

No. 618,094.

Patented Jan. 24, 1899.

G. HESS.

PROPELLING MECHANISM FOR VELOCIPEDES.

(No Model.)

(Application filed Dec. 15, 1897.)

2 Sheets—Sheet 1.

Fig: 1.

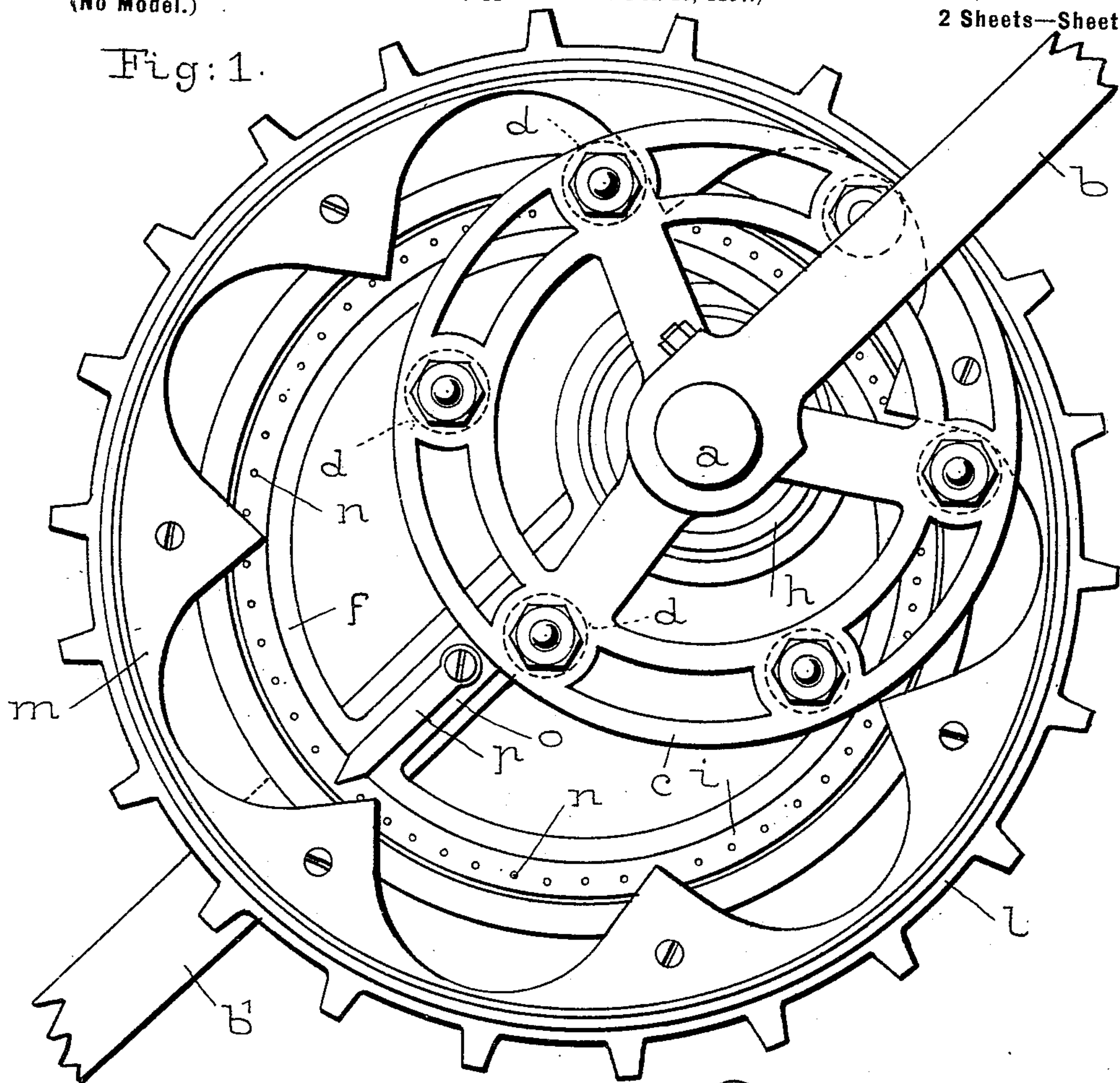
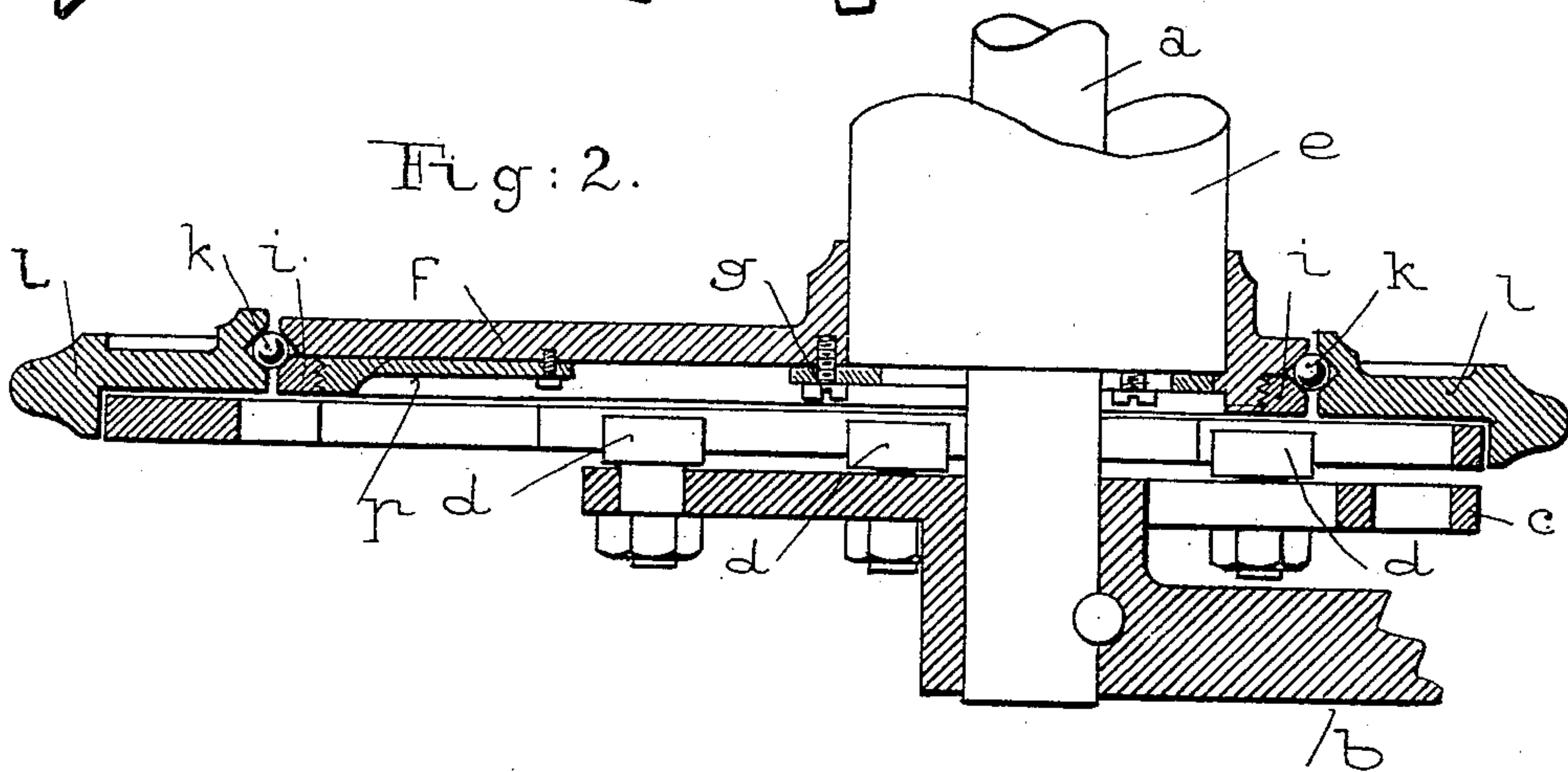


