

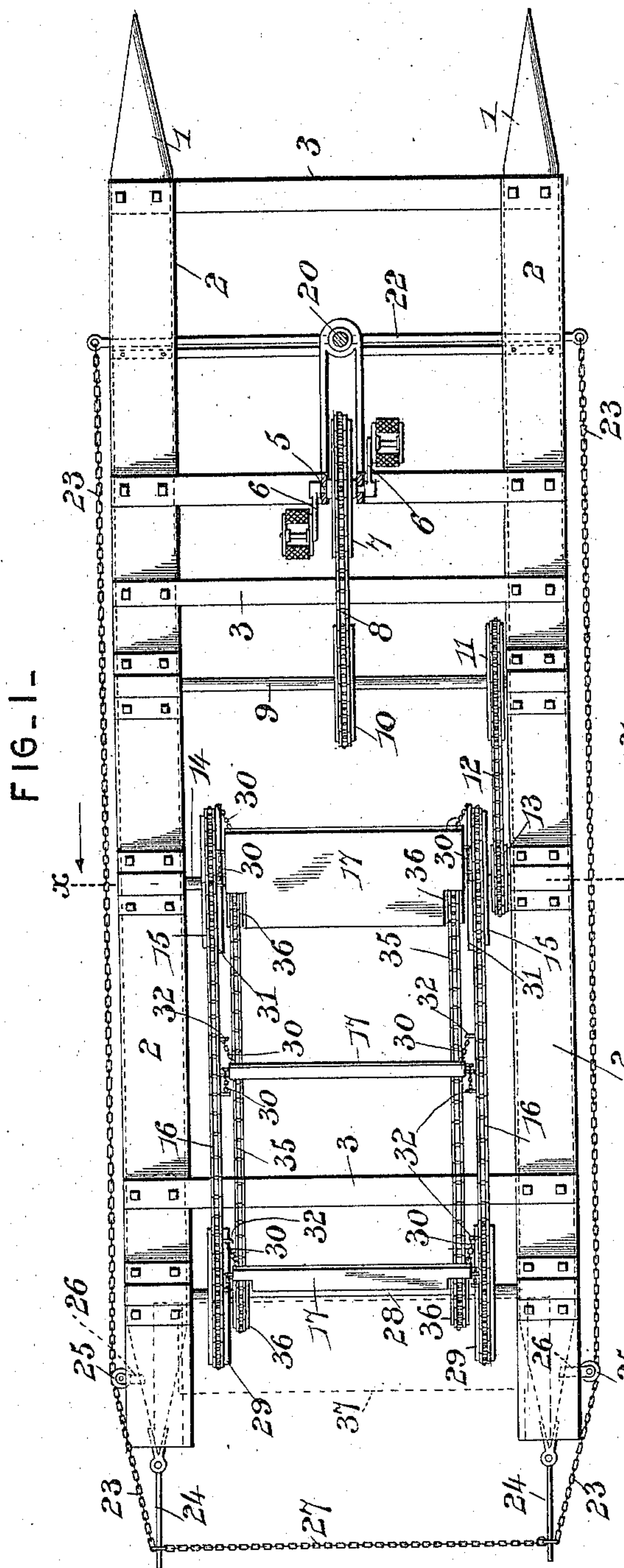
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