S. SANNA.

BRIDGE.

APPLICATION FILED JUNE 24, 1911.

1,052,971.

Patented Feb. 11, 1913.

3 SHEETS—SHEET 1.

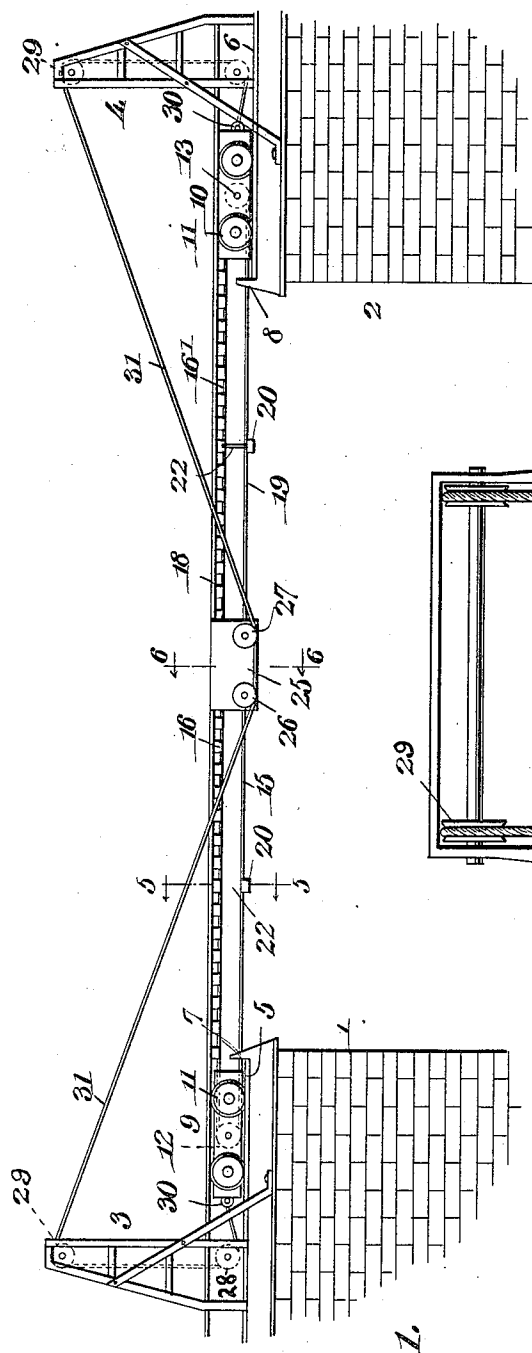

Fig. 1.

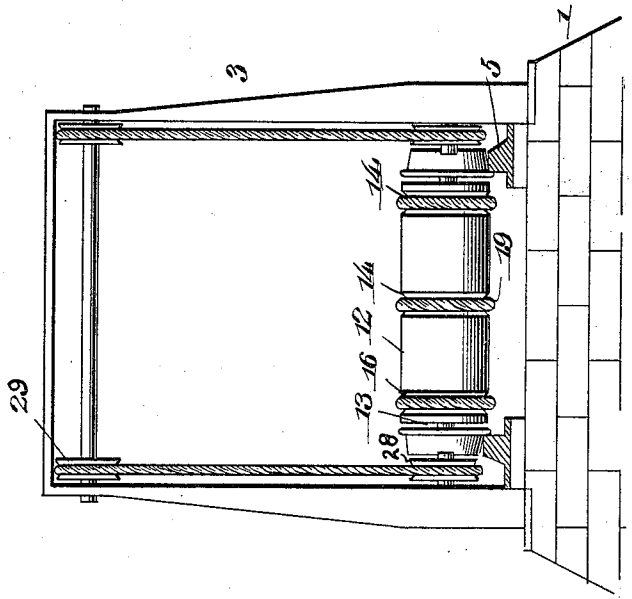

Fig. 3.

Witnesses

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3 SHEETS—SHEET 2.

