

H. A. MALTBY.

Improvement in Velocipedes.

No. 123,571.

Patented Feb. 13, 1872.

Fig. 1

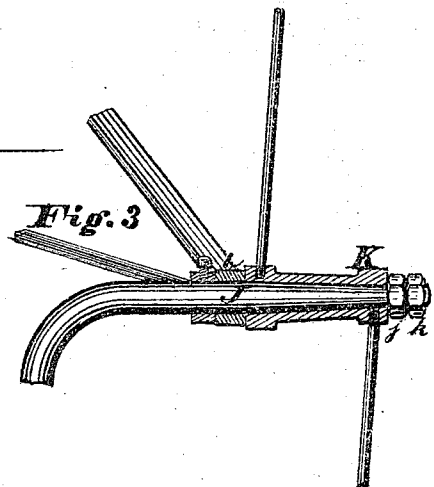
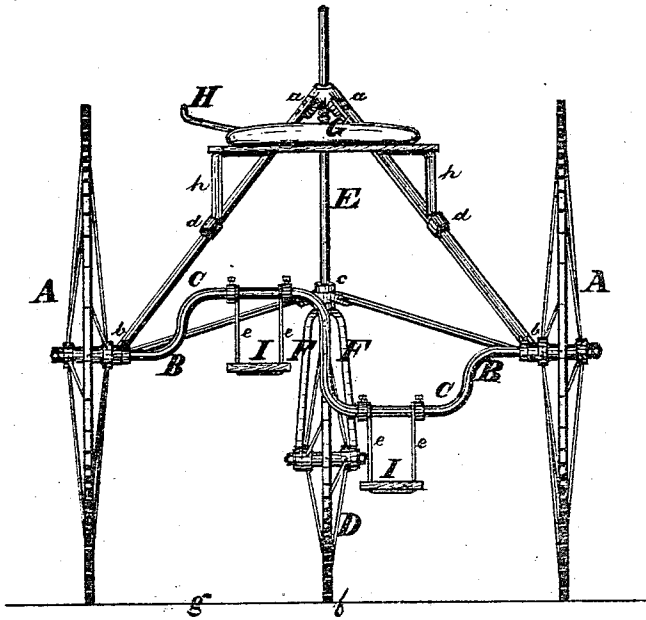
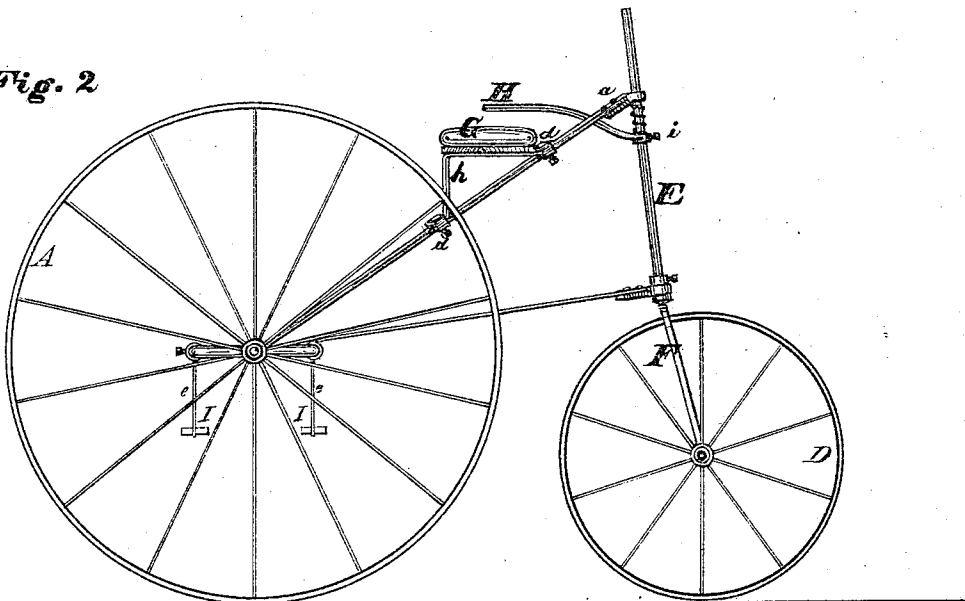


Fig. 2



Attest

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IMPROVEMENT IN VELOCIPEDES.

Specification forming part of Letters Patent No. 123,571, dated February 13, 1872; antedated February 9, 1872.

To all whom it may concern:

Be it known that I, HENRY A. MALTBY, of Brownsville, county of Cameron, State of Texas, have invented a new and Improved Velocipede; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming a part of this specification.

This invention relates to improvement in velocipedes; and consists in a new and novel combination and arrangement of propelling power, due to the weight of the body, which may be aided by the muscular force thereof and guiding apparatus.

