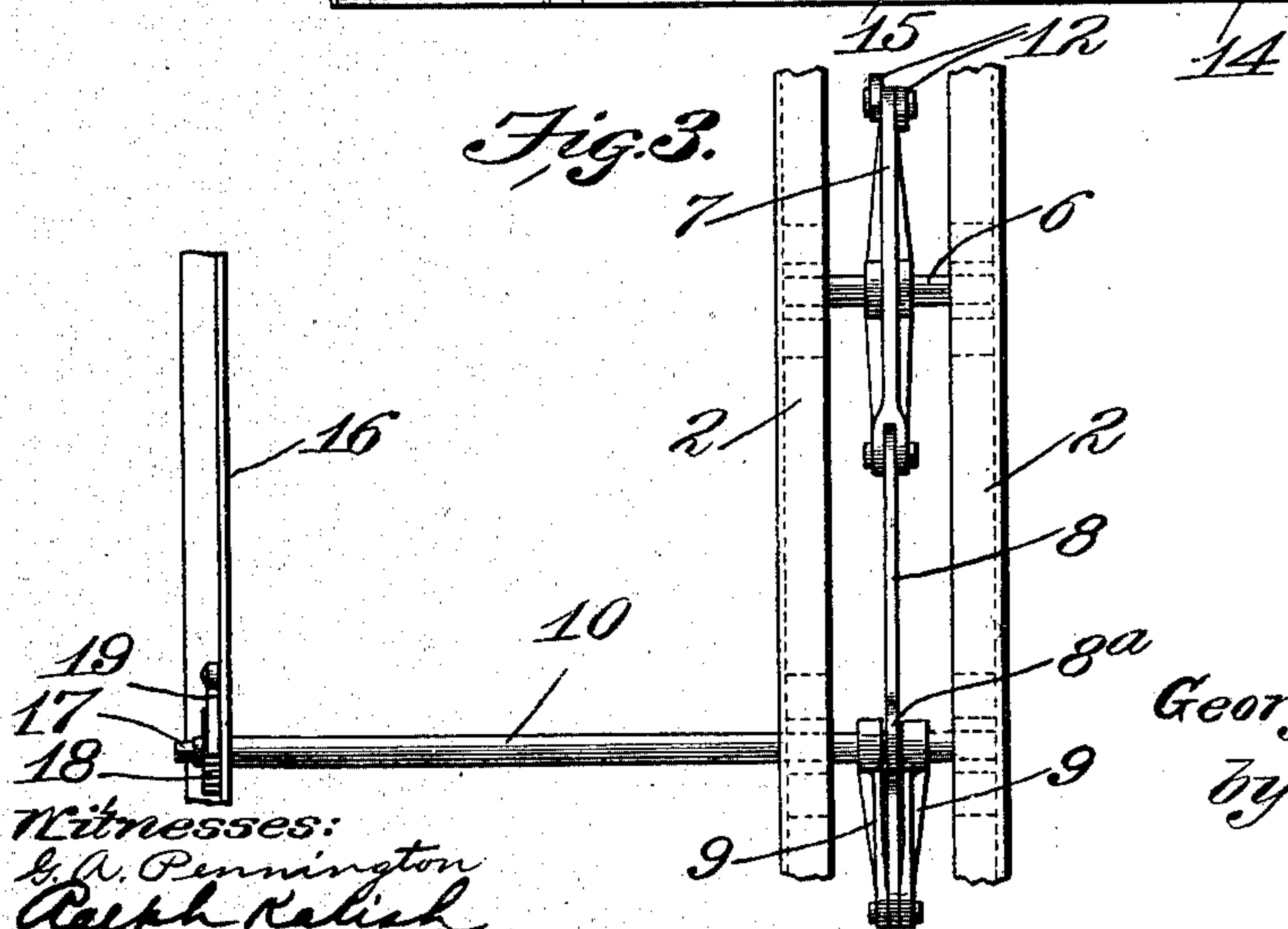
