

(No Model.)

2 Sheets—Sheet 1

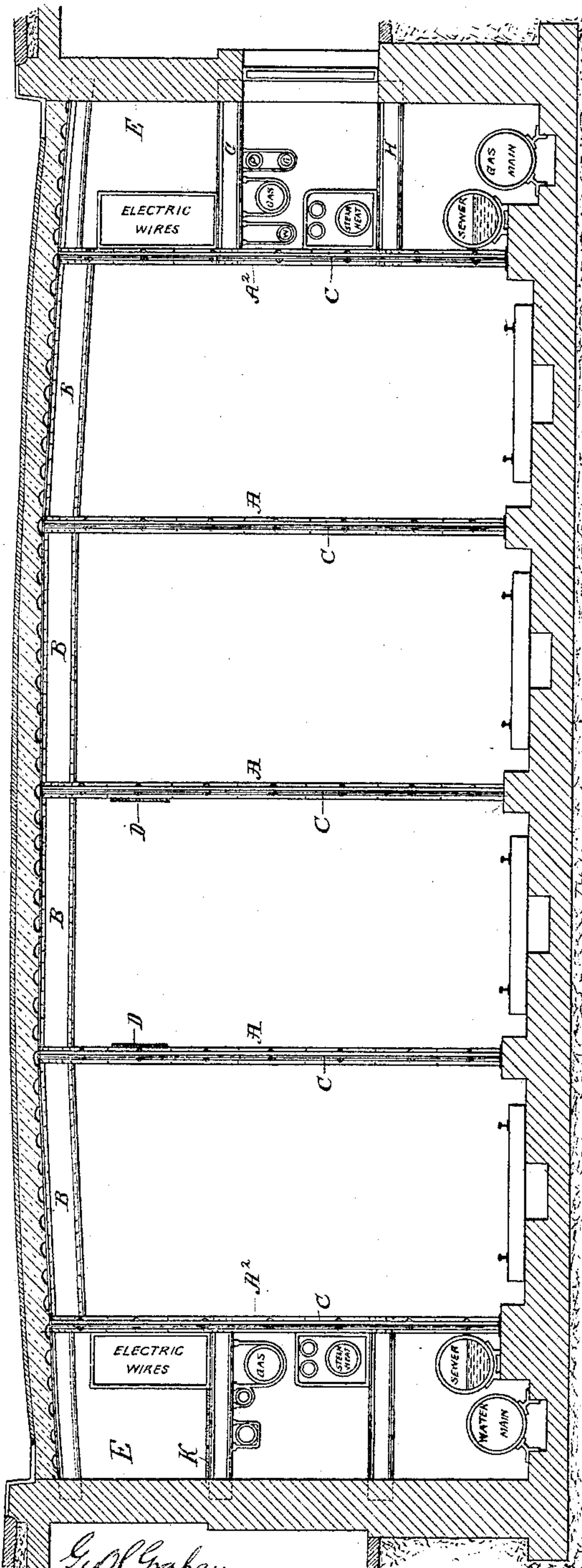
R. R. HAZARD.

STRUCTURE DESIGNED TO OCCUPY THE STREETS.

No. 328,027.

Patented Oct. 13, 1885.

Fig. 1.



Attest:

Geo. H. Graham
Geo. E. Marvin

Fig. 2.

