



No. 728,240.

PATENTED MAY 19, 1903.

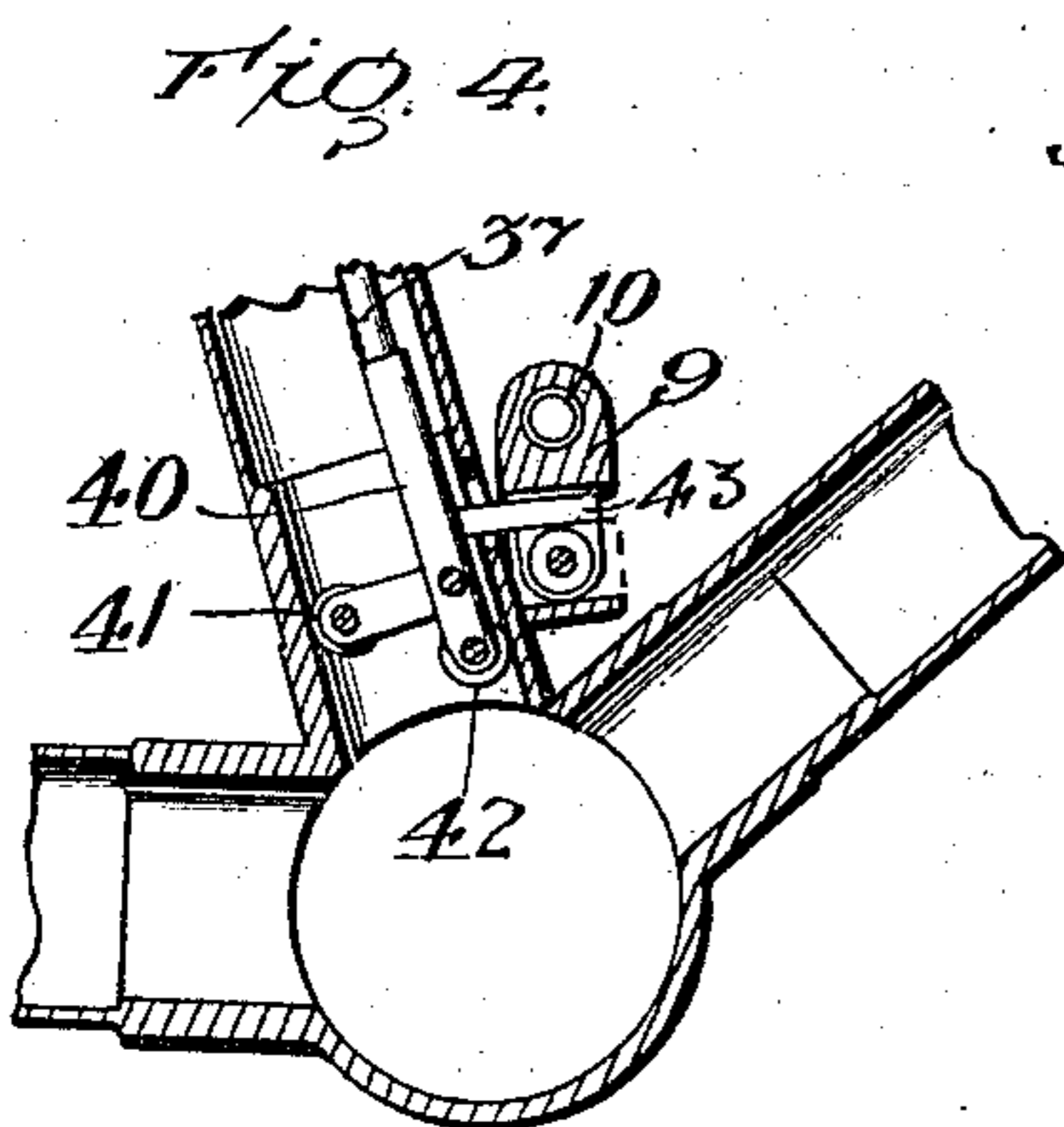