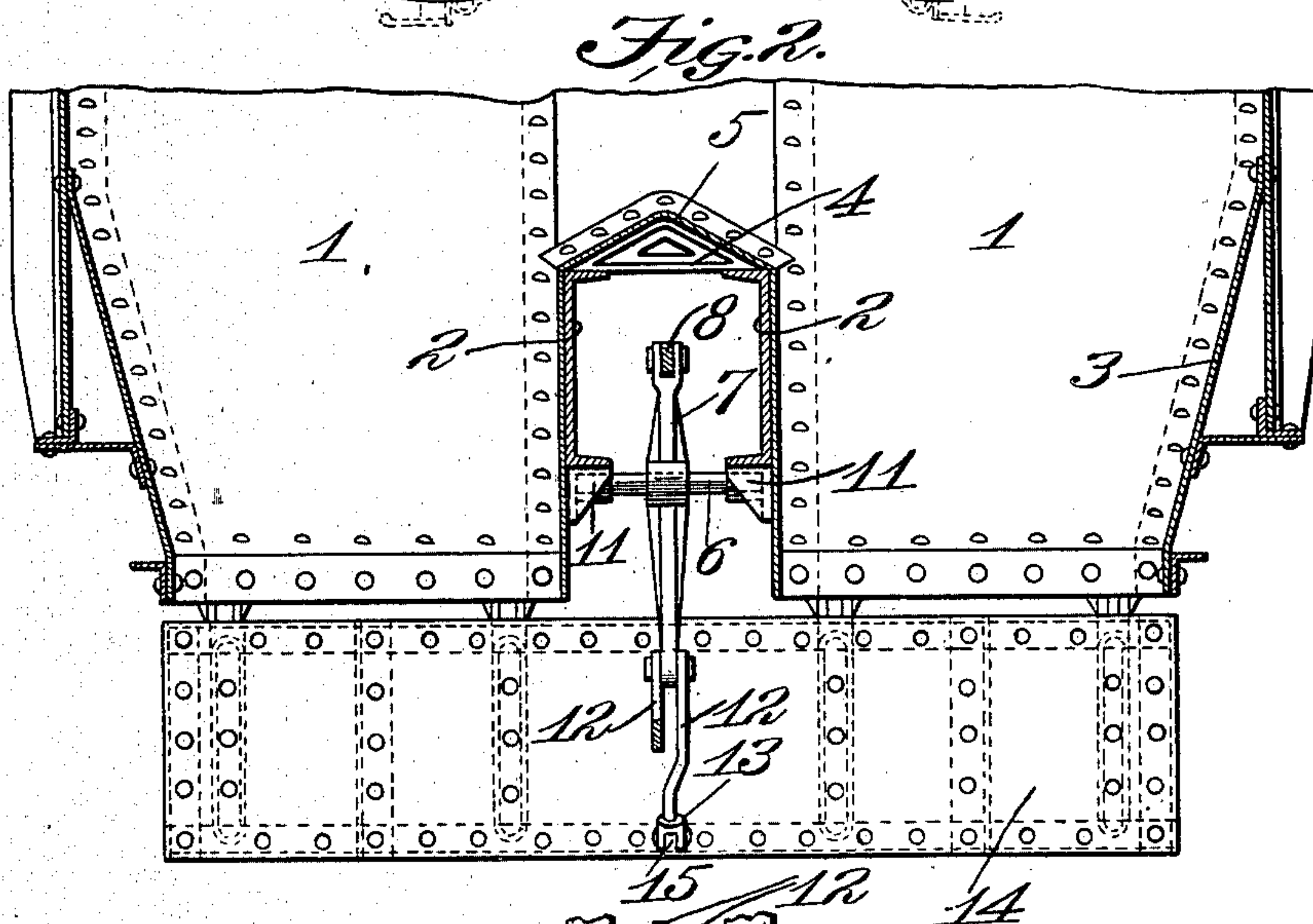
