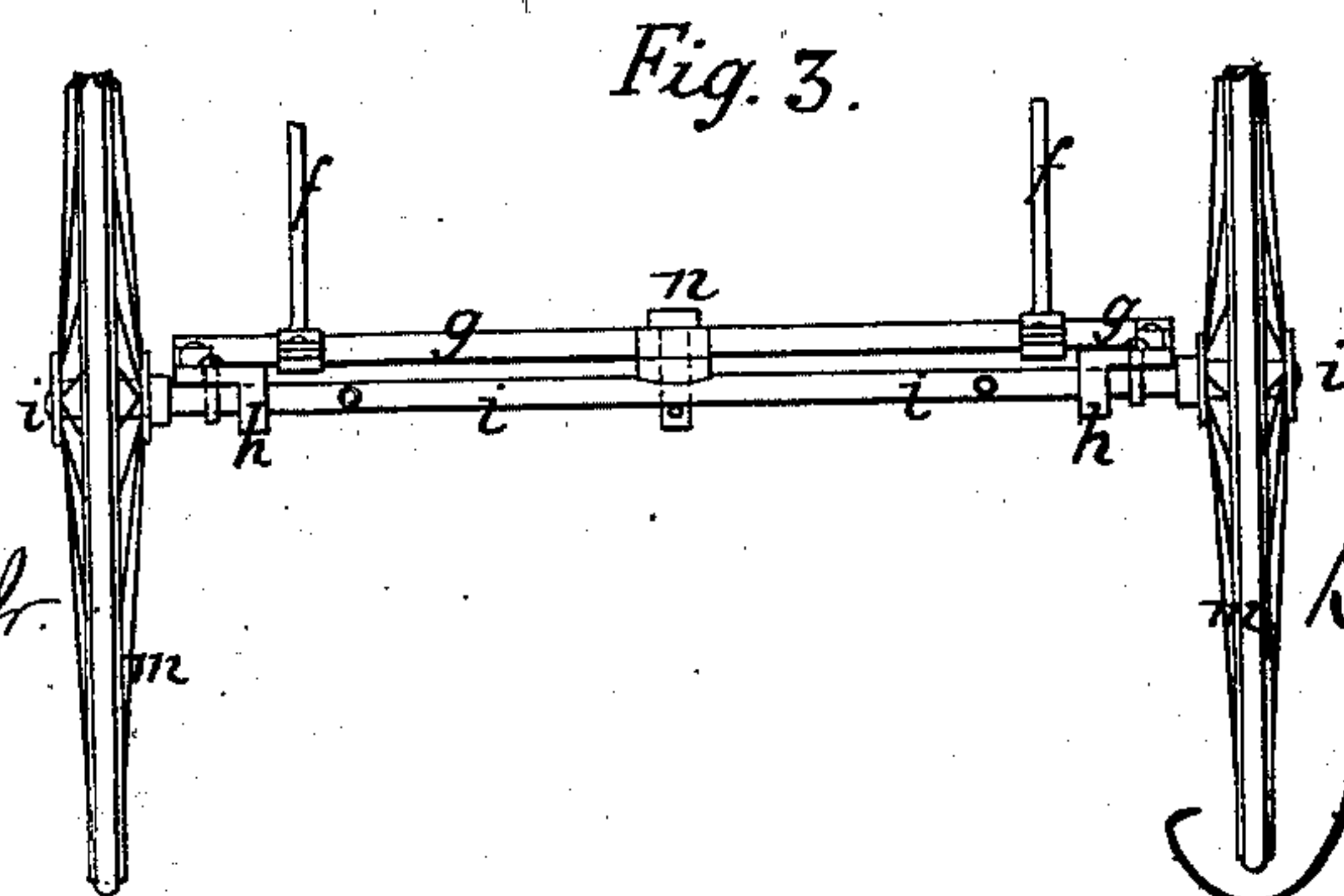
