

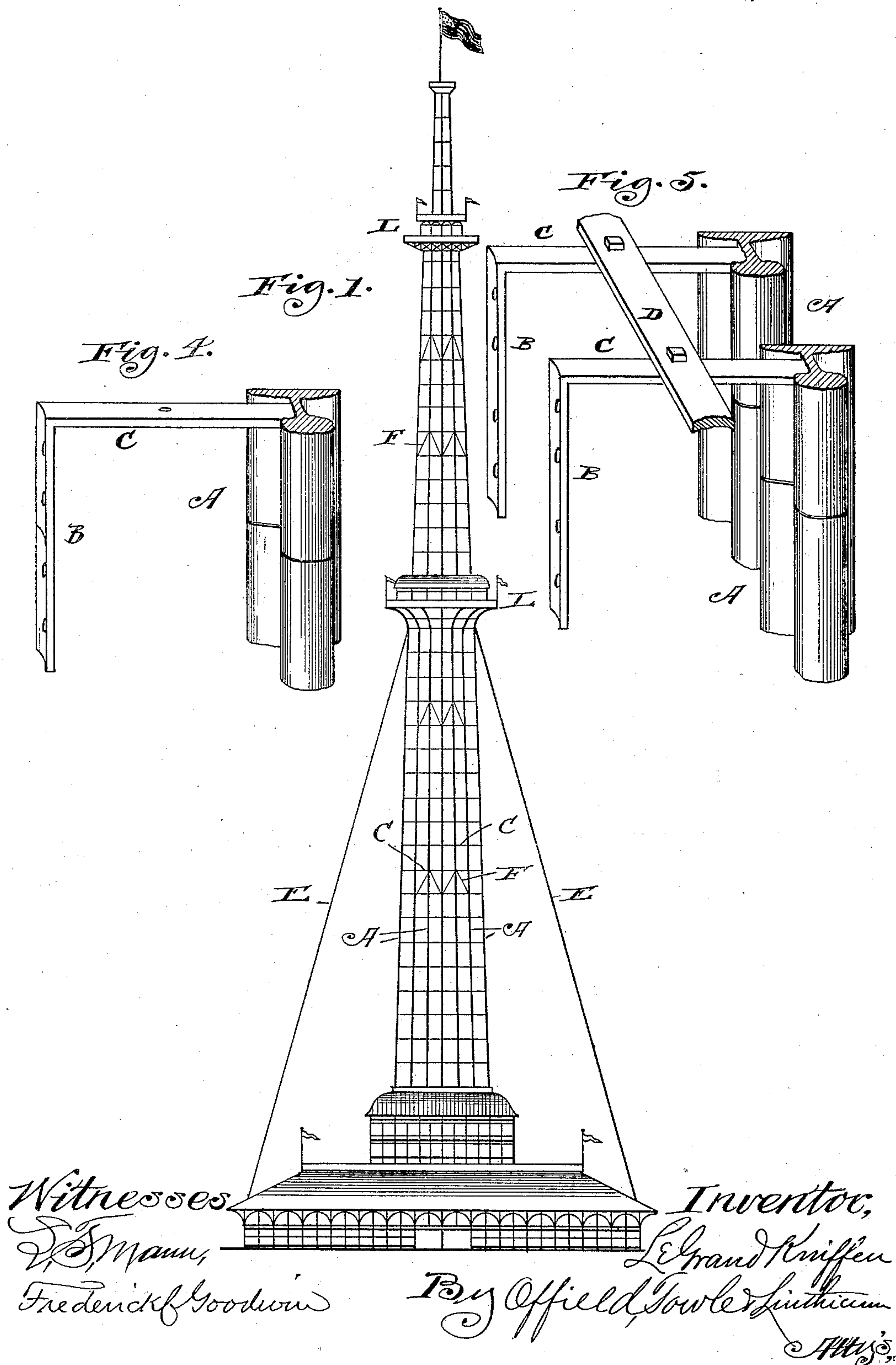
(No Model.)

2 Sheets—Sheet 1.

LE GRAND KNIFFEN.
TOWER OR OBSERVATORY.

No. 467,639.

Patented Jan. 26, 1892.



Witnesses
J. S. Mann,
Frederick Goodwin

Inventor,
Le Grand Kniffen
By Offield, Fowler & Luthicum
Attys.

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Fig. 2.

