

No. 753,237.

PATENTED MAR. 1, 1904.

C. R. B. CLAFLIN.
DERRICK.

APPLICATION FILED MAY 11, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

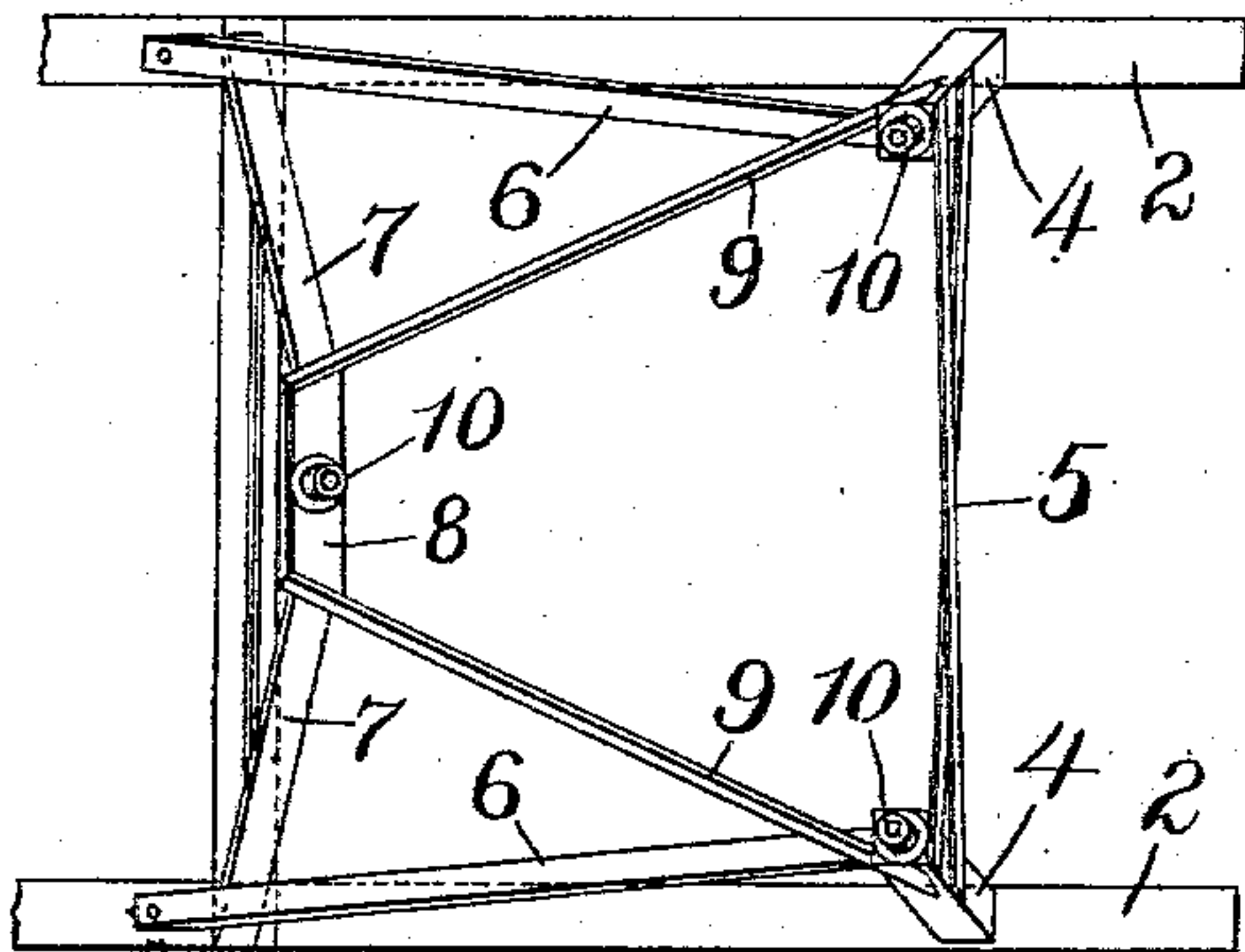


Fig. 2.

