Aug. 7, 1956 E. TRUTER 2,757,631

FLOATING ATTACHMENT FOR BICYCLES

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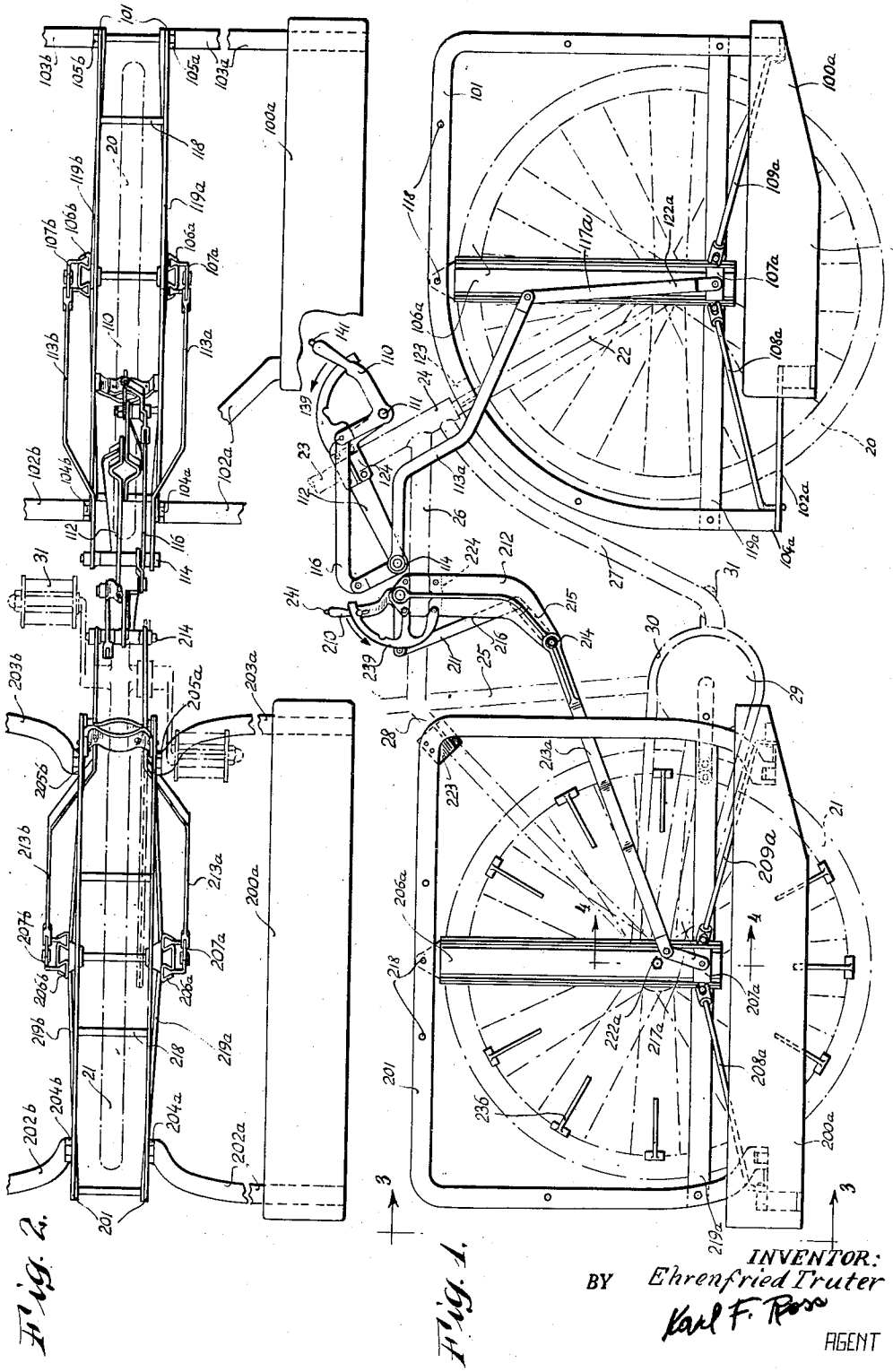


Fig. 2.

Fig. 1.

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Fig. 4.

