

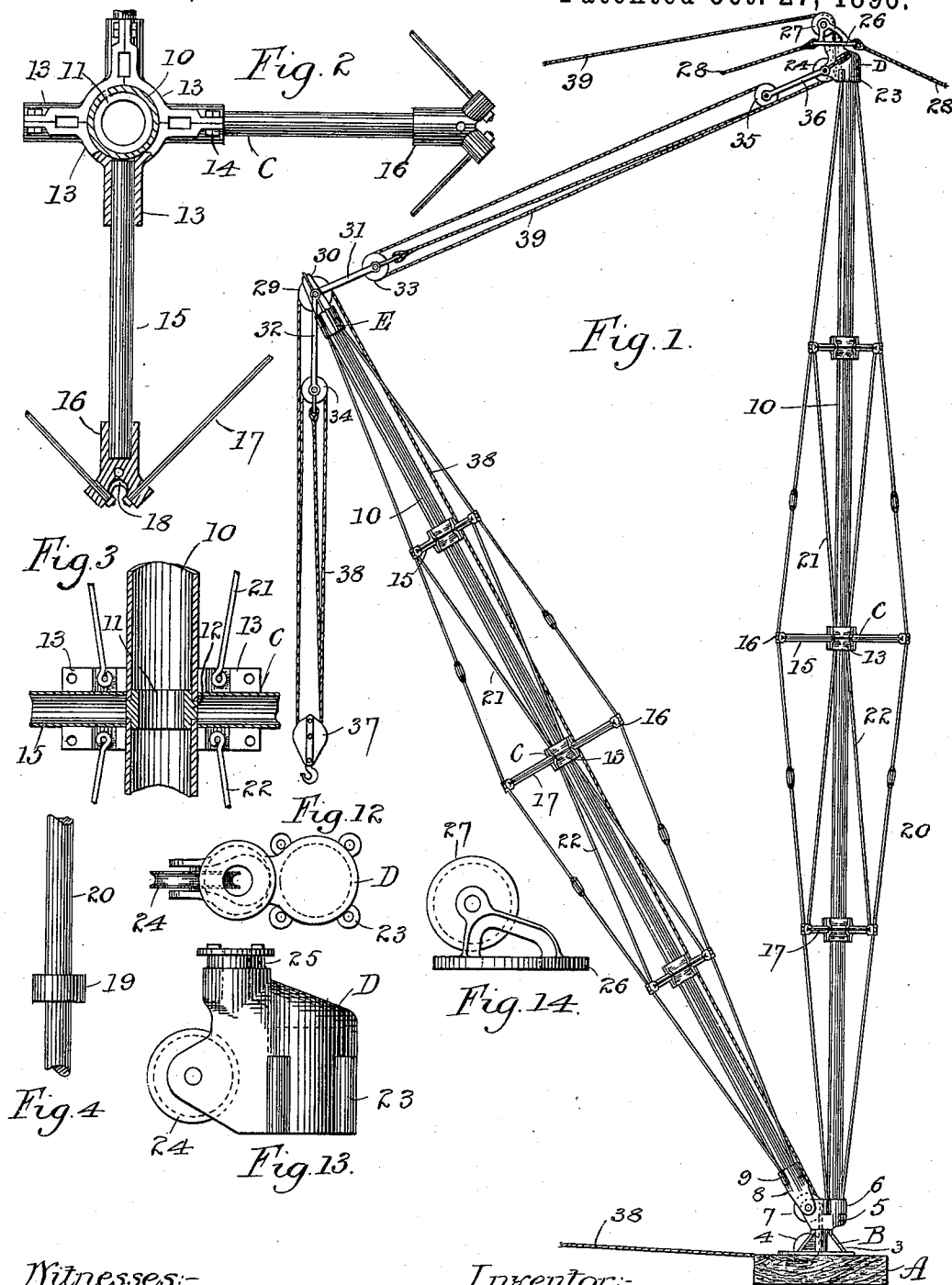
(No Model.)

3 Sheets—Sheet 1.

O. CROSBY.
SECTIONAL DERRICK.

No. 570,124.

Patented Oct. 27, 1896.



Witnesses:-

L. R. Caldwell.
H. S. Johnson

Inventor:-

Oliver Crosby,
per *Robert M. Brown*
Attorneys.

