(No Model.) 2 Sheets—Sheet 1.

G. KAUFMAN & W. F GRONAU.

GRAND STAND, PAVILION, &c.

No. 584,640. Patented June 15, 1897.

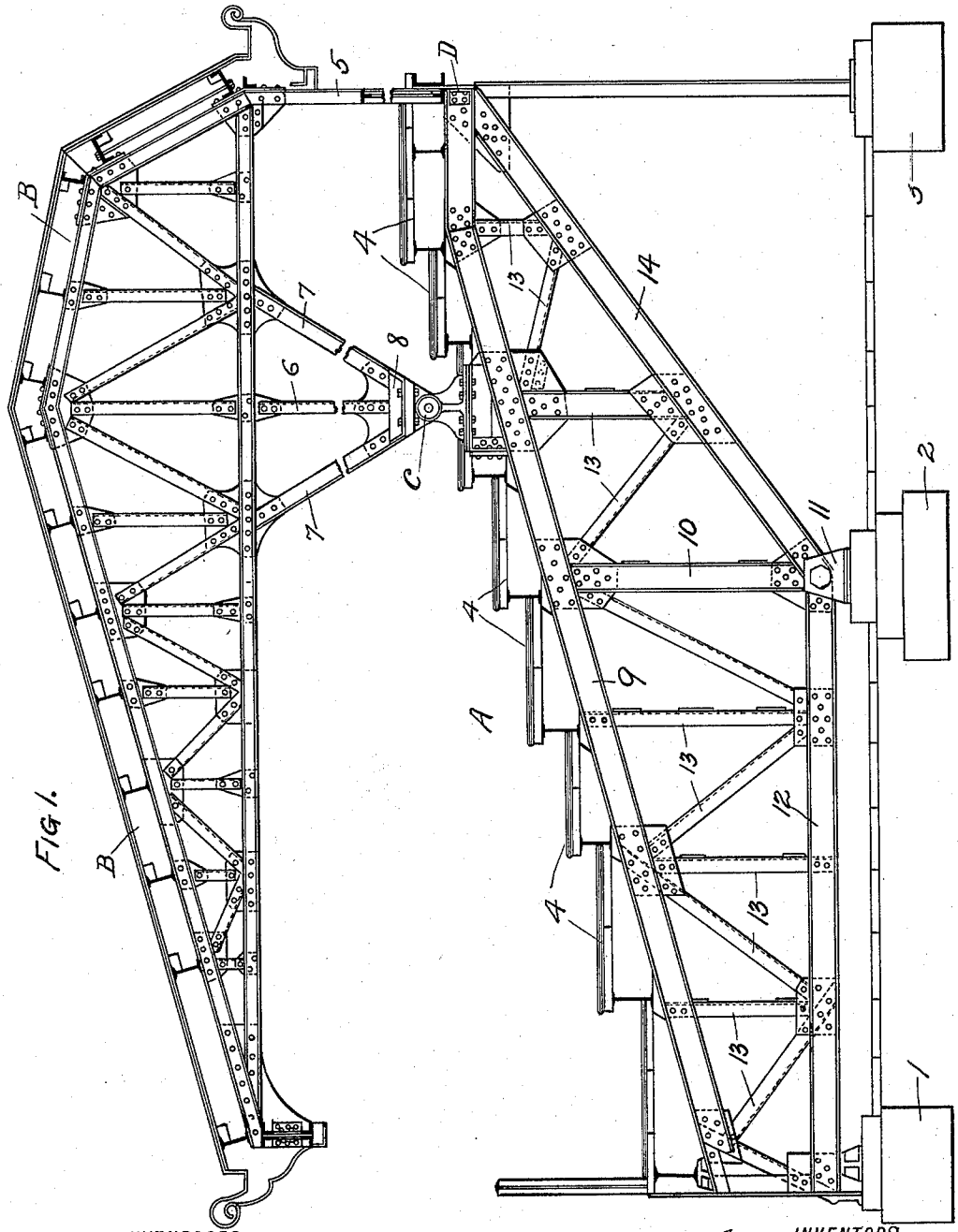

FIG. 1.

