

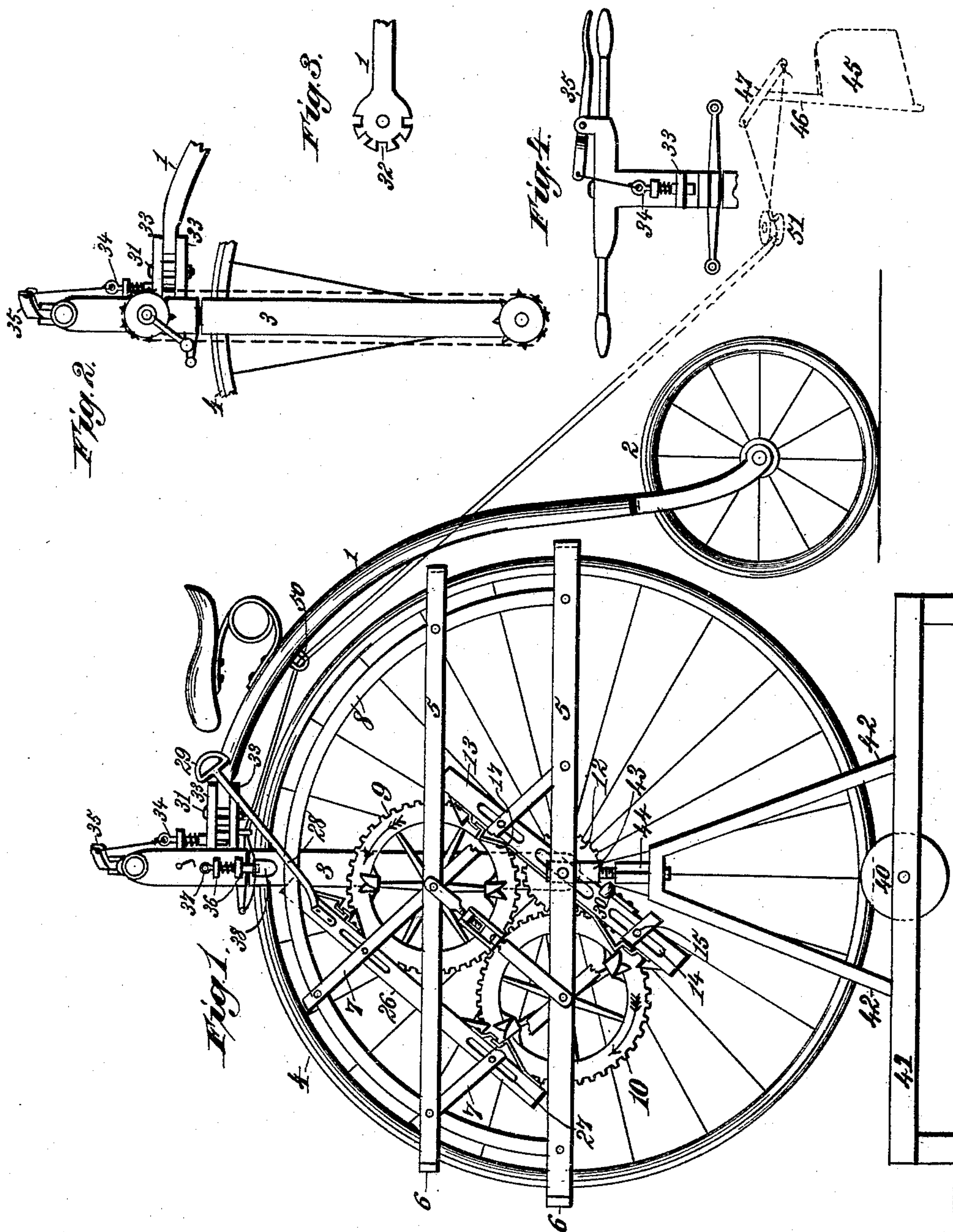
(No Model.)

2 Sheets—Sheet 1.

J. W. JAMES.  
VELOCIPÈDE.

No. 442,980.

