2 Sheets—Sheet 1.

C. W. BALDWIN.

HYDROATMOSPHERIC ELEVATOR.

No. 111,030. Patented Jan. 17, 1871.

Fig. 1.

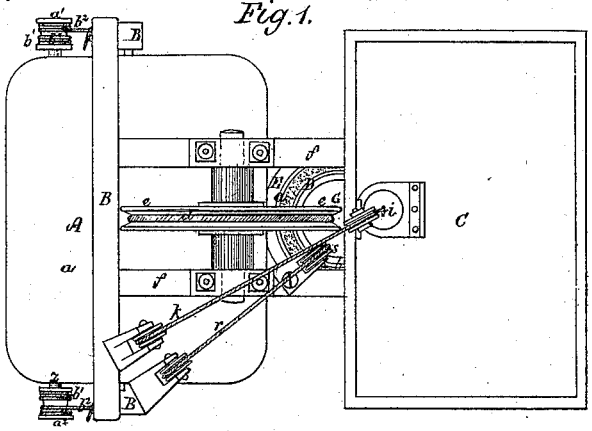
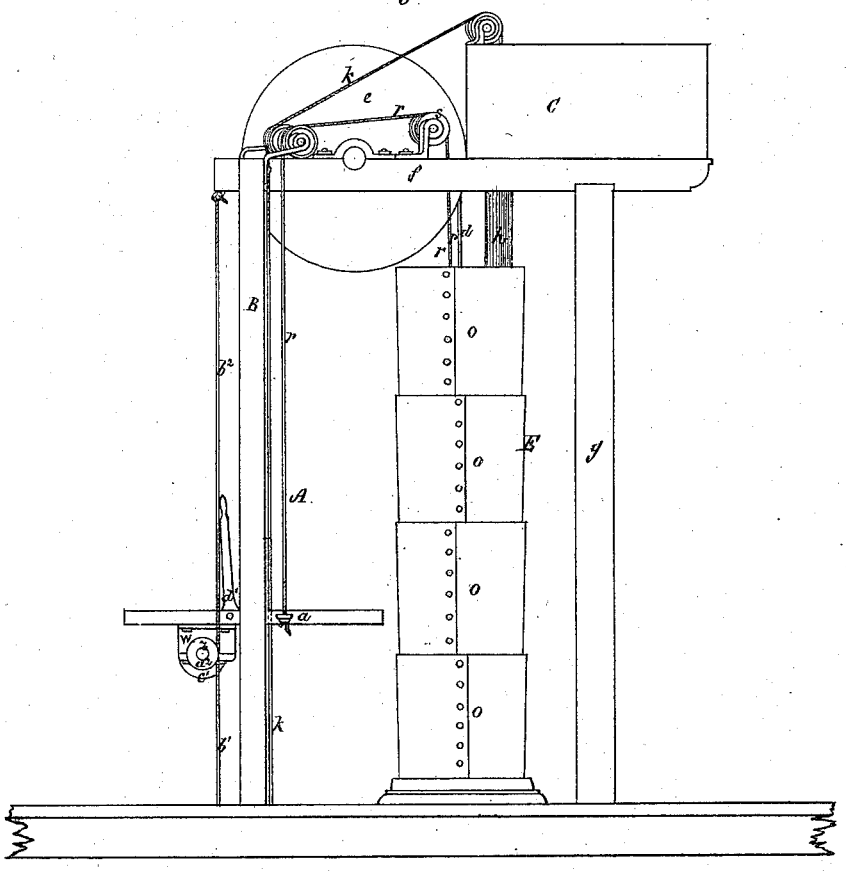


Fig. 2.



Witnesses.
Chas. F. Dawson.
Edward Griffith.

Cyrus W. Baldwin.
by his Attorney.
Frederick Curtis

C. W. BALDWIN.

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Fig. 3.

