

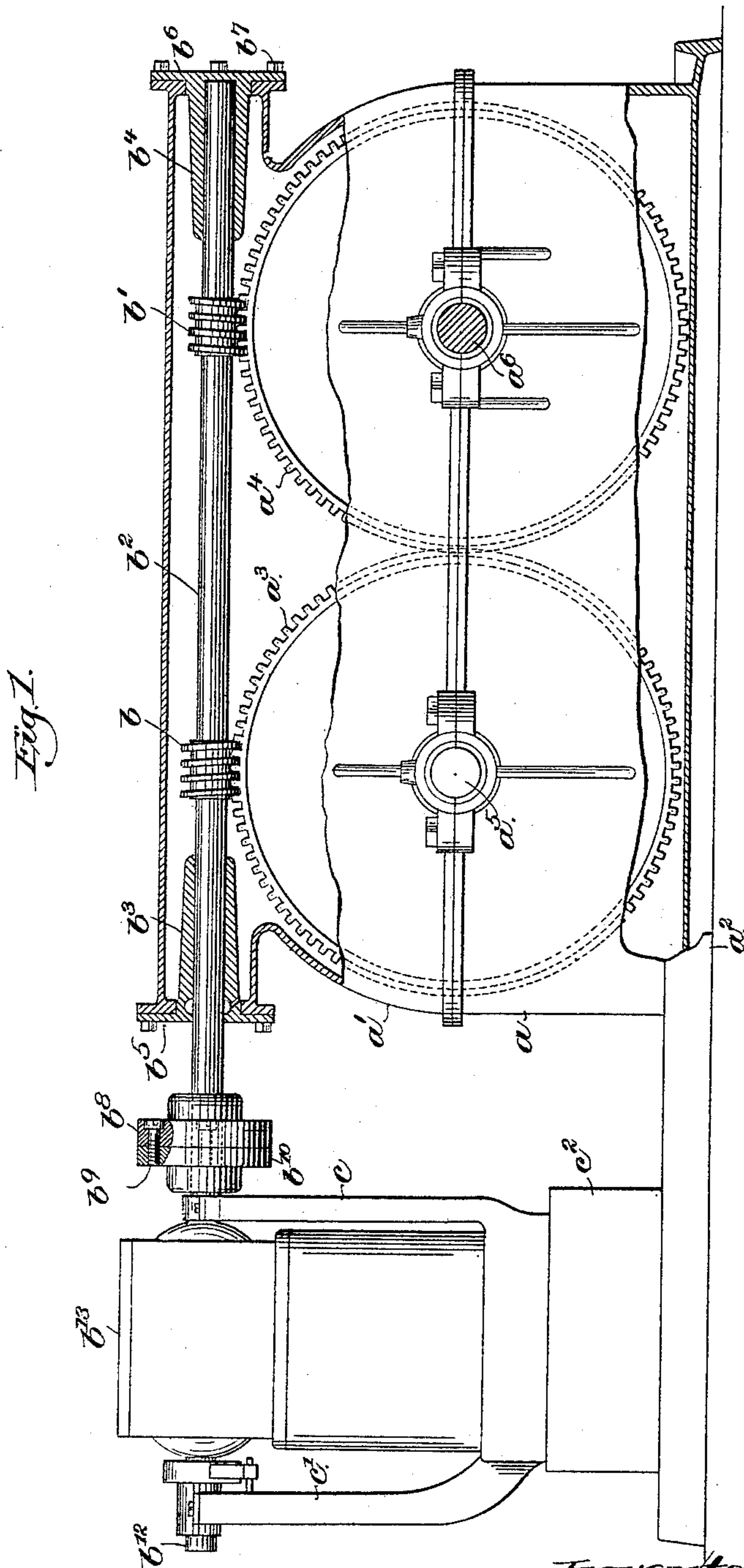
(No Model.)

2 Sheets—Sheet 1.

C. WHITTIER.  
ELEVATOR OPERATING MECHANISM.

No. 442,344.

Patented Dec. 9, 1890.



Witnesses.  
Fred. S. Grunleaf  
Marion L. Emery -

Inventor:  
Charles Whittier,  
by Crosby & Gregory,  
attys.

(No Model.)