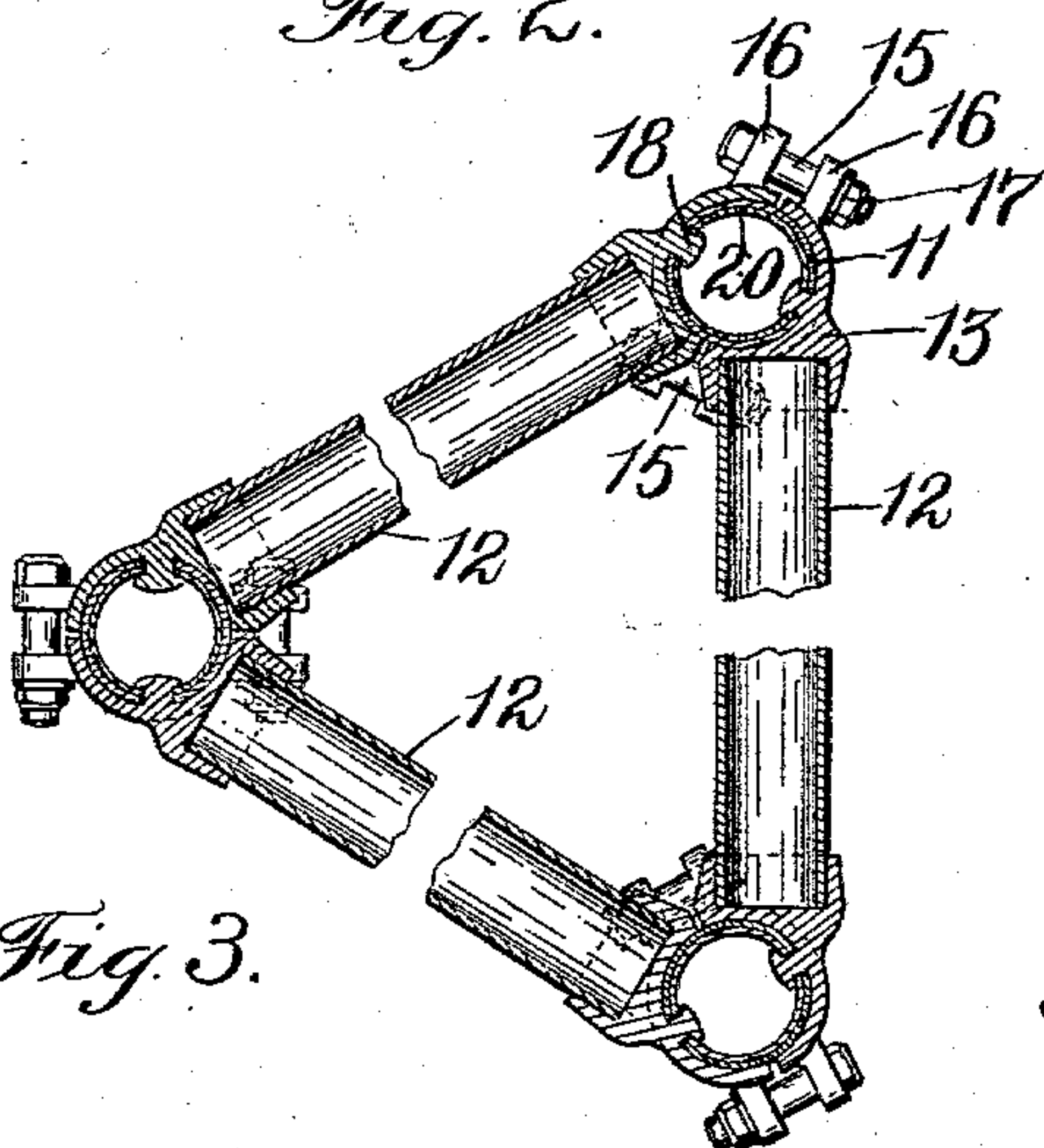


Fig. 3.

