

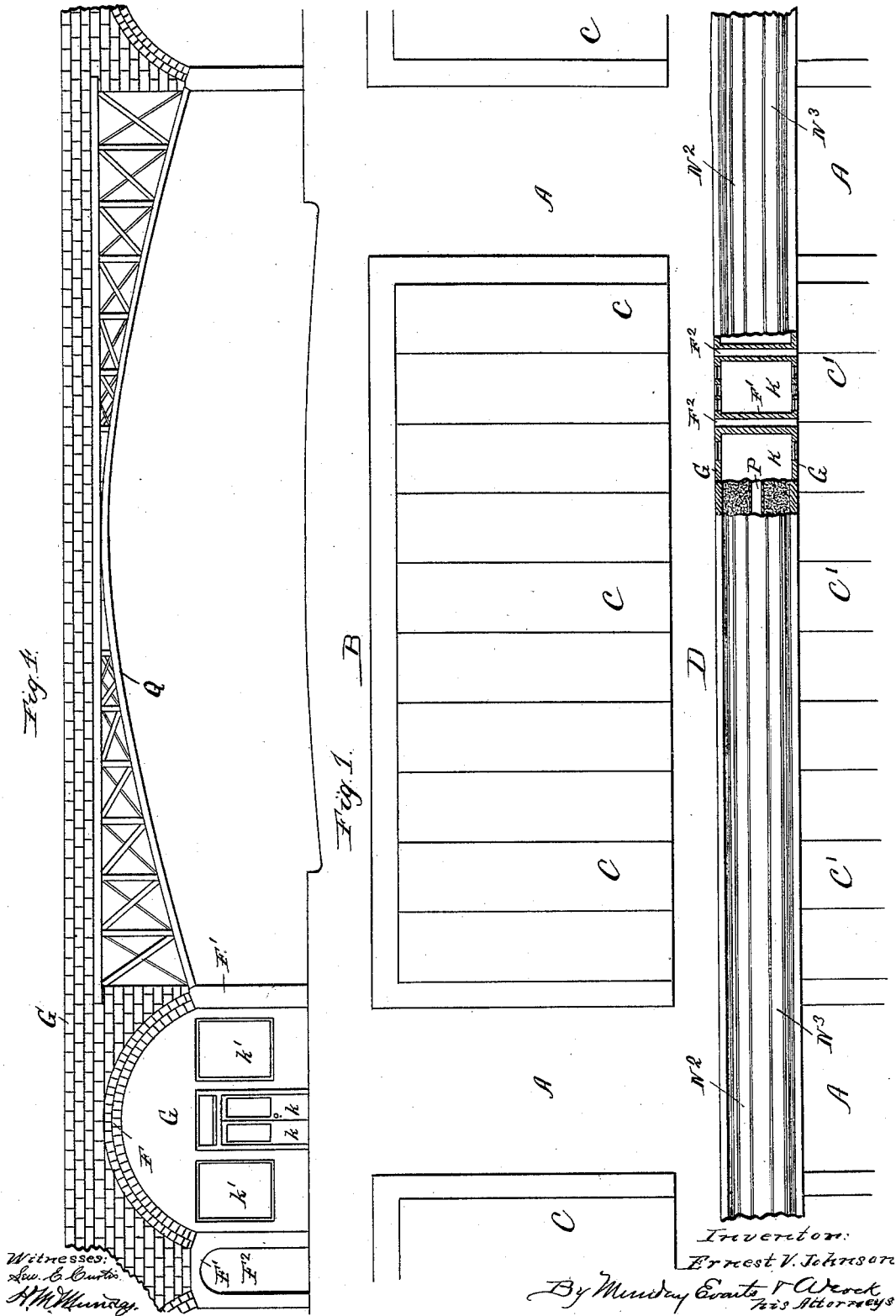
(No Model.)

3 Sheets—Sheet 1.

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ELEVATED RAILWAY.

No. 418,189.

