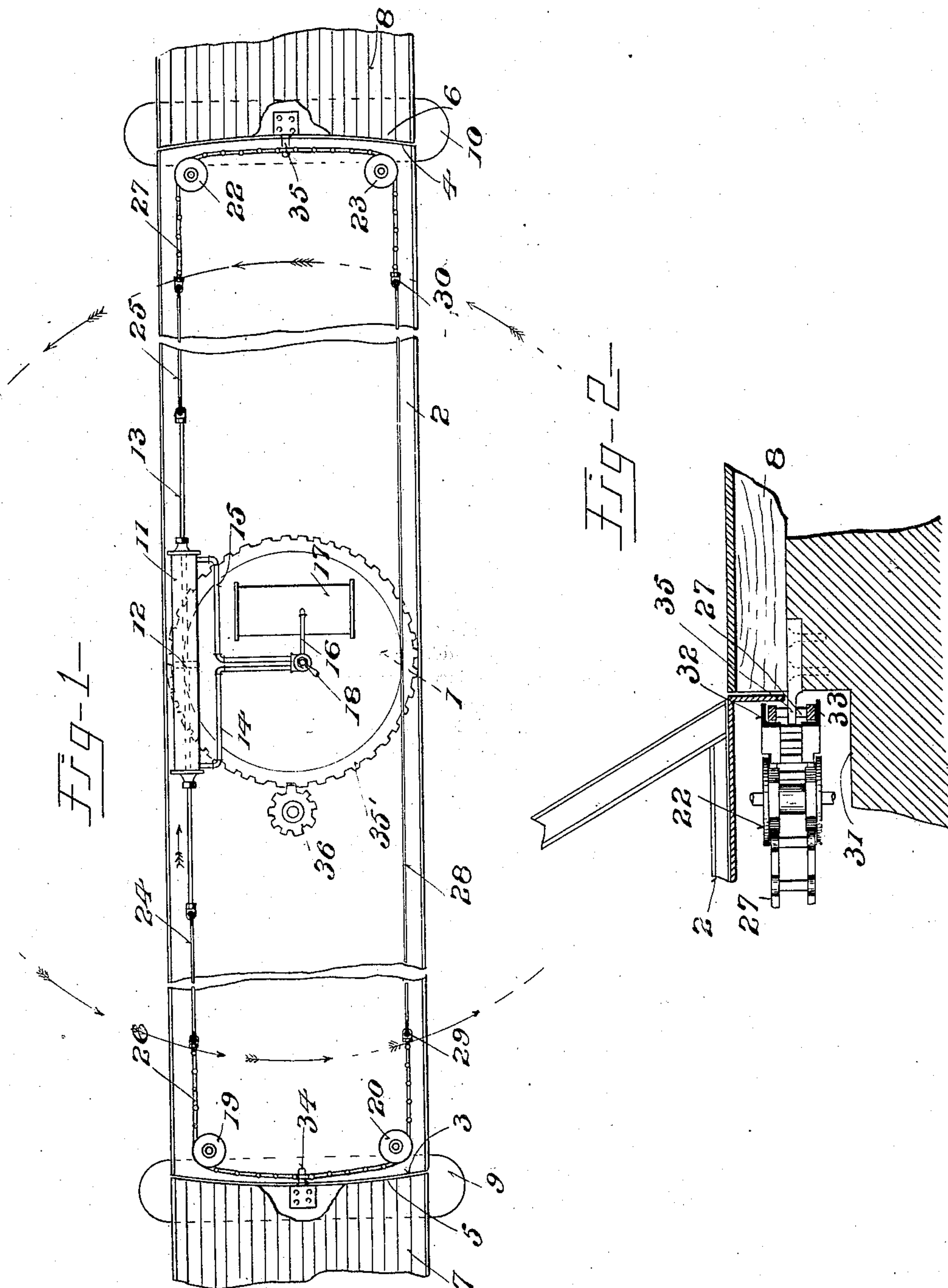


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DRAWBRIDGE.

