(No Model.) 2 Sheets—Sheet 1

J. L. YOST & C. J. MOORE.

BICYCLE.

No. 420,756. Patented Feb. 4, 1890.

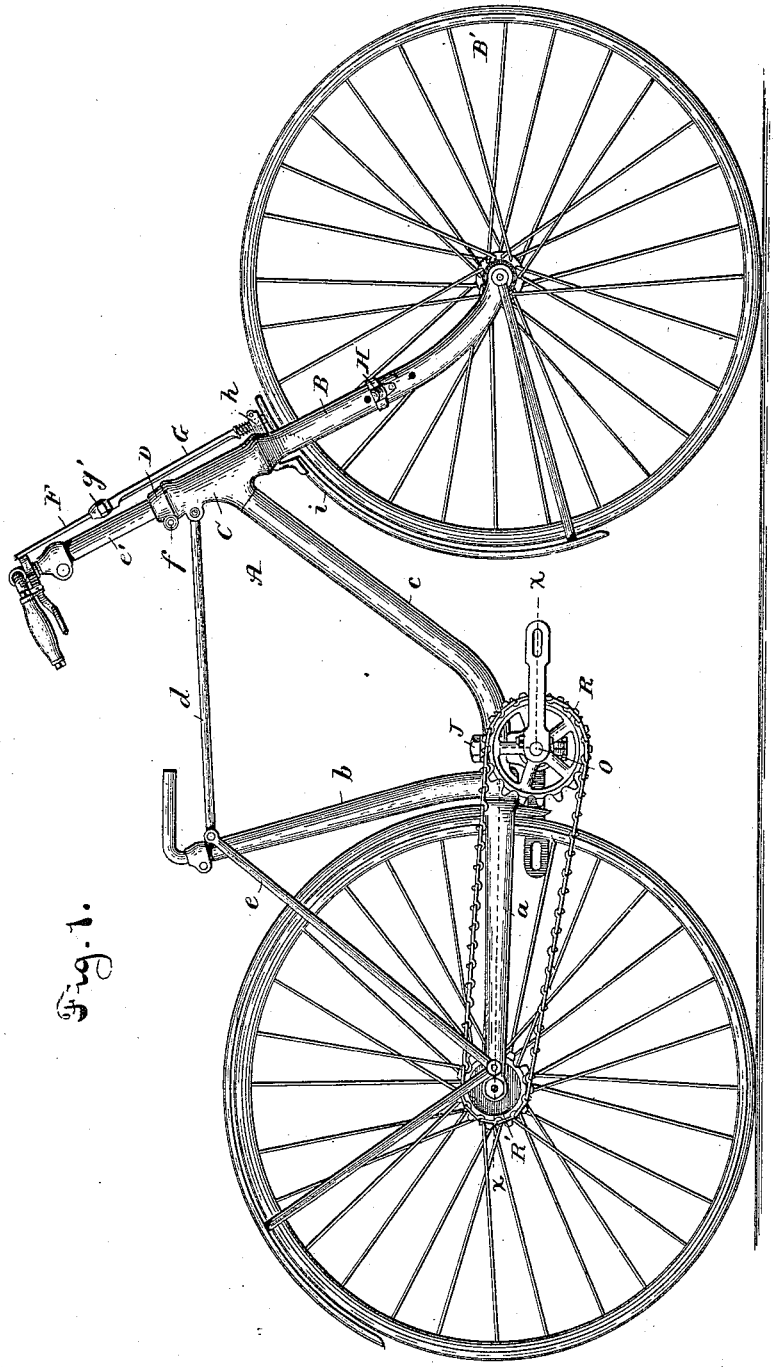

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

J. L. YOST & C. J. MOORE.

BICYCLE.

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Fig. 2.

