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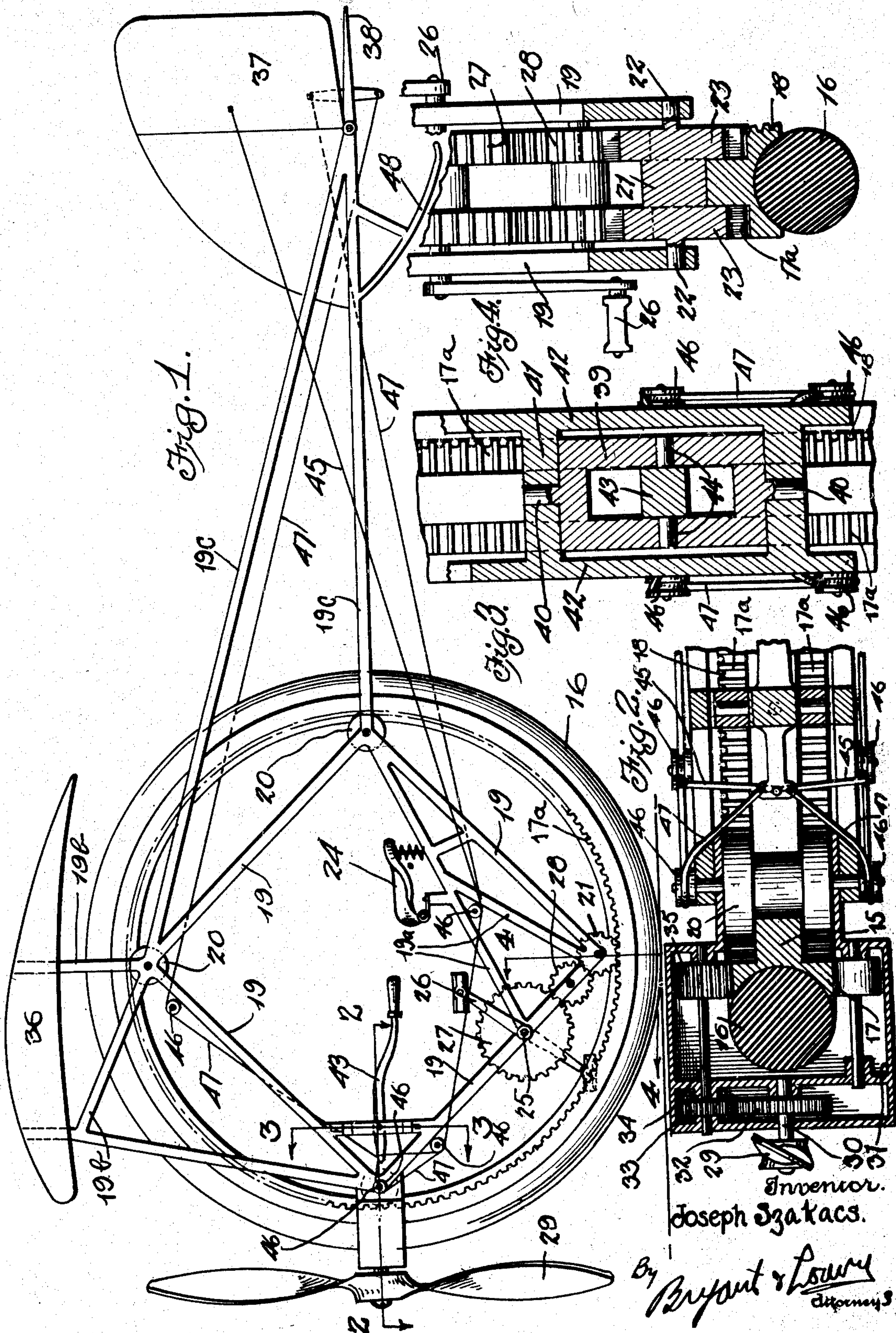
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1,777,941

