

(No Model.)

2 Sheets—Sheet 1.

G. BEEKMAN.
TRANSMITTING MECHANISM FOR CYCLES.

No. 550,938.

Patented Dec. 10, 1895.

Fig. 1.

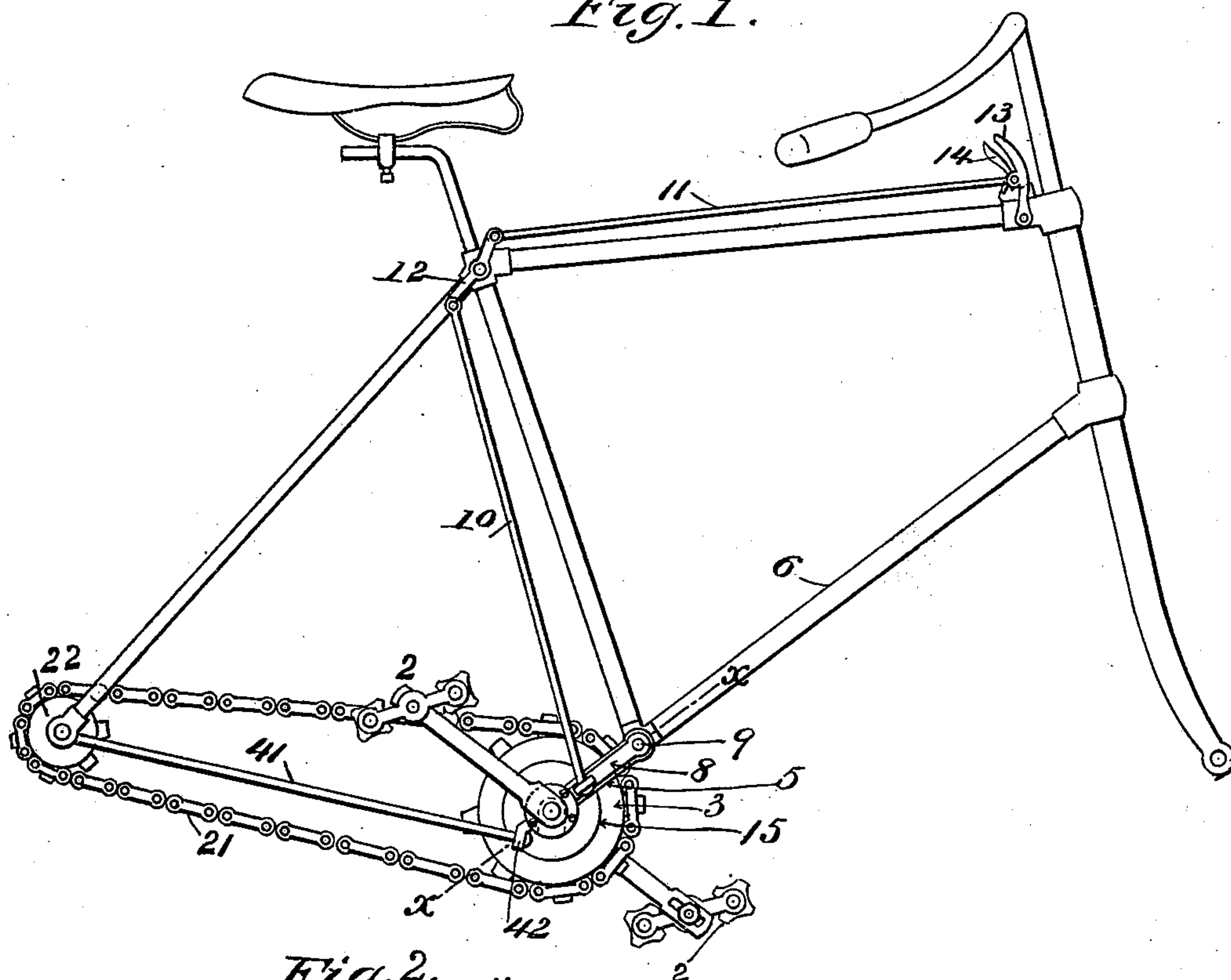
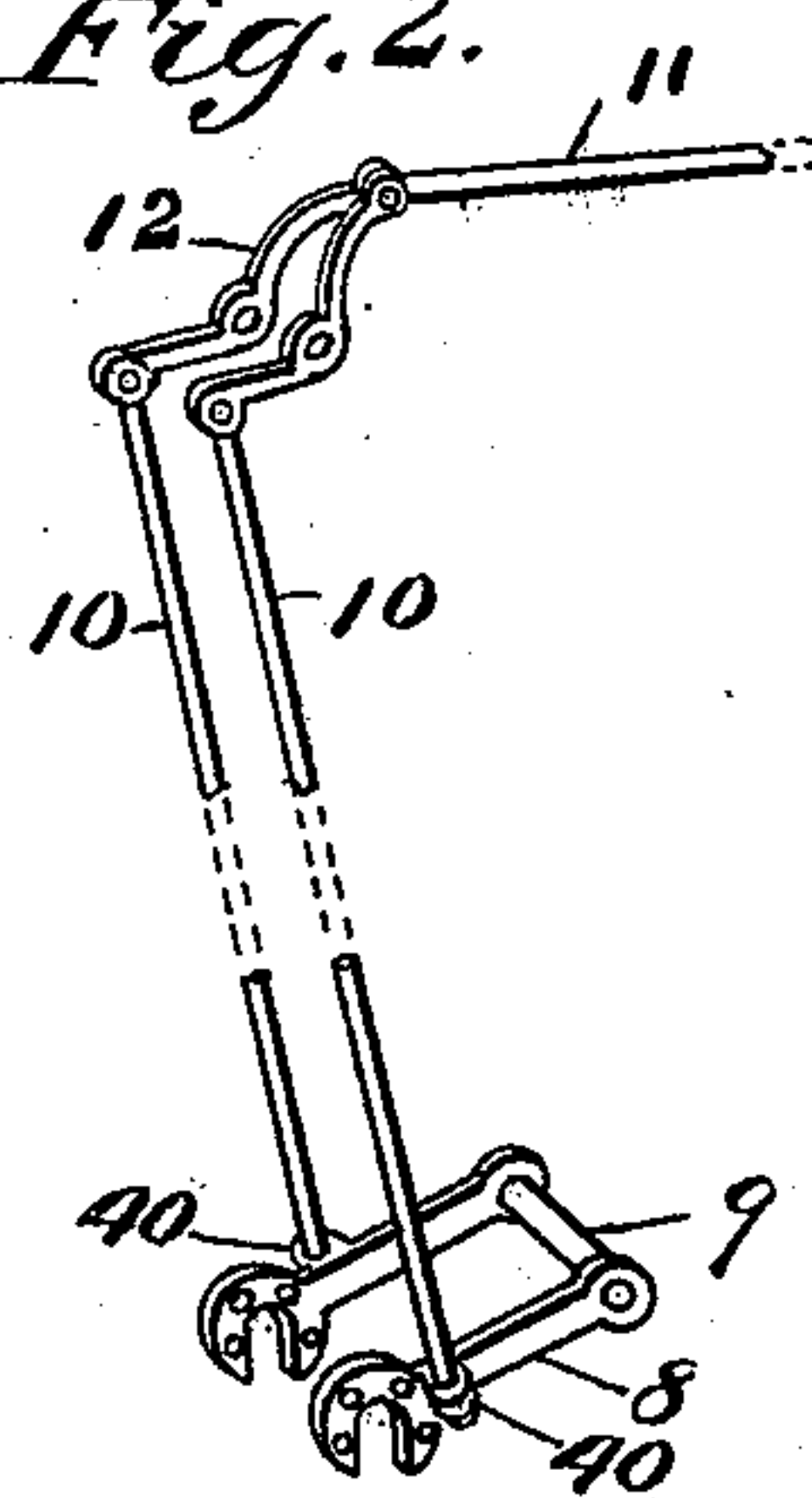


Fig. 2.