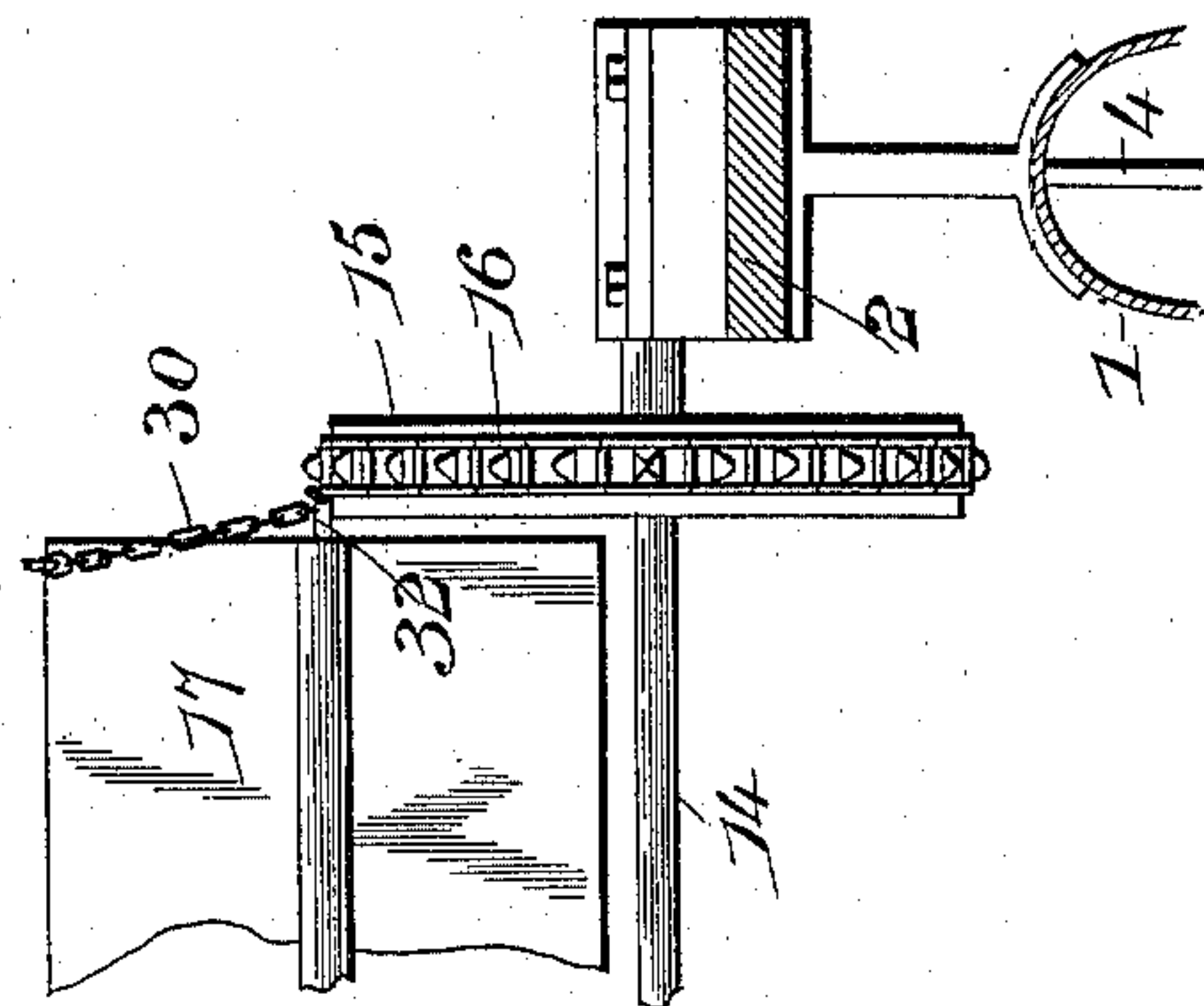
C. A. SULZMAN.  
MARINE VELOCIPED.

