 20 for convenience in manufacture may be each made in two pieces, as shown, (see Fig. 12,) one of said pieces being fitted inside of the other and rigidly secured therein in any suitable man-

ner, as by a lug 13^a on the inner piece, which fits in a recess 13^b in the outer piece.

26 is a helical spring which is wound around the sleeve 9 between the central portion 10 thereof and the upper clutch-ring 15, one end of said spring being engaged with a seat 15^a in the said ring and its other end with a similar seat 10^a in the said portion 10. 27 is a second and similarly-wound spring which is seated around the sleeve 9, between the central portion 10 thereof and the lower clutch-ring 22, its ends being held in the same manner as those of the spring 26. In order to seat the said springs neatly, the seating edges of the portion 10 and of the clutch-rings are beveled or turned to correspond to the direction of the adjacent coil of the spring. The sleeve 9, adjacent to the portion 10, is formed with slightly-enlarged portions 10^b to seat the end portions of the springs.

In the front side of the enlarged portion 10 of the sleeve 9 is a cavity or depression 30, which is designed to be engaged by a set-screw 31, seated in a clip 32, which is clamped around the head, the latter being slotted at 32^a to receive the said screw. In order to avoid the use of two clips, one to carry the lamp-bracket and another to carry this screw, the hinges 33 of this clip may be provided with tubular pivots 34, into which the arms of a wire lamp-bracket 35 may be inserted. (See Fig. 7.)

In assembling the parts the springs 26 and 27 are placed upon the sleeve 9 and are engaged with the seats in the central portion 10 of said sleeve. The respective end clutch devices are then slipped upon the said sleeve 9, and the opposite ends of the springs are engaged with the respective rings 15 and 22. The springs are then wound to the desired degree of tension. This is done by disengaging the engagement of the internal projections 14 and 21 of the respective sleeves 13 and 20 from the extensions 11 and 12 of the sleeve 19 and turning said sleeves 13 and 20 with the rings 15 and 22 until the desired degree of tension is obtained. The said sleeves 13 and 20 are then again engaged with the extensions 11 and 12. By changing the relative positions of the clutch-sleeve and the clutch-ring of each clutch device, which may be done by moving the lugs of the clutch-sleeves into engagement with different notches in the clutch-rings, the tension of the spring may be adjusted. In operation the clutch-ring and clutch-sleeve of each clutch device, being connected by the engagement of these lugs and notches, move together as one piece. The sleeve 9, with the springs wound thereon, as described and as shown in Fig. 5, is then slipped upon the fork-spindle, and the lugs 24 of the lower clutch-sleeve are engaged with the lugs 25 of the spindle. The sleeve 6 is next slipped upon the spindle and secured with its lugs 18 in engagement with the lugs 17 of the upper clutch-sleeve 13. The spindle is then inserted into the head,

the handle-bars connected thereto, and the proper adjustments made in the usual manner. If the devices embodying the invention are to be brought into use, the set-screw 31 is turned into engagement with the seat 30 in the portion 10 of the sleeve 9, whereby said sleeve is made fast to the head and is prevented from turning therein.

In operation if the front wheel be swung or deflected to one side the lugs 25 of the spindle engage the lugs 24 of the lower clutch-sleeve, and the sleeve 9 being held fast by the engagement of the screw 31 it follows that the lower clutch turns upon the sleeve 9 with the spindle until the increased tension thereby given the spring 27 overcomes the force of the deflecting impulse and returns the wheel to normal position. During this operation the spindle turns loosely in the upper clutch device and the upper spring 26 is not affected. When, however, the wheel is swung or deflected in the opposite direction, the spindle turns loosely in the lower clutch device, but the lugs 18 on the part 6 engage the lugs 17 of the upper clutch-sleeve and the spring 26 is put under increased tension and acts to return the wheel to line. The relative positions of the several clutch lugs or projections and the manner in which they engage each other will be best understood by reference to the cross-sectional views Figs. 8, 9, 10, and 11, which show the parts in their normal positions.

It will be seen that the movement of the fork-spindle is limited to one nearly complete revolution and that the springs cannot, therefore, be subjected to undue tension. The normal tension of the springs is against the projections or extensions 11 and 12 of the sleeve 9; but when the spindle is turned in one direction or the other the tension of the corresponding spring is taken and carried by the clutch engagement between the lower clutch and the spindle or between the upper clutch and the part 6, secured to the spindle, as the case may be.

