

(No Model.)

3 Sheets—Sheet 1.

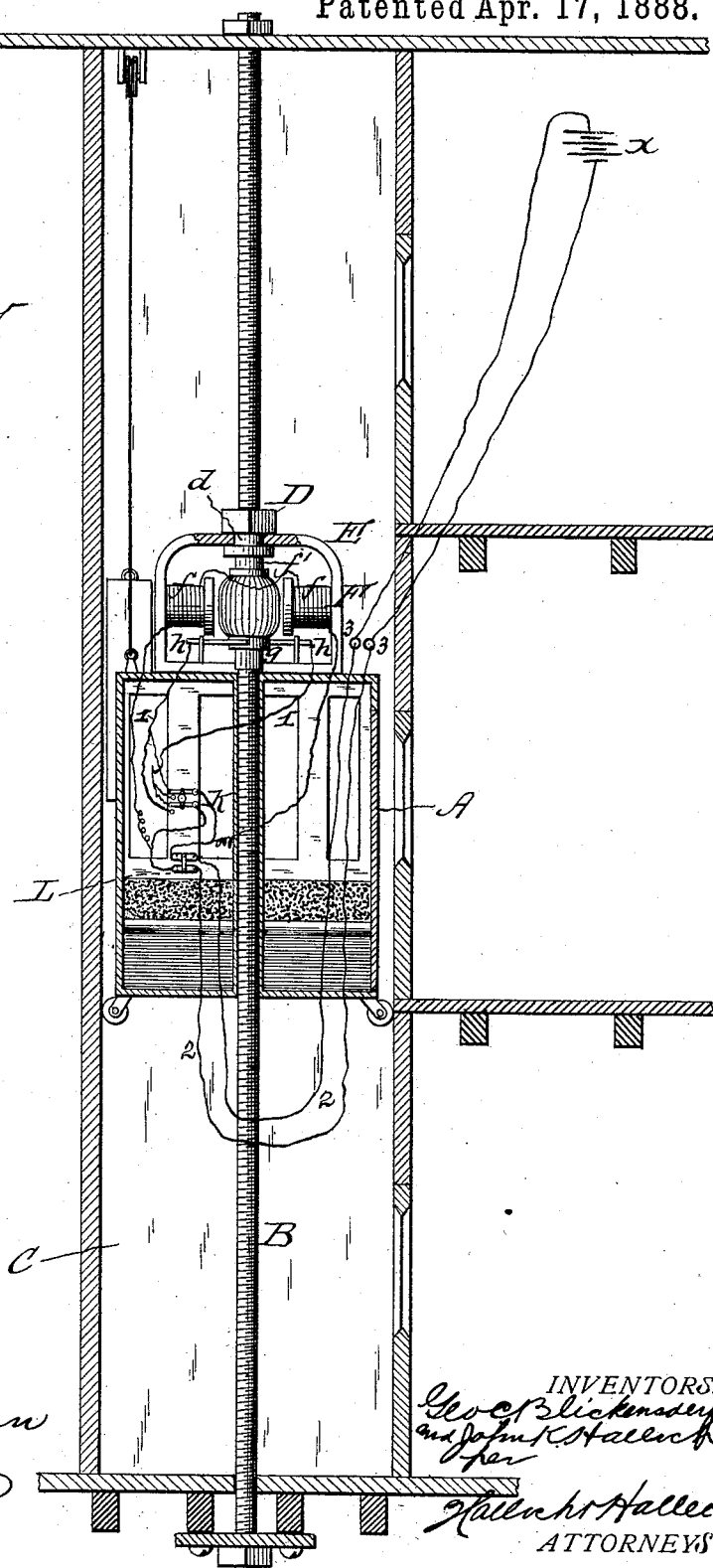
G. C. BLICKENSDERFER & J. K. HALLOCK.

ELECTRIC ELEVATOR.

No. 381,492.

Patented Apr. 17, 1888.

Fig. I



WITNESSES:

S. Van Stavoren
John D. Byington

INVENTORS:

G. C. Blickensderfer
and J. K. Hallock

Hallen & Halleck
ATTORNEYS.

(No Model.)

