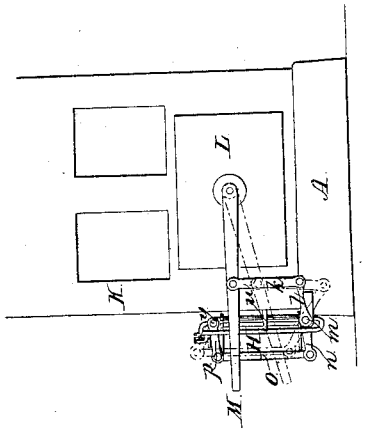
C. R. & N. P. Otis,

Elevator.

No. 51,076. Patented Nov. 21, 1865.

Fig. 3.



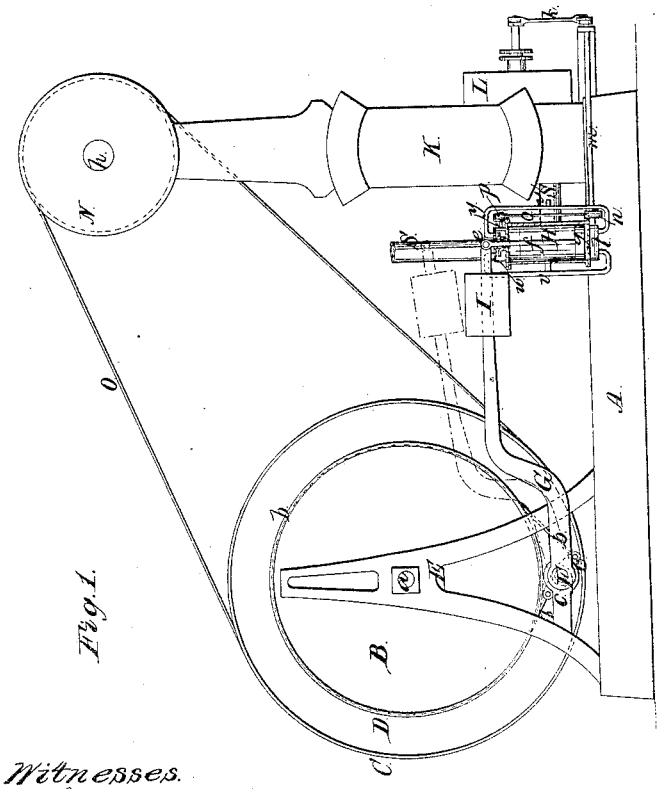


Fig. 1.

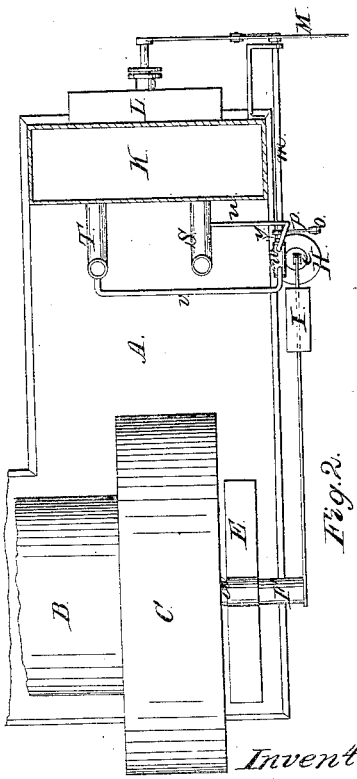


Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

CHAS. R. OTIS AND NORTON P. OTIS, OF YONKERS, NEW YORK.

IMPROVED STEAM HOISTING APPARATUS.

Specification forming part of Letters Patent No. **51,076**, dated November 21, 1865.

To all whom it may concern:

Be it known that we, CHARLES R. OTIS and NORTON P. OTIS, both of Yonkers, in the county of Westchester and State of New York, have invented a certain and new and useful Improvement in Steam Hoisting Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of a steam hoisting apparatus with our invention applied. Fig. 2 is a top view of the same, partly in section. Fig. 3 is a part of an end elevation of the same with our improvement attached.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a mode of combining the friction-brake of a steam hoisting apparatus with the stop-valve by which steam is shut off and admitted to the steam-engine of such apparatus, whereby the brake is brought or permitted to come into action by the act of closing such valve to shut off the steam, and is thrown out of action by the act of opening such valve to admit steam to the engine.

In carrying out the invention the brake may be operated either by a weight or by the pressure of steam on a piston; but in either case a piston working within a steam-cylinder is connected with the brake for the purpose of being acted upon by the pressure of steam within the said cylinder to throw the brake out of action, and the valve or valves which admit the steam to the said cylinder and provide for its escape therefrom are connected with the stop-valve of the engine in such manner that by the act of closing and opening the latter valve the former valve or valves will be properly actuated to produce or permit the action of the brake or to throw it out of action, as may be requisite.

To enable others skilled in the art to make and use our invention, we will now describe its construction and application with reference to the drawings.

