

(No Model.)

C. W. FOWLER.
ELEVATOR.

No. 486,709.

Patented Nov. 22, 1892.

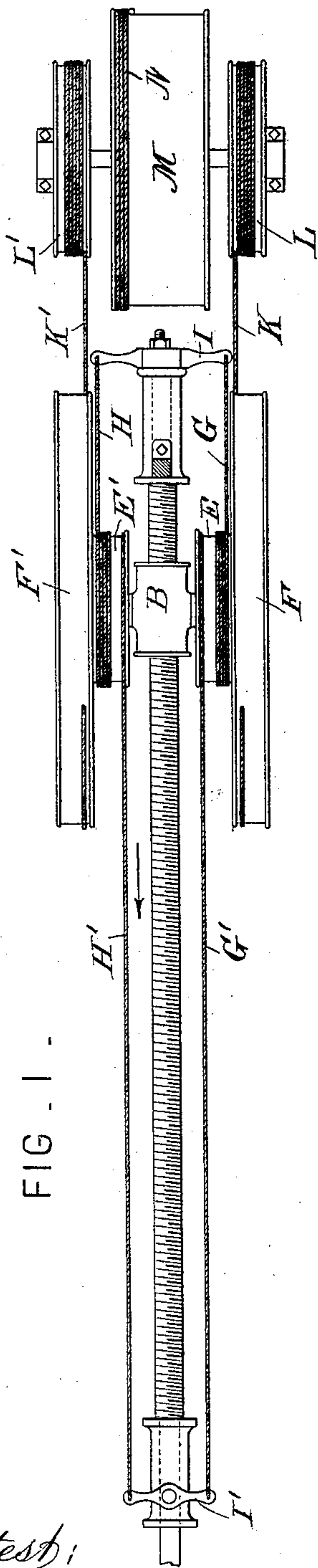


FIG. 1.

Attest: T
Geo. T. Smallwood.
RECORDED

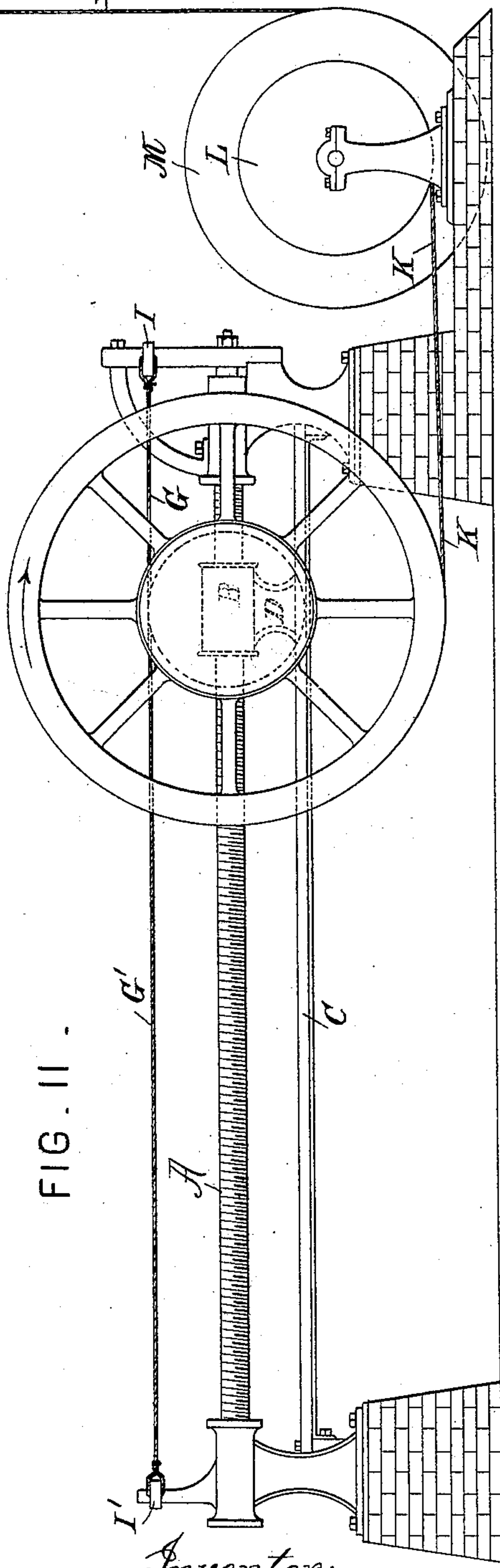


FIG. 11

Inventor:
Chas. W. Fowler
by Tolson & Maurio.
attys.

UNITED STATES PATENT OFFICE.

CHARLES W. FOWLER, OF BALTIMORE, MARYLAND.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 486,709, dated November 22, 1892.

Application filed March 2, 1892. Serial No. 423,491. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. FOWLER, a resident of Baltimore, in the State of Maryland, have invented a new and useful Improvement in Screw-Elevators, which improvement is fully set forth in the following specification.

This invention has reference to the construction of elevators or hoisting apparatus in which the power to move the car or platform is transmitted through a screw-shaft.