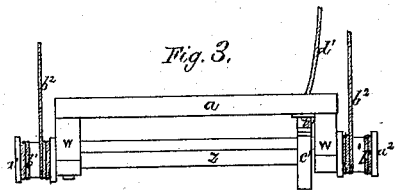
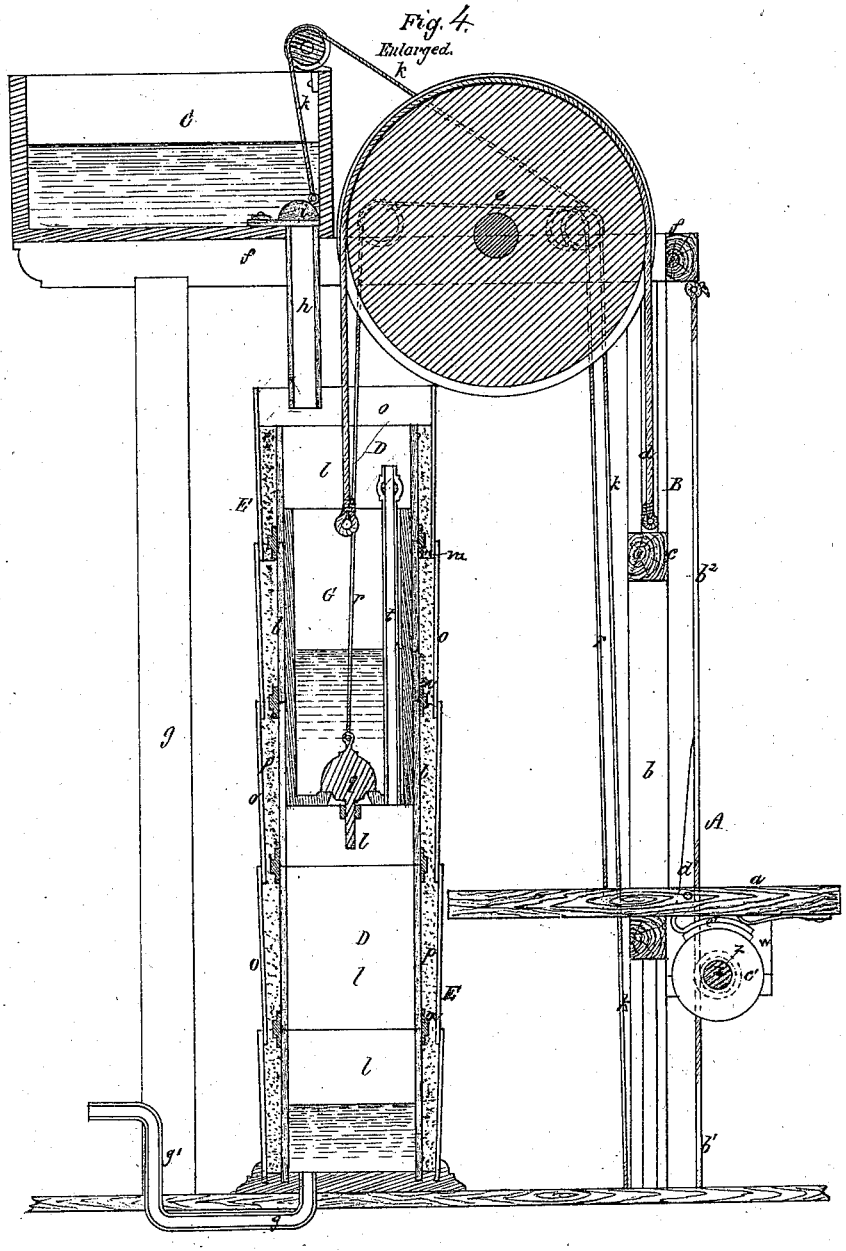


Fig. 4.
Enlarged.



Witnesses:
Chas. E. Dawson
Edward Griffith

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by his Attorney
Frederick Curtis

United States Patent Office.

CYRUS W. BALDWIN, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 111,030, dated January 17, 1871.

IMPROVEMENT IN HYDRO-ATMOSPHERIC ELEVATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these presents shall come:

Be it known that I, CYRUS W. BALDWIN, of Boston, in the county of Suffolk and State of Massachusetts, have made an invention of what I term a "Hydro-atmospheric Elevator;" and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawing making part of this specification, and in which—

Figure 1 is a plan;

Figure 2, a side elevation;

Figure 3, a front elevation of platform; and

Figure 4, a vertical central and longitudinal section of an elevator containing my improvements.

These improvements are based upon a class of elevators for hoisting human beings, merchandise, &c., of which a notable instance is seen in the application for Letters Patent of the United States No. 99,049, and issued to me, in which the weight of the elevator-carriage is counterbalanced by a bucket connected with it containing water, which is admitted to or discharged from such bucket, as the case may be, the bucket traveling in an opposite but parallel path to that of the carriage, and traversing the interior of a perpendicular well or stand-pipe, which receives it, a tank being situated at each extreme of movement of the bucket, and the latter being provided with a valve to regulate entrance and escape of water thereat, substantially as shown in the above-named application.

