

J. L. HARRINGTON.
 FLUID CONDUIT FOR LIFT BRIDGES.
 APPLICATION FILED OCT. 10, 1910.

1,003,901.

Patented Sept. 19, 1911.

3 SHEETS—SHEET 1.

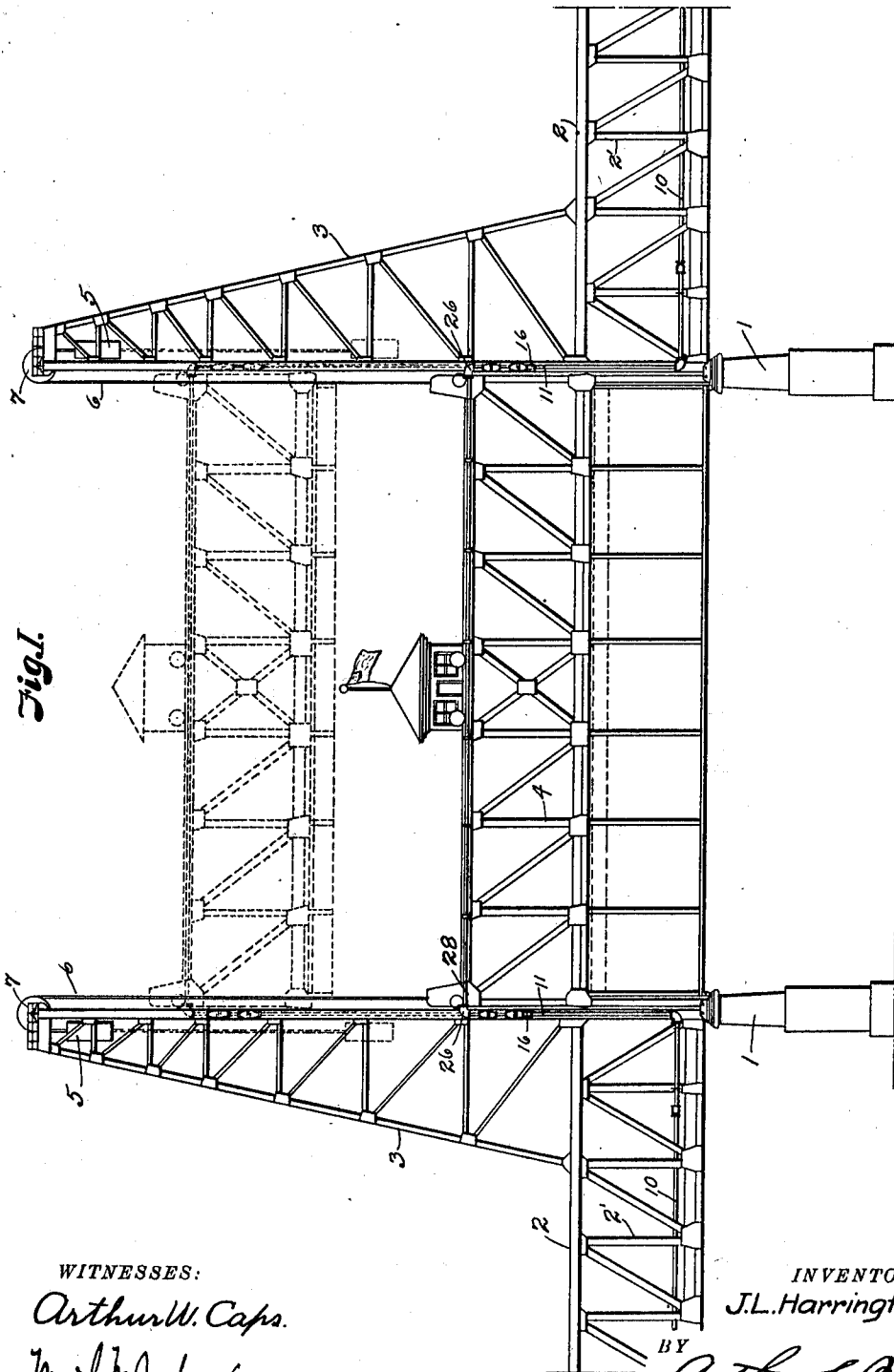


Fig. 1.