UNICYCLE GLIDER

Filed Jan. 12, 1929

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

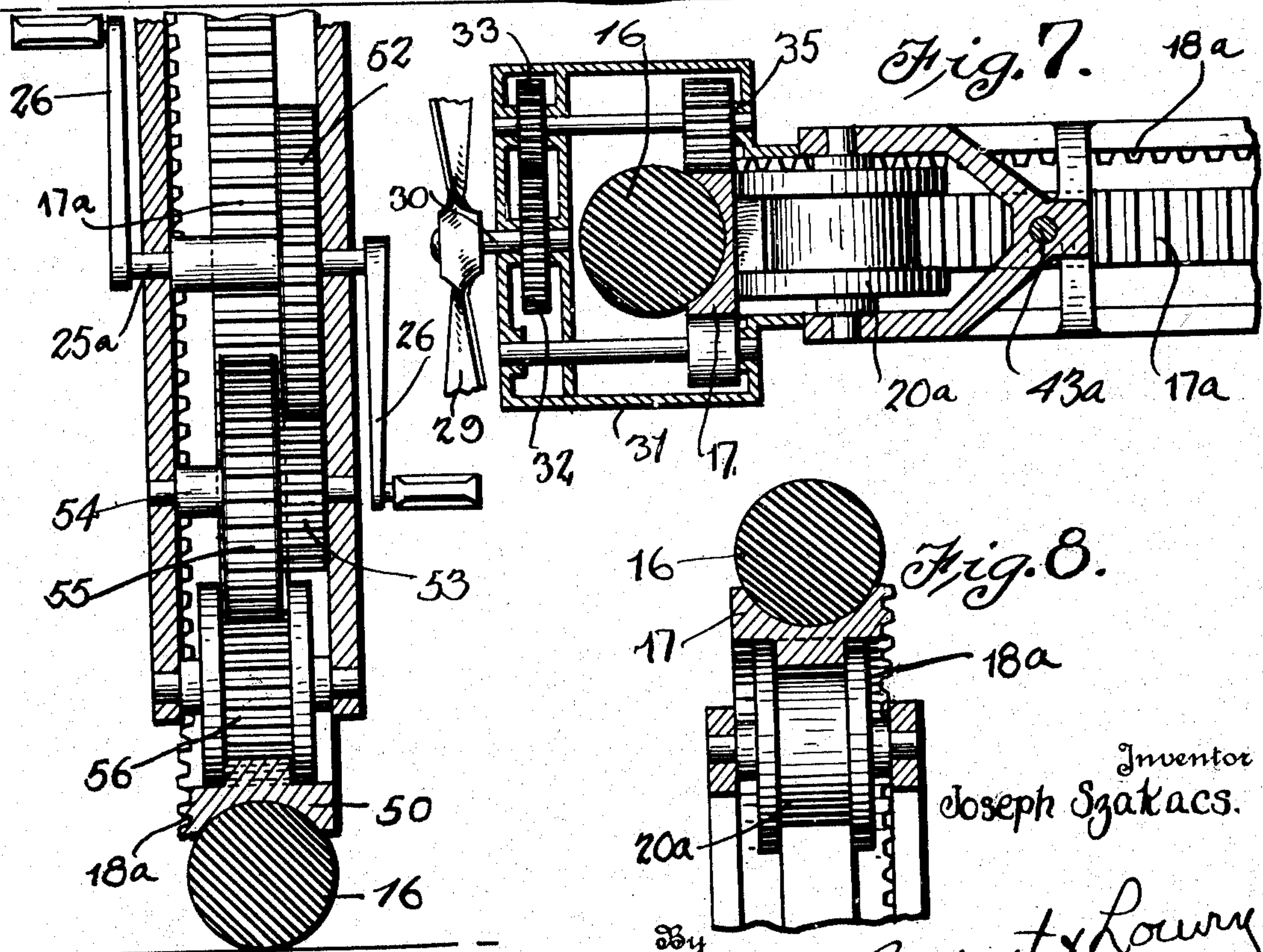
