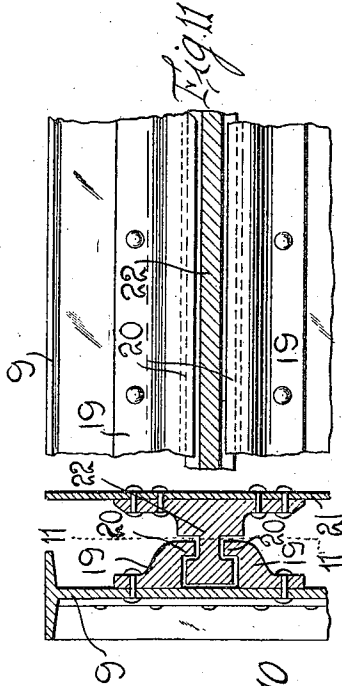
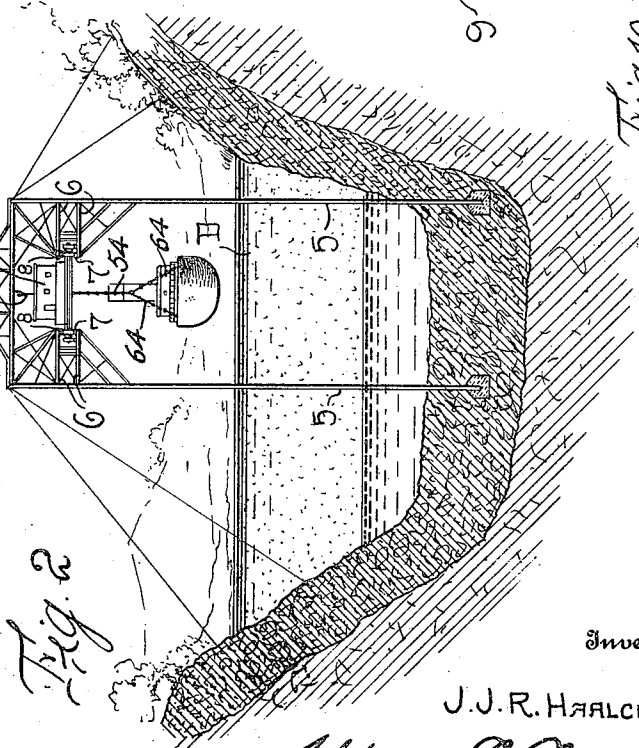
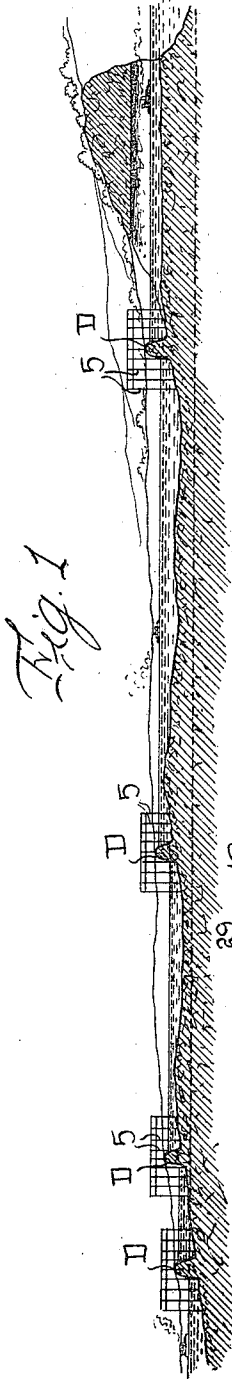


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APPLICATION FILED SEPT. 19, 1917.

Patented Mar. 19, 1918.
5 SHEETS—SHEET 1.