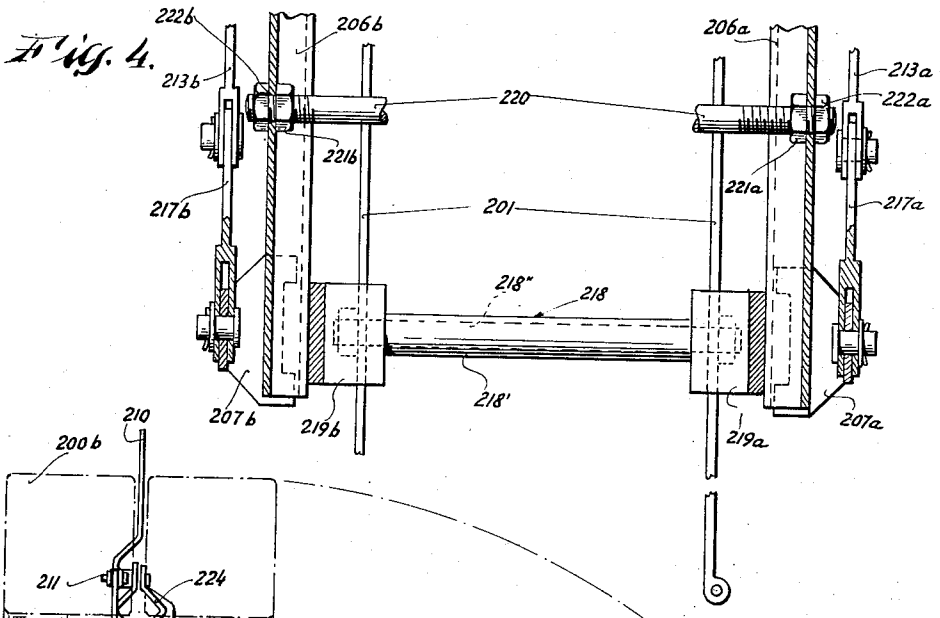
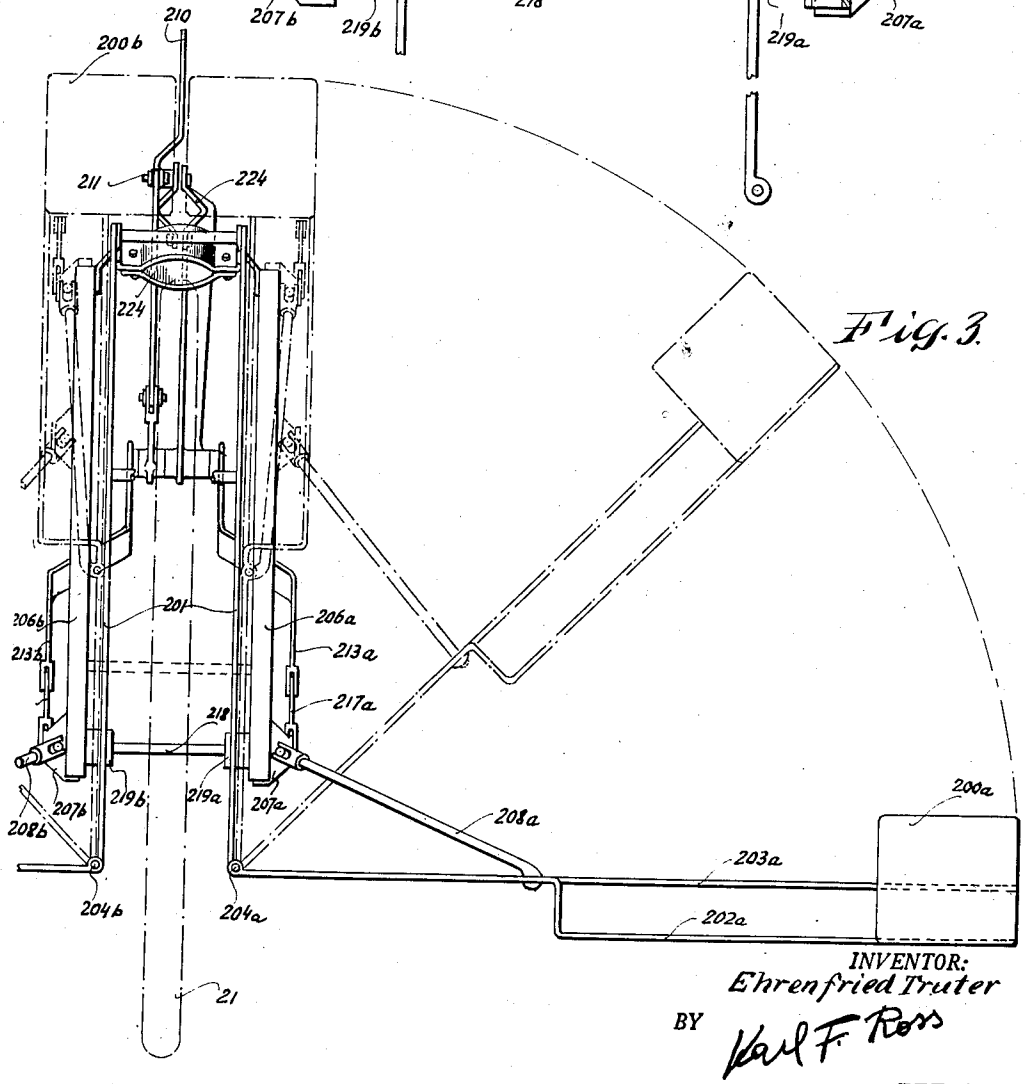


Fig. 3.



