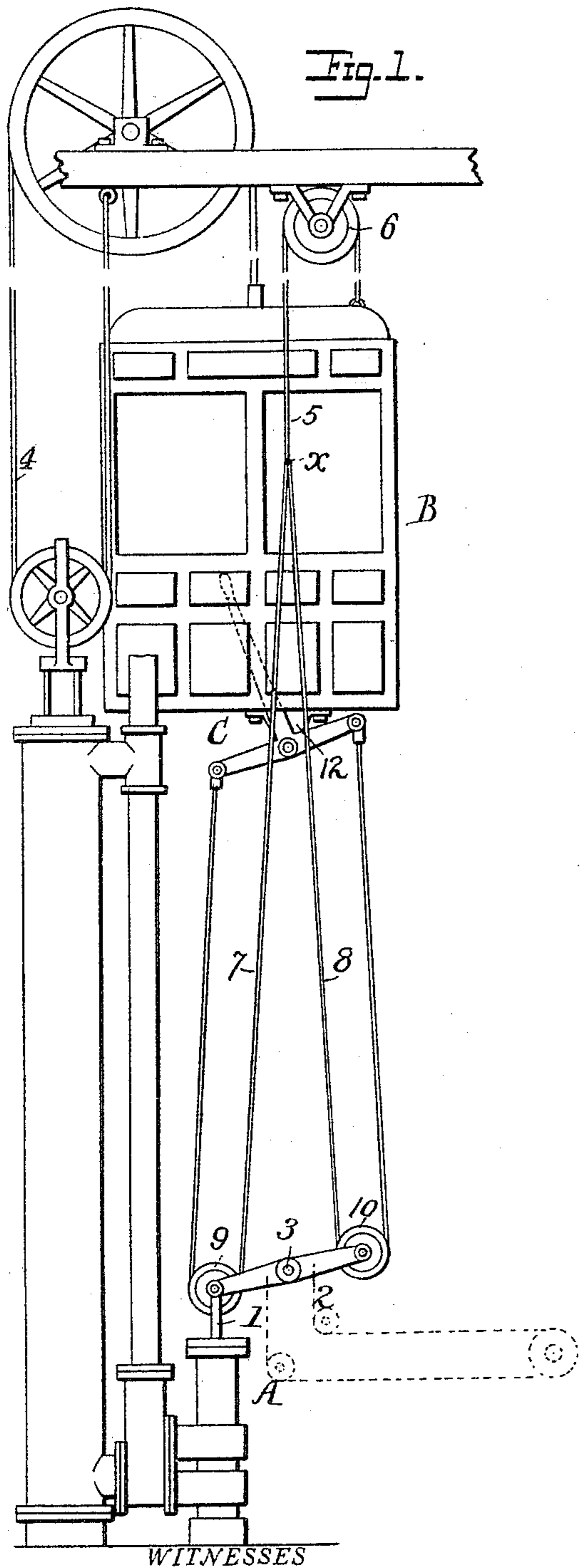


(No Model.)

C. E. FOSTER.  
ELEVATOR.

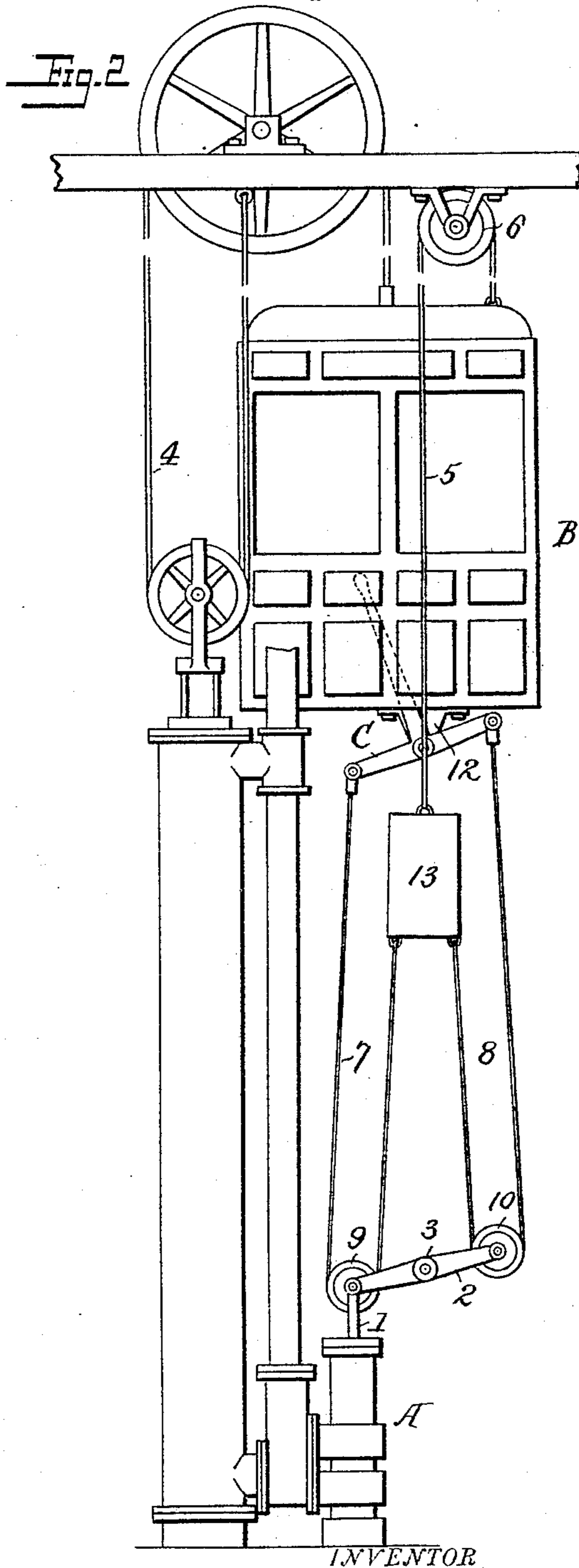
No. 459,238.