The object of the invention is to produce an efficient apparatus with comparatively few parts, reducing friction, and thus economizing power.

The invention is particularly applicable to hoisting mechanism in which the operating screw-shaft is arranged in a horizontal position, though the screw-shaft may be disposed vertically without departing from the spirit of the invention. The horizontal screw-shaft is advantageous when the power is derived from an electromotor, as in that case the armature can be mounted upon the screw-shaft without intermediate gearing.

According to the present invention the nut carries a sheave or pulley, around which are wound two trace-cables, these cables being wound in opposite directions and fastened, respectively, at opposite ends of the screw-shaft. The function of these trace-cables is to cause the pulley to rotate as the nut travels lengthwise of the screw, the direction of rotation being dependent on the direction of travel of the nut. On the same arbor with the pulley to which the trace-cables are attached is a second pulley of much larger diameter, which winds and unwinds a cable connected with a drum from which the hoisting-cable is operated. The effect of the arrangement described is that as the nut travels lengthwise of the screw a movement of rotation is imparted by the trace-cables (or it might be by other suitable gearing or driving mechanism) to the shaft of the large pulley, which therefore becomes a multiplying-pulley, winding up a length of cable which may be any desired multiple of the movement of the nut. For the purpose of equalizing the strain on the nut it is preferred to duplicate the above parts, putting one pair of trace-ca-

bles and their pulley and one lifting-cable, with its pulley, on each side of the screw-shaft.

The accompanying drawings, which form part of this specification, illustrate the construction in which it is preferred to embody the principle of the invention, Figure I being a plan view, and Fig. II a side elevation.

A represents a horizontal screw-shaft journaled to rotate in bearings and adapted to be driven by an engine or motor of suitable kind.

B represents the nut, which is guided by a guide-rail C, engaging a grooved shoe D on said nut. On opposite sides of the nut B are sheaves E E', and alongside of each of these sheaves and mounted on the same shaft is a larger sheave F F'. Each of the smaller sheaves is provided with two trace-cables G G' H H'. Cable G is fastened at one end to sheave E, wound around the same, and attached at its other end to the balanced beam I. Cable H is similarly applied to sheave E' and attached to the opposite end of the beam I. Cables G' H' are wound around their respective sheaves E E' in the opposite direction to the winding of cables G H and attached to the beam I' at the other end of the screw-shaft.

Sheaves F F' are, as shown, about three times the diameter of sheaves E E'. Each is provided with a cable K K', which impart movement to sheaves L L' on the shaft of the hoisting-drum M.

N is the hoisting-cable, which is led, as usual, over sheaves at the top of the shaft to the elevator car or platform.

The operation will be readily understood. Assuming that the nut is traveling in the direction of the arrow, Fig. I, trace-cables G H are drawn under tension and cause the sheaves on the nut or carriage to rotate in the direction of the arrow, Fig. II, thus winding up the cables K K' on the sheaves F F' and the cable N on the hoisting-drum M, thus raising the car. At the same time that the sheaves F F' are winding up their cables they are also traveling away from the hoisting-drum, thus further multiplying the movement of the sheaves E E'. If the travel of the nut B be, say, twelve feet, and if sheaves F F' are three times the diameter of the sheaves E E', it is obvious that the sheaves F F' will unwind

from sheaves L L' forty-eight feet of the cable when the nut moves from the extreme right to the extreme left of its path—that is to say, three times the peripheral motion of sheaves E E' plus the length of the screw. This movement is further multiplied by the difference in diameter between the hoisting-drum M and sheaves L L'. The reverse of the above movements take place when the nut travels toward the right to permit the descent of the car.

Having now fully described the principle of my said invention and the best form in which I have contemplated the embodiment thereof, what I claim, and desire to secure by Letters Patent, is—

1. In a hoisting apparatus, the combination of a driving-screw, a nut reciprocated thereby, a sheave carried by said nut, trace-cables wound around said sheave in opposite directions, a larger sheave on the same shaft with the former, and a cable which is wound upon and unwound from the larger sheave as it is rotated by the trace-cables, substantially as described.

2. The combination of the screw and nut, a sheave of large diameter on a shaft carried by said nut and having a power-transmitting

cable attached thereto, a sheave of small diameter on the said shaft, and trace-cables reversely wound upon the sheave of small diameter, substantially as described.

3. The combination of the screw and nut, a sheave carried by the latter, a cable operated by said sheave and transmitting motion to a sheave on the drum-shaft, a hoisting-drum of larger diameter than its driving-sheave, and trace-cables reversely wound on the shaft of the sheave carried by said nut, substantially as described.

4. The combination of the screw and nut, a pair of small sheaves and a pair of larger sheaves, all carried by said nuts, a pair of trace-cables on each of the smaller sheaves, one of each pair being attached to the end of a balanced beam, and power-transmitting cables operated by the larger sheaves, substantially as described.

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

CHARLES W. FOWLER.

Witnesses:

NELSON HISS,
A. M. COYLE.