

No. 790,048.

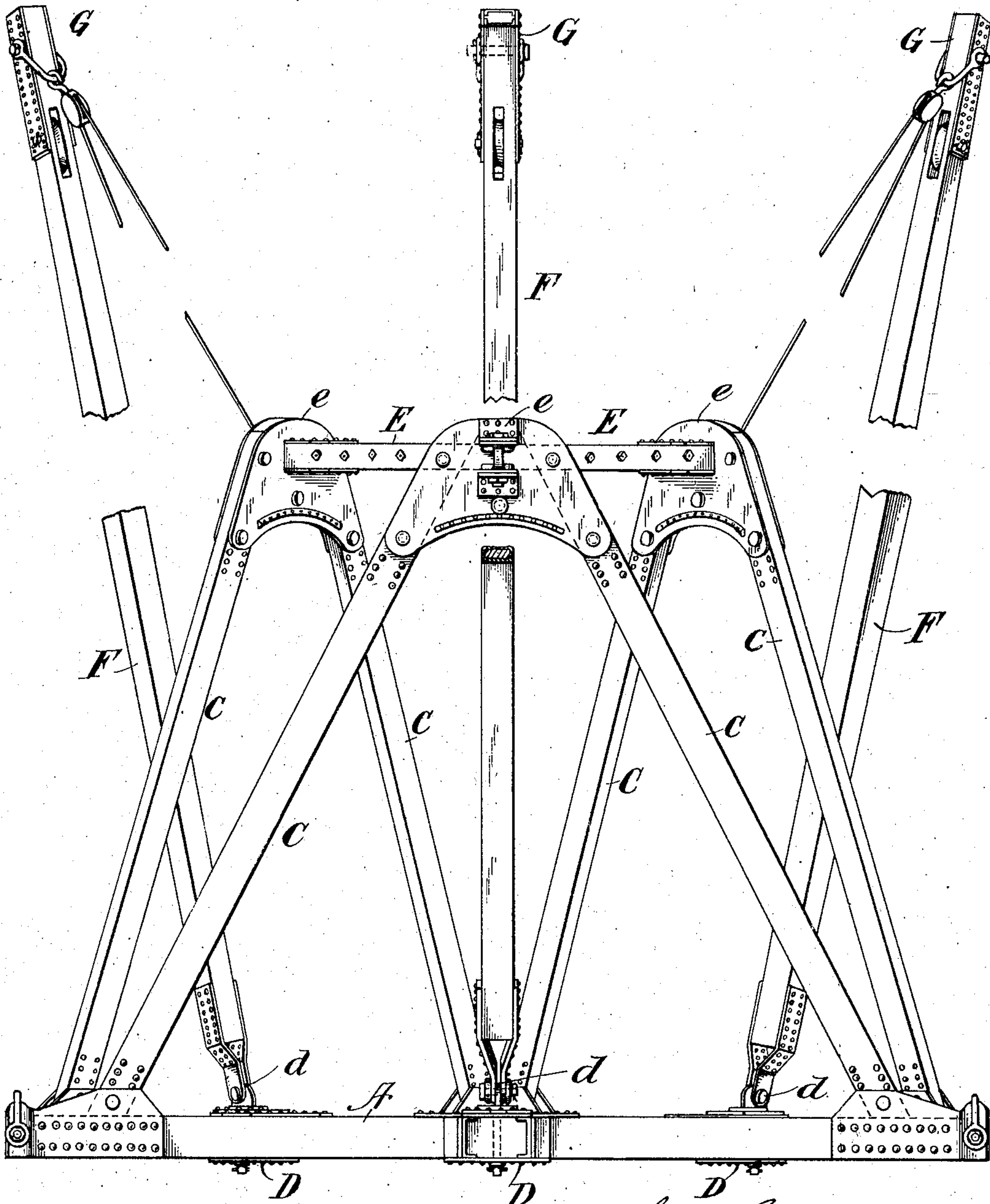
PATENTED MAY 16, 1905.

J. H. GRAY.  
DERRICK.

APPLICATION FILED FEB. 23, 1905.