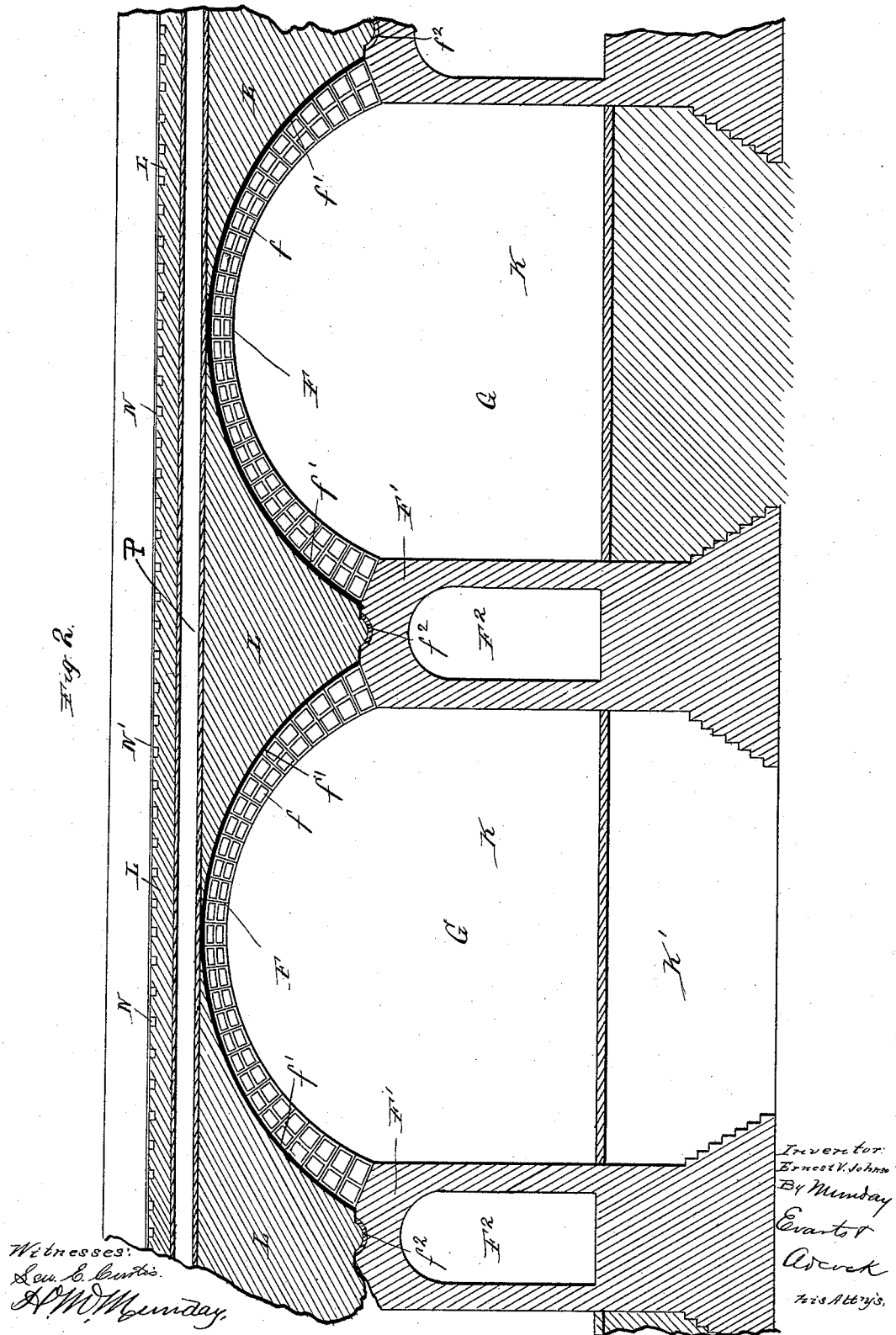
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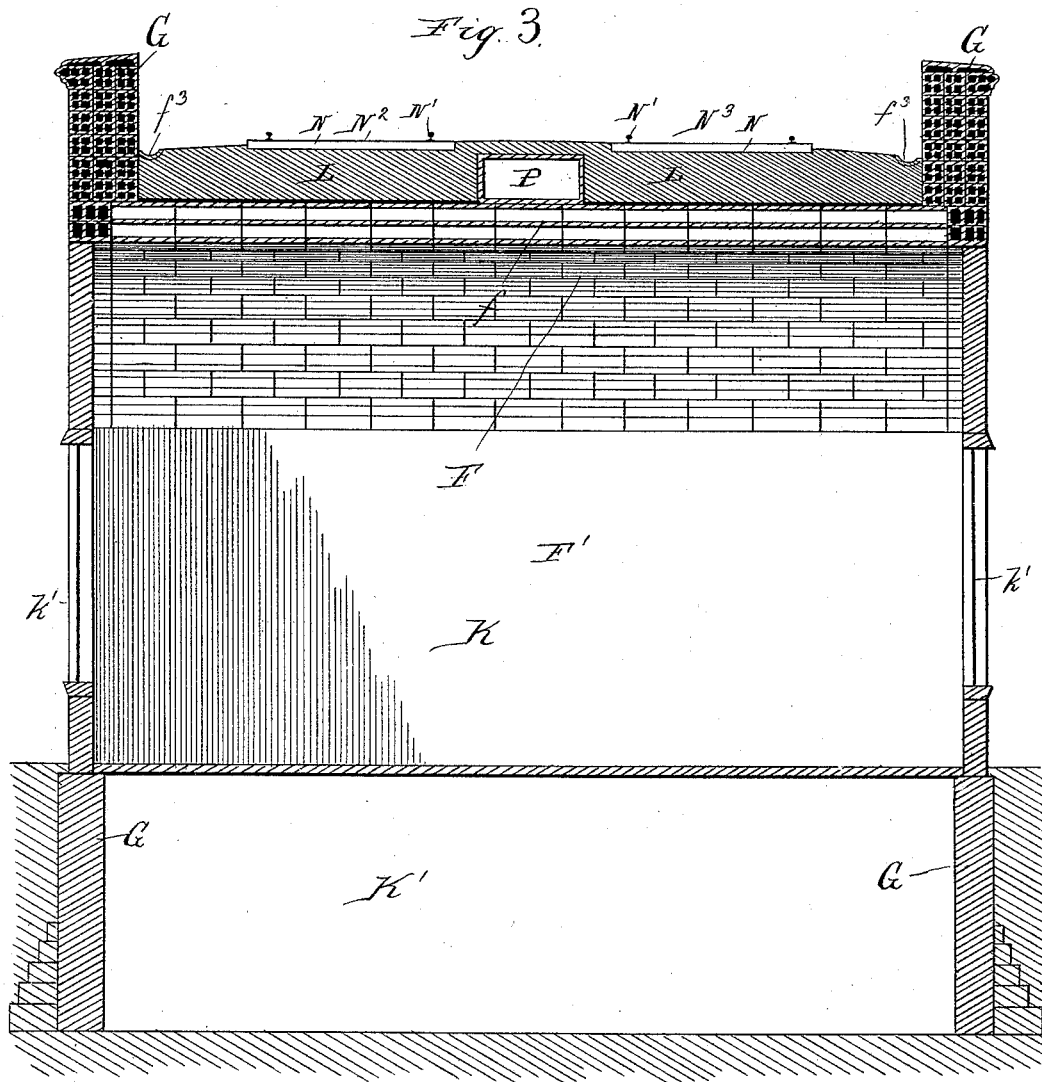
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Witnesses:  
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# UNITED STATES PATENT OFFICE.

