

No. 683,271.

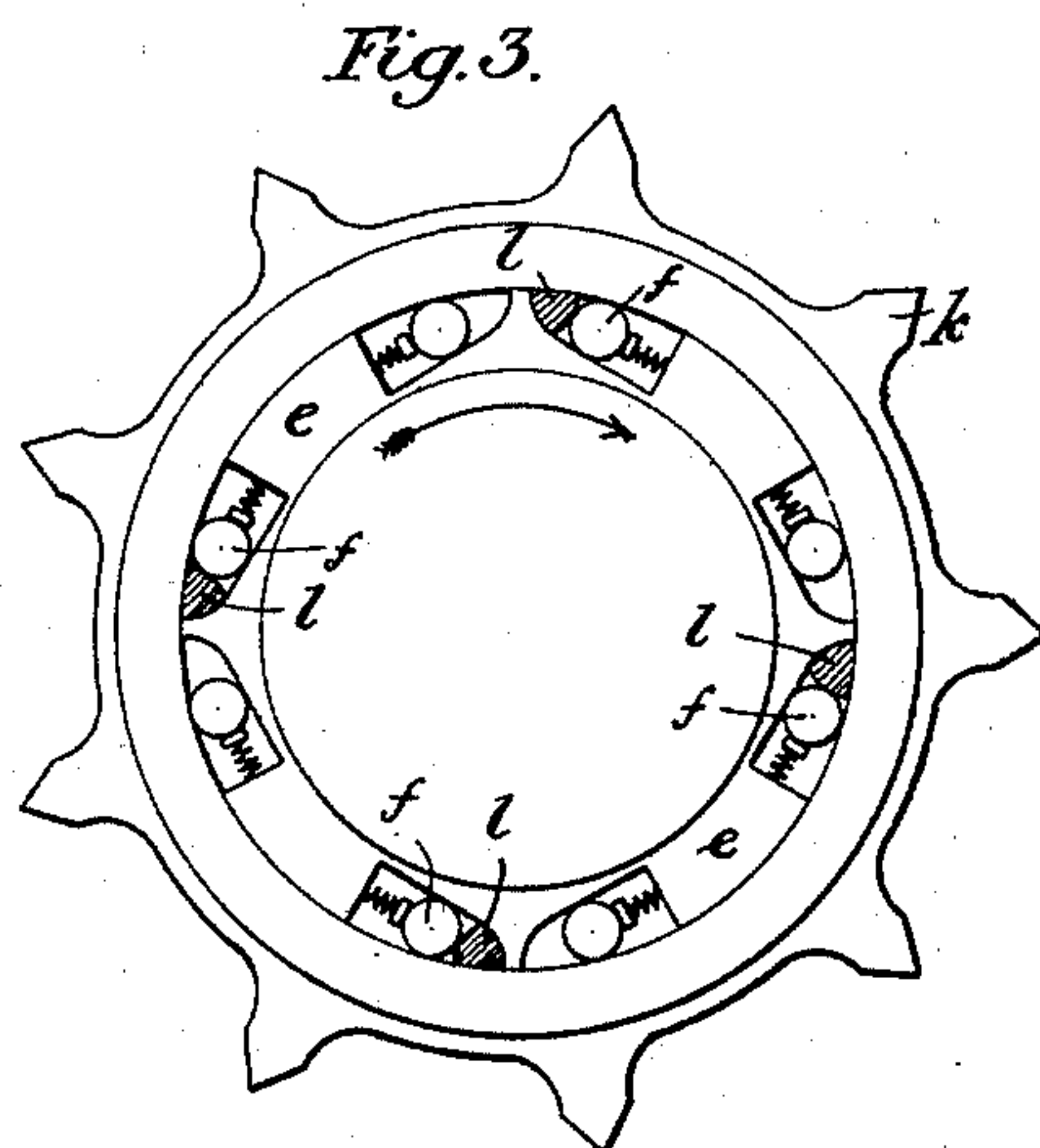
