

(No Model.)

3 Sheets—Sheet 1.

O. R. OLSEN.  
FIRE TRUCK.

No. 361,443.

Patented Apr. 19, 1887.

Fig. 1.

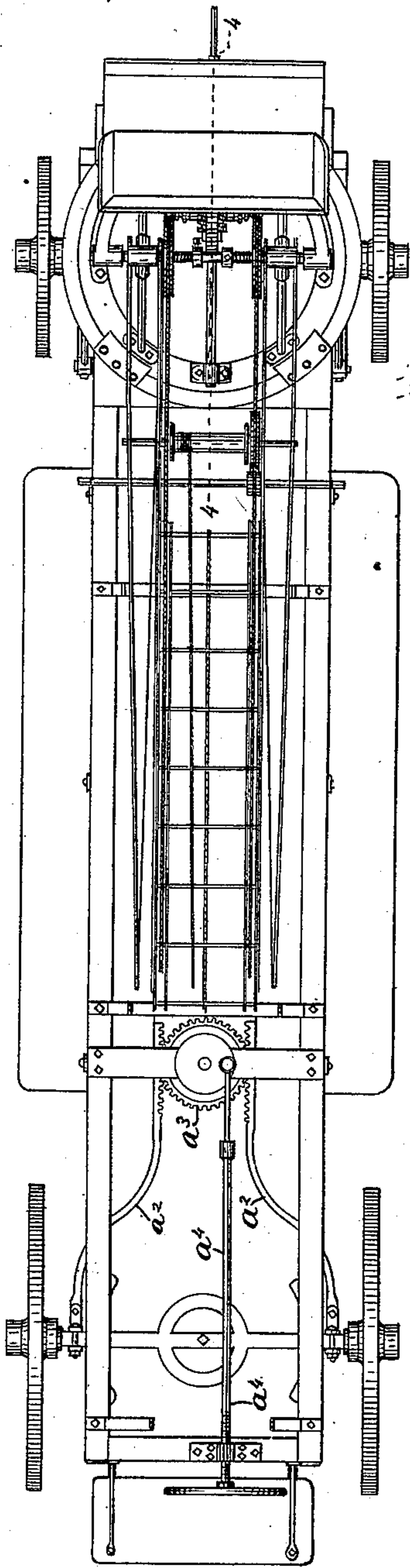
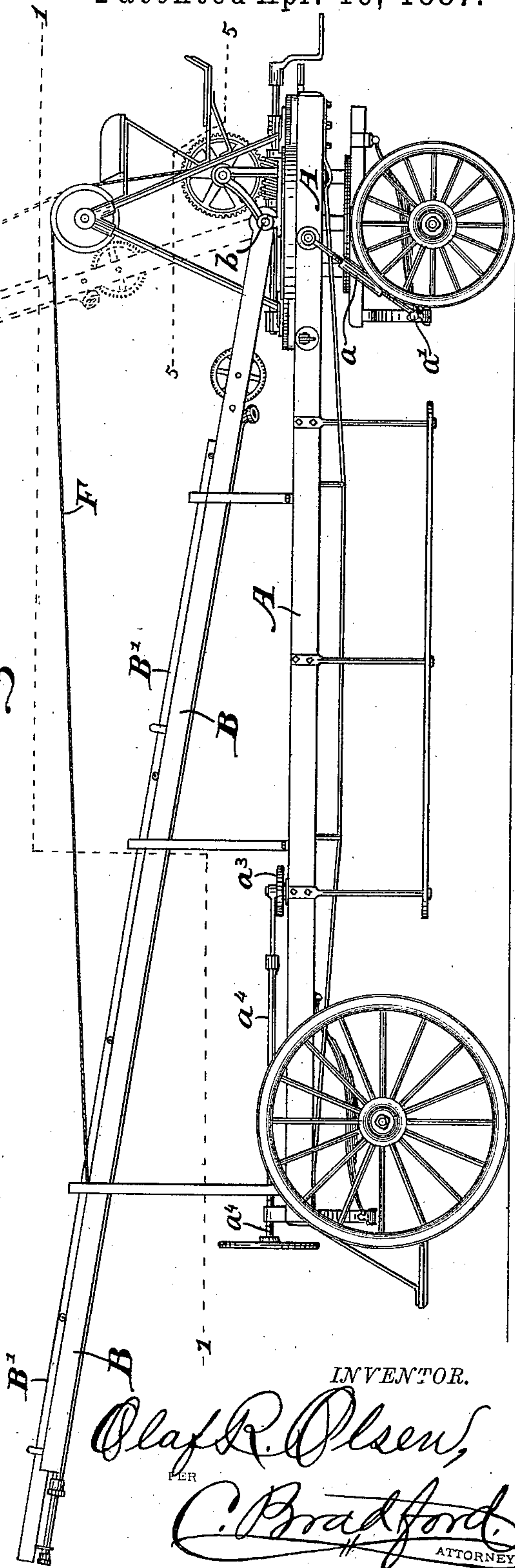


Fig. 2.



WITNESSES.

Cha. N. Leonard.  
Charles L. Thurber.

INVENTOR.

O. R. Olsen,  
PER  
C. Bradford,  
ATTORNEY.

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Fig. A.