Patented Dec. 16, 1890.



Witnesses:  
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*Percy B. Hills.*

Inventor:  
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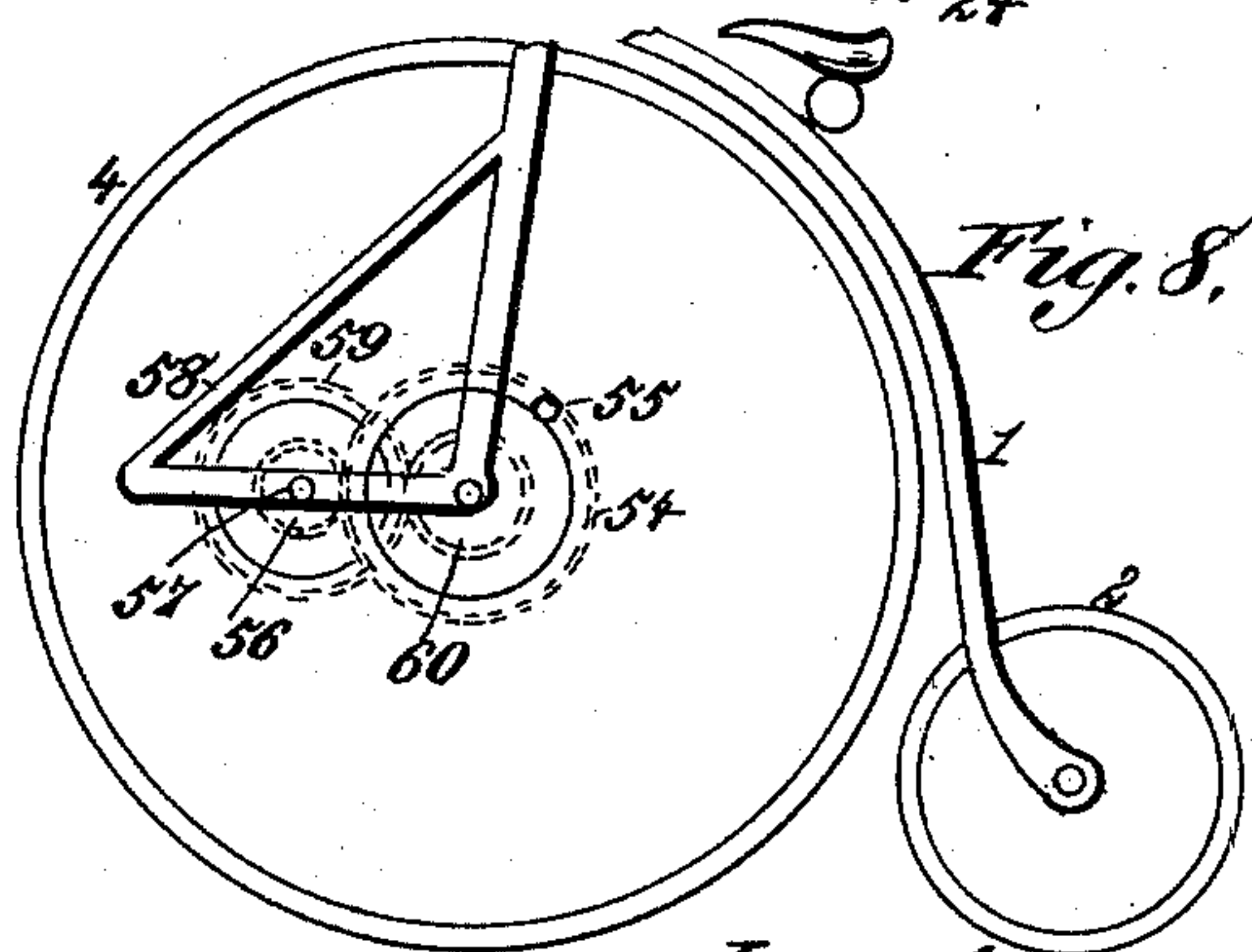
