(No Model.) 2 Sheets—Sheet 1.

M. M. MOORE.

STAND PIPE.

No. 547,962. Patented Oct. 15, 1895.

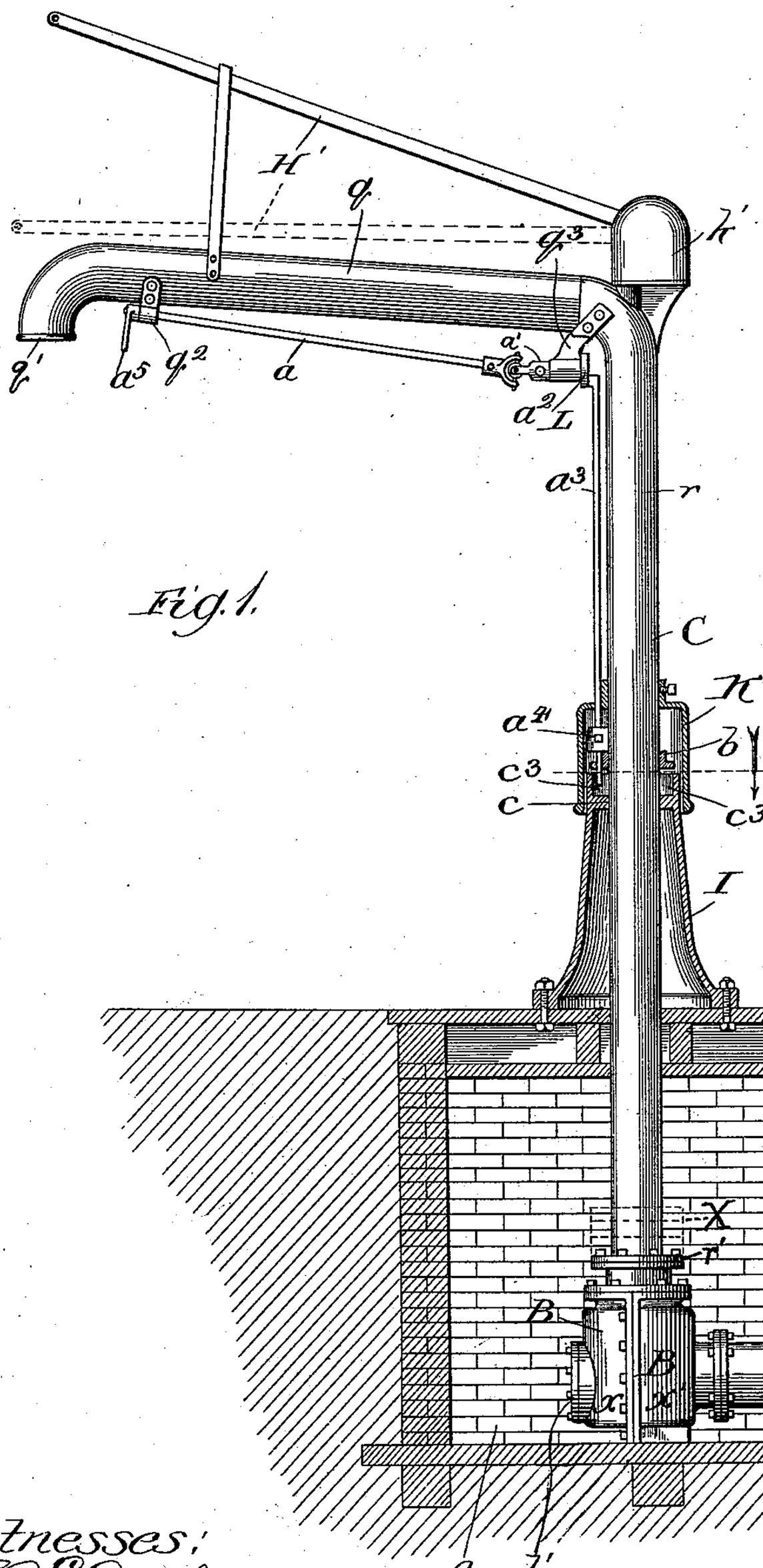

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