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BY

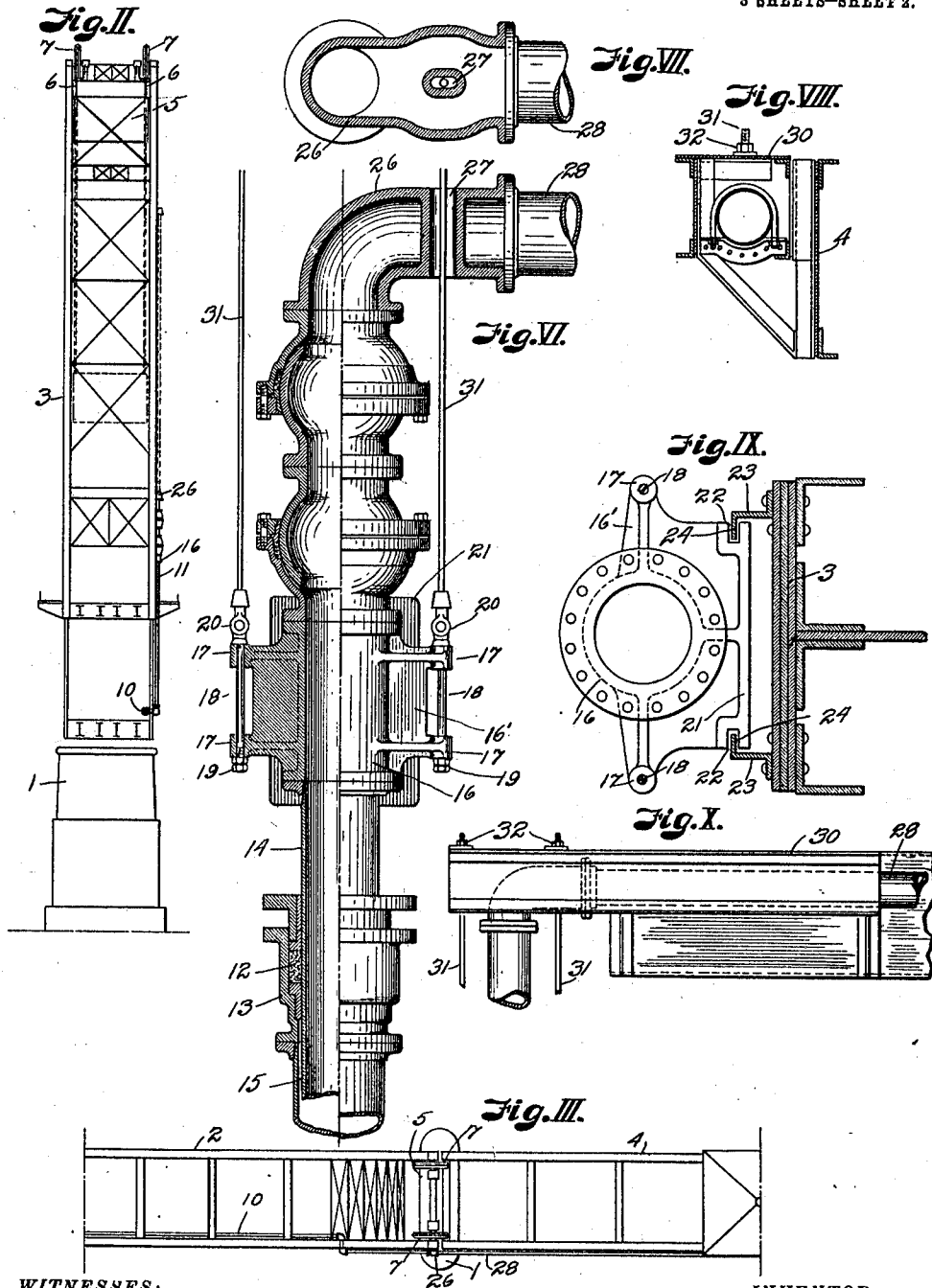
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