H. S. ALBRECHT.

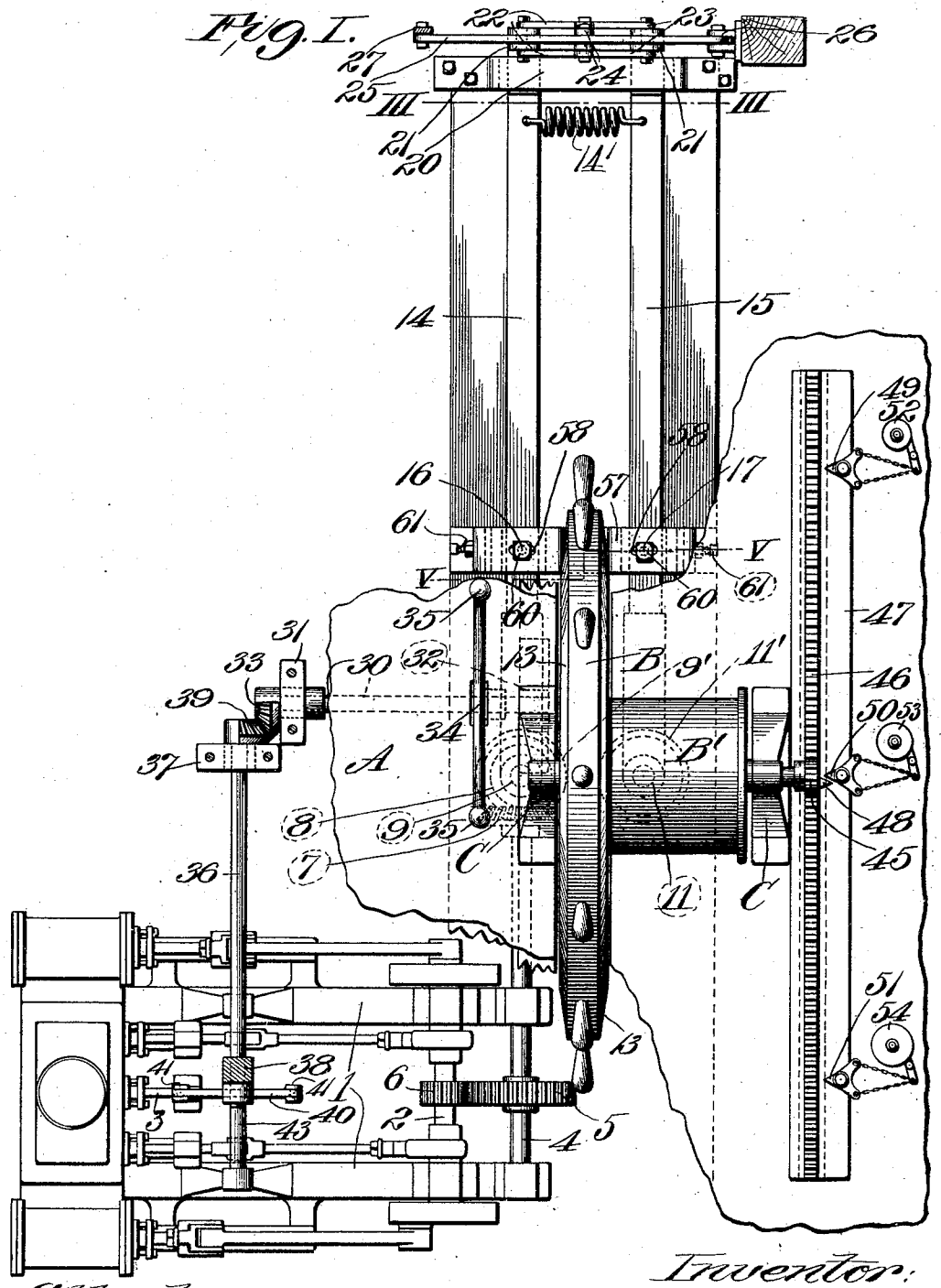
STEERING APPARATUS.

APPLICATION FILED MAR. 28, 1908.

906,089. Patented Dec. 8, 1908.

3 SHEETS—SHEET 1.

Fig. 1.



Attest:

Wm. H. Foth.

Blanche Hogan

Inventor:

H. S. Albrecht,

by Geo. H. Knight Atty.

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3 SHEETS—SHEET 2.