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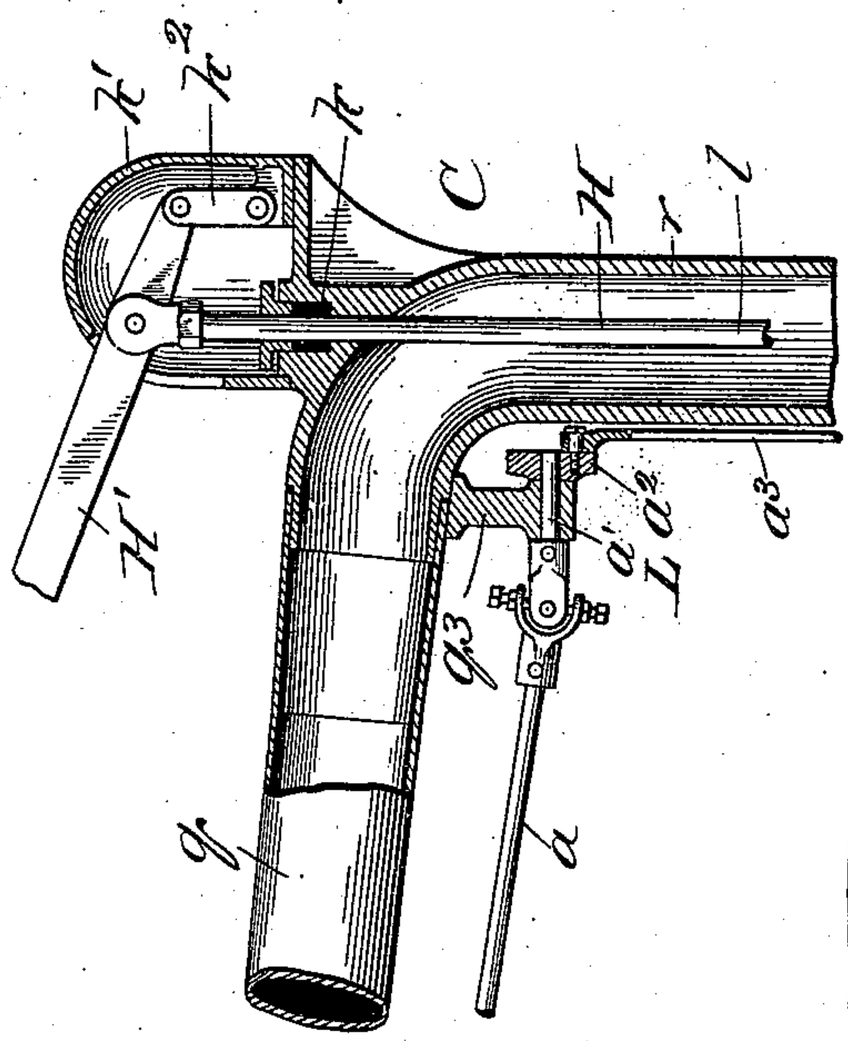

Fig. 3.

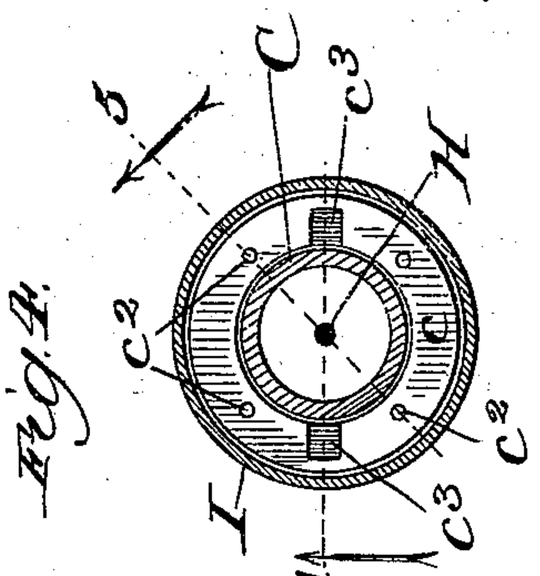

Fig. 4.