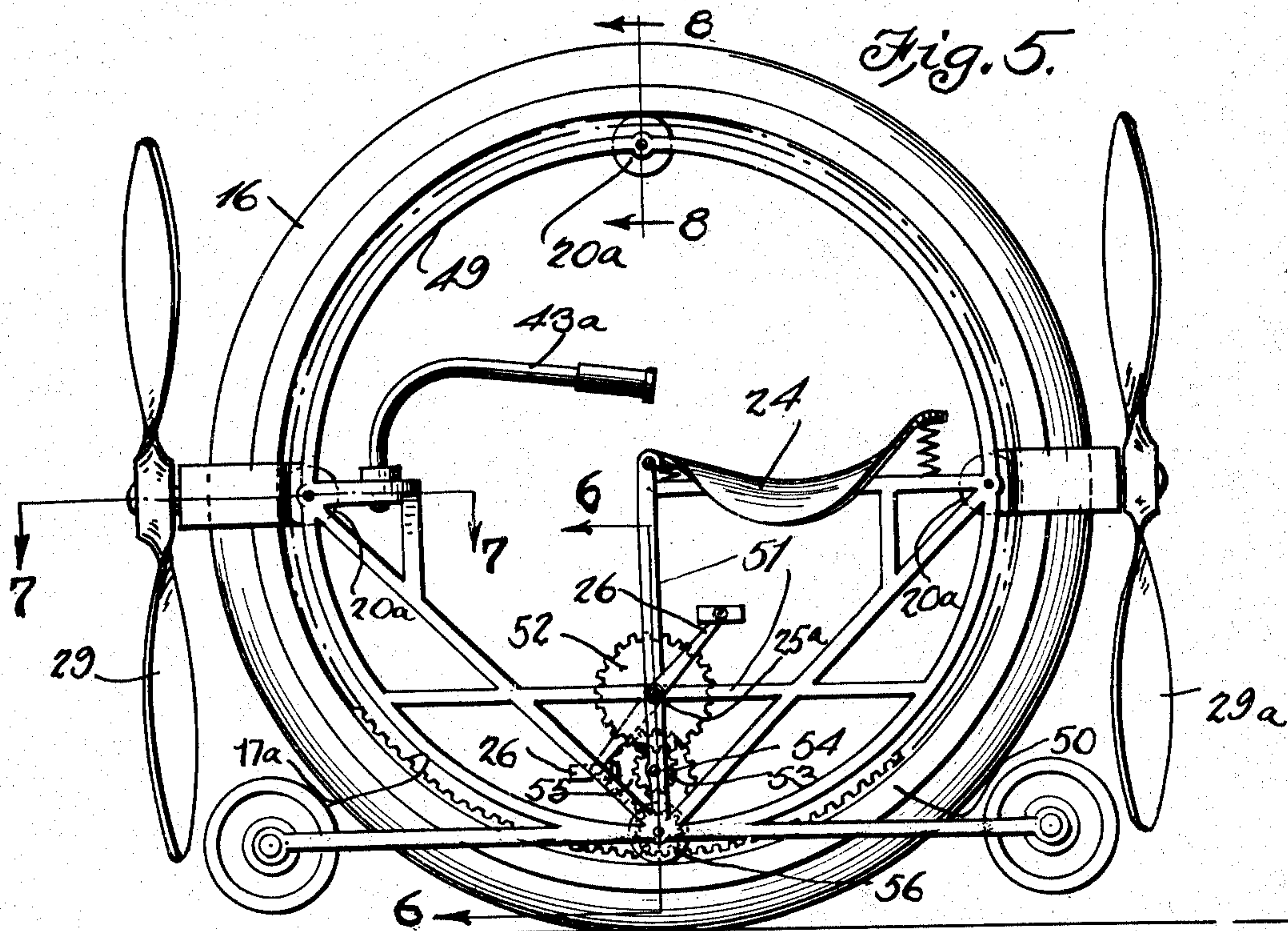
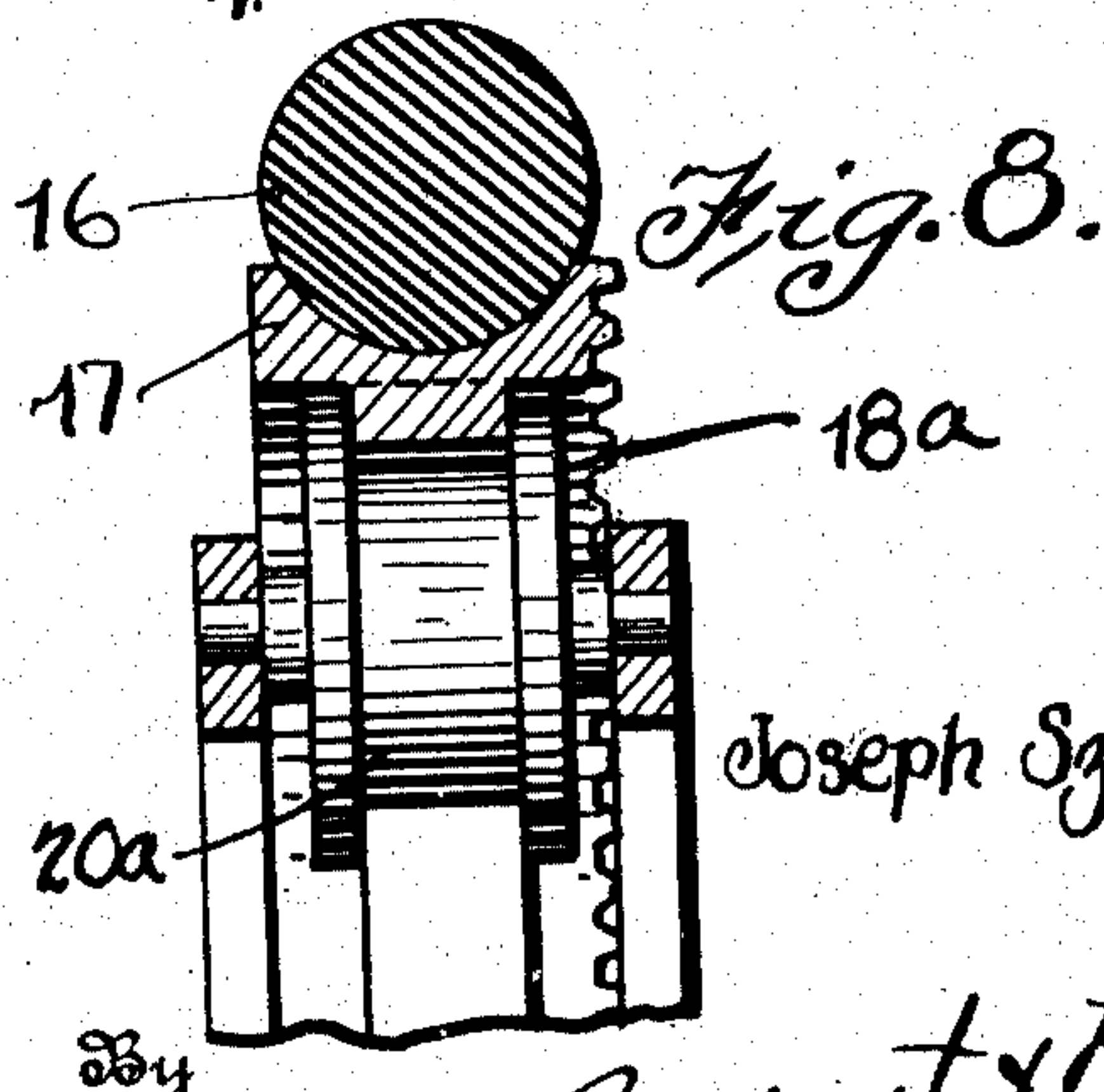