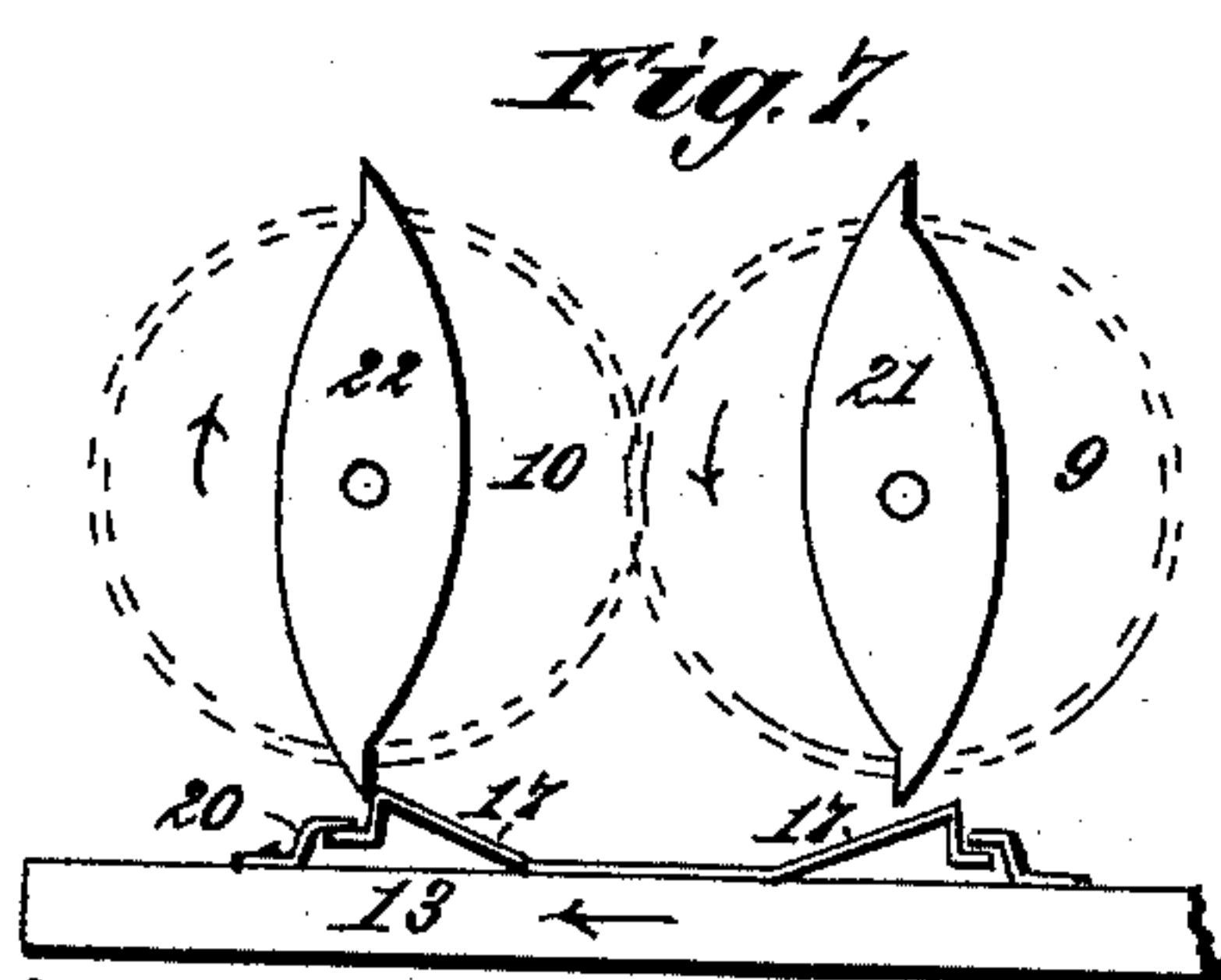
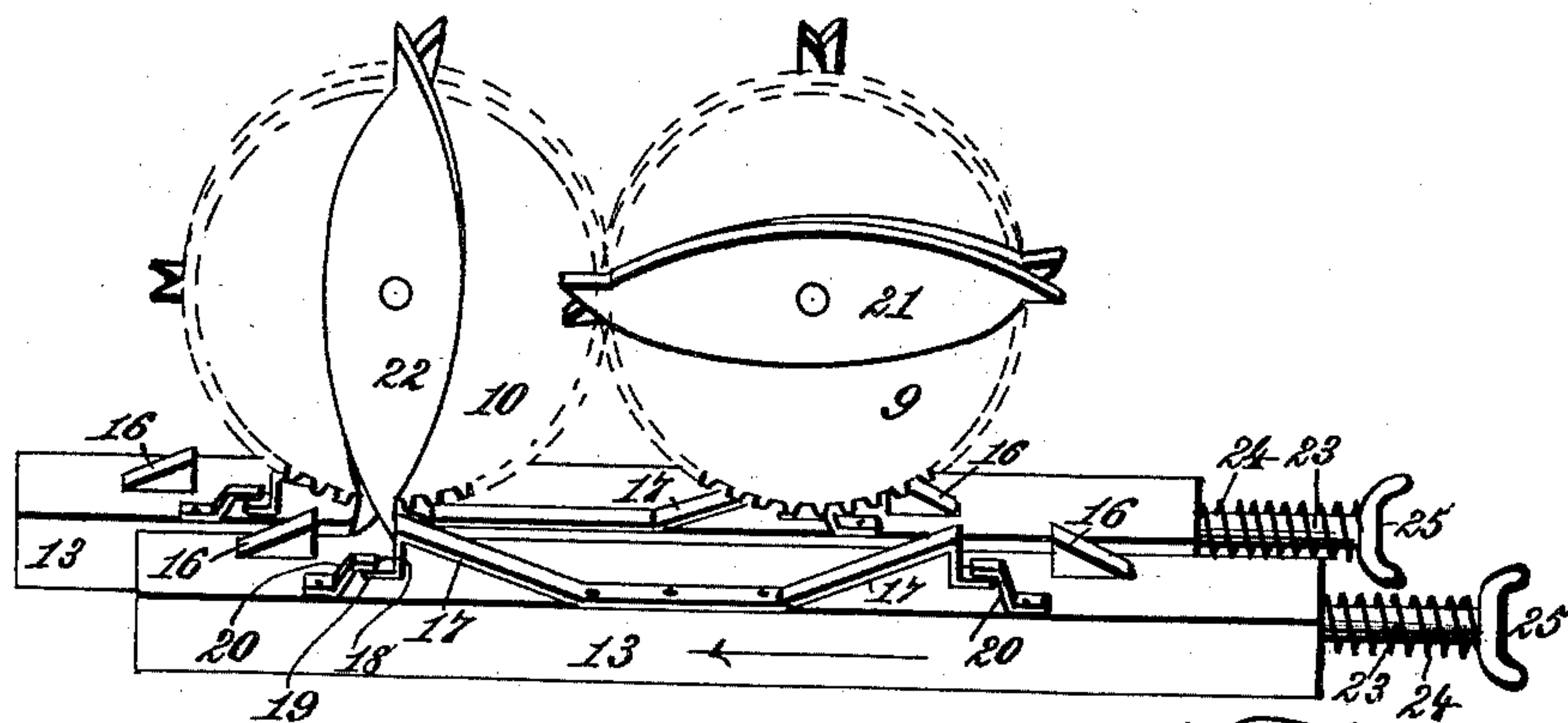
