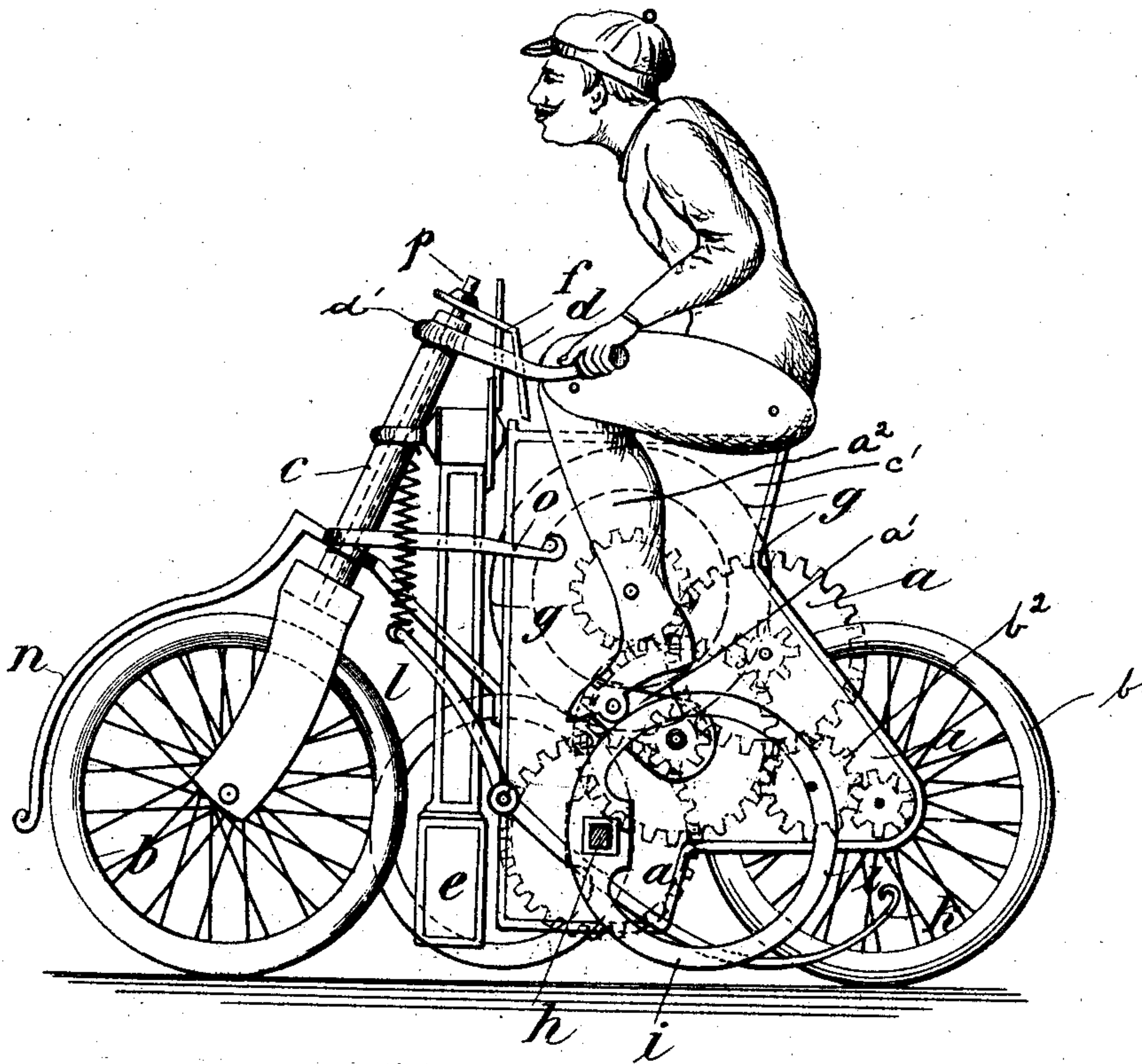


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3 SHEETS--SHEET 1.