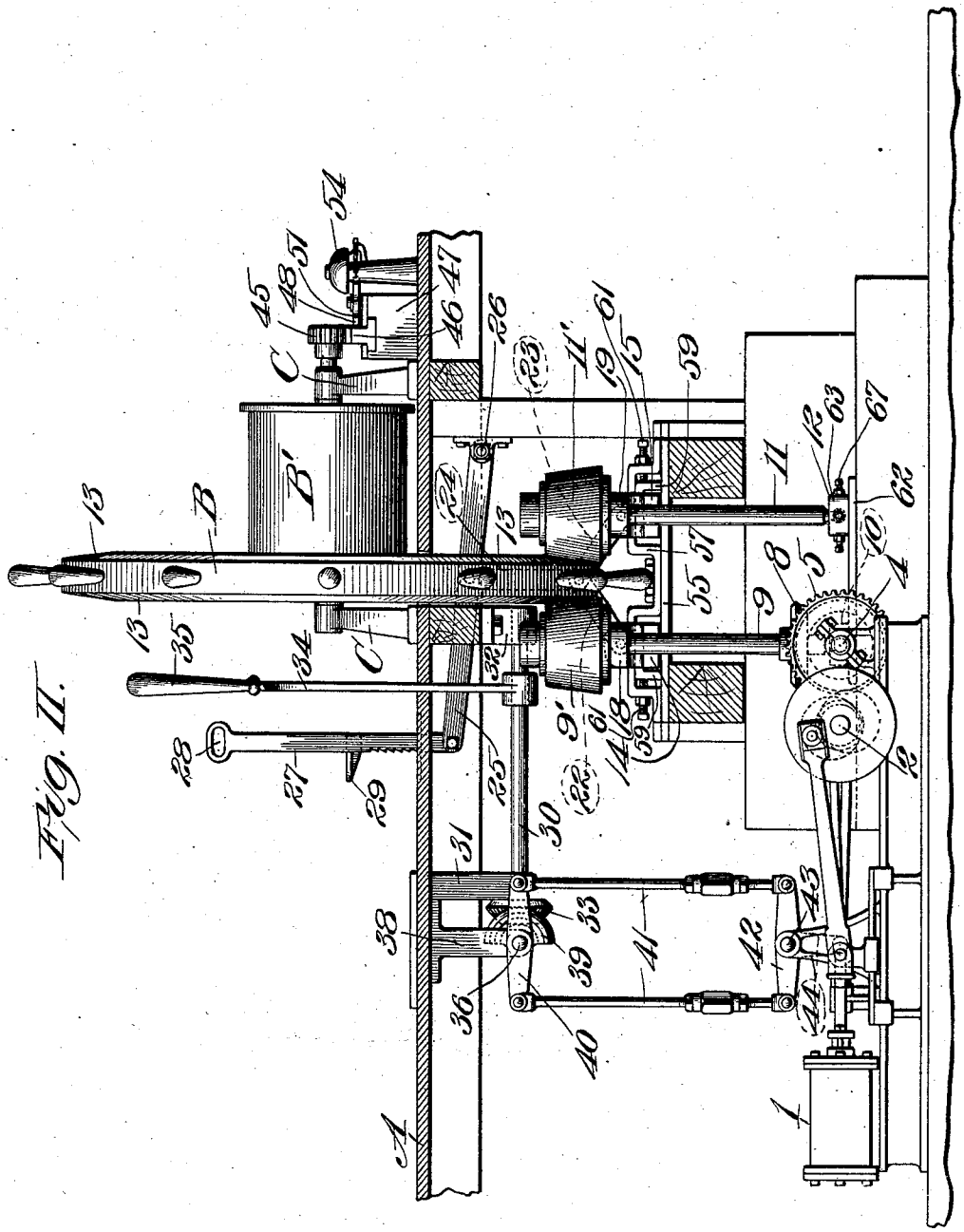

Fig. II.

Attest:
Wm. N. Scott
Blanche Hogan

Inventor:
H. S. Albrecht,
by Geo. H. Knight
Atty.

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3 SHEETS—SHEET 3.

Fig. III.

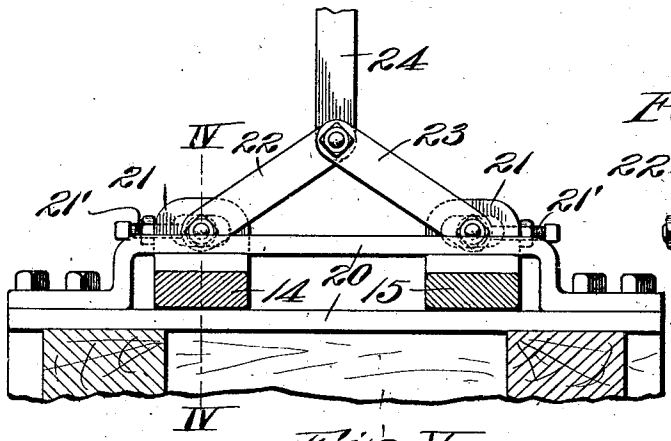


Fig. IV.

