(No Model.) 2 Sheets—Sheet 1.

A. HALL.

MACHINE FOR UNLOADING RAILROAD CARS.

No. 279,868. Patented June 19, 1883.

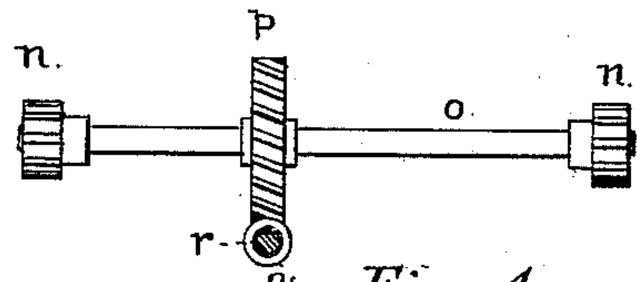


Fig. 4.

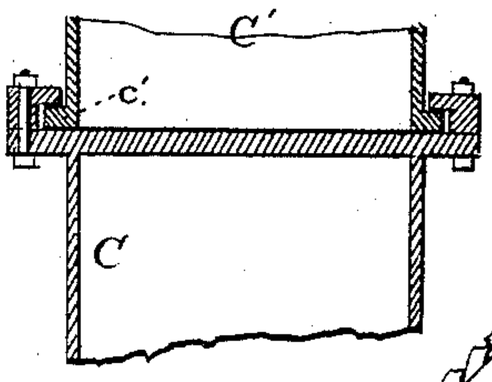


Fig. 5.