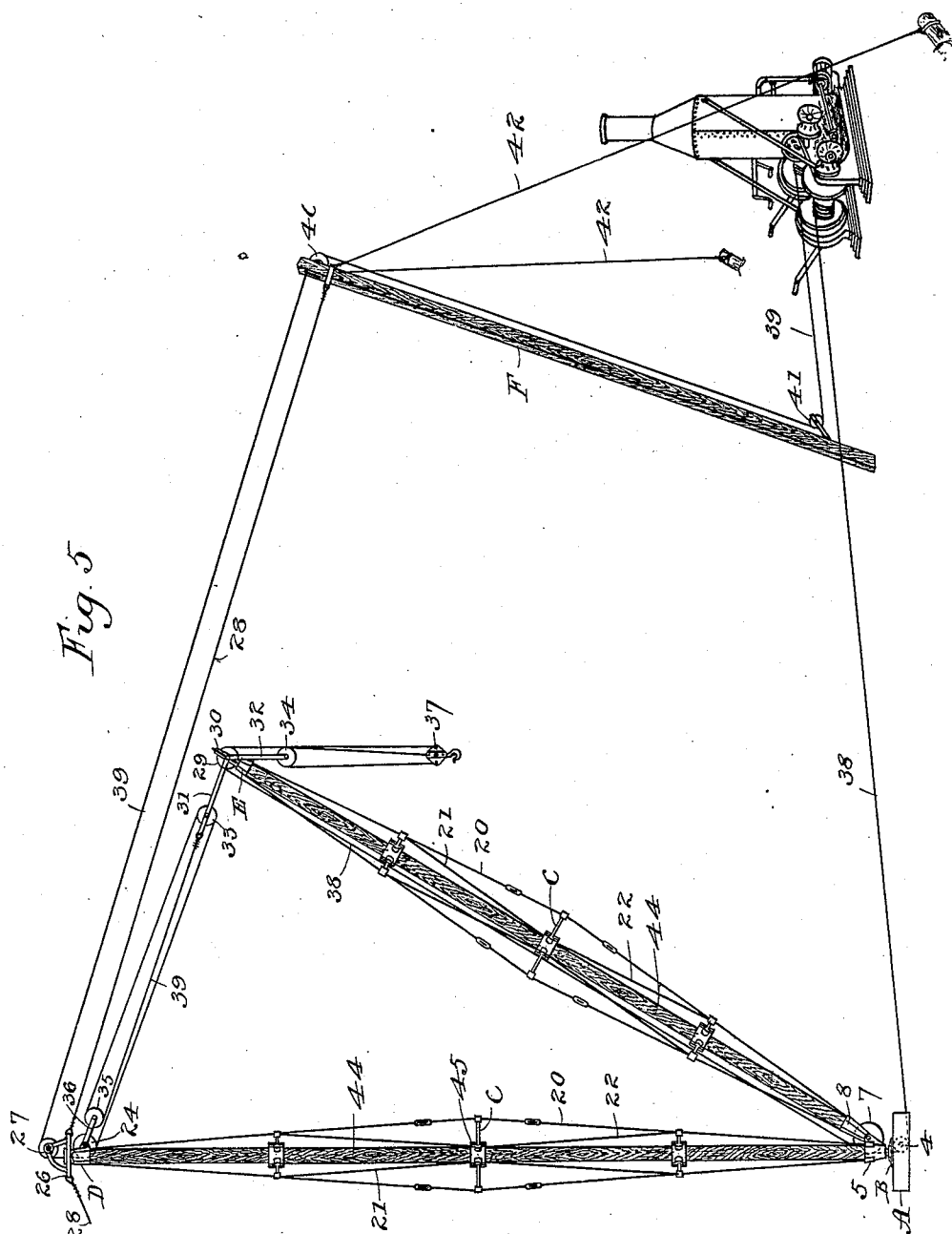
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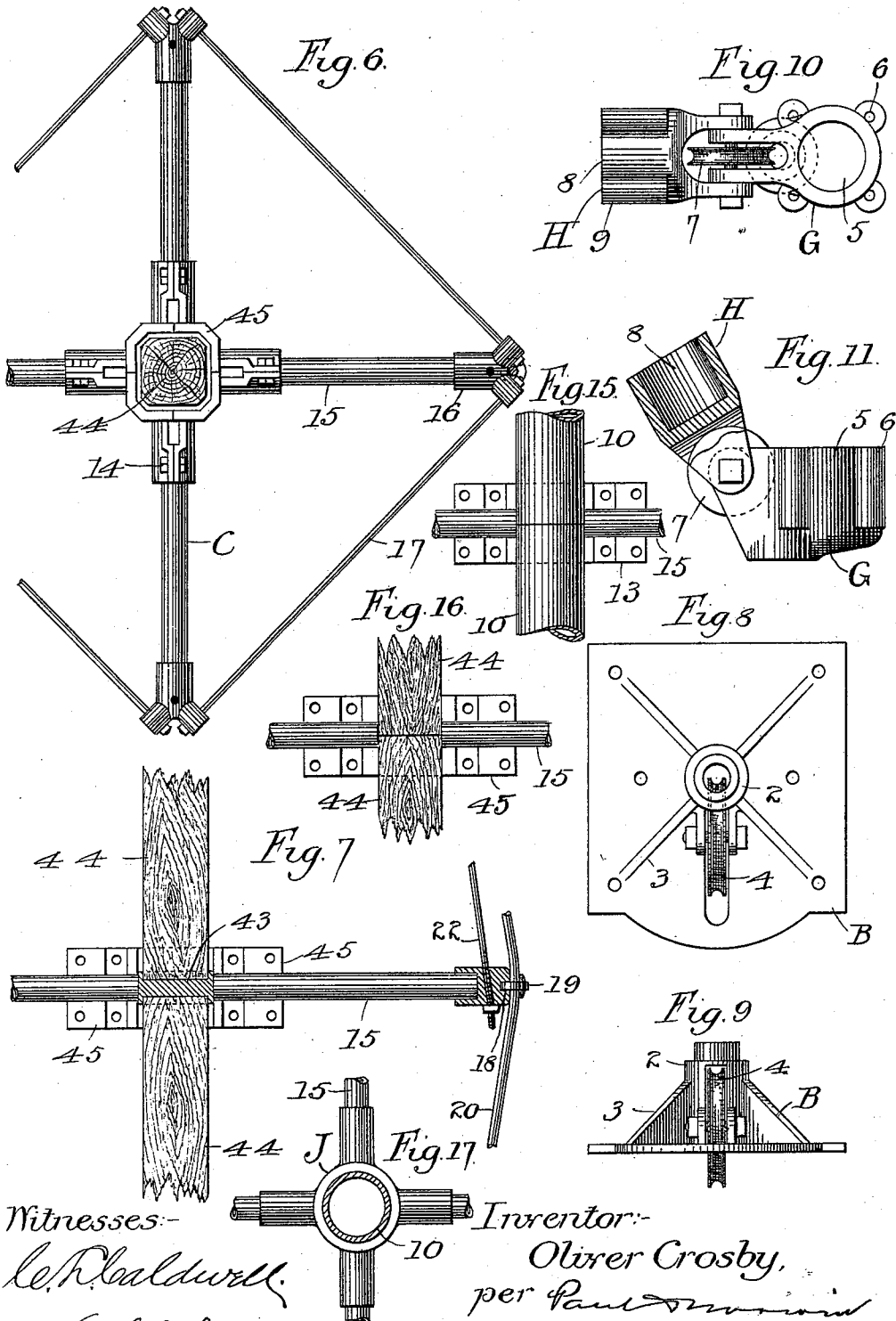
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Attorneys.