WITNESSES:

P. Martin
Edw. C. Leggett

INVENTOR

Gerard Beekman.

BY

Henry F. Parker

ATTORNEY

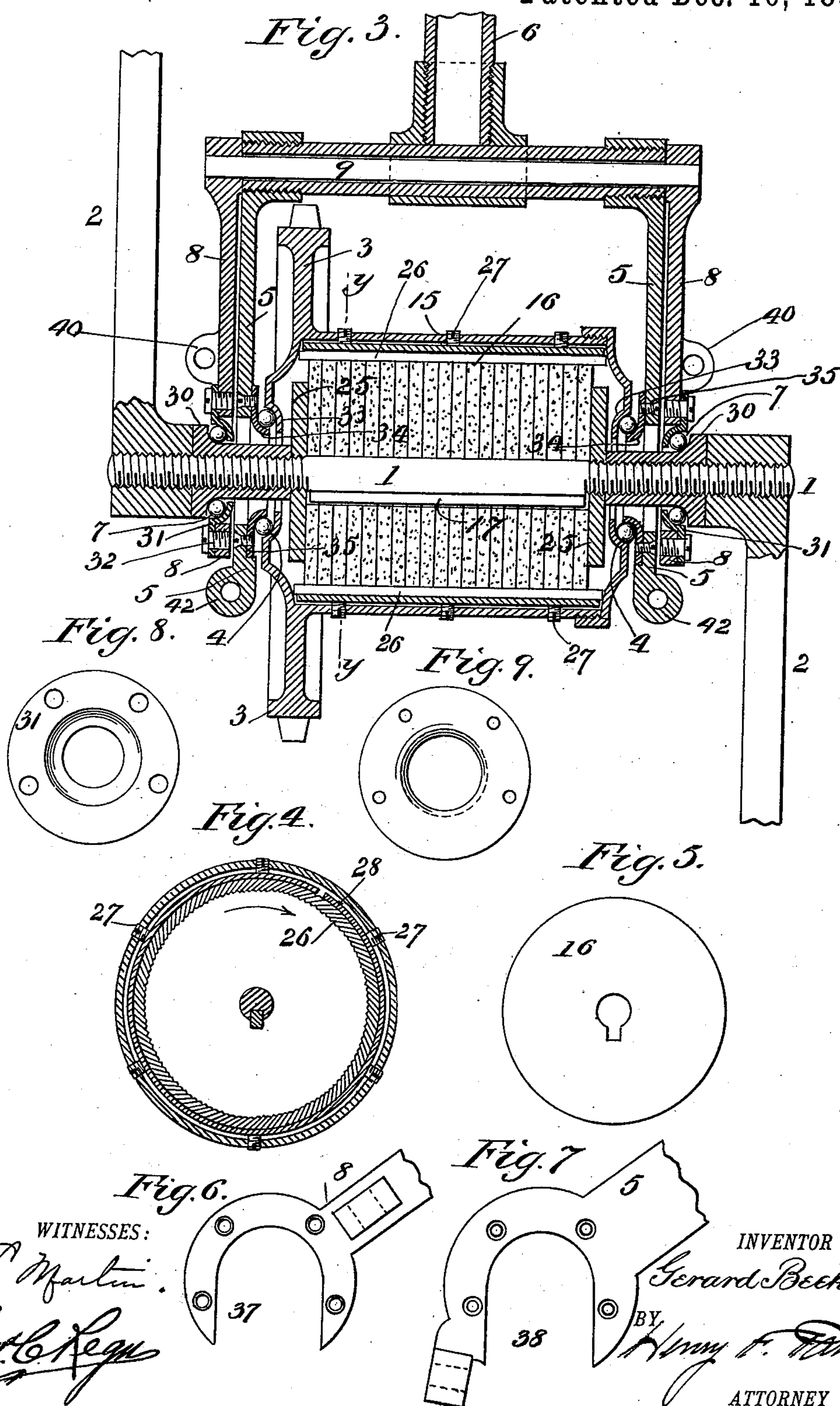
(No Model.)