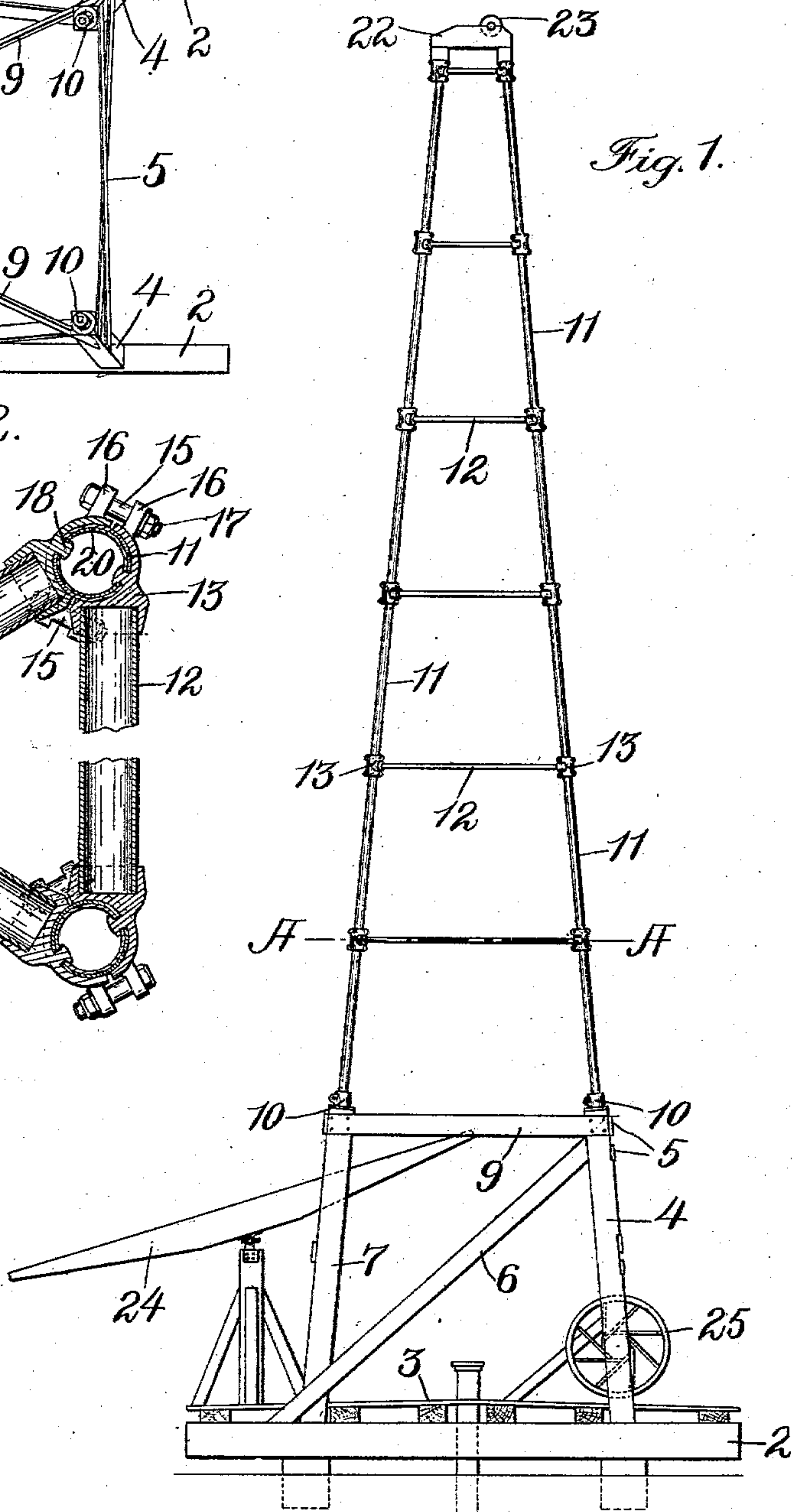


Fig. 1.

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2 SHEETS—SHEET 2.