*Fig. 1.*



Franklin D. Roosevelt  
to the President

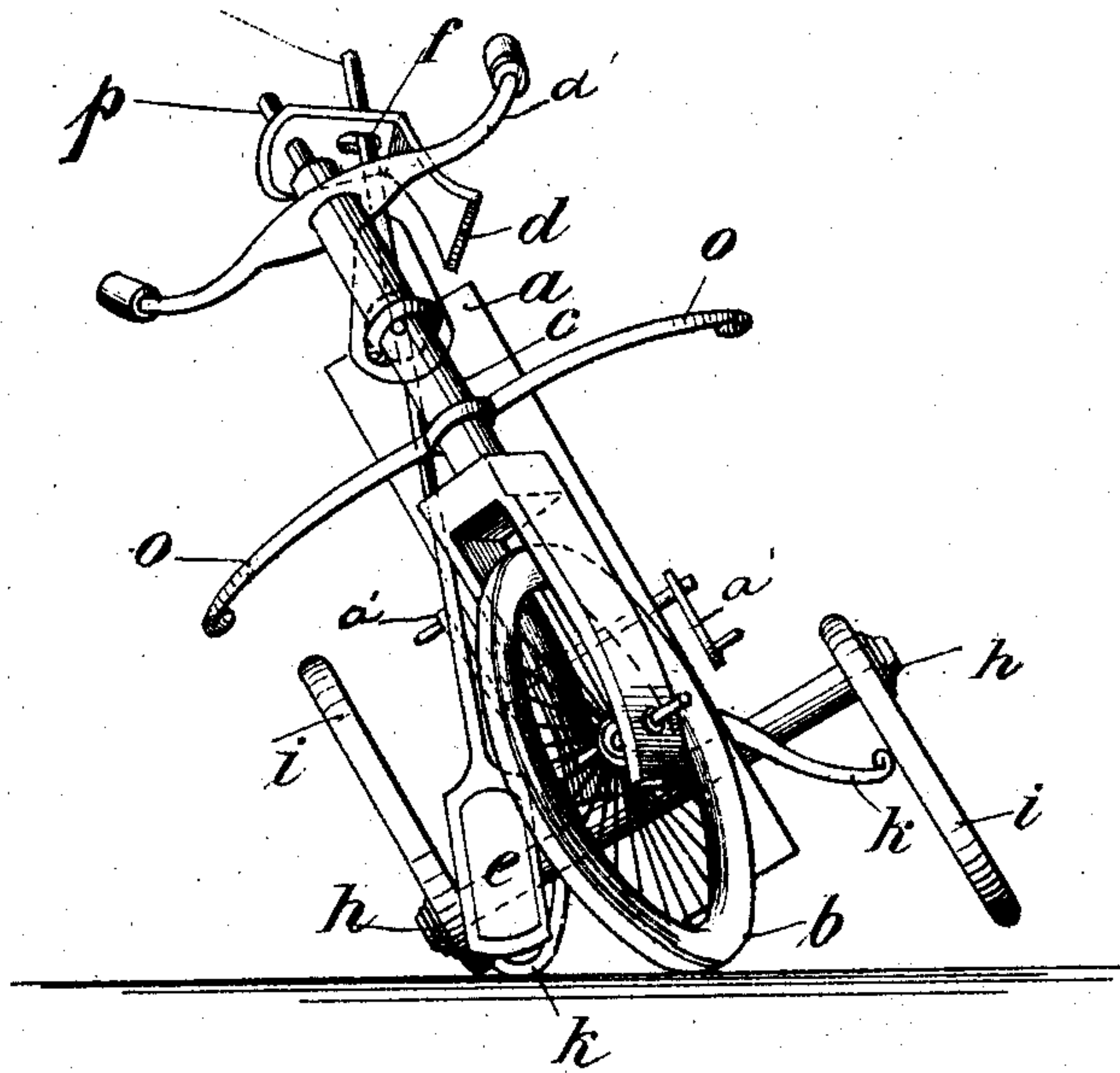
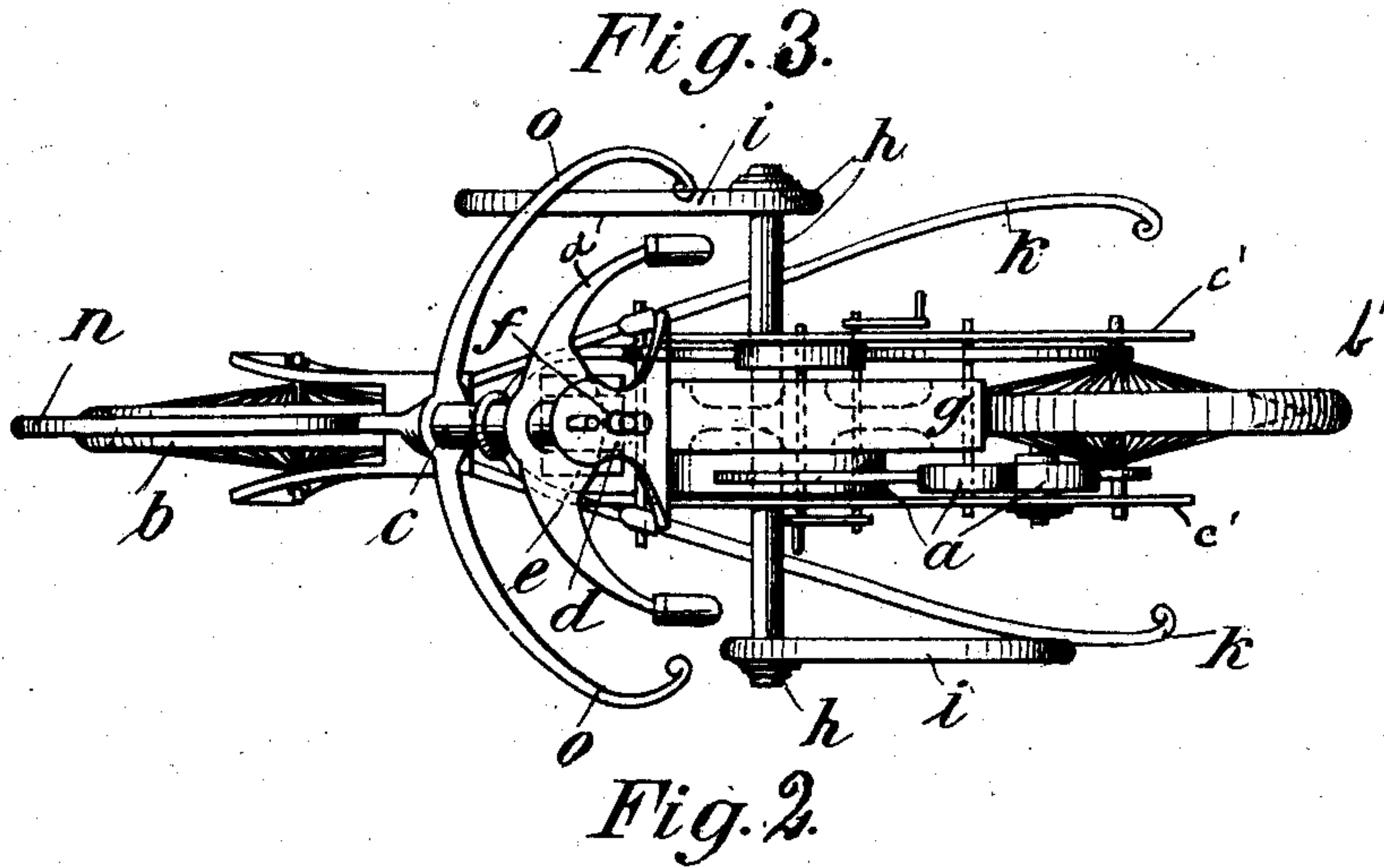
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MECHANICAL TOY.  
APPLICATION FILED APR. 4, 1907.

