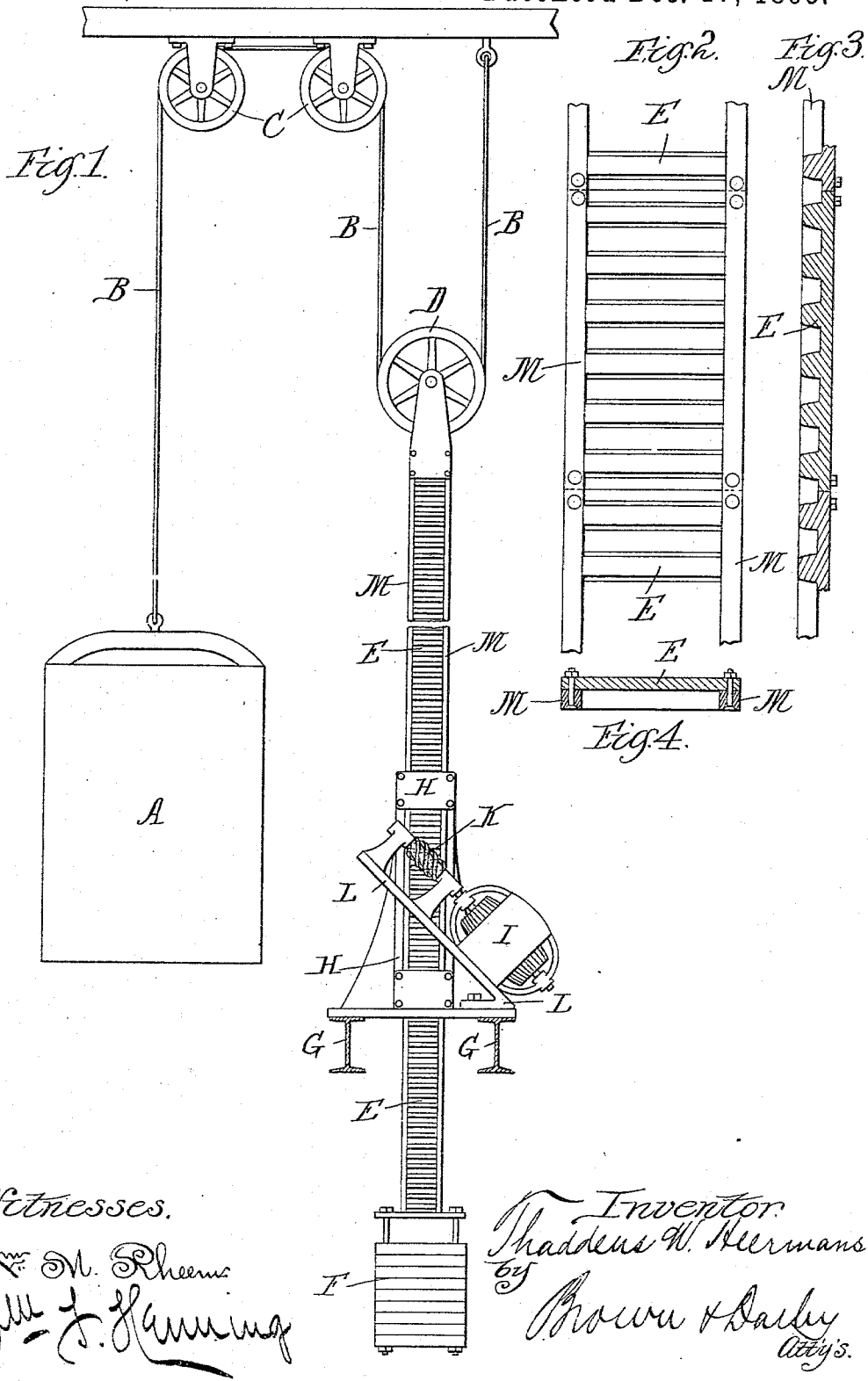


(No Model.)

T. W. HEERMANS.
ELEVATOR.

No. 551,545.

Patented Dec. 17, 1895.



Witnesses.

Wm. M. Rheems
Wm. J. Lanning

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Thaddeus W. Heermans
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UNITED STATES PATENT OFFICE.

THADDEUS W. HEERMANS, OF EVANSTON, ILLINOIS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 551,545, dated December 17, 1895.

Application filed July 8, 1895. Serial No. 555,287. (No model.)

To all whom it may concern:

Be it known that I, THADDEUS W. HEERMANS, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented new and useful Improvements in Elevators, of which the following is a specification.