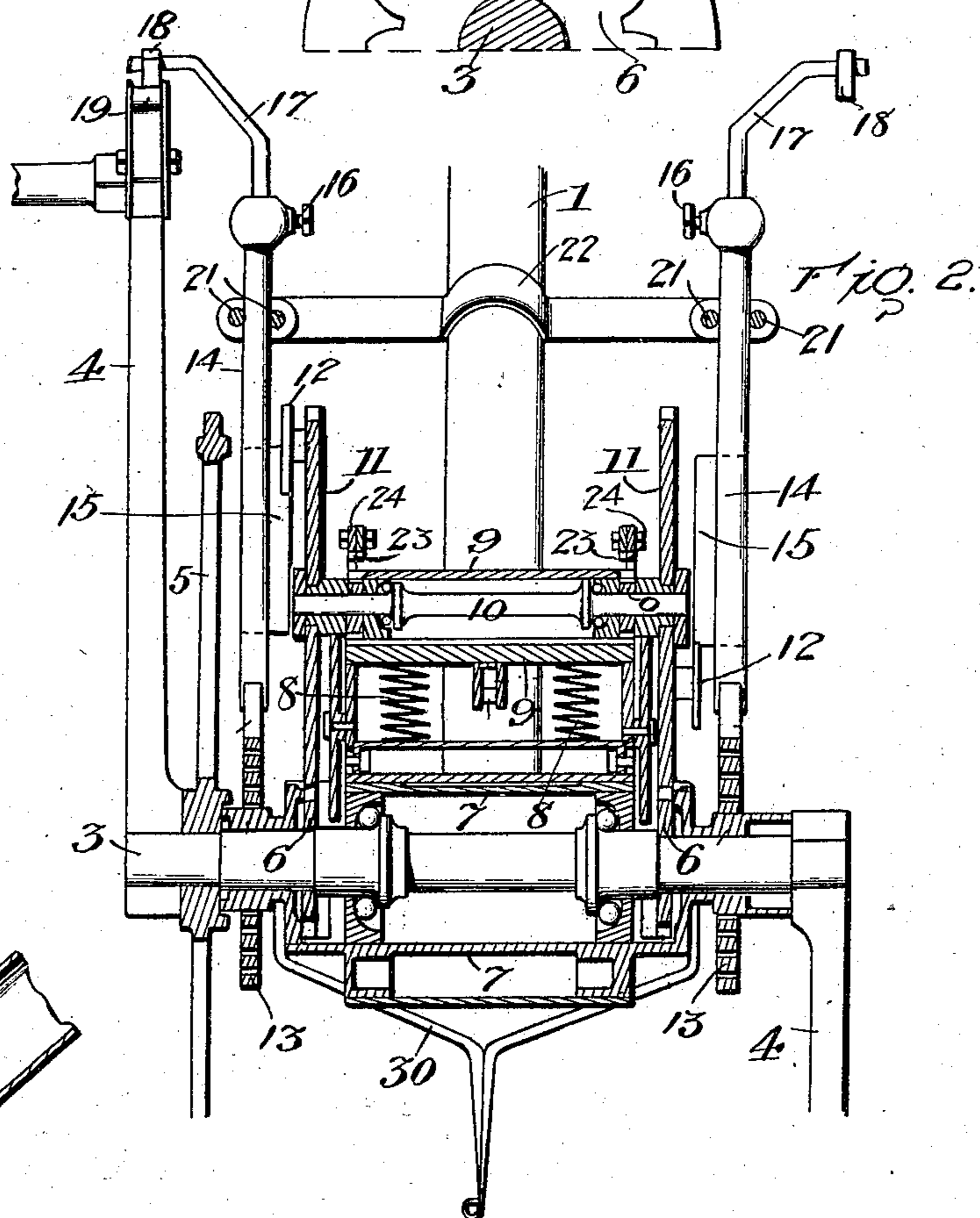
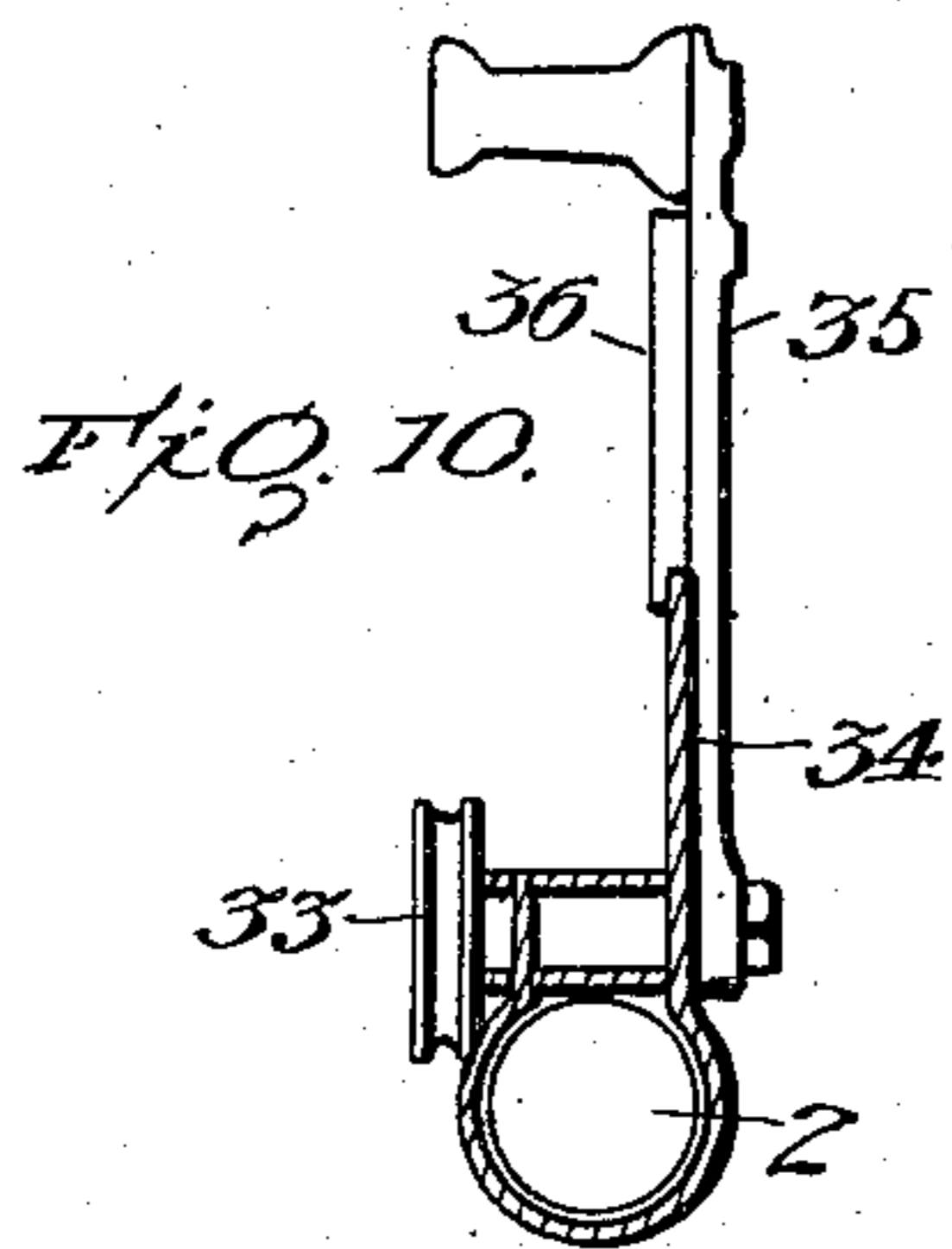