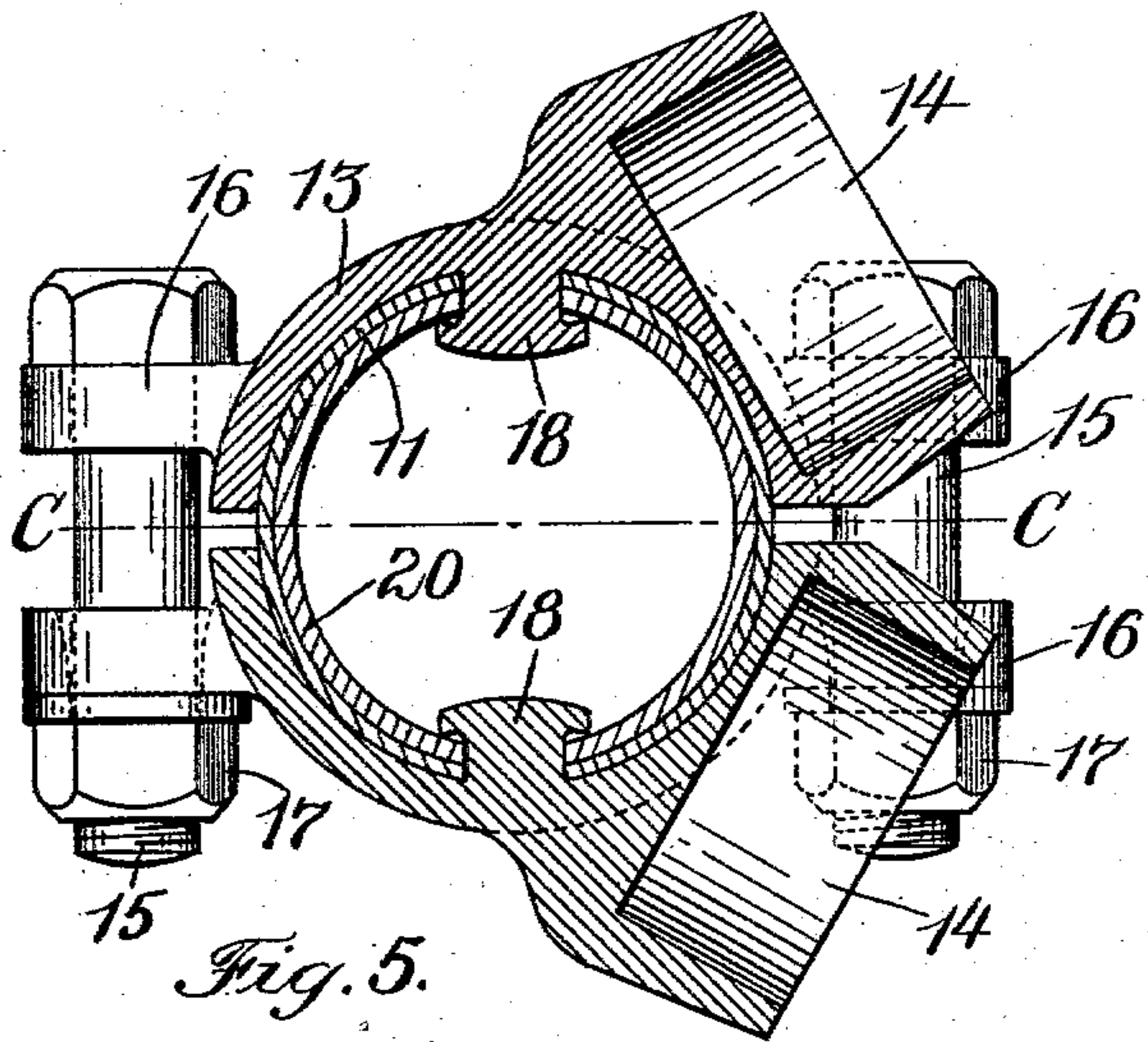


Fig. 5.