Patented Sept. 8, 1891.



WITNESSES

Alle H. Dobson  
A. E. Farnsworth.



INVENTOR

Charles E. Foster  
By Foster & Freeman  
Attorney

# UNITED STATES PATENT OFFICE.

CHARLES E. FOSTER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
TO OTIS BROTHERS & COMPANY, OF NEW YORK, N. Y.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 459,238, dated September 8, 1891.

Application filed July 11, 1891. Serial No. 399,232. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. FOSTER, a citizen of the United States, residing in Washington, District of Columbia, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

In that class of controlling devices for elevators in which the stopping and starting device is moved from the cage through the medium of two traveling cables such cables have heretofore both extended the entire length of the well, being connected each at their opposite ends with the cage or an attachment thereof. This of course necessitates the use of two cables, each twice the length of the well, and a duplicate set of pulleys at the top of the well for supporting the traveling cables.

My invention has for its object to reduce the amount of cable necessary to be used in controlling devices of this description; and to these ends I make use of flexible connections between the cage and the controlling device, consisting of a single cable for one-half the length and a double cable for the remaining portion of the length, as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is an elevation showing an ordinary vertical elevator apparatus embodying my improvements. Fig. 2 is an elevation of part of the apparatus, showing my improvements in modified form.

The actuating-engine may be of any suitable character used in raising and lowering the cages of elevators. As shown in Fig. 1, it is a vertical cylinder hydraulic engine provided with the usual valve device A, the stem 1 of the valve being connected to a lever 2, centrally pivoted at 3, and the cage B being connected with the usual suspensories 4 in a manner too well understood to require further description.

Instead of a hydraulic device A, stem-valve device, switch, belt-shifter, or other stopping and starting device may be employed, according to the character of the engine used.

The flexible connections between the cage and the stopping and starting device consists of traveling cables; but instead of using two

cables the entire length of the well I make use of a single cable 5, connected directly or indirectly with the cage, passing over a guide-pulley 6 at the top of the well, and thence downward to a point  $x$ , where it is connected to the ends of two cables 7 and 8, each passing around one of the pulleys 9 10, carried on the opposite ends of the lever 2, and thence upward and connected to the operating device C of any suitable character upon the cage.

As shown, the operating device is an inverted-T-shaped lever pivoted to a bracket 12 below the cage with its handle extending into the cage, and the movement of which in either direction serves to contract the bight of one of the sections 7 8 and relax the other, thereby positively moving the pulleys 9 10 in opposite directions and shifting the stopping and starting device.

By this construction I dispense with the use of a double cable above the point  $x$  and of double sheaves at the top of the well, and to this extent I reduce the cost of manufacture, while securing positive movements of the stopping and starting device in both directions.

The cable 5 may be a special cable constituting only a part of the controlling apparatus, or, as shown in Fig. 2, it may be the cable that supports the counterbalance-weight 13, which is used in nearly all elevators, the cables 7 and 8 being connected with the bottom of the counterbalance-weight. In such case I reduce by one-half the amount of cable required in the controlling device without in any degree impairing its efficiency.

In connection with the features already specified I may use any of the well-known appliances employed for taking up the slack of the cables in order to maintain them taut, and I may also make use of any suitable connection between the loops of the cables 7 and 8 and the stopping and starting device, those shown serving to illustrate my invention.

I do not here claim a flexible connection one portion of which consists of the counterweight and its cable, as this constitutes the subject-matter of a separate application for Letters Patent, Serial No. 393,233, of even date herewith.

When the stopping and starting device is not in line with the cables, connecting cables may extend round guide-pulleys, and from the lever to the stopping and starting device, as shown in dotted lines, Fig. 1.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. In a controlling device for elevators, the combination of the stopping and starting device, a cage, and an operating device carried by the cage, and flexible connections between the cage and the stopping and starting device, consisting of a single traveling cable connected with the cage and two traveling cables connected with the operating device, with the stopping and starting device, and with the single cable, substantially as set forth.

2. The combination, with the cage, a stopping and starting device, and operating device upon the cage, of a single cable connected with the cage to travel therewith, and two ca-

bles connected with the operating device, with the single cable, and with the stopping and starting device, substantially as set forth.

3. The combination, in an elevator, of the cage, a stopping and starting device, vertically-movable pulleys at one end of the well, connected with the stopping and starting device, a guide-pulley at the opposite end of the well, a single traveling cable connected with the cage and passing over the single guide-pulley, and two cables connected with the operating device, passing around the pulley at the opposite end of the well and connected with the single cable, substantially as set forth.

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

CHARLES E. FOSTER.

Witnesses:

ALLE N. DOBSON,  
G. P. KRAMER.