3 SHEETS—SHEET 1.

*Fig. 1.*



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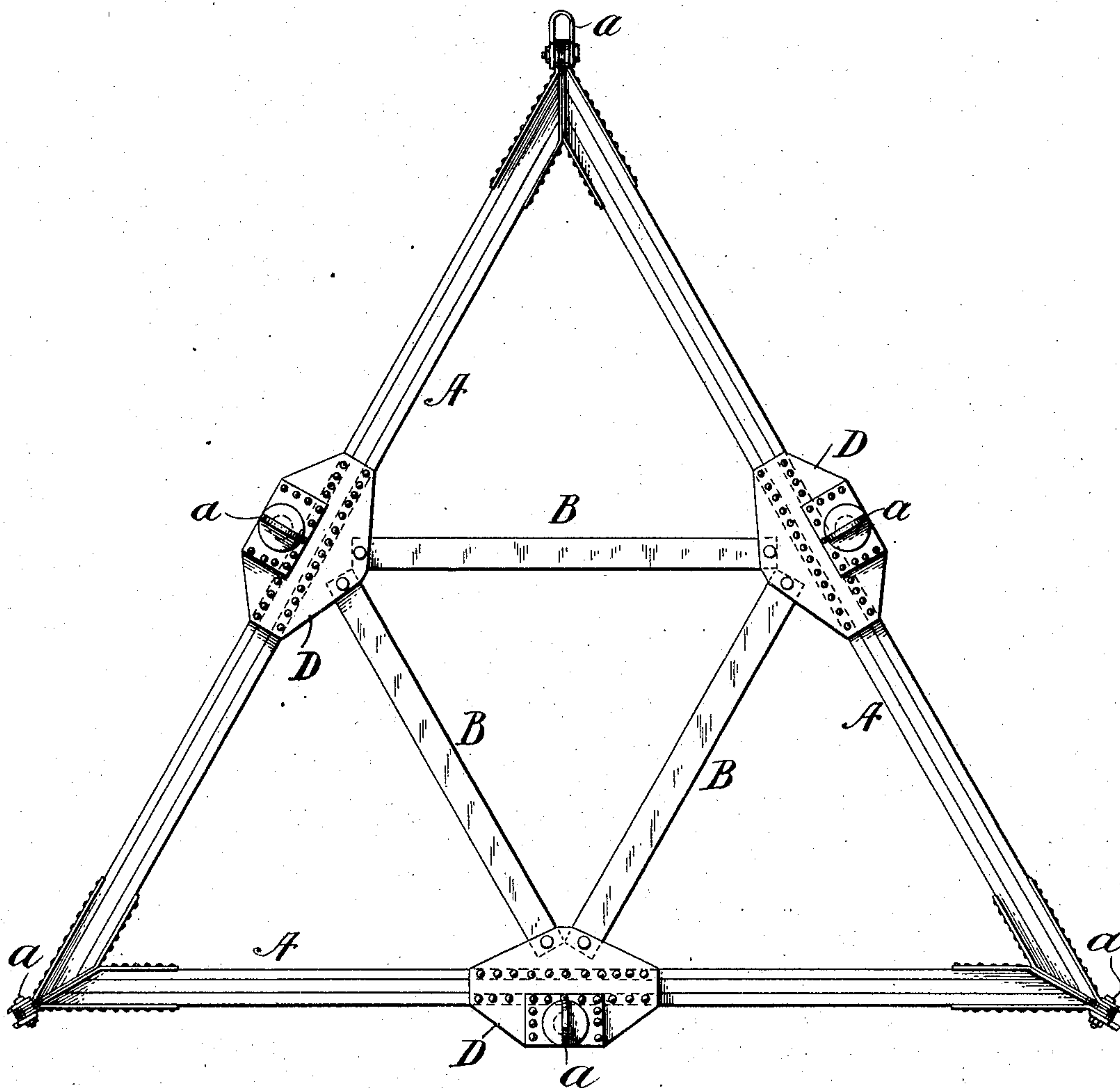
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3 SHEETS—SHEET 2.