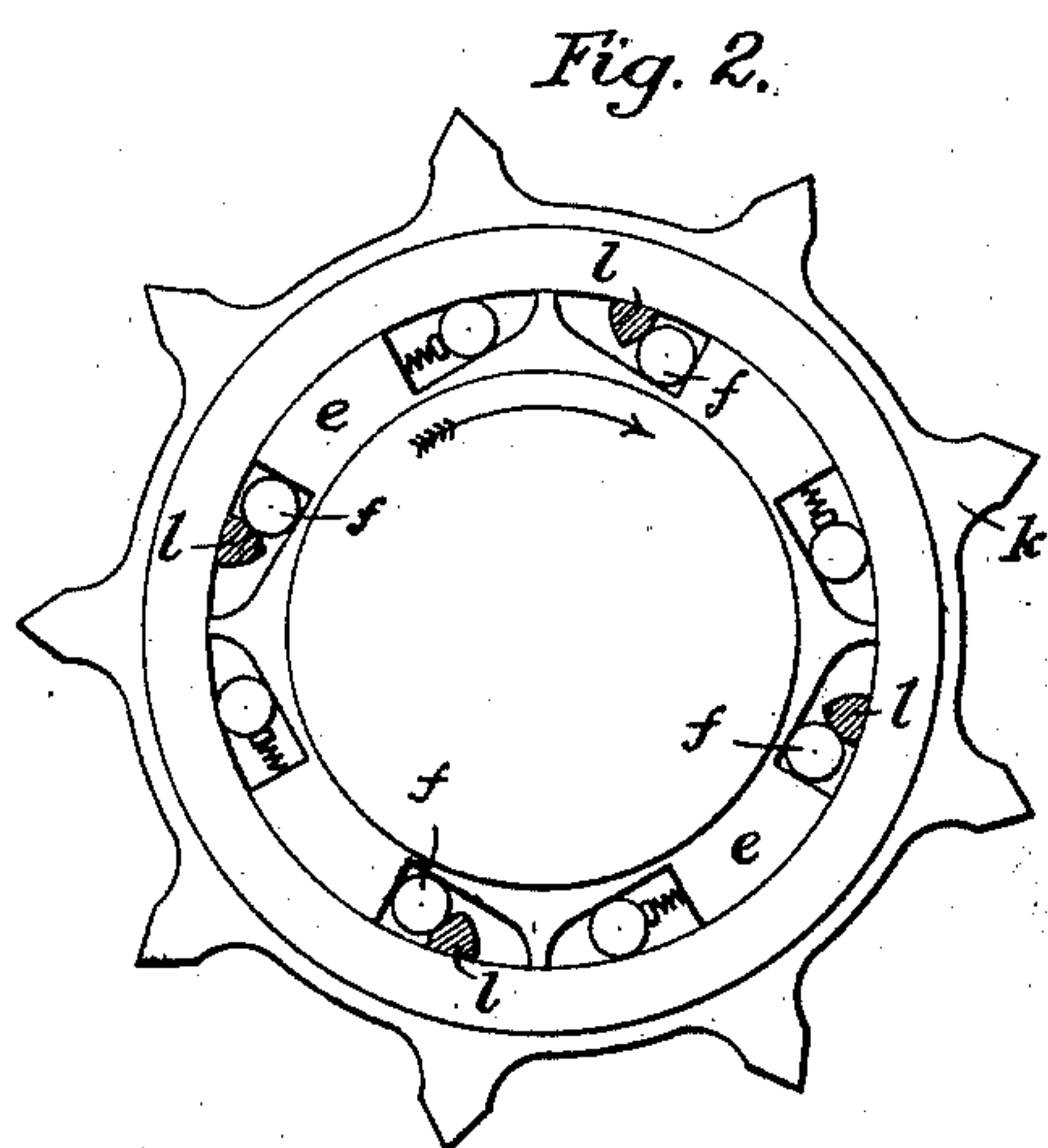
