

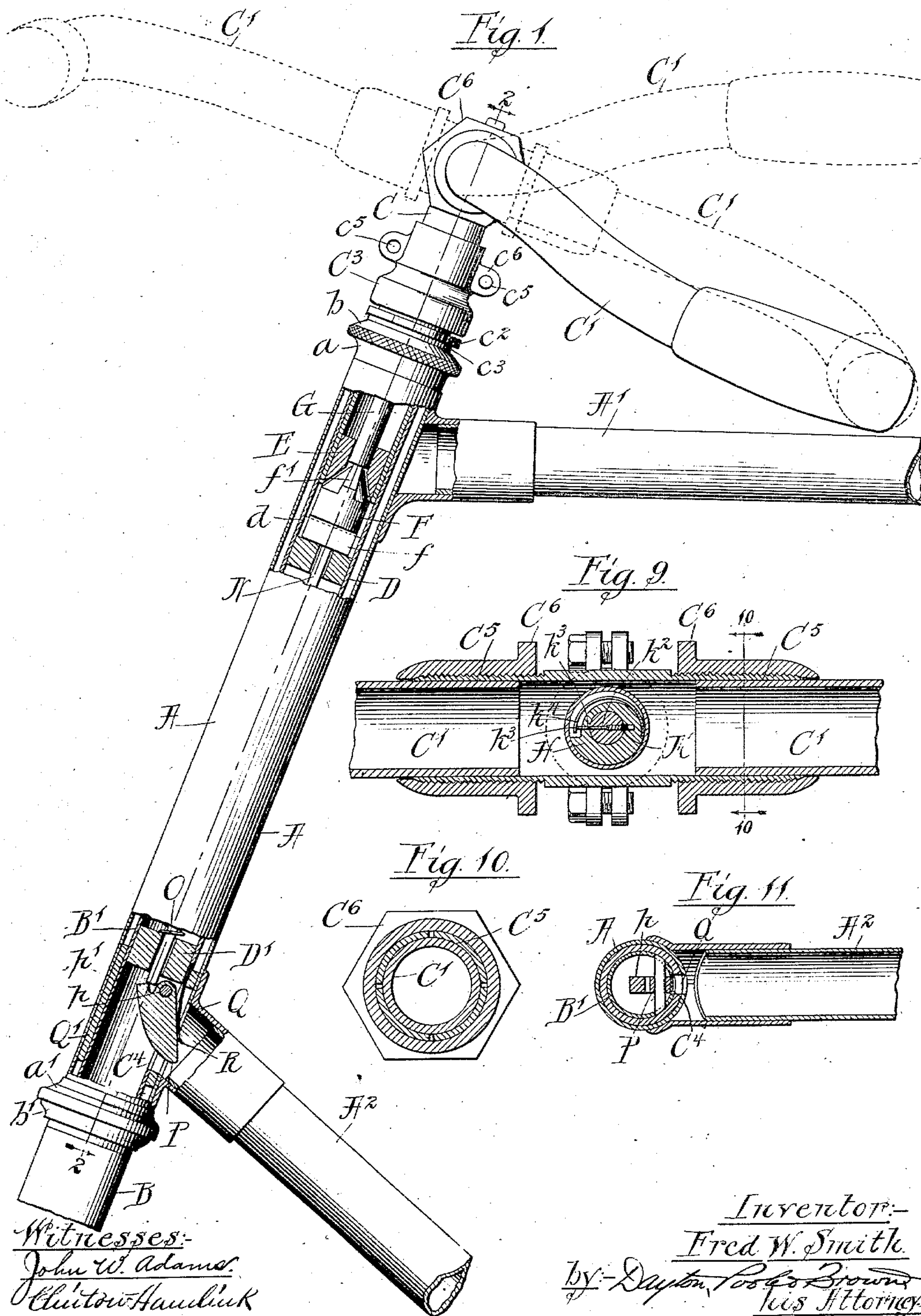
(No Model.)

2 Sheets—Sheet 1.

F. W. SMITH.
BICYCLE.

No. 597,441.

Patented Jan. 18, 1898.