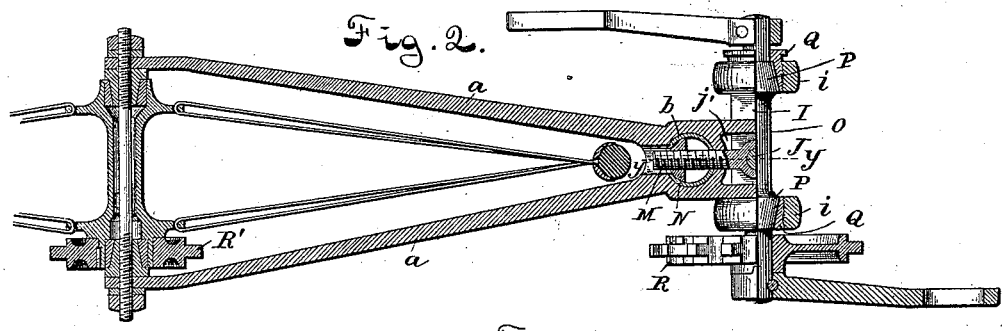


Fig. 3.

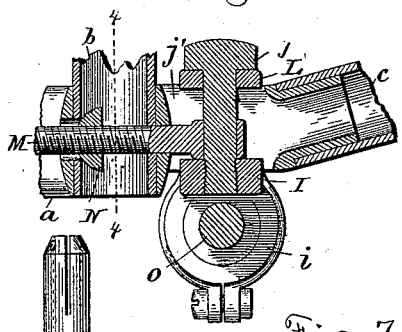


Fig. 4.

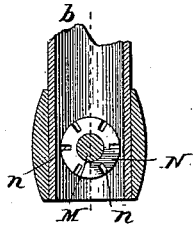


Fig. 5.

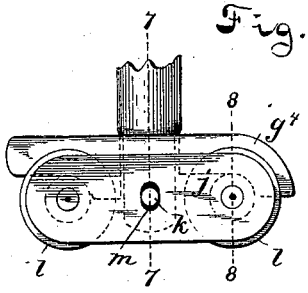


Fig. 8.

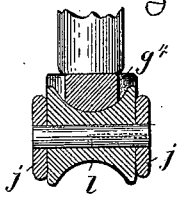


Fig. 6.

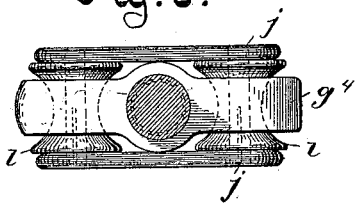


Fig. 7.

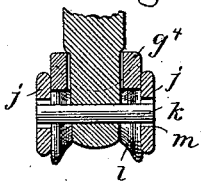


Fig. 9.

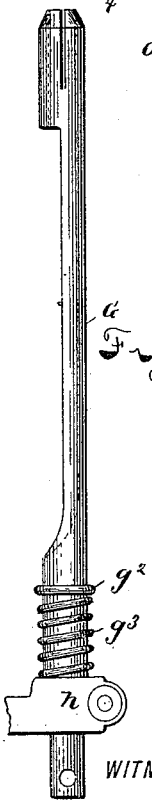


Fig. 11.

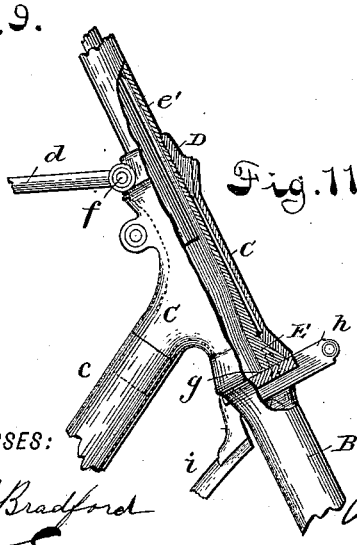
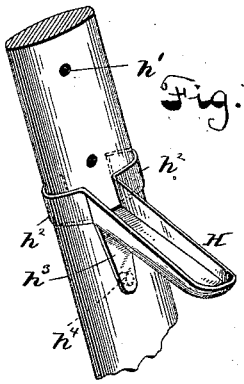


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOSEPH L. YOST AND CHARLES J. MOORE, OF TOLEDO, OHIO, ASSIGNORS TO THE LOZIER & YOST BICYCLE MANUFACTURING COMPANY, OF SAME PLACE.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 420,756, dated February 4, 1890.

Application filed November 11, 1889. Serial No. 329,906. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH L. YOST and CHARLES J. MOORE, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Bicycles; and we do hereby 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.

