

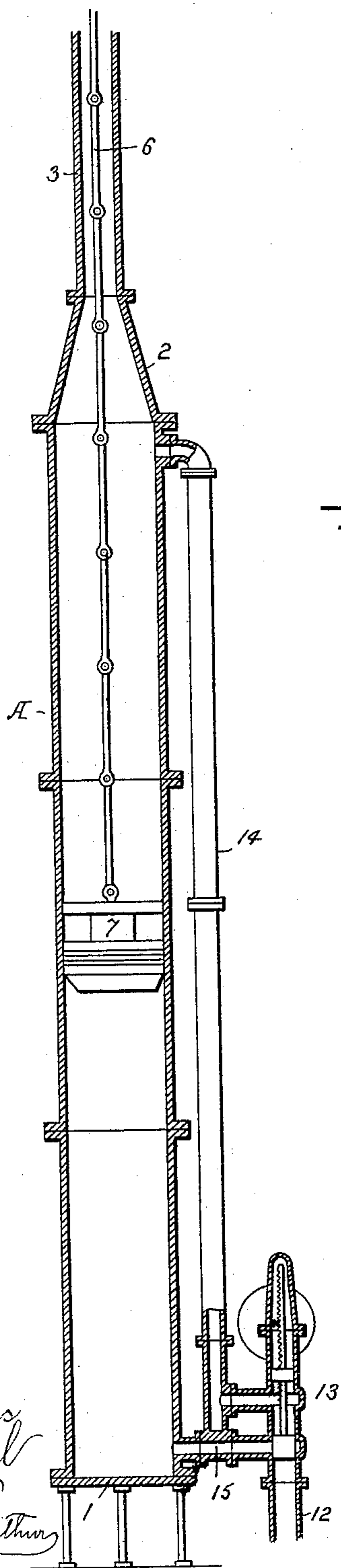
(No Model.)

T. E. BROWN, Jr.
HYDRAULIC ELEVATOR.

No. 487,709.

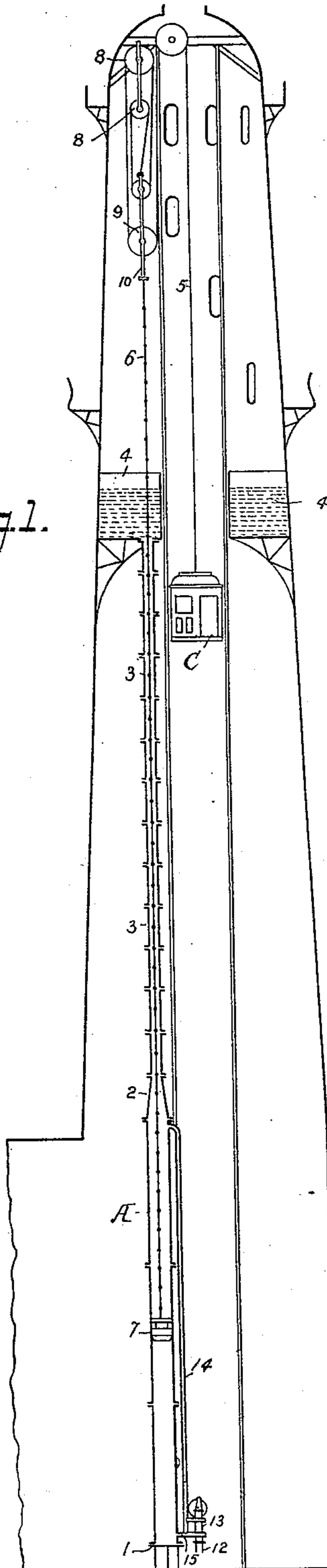
Patented Dec. 13, 1892.

Fig. 2.



Witnesses
J. G. Hinkel
Chas. S. McArthur

Fig. 1.



Inventor

Thos. E. Brown Jr.
Per

Forster & Freeman Atty

UNITED STATES PATENT OFFICE,

THOMAS E. BROWN, JR., OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL COMPANY, OF CHICAGO, ILLINOIS.

HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 487,709, dated December 13, 1892.

Application filed December 19, 1889. Serial No. 334,339. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. BROWN, Jr., a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Hydraulic Elevators, of which the following is a specification.