By releasing the set-screw 31 the devices are thrown entirely out of operation and turn loosely with the spindle in the head. In circle riding or in case one of the front-fork arms should become sprung or bent slightly in advance of the other one the front wheel may be set to the corresponding or compensating position by merely turning the clip 32 to the right or left on the head, the slot or opening 32^a in the head being made oblong for this purpose. This adjustment, it will be seen, has the effect of changing the line or center of the wheel a little to one side of the true line or center and determines the line to which the wheel is returned by the action of the springs.

It will be understood from the foregoing that the tension of the springs may be adjusted at any time by removing the fork-spindle from the head and adjusting the clutch-rings 15 and 22, or either of them if but one

of the springs requires adjustment, relatively to the clutch-sleeves 13 and 20.

In order for the rider to move the handle-bars of a wheel equipped with this invention, somewhat more force is of course required, depending upon the strength or tension of the springs; but when properly constructed this is not material or hardly noticeable, owing to the elastic character of the resistance, which is of a very different nature from the increased resistance which would occur from the undue tightening of the spindle-bearings. The action of the springs, on the other hand, in keeping the front wheel to line relieves the rider of much strain and greatly facilitates his riding with one hand or with both hands off the handle-bars. The device is also of advantage in carrying or leading the wheel, since it keeps the front wheel from "flopping" or swinging from side to side.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a bicycle, the combination with the fork-spindle rotatably journaled in the head of the frame, of a pair of independent coiled springs seated around the said spindle within the head, means whereby one of said springs is operatively connected at one end with the said spindle when the latter is turned in one direction and means whereby the other of said springs is similarly connected with the spindle when it is turned in the opposite direction, each of said springs being disconnected from said spindle and inoperative during the time the other spring is operative, a member loose with respect to the spindle and to which the adjacent ends of the two springs are connected, and means for locking the said member to the head, substantially as specified.

2. In a bicycle, the combination with the fork-spindle, and the frame-head, of a pair of springs coiled around the said spindle within the head, means whereby each of said springs is operatively connected to said spindle when the latter is turned in one direction but not when it is turned in the opposite direction, said means operating upon one spring when the spindle is turned in one direction, and upon the other spring when it is turned in the opposite direction, and means whereby the adjacent ends of the two springs may be connected to the frame-head, substantially as specified.

3. In a bicycle, the combination with the fork-spindle, and with the frame-head, of a sleeve loosely seated upon the said spindle, within the head, a clutch device at each end

of the said sleeve and having a clutch connection therewith and also with the spindle or with a part secured thereto, the two clutch devices being arranged to operate in opposite directions, two springs coiled around the said sleeve and respectively connected at opposite ends to the respective clutch devices, and at their adjacent ends to the said sleeve, and means whereby the said sleeve may be secured to the said head, substantially as specified.

4. In a bicycle, the combination with the fork-spindle, and with the frame-head, of a sleeve loosely mounted on said spindle within the said head, and having a central enlarged portion, a clutch-sleeve loosely mounted upon each end portion of the loose sleeve and having a clutch connection with said loose sleeve and also with the fork-spindle or a part secured thereto, a clutch-ring loosely mounted upon each clutch-sleeve and adjustably secured thereto, two springs coiled around the said loose sleeve and connected each at one end to the said enlarged portion thereof, and at their opposite ends to the respective clutch-rings, and a device carried upon the exterior of the said head and adapted to engage the said enlarged portion of the loose sleeve to prevent rotary movement thereof, substantially as specified.

5. In a bicycle, the combination with the fork-spindle and the frame-head, of a sleeve loosely mounted upon the spindle within the head and having longitudinal projections at its end portions, a clutch-sleeve loosely mounted upon each end portion of the said loose sleeve and formed with an internal projection which is designed to engage the adjacent projection of the loose sleeve, and with lateral projections which are designed to engage corresponding projections upon the fork-spindle or upon a part secured to said spindle, a clutch-ring loosely seated upon each clutch-sleeve and adjustably connected thereto, the two springs coiled around the said loose sleeve and connected at one end thereto and at their opposite ends to the respective clutch-rings, and a set-screw carried by the frame-head and arranged to engage the said loose sleeve through an opening in the said head, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

J. A. DUNNING.
KENNETH BARROW.

Witnesses:

PHILIP C. MASI,
GEORGE H. PARMELEE.