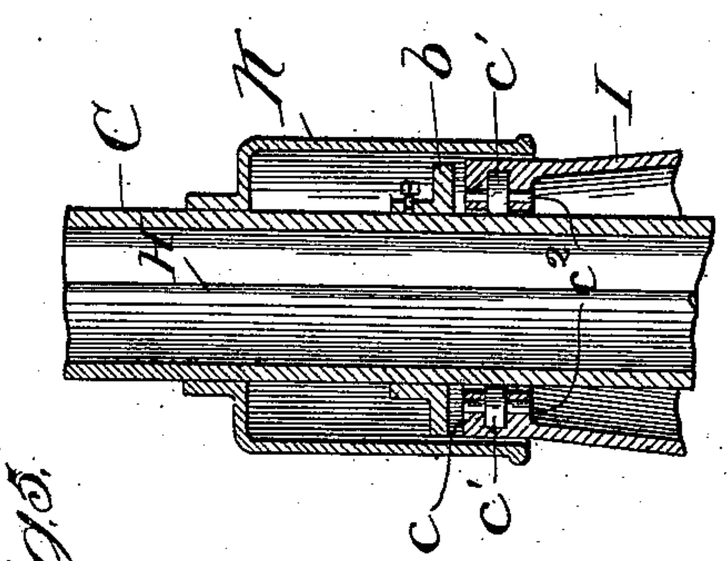

Fig. 5.