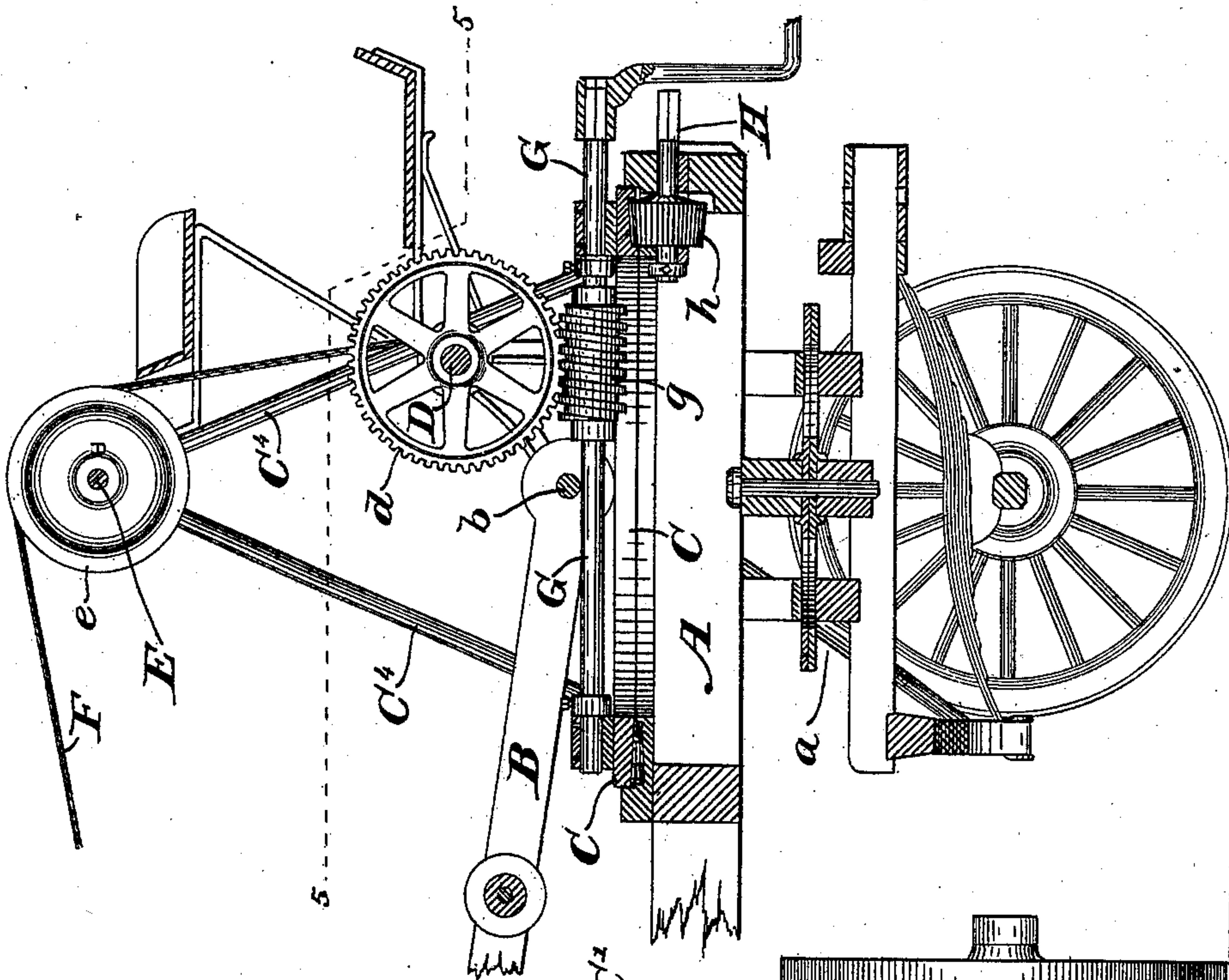
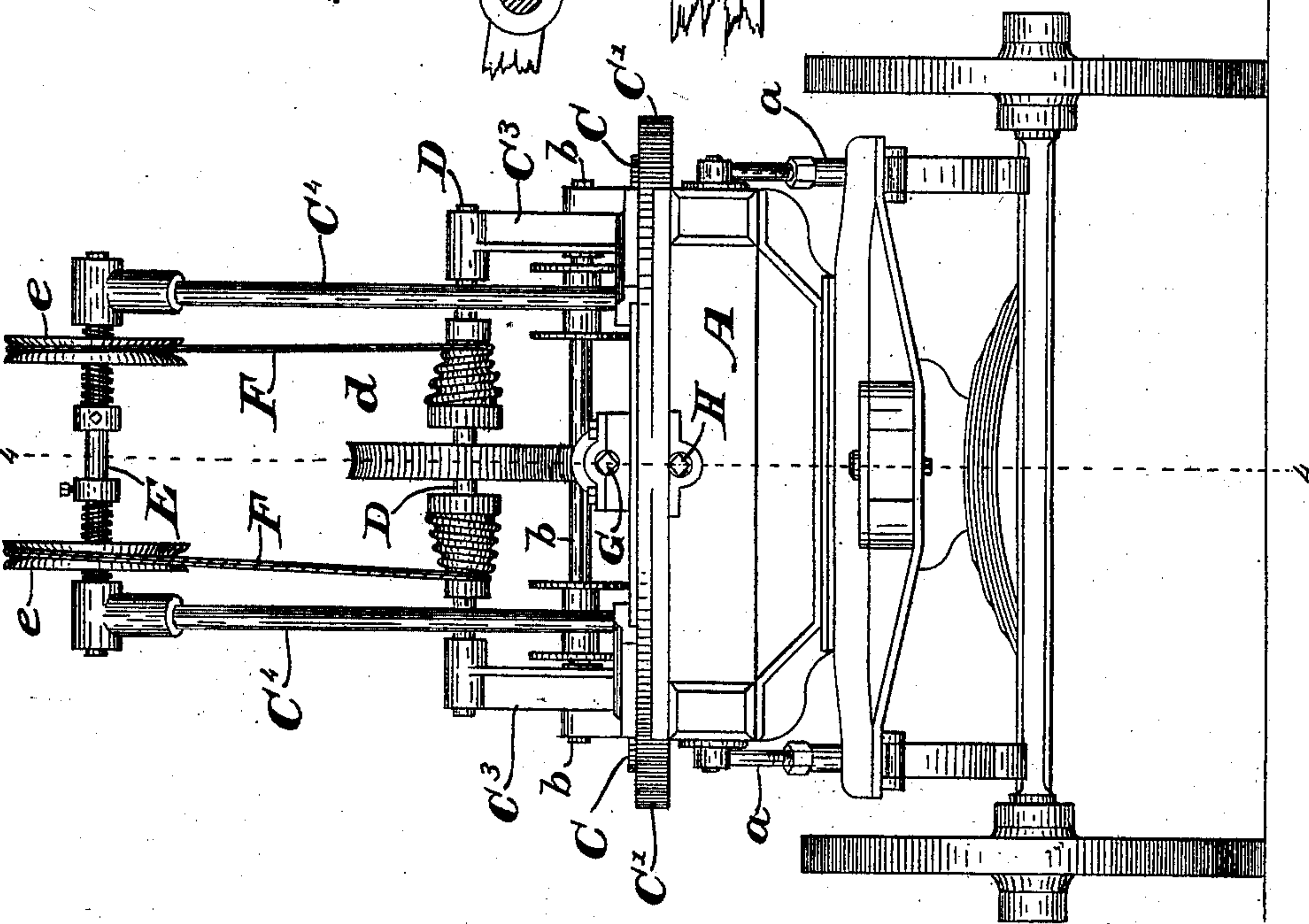