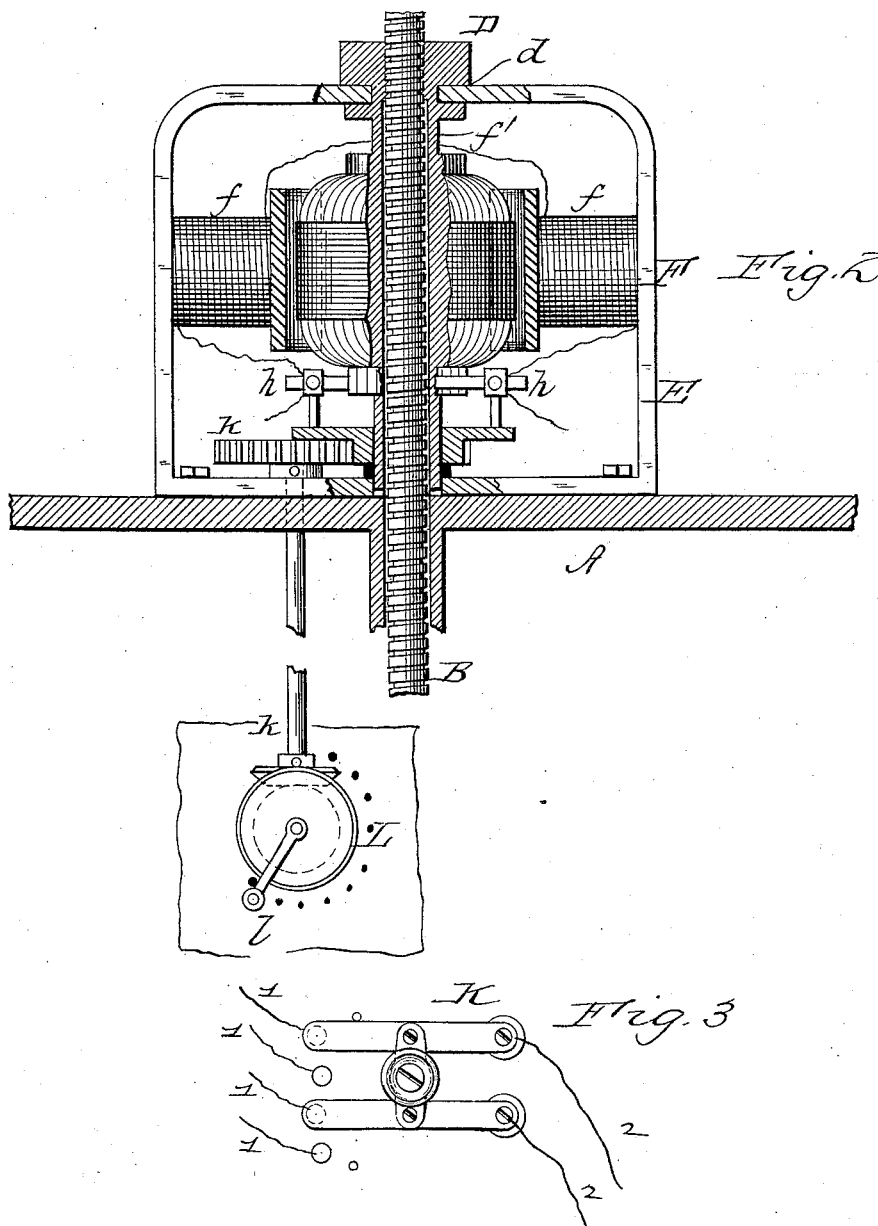
3 Sheets—Sheet 2.

G. C. BLICKENSDEYER & J. K. HALLOCK.

ELECTRIC ELEVATOR.

No. 381,492.

Patented Apr. 17, 1888.



WITNESSES:

S. J. Van Stavoren.
Geo. F. Byington

INVENTORS.

Geo. C. Blickensderfer.
and John K. Hallock.
per Hallock & Hallock.

ATTORNEYS.

(No Model.)