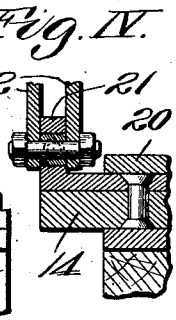


Fig. V.

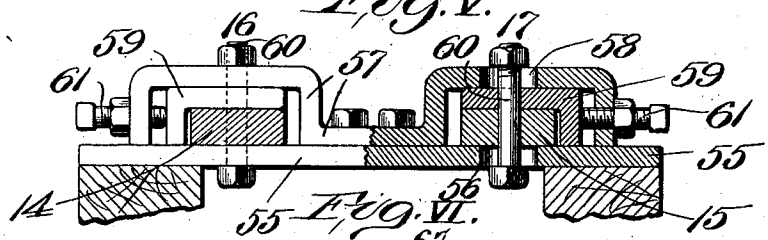


Fig. VI.

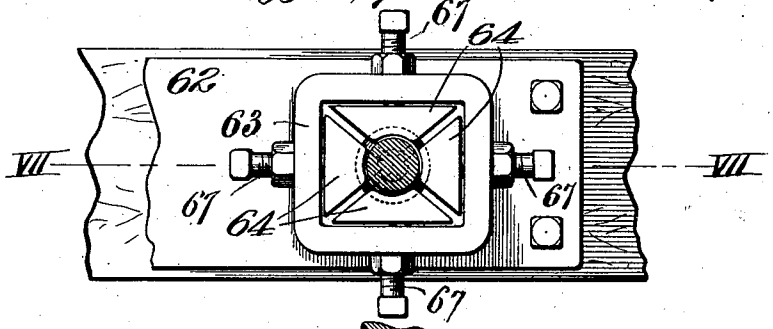
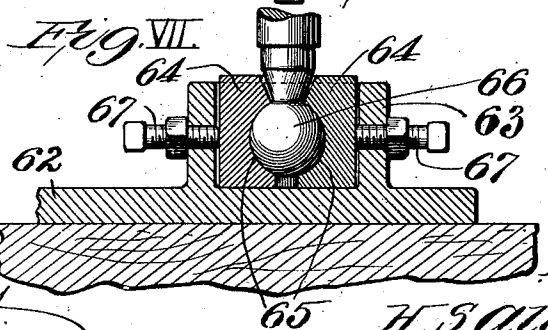


Fig. VII.



Attest:
Wm. A. Scott.
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Inventor:
H. S. Albrecht,
By Geo. H. Knight
Atty.

UNITED STATES PATENT OFFICE.

HERMAN S. ALBRECHT, OF ST. LOUIS, MISSOURI.

STEERING APPARATUS.

No. 906,089. Specification of Letters Patent. Patented Dec. 8, 1908.

Application filed March 28, 1908. Serial No. 423,812.

To all whom it may concern:

Be it known that I, HERMAN S. ALBRECHT, a citizen of the United States of America, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Steering Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a new and useful improvement in steering apparatus for steam boats and the like and has for its object to provide a motor and parts co-acting therewith to rotate the ordinary steering wheel of a boat by the proper manipulation of certain levers, obviating, by the mechanism I employ, the laborious task of operating the steering wheel manually.

Figure I is a top or plan view of my steering apparatus showing the same applied to the steering wheel and conjoined drum of a boat. Fig. II is a side elevation of the mechanisms shown in Fig. I, parts being shown in section. Fig. III is an enlarged transverse section taken on line III—III, Fig. I. Fig. IV is an enlarged transverse section taken on line IV—IV, Fig. III. Fig. V is a transverse section taken on line V—V, Fig. I. Fig. VI is an enlarged detail plan view of one of the toe bearing boxes employed in carrying out my invention. Fig. VII is a vertical section taken on line VII—VII, Fig. VI.

A designates a section of a pilot house floor.

B designates the steering wheel and B′ the windlass or cable drum conjoined thereto, said wheel and drum being located above the floor A and rotatively mounted in pedestals C, C, all of which parts are of well known construction.

