

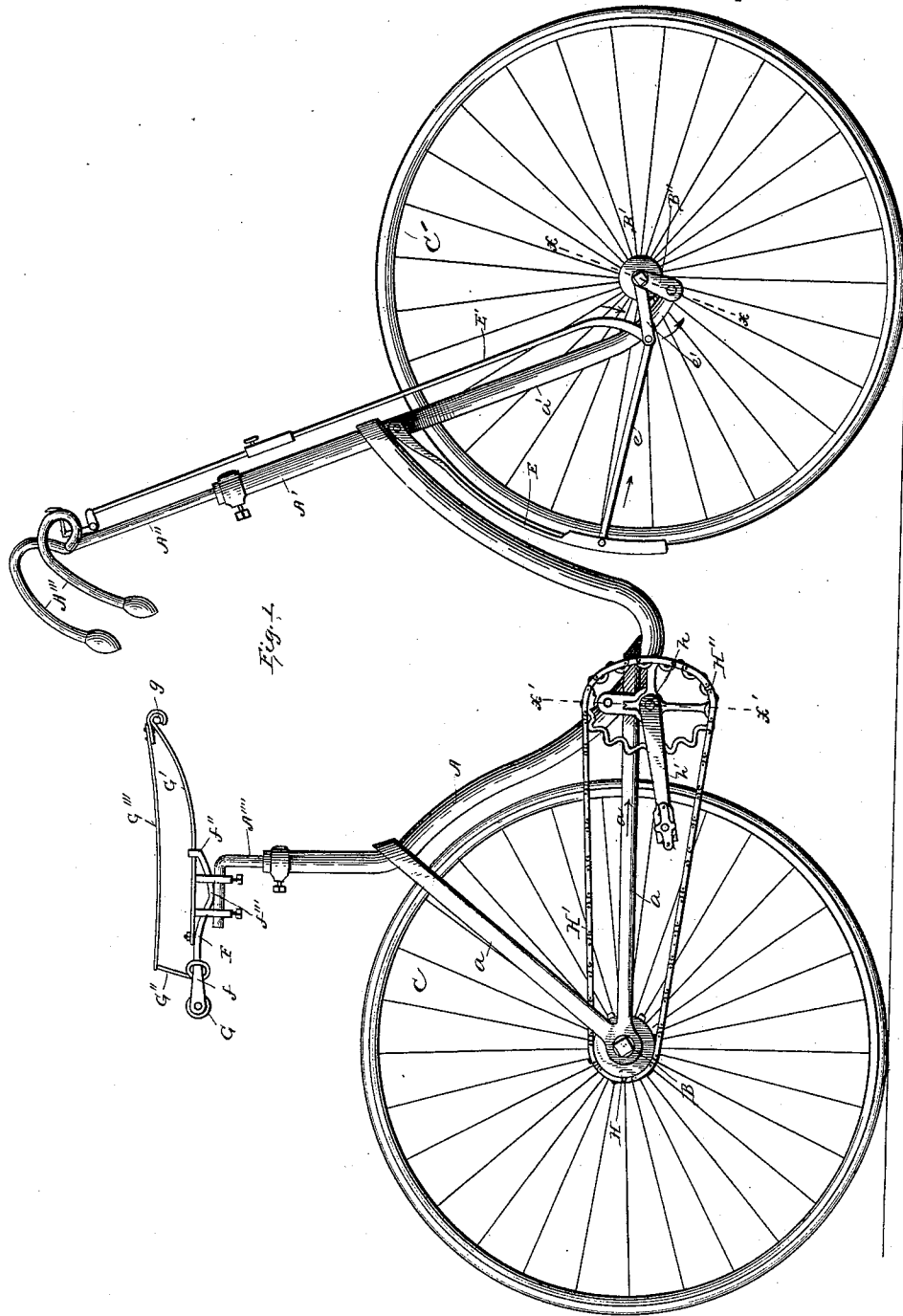
(No Model.)

M. REDLINGER.
VELOCIPÈDE.

3 Sheets—Sheet 1.

No. 431,529.

Patented July 1, 1890.



Witnesses

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By his Attorneys
Wiles & Brown

(No Model.)