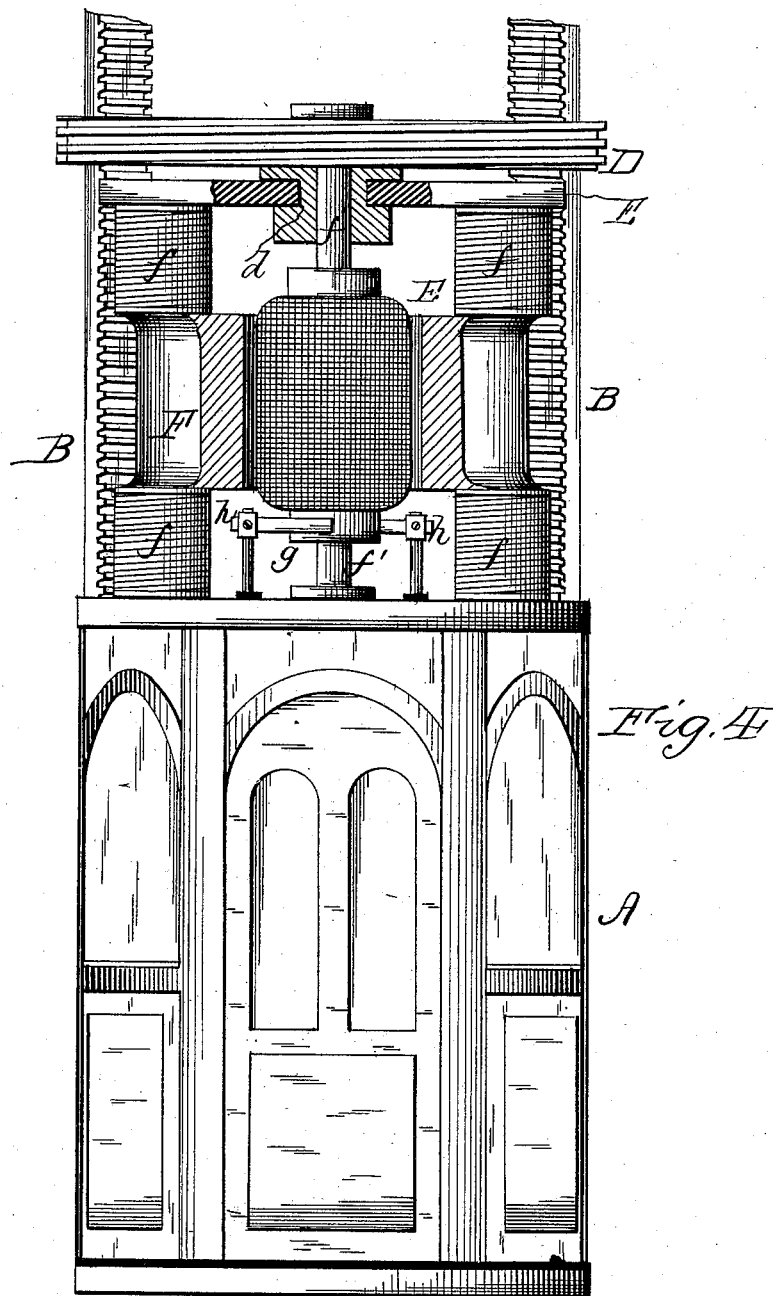
3 Sheets—Sheet 3.

G. C. BLICKENSDERFER & J. K. HALLOCK.

ELECTRIC ELEVATOR.

No. 381,492.

Patented Apr. 17, 1888.



WITNESSES:

S. J. Van Stavoren.

W. R. Williams.

INVENTORS,

Geo. C. Blickensderfer, and
John K. Hallock.

per Hallock & Hallock
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE C. BLICKENSDERFER AND JOHN K. HALLOCK, OF ERIE, PENNSYLVANIA, ASSIGNORS TO SAID GEORGE C. BLICKENSDERFER, TRUSTEE.

ELECTRIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 381,492, dated April 17, 1888.

Application filed April 13, 1887. Serial No. 234,582. (No model.)

To all whom it may concern:

Be it known that we, GEORGE C. BLICKENS-
DERFER and JOHN K. HALLOCK, citizens of
the United States, residing at Erie, in the
5 county of Erie and State of Pennsylvania,
have invented certain new and useful Im-
provements in Electric Elevators; and we do
hereby declare the following to be a full, clear,
and exact description of the invention, such
10 as will enable others skilled in the art to which
it appertains to make and use the same.