Fig: 2.



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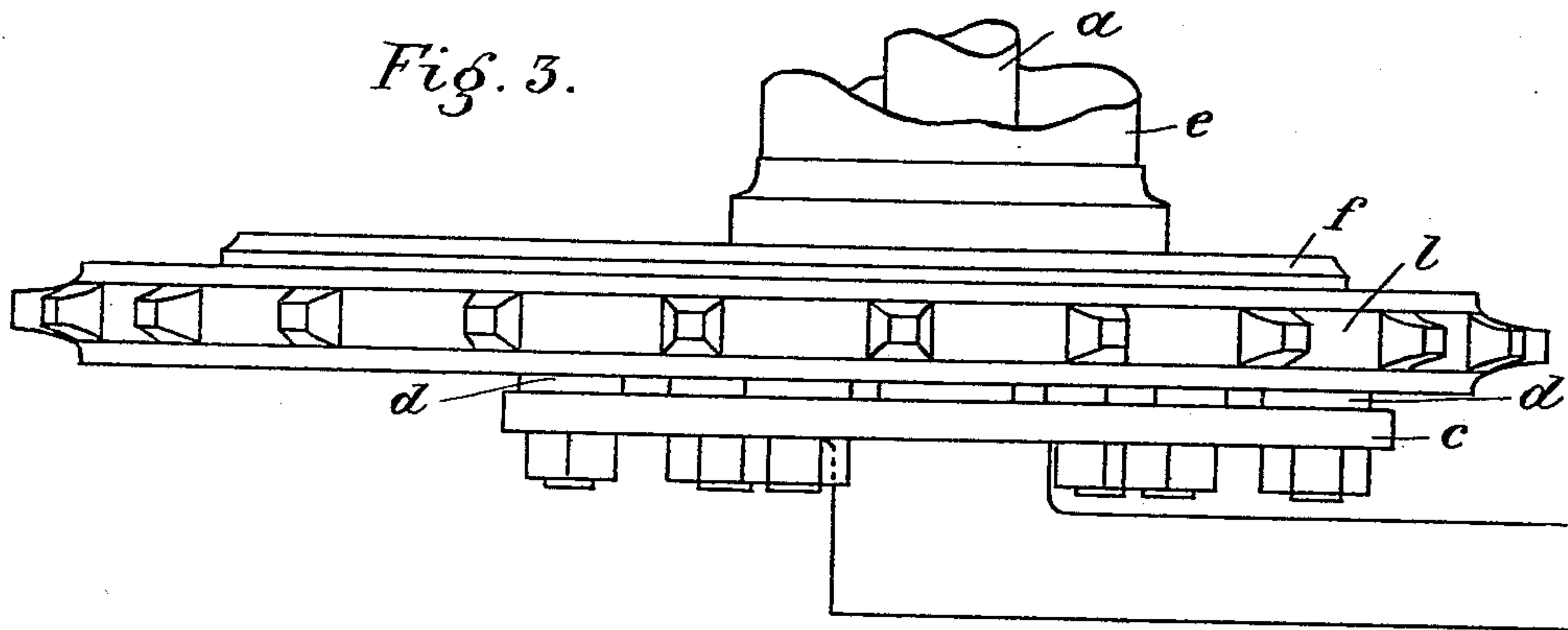
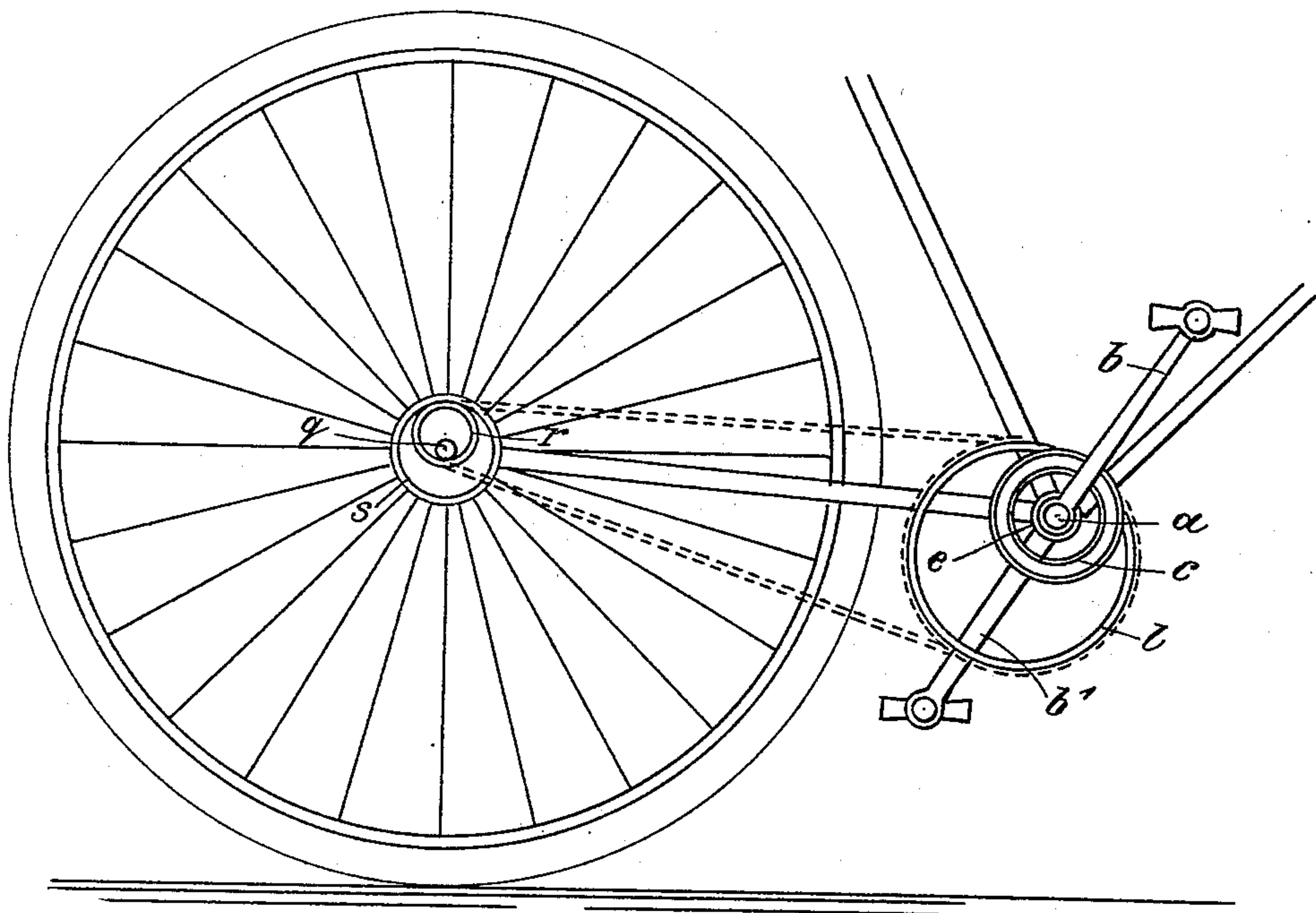