On smooth, level roads, only a part of the weight of the body will be required, by which a high rate of speed will be acquired with much less exertion than that of walking; but in ascending inclines, or in passing over sandy, muddy, or otherwise heavy roads, the entire weight of the body and the muscular force thereof can be used, when a high rate of speed may be obtained with less exertion than that required in walking under like circumstances.

Figure 1 is a front elevation of my improved machine. Fig. 2 is a side elevation of the same; and Fig. 3 is a section of hub and axle to large wheels.

Similar letters of reference represent corresponding parts.

A A are the larger wheels, one of which is the propelling-wheel, mounted on their axle B, which, in this case, has two cranks, C C, and which range in opposite directions. D is the guiding-wheel, ranging so as to form, in connection with the wheels A, a triangular position. E is the spindle of the crotch F, in which the guiding-wheel is mounted. It is made caster-shaped. G is the seat, and H the lever for turning guiding-wheel. I I are the stirrups or foot-pieces, mounted on cranks C C. J is the cone-shaped axle to large wheels, with hub K to fit same. The frame is composed of bars or rods, beginning, say, at *a*, a metal fork, to which it is fastened by bolts, and through the base of which the spindle E passes loosely, so as to be free to revolve when guiding; thence to *b*, where the bar or rod passes loosely around the axle-tree B, so that it may re-

volve freely when propelling the machine; thence to *c*, where it is fastened to another metal fork by bolts, through the base of which the spindle E passes loosely, so as to revolve easily when guiding. The reverse side of the frame is a counterpart of the one described, being placed apart at the extremities *b b*, so as to make room for the body of the operator. The frame is kept in position on the spindle E by means of collars fastened thereon with set-screws, whereby the frame at *a* can be fastened up or down on spindle E to suit the wish of the operator. The seat G rests on angled bars *h h*, which are fastened upon the frame between *a* and *b* by means of collars *d*, (with set-screws,) which grasp that part of the frame and the ends of the angled bars *h* at the same time. By this means, the seat G, in conjunction with fastening frame up and down on spindle, heretofore described, can be adjusted in any position on the frame between *a* and *b* and over the axle, so as to suit the wish and the length of the legs of the operator. The seat G is adjusted above axle-tree B, and toward steering or guiding wheel D, but only far enough to secure the operator against accident from pitching forward, and high enough so that one leg straightened will reach from the seat G to the lowest part of one of the stirrups I when it is furthest from the seat G. The frame from *a* to *b*, being suspended between those points, operates as a spring for seat G, which, in conjunction with spiral spring around spindle E, between *i* and beginning of frame at *a*, gives all spring to seat desired or required. The stirrups I I are adjusted along the cranks C C to suit the wish of the operator, and there maintained in position by collars (with set-screws) around axle-tree B. Each of the stirrups I I is made of strong wire or rods, which are fastened on cranks C C loosely, so they may revolve. They then run down to foot-piece at II; thence across bottom of foot pieces, and thence up to cranks C, and again fastened, as first stated. The foot pieces are of wood, and are crotched or fastened at ends upon wire *e*. The weight of stirrups hold them in proper position to receive the feet of the operator. The lever H is fastened on the spindle E at *i* by set-screw. By pulling or pushing upon the end of the lever, the guiding-wheel has its direction correspondingly changed,

whereby any direction of the vehicle from a straight line to a curve within the circle of the three wheels may be obtained.

The operator mounts upon his seat, using one of the stirrups standing in the lowermost position of the cranks as a step. Upon smooth, level roads, the operator will retain his seat, setting far enough forward not to allow the seat to interfere with the up-and-down motion of the legs while treading the cranks, which treading he does in the ordinary way to impart rotary motion to the wheels A A, and using but a part of his weight thereon. The better to ascend inclines, or to pass along sandy, muddy, or otherwise heavy roads, the operator has two ways of propelling the vehicle, first, by holding to the seat or frame and rising from the seat so that the entire weight of the body may be upon the cranks; second, by bringing the guiding-wheel to the front, face to the seat, and holding on to the same, as first stated, and then treading cranks. When it is desired to turn the guiding-wheel, one hand must be detached from the seat or frame, and taking hold of the hand-lever H give the desired turn or direction. When greater power is required than can be delivered by the operator's weight, he must lift against the seat or frame, and, as this lifting has to be sustained by the feet, it is very evident that whatever amount he lifts operates as so many additional pounds to the weight of the body as a motive-power. However, hardly ever will more power than that due to the weight of the body be required. The force of the foot-power is applied by keeping the weight of the body forward of the line of contact of propelling-wheel A with the earth, which is done by alternating the weight of the body through stirrups I I upon the cranks C C when in revolving they pass forward of that line. Thus it is that the operator's weight, being as it were suspended upon the ends of levers, (cranks are but revolving levers,) becomes a potent motive power. In other velocipedes, the power comes from the muscular exertion of the legs delivered upon the cranks, and sustained by a resistance obtained at the seat. The stirrups I I, by hanging from the cranks C C, allow the body of the operator to near the base, thereby overcoming the top-heaviness were the body higher up, and preventing capsizing or turning over. The stirrups can be made of length to suit operator, or can be made adjustable. Being made of steel wire, there is little friction. The ends of axle-tree B are made cone-shaped, as at J, and the hubs of the wheels A A, as shown at K, have to fit said cone-shaped axles. Wheels A are put upon the axle B in the ordinary way, which wheels are secured in their proper place by a nut, *j*, and a fastening-nut, *k*. One wheel must be forced against cone of axle B so firm and strong that axle and wheel will revolve simultaneously, one with the other, which is done by first screwing down nut *j* against hub, and forcing it on axle, and then following by fastening-nut *k*, and securing both so that the