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# UNITED STATES PATENT OFFICE.

GEORGE ALBERT WIELAND, OF DULUTH, MINNESOTA.

## DRAWBRIDGE.

No. 865,839.

Specification of Letters Patent.

Patented Sept. 10, 1907.

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To all whom it may concern:

Be it known that I, GEORGE ALBERT WIELAND, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Draw-bridges, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in draw-bridges, and pertains particularly to that class of bridges which are centrally pivoted and supported and operated from said central support.

The object of my invention is to provide an auxiliary operating means at the ends of the bridge which will greatly assist in their operation, and render them much safer and quicker in operation for use over water-ways susceptible to large volumes of shipping where many vessels are obliged to use the same.

Another object of my invention is to so construct said auxiliary operating means that it will serve as a cushioning device when closing the draw.

In the accompanying drawings, Figure 1, is a top plan view of a drawbridge of the type above referred to, and showing my invention applied thereto. Fig. 2, is an enlarged vertical sectional view showing my auxiliary driving mechanism connection between the movable and stationary part of the bridge.

In bridges of this character, the operating means is operated entirely on the central support, and therefore the operation is very slow and especially at the starting thereof, and stopping, and in order to obviate these difficulties I provide my auxiliary attachment which operates at the end of the bridge and therefore aids in more rapidly starting the draw in its outward movement.

Referring now to the drawings, 1 represents the central abutment or pier which, as shown in dotted lines, is of a circular form, and mounted thereon is the draw 2. This draw may be mounted in any well known manner and provided with any desired operating means, as this forms no part of my invention, as my attachment can be used in connection with any form of central operating mechanisms. In order to illustrate my invention, I have drawn the central pier 1 with the continuous rack 35', and into which meshes the spur gear or pinion 36, this latter being carried by the draw and operated by steam, compressed air, or electricity, whereby the draw is caused to travel around said gear. The ends of the draw 2 are curved at 3 and 4 to correspond to the curve 5 and 6 of the two stationary portions 7 and 8 of the bridge, and said stationary portions 7 and 8 being supported by the abutments or piers 9 and 10, all of which is well understood by those skilled in the art.

Located centrally upon the draw is a cylinder 11 which is provided with a piston 12 therein, and said piston being provided with a double piston rod 13, which extends outwardly through both ends of the cylinder. The cylinder, as shown, is adjacent one edge of the draw and extends longitudinally thereof, and the double piston rod necessarily extends longitudinal of the draw.

Connected to opposite ends of the cylinder are two pipes 14 and 15 which are connected to a single pipe 16, which is connected to a compressed air cylinder or tank 17, compressed air being the preferred power for operating the piston, although it will be understood that steam may be used if desired. Electricity may be employed to operate a motor which in turn would operate the chains 26 and 27 the same as the piston rods.

The pipes 14 and 15 at the juncture with the pipe 16 are provided with a two-way valve 18 by means of which the compressed air can be turned from the pipe 16 into either of the pipes 14 and 15 for supplying either end of the cylinder with compressed air or steam, or, as before stated, the chains 26 and 27 may be worked by electricity, or any other power.

The movable section 2 adjacent the curved end 3 is provided with two blocks or pulleys 19 and 20 which are located on opposite sides thereon, while adjacent the other curved end 4 are two pulleys 22 and 23 which are located similarly to the pulleys 19 and 20. The pulleys 19 and 22 are, as shown, horizontally pivoted and the outer peripheries thereof are in a line with the piston rod 13 and extending and connected to the said piston rods are the cables 24 and 25 which are swiveled thereto, and the outer ends thereof have a swivel connection with the chains 26 and 27 which extend outwardly around the pulleys 19 and 22. The said chains extend inwardly across the ends of the movable section and around the pulleys 20 and 23, and the ends of said chains are connected together by a cable 28. Said cable, as shown, has swiveled connections with the chain, as indicated at 29 and 30, and extends longitudinally of the movable bridge section. As shown in Fig. 2, all of this mechanism is located beneath the flooring of the movable section, and the abutments or piers 9 and 10 of the stationary portion of the bridge are cut away as indicated at 31 to allow the chain and the pulleys to freely pass the same. The ends of the movable sections are provided with curved guide ways for the chain which correspond with the curvature of the ends of said sections. Said guide ways, as shown, are formed of two angle bars 32 and 33 whereby the chain is at all times held in the curved position, as shown in Fig. 1, as will be hereinafter more fully described.