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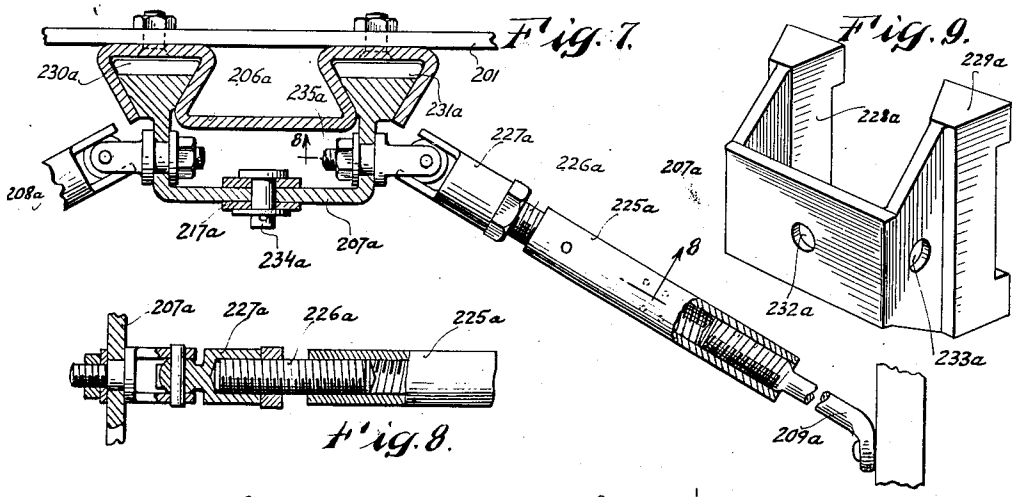


Fig. 7.

Fig. 8.

Fig. 9.

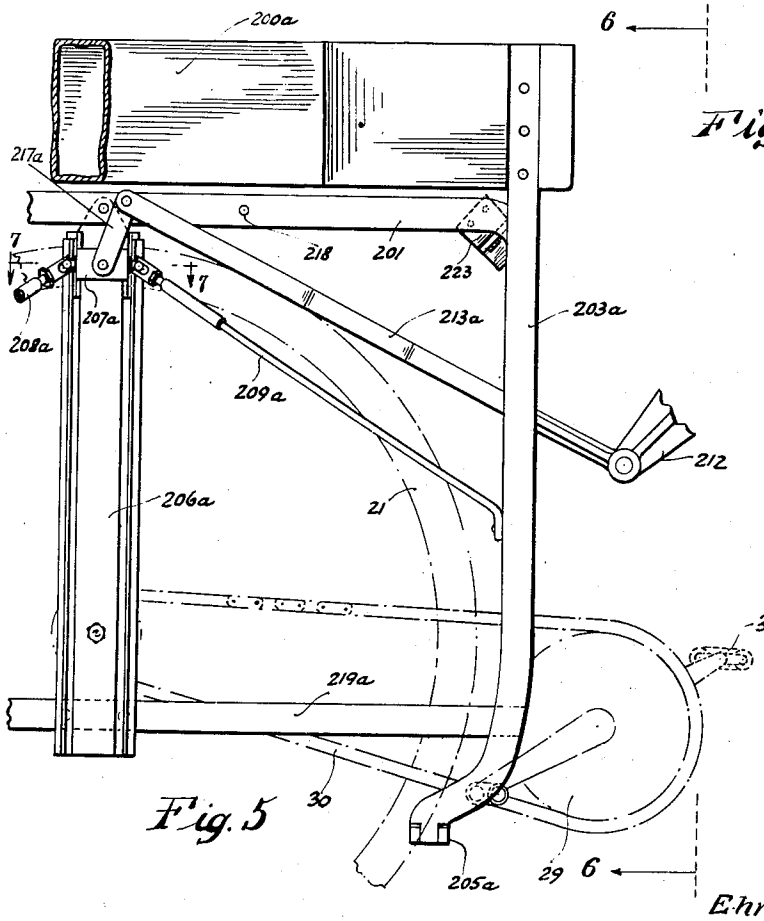
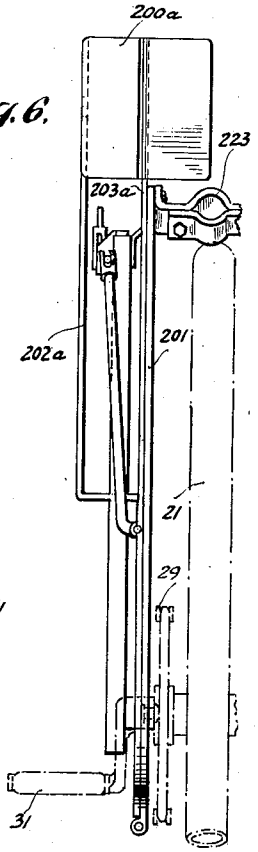


Fig. 5

Fig. 6.



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Fig. 16

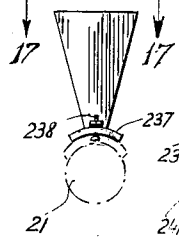


Fig. 17

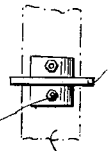


Fig. 11.

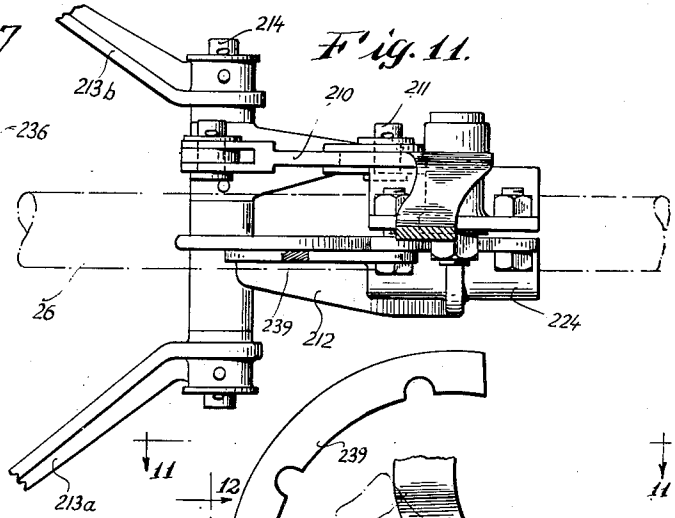


Fig. 12.