3 Sheets—Sheet 2.

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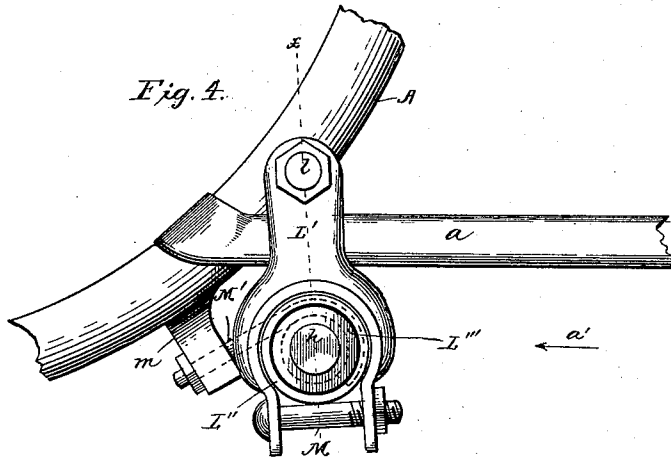


Fig. 1.

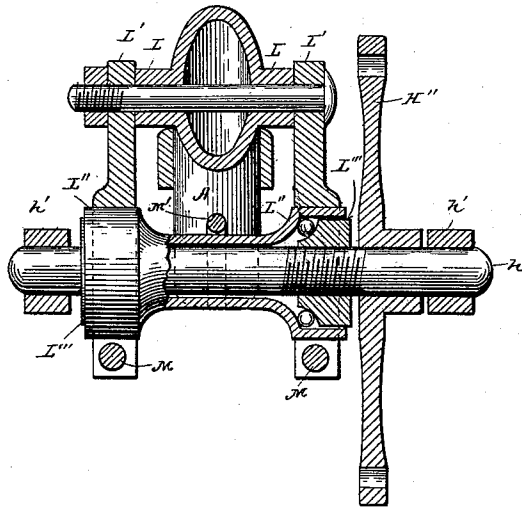
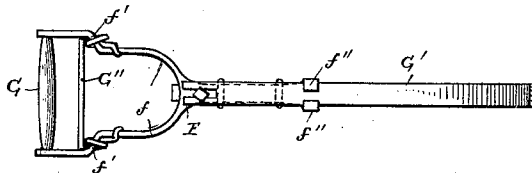


Fig. 2.



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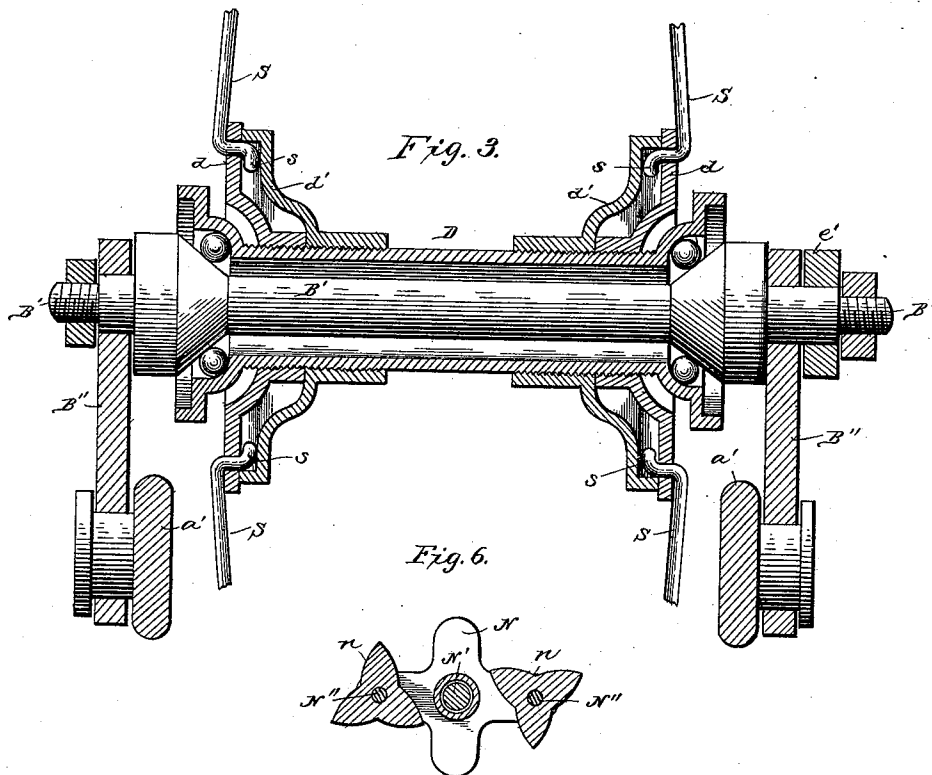
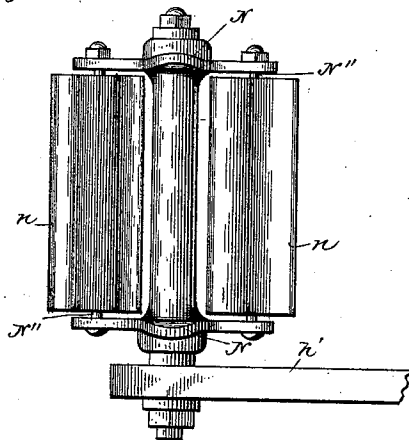


