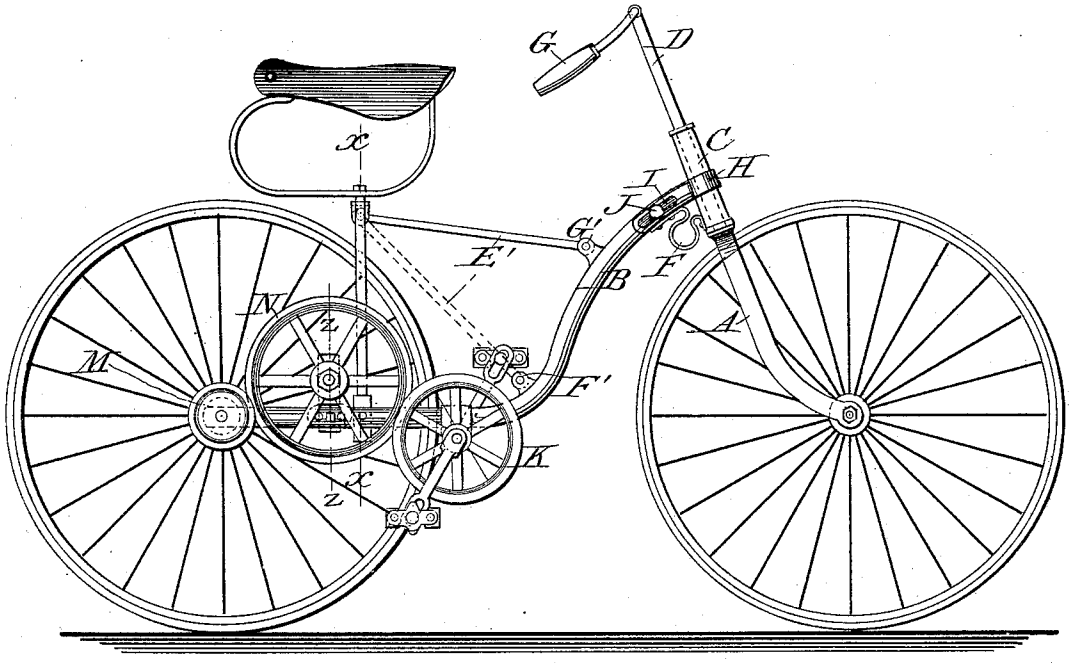
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No. 443,482. Patented Dec. 23, 1890.

Fig. 1.



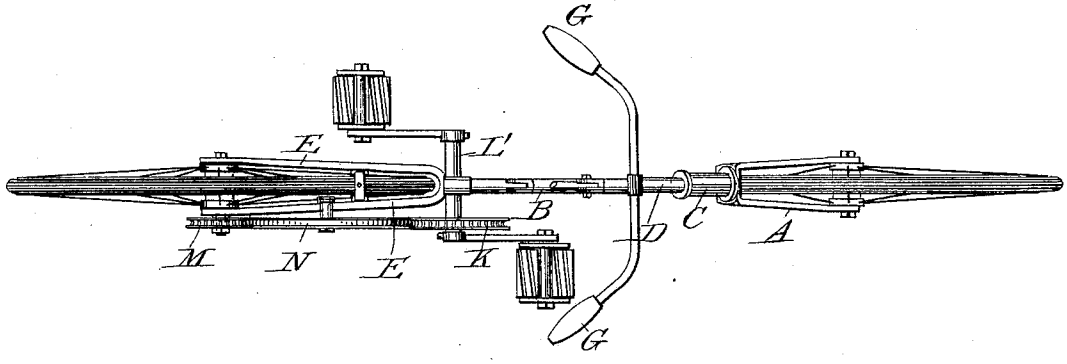


Fig. 2.

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Fig. 3.