Fig. 6.



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UNICYCLE GLIDER

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This invention relates to certain new and useful improvements in unicycle gliders and has for its primary object to provide a single wheel or unicycle with a seat carrying frame confined therein having driving means for the wheel and further equipped with a forwardly positioned propeller blade an upper plane and a rearwardly positioned rudder and elevator.

10 A further object of the invention is to provide a unicycle having forwardly and rearwardly positioned propeller blades operated upon rotation of the single wheel.

15 A still further object of this invention is to provide a unicycle glider in the form of a toy including a single manually propelled wheel with a seat carrying frame confined therein provided with a rear wheel support, a forwardly positioned propeller to increase 20 the speed of travel and an overhead wing.

With the above and other objects in view that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and 25 arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings:—

30 Figure 1 is a side elevational view of a unicycle glider constructed in accordance with the present invention;

35 Figure 2 is a horizontal detail sectional view taken on line 2—2 of Figure 1, showing the pedal operated gear train engaged with the rack teeth upon the single ground wheel and the driving gear connections between the ground wheel and forwardly positioned propeller;

40 Figure 3 is a vertical detail sectional view taken on line 3—3 of Figure 1 showing the universal mounting for the handle bars that control the rudder and elevator of the glider;

45 Figure 4 is a vertical detail sectional view taken on line 4—4 of Figure 1 showing the pedal operated gear train engaged with the single ground wheel;

50 Figure 5 is a side elevational view of another form of invention showing a unicycle equipped with front and rear propellers;

Figure 6 is a vertical detail sectional view taken on line 6—6 of Figure 5;

Figure 7 is a detail sectional view taken on line 7—7 of Figure 5;

Figure 8 is a vertical detail sectional view 55 taken on line 8—8 of Figure 5;

Figure 9 is a side elevational view of another form of the invention illustrated as a toy;

Figure 10 is a horizontal detail sectional 60 view taken on line 10—10 of Figure 9;

Figure 11 is a vertical detail sectional view taken on line 11—11 of Figure 9; and

Figure 12 is a vertical detail sectional view 65 taken on line 12—12 of Figure 9.

Referring more in detail to the accompanying drawings and particularly to Figures 1 to 4, there is illustrated a unicycle glider comprising a circular wheel rim 15 peripherally 70 grooved to receive the cushion tire 16, the rim 15 carrying side flanges 17 provided with gear teeth 17^a upon their inner faces, while one of said flanges is provided with gear teeth 18 upon its outer side as shown in Figures 2 to 4. 75

A frame is confined within the rim 15 of the wheel and being of substantially rectangular formation includes four side bars 19, disposed as illustrated in Figure 1 with the corners of the frame located at the upper and 80 lower, and the front and rear sides of said wheel. The front and rear, and the upper corners of the frame 19 carrying flanged rollers 20 forming guide mountings for the frame 19 upon the rim 15 as shown in Figure 2. The 85 lower corner of the frame 19 has a channeled or centrally grooved gear 21 journaled therein as at 22 with the side gear portions 23 thereof meshing with the gear teeth 17^a upon the two end flanges 17, this construction being 90 clearly shown in Figure 4. The intermediate portion of the gear 21 rides upon the rim 15 while the side portions 23 mesh with the rim teeth 17^a. The frame 19 constantly assumes the position shown in Figure 1, while the 95 wheel comprising the rim 15 and tire 16 rolls, the wheel being guided in its movement by the flanged rollers 20 and flanged gear wheel 21.