906,881.

Patented Dec. 15, 1908.

3 SHEETS—SHEET 2.



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Patented Dec. 15, 1908.

3 SHEETS—SHEET 3.

Fig: 4.

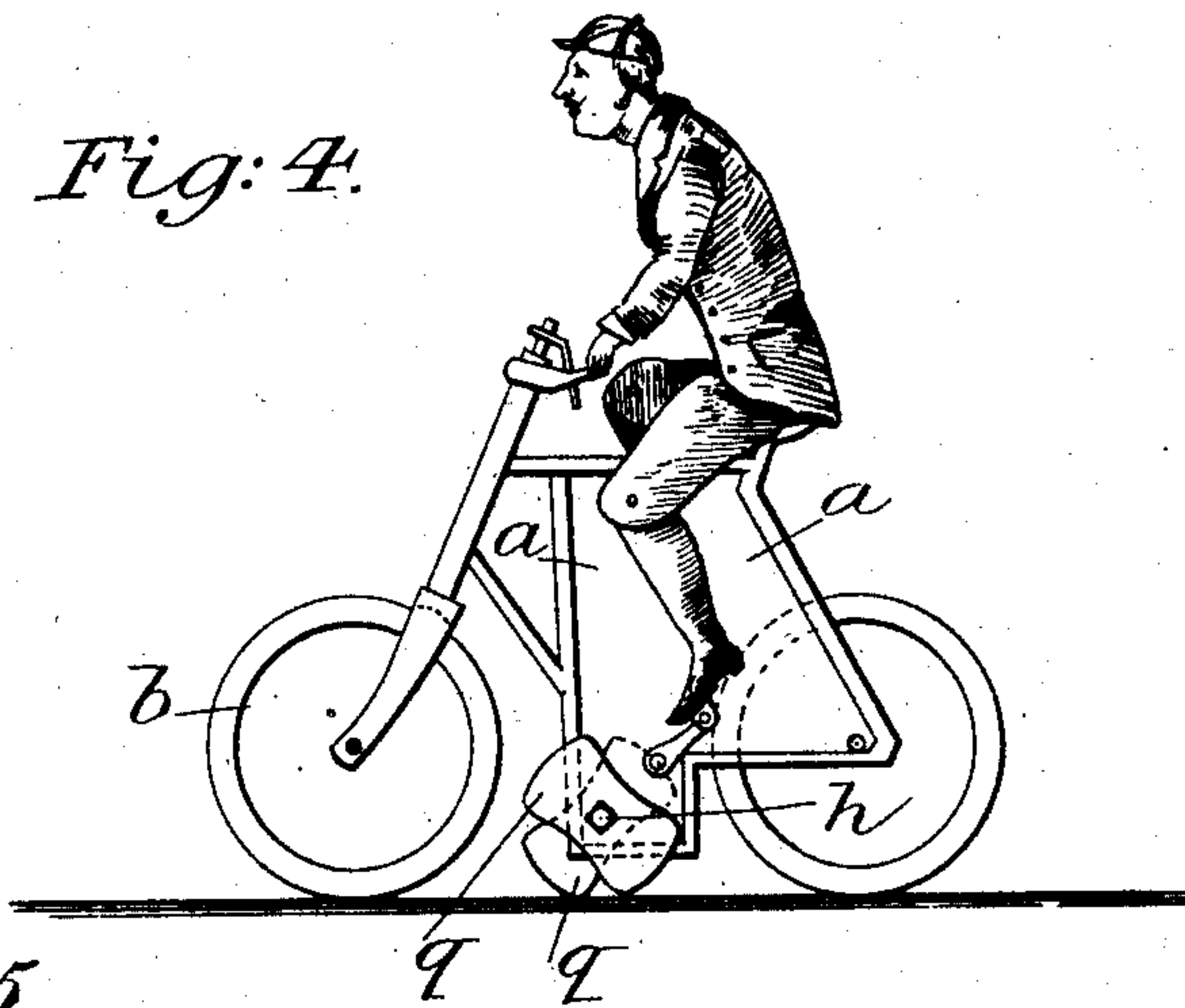


Fig: 5.

