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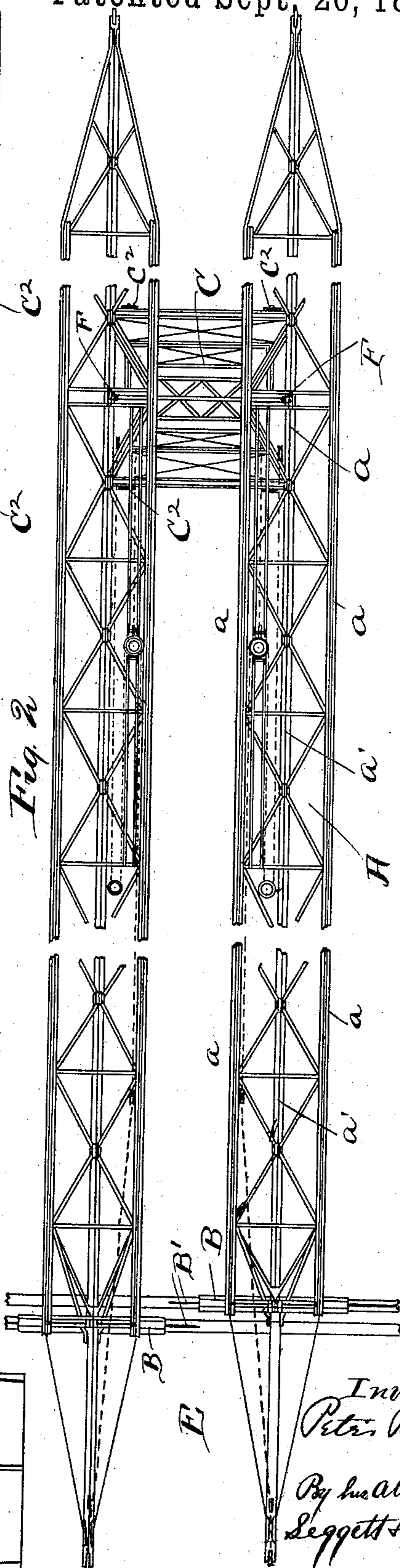
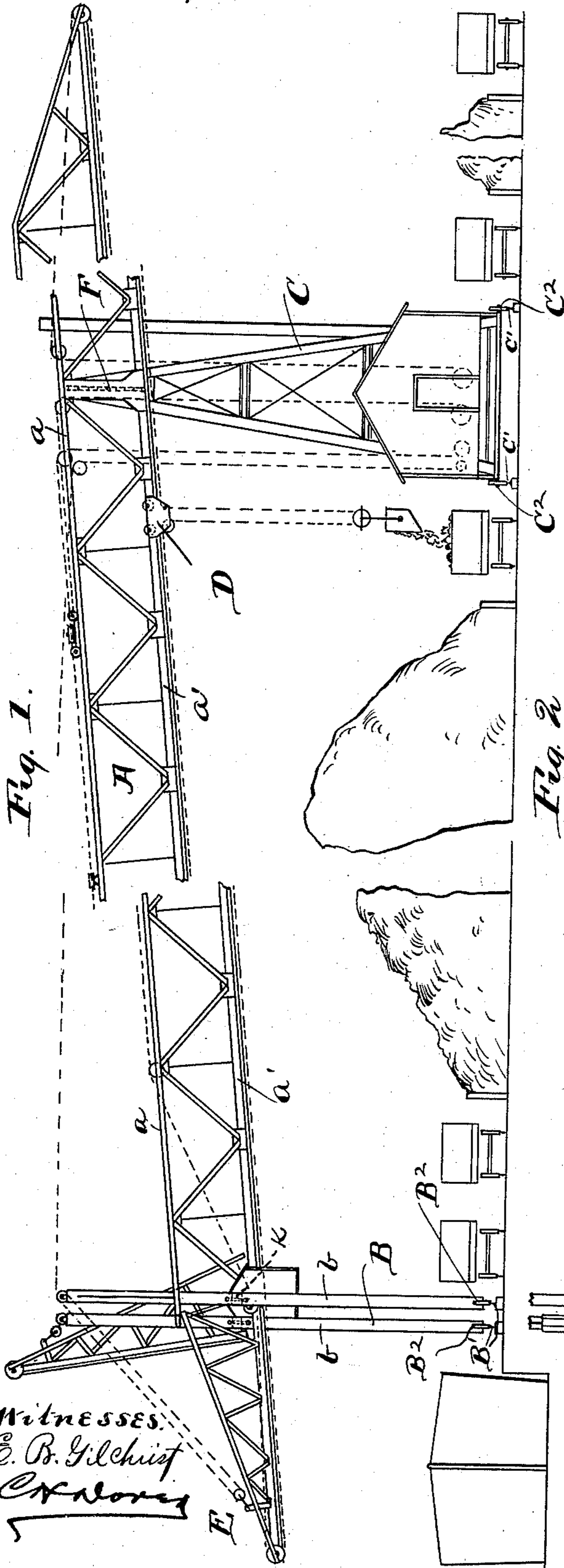
3 Sheets—Sheet 1.