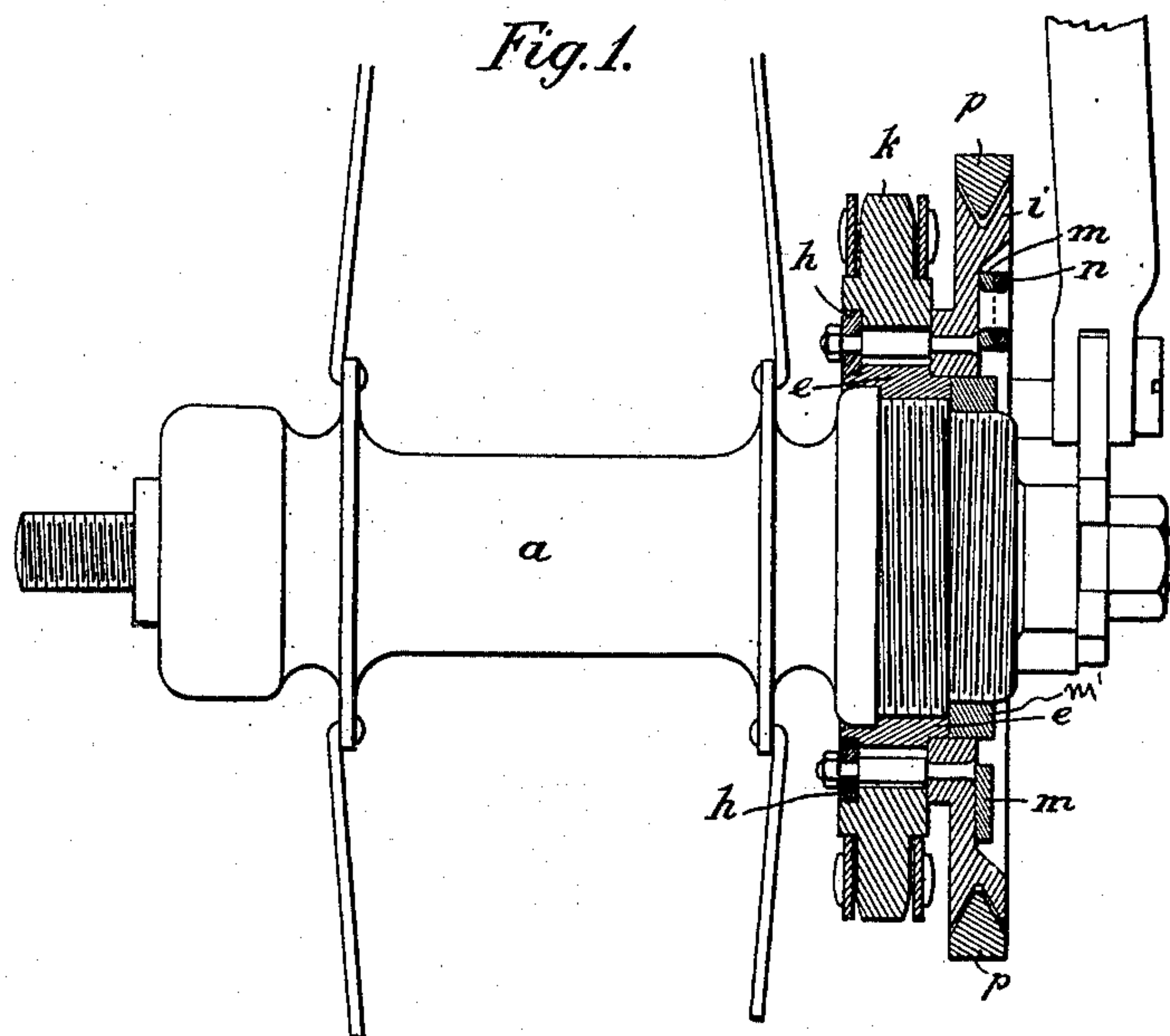
Patented Sept. 24, 1901.