wheel cannot loosen on axle by use. The revolving of cranks C C revolve this wheel, which is the driver, and gives motion to the vehicle. The other large wheel, being fastened on but free to revolve on axle B, in connection with its mate just described and the guiding-wheel, leaves the velocipede free to turn in any direction without forcing the slipping of one of the wheels A on the ground, as would be the case were they both fastened firm and fast to axle B; or one of the wheels A can be made fast upon the cone of axle B, so as only to resist the weight of the body while upon cranks C, and still loose enough so as to revolve on axle in turning—in other words, tight enough to resist the weight of the body, as before stated, but unable to resist both weight and the wrenching force exerted on wheels A in turning velocipede while being operated. Either of the wheels A can be made firm and fast to axle B to suit operator, leaving the other loose, as above described. Crotch F, in which the guiding-wheel is mounted, is inclined toward spindle E at top at an angle of ten degrees, more or less. This angle overcomes, in a measure, the centrifugal force when changing the direction of the velocipede. Thus, if the direction of the velocipede has to be changed to the left when moving forward, the front of the guiding-wheel has to be changed to the right, which, by reason of the spindle E and crotch F being inclined, throws the line of contact of guiding-wheel D with the earth from *f*, where it touches earth when vehicle is going in a straight line toward *g*, thus acting as a prop to sustain operator in his seat in thus operating to overcome centrifugal force. The wheels, in order to secure greater lightness and strength combined, can be made of wrought-iron, welded tubes, or of steel rods, in the ordinary way, with this difference: The spokes are fastened into the hub by a right-handed screw, and into the felly by a left-handed one. By this means the spokes, when once inserted into proper place, which can be done by bending them before and straightening them afterward, can, by turning them in the proper direction, be made to sustain a tension between the hub and felly, the same as a violin-string when strung. Made thus, the weight of the load resting on the hub is maintained by being suspended by spokes from the upper part of the felly, and is not supported by the endwise strength of the spoke, as is the case in the ordinary wheel. A wire will sustain a heavy weight when suspended from one end, which could not sustain it in any other manner. By having every alternate spoke enter the hub at its reverse end, as shown in the drawing, they will operate as braces, one against the other, to hold the hub in its proper place, and to resist force calculated to wrest or wrench it from such position.

This velocipede can be made of any desired size or proportion to suit age or wish of operator, and of any material, such as steel, iron, gas-pipe, wood, or of other material, and is

equally adapted for the use of both sexes. It can also be made with four wheels, to be operated by two persons, making two more wheels the same as the two large ones A herein described, and connecting both axle-trees, so that one can be turned for guiding. On good roads the operator can obtain as high a rate of speed as his temerity will permit him to go. For one-legged persons, one of the cranks can be operated by a lever by one of the hands. For no-legged persons, both of cranks C C can be operated by levers by both hands. The frame can be ornamented to suit the taste or fancy. In going down hills, or in stopping velocipede, reverse the weight upon cranks, and it will act as a brake; or brake can be attached to frame in the ordinary way.

I propose to call this the Ranger's Velocipede.

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

1. A velocipede constructed with a triangular frame, *a b*, and axle B, with two cranks, C C, between the wheels A A, stirrups I I suspended therefrom, an adjustable seat, G, and a caster steering-wheel, D, all as set forth.

2. The conical axle J and nuts *j k*, arranged, in connection with the wheel-hub K, so that said wheel-hub may be set tight upon said axle by means of said nuts, as and for the purpose set forth.

3. The spindle E and crotch F, inclined to each other, as described and shown, so that when said spindle is rotated to change the direction of the steering-wheel the point where said wheel rests upon the ground will be shifted laterally as respects the wheels A A, for the purpose set forth.

HENRY ALONZO MALTBY.

Witnesses:

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T. VAN KANNEL.