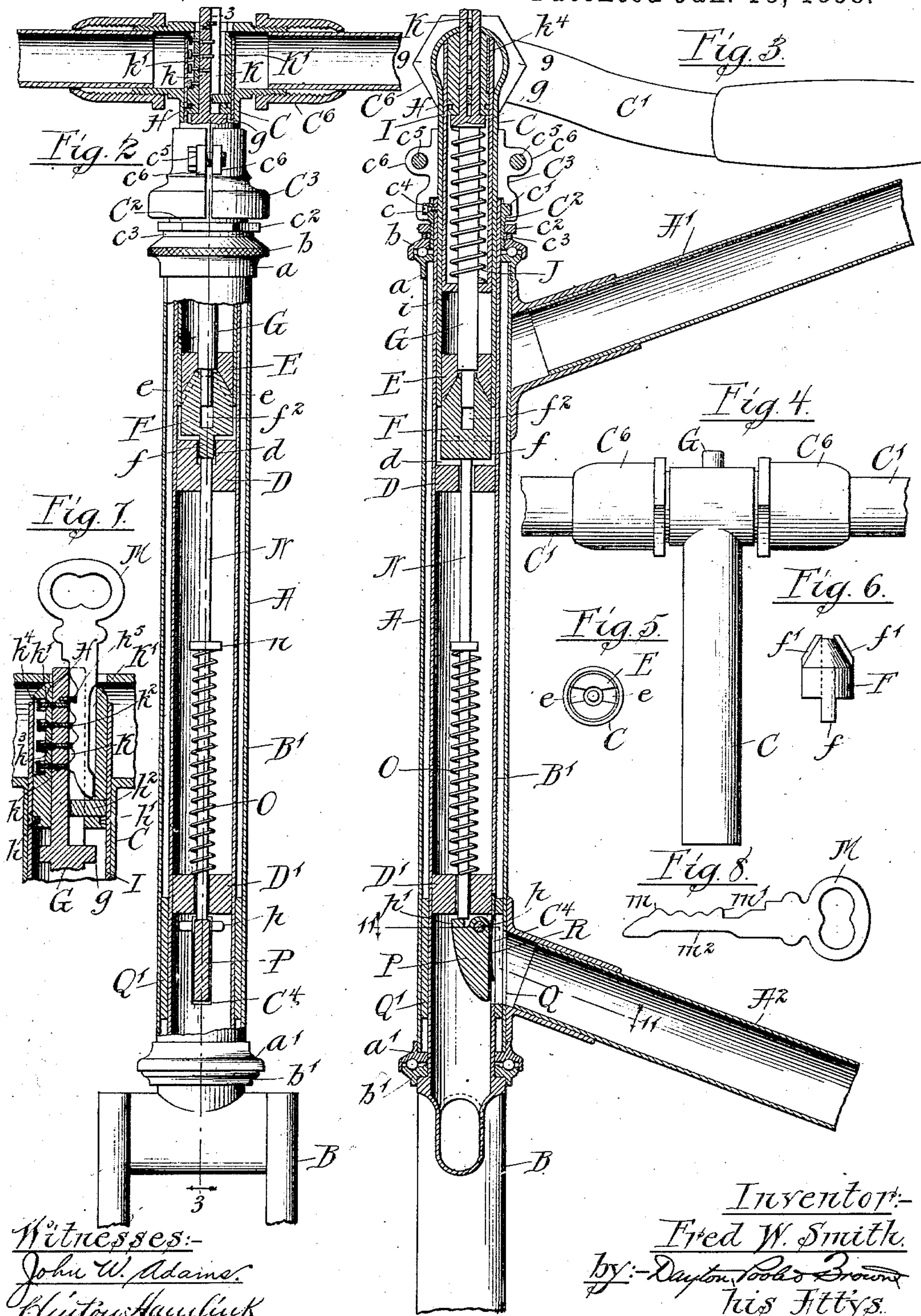
(No Model.)

2 Sheets—Sheet 2.

F. W. SMITH.
BICYCLE.

No. 597,441.

Patented Jan. 13, 1898.



UNITED STATES PATENT OFFICE.

FRED W. SMITH, OF EVANSTON, ILLINOIS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 597,441, dated January 18, 1898.

Application filed August 16, 1895. Serial No. 559,489. (No model.)

To all whom it may concern:

Be it known that I, FRED W. SMITH, of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bicycles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in bicycles, and more especially to a construction in a bicycle by which at the will of the rider it can be placed in such condition as to prevent it from being used or ridden, thereby preventing its being ridden away by unauthorized persons for the purpose of theft.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

One of the principal features of my invention consists in a detachable connection between the handle-bars and the front fork, such detachable connection being adapted to permit the release of the handle-bars from the fork, so as to leave them free to rotate independently of the said front fork, combined with a locking device for holding part of the connecting devices in their detached or disconnected relation, so that after the handle-bars are released from the fork and are free to revolve no person can secure the connection or interlocking of the handle-bars with the forks and thereby put the machine in condition for use except the owner or other person who has control of the locking device.