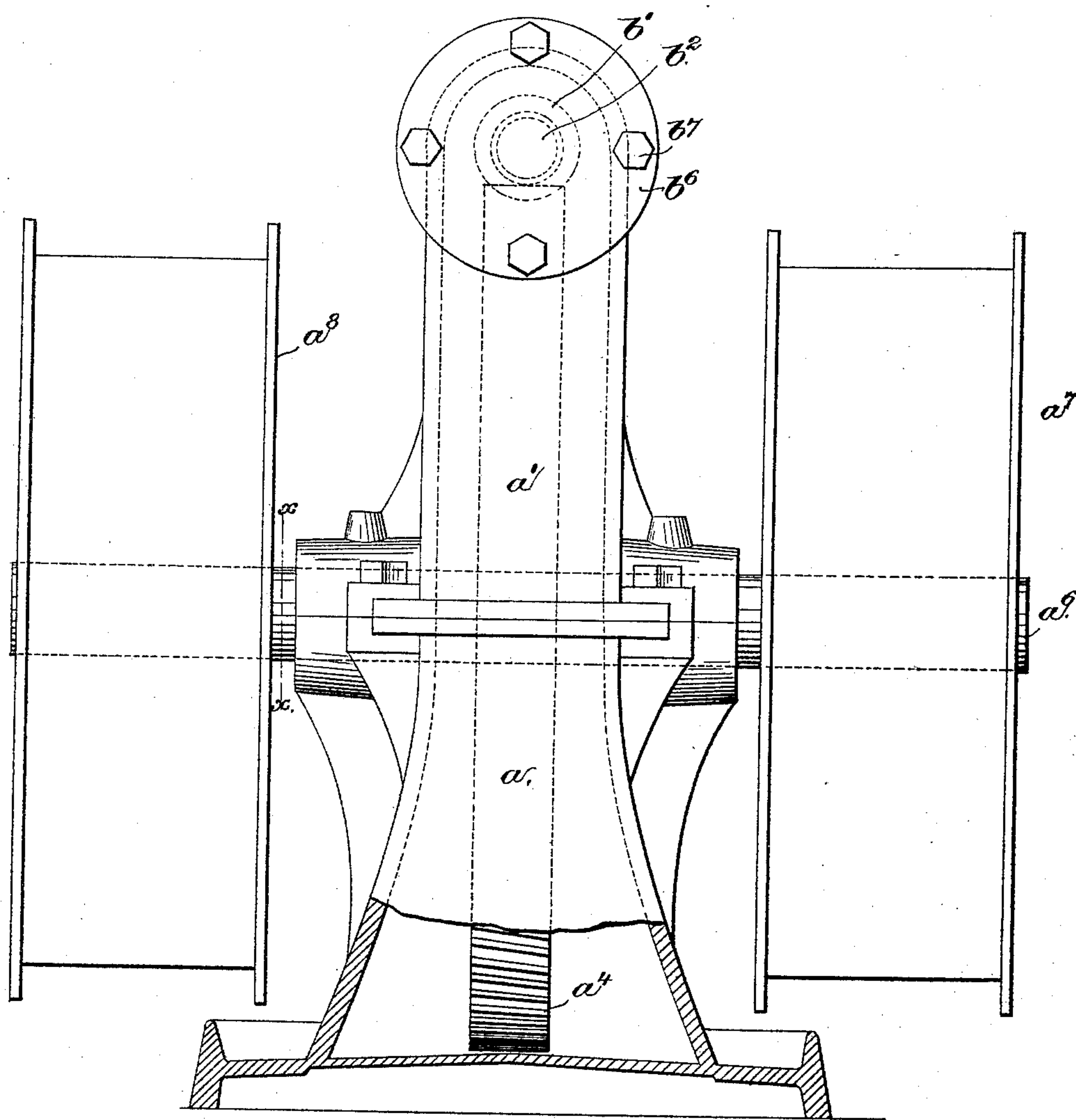
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*Fig. 2.*



Witnesses.

Fred. L. Shumley.  
Maurice L. Emery.

Inventor:

Charles Whittier,  
by Crosby & Gregory  
Attys.



# UNITED STATES PATENT OFFICE.

CHARLES WHITTIER, OF BOSTON, MASSACHUSETTS.

## ELEVATOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 442,344, dated December 9, 1890.

Application filed June 10, 1890. Serial No. 354,928. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES WHITTIER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Elevator-Operating Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to elevator-operating mechanism, and is herein shown as embodied in that class of elevators known as the "drum-elevator."

15 My invention has for its object to simplify and improve the construction of elevator-operating mechanism, whereby economy in space is obtained and the operating mechanism enabled to be placed in a substantially small compass, so that buildings in large cities, 20 where space is an important factor, may be equipped with an elevator mechanism at substantially small expense, the cost of maintaining the elevator mechanism being reduced to a minimum.

25 In accordance with my invention the power employed to operate the elevator mechanism is obtained from an electric motor having its armature-shaft detachably connected directly to an independent worm-shaft, preferably provided with a right and left worm in engagement with two worm-gears in mesh with one another.

35 The particular features in which my invention consists will be pointed out in the claims at the end of this specification.

