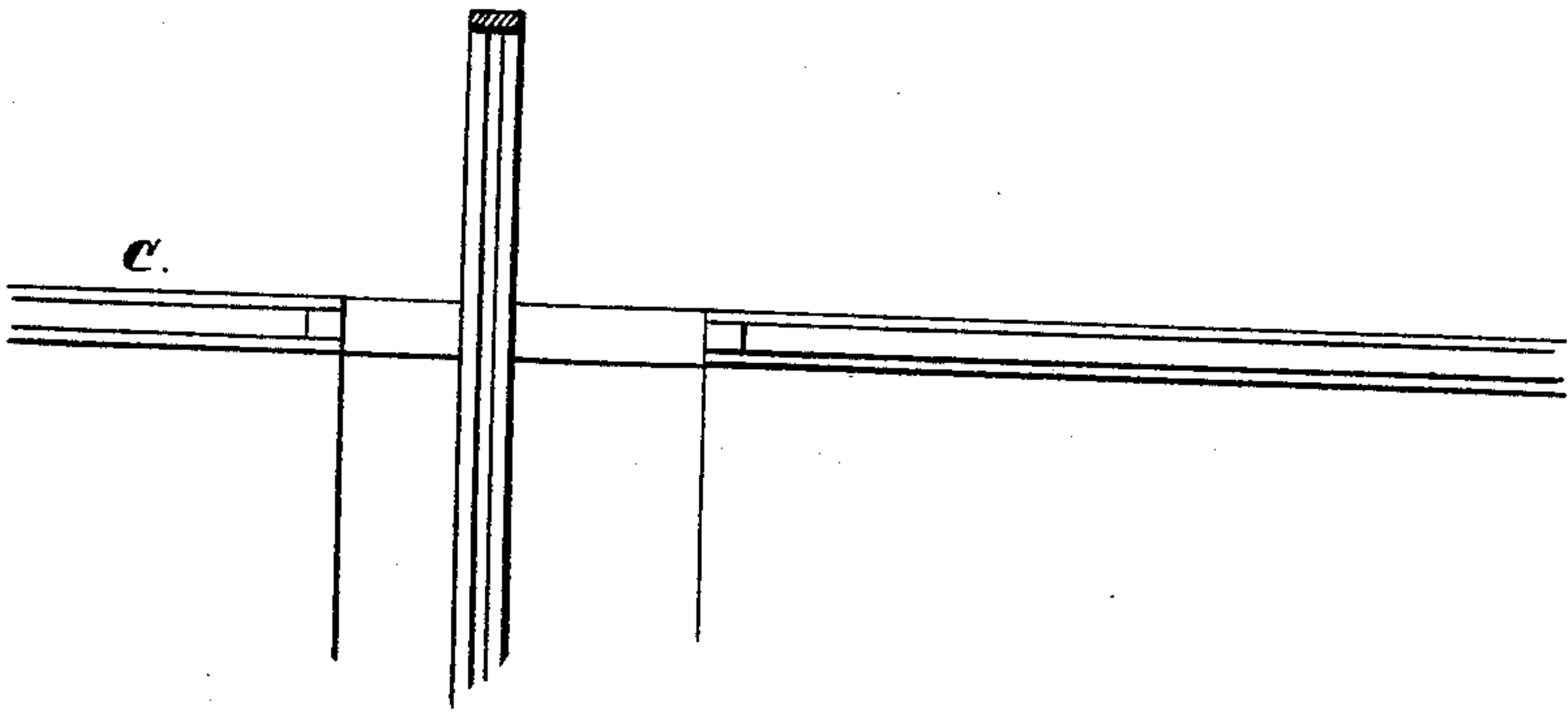


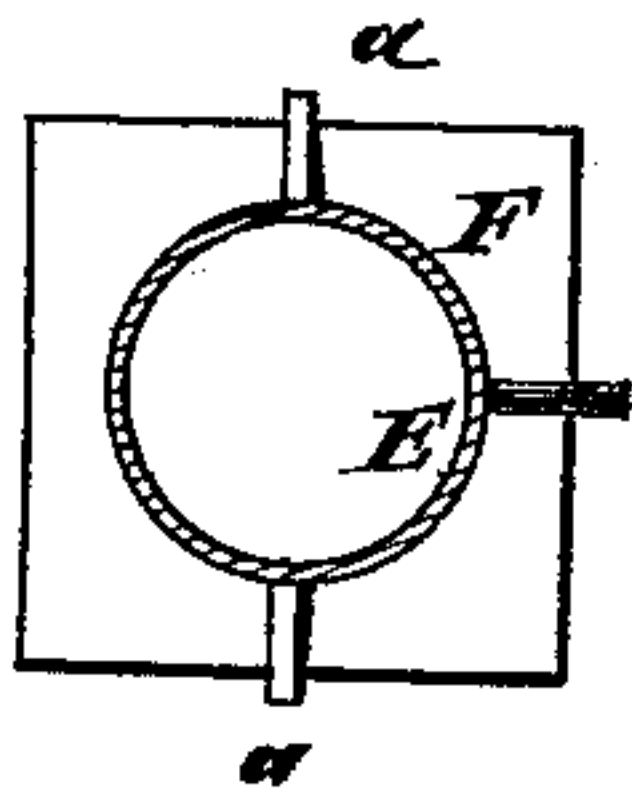
