S. Andrews.

Velocipede.

No. 92,928. Patented Jul. 27, 1869.

Fig. 1.

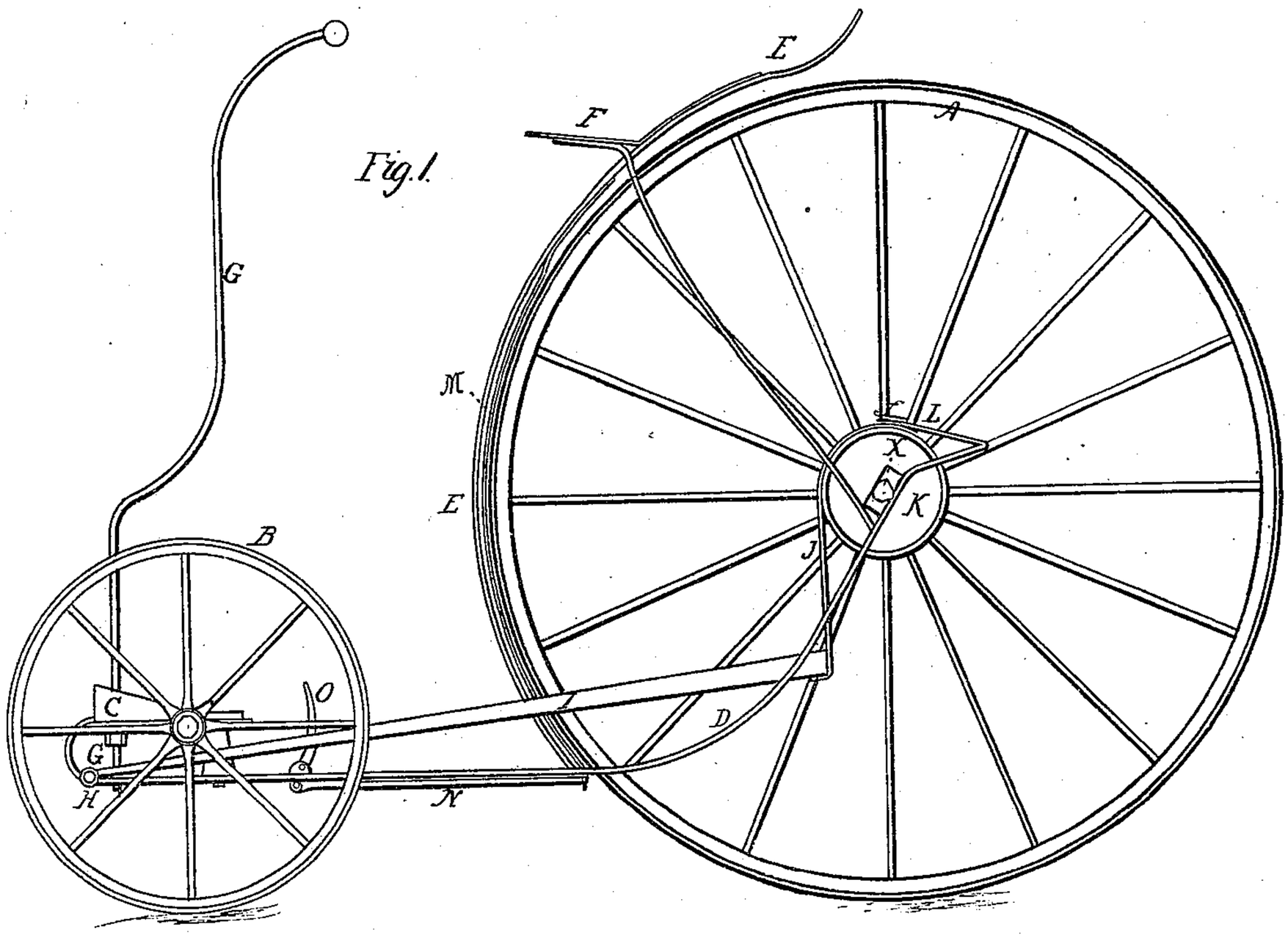

Fig. 3.

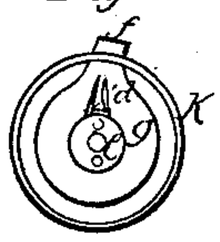

Fig. 5.

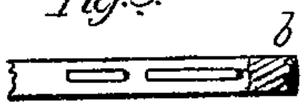

Fig. 2.