No. 575,180.

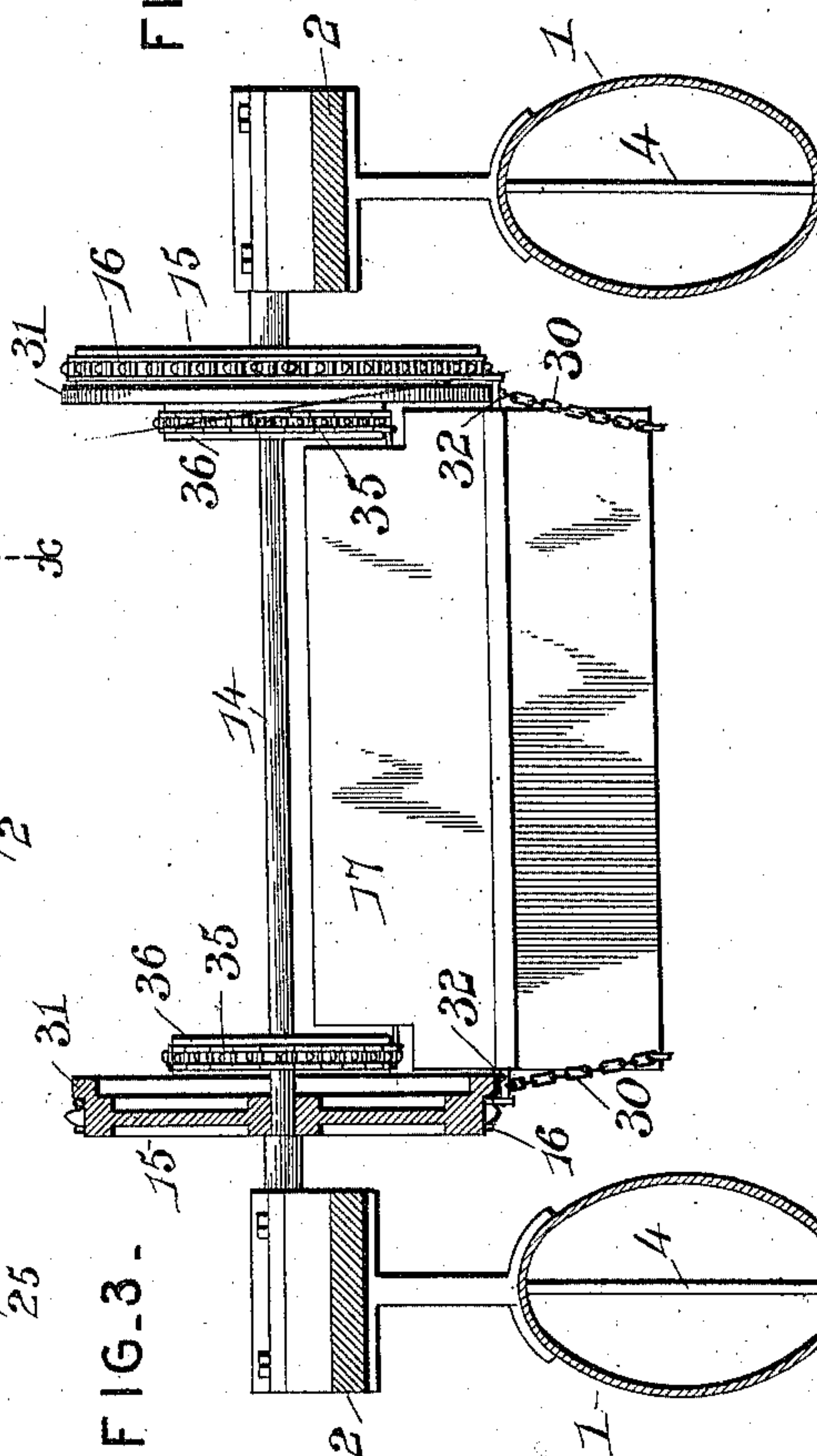
Patented Jan. 12, 1897.



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Inventor

Witnesses

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By *his* Attorneys,

*Charles A. Sulzman*

Chas. Snowles

(No Model.)