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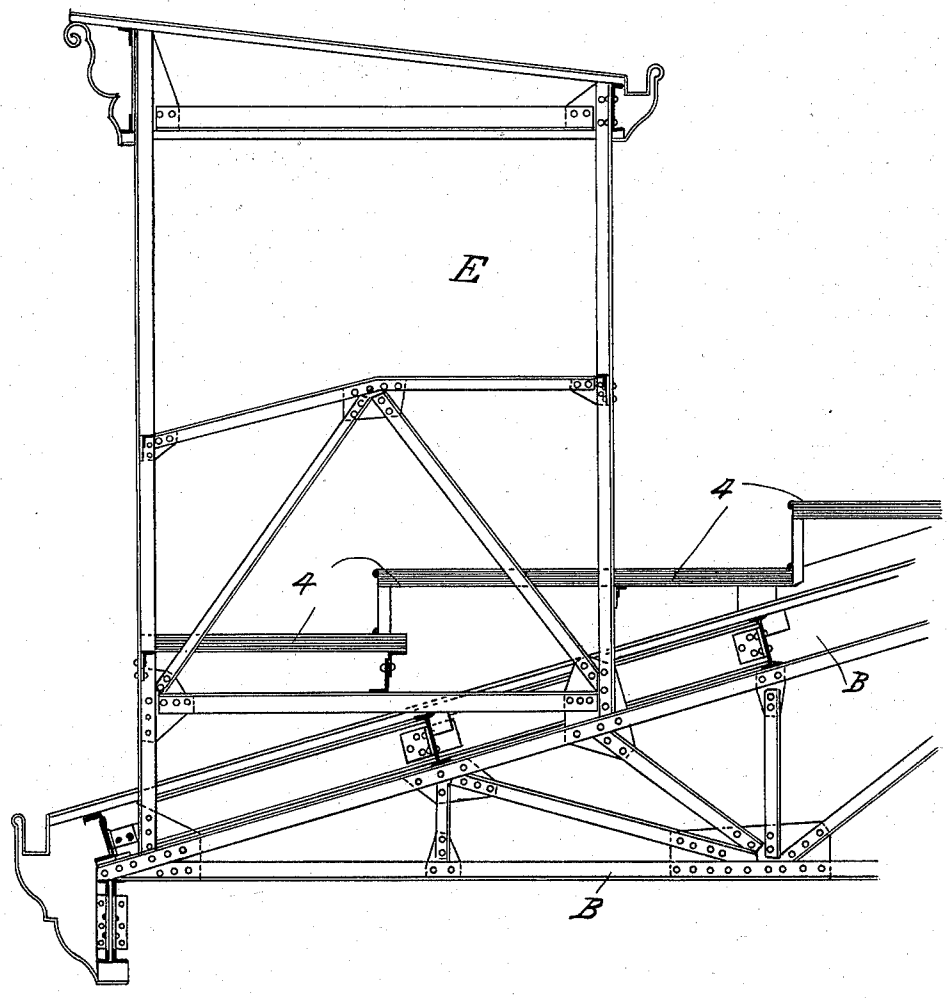
FIG 2.



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UNITED STATES PATENT OFFICE.

GUSTAVE KAUFMAN AND WILLIAM FREDERICK GRONAU, OF ALLEGHENY, PENNSYLVANIA; SAID GRONAU ASSIGNOR TO SAID KAUFMAN.

GRAND STAND, PAVILION, &c.

SPECIFICATION forming part of Letters Patent No. 584,640, dated June 15, 1897.

Application filed January 23, 1896. Serial No. 576,512. (No model.)

To all whom it may concern:

Be it known that we, GUSTAVE KAUFMAN and WILLIAM FREDERICK GRONAU, citizens of the United States, residing at the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Grand Stands, Pavilions, &c.; and we 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 which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 indicates a side elevation of our improved grand stand or pavilion. Fig. 2 is the same of the upper portion of the roof and box-seats thereon.

Our invention relates to improvements in grand stands or pavilions; and it consists of the novel construction and arrangement of parts hereinafter more specifically described, reference being had to the accompanying drawings, forming a part hereof.

Heretofore, so far as we are aware, grand stands or pavilions which are provided with roofs constructed on the cantaliver principle have had the same supported by a series of main posts and to the rear of which with tension members secured to expensive anchorages. The main posts in such construction have usually been placed quite far toward the front of the grand stand or pavilion for the purpose of reducing the pull or strain upon the anchorages and to admit of the use of less expensive anchorages than if posts were not so arranged, it being clear that the greater distance there is between the main posts and the tension members the less pull there will be on the anchorages and the size and strength of the anchorages used reduced and the consequent cost of the same largely reduced. In this construction not only were anchorages required, but the arrangement of the posts interfered very largely with the view of the occupants.