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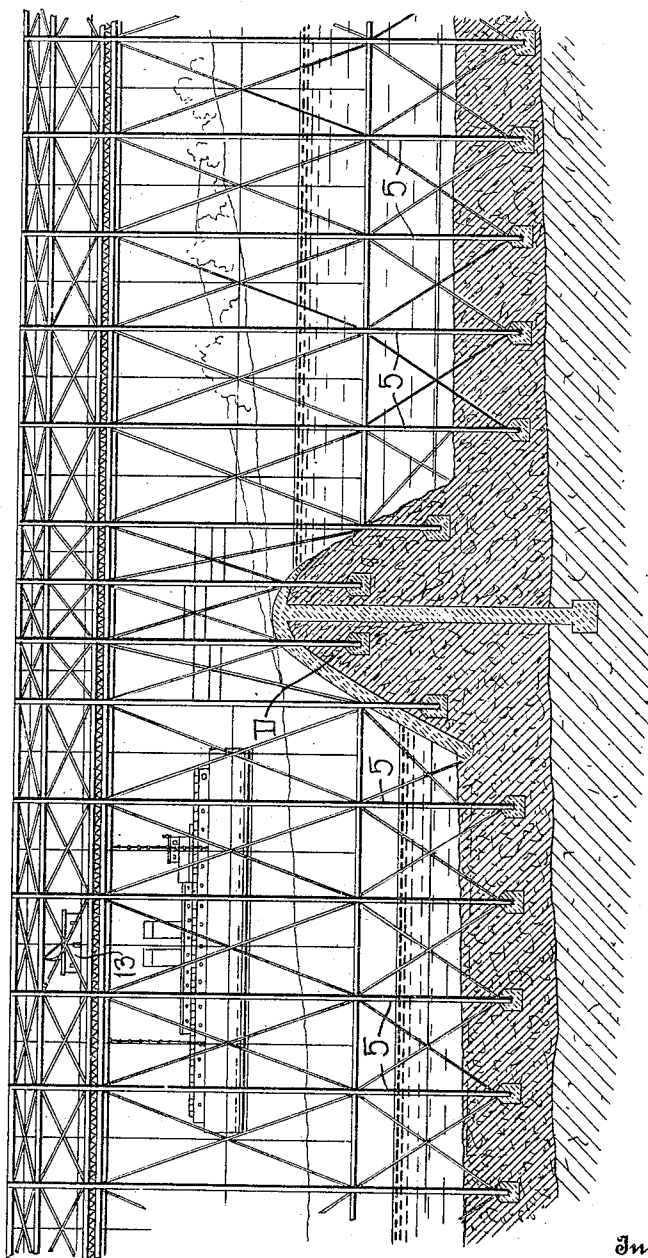
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Fig. 3