The driving or operating mechanism 21 100

which rotates the wheel is mounted upon one of the frame bars 19 while the frame bar 19^a supports the operator's seat 24. The operating mechanism includes a shaft 25 journaled in the lower forward frame bar 19 having crank pedals 26 upon opposite ends thereof and an intermediate driving gear 27, the driving gear 27 being arranged in pairs and meshing with intermediate pinions 28 upon the same frame bar 19 that in turn meshes with the side gear portions 23 of the gear wheels 21. Rotation of the gears 27 is communicated to the gear 21 for operating the ground wheel. A propeller blade 29 is positioned forwardly of the ground wheel and is geared thereto for operation during rolling movement of the ground wheel. The propeller blade 29 is carried by the shaft 30 that is journaled in the housing 31 carried by the forward corner of the frame 19 and through which housing the ground wheel moves. A gear wheel 32 is fixed on the shaft 30 within the housing 31 and meshes with the side gear 33 upon the shaft 34 that is journaled in said housing. A gear wheel 35 fixed to the rear end of the shaft 34 meshes with the side teeth 18 upon the adjacent rim flange 17, the propeller shaft 30 being operated during rolling movement of the ground wheel. A shaft 34^a journaled in the opposite side of the casing carries a guide roller engaged with the adjacent rim flange 17 coacting with the gear 35 for centering the travel of the wheel through the housing. Frame bars 19^b extend upwardly from the frame 19 and carry a transverse plane 36 while rearwardly directed frame 19^b carried by the frame 19 carry at their rear end a horizontally swinging rudder 37 and a vertically swinging elevator 38. The controlling means for the rudder 37 and elevator 38 comprises a universal joint mounting including a rectangular frame 39 journaled at its upper and lower ends as at 40 in cross bars 41 extending between side bars 42 connecting the forwardly positioned upper and lower frame bars 19 as shown in Figure 3, while a lever 43 extending through the frame 39 is rotatably supported therein upon horizontal pivot pins 44. A pair of cords 45 extending forwardly from each side of the rudder 37 pass over guide rollers 36 on the frame 19 for attachment to the forward end of the lever 43. When the lever 43 is horizontally shifted upon the frame bearings 40, the cords 45 are operated for horizontally shifting the rudder 37. Cords 47 extending forwardly from the elevator 38 pass over guide pulleys on the frame 19 and are also attached to the forward end of the lever 43, so that when said lever is vertically shifted upon the pin bearings 44, the cords 47 are moved for raising and lowering the elevator 38.

From the above detailed description of the invention, it is believed that the construction and operation thereof will at once be apparent,

it being noted that the operator upon the seat 24 causes rotation of the ground wheel by operating the gear train while rolling movement of the ground wheel operates the propeller shaft 30. When sufficient speed is obtained, the plane 36 has a tendency to lift the wheel from the ground for a grounding action, the device being steered by the rudder 37 and elevator 38. While at rest, the rear end of the frame bars 19^b rest upon the skid 48 which is raised from the ground line during movement.

In the form of the invention shown in Figures 5 to 8, a circular frame 49 is confined within the ground wheel and supports the gear train and operator's seat. The gear train and connection with the ground wheel rim 50 includes a pedal crank shaft 25^a journaled in the frame bars 51 and having a gear 52 fixed thereto that meshes with a pinion 53 upon the shaft 54, said shaft 54 carrying a larger gear 55 meshing with the drive pinion 56 that in turn meshes with the internal gear teeth arranged centrally of the wheel rim. The circular frame 49 is confined within the wheel by the flanged guide rollers 20^a enclosing the intermediate geared rib on the wheel rim 50. A handle bar 43^a is carried by the frame 51. In this form of the invention, the plane or wing 36 shown in Figure 1 together with the rudder and elevator are eliminated while a propeller blade is positioned both forwardly and rearwardly of the ground wheel. The driving mechanism for the two propeller blades 29^a is of the same construction illustrated in Figures 1 to 4, power for the propeller shaft 30 being derived from the gear train and side teeth 18^a on the wheel rim 50. The frame bars 49^a carrying wheels 49^b limit backward and forward tilting movements.