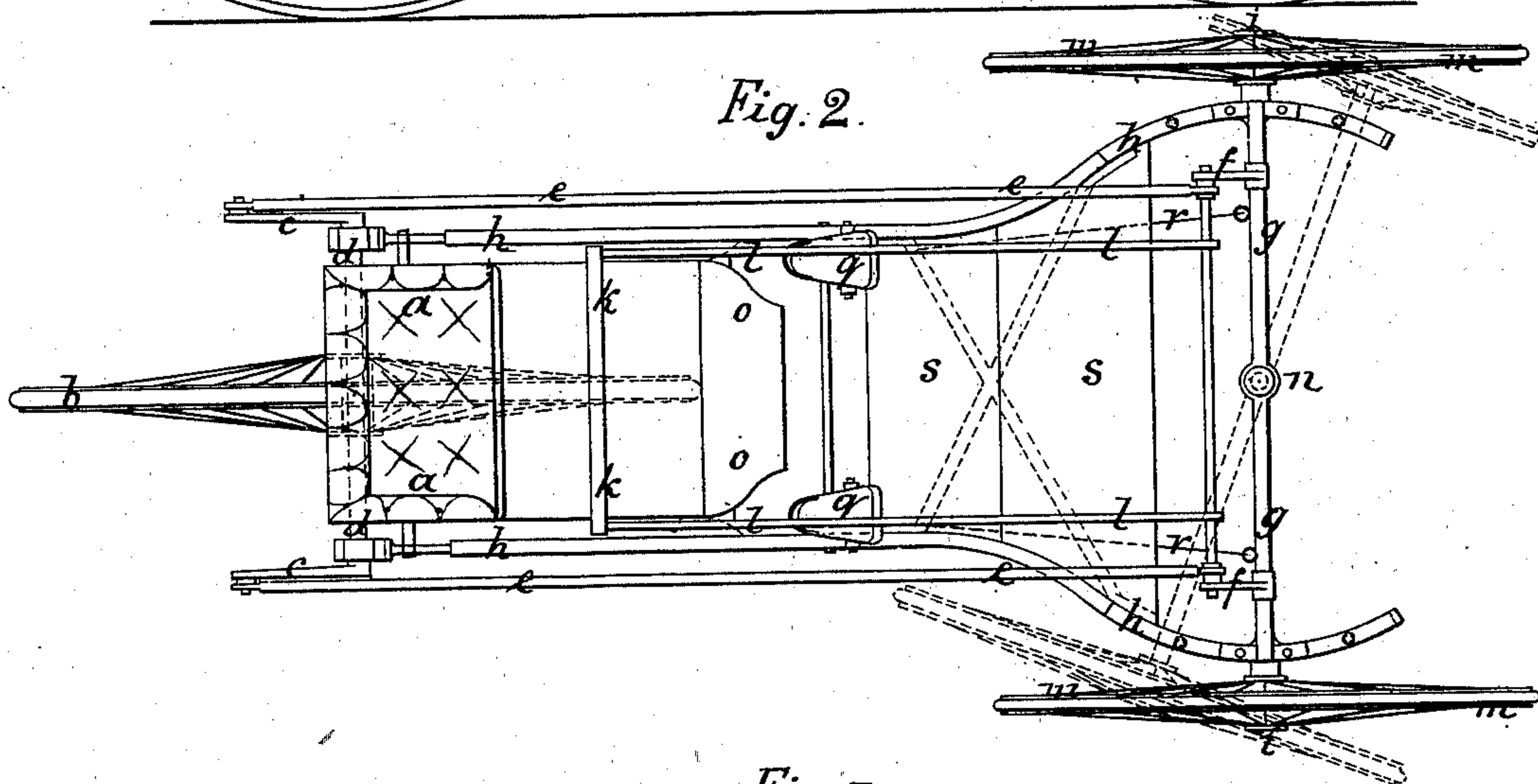