P. RASCH.

ELEVATED TRAMWAY FOR HOISTING AND CONVEYING MACHINES.

No. 505,635.

Patented Sept. 26, 1893.



Witnesses.
E. B. Gilchrist
C. H. Morris

Inventor,
Peter Rasch
By his Attorneys
Leggett Leggett

(No Model.)

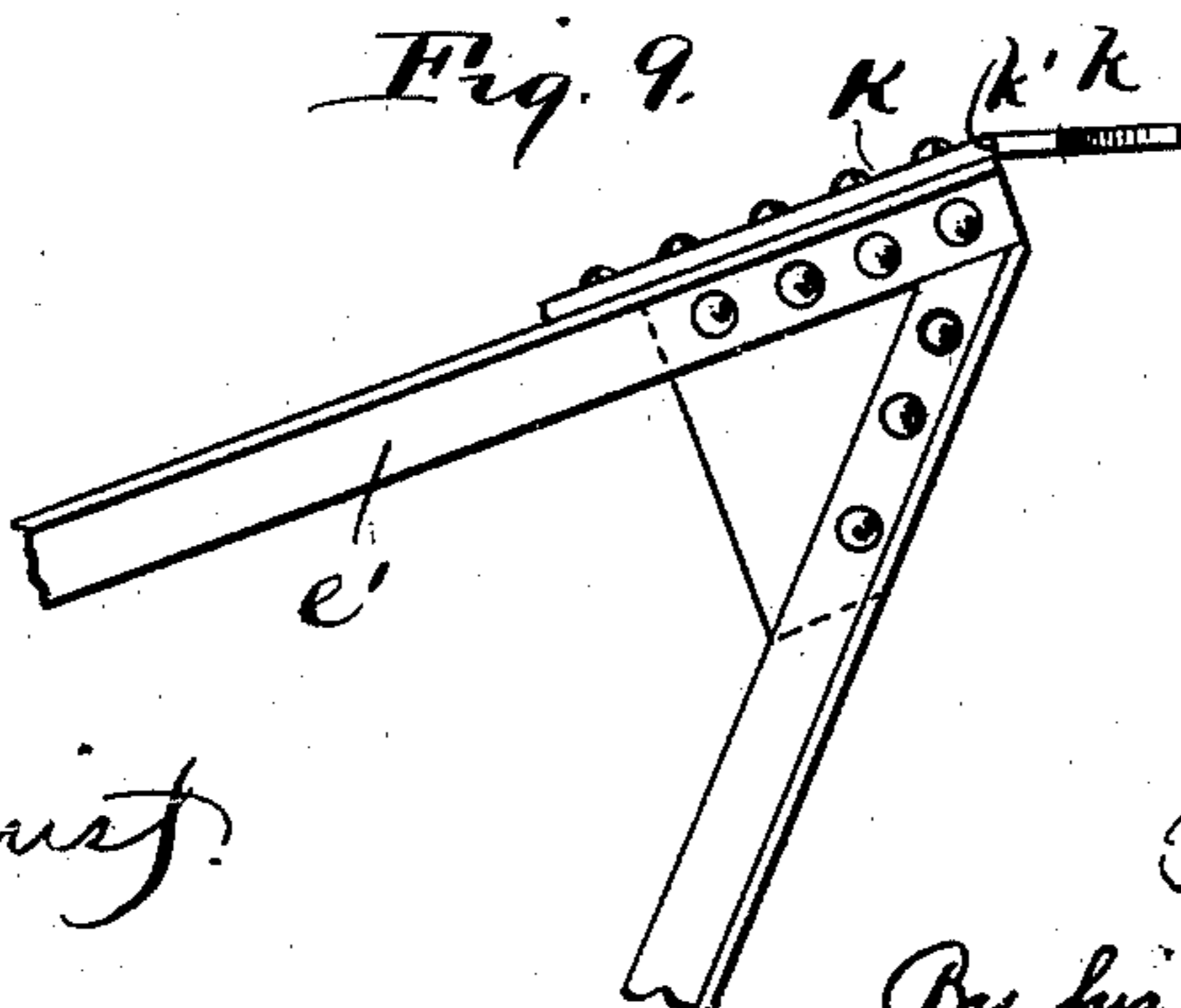
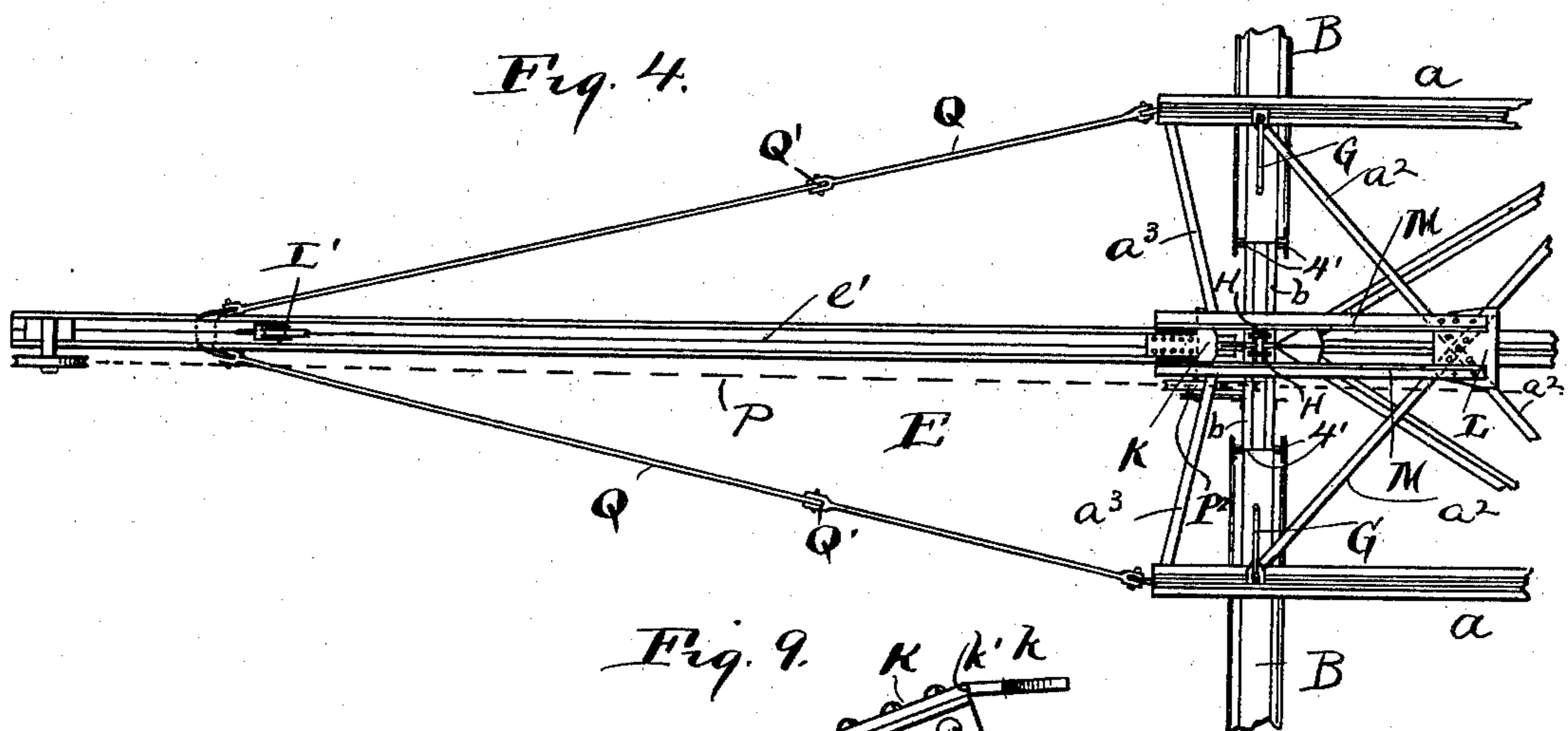
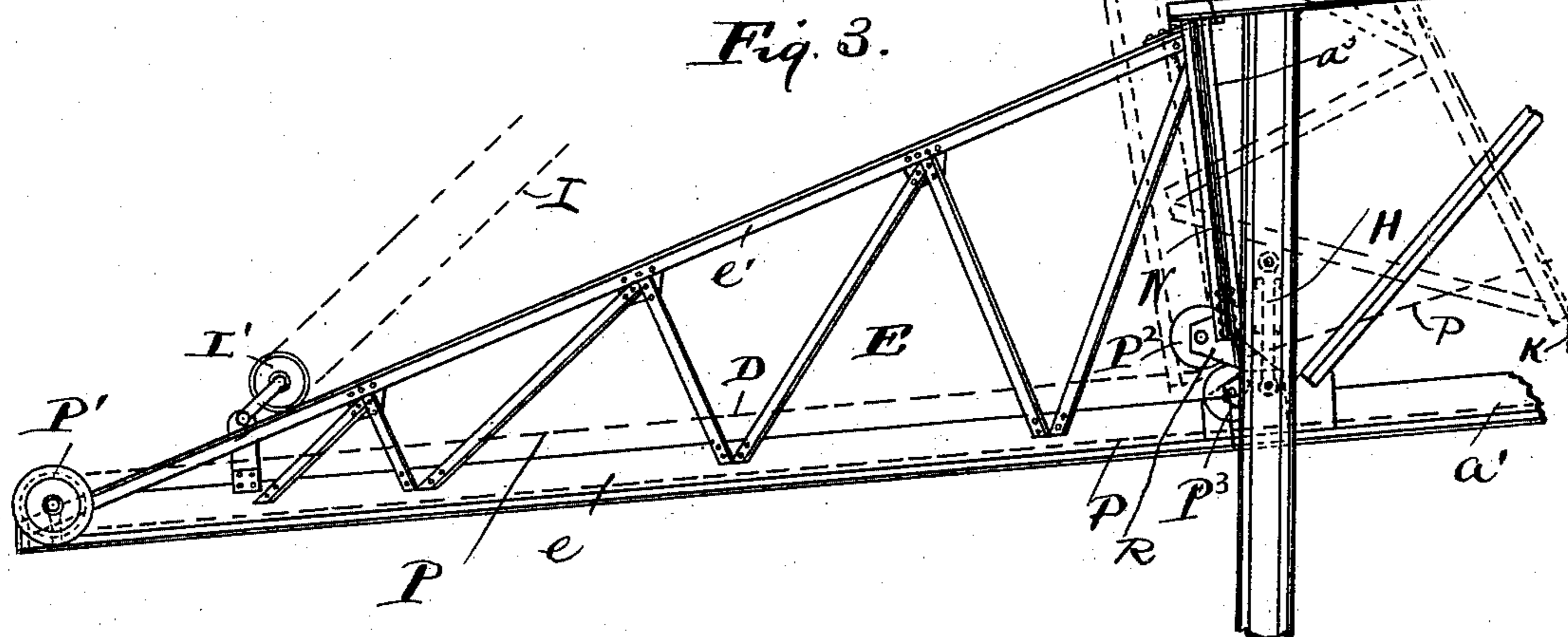
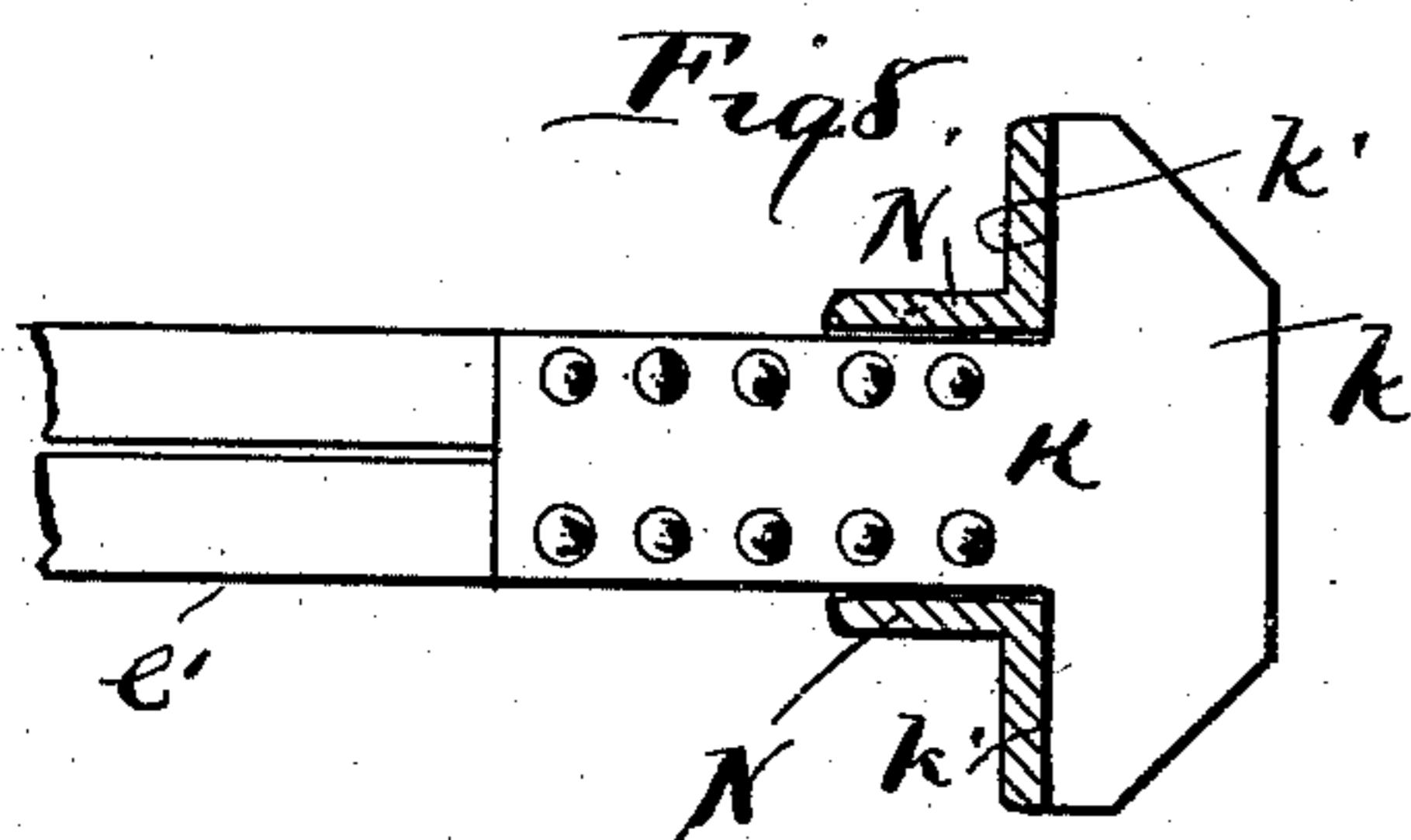
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E. Bryan Gilchrist.
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Inventor.
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(No Model.)