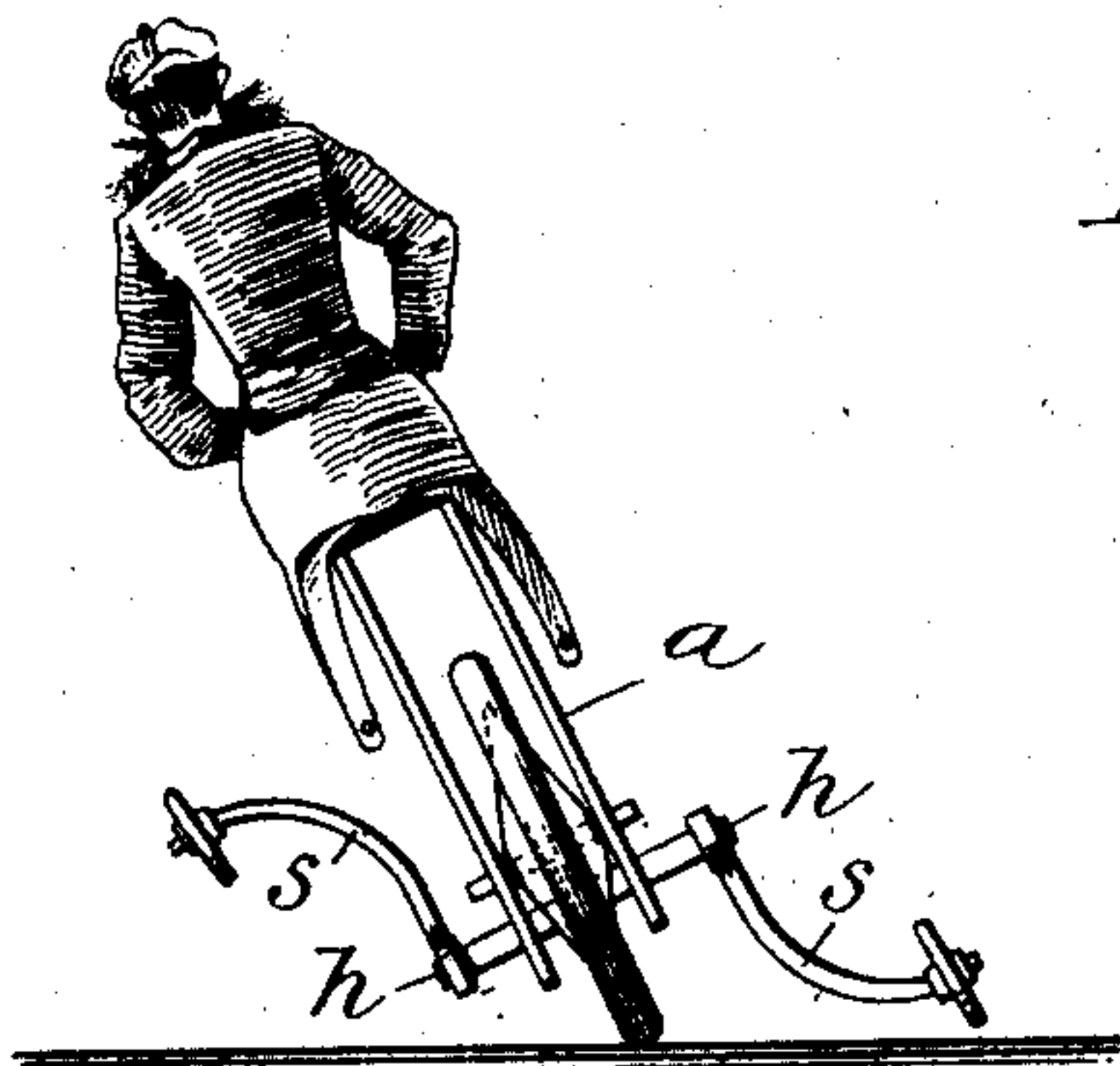


Fig: 6.