Fig. 7.



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UNITED STATES PATENT OFFICE.

MICHAEL REDLINGER, OF FREEPORT, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO L. M. DEVORE AND M. H. WILCOXON, BOTH OF SAME PLACE.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 431,529, dated July 1, 1890.

Application filed February 27, 1890. Serial No. 341,911. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL REDLINGER, a resident of Freeport, in the county of Stephenson and State of Illinois, 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 pertains to make and use the same.

My invention relates to improvements in bicycles, and is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a bicycle embodying my improvements. Fig. 2 is a top plan of the seat-frame thereof. Fig. 3 is a vertical section through the line xx , Fig. 1. Fig. 4 is a side elevation of the crank-shaft and its supporting parts, the crank being removed. Fig. 5 is a vertical section through the lines $x'x'$, Fig. 1, and $x''x''$, Fig. 4, the view being in the direction indicated by the arrow a , Fig. 1. Fig. 6 is a transverse section, and Fig. 7 is a top plan of the pedal.

In these views, A is the backbone of the machine, and A' is the neck, journaled in the front end of the backbone and provided at its lower end with forks a' and at its upper end with a vertically-adjustable handle-support A'', on which are formed handle-bars A'''. The rear portion of the backbone is provided with forks a , which embrace the rear wheel C of the machine and are supported by the axle B thereof, and in the upper rear end of the backbone is secured a vertically-adjustable seat-bar A''', carrying a seat whose structure is hereinafter described. Between the front forks a' lies the front wheel C', having an axle B', on whose ends are hung two swinging links B''. The lower ends of the forks a' are pivoted to the lower ends of the links B'', and as the lower ends of these links are free to swing forward or back the frame of the machine has a slightly-oscillating motion with reference to the front wheel. Thus when the front wheel strikes an obstruction its progress is temporarily arrested and the frame swings forward, but resumes its normal position as soon as the obstruction is

passed. This slight oscillation of the frame takes up and greatly lessens the shock caused by striking obstacles.

Both the wheels have the construction illustrated in Fig. 3, in which B' is the axle, and D the sleeve encircling the axle, the sleeve and axle being held in their proper relative position by means of the usual anti-friction balls lying between them. Plates $d d$ are provided with sleeves encircling the sleeve D and sliding freely thereon, and $d' d'$ are auxiliary plates provided with internal screw-threaded sleeves encircling the sleeve D and engaging a screw-thread thereon. The wheel is provided with a suitable number of wire spokes S, whose outer ends are set in the rim in the usual way, while their inner ends s are turned inward through holes near the margins of the plates $d d$ and then bent laterally in any desired direction, and thereby locked in place. The auxiliary plates $d' d'$ rest against the inner faces of the plates $d d$, which form the ends of the hub of the wheel, the position of said plates $d d$ being regulated and the spokes being properly tightened by screwing the auxiliary plates $d' d'$ toward the ends of the sleeve D. The construction thus described is extremely cheap, simple, and strong, and the adjustment of all of the spokes of the wheel can be effected in a moment by turning the two plates $d' d'$ slightly upon their support.