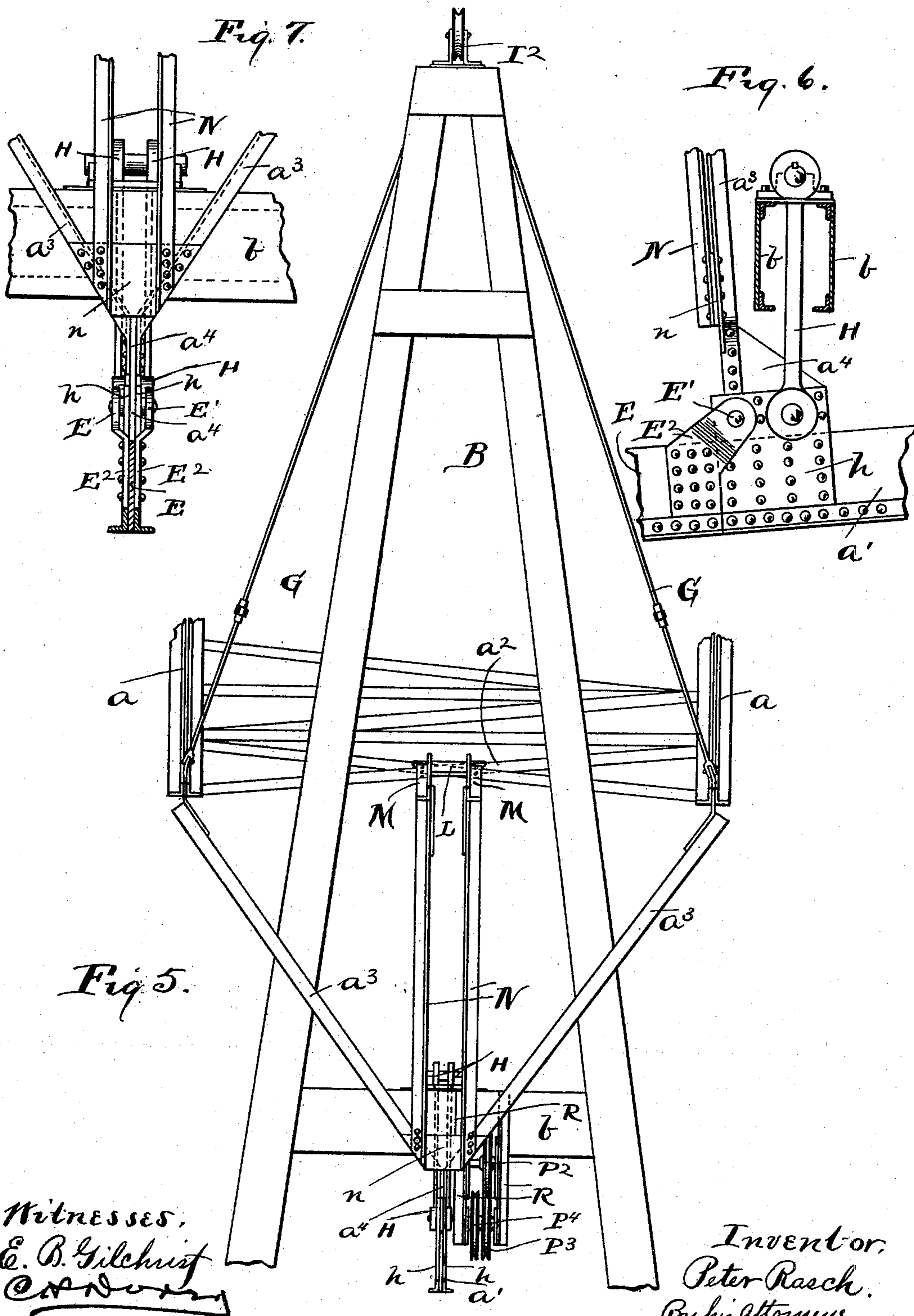
3 Sheets—Sheet 3.

