

(No Model.)

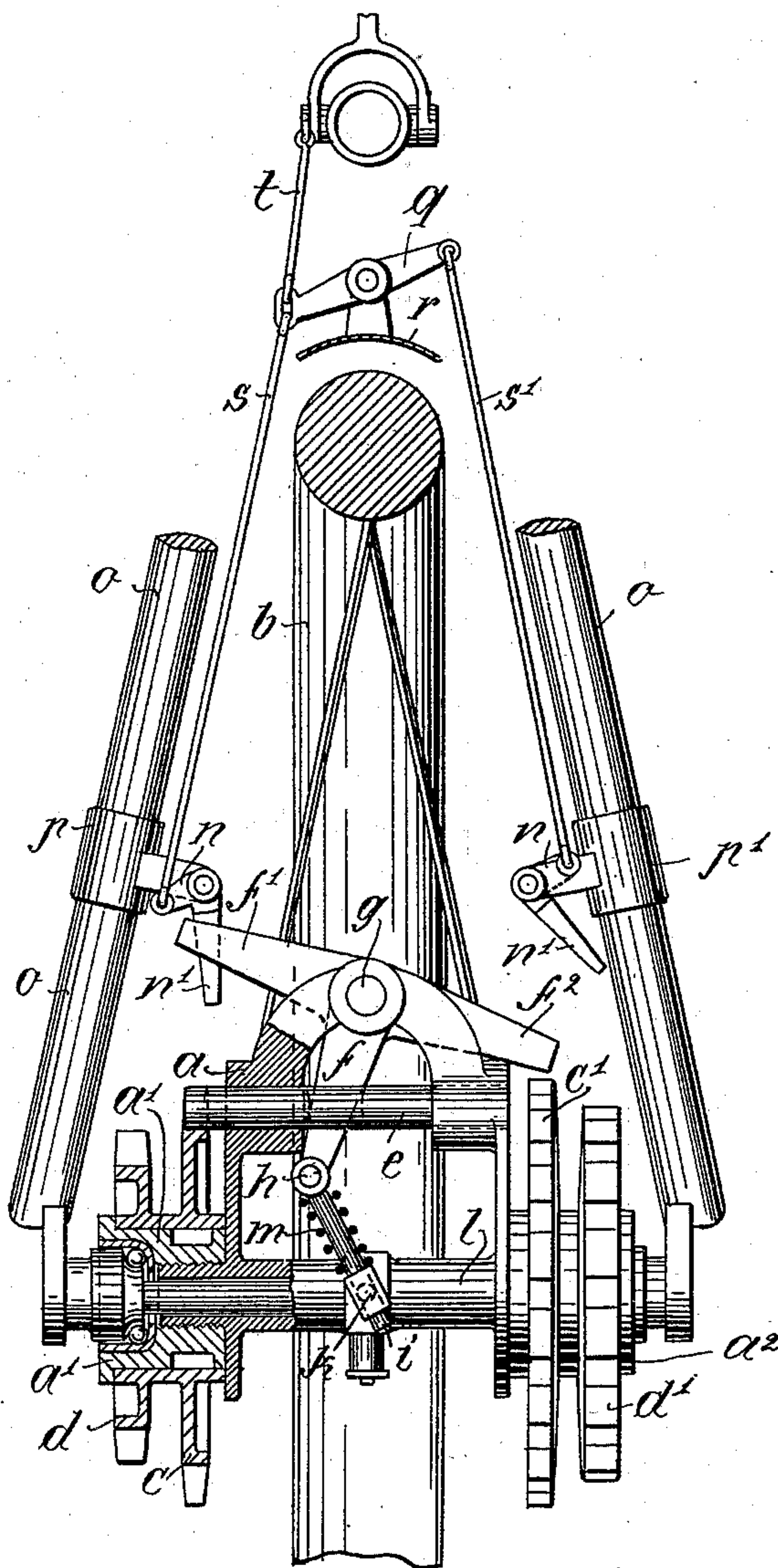
2 Sheets—Sheet 1.

