

(No Model.)

2 Sheets—Sheet 1.

A. K. MANSFIELD.
RAILWAY WATER COLUMN.

No. 429,141.

Patented June 3, 1890.

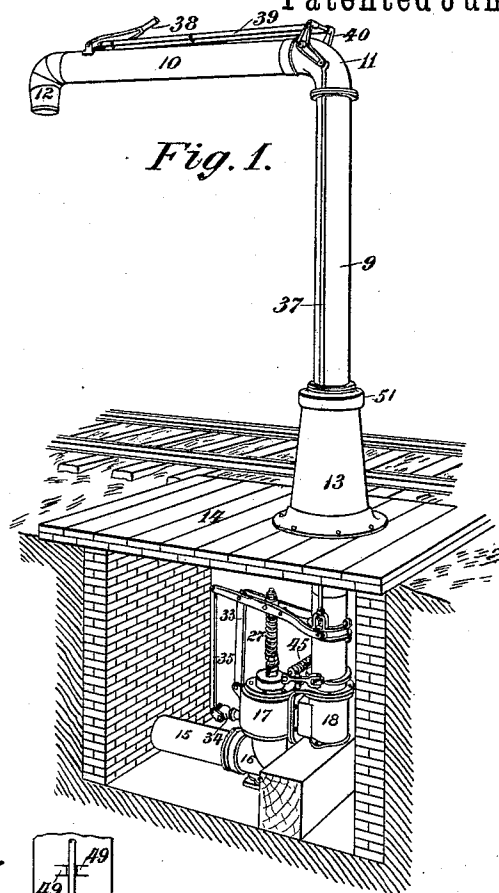


Fig. 1.

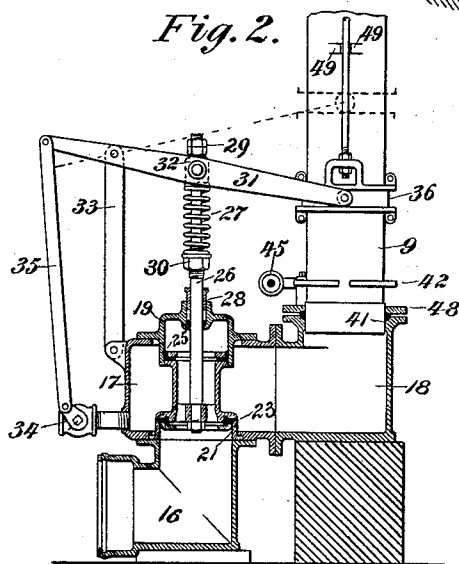


Fig. 2.

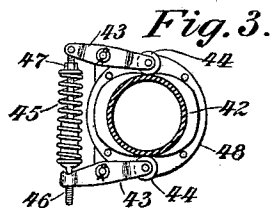


Fig. 3.

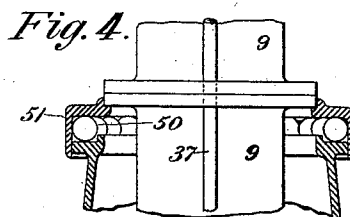


Fig. 4.

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Fig. 5.

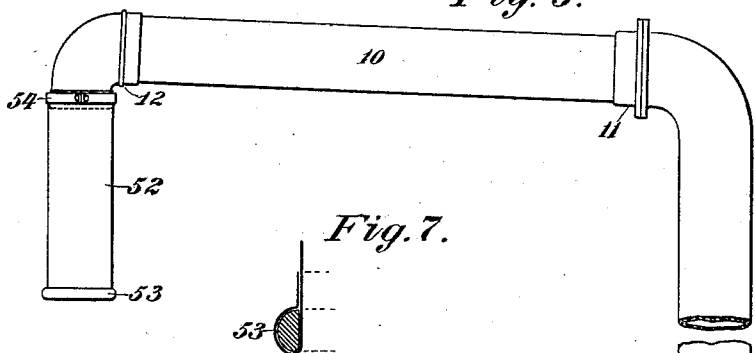


Fig. 7.