P. RASCH.

ELEVATED TRAMWAY FOR HOISTING AND CONVEYING MACHINES.

No. 505,635.

Patented Sept. 26, 1893.



Witnesses,
E. B. Gilchrist
Adversary

Inventor.
Peter Rasch.
By his Attorneys.
Seggitt & Seggitt.

UNITED STATES PATENT OFFICE.

PETER RASCH, OF CLEVELAND, OHIO, ASSIGNOR TO THE KING BRIDGE COMPANY, OF SAME PLACE.

ELEVATED TRAMWAY FOR HOISTING AND CONVEYING MACHINES.

SPECIFICATION forming part of Letters Patent No. 505,635, dated September 26, 1893.

Application filed October 1, 1892. Serial No. 447,576. (No model.)

To all whom it may concern:

Be it known that I, PETER RASCH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful
5 Improvements in Elevated Bridge-Tramways for Hoisting and Conveying Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to
10 which it pertains to make and use the same.

My invention relates to improvements in elevated bridge-tramways for hoisting and conveying machines employed in lifting and conveying materials, such, for instance, as
15 coal and ore, in loading and unloading boats or vessels; and it consists more especially in certain features of construction pertaining to an apron-truss that is hinged or pivotally secured to the forward or outer end of the main
20 truss or bridge and that is provided with a track that is adapted to form a continuation of the load-carriage track of the main truss or bridge and that enables the load-carriage to travel out over the boat or vessel for re-
25 ceiving or discharging the load, as the case may be; the object being to provide more simple and desirable means for supporting said apron in its lower or outwardly-extending position; to so hinge or pivotally connect
30 the apron with the main truss or bridge that, when in its lowered position, the load-carriage track of the apron will be contiguous to and make a perfect or approximately perfect joint with the load-carriage track of the
35 main bridge or truss, and, when tilted to an upright position, the lower portion of the same will come inside of the adjacent and outer end of the truss, thereby avoiding interference with navigation, and to so construct the forward or outer end of the main
40 bridge or truss as to accommodate the reception of the apron in its upright position.

A further object is to provide suitable and simple means whereby the truss-apron is
45 guided, as against swinging laterally, in its movement to an upright position, and whereby it is securely held against being swayed by the wind, when it has assumed an upright position.

50 With these objects in view, and to the end

of attaining certain other advantages herein-after detailed, my invention consists in certain features of construction and in combination of parts hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1 is a side elevation of an elevated bridge-tramway and hoisting and conveying apparatus embodying my invention, one of the aprons E being shown elevated and Fig. 2 is a top
55 plan, portions being broken away in said figures to reduce the size of the drawings. Fig. 3 is an enlarged side elevation, of the apron-truss and outer portion of the main truss or bridge, showing, in solid lines, the apron in
60 its lower position, and showing the same, in dotted lines, in position tilted upward or rearward, the forward or outer supporting tower or pier of the main truss or bridge being partly broken away. Fig. 4 is a top plan relative to Fig. 3, with the upper portion of the
65 tower or pier broken away at 4'. Fig. 5 is a front elevation, of the forward end of the main truss or bridge, showing, among other things, the means employed for guiding the truss
70 apron in tilting it upward or rearward and holding it against being swayed laterally by the wind, when in its upwardly or rearwardly tilted position. Fig. 6 is an enlarged side elevation, more clearly showing, among other
75 details, the manner of hinging the apron to the lower chord of the main truss or bridge. Fig. 7 is a front elevation relative to Fig. 6. Fig. 8 is a top view, in detail, of the upper inner or rear end of the apron and grip-plate K
80 secured thereto, showing bars N of the main bridge or truss in section. Fig. 9 is a side elevation relative to Fig. 8.

My improved tramway comprises a bridge or truss A supported at opposite ends by a pier
85 or tower; B representing the front or outer pier or tower, and C the inner tower or pier. Bridge or truss A shown is of the triangular variety, the upper chords *a a* and lower chord *a'* being arranged parallel with each other
90 and extending lengthwise of the bridge or truss, the lower chord of the truss or bridge being located centrally of the upper chord and constituting a track for the load-carriage
95 D, said chords being tied and braced together 100

in any suitable manner. The rear or inner pier or tower supports the engine-house containing the machinery for operating the cable or cables whereby the load-carriage is hoisted and propelled. Bridge or truss A, at its forward or outer end, is supplemented with an apron, E, adapted to extend out over boats to be loaded or unloaded at the dock. The piers or towers are mounted upon tracks arranged parallel with each other, the forward or outer pier or tower upon a single-rail track B' and the inner or rear tower or pier upon a two-rail track C', the piers or towers being adapted to be moved endwise of their respective tracks, being provided with wheels, B², and C², respectively, for the purpose.