Upon the front end of the backbone is pivoted a downwardly-extending brake-bar E, having at its lower end a suitable brake adapted to be pressed upon the rear margin of the front wheel, and this brake is connected by means of two links $e e'$ with the axle B' of the front wheel. An operating-rod E', adjustable as to length, extends upward from the junction of the links to a point just below the handle-bars, where it is pivoted to the outer end of the operating-lever, whose free end lies close to one of the handle-bars. This lever is so constructed that when its free end is pressed toward the handle-bar its opposite end moves downward and presses downward the operating-rod E' and the point of connection with said rod of the links $e e'$, thereby drawing the brake forward against the tire

of the wheel. This brake is easy of operation, is so placed as to have great power, and at the same time it acts as a mud-guard at such a point on the wheel that the mud it scrapes from the tire drops to the ground.

On the seat-support A''' , already mentioned, is adjustably secured an iron bar F , forming the base of the seat-frame and formed with a downward bend f''' , which is in contact with the seat-support and lies between the clips, by means of which the iron is preferably fastened to the support. The rear end of the iron F is formed with two forks f , between whose ends is fastened a handle G , adapted to be grasped by the operator in moving the bicycle from place to place or in guiding it when, for instance, a pupil is seated on the saddle and is learning the use of the machine. The front end of the iron F is formed with clasps f'' , embracing a curved bow-spring G' , whose rear end is bolted to the iron F , while its front end extends forward and is bent into the form of a hook, as shown in Fig. 1. The two forks f on the rear end of the iron F are formed with lateral bends f' , which are encircled by coils formed integrally with a transverse bail G'' , extending upward from the forks, and the seat G''' , of leather or other suitable material, is attached at its rear end to the bail and at its front end is provided with a strap, which is wrapped about and carried into the hook at the front end of the spring G' , and is held in place by a transverse bolt g , lying within the hook. The ends of the rod forming the bail G'' and its coils are bent upward and inward and hook over the forks, and the parts of the saddle are so arranged that when the leather seat is in position the bail G'' is drawn forward sufficiently to bring a considerable tension upon its coils. The seat thus is an elastic support, whose elasticity may be varied by moving the spring G' forward upon its support, the spring being slotted for the purpose of such adjustment. The position of the iron F with reference to the horizontal plane may be varied by rocking it upon the bend f''' , this change of position being easily effected by loosening one of the clips which hold it in place and tightening the other.

It is common in bicycles of the general form illustrated in the drawings to mount a sprocket-wheel of small diameter upon the rear wheel of the machine, a second sprocket-wheel of larger diameter being mounted on the crank-shaft, and the two being connected by a sprocket-chain. Heretofore, however, so far as I know, both the sprocket-wheels have been circular, so that the resistance has been constant, although the power of the cranks necessarily varies in accordance with their position at different points of each stroke. In order to equalize the resistance and power, I have mounted on the crank-shaft an oval driving sprocket-wheel having its major axis at right angles to the cranks, the speed of motion of the machine developed

by each crank being greatest when the crank is moving directly downward and least when it is passing through the upper and lower arcs of its circle of motion. The use of this form of sprocket-wheel enables the operator to do the greatest share of the required work on the downstroke of the pedal, when he has the greatest power, and this I have found a very material advantage in the operation of the machine.

It has been found necessary in practice to provide some means of adjusting the distance between the two sprocket-wheels in order to tighten the chain which connects them, and for the purpose of effecting this readily I have mounted the crank-shaft h in the swinging bearing illustrated in Figs. 5 and 4, in which L L are two bosses formed on the sides of the backbone A , and L' L' are two links pivoted to the bosses by means of the transverse bolt l . In the lower ends of the links are formed circular bearings, in which are seated the enlarged ends of the sleeve L'' , and within this sleeve lies the crank-shaft h , held in proper relation to the sleeve by means of anti-friction balls of the ordinary form. The bearing which supports and incloses the ends of the sleeve is open at its lower margin, each of the links being provided with ears, which extend below said opening, and bolts M , passing through these ears, clamp the sleeve firmly in place. The crank-shaft is thus held in a swinging support, whose oscillation varies the distance between the two sprocket-wheels, and the hooked bolt M' , having its straight end in engagement with the lug m on the backbone and its curved end in engagement with the sleeve L'' , serves as a means for regulating the position of the sleeve and of the parts connected therewith.

Fig. 5 shows the position of the sprocket-wheel H'' on the crank-shaft h , and also the position of the cranks h' h' , which are situated at the extreme ends of the crank-shaft.