This invention relates to improvements in elevators.

The invention consists substantially in the construction set forth in the subjoined specification, illustrated in the drawings, and more particularly pointed out in the claims.

Like letters refer to similar parts in the several figures in the drawings, in which—

Figure 1 is a side elevation of an elevator-car, the lifting-cable, and the motor mechanism for causing such car to ascend and descend. Fig. 2 is a front view of a portion of the rack constituting part of the motor. Fig. 3 is a longitudinal section of the same. Fig. 4 is a cross-section of the same.

In the drawings, A designates the car or cage of an elevator, which may be made to carry passengers or freight and be of suitable construction to adapt it to either of these kinds of loads. Inasmuch as the construction of such cage is well known to those skilled in the art, no detailed description is required and the drawings illustrate a mere outline of the cage. This cage is suspended by a cable B, which cable passes over suitable guide-sheaves C and under a motor-sheave D and then up to the framework of the building above the elevator-well, where it is suitably secured, as shown. Of course, the elevator-cage is guided by suitable ways formed in the elevator-well for that purpose after the usual manner.

The sheave D is secured to the top of a rack E, which may be of any desired length, but is preferably of a length equal to half the travel of the cage, and is shown in the drawings as arranged relatively to the cable and sheaves for that length. In high buildings it will be difficult and probably impossible to cast the rack in one piece of the desired length, and, therefore, it may be made of a number of sections, which sections may be joined together by securing them all to two upright bars M, as is best shown in Figs. 2, 3, and 4 of the drawings. Each of these bars M may be con-

tinuous and of a desired length, and may be secured to the sections of rack by detachable bolts, as is well shown in Fig. 4 of the drawings, or in any other suitable manner. The lower end of the rack may have attached thereto a weight F for the purpose of acting as a counterbalance for the car or cage. This rack must be properly guided, which can be readily effected by any competent mechanic, and in the drawings there are shown the guides H H for the purpose.

The rack is designed to be positively driven in each direction by a spiral pinion, such as K. The teeth of this pinion are arranged upon a shaft, which is rotated by any suitable power, and, in the present instance, I have illustrated an electric motor I for this purpose, which motor may be secured and mounted upon the bracket L, resting upon the I-beams G G. The bracket also has bearings for the axle, and should have these bearings so arranged that the axle with its spiral pinion is placed at such an angle with relation to the rack as is determined by the angle of the thread on the pinion.

By placing the armature of the electric motor upon the same shaft with the spiral pinion compactness and economy in power, as well as space, are secured.

Many modifications and variations may be made in the details of the above construction without departing from the principle thereof.

I am aware that it is not new to operate elevators by means of a worm-wheel and screw, but in such case the movement is too slow to be practical in modern office-buildings, where a long travel must be made in quick time, and if the thread of the screw is made quite coarse with a view of somewhat increasing the speed, great friction results in the operation, both of which difficulties are avoided by the present combination of a spiral pinion and rack, arranged as shown and described.

What I claim, and desire to secure by Letters Patent, is—

1. In an elevator, the combination with a cage, of a rack connected to such cage and carrying the counterbalancing weight at one end, and a spiral pinion for engaging and operating such rack, and mechanism for rotating such pinion; substantially as and for the purpose set forth.

2. In an elevator, the combination with a cage, of a rack having a sheave at one end, a hoisting cable connected to the cage and at the top of the elevator well, and having a loop
5 passing under and supporting the sheave on the rack, a spiral pinion meshing with such rack, and mechanism for rotating such pinion; substantially as and for the purpose set forth.

3. In an elevator, the combination with a
10 cage, a single rack, and connections between the cage and rack, of a spiral pinion for engaging and operating such rack, arranged on a shaft placed at a suitable angle to such rack, and mechanism for rotating such shaft and
15 pinion; substantially as and for the purpose set forth.

4. In an elevator, the combination with a cage, of a rack, a hoisting cable connected to

the cage and to the top of the well and by its loop to the rack, a spiral pinion meshing with
20 such rack and an electric motor for rotating such pinion; substantially as and for the purpose set forth.

5. In an elevator, the combination with a cage, of a rack made up of a series of sections,
25 such sections being secured to continuous bars, and mechanism for engaging and operating such rack; substantially as and for the purpose set forth.

In witness whereof I have hereunto set my
30 hand this 6th day of July, 1895.

THADDEUS W. HEERMANS.

Attest:

FRANK T. BROWN,
M. I. CAVANAGH.