UNITED STATES PATENT OFFICE.

OLIVER CROSBY, OF ST. PAUL, MINNESOTA.

SECTIONAL DERRICK.

SPECIFICATION forming part of Letters Patent No. 570,124, dated October 27, 1896.

Application filed January 13, 1893. Serial No. 458,228. (No model.)

To all whom it may concern:

Be it known that I, OLIVER CROSBY, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Sectional Derricks, of which the following is a specification.

My invention relates to improvements in derricks; and it consists in the features of construction hereinafter described and claimed.

15 In the accompanying drawings, forming part of this specification, Figure 1 is an elevation of one form of my improved derrick in which the mast and boom are formed of pipe-sections. Fig. 2 is a sectional detail of the crosstree shown in connection with the tubular mast. Fig. 3 is a sectional detail of the same, showing the manner of connecting to it the short or auxiliary truss-rods. Fig. 4 is a detail of the fixed collar upon the truss-rod adapted to fit upon the strut-arm. Fig. 5 is an elevation of a modified construction of derrick with guy-struts in which the mast and boom are formed of sections of timber. Fig. 6 is a detail of the crosstree as applied to the wooden mast. Fig. 7 is a sectional detail of the same. Figs. 8 and 9 are details of the derrick base-plate. Figs. 10 and 11 are details of the mast and boom sockets fitted to and turning upon the base-plate. Figs. 12 and 13 are details of the cap fitted to the top of the mast. Fig. 14 is a detail of the guy-plate journaled upon the cap. Figs. 15 and 16 are details showing the abutting ends, respectively, of pipe and timber mast sections held in position by the crosstree-hub without other coupling; and Fig. 17 is a detail of a solid crosstree-hub.

