No. 685,086. Patented Oct. 22, 1901.

G. B. H. AUSTIN.

CYCLE PROPELLING MECHANISM.

(Application filed Apr. 18, 1901.)

(No Model.) 3 Sheets—Sheet 1.

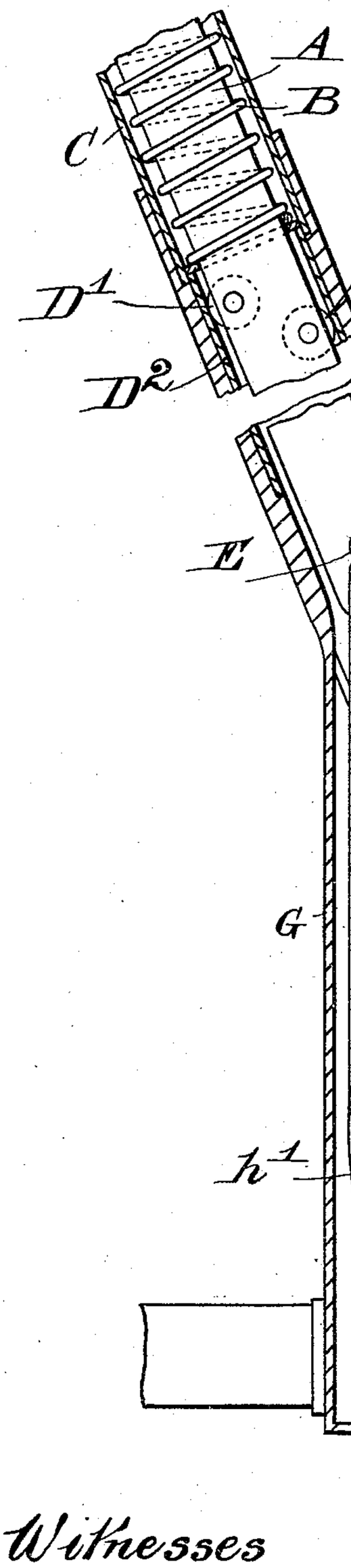

Fig. 1.

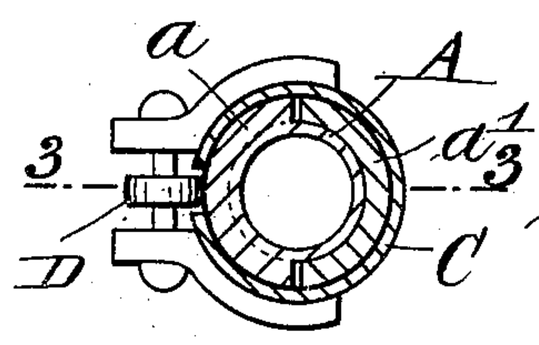

Fig. 2.

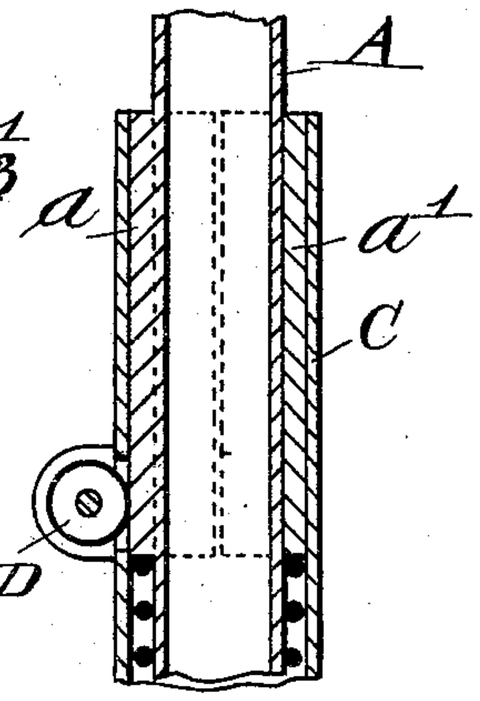

Fig. 3.

