

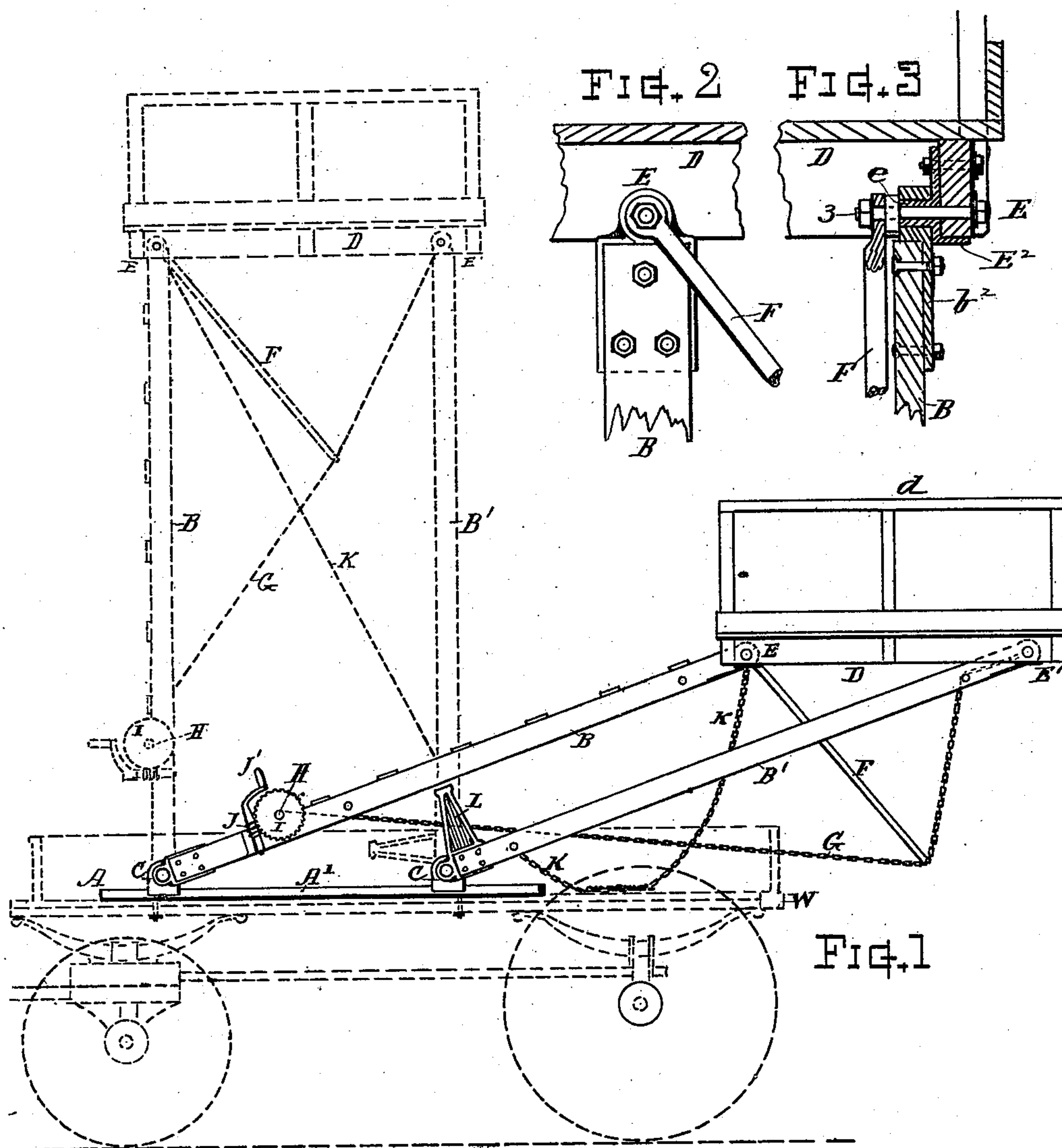
(No Model.)

2 Sheets—Sheet 1.

S. E. HARTHAN.  
ADJUSTABLE WAGON TOWER.

No. 533,059.