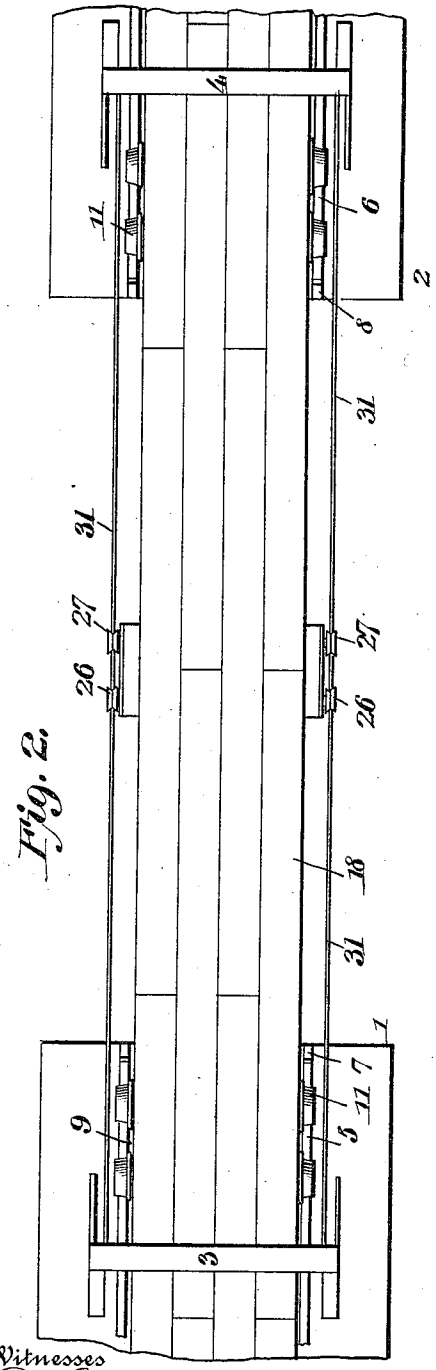

Fig. 2.

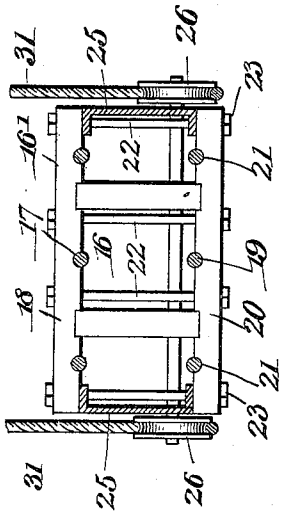

Fig. 6.

Witnesses

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3 SHEETS—SHEET 3.

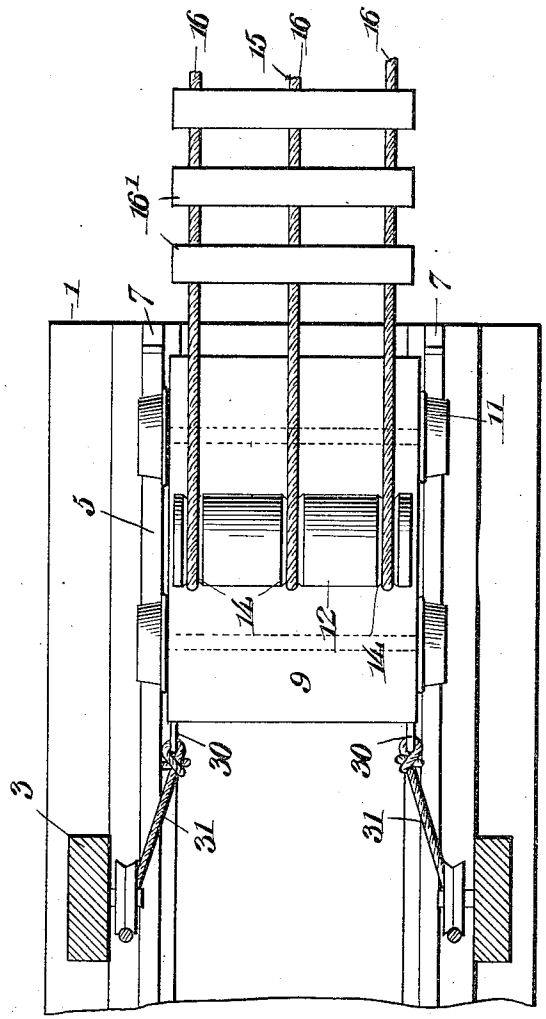

Fig. 4.

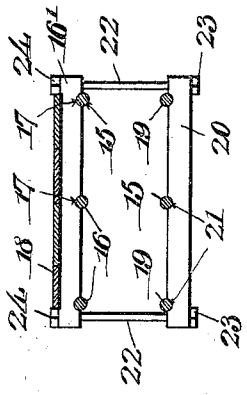

Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

SALVATORE SANNA, OF OLINGHOUSE, NEVADA.

BRIDGE.

1,052,971. Specification of Letters Patent. Patented Feb. 11, 1913.

Application filed June 24, 1911. Serial No. 635,151.