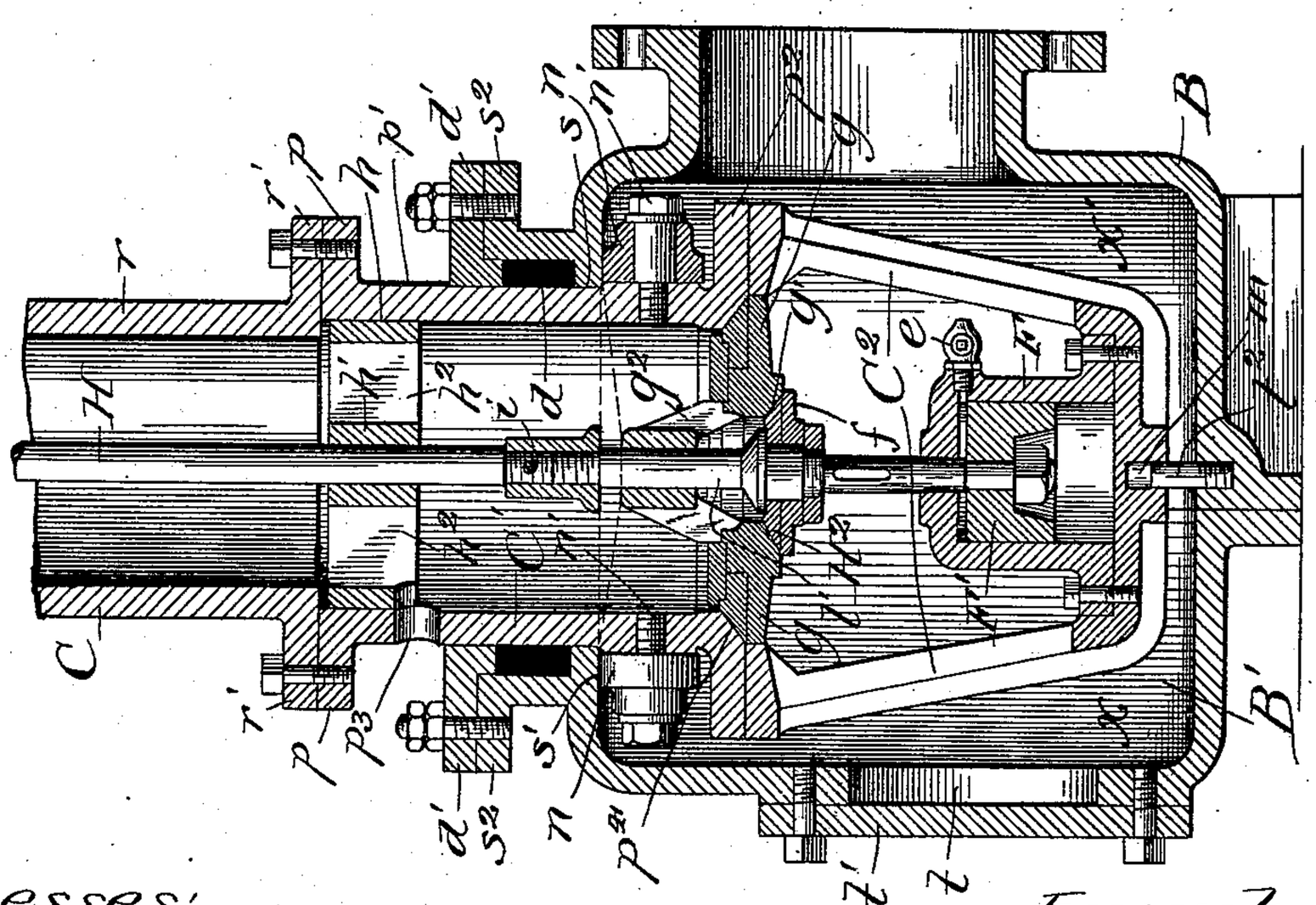

Fig. 2.

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MOSES M. MOORE, OF CHICAGO, ILLINOIS.

STAND-PIPE.

SPECIFICATION forming part of Letters Patent No. 547,962, dated October 15, 1895.

Application filed October 23, 1894. Serial No. 526,703. (No model.)

To all whom it may concern:

Be it known that I, MOSES M. MOORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Stand-Pipes, of which the following is a specification.

My invention relates to improvements in stand-pipes or water-columns of the class employed more especially on railroads for supplying the tanks of locomotive-tenders with water. Stand-pipes of this class as commonly constructed comprise, generally stated, a lower stationary part communicating with the water-supply and containing the valve for turning the water on and off and an upper part supported upon bearings on the lower part to swing on its vertical axis. The levers for operating the valves in the lower part are fulcrumed upon the upper part and connected with the valve by rods, either alone or with the addition of links and levers. The swinging part of such a stand-pipe weighs, usually, not less that fifteen hundred pounds, and it is found in practice that the frequent turning thereof causes the bearings to wear very materially. The tendency of such wear is to cause disarrangement of the valve-operating mechanism, whereby leakage occurs, and to render the swinging portion difficult to turn, all of which necessitates repair or renewal of parts, which it is desirable to avoid.

My object is to provide a stand-pipe of improved construction which shall overcome the above and other objections to the constructions of stand-pipes hitherto provided and which shall be particularly simple, strong, and durable, and well adapted to its purpose.

In the drawings, Figure 1 is a broken vertical and partly-sectional view of a stand-pipe provided with my improvements, the section being taken on line 1 of Fig. 4 and viewed in the direction of the arrow; Fig. 2, an enlarged broken and vertical section of the lower portion of the structure; Fig. 3, an enlarged broken and partly-sectional view of the upper portion of the swinging column; Fig. 4, an enlarged sectional plan view taken on line 4 of Fig. 1; and Fig. 5 a broken vertical section taken on line 5 of Fig. 4 and viewed in the direction of the arrow.

The stand-pipe rests at its lower end in a pit A in the usual manner, the pit having a cover A′. The stand-pipe structure consists, in the main, of a lower stationary shell or chamber portion B and an upper swinging column or pipe portion C. The shell B may be in two closely-fitting parts $x\,x'$, fastened together, and it rests firmly upon a foundation at the base of the pit, near which it is connected with a water-supply pipe D. The shell B contains a single chamber B′, having an opening t at one side closed by a cap-plate t' and a round opening in its top bounded by a bearing-surface s. On the inner side of the top of the chamber B′, adjacent to the bearing-surface s, is a bearing-face s'. On the outer side of the shell, around the opening or bearing-surface s, is an annular flange s^2. The swinging column C comprises a vertical pipe r and horizontally-disposed pipe or arm portion q, which latter terminates in a downwardly-opening nozzle q'. The pipe or column r is provided at its lower end with an annular flange r', which fits upon and is fastened to the annular flange p of a tube-section C′. The tube-section C′ has a smooth inner bore of a diameter somewhat greater than the bore of the pipe r. It also has a smooth outer surface p', at which it passes through the bearing s. Below the bearing s the tube-section C′ has a flange p^2, and above the flange is a series of antifriction-rollers n, mounted upon bearing-screws n', fastened to the tube-section. The antifriction-wheels n are adapted to travel upon the annular bearing-surface s'. Below the tube-section C′ is a cage or basket C^2, fastened at its upper surface to the flange p^2. In the under side of the lower end of the basket C^2 is a bearing-socket m, fitting over a central pin or bearing projection t^2 in the base of the chamber B′. In the tube-section C′, at the location shown, is an opening or drainage-outlet p^3, and the lower end of the said tube-section is rendered flaring to afford a valve-seat p^4.