A. GIBBS.
FREE WHEEL VELOCIPEDE.

(Application filed Feb. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

E. J. Clarkson
L. M. M. Coll.

Inventor:

Anthony Gibbs
by *J. C. Somes*
Attorney.

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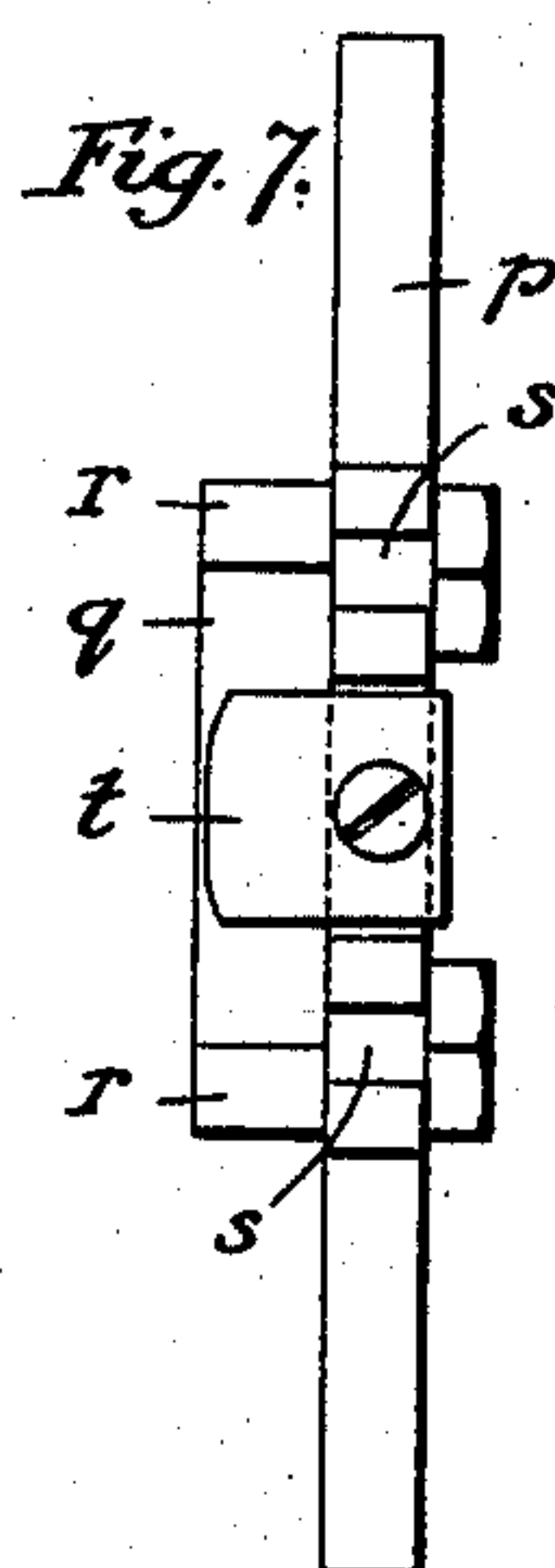
