No. 800,879. PATENTED OCT. 3, 1905.

H. DE RUTY.

CHANGE SPEED GEAR.

APPLICATION FILED APR. 11, 1905.

FIG. 1

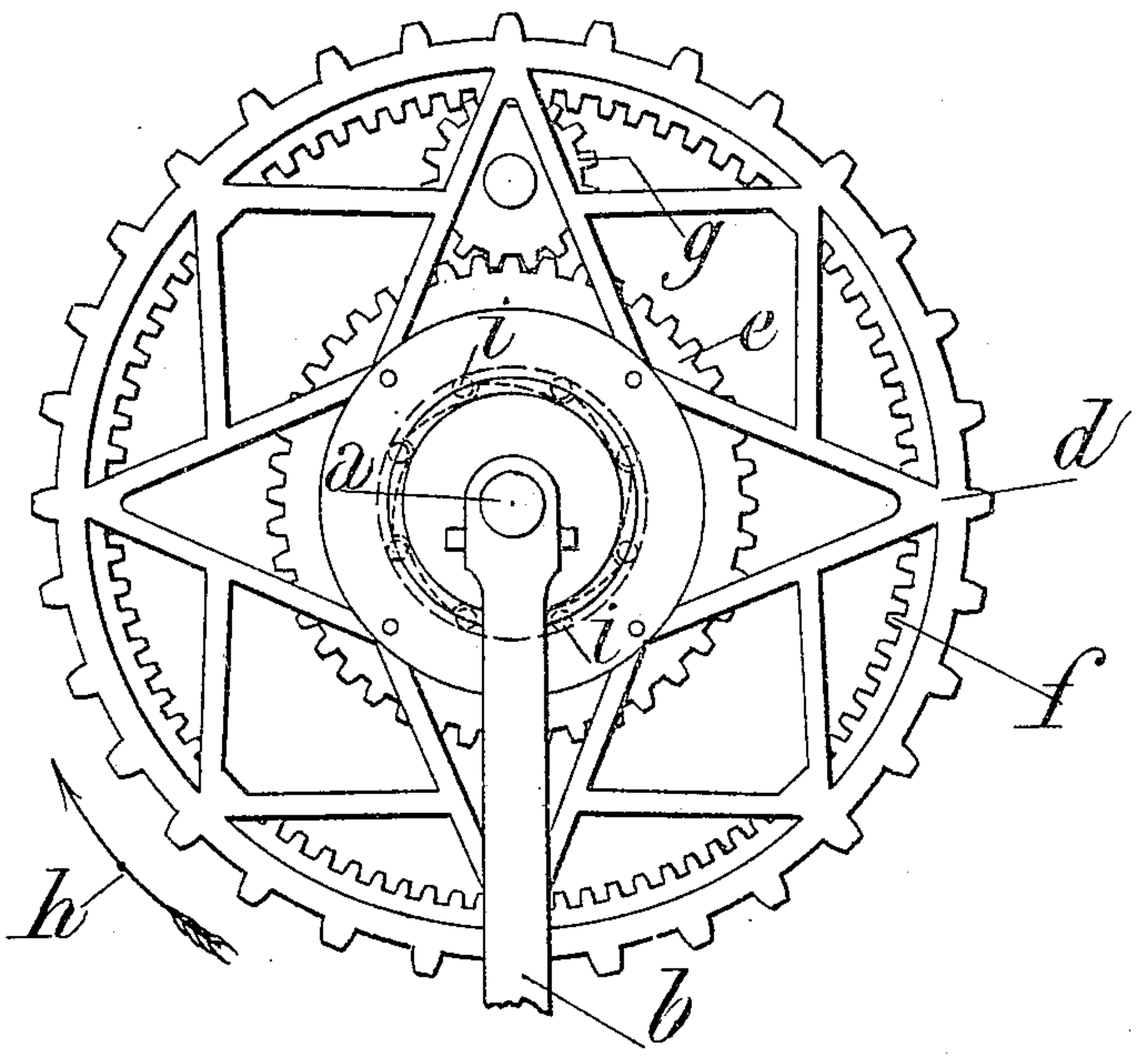
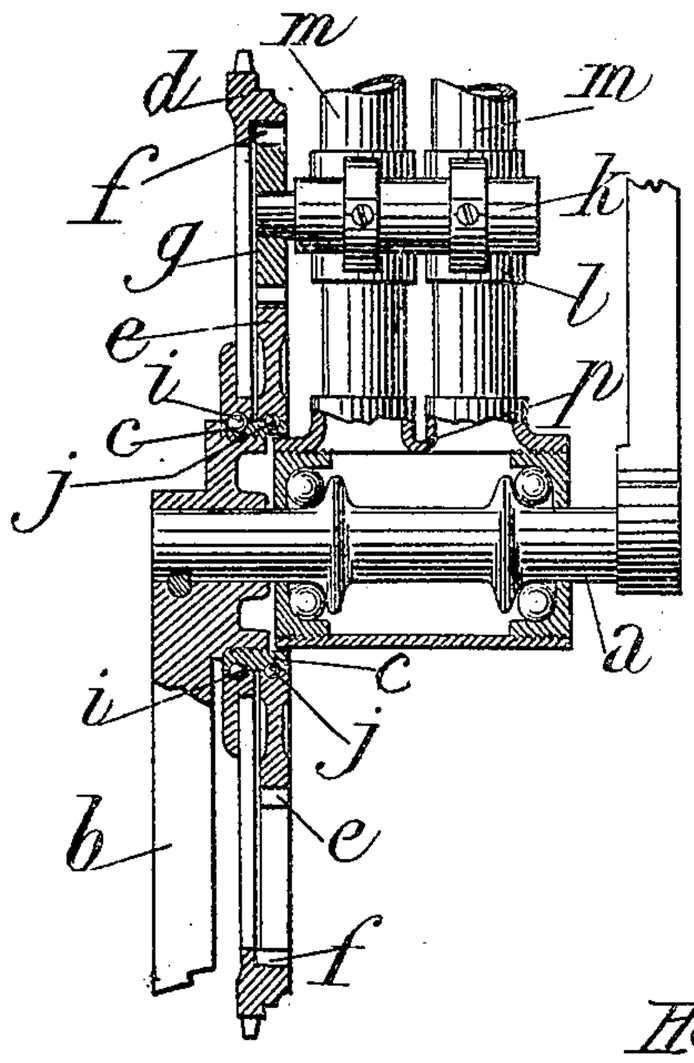