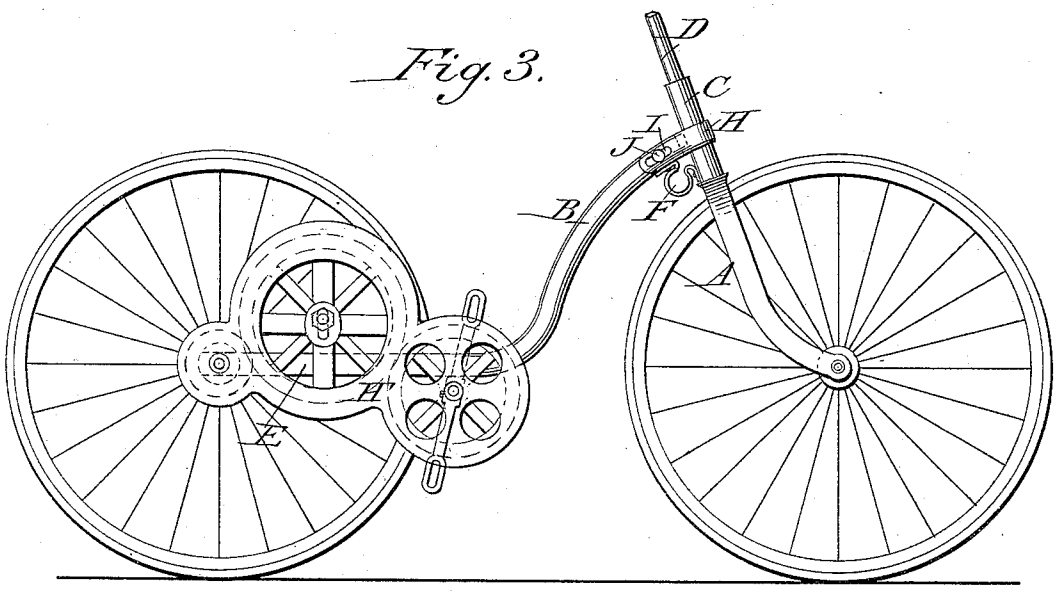
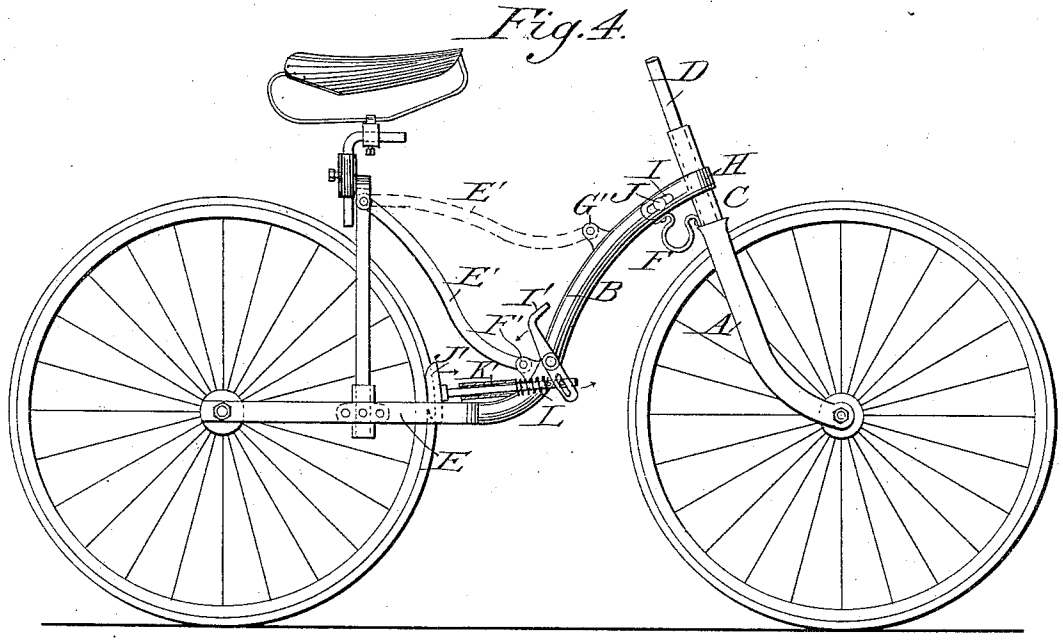


Fig. 4.



