

C. E. POWERS.  
Elevated Railway.

No. 233,015.

Patented Oct. 5, 1880.

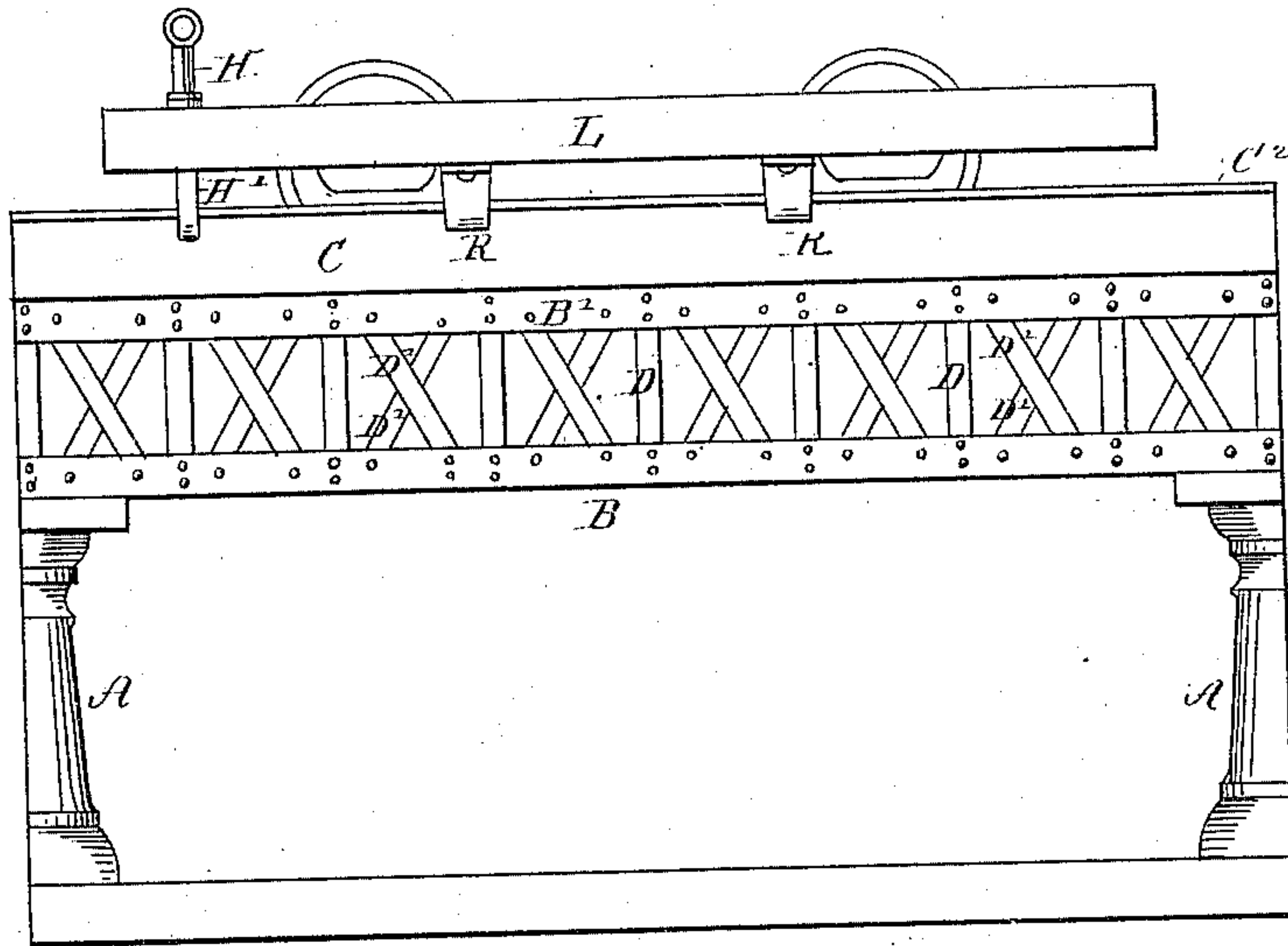


Fig. 1.