2 Sheets—Sheet 2.

G. BEEKMAN.
TRANSMITTING MECHANISM FOR CYCLES.

No. 550,938

Patented Dec. 10, 1895.



UNITED STATES PATENT OFFICE.

GERARD BEEKMAN, OF NEW YORK, N. Y.

TRANSMITTING MECHANISM FOR CYCLES.

SPECIFICATION forming part of Letters Patent No. 550,938, dated December 10, 1895.

Application filed October 26, 1893. Serial No. 489,196. (No model.)

To all whom it may concern:

Be it known that I, GERARD BEEKMAN, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Transmitting Mechanism for Cycles, of which the following is a specification.

This invention relates to means for varying the relative rate of rotation between the treadle-shaft and the driven wheel of a cycle, and the same consists in certain novel combinations of mechanical elements, hereinafter fully described and claimed.

Referring to the accompanying drawings, Figure 1 represents a side view of the frame of a "safety-bicycle," showing my invention applied thereto; Fig. 2, a detail perspective view of certain operating parts; Fig. 3, an enlarged sectional view taken on the line *xx*, Fig. 1; Fig. 4, a cross-section at *yy*, Fig. 3; Fig. 5, a detail view of one of the leather friction-disks; Figs. 6 and 7, detail views of the extremities of the bearing-yokes in Fig. 3; Fig. 8, a detail view of one of the ball-bearing cups on the outer yoke in Fig. 3; Fig. 9, a detail view of one of the ball-bearing cones on the inner yoke in Fig. 3.

In Fig. 3, 1 represents the driving or pedal shaft, 2 the pedals, and 3 the sprocket-wheel approximately concentric with said shaft, but independently rotative. The sprocket-wheel 3 is supported by ball-bearings 4 upon a rigid yoke 5, forming a continuation of the tube 6 of the frame. (See Fig. 1.)

The pedal-shaft 1 is supported by ball-bearings 7 upon a movable yoke 8, pivoted at 9. Means are provided for operating the yoke 8 at the will of the rider, consisting in three rods 10 10 11, forked bell-crank 12, and hand-lever 13, having a pawl and ratchet 14, whereby it is set. (See Fig. 1.)

The sprocket-wheel 3 bears a cylinder or drum 15, and the pedal-shaft bears a cylinder 16, composed, preferably, of leather washers fitting the feather 17 on the pedal-shaft 1 to prevent them from rotative displacement. Any other suitable material may be used to compose the friction-cylinder 16.

Means are provided for maintaining parallelism between the friction-cylinder 16 and the friction-drum 15, irrespective of the al-

ternating foot-pressure of the rider at the opposite ends of the pedal-shaft 1, consisting in the elongated pivotal support of the yoke 8 at 9 in the rigid frame of the machine.

When the pedals 2 are depressed by the feet of the rider, the cylinder 16, which fits loosely within the interior cylinder-surface of the drum 15, naturally engages therewith with friction, and the pedals 2 thereby impart motion to the sprocket-wheel 3, chain 21, rear sprocket-wheel 22, and the driven wheel of the bicycle.

When it is desired to counter the pressure of the feet and reduce the frictional engagement of the cylinder 16 with the drum 15, the lever 13 is set forward, lifting the yoke 8 and pedal-shaft slightly with it. When this is done, a certain amount of slip is permitted between the cylinder 16 and drum 15.

By entirely countering the pressure of the feet by the lever 13 the cycle may be used for coasting without removing the feet from the pedals, the latter remaining stationary. The lever 13 may again be used by pulling the same backward to co-operate with the pressure of the feet for the purpose of increasing the pressure of the cylinder 16 against the drum 15, and, moreover, with this movement the lever 13 may be operated as a brake-lever when the rider holds his pedals 2 stationary with his feet while the machine is running with momentum, the friction between the revolving drum 15 and the now stationary cylinder 16 serving to retard the machine.