*Fig. 2.*



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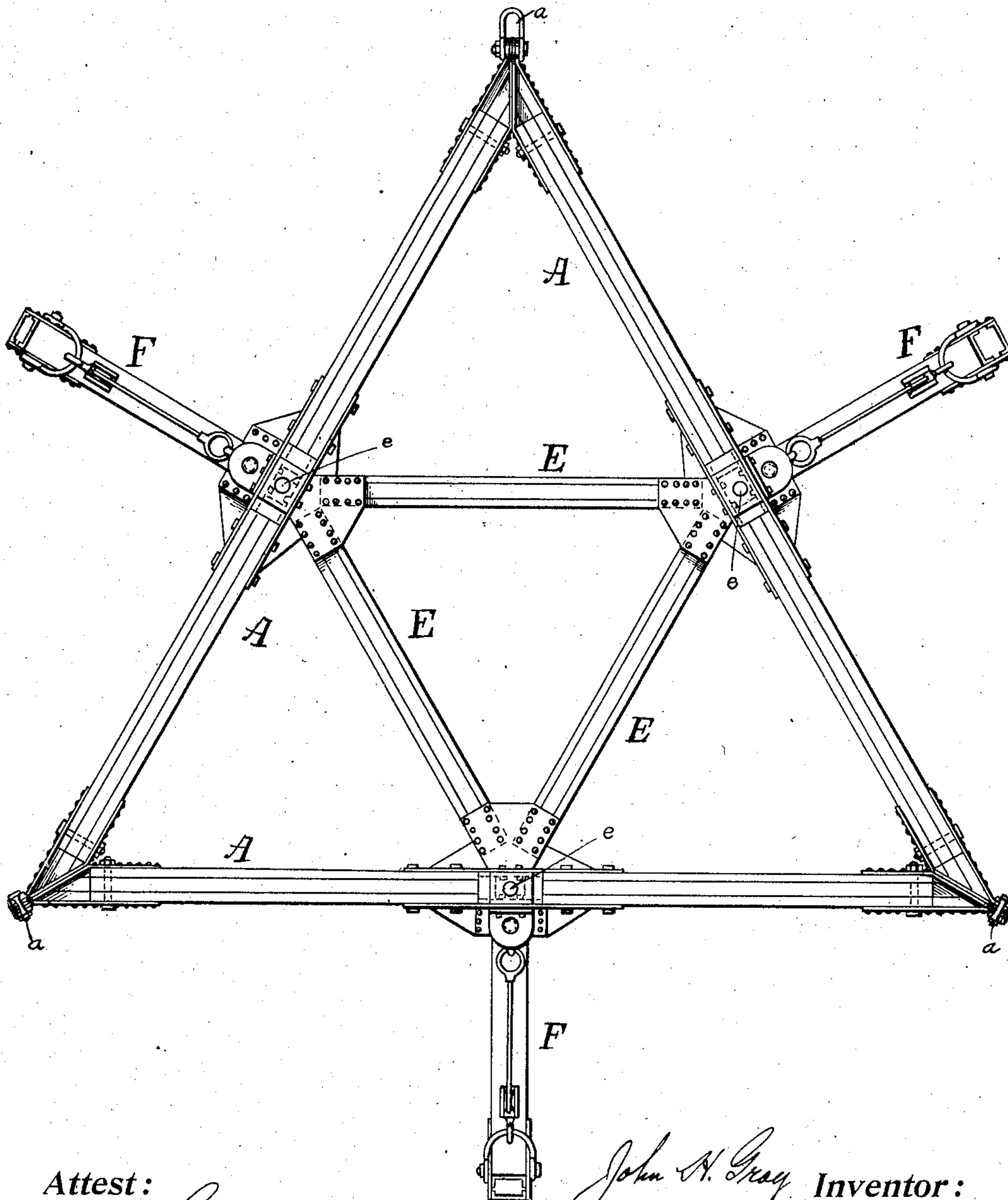
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3 SHEETS—SHEET 3.

*Fig. 3.*



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## UNITED STATES PATENT OFFICE.

JOHN H. GRAY, OF WATKINS, NEW YORK.

## DERRICK.

SPECIFICATION forming part of Letters Patent No. 790,048, dated May 16, 1905.

Application filed February 23, 1905. Serial No. 246,844.

*To all whom it may concern:*

Be it known that I, JOHN H. GRAY, a citizen of the United States of America, residing at Watkins, county of Schuyler, and State of New York, have invented certain new and useful Improvements in Derricks, of which the following is a specification, reference being made therein to the accompanying drawings.

My invention relates to improvements in derricks in which a plurality of booms are arranged upon a derrick-frame centrally located within the swing of the booms, so that the various strains and stresses due from the weight of the derrick are equalized, and, further, so that the weight of the loads which are to be supported by the booms may be distributed throughout the entire structure. Undue concentrations or localizations of strains or pressures at a particular point or points are obviated, and the entire strains resulting from the use of my invention are distributed more or less equally upon widely-separated points of support.