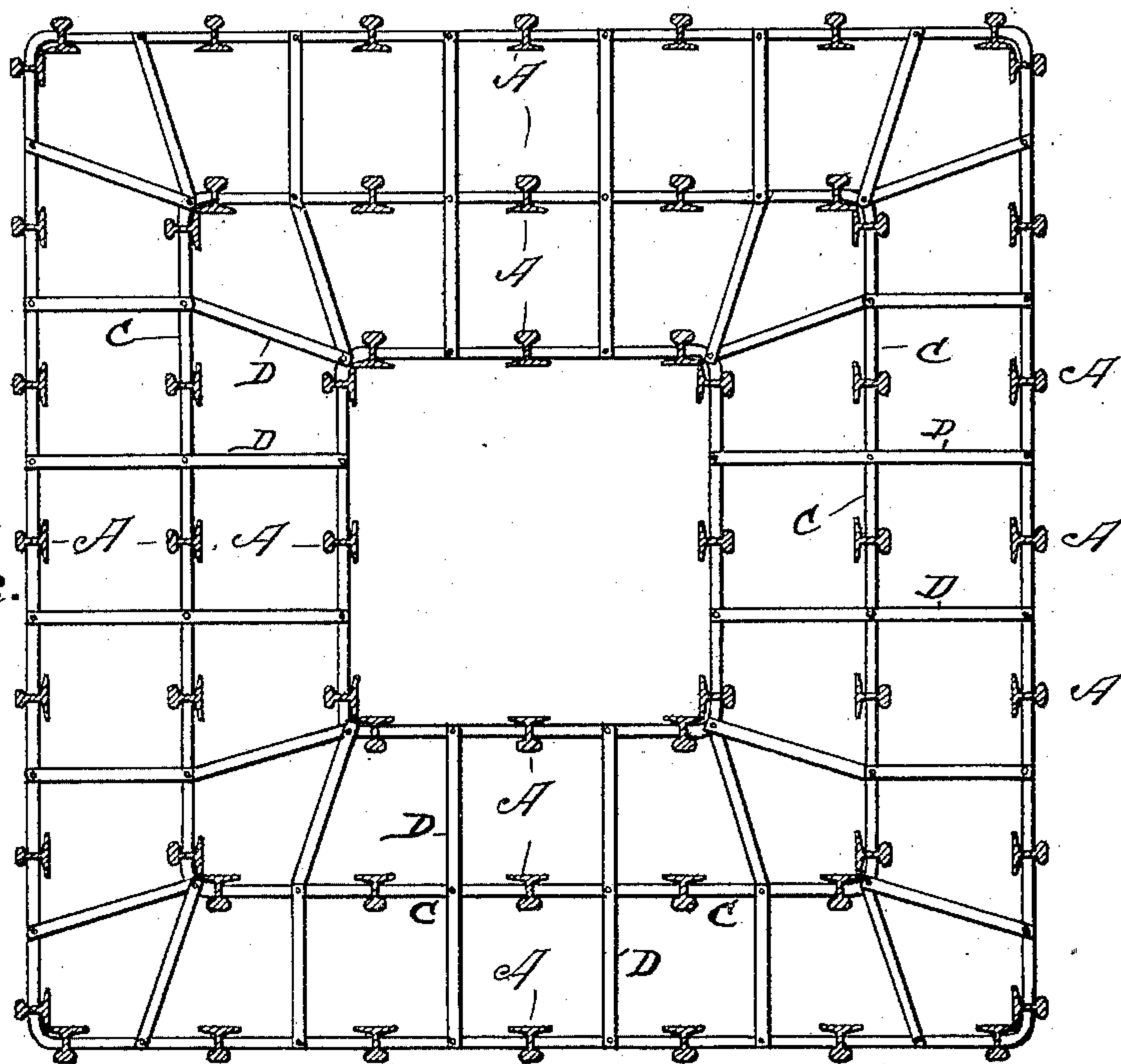
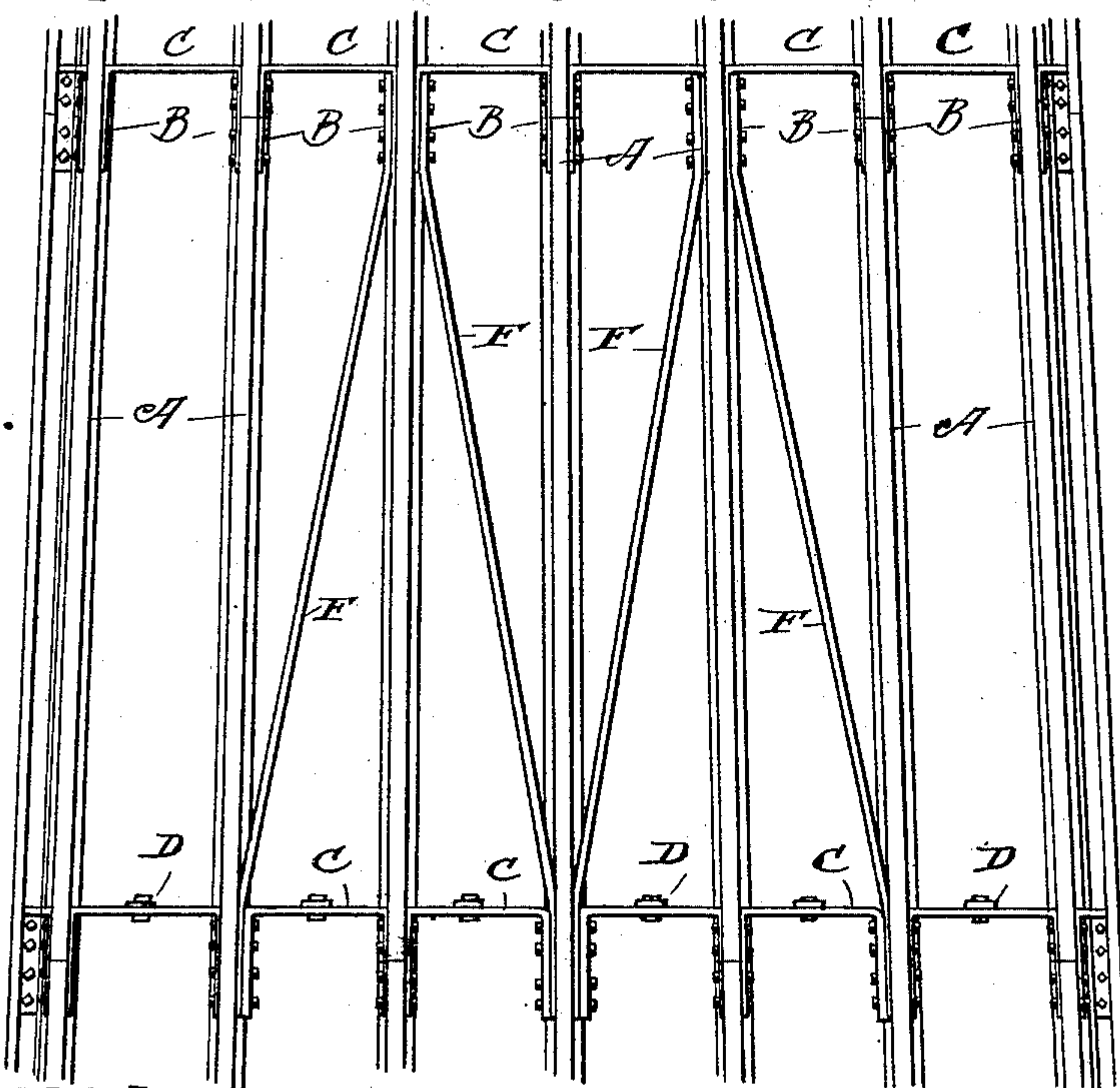