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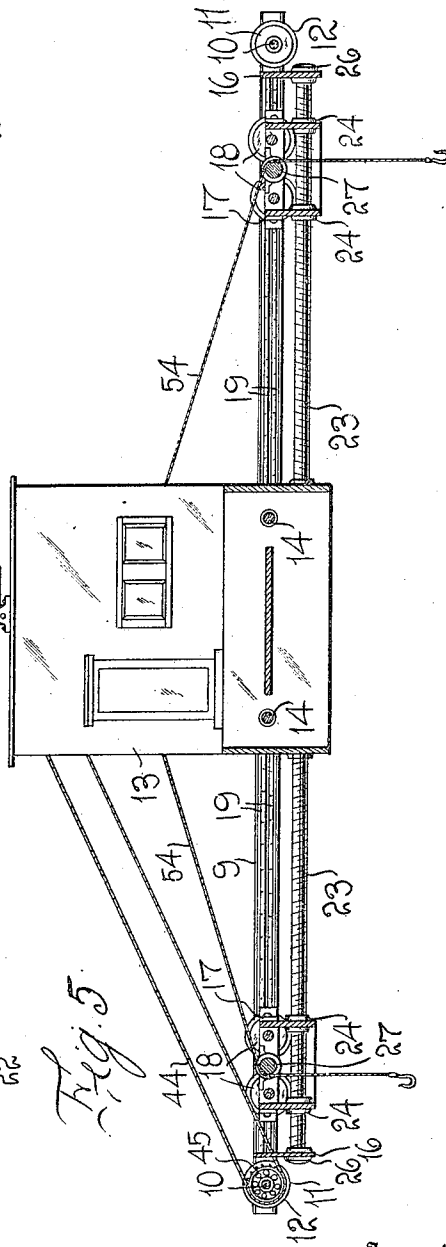
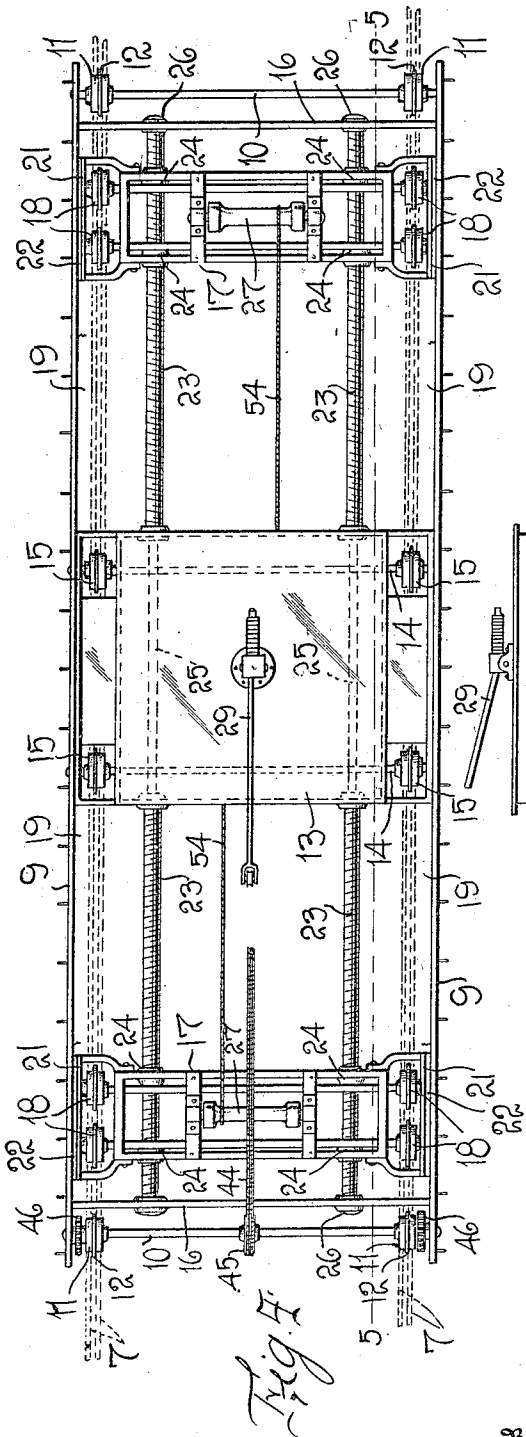
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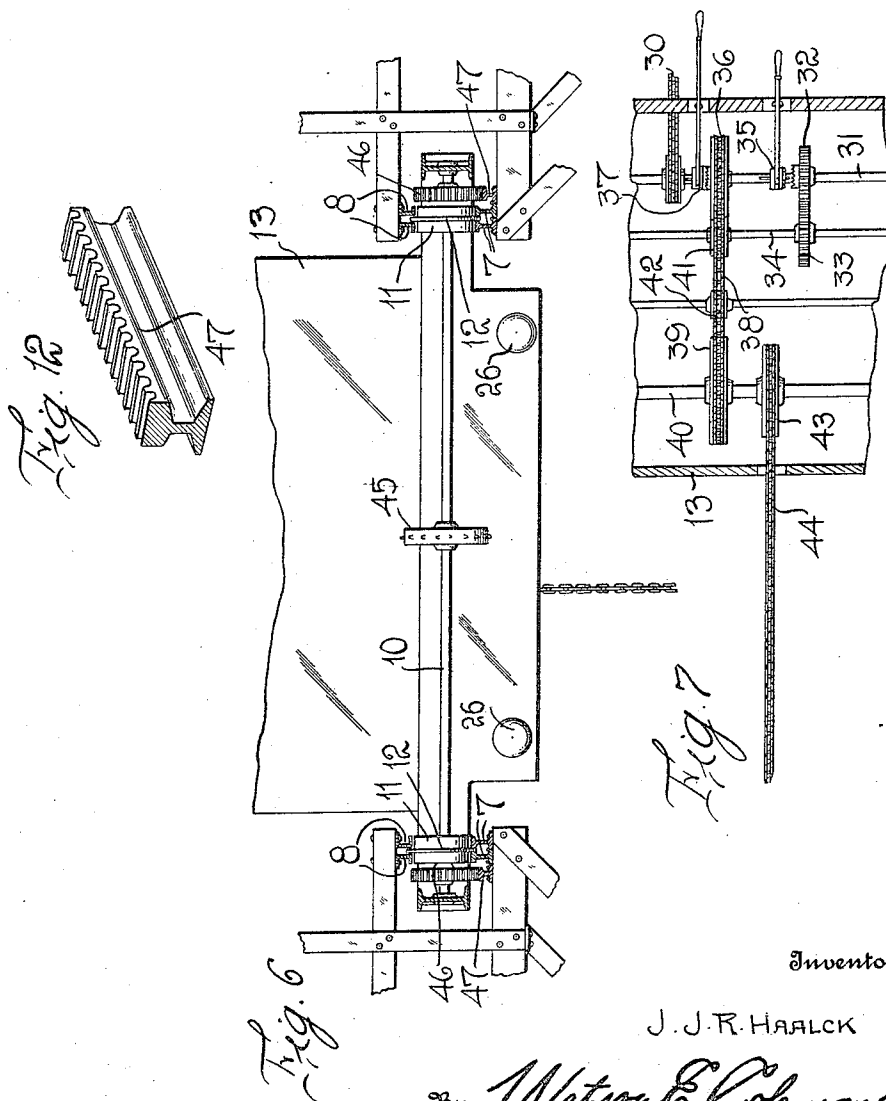