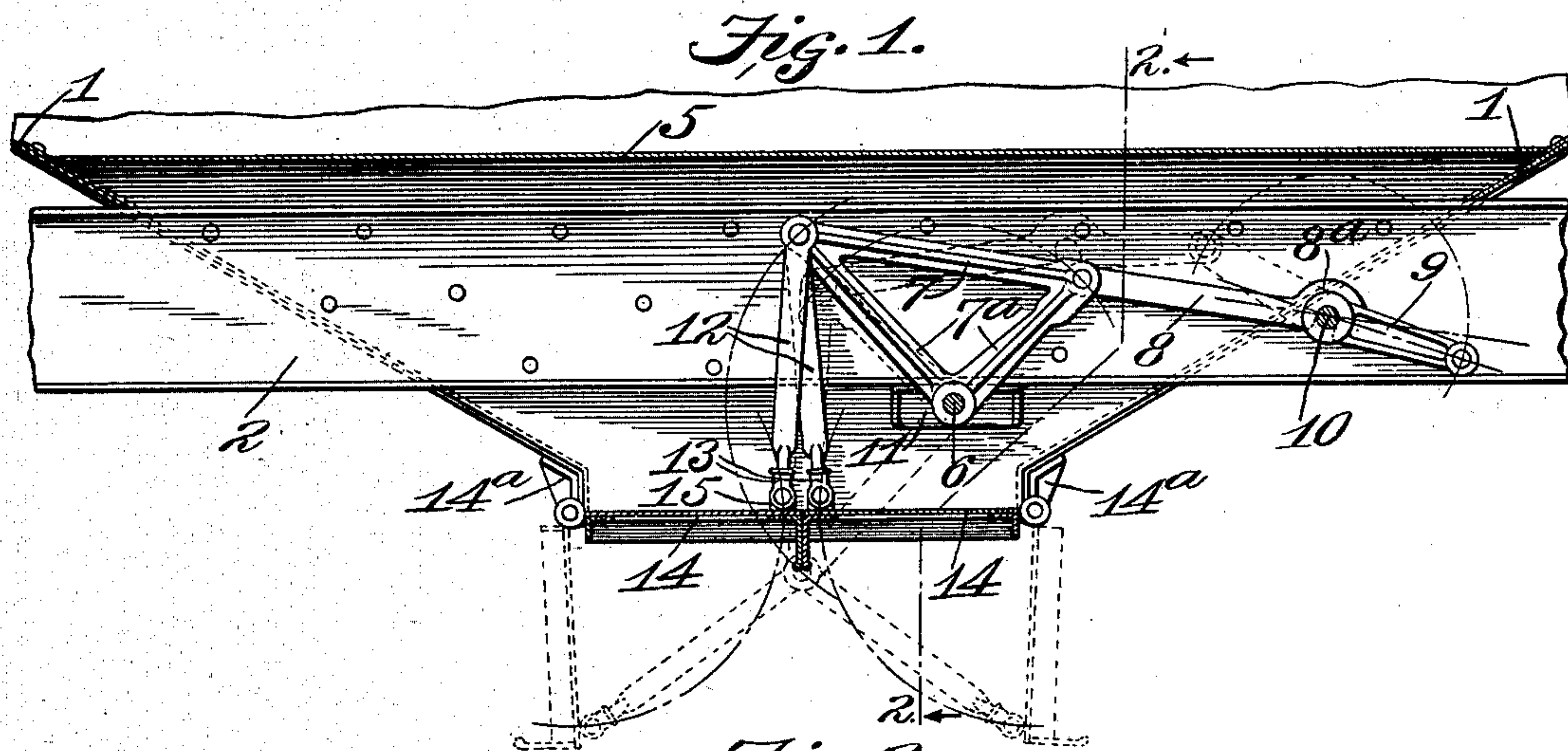