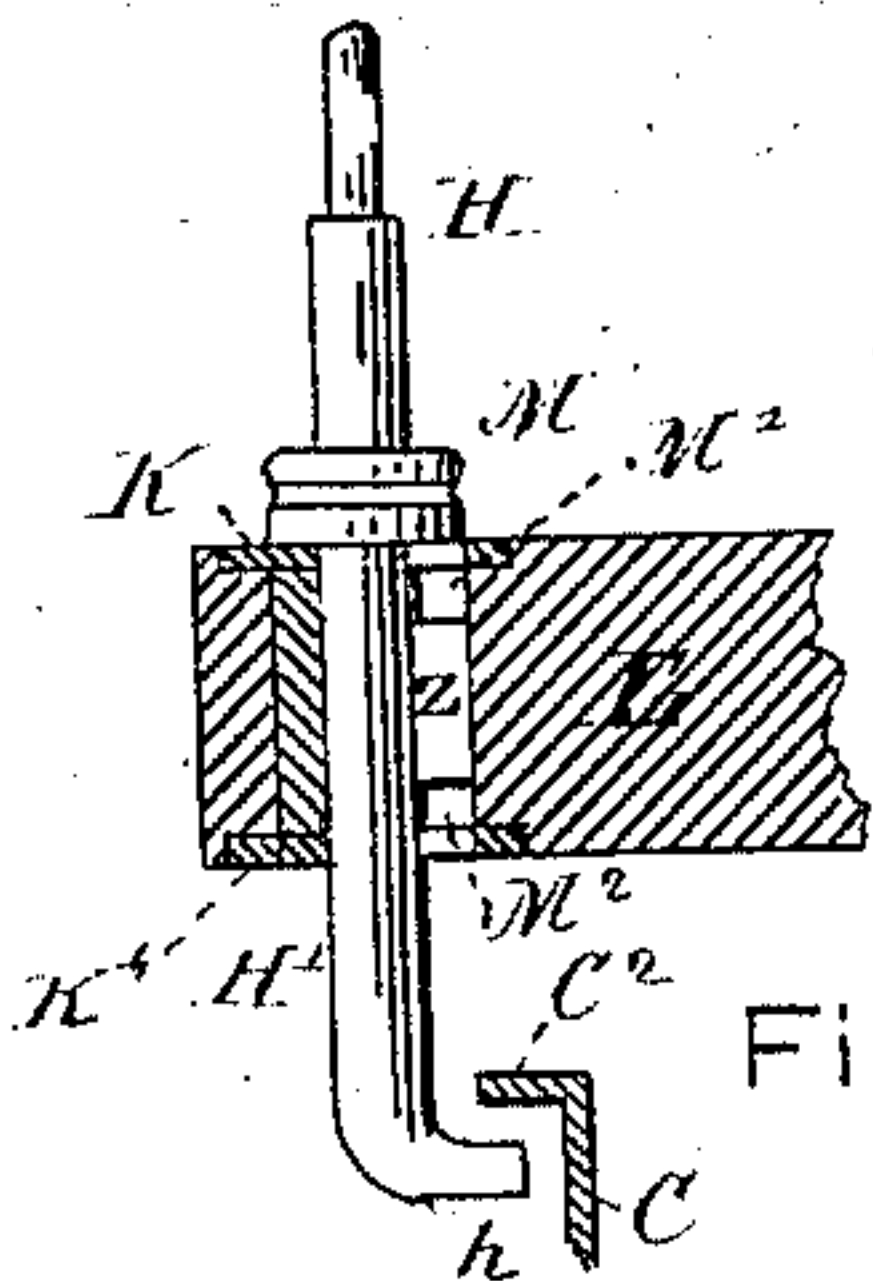


Fig. 3.