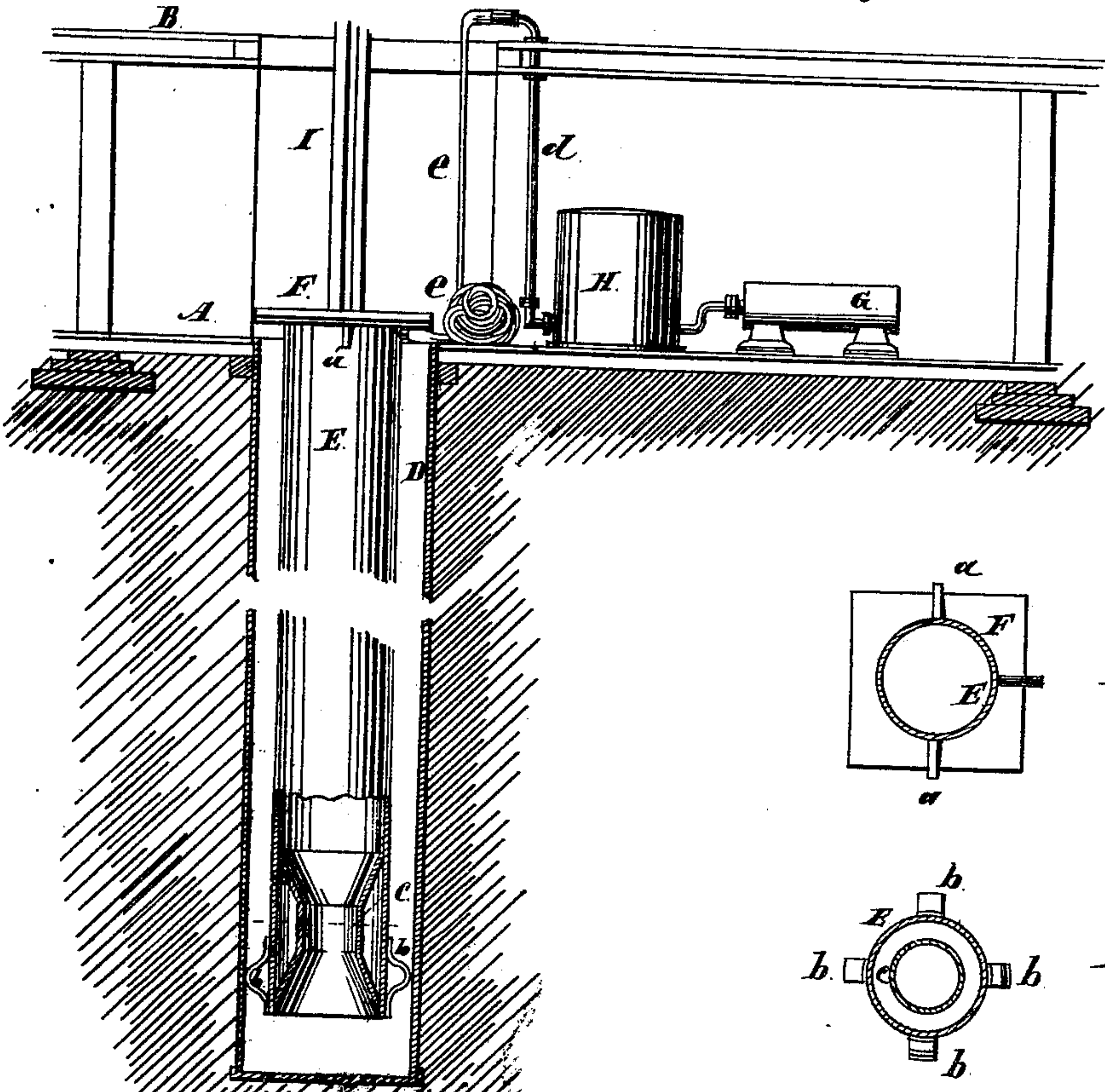
J. L. AGNEW.  
Pneumatic Elevator.

