(No Model.)

G. H. POND.

HYDRAULIC ELEVATOR.

No. 257,754. Patented May 9, 1882.

Fig. 1.

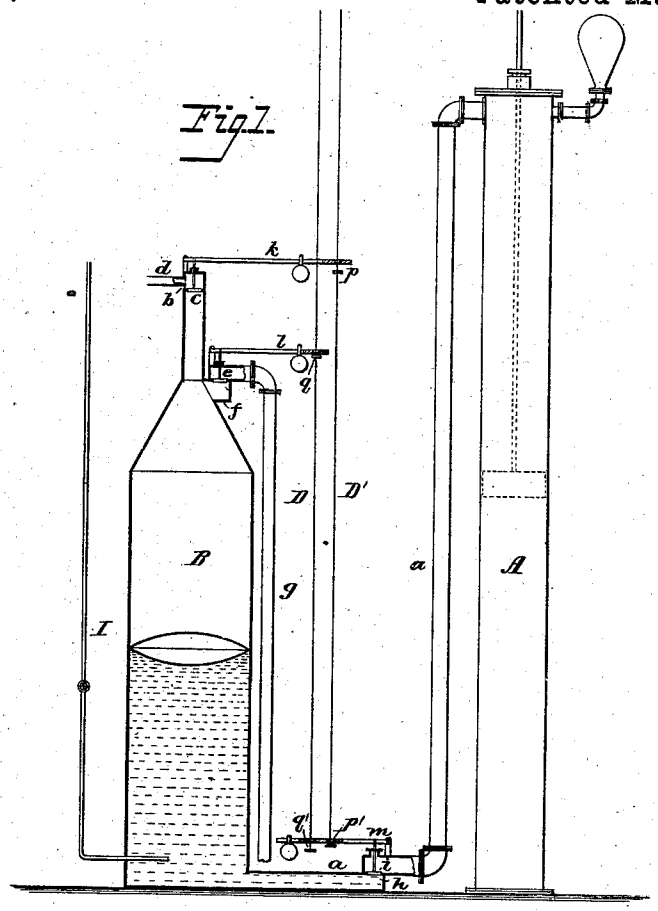
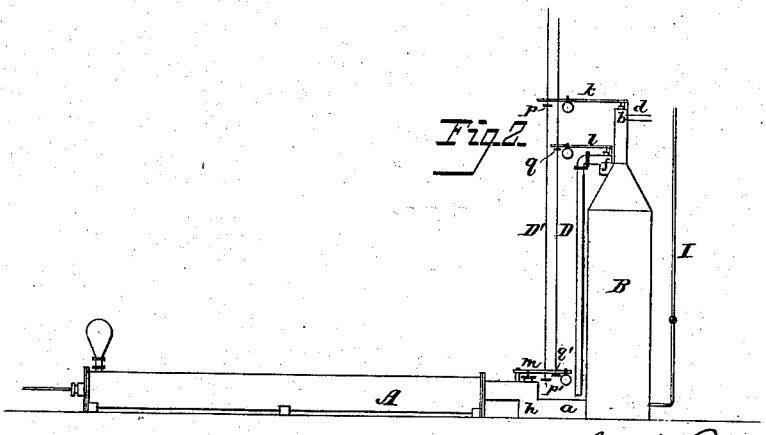


Fig. 2.



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UNITED STATES PATENT OFFICE.

GOLDSBURY H. POND, OF NEW YORK, N. Y.

HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 257,754, dated May 9, 1882.

Application filed April 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, GOLDSBURY H. POND, a citizen of the United States, and resident of the city, county, and State of New York, have invented certain new and useful Improvements in Hydraulic Elevators, of which the following is a specification.

My invention relates to that class of elevating apparatus in which a piston is caused to traverse the cylinder by the action of steam under pressure upon a body of water; and my invention consists in appliances, constructed and arranged as fully described hereinafter, to insure the proper and simple action of the regulating-valves, maintain the motor fluid at a proper uniform temperature, and prevent the overcharging of the steam and water chamber.

In the drawings, Figure 1 is a part-sectional elevation, showing a cylinder and piston, steam and water chamber and pipes, valves, and operating appliances of my improved elevator; and Fig. 2 is an elevation showing the improvement in connection with a horizontal cylinder.