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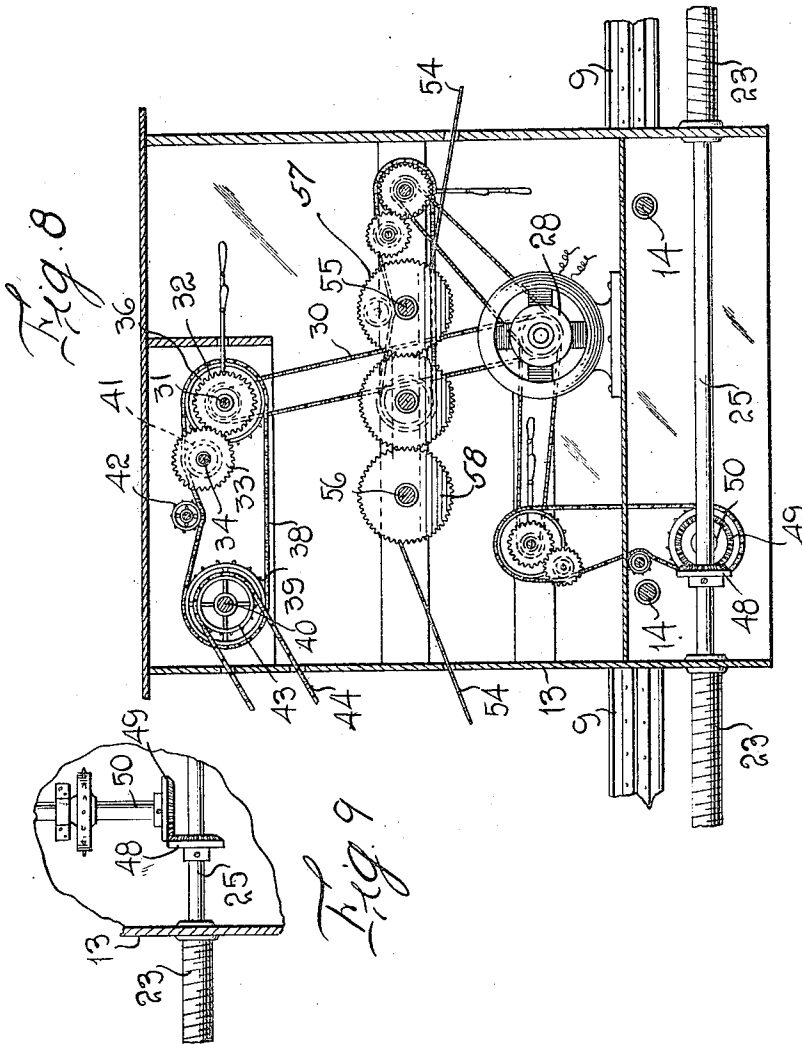
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UNITED STATES PATENT OFFICE.