No. 731,817.

PATENTED JUNE 23, 1903.

G. E. RUSSELL.
HOPPER BOTTOM CAR.
APPLICATION FILED DEC. 12, 1902

NO MODEL.



Witnesses:
J. A. Pennington
Ralph K. Ketch

Inventor:
George Edmond Russell,
by Bakewell Cornwell
Attys.

UNITED STATES PATENT OFFICE.

GEORGE E. RUSSELL, OF PASSAIC, NEW JERSEY, ASSIGNOR TO AMERICAN CAR & FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

HOPPER-BOTTOM CAR.

SPECIFICATION forming part of Letters Patent No. 731,817, dated June 23, 1903.

Application filed December 12, 1902. Serial No. 134,935. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. RUSSELL, a citizen of the United States, residing at Passaic, county of Passaic, State of New Jersey, have invented a certain new and useful Improvement in Hopper-Bottom Cars, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is a longitudinal sectional view of the hopper portion of a car. Fig. 2 is a sectional view on line 2 2, Fig. 1; and Fig. 3 is a fragmentary plan view of the hopper-actuating means.

This invention relates to hopper-bottom cars; and it consists in new and useful devices particularly adapted to the operation of the hopper-doors thereof, all as hereinafter more fully described, and specifically pointed out in the claims.

The object of the invention is to produce a hopper-bottom car wherein double doors, preferably extending entirely across the lower portion of the hopper, will be operated by means of a shaft set at one side of the hopper and protected from injury from the impact of the material carried in the car in loading and unloading and in which the hopper-doors will be positively locked against accidental opening thereof, which locking is an incident of the shape of the parts used in manipulating said doors.

Referring to the drawings, 1 indicates the inclined floor-sheets of the hopper, extending transversely of a car.

2 indicates the center sills; 3, the side hopper-sheets; 4, the casting resting on the center sills and supporting the hood-sheet 5; 6, the bell-crank shaft; 7, a bell-crank lever thereon. 8 is a link pivoted at one end to one arm of said bell-crank, and 9 represents cranks pivotally connected to the opposite end of said link 8, which cranks are disposed one at each side of said link 8 and are pivoted on the shaft 10. The bell-crank lever 7 has arms 7^a, which converge at the lower side and are there pivotally supported on said shaft 6, which shaft

is supported in suitable bearings 11, supported on the walls 5.

Depending from and pivotally connected to the forward end of the bell-crank lever 7 are two links 12, which at their opposite ends are connected to the turnbuckles 13, the latter being in turn pivotally connected to the upper faces of the doors 14 by means of lugs 15 thereon, whereby the doors may be more perfectly adjusted to insure closing the same, said doors being hinged on the casting 14^a, secured to the hopper-sheets, as shown.

The shaft 10 passes through the side sill 16, extending thence under the plate 1 through one center sill 2, where said sill is provided with a bearing therefor, and into a suitable bearing carried by the opposite center sill, whereby said shaft is provided with a rigid support in which it is freely rotatable.

The outer end of the shaft 10 is provided with an angular extension 17, adapted to receive a crank for the purpose of rotating the same, as required. Rigidly secured to said shaft 10 in proximity to said angular end is a ratchet 18, cooperating with which is a pivoted pawl 19, adapted to secure the same against accidental rotation.

From the foregoing it will be clear that the operative parts of the mechanism for manipulating the doors 14 are so situated as to be entirely protected from contact with the load at all times either in loading or dumping and that both doors are under control from one operating-shaft so located as to be easily accessible at all times.

The link 8 is provided with a curved portion forming a jog 8^a, which when the doors are closed, as indicated in full lines in Fig. 1, will ride over and engage with the shaft 10, and the line from the pivotal point of the levers 12, where they are connected to the bell-crank 7, to the point where the link 8 is pivoted between the cranks 9, being slightly below the axis of the shaft 10 it will be seen that said doors 14 will be automatically locked in their closed position and that the weight of a load carried thereby will so distribute the strain as to firmly lock said parts in their closed position, said load tending to draw the curved portion or jog 8^a of the link 8 into

more positive engagement with the shaft 10, as shown by said full lines, from which position they can only be moved upon release of the pawl 19 from the ratchet 18 and then rotating the shaft 10, which will cause the cranks 9 to rise from the lower position, whereupon the weight upon the doors will cause the same to open, thereby moving the links, bell-crank lever, lever 8, and cranks 9 into the position shown in dotted lines in said Fig. 1, when the load will be dumped.