2 Sheets—Sheet 2.

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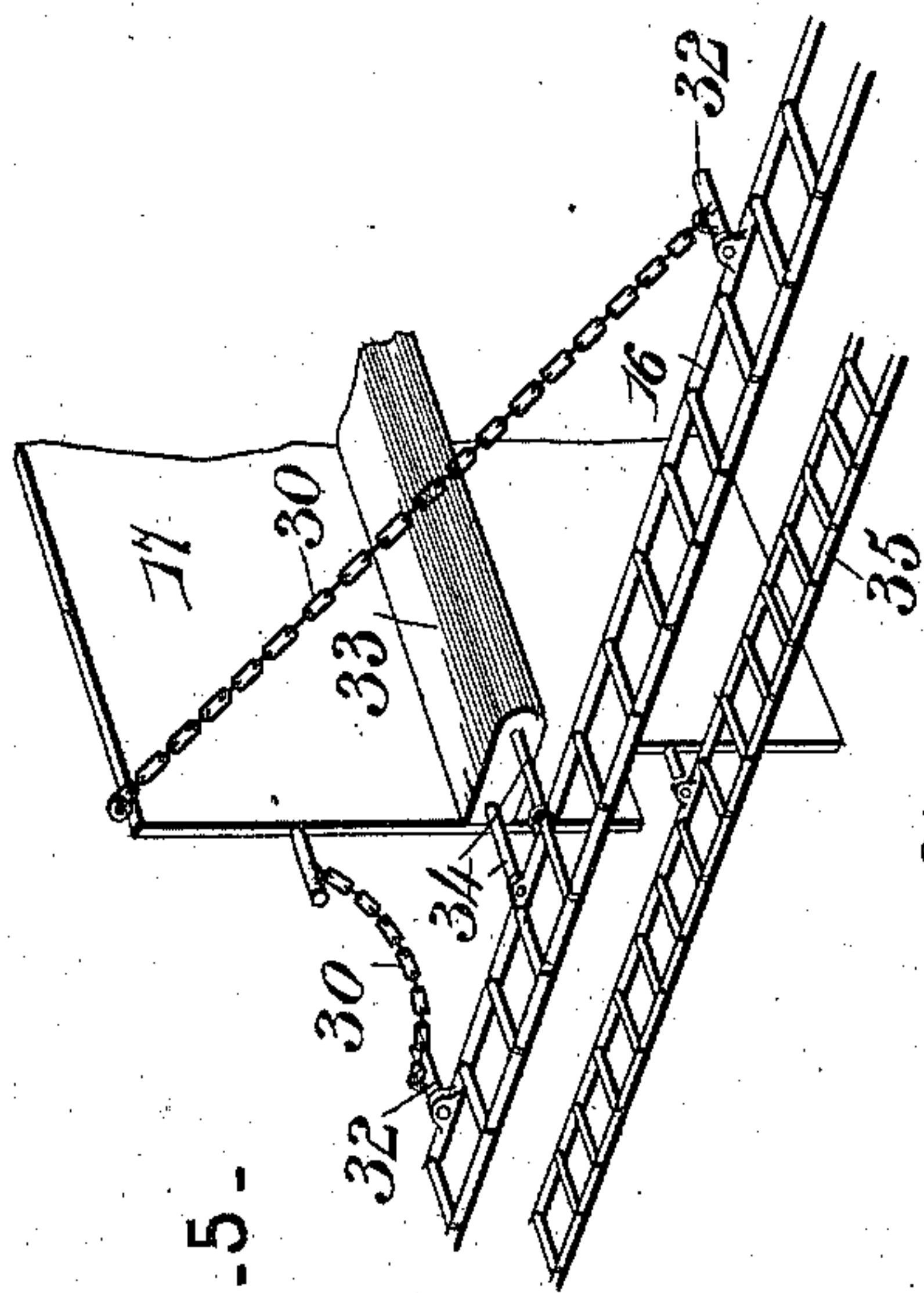


FIG. 5.