JOHANN JURGEN RICHARD HAALCK, OF SALT LAKE CITY, UTAH.

TRANSPORTING APPARATUS.

1,259,619.

Specification of Letters Patent.

Patented Mar. 19, 1918.

Application filed September 19, 1917. Serial No. 192,151.

To all whom it may concern:

Be it known that I, JOHANN JURGEN RICHARD HAALCK, a subject of the German Emperor, residing at Saltair, Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Transporting Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to transporting apparatus and more particularly to an apparatus for transporting vessels over dams.

It is the primary object of the present invention to provide an apparatus for the above purpose, which is capable of transporting freight boats and other vessels over high and low dams in waterways which would otherwise be unnavigable.

The invention also has for another important object to provide a tower construction at a suitable height above the dam, a crane movable upon the tower, and carriages movable toward and from each other on the crane and carrying means whereby the vessel may be elevated and suspended from the crane.

It is one of the more particular objects of the invention to provide improved means for mounting and operating the relatively movable carriages.

The invention also has for an additional object the provision of improved means for mounting the crane upon the tower structure for traveling movement, stationary racks mounted upon the tower, and means on the crane coöperating with said racks to effect a unitary movement of the crane and the relatively movable carriages.

It is a further general object of the invention to provide a relatively simple apparatus for the above purpose, which is strong and durable in its construction, comparatively inexpensive, and highly reliable in practical use.

With the above and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which,

Figure 1 is a diagrammatic view illustrating a waterway having a plurality of dams in conjunction with each of which my improved transporting apparatus is employed;

Fig. 2 is an end elevation showing a vessel

being transported over a dam by means of the apparatus;

Fig. 3 is a side elevation;

Fig. 4 is a top plan view;

Fig. 5 is a section taken on the line 5—5 of Fig. 4;

Fig. 6 is an enlarged end elevation illustrating the mounting of the traveling crane;

Fig. 7 is a detail horizontal section showing the means for controlling the movement of the crane;

Fig. 8 is a detail vertical section through the operator's compartment;

Fig. 9 is a detail plan view of the gearing for transmitting rotation to the carriage operating worms;

Fig. 10 is a detail transverse section illustrating the manner of mounting the carriages for movement upon the crane;

Fig. 11 is a section taken on the line 11—11 of Fig. 10;

Fig. 12 is a detail fragmentary perspective view of one of the rack bars upon which the crane travels.

Referring in detail to the drawing, 5 designates the vertical uprights of a tower or trestle structure, which are suitably anchored at their lower ends in concrete bases or other anchoring means in the bed of the river. These uprights are arranged in two parallel, longitudinal series suitably spaced apart, and to their upper ends the inwardly projecting, spaced, horizontal supports 6 are fixed and suitably braced from the uprights. These horizontal supports are arranged at the necessary elevation above the dam indicated at D, so that freight boats or other vessels of predetermined dimensions may be transported over the dam.

Upon the lower supports 6 of the trestle structure, spaced rails 7 are mounted and suitably secured, and above these rails, parallel angle bars 8 are fixed to the upper series of lateral supports 6. Upon the pairs of rails 7, a crane is arranged for longitudinal traveling movement; said crane including the longitudinal, parallel I-beams 9, in the ends of which the transverse shafts 10 are suitably journaled. Upon the opposite ends of each of these shafts, wheels 11 are fixed to travel upon the track rails 7, and each of said wheels is formed with a central, annular flange 12 for engagement between the heads of the track rails and between the angle bars 8. An operator's compartment 13 is centrally arranged between the beams

9 and suitably fixed thereto. Additional transverse shafts 14 also extend through the opposite ends of this compartment and have track wheels 15 on their opposite ends to travel upon the rails 7. In this manner, it will be seen that the traveling crane is properly supported for longitudinal movement upon the trestle structure, and at the same time, securely retained against any transverse shifting movement with respect thereto. The I-beams 9 are also connected at their ends inwardly of the shaft 10, by the transverse bars 16.

A carriage 17 is arranged upon each side of the operator's compartment 13, and each of these carriages is provided with parallel axles having wheels 18 on their opposite ends to travel upon the rails 7. To the inner sides of the beams 9, longitudinally extending guide bars 19 are fixed, said bars having tongues 20 projecting toward each other and disposed in spaced relation. Upon the end plates 21 of each carriage, a T-shaped bar 22 is secured, the head of said bar loosely fitting between the bars 19. Thus, the carriages are properly guided in their movement and held against any transverse movement relative to the side beams 9 of the crane.

23 designates worm screws which have threaded engagement in the bearing sleeves 24 fixed to each carriage. One of these screws is operatively connected with the carriage at each end thereof, and the longitudinally aligned worm screws are rigidly connected to each other by a shaft 25 extending through the operator's compartment 23. The outer ends of the screws are journaled and supported in suitable bearings 26 on the transverse bar 16. Each of the carriages 17 carries a drum 27, the purpose of which will be presently pointed out.