Both forms of the invention as illustrated in Figures 1 to 8 are intended for commercial purposes, while in the form of the invention shown in Figures 9 to 12, it is intended to construct such a device for use as a toy. Certain features of both forms of the invention are embodied in the type illustrated in Figures 9 to 12, and in addition thereto there is provided a rear ground wheel 57 carried by frame bars 58 projecting rearwardly from the circular frame 49^a confined within the ground wheel. The gear train 59 meshes with rack teeth on the rim of the ground wheel, while the housing 31 at the forward side of the ground wheel contains the operating mechanism for the propeller blade 49. A relatively small plane or wing 36^a is supported on frame bars above the ground wheel, while an imitation rudder 37^a projects rearwardly from said frame. A seat 24 is carried by the frame and also a handle bar 43^a while the lower pinion of the gear train 59 engages the centrally disposed teeth upon the ground wheel rim 50^a, said rim having gear teeth

formed upon one side thereof as at 18^b for operating the gear train in the housing 31. If desired, a motor drive may be substituted for the gear train and pedal mechanism, while the wings 36 and 36^a may be equipped with ailerons to aid in elevating the machine and for a steering adjunct.

While there are herein shown and described the preferred embodiments of the present invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

I claim:—

1. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, and a forwardly positioned propeller driven by the wheel.

2. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, guide rollers for the wheel carried by the frame, and the wheel driving means including an annular series of teeth on the wheel and a pinion on the frame.

3. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, and a gear train connection between the propeller shaft and wheel.

4. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, guide rollers for the wheel carried by the frame, the wheel driving means including an annular series of teeth on the wheel and a pinion on the frame, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, and a gear train connection between the propeller shaft and wheel.

5. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, a gear train connection between the propeller shaft and wheel, including a gear train in the housing, and an annular series of gear teeth on one of the wheels, and a friction guide roller in the housing for the other side of the wheel.

6. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, guide rollers for the wheel carried by the frame, the wheel driving means including an annular series of teeth on the wheel and a pinion on the frame, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, a gear train connection between the propeller shaft and wheel, including a gear train in the housing, and an annular series of gear teeth on one of the wheels, and a friction guide roller in the housing for the other side of the wheel.

7. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, a gear train connection between the propeller shaft and wheel, a pedal operated gear train driving the pinion, and an operator's seat on the frame.

8. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, guide rollers for the wheel carried by the frame, the wheel driving means including an annular series of teeth on the wheel and a pinion on the frame, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, a gear train connection between the propeller shaft and wheel, a pedal operated gear train driving the pinion, and an operator's seat on the frame.

9. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a forwardly positioned propeller driven by the wheel, a housing on the frame through which the wheel travels, a shaft for the propeller journaled in the housing, a gear train connection between the propeller shaft and wheel, including a gear train in the housing, and an annular series of gear teeth on one of the wheels, a friction guide roller in the housing for the other side of the wheel, an overhead wing carried by the frame, a rearwardly positioned rudder and elevator, and a control lever on the frame having cord connections with the rudder and elevator.

10. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, driving means for the wheel carried by the frame, a

forwardly positioned propeller driven by the wheel, guide rollers for the wheel carried by the frame, the wheel driving means including an annular series of teeth on the wheel and a pinion on the frame, a housing on the frame through which the wheel travels, a shaft of the propeller journaled in the housing, a gear train connection between the propeller shaft and wheel, including a gear train in the housing, and an annular series of gear teeth on one of the wheels, a friction guide roller in the housing for the other side of the wheel, an overhead wing carried by the frame, a rearwardly positioned rudder and elevator, and a control lever on the frame having cord connections with the rudder and elevator.

11. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, a manually operable gear train on the frame associated with an annular series of gear teeth on the wheel, and propeller blades and gear connections with the wheel.

12. A device of the class described comprising a wheel, a frame confined within the wheel about which the wheel rotates, a manually operable gear train on the frame associated with an annular series of gear teeth on the wheel, a propeller blade driven by the wheel, an overhead wing carried by the frame and a rear ground wheel and vertical rudder on the frame.

In testimony whereof I affix my signature.
JOSEPH SZAKACS.

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