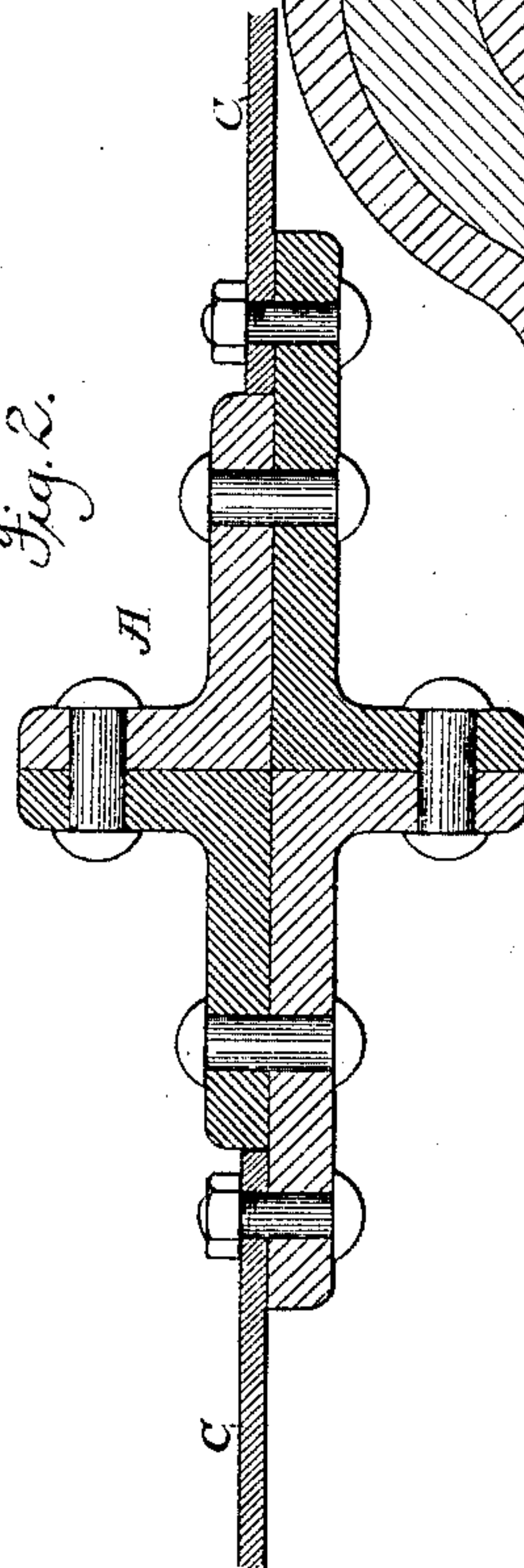
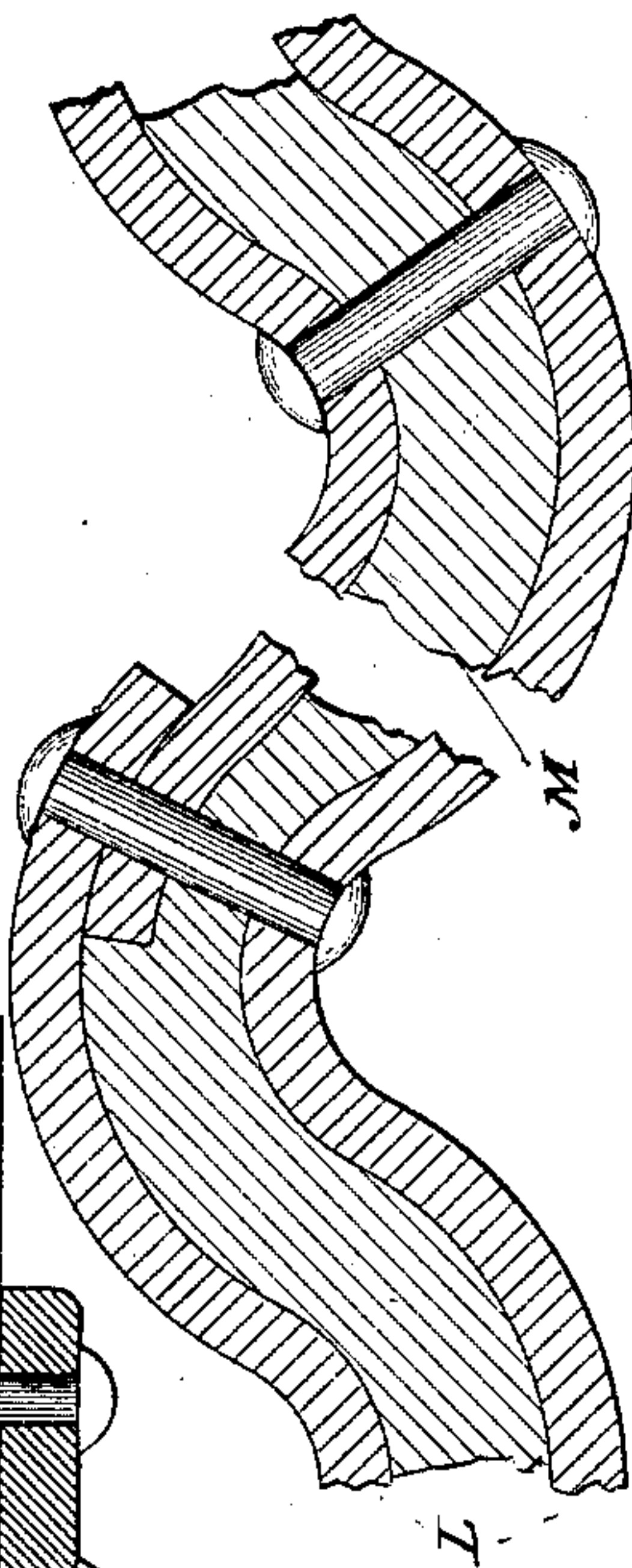


Fig. 3.



Inventor:

Rowland R. Hazard,
by
Thos. C. Schrand
attor.

(No Model.)

2 Sheets—Sheet 2.

R. R. HAZARD.

STRUCTURE DESIGNED TO OCCUPY THE STREETS.

No. 328,027.

Patented Oct. 13, 1885.