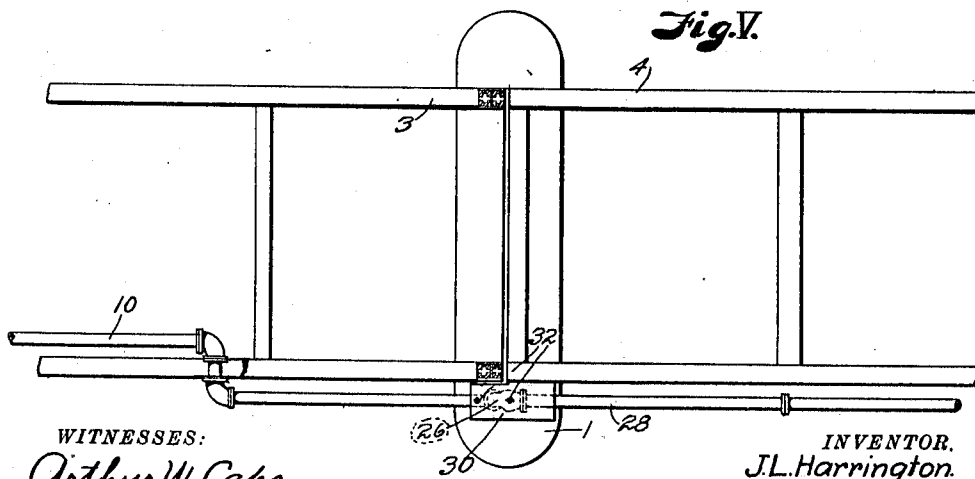
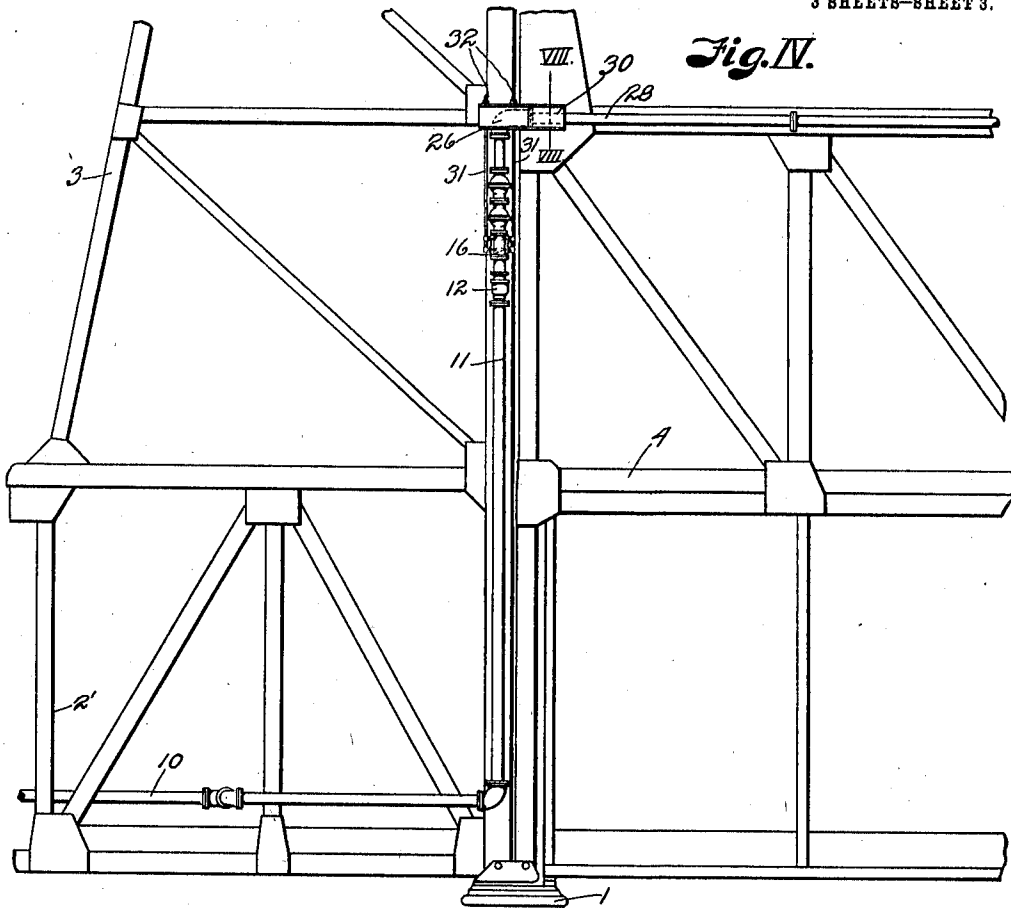
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UNITED STATES PATENT OFFICE.