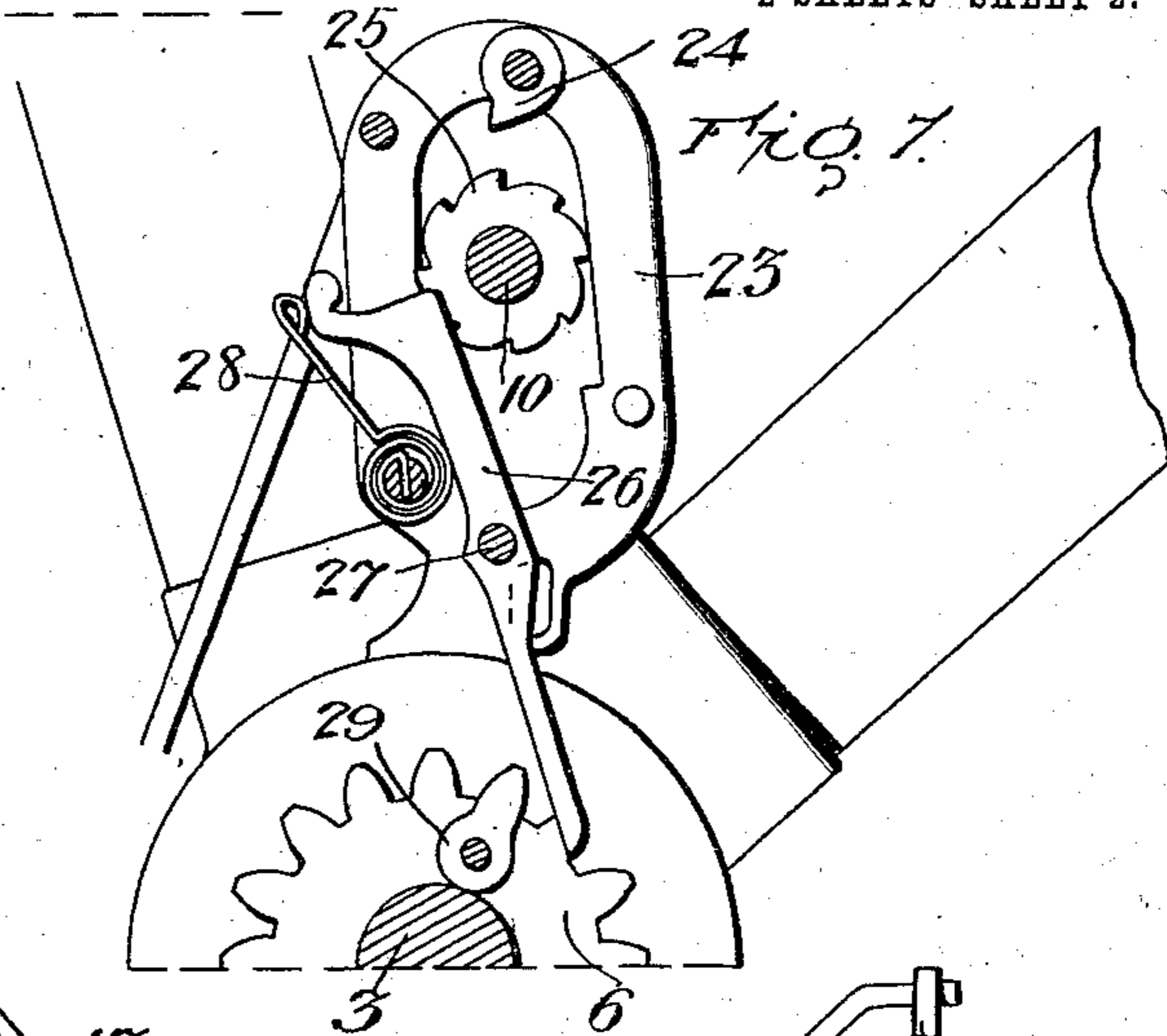