A is a foundation for the support of the hoisting apparatus and its operating-engine.

B is the main drum of the hoisting apparatus. The said drum B is provided at one end with a large pulley, C, Figs. 1 and 2, and a brake-pulley, D, Fig. 1, which are all attached to one shaft *a*, Figs. 1 and 2, and are supported between two standards, E, Figs. 1 and 2, of which but one is shown in Fig. 2, as the drum B is not represented in full length, but is broken off. These standards E are firmly attached to the foundation A. The pulley C receives a band, O, which also runs on a pulley, N, on the crank-shaft *h*, Fig. 1, of the steam-engine, and which so transmits motion from the engine to the hoisting-drum.

The only other parts of the engine represented are the framing K, the valve-box L, which contains the stop and reversing valve, the lever M for working said valve, and the induction and eduction pipes S and T.

Around the pulley D, Fig. 1, is placed the brake-strap *b*, the two ends of which are connected with the ends of two short arms of a lever, *c c*, Fig. 1, which extend in opposite direction from a rock-shaft, F, Figs. 1 and 2. To one end of said rock-shaft F is firmly attached a long lever, G, Figs. 1 and 2, the end of which is connected at *e* with the rod *f* of a piston, *g*, working in the stationary steam-cylinder H, which is firmly secured to the foundation A. The said lever G is represented in Figs. 1 and 2 as furnished with a weight, I, by which it is depressed, and thereby made to tighten the brake-strap *b* upon the pulley D by its action upon the rock-shaft F and its arms *c c*.

To the bottom of the cylinder there is attached a valve or four-way cock, *t*, Fig. 1, the shell or casing of which is connected by an induction-pipe, *u*, with the main induction-pipe *s* of the engine, and by an eduction-pipe, *v*, with the main eduction-pipe T of the engine. The passages of this valve or cock are so arranged that by turning or moving the said valve or cock a proper distance the lower end of the cylinder may be brought either into communication with the induction-pipe *u* or eduction-pipe *v*. The spindle *m* of this valve or cock *t* is so connected by an arm, *l*, and rod *k* with the lever M of the stop or reversing valve of the engine that when the said lever M is in the position represented in black outline in Fig. 3, to close the latter valve and stop the engine, the lower end of the cylinder H is in communication through the valve *t* with the eduction-pipe *v*, but closed to the induction-pipe *u*, and that when the said lever M is de-

pressed to the position shown in red outline in the same figure to bring the stop and reversing valve to a position to admit steam for driving the engine and hoisting-drum in a direction for raising the load, or when the said lever is raised a corresponding distance above the position shown in black to admit steam for driving the engine and hoisting-drum in a reverse direction, the lower end of the cylinder H is in communication through the said valve *t* with the induction-pipe, but not with the eduction-pipe, of the engine. It will be understood that by this system of connections between the lever M and valve-spindle *m*, in the act of closing the stop-valve to shut off steam from the engine, the lower end of the cylinder H will have the steam shut off from it and will be opened to the exhaust-pipe, so that its piston *g* can descend freely and allow the weight I to act upon the brake, and the act of opening the stop-valve to admit steam to the engine to start the hoisting apparatus in either direction will cause the admission of steam to the lower part of the cylinder H for raising the piston *g* and connected brake-lever G, and thereby throwing the brake out of action.

Instead of employing the weight I on the lever G for bringing the brake into action, the pressure of steam may be used above the piston *g;* and to provide for the admission of steam to the upper part of the cylinder H for this purpose, and the exhaustion of such steam when the brake is to be thrown out of operation, a valve or four-way cock, *w*, Fig. 2, similar to *t*, is attached to the upper end of the cylinder, and its shell or casing is connected in a similar manner with the branch induction and eduction pipes *u* and *v*, and an arm, *p*, on the spindle *y* of the said cock or valve is connected by a rod, *o*, with the arm *n* of the spindle *m* of the valve *t*, the arrangement of the passages and connections of the said valve or cock *w* being such that steam is admitted to the cylinder H above the piston *g* when the lever M is in a position to close the stop-valve of the engine, and the upper part of the said cylinder is opened to the eduction-pipe when the said lever is in position to open the stop-valve. The said valve or cock *w* always closes the upper end of the cylinder to the eduction-pipe when it opens it to the induction-pipe, and vice versa.

We have not thought it necessary to particularly describe the construction and the arrangement of the passages of the valves or four-way cocks *t* and *w*, for the reason that they have no particular novelty and could be constructed by any skilled engineer to whom the duties required of them were explained.

What we claim as our invention, and desire to secure by Letters Patent, is—

So applying the lever of the brake of a steam hoisting apparatus, steam-cylinder and piston, and suitable valves, and connecting the same with the lever of the stop-valve of said steam hoisting apparatus, that by operating the latter lever to let on or shut off steam a reverse movement is effected in the valves of the cylinder attached to the brake, substantially as herein described.

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