As a separate and further improvement adapted for use in connection with the handle-bars, arranged as above described, I also propose to provide a locking or holding device by which the front forks and the steering-wheel carried thereby may be locked or held from rotation relatively to the frame, thus placing the machine in condition to prevent its being steered or guided.

My improvement also includes means for adjusting the vertical position of the handle-bars and other features of construction, as will hereinafter more fully appear.

My invention may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a view in side elevation, with parts in section, of the steering-head, handle-bars, and adjacent portions of a bicycle. Fig. 2 is a sectional view taken on line 2 2 of Fig. 1, showing the parts in changed position. Fig. 3 is a sectional elevation taken on line 3 3 of Fig. 2, showing the parts in the same position as in said Fig. 2. Fig. 4 is a view in side elevation of the parts at the junction of the handle-bars and the part to which the same are attached. Figs. 5 and 6 are end and side views of the clutch member which forms the means of connecting the handle-bar part with the tubular spindle of the front fork. Fig. 7 is an enlarged detail section through the locking device. Fig. 8 is a side view of the key employed in connection with said locking device. Fig. 9 is an enlarged cross-sectional view taken on line 9 9 of Fig. 3. Fig. 10 is a cross-section taken on line 10 10 of Fig. 9. Fig. 11 is a detailed cross-section taken on line 11 11 of Fig. 3.

As shown in said drawings, A indicates a tubular steering-head, which is attached to the upper and lower front frame members A' A² in the usual manner.

B indicates the front fork, and B' the fork-spindle, which passes through the steering-head and is provided at its upper and lower ends with bearing-rings *b b'*, arranged in opposition to bearing-rings *a a'* at the upper and lower ends of the steering-head to form the parts of the usual ball-bearings.

C indicates a tubular handle-bar post, to which are attached the handle-bars C' C'. The fork-spindle B' is made hollow or tubular, and the handle-bar post C is also made hollow or tubular and is inserted in the upper end of the fork-spindle in the usual manner. In this instance, however, the handle-bar post, while adapted to turn or rotate within the fork-spindle, is not adapted for vertical movement or adjustment therein, but is permanently set at a definite vertical position, having for this purpose connection with the spindle by means permitting relative rotary movement of the handle-bar post and spindle, but preventing the longitudinal movement of said parts relatively to each other. The devices herein shown for effecting such connection are more clearly shown in Fig. 3 and are constructed as follows:

C² is a sleeve which is placed over the upper end of the fork-spindle in its part which projects above the steering-head, and is secured thereto conveniently by means of one or more screw-studs *c*. At its upper end the sleeve C² is provided with an outwardly-extending flange *c'*, while its lower part is threaded to receive the bearing-ring *b*. On the threaded part of the sleeve a jam-nut *c*² is provided for holding the bearing-ring from turning. A washer *c*³ is herein shown as located between the ring and jam-nut.

C³ indicates a split sleeve which is adapted to be clamped upon the handle-bar post above the fork-spindle and the lower part of which extends over the upper end of the fork-spindle and the sleeve C² therein and is provided with an internal groove, adapted to engage the flange *c'* and thereby hold the handle-bar post from upward and downward movement, while permitting it to turn or revolve freely within the fork-spindle when not otherwise connected with the latter. The split sleeve C³ is herein shown as made in two parts or halves, which are joined by means of bolts *c*⁴ *c*⁴, passing through lugs *c*⁵ *c*⁵ on opposite sides of the sleeve. Said bolts serve to clamp the parts of the sleeve around the handle-bar post and thereby hold the sleeve rigidly in place on said post.

To now refer to the parts illustrated for effecting engagement of the handle-bar post with the fork-spindle when it is desired to use the machine and for disengaging said parts when it is desired to leave the handle-bars free to rotate and thus put the machine in condition in which it cannot be used, these parts are constructed as follows:

