

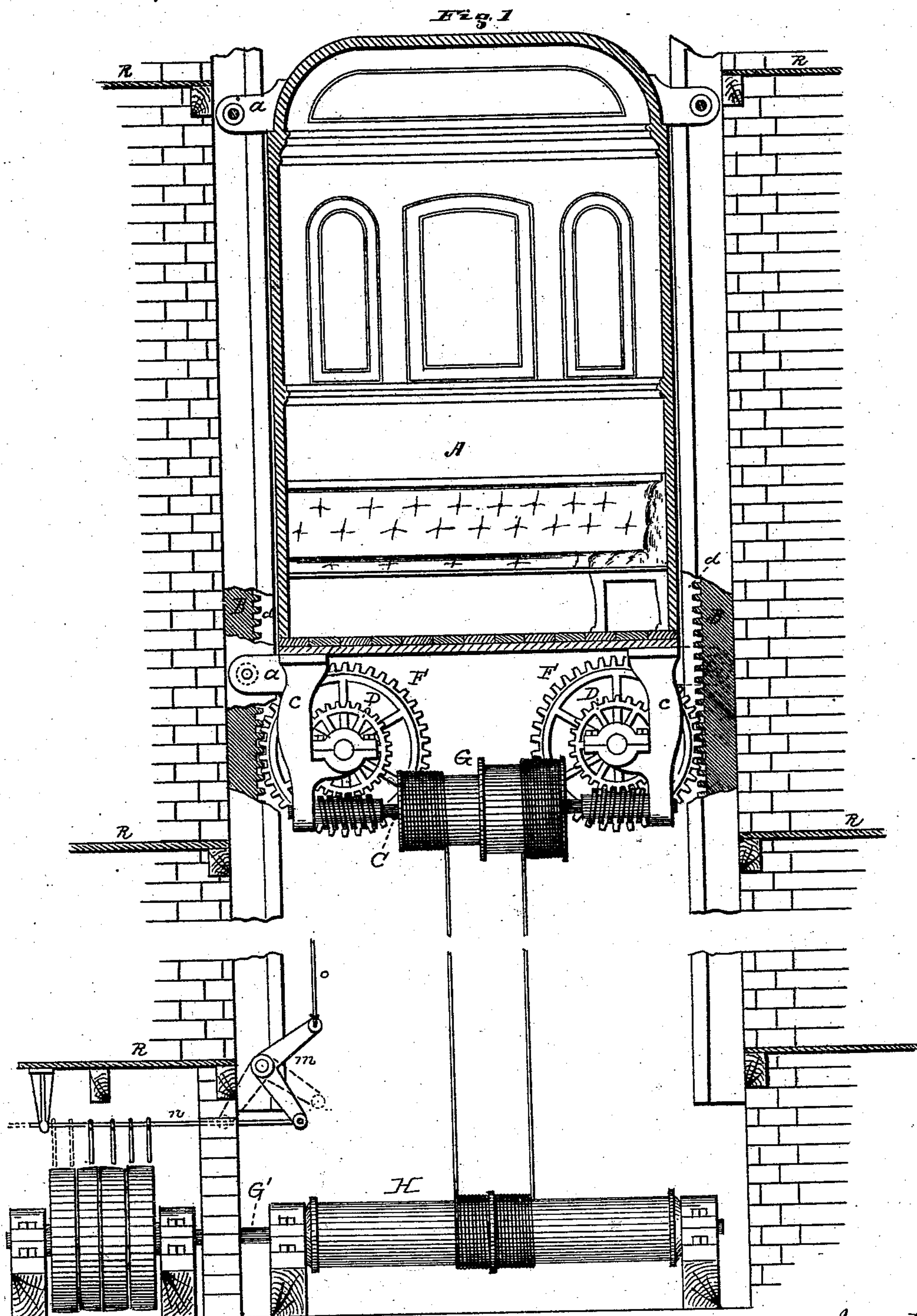
(No Model.)

2 Sheets—Sheet 1.

J. W. KING.
SAFETY ELEVATOR.

No. 287,549.

Patented Oct. 30, 1883.



Witnessed.
William R. King
George Perry

Inventor.
John W. King

(No Model.)