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DEVICE FOR ALTERING SPEED OF CYCLES.

No. 525,030.

Patented Aug. 28, 1894.

Fig. 1.



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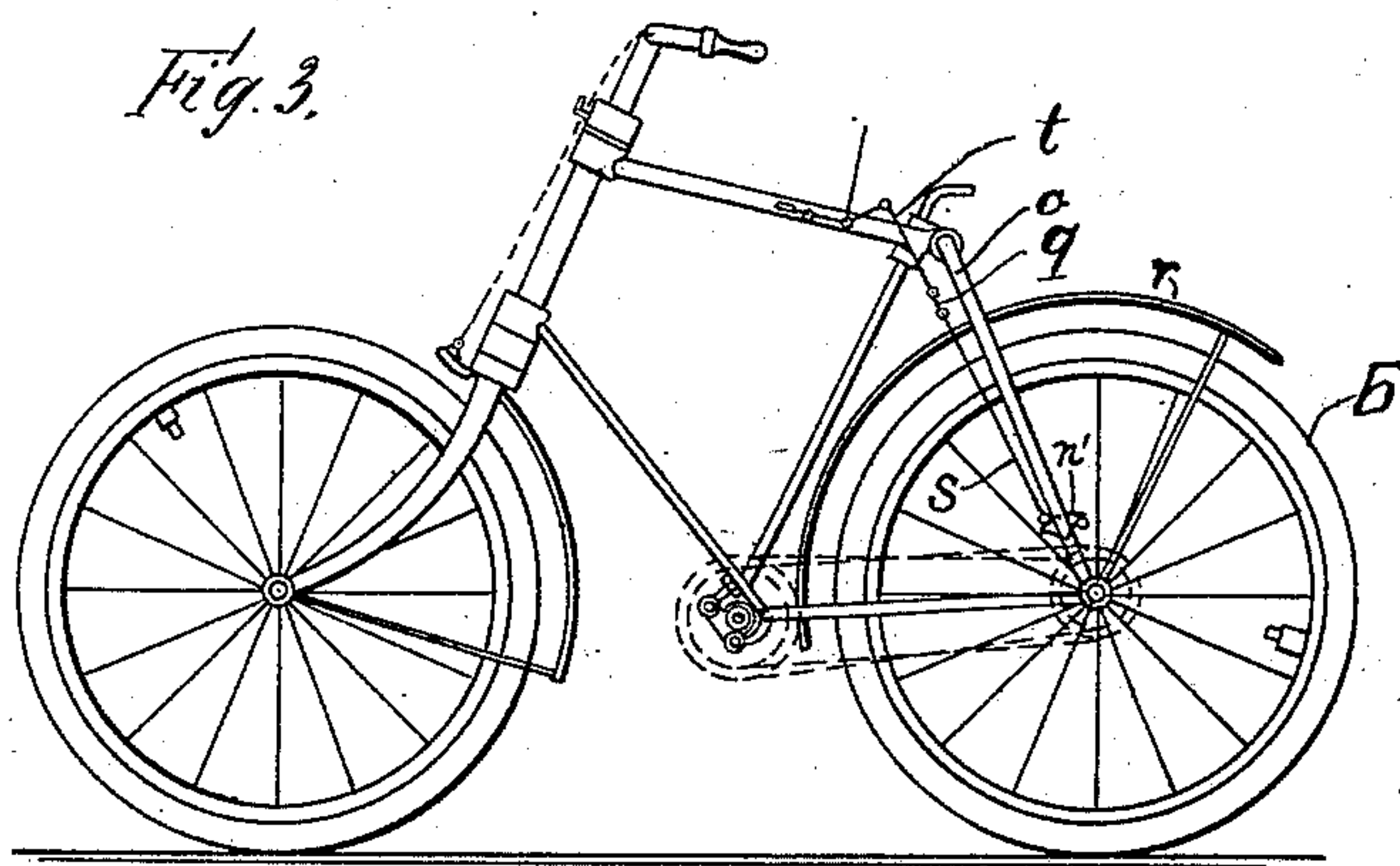
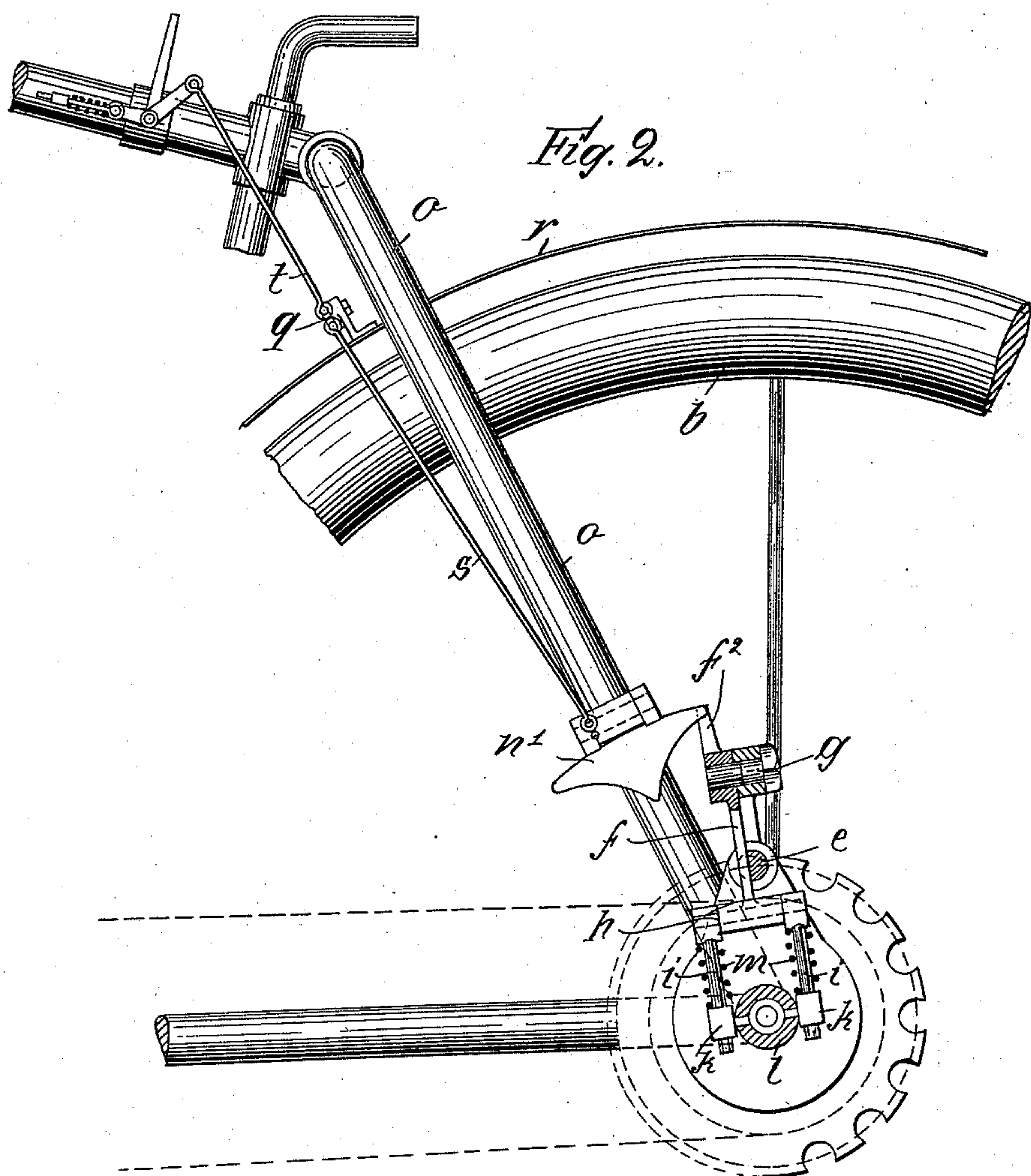
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# UNITED STATES PATENT OFFICE.