Patented Jan. 29, 1895.



Witnesses.

Ella P. Blum  
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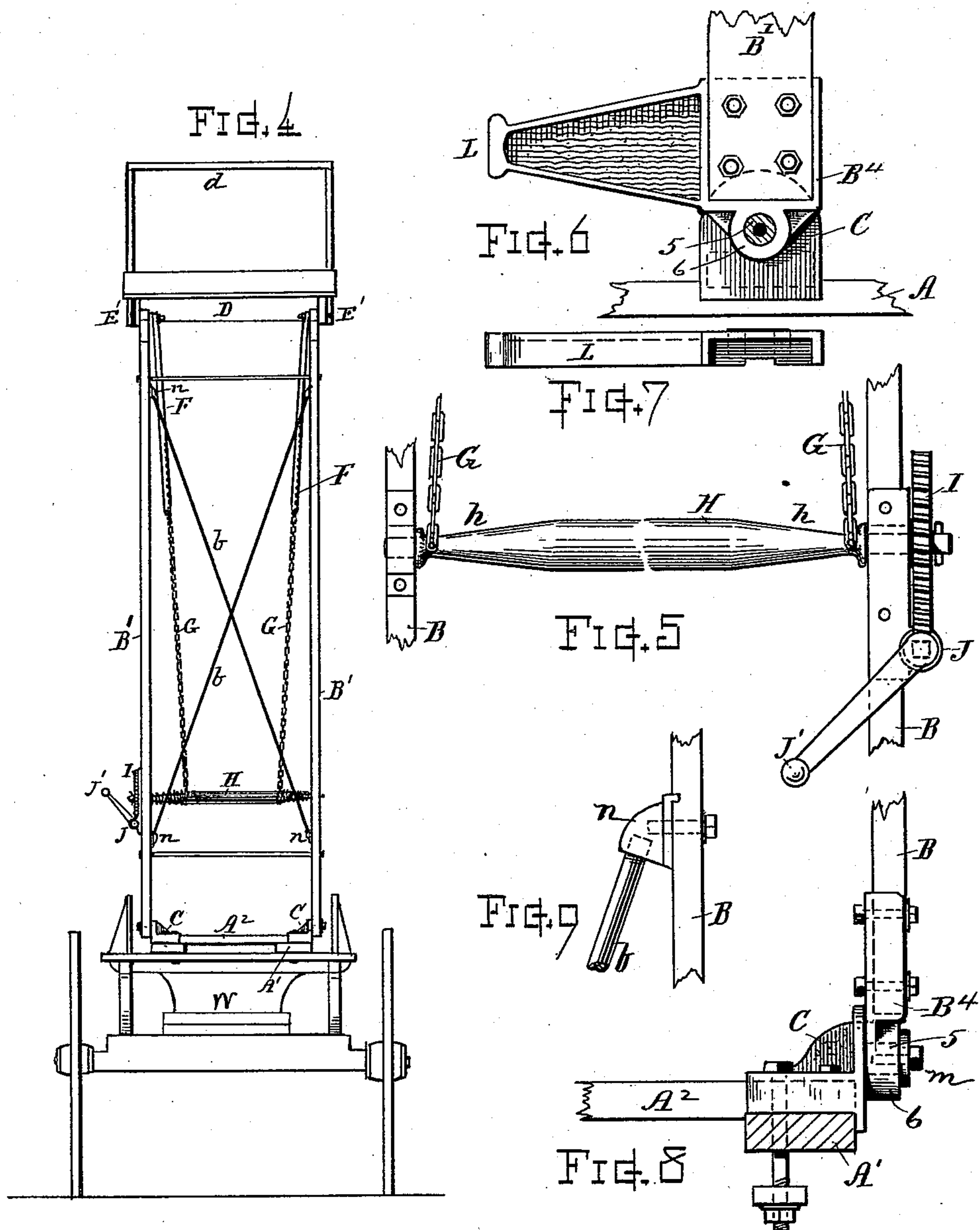
Inventor.

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# UNITED STATES PATENT OFFICE.