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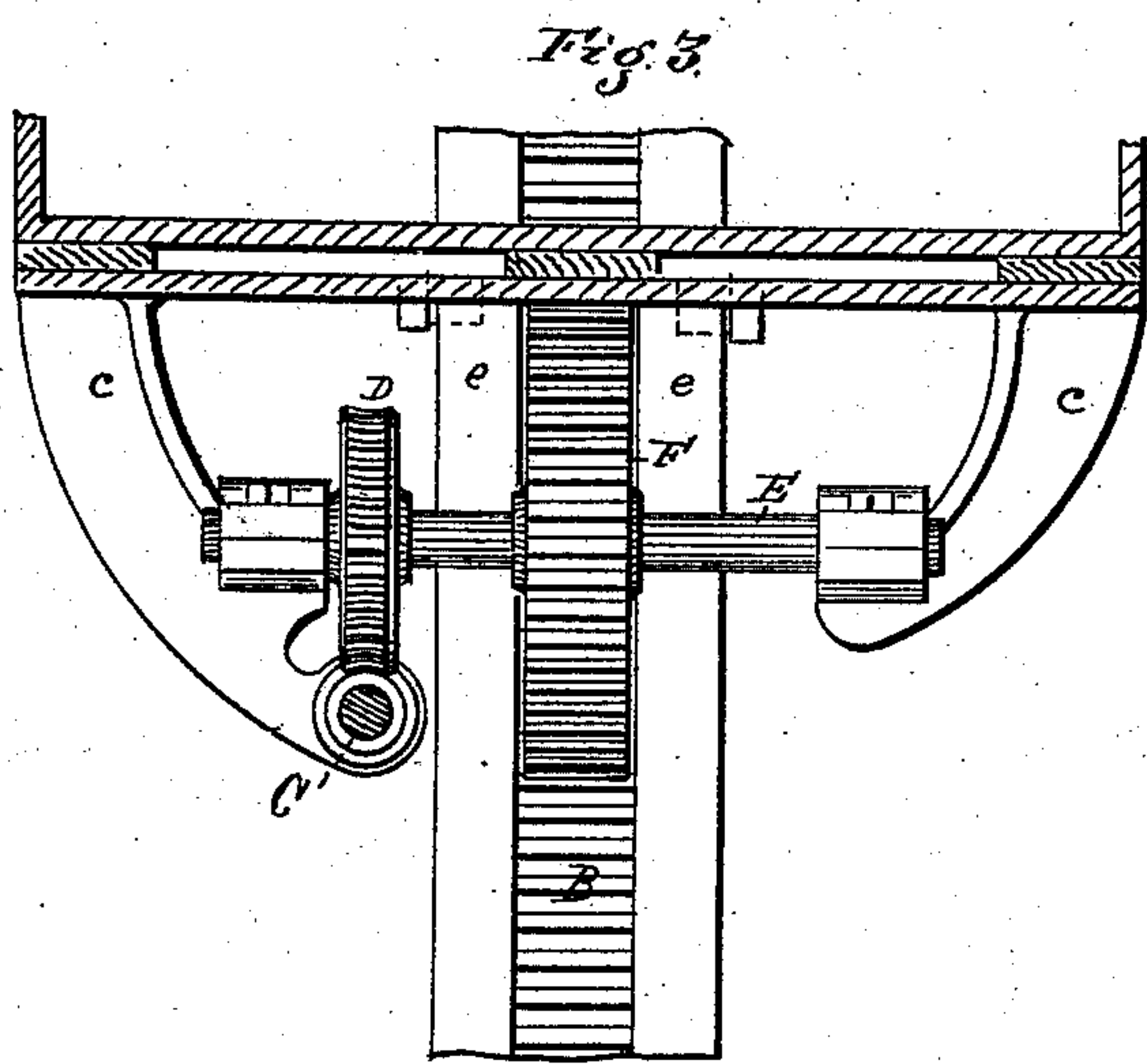