1 designates a motor which, in this instance, is represented as a steam or other fluid pressure actuated engine, and consists of two cylinders, piston rods, cross heads, connecting rods, a crank shaft 2, valve controlling eccentrics and a cut-off and reversing valve (not shown), the rod of which I will designate by the character 3, (see Fig. I).

4 designates a horizontally disposed driven shaft mounted in suitable bearings in the side frames of the engine, which driven shaft has suitably secured thereto a gear wheel 5 which meshes with a pinion 6 suitably secured to the crank shaft 2 of the engine.

7 designates a bevel gear secured to one end of the driven shaft 4 and which meshes with a bevel gear 8 secured to a vertically arranged drive shaft 9. The lower end of the drive shaft 9 is seated in a toe-bearing 10 supported upon suitable timbers arranged upon the flooring upon which the engine is supported.

11 designates a vertically arranged idle shaft located parallel with the drive shaft 9 and which is seated in a toe-bearing 12. These shafts 9 and 11 have respectively secured to their upper ends beveled or conical friction wheels 9′ and 11′, the former being a drive wheel and the latter an idle wheel. The shafts 9 and 11 and their carried friction wheels, are arranged at right angles to, and in vertical alinement with the axis of the steering wheel, said shafts being arranged one on each side of said steering wheel. Each side of the rim of the steering wheel is provided with a beveled or tapered face 13, the degree of which is complementary to the degree of the beveled or conical faces of the friction wheels 9′ and 11′ and with which they, upon proper manipulation of mechanism hereinafter to be described, coöperate.

14 and 15 designate a pair of levers (see Figs. I and III to V inclusive) fulcrumed respectively at 16 and 17, and which are connected by a retracting spring 14′ at their outer or free ends. The inner ends of these levers carry bearings 18 and 19 for the upper ends of the shafts 9 and 11 respectively, the shafts being loosely fitted in the bearings 18 and 19 to permit of a certain amount of oscillatory motion of the said pair of shafts 9 and 11 when the said levers are moved to and fro. The outer or free ends of these levers 14 and 15 operate in a suitable stationary guide 20 and at the extremities of said outer ends are vertical ears 21, which have pivoted thereto toggle links 22 and 23 which are in turn pivotally connected to a vertical link 24.

21′ (see Fig. III.) designates horizontal adjusting screws which have threaded engagement with the vertical ears 21 and are designed to bear against the outer ends of the toggle links 22 and 23 to adjust the same to desired positions. The upper end of the vertical link 24 is pivotally connected to a horizontal lever 25 (see Fig. I) which is pivoted at 26 to suitable framework and the forward end of which is pivotally connected to a vertically movable controller bar 27. This controller bar 27 extends upwardly

through the floor A and is provided with a plurality of teeth designed to engage a floor plate whereby it may be held in any desired position. Said bar is also provided with a handle 28 and a foot piece 29, whereby the bar may be conveniently raised and lowered.

30 designates a rock shaft, preferably mounted below the floor A, parallel with the axis of the steering wheel, in suitable bearings 31 and 32 and to which is fixed a segmental bevel gear 33 (see Figs. I and II). This rock shaft 30 is also provided with an operating lever 34 which extends upwardly through a suitable opening formed in the floor A, its upper end being preferably provided with a pair of operating handles 35 arranged in convenient reach of an operator as he stands at the steering wheel.

36 designates a rock shaft arranged beneath the floor A in suitable bearings 37 and 38. The rock shaft 36 is disposed at preferably a right angle to the rock shaft 30 and carries upon one of its ends a segmental bevel gear 39 which meshes with the segmental bevel gear 33.

40 designates a cross arm fixed to the shaft 36 and connected by suitable rods 41 to a second cross arm 42 mounted upon a shaft 43 supported by the side frames of the engine 1 parallel with the driven shaft 4. The cross arm 42 has a centrally arranged depending arm 44 which is suitably connected to the cut-off and reversing valve rod 3 of the engine.

Before describing other details of construction of the device, I will set forth the operation of the mechanism as described up to this point: The controller bar 27, having been forced downwardly as far as it will reasonably go and locked in such position, forces, through the instrumentality of the lever 25, the vertical link 24, and toggle links 22 and 23 (which latter act as a toggle) the outer or free ends of the levers 14 and 15 apart, which, in turn, force the beveled or conical, friction wheels 9′ and 11′ tightly against the beveled or tapered rim 13 of the steering wheel. When it is desired to move the tiller of the boat in one direction or the other, all that is necessary to do is to operate the lever 34 in the proper direction which results, through the medium of the rock shafts 30 and 36, their respective gearing, and the cross arms 40 and 42, in operating the cut-off and reversing valve in such direction as to operate the engine in the direction desired. The engine, when in operation, through the gearing already described, drives the conical beveled or friction drive wheel 9′, which in turn drives the steering wheel B and its conjoined drum and winds and unwinds the respective tiller ropes or cables (not shown) upon the drum.