Fig. 3.



WITNESSES.

Chas. Leonard,  
Charles L. Thurber.

INVENTOR.

Ola R. Olsen,  
PER  
C. Bradford,  
ATTORNEY.



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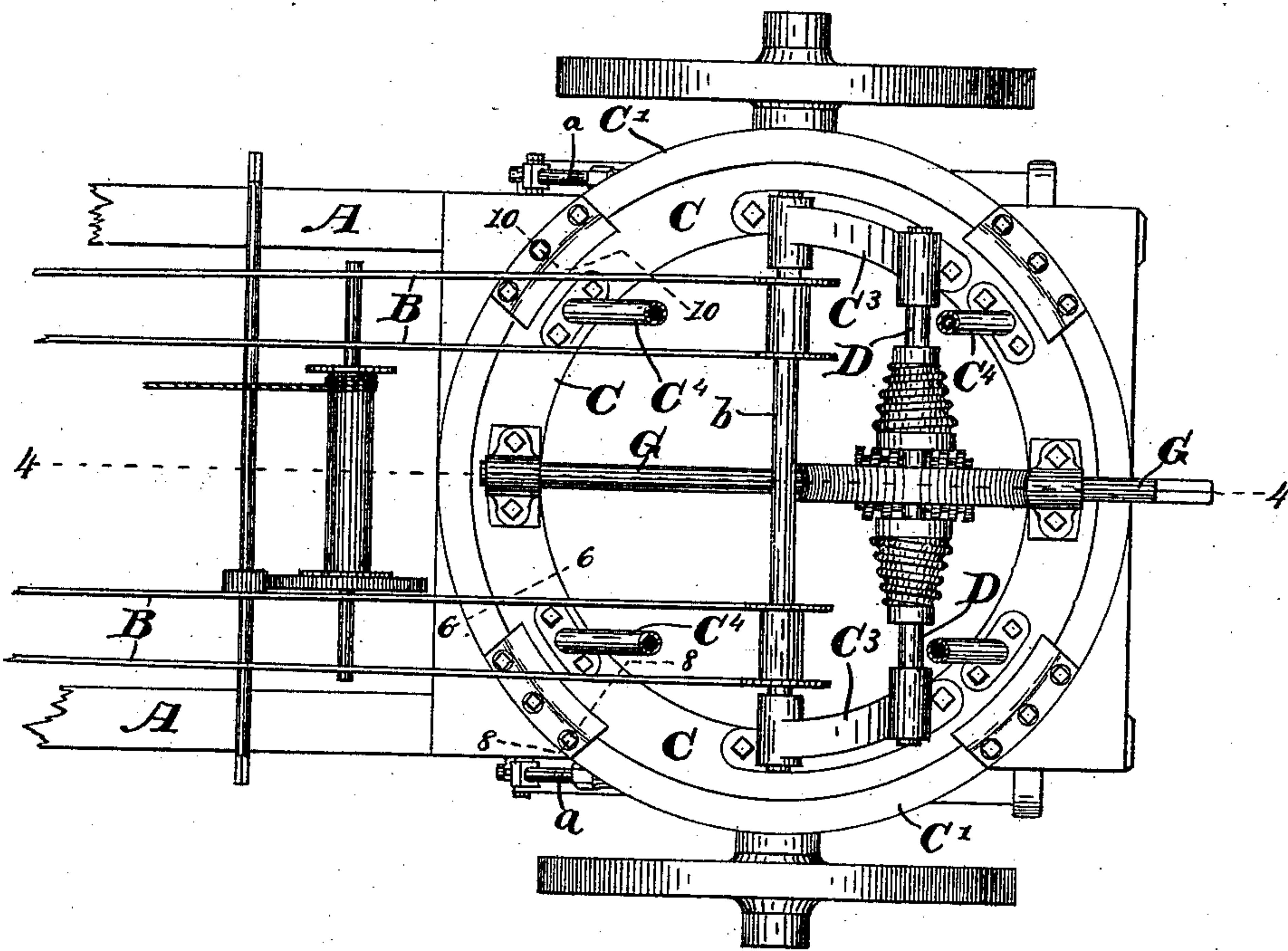
3 Sheets—Sheet 3.