I am aware that minor changes in the arrangement, construction, and combination of the several parts of my mechanism can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In a hopper-bottom car, center sills, a hopper, a plurality of doors adapted to close said hopper, and operating means therefor including a bell-crank lever, supported between said center sills; substantially as described.

2. In a hopper-bottom car, center sills, a hopper, a plurality of doors adapted to close said hopper, door-operating means therefor, including a bell-crank lever supported from means below said center sills, and a shaft extending transversely of the car in operative connection with said door-operating means; substantially as described.

3. In a hopper-bottom car, covered center sills, a hopper, doors therefor, an operating-shaft located on one side of said doors, and intermediate operating means including a bell-crank lever, and adjustable links centrally disposed with relation to said sills and protected against contact with the load; substantially as described.

4. In a hopper-bottom car, a hopper, a plurality of doors adapted to close the same, links connected to the upper side of said doors, and a bell-crank lever adapted to actuate said doors by means of said links, said lever being located at one side of the meeting edges of said doors; substantially as described.

5. In a hopper-bottom car, an operating-shaft located at one side of the hopper-opening, a bell-crank operated from said shaft, hopper-doors, and intermediate operating means adjustably connected to the upper side of said doors and operable from said crank; substantially as described.

6. In a hopper-bottom car, center sills, a hopper, doors pivotally suspended from the hopper-walls and opening in opposite directions, means connected with said doors for closing the same, a bell-crank lever operable between said sills and connecting with actuating means between said sills which means are operable from a shaft held in fixed bearings at one side of said hopper-opening; substantially as described.

7. In a hopper-bottom car, a hopper, castings secured to said hopper in convenient proximity to the discharge-opening thereof, doors opening in opposite directions hinged thereto, means for raising said doors pivotally connected above said doors, means for actuating said means pivotally supported above one of said doors only, and operating means therefor operable from a fixed shaft revoluble at one side of said hopper; substantially as described.

8. In a hopper-bottom car, a hopper, castings secured to said hopper in convenient proximity to the discharge-opening thereof, doors opening in opposite directions hinged thereto, means for raising said doors pivotally connected above said doors, means for actuating said means pivotally supported above one of said doors only, and operating means therefor operable from a fixed shaft revoluble at one side of said hopper and below the same; substantially as described.

9. In a hopper-bottom car, a hopper, a revoluble actuating-shaft supported below the hopper and at one side of the hopper-opening, means, including a bell-crank lever, connected with the upper side of the doors adapted to raise the same, and means therebetween and said actuating-shaft which, upon rotation of said shaft in a predetermined direction, will close said doors, all combined substantially as described.

10. In a hopper-bottom car, a hopper, doors extending across the discharge-opening thereof, links connected to the upper face of said doors, a bell-crank lever pivotally supported above one of said doors, a crank-carrying shaft revoluble at one side of said discharge-opening, and a link provided with a jog or bend, said link being operated thereby and adapted to engage with said shaft to lock the doors in their closed position; substantially as described.

11. In a hopper-bottom car, a door-actuating shaft revoluble in fixed bearings at one side of the hopper-opening, links connected to the upper side of the door, and pivoted connecting means including a bell-crank lever extending in a substantially straight line from said shaft to the upper ends of said links when the doors are closed, whereby said means are placed past the line of their dead-centers at such time; substantially as described.

12. In a hopper-bottom car, a hopper, doors extending across the discharge-opening thereof, a rotatable actuating-shaft located below the hopper-sheets at one side of said hopper-opening, and door-operating links and bell-crank lever pivotally supported between the center sills of the car; substantially as described.

13. In a hopper-bottom car, a hopper with divided discharge, doors extending laterally across the said opening, a bell-crank lever pivotally supported below the center sills, an actuating-shaft therefor projected through

one side sill and one of the center sills, and connections between said bell-crank lever, said shaft and doors, whereby, upon rotation of said shaft, the doors are actuated; substantially as described.