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORG HESS, OF NUREMBERG, GERMANY.

PROPELLING MECHANISM FOR VELOCIPEDES.

SPECIFICATION forming part of Letters Patent No. 618,094, dated January 24, 1899.

Application filed December 15, 1897. Serial No. 662,026. (No model.)

To all whom it may concern:

Be it known that I, GEORG HESS, a subject of the German Emperor, residing at Nuremberg, in the Kingdom of Bavaria, Germany, have invented certain new and useful Improvements in Propelling Mechanism for Velocipedes, (patented in Great Britain, No. 24,683, October 25, 1897;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-

15 like. My invention relates to an improvement in propelling mechanism for bicycles and the

20 The object of my invention is to provide a propelling mechanism by which a transmission of the power from the pedals to the driving-wheel more preferable than has heretofore been known is obtained.

25 My invention consists in the features, details of construction, and combinations of parts, which will first be described in connection with the accompanying drawings, and then particularly pointed out in the claims.

30 In the drawings, Figure 1 is a detail side elevation of the crank-shaft and its attached mechanism; Fig. 2, a section, partly in elevation, of the same; Fig. 3, a plan view of the same, and Fig. 4 a diagrammatic side elevation of the propelling mechanism applied to a bicycle.

Referring to the drawings, *a* is a crank-axle rotatably mounted in the journal-box or hanger-box *e* and provided at each end with a crank *b b'*, secured to the axle and serving to rotate the same within the hanger-box *e*. On one end of the crank-axle *a* and inside one of the cranks is secured a roller-wheel *c*, which, if desired, may be made integral with its adjacent crank *b*. The roller-wheel *c* is provided with a plurality of inward-projecting antifriction-rollers *d*, six being shown in the drawings.

45 To the hanger-box *e* is secured in any suitable manner an eccentric *f*, a plate *h* being attached to the eccentric by means of screws *g*, whereby if ball-bearings are used in the hanger-box the usual cone-bushing of the same cannot accidentally unscrew.

The eccentric *f* has an integral projecting

flange beveled or chamfered at its outer edge. Just outside this flange toward the pedal the rim of the eccentric is provided with a screw-thread, onto which may be secured a ring *i*, 55 also having a beveled edge corresponding to that of the flange. When the ring *i* is in place, the two beveled edges form a V-shaped groove in the periphery of the eccentric, into which groove are placed a series of balls *k*. 60 Outside these balls and running in contact with the same is a propulsion-wheel or sprocket-ring *l*, having a grooved internal surface arranged to receive the balls *k*. By this construction the sprocket-ring is held against 65 accidental lateral displacement with relation to the eccentric *f*, yet is free to rotate about the same. By removing the ring *i* the balls *k* may be taken out and the sprocket-ring *l* separated from the eccentric. The said 70 sprocket-ring *l* has an annular flange projecting outward, and inside this flange is secured by screws to the outer face of the sprocket-ring a contact-ring *m*, having recesses separated by projections extending to- 75 ward the center of the said contact-ring.