O. R. OLSEN.  
FIRE TRUCK.

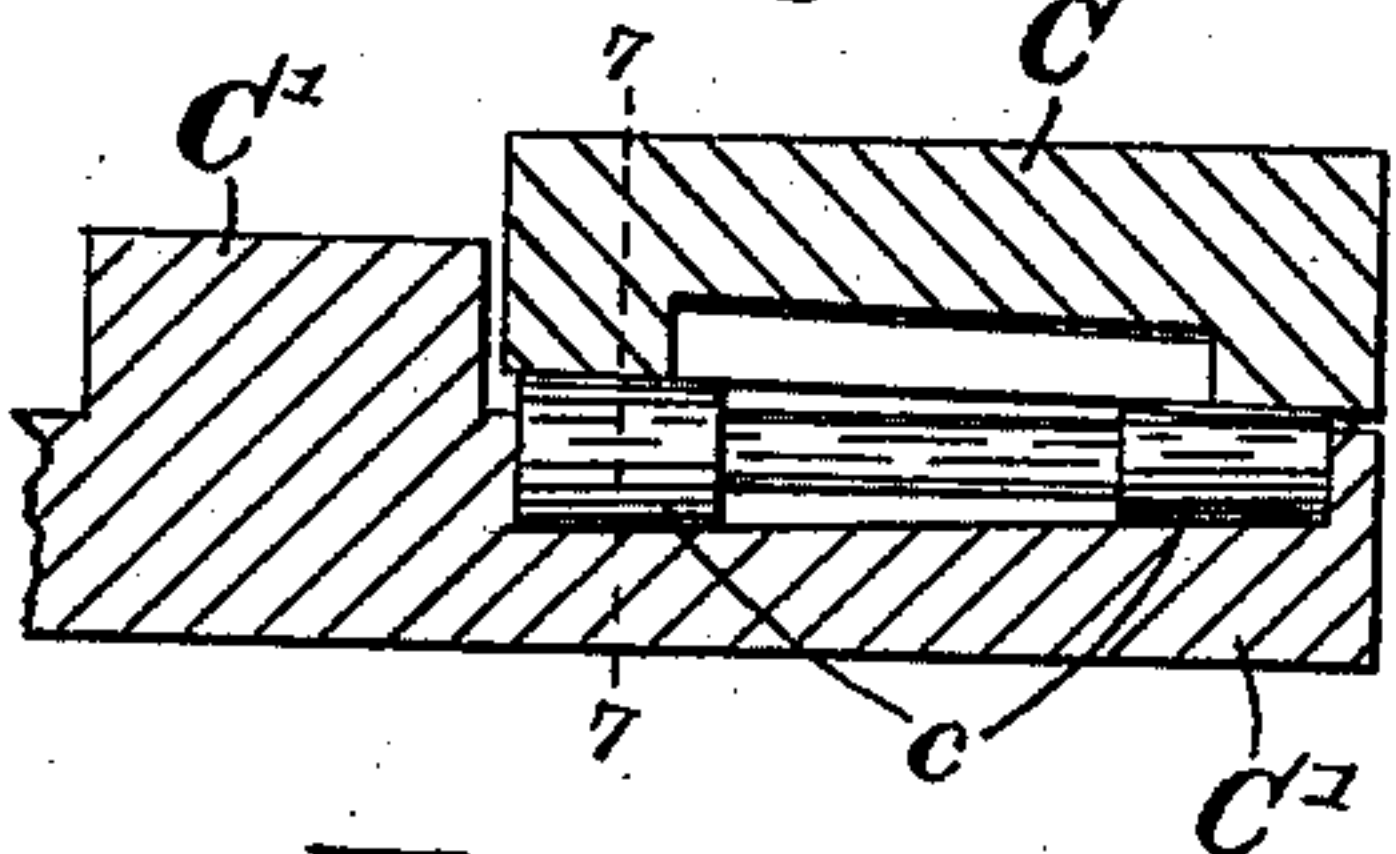
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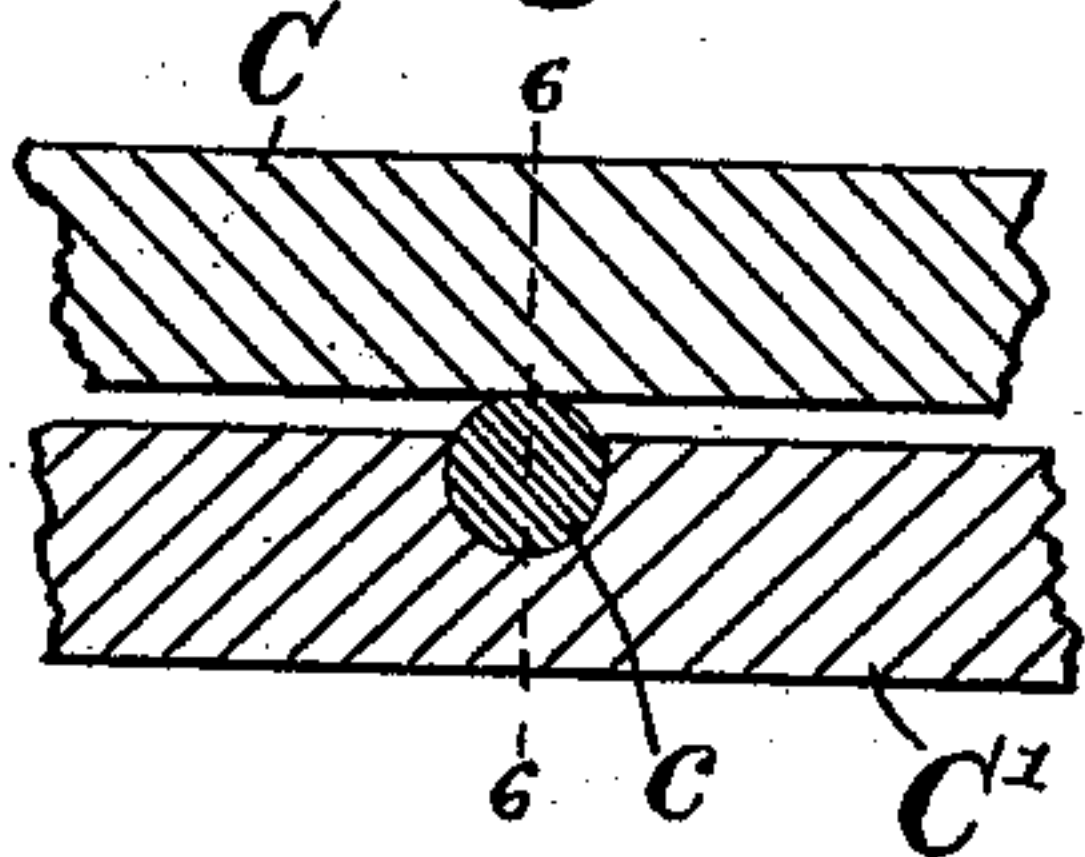
*Fig. 5.*