ERNEST V. JOHNSON, OF CHICAGO, ILLINOIS.

## ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 418,189, dated December 31, 1889.

Application filed October 22, 1889. Serial No. 327,803. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST V. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Elevated Railways, of which the following is a specification.

My invention relates to improvements in the art of constructing elevated railways.

10 Elevated railways have heretofore usually been made of an iron or steel bridge-truss construction, the main structure being supported upon iron pillars or posts erected at suitable intervals in the street. This iron or  
15 steel construction of elevated railway is not only very expensive to build in the first instance, but the cost of keeping it in repair and properly painted amounts to a large sum annually. Such iron or steel truss construction is also objectionable on account of the  
20 noise unavoidably occasioned by the passing trains; and, owing to the constant strains and vibrations to which the iron or steel is subjected, it, as is well known, is liable to  
25 crystallization or other structural deterioration, so that notwithstanding the great cost of building and maintaining them in repair such elevated railways cannot be of a very durable construction. Owing to the great  
30 amount of noise occasioned, the obstruction of the light, and other circumstances, these iron or steel elevated railways are usually considered an injury to the property adjacent to the street in which they are erected, so  
35 that the elevated-railway companies have usually had heavy damages to pay to property owners.

The object of my invention is to provide a system or construction of elevated railway  
40 which, when once erected, will be of a durable and permanent construction, and require little or no outlay for subsequent repairs; which will be as noiseless as an ordinary surface railway, and thus obviate the disagreeable noises which heretofore have been incident to the use of elevated railways; which  
45 will occasion little or no injury to adjacent property; which will afford a large amount of valuable space for storage, stores, or other purposes, and which may be erected at much

less cost than the ordinary iron and steel elevated railways now commonly in use.