D indicates a metal block which is inserted and secured within the hollow fork-spindle below the lower end of the handle-bar post, said block being provided in its upper surface with a transverse notch or groove *d*. Within the lower end of the handle-bar post is located a clutch member or thimble E, having in its lower surface radial grooves or recesses *e e*, Figs. 2 and 5. Between the block D and the thimble E is located a clutch member or plug F, which is provided at its lower end with a transverse projection or rib *f*, adapted to engage the transverse notch *d* of the block D, and having at its upper end two radial wings or flanges *f' f'*, adapted to engage the radial recesses *e e* of the thimble E. The plug F is permanently engaged with and held from turning by the block D; but said plug is at the same time made vertically movable, so that its wings or flanges *f'* can be engaged with the notches of the thimble E at pleasure, said plug and thimble thus constituting the two parts or members of a clutch. Said plug F is shown as made of conical form at its upper end and the thimble E as being made concave and of similar conical form at its lower end; but this construction is not essential, and the adjacent surfaces of the plug and thimble may be of other shape, if desired. The thim-

ble E is rigidly secured within the handle-bar post by brazing, soldering, or other suitable means. The said plug F has attached to it an actuating rod or spindle G, which rises centrally through the handle-bar post and extends a short distance above the upper end of the same. The upper end of said spindle forms a thumb or finger piece against which pressure may be readily applied to give endwise movement to the spindle. Said spindle is guided at its upper end by passing through a guide-aperture formed in a hollow plug or sleeve H, which is inserted and secured in the upper end of a tube I, which tube is in turn fitted within the upper end of the handle-bar post. The said spindle G is adapted to slide vertically within the sleeve H and is held at the upper limit of its movement by means of a spring J, herein shown as made of coiled form and arranged to surround the spindle. Said spring is preferably arranged to bear at its lower end against a ring or flange *i*, which is secured in the lower end of the tube I, while the upper end of the spring bears against a collar *g*, attached to the said stem below the sleeve H.

The plug F is adapted for engagement with the thimble E in the lower end of the handle-bar post when the spindle is lifted to the upper limit of its movement, so that the spring J tends to maintain the two parts of the clutch—namely, the thimble E and plug F—normally in engagement with each other. A downward or inward movement of the spindle against the action of the spring will have the effect of releasing the plug from the thimble or disconnecting the clutch, so that by pressing downward on the end of the stem which projects above the handle-bar post the handle-bar post will be freed from the fork-spindle and may be rotated at will. In the vertical movement of the plug F described the flange or projection *f* thereon slides within the notch *d* of the block D, such sliding of the projection in the notch affording the necessary vertical movement of the plug F for connecting and disconnecting the clutch without disconnecting said plug F from the fork-spindle.

For holding the parts of the clutch out of engagement with each other in order that the handle-bar may be free to rotate a locking device is provided adapted to hold the plug or movable member of the clutch from upward movement when thrust inwardly far enough to be disengaged from the sleeve E. Such locking device may be of any suitable form—as, for instance, it may be a key or a combination lock. In the construction illustrated, however, I have shown a key-lock of the same general character as that form of lock known as a "Yale" lock. Said lock is shown clearly in Figs. 2, 3, and 7 and is constructed as follows:

In the upper end of the spindle G is formed a longitudinal groove K, which extends about one-half way through the stem and opens

through the upper end of the same. Within the sleeve H is formed a longitudinal groove K', of corresponding width, which stands opposite the groove K. In the upper end of the said stem and in the same plane with the groove are formed a plurality of transverse guide-passages $k\ k'$, arranged in alinement with corresponding passages k' in the sleeve H. Within said passages $k\ k'$ are located two sets of sliding pins $k^2\ k^3$, of which the inner set, k^2 , is located in the passages of the spindle, and the outer set, k^3 , is arranged in the sleeve H, the pins in the sleeve being in alinement with those in the spindle when the latter is thrust inwardly or is at the inward limit of its movement. A series of leaf-springs k^4 are shown as applied to act on the outer ends of the pins k^3 in such manner as to force the latter inward. A key M is employed, which is made of flat sheet metal and is adapted for insertion in the grooves K and K' of the spindle and sleeve. Said key is provided with a corrugated or serrated edge m , adapted for contact with the inner ends of the pins k^2 when the key is inserted in the groove of the spindle, into which groove the said pins are thrust by the springs k^4 when the parts are in their locked position, as shown in Fig. 2. The inner and outer pins $k^2\ k^3$ are made of varying lengths corresponding with the distance from a straight line of the points on the serrated edge of the key at which the inner pins come in contact with the same, so that when the key is inserted and the pins are pushed back the contact ends of the several inner and outer pins will come in alinement with the joint between the spindle and sleeve and will therefore leave the spindle free to slide outwardly or inwardly under the action of the spring J or of pressure applied to the outer end of the spindle.