Our invention has relation to electrically-
propelled elevator cars or cages for buildings;
and it has for its object simplicity of construc-
15 tion of parts, whereby an economical, effective,
and durable form of elevator is provided,
wherein safety catches or devices and appur-
tenances usually accompanying the same are
dispensed with.

20 Our invention accordingly consists of the
combination, construction, and arrangement
of parts, as hereinafter described and claimed,
having reference particularly to a fixed screw
shaft or column, a revolving nut or gear en-
25 gaging with the screw-shaft, an elevator car or
cage suspended from or supported by said nut
or gear, and an electric motor on the cage for
rotating said nut or gear in reverse directions
for raising or lowering the car or cage E, refer-
30 ence being had to the accompanying draw-
ings, wherein—

Figure 1 is a sectional elevation showing the
application of our improvements to a screw
form of elevator; Fig. 2, an enlarged sectional
35 view, partly in elevation, of the motor, car,
and screw-rod; Fig. 3, a plan of reversing-
switch for the motor, and Fig. 4 a longitudi-
nal section showing modification.

A represents the car or cage, and B the
40 screw rod or column of a screw form of ele-
vator, which column may be constructed or
provided for as desired; but we prefer a single
central screw-rod, as shown in Fig. 1, which
is fixed or immovable and extends from the
45 top to the bottom of well C, and has a revol-
ving gear or screw-nut, D, in engagement there-
with, by means of which the car is raised or
lowered.

The nut D (shown in Figs. 1 and 2,) is pro-
vided with an annular groove or bearing, *d*, 50
in or on which is swiveled a frame, E, secured
to the car A. This frame E serves as a sup-
port for the field-magnets *f* of an electric mo-
tor, F, the armature-shaft *f'* of which is tubu-
lar, surrounds the screw-rod B, and is firmly 55
secured to or forms an integral part or exten-
sion of nut D. Upon the armature-shaft *f'* is
the commutator *g*, as usual, and the brushes *h*
h therefor are supported upon the field-mag-
net frame E in the usual or any other suitable 60
manner, as indicated.

From such described construction it will be
noted that the electric motor intervenes be-
tween the car and the nut upon the screw-rod,
that the nut is a part of the armature-shaft, 65
and that the nut or armature-shaft supports
the field-magnets, their frame, and the car A,
so that a rotation of the armature-shaft and
nut in reverse directions raises or lowers the
car, as desired. 70

From brushes *h h* lead divided or split wires
or connections 1 1 to a reversing-switch, K,
located in car A, and from switch K lead
wires 2 2, including a cut-out switch, *L'*, as
desired, to a battery or generator, *x*, said wires 75
2 2 preferably leading to binding-posts 3 3, lo-
cated half-way up the well C, as indicated, for
well-known reasons. By suitably operating
the reversing-switch K the direction of rota-
tion of the armature is reversed, as desired, 80
for changing the direction of travel of car A.

Instead of using the reversing-switch K, the
brushes *h h* may be rotated to change the po-
larity of the armature in the well-known way
by means of mechanical gearing *h h* in engage- 85
ment with a rotating brush-holder, as indi-
cated in Fig. 2, a pointer, *l*, and a dial, *L*, be-
ing employed in connection with said gearing
for positively controlling the movement of the
brushes to effect the necessary or required 90
changes of travel of the car.

Instead of using a central screw-rod, as
shown in Fig. 1, corner or other suitably-lo-
cated screw-teeth racks engaging with gear- 95
ing operated by the armature-shaft of the mo-
tor may be employed, and suitable counter-

balancing-weights may be employed to lessen the frictional wear on nut D, in a manner as heretofore practiced.

It will be noticed from the foregoing that as the screw shaft or column is fixed and the nut or gear D only is rotated the speed of its rotation, and consequently the speed of travel of the car, may therefore be as fast as desired, and the slow motion heretofore incident to screw-shaft elevators necessitated by the revolution of the screw column or shaft is avoided. It will be further noted that we prefer to use no part of the column or shaft or the fixtures in the well as conductors leading to the car-motor, but employ separate conductors therefor, one end of each of which is secured to fixed or line conductors at a point about half-way up the well, and these conductors rise and fall with the car as it moves; hence there is less liability of short-circuiting and of danger from their use, and they are readily placed in position and are correspondingly removable when repairs are necessary either for the conductors themselves or for the other parts of the elevator.