RAPHAEL SCHWÉERS AND CARL FUCHS, OF DANTZIC, GERMANY.

## DEVICE FOR ALTERING SPEED OF CYCLES.

SPECIFICATION forming part of Letters Patent No. 525,030, dated August 28, 1894.

Application filed January 24, 1894. Serial No. 497,942. (No model.)

*To all whom it may concern:*

Be it known that we, RAPHAEL SCHWÉERS, Government architect, and CARL FUCHS, premier lieutenant, both subjects of the King of Prussia, German Emperor, and residents of Dantzic, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Devices for Altering the Speed of Cycles, of which the following is an exact specification.

This invention relates to cycles in which chains are used for transferring the rotations of the crank-axle to the shaft of the driving-wheel or wheels, and in which the crank-axle as well as the shaft of the driving-wheel or wheels are each provided with two chain-wheels of different diameter, which are connected by chains in such a manner, that the smaller chain-wheel of the crank-axle is connected with the larger wheel of the driving-wheel-shaft, and vice-versa; and our improvements in such [transferring-devices relate to a combination of parts, by means of which the chains may be changed in a quick and convenient manner by the wheelman, even while the latter is racing with full speed, as will be more fully described hereinafter.

In order to make our invention more clear, we refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 shows the nave with its accessories of the driving-wheel of a so-called safety-bicycle, half of the nave being in section. Fig. 2 shows a side-view, also partly in section, and Fig. 3 shows a side-view of the whole bicycle provided with our improvement.

The nave *a* of the driving-wheel *b* has two central projections *a' a²* at its two sides, upon which projections the cogged coupling-wheels *c c'* are loosely arranged. Coupling-wheel *c* is made in one piece with a chain-wheel *d*, and coupling-wheel *c'* is made in one piece with a chain-wheel *d'*, the latter being of greater diameter than chain-wheel *d*. Both these chain-wheels are constantly driven from the two chain-wheels on the crank-axle, but they are driven with different velocity, as those chain-wheels on the crank-axle are of different diameter, as has been mentioned in the preface. In order, now, to drive also wheel *b* with a slower or quicker velocity, it

becomes necessary to couple the nave *a* of said wheel with the coupling-wheel *c'* or *c*, which is performed by means of a displaceable bolt *e* by the following arrangement: Bolt *e* is situated within nave *a* near the periphery of the latter, and is provided in its middle part with a hole, through which takes an arm *f* made in one piece with a double-armed lever *f' f²* fulcrumed at *g* in a projection of the nave. Arm *f* is connected by a hinge *h* with rods *i*, which may be displaced within short tube *k* pivotally secured to sleeve *l*. Against the said tube bear spiral-springs *m*, the other end of which lies against the hinge *h*. These springs constantly tend to keep lever *f' f²* in one or the other of its two end-positions, and prevent it from staying in a middle-position, so that bolt *e* must be in secure connection with one or the other of the coupling-wheels *c c'*. The nave rotates, as a matter of course, together with wheel *b*, and with the nave rotates also lever *f' f²*.

Two angular double-armed levers *n n'* are secured to the hind-fork *o* of wheel *b* by means of sleeves *p p'*, and are connected with a double-armed lever *q* held by the frame-part *r* by rods *s s'*. Lever *q* may be turned from the seat of the cycle by means of a connecting-rod *t*, and the position of the two levers *n n'* may be changed from that shown in the right-hand part of Fig. 1 to that shown in the left-hand part of the same figure. The arms *n'* of the levers *n n'* are considerably broad, as to be seen in Fig. 2, and the rear part of these broad lever-arms is adapted to act as hinderance to the arms of the lever *f' f²*, so that, if, for instance, the nave is coupled with the coupling-wheel *c'*, and the arm *f'*, therefore, is in its raised position, this arm may be lowered and arm *f²* may be raised, i. e. lever *f' f²* may be turned, by bringing the left-hand lever *n n'* into the way of the lever *f' f'*, which latter moves in a circle, as has been already explained. If, thus, the driving-wheel *b*, which now (Fig. 1) is driven from chain-wheel *d*, shall be driven from chain-wheel *d'*, lever *q* is turned by means of rod *t* into the position shown in Fig. 1, so that the left-hand lever-arm *n'* is brought into the way of the lever-arm *f'*. This latter will thus, strike against the curved edge (Fig. 2) of that arm *n'*, and lever *f' f²* will be turned then