The curved portions 5 and 6 of the stationary sections 7 and 8 are provided at the center with the inwardly-



extending arms or pins 34 and 35 which are in a plane with the chains 26 and 27, and enter the links thereof, as clearly shown in both figures of the drawings, the operation of which will be fully described.

- 5 The bridge being in the position shown, the piston 12 is at the center of the cylinder, and thus it is adapted to work in either direction, but in coöperation with the usual operating mechanism. The movable section being operated in the direction indicated by arrow in
- 10 Fig. 1, the usual operating mechanism is started and the draw is started to swing in the direction indicated by the arrow in Fig. 1. Simultaneously with the starting of the usual operating mechanism the valve 18 is turned so that the compressed air or steam passes into
- 15 the cylinder 11 through the pipe 14 moving the piston rod 13 in the direction indicated by the arrow in Fig. 1, and the chain 26 being connected or interlocked with the pin 34, there is a pulling action between the said chain and pin which tends to move the movable section in the direction indicated by the arrow on the left of Fig. 1. The chain 26 through the cable 28 is exerting a pulling action on the chain 27, and moving the opposite end of the movable section of the bridge in the direction indicated by the arrow on the right of Fig. 1,
- 20 and thus aids in starting the said section on its outward movement. When the pulleys 19 and 23 have reached the pins 34 and 35 they disengage from the chains 26 and 27, caused by the curved position of the chains, and the usual operating mechanism carries the section outwardly to a point transverse the bridge, so that the channel on each side of the center pier is open to allow vessels to pass on each side thereof. This construction also serves as means for limiting the closing movement of the movable section. As the movable section closes
- 25 the links of the two chains 26 and 27 will engage the pins 34 and 35 on the ends of the stationary piers, and thus cause the chains to assume their original position which will carry the piston back towards the center of the cylinder. In doing this a compression of air is
- 30 formed back of the piston and this being controlled by the operator of the valve, the closing of the draw can be regulated as desired.

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

- 45 1. The combination with a pivotally operative bridge, of accelerating means at the ends thereof designed to engage with the end piers of the bridge.
2. The combination with a pivotally operative bridge, of accelerating means independent of the operative means.
- 50 3. A drawbridge, comprising a movable section centrally supported, means for operating said movable section at the center, and auxiliary operating means at the ends of the movable section.
4. A drawbridge, comprising a movable section centrally
- 55 supported having the usual operating means and auxiliary operating means at the ends of the movable section and adapted to be used as a cushioning means during the closing thereof.
5. A drawbridge, comprising a movable section centrally
- 60 supported and having the usual operating means, and auxiliary operating means engaging the stationary part of the bridge and adapted to aid in starting the movable section on its outward movement.
6. A drawbridge, comprising a movable section centrally
- 65 supported and having the usual operating means and auxiliary operating means engaging the stationary part of the bridge, and adapted to aid in starting the movable section on its outward movement and retarding it on its inward movement.
- 70 7. A drawbridge, comprising a movable section centrally

supported and having the usual operating means, and an auxiliary operating means carried by the movable section and engaging the stationary part of the bridge.