To render more certain and positive the outward movement of the spindle and at the same time to lessen the liability of the pins being manipulated by a tool inserted into the key-slot, the groove of the stem is provided outside of the outermost pins with a lug or projection k^5 , adapted to engage a notch m' of the key. Said key is provided with a cut-away part m^2 in its rear or outer edge to enable it to be inserted past said lug or projection k^5 . The interlocking of the key with the pin or lug k^5 obviously enables the key to be used for drawing or pulling the spindle outward or upward. It will of course be understood that when the spindle is thrust outwardly the several outermost pins k^3 will be thrust or pressed against the same by the action of the spiral springs k^4 , and when the spindle is thrust inwardly and reaches a point where the inner and outer pins are in alinement with each other the outer pins will be forced into the holes by their actuating-springs and will thus lock the stem until it is again released by the insertion of the key.

As a means of obviating the liability of the lock being broken by force applied thereto

in a manner to rotate the spindle G, I construct the parts as follows: The sleeve H, instead of being rigidly secured within the tube I, is held therein and turning therein by frictional contact only, being fitted so tightly as to prevent any movement of the sleeve in the tube under ordinary circumstances. The sleeve is held in the tube by means of a screw h , projecting through the tube and engaging a circumferential groove h' , whereby the sleeve is held from endwise movement in the tube. The spindle G is held positively from rotation in such spindle by means of a lug or feather h^2 , which is secured in the sleeve and engages the key-groove k of the spindle. From this construction it will be seen that if any instrument be inserted in the key-groove and then turned, with the object of breaking off the locking-pins, the only result accomplished will be the rotation of the spindle and sleeve within the tube I, and such rotation may continue indefinitely without injuring any of the parts. In order to permit such rotation of the spindle G without affecting the clutch mechanism, said spindle is attached to the clutch F by having its lower end inserted and held by frictional contact in a socket f^2 , formed in said plug, as seen in Fig. 2.

It will be observed that the lock, arranged as described, is adapted for automatic locking of the spindle when the latter is thrust inwardly, so that the key is required only at the time of unlocking or releasing the spindle for putting the machine in condition for use—that is to say, when the machine is in working condition the handle-bar post will be rigidly connected with the fork-spindle through the medium of the interlocking parts of the clutch, and those parts may be disconnected to free the handle-bar from the forks by merely thrusting inwardly the spindle G by pressure at its outer end, and when the stem has been thrust inwardly far enough to release the movable member of the clutch the spring-actuated pins of the lock will engage the stem and thus hold it in its inward position. The clutch device may thus be released and the handle-bars left free to rotate by simply pressing inwardly on the stem G, so that the use of a key is necessary only when it is desired to release the spindle and permit the parts of the clutch to become reengaged in order to again establish rigid connection between the handle-bars and the fork. It will be observed from the above that the lock, constructed as described, is, in fact, an automatic or spring lock adapted to secure the locking of the parts without the use of a key, and as far as this part of my invention is concerned the same result may be produced by any other form of spring-lock which will automatically engage the spindle or clutch-actuated part of the device.

The stem G, sleeve H, and parts of the lock being mounted in the tube I, said tube, with all of said parts, may be made separate from the handle-bar post and inserted and secured

within the same, thereby greatly simplifying the original construction of and repairs to the said parts.

To now refer to the locking device for the front fork, hereinbefore referred to, the same is herein shown as arranged to be actuated through the same locking device and actuating-spindle G which is employed to operate the clutch mechanism described. To enable the locking device to be so actuated, an actuating-rod N is arranged longitudinally within the fork-spindle, below the plug F, the same being guided at its upper end in the block D and at its lower end in a similar block D', secured in the lower part of the fork-spindle. The upper end of said rod N bears against the lower surface of the plug F and is held in contact therewith by means of a spirally-coiled spring O, which surrounds the rod between the lower block D' and a collar n on the said actuating-rod. The locking means illustrated for securing engagement of the fork-spindle with the steering-head consists of a pivoted detent P, which is mounted within the fork-spindle, below the block D', on a transverse pivot p in such manner as to swing in a vertical plane, the free end of the detent being adapted to be projected outwardly to slot C⁴ in the spindle and to engage a slot Q in the steering-head. This slot Q is shown as extending through the tube which forms the steering-head and also through a metal reinforcing piece or sleeve Q', inserted and secured in the lower part of the tube which forms the steering-head. At the same time the slot Q is shown as arranged opposite the adjacent end of the lower tubular frame member H², so that the detent when swung into position to engage the slot Q may pass through the steering-head without being exposed and may enter the said frame member to a greater or less extent, as may be necessary to secure a positive and certain engagement of the detent with the frame. In a construction in which there is no room for the sleeve Q' within the steering-head the detent P may engage a slot in the tube forming the steering-head and may enter the end of the frame-bar A² in the same manner as in the case illustrated. Said detent P is provided with a horizontal part or arm p', located beneath and in position for engagement with the lower end of the actuating-rod N. The downward pressure of the said rod on said arm P' of the detent acts to depress the same and at the same time to swing the lower or depending end of the detent laterally in engagement with the locking-slot of the steering-head. In the construction illustrated the detent is shown as being unattached to the actuating-rod, and in order to maintain the parts in engagement and to retract the dog from engagement with the steering-head a suitable spring is applied to the detent, said spring, as herein shown, consisting of a leaf-spring R, secured to the spindle and acting through the slot thereof against the outer edge of the detent.

