(No Model.)

A. K. MANSFIELD.

WATER CRANE FOR SUPPLYING LOCOMOTIVES.

No. 304,741. Patented Sept. 9, 1884.

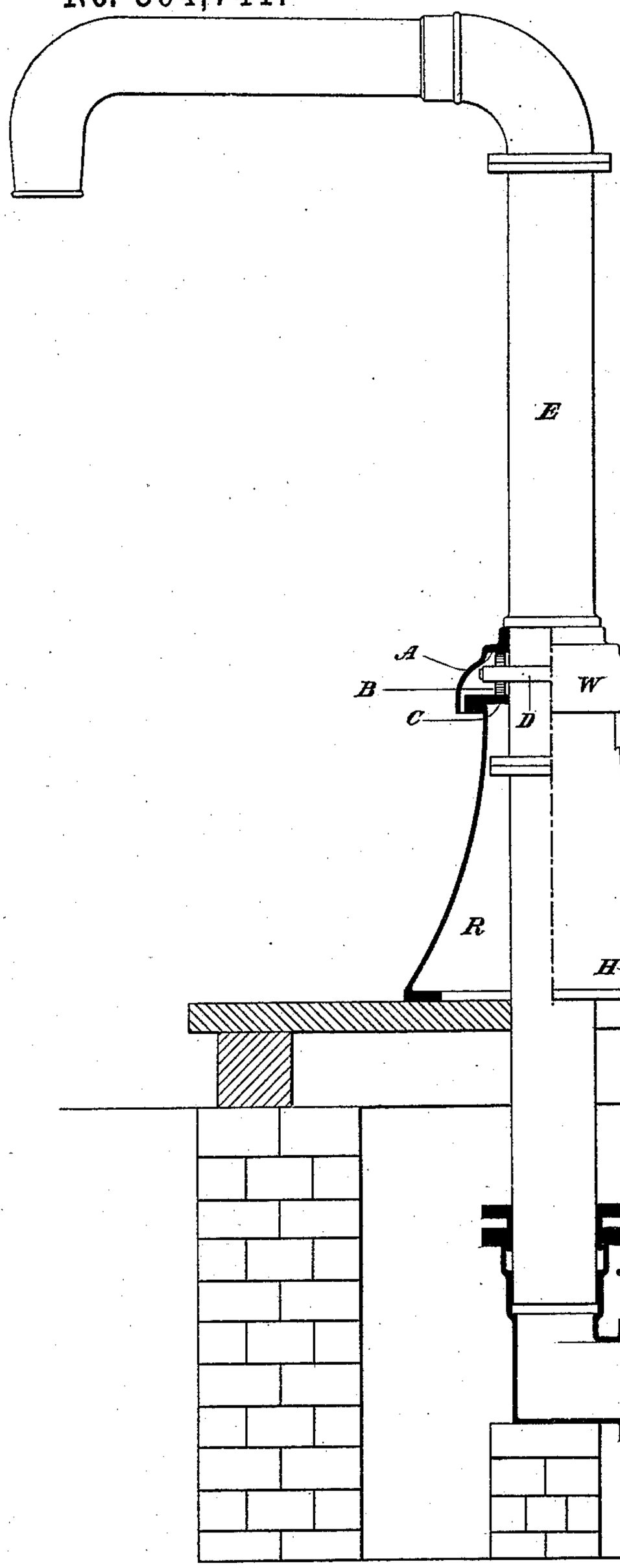

Fig. 1.

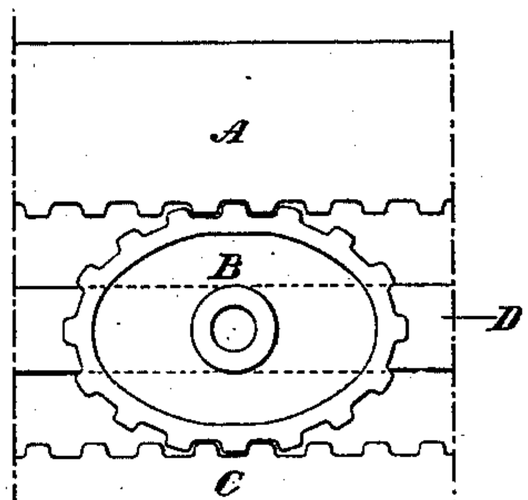

Fig. 2.

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UNITED STATES PATENT OFFICE.

ALBERT K. MANSFIELD, OF BOSTON, MASSACHUSETTS.

WATER-CRANE FOR SUPPLYING LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 304,741, dated September 9, 1884.

Application filed October 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBERT K. MANSFIELD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful improvement in water-cranes for supplying locomotives on the line of a railroad with water, of which the following is a specification.