so far, that the hinge *h* between arm *f* and rod *i* comes beyond the dead point, so that lever *f' f<sup>2</sup>* is turned then completely into the other position by the springs *m*. The bolt *e* is displaced on account of the movement of arm *f*, and its left-hand end is drawn out of the coupling-wheel *c*, while the right-hand end of bolt *e* is pushed into coupling-wheel *c'*, so that wheel *b* is driven now from chain-wheel *d'*.

Having thus fully described the nature of this invention, what we desire to secure by Letters Patent of the United States is—

1. In a cycle with two changeable chain-wheels of different diameter adapted to be coupled alternately with the driving wheel or -wheels, the combination with said chain-wheels each being rigidly connected with a coupling-wheel, of a displaceable coupling-bolt situated in the nave of the driving-wheel or -axle, said nave carrying a three-armed lever, the middle arm being adapted to displace the coupling-bolt, the other arms being adapted to be turned by movable projections held by the frame of the cycle, for the purpose as described.

2. In a cycle with two changeable chain-wheels of different diameter adapted to be coupled alternately with the driving wheel or -wheels, the combination with said chain-wheels each being rigidly connected with a coupling-wheel, of a displaceable coupling-bolt situated in the nave of the driving-wheel or -axle, said nave carrying a three-armed lever, the middle arm being adapted to displace the coupling-bolt, the other arms being adapted to be turned by movable projections held by the frame of the cycle, said middle-arm of the three-armed lever having hinged to it a rod adapted to slide in a movable sleeve, said rod being surrounded by a spring tending to overcome the dead point of the joint, for the purpose as described.

3. In a cycle with two changeable chain-wheels of different diameter adapted to be coupled alternately with the driving-wheel

or -wheels, the combination with said chain-wheels each being rigidly connected with a coupling-wheel, of a displaceable coupling-bolt situated in the nave of the driving-wheel or -axle, said nave carrying a three-armed lever, the middle arm being adapted to displace the coupling-bolt, the other arms being adapted to be turned by movable projections held by the frame of the cycle, said projections forming part of double-armed levers adapted to be turned from another double-armed lever by connecting-rods, the latter lever being connected with a hand-lever situated in the proximity of the seat or saddle of the cycle, for the purpose as described.

4. In a cycle with two changeable chain-wheels of different diameter, adapted to be coupled alternately with the driving-wheel or -wheels, the combination with said chain-wheels (*d d'*), each being rigidly connected with a coupling-wheel (*c c'*) of a displaceable coupling-bolt (*e*), situated in the nave (*a*) of the driving-wheel or -axle, said nave carrying a three-armed lever (*f f' f<sup>2</sup>*), the middle-arm (*f*) being adapted to be turned by movable projections (*n'*) held by the frame (*o*) said projections (*n'*) forming part of double-armed levers (*n n'*) adapted to be turned from another double-armed lever (*q*) by connecting rods (*s s'*), the latter lever (*q*) being connected with a hand-lever situated in the proximity of the seat or saddle of the cycle, the middle-arm (*f*) of the three-armed lever (*f f' f<sup>2</sup>*) having hinged to it a rod (*i*) adapted to slide in a movable sleeve (*k*), said rod being surrounded by a spring (*m*) tending to overcome the dead point of the joint (*h*), for the purpose as described.

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

RAPHAEL SCHWÉERS.  
CARL FUCHS.

Witnesses:

C. KEINKOWSKI,  
P. HÜNERFÜRST.