In the drawings, A represents the base block or timbers, serving as a foundation for the derrick. Upon this is secured the base-plate B, (see Figs. 8 and 9,) provided with a hollow stud or pivot-post 2, which is strengthened by the radiating ribs 3. The bottom of the post is grooved vertically, the groove extending into and connecting with the axial opening, and the base-plate itself is slotted in line with said groove, so as to receive the sheave 4, which has journal-support upon the top of the base-plate and projects into the groove in the post, so that its periphery aligns with the axial opening of the post and will receive a rope or cable running through the

post. The foot-block G is pivoted upon the stud 2 and is provided with an offset socket 5 to receive the mast on the outside of the socket, the ears 6 being arranged to receive the truss-rods. On the opposite side of the foot-block from the socket 5 is arranged the sheave 7, journaled between projecting ears, and in such position that its grooved periphery also aligns with the opening in the pivot-post. The boom-seat H, having a socket 8 to receive the boom, is journaled upon the same axle as the sheave 7 and is provided with ears 9 to receive the boom truss-rods. It will thus be seen that the mast is offset from the axis of rotation of the derrick and is counterbalanced by the similar and opposite offset foot of the boom.

With the tubular construction, as shown in Figs. 1, 2, and 3, the mast is made up of the sections of iron pipe 10. These sections are connected together by means of the coupling-blocks 11, which consist of interior collars having a circumferential rib 12, against which the ends of the pipe-sections abut, and are held thus from lateral displacement.

The crosstree C is arranged at the joint and surrounding the coupling. This crosstree has a quartered or sectional hub, the faces of the meeting parts of the quarters or sections 13 being similarly grooved, so that when secured together, as by bolts 14, the hub surrounds the mast and the grooves form sockets to receive the struts 15. These struts are made, preferably, of pipe-sections fitted loosely into the sockets in the hub. Upon the projecting ends of the struts are fitted the caps 16, which are held in place and the struts firmly secured by the brace-rods 17, connecting the adjacent caps, as shown in Fig. 2. The caps are provided with sockets 18 to receive the collars 19, fixed upon the truss-rods 20, which are carried from end to end of the mast and pass over the ends of the struts, as shown in Figs. 1, 5, 6, and 7. The mast, as shown, is made up of four sections, thus requiring three crosstrees, with which construction I prefer to reinforce the structure by means of the auxiliary truss-rods 21 and 22, one end of each of which is secured, as shown in Fig. 3, to the hub of the middle crosstree, the other end passing through a cap of the next strut and therein

adjustably secured by a nut threaded thereon, as shown in Figs. 1, 2, 5, 6, and 7. The upper ends of the truss-rods 20 are passed through and secured in the ears 23 of the head-block

5 D. This head-block has a hollow pivot-post 25 similar to the post 2 of the base-plate, and a mast-socket offset from it similar to that of the socket 5 with relation to the post 2. It will thus be seen that when the mast is in
10 place it stands parallel with but offset from the axes of the two pivot-posts 2 and 25, which are coincident with the axis of rotation of the derrick. On the opposite side of the post 25 from the mast-socket is journaled the
15 sheave 24 in such position that its periphery is in line with the axial opening of the post, (see Figs. 12 and 13,) and upon the pivot-post 25 is journaled the guy-plate 26, which carries a sheave 27, the periphery of which is in
20 line with the axial opening of the pivot-post, (see Fig. 14,) and to this guy-plate are connected the derrick-guys 28. (See Fig. 1.)