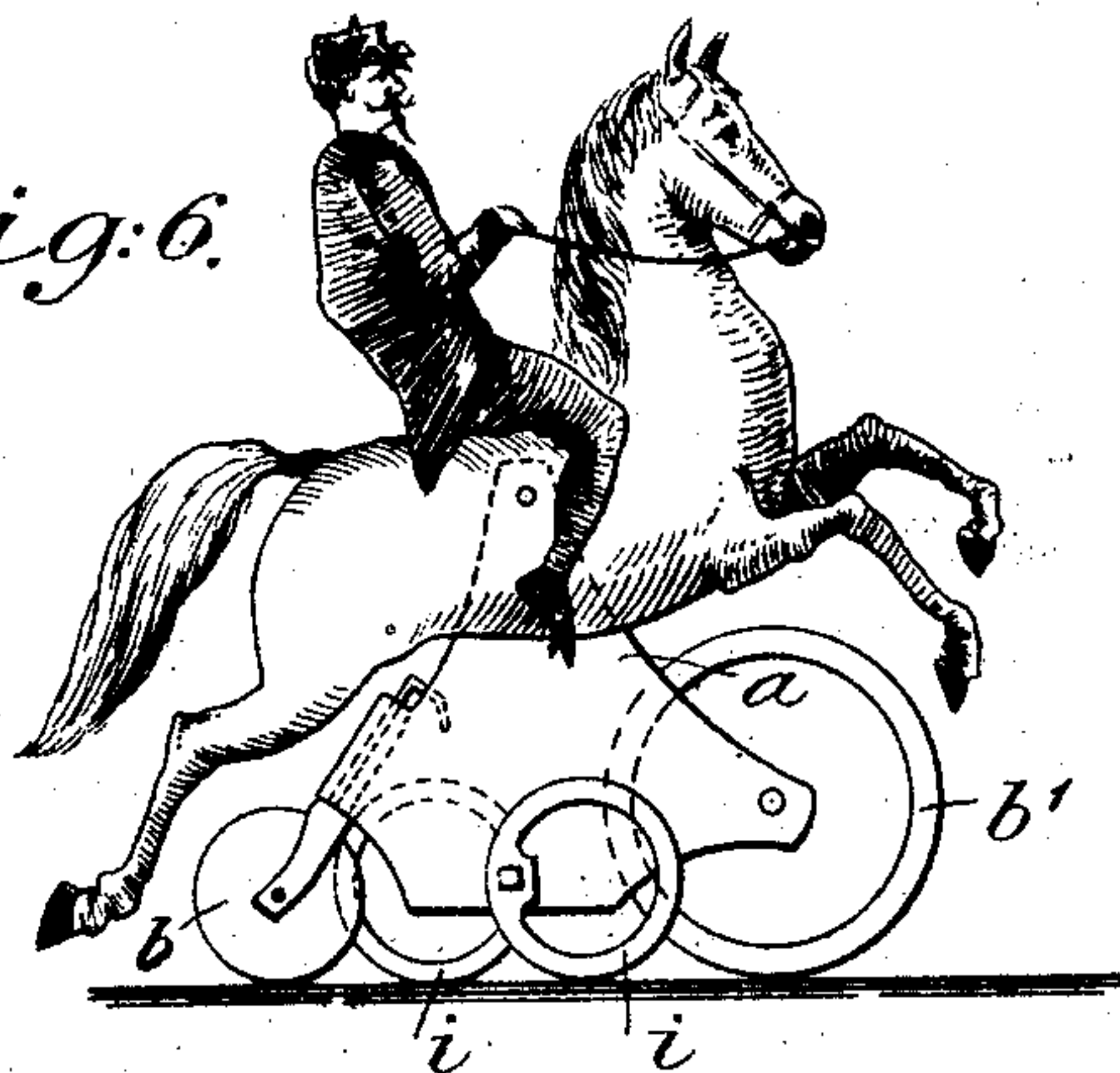
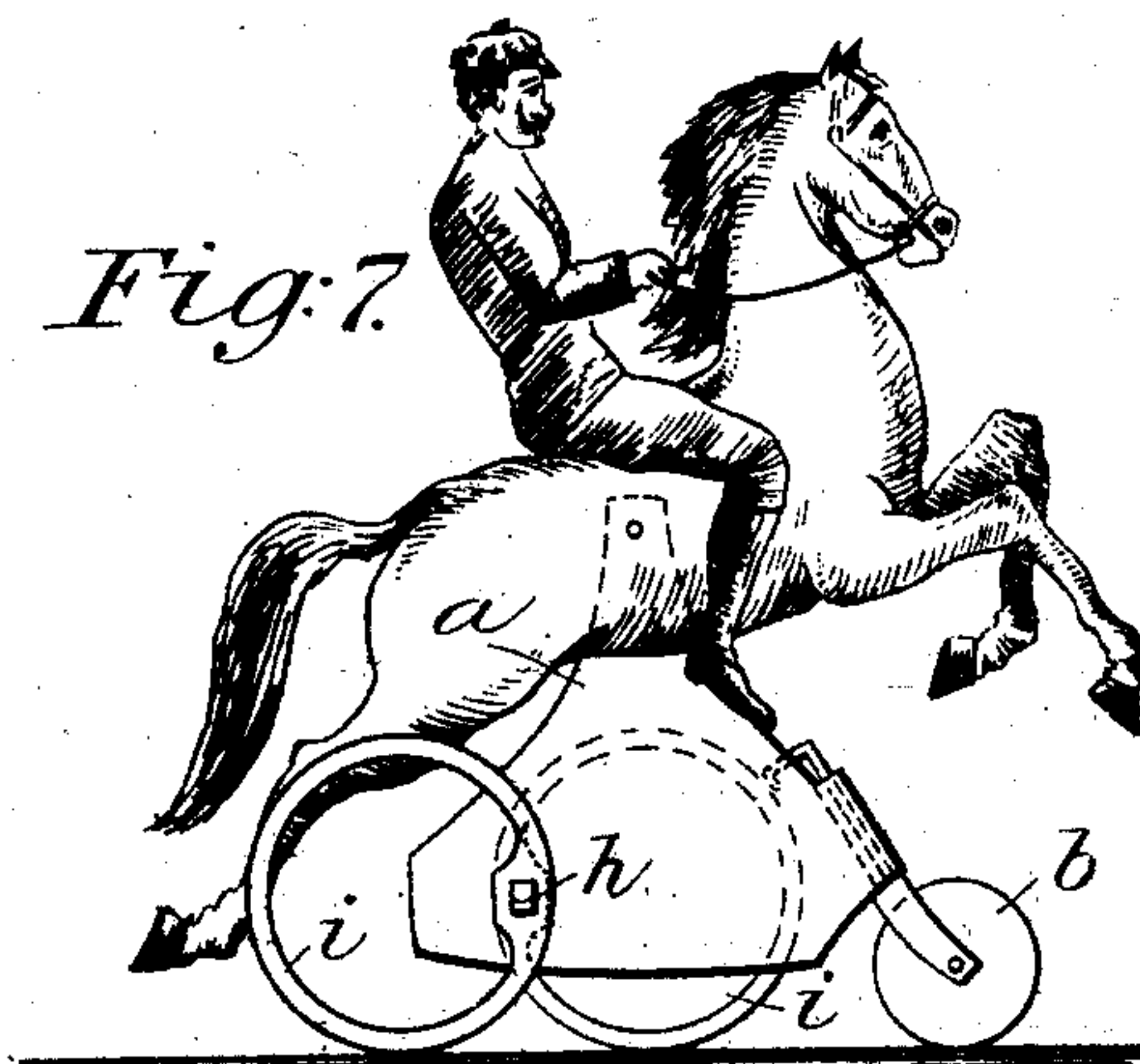


Fig: 7.



Attest:

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Inventor:

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Atty



# UNITED STATES PATENT OFFICE.

FRANZ HOFFMANN, OF DANZIG, GERMANY.

## MECHANICAL TOY.

No. 906,881.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed April 4, 1907. Serial No. 366,452.

*To all whom it may concern:*

Be it known that I, FRANZ HOFFMANN, a subject of the German Emperor, and resident of Danzig, Germany, have invented certain new and useful Improvements in Mechanical Toys, of which the following is a specification.

