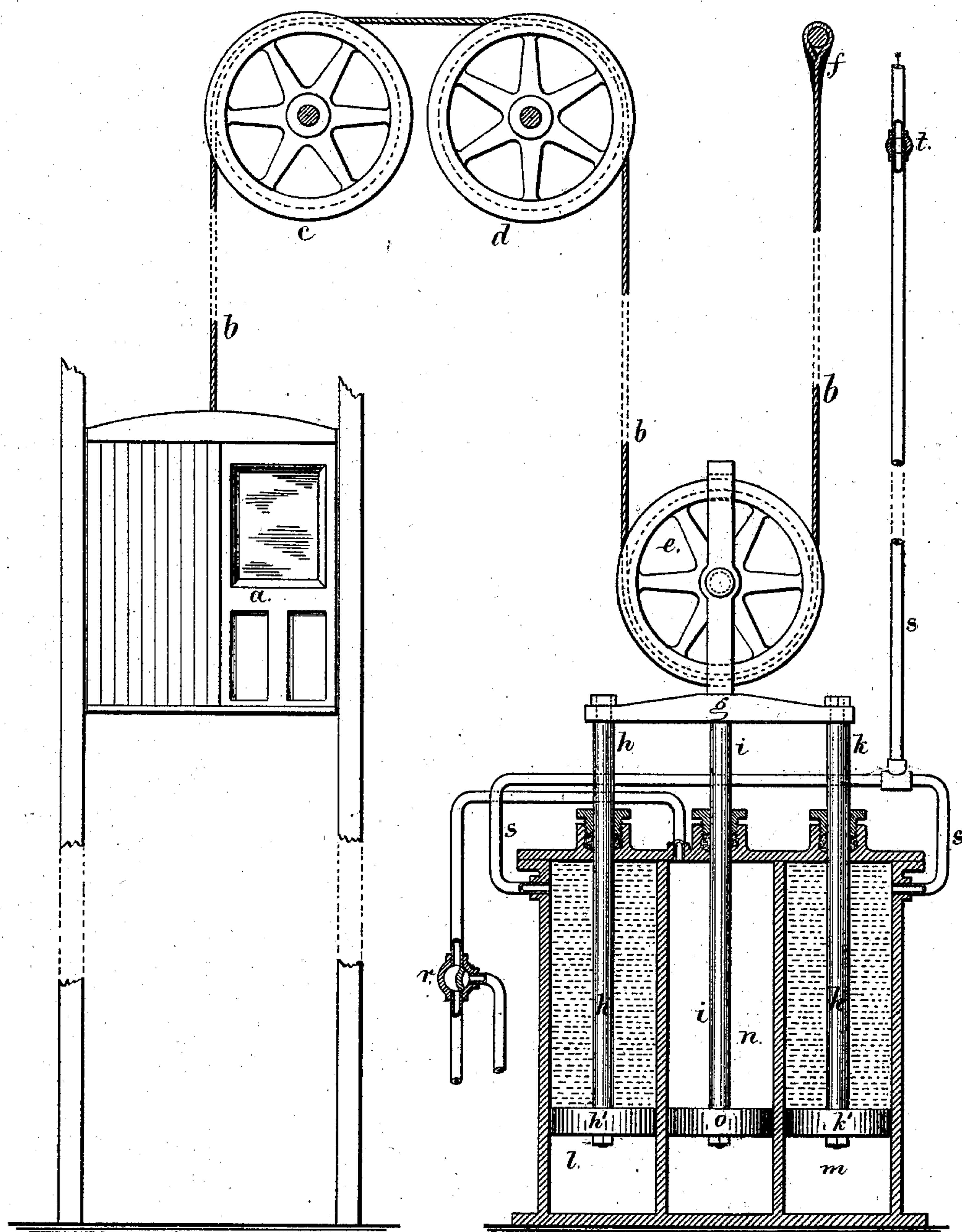


S. H. BEVINS & W. H. PHILLIPS.
Elevator.

No. 224,574.

Patented Feb. 17, 1880.



Witnesses

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per

att'y

UNITED STATES PATENT OFFICE.

SETH H. BEVINS AND WILLIAM H. PHILLIPS, OF NEW YORK, N. Y.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 224,574, dated February 17, 1880.

Application filed September 22, 1879.

To all whom it may concern:

Be it known that we, SETH H. BEVINS and WILLIAM H. PHILLIPS, of the city and State of New York, have invented an Improvement in Elevators for Buildings, of which the following is a specification.

Elevators have been operated by steam-engines, and water has been employed to hold the elevator in position or to move the same in either direction.

Our present invention is for dispensing with the complicated steam-engines and hoisting devices heretofore employed, and to insure a steady movement of the car in either direction, a perfect control of the speed, and a rigid hold of the car in any position, without the possibility of a vacant space in the water-cylinder that will allow the car to drop.