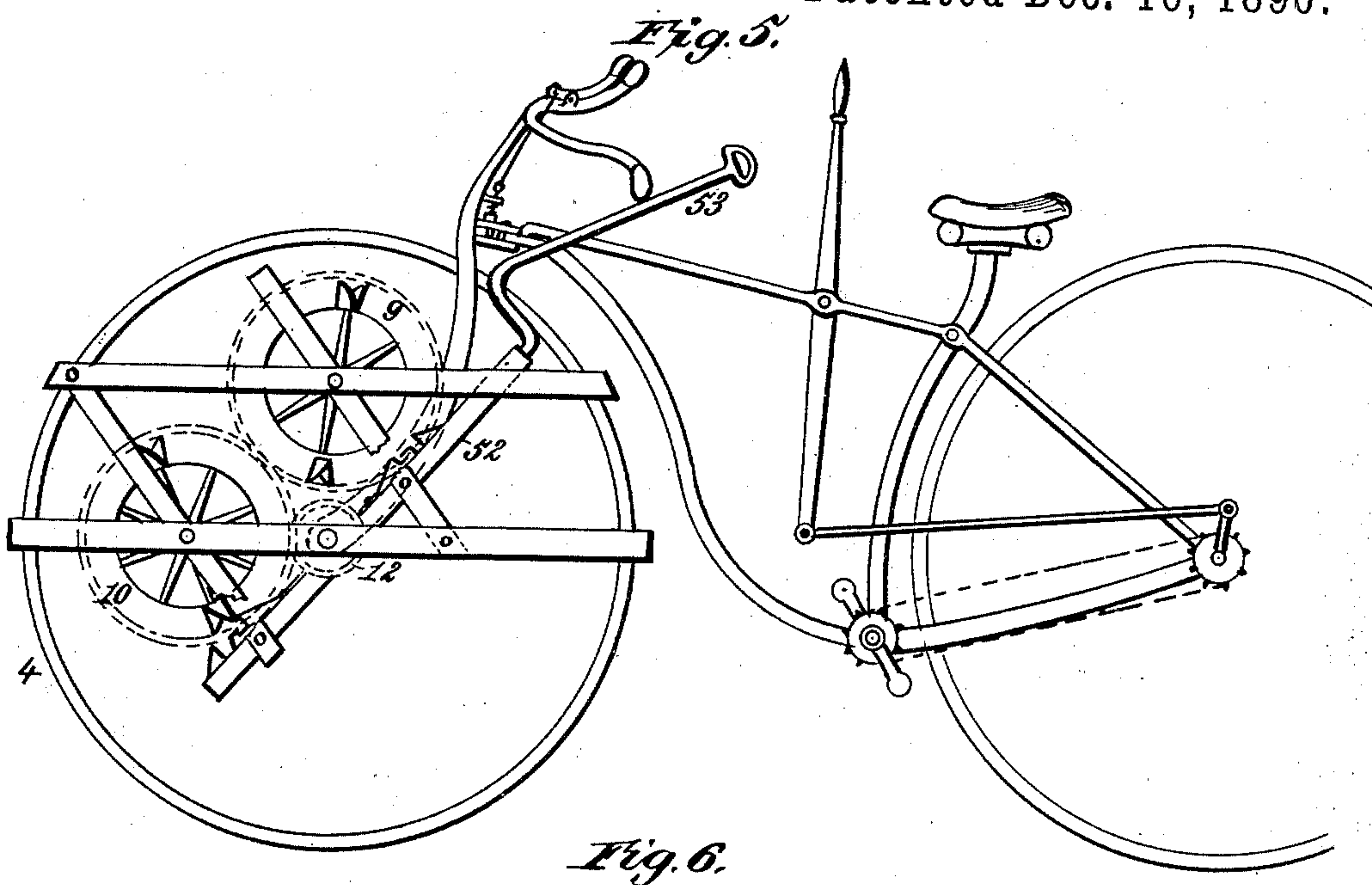
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2 Sheets—Sheet 2.