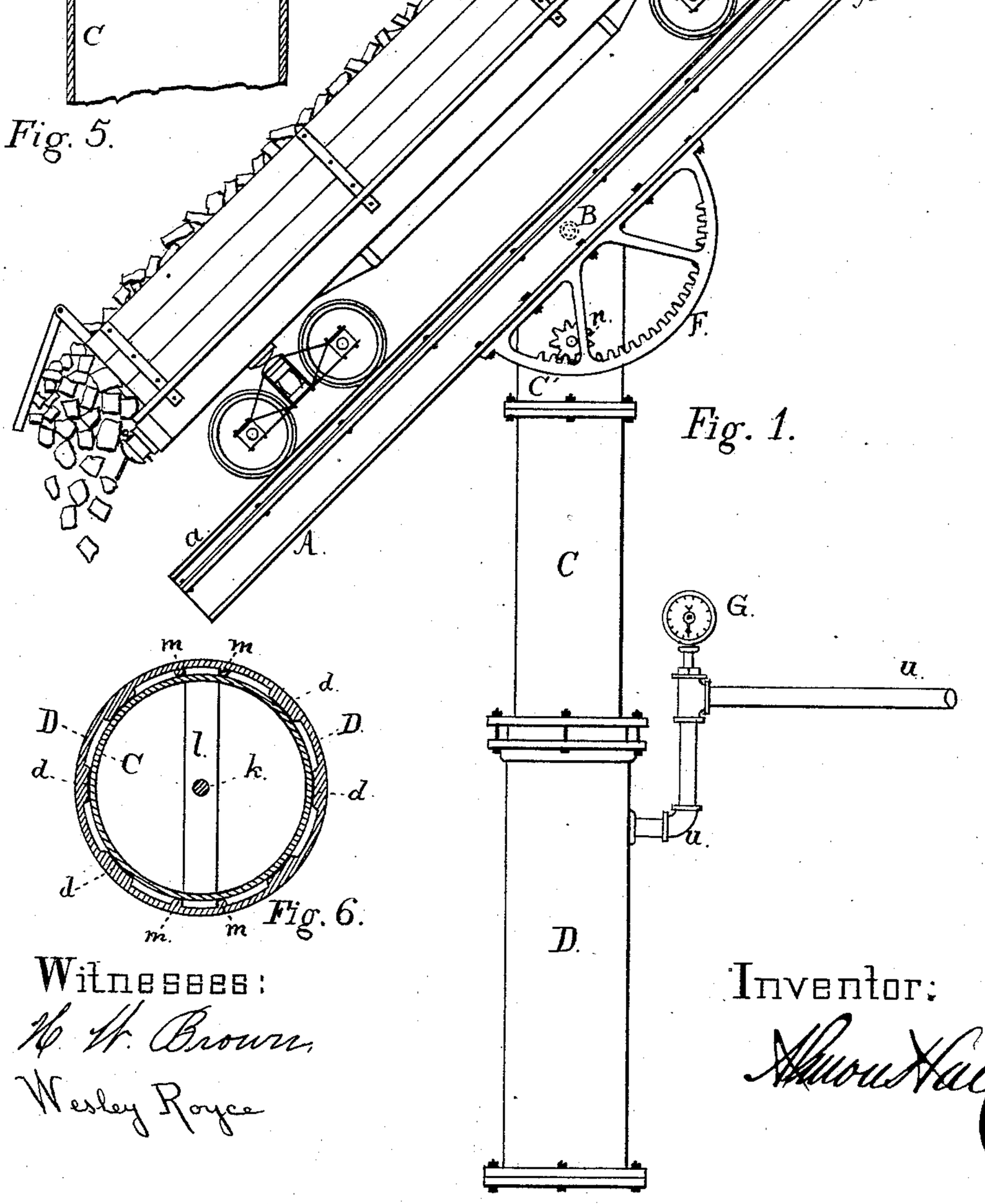


Fig. 1.

Fig. 6.

Witnesses:
H. W. Brown.
Wesley Royce

Inventor:
Albert Hall

(No Model.) 2 Sheets—Sheet 2.

A. HALL.

MACHINE FOR UNLOADING RAILROAD CARS.

No. 279,868. Patented June 19, 1883.

Fig. 2.

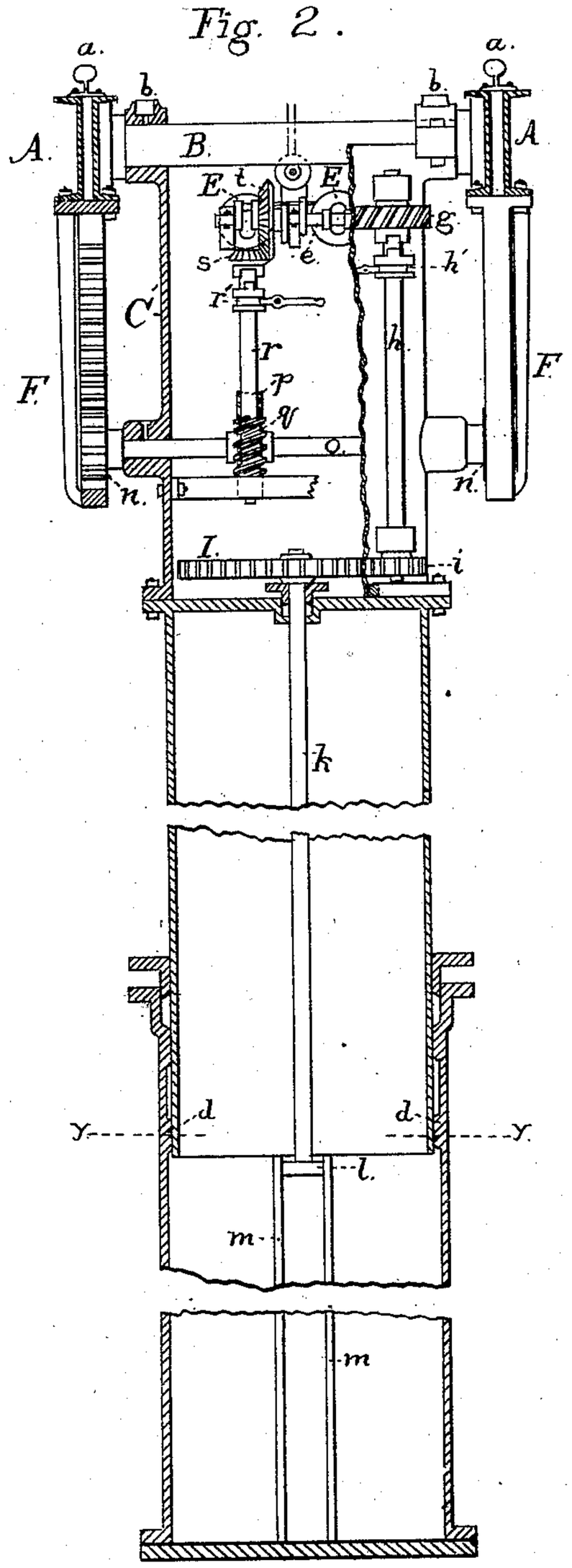
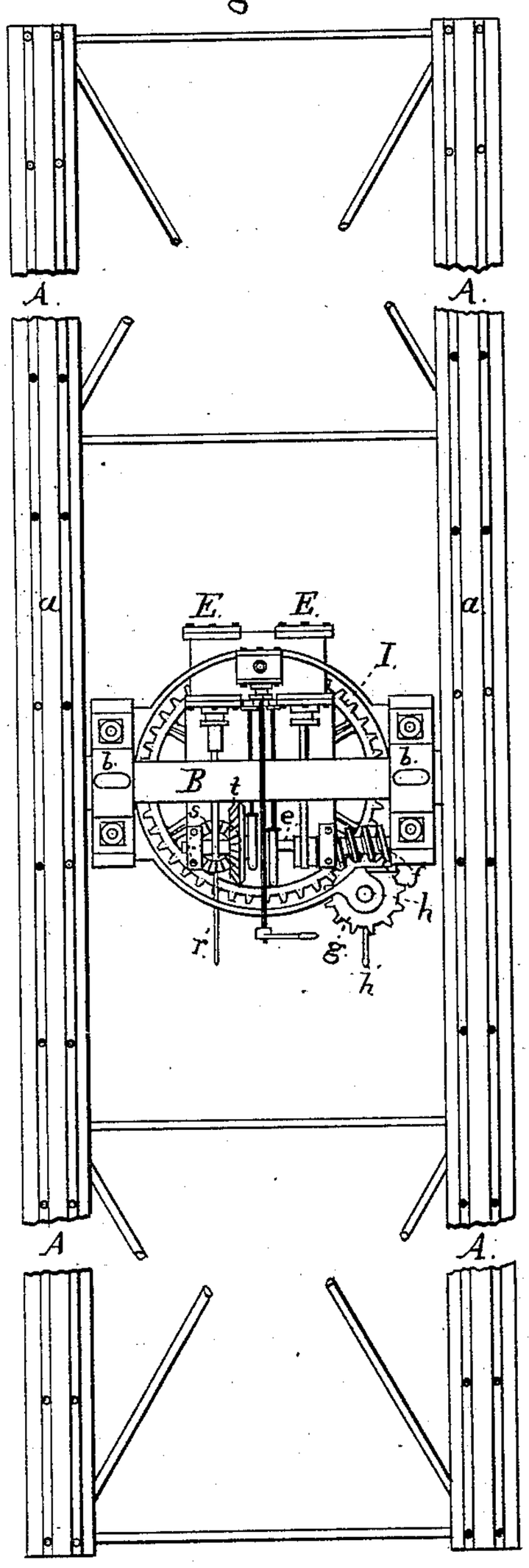


