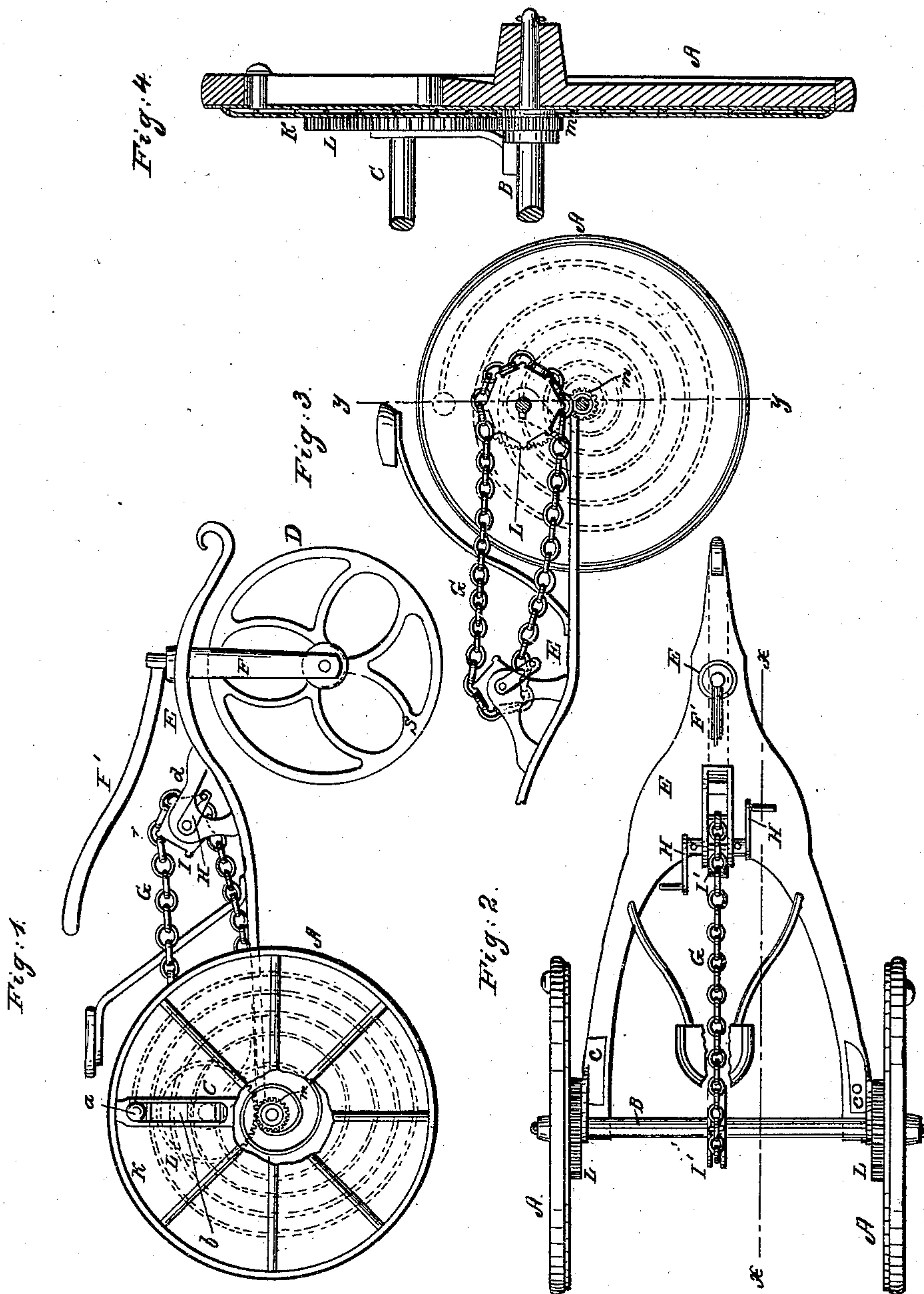


J. A. MORRELL.

Velocipede.

No. 86,573.

Patented Feb. 2, 1869.



Witnesses:
C. F. Clausen
& Ruppert.

Inventor:
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per
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United States Patent Office.

JAMES A. MORRELL, OF NEW YORK, N. Y.

Letters Patent No. 86,573, dated February 2, 1869.

IMPROVED VELOCIPEDE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JAMES A. MORRELL, of the city, county, and State of New York, have invented a new and useful Improvement in Velocipedes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation of my improved velocipede, with a portion of the plate, which covers the spring, cut away for the purpose of showing the spring attached to the pinion, which revolves upon the shaft for the purpose of winding up said spring.

Figure 2 is a plan or top view, showing the general arrangement of the parts.

Figure 3 is a sectional elevation, taken on line *x x* of fig. 2, and showing the chain and cranks for winding up the springs.

Figure 4 is a sectional elevation, taken on line *y y* of fig. 3.

Corresponding letters refer to corresponding parts in the several figures.

This invention relates to an improvement in velocipedes; and

It consists in providing the driving-wheel, or driving-wheels, with a compensating-spring, as a medium for imparting motion to such wheels; and

It further consists, in the combination and arrangement of the parts of the device, as will be more fully explained hereafter.