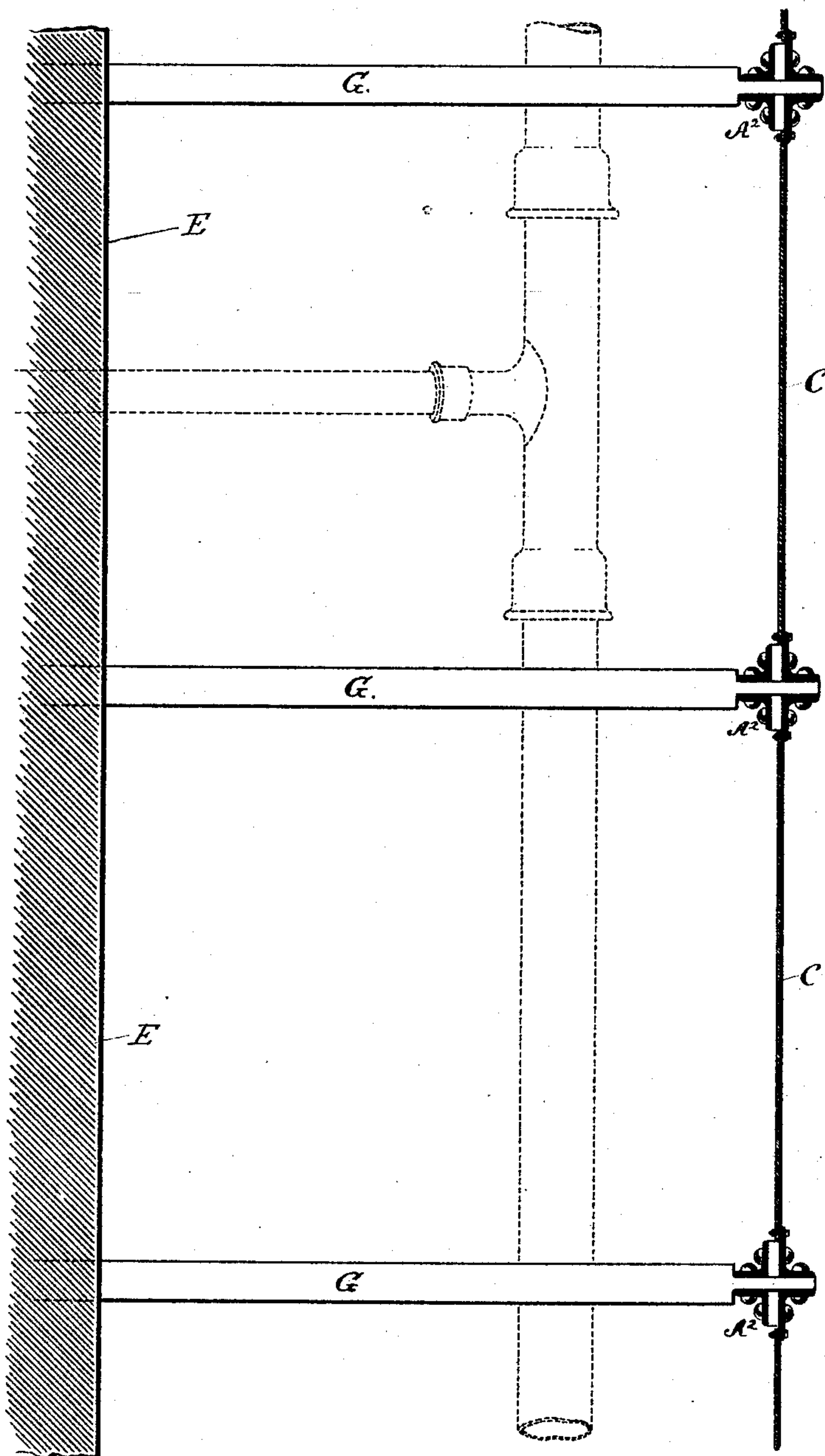


Fig. 4.

WITNESSES

Frederic W. Blanc
F. Renault

Rowland R. Hazard.

INVENTOR

by H. C. Behrend
Attorney

UNITED STATES PATENT OFFICE.

ROWLAND ROBINSON HAZARD, OF NEW YORK, N. Y.

STRUCTURE DESIGNED TO OCCUPY THE STREETS.

SPECIFICATION forming part of Letters Patent No. 328,027, dated October 13, 1885.

Application filed July 26, 1884. Serial No. 138,858. (No model.) Patented in England August 6, 1884, No. 11,000, and in France August 9, 1884, No. 151,159.

To all whom it may concern:

Be it known that I, ROWLAND ROBINSON HAZARD, a citizen of the United States, and a resident of the city, county, and State of New York, have invented a new and useful Improvement in Structures Designed to Occupy the Streets, fully described and represented in the following specification and accompanying drawings, forming a part of the same.