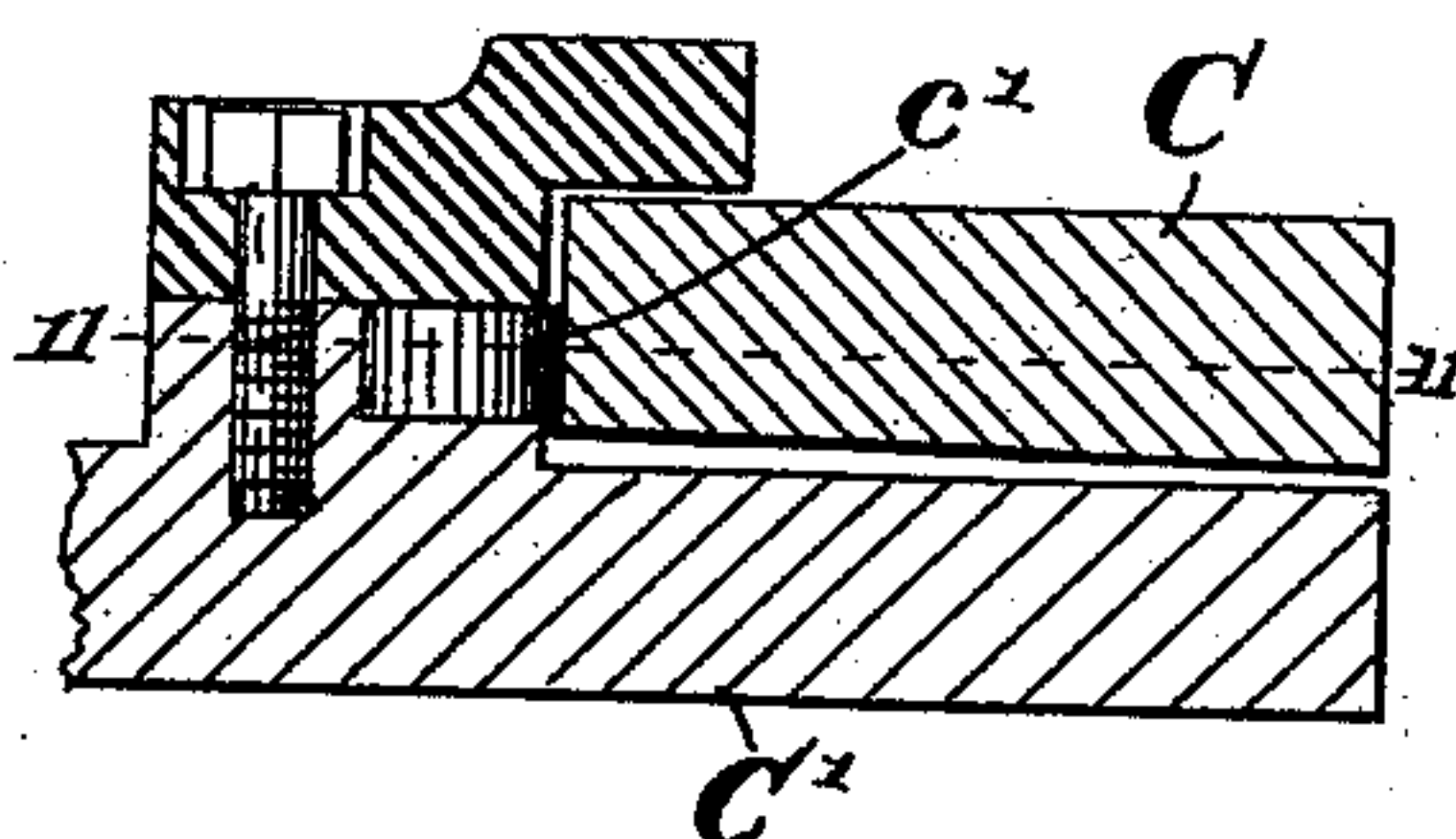
*Fig. 6.*



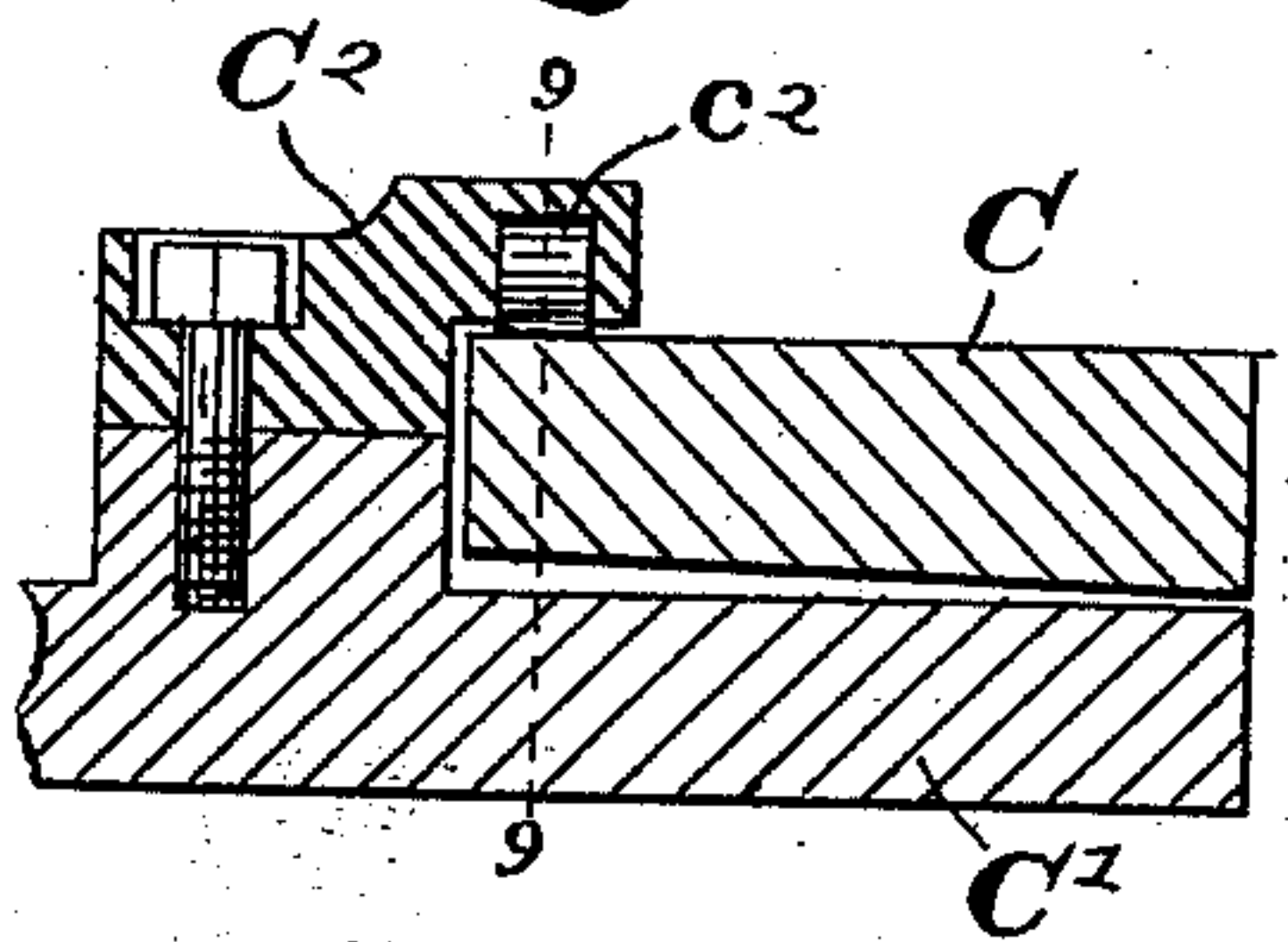
*Fig. 7.*



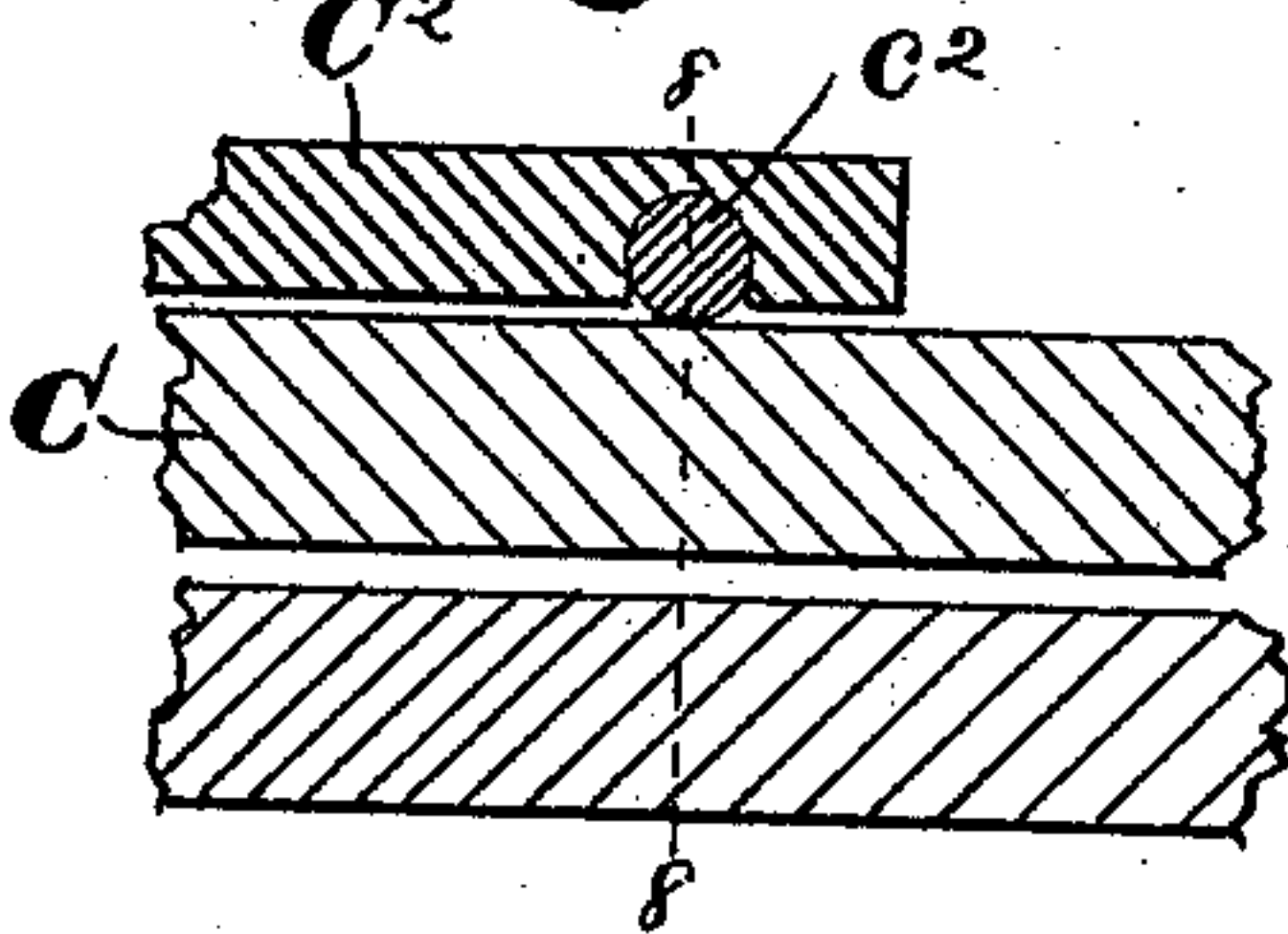
*Fig. 10.*



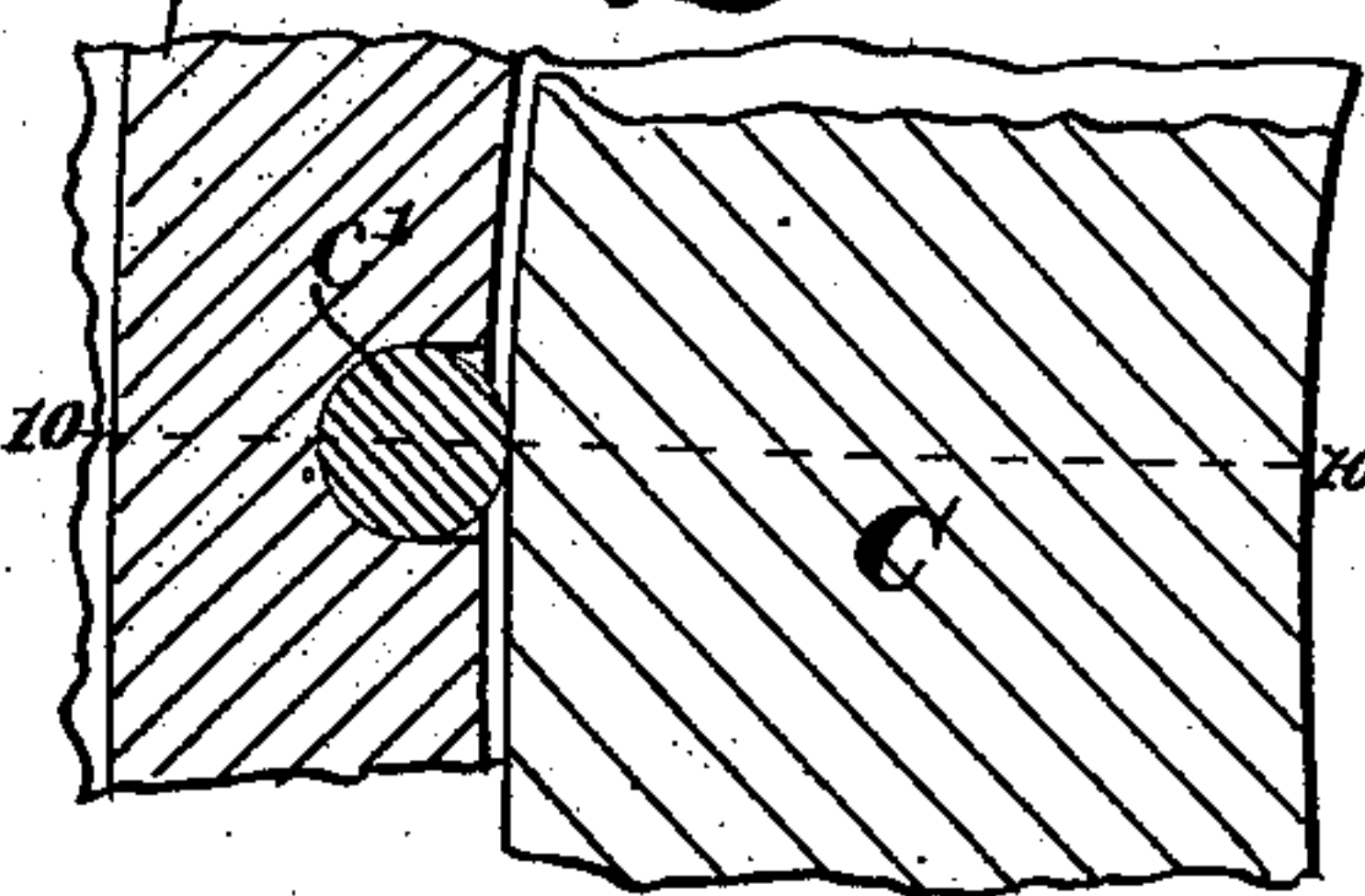
*Fig. 8.*



*Fig. 9.*



*Fig. 11.*



WITNESSES.

Chas. Leonard,  
Charles B. Thurber.

INVENTOR.

Ola R. Olsen,  
PER  
C. Bradford,  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

OLAF R. OLSEN, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE COVERT  
FIRE LADDER AND STAND PIPE COMPANY, OF SAME PLACE.

## FIRE-TRUCK.

SPECIFICATION forming part of Letters Patent No. 361,443, dated April 19, 1887.

Application filed September 11, 1886. Serial No. 213,295. (No model.)

*To all whom it may concern:*

Be it known that I, OLAF R. OLSEN, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful improvements in Fire-Trucks, of which the following is a specification.

