

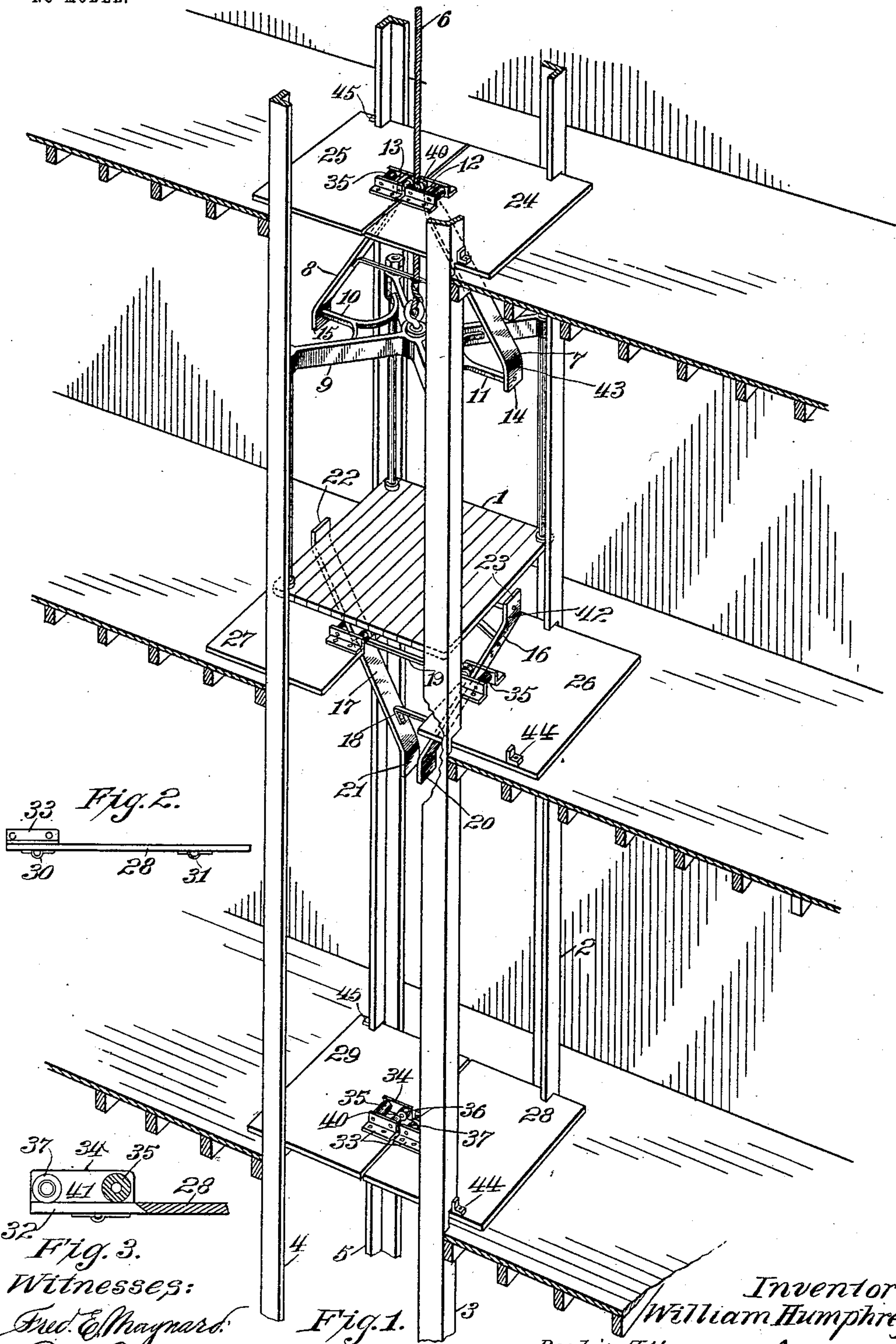
No. 751,173.

PATENTED FEB. 2, 1904.

W. HUMPHREYS.  
ELEVATOR CAM.

APPLICATION FILED OCT. 3, 1903.

NO MODEL.



32  
Fig. 3.

*Witnesses:*

Fred. E. Maynard.

R. W. Filleman

*Fig. 1.*

*Inventor:*

*William Humphreys,*

By his Attorney

torney  
F. H. Richards.



## UNITED STATES PATENT OFFICE.

WILLIAM HUMPHREYS, OF NEW YORK, N. Y.

## ELEVATOR-CAM.

SPECIFICATION forming part of Letters Patent No. 751,173, dated February 2, 1904.

Application filed October 3, 1903. Serial No. 175,553. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HUMPHREYS, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Elevator - Cams, of which the following is a specification.

This invention has reference to means to automatically open and close gates which cross the path of moving vehicles, and is designed primarily to automatically, gradually, and noiselessly open and close the gate simultaneously with the travel of said vehicle.

The adaptability of this invention to various classes of vehicles is apprehended; but for purposes of illustration the improved means have been applied to an elevator and are designed to open and close slidable covers for hatchways of an elevator-shaft as a car approaches and leaves each floor.

In the drawings accompanying and forming part of this specification, Figure 1 is a perspective view of a series of floors, an elevator-shaft, a car, and a plurality of hatchway-covers, one of said hatchway-covers being in process of operation through the instrumentality of the means. Fig. 2 shows one of the covers, and Fig. 3 is a detail view illustrating the roller system employed on the covers.

Similar characters of reference indicate like parts throughout all figures.