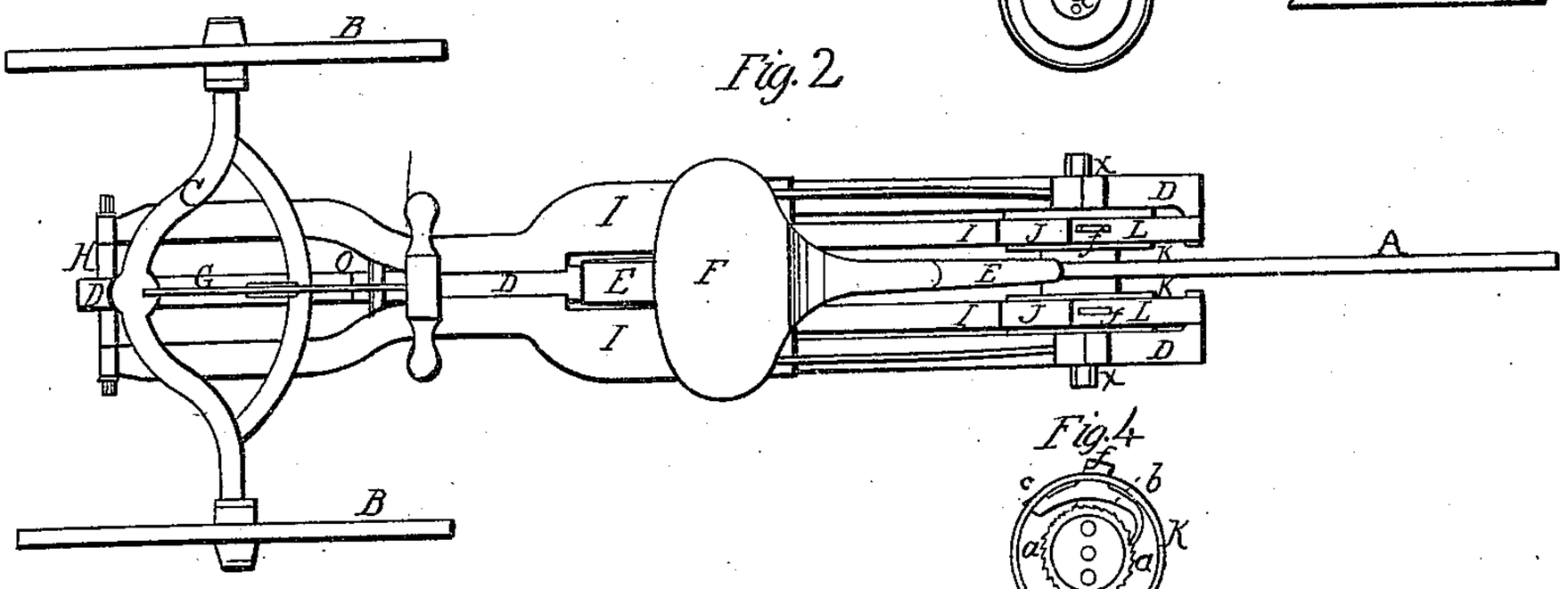

Fig. 4.

Witnesses:

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IMPROVED VELOCIPEDE.

Specification forming part of Letters Patent No. **97,928**, dated July 27, 1869.

To all whom it may concern:

Be it known that I, SOLOMON ANDREWS, of Perth Amboy, county of Middlesex and State of New Jersey, have invented certain new and useful Improvements on a Velocipede; 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, and to the letters of reference marked thereon, making a part of this specification.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct my machine with one larger or driving wheel, A, in the rear, connected by a reach or frame-work, D, to two smaller or pilot-wheels, B B, in front of it. These pilot-wheels are connected together by an axle-tree having a horizontal anterior curve, as shown at C, Fig. 2, (or a bar may project anteriorly from a straight axle-tree,) so as to bring the center of vibration anterior to the center of motion or rotation of the wheels. The connection with the reach at that anterior point by a bolt, G, commonly called a "king-bolt," but in this case constituting both king-bolt and steering-rod, passing through the axle-tree and a hole in the reach in the usual manner, will cause the pilot-wheels to assume and retain a position in a straight line. As a pendulum tends to its center of gravity, so will the pilot-wheels tend to a central line, the driving power being in the rear and pushing the pilot-wheels ahead. The hinder part of the reach D is double, in the form of a crotch, straddling the driving-wheel, and shown in Fig. 2. Near the two ends of the crotch the axle of the driving-wheel is attached, on both sides of the hub, (*x*, Figs. 1 and 2,) the wheel revolving on this short axle. The forward portion of the reach, a single bar, connects the aforesaid center of the axle-tree with the doubled end of the crotch in front of the driving-wheel, and it then proceeds upward around the periphery of the said wheel, but at a little distance from it, to near its top, as shown at E, Fig. 1. On the upper portion of this curve of the reach is a seat, F, Figs. 1 and 2, for the rider. This seat may be made adjustable by sliding it up or down on the curve of the reach. The aforesaid king-bolt G is made fast to the axle-tree, and extends upward and backward in front of the rider, having on the end of it a handle, for his convenience in guiding the machine. (See G, Fig. 1.) By this handle the pilot-wheels are turned to the right or left. Near the fore end of the reach, under the axle-tree, is a small cross-bar, H, attached, which serves for fulcra to two treadles, I I, one on each side of the reach, seen in Fig. 2, which treadles extend backward, side by side, to the driving-wheel, then one on each side of the driving-wheel, as far as the perpendicular of its hub. To the rear ends of these treadles are attached straps or cords J J, which pass up over caps K K, surrounding and covering the ends of the hub of the driving-wheel. The straps connect on the rims of these caps with elastic bands L L, or other suitable springs, fixed to the posterior end of the reach or frame-work. These elastic bands or springs are to bring up the posterior ends of the treadles and hold them in that position when there is no pressure upon them. The caps K K are made by putting a rim on a disk, somewhat like the cover of a common round box, and having a hole in the center of the disk, which fits upon the axle, so that their rims may revolve or vibrate over the ends of the hub. On the ends of the hub is a ring, *a*, Fig. 4, with notches in it, which may be called a "ratchet-ring," the notches in it being of that form to receive the end of a pawl, *b*, working on a pin secured to the disk of the cap under the rim, and having just sufficient play between the rim and the ratchet-ring to catch and relieve itself like a pawl-wrench. This pawl is double-ended, as shown in Fig. 4. The knob on the posterior end *c*, protruding through the rim of the cap, comes under the band at the end of the stroke and throws the pawl out of gear. A central arm, *f*, also protrudes through the rim of the cap, to which the strap or band is attached outside the rim.