From the construction described it will be obvious that when the stem G is thrust inwardly the actuating-rod N will also be thrust inwardly and thereby project the detent P outwardly into the locking-slot of the head, and thus lock the fork from turning at the same time when the fork-spindle is free from connection with the handle-bars, and the latter are left free to turn independently of the fork. Moreover, the detent will remain in engagement with the steering-head and will be held from turning until by the use of the key the spindle shall have been unlocked and the parts of the clutch again engaged to hold the handle from turning relatively to the fork-spindle. It is to be noted in this connection, however, that the plug F merely forms a means of transmitting motion from the spindle G to the actuating-rod N, and that said actuating-rod and the locking device operated by it would operate in the same manner, as above described, if the clutch device for affording detachable connection of the handle-bars with the fork-spindle were entirely absent. A machine may therefore be made embodying this part of my invention in which the locking of the front fork only is relied upon as a means of safety or to prevent the wheel from being used.

The handle-bar post in the construction described has no vertical adjustment for raising and lowering the position of the handles. I have, therefore, provided a means by which the free end of the handle-bars may be lifted or depressed to bring the handles at a height suitable for the rider. To this end I provide a rotary connection between each handle-bar and the upper end of the handle-bar post in connection with fastening or locking devices by which the handle-bars may be rigidly secured in any position in which they may be placed. The special form of attaching device illustrated is made as follows: Each handle-bar C' is made separate from the handle-bar post, and on the opposite sides of the latter, at its upper end, are formed tubular sockets C⁵, the outer ends of which are screw-threaded and split longitudinally. Said sockets are adapted to receive the smooth inner ends of the handle-bars and are provided with exterior screw-threads adapted for engagement with thimbles C⁶ C⁶, which are tapered interiorly in such manner that when screwed upon the split ends of the sockets they will clamp the parts of the same rigidly against the handle-bars. While these means for clamping or holding the handle-bars at a desired angle are practical and convenient, yet I do not wish to be limited to this exact construction, as other clamping or holding means may be employed for securing the same result.

The construction described, embracing a locking device for holding the front fork from turning and also the device for releasing the handle-bars and leaving them free to rotate, is not only a great advantage as affording

means for preventing unauthorized use of the bicycle, but is of great convenience in handling the machine or storing it when not in use or when it is being shipped by train or otherwise. When the front fork is locked from rotation, the bicycle may obviously be allowed to rest against an upright object with much less liability of falling than when the front fork is left free to turn. Moreover, the wheel may be readily placed against a vertical surface or wall, because not only will the front wheel remain in the same plane with the rear wheel, but the handle-bars may be turned so as to bring them in the same plane with the machine-frame and away from the wall, if necessary, so that the machine will not only stand securely, but will occupy but very little space. Similarly, in transporting the bicycles by railway—as, for instance, when they are checked as baggage—they can be much more easily handled by the baggage-men and others if the front wheel be rigid and the handles be free to turn into a position in the same plane with the frame. It is not uncommon when a number of bicycles are being carried in a baggage-car for the baggageman to throw or pile a number of them one on top of the other, and as ordinarily constructed they occupy much room and are very liable to be damaged in such handling. When the front wheel is rigidly secured and the handle-bars are free to turn, they may be packed more closely by placing the handle-bars in position at right angles to the usual position, while the locking of the front fork prevents the same from oscillating or vibrating when the machine is lifted or moved about, so that when arranged as described the front wheel and handle-bars are less likely to be brought forcibly in contact with other objects, and the machine is therefore less liable to breakage or injury. Similarly, in the handling of bicycles by baggage-men they are, as ordinarily constructed, likely to be injured by carelessly placing or standing them against other objects, the turning of the front wheel allowing them to easily fall, whereas if the front wheel be locked as described they will remain where placed if rested against any object either temporarily or when deposited in a car or place of storage.