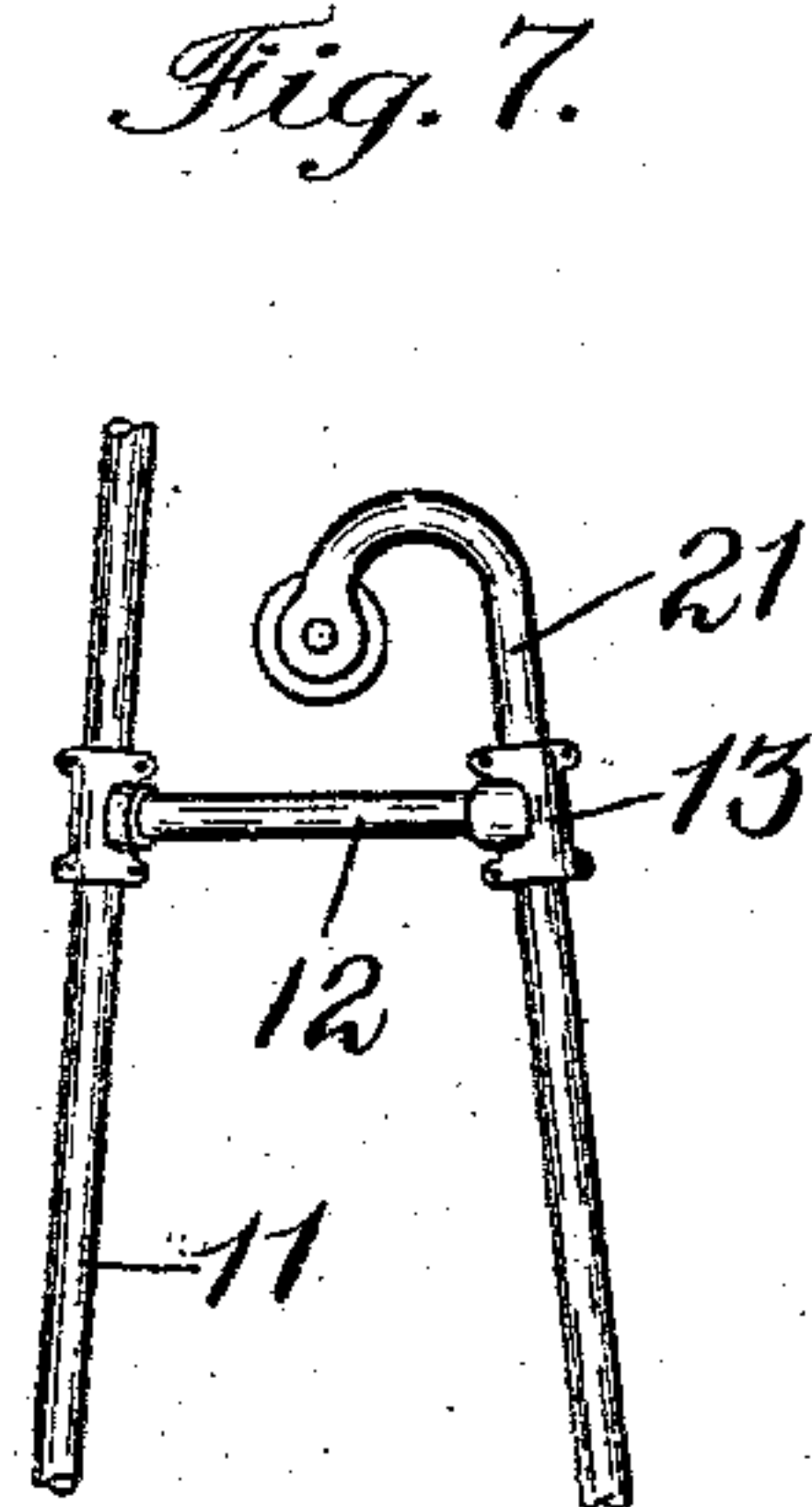


Fig. 7.