A, in the drawings, represents a driving-wheel for a velocipede, which may be constructed with a hub, and with spokes and felloes, or a rim, in any suitable manner, in which respects it may resemble other wheels, or those in use for analogous purposes, but it differs from all others of which I have any knowledge, in that it has one of its spokes widened, so as to admit of there being a slot, *b*, formed therein, and it also differs from others, in that it has two plates of metal secured to the edges of its rim, which plates extend nearly to the hub of said wheel. This wheel, or these wheels, revolve upon an axle in the usual manner.

B represents the axle of the machine, upon which the wheels rotate, and to which the rear ends of the frame E are secured.

C represents a counter-shaft, which is placed in a line parallel with the axle of the machine, and is held in position with reference thereto, by means of brackets or hangers *c c*, attached to frame E, as shown in figs. 1 and 2 of the drawings.

Upon the outer ends of this shaft are secured the gear-wheels L L, which mesh into the pinions *m m*, to which the springs are attached, the shaft being driven or rotated by means of a wheel placed thereon, between said gear-wheels, around which a chain, or rope, or belt passes from the wheel I.

D represents a wheel, which is secured to the front end of frame E, in which its guide rotates.

E represents the frame of the carriage, which is bifurcated at its rear end, and secured at that point to the axle B, while near its front end it is curved upward, and formed into a segment of a circle, as shown in fig. 1, so as to permit of the guide-wheel being secured thereto, and working beneath the same, without giving too great an elevation to that portion of the frame.

F represents a vertical spindle, the lower portion of which is slotted for a distance something more than the semi-diameter of the guide-wheel, so that said wheel may work within said slot, a pin being passed through the lower portion of such spindle and through the hubs of said wheel, which pin serves as the axle upon which it rotates.

The upper end of this spindle is round, and passes through a hole formed in the frame, into which it fits snugly, and yet loosely, so as to rotate thereon freely.

To the upper end of this spindle, the crank or handle F' is attached, which handle is for the purpose of controlling the guide-wheel, and thus enabling the operator to give the desired direction to the carriage.

G represents the chain above alluded to, which passes over the wheel I, which is secured to the shaft of cranks H H, and thence over and around the wheel I', upon the shaft B.

H H represent cranks attached to a short shaft, which rotates in bearings *d*, secured to the frame E in such a position as to be conveniently operated by a person seated upon the machine.

It will be observed that by rotating or turning these cranks, motion is given to all of the propelling-parts of the machine.

K represents a spring, one end of which is firmly attached to the pinion *m*, which rotates freely upon the axle B, while its opposite end is secured to a wrist or crank-pin, which traverses the slot *b* formed in the spoke of the driving-wheel.

This spring is represented in the drawings as an ordinary coiled spring, but it is apparent that a series of such springs may be used, they being so arranged as to be wound up by the action of the other parts of the machine, in a manner similar to that shown in the present case, or other forms of springs may be used if found desirable, the office of such springs being to receive the power applied to propelling the machine, and transmit it to the driving-wheels in such a manner as to compensate for the inequalities of the surface over which the machine has to pass, or, in other words, to store up, at times when but a small amount is required, a surplus quantity of power to be used when the resistance to the movements of the machine is increased, from any cause.

This effect is produced in the present case by means of the pinion *m* acting upon the inner end of the coiled spring, and through such spring upon the pin *a*, by which means, when the resistance is great, the pin will be drawn in toward the hub of the wheel, and the coils of the springs caused to approach each other, and thus

an additional amount of force is imparted to such springs, to be given out as circumstances may require.

L L represent the gear-wheels, which are secured to the shaft C, and which communicate motion to the pinions M M.

The operation of my velocipede is as follows:

The parts being constructed and arranged as shown in the drawings, the operator seats himself upon the seat provided for that purpose, and operates the cranks H H, which causes the wheel I to rotate, the chain G communicating such motion to the shaft C, through the medium of wheel I', the shaft C in its turn imparting motion to the pinions M M, which causes the springs K to be wound up, until the force they exert upon the wheels is sufficient to set them in motion, when the machine starts, and continues in motion so long as force is applied to move the parts described, and in cases where the track is smooth and level, it will be found that the power stored up in the springs will continue to move the carriage for some time after the operator ceases to apply them thereto.

It will be apparent that in operating this device, there will always be an amount of power stored up in the springs, which will compensate for any increased resistance which may at the time be offered to the movements of the machine, and that this will be what may be termed an elastic force, ready to act at the moment at which it is needed.

It will also be apparent that such springs are applicable in cases where one or more than one wheel is used as propelling-wheels, and that it could be used to advantage as a motive-power, by passing a belt around the periphery of the wheel to which it should be applied.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. Combining, with the driving-wheels of a velocipede, or other similar carriage, a compensating-spring, substantially as and for the purpose described.

2. The combination of the cranks H H, and the shaft upon which they are secured, the chain G, and chain-wheels I and I', the gear-wheels L L, pinions m m, springs K K, and wheels A A, substantially as and for the purpose set forth.

3. The combination of the slotted spoke of the wheel, the crank-pin a, the springs K K, or their equivalent, and the pinions m m, or their equivalent, substantially as and for the purpose set forth, as shown.

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

JAS. A. MORRELL.

Witnesses:

R. N. EAGLE,

CHAS. F. CLAUSEN.