To this end my invention or improvement consists in an elevated railway built along the line of the alley between two contiguous streets and across the rear ends of lots abutting the alley, and consisting of a series of arches spanning the lots. These arches may be constructed of any suitable material, preferably of hollow building-tile. The space at the rear end of the lot spanned or covered by the arch will form a large room when the alley front is closed by a wall, which may be utilized as a store fronting on the alley, as a storage-room, or as a barn or other out-building for the particular lot upon which it is located. The pier or abutment upon which the arch rests is made hollow or with an open passage through it to give access to the alley from the lot. The road-bed is formed by filling the space above the arches with any suitable earth or material, preferably with sand, to a preferred depth of about two feet at the highest point of the arch. The railway-ties are planted in the usual manner of an ordinary surface road in this sand or other filling above the arches, and the rails are or should be placed in the customary manner on the ties. By this means the elevated railway may be constructed, as I estimate, at a less cost than the ordinary iron or steel elevated railway now commonly in use. In addition to this saving in the original cost of construction, my elevated-railway structure requires no painting and little or no cost for subsequent repairs. Beyond these advantages I also secure a construction which is permanent and durable, and one which renders my elevated railway as noiseless as an ordinary surface road; and the large amount of valuable store or storage room formed by the arches beneath the railway at the rear ends of the lots and fronting on the alley causes my construction of elevated railway, in connection with its freedom from noise, to be of little or no injury to the adjacent property, while in many locations it may well be considered as an advantage or improvement to the property.

The nature and construction of my inven- 100

tion or improvement will be more fully understood from the accompanying drawings, which form a part of this specification, and in which I have shown, at—

5 Figure 1, a plan view of a short section of my elevated railway, the same extending along the alley and across two streets. Fig. 2 is a vertical longitudinal section enlarged. Fig. 3 is a cross-section, and Fig. 4 is a side  
10 elevation, showing the span across the street.

In the drawings, A A represent the cross-streets; B, the street or streets parallel to the railway; C, the lots fronting on the street B, and across the rear end of which the elevated  
15 railway is built along the line of the alley D. The alley D, it will be observed, extends between the lots C, which front on the street B, and the lots C' on the opposite side of the alley.

20 F F are a series of arches constituting the elevated-railway structure and spanning the rear ends of the lots C C. The adjacent arches spring from a common abutment or pier F', which is hollow or furnished with a  
25 passage F<sup>2</sup>, preferably about four feet wide, to give access to the lots from the alley D. This passage F<sup>2</sup> or this hollow construction of the piers F' F' also serves to shorten the span of the arch.

30 The arches F may be made of any suitable material; but they are preferably composed of hollow building-tile *f*. Side walls G G are provided at the opposite ends of the series of arches extending along the line of the track.  
35 These side walls may preferably extend to the ground or foundation, as they will thus serve to close the ends of the arches and form inclosed rooms K K beneath the arches. The side walls G G should preferably extend up  
40 about five feet above the middle or highest point of the arch, so that when the space above the arches is filled in with sand or other suitable material L, to form the road-bed to the depth of, say, two feet above the  
45 highest point of the arch, the side walls will still extend some three feet above the surface of the road-bed. If desired, however, the side walls G may extend up only to the level of the road-bed. Cellars or basements  
50 K' may be provided beneath the rooms K below the arches.

N N represent the railway-ties, and N' the rails laid thereon, forming the two tracks N<sup>2</sup> N<sup>3</sup>. Between the tracks N<sup>2</sup> N<sup>3</sup> a conduit P  
55 is provided to receive water-pipes, gas-pipes, electric wires, or for other uses.

At the street-crossings the span or arch Q is preferably formed of iron or wood, the same being made of any suitable construction  
60 known to those skilled in the art. This street-span may, however, have the same sand or earth filling L to form the road-bed as the arches.

In cases where the alley does not extend  
65 continuously, or where for other causes the road is not desired to be constructed along the alley, it may of course be built through

the lot or block, and where the land is of value the space above the railway, as well as that below, may be utilized by erecting suitable buildings above the same, resting upon  
70 the railway as a foundation.