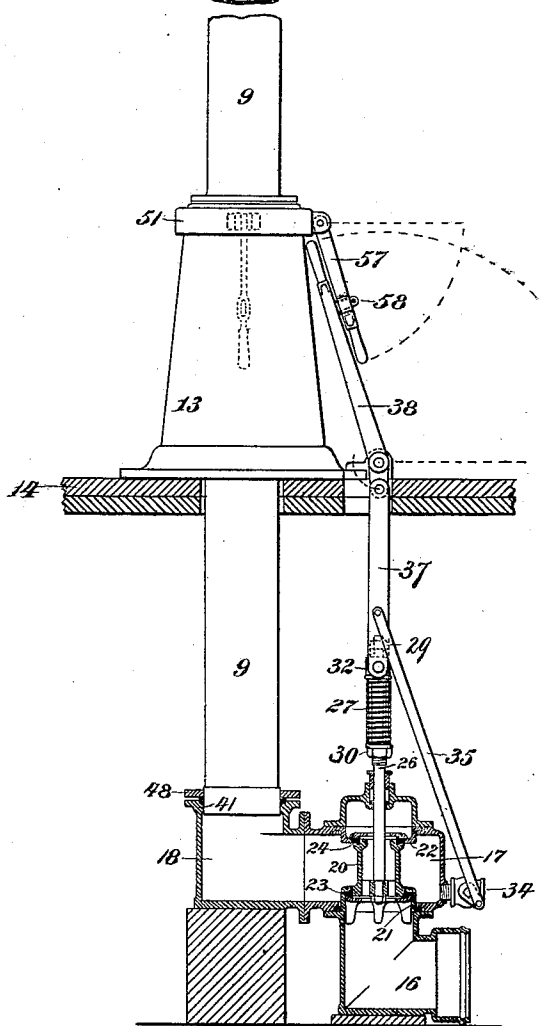
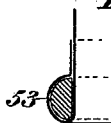
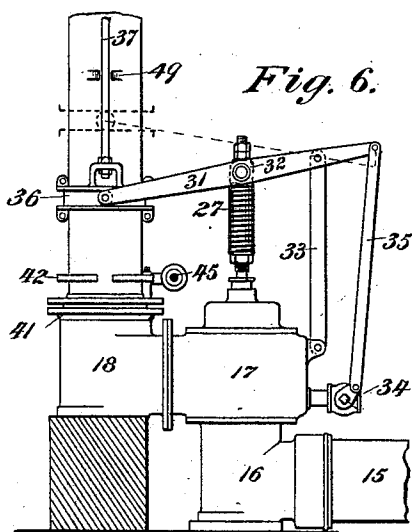


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALBERT K. MANSFIELD, OF NEW YORK, N. Y.

RAILWAY WATER COLUMN.

SPECIFICATION forming part of Letters Patent No. 429,141, dated June 3, 1890.

Application filed March 6, 1888. Serial No. 266,383. (No model.)

To all whom it may concern:

Be it known that I, ALBERT K. MANSFIELD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Railway Water Columns, of which the following is a specification.

My invention relates to improvements in water columns or stand-pipes for delivering water to locomotives on the line of a railroad; and the objects of my improvement are to render such machines easy and quick-operating, safe against bursting of pipes, automatic to return to and hold themselves in their normal positions by adjustable mechanism, and capable of delivering water to engine-tanks of various heights without waste. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a sectional perspective view of one form of my water column complete in its normal position beside the track. Fig. 2 is a sectional elevation of the parts of the machine situated below the platform. Fig. 3 is a sectional plan showing the automatic cam arrangement. Fig. 4 is a sectional elevation showing the anti-friction balls on which the weight of the moving parts is supported. Fig. 5 is a sectional elevation showing a second method of operating the valve. Fig. 6 is an elevation corresponding to the section of Fig. 2. Fig. 7 is a part section of the flexible pipe.