J. W. JAMES.  
VELOCIPEDÉ.

No. 442,980.

Patented Dec. 16, 1890.



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# UNITED STATES PATENT OFFICE.

JACK W. JAMES, OF CUBA, TENNESSEE.

## VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 442,980, dated December 16, 1890.

Application filed April 24, 1890. Serial No. 349,362. (No model.)

*To all whom it may concern:*

Be it known that I, JACK W. JAMES, a citizen of the United States, residing at Cuba, in the county of Shelby and State of Tennessee, have invented new and useful Improvements in Marine Cycles, of which the following is a specification.

My invention relates to certain improvements in bicycles, and one purpose thereof is to provide novel means whereby the driving-power and speed may be materially increased, while all dead-centers are avoided and a more uniform and smoother revolution is imparted to the power-shaft.

It is my purpose, also, to provide novel means whereby a propelling force may be communicated to the driving-wheel of either a land or a marine bicycle by either the feet or the hands separately or by both conjointly.

It is my further purpose to combine with a marine bicycle having the novel means of propulsion, hereinafter fully set forth, simple devices for operating the rudder by which the boat is steered.

The invention consists to these ends in the novel features of construction and new combinations of parts hereinafter fully set forth, and then defined in the claims following this specification.

To enable others skilled in the art to practice my said invention, I will proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a bicycle embodying my invention. Fig. 2 is a partial elevation showing a modified construction. Fig. 3 is a detail view showing a part of the backbone with the locking-disk mounted thereon. Fig. 4 is a detail front elevation showing the locking devices. Fig. 5 is a side elevation showing the application of my invention to a Safety machine. Fig. 6 is a detail perspective of the reciprocating foot-bars, each having a double series of lugs, from the continuous reciprocation of which continuous rotary movement is produced. Fig. 7 is a detail side elevation showing a modified construction of the parts shown in Fig. 6. Fig. 8 is a detail side elevation showing a modification in the manner of gearing the bicycle for higher speed.

In the said drawings, the reference-numeral

1 denotes the backbone of a bicycle, in the lower end of which is journaled the running-wheel or small wheel 2. At the upper end it is pivotally connected in the manner fully described hereinafter with the post or upright 3, in the ends of which the journals of the traction-wheel 4 have bearing.

Upon the post or standard 3 is mounted a frame consisting of horizontal parallel bars 5, arranged upon opposite sides of the upper portion of the wheel and connected at their ends by short transverse pieces or braces 6, the lower horizontal bars of the frame being in or nearly in the diametrical line of the traction-wheel 4. This frame is further braced by diagonally-inclined bars or braces 7, which unite with the bars 5. These bars, moreover, as well as the braces 7, have connection with semi-circumferential braces 8 concentric with the wheel 4. Each of the diagonal braces 7 forms one member of a frame having a second and parallel brace lying directly behind the brace or bar 7 upon the same side of the traction-wheel 4, but upon the opposite side of the bar 8.

Within the upper frame 7, and having journal bearing therein, is arranged a gear-wheel 9, and within the lower frame is journaled in like manner a gear-wheel 10, which meshes with the gear 9. The gear 10 meshes with a pinion 12, which is rigid with the shaft of the traction-wheel 4, and I will now show how motion is communicated by the rider to the traction-wheel.

It must be understood that upon each side of the traction-wheel 4 are arranged diagonal frames 7, and within each frame are arranged gears 9 and 10, meshing one with another, and the gear 10, as already set forth, meshing on each side of the wheel with the pinion 12 on the shaft of the wheel 4. Upon each side of the wheel is arranged a bar 13, having its axis in or nearly in the direct line of action of the feet of the rider sitting upon the saddle. These bars are each provided with two slots 14, which receive pins 15, mounted on the diagonal braces or frames 7, whereby longitudinal movement of said bars is permitted to the extent of the said slots 14. These bars 13 are reciprocated by the feet of the rider who sits upon the saddle, the upward movement of the bar being



effected in the manner hereinafter described. The construction which is now to be described is duplicated upon each side of the traction-wheel 4.

5 Upon each bar 13 I mount lugs 16, rigid upon the bar and having faces at right angles with said bar, said faces being adjacent one to the other and separated from each other by a suitable interval. Upon said bars,  
10 also, I arrange two independent lugs 17, each composed of a strap of elastic metal and having a shoulder 18 formed at right angles with the bar. This shoulder is formed by a sharp bend in the strap, terminating in the  
15 tang 19, which lies beneath a keeper 20, mounted on the bar. These spring-lugs 17 are arranged in a line parallel with the line of movement of the bar, as shown in Fig. 6, but in a different longitudinal line from the  
20 rigid lugs 16.