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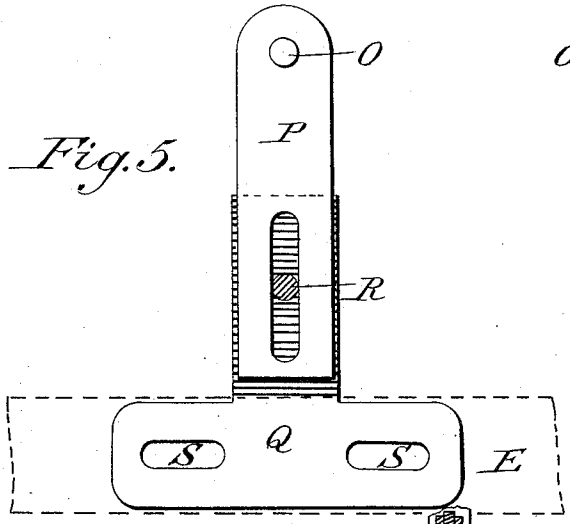


Fig. 5.

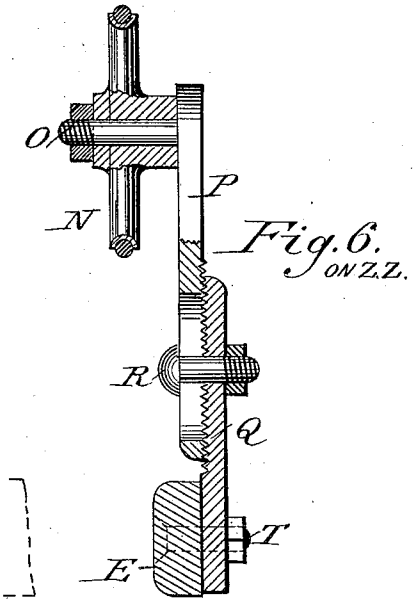
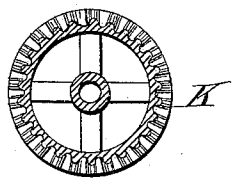


Fig. 6. ON Z.Z.

Fig. 7.



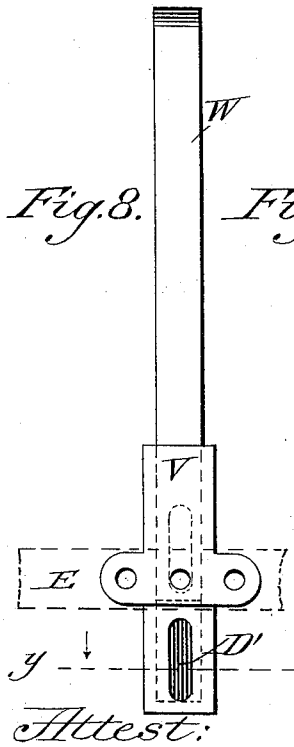


Fig. 8.

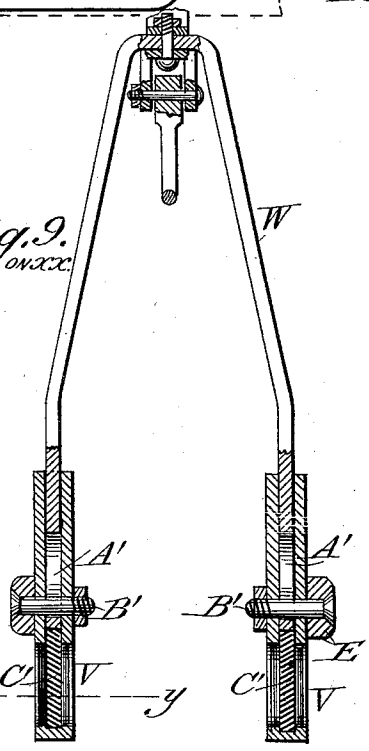
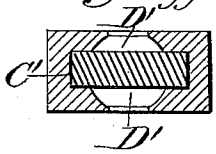


Fig. 9. ON X.X.