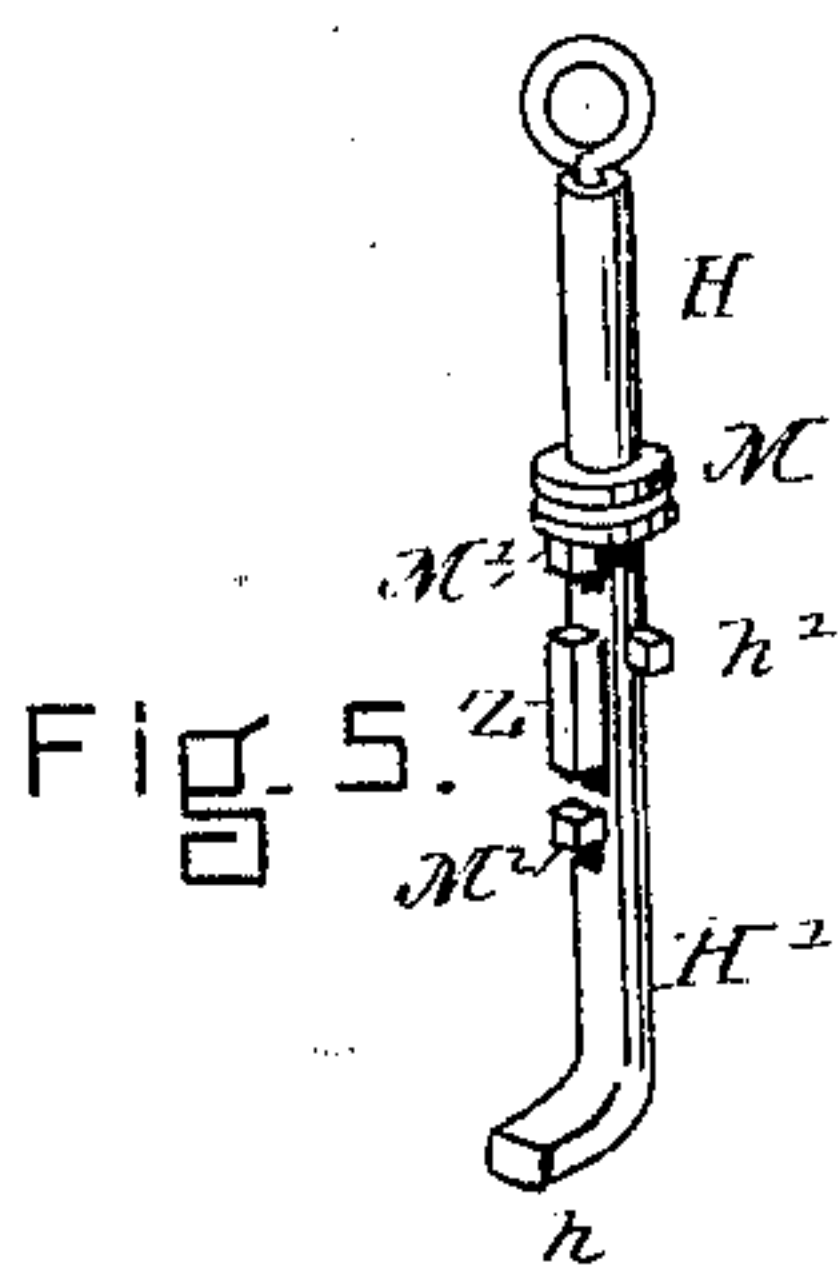


Fig. 5.