H is a valve-operating rod, formed in sections for convenience in putting the details of the valve and valve-operating mechanism together. The upper section l of the rod H passes through a stuffing-box k in the bend of the water-column and in line with the center of the vertical portion r. On the stand-pipe,

over the stuffing-box k, is a chamber or housing k' for the upper end of the rod H, and in which the latter is pivotally connected to an operating-lever H′, which extends along the arm q of the stand-pipe. The lever H′ is fulcrumed upon a pivotal link k^2 in the chamber k'. The upper section l extends to the tube-section C′, where it is fastened by means of a screw-coupling i to the lower rod-section l'. In the tube-section is an annular valve h, having a wide circumferential face fitting and sliding upon the inner circumferential face of the tube-section C′. The valve comprises an outer ring and an inner hub portion h', connected together by radial aims h^2, and at its hub portion it fits over and is securely fastened to the rod H. The object of the valve h is to open and close the drainage-opening p^3 in the movement of the rod H, as hereinafter explained.

H² is a valve, preferably in the form of a double valve. It comprises an outer ring or member g, having a tapering circumferential face to fit the valve-seat p^4 and presenting an inner annular tapering valve-seat g', and an inner member f, having a tapering face to fit the seat g'. The ring portion g of the valve is upon a spider g^2, which slides upon the section l' of the rod H to the stop formed by the coupling i. The valve member f is firmly fastened between stops on the rods l'.

In the basket C² and fastened thereto is a chamber or dash-pot F, having a central bearing-opening in its top for the section l' of the stem H and an opening provided with a valve e. In the dash-pot is a piston F′, secured to the lower end of the rod-section l'. The valve e is constructed to permit water to pass freely through it to the dash-pot, but to retard the escape of water from the dash-pot. The swinging column C, as before stated, passes at its annular surface p' through the opening s of the chamber B. The flange s^2 is concentric with the surface p', leaving a space for a packing d. Fastened upon the flange s^2 is a collar d', which holds the packing in place and forms with the latter a stuffing-box in which the column may turn and which prevents all danger of leakage.

In the construction of water-columns for railroads it is usual to provide for supplying water through the mains or pipes D under pressure of from fifteen to eighteen pounds to the square inch, this pressure being necessary to cause water to flow through the stand-pipe with the desired speed. I utilize this water-pressure in sustaining the swinging column C. In practice the lower end of the tube-section C′, when closed with the valve H², presents an area which causes the pressure against it from the pipe D to overbalance the weight of the column and thus press the latter at its antifriction-bearings n against the bearing-surface s'. In the turning of the swinging column there is no downward pressure upon the bearing t^2.

Around the swinging column C and mounted on the platform A′ is a base-piece or guide I, having an inward-projecting annular shelf c, in which are mounted rotary antifriction-wheels c' on pins c^2. The antifriction-wheels bear against the outer surface of the swinging column and steady it. Fastened upon the column is an annular hood K, which extends downward, overlapping and out of contact with the base-piece I. In the chamber formed by the hood is a collar b, fixed upon the column C. L is a lock mechanism for the swinging column, operating to lock it against being swung by the wind when it extends parallel with the railway-track. The locking mechanism comprises a rod a, extending through a bearing q^2 on the arm q' and pivotally connected with a shaft-piece a', extending through a bearing q^3 and carrying a disk a^2. Pivotally connected with the disk a^2 eccentrally with relation to the shaft a' is a plunger-rod a^3, which passes downward through guide-openings in the hood K and collar b. In the hood above the collar b the rod a^3 is provided with a weight a^4. At opposite sides the annular shelf c on the base-piece I is provided with sockets c^3 c^3, with which the lower end of the rod a^3 will register when the arm q of the swinging column is swung out of the way to extend parallel with the track. When registering with either of the sockets c^3, the rod a^3 drops into the same and locks the swinging column against turning on its axis. To unlock the column a handle a^5 on the rod a is turned, causing the shaft a' to turn in its bearing and turn the disk a^2 and thereby raise the rod a^3 out of engagement with the socket c^3. As the column is swung to a position across the track, the lower end of the rod a^3 slides upon the upper surface of the shelf c.