Fig. 10. ON Y.Y.



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UNITED STATES PATENT OFFICE.

FRANKLIN B. HUNT, OF RICHMOND, INDIANA, ASSIGNOR OF ONE-HALF TO L. C. ALLEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 443,482, dated December 23, 1890.

Application filed September 16, 1890. Serial No. 365,154. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN B. HUNT, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Bicycles; and I 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 has reference to an improvement in bicycles, and particularly to that type of the general class known as "safeties," the object of the invention being to simplify, cheapen, perfect, and make more efficient and useful the construction of bicycles; and the invention, therefore, consists in the construction, arrangement, and combination of the several parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of my improved bicycle. Fig. 2 is a top plan view of the same. Fig. 3 is a side elevation similar to Fig. 1, with certain parts removed, and showing the shields that cover the driving mechanism. Fig. 4 is another side elevation of my improved bicycle, showing particularly the construction and arrangement of the improved foot-brake applied to the rear wheel, and showing also the arrangement of yielding mechanism to provide a spring motion in the front and rear of the bicycle. Figs. 5 and 6 are elevation and sectional detail views, respectively, of the devices for supporting and adjusting the intermediate tension-wheel, which is situated between the drivers. Fig. 7 is a sectional detail view of the driving-pulley, showing its corrugated structure. Fig. 8 is an edge elevation of the seat-standard. Fig. 9 is another elevational view of the same in partial section on the line $x\,x$ of Fig. 8. Fig. 10 is a horizontal section on the line $y\,y$ of Figs. 8 and 9.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

A designates the front fork of the bicycle-frame, within which is arranged the front wheel of the bicycle.

E designates the rear fork, in connection with which the rear wheel is arranged. The rear fork E has the forwardly-extending reach B. The front fork A has the upward extension D, which carries at its upper ends the handles G.

C designates the socket which surrounds the extension D of the front fork, said extension being permitted to turn neatly within a socket C, under the manipulation of the handles G by the hands of the driver or rider. The front end of the reach B is contiguous to the socket C. Said front end of the reach and the socket C are connected by the intermediate spring F, which may be of any suitable and desirable construction, consisting, in the example shown in the drawings, of a flat piece of steel bent into suitable shape and having one arm thereof rigidly bolted or otherwise secured to the reach B, while another arm thereof is rigidly secured to the socket C, so that by this connection a yielding connection between the said parts may be afforded, and thus a vertical spring movement allowed whenever the front wheel strikes an obstruction during the progress of the bicycle. The socket C is surrounded by a clip H, the shank of which extends backward alongside of the reach B, said shank being provided with a slot I, that receives a bolt J on the reach, by means of which bolt and slot an adjustment can readily be effected at any time.

K designates the driving-pulley. It is secured firmly on a horizontal driving-shaft L′, lying transversely between the wheels in bearings between the driving and steering wheels, and provided at its two ends with cranks carrying the ordinary pedals. The wheel K communicates motion through an intermediate idler N, mounted on the frame, to a pulley M, fixed on the axle of the driving-wheel. The wheels K, N, and M are arranged to engage frictionally, preferably in the manner shown, by grooving or serrating the edges of wheels K and M, and providing wheel N with a rubber rim to engage therewith.