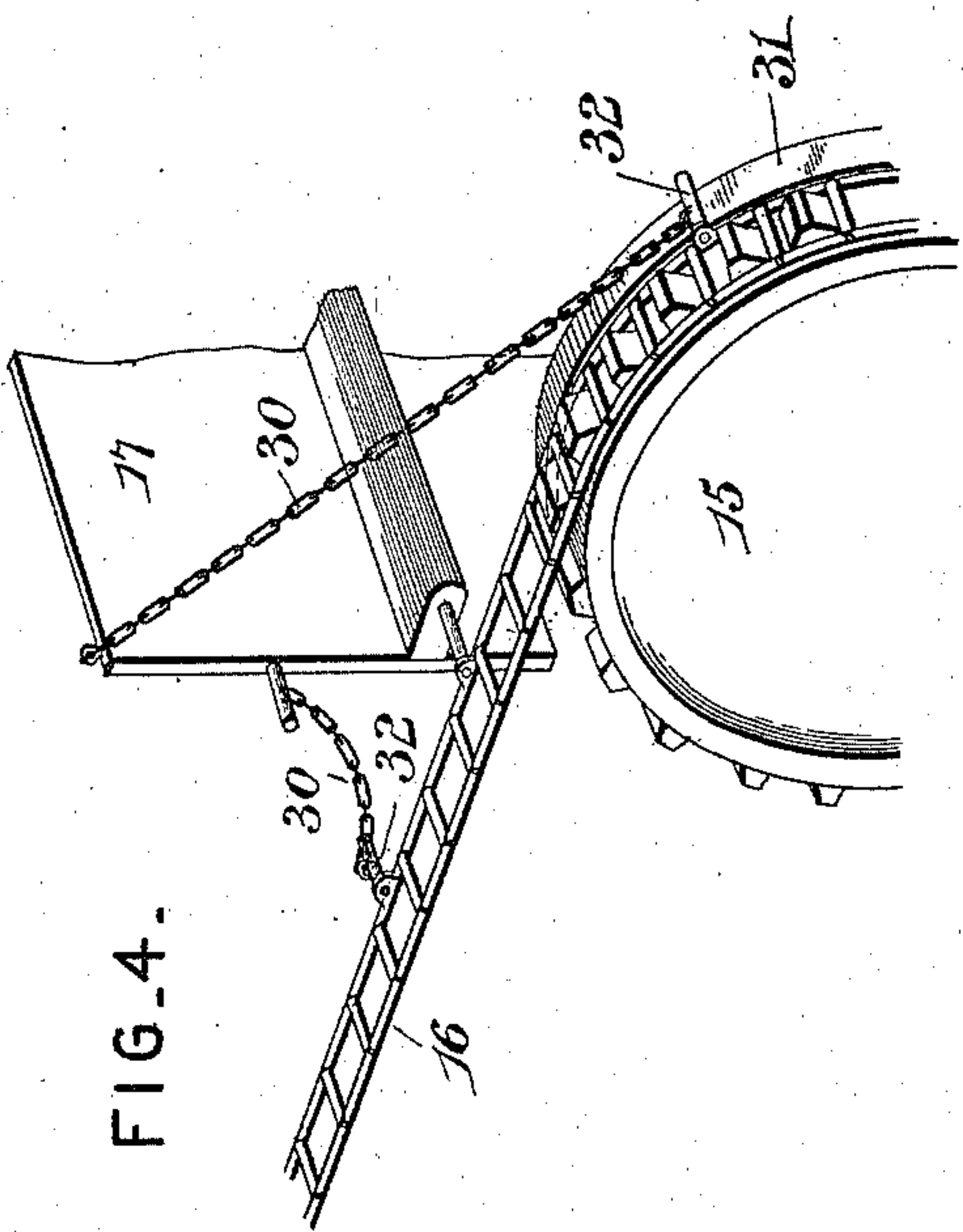


FIG. 4.