A car 1, movable in a series of guides 2, 3, 4, and 5, has attached to it a cable 6, which passes over a suitable train of pulleys. (Not shown.) Suitably mounted above the car and attached thereto is a pair of oppositely-located cams 7 and 8, which are preferably supported upon the beamwork 9 of the car by braces 10 and 11, and the inclination of these cams with relation to the longitudinal axis of the elevator-shaft or the line of longitudinal movement of the car is preferably about twenty-five degrees, for purposes which will be hereinafter more fully explained. The upper and lower portion 12, 13, 14, and 15, respectively, of each of the cams 7 and 8 is so curved or bent that it will travel in a path parallel to the longitudinal axis of said shaft.

The cam construction is duplicated beneath

the floor of the car and comprises cams 16 and 17, which are united by braces 18 and 19, respectively, the extremities 20, 21, 22, and 23 of said cams being likewise disposed so as to travel in planes or paths parallel with the longitudinal axis of the shaft. The degree of inclination of these cams will be substantially the same as that mentioned for the above-mentioned cams.

Each hatchway of each floor is provided with a set of covers or gates 24, 25, 26, 27, 28, and 29. These gates are constructed to move in planes lateral to the path of movement of the car, and although shown in the drawings as movable upon the top of the floors and provided with rollers 30 and 31 the method of construction, operation, and disposition of these doors may be varied at will.

Each door or gate is provided with a slot 32 on its inner edge and preferably midway its width, (although such slot may be disposed at any suitable point, according to the construction and disposition of the cams hereinbefore referred to,) through which to allow the cams to pass during operation. At each of these slots is a set of bearings 33 and 34, in which are mounted a plurality of rollers 35, 36, and 37.

In the present instance the rollers 35 may comprise an elongated cylinder which is situated in the bearings at the rear of the slot in the door, while at the front portion of the bearings or that portion nearest the edge of the door there is a space 40 between the bearings 36 and 37 for the purpose of allowing the brackets 10 and 11 and 18 and 19, respectively, to pass when the cams 7 and 8, 16 and 17 pass in between the rollers and through a space 41.

As has been before mentioned, it is desirable that the inclinations of the various cams 7 and 8, 16 and 17, respectively, shall be, with relation to the longitudinal axis of the elevator-shaft, substantially about twenty-five degrees. The object of so disposing these cams is to effect the gradual opening or closing of the doors simultaneously with the movement of the car, and such a disposition of the cams renders the construction highly efficient and practical for high-speed elevators. There is positive efficiency in gradually opening the



doors, even when the car is traveling at a high rate of speed, without danger of the doors being pushed out of their bearings.

The engagement between the doors and the 5 cams of course may be effected in any desirable manner; but in the present instance the cams press against the larger roll 35 in the bearings on the door to force the doors open during either the upward or the downward 10 movement of the car and likewise to press against the rollers 36 and 37 for the purpose of closing the doors, said cams of course traveling between the sets of rollers through a space 41 therebetween. It is to be said in this 15 connection also that each cam near its extremity—as for instance, at 42 and 43—is so bent that when said cam commences to engage with the rollers the movement of the doors is gradually initiated, and thus is prevented the sudden or abrupt opening of the same. 20

The operation is as follows: Assuming the car to be in the position shown in the drawings and in process of descent, the cams 16 and 17 are gradually pushing the doors 26 and 25 27 to a full-open position, allowing the car to pass through the hatch. As the upper portion of the elevator approaches these doors 26 and 27 the extreme portions 14 and 15 of the cams 7 and 8 will enter into the spaces 41 between the rollers, when, as is obvious, the 30 doors will likewise gradually commence to close by being drawn together by said cams.

It will be noted, of course, that during the ascension of the elevator the cams 7 and 8 will 35 serve the purpose of opening all the doors of the hatchway as the car approaches each floor and that the cams 16 and 17 will close the doors as the car leaves each floor. During the descent of the elevator the operation is reversed.

40 As has been stated in the fore part of this specification, I apprehend the applicability of this cam principle to moving vehicles of any character. For instance, the same may be applied to rolling-stock of any character, and

I also reserve the right to vary the construction, arrangement of parts, and operation in 45 any way to reduce the cost of manufacture, to reduce friction, and to increase efficiency and durability.

There is provided on one door a stop 44 and 50 on the other door a stop 45, which bears against the upright rails in the shaft when the doors are in a closed position, and these stops prevent the doors from moving too far inward over the shaft, and thus cause them to meet 55 about midway across said shafts.

Having thus described my invention, I claim—

1. The combination with an elevator-shaft, a car, covers for the hatchway of said car, 60 each of which is bifurcated substantially midway its width; bearings located at such bifurcations and on top of the covers; rollers in said bearings one of which is at the rear of said bifurcation and the others being at the 65 fore part thereof; and cams extending below the car at an angle thereto which are adapted to cooperate with said rollers to gradually spread the covers apart during the movement of the car. 70

2. The combination with an elevator-shaft, a car, covers for the hatchways of said car, each of which is bifurcated substantially midway its width; bearings located at said bifurcations and on top of the covers; and a roller 75 carried near the rear of each of said bifurcations; a plurality of rollers carried near the fore part of said bifurcations; and cams extending above and below said car at an angle thereto, and which are adapted to cooperate 80 with said rollers to gradually spread the covers apart during the movement of the car.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 2d day of October, 1903.

WILLIAM HUMPHREYS.

Witnesses:

FRED. W. BARNACLO,  
JOHN O. SEIFERT.