To accommodate the lateral horizontal movement of the bridge or truss of either pier or tower endwise of its track independently of the other pier or tower, the bridge or truss is hinged to the rear pier or tower, at F, in any suitable manner. I would here remark that there is preferably employed a pair of trusses or bridges hinged, respectively, at opposite sides of the rear tower or pier and a tower or pier B is provided for each truss or bridge, each pier or tower B having a track of its own.

The main bridge or truss is preferably suspended from the outer or forward pier or tower by a pair of guy-rods, G, (see Fig. 5) secured to the upper end of the tower or pier and by one or more suspending-links or bars H, (see Figs. 4, 5, 6 and 7) suitably connected, at their upper ends, with cross-beams b of said pier or tower and suitably connected at their lower ends, with the lower chord of the main truss or bridge.

Apron E, that, as already indicated, supplements the main bridge or truss at the forward or outer end of the latter, comprises a truss composed of two chords, e e', tied and braced together in any suitable manner. The lower chord of the apron constitutes a track for the load-carriage and is adapted to form an extension or continuation of the lower chord and load-carriage track of the main truss or bridge. The apron is preferably of the form shown, being gradually reduced in size toward its forward or outer end. The lower chord of the apron, at its rear end, is hinged or pivotally connected with the lower chord of the main truss or bridge, as at E', (see Figs. 6 and 7) and in such a manner that, when the apron is lowered, the lower chord of the apron will make a perfect or approximately perfect joint with the lower chord of the main truss or bridge, thereby avoiding any objectionable break in the continuation of the load-carriage track. A preferable construction consists in a plate, E², secured to each side of the lower chord of the apron and pivoted to the adjacent plate of a pair of plates, h, secured at the forward end of the lower chord of the main bridge or truss at opposite sides of said chord, respectively.

I (shown in broken lines, Figs. 1 and 3) represents the rope or cable for elevating and lowering the apron, said rope or cable being secured to the upper end of the adjacent tower or pier, thence leading to and over sheave I' secured to and at or near the forward end of the apron, and thence returning to the upper end of said pier or tower, where it leads over a guide-sheave I² and thence leads to the engine-house.

A feature of my present invention, of vast importance, consists in the simple and efficient means employed for limiting the lowering of apron E and holding it in proper position with its load-carriage track directly in line with the load-carriage track of the main bridge or truss, and for guiding the apron as it is tilted rearwardly and preventing lateral swaying of the same, by the wind, when tilted to the upright position shown in dotted lines. See Fig. 3.

K represents a grip-plate (see Figs. 3, 4, 8 and 9) secured to the upper or outer side of the upper chord of the apron-truss. Plate K extends rearward beyond the rear end of said chord and, at its rear or free end, terminates in a head, k, forming shoulders k' k' at opposite sides, respectively, of the aforesaid chord.

To the pair of diagonally arranged and overlapping tie and brace-bars a² at the forward end of the main truss or bridge, (see Figs. 4 and 5) are secured, by means of a plate L, two forwardly-extending bars M arranged centrally of and parallel with the upper chords of the main bridge or truss. Bars, M, at their forward ends, are supported by a pair of upright bars, N, which in turn are rigidly secured at their lower ends, by means of a plate n, to the forward pair of upright diagonal brace and tie-bars a³ of the main truss or bridge, bars a³ being secured by means of a plate, a⁴, rigidly interposed between plates h, to the lower chord of the main truss or bridge. The bars of the pairs of bars M and N, respectively, are located such a distance apart and the one pair of bars is so arranged relative to the other, that the apron-truss will be conveniently accommodated between the bars of the pair of bars when said truss is elevated or tilted upwardly and within the main bridge or truss out of the way of passing boats or vessels, as shown in dotted lines. See Fig. 3.

The upper ends of bars N, that are preferably angle-bars disposed as shown more clearly in Fig. 8, are adapted to be engaged by shoulders k' k' of grip-plate K of the apron in the lowered or outwardly-extending position of the latter, and serve as stops for the apron, when the latter, for use, is lowered to the proper position relative to the main bridge or truss. The apron is thus adequately supported and it will be observed that the greater of the strains upon the upper chords of the main truss or bridge is the tensional strain.

Q represents guy-rods (shown in Fig. 4) for

steadying the apron when the latter is in its lowered position, said rods being secured to the apron at or near the forward end thereof, and to the outer ends of the chords *a, a*, said rods being jointed, as at *Q'*, so as to accommodate the upward tilting of the apron.