Fig. 3.



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UNITED STATES PATENT OFFICE.

LE GRAND KNIFFEN, OF CHICAGO, ILLINOIS.

TOWER OR OBSERVATORY.

SPECIFICATION forming part of Letters Patent No. 467,639, dated January 26, 1892.

Application filed August 1, 1891. Serial No. 401,353. (No model.)

To all whom it may concern:

Be it known that I, LE GRAND KNIFFEN, of Chicago, Illinois, have invented certain new and useful Improvements in Towers and Observatories, of which the following is a specification.

My invention relates to the construction of towers, observatories, and like structures, and has for its object to enable the erection of such structures with great rapidity, at small cost, and in such manner that they shall possess the maximum strength and be capable of being increased or diminished in size or height or easily taken down and the materials thereof made available for use again with slight if any depreciation in value.

To these ends I construct my improved tower or observatory in skeleton frame from railroad-rails, which form the uprights of the frame, and couple these rails together end to end by means of fish-bar plates, which serve also as girders, and I employ the usual fish-bar bolts for securing the fish-bar plates and rails together. The rails or uprights are coupled together so as to break joints, and the entire structure preferably tapers from bottom to top. The body of the tower may be of any form in cross-section; but when it is to attain great height I prefer to construct it with a central skeleton frame or core and with one or more outside or surrounding skeleton frames, the uprights of each frame being connected together and the concentric frames being also interconnected by girders or struts and braces. This form of construction permits the structure to be readily increased or diminished in size by adding or taking away one or more outer shells or frames.

In the accompanying drawings, Figure 1 shows a tower or observatory in side elevation. Fig. 2 is a cross-section. Fig. 3 is an enlarged detail in elevation, and Figs. 4 and 5 are enlarged details in perspective.