The object of our invention is to produce a grand stand, pavilion, or platform which is provided with a roof, so that the main posts which support the roof may be put back as far as possible in order not to obstruct the view of the occupants and at the same time entirely dispense with the anchorages heretofore used, and to this purpose we place the main support of the whole structure to one side of the main post supporting the roof, the center of gravity of the structure being in a vertical line passing through the main support, so that the leverage or moment of the pressure through the main posts may be counterbalanced by the leverage or moment of the upward pull in the back tension members. The exact distance that the main support of the structure should be placed from the main posts will be determined by the consideration which will give the most economical utilization of materials of construction. In other words, the most economical production of a device of this general character will result when a line passing through the center of gravity of the roof, with all the forces or loads to which it may be subjected, (line of the resultant force,) will pass through or coincide with the center pier or main support of the whole structure.

When the roof is subjected to different loads and forces, so that the center of gravity or resultant force may be changed, it will be found by calculation that under these circumstances supports will be required on both sides of the center main pier. Such, however, will be very inconsiderable.

We will now describe our invention.

Referring to said drawings, A represents a platform constructed of a series of iron girders and beams properly braced and supported and arranged on any required angle, said platform being supported upon piers 1, 2, and 3, provided with seats 4. Said platform A is protected by a roof B, constructed on the cantaliver principle, and is connected therewith at points C and D, respectively, by the vertical beams or posts 5 at the extreme rear thereof, by the main posts 6, and tension members 7 7. Said roof is mainly supported by said main posts or supports 6, the lower ends of which and the lower ends of the tension members are suitably secured in the heavy plates 8, which are suitably secured to the

main or floor beams 9 of the structure. Said beams 9 are supported by the main posts 10 of the structure, which are suitably secured at their lower ends to heavy plates 11 on the top of the main pier 2, said main beams being connected with the horizontal beams 12 by brace-bars 13 13, the ends, respectively, of said beams 12 being secured in pier 1 and main pier 2. Said floor-beams 9 are also connected to beams 14 by similar brace-bars, the lower ends, respectively, of said beams 14 being secured in the main pier 2 and the upper ends thereof to the rear of the platform or floor beam 9.

As before stated, the main supporting-piers are placed to one side or below the main posts which support the roof, the center of gravity of which and its ordinary loads coincide with a line through the center of the center or main pier. It is also obvious, as heretofore stated, that when this equilibrium is varied or changed by particular loads placed upon said roof auxiliary supports may be employed on each side of the main supports.

The middle of the roof may be provided with a series of boxes E, as shown.

It is also obvious that this arrangement of platform for the reception of chairs or seats may be utilized in halls and theaters, the upper tiers or galleries being loaded under and within the roof without departing from this invention.

The advantages of our invention consist in its simplicity and cheapness, and that we are enabled to dispense with the expensive anchorages to the tension members and to place the pillars or posts supporting the roof a very considerable distance from the front, so as to avoid obstructing the view of the occupants as heretofore when said posts were located at the front thereof.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a structure of the character herein, the combination of a base or platform, and a roof supported from the platform solely at points in rear of the main supports of said platform, substantially as set forth.

2. In a structure of the character herein, the combination of a base or platform, uprights mounted on said platform in rear of the main supports thereof, a roof supported by said uprights, and connections between the roof in rear of said uprights and the base or platform, substantially as set forth.

3. In a structure of the character herein, the combination of the main support, 2, a platform or stand suitably supported on said support, and a roof supported from said platform at points in rear of said main support, 2, and having its center of gravity within the vertical planes of said main support, substantially as set forth.

4. In a structure of the character described, the combination of a base or platform, uprights, 6, connected with said base or platform at points in rear of the main support of said base, a roof connected with the upper ends of said uprights, tension members or rods, 7, connected to the roof and to said uprights, 6, and posts or uprights, 5, connecting the roof and the platform or base in rear of the uprights, 6, substantially as set forth.

In testimony that we claim the foregoing we hereunto affix our signatures this 13th day of November, A. D. 1895.

GUSTAVE KAUFMAN. [L. S.]
WILLIAM FREDERICK GRONAU. [L. S.]

In presence of—
C. A. WILLIAMS,
L. BLATTNER,
A. W. HEZLEP.