Another feature of my invention relates to the form of rubber tread for the pedal, and is illustrated in Figs. 6 and 7, in which N N are the end plates, and N' is the central shaft of a pedal-frame of usual construction. N'' N'' are rods set in the end plates and parallel with the central shaft N' , and n n are rubber treads which are mounted on the rods N'' . These treads vary from those in ordinary use in the fact that they are approximately triangular in cross-section, as illustrated in Fig. 6. A tread of this form presents as favorable a surface to the foot of the operator as any other, and each of its sides is so near the central rod on which it is mounted as to offer an extremely stable support.

It is evident that the machine shown in the drawings and hereinbefore described may be varied in many particulars without departing from the spirit of my invention, since any mechanic from these drawings might by the exercise of mere mechanical skill produce a machine embodying such variations. Thus,

for instance, the elliptical sprocket-wheel may be placed on the axle of the rear wheel and a circular driving-sprocket be placed upon the crank-shaft. The means shown for tightening the spokes might also be altered in various ways and still produce substantially the same result—namely, the forcing outward of the plates forming the ends of the hub of each wheel, and thereby in effect lengthening the hub and tightening the spoke. The details of the link-connection of the front forks with the front axle and of the crank-shaft with the frame of the machine might also be modified in numberless ways, and the forms of the device shown are merely intended as illustrations of the principle of the invention in each case.

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

1. In a bicycle, the combination, with the front wheel, of a brake lying in rear thereof and two links connecting said brake with the axle of the wheel, an operating-rod extending upward from the junction of said links to a point near the handle-bar, and an operating-lever adapted to move said operating-rod longitudinally, and thereby press said brake against or withdraw it from the wheel.

2. The combination, with the wheel *C'* and its axle *B'*, of the neck *A'*, the combined brake and mud-guard pivoted at its upper end to the neck, the links *ee'*, connecting said brake with the axle of the wheel, and the rod *E'*, extending upward from the junction of said links and connecting with a lever mounted on the neck or an attachment thereof, whereby the operation of the lever moves said rod longitudinally and presses the brake against or releases it from the wheel, substantially as and for the purpose set forth.

3. In a machine of the class described, the combination, with the wheels and their axles and the frame supported thereby, of a sprocket-wheel mounted on the rear axle, a crank-shaft supported by the frame, an elliptical sprocket-wheel mounted on said crank-shaft, and a sprocket-chain connecting said two sprocket-wheels, substantially as and for the purpose set forth.

4. In a machine of the class described, the combination, with the wheels and their axles and a frame supported thereby, of a sprocket-

wheel mounted on the rear axle, a crank-shaft journaled in a swinging support attached to the frame, an elliptical sprocket-wheel mounted on said crank-shaft, and a sprocket-chain connecting the two sprocket-wheels, substantially as and for the purpose set forth.

5. The combination, with the rear wheel and its axle and the sprocket-wheel mounted thereon, of the forked links *L'*, suspended from the backbone, the sleeve *L''*, supported in the forks of said links, the shaft *h*, journaled in said sleeve, the sprocket-wheel *H''*, mounted on said shaft, and the adjustable hooked rods *M'*, for regulating the position of said wheels and shaft, substantially as and for the purpose set forth.

6. In a bicycle, the combination, with a horizontal seat-support, of a seat-iron having a convex bend resting on said support, fastenings adjustably securing said seat-iron to said support, and means for attaching the leather seat or saddle to said seat-iron, substantially as and for the purpose set forth.

7. In a bicycle-saddle, a base provided with a handle for guiding the machine, substantially as shown and described.

8. In a bicycle-saddle, a base formed at its rear end with a fork, in combination with a handle lying between and supported by the parts of said fork, substantially as and for the purpose set forth.

9. The combination, with the iron *F* and the spring *G'*, of the spring-bail *G''*, supported by the iron *F*, and the seat *G'''*, supported by the spring *G'* and bail *G''*, substantially as and for the purpose set forth.

10. In a bicycle, the combination, with the wheels and their axles and a frame supported thereby, of a sprocket-wheel mounted on the rear axle and a second sprocket-wheel mounted on a shaft supported by the frame, and a sprocket-chain connecting said two sprocket-wheels, one of said sprocket-wheels being approximately elliptical in form, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MICHAEL REDLINGER.

Witnesses:

R. H. WILES,
L. M. DEVORE.