Upon each of the gears 9 and 10 are mounted duplex cams 21 and 22, rigid with the shafts of the said gears and having their ends projecting beyond the peripheries of the said  
25 gears, the engaging ends of said cams facing in opposite directions, as shown in Fig. 6. These cams are placed side by side and their oppositely-faced acting-surfaces act in different but parallel planes, whereby one of said  
30 cam-faces engages the rigid lugs 16 and the other the spring-lugs or cam-shoulders 17, as shown in Fig. 6.

In suitable recesses in the end of each bar 13 I mount a rod or bar 23, which enters the  
35 end of said bar 13, and is projected therefrom by springs 24, coiled upon the said rod and resting at one end against the end of the bar 13, while their other ends rest against the crutch or other support 25, which affords a  
40 rest for the foot of the rider. It will readily be seen that as the bar 13 is pushed by the foot of the rider in the direction of the arrow in Fig. 6 the spring-lug 17 on gear 9 will engage the cam on arm 21 and cause the partial  
45 revolution of the gear 9, which is communicated by the mesh of said gears to the similar gear 10, which revolves in an opposite direction, and is provided with duplex cams 22, similar to those upon the gear 9 and rigidly  
50 mounted on the shaft thereof, but arranged quartering therewith, whereby the succeeding action of the other bar 13 will, after the cam or gear 10 has snapped over the spring-lug 17, raise the bar 13 back to its original position  
55 in readiness for a second stroke.

When the slotted bars 26 are used in connection with the reciprocating bars 13, but diametrically separated therefrom, as shown in Fig. 1, the said bars 26 are equipped in all  
60 respects in the same manner with the bars 13—that is to say, with rigid lugs 16 and yielding or spring lugs 17, the latter being arranged in one longitudinal line and the rigid lugs in a different but parallel line, in the manner  
65 shown in Fig. 6. They are provided, also, with slots 27, which receive pins on the diagonal bars 7, by which the reciprocating bar is

supported. The reciprocation of each bar is effected by a hand-rod 28, bolted to the upper end of the bar 26, and having a loop 29, which  
70 lies within convenient reach of each hand. The bar 13 is provided with a foot-rest 30 (shown in Fig. 1) for a similar purpose. It should be understood that the construction described is duplicated upon both sides of  
75 the wheel.

The backbone 1 is provided with a disk-shaped extremity (shown in Fig. 3) having a central opening to receive the pivot-pin 31. Upon its periphery or throughout a portion  
80 of the same I form notches 32 at regular intervals, and this notched circular end is arranged horizontally between two parallel brackets 33, projecting rearward from the post or standard 3. In suitable openings formed  
85 in said parallel brackets is a spring-pressed pin 34, which engages one of the notches 32 and prevents the backbone from swinging or turning upon the pivot-pin 31. The locking-pin 34 is drawn by means of a lever 35, ful-  
90 crumed upon the steering-bar and connected with the pin by a cord or wire.

Upon the upper end of the post or standard 3 I mount laterally-projecting brackets 36, in which is arranged a spring-pressed pin  
95 or bolt 37, engaging with a socket 38 on the pivotal part of the standard, the pivotal joint being formed at a point between the supports for the pin and the socket therefor. The pin may be released in the manner already de-  
100 scribed or in any other suitable manner. By engaging the pin with its socket the steering-bar is rendered inoperative, while by releasing it the steering-bar may be operated without operating the traction-wheel. This con-  
105 struction is especially adapted for use with a marine bicycle, as hereinafter more fully described, the purpose being to permit continuous rotation of the traction-wheel in one and the same plane, and at the same time allow  
110 the rudder to be manipulated by the steering-bar without interfering with the revolution of the propeller-shaft, which is produced by the frictional contact between the rubber tire of the traction-wheel and the small grooved  
115 friction-gear 40, mounted in bearings in a frame 41, having brackets 42, which support the adjustable arms 43 of the frame 5 5, which are tapped into attachments 44 of the brackets 42. When thus mounted, the shaft of the  
120 gear 40 is geared in any suitable manner with the longitudinal shaft carrying the propeller. The rudder 45 may be mounted upon a rudder-post 46, having a cross-head 47, which is connected by cords 48 with the pivotally-  
125 mounted upper portion of the standard or post 3. These cords are passed from the cross-head 49 on the standard through an eye 50 on the backbone, and thence over a grooved pulley 51, whence they pass to the cross-head on  
130 the rudder-post.