This invention relates to certain improvements in mechanical toys, and has for its object, in part, to provide a device of this character of a simple and comparatively inexpensive nature having a novel and improved arrangement of balancing means, whereby the device, when made to simulate a bicycle or other moving object, is caused to retain its erect position during operation, and in part, to provide for use in such toys, means of a novel and improved character for imparting irregular or swaying movement to the toy during operation thereof, in such a manner as to permit of closely simulating the swaying of a bicycle, the galloping of a horse, and the like.

The invention consists in certain novel features of the construction, and combinations and arrangements of the several parts of the improved mechanical toy, whereby certain important advantages are attained, and the device is rendered simpler, less expensive, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings which serve to illustrate my invention, Figure 1 is a side elevation showing an embodiment of the invention constructed in the form of a toy bicycle; Fig. 2 is a fragmentary front elevation of the device constructed as shown in Fig. 1; Fig. 3 is a fragmentary plan view showing a modified formation of the improved toy also made in the form of a toy bicycle; Fig. 4 is a side view showing another modified formation of toy bicycle embodying my improvements; Fig. 5 is a rear view showing still another modified formation of toy bicycle embodying the invention; Fig. 6 is a side elevation showing a further modified formation of the improved mechanical toy embodying my invention, wherein the device is made to simulate the appearance of a horse and rider, and Fig. 7 is a view similar to Fig. 6, but showing still another embodiment of my invention.

Referring first to Figs. 1 and 2, wherein I

have shown my improvements embodied in the form of a toy bicycle, although it will be evident that this is immaterial to my invention since the device to which my improvements are applied may be given any desirable form and appearance, the device is constructed with a frame, the forward part of which is provided with a rearwardly inclined bearing *c*, simulating the steering head of a bicycle, and serving for the passage of a rearwardly inclined and upwardly directed stem or shaft *p*, the lower end of which is provided with forks between which the front or steering wheel *b* is arranged to turn, while the upper end of said stem or shaft is extended above the bearing *c* and is provided with a rearwardly directed detent arm *d*, the rear extremity of which is bent or directed downwards, as clearly shown in Fig. 1, and is arranged for reverse pivotal movement in unison with said shaft or stem *p* and the steering wheel *b* wherewith the same is connected, between spaced stops *d*<sup>1</sup> *d*<sup>1</sup> which are herein shown as made to simulate the branches of a handle bar, the forward part of which is fixedly connected with the frame adjacent to the steering head *c*, while the rear extremities of said branches are connected with the arms of a figure simulating the rider of the bicycle.

As herein shown, the frame of the improved toy is formed from two plates *c*<sup>1</sup>, *c*<sup>1</sup>, spaced apart from each other in position to receive and house between them a driving mechanism *a* which may be of any preferred kind. As herein shown such driving mechanism is a spring actuated and comprises a clock train, the several arbors of which have their ends journaled in the spaced frame plates *c*<sup>1</sup>, *c*<sup>1</sup>, one of said arbors having its extremities extended outside the said frame plates and provided with cranks *a*<sup>1</sup>, simulating the pedals of a bicycle, and adapted for connection with the lower parts of the movable legs *a*<sup>2</sup> of the figure carried upon the toy, such legs being herein shown as formed from pivotally mounted and connected sections adapted for movement in unison with the cranks to simulate the movement of a bicycle rider.

*b*<sup>1</sup> represents the rear wheel of the toy bicycle, the same being shown in Figs. 1 and 2 as the driving wheel and being mounted to turn at the rear part of the frame of the device and driven by means of pinions *b*<sup>2</sup> from the actuating mechanism *a* above referred to, and serving, when so driven, to propel the device



over the surface whereon the toy rests in a manner similar to the rear driving wheel of an ordinary bicycle. By this arrangement of the parts, it will be seen that a certain extent of lateral movement of the front wheel is permitted during the operation of the improved mechanical toy, the upwardly directed stem or shaft *p* turning in the bearing *c*, and the detent arm *d* playing pivotally between the stops *c*<sup>1</sup>, *c*<sup>1</sup>, so that when the toy is driven over a substantially smooth supporting surface, such lateral or swaying movement will operate, in connection with the inertia of the moving toy, to balance the same and prevent it from toppling or being overturned.

*n* represents a curved guard herein shown as fixed upon the forward part of the frame and extended in front of and above the front or steering wheel *b* in such a manner as to afford an effective protection against bending of the stem or other injury to the front or steering wheel or adjacent parts from accidental contact with obstructions encountered in the course of the device, said steering wheel and the adjacent connected parts being necessarily of rather fragile construction in a device of this character, and *o*, *o* represent similar guards extended laterally beyond opposite sides of the forward part of the device and having rearwardly curved extremities adapted to operate in a similar manner to prevent injury to adjacent parts from contact with obstructions, or from overturning of the improved toy.

When the improved toy is driven at a suitable speed over a comparatively smooth and level supporting surface, the loosely mounted front or steering wheel is adapted for operation in a substantially automatic manner to shift the center of gravity from side to side sufficiently to permit the device to retain an upright position by its own inertia, but in certain cases, and more especially where the improved toy is designed to be operated upon uneven surfaces it may be desirable to employ auxiliary balancing means, and for this purpose I have shown the improved toy as provided with a balance wheel *g*, adapted to be driven at a suitable speed in order that it may operate by its inertia to assist in retaining the toy in an upright position during its movement, despite any ordinary irregularities of the supporting surface. As herein shown, this balance wheel is driven in unison with the actuating means *a*, but the employment of the actuating mechanism for this purpose is not material to the present invention. Where such a balance wheel is employed, it is desirable, however, that there be a driving connection between the same and the driving wheel of the toy, in order that the momentum of the balance wheel may be communicated to said driving wheel to assist in propelling the device over the supporting