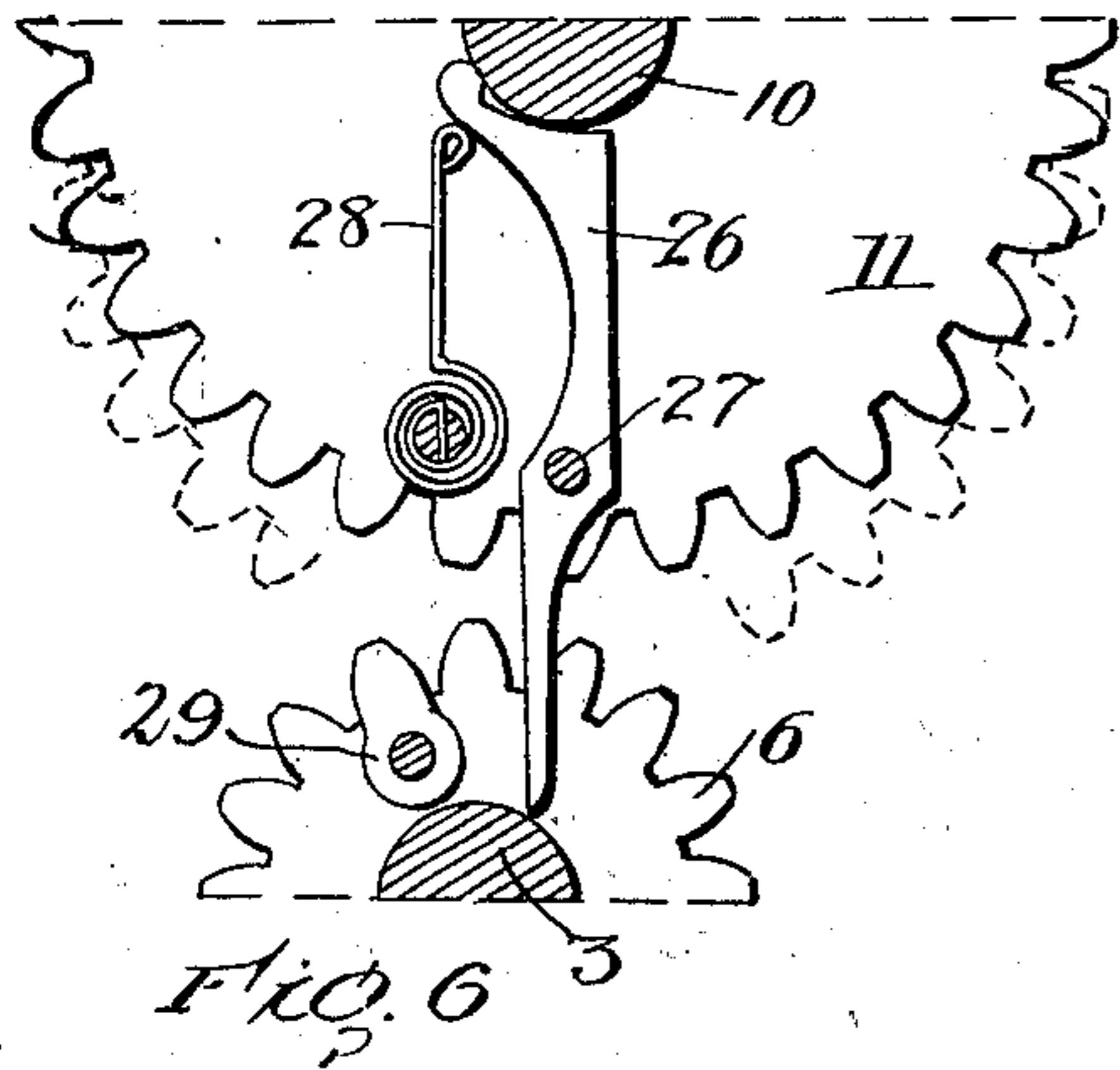
E. JOHOW.