To all whom it may concern:

Be it known that I, SALVATORE SANNA, a citizen of the United States, residing at Olinghouse, in the county of Washoe and State of Nevada, have invented new and useful Improvements in Bridges, of which the following is a specification.

The present invention relates to bridge construction, the primary object being to provide a suspension bridge which is particularly designed for use over small streams, the said bridge having its opposite ends connected with trucks supported upon suitable tracks arranged upon the piers, the trucks also being provided with endless cables, the upper leads of which underlie the bridge, and the bridge being further provided with spaced members which also connect with the lower leads of the cables, while mounted upon the piers are towers, each having grooved wheels or sheaves. A cable which has its opposite ends connected with the trucks and guided by the grooved wheels of the piers, is also provided, and the said cable is adapted to pass beneath grooved pulleys which are disposed centrally of the flexible bridge.

With the above, and other objects in view, which will appear as the description of the invention progresses, the improvement resides in the novel construction and arrangement of parts hereinafter fully described and claimed.

In the accompanying drawings, there has been illustrated a simple and preferred embodiment of the improvement, it being understood, however, that the showing therein is merely illustrative and that changes in the minor details of construction as to size, shape, proportion, material, etc., which fall within the scope of the appended claims, may be made, if desired.

In the drawings,—Figure 1 is a side elevation of a suspension bridge constructed in accordance with the present invention. Fig. 2 is a top plan view of the same. Fig. 3 is a front elevation of the same. Fig. 4 is a detailed plan view with the road way of the bridge removed. Fig. 5 is a sectional view upon the line 5—5 of Fig. 1. Fig. 6 is a similar sectional view upon the line 6—6 of Fig. 1.

In the drawings, the numerals 1 and 2 designate the piers, preferably constructed of masonry, and arranged adjacent the opposite banks of a stream. In the drawings but two are shown, as well as only a single bridge structure, but it is to be understood that when the device is employed in connection with large streams, any number of piers, as well as bridge structures, may be employed.

The numerals 3 and 4 designate the towers which are immovably connected with the piers 1 and 2.

The piers 1 and 2 are each provided with spaced tracks 5 and 6, each of the said tracks having its outer extremity or that portion adjacent the face of the piers nearest the body of the water upturned to provide integrally formed stops 7 and 8.

The numerals 9 and 10 designate a pair of trucks, the said trucks being provided with the usual flanged wheels 11 whereby the said trucks may travel upon the tracks 5 and 6 and the upstanding stop members 7 and 8 are adapted to limit the movement of the said trucks in one direction or toward each other. Each of the trucks is centrally provided with a drum 12, the same being provided with trunnions 13 which engage within suitable bearings provided upon the side of the trucks 9 and 10. The drums 12 are each provided with a plurality of grooves or depressions 14, preferably three in number, one being centrally arranged while the remaining pair are arranged adjacent the ends of the said drum. These grooves or depressions are adapted for the reception of endless supporting cables 15. The upper flight 16 of each of the said cables is adapted to support a plurality of spaced transversely arranged bed plates 16′, the same being each formed with depressions 17, wherein the cables are received and whereby the accidental removal of the said bed plates from the cables is effectively obviated. The bed plates 16′ are adapted to support the bed or road way 18 of the bridge. This road way is made up of a plurality of longitudinally arranged boards, the same preferably extending the entire length of the bridge, and while arranged side by side, do not detract from the flexibility of the bridge.

The lower flight 19 of the endless cables 15 is supported by a plurality of transversely arranged plates 20, the latter being formed with depressions 21 forming seats for the said cables. These plates 20 are connected with the bed plates 16′, through the

medium of a plurality of suspension rods 22. The rods 22 preferably have their lower ends headed as at 23, and extend through suitable openings provided in both the plates 20 and 16'. The portions of the rods projecting above the bed plates 16' are preferably threaded and receive suitable nuts 24. By this arrangement it will be noted that the lower plate 20 may be adjusted in relation to the bed plate 16' if desired.

Centrally secured to the bridge, in any desired or preferred manner, are substantially rectangular plates 25. One of these plates is connected with the bridge upon each of its sides, and each of the said plates 25 is provided with grooved wheels 26 and 27, which are mounted for rotation upon the said plates 25 in any desired manner. These grooved wheels 26 and 27 are positioned adjacent the opposite lower edges of the said plates 25 and the purpose of the wheels will presently be set forth.