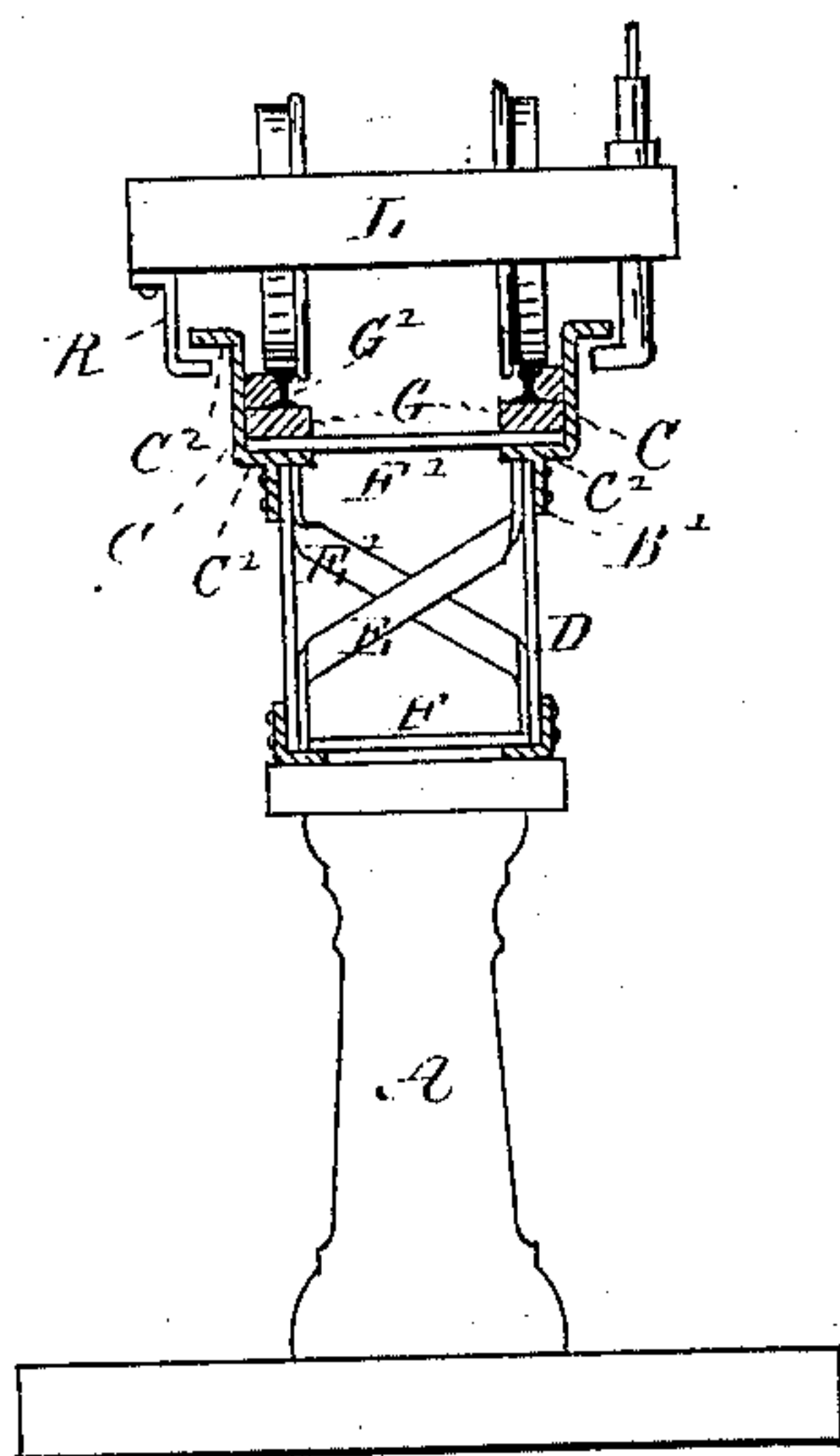


Fig. 2.