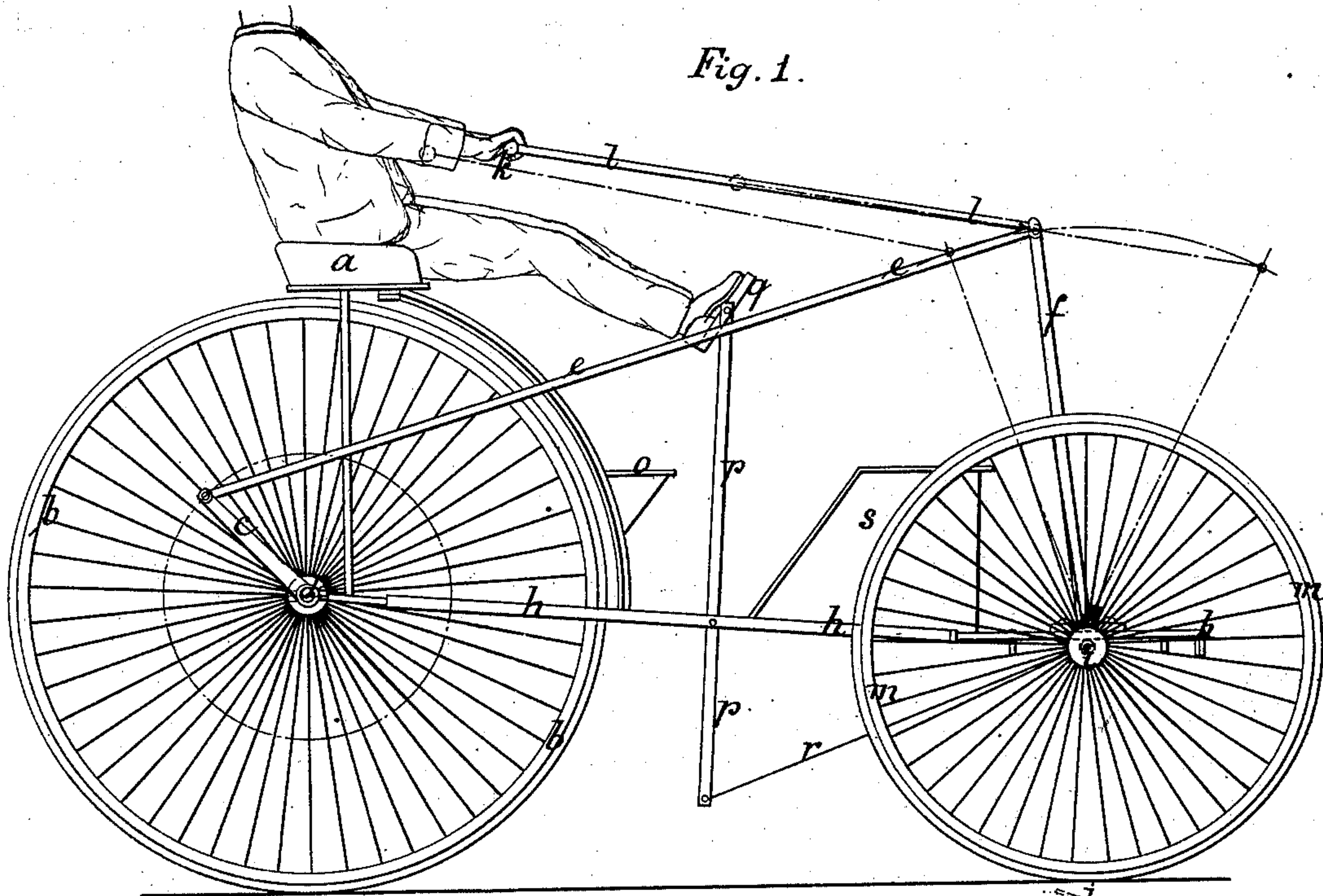