Another feature of my invention is that the derrick-frame is so constructed in its various parts, which are adjustably secured and hinged together, that it is readily collapsible, thereby enabling the derrick-frame to be raised and lowered through comparatively small openings by means of the booms. This has an added advantage and usefulness in the construction of lofty buildings, &c., where the derrick must be raised from floor to floor as the work proceeds. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 illustrates a side elevation of my improved derrick with the booms in position. Fig. 2 represents the bottom plan of the derrick-frame with the booms and triangular supports removed. Fig. 3 represents the top plan of the derrick-frame with the several booms suspended in position.

Similar letters refer to similar parts throughout the several views.

A is the base or bottom frame of my derrick constructed of suitable material in the form of a substantially equilateral triangle and provided with hinged loops *a a a* at its apices. Midway upon each of the three sides

A A A is firmly secured the boom-bases D D D, of any suitable form of construction, upon which the base of the booms F F F are adjustably secured and hinged at *d*. The stretchers or braces B B B connect the boom-bases D D D, as shown in Fig. 2, and serve to strengthen the base-frame and to equalize pressures and strains.

Six equally-inclined supports C C C, &c., are arranged so that they form when supported at their bases at *a* and joined together at their tops *e* isosceles triangles, and these supports at their bases hold the top frame E of the derrick, as shown in Fig. 1. The top frame E is in the form of an equilateral triangle, and the respective bases are in a directly vertical plane over the middle part of their respective boom-bases D D D.

As shown, the supports C C C, &c., are of equal length and are removably and adjustably secured to the bottom frame A at the points *a a a* and being hinged at *e* are collapsible in coacting pairs in substantial parallelism when it is desired that the structure is to be raised or lowered by means of the booms F F F. These booms F F F, three in number, are arranged to swing at their apices in the universal joint at *d*, and their outer extremities G G G are held in operative position to the top frame E at *e* by any of the well-known means—as, for instance, by blocks and tackle, as shown in Fig. 1.

It will be observed that my improved derrick-frame is prismoidal in form and that the relation of the various parts is such that all of the stress and strain are taken care of within the derrick-frame itself, thus dispensing with the cumbrous guys and lashings now necessary to support and hold firm derricks of this nature. It will also be seen that the various booms have an overlapping swing each with its adjoining one, so that they cover a combined swing of not less than five hundred and forty degrees.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is the following, viz:

1. In a derrick, the combination of a triangular bottom frame supporting a triangular top frame, so that the apices of the top



frame are above the sides of the bottom frame, a plurality of booms independently supported on said top and bottom frames, and means to operate said booms, substantially as described.

5 2. In a derrick, the combination of a triangular bottom frame, a triangular top frame, collapsible supports holding said top frame, three booms independently supported on said top and bottom frames, and means to operate  
10 said booms, substantially as described.

3. In a derrick the combination of an equilateral triangular bottom frame, an equilateral triangular top frame, so supported that the apices of said top frame bisect in a vertical  
15 cal plane the sides of the bottom frame, three booms independently supported on said top and bottom frames, and means to operate said booms, substantially as described.

4. In a derrick the combination of an equilateral triangular bottom frame, collapsible  
20 inclined supports, an equilateral triangular top frame upon said supports, three booms independently supported on said top and bottom frames, and means to operate said booms, substantially as described.

5. In a derrick the combination of an equilateral triangular bottom frame, an equilateral triangular top frame with its sides one-half the length of the sides of said bottom  
30 frame, said top frame so supported that its apices bisect in a vertical plane the sides of said bottom frame, three booms adjustably supported at their bases at the middle points of the respective sides of said bottom frame

and held at their extremities by the apices of  
the top frame, and means to operate said  
booms, substantially as described. 35

6. In a derrick, the combination of an equilateral triangular bottom frame, collapsible  
inclined supports, an equilateral triangular  
40 top frame with its sides one-half the length the sides of said bottom frame upon said supports, said top frame so supported that its apices bisect in a vertical plane the sides of said bottom frame, three booms adjustably  
45 supported at their bases at the middle points of the respective sides of said bottom frame and held at their extremities to the apices of the top frame, and means to operate said booms, substantially as described. 50

7. In a derrick the combination of an equilateral triangular bottom frame, and equilateral triangular top frame, supports extending from the apices of one of the said triangles to those of the other and forming isosceles  
55 triangles having as basis the sides of said equilateral triangles, booms supported at their basis at the middle points of the respective sides of said bottom frame and held at their extremities to the apices of the top frame, 60 and means to operate said booms, substantially as described.

In witness whereof I have hereunto set my hand this 20th day of February, 1905.

JOHN H. GRAY.

In presence of—

EDMUND E. FIELD, Jr.,  
FRANCIS L. FIELD.