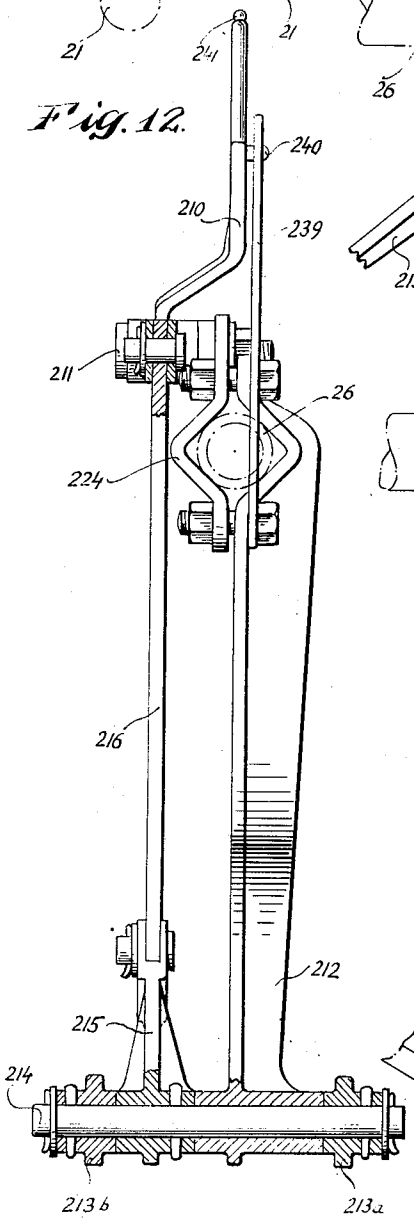
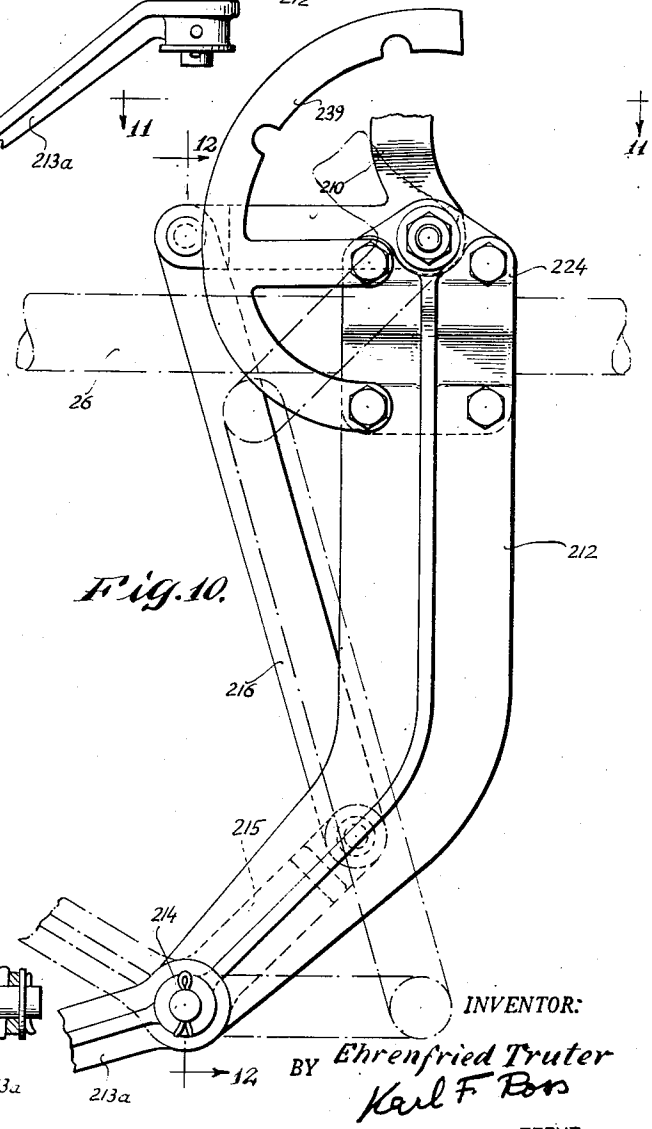


Fig. 10.