A clutch (shown at Fig. 3) may be made to produce the same effect as the aforesaid pawl and ratchet. This clutch is a ring, *g*, around the hub or axle *e*, with an arm, *f*, protruding through the rim of the aforesaid cap K, and containing a triangular piece of metal, *d*, in a cavity within the ring next to the hub or axle. This clutch will seize the hub or axle in its center or ring whenever moved in one direction, and will loosen itself in the contrary direction. The rolling motion of the irregular triangular-formed piece *d* will jam when

moved one way and relieve itself when moved the other way. If the outer end of this triangular piece be moved the fastest in one direction, it will jam or clutch by drawing the ring *g* tight on the axle or hub. If the inner end be moved the fastest in the same direction, it will release its hold and let the hub or axle go on in its rotation. This clutch avoids the teeth of a ratchet and has less loss of motion, unless the teeth are very fine, which would impair its strength. Besides, it is cheaper made and will wear longer; perhaps not wear longer, but it will make less noise.

A simple arm or lever may be extended from the clutch-ring, or from its cap, or from the pawl in Fig. 4, and a rod attaching it to the end of the treadle may be used instead of the strap and pulley-cap; but the latter will give the most uniform motion.

The extension of the arm *f* of the pawl, and also of the arm *f* of the clutch-ring, with a handle on the end thereof, to the side of the rider will enable him to propel with his hands, if he wishes, or with feet and hands both. By this method of propelling a velocipede without the use of a crank the foot may be pressed upon the treadle at any time the rider pleases, and as often or seldom as he pleases, and the foot may be kept upon it as long as he pleases, or he may take it off whenever he pleases, without retarding the motion of the driving-wheel. With a crank this cannot be done, for you must wait a half-revolution of the wheel, and be ready at the proper time to make the pressure upon it. Moreover, the crank does not give a uniform leverage, and you can operate but once upon it during one revolution of the wheel; but with this construction you are not limited. You may stand your weight upon the treadles, using one foot and the other as fast as you please, or stand on one and use the other, or sit down and use both at once, or either, or neither, the treadles meanwhile being stationary or at rest. When the foot is taken off the treadle, it is immediately brought for a new operation by means of the spring drawing back the pulley. When the foot is on the treadle, the arm *f* of the pawl, or the arm *f* of the clutch-ring, is held stationary. When the foot is off and the strap drawn back, the said arm *f* may be made to rest against a stop on the reach or frame-work. In either case the driving-wheel cannot turn backward; so in going up a hill you may stop and rest either in a standing or sitting posture without inconvenience or effort or the fear of running backward.

On the posterior part of the curved portion of the reach, and below the seat, is a bar, M, Fig. 1, suspended on a spring, or a joint would answer as well, having the same curve as the periphery of the wheel, and its lower end reaching down below the doubled end of the crotch, which bar is to serve for a brake. Its lower end connects with a rod, N, running parallel with the single portion of the reach, above or below it, toward the axle-tree, where a short pedal-lever, O, jointed on the reach, passes down through a mortise in it and connects by a joint to the said brake-rod when below, as in the drawings.

By putting a foot on the pedal-lever at O the brake is applied to the periphery of the driving-wheel.

The brake-rod may be made to push or pull the brake into action. By a suitable adjustment of the rod with a lever at each end it will pull, which would reduce the weight of the brake-rod.

At Fig. 5, *a*, is shown a section of the tire-iron on a piece of felly broken out. The tire-iron is made concave on the side next to the felly, the fellies being made convex to match the concave of the tire-iron. When the wheel is hooped with this tire-iron, it is stronger than with the same weight of iron in any other shape. The fellies cannot be bulged out sidewise. No holes are made in it for bolts or nails, which would weaken the tire, and the bolts have a tendency, also, to split the fellies. Less weight of iron will make a wheel stronger, and allow the same thickness on the outer edges, where the wear mostly comes, than any other shape or form, and will cost less in labor to secure it on the wheel; no holes to drill or punch, no bolts or nails to make. In a velocipede it is important to make the wheels as light as possible, and yet strong.

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

In the velocipede having a single driving-wheel in the rear and two guide-wheels in front, the arrangement of the several parts which constitute the velocipede, as and for the purpose set forth.

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Witnesses:
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