14. In a hopper-bottom car, a hopper with divided discharge, doors extending laterally across the said opening, a bell-crank lever pivotally supported below the center sills, an actuating-shaft therefor extending beyond one side sill and one of the center sills, and connections between said bell-crank lever, said shaft and doors, whereby, upon rotation of said shaft, the doors are actuated; substantially as described.

15. In a hopper-bottom car, center sills, a discharge-opening, a plurality of doors therefor, and means for operating said doors comprising links, bell-crank lever between the sills, an operating-shaft, and intermediate locking-lever, the said operating mechanism being located at one side of the meeting edges of said doors; substantially as described.

16. In a hopper-bottom car, a hopper, doors therefor, links connected to the upper side of the doors, a bell-crank lever to which said links are connected, and actuating means therefor operable from one side of the hopper; substantially as described.

17. In a hopper-bottom car, a single discharge-opening, a plurality of doors therefor, links connected to the upper side of said doors, a bell-crank lever to which said links are pivotally connected, an actuating-shaft rotatably secured at one side of the hopper, and connections between the shaft and said bell-crank lever for actuating said lever; substantially as described.

18. In a hopper-bottom car, a hopper, inner hopper-sheets, a door, a link connected thereto, a pair of crank-arms pivotally supported away from said hopper, and a bell-crank lever interposed between said crank-arms and link supported from said hopper-sheets; substantially as described.

19. In a hopper-bottom car, a hopper, doors therefor, links connected to said doors at one end, bell-crank lever connected to the opposite end of said links, a link provided with an offset or jog connected to the opposite end of said bell-crank lever, crank connected to the opposite end of said offset link, and a shaft supporting said crank and adapted to engage said offset link when the doors are closed; substantially as described.

20. In a hopper-bottom car, a hopper, a door, a link connected thereto, a pair of crank-arms pivotally supported away from said hopper between center sills and a bell-crank lever supported below said sills, interposed between said crank-arms and link; substantially as described.

21. In a hopper-bottom car, covered center sills, supporting-brackets, a bell-crank lever supported therein between said sills, connections therefrom to hopper-doors below said sills and operating means therefor; substantially as described.

22. In a hopper-bottom car, covered center sills, supporting-brackets, a bell-crank lever supported therein between said sills, connections therefrom to hopper-doors below said sills, and operating means therefor, including a notched locking-lever; substantially as described.

23. In a hopper-bottom car, covered center sills, a bell-crank lever paralleled with said sills and supported therebetween, links from said lever, doors connected with said links, a notched operating-lever connecting with said bell-crank lever, and a shaft extending to the sides of the hopper; substantially as described.

24. In a hopper-bottom car, covered center sills dividing the discharge-opening, a plurality of doors for said opening, a bell-crank lever extending parallel with said sills and connected with said doors, an operating-shaft, and a notched operating-lever connected therewith and with said bell-crank lever; substantially as described.

25. In a hopper-bottom car with a hopper-opening, covered center sills dividing said hopper-opening, a bell-crank lever parallel therewith, supported below said center sills and connected with doors for said hopper-opening, and an offset link connected with said bell-crank lever operable from the side of the car; substantially as described.

26. In a hopper-bottom car, a bell-crank lever supported between inner hopper-sheets, an operating-shaft supported at one side of the hopper, a notched link connected with said crank and adapted to engage said shaft to hold the hopper-doors in closed position; substantially as described.

27. In a hopper-bottom car, a divided hopper-opening with inner parallel hopper-sheets, supporting-brackets on said sheets, a shaft supported therein, a bell-crank lever thereon, links connected with said lever and hopper-doors and an offset link connected with said bell-crank lever adapted to interlock with an operating-shaft to hold said doors in closed position; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 5th day of December, 1902.

GEORGE E. RUSSELL.

Witnesses:

H. P. FIELD, Jr.,
J. P. LYON.