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J. B. FRENCH.

TRANSFER OR FLOAT BRIDGE.

APPLICATION FILED JULY 16, 1910.

Patented Feb. 7, 1911.

2 SHEETS—SHEET 1.

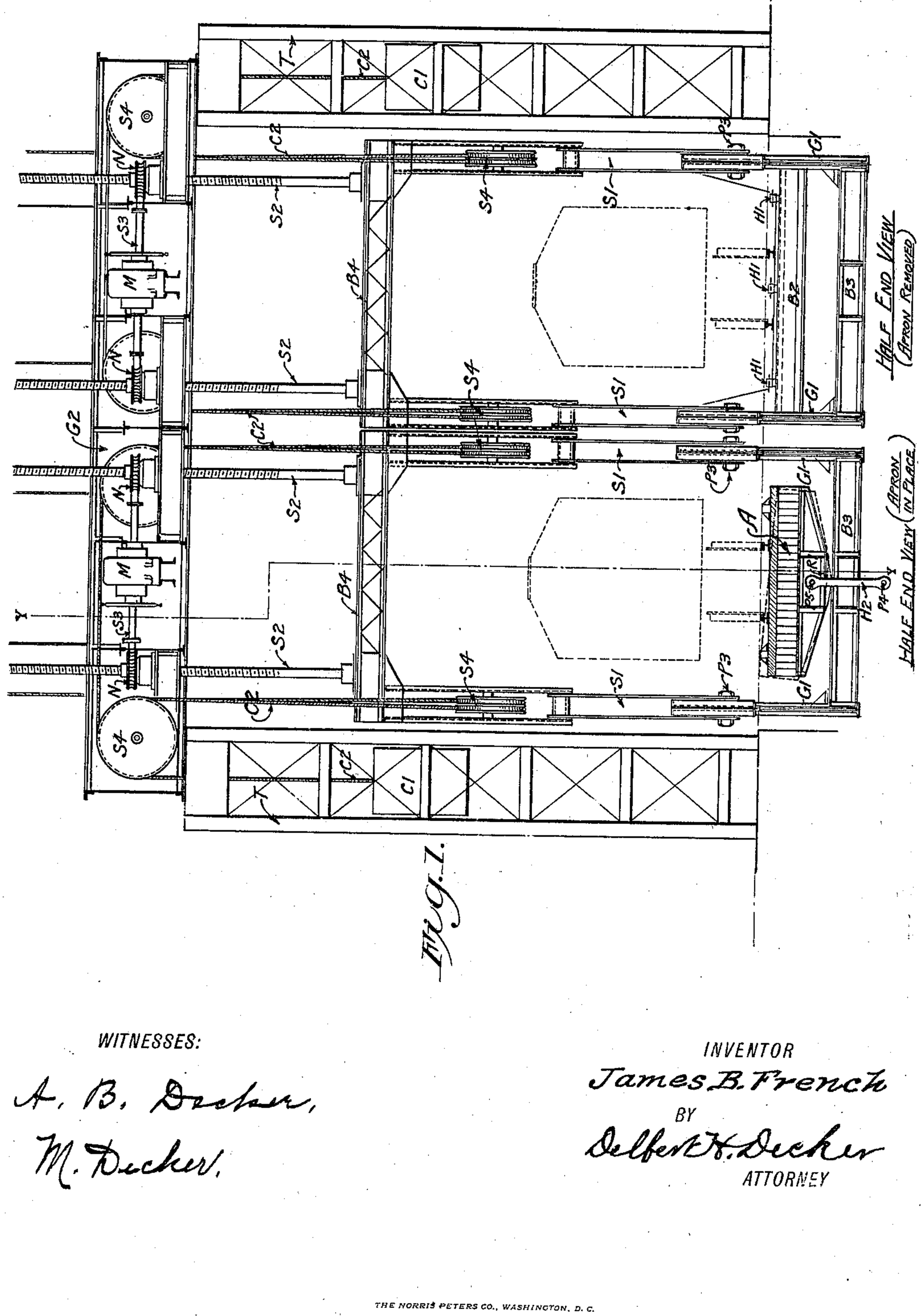

Fig. 1.