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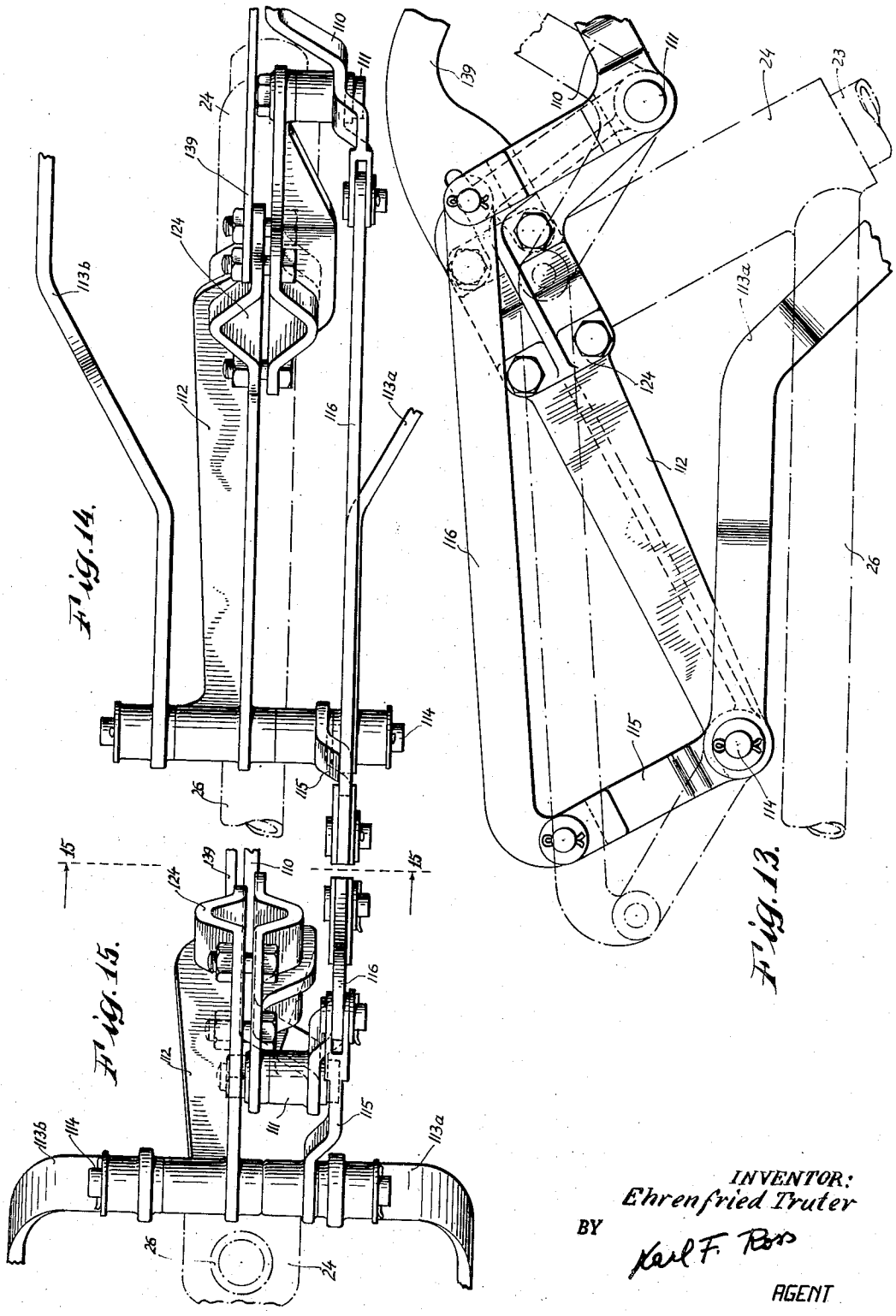


Fig. 14.

Fig. 15.

Fig. 13.

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FLOATING ATTACHMENT FOR BICYCLES

Ehrenfried Truter, New York, N. Y.

Application April 22, 1953, Serial No. 350,340

16 Claims. (Cl. 115—2)

My present invention relates to floating attachments for bicycles designed to adapt conventional vehicles of this type for travel across the surface of lakes, rivers and other bodies of water.

A primary object of my invention is to provide a detachable floating gear adapted to be conveniently secured to and removed from the frame of an ordinary bicycle, either of the men's or of the women's type, and when in operative position to provide safe and dependable support on water for the vehicle and its rider.

Another object of this invention is to provide a floating gear of this description which can be quickly and easily placed in operative position and just as easily and quickly retracted into an inoperative position when its use is no longer required, thereby enabling the use of the vehicle on dry land in the conventional manner.

A further object of my present invention is to provide a floating gear, of the character described, in combination with detachable paddles serving for the propulsion of the vehicle on water without interfering with its movement when on dry land.

Still another object of my invention is to provide a floating gear also capable of assisting in the movement of a bicycle or the like over snow or ice.

An important feature of my invention resides in the provision of a detachable float mount comprising a retracting mechanism which controls a set of float-supporting arms adapted to be swung up or down between a substantially horizontal, operative position and a substantially vertical, inoperative position; the retracting mechanism preferably comprises a pair of independent levers for operating respective front and rear float supports. The front float support, in the latter case, together with its retracting means and control lever is secured to the front fork of the vehicle so as to follow the movements of the handle bar.