In order that the pilot of the boat may know the position of the tiller when operating the boat in the dark, I have provided audible signals preferably in the form of differently sounding bells which inform him whether the tiller is centrally arranged, or to the extreme right, or to the extreme left, these signals being produced by the following mechanism.

45 designates a pinion secured to one end of the steering wheel and drum shaft and which is in mesh with a sliding rack bar 46 suitably mounted beneath it on a support 47. This sliding rack bar carries a horizontally arranged trip finger 48 designed to move in the path of, and contact with, pivoted horizontally arranged bell crank levers or dogs 49, 50 and 51, each of which are connected to the horizontally arranged hammers of bells 52, 53 and 54 respectively. When the tiller of the boat is in a central position, the bell 53 will be sounded, and when said tiller has been moved to its extreme right or left position, one or the other of the bells 52 or 54 will be sounded as will be clearly understood.

It is desirable at times to adjust the fulcrum points of the pair of levers 14 and 15, and to permit of such adjustment I employ a lower stationary bearing bar 55 (see Figs. II and V) provided with longitudinal slots 56, and an upper bar 57 also provided with longitudinal slots 58, said bars being secured together in any desired way. The pair of levers 14 and 15 operate between these bars. Each of said levers is provided with an L-shaped block 59 held to its respective lever by a bolt 60 which passes through suitable alining openings formed in said levers and said blocks, said bolts 60 also passing through the aforesaid longitudinal slots 56 and 58.

61 designates adjusting screws mounted in the ends of the bar 57 and bearing against the blocks 59, whereby the latter may be moved to any desired position.

62 designates a bar provided with pockets 63 which afford toe bearings for the vertical shafts 9 and 11. Each of said pockets contains a plurality of adjustable bearing blocks proper 64 having inwardly disposed segmental spherically shaped recesses 65 in which are received the spherically shaped ends 66 of said vertical shafts 9 and 11.

67 are adjustment screws mounted in the walls of the pockets 63 and the ends of which bear against the blocks 64, whereby the latter may be adjusted inwardly to compensate for wear of the parts.

I claim:

1. The combination, with a steering wheel having a rim formed with beveled faces at its sides; of a vertical drive shaft having a beveled drive wheel located on one side of the rim, a vertical idle shaft having a beveled idle wheel and located on the other side of the rim, means for driving the vertical drive shaft, a pair of horizontally arranged

single levers having vertical ears at their outer ends, and provided with bearings in which the vertical shafts are journaled at their inner ends, a retracting spring connecting the outer ends of the single levers, a vertical link, toggle links connecting the ears of the single levers to the vertical link, and a horizontal lever to which the vertical lever is connected, having a controller bar.

2. The combination, with a steering wheel having a rim formed with beveled faces at its sides; of a vertical drive shaft having a beveled drive wheel, located on one side of the rim, a vertical idle shaft having a beveled idle wheel and located on the other side of the rim, means for driving the vertical drive shaft, a pair of horizontally arranged single levers having vertical ears at their outer ends, formed with slots, and provided with bearings in which the vertical shafts are journaled at their inner ends, a retracting spring connecting the outer ends of the single levers, a vertical link, toggle links having their lower ends adjustably mounted in the slots of the ears and connecting the ears of the single levers to the vertical link, adjusting screws bearing against the lower ends of the toggle links, and a horizontal lever, to which the vertical link is connected, having a controller bar.

3. The combination, with a steering wheel having a rim formed with beveled faces at its sides; of a vertical drive shaft having a beveled drive wheel, located at one side of the rim, a vertical idle shaft having a beveled idle wheel and located on the other side of the rim, means for driving the vertical drive shaft, a pair of horizontally arranged levers having vertical ears at their outer ends, and provided with bearings for the vertical shafts at their inner ends, means for adjusting the fulcrum points of the levers comprising lower and upper bars formed with longitudinal slots, L-shaped blocks, bolts extending through the levers and the L-shaped blocks, and adjusting screws, a retracting spring connecting the outer ends of the levers, a vertical link, toggle links connecting the ears of the levers to the vertical link, and a horizontal lever, to which the vertical link is connected, having a controller bar.

HERMAN S. ALBRECHT.

In presence of—

BLANCHE HOGAN,

H. G. COOK.