The object of my present invention is to provide improved mechanism for raising and handling ladders of fire-trucks, and is shown as embodied in a "combined stand-pipe and ladder;" and it consists of the mechanism hereinafter particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of a combined stand-pipe and ladder, the upper portion of the ladder being removed, as seen from the dotted line 1 1 in Fig. 2; Fig. 2, a side elevation of such a ladder; Fig. 3, a front end elevation; Fig. 4, a central vertical sectional view looking toward the right from the dotted line 4 4 in Fig. 3; Fig. 5, a horizontal sectional view looking from the dotted line 5 5 in Fig. 4; Fig. 6, a detail sectional view on the dotted line 6 6 in Figs. 5 and 7; Fig. 7, a detail sectional view on the dotted line 7 7 in Fig. 6; Fig. 8, a detail sectional view on the dotted line 8 8 in Figs. 5 and 9; Fig. 9, a detail sectional view on the dotted line 9 9 in Fig. 8; Fig. 10, a detail sectional view on the dotted line 10 10 in Figs. 5 and 11, and Fig. 11 a detail sectional view on the dotted line 11 11 in Fig. 10.

In said drawings, the portions marked A represent the bed or frame-work of the running-gear; B B', the ladder-sections; C, the turn-table on which the ladder and hoisting mechanism are mounted; D, a winding-shaft; E, a screw-threaded non-revolving shaft carrying sheaves; F, ropes passing from the winding shaft or drums thereon over said sheaves to near the upper end of the ladder-section B; G, a crank-shaft which is connected to and drives the winding-shaft through gearing, and H a crank-shaft by which the turn-table, carrying the ladder and its operating mechanism, is revolved.