The above and other objects and features of my invention will become apparent from the following detailed description of a now preferred embodiment, reference being had to the accompanying drawing wherein only the elements of my novel floating gear are shown in solid lines, all conventional bicycle parts being represented in dot-dash outlines. In the drawing:

Fig. 1 is a side elevation of a men's bicycle having attached to it a floating gear, according to the invention, in operative position;

Fig. 2 is a top plan view of the major parts of the assembly shown in Fig. 1;

Fig. 3 is a partial rear view of the rear portion of the assembly, taken on the line 3—3 of Fig. 1 and illustrating the lowering and raising of the floats;

Fig. 4 is an enlarged fragmentary section of the floating attachment (omitting all conventional bicycle parts) taken on the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary side elevation of part of the rear assembly on a scale slightly larger than that of Fig. 1, showing one of the rear floats in raised (retracted) position;

Fig. 6 is a partial front view of the rear assembly, taken on the line 6—6 of Fig. 5;

Fig. 7 is an enlarged fragmentary section on the line 7—7 of Fig. 5;

Fig. 8 is a fragmentary section taken on the line 8—8 of Fig. 7;

Fig. 9 is a perspective view of one of the elements shown in Fig. 8;

Fig. 10 is an enlarged detail view, in side elevation, of part of the retracting mechanism for the rear floats;

Fig. 11 is a fragmentary top view on the line 11—11 of Fig. 10;

Fig. 12 is a fragmentary sectional elevation on the line 12—12 of Fig. 10;

Fig. 13 is an enlarged detail view, in side elevation, of part of the retracting mechanism for the front floats;

Fig. 14 is a fragmentary top view of the mechanism shown in Fig. 13;

Fig. 15 is a fragmentary rear elevation on the line 15—15 of Fig. 14;

Fig. 16 is an enlarged elevational view of one of the paddles serving for the propulsion of the vehicle on water; and

Fig. 17 is a top view of the paddle, taken on the line 17—17 of Fig. 16.

The bicycle to which the embodiment of my invention is applied, shown in dot-dash lines in the drawing, comprises front wheel **20**, rear wheel **21**, front fork **22** with steering post **23** passing through tube **24**, the latter along with saddle pillar **25** and tube members **26**, **27**, **28** forming part of the vehicle frame, sprocket **29**, chain **30** and pedals **31**, as well as the usual handle bar and saddle (not shown) secured, respectively, to the steering post **23** and to the saddle pillar **25**.

The floating gear in the illustrated embodiment of my invention is divided into a front assembly and a rear assembly with similar but not identical parts; corresponding elements are designated by like two-digit numerals preceded by the digit "1" in the case of the front assembly and by the digit "2" in the case of the rear assembly. Many of the elements of either assembly occur, moreover, in pairs at opposite sides of the vehicle; these paired elements, to the extent that they appear on the drawing, have been given the postscripts "*a*" and "*b*" (e. g. **200***a*, **200***b*), respectively, yet only those on the right-hand side of the rider, identified by the postscript "*a*," will be particularly referred to in the following description.

In Figs. 1 and 2 there is shown a front float assembly comprising a float **100***a*, a mounting frame **101** detachably secured to the frame of the bicycle in a manner more fully described hereinafter, supporting arms **102***a*, **103***a* pivoted at **104***a*, **105***a* to the mounting frame **101** and holding the float **100***a* at their extremities, a vertically channeled guide post **106***a*, accommodating a sliding head **107***a* from which extend a pair of rods **108***a*, **109***a* whose other extremities are hingedly connected to the arms **102***a*, **103***a*, respectively, a control lever **110** pivoted at **111** to a rest **112**, a transmission lever **113***a* fixed to a pin **114** which is journaled in the rest **112**, a connecting arm **115** (see Fig. 13) likewise fixed to the pin **114**, a link member **116** interconnecting the control lever **110** with the arm **115**, and a link member **117***a* interconnecting the transmission lever **113***a* with the sliding head **107***a*. There is similarly shown in these figures a rear float assembly comprising a float **200***a*, a mounting frame **201** detachably secured to the bicycle frame in a manner more fully described hereinafter, supporting arms **202***a*, **203***a* pivoted at **204***a*, **205***a* to the mounting frame **201** and holding the float **200***a* at their extremities, a vertically channeled guide post **206***a* accommodating a sliding head **207***a* from which extend a pair of rods **208***a*, **209***a* whose other extremities are hingedly connected to the arms

202a, 203a, respectively, a control lever 210 pivoted at 211 to a rest 212, a transmission lever 213a fixed to a pin 214 which is journaled in the rest 212, a connecting arm 215 likewise fixed to the pin 214, a link member 216 interconnecting the control lever 210 with the arm 215, and a link member 217a interconnecting the transmission lever 213a with the sliding head 207a. It will be understood in the light of the foregoing explanation that the members 110, 111, 112 etc., which bear no postscripts, occur only once and are common to both sides of the respective assembly.

Each of the frames 101, 201 comprises two halves of inverted U-shape interconnected by stays 118, 218, respectively. The arms of each inverted "U" are spanned by a slightly deformed, horizontal bar 119a, 219a, respectively, to which the guide posts 106a, 206a are fixed at their lower ends as best seen in Fig. 4. The connection between the frames 101, 201 and the bars 119a, 219a is effected by certain of the stays 118, 218 which, as shown in Fig. 4 for one of the stays 218, consist of a tube 218' traversed by a bolt 218''. Other stays of this type serve to connect the tops of guide posts 106a, 206a with the upper, horizontal members of the frames 101, 201.