**No. 218,209.**

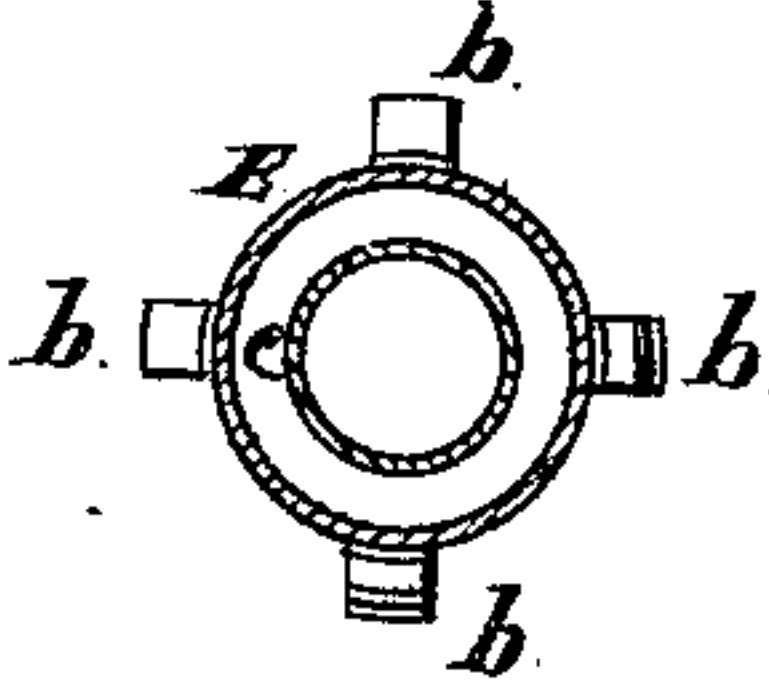
Patented Aug. 5, 1879.



*Fig 1.*



*Fig. 2*



*Fig. 3.*

*Witnesses*

East West  
Air Bond

*Inventor:*

John L. Agnew



# UNITED STATES PATENT OFFICE.

JOHN L. AGNEW, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN PNEUMATIC ELEVATORS.

Specification forming part of Letters Patent No. 218,209, dated August 5, 1879; application filed April 21, 1879.