The boom is constructed in the same manner as the mast, the lower end of it being
25 supported in the boom-seat H, and its upper end being provided with a cap E, carrying the sheave 29, journaled between the standards or yoke 30, to which also are connected links 31 and 32, carrying, respectively, the
30 sheaves 33 and 34. (See Fig. 1.) Similarly to the head-block D is connected the sheave 35 by means of the link 36. With a derrick constructed as described the lifting pulley-block 37 is operated by means of the rope 38
35 running over the sheaves 34 and 29, down the boom and around the sheaves 7 and 4, and thence to the source of power. The position of the boom is controlled by the rope 39, running over the sheaves 33, 35, and 24,
40 and 27 to the source of power. The advantage of this arrangement of the tackle is that the position of the boom is not affected by the pull upon the rope in hoisting a weight, as is the case when the hoisting-rope passes
45 over the top of the boom to the top of the mast and thence downward. The hoisting and boom-tackle ropes not running parallel down the mast do not become twisted and tangled, as is often the case when both are
50 carried down the mast.

Sections of timber are used to make up the mast and boom, as shown in Fig. 5, in some cases, instead of sections of pipe. As shown in this figure, the derrick is erected in the
55 same manner as in Fig. 1, except that it is provided with a guy-strut F, the boom-tackle being carried from the top of the mast over the sheave 40 at the top of the guy-strut, then downward around the sheave 41, and thence
60 to the source of power, the guy-strut being held in place by guys 28 and 42. The advantage secured by the use of the guy-strut is that with the hoisting-rope running from the top of the mast to the engine the strut
65 supports it so as to permit the boom to swing underneath, while the engine can be placed close to the strut. Otherwise the engine would

need to be placed at such a distance that the hoisting-rope running to it directly from the top of the mast would clear the boom. 70

In the wooden derrick the mast and boom are both similarly formed, and the sections of both are connected together by means of the coupling-blocks 43, having similar sockets to receive the ends of the sections 44, the sections
75 of the crosstree-hub being formed to fit to the shape of the timber, as shown in Figs. 5 and 6, the derrick being in other respects fitted together and held in place in the same manner as the tubular iron derrick shown in Fig. 1. In
80 some cases it is unnecessary to employ any couplings between the mast and boom sections, they being held from lateral displacement solely by the crosstree-hub, which thus serves as a common socket, as shown in Figs. 85
15 and 16; also in some cases a solid crosstree-hub may be used, as shown in Fig. 17.

The advantage in having the mast offset from and parallel with the axis of rotation and the hollow pivot-posts at top and bottom
90 of the derrick with their sheaves above described is that the mast is at all times in vertical position no matter what the position of the derrick, and the boom tackle-rope may be passed over the sheave 24, either upward
95 or downward, as desired, and the weight-lifting rope is carried downward, as shown, in the axis of rotation of the derrick.

I claim—

1. In a derrick, in combination with the
100 hollow pivot-posts for the foot-block and guy-plate, and their sheaves for carrying the tackle through said posts along the axis of rotation of the derrick, the mast offset from and parallel with said axis of rotation. 105

2. In a derrick, the combination with the mast thereof, of the head-block, the hollow pivot-post thereon offset from the mast, and the guy-plate fitted to said pivot-post, substantially as described. 110

3. In a derrick, the combination with the mast thereof, of the head-block therefor, the sheave journaled in one side thereof, the hollow pivot-post carried by said head-block offset from the mast, the guy-plate turning upon
115 said pivot-post, and the sheave carried by said guy-plate, said sheaves being so arranged that a rope passing from one to another, runs freely through the opening in said pivot-post, substantially as described. 120

4. In a derrick, the combination with the mast thereof, of the foot-block turning upon the offset hollow pivot-post, the head-block therefor having a similarly offset hollow pivot-post, and the guy-plate journaled upon the
125 pivot-post of said head-block, substantially as described.

5. In a derrick, the combination with the mast thereof, of the guy-strut and the idler-sheaves at the top of the mast, the top of the
130 guy-strut, and the base of the strut, for carrying the rope from the boom-tackle to the source of power, substantially as described.

6. In a derrick, the combination with its

mast, of the guy-strut, the guy connecting the
top of the mast and guy-strut, the guys ex-
tending laterally from said strut, the sheaves
at the top of the mast and top of the strut,
5 arranged above the guy and connecting the
same to the sheave at the base of the strut,
said sheaves being so arranged that the rope
from the boom-tackle passes from mast to
strut above the connecting-guy and down-

ward between the lateral guys to the source 10
of power, substantially as described.

In testimony whereof I have hereunto set
my hand this 4th day of January, 1893.

OLIVER CROSBY.

In presence of—

T. D. MERWIN,
H. S. JOHNSON.