Each of the rigid units 101, 106a, 119a and 201, 206a, 219a is removably attached to the bicycle at two points. One of these points is represented by a threaded stud such as 220, Fig. 4, which replaces the usual axle stud of the wheel 20 or 21 and which is characterized by a sufficiently long thread at each end to accommodate a respective pair of nuts such as 221a, 222a. Clamped between these nuts is the suitably perforated guide post 206a, it being understood that the corresponding front guide post 106a is clamped in analogous manner to a similarly threaded stud of which only the nut 122a is visible in the drawing. The second point of attachment is constituted for the frame 101 by a clamp 123 embracing the steering post 23 and for the frame 201 by a clamp 223 embracing the tubular member 28 of the bicycle frame. The rests 112, 212 are formed in two parts to constitute clamping jaws 124, 224 serving to engage the steering post 23 (just above tube 24) and the tubular frame member 26, respectively.

Figs. 7 and 8 show how each of the control rods such as 209a is threadedly received by a turnbuckle such as 225a which also engages an oppositely threaded extension rod 226a, the latter being held in a socket member 227a forming part of a universal joint whereby the control rod is coupled to the associated sliding head such as 207a. Rotation of the turnbuckle thus imparts the proper length and tension to the control rod.

Figs. 7 and 9 further show how the sliding head 207a, which is also representative of the head 107a, is provided with two dovetails 228a, 229a which fit in corresponding channels 230a, 231a of the guiding post 206a. The head 207a is also apertured at 232a, 233a to receive pins 234a, 235a connecting it with the link member 217a and with the socket member 227a, respectively.

Paddles 236 are fastened to the inner periphery of the chain-driven rear wheel 21 between the spokes thereof. Their mounting is illustrated in greater detail in Figs. 16 and 17 which show these paddles provided at their bottoms with a flange 237 traversed by screws 238 engaging the felly of the wheel 21.

The floats 100a, 200a are provided with beveled front edges which are at the underside of the float when the same is in its operative, lowered position as shown in Figs. 1, 2 and 3 (solid lines). This minimizes the resistance of the floats when in water. It will be noted that the supporting arms 102a and 103a as well as the arms 202a and 203a are relatively offset in their outer extremities engaging the beveled front portion and the straight rear portion, respectively, of the corresponding float.

From the foregoing it will be understood that the levers 110 and 210, which are in such relative position as not to interfere with each other upon a swinging of the steering post 23 (and, with it, the rest 112) to either side, have each a forward position illustrated in Fig. 1 and are retractable toward the rider (arrows) to a rear position in which the associated linkages occupy the positions shown in dot-dash lines in Figs. 13 and 10, respectively. When the vehicle is to be used on water, the levers 110 and 210 are in their forward positions and the floats 100a, 200a are held below the level of the sprocket 29 and chain 30 by the horizontally extending arms 102a, 103a and 202a, 203a, the sliding heads 107a, 207a being then at their lowest points on the guiding posts 106a, 206a as clearly seen in Fig. 1. It will further be seen that the rests 112, 212 have mounted thereon respective segments 139, 239 provided with spaced notches to receive an index pin, such as 240 (Fig. 12), controlled by spring-urged knobs 141, 241 at the heads of the levers 110, 210 for selectively arresting each of these levers in either "floating" (forward) or "non-floating" (retracted) position.

While the attachment of my invention is primarily intended for transportation over water, the same can be used with equal facility on icy or snowbound surfaces. In the case of ice the floats 100a, 200a are simply lowered, by operating the turnbuckles such as 225a, so as to be substantially flush with the tread surfaces of the wheels 20, 21, care being taken that at least one of the floats on either side of the rear wheel 21 should remain at all times sufficiently high above ground to afford the necessary traction to this wheel; it will be apparent that the floats will be somewhat inclined toward the horizontal when thus lowered, whereby only the outer edge of any float will touch the surface so as to reduce friction. In the case of deep snow it may be desirable to raise the rear floats 200a, 200b somewhat higher above ground to insure traction.

It will also be noted, particularly from Figs. 2 and 3, that the floats are positioned sufficiently remote from the wheels 20, 21 so as not to interfere with the operation of the pedals 31 while insuring the necessary stability on the water surface. If, now, travel on dry land is to be resumed, the levers 110, 210 are retracted and, via their associated linkages 116, 115, 113a, 117a and 216, 215, 213a, 217a, raise the heads 107a and 207a to an elevated position illustrated in Figs. 5 and 6 for the head 207a. From Fig. 3, which shows in dot-dash lines an intermediate as well as the top position of the head 207a and associated parts, it will be apparent how the control rods (represented in Fig. 3 by the rod 208a) swing each float about its two pivots, such as 204a, into a raised position in which the arms 202a etc. extend vertically upwardly from their respective pivots; it will also be seen that float 200a in retracted position comes to rest above the mounting frame 201 and almost touches its companion float 200b.

Since the paddles 236 project only slightly beyond the felly of the wheel 21 (as will be apparent from Figs. 16 and 17), they will not interfere with the operation of either the bicycle itself or the control mechanism for the floats. They can, however, readily be removed by unscrewing the nuts from their retaining screws 238, even as the entire floating gear can be detached by opening the clamps 123, 124, 223, 224 and removing the screws 122a, 222a (frame members 201, 219a being sufficiently flexible to enable the disengagement of post 206a from bolt 220).

It will thus be seen that I have provided simple and efficient means constituting a floating attachment for the purposes set forth, it being understood, however, that the same may be modified in various ways without departing from the spirit and scope of my invention as defined in the appended claims. The invention is, of course, also applicable to motor-driven bicycles or motorcycles.