In the drawings we have represented, by a section of the cylinders and a diagram of the car and connections, our said improvements.

The car or platform *a* is of any desired character. It is raised and lowered by a wire rope or ropes, *b*, over pulleys *c d*. Any desired character of pulleys can be used between the car and the cylinders giving motion to the parts. We have shown the rope *b* as passing over the pulleys *c d* and descending and passing below the pulley *e* and then led up to the fixed attachment *f*.

The head-block *g* is connected with the pulley *e*, and to this head-block there are three piston rods connected to insure a parallel movement and a proper distribution of the forces applied to move the car. The piston-rods *h* and *k* pass into the cylinders *l* and *m* and are provided with the pistons *h' k'*, and the piston-rod *i* passes into the cylinder *n* and is provided with the piston *o*.

Steam or other fluid under pressure is admitted above the piston *o*, and its inlet regulated by a suitable cock or valve, and such steam or fluid under pressure is allowed to escape, the supply and escape valves or cocks being under the control of the attendant in the elevator in any well-known manner. We have shown the three-way cock *r* as a convenient device for this purpose.

The cylinders *l* and *m* are supplied with water or similar liquid by the pipes *s*, that lead to a suitable reservoir or column to furnish

the required pressure; and *t* is a valve or cock to open or close the pipe *s*, and this cock *t* is operated by the attendant in the elevator at the same time the cock *r* is operated in the following manner:

The column of water and the pressure thereof upon the pistons *h'* and *k'* need not be sufficient to sustain the car when empty. Hence when the valve *t* is open the car will descend and force the water out of the cylinders *l* and *m* up through the pipe *s* into the tank or reservoir, and when the cock *t* is closed the water will be held so that the car cannot descend, but it remains immovable.

When the car is to be raised the valve *r* is to be opened simultaneously with the cock *t*, and the pressure of steam or other fluid in the cylinder *n* forces down the piston *o* and raises the car. This motion, however, is partially controlled by the extent to which the valve *t* is opened to admit water, because the car cannot move faster than the water flows into the cylinders *l* and *m* without producing a vacuum that the steam-pressure would not be sufficient to overcome.

When the car is to be held the steam is shut off, or partially so, and the valve or cock *t* closed. When the car is to descend the cock or valve *r* is moved to close the steam-inlet and open the exhaust, and the valve *t* is opened to whatever extent is desired for allowing the required speed of movement.

It is to be understood that this improvement allows for the use of a boiler only for obtaining the necessary pressure to work the elevator; but where it is desired to use a steam engine and pump to compress air into a reservoir, such air may take the place of steam in the cylinder *n*.

If desired, steam may be admitted to the cylinder *n* beneath the piston to increase the speed of the descent of the car and force the water back into the elevated reservoir. In this case the reservoir may be placed at any desired height, and the pressure of the column of water may be sufficient to raise the car.

We are aware that hydraulic elevators have been made in which there are three cylinders and pistons; but the piston-rods are not connected together, and one can be moved in one direction while the other two are moved in the opposite direction. Hence the movements are

independent, and one piston does not necessarily influence the movements of the others.

We are also aware that a water-engine has been used to operate the drum and other machinery for drawing up an elevator-car, and that when the car is descending its weight has been used to pump water through the same engine from a tank and control the action of the engine and allow for stopping or starting the car by opening or closing the valves; but in this case the water-pressure made use of in operating the hoisting machinery was not used to force the water back into an elevated tank, but the water itself, as it discharged from the engine in hoisting a car, ran off into a tank. In our apparatus the fluid under pressure serves to bring down the car, and at the same time to force up the water into the tank, so that the same may be afterward operative in raising the car.

We are also aware that three cylinders have been used with three piston-rods connected to one head. In this case the water always acts below the pistons, and the column of water acting in the central cylinder simply counterbalances the car.

We claim as our invention—

1. The combination, in an elevating appara-

tus, of a cross-head, *g*, piston-rods *h i k*, pistons *h' o k'*, cylinders *l m n*, water-pipes *s* to an elevated reservoir, and valve *t*, and a supply pipe and cock, *r*, for fluid under pressure to act in the cylinder *n* in raising the car, the water in the cylinders *l m*, as controlled by the valve *t*, serving to regulate the upward-and-downward movement of the car, substantially as set forth.

2. In an elevating apparatus, two cylinders with their pistons and piston-rods and a head-block, in combination with water-pipes connecting to an elevated reservoir to supply water under pressure into the said cylinders, and a valve, *t*, to regulate the inlet and outlet of such water in controlling the movements of the car, and a cylinder, *n*, piston *o*, and rod *i* to the head-block, and a cock to supply steam or fluid under pressure above the piston *o* to raise the elevator platform or car, substantially as set forth.

Signed by us this 19th day of September, 1879.

SETH H. BEVINS.

WM. H. PHILLIPS.

Witnesses:

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GEO. T. PINCKNEY.