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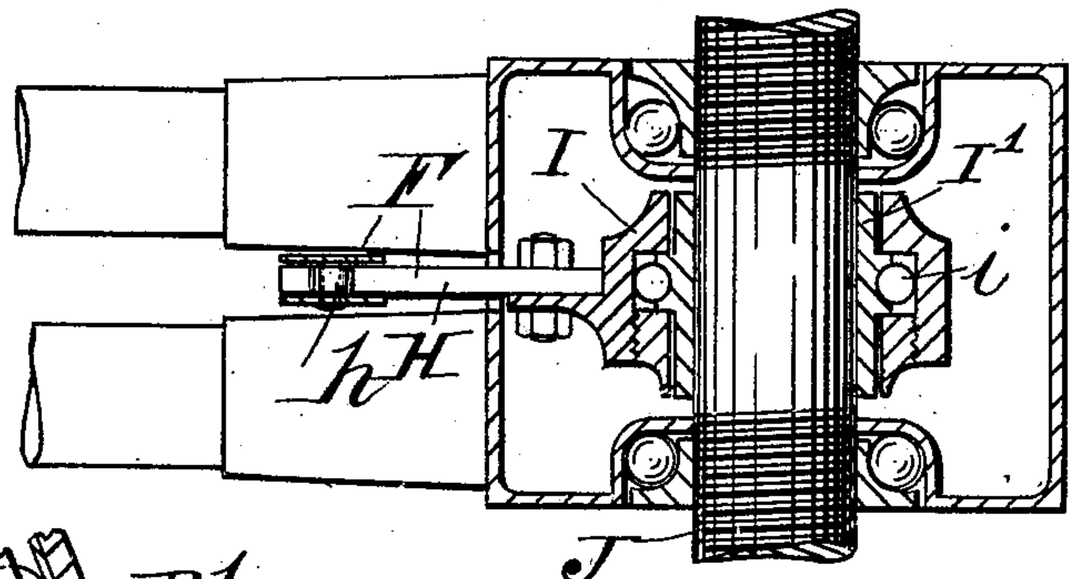

Fig. 4.