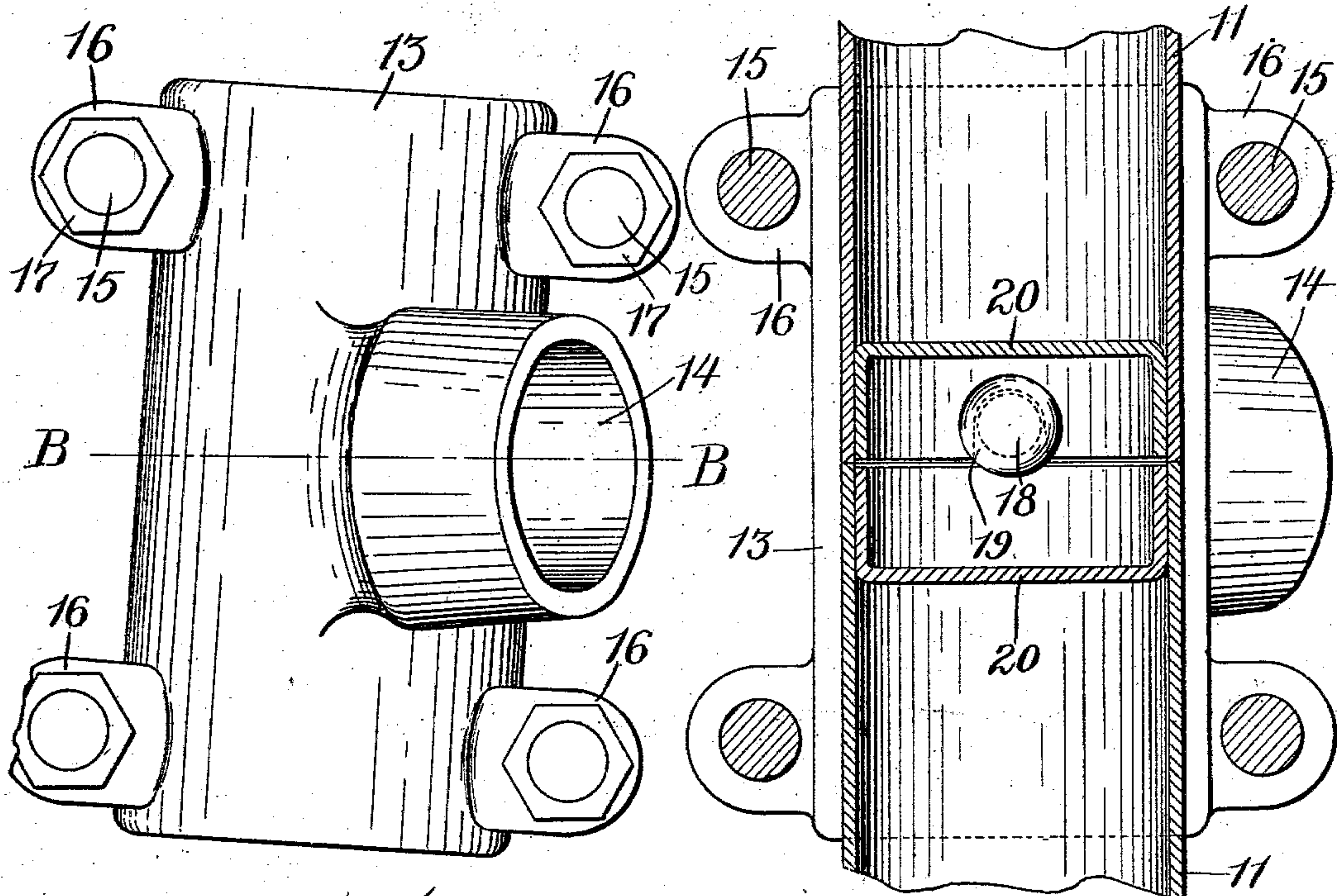


Fig. 4.

Fig. 6.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES R. B. CLAFLIN, OF WINTHROP, MASSACHUSETTS.

DERRICK.

SPECIFICATION forming part of Letters Patent No. 753,237, dated March 1, 1904.

Application filed May 11, 1903. Serial No. 156,589. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. B. CLAFLIN, a citizen of the United States, and a resident of Winthrop, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Derricks, of which the following is a specification.

My invention relates to derricks such as are used in drilling oil-wells and the like, and is intended to provide an improved knockdown derrick which without sacrificing strength or rigidity may be made of less material and may be set up and taken down more quickly and easily than the derricks of this class heretofore employed. To this end I make my derrick triangular, as distinguished from the four-sided derricks heretofore employed, and I so construct and combine its parts that no diagonal braces of any kind are required, thereby effecting a great saving in material and in the labor required for setting up and taking down the derrick. It is desirable for certain reasons to construct a wooden base at the place where such a derrick is to be set up and to support upon this base a steel superstructure, and my invention includes a novel construction of base which embodies the best mechanical principles of bracing against the strains developed and is especially adapted for use in connection with the triangular superstructure hereinafter described.

My derrick as preferably constructed is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the complete derrick. Fig. 2 is a plan view of the base with the floor omitted. Fig. 3 is a section on the line A A in Fig. 1. Fig. 4 is a perspective view, on an enlarged scale, of a clamp-joint hereinafter described. Fig. 5 is a transverse section on the line B B in Fig. 4. Fig. 6 is a vertical section on the line C C in Fig. 5, and Fig. 7 is a detail view illustrating the operation of setting up the derrick.

The base of the derrick illustrated in the drawings comprises the usual sills 2 2 and floor 3. Upon the sills 2, near one end thereof, are mounted two uprights 4 4, which are inclined at an angle corresponding to the taper of the superstructure and are connected near

their upper ends by cross-pieces 5. The uprights 4 4 are also preferably connected with their respective sills, near the opposite ends of the latter, by inclined braces 6.

7 7 represent two slanting uprights which are supported upon the sills at a suitable distance from the uprights 4 and are connected at their tops by a short cross-piece 8, thus forming a substantially triangular frame, and this frame is braced and held in position by horizontal braces 9, connecting the uprights 7 with the uprights 4 near their upper ends. The top of the base being composed of the pieces 5 8 and 9 9, thus has a substantially triangular shape and is adapted to support the three columns of the triangular superstructure and to this end is provided with three sockets 10, one of which rests upon and is secured to the upper end of each upright 4, while the other rests upon and is secured to the cross-piece 8.