It will be seen that under the arrangement shown I am enabled to use a single driving-shaft located beyond the periphery of the

driving-wheel and adapted to be sustained by widely-separated bearings, so that it may be held firmly in position against the severe strains to which it is subjected. By this single shaft I transmit the power from both feet through the frictional driving-train on one side to the driving-wheel. This intermediate pulley N is supported in place and arranged adjustably by means of a suitable upright. The detailed construction of this upright is shown in Figs. 5 and 6. The upright consists of two sections P and Q. The upper section P carries the bolt O, which passes through the hub of the pulley N and carries on its outer end a suitable nut, as clearly shown in Fig. 6. Furthermore, the lower end of the section P is provided with a vertical slot. The section Q carries a bolt R, provided with a nut, which bolt passes through the slot in the section P. The opposing faces of the sections P and Q are serrated, corrugated, or grooved. It will be readily apparent that by means of the bolt R the two sections may be easily adjusted upon each other, so as to shorten or lengthen the upright, as may be desired, and the corrugated faces of the sections will enable them to be more firmly held together when the bolt is screwed tight after adjustment. The section Q, furthermore, is made in a T form, its lower horizontal arm being provided with slots S S, through which pass the bolts T, so that said sections may slide horizontally on said bolt for the purpose of laterally adjusting the upright, and thus, in consequence, laterally adjusting the position of the intermediate wheel N. These bolts T are seen in Fig. 6, and they obviously project horizontally from the rear fork E. It will thus be seen that the position of the intermediate wheel N may easily be adjusted either up or down, or to the right or left, in order to suit the weight of the rider who may wish to use the bicycle or for any other purpose for which adjustment may be at any time needed.

Attached to the rear fork E, as plainly shown in the enlarged detail views of Figs. 8 and 9, are vertical sockets V. W denotes the seat-standard, having the two downwardly-extending arms. The bicycle-seat is mounted on this standard, and it may be of any suitable and preferred construction. An example of seat is shown in Figs. 1 and 4. The lower ends of the seat-standard W enter the sockets V V. (See Fig. 9.) These lower ends of standard W are slotted at A′ and are adapted to move up and down upon the horizontal bolts B′, which bolts, as shown in Fig. 9, pass through the fork E and the sockets V V and are provided with suitable nuts. Rubber cushions C′ are placed within the bottom portions of the sockets V and the lower ends of the seat-standard rest upon the upper ends of these rubber cushions C′. The lower portions of the sockets V are provided with vertical slots D′, the inner corners of which are preferably chamfered to provide space and room for the expansion of the rubber cushions laterally when said cushion is depressed vertically, as plainly shown in the cross-section, Fig. 10. In this way it will be observed that the spring may be altered or adjusted to correspond to the weight of the rider, inasmuch as a shorter or longer piece of rubber may be inserted within each of the sockets V, according as a greater or less weight is to be supported upon the seat, which is mounted at the upper end of the seat-standard. By inspection of Fig. 10 the chamfered corners of the sockets V, which provide space for the lateral expansion of the rubber, will be clearly seen. Secured to the seat-standard is a stay-rod E′, (see Fig. 1,) which has its front end connected to the lugs F′ or G′, as the case may be, on the forwardly-extending reach B of the rear fork.

In Fig. 1 the stay-rod E′ is shown in full lines as connected to the lug G′, which is the upper one of the two lugs, and in dotted lines the position which it will occupy when connected to the lower lug F′, as indicated. In Fig. 4 the stay-rod E′ is shown in full lines as connected to the lower lug F′, and in dotted lines its position is indicated as connected to the upper lug G′. Further, the stay-rod E′ may vary in its form. The two examples shown in Figs. 1 and 4, respectively, differ slightly and may be changed still further from what is shown in the drawings in order to suit the exigencies of different cases.