The tower, which is shown in Fig. 1, is built in the proper proportion for a height of one thousand feet, and is shown with a broad base, which may be constructed from railroad iron or from masonry, if preferred. The uprights of the main body of the tower are railroad rails A, which may be new or old, but are preferably steel rails. These are joined together end to end, as clearly shown in the

detail view, Fig. 3, and are secured by means of the fish-bar plates B, which plates are preferably specially constructed in U form, the legs B furnishing the fish-bar and the central portion C providing a girder, which serves the double purpose of bracing the uprights laterally and also of furnishing supports for the cross-ties D, as shown in the detail of Fig. 5.

By reference to Fig. 2 of the drawings it will be seen that the tower herein illustrated is composed of three skeleton frames concentrically arranged, each composed, when separately considered, of the rails A, joined end to end, and fish-plates, whereby the ends of said rails are connected, and whereby adjoining rails are also tied or lashed together, and that the several frames are interconnected by means of the cross-ties D. F represents diagonal struts, and E steel-wire-cable guys, for steadying the structure against vibration due to the elements. It will also be observed that all of the rails are placed with their heads outwardly, and this is the preferred construction, as the rounded heads of the rails present a better appearance from the exterior of the tower, and because, also, it is desirable, if not essential, that all the rails should face in the same way, so that the fish-plates may be joined thereto. The tower as viewed in side elevation tapers from its base to its apex with two landings L, the first being at about the mid-height of the tower and the other some distance below its top. These landings, as shown, are supported by the rails of the frame, which rails have the appearance of being bent or curved below the first landing, but this is apparently only due to the scale on which the drawings are made. In the actual construction it will be entirely feasible to construct these projecting landings from straight rails. The space inclosed by the inner frame may be utilized for stairways or as an elevator-shaft, and suitable apartments may be fitted up at different elevations within the tower.

Structures of this kind may be used to afford amusement and also for scientific purposes; but the cost of erection has heretofore made their use quite limited, and particularly for purposes of amusement.

An advantage of my construction is that the chief materials which I use are readily obtainable in the market, possess great strength,

may be rapidly put together without machinery or special preparation, and when the structure has served its purpose as a tower or observatory it may be taken down entirely or
5 diminished in size and the materials thereof used for railroad building without any appreciable loss or deterioration in value as materials. The railroad-rails are of course not
10 changed in their structure in any manner, while the fish-plates of the **U** form shown can be readily utilized by severing them from the part C.

By constructing the tower from a number of concentric shells or frames, as described,
15 its strength is greatly increased, and in this way it may also be readily increased or diminished in size and in diameter or height.

While my invention is peculiarly adapted to high structures, it may also be utilized for
20 other purposes than those hereinbefore specifically mentioned. For example, it would be particularly well adapted for use in the construction of windmill-towers where second-hand materials—such as old railroad-rails and fish-bar plates—could be obtained
25 at small cost, while such materials would be almost as well suited for the purpose indicated as new materials. The same considerations would also make the invention well
30 adapted to the construction of derrick-frames, towers for well boring and drilling machinery, for electric-light towers, and other structures in which it is desired to attain the maximum strength with the least weight of materials
35 and presenting small wind-surface.

I claim—

1. A tower or similar structure constructed from railroad-rails joined end to end by fish-bar plates and braced laterally, substantially
40 as described.

2. A tower or similar structure composed of railroad-rails secured end to end by fish-bar plates, said plates being of **U** form and hav-

ing the legs thereof joined to abutting rails and their middles adapted to provide trans- 45
verse braces for adjoining rails, substantially as described.

3. A tower or similar structure composed of a plurality of skeleton frames, each consisting of railroad-rails secured end to end by 50
suitable connecting-plates, lateral braces between the rails of each frame, and ties connecting the several frames, substantially as described.

4. A tower or similar structure consisting 55
of a skeleton frame, the uprights whereof are railroad-rails joined end to end by fish-bar splice-plates, whereby are provided continuous posts throughout the height of the structure, substantially as described. 60

5. In a tower or similar structure, the combination, with continuous uprights composed of railroad-rails, of **U**-shaped couplings joining the ends of said rails and cross-ties resting on said couplings, substantially as de- 65
scribed.

6. A tower or similar structure composed of a plurality of concentric frames whose uprights are railroad-rails, **U**-shaped couplings joining the ends of said rails, and cross-ties 70
connecting the couplings of the frames, substantially as described.

7. A tower or similar structure having its uprights composed of railroad-rails joined end to end with their heads presenting out- 75
wardly and fish-bar plates connecting their abutting ends, substantially as described.

8. A tower or similar structure composed of railway-rails joined together end to end and laterally braced, and steel-cable guys bracing 80
said structure, substantially as described.

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Witnesses:

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