J. B. STRAUSS.

BRIDGE.

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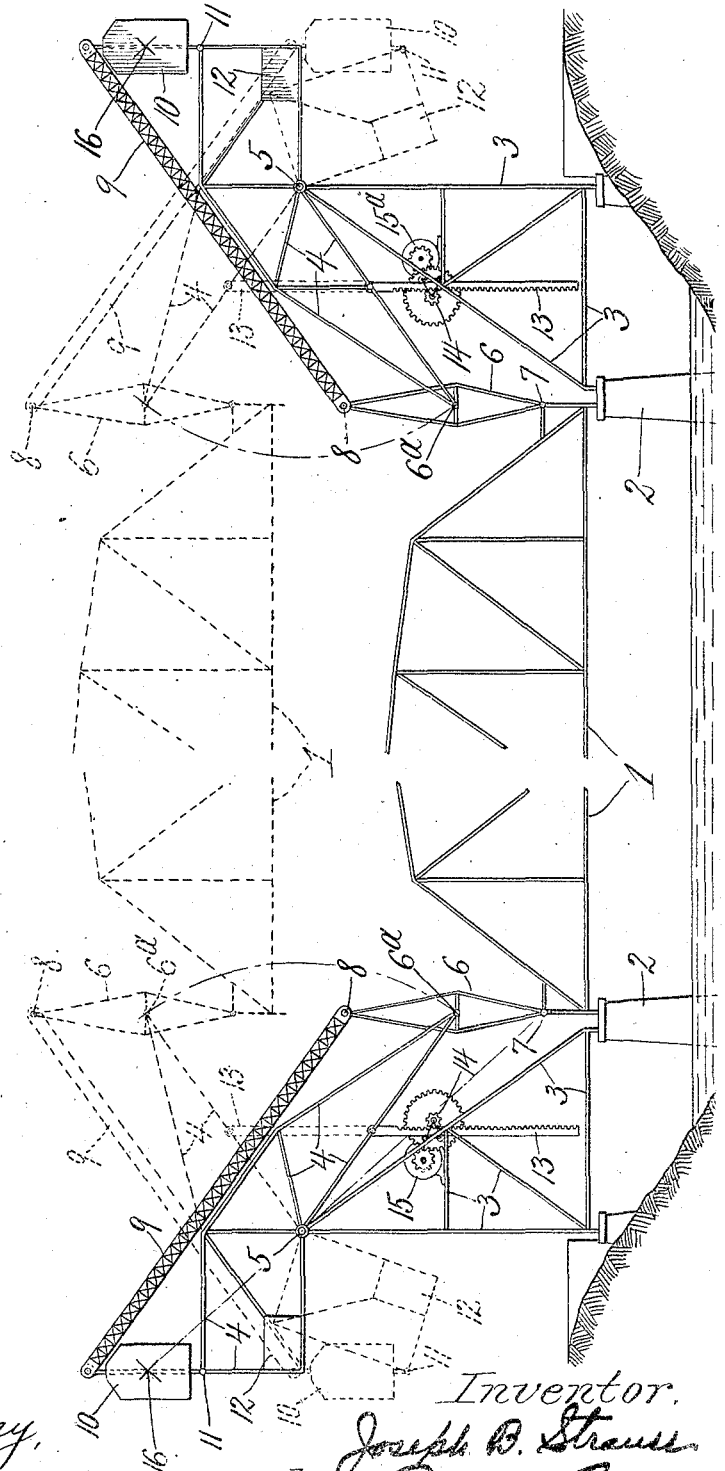
1,038,226. Patented Sept. 10, 1912



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UNITED STATES PATENT OFFICE.

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BRIDGE.

1,038,226. Specification of Letters Patent. Patented Sept. 10, 1912.

Application filed May 1, 1911. Serial No. 624,326

To all whom it may concern:

Be it known that I, JOSEPH B. STRAUSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bridges, of which the following is a specification.

This invention relates to lifting devices, such as lift bridges and the like, and has for its object to provide a new and improved device of this description.

The invention is illustrated in the accompanying drawings, wherein is shown a diagrammatic view illustrating one form of the invention as applied to a lift bridge.