SILAS EMERSON HARTMAN, OF WORCESTER, MASSACHUSETTS.

## ADJUSTABLE WAGON-TOWER.

SPECIFICATION forming part of Letters Patent No. 533,059, dated January 29, 1895.

Application filed May 18, 1894. Serial No. 511,660. (No model.)

*To all whom it may concern:*

Be it known that I, SILAS EMERSON HARTMAN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Adjustable Wagon-Tower, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My invention relates to improvements in the construction of the tower and its operating mechanism in that class of wagon-towers employed in the construction and repair of trolley ways for electrical railways, and for similar purposes, and in which the cage or platform is upheld by hinged posts or standards, and lowered and raised by swinging the same backward or forward in relation to the wagon.

The object of my invention is to provide a tower for the purpose named which is readily and conveniently detachable from the wagon and adapted for use in connection with any suitable wagon; also, to provide elevating mechanism for said tower that can be operated with ease and facility; and to so construct and combine the supports, pivoting joints and operating parts as to render the apparatus comparatively light, strong and durable, and efficiently convenient for practical use. I attain these objects by the mechanism constructed and operating as explained in the following description and illustrated in the drawings, wherein—

Figure 1 is a side view of a wagon tower made in accordance with my invention; the elevated position of the tower being indicated by dotted lines. Fig. 2 is an inner side view of one of the top joints. Fig. 3 is a vertical section of the top joint. Fig. 4 is a rear elevation view of the tower. Fig. 5 is a front view of the operating windlass. Fig. 6 is a side view of the foot joint on the rear standard. Fig. 7 is a top view of the foot-joint-plate and rest arm. Fig. 8 is a front view of one of the foot-joints, and Fig. 9 is a front view of the brace-attaching joint.

Referring to parts as employed in my detachable wagon tower, A indicates a bed-frame composed of longitudinal timbers or sills A', adapted to rest upon the floor of the wagon W, and connected one with the other near their ends by transverse pieces A<sup>2</sup>; having at

their ends and rigidly attached thereto joint castings C, as shown.

B B' indicate the front and rear posts or swinging standards, the lower ends of which are pivotally connected with said bed-frame by the joints C, and their upper ends to the platform or cage D by suitable hinging joints at E E'. The standards swing backward and forward for lowering or raising the platform as desired. The standards are transversely braced in front and rear pairs by crossed rods or pipe-braces b to give requisite lateral stiffness.

F F indicate backwardly inclined struts connected with the top of the front standard or its joint E, and having their lower ends respectively attached to the lift cords or chains G G, which latter are secured at their rear ends to the top or joint E' of the rear standards; while the forward ends of said chains are attached to a windlass or windingshaft H, mounted to turn in bearings fixed on the front standards B at a convenient height above the foot thereof.

A worm wheel I is fixed on the windlass arbor and a worm-screw J supported in a bearing on the side of the standard engages with said worm-wheel for operating the same. The worm-shaft is fitted to receive a crank or wrench J' by which it can be turned for working the windlass and winding up or unwinding the chains.

K indicates chains or flexible connections joining the lower part of the rear standards with the top of the front standards, and which serves as a back brace when the tower is at its limit of elevation.

Upon each of the rear standards B', at or near the foot, I arrange a block or projecting arm L that swings into position for sustaining the front standard B when the tower is at its lowest position; the edge of said front standard seating upon the end of the arm L and thus preventing an excessive strain that might otherwise occur, due to the knuckle-joint action of the platform D and front standard B when in depressed position.

The front top-joint (see Figs. 2 and 3) is best formed with a plate or casting b<sup>2</sup> rigidly attached to the standard and having at its end an eye or bearing that receives a pivot-boss e integrally formed on a plate E<sup>2</sup> which is secured to the platform frame. A bolt 3 is arranged in the boss e and the head of the



strut F is connected to said bolt. The rear top-joint is substantially the same, except that the chain connects in place of the strut.

The foot joint is best formed with the casting C having a projecting pivot-boss 5 and a foot-plate B<sup>4</sup> fixed to the standard and having an eye 6 that fits over and hinges on said boss, confined thereto by a bolt and washer, as at *m*. (See Fig. 8.) The supporting arm L is best made integral with the foot-plate casting B<sup>4</sup> for the rear standards B', as indicated in Figs. 6 and 7.