The objects of my invention are to overcome the danger of bursting of pipes through quick closing of the supply-valve; to insure that the crane at all times when not in use occupies its proper position relative to the track; to simplify the construction, and to render it difficult for unauthorized persons to tamper with the valve. I attain these objects as shown in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the entire water-crane, and Fig. 2 is an elevation showing one of the wheels on which the crane turns.

E is a vertical pipe through which water flows to the goose-neck, and from thence into the tank of the engine. R is a hollow stand supporting and guiding the pipe. S is a valve-chamber containing the supply-valve L; P, a horizontal pipe conveying water to the crane; F, a hand-lever for operating the valve; I, a spring which balances the pressure of water against the under side of the closed valve; B, one of three elliptic rollers supporting the weight of the vertical pipe and goose-neck.

In opening the valve the lever F, which has its fulcrum at H, is unlatched at G and thrown to a horizontal position, or until the handle reaches the platform, or nearly so. This raises one end of the lever T, which has its fulcrum at V, opening the main valve L, and at the same time closing the waste-cock O. The spring-rod or connecting-rod between the two levers passes through a block at J, the rod having a nut and check-nut on its end. When the valve is closed, these nuts do not bear against the block. If they did, the full force of the compressed spring would not act to hold the valve against its seat. By drawing the bottom nuts slightly away from the block, and by compressing the spring by the top nut, the valve may be held against its seat with any force desired, depending only on the stiffness of the spring.

The object of the spring is both to balance the pressure against the valve and to render it a "safety-valve," for, if the pressure under the valve, through impact or otherwise, becomes greater than the opposite pressure due to the spring, the valve will be opened and remain so until the undue pressure is relieved, thus preventing any liability of bursting pipes. The arrangement of levers will readily be seen to be such as to make it easy to close the valve against any pressure of water which may occur. The waste-cock O is so connected with the lever T as to be open when the supply-valve is closed, and vice versa. This is to prevent freezing of water in the vertical pipe, and to drain any leakage through the valve. The water-crane is so placed beside the railroad-track that when the goose-neck is turned to a position at right angles to the track its mouth may be directly over the center of the engine-tank. When the goose-neck is released from this position, it will return automatically to its normal position parallel to the track. This is accomplished by means of three (more or less) elliptic rollers, B. These rollers and the surfaces in contact with them are provided with teeth, in order to keep them in the proper positions relative to each other. The surface A is part of an annular ring or flange attached to the stand-pipe E, and turns with the pipe. The surface C is a part of an annular ring fastened to the stationary stand R. The three rollers are pivoted to the follower-ring D, which moves with the rollers. When the rollers are in the position indicated by Fig. 2, the stand-pipe occupies its normal position. When the stand-pipe is turned through a quarter of a circle, the long diameters of the elliptic rollers become vertical. The weight of the pipe falling through a distance equal to the difference of diameters of the ellipse is the power which moves the stand-pipe to its original position.

To insure that the stand-pipe rises to its highest point in turning through one-quarter of a revolution, the number of teeth in each of the elliptic rollers B must be one-half as many as in the annular rings A and C. The angular motion of the follower-ring D will be found to be one-half as great as that of the stand-pipe. The friction on the pivots of the rollers is only

that due to the weight of the follower-ring. The shield W, which covers the elliptic rollers, is fastened to the stand-pipe, and therefore rises and falls with it, and is substantially a projecting part or flange of the same. The latch G, which latches the lever F in its vertical position, is so formed (see Fig. 1) that the latch cannot be raised until the shield rises. The result is that the valve can only be opened when the goose-neck is at or nearly at right angles to the track. This makes it difficult for the lever to be tampered with.

What I claim as my invention is—

1. In a water-column, the combination of valve L, operating-lever F, and a connecting-rod between the stem of the valve and said lever, carrying an adjustable spring, I, the pressure of which acts in a contrary direction and opposed to the pressure of the water, making the valve at once an operating and a safety valve, as set forth.

2. In a water-column, the combination of the vertically moving and revolving stand-pipe E, provided with the toothed annular ring A, with the stationary toothed ring C, and the elliptic wheels B B B, journaled to the follower-ring D, and engaging with the rings A and C, substantially as described.

3. In a water-column, the combination of the valve L, the intermediate lever, T, pivoted to the stem of said valve, the spring-rod carrying the adjustable spring I, and the operating-lever F, substantially as described.

4. In a water-crane, the latch G, pivoted to a stationary bearing, combined with an engaging projection on the operating-lever F, and the revolving stand-pipe R, carrying a locking-flange, W, as set forth.

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