surface. As a further means to assist in retaining the upright position of the improved toy during operation thereof I have shown a pendulum *e* pivoted at *e*<sup>1</sup> upon the frame adjacent to the steering head *e*, so that its lower weighted end may swing laterally or sidewise of the frame in unison with reverse tilting movements of the device. The upper end of this pendulum has a finger or projection *e*<sup>2</sup> extended above its pivot *e*<sup>1</sup> and engaged with an aperture *f* in the detent arm *d* of the stem or shaft *p* of the front or steering wheel. By this arrangement it will be seen that as the device tends to tip or tilt in one direction, the lower weighted end of the pendulum is caused to swing in that direction, as clearly shown in Fig. 2, whereby reverse movement is imparted to the upwardly extended finger or projection *e*<sup>2</sup> and thence to the detent arm *d* and stem or shaft *p*, whereby the front or steering wheel *b* is turned laterally in such a manner as to shift the center of gravity and prevent the device from toppling over. While this means actuated in unison with the tilting of the toy for controlling the lateral turning movement of the front wheel is desirable in some cases, I do not desire to be understood as limiting myself to the employment thereof, since it will be evident that the same may be dispensed with without departure from the principles and spirit of the invention. It may also be stated that this controlling means is not the equivalent of the balance wheel *g*, although they contribute to assist in retaining the erect position of the toy, for the pendulum operates in such a manner as to tend, when the front or steering wheel is deflected laterally by contact with an obstruction, to return said wheel to a central position in alinement with the rear or driving wheel, and thereby maintain the equilibrium of the device under conditions where the balance wheel would not be serviceable.

The present invention also contemplates the employment of means for compelling irregular or swaying movement of the improved mechanical toy during the operation thereof, and in Figs. 1 and 2 I have shown one embodiment of such means comprising rounded cam-like members *i*, *i*, eccentrically mounted upon the opposite ends of a shaft *h*, journaled at the lower part of the frame with its extremities projecting beyond the opposite sides of the toy, the said rounded cam-like members *i*, *i*, being reversely arranged with relation to each other and being adapted when the shaft *h* is turned, to be alternately pressed downwards upon the surface whereon the toy rests in such a manner as to compel lateral tilting movement of the device first in one direction, or toward one side, as shown in Fig. 2, and then in the reverse direction, or toward the opposite side.

In order to drive the shaft *h* I have herein shown in dotted lines, a gear connection ex-



tended from the same to the actuating mechanism *a* which serves to drive the rear wheel *b*<sup>1</sup>, and it will be seen by this arrangement of the parts that the cam-like members *i*, *i* are  
 5 caused to operate during the travel of the improved toy to compel the same to tilt first in one direction and then in the other, and since the pendulum *o* compels the front or steering wheel *b* to move in unison with the  
 10 tilting of the device, it will be evident that the improved toy will present a very entertaining series of evolutions during its operation.

Since the cam-like members *i*, *i* will compel a comparatively sudden and forcible lateral or sidewise movement of the device, which might, under some circumstances, suffice to overturn the improved toy, it may be desirable, in certain cases, to provide  
 20 means for limiting such lateral or sidewise movement and for this purpose I have shown in Figs 1 and 3, resilient guard members *k*, *k* pivoted at their forward parts at opposite sides of the frame and connected with a forwardly extended arm *l* connected with the  
 25 lower end of a spiral spring *l*<sup>1</sup>, the upper end of which is affixed to the frame adjacent to the steering head *c* in such a manner as to compel said spring to exert its tension to  
 30 force the rear ends of said guard members *k*, *k* downward with a resilient or yielding pressure. The rear ends of said guard members *k*, *k* are arranged to diverge as clearly shown in Fig. 3, and are normally supported, in the  
 35 upright position of the toy shown in Fig. 1, above and out of contact with the surface whereon the toy rests, but when the device is tilted by the operation of the cam-like members *i*, as above described, the resilient  
 40 or yielding guard members *k* are alternately moved downwards into contact with the supporting surface. It will therefore be evident that in the operation of the device, as the cam-like member *i* at one side of the frame  
 45 contacts with the supporting surface and tilts the toy toward its opposite side, the guard member *k* at such opposite side will be moved into yielding contact with the supporting surface in such a manner that the  
 50 spring tension will act to oppose the tilting of the toy and to terminate such tilting so soon as the member *i* then in operation shall have reached the limit of its downward stroke.

55 In Fig. 2 I have shown a slightly modified formation of such limiting means, wherein the guard members *k*<sup>1</sup>, *k*<sup>1</sup>, are not resilient, but are fixed in position at opposite sides of the frame, with their lower ends at such an  
 60 elevation as to be adapted to come into contact with the supporting surface only when the operating cam-like member *i* shall have completed its downward stroke.

65 In Fig. 4 I have illustrated a modified formation of the means for compelling irregular

movement of the improved toy, wherein such means comprises reversely set cams *q*, *q*, secured upon the opposite ends of the transverse shaft *h*. The chief distinction between this construction and that above described  
 70 is that the cams *q* are not rounded like the members *i*, but are flattened at opposite sides so as to afford duplicate bearing surfaces at their opposite ends adapted for contact with the supporting surface to compel  
 75 tilting or lateral movement of the toy during its travel.

In Fig. 5 I have shown another modified formation of the means for compelling irregular movement of the improved toy during  
 80 operation thereof, such means comprising reversely set levers *s*, *s*, secured at opposite ends of the shaft *h* and having anti-friction wheels at their extremities for contact with the supporting surface to produce the reverse  
 85 tilting movement of the device as above described.