In certain cases I may dispense with the duplication of parts shown in Fig. 1 and may use the single bars 52 illustrated in Fig. 5.



These bars are substantially similar to those already described in Fig. 1 and are operated by hand-holds 53.

In Fig. 8 of the drawings I have shown a novel manner of gearing the traction-wheel for speed. In this figure the numeral 54 denotes a gear loose on the wheel of the bicycle and having a foot-rest 55, said wheel being supported in the end of the central standard of the bicycle. The gear 54 meshes with a pinion 56, mounted upon a shaft 57, journaled in an angular frame 58, forming an extension of the standard 3. Upon the shaft of the said gear 56 is a larger gear 59, which meshes with a pinion 60, rigid with the traction-shaft of the large wheel. Thus it will be seen that it is an easy matter to transmit rotary movement from the gear 54 and obtain a very high rate of speed through the train of gearing set forth.

What I claim is—

1. In a bicycle, the combination, with a frame inclosing part of the traction-wheel, of gears journaled in said frame and meshing one with the other, bars reciprocating upon suitable supports carried by said frame and provided with rigid lugs, and spring-lugs arranged in parallel but separate lines upon each bar, substantially as described.

2. In a bicycle, the combination, with the standard, of the backbone having its end formed into a flattened disk and centrally pivoted between rearwardly-projecting brackets on the standard, of a spring-pressed pin lying in openings in said brackets and engaging with a series of notches in the periphery of the flattened disk, and a lever fulcrumed on the steering-bar and connected by a cord with the pin, substantially as described.

3. In a bicycle, the combination, with a traction-wheel, of a gear rigid on the shaft thereof, a frame inclosing part of said traction-wheel, two intermeshing gears, one of which meshes with the gear on the shaft of the traction-wheel, reciprocating bars arranged on each side of the traction-wheel and provided with two series of lugs, one series being rigid and the other elastic and each being arranged in different planes, and double cams rigidly mounted upon the two gears on each side of the traction-wheel, substantially as described.

4. In a gearing for bicycles, the combination, with a traction-wheel having a triangular supporting-frame, of gear-wheels loose upon the shaft of the traction-wheel and arranged upon each side thereof, and pinions driven by said gears and having gears intermeshing with pinions rigid on the shaft of the traction-wheel, substantially as described.

5. In a bicycle, the combination, with a post having a semicircular frame inclosing the upper half of said wheel, of a traction-wheel journaled in the lower end of said post and having upon each side of the traction-wheel a pinion rigid on the shaft of said wheel, a pair of similar intermeshing gears on each side of the traction-wheel, one of which meshes with the pinion upon the same side, duplex cams facing in opposite directions and having their opposite working-faces on diametrically-opposite sides on each gear, and one or more reciprocating bars mounted upon the semicircular frame and having longitudinal movement in the direction of the stroke of the feet of the rider, said bars being arranged one on each side of the traction-wheel and being each provided with two rigid cams facing toward each other and lying in the line of action of one set of said cams, and two yielding or spring cams arranged in the line of action of the other set of cams and facing in the opposite direction, substantially as described.

6. The combination, with the traction-wheel of a bicycle, of the frame carrying reciprocating bars having lugs, the two wheels geared together and one geared to the shaft of the traction-wheel, and each provided with duplex cams co-operating with the reciprocating bars to drive the traction-wheel, a front-wheel standard or post, a steering-bar pivotally engaged with the standard or post, and devices for rigidly locking the steering-bar to the standard or post, substantially as described.

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

JACK W. JAMES.

Witnesses:

FRANK HAWKINS,  
M. L. YORK.