As herein shown I provide a vertically movable part 1, which in this instance is shown as a bridge span, adapted to be supported by the piers 2. At each end of the span is provided a stationary support 3. Upon each of these supports is mounted a lifting lever 4, pivoted at 5 to the support. Each lifting lever is pivotally connected to a connecting piece 6 between the ends thereof, as shown at the point 6^a. Each connecting piece is pivotally connected at the point 7 with the main span. The end of each connecting piece projects upwardly and is pivotally connected at 8 with its associated counterweight arm 9. This counterweight arm may be of any desired construction. A counterweight 10 is pivotally connected to the other end of each counterweight arm and is also pivotally connected at 11 with the lifting lever 4. Each lifting lever is provided with a separate counterweight 12. In the particular construction illustrated, the arm 9 is connected at one end with the main span and the arm 4 by means of the part 6 and is connected at the other end with the part 4, said arm being supported by these connections. The counterweights 12 counterbalance the lifting levers, and the counterweights 10 counterbalance the main span. This construction provides means for counteracting the circular movement of the ends of the lifting levers 4 so that the main span can be lifted bodily, and is not affected by the fact that the distance between the ends of the lifting levers varies as said levers move upwardly. The counterweight arms and the associated lifting levers, it will be noted, are placed one above the other with their ends in the same vertical plane. In this construction the main span may be lifted vertically by means of a system of rigid levers at each end thereof, and may at all times be counterbalanced so as to be held in any desired position, this result being secured without the use of cables or other flexible power transmitting devices. It will further be noted that the counterweight arm and the lifting lever at each end are connected by the same connecting piece 6 with the main span. The lifting levers are controlled by means of the operating struts 13, which are provided with teeth, said teeth coöperating with the pinions 14, the pinions being actuated by suitable motors 15 and 15^a.

Referring to the system of levers on one side of the main span, it will be noted that the pivotal point 7, where the connecting piece 6 is pivoted to the main span, and the pivotal point 5, and the center of gravity 16 of the counterweight 10 are all in alinement and remain in alinement throughout the various positions of the parts.

When separate motors, for example, are used to lift the vertically movable part, some means may be provided for preventing one end from being moved faster than the other, such for example as shown in my prior patent application No. 505,989. The parts are shown in dotted line in their raised position.

I claim:

1. A bridge comprising a vertically movable span, fixed supports at each end of said span, a plurality of pivoted levers at each end carried by said fixed supports and connected with said span so as to move it vertically when the levers are moved.

2. A bridge comprising a vertically movable span, fixed supports at each end of said span, a plurality of pivoted levers at each end carried by said fixed supports and connected with said span so as to move it vertically when the levers are moved, and separate counterweights for said span and for said levers.

3. A bridge comprising a vertically movable span, a fixed support at each end of said span, a lever at each end of said span and connected therewith and movably mounted on said fixed supports, and means associated with said levers for compensating for the pivotal movement thereof so as to allow the span to be moved vertically when the levers are moved.

4. A bridge comprising a vertically mov-

able span, a connecting piece at each end thereof pivotally connected therewith, a support at each end of said span, a pivoted lever at each end of said span mounted on said support, said pivoted levers connected with said connecting pieces, an arm at each end of said span each pivotally connected with one of said connecting pieces, and a counterweight connected with each arm.

5. A lifting device comprising a vertically movable part, a pivoted lifting lever at each end thereof, supports to which said levers are pivoted, a counter-weight arm at each end thereof, and a connecting piece at each end of said vertically movable part connecting both the lifting lever and the counterweight arm to said vertically movable part.

6. A lifting device comprising a vertically movable part, a pivoted lifting lever at each end thereof, supports to which said levers are pivoted, a counterweight arm at each end thereof, and a connecting piece at each end of said vertically movable part connecting both the lifting lever and the counterweight arm to said vertically movable part, and separate counterweights associated with said lifting levers and counterweight arms.

7. A lifting device comprising a vertically movable part, a pivoted lifting lever at each end thereof, a connecting piece at each end of the vertically movable part and pivotally connected therewith, to which said lifting levers are pivotally connected, fixed supports at the ends of said vertically movable part upon which said lifting levers are pivotally supported, a counterweight arm associated with each of said lifting levers and connected with said movable part, a counterweight pivoted to each of said counterweight arms, the center of gravity of said counterweight, the pivots upon which the lifting lever is supported and the pivotal connection of the connecting piece with the movable part all being in alinement.

8. A bridge comprising a vertically movable span, a connecting piece at each end thereof pivotally connected therewith, a pivoted lever at each end of said span, fixed supports upon which said levers are mounted, said pivoted levers connected with said connecting pieces, the pivots of said levers supported upon said fixed supports, a counterweight connected with each lever, and means for causing the center of gravity of said counterweight to move in a vertical line at all times.

9. A bridge comprising a vertically movable main span, levers associated with said span at the opposite ends thereof and connected with said span, fixed supports carrying said levers, separated counterweights for said levers and means for moving said span, the separated counterweights acting to counterbalance the span during its vertical movement.

Signed at Chicago, county of Cook, State of Illinois, this 24th day of April 1911.

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Witnesses:
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