40 Figure 1 is a section to the right of the dotted line  $x x$ , Fig. 2, of a drum-elevator-operating mechanism embodying my invention, the case containing the worms and worm-gears being broken out; and Fig. 2, an end elevation of the motor mechanism shown in Fig. 1, looking toward the left, both of the drums being shown by full lines.

45 The case A, of suitable strength, is herein shown as made in two parts  $a a'$ , which are suitably joined together in any well-known manner, the lower part  $a$  of the said casing being secured to or forming part of the base  $a^2$ .

50 The case A contains within it, as herein shown, two worm-gears  $a^3 a^4$ , in mesh with

one another and mounted on shafts  $a^5 a^6$ , having bearings in the sides of the case A. The shaft  $a^6$ , as herein shown, is extended beyond the sides of the case A, and has mounted on it at opposite sides of the said case drums  $a^7$  55  $a^8$ , (see Fig. 2,) upon which are wound the usual hoisting-ropes, (not shown,) but which in practice pass about sheaves at the top of the elevator shaft or well, and are secured to the top of the elevator car or platform. 60

I have herein shown the shaft  $a^6$  as provided with two hoisting-drums, which are preferably used in passenger service on account of safety; but, if desired, only one drum may be used. 65

The worm-gears  $a^3 a^4$  are engaged by right and left worms  $b b'$ , fast on a worm-shaft  $b^2$ , having bearings in inwardly-projecting hubs  $b^3 b^4$ , forming part of or secured to caps  $b^5 b^6$ , fastened to the case A, as by bolts  $b^7$ . 70

The worm-shaft  $b^2$  is extended through the cap  $b^5$ , and is secured directly to the armature-shaft  $b^{12}$  of an electric motor  $b^{13}$  by an intermediate coupling, herein shown as a flanged hub  $b^8$  on the worm-shaft, and a 75 flanged hub  $b^{10}$ , fast on the armature-shaft  $b^{12}$ , which is in line with the said worm-shaft, the said hubs being detachably secured together by bolts  $b^{10}$ , the armature-shaft having bearings, as herein shown, in uprights  $c$  80  $c'$ , secured to or forming part of a base  $c^2$ .

In operation the electric motor  $b^{13}$  may be supplied with current in any usual or well-known manner, and the polarity of the said current may be changed in any usual or well- 85 known manner, as by a pole-changer, (not shown,) but which in practice may be connected to the shipper-rope or other usual starting mechanism to produce revolution of the armature-shaft in opposite directions to 90 thereby produce rotations of the hoisting drum or drums in one or the opposite direction, as desired, to raise or lower the car. The base  $c^2$  of the motor is preferably supported on the base  $a^2$ . By connecting the ar- 95 mature-shaft of the motor directly to the worm-shaft, as described, the elevator-operating mechanism is made compact in form and occupies substantially little space, which is a very important factor in buildings in 100



large cities, and the said operating mechanism may be put in and maintained in operative condition at a very considerable saving over the ordinary style of elevator-operating mechanism.

In practice it frequently happens that an armature burns out and must be replaced, and in order that this change may be quickly effected without disturbing the remaining parts of the mechanism and without occasioning any great delay in the operation of the elevator mechanism the armature-shaft is connected directly to the independent worm-shaft by a detachable coupling.

The periphery of the flanged hub  $b^8$  on the worm-shaft is in practice preferably made wide enough to be utilized as a brake-wheel.

In actual practice the worm-shaft and the connected armature-shaft have a very slight longitudinal motion which acts beneficially upon the surfaces of the commutator and the brushes and prevents uneven wear of the commutator-surface, and thereby obviates sparking at the brushes.

I do not herein claim, generically, the combination, in an elevator mechanism, of a worm-shaft provided with a single worm in mesh with a worm-gear, and an electric motor having its armature-shaft connected directly to the worm-shaft by an intermediate detachable coupling, as the same forms the sub-

ject-matter of another application, Serial No. 370,280, filed by me November 4, 1890.

I claim—

1. In elevator-operating mechanism, the following instrumentalities, viz: two worm-gears in mesh with each other, a worm-shaft provided with a right-and-left worm in engagement with the said gears, an electric motor, its armature-shaft, and an intermediate detachable coupling connecting the said armature-shaft directly to the worm-shaft, substantially as described.

2. In an elevator-operating mechanism, the case A, worm-gears in mesh with one another, located therein and mounted on said shafts, having bearings in said case, a worm-shaft supported by the said case and having a right-and-left worm in engagement with said gears, combined with an electric motor, its armature-shaft in line with the worm-shaft, and an intermediate coupling, consisting of the flanged hubs  $b^8b^{10}$ , connecting the said armature-shaft directly to the worm-shaft, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES WHITTIER.

Witnesses:

JAS. H. CHURCHILL,  
EMMA J. BENNETT.