The improvements herein named consist—

First, in the peculiar construction of the upright well or stand-pipe in which the bucket travels, whereby I secure a stiff, water-tight, and durable object, at very small comparative cost, such construction consisting in the employment of an inner cylinder of sheet metal, built up as hereinafter explained, and an outer concentric jacket or casing of like material, the intervening annular space being filled with mortar, plaster, or other suitable material or composition; and

Secondly, these improvements consist in the combination, with the stand-pipe or well and the bucket contained therein, of an air-pipe leading from the atmosphere through the bottom of the bucket and into the well, whereby the tendency to a vacuum created by the ascent of the bucket, and the resistance to the atmosphere encountered in the descent of the bucket, are overcome, and made available for regulating the speed of the said ascent or descent of the elevator-carriage, substantially as hereinafter explained; and

Thirdly, these improvements will be found to consist in the combination, with the carriage of an elevator of the class hereinbefore premised, of a brake or friction apparatus, whereby such carriage is locked motionless to its guides while its equipoise with the bucket is being effected by the admission to or discharge from the latter of water, or while a load is being deposited upon or removed therefrom, essentially as hereinafter explained; and

Fourthly, these improvements consist in combining with the lower tank of the apparatus, or that containing the water discharged from the balancing-bucket, a bent pipe or siphon, whose outlet is of an altitude to correspond with the desired level of water to be maintained in such tank, by which means the vacuum in the well D is secured and access of air to the lower end of the plunger prevented, except as the operator may admit by means hereinafter explained, the pipe also being an escape-outlet for removal of surplus water from the well.

The drawing accompanying this specification represents at A the carriage of an elevator for hoisting merchandise, &c., of which *a* is the platform, *b b* the side posts or bars, and *c* the cross-head by which the carriage is suspended, the suspensory being a rope or chain, *d*, secured at one end to the center of such cross-head, and passing over a pulley, *e*, pivoted in a horizontal platform or stage, *f*, receding laterally from the upper part of the frame B, which guides the vertical movements of the carriage, the opposite or remote end of the stage *f* being mounted upon one or more posts, *g*, erected in the rear of the elevator-frame B.

C represents a water-tank of suitable size and shape, mounted upon the rear part of the stage *f*, and provided at bottom with a discharge-pipe, *h*, whose mouth is regulated by a clapper-valve, *i*, this valve in turn being connected with a cord, *k*, which passes over a pulley pivoted to the upper part of the tank, such cord being thence carried through a hole in the platform of the carriage, and carried and secured to the base or flooring of the elevator.

The above arrangement of carriage and tank, with their adjuncts and connections, is substantially the same as that exhibited in the invention herein named, and for which Letters Patent have been issued to me, No. 99,049, as stated.

I. In carrying out the first part of these improvements in the order before given, I erect upon the substructure or flooring of the elevator an upright hollow cylinder or stand-pipe, D, composed of a plurality of sections, *l l*, &c., of sheet metal, preferably zinc, placed one upon another, the seams or joints between the abutting ends of the same being strengthened by encircling rings *m m*, &c., of cast metal, which serve not only to insure the longitudinal coincidence of the sections, but to strengthen and stiffen the whole pipe.

Having built up in this manner a stand-pipe or well of a determined height, I inclose the same in a second

cylinder or jacket, E, built up of a series of sections or short pipes, *o o*, &c., after the manner of a stove-pipe, the formation of the two being carried on simultaneously and the intervening space filled with mortar or composition, as shown at *p*, until a well of the requisite height is obtained.

The mortar or cement insures a water-tight joint between the sections of the inner pipe, and produces a stiff and substantial structure at a very small cost.

G in the drawing denotes a cylindrical bucket or cavernous plunger attached to the end of the rope *d*, and playing within the inner well or column D, the joint between the two being sufficiently close to prevent escape of water or air at this point—an evil to which my former apparatus was subject to an injurious extent.

The bottom of the bucket or plunger G is provided with a clapper-valve, *q*, to which a hand cord, *r*, is secured, the opposite end of such cord being carried over a pulley, S, mounted upon the upper bar of the frame B, and thence downward and secured to the platform of elevator-carriage, this cord enabling the attendant to discharge water from the bucket should the weight of this water counterbalance to an undesirable extent that of the carriage.

This arrangement, however, of the valve *q* and cord *r* with respect to the carriage has been explained in my former application and needs no further reference herein.

II. In carrying out the second classified portion of these improvements I erect upon the bottom of the bucket or plunger G an air-pipe, *t*, this pipe rising to or slightly above the top of the bucket, and opening free communication between the atmosphere and the interior of the well, a cock, *v*, being applied to the pipe to partially or entirely shut off this communication when necessary.

Should this cock be suffered to remain closed the tendency to a vacuum within the well during the rise of the elevator-carriage, and the resistance of the atmosphere in such well during the descent of such carriage, would, of course, seriously interfere with if not entirely retard the movements of the latter.