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FLUID-CONDUIT FOR LIFT-BRIDGES.

1,003,901.

Specification of Letters Patent. Patented Sept. 19, 1911.

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To all whom it may concern:

Be it known that I, JOHN LYLE HARRINGTON, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Fluid-Conduits for Lift-Bridges; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to fluid conduits for use on lift bridges, and has for its principal object to provide means for conducting fluids across a bridge comprising a span which is movable vertically to allow the passage of vessels therebeneath.

In accomplishing this object I place a section of pipe on the vertically movable span of the lift bridge, stationary parts on the approaches at the ends of the movable span, and unions between the movable and stationary parts, so that flow through the pipe may be continuous for either position of the span or when the span is being raised or lowered.

It is a further object of my invention to provide means for supporting telescoping parts of the movable pipe section whereby a direct lift is provided that relieves the pipe from bending strain and facilitates the travel of the telescoping section through the stuffing boxes.

It is a further object of my invention to provide other improved details of structure which will presently be fully described and claimed and are illustrated in the accompanying drawings, in which:—

Figure I is a side view of a lift bridge carrying a telescoping pipe structure, constructed according to my invention. Fig. II is an end view of same. Fig. III is a plan view of a part of the bridge. Fig. IV is an enlarged side view of parts of the stationary and movable portions of the bridge, together with the pipe carried thereby. Fig. V is a plan view of same. Fig. VI is an enlarged side view, partly in section of the telescoping part of the pipe, showing the construction and arrangement of the stuffing box and universal joint. Fig. VII is a horizontal section of the pipe elbow, show-

ing the suspension rod conduit. Fig. VIII is a vertical section on the line VIII—VIII, Fig. IV. Fig. IX is a plan view of the suspension and guide section of the telescoping part of the pipe. Fig. X is a side elevation of a part of the movable section of the pipe with its surrounding frame and a part of the movable span.

Referring more in detail to the parts:— 1 designates piers, 2 approaches, 3 towers and 4 a movable span of a lift bridge of any suitable construction, wherein the span is counterpoised by weights 5 having connection with the movable span through cables 6 that travel over the pulleys 7 on the top of the towers.

Inasmuch as the construction and operation of the bridge itself forms no part of the present invention, I have illustrated same only to the extent necessary to illustrate the application of my improved pipe construction thereto; the span guides, motor transmission etc., which usually form a part of a bridge of this construction, not being illustrated at all.

Referring now to the pipe structure, 10 designates a pipe suitable for carrying water, oil, gas, or any fluid which it is desired to pipe from one locality to another; the section 10 being supported on the bridge approaches, preferably within the trusses 2'. At the end of the approach, adjacent to the movable span, pipe 10 is turned outwardly and carried along the outside of the approach until it is even with the tower standard, when it is turned upwardly to form the vertical section 11. On the upper end of section 11 is a stuffing box 12 of any suitable construction, but preferably set in from its casing 13, so that its inner circumference is of less diameter than the circumference of the pipe 11. Extending through the stuffing box 12 and into the pipe 11 is a pipe 14, the outside diameter of which is sufficiently less than the interior diameter of pipe 11 to provide an annulus 15 therebetween. Fixed to the upper end of the pipe 14 is a supporting and guide section 16 having a pipe channel registering with that of the pipe 14, and provided with laterally projecting wings 16' having collars 17, through which the bolts 18 are projected and to which said bolts are fixed by the fastening members 19 and 20. On the side of the supporting and guide member 16, facing the tower standard, is a guide plate 21 having

side grooves 22 opening laterally from near its rear face. Fixed to the tower standard are the Z-bars 23, the flanges 24 of which are spaced from the standard to provide a channel within which the rear part of the guide plate 21 may travel freely and are projected into the guide grooves 22 in said plate. Fixed to the top of the supporting and guide section 16 is a universal mechanism preferably comprising two ball joints, the members of which are adapted for free movement within each other, but are packed to prevent the escape of the fluid passed through said pipe. As this universal joint may be of any suitable construction or design, I will not describe same specifically; although a preferred form of joint has been shown in detail.

Fixed to the upper end of the universal joint is an elbow 26 which I prefer to construct as shown in Figs. VI and VII, that is, with a channel 27 extending through the horizontal portion of the elbow in line with the collars 17 on the guide member 16; this channel being preferably cast into the elbow pipe when the latter is formed. Connected with the horizontal portion of the elbow 16 is a pipe 28 which extends across and is carried by the movable bridge span 4.

Referring now more specifically to the device for supporting the telescoping section of the pipe, 30 designates a frame or bracket which is attached to the movable span and contains and supports the elbow 26 and outer end of pipe 28; this frame or bracket being extended outwardly beyond the plane of the telescoping section of the pipe. Carried by bracket 30 are rods or cables 31 having a suitable supporting means 32 bearing against the top of the bracket. These rods or cables are extended downwardly and connected with the devices 20 on the bolts 18, carried by the collars 17 on the supporting and guide member 16; one of the rods or cables being extended through the conduit 27, in the elbow 26, so that it may pass directly from the supporting bracket to the guide member.