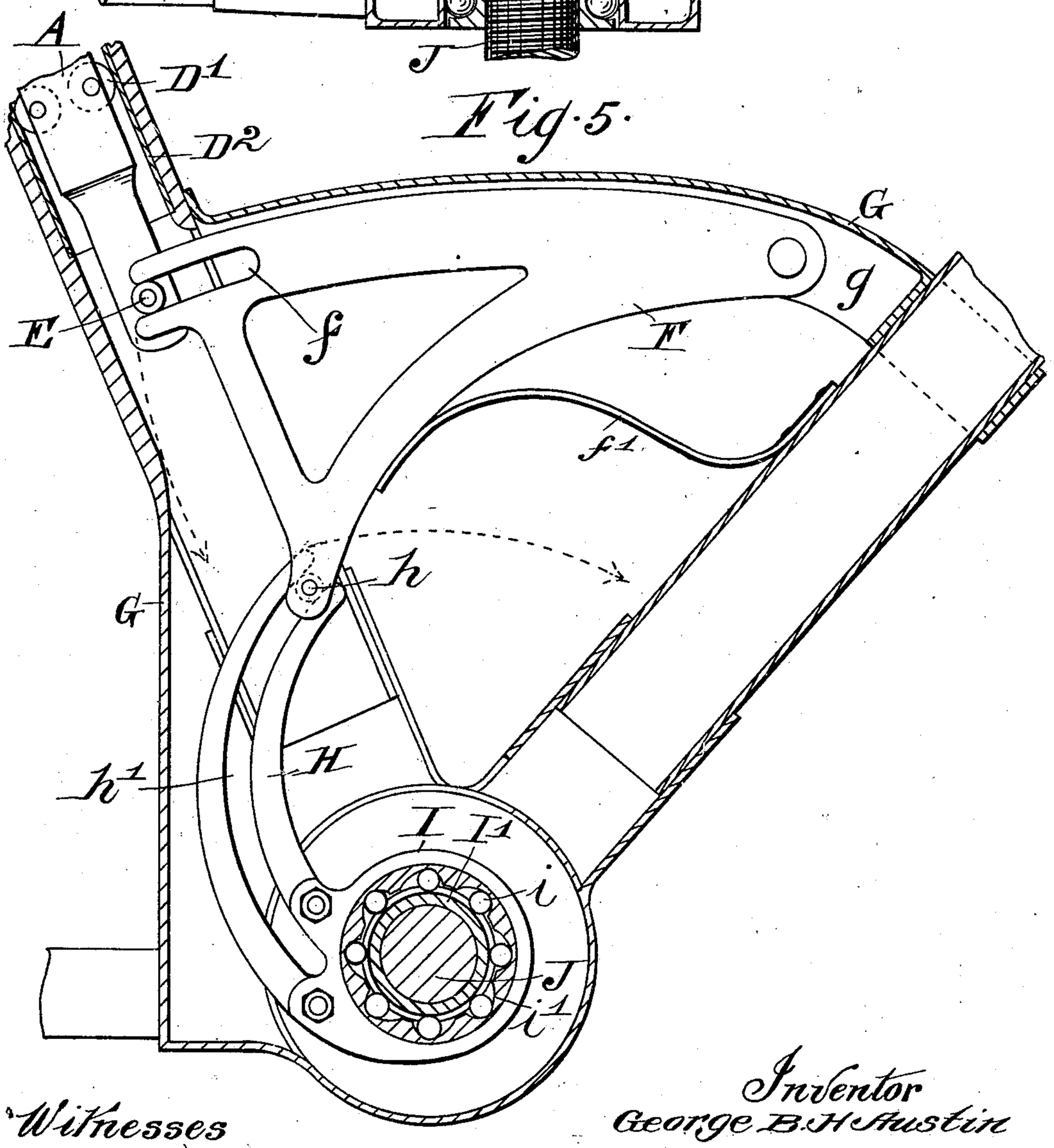

Fig. 5.

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CYCLE PROPELLING MECHANISM.

(Application filed Apr. 18, 1901.)

(No Model.) 3 Sheets—Sheet 3.