A motor 28 is arranged within the compartment 13 and receives its current from the trolley pole 29 mounted upon the top of said compartment and having the usual wheel to travel upon a trolley wire which is charged from any suitable current generating source. The shaft of this motor is connected by a chain 30 to a shaft 31 mounted in the upper portion of the compartment 13. A gear 32 is loosely mounted upon said shaft and meshes with the gear 33 on a parallel shaft 34. The gear 32 may be locked on the shaft 31 by a manually operable clutch member 35 keyed upon the shaft. A sprocket wheel 36 is also loose on the shaft 31 and is adapted to be locked to the shaft for rotation therewith by a second shiftable clutch member 37. The sprocket wheel 36 is connected by an endless chain 38 to a sprocket 39 fixed upon a shaft 40, and the upper stretch of this chain engages a sprocket 41 fixed upon the shaft 34. The sprocket pinion 42 is arranged above and bears upon the

upper stretch of said chain to hold the same taut. Upon the shaft 40, the sprocket wheel 43 is fixed, around which the chain 44 extends, said chain extending to the sprocket wheel 45 on one of the shafts 10. Upon the ends of this latter shaft 10, the cog gears 46 are fixed to engage with the respective longitudinal rack bars 47 which are suitably secured to the lower series of lateral supports 6 of the trestle structure. Thus, it will be apparent that when the gear 32 is loose on the shaft 31 and the gear 36 locked on the shaft by means of the clutch 37, rotation will be transmitted in one direction through the chain 44 to the shaft 10, thus causing a travel of the crane in the desired direction upon the supporting trestle. The movement of the crane may be reversed by throwing out the clutch 37 and locking the gear 32 on the shaft 31 through the medium of the clutch 35. Rotation will then be transmitted through the medium of the shaft 34 to the sprocket 41 engaging the upper stretch of the chain 38, and the direction of rotation of the shaft 10 reversed.

Upon each of the shafts 25 connecting the corresponding worms 23, a bevel gear 48 is secured, with which similar gears 49 on the ends of the transverse shaft 50 have meshing engagement. This shaft is driven through the medium of the chain 51 from a shaft 52 which, in turn, is driven by the chain 53 from the motor shaft. Reversing gearing similar to that just described, is provided, whereby the direction of rotation of the shaft 50 may be reversed, and the rotation of the worms 23 reversed to move the carriages inwardly or outwardly, as desired. It will be understood that the turns of the corresponding aligned worms 23 extend in relatively opposite directions.

A lifting cable 54 extends over each of the drums 27 mounted in the carriages 17. These cables extend into the compartment 13 through the side walls thereof, and one cable is wound in one direction around the drum on the shaft 55 and the other cable is wound in a relatively opposite direction around the drum of the shaft 56. To the ends of these drum shafts, gears 57 and 58 respectively are secured and engaged at opposite points by an intermediate gear 59 fixed upon a shaft 60. This shaft is driven by an endless chain 61 from the shaft 62 which, in turn, is driven by the chain 63 from the shaft of the motor 28. Manually controllable, reversing gearing, as previously referred to, is also provided for transmitting power to the shaft 60, whereby the rotation of the drum shafts may be reversed when desired. To the free ends of the cables 54, branch cables 64 are connected, having terminal hooks or other suitable means whereby they may be attached to opposite ends of a vessel.

In the operation of the above described form of the apparatus, when the vessel approaches the dam, the operator in the compartment 13 shifts the gearing to transmit rotation to the shaft 10 in the proper direction and thus move the crane to one end of the trestle or supporting structure and above the vessel. The shafts 55 and 56 are then operated to unwind the cables 54 from the respective drums so that the free ends of the cables will be lowered to the deck of the vessel. After these cables have been properly attached, the signal is given to the operator in the compartment 13 and the rotation of the drums is reversed to wind the cables thereon, thus elevating the vessel from the water so that its entire weight will be supported by the traveling crane. It will, of course, be understood that suitable means is provided for locking the several operating gearings against operation. The sliding carriages 17 are first actuated and suitably spaced from each other so that the ends of the cables 54 will extend downwardly above the opposite ends of the vessel. Thus, these cables may be properly positioned in accordance with the length of the particular vessel. After the vessel has been elevated in this manner to a suitable height, rotation is transmitted to the shaft 10 having the gears 46 thereon, in the proper direction so as to cause the crane to travel longitudinally and thus move the vessel to a position on the opposite side of the dam. The cable drums are then released so that the vessel will be again lowered into the water, when it may proceed upon its way. In this manner, it will be understood that freight vessels of various sizes may be easily and quickly lifted and transported over dams and the river thus rendered navigable for the facilitation of commerce.