Fig. 3.



Witnesses:
H. M. Brown.
Wesley Royce

Inventor:
Alonzo Hall.

UNITED STATES PATENT OFFICE.

ALMON HALL, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO HOSEA T. STOCK, OF SAME PLACE.

MACHINE FOR UNLOADING RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 279,868, dated June 19, 1883.

Application filed April 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALMON HALL, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented a new and useful Machine for Unloading Railroad-Cars, of which the following is a specification.

My invention relates to a device for unloading ordinary railroad-cars by securing the car to be unloaded upon a platform or table designed to rise and fall, to rotate in a horizontal plane, and to tilt so as to dump the load from the car.

In unloading coal and ore from railroad-cars into vessels and chutes the usual process of shoveling the load into tilting buckets suspended from a swinging crane is found to be slow and expensive. Where dumping-cars of special construction are employed their capacity is less than that of the ordinary flat car, and they can be used but for one class of freight. In unloading such vessels, elevated permanent chutes are employed, approached by inclined tracks of heavy grade. This plan is also objectionable on account of the great original cost of the elevated ways, chutes, and cars, and from the fact that valuable docks and other spaces arranged on this plan are rendered practically useless for other purposes.

The general object of my invention is to obviate the objections above mentioned, but more particularly, first, to provide a device for lifting a loaded car bodily to a height suitable for the operation hereinafter described, which device, when not in use, shall be below the track, out of the way of moving trains; second, to afford means of swinging the car completely around (as upon a turn-table) at any height to which it may be lifted; third, to provide mechanism by which the car may, at any point to which it is turned or lifted, be tilted to any desired angle, so that its load may slide or shoot from the car; fourth, to arrange the engine which swings and tilts the car at or near the top of the lift employed, so as to rise and fall and swing with the platform, dispensing with complicated gearing necessary were these operations performed by a stationary engine; and, fifth, to combine with such device a pressure-gage or scale for determining the weight of the load handled. I attain these objects by means of the mechanism illustrated in the accompanying drawings, made part hereof, in which—

Figure 1 is a side elevation of my device employing a hydraulic lift. Fig. 2 is a vertical cross-sectional view of the same. Fig. 3 is a plan view of the same. Fig. 4 is a plan of gearing, *n o p q r*, hereinafter referred to. Fig. 5 is a vertical section of modification of joint between cylinders C and C′, hereinafter referred to; and Fig. 6 is a plan view on line *y y*.