In Fig. 6 I have shown an embodiment of my invention wherein the improved mechanical toy is made to simulate the appearance of  
 90 a horse and rider. Otherwise this form of the device is similar to that shown in Figs. 1 and 3, excepting that the driving wheel *b*<sup>1</sup> is arranged at the forward end of the frame and the rear wheel is made laterally movable  
 95 similarly to the front wheel *b* in the structure first described, so as to permit of turning laterally to shift the center of gravity and prevent overturning of the device. The pendulum *e* is also omitted in this form of  
 100 the device, and the balance wheel *g* may or may not be employed.

In Fig. 7 I have shown still another embodiment of my invention somewhat similar to that illustrated in Fig. 6, excepting that  
 105 the laterally movable balancing wheel *b* is arranged at the forward end of the frame, and the rear driving wheel is dispensed with, the cam-like members *i*, *i*, upon the opposite ends of the shaft *h* serving, by contact upon  
 110 the supporting surface, to propel the toy forwardly over the same as well as to impart irregular motion to the device during its propulsion.

From the above description of my improvements it will be seen that the mechanical toy constructed according to my invention is of an extremely simple and comparatively inexpensive nature, and is particularly well adapted for use by reason of the security  
 120 with which it may be propelled without liability of overturning, and also by reason of the close simulation of the movement of various objects afforded by it, and it will also be obvious from the above description that the  
 125 device is susceptible of considerable change without material departure from the principles and spirit of the invention and for this reason I do not desire to be understood as limiting myself to the precise form and ar- 130



rangement of the several parts herein set forth in carrying out my invention in practice.

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

1. A device of the character described having a frame, two wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, one of said wheels being pivotally mounted for movement upon an upwardly directed axis to permit lateral movement thereof, means actuated from tilting of the device and controlling the lateral movement of said wheel and mechanical means for actuating the other wheel.

2. A device of the character described having a frame, two wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, one of said wheels being pivotally mounted for movement upon an upwardly directed axis to permit lateral movement thereof, means actuated from tilting of the device and having operative connection with said wheel to impart lateral movement thereto, and mechanical means for actuating the other wheel.

3. A device of the character described having a frame, two wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, one of said wheels being pivotally mounted for movement upon an upwardly directed axis to permit lateral movement thereof, a pendulum mounted to swing upon the frame, means for actuating said wheel from said pendulum, and mechanical means for driving the other wheel.

4. A device of the character described having a frame, two wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, one of said wheels being pivotally mounted for movement upon an upwardly directed axis to permit lateral movement thereof, means to limit lateral movement of said wheel, means actuated from tilting of the device and having operative connection with said wheel to impart lateral movement thereto, and mechanical means for actuating the other wheel.

5. A device of the character described having a frame, a rotatable driving wheel centrally arranged upon the frame and adapted for contact with a supporting surface, mechanical means carried by the frame for actuating said driving wheel, an inclined upwardly directed shaft, a bearing on the frame wherein said shaft is arranged to turn, a rotatable wheel carried at the lower end of said shaft and also adapted for contact with a

supporting surface and capable of lateral movement in unison with the turning of said shaft, a detent extended from said shaft, and means actuated from tilting of the device and having operative connection with said detent for imparting turning movement to said shaft.

6. A device of the character described having a frame, two supporting wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, one of said wheels being pivotally mounted for movement upon a vertically directed axis to permit lateral movement thereof, and a rotatory balance wheel mounted upon the frame.

7. A device of the character described having a frame, two supporting wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, one of said wheels being pivotally mounted for movement upon a vertically directed axis to permit lateral movement thereof, a rotatory balance wheel mounted upon the frame, and spring-actuated mechanism for driving the balance wheel.

8. A device of the character described having a frame, two supporting wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, and a member capable of vertical movement upon one side of the frame and adapted, upon contact with the supporting surface, to impart tilting movement to the device.

9. A device of the character described having a wheeled frame a member capable of vertical movement and adapted, on contact with a supporting surface, to impart irregular movement to the wheeled frame, and means, carried by the frame, for actuating said member.

10. A device of the character described having a wheeled frame members capable of vertical movement at opposite sides of the frame and arranged for alternate contact with a supporting surface, to impart tilting movement to the device, and means for actuating the respective members.

11. A device of the character described having a wheeled frame a rotatively mounted eccentric member carried upon the frame and adapted for contact with a supporting surface to impart irregular movement to said frame, and means for actuating said eccentric member.

12. A device of the character described having a wheeled frame a shaft mounted to turn thereon and provided with a projection adapted, when the shaft is turned, to contact with a supporting surface for imparting irregular movement to said frame, and means for turning said shaft.

13. A device of the character described



having a frame, two supporting wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, balancing means, and parts directed beyond opposite sides of the frame and normally elevated above the supporting surface and adapted to contact therewith when the device is tilted.

14. A device of the character described having a frame, two supporting wheels alined with each other and centrally arranged upon the frame and adapted for rotatory movement in contact with a supporting surface, balancing means, and resilient parts directed beyond opposite sides of the frame and adapted for contact with a supporting surface when the device is tilted.

15. A device of the character described having a frame, two wheels alined with each other and centrally arranged upon the frame, means for driving the rear wheel, and a curved guard fixed upon the frame and forwardly extended around the forward and up-

per parts of the perimeter of the front wheel and adapted for contact with obstructions.

16. A device of the character described having a frame, two wheels alined with each other and centrally arranged upon the frame, driving means, and curved guards directed beyond opposite sides of the frame and adapted for contact with a supporting surface when the device is overturned to prevent injury to the parts.

17. A device of the character described having a wheeled frame a part mounted to turn on the frame and having an eccentric portion adapted for rolling contact upon a supporting surface to impart movement to the frame, and means for driving said part.

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

FRANZ HOFFMANN.

Witnesses:

OSKAR SCHULTZ,

ERNST RUMMLER.