This invention relates to certain new and useful improvements in safety-bicycles; and it consists, substantially, in such features of arrangement, construction, and combinations of parts as will hereinafter be more particularly described, and pointed out in the claims.

The invention has for its object to provide the supporting-frame of such construction as that it shall be thoroughly rigid, so as to resist the evil effects of strain which may be exerted to the machine.

The invention has for its further object to provide the supporting-frame of a construction by which the same may be changed or converted in such manner as to leave an unobstructed space between the wheels by which females can ride the machine without any difficulty.

The invention has for its still further object to supply simple and effective devices for attaching the crank-axle to the frame, and also to provide improved means for adjusting the driving-chain.

Finally, the invention has for its object to supply a simple and more effective roller-brake for the machine than is employed with many former inventions, and also to provide a more simplified form of mud-guard and foot-rest, all as will more fully hereinafter appear when taken in connection with the accompanying sheets of drawings, wherein—

Figure 1 represents a side view of our improved machine as when it appears complete and ready for use. Fig. 2 represents a horizontal sectional view of the machine-frame to the rear of the driving-axle, about on the line x x of Fig. 1, showing the supports for said axle, together with the means for adjusting the driving-chain. Fig. 3 is an enlarged sectional detail on the line y y of Fig. 2, to more clearly indicate the construction and arrangement of the axle attaching and supporting devices, as well as the chain-adjusting devices. Fig. 4 is a vertical sectional detail taken transversely to Fig. 3 on the line 4 4. Fig. 5 is a side view of our improved roller-brake, and Fig. 6 is a top or plan view thereof. Figs. 7 and 8 are sectional detail views on the lines 7 7 and 8 8 of Fig. 5, respectively, of such brake, to more clearly indicate the construction and arrangement thereof. Fig. 9 is a vertical side elevation of the rod which operates the brake. Fig. 10 is a view in perspective and representing the manner of attachment of our improved foot-rest to the sides of the steering-fork. Fig. 11 is a side view, partly in section, to show the construction and arrangement of the adjustable sleeve, that is journaled on the upper portion of the steering-fork, and also showing the adjusting-cones for taking up wear as well as tightening up these parts of the machine when they become loose.

In carrying our invention into effect we resort to the use of a frame, which in side elevation approximates the shape of a diamond and which extends from the center of the rear wheel forward, the said frame possessing peculiarities of construction, which will hereinafter be more particularly pointed out. The said frame curves gradually upward and forward to the steering-head, at which point is a removable rod or tube which connects with the seat-supporting tube, and by the removal of said rod our machine becomes adapted to female riders.

The peculiar construction and arrangement of our supporting-frame are such as to insure thorough rigidity and an equal distribution of strain and vibration to which the machine may be subjected in use.

Journaled on the upper portion of the steering-fork is an adjustable sleeve-head, which is held in position by suitable cones, by the adjustment of which any wear which may oc-

cur in the sleeve-head may be readily taken up and the parts kept together in place tightly and securely.

Attached to the steering-fork, at the crotch thereof, is a brake-rod holder which supports a suitable mud-guard, as well as the upright rod, through the medium of which the brake itself is operated, all as will more fully hereinafter appear by referring to the accompanying drawings, wherein—

A represents the frame of the machine as a whole, and which frame is constituted of the part *a*, in which the rear wheel is journaled, the upright seat-support *b*, the upwardly-curved and forwardly-extending portion *c*, the removable portion *d*, connecting between the steering-head and the seat-support, and the portion *e*, between the upper end of the seat-tube and the rear end of the portion *a*, the whole approximating in side view to the shape of a diamond. The portion *d* is made removable, as shown, so as to enable the machine to be readily adapted to female riders.

B represents the steering-fork, in which the front wheel B′ is mounted in the usual way, and which fork has its upper portion *e′* journaled in an adjustable sleeve C, and is held in position within such sleeve by means of cones D and E, the former of which is separate and is screw-threaded interiorly to fit the correspondingly-threaded surface of the fork-shank, as shown. (See Fig. 11.) Cone E may be made either turned on the shank of the steering-fork, as is shown in the present drawings, or it may be made separate and adjustable, if desired, although the arrangement shown is that which is preferred in use.