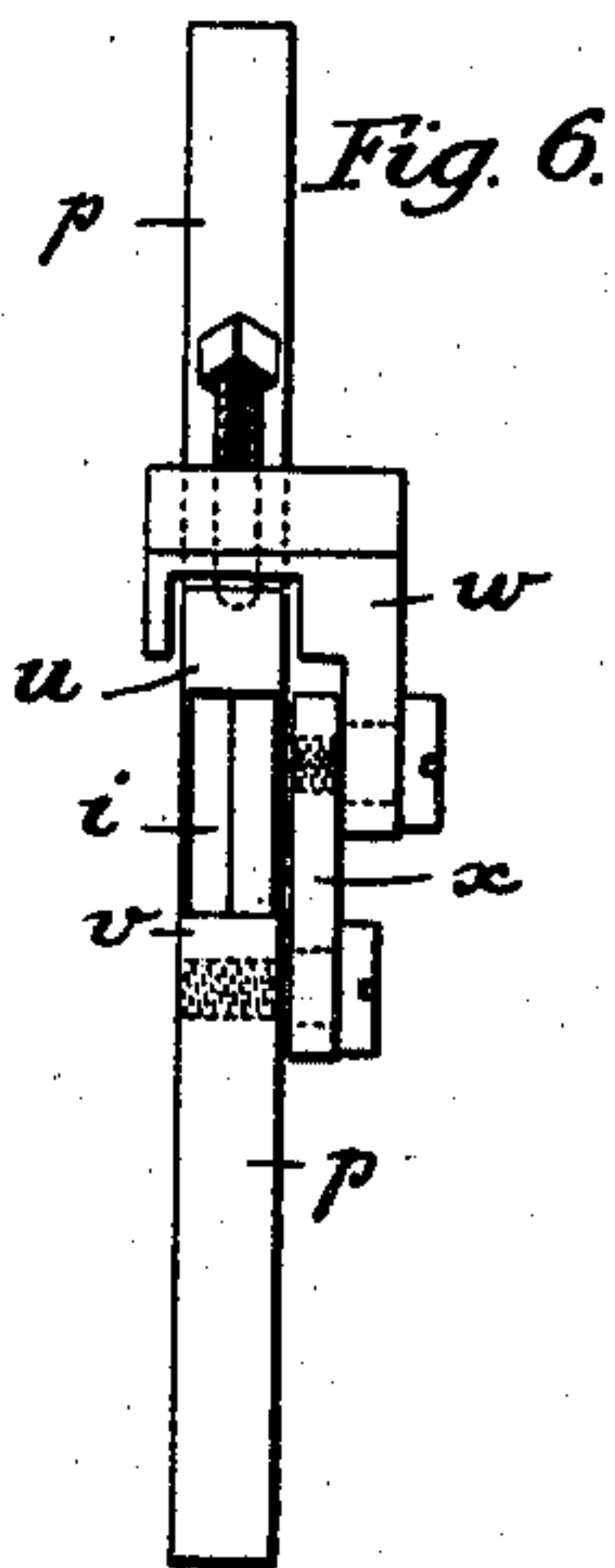
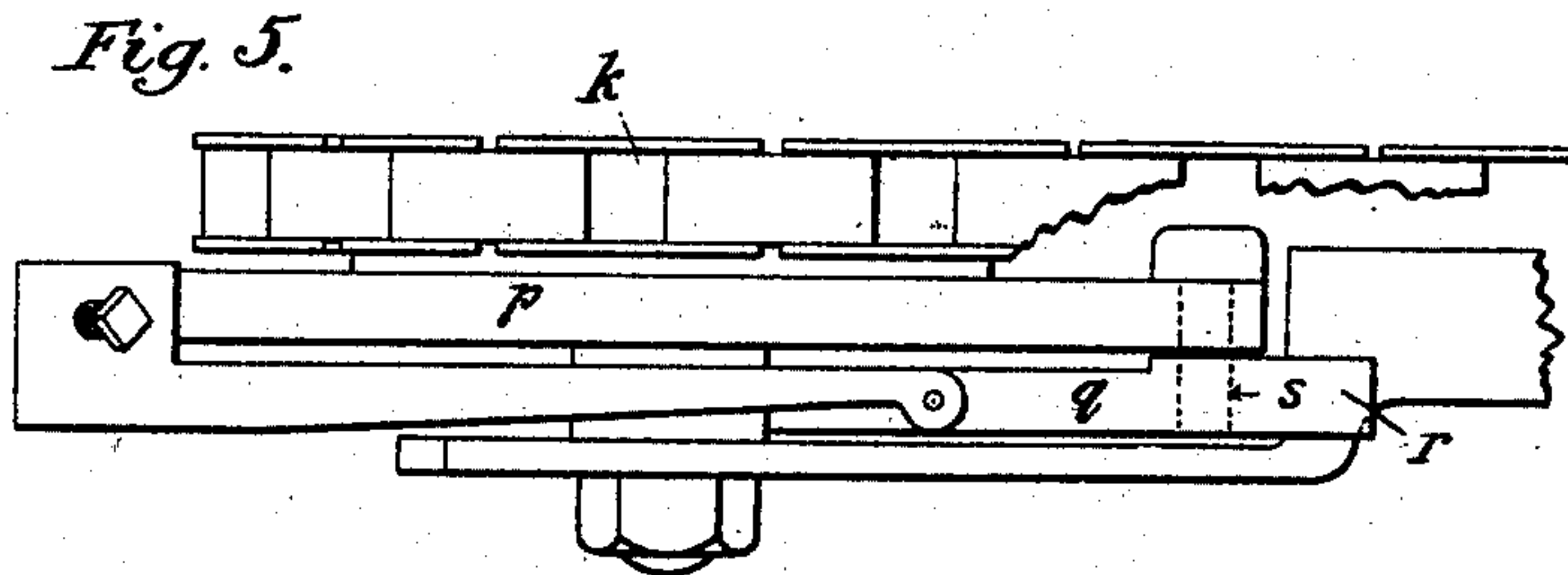
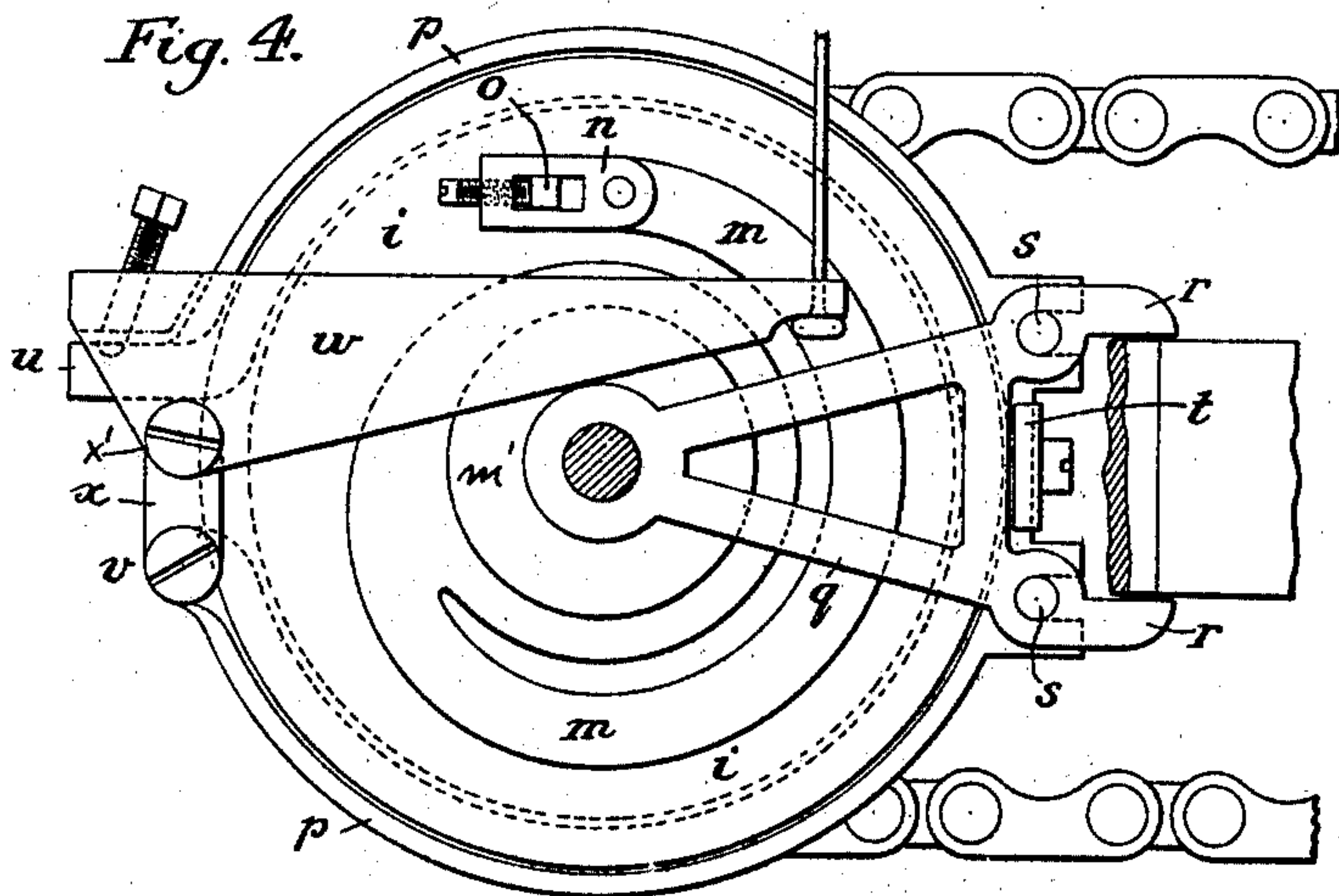
A. GIBBS.