*To all whom it may concern:*

Be it known that I, JOHN L. AGNEW, of Chicago, Cook county, State of Illinois, have invented a new and useful Improvement in Pneumatic Elevators, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section; Fig. 2, a section of the parts shown, taken at *x* of Fig. 1, looking up; Fig. 3, a bottom view of the parts shown.

The object of my invention is to provide improved devices for utilizing air-pressure in operating the platform of an elevator, which I accomplish by providing a well of sufficient depth, which is to be nearly filled with water, and by providing a cylinder or tube having its upper end permanently connected with the platform, said tube being located in the well, and being open at the bottom, but otherwise air-tight, and moving up and down with the platform or cage, air being forced into the cylinder or tube, all as more fully hereinafter described.

I provide a suitable counter-balance for the tube, and use an air-pump, an equalizing-tank, and suitable valves.

In the drawings, A represents the ground floor of a building. B is the second floor. C may be regarded as the fourth floor, the third floor being omitted.

D is a well, sunk into the ground. It may be made of iron tubing or masonry, as may be most convenient, but should be water-tight. Its depth depends upon the height to which the platform is to be elevated.

E is a tube, which may be made of steel. It is open at the bottom, but otherwise is air-tight. It is connected at its upper end with the platform F in an air-tight manner; or it may be provided with an air-tight head, and be connected with the platform in any suitable manner.

*a* are guides upon the upper end of the tube E. I do not limit myself to guides of this form, any suitable known guide may be used. *b* are guides upon the lower end of the tube E.

I are posts, one upon two of the opposite sides of the passage-way for the platform, as usual.

*c* is an air-chamber at or near the lower end of

the tube E, as shown, for the purpose of counterbalancing the weight of the tube and platform. As shown, it is formed of sheet metal, inserted in the tube E, and secured thereto in an air-tight manner, the wall of the tube E forming the outer wall of the air-chamber. It is advisable to bevel the upper and lower portions of the inner wall of this chamber *c*, as shown, to facilitate the movement of the tube through the water. The tube might be counterbalanced by means of weights; but, as now informed, I prefer the air-chamber *c*.

G is a suitable air-pump. H is an air-tank, located between the pump and tube E, for the purpose of equalizing the pressure and maintaining a supply of air. *d* is a rigid tube. *e* is a flexible tube, one end of which is connected with the tube *d*, and the other end with the upper end of the tube E. Instead of this flexible tube, a rigid tube might be used for conveying air from the pump to the interior of the tube E; but such rigid tube would have to be carried down to the bottom of the well, between the wall thereof and the tube E, and up into the tube E, and somewhat above the water-line in the well.

In connection with the engine, I propose to use an automatic valve arranged to cut off at a given pressure. Any suitable gage may be used to indicate the pressure, and any well-known brake may be used. So other appliances in common use with elevators, which are adapted to be used in connection with my devices, may be adopted.

For ordinary purposes for passengers the well may be six feet in diameter, and the tube E four feet in diameter, or a little more.

A suitable valve must be provided to permit air to escape from the tube E when the platform descends.

In use the well D is to be nearly filled with water constantly, say to within about two feet of the top.

When the platform is at its lowest point, the water in the tube E and in the well will stand at the same level, if there be no air-pressure in the tube E. Now, if air be forced into the tube E, by means of the pump G, through the tube *e*, the effect will be at first to displace a small portion of the water in E, and then the platform will be elevated by the air-pressure.

One pound pressure will raise the water in the well about thirteen and a half inches, the cylinder E being four feet in diameter, and the water in the tube E will then be about the same distance below the ordinary level, the relative sizes of the tube and well being as above given.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. A well, D, and a tube, E, adapted to re-

ceive air under pressure, in combination with the platform of an elevator, substantially as and for the purpose set forth.

2. The air-chamber c, in combination with the tube E, platform F, and well D, substantially as and for the purposes set forth.

JOHN L. AGNEW.

Witnesses:

E. A. WEST,  
O. W. BOND.