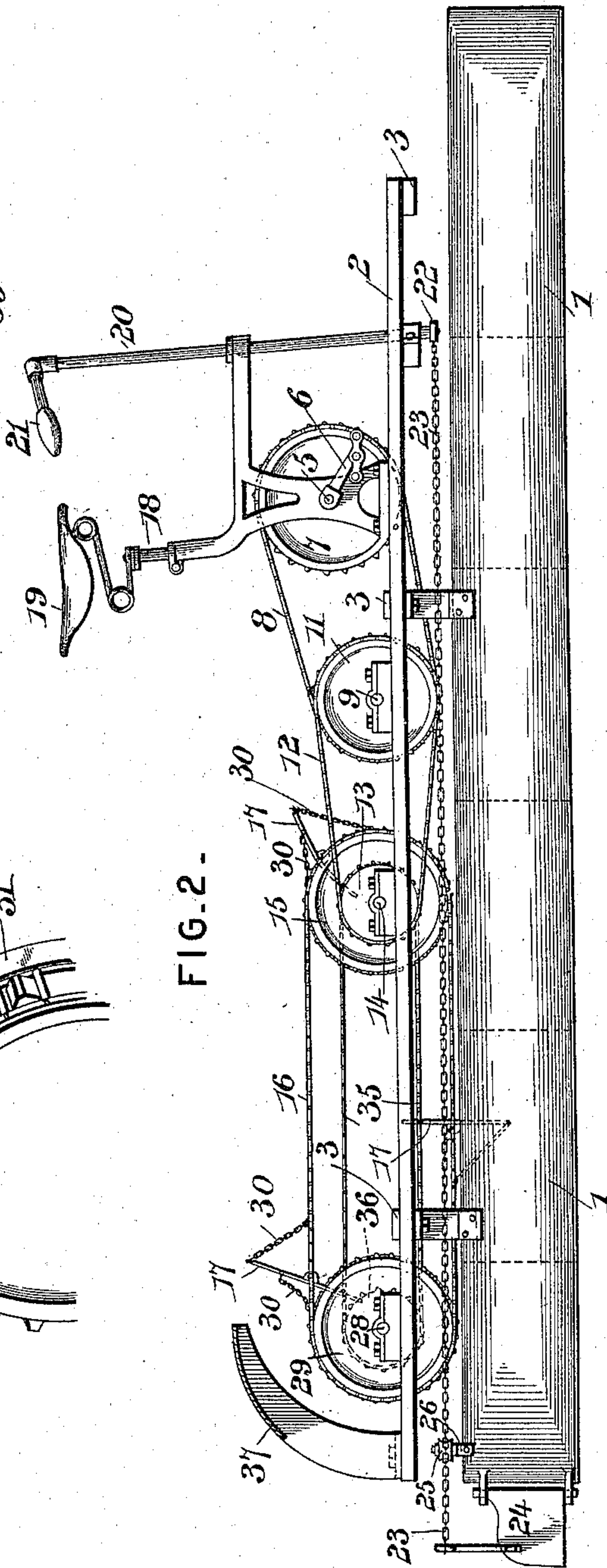


FIG. 2.

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# UNITED STATES PATENT OFFICE.

CHARLES A. SULZMAN, OF WATERFORD, NEW YORK.

## MARINE VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 575,180, dated January 12, 1897.

Application filed August 14, 1895. Serial No. 559,276. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. SULZMAN, a citizen of the United States, residing at Waterford, in the county of Saratoga and State of New York, have invented a new and useful Aquatic Bicycle, of which the following is a specification.

This invention relates to certain new and useful improvements in water-craft of that class generally known as "marine velocipedes," and has for its object to improve the general construction of this class of devices, and most especially the propelling mechanism, whereby increased speed is had and the craft propelled with comparative ease and with an expenditure of a minimum amount of manual energy or other force.

A further object is to secure lightness, together with strength and durability, and to combine with the structure a propelling mechanism which will offer the least resistance to the forward movement of the craft and which will obviate water-hammering incident to that class of propelling mechanism which depends for its efficiency upon the employment of blades or buckets.

Various other objects and advantages are attendant upon the organization of the present invention and will become apparent as the nature of the improvement is understood from the subjoined description; and to this end the improvement consists, essentially, of the novel features and peculiar construction and combination of the parts, which hereinafter will be more particularly set forth and claimed, and which are shown in the accompanying drawings, in which—

Figure 1 is a top plan view of a marine velocipede constructed in accordance with this invention. Fig. 2 is a side elevation thereof. Fig. 3 is a cross-section on the line X X of Fig. 1, looking in the direction of the arrow. Fig. 4 is a detail view of one end of a blade, showing its drive-chain, the check for holding the paddle or blade in working position, and the enlarged rim portion of the wheel for supporting and imparting motion to the said drive-chain. Fig. 5 is a view similar to Fig. 4, showing a different manner of mounting and attaching the blades or paddles to the drive-chains. Fig. 6 is a detail view.

Referring by numerals to the drawings, in which similar characters denote corresponding parts in all the figures, 1 indicates two similar floats spaced a proper distance apart and located in parallel relation, 2 longitudinal side bars, and 3 transverse bars for connecting the longitudinal bars and forming therewith a substantial framework or structure for supporting the operating parts of the device.