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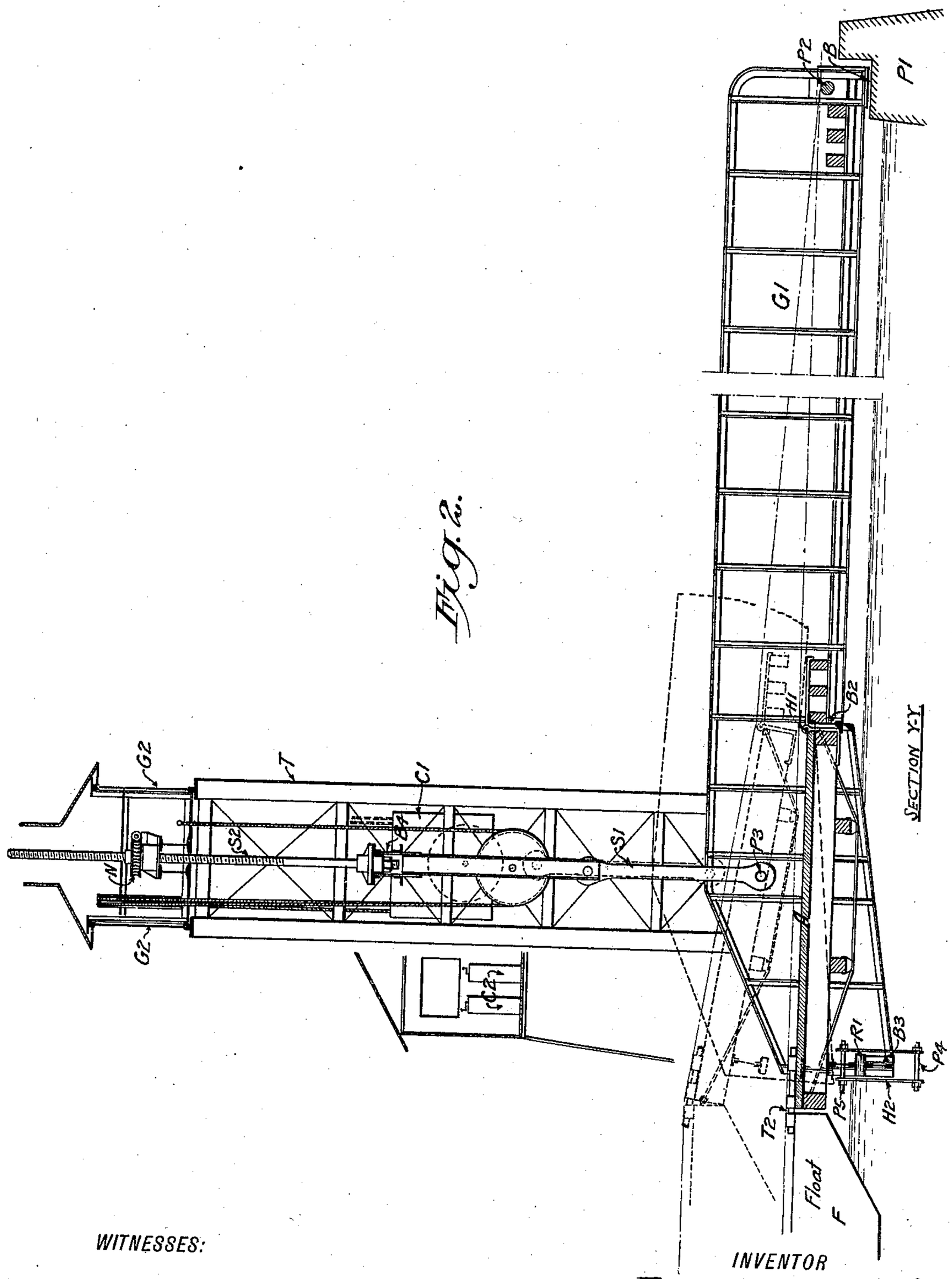

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TRANSFER OR FLOAT BRIDGE.

983,617. Specification of Letters Patent. Patented Feb. 7, 1911.

Application filed July 16, 1910. Serial No. 572,382.

To all whom it may concern:

Be it known that I, JAMES B. FRENCH, a citizen of the United States, residing at Jamaica, in the county of Queens and State of New York, have invented certain new and useful Improvements in Transfer or Float Bridges, of which the following is a specification.

This invention relates to the construction and operation of bridges for the transfer of railroad cars from floats to land and from land to floats, where the elevation of the floats is subject to variation on account of tides and conditions of loading.

In the accompanying drawings a suspended transfer bridge embodying this invention is illustrated.

Figure 1 is an end view with one of the overhead girders removed to show the arrangement of the operating machinery. Fig. 2 is a longitudinal section taken along line Y—Y in Fig. 1. In these drawings the bridge is shown in two parts, one for each track, but it is to be understood that these two parts may be combined and built as one.

Fig. 2 shows the inner or shore end of the main girders of the bridge G_1 pivoted on the pin P_2 carried by the bolster B resting on a fixed pier P_1: and the outer or "water" end, carried by the suspenders S_1 and screws S_2 to the overhead girders G_2 and thence to the towers T which rest on fixed foundations. This figure also shows a longitudinal section of the apron A supported at its inner or "shore" end by the hinges H_1 carried by the floorbeam B_2 connected at each end to the main girders G_1: and at its outer end supported either by the end floorbeam B_3 through the rocker bearing R_1 or during operation, by the end of the float F by means of the toggle bars T_2. The controllers C_2 for the control of the operating machinery appear in Fig. 2 but the latter is more clearly shown in Fig. 1.