8. A drawbridge, comprising a movable section centrally supported and having the usual operating means and auxiliary operating means, carried by the ends of the movable section, and engaging the stationary part of the bridge. 75

9. A drawbridge comprising a movable section centrally supported and having the usual operating means, and chains carried by the movable section and engaging the stationary part of the bridge for aiding in starting the movement of the movable section. 80

10. A drawbridge, comprising a movable section centrally supported and having the usual operating means, and chains passing around the ends of the movable section and engaging the stationary part of the bridge for aiding in starting the movement of the movable section. 85

11. A drawbridge, comprising a pivoted movable section having the usual operating means, chains traveling around the ends of the movable section for engaging the stationary part of the bridge, and means carried by the movable section for operating said chains for aiding in the starting of the movable section. 90

12. A drawbridge, comprising a pivoted movable section having the usual central operating means, means carried by the ends of the movable section for engaging the stationary part of the bridge, and means centrally carried by the movable section for operating the engaging means at the end thereof for aiding in starting the movable section outwardly. 95

13. A drawbridge, comprising a pivoted movable section having the usual central operating means, chains passing transversely across the ends of said movable section, pins carried by the stationary part of the bridge and entering the chains, and means carried by the movable section for operating the chains for aiding in starting the movable section outwardly. 100

14. A drawbridge, comprising a pivoted movable section having the usual central operating means, chains passing transversely across the ends of said movable section, pins carried by the stationary part of the bridge and passing into the links of said chains, a cylinder carried by the movable section, a piston therein, a double piston rod carried by the piston and extending through the ends of the cylinder, cables operatively connecting the chains to said piston rod. 105

15. A drawbridge, comprising a pivoted movable section having the usual operating means, pulleys carried by the ends of said movable section, chains passing around the said pulleys and extending transversely across the ends of said movable section, pins carried by the stationary part of the bridge and passing into the links of the chains, a cable connecting two free ends of said chains, and an operating means connecting the opposite ends of the chains, whereby the chains aid in starting the movable section when the same is being closed and a cushion for stopping said section. 110

16. A drawbridge, comprising a movable section having the usual operating means, pulleys carried by the ends of said movable section, chains passing around said pulleys and extending transversely across the ends of said movable sections, guideways extending across said sections and in which the chain travels to limit the inward movement of the chains, pins carried by the stationary part of the bridge and passing into the links of the chains, and means for operating said chains. 115

17. A drawbridge, comprising a movable section having the usual operating means, pulleys carried by the ends of the said movable section, and oppositely arranged, chains passing around said pulleys and extending transversely across the ends of said movable sections, guideways formed of curved angle bars and in which the chain travels to limit the inward movement of the chains, pins carried by the stationary parts of the bridge and passing into the links of the chains and means for operating said chains. 120

18. A drawbridge, comprising a movable section having the usual operating means, pulleys carried by the ends of the said movable section, chains passing over said pulleys and extending transversely across the ends of the movable section, a cable connecting the ends of said chains, a cyl- 125



inder carried by the movable section, a piston therein, a double piston rod carried by the piston and extending out through the ends of the cylinder, cables connecting the ends of the piston rod with the chains, and means for admitting air or steam to both ends of the cylinder.

19. A drawbridge comprising a movable section having the usual operating means, pulleys carried by the ends of said movable section, chains passing around the pulleys and extending transversely of the section, a guideway formed of curved angle bars and in which the chains travel to limit the inward movement of the chains, pins carried by the stationary part of the bridge and passing into the links of the chains, a cable connected to two ends of the chains, a cylinder extending longitudinally of the movable section, a piston therein, a double piston rod carried by the piston and extending out through the ends of the cyl-

inder, cables connected to the ends of the piston rods, and connected to the opposite ends of the chains, pipes connected to the ends of the cylinder and means for supplying compressed air or steam to either end of the cylinder.

20. A bridge, comprising a movable section pivotally supported and having the usual operating means, and auxiliary operating means engaging the stationary part of the bridge and adapted to aid in starting and stopping the movable section.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE ALBERT WIELAND.

Witnesses:

FRED. W. WIELAND,  
S. GEO. STEVENS.