The hoisting and propelling rope or cable, *P*, (shown in broken lines) is secured at opposite ends, to the load-carriage, as at *p p'*, (see Fig. 1) leading from *p* to and over a sheave, *P'*, at the forward end of apron *E* and thence leading to and under a sheave, *P²*, (see Figs. 3, 4, and 5) supported by a pair of brackets or hangers, *R*, secured to cross-beams *b* of the outer or forward pier or tower. From sheave *P²* the hoisting and propelling rope or cable leads to the other end of the route and thence returns and is secured to the load-carriage at *p'*, suitable hoisting and propelling machinery being of course provided for operating said rope or cable as required. Directly below sheave *P²*, brackets or hangers *R* support another sheave, *P³*, (see Fig. 5) that prevents a displacement of the hoisting or propelling rope or cable from sheave *P²*, and said brackets or hangers, preferably at one side of sheave *P³*, support still another sheave *P⁴* to properly guide the hoisting-rope or cable in its course to sheave *P'* at the outer end of apron *E* when said apron is tilted to the upright position shown in dotted lines. See Fig. 3. The location and arrangement of sheaves *P²* and *P⁴* are such relative to that of the hinge or pivot of apron *E* that, when said apron is tilted to an upright position, as would be the case when navigation closed and at other times when the use of apron *E* was not required, the operation of the hoisting and propelling-rope will not be interfered with.

In conclusion reference may be made to application Serial No. 447,577, having same date of filing as this case, and certain features of which are disclosed but not claimed in this application but which are properly claimed in above application.

What I claim is—

1. The combination with the main bridge or truss, of an apron truss hinged at its lower inner end to the bridge or truss, and having sliding connection with the bridge or truss at its upper inner end, substantially as set forth.

2. The combination with the main bridge or truss and a stop rigid with the forward end of said bridge-truss, of an apron-truss hinged or pivoted at its rear lower end to said main truss or bridge, and suitable means rigid with said apron and adapted to engage the aforesaid stop to thereby limit the lowering of the apron, substantially as set forth.

3. The combination with the main bridge or truss composed of three chords arranged substantially as indicated and suitably tied and braced together, of an apron truss hinged or pivoted, at its rear lower end, to the lower chord of the main truss or bridge in such a

manner that said apron-truss shall be capable of being tilted upwardly within the main truss or bridge, substantially as and for the purpose set forth.

4. The combination with the main bridge or truss composed of chords suitably tied and braced together, of an apron-truss hinged or pivoted, at its rear lower end, to the lower chord of the main truss or bridge in such a manner that said apron-truss shall be capable of being tilted upwardly within the main truss or bridge, and suitable means for preventing lateral swaying of said apron in its upright position, substantially as set forth.

5. The combination with a bridge or truss composed of chords suitably tied and braced together, and one or more stops rigid with the forward end of said truss or bridge, of an apron hinged or pivoted to said bridge or truss and a grip-plate rigid with said apron and adapted to engage the aforesaid stop or stops, from the rear, in the lowered position of the apron, substantially as and for the purpose set forth.

6. The combination with a bridge or truss comprising three chords arranged the one below the others and suitably tied and braced together, and a pair of stops located centrally of the upper two of said chords at the forward end of the truss or bridge, of an apron hinged or pivoted to the lower chord aforesaid and a grip-plate rigid with said apron and adapted to engage the aforesaid stops, from the rear, in the lowered position of the apron, substantially as and for the purpose set forth.

7. The combination with the main bridge or truss composed of chords arranged the one below the others and suitably tied and braced together and one or more pairs of parallel or approximately parallel bars or members arranged centrally of and rigid with the forward ends of said chords, of a truss hinged or pivoted at its rear lower end to the one end of the lower chord of the main bridge or truss, the arrangement of parts being such that said hinged truss is capable of being tilted upwardly between the parallel bars or members aforesaid, the latter being located such a distance apart, that they will prevent material lateral swaying, by the wind, of said hinged truss, substantially as set forth.

8. The combination with the main bridge or truss composed of three chords arranged the one below the others and suitably tied and braced together, a pair of bars located centrally of and parallel with the upper two of said chords and rigid with said bridge or truss, and a pair of upright bars connected with the forward ends of said first-mentioned pair of bars and rigidly connected with the lower chord aforesaid, of an apron-truss hinged or pivoted, at its rear lower end, to the aforesaid lower chord of the main bridge or truss and a grip-plate rigid with the rear

upper end of said apron-truss, the arrangement of parts being substantially as shown and for the purpose specified.

9. The combination with a bridge or truss
5 and an apron hinged, at its rear end, to said truss or bridge, of sheaves P' , P^2 , and P^4 , located and arranged substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 23d day of August, 1892.

PETER RASCH.

Witnesses:

C. H. DORER,
WARD HOOVER.