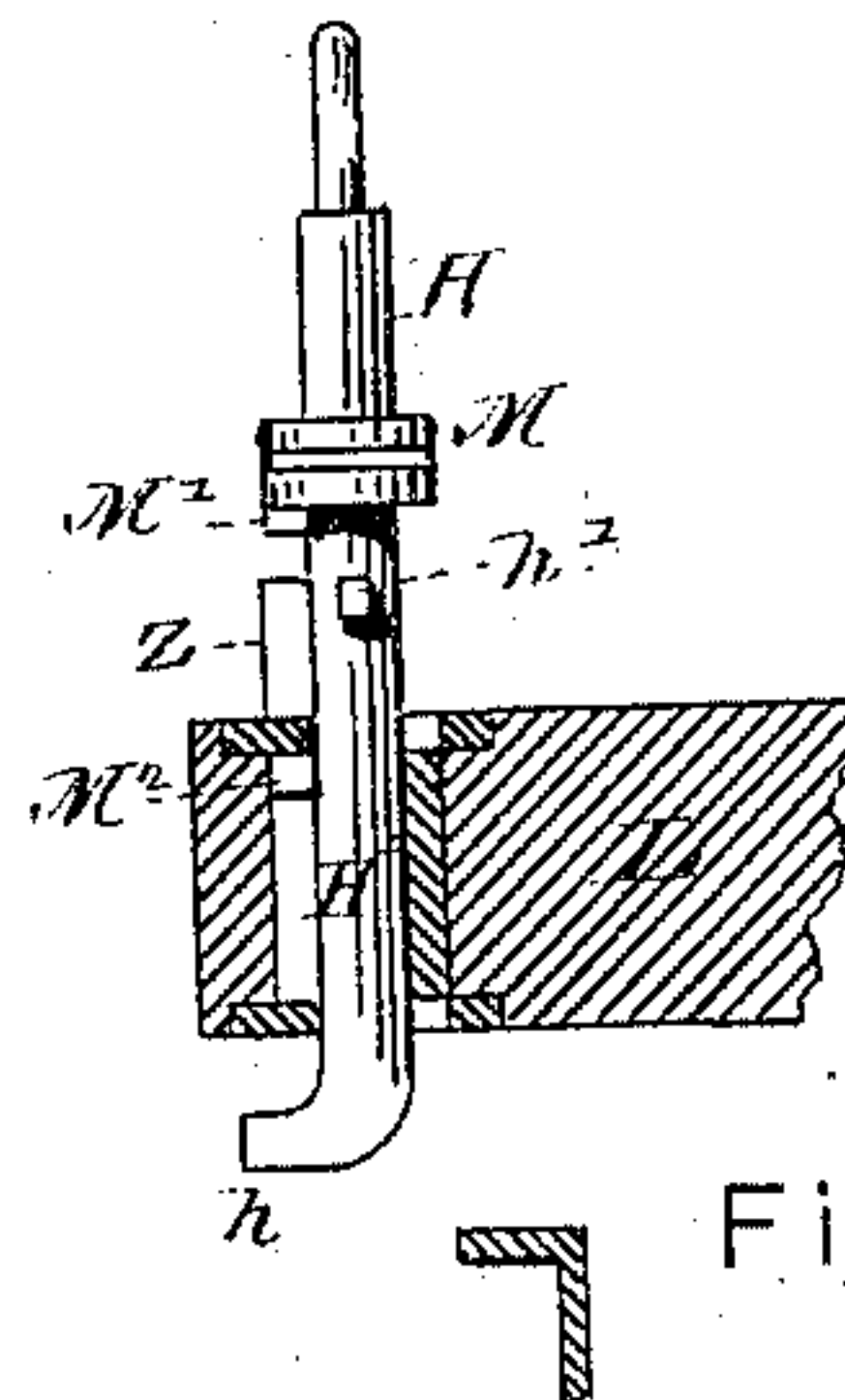


Fig. 4.

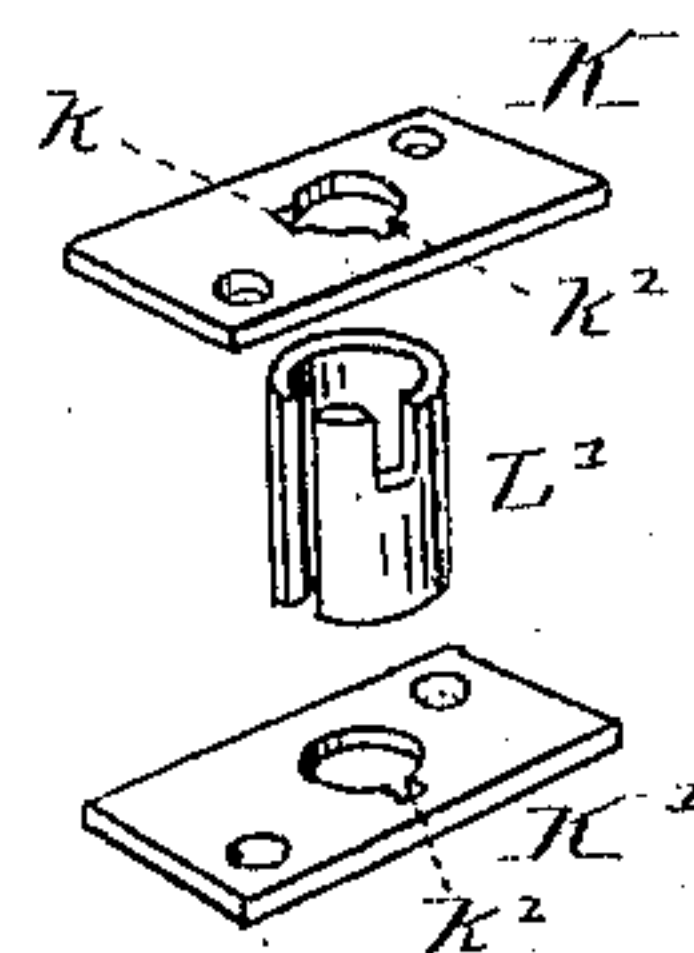


Fig. 6.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

CHARLES E. POWERS, OF BOSTON, MASSACHUSETTS.

## ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 233,015, dated October 5, 1880.

Application filed August 29, 1879.

*To all whom it may concern:*

Be it known that I, CHARLES E. POWERS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Elevated Railways, (Case A,) of which the following is a specification.

My invention consists in the details of construction, and may best be understood by reference to the specification and drawings, the object being to so modify the car and the track that a narrow gage may be used and increased safety and lightness of construction be attained.