I claim:

1. A floating gear for a bicycle having a frame, a rear wheel and a front wheel, said gear comprising mounting means, fastening means for detachably securing said

mounting means to said frame, at least one pair of floats on opposite sides of said mounting means, pivot means on said mounting means, at least one pair of supporting members fixed to said floats, respectively, and swingably connected with said mounting means by said pivot means, lever means attachable to a part of said bicycle, and mechanism controlled by said lever means for displacing said supporting members between an outwardly extended and an upwardly retracted position, said floats being spaced apart below the level of the hubs of said wheels in said outwardly extended position while being close together above said wheels in said upwardly retracted position of said supporting members upon the attachment of said mounting means to the bicycle frame, said mechanism comprising a pair of vertical guide posts secured to said mounting means, a sliding head engaging each of said guide posts and connected with said lever means, and rod means pivotally interlinking said sliding head with a respective one of said supporting members.

2. A floating gear according to claim 1 wherein said floats have a beveled forward edge lying at their undersides in said outwardly extended position of said supporting members.

3. A floating gear according to claim 1, including screw means for securing said pair of guide posts to opposite ends of the axle of one of said wheels.

4. A floating gear according to claim 1, including a second pair of supporting members fixed to respective ones of said floats and pivotally connected with said mounting means, said rod means comprising a pair of rods extending from said sliding head toward respective ones of said supporting members.

5. A floating gear according to claim 4 wherein said pairs of supporting members are positioned forwardly and rearwardly of said pair of guide posts, respectively.

6. A floating gear according to claim 5 wherein each of said floats has a straight rear surface portion and a beveled front surface portion, said pairs of supporting members having relatively offset portions fixed to said rear and front surface portions, respectively.

7. A floating gear according to claim 1 wherein each of said guide posts is provided with a double vertical channel and wherein said sliding head is provided with dual dovetailed extremities fitting inside said double channel.

8. A floating gear according to claim 1 wherein said lever means includes a rest attachable to a part of the bicycle, a control lever having a fulcrum on said rest, and a plurality of links extending between said control lever and the sliding head of each of said guide posts, certain of said links having a fulcrum on said rest.

9. A floating gear according to claim 8, including indexing means on said rest for immobilizing said control lever in a selected one of two positions corresponding, respectively, to said outwardly extended position and to said upwardly retracted position of said supporting members.

10. A floating gear according to claim 1 wherein said mechanism comprises adjusting means for selectively raising and lowering said floats in said outwardly extended position of said supporting members.

11. A floating gear according to claim 10 wherein said adjusting means includes turnbuckle means in said rod means for varying the effective length thereof.

12. A floating gear for a bicycle having a frame with a steering post, a chain-driven rear wheel and a front wheel controlled by said steering post, said gear comprising first and second mounting means, fastening means for detachably securing said first and second mounting means to a stationary part of said frame and to said steering post, respectively, a first and a second pair of floats on opposite sides of said first and second mounting means, respectively, at least one first and second pair of supporting members fixed to said first and second pair of floats, respectively, first and second pivot means swingably connecting said first and second pair of supporting members with said first and second mounting means, respectively, first and second lever means attachable to a stationary part of said frame and to said steering post, respectively, and first and second mechanism independently controlled by said first and second lever means, respectively, for displacing said first and said second pair of supporting members between outwardly extended and upwardly retracted positions, the floats of each pair being spaced apart below the level of the hubs of said wheels in said outwardly extended position while being close together above the respective wheels in said upwardly retracted position of the corresponding pair of supporting members upon the attachment of said first and second mounting means to the bicycle frame, each of said mechanisms comprising a pair of vertical guide posts secured to the respective mounting means, a sliding head engaging each of said guide posts and connected with the respective lever means, and rod means pivotally interlinking said sliding head with a respective one of said supporting members.

13. A floating gear according to claim 12 wherein said first lever means includes a rest attachable to a stationary part of the bicycle frame, a first control lever having a fulcrum on said stationary rest, and a plurality of first links extending between said first control lever and the sliding head of each of a first pair of said guide posts, certain of said first links having a fulcrum on said stationary rest, and wherein said second lever means includes a swingable rest attachable to said steering post, a second control lever having a fulcrum on said swingable rest, and a plurality of second links extending between said second control lever and the sliding head on each of a second pair of said guide posts.

14. A floating gear according to claim 12, including screw means for securing each of said pairs of guide posts to opposite ends of the axles of said rear and front wheels, respectively.

15. In combination, a floating gear according to claim 12 and a set of paddles detachably secured to the inner periphery of said rear wheel between the spokes thereof.

16. In a bicycle, in combination, a pair of floats on opposite sides of a wheel thereof, horizontal pivot means supported by a frame element of said bicycle below the level of the hub of said wheel and on opposite sides thereof, bracing means extending from said pivot means to said floats, mechanism including a pair of rods, each connected to a respective one of said floats, for selectively swinging said floats into a plurality of predetermined positions about said pivot means, said rods lying substantially in a vertical plane parallel to the wheel in a retracted position and extending inclinedly downwards and away from the wheel in an operative position of said floats, means for selectively locking said floats in said retracted or in said operative position, and adjusting means for varying the effective length of said rods, thereby altering the level of said floats in said operative position.

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