From the foregoing description, taken in connection with the accompanying drawings, the construction, manner of operation and several advantages of the described form of my apparatus will be clearly and fully understood. My improved transporting means for the vessels may be installed either in instances where the closed dam is used or where a dam of the lock type is employed, and the towers or superstructures may be built of various heights in accordance with the particular conditions or circumstances encountered in the erection of the apparatus. While I have indicated in the accompanying drawings a particular type of dam and tower or trestle work construction, it will be understood that these illustrations are simply conventional, and the present invention is in no manner limited thereto. The construction of the traveling crane, as well as the specific means provided for the mounting of the same upon the superstructure, can likewise be consid-

erably varied, and the form, construction and relative arrangement of the detail parts of the apparatus are also susceptible of considerable modification. I, therefore, reserve the privilege of adopting all such legitimate modifications therein as may be fairly embodied within the spirit and scope of the invention as claimed.

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

1. In an apparatus of the character described, the combination with a supporting structure, of a crane mounted to travel thereon, manually controllable means for moving the crane upon the supporting structure, cable drums mounted upon the crane, means for actuating the same, a pair of sliding carriages mounted on the crane, each carriage being provided with a cable supporting roller, and means for moving the carriages in unison toward or from each other upon the crane.

2. In an apparatus of the character described, the combination with a supporting structure, of a crane mounted to travel thereon and provided with a plurality of supporting trucks, racks fixed upon the supporting structure, a shaft mounted upon the crane, gears on the shaft meshing with the respective racks, operating means for said shaft including reversing gearing whereby the crane may be moved in either direction upon the support, cable drums mounted upon the crane and means for actuating the same, cable supporting carriages movably mounted upon the crane, and means for moving the carriages in unison toward or from each other.

3. The combination with a supporting structure, of a crane having a plurality of trucks, spaced pairs of upper and lower guides mounted upon the supporting structure between which the truck wheels are engaged, racks fixed to the supporting structure in parallel relation to the guides, gears on the crane meshing with the respective racks, manually controlled means for operating the gears to move the crane in either direction upon the supporting structure, and elevating means carried by the crane.

4. The combination with a supporting structure, of a crane mounted to travel thereon, manually controlled means for moving the crane in either direction, carriages longitudinally movable upon the crane, elevating means carried by the crane including cables supported by the respective carriages, worms operatively engaged with the carriages to move the same toward or from each other upon the crane, and manually controlled means for operating the worms.

5. The combination with a supporting structure, of a crane mounted to travel

thereon, manually controllable means for moving the crane in either direction, spaced carriages removably mounted upon the crane and each provided with truck wheels, spaced
5 pairs of guide rails fixed to the supporting structure upon which said truck wheels are mounted, elevating means carried by the crane including cables supported by the respective carriages, and manually control-
10 able means for moving the carriages in unison toward or from each other.

6. The combination with a traveling crane, of spaced carriages longitudinally movable upon the crane, elevating means
15 carried by the crane including cables supported by the respective carriages, and manually controllable means operatively connected to the carriages to move the same in unison toward or from each other.

20 7. The combination with a traveling crane, of spaced carriages movably mounted upon the crane and each provided with truck

wheels, relatively fixed pairs of upper and lower longitudinal guides between which the truck wheels are engaged, spaced worms
25 operatively engaged with each of the carriages, and manually controllable means for operating said worms to move the carriages in unison toward or from each other.

8. The combination with a traveling
30 crane, of guides fixed upon the frame, spaced carriages each having means movably engaged in the guides, elevating means including a cable supported by the respective carriages, worms operatively engaged with said
35 carriages, and manually controllable means for operating said worms to move the carriages in unison toward or from each other.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 40

JOHANN JURGEN RICHARD HAALCK.

Witnesses:

B. L. LIBERMAN,
DANE WOLF.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."