The increase in the height of various architectural structures in which elevating apparatus must be employed has rendered inefficient for the higher buildings many constructions of elevating apparatus and appliances therefor which are practically effective in buildings of ordinary heights. Thus the increased distance which the elevator-car must travel renders it necessary to extend the length of the cylinder; but this cannot in ordinary constructions be done beyond a limited extent, inasmuch as it is not practicable to use piston rods or connections longer than metallic bars can be rolled in continuous pieces, which length is insufficient to secure the extent or amount necessary in very high structures. In order to secure the desired travel of the cage and avoid the necessity of using long continuous rods passing through stuffing-boxes for connecting the piston to the flexible suspensories, I construct the apparatus as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 represents in elevation a tower of unusual height with an elevating apparatus embodying my invention. Fig. 2 is an enlarged view of part of the apparatus.

The cylinder A is of more than ordinary length, and instead of being closed at both ends has a lower cap 1 and is open at the upper end and is there connected by a contracting trunk 2 with a tubular conductor 3, which extends to and receives the motor-fluid from a tank 4. The tank 4 is situated at such a height as may be necessary to secure a fluid column of the weight sufficient to lift the cage, and as this height above the cylinder A is greater than the length of any continuous piston-rod that could be practicably employed I extend the connection 6 between the piston and the cage or flexible suspensories 5 in the form of cables, or preferably, as shown, of a series of jointed links. As said connection

6 is thus carried through the conducting-tube 3 and through and above the body of the liquid in the tank, there is no necessity for using any packing-box, and the connection 55 between the piston 7 and the traveling pulley or pulleys for the flexible suspensories can be made in any suitable manner and without the use of continuous rods of uniform diameter, as would be necessary if the cylinder 60 were closed at the top, as usual.

To reduce the weight and amount of fluid stored in the apparatus, I reduce the diameter of the conductor 3; but, if desired, the same may be continued its whole length of the same 65 diameter as the cylinder.

The connections between the piston connection 6 and the flexible suspensories may be of any suitable character—as, for instance, pulleys 8, supported by fixed bearings, and 70 pulleys 9, carried by the head 10 at the termination of the connection 6, round which pulleys the suspensories 5 pass to multiply the movement between the head 10 and the cage C, as usual. 75

The motor-power is applied to lift the cage by permitting the fluid to flow from below the piston to the discharge-pipe 12 by properly adjusting the valve device 13 by any suitable connections from the cage. When the 80 cage is to descend, the valve is adjusted to permit the fluid to pass through a circulating-pipe 14 and valve-casing and pipe 15 to the bottom of the cylinder. It will be seen that it is practicable to lift the piston with 85 the upper end of the cylinder open and with the heavy column between the piston and the tank by thus circulating the fluid, while it would not be practicable to elevate the piston with the cylinder in constant communication 90 with the tank and under such pressure in any other manner.

Without limiting myself to the precise construction and arrangement of parts shown, I claim— 95

1. An elevating apparatus provided with a cylinder and piston, a conducting-tube extending from the top of the cylinder above the limit of travel of the piston to an elevated reservoir containing the motor-fluid, and a 100 cage connected with the piston by connections extending through the said tube and

reservoir, and a valve device controlling the flow of said motor-fluid to and from the opposite sides of the piston, substantially as set forth.

5 2. In an elevating apparatus provided with a cylinder, piston, cage, and elevated reservoir containing the motor-fluid and with a conducting-tube between the top of the cylinder from a point above the limit of travel of the
10 piston and reservoir, the cage attached to the piston by connections extending through the tube, and circulating-tubes connecting the lower end of the cylinder and with the upper end below the conducting-tube, and a valve
15 device for permitting the fluid to circulate from the open space above the piston to the closed space below, substantially as described.

20 3. The combination, in an elevating apparatus, of a cylinder, piston, elevated tank containing motor-fluid communicating with the open upper end of the cylinder above the limit of travel of the piston through a tubular

connecting-pipe, and a cage, flexible suspensories, connections extending from the piston through said pipe, and traveling sheaves arranged above the tank and carrying the suspensories, substantially as set forth. 25

4. The combination, in an elevator apparatus, of a cylinder, piston, elevated tank containing motor-fluid communicating with the
30 open upper end of the cylinder above the limit of travel of the piston through a tubular connecting-pipe, and connections extending from the piston through said pipe to the traveling sheaves arranged above the tank and
35 carrying the flexible suspensories and cage, substantially as set forth.

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

THOMAS E. BROWN, JR.

Witnesses:

ISAAC B. POTTER,
KENNERLEY BRYAN.