DEVICE FOR OVERCOMING THE DEAD POINT POSITION OF CYCLE CRANKS.

APPLICATION FILED JAN. 27, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



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Witnesses

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## UNITED STATES PATENT OFFICE.

EMIL JOHOW, OF BERLIN, GERMANY.

DEVICE FOR OVERCOMING THE DEAD-POINT POSITION OF CYCLE-CRANKS.

SPECIFICATION forming part of Letters Patent No. 728,240, dated May 19, 1903.

Application filed January 27, 1903. Serial No. 140,757. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL JOHOW, architect, a subject of the German Emperor, and a resident at No. 31 Elbingerstrasse, in the city of Berlin, Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Devices for Overcoming the Dead-Point Positions of Cycle-Cranks, of which the following is a specification.

The present invention relates to devices for overcoming dead-centers of pedal-cranks or bicycles when the latter are positioned in a substantially vertical diameter. It is known that the bicycle rider acts upon the pedal-cranks to the greatest advantage when said pedal-cranks are in a substantially horizontal diameter, but that the pedal-cranks are carried through the vertical diameter only by the momentum of the rotation of the cranks without any exertion or help of the rider.

One of the objects of the present invention, therefore, is to overcome this defect; and the nature of the invention consists of devices substantially as described hereinbelow and illustrated by the accompanying drawings, of which—

Figure 1 is a side view illustrating the device applied to a bicycle; Fig. 2, a vertical cross-section in the axis of the pedal-shaft of the device; Fig. 3, a top view of a frame limiting the stroke of the spring-acted levers. Fig. 4 illustrates the arrangements for bringing the device into and out of operation. Fig. 5 is a detailed view of the end of the pedal-crank, showing the device for receiving the stroke of the spring-acted levers. Figs. 6 and 7 illustrate the arrangement for supporting and releasing the axis of the device. Figs. 8 and 9 illustrate the connection of the saddle-beam with the operating-rod. Fig. 10 illustrates the arrangement for adjusting the tension of the spiral springs of the device.

Similar figures of reference indicate corresponding parts throughout the several views. 1 in Figs. 1 and 2 is the upright of the bicycle-frame, and 2 in Fig. 1 is the horizontal rod of the bicycle-frame.

3 illustrates the pedal-shaft, provided with the pedals 4 and the sprocket-wheel 5. A pair of pinions or gears 6 are keyed to the pedal-shaft. The pedal-shaft runs in a hub 7, provided with ordinary ball-bearings. Rest-

ing upon the hub 7 is a pair of helical springs supporting a casing 9, which holds in suitable bearings a shaft 10, provided on each side with gears 11, at times in mesh with pinions 6 of the pedal-shaft 3. The gears 11 are provided with contact-rollers 12.

Secured to a sleeve rotatable on the shaft 3 is a pair of spiral springs 13, the outer ends of which extend in the form of rods 14 and are provided with contact-strips 15, located in the path of rotation of the contact-rollers 12, so that during the rotation of the shaft 10 and gear-wheels 11 the contact-rollers 12 will come in contact with the forward surface of the contact-strips 15 and force the lever 14 backward until the contact-rollers 12 leave the said contact-strips 15, whereafter the lever 14 will be forced forward on account of the tension of the spiral springs 13. The upper end of the levers 14 is provided with a head, into which is set a pair of bent levers 17 and adjustably secured therein by means of a set-screw 16. The ends of these bent levers 17 are provided with a hammer 18, which at times is forced against an anvil, held under the tension of a helical spring 20 at the end of the pedals 4. The movement of the levers 14 is guided and limited by two pairs of guide-rods 21, rigidly secured to the frame of the bicycle by means of collars 22 and 22'.