The purpose of the adjustability of the cone D is to enable the taking up of wear which may occur in the sleeve C, and such cone is slotted through and clamped fast to the fork-shank by means of clamp-screw *f*, which holds it firmly in place when located. (See Figs. 1 and 11.)

An obvious modification of the arrangement of the cones D and E would be the placing of a spiral spring beneath the cone E and above cone D, so as to permit of a self-adjustment of said cones, each of which in this instance would be separate and adjustable. The said cones, while being intended to be movable up and down on the shank, could be prevented from rotating by means of any suitable connection, which, for instance, could extend over to the upright rod for operating the brake. In this instance the rider would be protected from sudden jars in traveling over rough roads or when encountering obstructions, the purpose being to have as little tremor or vibration of the parts of the machine as possible.

Attached to the fork B at *g* is the brake-rod holder *h*, which supports the mud-guard *i* as well as the brake-operating rod.

Preferably we employ the construction of holder and brake represented in Figs. 5, 6, 7, and 8, wherein is represented two side pieces *j j*, through which passes centrally a pin *k*, and at the ends of which are held two concave rollers *l l*, adapted to fit the tire of the wheel. The holder *h* in this instance is separate from the brake-operating rod F, and on its under side is shaped to fit or correspond to the shape of the rollers. (See dotted lines Fig. 5.) The lower end of the holder is slotted at *m*, where it works on the pin *k*, as shown, after passing through the top of the loose holder. On rod F is mounted the rod G, which has tubular portions or sleeves at each end to encircle said rod F, and which is held from vertical displacement on said rod F by coupling *g′*. The lower end of rod G passes loosely through the holder *h*, and above said holder is provided with an annular flange or shoulder g^2, between which and the holder *h* is placed the coil-spring g^3, that is mounted on the rod, and which serves to return rod G to its normal position and release the brake when the pressure is removed from the brake-lever. (See Fig. 9.) The lower end of the rod G is reduced and passes through a cross-bar g^4, which normally rests on the brake-rollers *l*, and which is shaped on its under side to conform to the grooved peripheries of said rollers, whereby a greater area of frictional surface is had between said bar g^4 and the rollers *l*. When the rod G is depressed, the rollers *l* are brought to bear gradually on the periphery of the tire, and the cross-bar g^4 is pressed gradually against the periphery of the rollers, thereby checking the momentum of the said rollers and clamping them between the said cross-bar and the periphery of the tire, bringing the machine to a stop without the quick jerking action of brake as generally employed and without banking the tire or burning the brakespoon. The side pieces *j j* have a loose connection with the rod; hence the cross-bar g^4 and the brake have each an independent vertical movement on the rod. (See Figs. 5 and 7.) Obviously additional friction can be had on the rollers *l* by interposing concave washers between the said rollers and the side pieces *j j*.

The foot-rest H, placed on the fork and adjustable thereon, has arms h^2, which encircle the fork, and a vertical extension h^3, that bears against the sides of the fork and braces the rest. This extension h^3 has positive engagement with the fork to prevent possible slipping, and, preferably, is provided with lug h^4, which is adapted to enter one of a series of openings *h′* in the fork. If desired, pins may be provided on the fork and the extension h^3 may be apertured to receive the said pins and the result will be the same as in the first instance. The arms h^2 are preferably elastic to clamp the fork, and the extension h^3 is likewise elastic to permit the disengagement of the lug h^4 from the open-