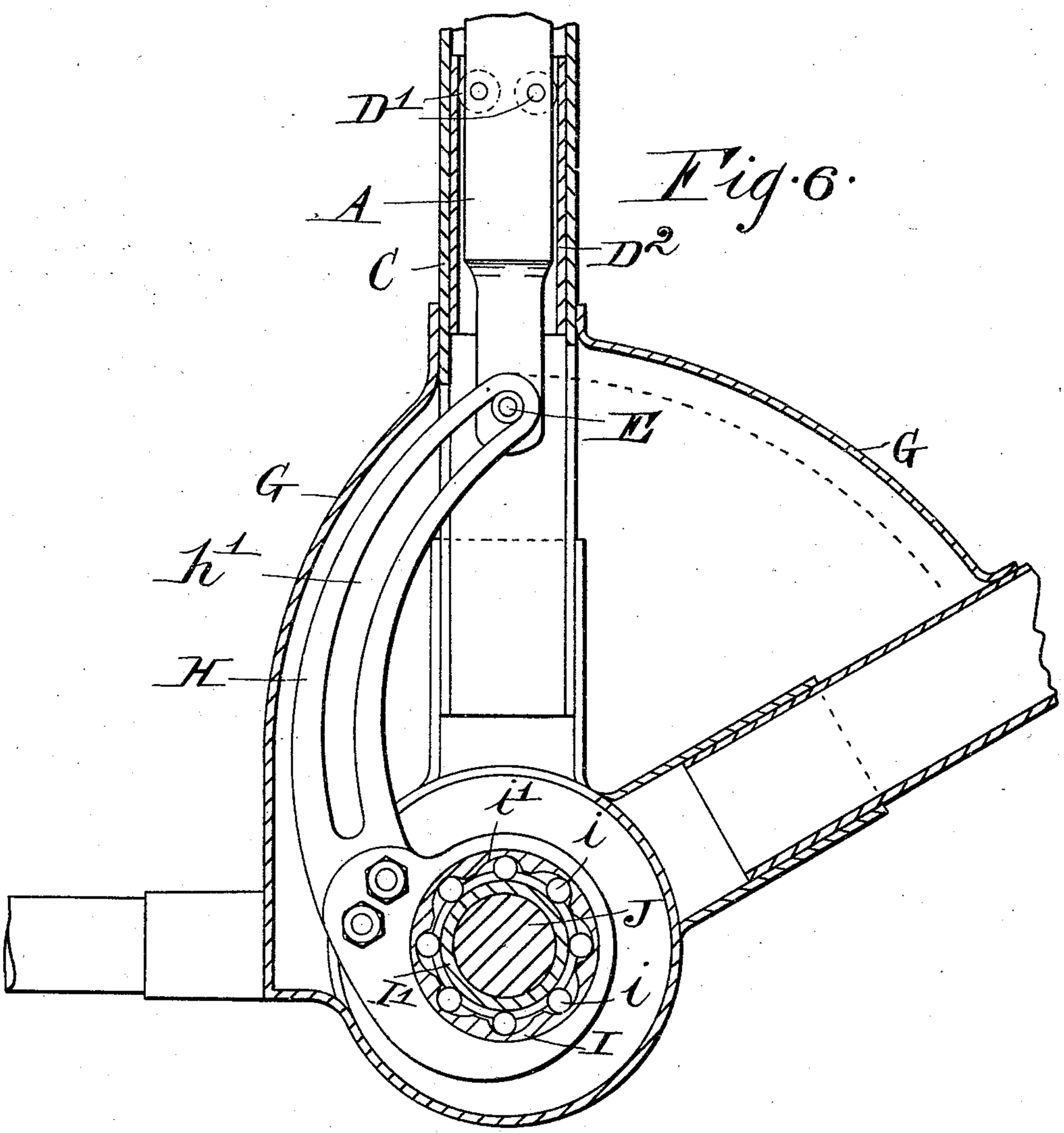

Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE BROUGHAM HUBERT AUSTIN, OF MALVERN, VICTORIA.

CYCLE PROPELLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 685,086, dated October 22, 1901.

Application filed April 18, 1901. Serial No. 56,463. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BROUGHAM HUBERT AUSTIN, architect, a subject of the King of Great Britain, residing at Tooronga road, Malvern, near Melbourne, in the State of Victoria and Commonwealth of Australia, have invented a Cycle Propelling Mechanism, of which the following is a specification.

This invention relates to cycle propelling mechanism, and especially to that class involving the utilization of the varying weight upon the saddle for the purpose of assisting in propelling the machine. Hitherto with contrivances used for this purpose no provision was made for regulating the movement of the mechanism in accordance with the strength of the bump of the rider upon the saddle, the consequence being that such weight was either brought with a sudden jar down upon the driving mechanism or else it was too slow to overtake the rotation of the drive-wheel, especially in the case of small vibrations or bumps. The present invention has been devised in order to provide a mechanism which will remedy these defects and the main part of which can be mounted in a very small space in or upon the lower bracket.

In order that my invention may be clearly understood, I will describe it by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation illustrating my improved mechanism for utilizing the bumping of cyclists for assisting in the propulsion of cycles, and Fig. 2 is a horizontal section across the upper part of the down-tube and seat pillar or support. Fig. 3 is a central vertical section thereof on line 3 3, Fig. 2. Fig. 4 is a horizontal section, and Fig. 5 a sectional side elevation, illustrating a modification of my invention, while Fig. 6 is a similar view to Figs. 1 and 5, illustrating yet another modification.