Similar letters refer to similar parts throughout the several views.

Table or platform A is of sufficient length to receive a railroad-car. The beams are composed preferably of I-beams or channel-bars, suitably braced and tied, upon the tops of which are bolted track-rails *a*. This table, when not in use, rests upon suitable supports, so that its rails *a* are on a level and in line with the rails of the track. Table A, at its center, is supported by and oscillates upon trunnions B. The car to be unloaded is secured to table A by chains or other suitable means.

C D is a hydraulic lift, cylinder C, closed at top, moving vertically within fixed cylinder D, which is closed at bottom. Cylinder C may also rotate upon its vertical axis. These cylinders are of sufficient diameter and weight to form an independent supporting-column sufficient to withstand vertical and side strains and jars. The lift is supplied with water from a force-pump through pipe *u*.

As it is impracticable with my device to provide the table A with the usual vertical guides, slides, and runway, which keep the sliding cylinder vertical and in line with the fixed cylinder, the inner surface of cylinder D (or the outer surface of cylinder C, at its lower end) is supplied with projections *d*, which touch the adjoining surface, leaving space for the free passage of water between the two cylinders. These points of contact, with but little friction, serve as guides for the moving cylinder, and keep it steady and in vertical position.

C′ is an open cylinder provided at bottom with flange *c′*, which is bolted to a corresponding flange at the top of cylinder C. Piece C′ has at top journals *b b*, forming bearings for

shaft B, and contains and supports the mechanism by which table A is swung and tilted.

E E is a small double reversible engine, which takes steam through a flexible hose, (not shown in the drawings,) and is placed near the top of the column C′ C D. Shaft *e* of the engine is provided with a screw, *f*, which engages worm-wheel *g* upon one end of vertical shaft *h*, which has upon the other and lower end pinion *i*, which, through an opening in C′, engages horizontal cog-wheel I. This cog-wheel is fixed upon its shaft *k*, which extends downward through a stuffing-box in the head of cylinder C, terminating in cross-piece *l*, (below cylinder C,) to which shaft *k* is also fixed.

On the inner surface of cylinder D are two pairs of vertical projecting ridges, *m m*. Single ridges projecting into a notch in the ends of piece *l* would serve the same purpose. In the channels formed by ridges *m m* rest the ends of cross-piece *l*, which rises and falls with the moving column, but is prevented from rotating horizontally by said ridges *m m*. The shaft *k* being fixed to cross-piece *l*, and cog-wheel I being fixed to shaft *k*, neither of these parts is permitted to revolve. When pinion *i* is set in motion by means of its shaft and worm-gearing *h g f*, said pinion travels around the periphery of wheel I, (which stands fast,) carrying with it, in its circuit, column C C′, to which pinion *i* is attached, together with all the load supported upon said column, the table A swinging upon its center, like a railroad turn-table, at any height to which it is lifted.

Cross-piece *l* and ridges *m* may be dispensed with by allowing shaft *k* to extend through the bottom of cylinder D, said shaft being provided with a fast feather to prevent its revolving. Shaft *k* may also be dispensed with by attaching wheel I to top of cylinder C, and constructing the connecting-flanges of C and C′ so that one flange may overlap and partly embrace the other, thus forming a joint which will permit C′ to rotate horizontally upon cylinder C, as shown in section in Fig. 5.

Table A is provided at either side with segmental toothed racks F F, having for their center trunnion B, and which racks, in addition to their function of communicating motion to table A, serve as braces or trusses for table A. Racks F F are engaged by pinions *n n* upon the ends of shaft *o*, which passes through cylinder C′.

Fixed to shaft *o* is worm-wheel *p*, which is engaged by screw *q* upon vertical shaft *r*, which is provided at top with beveled pinion *s*, to which motion is imparted by beveled gear-wheel *t* upon shaft *e* of the engine.