It is, however, very desirable to bring both these results, to a certain extent, into action, in order to prevent too sudden a rise or fall of the carriage, and the adoption of the pipe *t* and cock *v*, or their equivalents, is to enable the extent of the resistance to be varied with respect to the load upon such carriage.

III. In pursuance of the object embraced in the third part of these improvements I suspend, below the platform *a* of the carriage A, and in suitable hangers or boxes, *w*, a horizontal shaft, *z*, the opposite ends of such shaft extending beyond the sides of the platform, and being provided each with a grooved pulley, a^1 or a^2, as represented.

To each pulley two cords, b^1 or b^2, are attached, at one end, and wound in opposite directions about the periphery thereof, one cord being carried upward and secured to the cross-bar of the frame B, and the other downward and secured to the base or foundation of the elevator.

Upon one end of the shaft *z*, for convenience to the right hand, I mount a circular disk or drum, *c'*, while over this disk I dispose a bent lever *d'*, suitably pivoted to the platform and vibrating in a slot formed therein, the lower or horizontal portion *e'* of such lever constituting a friction-brake to act upon the disk, while the upper portion *f'* of such lever, which protrudes through the platform, constitutes a handle whereby to depress the brake upon the disk with a power sufficient to partially or entirely prevent or arrest rotation of the shaft *z* and pulleys a^1 a^2, and, as a consequence, the motion of the carriage.

This stoppage of the elevator-carriage becomes necessary when, as before stated, a load is to be placed upon or removed from it, or while the equipoise of such carriage is being effected by the attendant, and the disk or drum *c'* and lever *d'* constitute a very convenient means of permitting this to be easily accomplished.

It will be seen, therefore, that should the equipoise of the carriage be considerably overbalanced in either direction, which in some instances may be desirable, as, for instance, when great rapidity of movement is required, the disk and lever serve both to check and control the rate of this speed, or to entirely stop the movement of the carriage; or, by starting or releasing once or twice the friction of the brake upon the disk, enable the attendant to ascertain immediately if the proper balance of the carriage has been attained.

By disposing the brake below the platform the latter is left free from encumbrance, and presents an unobstructed surface for reception of merchandise or passengers.

This position of the brake, also, is attendant with much greater security to passengers, as the chances of its giving way are infinitely less than would be the case were the suspensory of the carriage a constituent part of the brake, and the latter, in my invention, becomes a means of safety against accidental descent of the carriage.

IV. In carrying out the purpose sought in the fourth portion of these improvements, I dispose, in the immediate vicinity of the lower tank H, of the apparatus, (which tank, in the present instance, is formed by the lower part of the well or stand-pipe D,) a pipe, *g'*, bent preferably into the form of a siphon, the outer limbs of which terminate at such an altitude above the bottom of the tank H as practice shall determine necessary or desirable.

The pipe *g'*, while permitting of escape of surplus water from the tank H, also insures, at all times, a given quantity of water therein, and by this means prevents such a communication between the well D and the atmosphere as would destroy the vacuum in the former did the atmosphere have free access to both sides of the bucket or plunger G.

The control of this vacuum, by the admission of a greater or lesser amount of air, is effected by the operator by means of the cock *v* in the pipe *t*, as before stated.

Claims.

I claim—

1. The construction of the stand-pipe or well herein explained, the same consisting of two upright hollow cylinders of sheet metal, of different diameters, arranged one within the other, the space intervening between them being filled with a suitable cement or composition, whereby a tight joint and stiffness of structure are insured, substantially as set forth.

2. In combination with the poising plunger or bucket of the elevator, an air-pipe, or its equivalent, which opens and regulates communication between the interior of the well or cylinder in which such plunger plays, and the atmosphere above such plunger, for purposes stated.

3. The combination, with the carriage of an elevator, of a well or cylinder and a poising-plunger or bucket playing therein, and connected to the carriage, and operating in conjunction with two water-tanks, the arrangement of the carriage, cylinder, and plunger being as and for purposes stated.

4. In combination with the poising-plunger or bucket, and the carriage of an elevator of the class upon which these improvements are based, a suitable brake or stopping mechanism for arresting motion of said carriage, for purposes set forth.

5. The combination, with the elevator-carriage, of the shaft *z*, disks or drum *c*, pulleys a^1 a^2, cords b^1 b^2, or their equivalents, and the friction-bar or bent lever *d'*, the whole operating as shown and described.

6. In combination with the well D and plunger G, the pipe *g'*, or its equivalent, for preventing access of air to the lower end of the plunger except at such times and in such quantities as shall be admitted by the operator by means of the air-pipe *t*, or its equivalent.

CYRUS W. BALDWIN.

Witnesses:
FRED. CURTIS,
EDW. GRIFFITH.