FREE WHEEL VELOCIPEDE.

(Application filed Feb. 4, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

Witnesses:
E. J. Clarkson
S. M. McCall

Inventor:

Antony Gibbs
by J. C. Jones
Attorney.

UNITED STATES PATENT OFFICE.

ANTONY GIBBS, OF BRISTOL, ENGLAND.

FREE-WHEEL VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 683,271, dated September 24, 1901.

Application filed February 4, 1901. Serial No. 46,002. (No model.)

To all whom it may concern:

Be it known that I, ANTONY GIBBS, a subject of the Queen of Great Britain, residing at Tyntesfield, Bristol, in the county of Somerset, England, have invented certain new and useful Improvements in Free-Wheel Velocipedes, (for which I have made application for Letters Patent in Great Britain, No. 20,848, dated November 19, 1900, and in Germany on the 16th day of November, 1900,) of which the following is a specification.

The object of this invention is to add to the advantage and satisfaction the rider of a velocipede derives from the use of a free wheel the security which a rigid wheel affords in going down a steep hill or when it is desired to bring the machine quickly to a stop.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the hub of my improved wheel with the clutch mechanism in section. Figs. 2 and 3 show the disk or ring with the recesses for the rollers or balls, the latter being shown in the normal or "free-wheel" position in Fig. 2 and in the position for permitting back-pedaling in Fig. 3. Fig. 4 is a side elevation of the means for operating the clutch mechanism; Fig. 5, a plan view thereof; and Figs. 6 and 7 end views thereof, taken from opposite sides of Fig. 4.

Referring to Fig. 1, it will be seen that according to this invention within the chain-wheel k of the machine is a disk or ring e , which by means of a right-handed thread is firmly screwed to the hub a . This ring e is furnished with recesses commonly used to receive the rollers of roller or ball couplings. The recesses alternately taper off in opposite directions. When all the rollers occupy the positions into which they are forced by the springs acting on them, the ring e is firmly locked with the chain-wheel k in both directions. In order to get a free wheel in the direction which is shown by arrows in Figs. 2 and 3, one of the sets of rollers f must be forced from the narrow to the wider part of their recesses. This is done by means of the pins l , which reach in between the open spaces of the recesses in front of the rollers f . These pins l are joined front and back to two disks i and h , as shown in Fig. 1, which disks fit in recesses cut out for them in the

ring e and in which they turn freely within the limits of their motion as determined by the extent of the movement of the pins l in front of their rollers f . The hub a has a left-threaded lock-nut m' , which is formed with a tail-like extension m , which acts as a controlling-spring. The free end of this controlling-spring is attached to the disk i by means of a link n and screw and stud o , as shown clearly in Fig. 4, so that the tension of such spring is capable of adjustment. In tightening up this spring m by means of the screw bearing against stud o the disk i is subjected to a displacement relative to the hub a toward the right till the pins l abut against the ends of their respective recesses in the ring e . Any desired amount of additional tightening up may be given to the spring m .

The disk i is grooved outside its circumference in order to receive a spring brake-band p , which ordinarily is free of the groove. In order to keep this band p entirely free from the disk i , a piece q , preferably of triangular form, is provided and is attached to the fork of the frame of the machine. The spring brake-band p carries at its middle part a spring t . The triangular piece q is held in position by projections r r to prevent any turning movement. Pins s s hold the spring brake-band p in position, so that it can neither turn nor move sidewise, but it is capable of being moved in the direction of its length, which movement is rendered possible by two notches, within which the pins s s are placed. Ordinarily the spring t by abutting with its free end against the triangular piece q keeps the spring brake-band p away from disk i . The free ends (u and v) of the brake-band p are coupled up by a pivoted lever w (to one end of which the brake-rod is connected) and a screw x' and link x . When now the brake-rod is pulled, the brake-band p closes in the ordinary manner and at the same time the spring t it carries permits its middle part to move toward the disk i , so that such band p is wholly in contact with said disk i . In this manner brake-power is applied to the wheel while it is yet a free wheel in the sense that the chain and chain-wheels are at rest; but if for any reason the rider desires the wheel to be rigid he has only to give an additional pull to his brake-

lever till the friction on disk *i* overcomes the power of the controlling-spring *m*, above referred to. Directly this takes place the disk *i* undergoes a displacement relative to the hub *a*, the rollers *f* are forced by their springs into the narrow part of their respective recesses in the ring *e*, as shown in Fig. 3, and a rigid or fast wheel is obtained.