In matter of detail the leather washers 16 composing the cylinder are clamped together by nuts 25, by the compression of which the diametrical expansion of the body of leather may be slightly varied, and within the drum 15 there are inserted longitudinal strips 26, Fig. 4, which lie in inclined positions approaching tangents disposed in opposition to the direction in which the cylinder 16 rotates when the machine is moving forward, and these strips thereby engage with increased effectiveness of friction with the peripheries of the leather disks. The frictional engagement of the cylinder and drum may also be varied by adjusting the screws 27 against the split bushing 28, that forms a backing for the strips 26.

Bearing-cones 30 are provided to the pedal-shaft 1, and bearing-cups 31 therefor are removably attached by screws 32 to the movable outer yoke 8. The drum 15 contains bearing-cups 33 for supporting the sprocket-wheel 3, and the bearing-cones 34 therefor are removably attached by screws 35 to the fixed inner yoke 5. The extremities of the yokes are left open at 37 38, as in Figs. 6 and 7, to facilitate separating the parts.

The operating-rods 10 10 are attached to the movable yoke 8 at the ears 40, and the frame-rods 41, Fig. 1, are attached to the fixed yoke 5 at 42.

It is to be understood that my invention is not limited to the construction shown, wherein the concave cylindric surface embodied in the drum 15 is attached to the driven part and the convex cylindric surface embodied in the cylinder 16 is attached to the driving part, whereas said relation of attachment may be reversed, and, moreover, the construction of the cylindrically-surfaced parts may be greatly varied or even substituted by conic or other tapering surfaces, the essential feature consisting in that the frictional engagement of such surfaces the one with the other shall vary with the variation in the relative positions of the respective axes of rotation of the engaging parts.

My invention is of course applicable to other forms of cycles than that shown.

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

1. In a cycle, the combination of a pedal and its shaft; a wheel or part to be driven by said shaft, and unattached thereto; and a two-part friction device the members of which are secured respectively to said shaft and driven part, and are movable diametrically with relation to each other, whereby a varied pressure upon the pedal by the foot of the rider, will produce a correspondingly varied degree of rotation of said driven part, substantially as set forth.

2. In a cycle, the combination of a pedal and its shaft, the latter furnished with an attached friction-member, having a cylindrical surface; and a non-attached wheel or driven part provided with a hollow cylindrical friction-member, which approximately fits the

friction-member on the shaft, the said shaft and driven part being diametrically movable with relation to each other, whereby a varied pressure upon the pedal by the foot of the rider, will vary the degree of rotation of said driven part, substantially as set forth.

3. In a rear-driven bicycle, the combination of a sprocket wheel journaled on a stationary part or frame of the machine, and having a friction drum; a pedal and its shaft, the latter journaled in a part or frame which is movable with relation to said wheel support, the said shaft being furnished with a cylindrical friction-member approximately fitting within said drum, whereby a varied pressure upon the pedal by the foot of the rider, will vary the degree of rotation of the sprocket wheel, substantially as set forth.

4. In a rear-driven bicycle, the combination of a sprocket wheel, having an attached friction drum; a fixed yoke, supporting said wheel; a pedal and its shaft; a friction cylinder secured to the shaft and approximately fitting within the drum; and a supporting yoke for said shaft, which yoke is mounted to swing with relation to said fixed yoke, to allow a variably close engagement between the friction drum and cylinder to be effected by a varied pressure upon the pedal, substantially as set forth.

5. In a cycle, the combination of a pedal and its shaft; a wheel or part to be driven by said shaft, and unattached thereto, and a two-part friction device the members of which are secured respectively to said shaft and driven part, and are movable diametrically with relation to each other, whereby a varied pressure upon the pedal by the foot of the rider, will produce a correspondingly varied degree of rotation of said driven part, and co-operating therewith a hand operated mechanism attached to the frame of the machine suitably connected to control the relative diametric movement of said members, and partially or wholly counteract or augment the frictional transmitting effect of the foot pressure by the independent action of the hands of the rider.

GERARD BEEKMAN.

Witnesses:

HENRY F. PARKER,
EUGENE LUCAS.