The saddle is mounted upon a vertically-sliding rod, tube, or plunger A, which is fitted with a spring B, whose strength can be adjusted to suit the weight of the rider. Said plunger can be prevented from rotating and at the same time be strengthened by forming it with a semicircular strip *a*, Figs. 2 and 3, upon its outer surface and by securing a corresponding strip *a'* to the inner surface of the down-tube C, in which said plunger works. An antifriction wheel or roller D may be mounted behind said down-tube C, so as to bear against said plunger A, and thereby reduce the friction thereof against the down-tube. Similar rollers D' may be mounted upon said plunger at intervals and be arranged to bear against liners D^2 within said down-tube. The lower end of said plunger A is fitted with an antifriction-roller E, which works within a horizontal slot *f* in the upper arm of a bell-crank lever F, Figs. 1 and 5, which is pivotally mounted upon or between a pair of brackets or sides *g* of a casing G. The lower end of said bell-crank lever F is provided with another antifriction-roller *h*, which works within a curved slot or path *h'* in a curved arm H, projecting upwardly from the rotary half I of a clutch upon the crank-axle J. Said clutch is by preference a silent one, fitted with balls or rollers *i*, arranged to work up inclined surfaces *i'* in the half I of said clutch, so as to cause them to jam against the other half I' of the clutch when turned in one direction, while allowing them to rotate freely when turned in the other direction.

A flat spring *f'* may be used to return the bell-crank lever F to its normal position, and, if preferred, the ends of the two arms of said lever can be connected together and thereby strengthened.

In order that the bicycle may be wheeled backward when required, the sleeve I', forming the inner half of the clutch, may be divided or be split radially, as illustrated at i^2, Fig. 1, so that it is free to spring outward. Its inner surface is roughened, and the corresponding surface of the axle J is also roughened, so that when the outer part of the clutch is moved forward the balls *i* will jam the split ring around the axle, and thus communicate motion to this latter. When, however, the clutch is in its released position, the tendency of the split ring will be to hold the balls in the deep part of their inclined grooves and will expand, so as to release the axle.

The modification illustrated in Fig. 5 is substantially the same as that shown in Fig. 1, except that the shape of the bell-crank lever F is different. Both its upper and lower arms are curved, and the slot *f* in the former is also curved instead of being straight.

The mechanism above described is so arranged that when the saddle and seat-support are in their highest position, as indicated in the drawings, the antifriction-roller *h* on the lower end of the bell-crank lever F will engage with the end of the curved arm H upon the clutch I, and consequently the leverage against said bell-crank lever, and therefore against the seat-support, will be small, but will gradually be increased as the antifriction-roller on the lower end of said bell-crank lever is moved down toward the bottom of the curved slot in the arm H upon the clutch.

The bell-crank lever F can be arranged so as to work either through the bottom of the down-tube, as illustrated, or on the outside thereof, in which case a pin on the lower end of the sliding seat-support would require to be provided, so that it projects through a slot or slots in the side of the down-tube.

In some cases the bell-crank lever might be dispensed with altogether, as illustrated in Fig. 6, the roller E or pin on the lower end of the vertically-sliding seat-support A being arranged to engage directly with a slot *h* in the curved arm H upon the clutch.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a cycle propelling mechanism, a tube, a saddle-carrying plunger slidable in said tube and having a projection, a spring coöperative with said plunger, a bell-crank lever having a slot to receive said projection, a driving-axle, a clutch operative with the axle, an arm for actuating one of the members of the clutch, said arm having a slot, and a projection on said angle-lever to enter said slot.

2. In a cycle propelling mechanism, a tube, a saddle-carrying plunger slidable in said tube, a clutch, an arm for actuating the clutch, said arm having a curved slot, and an operating member working in said slot and connected with said plunger.

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