Mounted for rotation upon each of the towers 3 and 4 is a pair of sheave wheels designated by the numerals 28 and 29, respectively. The sheave wheels 28 are arranged adjacent the lower portions of the towers while the sheave wheels 29 are arranged adjacent the upper portions of the said towers. These sheave wheels are arranged in pairs adjacent the opposite sides of the towers, and each of the trucks 9 and 10 have their inner faces provided with suitable eyes 30 to which is secured the opposite ends of a sustaining cable 31. This cable 31 is adapted to pass over the lower sheave wheels 28 as well as the upper sheave wheels 29 and to underlie and engage with the grooved wheels 26 and 27 trunnioned upon the plates 25.

From the above description, taken in connection with the accompanying drawings, the simplicity of the device, as well as the advantages thereof will, it is thought, commend themselves to those skilled in the art to which such inventions appertain, it being noted that the device provides for the expansion and contraction of different parts thereof incident to the weather conditions, and it will be noted that when a load is passing over the flexible bridge the suspending cable 31 will be drawn taut so as to cause the trucks to travel in opposite directions, or toward the towers secured upon the piers 1 and 2.

Having thus fully described the said invention, what I claim is:—

1. The combination with spaced piers, of trucks upon the piers, an endless cable supported by and arranged between the trucks, a flexible bridge carried by the upper lead of the endless cable, means for limiting the seaward movement of the trucks, members provided with pulleys arranged shoreward of the trucks upon the piers, and a flexible member connected with the truck and guided by the pulleys and engaging with the central portion of the bridge.

2. A suspension bridge embodying a flexible roadway, piers for the roadway, trucks upon the piers, means for limiting the seaward movement of the trucks, a cable upon the trucks and arranged below and supporting the flexible bridge, towers upon the piers and arranged shoreward of the trucks, sheave wheels on the towers, grooved wheels upon the bridge and arranged centrally thereof, and a cable connected with the trucks and guided by the sheave wheels of the towers and passed under the grooved wheels of the bridge.

3. A bridge comprising a flexible roadway, wheeled trucks arranged shoreward of the bridge and connected with the opposite end of the road-way, tracks for the trucks, said tracks having their adjacent faces provided with stops, a drum mounted upon each of the trucks, an endless cable connected with each of the drums, said cable underlying the flexible road-way, plates centrally connected with the opposite sides of the road-way, grooved wheels upon the plates, towers provided with sheave wheels arranged shoreward of the bridge, and a suspending cable connected with the trucks and passing over the sheaves of the towers and under the grooved wheels of the road-way.

4. A suspension bridge comprising a flexible road-way, trucks arranged shoreward of the bridge and connected with the opposite ends of the road-way, wheels for the trucks, tracks provided at their outer ends with stops for the wheels, a drum mounted for rotation upon each of the trucks, endless supporting cables upon the drums and underlying the road-way, a plurality of plates engaging with the upper lead of the cable and under-lying the road-way, means for sustaining the lower lead of the cable in adjusted relation with the upper lead of the said cable, grooved wheels upon the road-way, towers arranged shoreward of the bridge and being provided with sheaves and a cable secured to each of the trucks and guided by the sheaves of the towers and engaged beneath the grooved wheels of the road-way.

5. A suspension bridge comprising a flexible road-way, wheeled trucks arranged shoreward of the bridge and connected with the flexible road-way, means for limiting the movement of the trucks toward the span, a drum trunnioned upon each of the trucks, a plurality of endless cables upon the drums, bed plates connected with the upper leads of the cable and under-lying the road-way, plates under-lying the lower leads of the cables, an adjustable connection between the said plates and the bed plates, towers provided with sheaves arranged shoreward of

the bridge, and a suspending cable passing under the grooved wheels of the road-way and guided by the sheaves of the towers and connected with the trucks.

6. A suspension bridge embodying piers, tracks upon the piers having offset stops arranged adjacent the water faces of the piers, a wheeled truck upon the track of each of the piers, each of said trucks having a rotatable drum, a plurality of endless cables connecting the drums of the oppositely arranged trucks, a plurality of bed plates having their under faces formed with depressions engaging with the upper leads of the cables, plates having their upper faces formed with depressions engaging with the lower leads of the cables, adjustable rods connecting the plates, a flexible road-way arranged upon the bed plates, said road-way being centrally provided with grooved wheels arranged upon the opposite sides thereof, a tower provided with sheave wheels upon each of the piers, a suspending cable passing under the grooved wheels of the bridge and being guided by the sheave wheels of the towers, and the ends of the said cable being connected with the oppositely arranged trucks and whereby the said cable tends to draw the adjacent ends of the bridge shoreward.

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

SALVATORE SANNA.

Witnesses:
B. C. LIPSENS,
J. AARON INGALLS.