In the drawings, Figure 1 is a side elevation, showing the track, safety-beam and its supporting-girder, and a part of a car. Fig. 2 is an end elevation of the same. Figs. 3, 4, 5, and 6 show, in detail, the parts of the device for preventing the car from leaving the track or freeing itself from the girder.

The track, safety-beam, and girder form, when built, a beam of great strength and compactness, which is supported on pillars A at suitable intervals, or it may be supported by arches or other devices.

The lower part of the beam is made with a rectangular section, and has longitudinal bars B B', verticals D, side braces, D' D', cross-ties F F', and cross-braces E E', all made and riveted together substantially as shown; or this part of the built beam may be constructed in any other of the well-known methods.

The safety-beam C has its upper edge, C<sup>2</sup>, bent outwardly at right angles, as shown in Figs. 2 and 3, and its lower edge is bent inwardly at right angles, as shown at C', Figs. 2 and 3, and has, in addition to the other members, a web, B', Figs. 1 and 2. This web B' constitutes the longitudinal bar. (Shown in Fig. 1.)

G, Fig. 2, is a stringer of wood or of iron, resting upon some yielding material, so as not to be too solid for a suitable rail-support.

G', Fig. 2, represents the rail, which may be of any desired pattern. The space between the rail G' and the longitudinal piece B' may be filled with wood or other similar elastic substance.

By the above combination and union of the three elements—viz., the track, the safety-beam, and the girder—I am enabled to obtain the required strength and safety with the least possible amount of material.

The device for preventing the car from being wholly thrown from the track is shown in detail in Figs. 3, 4, 5, and 6, and consists of a strong metallic rod, H H', the part H projecting above the platform, and the part H' going below the same to such an extent as to reach below the horizontal flange C<sup>2</sup> of the safety-beam C, Figs. 1, 2, and 3, its end h being turned at right angles, as shown in Fig. 3, so as to underrun the part C<sup>2</sup> of the rail-guard, so that when the rod H is turned as indicated in Figs. 2 and 3 it is impossible for the car L, Fig. 1, to leave the track without breaking this rod or a part of the safety-beam.

The locking-rod H H' has a collar, M, and four projections, M', Z, M'', and h', from its cylindrical surface. (See Figs. 4 and 5.) Three of these, the projections M', Z, and M'', are in line, while the fourth, h', is one-fourth way round the rod.

The plate K has two radial openings (see Fig. 6) at right angles to each other. The lower plate, K', has but one radial opening, k<sup>2</sup>, Fig. 6, the opening k<sup>2</sup> being under and in line with the opening k' in the upper plate, K.

In use the projections M', Z, M'', and h' act as follows: When the holding-rod is down, as shown in Fig. 3, both the projections M' and M'' prevent it from revolving, the projection M' being held by the opening k' in the upper plate, and the projection M'' by the opening k<sup>2</sup> in the lower plate. To free the rod H from this position it can be raised slightly—that is, as high as the projection h' will allow, (h' being checked by the upper plate, K.) This action lifts both of the projections M' and M'' from the plates K and K', and leaves the rod H free to be turned around until the projection h' comes in line with the opening k', and the projections M' Z M'' come in line with the opening k; then the rod H may be raised up, as shown in Fig. 4, so high that its lower end, h, will be above the safety-beam C C' C<sup>2</sup>. This will allow the car to be switched or to cross



an intersecting road. When the rod H is raised to the full height desired it may be turned so that the lower end of the projection Z will rest upon some part of the plate K, and thus hold the rod up.

R R, Figs. 1 and 2, are down-hanging arms, which are firmly attached to the under side of the car, the lower end being bent inwardly, so as to underrun the flange C<sup>2</sup> of the safety-beam C.

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

1. On an elevated railway, the safety-beam C<sup>2</sup> C' C and the rail G', in combination with devices upon the car to take under the hori-

zontal flange, substantially as described, and for the purpose set forth.

2. In an elevated railway, the combination of the safety-beam C<sup>2</sup> C' C and the holding-rod H H' with the car L, arranged to operate substantially as described, and for the purpose set forth.

3. The combination of the holding-rod H H' and its projections M', Z, M'', and h with the plates K and K', substantially as described, and for the purpose set forth.

CHARLES E. POWERS.

Witnesses:

WILLIAM EDSON,  
WILLIAM COGAN.