The rollers *d* on the roller-wheel *c* are arranged to run in contact with the internal surface of the said contact-ring *m*, whereby as the crank-shaft *a* is rotated the rollers *d* 80 will come into engagement, one after the other, with the projections of the contact-ring and will cause a rotation of the latter and of the sprocket-ring *l*, attached thereto. It will be seen from Fig. 2 that the rollers are so ar- 85 ranged that there is always one in condition for operating the contact-ring *m* and that as soon as one roller passes out of contact with said contact-ring another roller enters into contact with the same. 90

In order to permit the adjustment of the ring *i* as the balls *k* become worn and at the same time to hold said ring *i* in any adjusted position, I provide a locking device for the ring *i*. This consists in the example illus- 95 trated of the following: The threaded portion of the periphery of the eccentric *f* is slotted opposite one of the spokes *o* of said eccentric, and into this slot is inserted a dog *p*, threaded on its end to fit into the thread 100 on the internal surface of the ring *i*. The said dog *p* is secured to the spoke *o* in a re-

movable manner by a screw, as shown, or in any other well-known manner. The exterior end of the dog *p* is extended over the ring *i* and is provided with a tooth which is arranged to enter any desired one of a series of holes *n* in the outer surface of the ring *i*, thereby locking said ring *i* against accidental rotation. By removing the screw which attaches the dog *p* to the spoke of the eccentric the dog may be removed and the ring *i* adjusted or removed.

In applying my invention to a bicycle, as illustrated diagrammatically in Fig. 4, a structure similar to that described is attached to the driving-wheel of the machine, the eccentric being held immovable by the framework, while the roller-wheel is provided with sprocket-teeth on its periphery, and the driving-wheel of the bicycle carries the ring, which is the equivalent of the sprocket-ring *l*, described above. A chain connects the sprocket-ring *l* with the roller-wheel on the bicycle driving-wheel. Upon the turning of the crank shaft or axle *a* by force applied to the pedals the driving-wheel will be propelled.

While I have specifically described my invention as applied to a bicycle, it is obvious that it may be employed for other purposes, and, if desired, the sprocket-ring *l* may be transformed into a gear-wheel for engagement with corresponding gearing.

The advantage of my construction is that the diameter of the sprocket-gear on the pedal or crank shaft can be considerably increased, thereby reducing the friction in the chain-joints as they turn over the said sprocket-gear without reducing the ratio of the power to the resistance to be overcome. This is due to the fact that the rotation of the sprocket-gear is accomplished by force applied near its periphery by means of the roller-wheel, whose axis of rotation is not coincident with that of the sprocket-gear.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a driving-gear, the combination, with a fixed eccentric having a projecting flange beveled at its outer edge and provided with a screw-threaded rim having a slot, of a ring screwed onto the rim and provided with a beveled edge and with a series of holes, the beveled edges of the flange and ring forming a ball-raceway, a series of balls in said raceway, a propulsion-wheel outside said balls and having a channel to receive the balls, means for rotating the propulsion-wheel, and a dog removably secured to the fixed eccentric and provided with a screw-threaded portion projecting through the slot in the rim of the eccentric, said dog having a tooth arranged to engage any desired one of the holes in the ring, whereby the latter may be held against rotation.

2. In a driving-gear, the combination with a hanger, a crank-axle journaled therein and provided with cranks, a roller-wheel secured to the crank-axle and provided with rollers, and an eccentric fixed to the hanger, said eccentric having a projecting flange beveled at its outer edge and provided with a screw-threaded rim, of a ring screwed onto the rim and provided with a beveled edge, the beveled edge of the flange and ring forming a ball-raceway, a series of balls in said raceway, a propulsion-wheel outside said balls and provided with a channel to receive the balls, said propulsion-wheel having an annular flange, and a contact-ring detachably secured inside the said annular flange of the propulsion-wheel and provided with internal recesses arranged to receive the rollers on the roller-wheel, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORG HESS.

Witnesses;

THEODOR KRÄMER,
OSCAR BÖCK.