It will be evident to the student of this bicycle that the corrugations on the peripheries of the drive-wheels K and M will take firm hold of the rubber band of the intermediate wheel N, and thus prevent any possibility of slipping. In this way an easy regular motion will be produced. Furthermore, the bicycle has, so to speak, a spring or cushion motion throughout its entire structure, all the parts being so relatively arranged as to be yieldingly connected, and although these connections are sufficiently firm to enable the machine to be driven with steadiness and accuracy, yet the yielding characteristics of the various connected parts are such as to make the motion of the bicycle easy in every respect. Further, mechanism arranged as I have herein shown and described may be kept free from the dirt and grease that necessarily accumulate with certain other species of driving mechanism—as, for instance, a driving-chain. It is well known that a chain is often used to transmit power from the pedals to the wheels. Instead of a chain, however, I use a frictional gearing-connection, whereby I attain many obvious advantages and am enabled to avoid many disadvantages attendant upon the use of the chain.

Referring to Fig. 3, I have therein shown a shield H′, which covers the driving devices and protects the same, making also a neat and tasteful finish to the whole structure. This shield or cover may vary in its form and details. I have simply shown it here by way of example only, in order to indicate that the

driving mechanism may, if desired, be properly covered and protected.

Another feature which is distinctive and valuable consists of the foot-brake, which is of great simplicity, and is connected to the reach B of the rear fork E. This brake is best shown in Fig. 4.

K′ designates a socket, which is attached to the reach in any suitable manner. Through this socket passes the stem, which carries the brake-shoe J′ at one end, which is applied to the periphery of the rear wheel of the bicycle, while the other end of the said stem is enveloped by a spiral spring L, which bears between the end of the socket K′ and a pin in the stem.

I′ designates the foot-lever, which is pivoted to the reach B, its bottom end being slotted to permit the passage therethrough of a pin on the end of the brake-stem. By pressing upon the foot-lever I′ with the foot the shoe J′ will be pressed against the periphery of the wheel, and thus the motion of the bicycle retarded or stopped. When the pressure is relaxed, the spring L will serve to normally hold the shoe sufficiently far from the wheel. The foot-lever I′ serves not only for the purpose of operating the brake, but it may also serve as a rest for the foot in dismounting.

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

1. The intermediate wheel N, provided with a rubber band and arranged between the crank-shaft attached to the reach and the rear axle of the ground-wheel.

2. The crank and axle pulleys provided with corrugations, in combination with the rubber band of the intermediate or transmitting wheel.

3. The combination, with the rear fork and ground-wheel, of the corrugated driving-wheels and the intermediate wheel provided with a rubber band.

4. The support, Fig. 6, for the intermediate wheel, provided with the slots and corrugations and bolt for the complete adjustment of the driving-tension.

5. The vertical sockets attached to the rear fork and provided with slotted recesses, in combination with springs operating in the bottom of said sockets.

6. In combination with vertical sockets provided with chamfered slots at their inner ends, the rubber springs.

7. The vertical seat support or standard working in vertical sockets attached to the rear fork.

8. The lower ends of the seat-standard working in vertical sockets and provided with slots, in combination with the rubber springs and the bolts passing through the slots.

9. The combination and arrangement of vertical sockets attached to the rear fork and provided with springs or cushions, the vertical seat-supports provided with slots at their lower ends, and bolts passing through the same.

10. The vertical sockets provided with springs and lugs by which they are attached to the arms of the rear fork, and a central hole for a bolt to retain the vertical seat-support in place.

11. In combination with the rear ground-wheel and the reach, a brake actuated by a foot-lever and spring, whereby said foot-lever may act as a support in dismounting.

12. In a rear-driving Safety bicycle, the combination of the driving-wheel provided with a friction-pulley, a cross-shaft lying forward of the driving-wheel and provided with cranks and pedals, a friction-wheel on said shaft, and an intermediate friction-wheel.

13. In a bicycle, a main frame, a swiveled steering-wheel at its front, and a non-swiveled driving-wheel at the rear, in combination with a cross-shaft located between the wheels and provided with pedal-carrying cranks, and a train of friction-wheels connecting the shaft and the driving-wheel.

In testimony whereof I affix my signature in presence of witnesses.

FRANKLIN B. HUNT.

Witnesses:

WILLIAM L. BOYDEN,

E. N. WATERS.