The arches F are or should be provided with a water-proof coating *f'*, of cement or asphalt or other suitable material, and a gutter, formed, preferably, of gutter-shaped tile  
75 *f*<sup>2</sup>, is provided between the arches to convey off the water which may seep through the sand filling. The surface of the road-bed should be given the ordinary street curvature  
80 or pitch, as is clearly indicated in Fig. 3, and gutters *f*<sup>3</sup> are provided adjacent to the side walls G, which serve to carry off the greater portion of the surface-water which may collect from rains or snow. The gutters *f*<sup>3</sup>, as  
85 well as the gutters *f'*, communicate, of course, with the sewerage system of the city through a suitable system of down-pipes.

The arches F will vary in span somewhat, according to the width of the lots, so that the  
90 room K, formed by the arches, may each be located solely on its proper lot. As most cities are laid out, however, the widths of the lots do not vary in different blocks usually more than two feet.  
95

The rooms K may be provided with doors *k* and windows *k'* through the wall G G, which inclose the same at the ends of the arches.

I claim—

1. The improved elevated-railway structure  
100 consisting of a series of arches F F, composed of building-tile or other suitable material and spanning the lots across which the road extends, said arches forming a series of rooms K K beneath the same, and said arches hav-  
105 ing a road-bed above the same, consisting of a filling L, of sand or other suitable material, substantially as specified.

2. The improved elevated-railway structure consisting of a series of arches F F, composed  
110 of building-tile or other suitable material and spanning the lots across which the road extends, said arches forming a series of rooms K K beneath the same, and said arches having a road-bed above the same, consisting of  
115 a filling L, of sand or other suitable material, said arches F resting on abutments or piers F', furnished with passages F<sup>2</sup> through the same to give access to the lots, substantially  
120 as specified.

3. The elevated-railway structure consisting of a series of arches F, furnished with side walls G G at the ends of said arches, and having a road-bed above said arches and between said side walls, composed of a filling L,  
125 of sand or other suitable material, railway-tracks N<sup>2</sup> N<sup>3</sup>, and a conduit P between said railway-tracks, substantially as specified.

4. The elevated-railway structure consisting of a series of arches F, furnished with side  
130 walls G G at the ends of said arches, and having a road-bed above said arches and between said side walls, composed of a filling L, of sand or other suitable material, railway-

tracks N<sup>2</sup> N<sup>3</sup>, and a conduit P between said railway-tracks, said road-bed being furnished with gutters *f*<sup>3</sup> adjacent to said walls G G to carry off the surface-water, substantially as specified.

5 5. The elevated-railway structure consisting of a series of arches F, furnished with side walls G G at the ends of said arches, and having a road-bed above said arches and between said side walls, composed of a filling L, of sand or other suitable material, railway-tracks N<sup>2</sup> N<sup>3</sup>, and a conduit P between said railway-tracks, said arches having a water-proof coating and provided with cross-gutters *f*<sup>3</sup> to carry off the water that may extend through the road-bed K, substantially as specified.

6. The elevated-railway structure consisting of a series of arches F, furnished with side walls G G at the ends of said arches, and having a road-bed above said arches and between said side walls, composed of a filling L, of sand or other suitable material, railway-tracks N<sup>2</sup> N<sup>3</sup>, and a conduit P between said railway-tracks, said road-bed being furnished with gutters *f*<sup>3</sup>, adjacent to said walls G G to carry off the surface-water, said arches having a water-proof coating and provided with cross-gutters *f*<sup>3</sup> to carry off the water that may extend through the road-bed K, substantially as specified.

7. The elevated-railway structure, extending along the line of an alley D and across lots C abutting thereon, composed of a series

of arches F, constructed of building-tile or other suitable masonry, each arch spanning one of said lots to form rooms K on the rear ends of the lots, said arches having side walls G G, and a road-bed formed by a filling L above said arches and between said side walls G G, substantially as specified.

8. The elevated-railway structure, extending along the line of an alley D and across lots C abutting thereon, composed of a series of arches F, constructed of building-tile or other suitable masonry, each arch spanning one of said lots to form rooms K on the rear ends of the lots, said arches having side walls G G, and a road-bed formed by a filling L above said arches and between said side walls G G, the piers or abutments F of said arches being furnished with passages F through the same, substantially as specified.

9. The improved elevated-railway structure consisting of an elevated road-bed having a series of rooms or inclosed spaces beneath the same, substantially as specified.

10. The improved elevated-railway structure consisting of an elevated road-bed having a water-tight bottom, and provided with a series of rooms or inclosed spaces beneath the same, the water-tight bottom of said road-bed forming the roof or covering for said rooms, substantially as specified.

ERNEST V. JOHNSON.

Witnesses:

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