Upon motion being communicated to shaft *o* through *p*, *q*, *r*, *s*, and *t*, pinions *n n* revolve, causing segmental racks to travel, carrying with them their attached table A, which tilts upon trunnion B to a sufficient inclination to permit the load contained in the car to slide out.

It will be observed that worm-gearing *p q* serves as a constant safety-lock, preventing motion of table A upon its trunnions unless said worm-gearing is actuated by the engine.

Shafts *h* and *r* are provided with clutches *h′* and *r′*, by means of which either the swinging or tilting machinery may at will be thrown in or out of gear.

Other arrangements of engine and gearing will readily suggest themselves for swinging and tilting table A, and I therefore do not confine my invention to the particular arrangement of engine and gearing here described; nor do I limit my device to a steam-engine, as obviously the pump employed for operating the lift could also be utilized for actuating hydraulic pistons or jacks, which would accomplish the same results. Neither do I limit my invention to a hydraulic lift, as piece C′ or its equivalent might, with all its attachments, be hoisted by screws or racks and pinions. The arrangement here shown is more particularly designed for use on low docks, subject to high waters, in loading large vessels, which, when light, set many feet above the dock, but which, when loaded, may sink so that the deck may be below the level of the dock or pier.

G is a pressure-gage or scale attached to or connected with hydraulic lift C D, and serves to indicate the pressure of the fluid within cylinders C D and the resistance and weight of the superimposed load.

I am aware that a turn-table operated by hand, supported upon revolving vertical screws, has been employed for the purpose of lowering and raising small cars and wagons into and out of the holds of vessels, and I do not claim a horizontally-rotating table combined with a lift; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for unloading railroad-cars, table or platform A, designed and arranged to be raised and lowered and to tilt at any point to which it may be lifted, so as to dump and discharge the load from its car, substantially as shown and described, for the purposes set forth.

2. In a machine for unloading railroad-cars, table A, designed and arranged to rise and fall, to swing, at any height to which it may be lifted, as a turn-table, and, at any point to which it may be lifted or turned, to tilt so as to discharge the load from its car, substantially as shown and described, for the purposes set forth.

3. The combination of cylinders C and D with table A, arranged to swing as a turn-table at any point to which it may be lifted, all substantially as set forth.

4. The combination of cylinders C D with table A, designed and arranged to tilt so as to discharge the load from its car at any point to which it may be lifted or turned, substantially as set forth.

5. In a machine for unloading railroad-cars, the combination of cylinders C and D with table A, designed and arranged to swing as a

turn-table at any height to which it may be lifted, and to tilt so as to discharge the load from its car at any point to which it may be lifted and turned, substantially as shown and described, for the purposes set forth.

6. The combination of table A and cylinders C and D with projecting guides *d*, substantially as shown and described, for the purposes set forth.

7. In a machine for unloading railroad-cars, the combination of table A and fixed cylinder D with movable column C and C′, said column being arranged to rotate in whole or in part on its vertical axis, substantially as shown and described, for the purposes specified.

8. In a machine for unloading railroad-cars, the combination of hydraulic lift C D with fixed cog-wheel I and pinion *i*, all substantially as set forth.

9. The combination of cylinders C and D with pinion *i*, fixed wheel I, shaft *k*, cross-piece *l*, and ridges *m*, all substantially as set forth.

10. The combination of screw *f*, worm *g*, shaft *h*, pinion *i*, and gear-wheel I with lift C D, substantially as shown and described.

11. The combination, in a machine for unloading railroad-cars, of table A, trunnions or shaft B, and lift C D, substantially as shown and described.

12. The combination of lift C D with table A, shaft or trunnions B, segmental racks F F, and pinions *n n*, substantially as shown and described, for the purposes set forth.

13. The combination of lift C D with table A, shaft or trunnions B, segmental racks F F, pinions *n n*, shaft *o*, worm *p*, and screw *q*, substantially as shown and described, for the purposes set forth.

14. The combination of lift C D and table A with fixed wheel I and pinion *i*, and with trunnions B, segmental racks F F, and pinions *n n*, substantially as shown and described, for the purposes set forth.

15. In a machine for unloading railroad-cars, the arrangement of engine E (designed to actuate the swinging and tilting mechanism of said machine) in relation to lift C D and table A, substantially as shown and described, for the purposes set forth.

16. In combination with hydraulic lift C D and table A, the pressure-gage G, substantially as shown and described, for the purposes set forth.

ALMON HALL.

Witnesses:
FRANK B. SWAYNE,
HARRY E. KING.