I claim as my invention—

1. The combination with a tubular steering-head and a fork-spindle, of handle-bars having a tubular post which is inserted within the fork-spindle and is connected therewith by means permitting free rotation of the post relatively to the spindle while preventing vertical movement of the post, interlocking means on the post and spindle, within the latter, holding the handle-bar post from rotation relatively to the fork-spindle, an actuating-spindle extending through said tubular post to the upper end of the same, for operating said interlocking means and a key-actuated lock constructed to engage the actu-

ating-spindle to hold the same from movement, substantially as described.

2. The combination with a tubular steering-head and a tubular fork-spindle, of a hollow handle-bar post inserted within the fork-spindle and connected therewith by means permitting free rotation of the post and the spindle while preventing vertical movement of the post, means located within the fork for holding the post from turning, embracing interlocking parts attached to the interior of the fork-spindle and to the lower end of the post, a spring-actuated spindle connected with the movable part of the interlocking means and operating to hold the same normally engaged, said spindle having an exposed finger-piece at the top of the post, and a spring-lock adapted to engage the said spindle to hold the same from movement when the post is free to turn in the spindle, substantially as described.

3. The combination with a tubular steering-head and a tubular fork-spindle, of a hollow handle-bar post inserted within the fork-spindle and connected therewith by means permitting free rotation of the handle-bars relatively to the said spindle while preventing vertical movement of the handle-bars, a clutch for connecting the post with the spindle consisting of two clutch members located within the spindle and one of which is connected with the lower end of the post and the other secured to the spindle, an endwise-movable, spring-actuated spindle connected with the movable part of the clutch and extending through the post to the top of the same and having an exposed finger-piece, said spindle holding the parts of the clutch normally engaged, and a spring-lock adapted to engage said spindle when the parts of the clutch are disengaged from each other, substantially as described.

4. The combination with the frame, front fork and handle-bars of a bicycle, of a detachable connection between the handle-bars and the front fork and a lock adapted to hold the parts of the detachable connection in disconnected relation, substantially as described.

5. The combination with the bicycle-frame, a fork-spindle and handle-bar post, of a clutch for connecting the post with the spindle, embracing a longitudinally-movable clutch member, an endwise-movable spindle within the post for actuating said clutch member, a lock to engage and hold from movement the said spindle when the clutch member is released and a spring applied to hold the members of the clutch normally in engagement with each other, substantially as described.

6. The combination with a fork-spindle, a handle-bar post, a clutch for connecting the same, a spring applied to hold the parts of the clutch in engagement with each other, and a locking device for holding them in their disengaged position, substantially as described.

7. The combination with the front fork and handle-bar of a clutch for connecting the same, means for operating the movable part of the clutch embracing a part which is exposed for actuation by the finger, and a spring-lock engaging said movable part of the clutch to hold the latter in its disengaged position, substantially as described.

8. The combination with the front fork and handle-bar, of a clutch for connecting the same, means for operating the movable part of the clutch embracing a part which is exposed for actuation by the finger, an actuating-spring for the movable part of the clutch and a spring-lock engaging the said movable part to hold the parts of the clutch disengaged from each other, substantially as described.

9. The combination, with a tubular fork-spindle and a tubular handle-bar post, said post having rotative but non-sliding connection with the spindle, of a clutch consisting of a thimble within the post, a block within the spindle and an endwise-movable clutch member having sliding, but non-rotative engagement with said block, said clutch member and thimble being provided with interlocking parts which are engaged by endwise movement of said clutch member, and an endwise-sliding actuating-spindle attached to the movable clutch member, substantially as described.

10. The combination with a tubular fork-spindle and a tubular handle-bar post, said post having rotative, but non-sliding connection with the spindle, of a clutch consisting of a thimble secured within the post, a block secured within the spindle and an endwise-movable clutch member, having sliding, but non-rotative engagement with said block, said clutch member and thimble being provided with interlocking parts which are engaged by endwise movement of said clutch member, an endwise-sliding actuating-spindle for the movable clutch member, and a spring applied to said spindle for holding the clutch members engaged with each other, substantially as described.

11. The combination with a tubular fork-spindle and a tubular handle-bar post, said post having a rotative but non-sliding connection with the spindle, of a clutch consisting of a thimble within the post, a block within the spindle and an endwise-movable clutch member having sliding but non-rotative engagement with said block, said clutch member and thimble being provided with interlocking parts which are engaged by endwise movement of said clutch member, an endwise-sliding actuating-spindle for the movable clutch member, a spring applied to said spindle for holding the clutch members engaged with each other, and a lock to hold the said spindle from endwise movement, substantially as described.