The winding surfaces *h* of the windlass are made conical with small diameter at that part on which the chain starts to wind when the tower is at its lowest position, and of larger diameter at the final point of wind. This enables the operator to elevate the tower with less exertion, there being greater leverage for moving the parts when the tower is at the lower positions.

The brace connection is best made by a block *n* bolted to the side of the standard (see Fig. 9) and having a screw-threaded opening into which the threaded end of the brace *b* is screwed. Said block has a lip sunk into the side of the standard, as shown, thus making a very strong attachment for holding against either thrust or tensile strains.

The platform is of usual form with a guard-rail *d* and foot-board about it.

In the operation, the operator by turning the crank and worm-screw effects rotation of the windlass, thereby winding up the chains G, which latter draw forward the lower ends of the struts F, and these acting on the top joints of the supporting standards swing them toward upright position and thus raises the tower. When at upright position the chains or flexible stays K are drawn taut, and these together with the oppositely tightened chains G afford a very efficient and safe bracing for stiffening the tower. The screw-worm in connection with the windlass wheel serves to hold the mechanism at any position of adjustment without other stop or fastenings.

My detachable tower, as constructed, is adapted for and can be used with any suitable express wagon of ordinary kind such as employed for moderately heavy transportation; the bed frame being readily attached to or detached from the wagon by four removable clamp bolts that pass through the joint castings C and through the wagon bottom attaching the bed frame firmly thereto when the tower is in position.

I claim and desire to secure by Letters Patent—

1. The combination of the standards arranged in front and rear pairs, having their lower ends flexibly jointed to the bed-frame to swing backward and forward, and their upper ends to the platform, the windlass mounted in bearings on the front standards, the lift-chains extending from the tops of the rear standards and connecting with said windlass, the inclined struts having their respect-

ive ends attached to said chains and to the tops of the front standards, and the worm-wheel and worm-screw for rotating said windlass.

2. A wagon-tower provided with an independent horizontal bed-frame carrying hinging joints and arranged for resting upon and removable bodily from the floor of an ordinary wagon; and means for detachably securing said bed frame in position thereon, in combination with swinging standards having their foot ends attached to said bed-frame by the hinging joints, the platform carried upon the top of said standards, and mechanism mounted upon the tower-frame or standards for swinging said standards to upright or depressed positions, whereby said tower and wagon are completely separable, for the purpose set forth.

3. In an adjustable wagon tower, the top hinge-joint consisting of joint-plate E<sup>2</sup> having the projecting boss *e*, the standard plate b<sup>2</sup> having an eye that receives said boss, the perforated strut-head, and the joint-bolt passing through and connecting the same, as set forth.

4. In a wagon tower having its platform supported on front and rear backwardly swinging standards, the combination with the rear standard, of a projecting block or arm L that serves as a rest or seat for the front standard when the tower is at lowered position.

5. In an adjustable wagon tower, the combination of the backwardly swinging standards and platform, the lift-chains, and the chain-winding arbor therefor having its chain-winding surfaces made of conical form with small diameter at the starting position and increasing in diameter as the elevation of the tower increases, and means for turning said windlass.

6. In an adjustable wagon tower, the combination with the swinging standards carrying the platform, and the means for raising and lowering the same, of the back brace-chains or flexible connections K joining the lower part of the rear standards with the top of the front standards, for the purpose set forth.

7. A wagon tower comprising a platform, supporting standards hinged to said platform, the lower ends of said standards provided with foot-plates, the joint-castings or feet supported on the bed and pivotally sustaining said foot-plates by the inter-matching boss and eye joint, facilities for detachable connection of said joint-castings with the bed or bottom of a wagon, and means for elevating said platform and standards, for the purpose set forth.

Witness my hand this 15th day of May, A. D. 1894.

SILAS EMERSON HARTMAN.

Witnesses:

CHAS. H. BURLEIGH,  
ORRIN B. CHAFFEE.