While I have described but one of the telescoping sections, it is apparent that the same construction may be provided at each end of the movable span.

With the device in use on a lift bridge, such as shown in the drawings, water, oil, or gas may be conducted through the pipe and over the river or other body of water spanned by the bridge; the telescoping sections 14 being projected to their full extent into the larger pipe sections 11 when the movable span is in its lowered position.

When it is desired to raise the span to permit the passage of a vessel therebeneath, the span is lifted in the ordinary manner and carries the pipe 28 up with it; the telescoping sections comprising the universal

joint and guide member being lifted with the span through the rods or cables 31, so that the entire weight of the telescoping parts is carried by the rods or cables rather than by the pipe itself, as, should the weight be on the horizontal part of the pipe there would be more of a tendency of the telescoping part to jam in the stuffing box and cause a leak.

It is apparent that the unavoidable play of the movable span will be taken up by the universal joint, so that the packing will not be affected thereby.

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

1. The combination with a lift bridge, having a vertically movable span, of upright pipe sections carried by stationary parts of the bridge at the ends of the movable span, and a pipe section carried by the span and having downturned ends projected into the stationary pipe sections.

2. The combination with a lift bridge, having a vertically movable span, of pipes, having vertical members carried on the stationary parts of the bridge at the ends of said span, a pipe carried by the span and having depending end members telescoped within said vertical members, and stuffing boxes carried by the stationary pipe members and engaging the depending end members, substantially as set forth.

3. The combination with a lift bridge, having a vertically movable span, of pipes carried by the stationary parts of the bridge and having vertical members located adjacent to said span, a pipe carried by said span and having downturned ends slidably mounted in the ends of said vertical members, and universal joints in the downturned ends of said span pipe.

4. The combination with a lift bridge, having a vertically movable span, of pipes carried by stationary parts of the bridge and having upturned portions adjacent to the span opening, a pipe carried by the span and having downturned ends telescopically connected with the stationary pipes, and co-operating guide members on the stationary bridge parts and span pipe.

5. The combination with a lift bridge, having a vertically movable span, of pipes carried by stationary parts of the bridge and having upturned portions adjacent to the span opening, a pipe carried by the span and having downturned ends telescopically connected with the stationary pipes, guides on the stationary bridge parts, and guide members on the downturned ends of the span pipe co-operating with said guides.

6. The combination with a lift bridge, having a vertically movable span, of pipes carried by stationary parts of the bridge and having upturned portions adjacent to

the span opening, a pipe carried by the span and having downturned ends telescopically connected with the stationary pipes, guide members on the downturned ends of said span pipe comprising a plate having laterally opening grooves, and guide bars on the stationary bridge parts projected into said grooves.

7. The combination with a lift bridge, having a vertically movable span, of pipes carried by stationary parts of the bridge and having upturned portions adjacent to the span opening, a pipe carried by the span and having downturned ends telescopically connected with the stationary pipes, guide members on the downturned ends of said span pipe comprising a plate having laterally opening grooves, and two bars carried by the stationary bridge parts and having flanges projected into said grooves.

8. The combination with a lift bridge having a vertically movable span, of pipes carried by the stationary parts of the bridge and having upturned portions adjacent to the span opening, a pipe carried by the span and having downturned portions telescoping within the upturned parts of the stationary pipes, and means independent of the pipe body for supporting said downturned ends.

9. The combination with a lift bridge having a vertically movable span, of pipes

carried by the stationary parts of the bridge and having upturned portions adjacent to the span opening, a pipe carried by the span and having downturned portions telescoping within the upturned parts of the stationary pipes, brackets on said span and rods carried by said brackets and connected with said downturned ends, for the purpose set forth.

10. The combination with a lift bridge having a vertically movable span, of pipes carried by the stationary parts of the bridge and having upturned portions adjacent to the span opening, a pipe carried by the span and having downturned portions telescoping within the upturned parts of the stationary pipes, said downturned portions being connected with the pipe body by an elbow, and said elbow being provided with a vertical conduit in its horizontal portion, a bracket on said span and rods depending from said bracket and connected with the downturned portions of said pipe, one of the rods at each end of said span being projected through the elbow conduits, substantially as set forth.

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

JOHN LYLE HARRINGTON.

Witnesses:

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