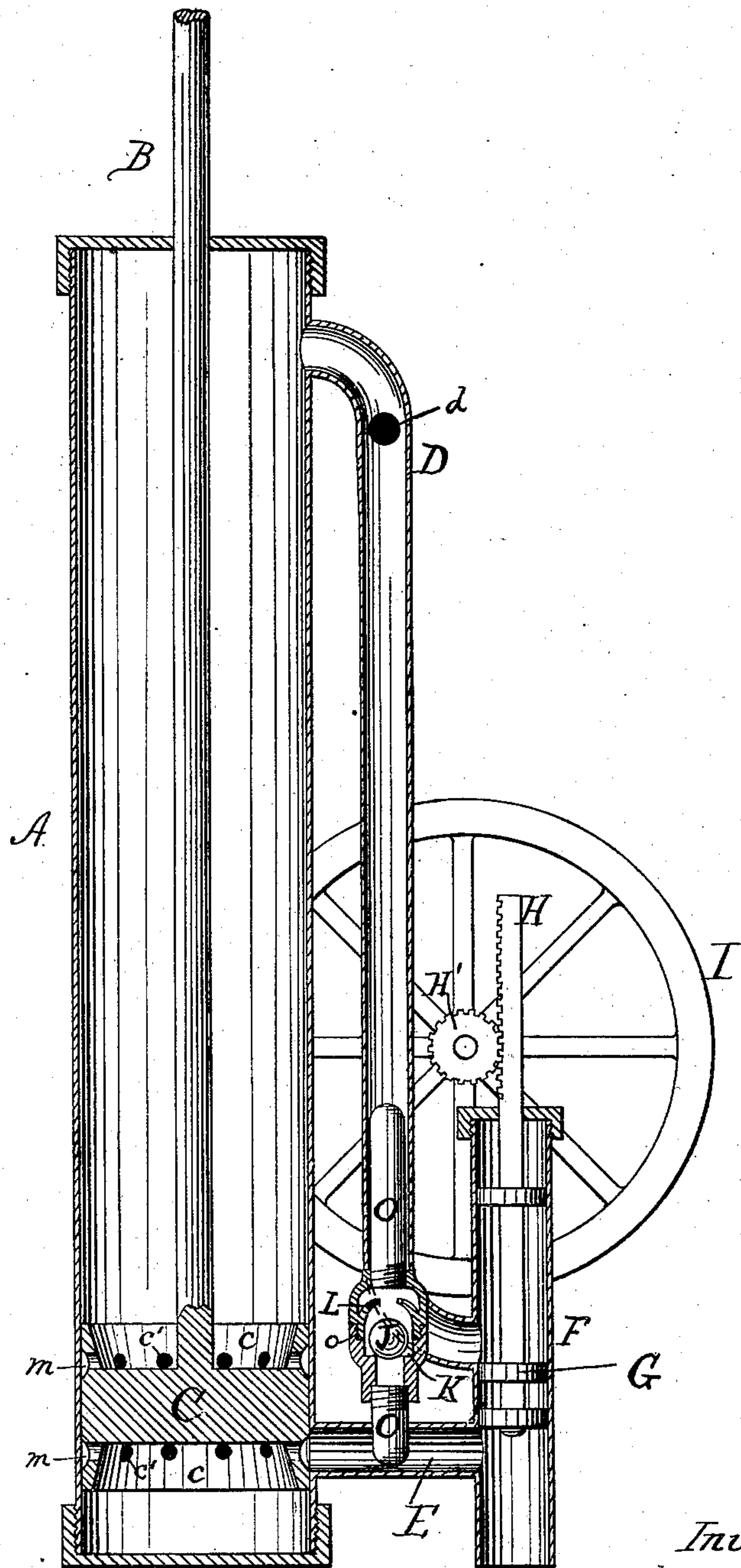


O. E. MERRILL.  
Hydraulic Elevator.

No. 235,693.

Patented Dec. 21, 1880.