A is the cylinder, which may be vertical, as in Fig. 1, or horizontal, as in Fig. 2, and is provided with the usual piston and piston-rod and appliances connecting the same to the cage or platform; and B is an air-tight tank, which communicates through a pipe, *a*, with the cylinder A, near one end of the piston. The upper end of the tank B is contracted, and to the same is connected the casing *b* of the valve *c*, which controls the flow of steam from the pipe *d*, which communicates with a steam-generator. Below the case *b* is a second valve-case, *f*, provided with a valve, *e*, and communicating with the tank and with an exhaust-pipe, *g*. In the pipe *a* is a valve-casing, *h*, having a valve, *i*, opening upward. The stems of the different valves are connected respectively to weighted levers *k l m*, so arranged that the ends of the levers shall be in the same vertical plane with two rods or cables, D D′, extending through eyes or slots in the levers and through or adjacent to the cage.

Upon the rod D′ are two tappets, *p p′*, and upon the rod D are two tappets, *q q′*, which are so arranged that on elevating the rod D′ the tappet *p′* will strike the lever *m* and elevate the latter and its valve *i*, affording a free communication between the tank and the cylinder A through the pipe *a*, after which the further movements of the rod will bring the tappet *p* against the lever *k* and elevate the latter and the valve *c*, permitting the steam to flow upon the surface of the body of water contained in the tank and filling the pipe *a* and the end of the cylinder with which the pipe connects. The pressure of the steam forces the water into the cylinder, thus imparting movement to the piston and to the cage.

The cage may be arrested by lowering the rod D′, thereby first closing the steam-valve *c* and then the valve *i*.

To lower the cage the rod D is elevated, thereby first opening the exhaust-valve *e* to permit the escape of steam from the tank, after which the tappet *q′* is brought against the lever *m*, thereby opening the valve *i* and permitting the water to pass from the cylinder through the pipe *a* back into the tank B.

By first opening the valve *i* and then the steam-valve I prevent the sudden movements that would be apt to occur if the valve in the water-passage were opened after the pressure of the steam had been brought upon the water, and by first opening the exhaust before raising the valve *i*, I secure the discharge of the steam from the tank, so as to avoid any possible reaction from its expansion upon raising the valve *i*.

The water in the tank may be heated to prevent the condensation of the steam; but as a general thing no appliances are required for this purpose, as the steam would in most instances soon heat the water to such an extent as would interfere with the operation of the apparatus. To prevent this I introduce a cold-water pipe, I, into the tank B, and pass cold water through the same in such quantites as to maintain the water in the tank at about the temperature of 200°, which is sufficient to prevent any material condensation of the steam, and will prevent any undue generation of steam. I am thus enabled to maintain the efficiency of the apparatus, whatever may be the condition of the external temperature.

As a constant flow of cold water in the tank would soon fill the same, and by carrying the water into the steam-pipe cause foaming of the water, and thus impair the operation of the apparatus, I arrange the discharge-valve below the steam-pipe, so that any surplus water will

flow off through the casing of the said valve upon the descent of the elevator-cage.

It will be apparent that cocks or other forms of valves may be used, and that other devices than levers may be employed for operating them.

I claim—

1. The combination, with the elevator-cylinder A, tank B, connecting-pipe *a*, and steam-pipe *d*, and the valves *c e i*, of the rods D D′, both provided with tappets arranged so as to open the water-valve and afterward the steam-valve, to raise the piston, in the cylinder, and also to open the overflow-valve before the water-valve is raised to lower the piston, for the purpose set forth.

2. The combination of the steam and water tank B, communicating with the cylinder, with the overflow-pipe which regulates the water-line, and a steam-pipe communicating with an extension of the tank above the water-line, substantially as described.

3. The combination, with the steam and water tank communicating with the cylinder and provided with steam and overflow valves and pipes, of pipe I, admitting cold water to the tank, for the purpose specified.

4. The combination, with the steam and water tank B, communicating with a steam-pipe and with an elevator-cylinder, of a water-inlet pipe and an overflow-pipe, substantially as and for the purpose set forth.

5. The combination, with the steam and water tank, communicating with a steam-pipe and with an elevator-cylinder, and provided with a water-inlet pipe and an overflow, of valves arranged in the steam-inlet overflow, and in the pipe between the tank and cylinder, and appliances, substantially as described, for operating the valves successively, as specified.

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

GOLDSBURY H. POND.

Witnesses:
JNO. W. SIMS,
L. A. SWARTZELL.