ings h'. The rest with the clamping-arms h^2 and the brace h^3 may be cast, but is preferably struck up from sheet metal, the edges of the "rest" being turned up, as shown, to give stability thereto and prevent the foot slipping when the rider is coasting. By having the arms h^2 elastic they will adapt themselves to any variations in size of forks and grip them tightly. The yoke I, having clamping-rings i at each end, is placed against the nether side of the diamond-frame or the portion a thereof, and is held thereto by the clamping-bolt J, which passes through a slot j' in the said frame. The upper side of the yoke is grooved to fit on corresponding ways on the nether side of the frame, whereby the said yoke is held from sidewise movement or lateral displacement. To further guard against any lateral displacement of the yoke, a plate or washer L is placed between the head of the bolt and the upper side of the frame, the oposing sides of the said plate and washer being held from lateral displacement by grooves and ways similar to the grooves and ways between the yoke and the frame. The yoke is moved on the frame to and from the axis of the drive or rear wheel by the adjusting-bolt M, which may be arranged to draw or push the said bolt J forward. The latter, which is by far the simpler constructions, is shown, and is arranged in the following manner: The adjusting-bolt M is apertured at its front end to permit the insertion therethrough of the clamping-bolt J, and its rear end is threaded and passes through openings in the seat-tube b. The adjusting-nut N is placed on the threaded end of the bolt M and is arranged within the seat-tube, its rear side being semi-spherical to conform to the curvature of the inner walls of the said seat-tube. This adjusting-nut is provided with radial openings n around its periphery to receive a pin, wrench, or other suitable tool by which it can be turned to adjust the bolt M. When taking up slack in the drive-chain, the bolt J is loosened and the nut N turned until the yoke I is sufficiently adjusted to take up the slack. Then the bolt J is retightened.

The crank-shaft O is provided near each end with cone-bearings P, which are journaled in cone-sleeves Q, that are screwed into the said clamping-rings i at the ends of yoke I. One sleeve has a right-hand thread and the other sleeve a left-hand thread, and by adjusting said sleeves the crank-shaft can be moved to the right or the left, as may be required, to bring the sprocket-wheels R and R' into alignment. The purpose of the right and left handed screw-threaded arrangement shown is to prevent the locking of parts in cases of extra friction, which might be caused by the accumulation of any foreign substance that may be in the bearings. Further, the parts cannot become set, so as to stop the wheel from revolving; but they can be unscrewed from their position and allow the wheel to turn without injury to the machine or rider. The cones P, instead of pointing outward, may be made to extend toward each other, the other parts being changed slightly to adapt them to this feature of construction.

The sprocket-wheel R has a groove in its side which receives a corresponding projection on the crank, and inasmuch as the latter is keyed to shaft O the said sprocket-wheel is also held from turning on the said shaft.

The object of keying fast to the sprocket-wheel is to enable the power to be applied direct to the sprocket-wheel and chain, and thus avoid strain on the shaft, which occurs when the power is applied through the crank to the shaft and thence to the sprocket-wheel.

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

1. The combination, with the drive-wheel and the sprocket-wheel revolving therewith, of the crank-shaft provided with a sprocket-wheel, and adjustable laterally, whereby the said sprocket-wheel can be brought into alignment, substantially as described.

2. The combination, with the drive-wheel and the frame, of the crank-shaft adjustable laterally to align the sprocket-wheels, and also adjustable to and from the axis of the drive-wheel to regulate the tension on the drive-chain, substantially as described.

3. The combination, with the frame having slot j', of the yoke I, having clamping-rings i on each end, and the clamping-bolt J, passing through said slot, the said yoke being grooved on its upper side to fit corresponding "ways" on the under side of the frame adjacent to the slot, substantially as described.

4. The combination, with the bicycle-frame having slot j', the seat-tube, and the yoke, of the clamping-bolt, the adjustable screw, and the adjusting-nut mounted on the adjusting-screw and located in the seat-tube, substantially as specified.

5. The combination, with the bicycle-frame, of the holder h, adapted to guide the brake-rod, and the mud-guard secured to said holder, substantially as set forth.

6. In a bicycle, the combination, with the wheel and the brake-bar, of the grooved brake-rollers, and the cross-bar adapted to press on the said rollers and conformed on its bearing-surface to the grooves in the said rollers, substantially as set forth.

7. The combination, with the bicycle-frame, the holder h, and the brake-rod, of the spring g^3, and the brake-shoe and the cross-bar, each having an independent movement on the lower end of the brake-bar, substantially as and for the purposes set forth.

8. The combination, with the fork, of the foot-rest having clamping-arms, and an elastic brace which is adapted to have a positive

engagement with the fork, substantially as described.

9. The hereinbefore-described foot-rest, struck up from sheet metal and having spring clamping-arms, and a vertical brace-extension which is adapted to have a positive engagement with the fork, substantially as described.

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

JOS. L. YOST.
CHAS. J. MOORE.

Witnesses:
E. W. TOLERTON,
CHAS. W. BOND.