The three columns of the superstructure are each composed of a number of similar sections 11, which are usually made of steel tubing. The adjacent ends of these sections are detachably secured together and properly braced by means of suitable connecting devices carried by horizontal cross-braces 12, each set of cross-braces therefore forming a triangle, as illustrated in Fig. 3. My preferred form of clamp, by means of which the adjacent ends of the sections 11 are secured together and to the corresponding cross-braces, is shown in detail in Figs. 4, 5, and 6 and is formed in two parts or halves 13. Each half-clamp 13 is rigidly secured to one end of one of the cross-braces 12, preferably by brazing the end of the latter into a socket 14, formed integral with the half-clamp. Each cross-brace 12 is therefore provided at each end with a half-clamp, and the half-clamps are so formed that when two of them are brought together they form a cylindrical socket adapted to embrace the adjacent ends of two of the sections 11. The half-clamps are also provided with means for detachably securing them together, such as clamping-bolts 15, passing through lugs 16 and provided with nuts 17, a pair of lugs 16 being provided near each end of each half-clamp. On the inside of each half-clamp

about midway between its ends I prefer to provide a headed stud 18 for a purpose hereinafter described.

The lower end of each section 11 (except the 5 bottom ones) is supported when the derrick is set up by the upper end of the section 11 next below it and is provided with notches 19, adapted to receive the shanks of the headed studs 18, thus permitting the adjacent ends of 10 the sections to come together with the upper section resting directly upon the lower section and also securing the perfect alinement of the sections. In order to reinforce the ends of the sections 11 to preserve their shape 15 and to exclude moisture from the interior thereof, I prefer to insert into each end of each of the sections a cup 20, the walls of which point outward and fit tightly against the surrounding tubular walls of the section. This 20 provides a recess of sufficient depth for receiving the heads of the studs 18, which are made to extend beyond and hook over the flanges of the cup 20, and these studs 18 and the notches 19 are preferably so formed that 25 they will fit together, and the heads of the studs will engage the side of the cup 20 with somewhat of a wedging action, so that there will be no chance for play between the parts when assembled.

30 In assembling the derrick the wooden base is first constructed and provided with the sockets 10, and an upright section 11 is then placed within each socket 10. The first set of cross-braces 12 is then secured to the upper ends of 35 these three sections 11 by hooking the headed studs 18, carried by the ends of the respective cross-braces, over the upper edges of said sections. The first set of cross-braces is thus supported and held in position independently of 40 the clamping-bolts 15, and the latter are then inserted and the nuts 17 are set up loosely. The upper half of each pair of half-clamps is thus made to form a socket, and into these sockets are inserted, respectively, the lower 45 ends of the next series of sections 11, with the notches 19 passing over the studs 18 and locking the sections against turning. The next set of cross-braces is then applied in the same manner to the upper ends of the sections 11 50 which have just been set in place, and this process is continued until the whole superstructure has been set up, whereupon the nuts 17 are tightened and the derrick is complete. By virtue of the wedging action of the headed 55 studs 18 and the notches 19 the parts of the derrick will be kept in proper relation and held together with such firmness and rigidity that the derrick will be serviceable and will not fall apart even if the bolts 15 are removed 60 or omitted. The bolted half-clamps serve, however, as a reinforcement of the lock-joints formed by the studs 18 and adjacent parts and also serve to resist any possible lifting force tending to pull the structure apart. It will 65 be understood that in setting up the super-

structure temporary platforms are laid on each set of cross-braces as fast as they are secured in place, and to facilitate the lifting of the various sections into place a gooseneck-crane 21 (shown in Fig. 7) may be temporarily inserted 70 into the socket formed by the upper ends of any pair of half-clamps, in which socket it will of course turn freely.