Similar numerals refer to similar parts in all the figures.

9 is the revolving stand-pipe, which may be made in one or more sections.

10 is the horizontal delivery-pipe or goose-neck, which is connected with the stand-pipe by the elbow 11 and carries the elbow 12 at its outer end.

13 is the supporting-base; 14, the platform; 15, the water-main; 16, the admission-elbow; 17, the valve-chamber; 18, the lower delivery-elbow; 19, the valve-cylinder; 20, the valve; 21, the main valve-seat; 22, the secondary valve-seat; 23, the main valve-ring; 24, the secondary valve-ring; 25, the hydraulic packing-ring; 26, the valve-stem; 27, the valve-spring; 28, the valve-stem stuffing-box; 29

and 30, valve-spring adjusting-nuts; 31, the valve-lever; 32, a sliding collar, to which the valve-lever is pivoted; 33, a fulcrum-support; 34, a drain-cock; 35, drain-cock connecting-rod; 36, sliding collar on stand-pipe; 37 37, 55 valve-rods; 38, operating-lever; 39, connecting-rods; 40, bell-cranks; 41, stand-pipe stuffing-box; 42, automatic cam; 43 43, cam-levers; 44 44, cam-rollers; 45, cam-spring; 46, spring-rod; 47, spring adjusting-nut; 48, 60 stand-pipe stuffing-box gland; 49 49, lugs to guide valve-rods; 50, rolling balls, which support the weight of revolving parts; 51, ball-cover; 52, a flexible hanging pipe; 53, a ring-weight; 54, pipe-clamp; 57, a hanging lever, 65 and 58 a tongue to receive a padlock.

Figs. 1 and 5 show two different methods of operating the machine. In one case the valve-operating lever is on the goose-neck 10 and in the other case it is pivoted to the base 70 13 near the platform 14. In both cases the valve is opened by throwing the lever over to a horizontal position. In the former case all the operations incident to using the machine may be made from the tank of the engine, 75 while in the latter case they must be made from the platform.

The valve is approximately balanced in the construction of Fig. 2 through means of the hydraulic packing working in the cylinder 19 80 and in the construction of Fig. 5 by means of the secondary valve-ring and seats 24 and 22. The valve is open to allow water to pass freely through from elbow 16 to the cylinder 19. The size of the secondary valve 24, as well 85 as of the hydraulic packing 25, is less than the inside diameter of main valve-seat 21. Thus the greater pressure of water on the valve when closed is upward, tending to force the valve open, and the valve may be said to 90 be underbalanced. The resultant pressure acts against the spring 27, which is compressed to hold the valve to its seat by the collar 32 and connections to operating-lever. The compression of the spring is adjustable by the 95 nut 30. The nuts 29 are slightly above and away from the collar 32 when the valve is closed. In opening the valve this collar first rises to meet the nuts 29, and then by its action against said nuts raises the valve. The 100

object of underbalancing the valve is to prevent danger of bursting the pipes through too suddenly stopping the flow of water. The operating-lever may be thrown home instantly; but the valve will, if the spring 27 is properly adjusted, only gradually take its seat, thus bringing the flowing water gradually to rest and preventing any dangerous "water-hammer."

The connection between sliding collar 32 and the valve-stem will be readily understood from Figs. 1, 2, and 6. The connecting-rod 35 holds the drain-cock 34 open when the machine is not in use; but the connection is so made that the operation of opening the main valve closes the drain-cock.

The hand-lever 57 is pivoted to the ball-cover 51, which is made fast to the stand-pipe in such a way that it (the lever) may be raised to a horizontal position. When in this position, it is used to rotate the pipe about to deliver water to the engine-tank. When the pipe is in its normal position—that is, with the goose-neck 10 parallel to the track, the valve being closed, and the lever 38 in the position shown in Fig. 5—the lever 57, which is provided with a suitable slot, may be dropped over the tongue 58, in which position the two levers 57 and 38 may be locked or interlocked together, thus locking the pipe against turning and the valve against being opened.