The casing 7, containing the pedal-shaft 3, is provided on each side with an oblong slotted extension 23, forming the guideway for the axle 10 of the auxiliary device. Secured to this extension is a lever 26, pivoted on a pin 27, which lever 26 is under pressure of a spiral spring 28. The pinions 6 on the pedal-shaft 3 are provided with an auxiliary tooth 29.

Secured to the sleeves carrying the spiral springs 13 is a frame 30, from which a wire rope or cord is carried over a roller 32 to a take-up roller 33 on the horizontal bar 2. The collar supporting this roller 33 is extended upwardly, forming a disk 34 and provided with teeth, into which enters a dog 36 of a lever 35.

The saddle is secured to the saddle-beam, which glides in the upright part 1 of the bicycle-frame and contains a rod 37 in a tube 38, secured to the saddle-beam by means of a

collar 39. The lower head 40 of the rod 37 is provided with guide-rollers 40 and 42 and with a pin 43, which enters into a yoke provided on the casing 9, containing and supporting axis 10 of the auxiliary device.

The operation of the device is as follows: As soon as a rider mounts the saddle of a bicycle the rod 37 is depressed, the point 43 carries casing 9 against the pressure of the helical springs 8 downward and brings the gears 11 in mesh with the pinions 6 of the pedal-shaft. During the rotation of the pedal-shaft, and therefore the rotation of the gears 11, the contact rollers 12 will act against the contact-strips 15 of the levers 14 and force this lever backward to the extent of the length of said contact-strips 15, and as soon as one of the contact-rollers leaves the said contact-strip 15 the levers 14 will bound forward and the head 18 will meet the anvil 19 at the end of the pedal-crank, which is now at or near its vertical diameter, and will support and help to carry the pedal-crank through this vertical diameter. As the shaft 10 of the auxiliary device is normally supported by the lever 26, an auxiliary tooth 29 is provided on the pinion 6, which will release the lever 26 at each revolution of the pedal-shaft, but the gears 11 will not come into mesh with the pinion 6 unless the rider has mounted the wheel, and thereby forces downward the rod 37.

In order to increase or decrease the tension of the spiral springs 30, the lever 35 on the horizontal bar 2 of the bicycle-frame may be turned back or forth and retain its position by means of the dog 36 entering the teeth of the disk 34.

What is claimed as new and useful, and desired to be secured by Letters Patent, is—

1. In a device for overcoming dead-centers, the combination with a pedal-shaft, of pinions keyed thereto, spiral springs rotatably

carried thereon, operating-levers secured to the outer ends of said spiral springs, contact-strips on said operating-levers, an auxiliary device adapted to be engaged by said pinions and to act upon said contact-strips, a hammer on the end of each operating-lever, pedal-cranks on the pedal-shaft and an anvil on the end of each of said pedal-cranks and adapted to receive the stroke of said hammer when said pedal-cranks pass through the substantially vertical diameter.

2. In a device for overcoming dead-centers, the combination with a pair of rotatable sleeves on a pedal-shaft, of spiral springs secured to said sleeves, a frame 30 connected to said sleeves, a flexible cord secured to the end of said frame, a take-up roller for said flexible cord, and means for locking said roller in any predetermined position to adjust the tension of said springs.

3. In a device for overcoming dead-centers, the combination with the hub of a bicycle-frame, slotted extensions on said hub, a rotatable shaft movable in said extensions, a spring-controlled lever pinioned to said extensions and adapted to support said shaft, and means to operate said lever.

4. In a bicycle, the combination with a pedal-shaft of spiral springs carried thereon, means for adjusting the tension of said spiral springs, an auxiliary rotatable device, means for bringing said auxiliary device in and out of cooperation with said pedal-shaft, and means for causing said spiral springs to support the rotation of said pedal-shaft.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EMIL JOHOW.

Witnesses:

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HENRY HASPER.