The frame-work A is much like the bed-frame of an ordinary fire-ladder wagon, and is

suitably mounted on appropriate running-gear, as shown. At its forward end are hinged extensible stay-braces *a*, pivoted to said frame-work and adapted to swing down and hook over studs *a'* on the running-gear, and thus steady the front portion of said bed-frame, or keep it from rocking laterally. The central portion of this brace is in the form of a turntable, as shown, and it can thus be adjusted as desired. As in ordinary fire-ladders, this bed-frame is mounted on fifth-wheels at the rear, as well as at the front end, and rods *a''* run from the rear axle to and by means of lugs thereon engage with a spur gear-wheel or pinion, *a'''*, mounted in appropriate bearings therein. This gear-wheel has a crank-pin, as shown, and is connected to a rod, *a''''*, which is threaded near the rear end and passes through a threaded bearing, and on which is a hand-wheel or other handle, by which it may be turned. The turning of this rod of course turns the wheel *a'''*, and thus, through the rod *a''*, changes the relation of the rear portion of the running-gear to the frame-work A, and the whole apparatus, when in motion, is thus steered. This steering apparatus is extremely simple and quite efficient.

The ladder-sections B and B', and the pipe-sections attached thereto, are similar in nearly all respects to those shown in Letters Patent No. 321,342 to William T. Covert, dated June 30, 1885, and will not be further described herein, as they do not form the present invention. Said ladder is mounted on a shaft or pivot, *b*, on the turn-table C.

The turn-table C is mounted on the front end of the frame A, and is supported on anti-friction rollers *c* therein, and is also stayed laterally by other anti-friction rollers, *c'*, which are arranged around its edges in the rim C', secured to the frame A. Rollers *c''* are arranged in brackets C'' above the turn-table, and thus said turn-table is relieved of friction in all directions by anti-friction rollers, as will be readily understood by an examination of the drawings. Upon this turn-table is mounted the pivot-shaft *b*, for the ladders, a frame, C<sup>3</sup>, carrying the winding-shaft, and a frame, C<sup>4</sup>, carrying the sheave-shaft. The crank-shaft G is also mounted in suitable bear-



ings thereon, and all these parts revolve therewith.

The winding-shaft D is mounted in suitable bearings in the frame or brace C<sup>3</sup>, and has drums preferably of a conical form, and provided with spiral grooves for receiving the ropes by which the ladder is elevated. It is also provided with a screw gear-wheel, *d*, by which it may be driven.

The sheave-shaft E is mounted in bearings at the upper extremity of the frame-work C<sup>4</sup>, but does not revolve in its bearings. For a considerable portion of its length it is formed with screw-threads running from the ends toward the center reversely to each other, and on these screw-threads are mounted sheaves *e*. These screw-threads correspond to the spiral grooves in the drums on the shaft D, and thus, as the ropes are wound upon said drums, said sheaves, over which said ropes pass, being also driven thereby, are at the same time driven toward the center of the machine, and thus are kept in the same relation to the points at which said ropes pass onto said drums at all times—*i. e.*, when the ropes are nearly unwound, and are thus near the end of the drums, the sheaves will also be near the outer ends of their shafts, and as the rope is wound up, and thus comes nearer the inner ends of the drums, said sheaves travel correspondingly along their shafts, and near its center, maintaining an equal pull from said sheaves to said winding-drum at all times.

The ropes F are in themselves ordinary ropes. They are attached to the ladder-section B, near its upper end, at one end, and to the drums on the winding-shaft D at the other ends, and as said winding-shaft is turned serve to draw up said ladder.

The crank-shaft G is mounted in bearings in the turn-table C, and is provided with a screw, *g*, which engages with the screw gear-wheel *d* on the winding-shaft D, and as it is turned drives said winding-shaft through said screw and screw-gear, and winds up the ladder, as will be readily understood.

The crank-shaft H is mounted in bearings in the frame A or rim C<sup>5</sup> directly below the crank-shaft G. It is provided with a gear-wheel, *h*, which engages with a circular rack on the under side of the turn-table C, and thus said turn-table may be revolved by turning this shaft H, as will be readily understood.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the ladder-frame C<sup>4</sup>, sheaves mounted at the upper part of said frame, the winding-shaft D, a crank-shaft, G, gearing with said shaft D, and a rope, F, connecting said ladder and said shaft D, substantially as shown and described.

2. The combination of a ladder, a winding-shaft bearing drums having spiral grooves, a frame carrying a stationary shaft having screw-threads cut in opposite directions thereon, sheaves mounted on said screw-threads, and ropes passing from said wheel over said sheaves to said drums, whereby as the ropes are wound upon said drums toward their inner ends said sheaves will also advance toward the center of the shaft and the relative points of the rope's attachment be maintained, substantially as set forth.

3. The combination of a ladder, a winding-shaft, D, drums having spiral grooves thereon, a shaft, E, having screw-threads thereon, as specified, sheaves *e*, mounted on said screw-threads, and ropes F, passing from said spiral drums over said sheaves to the ladder, substantially as set forth.

4. The combination of a ladder mounted on a turn-table, mechanism for elevating said ladder, also mounted on said turn-table, anti-friction rollers *c*, *c'*, and *c''*, upon and against which said turn-table rests, and a crank-shaft for revolving said turn-table, substantially as set forth.

5. The combination of the frame-work A, turn-table C, the ladder and mechanism for elevating the same, mounted thereon, the running-gear, the rods *a*<sup>2</sup>, spur-pinion *a*<sup>3</sup>, and screw-rod *a*<sup>4</sup>, mounted in a threaded bearing on the frame and connected at its front end to a crank-pin on said spur-pinion, substantially as shown and described, and for the purposes specified.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 29th day of March, A. D. 1886.

OLAF R. OLSEN. [L. S.]

Witnesses:

HEYDEN S. BIGHAM,  
E. W. BRADFORD.