The levers 43 43 are pivoted to the stuffing-box gland 48, and are forced apart at their outer ends by the action of the spring 45. This forces the rollers toward each other and against the cam 42, which is of such form that the rollers are in every position equidistant from the axis of the stand-pipe, and when they are in the position nearest to this axis, as shown in Fig. 3, the stand-pipe is in its normal position. The cam is, moreover, so shaped that the pressure of the rollers tends to hold the pipe in this position and to return it thereto when rotated away therefrom. The force of the spring is exerted equally on each roller, so that no friction is produced by the action of the spring against the sides of the stuffing-box 41. This spring and cam device may be used in the construction of Fig. 5 or not. It is not essential there, but may be convenient. The essential elements of this device are the cam, the rollers (one or more) to reduce friction, the adjustable spring to produce the required pressure of rollers against cam, and suitable supporting and connecting parts. A variety of methods will suggest themselves to mechanics by which these elements may be combined to produce the result, either with or without the interposed levers 43. The compression of this spring, and therefore the force with which the stand-pipe is held to or returned to its normal position, is adjustable through means of the nut 47. This adjustability is important, in that under the various conditions of frictional resistance heavy winds tending to blow the column out of po-

sition, &c., the force may readily be made of such magnitude as is found best to produce the required result.

The pipe 52 is made of canvas or rubber or other flexible material. Flexible pipes have before been used in this place, but have caused trouble in winter in the following way: After the stand-pipe has been used, the drain-cock 34 being opened to drain the pipe, air must of course enter to take the place of the water. This causes suction through the pipe 52, which collapses, and, being wet, freezes together, and the next time the stand-pipe is used the pipe 52 becomes injured or destroyed. To prevent this I attach the ring-weight 53 to the bottom end of the pipe, making the weight heavy enough to hold the pipe in tension strong enough to prevent collapsing between weight and point of attachment. The weight need not necessarily be round nor in a single piece. The necessity of making the pipe 52 flexible comes from the fact that the tanks to which water is delivered are of various heights, some of them reaching up nearly to the mouth of the elbow 12, and in this latter case it would not be possible to swing the elbow past the edge of the tank if the pipe 52 were rigid and rigidly connected.

What I claim as my invention is—

1. In a water column, a combined operating and relief valve approximately balanced between two water-pressures equal in intensity, but the gross pressure tending to hold the valve to its seat being less than that tending to open the valve, in combination with the spring 27, adjusted to hold the valve to its seat, the operating-lever 38, and suitable connections from lever to valve, substantially as and for the purpose described.

2. In a water column, the combination of the revolving pipe 9, the cam 42, revolving with said pipe, and the adjustable spring and roller device consisting of rollers 44, arranged to roll in plane with the cam, the spring 45, spring-rod 46, adjusting-nut 47, and supporting and connecting parts, whereby the spring forces the rollers against the irregular face of the cam, substantially as and for the purpose set forth.

3. In combination with the revolving stand-pipe 9 10 12, the valve-chamber 17, the valve 20 and operating parts, and the drain-cock 34, the flexible hanging pipe 52, carrying one or more ring-weights, substantially as and for the purpose described.

4. The combination of pipe 9, elbow or case 18, in which the pipe rotates, arms 43 upon the case, yielding rollers 44 upon the arms, and a cam or collar 42 upon the rotating pipe, provided with inclined sides, against which the rollers bear, substantially as set forth.

5. In a water column, the balanced spring and cam device consisting of cam 42, revolving with the pipe 9, levers 43 43, pivoted

to a stationary part and carrying the friction-rollers 44, which roll against the cam, and the spring 45, arranged to force apart the free ends of the levers, whereby the
5 pressure of rollers against cam is equalized, substantially as and for the purpose set forth.

In testimony whereof I hereunto subscribe my name.

ALBERT K. MANSFIELD.

Witnesses:

J. C. LULLEY;
GEO. L. MANSFIELD.