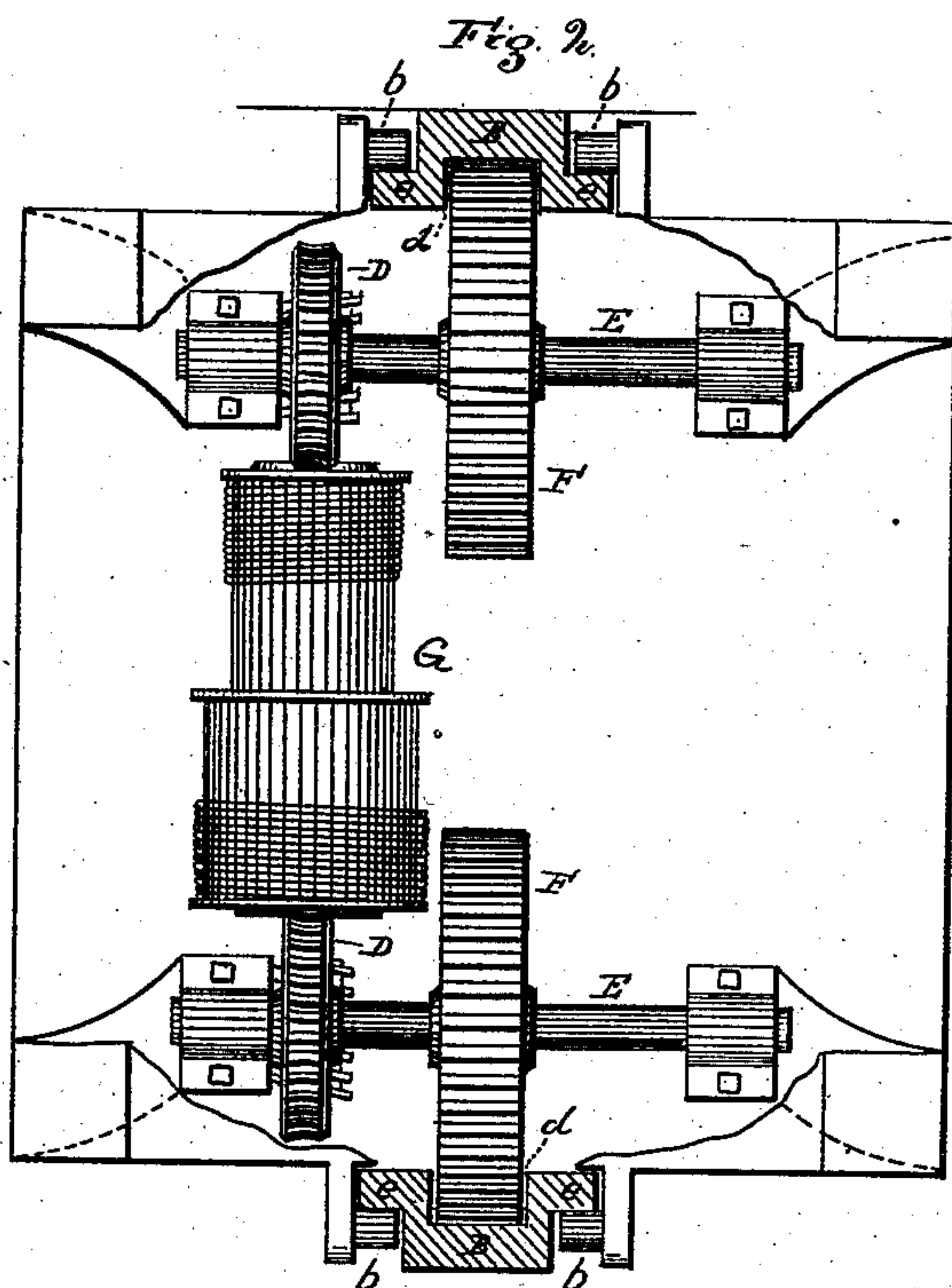
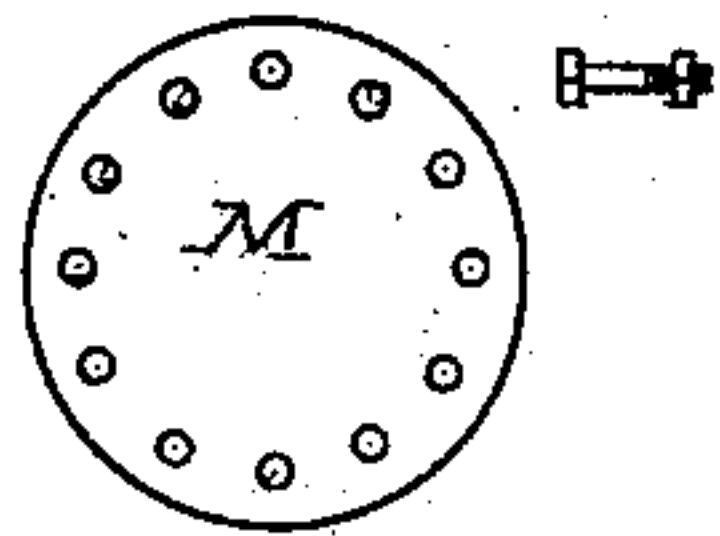