My invention relates to a structure designed to occupy the streets of a populous city beneath the surface and between the curb-lines.

The objects of my invention are two—first, to provide a series of tunnels adequate to the requirements of railway traffic; second, to provide a permanent and accessible way for housing, arranging and inspecting indispensable pipes, conduits, and cables.

I attain these objects by the construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a transverse section of a structure occupying the street beneath the surface and between the curbs. Fig. 2 is a horizontal cross-section of a column and panels of one of the walls forming the tunnels. Fig. 3 represents a modified construction of the internal division-walls. Fig. 4 represents a horizontal cross-section taken through the upper gallery or passage adjacent to the curb.

The structure consists of traffic-tunnels centrally disposed, and on either side thereof similar tunnels subdivided longitudinally. The street is excavated between the curbs, the depth being determined by the varying requirements of transit, access, stations, &c. Walls of masonry E are constructed to support either curb, and are also used to sustain the beams or floors, as shown. Between these walls thin walls of suitable strength are constructed, forming traffic-tunnels, preferably five walls, forming four tunnels, two for "express" and two for "way." These walls may be formed of rows of steel or iron columns A A², which support the roof and roadway, which is preferably water-proof.

To provide proper ventilation to the traffic-tunnels, it is essential that each track be inclosed, so that passing trains may displace the air, acting as a piston in an open cylinder, and

I therefore fill the space between the columns with any thin strong material, C, attached to said columns in any manner, but preferably as shown. I prefer to use for this purpose a non-resonant material, described in an application filed by me simultaneously herewith.

Another form of thin non-resonant wall for this purpose is illustrated in Fig. 3, particularly adapted for the internal division-walls. In this construction a continuous double wall, L, of corrugated iron or steel, with a filling, M, of asphalt, cement, or equivalent material for preventing resonance takes the place of the columns and panels first described.

A double wall of flat instead of corrugated metal suitably braced and filled, as described, would constitute a modification of my invention.

By the use of iron or steel columns, which can be made of relatively small cross-section, and thin panels or sheets to fill the spaces between said columns or other continuous thin strong wall, I obtain perfect ventilation, reduce the width of the tunnel to a minimum, and secure space at each side thereof for the disposition of pipes. This space I divide into two or more galleries or passages by one or more series of beams, G H, or floors K, the beams of each series being placed about four feet apart, or any distance found desirable. In these galleries or passages, and resting on the bottom, or on or suspended from said beams or floors, the sewers, gas, water, and other pipes and electric wires or conduits are arranged in a manner preferably as shown, so as to be easily accessible. A board placed on said beams may serve as a temporary walk or support for workmen. Electric wires are preferably placed in the upper gallery, so as to leave a passage between the wires or conduit and the wall of the vault. Street opening is by this arrangement rendered unnecessary, and connections with each house can readily be made through the wall. The entrances to the galleries will preferably be located at the railway-stations, and the galleries may also communicate with the sidewalk-vaults, as shown.

The advantage of several lines of support is that underground pipes may each be sustained

or suspended, so as to be accessible, and the advantage of open communication between the galleries is that workmen may stand in one and make repairs or connections in another, and that pipes suspended to the beams are accessible from above and below.

My invention is not confined to any particular number of tunnels, as the structure may embrace a less or greater number than shown.

I claim—

1. A structure occupying a street beneath its pavement and embracing tunnels or ways formed by comparatively-thin internal walls, those centrally placed being calculated for railway traffic and those at the curb-line provided with supports for sewers, pipes, and conduits, substantially as described.

2. A structure occupying a street beneath its pavement and embracing tunnels or ways formed by comparatively-thin internal walls, those centrally placed being calculated for railway traffic and those at the curb-line subdivided into galleries or passages and adapted to other uses, substantially as described.

3. A structure divided horizontally into longitudinal galleries or passages located one over another, occupying part of a street beneath its surface, and calculated to contain and support the sewers, water, gas, and other pipes,

and cables, conduits, and wires for electric service, substantially as described.

4. A structure divided longitudinally by rows of beams into galleries or passages, and accessible throughout, occupying part of a street beneath its surface and calculated to contain and support the sewers, water, gas, and other pipes, and cables, conduits, and wires for electric service, substantially as described.

5. A structure calculated for railway traffic, the walls whereof are constructed of iron or steel, in combination with a filling of asphalt, cement, or equivalent material forming a comparatively-thin non-resonant wall, substantially as described.

6. A structure calculated for railway traffic, the walls whereof are constructed of corrugated iron or steel, in combination with a filling of asphalt, cement, or equivalent material forming a comparatively-thin non-resonant wall, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROWLAND ROBINSON HAZARD.

Witnesses:

J. H. CANIFF,
W. H. SHUEY.