FIG. 2



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HENRI DE RUTY, OF MACON, FRANCE.

CHANGE-SPEED GEAR.

No. 800,879. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed April 11, 1905. Serial No. 254,972.

To all whom it may concern:

Be it known that I, HENRI DE RUTY, a citizen of France, residing at Macon, Saône-et-Loire, France, have invented new and useful Improvements in Change-Speed Gear, of which the following is a specification.

The arrangement of change-speed gear forming the subject of the present invention is applicable to different mechanisms driven by cranks, and has for its object to give to these mechanisms different speeds according as the cranks are operated in one or the other direction, the mechanism running nevertheless always in the same direction. The accompanying drawings represent its application to a bicycle-crank bracket, in which—

Figure 1 is a face view of the arrangement, and Fig. 2 is an axial section thereof.

The crank-bracket *p* and the crank-axle *a* are in no way changed. The whole of the mechanism is carried by the crank *b* and by the frame of the machine. On the crank *b* is fixed a ring *c*, on which turn the two wheels *d* and *e*. The larger of these wheels *d* is that which carries the driving-chain. It is connected to the ring *c* by means of ball-clutch mechanism *i*, of known construction, (shown in dotted lines at Fig. 1,) which permits it to be driven only in one direction by the crank—namely, in the forward motion, as indicated by the arrow *h*. The wheel *d* is provided with an internally-toothed ring *f*.

The wheel *e*, smaller than the ring *f*, is externally toothed to the same pitch as the ring. It is connected to the ring *c* by ball-clutch mechanism *j* of similar form to that marked *i*, but arranged in reverse direction, so that it can be driven by the crank only in the opposite direction to that of the arrow *h*. The toothed rings *e* and *f* both gear with a small pinion *g*, the axle of which rotates in ball-bearings within a sleeve *k*, fixed by collars *l l* to the arms *m m* of the frame. It results from these arrangements that when the cyclist operates the pedals directly—that is to say, in the forward direction (indicated by the arrow *h*)—the wheel *d* is rotated in the same direction and at the same speed. The wheel *e* is driven in the contrary direction by the intermediate pinion *g;* but it rotates loosely on the ring *c* and produces no action. When the cyclist back-pedals—that is to say, rotates the pedals in the direction contrary to the arrow—it is the wheel *e* which is driven and which by the intermediate pinion *g* drives the chain-wheel *d* in the direction of the arrow, as in the first case, but with a reduced speed in the proportion of the toothed wheels *e* and *f*.

The mode of mounting above described permits the ready adaptation of the mechanism to existing bicycles and the retention of the line of chain. It suffices, in fact, to fix the crank *b*, provided with its wheels *d* and *e*, in the position of the old crank and to mount the sleeve *k*, carrying the pinion *g*, on the arms *m* of the frame. This mounting is rendered very easy by the arrangement of the sleeve *k*, which can slide in the collars *n*, thus enabling the latter to be placed at the distance required by the arms *m* and to bring the pinion *g* exactly to its proper position.

The arrangements above described will necessarily be varied according to the applications of the invention. For instance, several intermediate pinions similar to *g* might be placed between the tooth-wheels *e* and *f*, these pinions rotating on axles equally distributed around the main axle *a*.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a change-speed gear for mechanisms driven by cranks, the combination with the cranks, toothed wheels, reversely-arranged clutch mechanisms operatively connecting the one or the other of the wheels with the cranks according to the direction in which the cranks are rotated and a pinion coupling the two wheels so that they rotate in contrary directions, one of the wheels being larger than the other and said larger wheel driving the mechanism, substantially as described.

2. In change-speed gear for bicycles, the combination with the cranks and their hub, of the two toothed wheels of different size mounted on the hub, means for operatively connecting one or the other of said wheels to the cranks, a support, a sleeve carried in the support and an intermediate pinion carried in said sleeve, said pinion engaging with both wheels.

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

HENRI DE RUTY.

Witnesses:

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