The floats 1 are hollow and are of required length, which varies according to the capacity and design of the craft, and these floats are substantially circular in cross-section and have their ends tapering, so as to offer a minimum resistance to the movement of the craft through the water. In the formation of the floats any suitable material may be employed; but it is preferred to use sheet metal of comparatively light gage, and these floats are air-tight and are preferably supplied with air under pressure, so as to give stiffness and rigidity to the floats and enable them the better to withstand the external pressure of the water and any knocks which may be received upon their sides. The floats are stiffened and braced longitudinally by means of a backbone 4, which is a plank arranged vertically and secured at its top and bottom edges to the upper and lower sides, respectively, of the floats, and this board or backbone is centrally disposed and extends the full length, or nearly so, of the floats.

The pedal-shaft 5 is located near the front end of the craft and is provided at its ends with cranks 6 and midway of its ends with a sprocket-wheel 7, around which passes the sprocket-chain 8 for imparting motion to a shaft 9, extending parallel with the pedal-shaft 5 and having a sprocket-wheel 10, which supports the rear ends of the said sprocket-chain 8. On the outer end of the shaft 9 is a sprocket-wheel 11, which receives one end of a sprocket-chain 12, by means of which motion is transmitted to a sprocket-wheel 13 on the outer end of a shaft 14, which latter shaft receives and supports the sprocket-wheels 15, which sustain the front ends of the drive-chains 16, bearing the blades or paddles 17.

The seat-post 18 is located in proximate re-



lation to the pedal-shaft and is vertically adjustable in any of the well-known ways, so as to adapt the height of the seat 19 to the person perched thereupon, so as to enable the cranks 6 to be within easy and convenient reach when propelling the craft.

The steering-post 20 is provided at its upper end with the handle-bar 21 and at its lower end with a transversely-disposed bar 22, from the opposite ends of which extend chains or cords 23, which make connection at their rear ends with the rudders 24, by means of which the device is guided in its movements through the water. In order to secure the proper connection of the chains or cords with the rudders 24, so that the latter may be properly operated, guide-pulleys 25 are located at the outer ends of laterally-extending arms 26 and the said chains or cords pass thereover, as clearly indicated in Fig. 1, and to secure a synchronous action of the two rudders the latter are suitably connected near their rear ends by means of the chain or equivalent device 27.

A shaft 28 is arranged parallel with and in the rear of the shaft 14 and has supporting sprocket-wheels 29, corresponding in position and size with the sprocket-wheels 15 and which are designed to receive the rear ends of the drive-chains 16. The blades or paddles 17 have pivotal connection at their ends with the drive-chains 16 and will be provided in sufficient number to secure the best possible results, and in order to hold the said blades or paddles in working position and to give proper direction thereto in their passage over the supporting-wheels 15 checks 30 have been devised and arranged to pass over guides 31 contiguous to the inner sides of the respective supporting-wheels 15. These checks 30 are short lengths of chain and extend obliquely and are connected at their ends, respectively, with the end portion of the paddles or blades at a distance from the pivotal connections of the said paddles with the drive-chains and with the said drive-chains by means of pins 32, extending laterally therefrom. The guides 31 are circles of larger diameter than the supporting-wheels 15 and are formed, preferably, by enlarging the inner marginal rim portion thereof. In the operation of the drive-chains 16 the blades or paddles will be carried successively over the supporting-wheels 15, and the checks 30, engaging with the circular guides 31, will turn the blades into such relative position that their lower edges will enter the water, thereby obviating water-hammering and the detracting from the effectiveness of the said blades to any appreciable degree.

Supplemental chains 35 will be provided and extend parallel with the drive-chains 16, and are mounted upon pulleys 36, placed upon the shafts of the respective supporting sprocket-wheels, and these supplemental chains will have their links of proportionate lengths to correspond with the distance be-

tween the parallel portions of the adjacent and cooperating chains 16 and 35. The supplemental chains 35 are shorter than the drive-chains 16, and have pivotal connection with the ends of the paddles or blades in any convenient manner, and are intended to cooperate with the drive-chains and carry a proportionate amount of the load, and making it possible to construct the drive-chains 16 of less weight than would be possible if the said chains 35 were dispensed with. These supplemental chains may be dispensed with and will not be employed in constructing light craft, but for heavy craft their employment is preferred, and they will not be dispensed with.