Witnesses:  
F. B. Townsend  
H. Munday

Inventor:  
Orson E. Merrill  
per Munday & Everts.  
Attorneys.

# UNITED STATES PATENT OFFICE.

ORSON E. MERRILL, OF BELOIT, WISCONSIN, ASSIGNOR TO HYDRAULIC ELEVATOR COMPANY.

## HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 235,693, dated December 21, 1880.

Application filed August 5, 1879.

*To all whom it may concern:*

Be it known that I, ORSON E. MERRILL, of Beloit, in the county of Rock, in the State of Wisconsin, have invented certain Improvements in Hydraulic Elevators, of which the following is a specification.

The objects of my invention are to reduce shocks and jars in operating hydraulic elevators; and my invention consists in constructing the parts, as hereinafter fully described, so as to prevent a too sudden cutting off of the flow of discharge-water.

The drawing shows a vertical section of the water-containing parts of a hydraulic elevator embodying the invention, and therein the letter A represents the stand-pipe, and B is the piston, and C the piston-head traversing said pipe and operated therein by the water. D, E, and F are the pipes through which the water is fed to and discharged from the stand-pipe, the supply-water being admitted to the pipe D at the orifice *d*. The pipe F contains the valve G, whereby the water is controlled, and which is operated by rack and pinion H H', the latter receiving motion through the wheel I.

To avoid the shocks resulting from suddenly cutting off the discharge, I use a piston having openings arranged to gradually reduce the outward flow to the discharge-port. In the piston shown there is an annular depending apron, *c*, grooved or otherwise concaved externally, so as to form between it and the inside of the stand-pipe an annular chamber, *m*, and openings *c'* through the apron into such chamber. The openings are preferably several in number and distributed at equal distances around the apron, as thereby it becomes unimportant that they should coincide exactly with the exit-port. The operation of this construction is plain. When the piston-head passes the discharge-pipe it shuts off the exit of all the water except such as can find its way through the small openings *c'* into the chamber and from thence into the discharge-pipe, and the piston need not come to an absolute stop until the chambered part of

the apron has passed entirely below the pipe-opening, as the water below the piston-head is not wholly confined until then. The shutting off of the major flow of the water by the apron as it passes the opening of course necessarily slows the descent of the head, but does not cause an entire stoppage, because the limited flow through the openings and annular chamber permits some further movement, and thus cushions the impact of the head upon the imprisoned water at the bottom of the pipe. As the same evil occurs when the head goes to the top of the stand-pipe, I place upon the top of the head the same construction as upon the bottom—that is, an upward rim, *c*, channeled upon its exterior, and with similar openings *c'* through into the chamber *m*, formed by such channel. This rim operates upon the outflow through the pipe D in precisely the same manner as the lower one operates upon the outflow through the pipe E.

Of course it will be understood that more or less perfect results may be obtained by dispensing with the annular chamber and making the opening through the flange to coincide with the outflow-port of the stand-pipe; also by forming the chamber in the walls of the stand-pipe. Both these constructions are within the purview of my invention.

I am aware that dash-pots have been used for preventing shocks in closing valves by permitting water to flow through contracted openings in a plunger. This I do not claim; but—

I claim—

1. The combination, with the piston-head of an elevator, of a depending or upward annular apron or rim, between which and the stand-pipe is formed an exterior annular chamber, said annular apron having openings from its interior into such chamber, substantially as specified.

2. The combination, with the piston-head of an elevator, of a projecting annular rim provided with an opening or openings coinciding with the outflow-port of the stand-pipe



and operating to partially close such port, substantially as set forth.

3. In combination with the cylinder having ports communicating therewith, a piston  
5 having openings arranged therein, whereby a limited flow of the contents from one side of the piston to the ports, as the piston passes the same, is permitted, substantially as set forth.

In testimony that I claim the above I here- 10  
to set my hand this 31st day of July, A. D.  
1879.

ORSON E. MERRILL.

Witnesses:

EDWARD S. EVARTS,  
H. M. MUNDAY.