B. A. JOULE.
Velocipede.

No. 216,190.

Patented June 3, 1879.



WITNESSES

Henry Howson Jr.
Harry Smith

INVENTOR

Benjamin A. Joule
by his Attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

BENJAMIN A. JOULE, OF SALE, COUNTY OF CHESTER, GREAT BRITAIN.

IMPROVEMENT IN VELOCIPEDES.

Specification forming part of Letters Patent No. **216,190**, dated June 3, 1879; application filed March 10, 1879; patented in England, September 28, 1878.

To all whom it may concern:

Be it known that I, BENJAMIN ARTHUR JOULE, of Sale, in the county of Chester, Kingdom of Great Britain, have invented new and useful Improvements in the Construction of Velocipedes, of which the following is a specification.

This invention, for which an English Patent, No. 3,827 of 1878, has been granted to me, relates, principally, to the construction of that class of velocipedes called "tricycles," wherein a single driving-wheel is employed behind and two steering-wheels in the front; but it may also be adapted to velocipedes with two wheels on the hind axle and one or two steering-wheels in front.

For the sake of illustration, I will now describe the invention as applied to a tricycle with one driving-wheel on the hind axle and two steering-wheels on the leading axle.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a side elevation of my improved velocipede. Fig. 2 is a plan view of the same; and Fig. 3 is a partial front view, showing more clearly the arrangement of the steering-axle.

The seat *a a* for the rider is placed immediately above the driving-wheel *b b*, so that his weight assists the hold of the driving-wheel *b b* on the ground, and prevents its slipping, which is an essential point, especially in ascending hills. The driving-cranks *c c* are keyed (or forged) on the main or hinder axle, *d d*, both on the same side of the center, so that they "throw" together. They are connected by rods *e e* to the upper end of two vertical oscillating levers, *f f*, the center of motion of which is at *g* on the main framing *h h* above the front axle, *i i*. The upper ends of these levers *f f* are level, or nearly so, with the hands of the rider when seated, and are caused to oscillate to and fro, so as to impart rotary motion to the cranks, by means of a hand-rail, *k k*, which the rider grasps with both hands, the outer ends of the said rail being connected by horizontal side rods, *l l*, to the upper ends of the levers *f f*.

It will thus be evident that by alternately pushing forward and pulling backward the said hand-rail *k k*, (assisted by a rocking motion of the body, as in rowing,) the rider will give an oscillating motion to the levers *f f*, and these, by means of connecting-rods *e e* and cranks *c c*, will give a continuous rotary motion to the crank-axle *d d* and driving-wheel *b b*.

The steering of the tricycle is effected solely by the feet, as follows: The front axle, *i i*, carrying the two steering-wheels *m m*, (which are, by preference, of smaller diameter than the driving-wheel,) is capable of turning a definite distance to the right or left on a vertical pivot, *n n*, attached to the frame *h h*. On each side of the foot-board *o o* is a lever, *p p*, pivoted on the frame *h h*, and having on its upper end a treadle, *q q*. The lower ends of these two levers *p p* are connected by cords *r r*, or other suitable appliances, to the front or steering axle, *i i*, one on each side of the central pivot, *n*, and thus by means of his feet the rider can either keep the front axle, *i i*, parallel with the driving-axle *d d*, and thus cause the machine to travel in a straight line; or, by advancing either foot he can steer the machine either to the right or left, as he may desire.

s s is a box to contain luggage, &c. The foot-board *o o* is also made to lift on a hinge, and beneath it is a small box for oil-can, tools, or other like articles.

I claim as my invention—

1. The combination of the handle *k k*, side rods, *l l*, levers *f f*, connecting-rods *e e*, cranks *c c*, axle *d d*, and driving-wheel *b b*, whereby the rider is enabled to drive the velocipede by a rowing motion of the body and arms.

2. The combination of the treadles *q q*, levers *p p*, and cords or rods *r r*, whereby the rider is enabled to steer by means of his foot.

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

B. A. JOULE.

Witnesses:

JNO. HUGHES,
FERD. BOSSHARDT.