In Fig. 1, one-half of the bridge is shown with the apron A in place, and the other half is shown with the apron removed. This figure also shows the counterweights C_1 attached by means of the cables C_2, sheaves S_4, suspenders S_1 and pins P_3 to the main girders G_1. The purpose of these counterweights is to balance the major part of the dead load reaction in suspenders S_1 due to the weight of the bridge and the apron, and thereby to reduce the load carried by the screws S_2 and the wear on the operating machinery: but their use is not necessary in all cases. Fig. 1 also shows the motors M which raise or lower the outer end of the bridge by actuating the shafts S_3 and, by means of worm and worm-wheel connection, turning the nuts N on the screws S_2, which are connected, through the cross beams B_4, to the suspenders S_1.

The outer end of the apron A, after it is connected to the float, is free to move vertically in the arc of a circle, of which the axis of the hinges H_1 is the center, independently of any movement of the girders G_1. This independent vertical movement is limited in the downward direction when the rocker bearing R_1 strikes the top of the end floorbeam B_3 and in the upward direction when the lower pin P_4, in the hanger H_2, strikes the bottom of the same end floorbeam B_3, the upper end of the hanger H_2 being connected to the outer end of the apron by the pin P_5. It is to be noted that by making the hanger H_2 shorter, the movement of the outer end of the apron, independent of the girders G_1, can be reduced to as small limits as desired: that by making the hanger H_2 longer, this movement can be given a greater range; and that by removing the hangers altogether, all restraint to independent upward movement is taken away, while downward movement is still limited by the floorbeam B_3.

The raising or lowering of the water end of the girders G_1 by means of the screws S_2, motors M, etc., raises or lowers the hinges H_1 which hold the inner or shore end of the apron in a constantly fixed relation to the main girders G_1 and therefore the relative position of the outer end of the apron, (when toggled to the float) and the end floor-beam B_3 will depend on the relative speeds at which the float and bridge rise or fall during operation, it being understood that when cars are moved from floats to land, the floats rise as the loads go off the float and onto the bridge and vice versa when the cars are moved from the land to the floats, the latter sink in proportion to the load they receive. It therefore follows that if the motors and operating machinery are made sufficiently powerful to raise or lower the outer end of the bridge as fast as the float rises or falls during unloading or loading operations, the relative position of the rocker bearing R_1 and the floorbeam B_3 can be fully controlled at all times by the

operator, in which case telltales could be provided showing continuously the relative positions of these parts. For the method of operation just described the hanger H_2 would be omitted and the load transferred to the end of the float, through the toggle bars T_2, need never exceed one-half of the weight of the apron and the live load resting on it. In cases, however, where it is not considered necessary or desirable to make the motors and operating machinery sufficiently powerful to raise or lower the bridge as fast as the float rises or falls during loading and unloading operations, the addition of the hangers H_2 makes it possible to confine the movement of the outer end of the apron within any limits desired. It is also to be noted that the rocker bearings R_1, at the outer ends of the apron A, deliver the load into the floorbeam B_3 centrally and thus prevent transverse torsion in the main bridge, regardless of the transverse listing or tilting of the floats to which the aprons are attached, all torsion of this sort being taken up in the aprons, which are made flexible on that account.

The gist of the invention resides primarily in the structure of the outer end of the bridge and in the manner of supporting the outer end of the apron portion thereof. Through this invention also, the independent towers, cables, counterweights and extra operating devices, now commonly used, for the support and operation of the outer end of the apron may be dispensed with, while all the advantages of flexible aprons are retained and their disadvantages largely eliminated.

It is not intended to definitely describe the special construction of the parts enumerated as they can be greatly varied without affecting the general arrangement and relation of parts herein contemplated.

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

1. In a transfer bridge hinged at its shore end and consisting of a single span of girders, the combination with the inner portion of the floor fixed to the girders, of the outer portion of the floor hinged to the inner portion to form an apron, and a loose connection between the free end of said apron and the outer end of the span permitting within limits an independent movement of the free end of said apron.

2. In a transfer bridge at its outer end, an apron or platform having its inner end attached to the bridge by hinges and its outer end, when not attached to a float, resting centrally by means of a rocker bearing on an end floor-beam built as part of the main bridge, substantially as described.

3. In a transfer bridge with apron and end floorbeam, a hanger or link attached at its upper end to the outer end of the apron and shaped at its lower end to engage the end floorbeam of the bridge and limit the upward movement of the outer end of the apron relative to the bridge, substantially as described.

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

JAMES B. FRENCH.

Witnesses:
K. J. Cusack,
John C. Wait.