What we claim as our invention is—

1. The combination of a fixed screw shaft or column, a revolving nut or gear in engagement with said shaft, a cage or car supported by or suspended from said gear, and an electric motor and circuit-connections for effecting the rotation of said gear to raise and lower said cage, substantially as set forth.

2. The combination of a fixed screw shaft or column, a revolving nut or gear in engagement with said shaft and affixed to an electric-motor armature-shaft, a car or cage supported by said armature-shaft, field-magnets for said armature located upon said cage, circuit-connections for said motor, and devices for reversing the direction of rotation of the armature-shaft and revolving nut, substantially as set forth.

3. The combination of an elevator-car, an electric motor secured to the car, having an armature and shaft therefor separate from the car, and provided with a screw nut or gear which engages with a fixed screw-shaft, substantially as set forth.

4. In combination with a fixed screw-rod, an armature-shaft having a threaded nut engaging with the screw-rod, a field-magnet frame swiveled to said nut, and an elevator-car attached to said frame, substantially as set forth.

5. In combination with a fixed screw-rod, an elevator-car suspended or supported by a revolving nut or gear on said shaft, an electric motor on the car for revolving said nut, and separate and movable conductors leading from the car to terminals of fixed conductors located at or about half-way up the elevator-well, substantially as set forth.

6. The combination of a fixed screw-rod, an elevator-car, an electric motor on the car having a tubular armature-shaft, gear-con-

nection between said armature-shaft and the screw-rod, and devices for reversing the direction of rotation of the armature for changing the direction of travel of the car, substantially as set forth.

7. The combination of a fixed screw-rod, an elevator-car, an electric-motor field-magnet frame secured to said car and having a bearing or support on the motor armature-shaft which is separate from the car, and a gear-connection between said armature-shaft and the screw-rod, substantially as set forth.

8. The combination, with an elevator-car and a fixed screw-rod, of an electric motor on said car having a hollow or tubular armature-shaft for engagement with said screw-rod, substantially as set forth.

9. The combination, with an elevator-car and a fixed screw-rod, of an electric motor on said car the armature-shaft of which is in engagement with said screw-rod, as and for the purpose set forth.

10. In combination with a traveling car on a fixed screw-rod, an electromotor the armature-shaft of which engages directly with said screw-rod, as and for the purpose set forth.

11. The combination of a fixed screw-rod, a revolving gear on said rod, a car or cage suspended or supported by said gear, and a motor for rotating said gear to raise and lower the car, substantially as set forth.

12. In combination with a fixed screw-shaft of an elevator-car and its operating devices, an electromotor having a hollow armature-shaft in engagement with said devices, substantially as set forth.

13. In combination with an elevator-car, an electric motor having its field-magnets and frame secured to the car, and its armature-shaft journaled in said frame and supported directly upon the elevating mechanism, substantially as set forth.

14. The combination of a fixed screw-shaft, an elevator-car, an electric motor, a rotating gear on the motor armature-shaft in engagement with the screw-shaft, a generator or battery, and reversing and cut-out switches, substantially as set forth.

15. The combination of fixed screw-shaft, an elevator car or cage, an electric motor therefor having tubular armature-shaft in engagement with said screw-shaft, and reversing and cut-out switches located in said car, substantially as and for the purpose set forth.

16. The combination, with an elevator-car, an electric motor for actuating said car, flexible circuit connections or conductors for the motor connected at one end to the car and at the other to fixed terminals of a line of conductors, and a cut-out switch and devices for reversing the motor included in said circuit-connections, substantially as shown and described.

17. The combination, with an elevator-car, an electric motor for propelling the car, devices for controlling the movement of and re-

versing the direction of rotation of the motor armature-shaft, and flexible electric conductors 2 2 in circuit with said motor and secured to and hanging pendent from the car and the
5 fixed ends or terminals of a line or working circuit, substantially as set forth.

18. The combination of an elevator-car having an actuating or propelling electric motor, brushes for the commutator of the motor, a
10 dial and indicator, and gearing interposed be-

tween said indicator and brushes, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

GEO. C. BLICKENSDECKER.
JNO. K. HALLOCK.

Witnesses:

S. J. VAN STAVOREN,
M. F. HALLECK.