The checks 30 are duplicated and extend upon opposite sides of the paddles or blades, so as to strengthen and brace the latter from opposite directions, which is desirable when it is necessary to back or reverse the motion of the device. The checks arranged on the hindmost sides of the blades are shorter than the checks placed on the forward sides of the blades, so as to obviate increasing the weight of the propelling mechanism and to provide for the more easy passage of the blades around the supporting-wheels.

In order to prevent the sinking of the craft in the event of a puncture of one or both floats, the latter will be constructed in sections or compartments, as indicated by the dotted lines in Fig. 2. Hence in the event of serious injury to any one of the many compartments the floats will not fill with water and cause a settling of the device, which would take place if the floats were constructed of a single compartment.

A guard or fender 37 is located at the rear end of the craft and incloses the rear portion of the propelling mechanism, and is intended to prevent the splashing of the water upon the rider and the framework of the device.

In the modifications shown in Fig. 5 a construction is shown which contemplates the use of a comparatively thin metal blade, and the latter is strengthened by being attached to a transverse bar 33, from the end of which extend two pins 34 in parallel and proximate relation, and which form the connection between the said bar and the drive-chains 16. These pins 34, being disposed the one in advance of the other, serve to hold the blade in working position when the drive-chain is subjected to tension, as will be readily understood. The check 30 in this instance is so arranged as to subject that portion of the blade to which it is attached to tension by deflecting the same, and also serves to hold the blade in working position.

The provision of the shaft 9 admits of a central disposition of the pedal-shaft and the parts intimately associated therewith, thereby resulting in an equal distribution of the rider's weight upon each of the floats, and the employment of the checks and the parts cooperating therewith results in a simple, positive, and efficient manner of feathering the paddles



or blades, so as to obviate water-hammering and the detracting from the efficient propelling force.

It is obvious that the craft may be propelled by other than manual force and that the principles of the invention may be applied to water-craft generally. Hence in the embodiment of the invention it is to be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is--

1. In a marine velocipede or water-craft, the combination with a float of required length substantially oval-shaped vertically in cross-section, of a backbone arranged within the float and comprising a vertically-disposed brace attached at its top and bottom edges centrally to the upper and lower sides of the said float, and extending longitudinally thereof and dividing the same into longitudinal air-tight compartments, substantially as set forth for the purpose described.

2. The herein shown and described marine velocipede comprising in its organization longitudinally-disposed floats having rudders at their rear ends which are connected so as to operate in unison, a framework supported by the said floats, front and rear supporting-wheels, the forward supporting-wheels having their inner marginal rim portions enlarged to provide circular guides, drive-chains mounted upon the supporting-wheels, blades having pivotal connection with the drive-chains, checks connecting the ends of the blades with the drive-chains, and adapted to engage with the aforesaid circular guides, a pedal-shaft

operatively connected with and adapted to actuate the said drive-chains, a steering-post located within convenient reach of the driver's seat, and provided with a transverse bar, and connections between the ends of the said transverse bars and the rear portions of the rudders, substantially as set forth for the purpose described.

3. In a marine velocipede or water-craft, the combination of front and rear supporting-wheels, main drive-chains mounted thereon, blades having pivotal connection at their ends with the said drive-chains, supplemental main chains extending parallel with the main drive-chains and having connection with the said blades, and sprocket-wheels for supporting the said supplemental chains and revolving in unison with the aforementioned supporting-wheels, substantially as set forth for the purpose described.

4. In a marine velocipede or water-craft, the combination of front and rear supporting-wheels, main drive-chains mounted thereon, blades having connection at their ends with the said main drive-chains, supplemental chains having connection with the aforementioned blades and mounted upon sprocket-wheels in line with the respective supporting-wheels, and two sets of checks connecting each blade with the drive-chains and extending in opposite directions, substantially as set forth for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES A. SULZMAN.

Witnesses:

E. G. SIGGERS,

G. C. SHOEMAKER.