

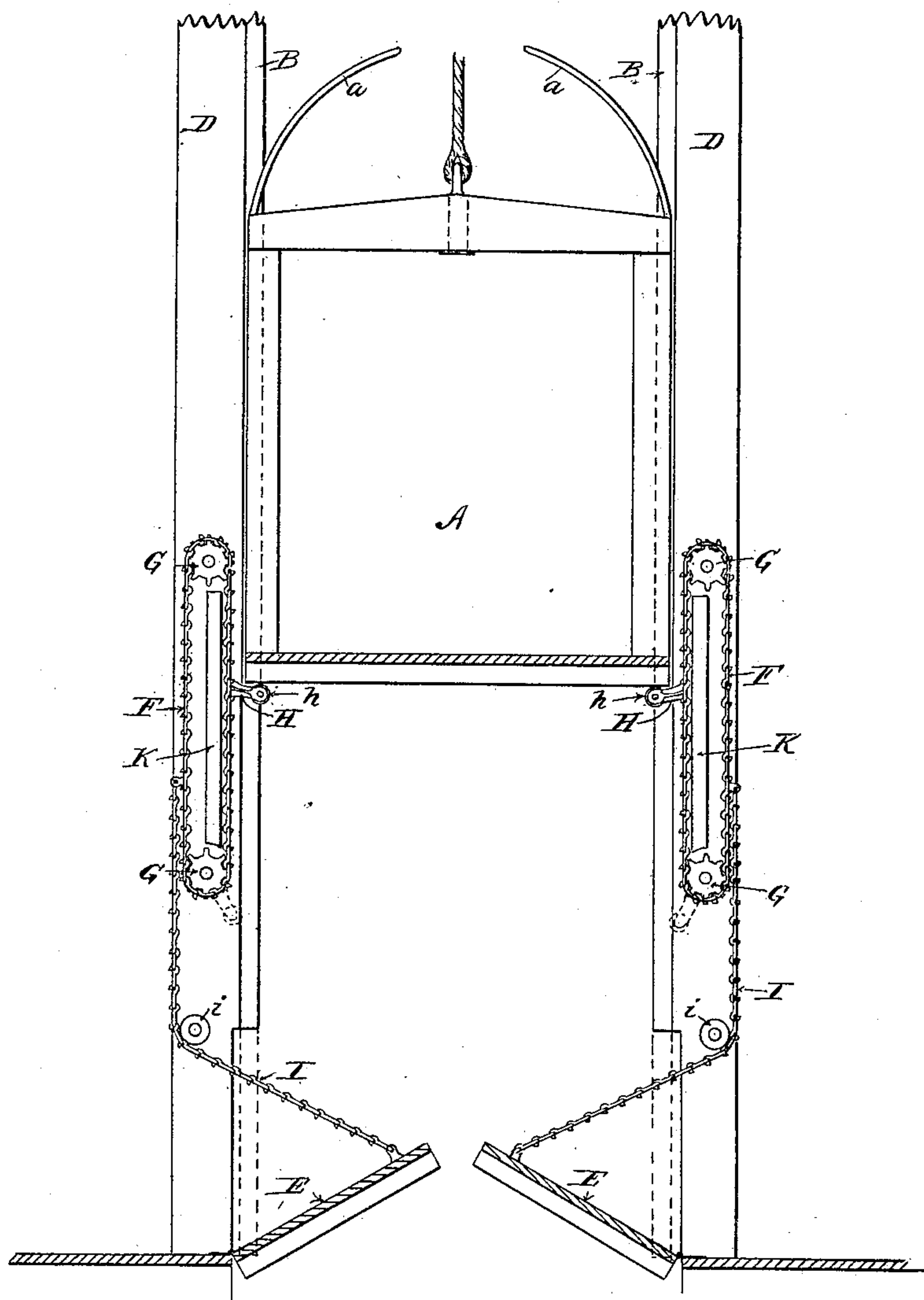
(No Model.)

G. LAGERQUIST.

HATCHWAY.

No. 353,951.

Patented Dec. 7, 1886.



Witnesses

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UNITED STATES PATENT OFFICE.

GUST LAGERQUIST, OF MINNEAPOLIS, MINNESOTA.

HATCHWAY.

SPECIFICATION forming part of Letters Patent No. 353,951, dated December 7, 1886.

Application filed August 7, 1886. Serial No. 210,261. (No model.)

To all whom it may concern:

Be it known that I, GUST LAGERQUIST, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Automatic Hatchway-Doors, of which the following is a specification.

My invention relates to means for automatically operating hatchway-doors; and it consists, generally, in placing upon the leaders or guidetimbers upon each side of the hatchway one or more endless chains, which shall be attached to the door or doors of the hatch and operated by the cage in its downward course to open the door and in its upward course to gradually close the door.

My invention further consists in the combination and arrangement hereinafter described, and particularly pointed out in the claim.

In the drawing which forms part of this specification I have shown a section of a hatchway or hoist embodying my invention.

A represents the cage of the hoist, which slides in vertical ways B upon the leaders D, and provided at the top with curved pieces a.

E are the hatchway-doors, hinged at the sides and opening from the center upward. I prefer to place a single door upon each side; but in the case of large hatchways it may be more convenient to divide the door, or place two doors side by side, in which case I provide each door with my automatic operating device.

F is an endless chain, which passes over the sprockets G, journaled upon the side of the leaders. Upon the surface of the chain, and projecting inward toward the center of the hatch, I place projections H. These projections preferably terminate with a roller, h.

Upon the opposite side of the sprocket, and attached to the chain F, I place the auxiliary chain I, which passes over the pulley i, and is fastened at its lower end to the hatch-door E.

The side of the chain to which the projection H is attached may be weighted sufficiently to counterbalance the weight of the auxiliary chain and the friction upon the sprockets, so that when the doors are raised from below the

said sprockets will be revolved and the projection will assume the position denoted in dotted lines in the drawing. The same result may also be attained by a volute or coiled spring acting upon one of the sprocket-wheels. K are guide-bars to hold the chain in line.

The operation is as follows: The elevator-cage in its upward passage brings the curves a in contact with the hatch-doors and gradually raises them until they are brought into the position shown by dotted lines in the drawing. When in this position, the ways upon the door and the ways upon the leaders are continuous, and the cage passes and holds the doors in a perpendicular position. In the meantime, as the door opens, the chain F has traveled over the sprockets, and the projection H is brought to its lowest position, as shown in dotted lines in the drawing, and remains in this position until the elevator-cage passes, when it follows up the cage and allows the doors to be gradually closed. In the downward passage of the cage the bottom strikes the projection H and carries it down with it, at the same time carrying up the auxiliary chain I and lifting the doors attached thereto and causing them to assume a perpendicular position, holding them in this position until the cage has passed down through the hatch, when the doors following the curve at the top of the cage are gradually closed.

The advantage of my invention is particularly in its simplicity and cheapness of construction.

What I claim is—

The combination, with the cage and the hatchway-doors, of the endless chains F, the projections H on said chains, the sprocket-wheels G, over which said chains extend, and the chains I, attached to the doors and to said endless chains, substantially in the manner and for the purpose described.

In testimony whereof I have hereunto set my hand this 2d day of August, 1886.

GUST LAGERQUIST.

Witnesses:

A. C. PAUL,
R. H. SANFORD.