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. KING, OF LAMBERTVILLE, NEW JERSEY.

SAFETY-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 287,549, dated October 30, 1883.

Application filed April 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. KING, a citizen of the United States of America, residing at Lambertville, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in Safety-Elevators, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of the elevator, with a portion of the same left out, and the parts brought near each other for the purpose of showing them on a larger scale, and with a vertical section in places to show the construction. Fig. 2 is a plan view of the devices arranged immediately beneath the car, and Fig. 3 shows a portion of the rack and two of the arms, which extend downward from the car to hold the devices underneath the same. Fig. 4 is a circular disk through which holes are made.

The object of my invention is to secure greater safety to life and limb than has hitherto been secured in elevators.

To this end the nature of the invention consists in the use of racks into which wheels mesh, and in connecting the wheels with wheels and worms for the purpose of raising and lowering the car; also, in passing ties through the top and bottom of the car, which engage the racks and prevent the spreading of the same, and also in devices for turning the worms in either direction.

To enable others to make and use my improved elevator, I will give a detailed description of the same.

In the drawings the floors of the building are indicated by the letter R, and the racks are represented as placed against walls of brick.

A is the passenger-car, constructed in the usual way, and needs no detailed description. Through the top and bottom the ties *a* pass, are fastened to the car, and engage the racks by studs *b*, fastened to the ties, on which rollers may be placed, if desired. From the car four arms, *c*, extend downward, and hold part of the machinery for raising and lowering the car.

The racks B may be flat bars, with cogs or teeth formed on the same, and if so made

should be wide enough to have firm bearings against the timbers or walls to which they are fastened, and the timbers or walls should have grooves in which the studs *b* may move; but I prefer to make the racks with the recesses or grooves *d*, in the bottoms of which the cogs are formed, as this construction makes the cogs stronger, and with the flanges *e*, back of which the studs *b* come, as shown in Fig. 3 and in cross-section in Fig. 2.

C is a shaft with journals on its ends, and turns in boxes in the arms *c*. On the shaft two threaded cylinders or "worms," as they are commonly called, one having a right-hand thread and the other a left-hand thread, are fastened. These worms engage the teeth on the wheels D, which are fastened on the shafts E. The shafts E have journals on their ends and turn in boxes supported by the arms *c*. The wheels F are fastened on the shafts E and engage the cogs on the racks. The drum G is fastened on the shaft C, and consists of two cylinders, the difference of whose circumferences is such as to keep the lines wound on the same taut as the car is raised or lowered.

The shaft G' rests in four boxes, as shown in Fig. 1. The drum H is fastened on the shaft G', and may be made in one piece; but is preferably made in two parts, one of which is fastened to the shaft, and the other is free to turn on the same. When made in two pieces a circular disk, like M, Fig. 4, is fastened to each of the meeting ends. In the disks holes are made, through which bolts pass to connect the disks together. By disconnecting the disks the parts of the drum may be turned and the lines tightened. Four pulleys are placed on the shaft G'. The two inside pulleys are loose, and the outside pulleys are fastened to the shaft. Two belts running on the pulleys in opposite directions connect them with the driving-power. The bell-crank *m* is pivoted to the rack or other suitable fixture, and the rod *n*, carrying the forks for shifting the belts, is pivoted to one end of the crank. The rod *o* is pivoted to the other end, and extends through the car to the upper ends of the racks. To the ends of the drum G lines are attached, and are wound on the drum in opposite directions. The lines are also attached near the middle of the drum H, and are wound on the same in

opposite directions, so that as the drum turns one line is wound on the drum and the other is unwound.

It is obvious that other means may be employed to operate the shaft carrying the worms, and that the means may be arranged in the car—*e. g.*, a compressed-air motor—and that four racks and the requisite gears may be used. When other means are used, it is also obvious that two vertical shafts suitably connected may be used in the place of the shaft C, and a worm be fastened on each shaft. It is also obvious that the devices are arranged beneath and attached to the car for raising and lowering the same by whatever means they may be operated, will hold the car in any position on the racks, and that no special device is needed for the purpose, in case of accident to the machinery operating them. It is also obvious that a lever may be so arranged in connection with these devices that a person in the car may operate them by means of the lever.

The larger cylinder of the drum G should have a circumference at least three times as great as the distance the passenger-car is raised by one turn of the drum, and the larger the cylinder the less will be the downward pull required to raise the car, and, of course, the less will be the strain on the racks. The circumference of the smaller cylinder of the drum G should be less than the circumference of the larger cylinder by the distance which the car rises in one turn of the drum.

Constructed as above described, and as shown, as the lower drum H is turned in a direction to unwind the line on the larger cylinder of the drum G the passenger-car is raised, and is lowered when the lower drum is turned in the opposite direction.

Having described my improved elevator, what I claim as new, and desire to secure by Letters Patent, is—

1. The shaft C, provided with the threaded cylinders or worms, as described, in combination with the racks B, and with the shafts E, carrying the wheels D and F, the wheels D meshing in the threaded cylinders, and the wheels F meshing in the racks, substantially as shown and set forth.

2. The passenger-car A, provided with means arranged beneath the same, and connected with the car and the racks B, as described, whereby the car is held in any position on the racks, substantially as set forth.

3. In an elevator, the ties *a*, passing through the car, and provided with suitable means for engaging the racks in rear of the same to prevent the spreading of the racks, substantially as set forth.

4. In an elevator, the racks B, having the grooves or channels *d*, at the bottom of which cogs are formed, whereby the ends of the cogs are united to the parts on which they are formed to give them greater strength, substantially as set forth.

5. In an elevator, the device consisting of the drum G, having two cylinders varying in size, as described, and of the drum H, made in two parts, and of the lines on the drums, all the said parts constructed and combined, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. KING.

Witnesses:

WILLIAM R. KING,
GEORGE TERRY.