12. The combination with a tubular fork-spindle and a tubular handle-bar post, said

post having rotative but non-sliding connection with the spindle, of a clutch consisting of a thimble within the post, a block within the spindle and an endwise-movable clutch member having sliding but non-rotative engagement with said block, said clutch member and thimble being provided with interlocking parts which are engaged by an endwise movement of said clutch member, an endwise-sliding actuating-spindle for the movable clutch member, a spring applied to said spindle for holding the clutch members engaged with each other and a lock to hold said spindle from movement, said spindle being extended outside of the handle-bar post to form a finger-piece by which the spindle may be actuated, substantially as described.

13. The combination with a steering-head of a fork-spindle and handle-bar post, means for connecting the handle-bar post with the spindle comprising a clamping-sleeve secured to the post and engaging a flange on the spindle to permit the post to turn freely, while preventing endwise movement thereof, a clutch for connecting the spindle with the post consisting of clutch members, one connected with the spindle and the other with the post, and means for actuating the movable member of the clutch so as to hold the post from turning and release the same at will, substantially as described.

14. The combination with a tubular fork-spindle and hollow handle-bar post, of a clutch consisting of two clutch members one of which is attached within the spindle and the other secured to the lower end of the post, an endwise-movable spindle within the post for actuating the movable part of the clutch, said spindle extending at its end through the upper end of the post, a spring for giving endwise movement to the said spindle adapted to hold the clutch in its interlocked position and a lock for the spindle comprising two sets of sliding, spring-actuated pins, one set of which is mounted in the spindle and a serrated key for actuating said pins, substantially as described.

15. The combination with a bicycle-frame and a fork-spindle, of a normally-disengaged locking-detent mounted in the spindle and adapted to engage the frame and means for actuating the said detent comprising an endwise-sliding actuating-rod located within the spindle and connected with the detent, a spring-actuated finger-piece which is connected and moves with the said rod and which stands at the outward limit of its throw when the locking-detent is disengaged and which is held by its actuating-spring normally in such outward position and a spring-actuated lug operating to engage the rod and hold it from movement when the said rod is thrust inwardly by pressure on the finger-piece when the detent is in its engaged position, whereby inward pressure on the finger-piece will effect the automatic locking of the detent, substantially as described.

16. The combination with a bicycle-frame, a fork-spindle and handle-bar post, of a locking-detent mounted in the spindle, an endwise-sliding actuating-rod within the spindle, 5 and a lock for holding said rod from endwise movement, substantially as described.

17. The combination with a bicycle-frame and fork-spindle, of a locking-detent mounted in the spindle, an endwise-sliding rod for 10 actuating the detent, a spring applied to said rod for moving the same endwise, a movable finger-piece for actuating the rod against the action of the spring, and a lock for holding the rod from endwise movement, substan- 15 tially as described.

18. The combination with a bicycle-frame and fork-spindle, of a handle-bar post and locking-detent mounted in the spindle, an endwise-sliding spindle extending through 20 the post and exposed at the upper end of the same to form a finger-piece, a spring applied to said spindle to throw the same upwardly and a spring-lock mounted in the post and adapted to engage the spindle when the de- 25 tent is in its locked position, substantially as described.

19. The combination with a bicycle-frame and fork-spindle, of a handle-bar post, a locking-detent mounted in the spindle, an 30 endwise-sliding actuating-spindle extending through the post and exposed at its upper end to form a finger-piece, a spring applied to the rod to move the same endwise, a lock

for holding the rod from endwise movement and a second spring acting on the detent to 35 hold it in contact with the rod, substantially as described.

20. The combination with a bicycle-frame and its front fork, of a handle-bar having ro- 40 tative connection with the front fork, a locking device for engaging the front fork with the machine-frame, a detachable connection by which the handle-bar may be rigidly at- 45 tached to the front forks, and a single lock adapted to control both said locking device and the detachable connection, substantially as described.

21. The combination with a bicycle-frame, a fork-spindle and a handle-bar post, of a clutch 50 connecting the handle-bar post with the spindle, a locking-detent mounted in the spindle, for holding the latter from turning in the frame, actuating means extending through the post and spindle for operating said clutch 55 and locking-detent and a lock controlling the movement of said actuating means, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature, in pres- 60 ence of two witnesses, this 12th day of August, A. D. 1895.

FRED W. SMITH.

Witnesses:

C. CLARENCE POOLE,
WILLIAM L. HALL.