The derrick when complete is surmounted by the usual block 22, carrying the pulley 23. 75

I consider that an important feature of my invention resides in forming each of the clamps or connecting devices in two halves each of which is secured to one end of one of the cross-braces, so that each cross-brace carries one of 80 said halves at each end, and this construction may evidently be embodied in various modified forms without departing from my invention and may be employed in derricks having more than three sides, if desired. It will be noted 85 that the described construction eliminates all screw-threaded connections between the sections 11 and 12 and the clamping-sockets, and I thus avoid weakening these sections by cutting threads therein, and I also get rid of the diffi- 90 culties heretofore encountered in taking apart rusted joints. This construction, in connection with the triangular arrangement of the sections, also enables me to dispense with the diagonal braces which have heretofore been neces- 95 sary. I also consider the construction of base herein shown and described to form one of the features of my invention, because by reason of its triangular construction it may be made very light without sacrificing rigidity and be- 100 cause the open triangles formed by the pieces 5, 6, 7, and 9 permit the passing of the drilling-tools up through the base and into the superstructure with less difficulty than has heretofore been encountered. The large tri- 105 angle formed by the uprights 7 and cross-piece 8 provides an ample space for the operation of the walking-beam 24, and the bull-wheel 25 is located between the uprights 4 in the usual manner. 110

I claim as my invention—

1. In a knockdown derrick, the combination with upright sections, of cross-braces each having a half-clamp secured to each of its ends, each pair of half-clamps being formed 115 to fit the adjacent ends of two upright sections and detachably secure them together.

2. In a knockdown derrick, a set of cross-braces each provided at each end with a half-clamp, each pair of half-clamps forming to- 120 gether a socket adapted to receive the adjacent ends of two upright sections and being provided with means for detachably securing them together.

3. In a knockdown derrick, a clamp comprising two halves and means for detachably securing them together, each of the half-clamps being provided with a socket extend- 125 ing therefrom at an angle to the meeting faces of said half-clamps. 130

4. In a knockdown derrick, a clamp composed of two similar halves, each provided with a socket and with an inwardly-projecting headed stud, and means for detachably securing said half-clamps together.

5. In a knockdown derrick, the combination with a hollow upright section, of cups inserted into the ends thereof and forming closures for the same.

6. In a knockdown derrick, a base comprising sills, uprights 4 4 and cross-pieces 5, in combination with slanting uprights 7, cross-piece 8 and braces 9, forming a series of triangles, substantially as described.

7. In a knockdown derrick, a base comprising sills, uprights 4 4, cross-pieces 5 and braces 6, in combination with slanting uprights 7, cross-piece 8 and braces 9, forming a series of triangles, substantially as described.

8. In a knockdown derrick, the combination with a base having a rectangular bottom and a substantially triangular top, supported at a distance above said bottom, of a superstructure composed of three columns of upright sections, means for detachably connecting the meeting ends of each pair of sections, and a triangular set of cross-braces secured to each set of connecting means.

9. In a knockdown derrick, the combination of three columns of upright sections, triangular sets of horizontal cross-braces, and devices for detachably connecting said sections and cross-braces, each of said devices being composed of two halves and each of said halves being secured to one end of one of said cross-braces.

10. In a knockdown derrick, the combination with upright sections provided respectively with notches, of cross-braces each carrying one or more headed studs, each of said studs being formed to enter one of said notches and to hook over the wall of a section.

11. In a knockdown derrick, the combination with upright sections, each provided at its lower end with notches, of cross-braces each

having a half-clamp secured to each of its ends, and a headed stud carried by each half-clamp, and formed to fit one of the notches and to hook over the wall of the section next below it.

12. In a knockdown derrick, the combination of upright sections, the lower end of each section resting directly upon the upper end of the section next below, connecting devices each comprising two half-clamps which form a socket embracing the meeting ends of adjacent sections and provided with means for detachably securing said half-clamps together, and cross-braces each connected at each end to one of said half-clamps.

13. In a knockdown derrick, the combination of upright sections adapted to rest one upon another, one end of each section being provided with notches, two half-clamps surrounding the meeting ends of each pair of sections and provided with headed studs passing through said notches and hooking over the walls of said sections, cross-braces secured to said half-clamps, and means for detachably securing each pair of half-clamps together.

14. In a knockdown derrick, the combination of upright sections 11, each provided near its ends with cups 20, sets of cross-braces each having at each end a half-clamp provided with an inwardly-projecting headed stud which is adapted to hook over the walls of the corresponding upright section and its contained cup, and means for detachably securing the half-clamps of each pair together.

15. In a knockdown derrick, the combination of a base having a rectangular bottom and a substantially triangular top supported at a distance above said bottom, and a triangular superstructure supported on the triangular top of said base.

In testimony whereof I have hereunto subscribed my name this 5th day of May, 1903.

CHARLES R. B. CLAFLIN.

Witnesses:

E. D. CHADWICK,

JOSEPH T. BRENNAN.