It has already been mentioned that the controlling-spring *m* can be set up to any desired tension, and it only depends upon the extent to which this is done to determine the limits within which the free wheel as such can be braked before it becomes rigid or fast.

In the drawings only four rollers have been shown in each set; but it is evident that any convenient number may be employed.

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

1. The combination of an axle, a wheel thereon, a pedaling mechanism, a double-acting clutch for connecting said pedaling mechanism with said wheel, a spring for holding said clutch open, and means for overcoming the tension of said spring to lock the clutch in back-pedaling.

2. The combination of an axle, a wheel thereon, a pedaling mechanism, a double-acting clutch for connecting said pedaling mechanism with said wheel, a spring for holding said clutch open, means for overcoming the tension of said spring to lock the clutch in back-pedaling, and means for regulating the tension of said spring.

3. The combination of an axle, a wheel thereon, a pedaling mechanism, a double-acting clutch for connecting said pedaling mechanism with said wheel, a spring for holding said clutch open, and a brake for overcoming the tension of said spring to lock the clutch members for back-pedaling.

4. In a velocipede, the combination of an axle, a wheel thereon, a pedaling mechanism, a double-acting clutch for connecting said pedaling mechanism with said wheel, and a brake adapted to perform the double function of braking the wheel and of uniting the clutch members for back-pedaling.

5. The combination of two rotary parts, one of which is provided with two sets of recesses tapering in opposite directions, balls disposed in said recesses, springs normally forcing said balls in contact with the other rotary part for locking said parts together, a brake-disk provided with pins extending into said recesses, a torsional spring connected with one of said parts and with said brake-disk, a brake-band for operating against said brake-disk, and a brake-lever connected with said brake-band.

6. The combination of an axle, a wheel thereon, a pedaling mechanism, a double-acting clutch for connecting said pedaling mechanism with said wheel, a spring for regulat-

ing the tension of said clutch, and a brake for retarding the movement of the free wheel when lightly applied, and for overcoming the tension of said spring and locking the clutch members together for back-pedaling when more forcibly applied, whereby the back-pedaling movement may be employed to further brake the wheel.

7. In a velocipede, the combination of an axle, a wheel thereon, a sprocket-wheel, a ring disposed in said sprocket-wheel and having recesses therein tapering alternately in opposite directions, said ring being fixed to said wheel, balls disposed in said recesses, springs disposed in said recesses for normally forcing said balls in contact with the sprocket-wheel for locking it to said ring, a disk provided with pins extending into said recesses for forcing the balls of one set of recesses back against the tension of their springs, means disposed on said wheel and connected with the pin-disk for holding the ring and sprocket-wheel apart, and a brake connected with said means for connecting the ring and sprocket-wheel for back-pedaling.

8. The combination of a wheel, a pedaling mechanism connected therewith, a ring connected to said wheel, a disk having pins adapted to act on said ring to free it from said pedaling mechanism, an adjustable spring connecting said disk to the wheel, and a brake adapted to act on said disk to overcome said spring and connect the ring to the pedaling mechanism for back-pedaling.

9. The combination of a wheel, a ring connected therewith having tapered recesses therein, spring-actuated balls disposed in said recesses, a disk provided with pins adapted to force the balls against their springs to obtain a free wheel, a spring connected to said wheel and to said disk, and a brake-band adapted to engage said disk and perform the double function of a brake and a releasing device for the pins whereby a rigid wheel is obtained for back-pedaling.

10. The combination of a wheel, a ring connected therewith having tapered recesses therein, spring-actuated balls disposed in said recesses, a disk provided with pins adapted to force said balls against their springs to obtain a free wheel on back-pedaling, a spring connected to said wheel and to said disk, a brake-band adapted to perform the double function of a brake, and a releasing device for the pins whereby a rigid wheel is obtained for back-pedaling, and means for adjusting the tension of said spring to regulate the point at which the brake-power shall exceed that of the spring.

ANTONY GIBBS.

Witnesses:

ERNEST JOHN BALL,
GILBERT HENRY PHILLPOTT.