The operation is as follows: When it is desired to fill the tank of a locomotive-tender with water, the swinging column is unlocked by turning the handle a^5, as described, and swung across the track. The lever H′ is then swung downward to turn on the water. In the downward swinging of the lever the rod H is plunged downward, causing the valve h to close the outlet p^3, the valve member f to leave its seat g', and the piston F′ to move downward in the dash-pot. In the initial downward movement of the rod H, therefore, the opening of the small valve member f causes water to flow immediately through the opening bounded by the valve-seat g' and rise in the column, thereby relieving pressure against the under side of the valve g. In the further downward movement of the lever H′ the stop i strikes the spider g^2 and presses the valve member g away from its seat p^4. In the downward movement of the piston F′ the dash-pot fills with water through the valve e. When the entire valve H² is open, as described, water to the full capacity of the stand-pipe flows through the nozzle q'. The pressure of the water against the valve H² tends at all times to close the latter, so that the lever H′ must be held or locked down to hold the valve open.

To shut off the water the operating-lever H′ is released. The water-pressure against the under side of the valve member *g* maintains the latter in contact with the stop *i* and raises said valve member and rod against the resistance of the slowly-escaping water from the dash-pot until the valve member arrives at its seat p^4. The water-pressure against the valve member *f* causes the latter to continue in its rise and raise the rod H until the said valve member arrives at the seat *g′*. The dash-pot operates by retarding the upward movement of the rod H to prevent sudden closure of the valve, thereby avoiding a water-hammer. When the valve H^2 is open, and pressure against the base of the swinging column is thus relieved, the latter sinks in the chamber B′ and rests at the base of its basket on the base of the chamber. When the valve H^2 is closed, the swinging column will be raised by the water-pressure until its wheels *n* engage the surface *s′*. In its rise the rod H slides the valve *h* upward to open the outlet p^3 and cause the water in the swinging column to drain into the pit, where any suitable means may be provided for its escape.

While it is not necessary in carrying out my invention to provide for counterbalancing the entire weight of the swinging pipe or column when full of water with water-pressure, it is preferred to construct the parts with a view to having the water-pressure slightly overbalance said weight when the column is filled and the valve is closed. As in practice the water-pressure is rarely, if ever, below fifteen pounds to the square inch, I prefer to provide the lower end of the swinging column of an area with reference to the weight of the column which will cause pressure of fifteen pounds to the square inch against the closed valve to raise the column-bearings *n* to the bearing-surface *s′*. When the water-pressure materially exceeds fifteen pounds to the square inch, weights X, (indicated by dotted lines in Fig. 1,) sufficient to counterbalance the surplus pressure, may be placed upon the flange *r′*.

When my improvements are constructed as described, the swinging column will move without material friction, and there will be no such contact between moving surfaces as will produce material wear. By having the valve and valve-operating mechanism supported entirely by the swinging column any relative displacement between the latter and stationary base will not affect the valve or its operating mechanism. The opening *t* in the shell B, which is closed by the removable cap *t′*, renders the chamber B′ easily accessible when it is desired to clean it out. The shell B, as before explained, is formed in separable parts *x x′*, whereby, should it be necessary to remove the valve for repair or renewal, it may be done without disturbing the upper structure.

Fig. 2 shows the relative arrangement of parts when the valves are closed and the stand-pipe is swung out of the way to extend with its arm portion parallel with the track. The bearing-surface *s′*, against which the anti-friction-rollers travel, is of cam-shape on diametrically-opposite sides, (indicated by dotted lines in Fig. 2,) whereby in turning the stand-pipe to the position of extending at its arm portion across the track the rollers *n*, by their engagement with the cam portions of the bearing-surface *s′*, force the swinging column downward against the resistance of the water-pressure until the base of the basket C^2 is against the base of the chamber B′. Thus when the valve is opened to let the water flow through the column, the latter, being already down, will not drop and jar the parts, and when the valve is closed there will be no jarring of the parts by the sudden rise of the column. Furthermore, the pressure of the antifriction-wheels against the cams, under the force of the water when the valve is closed, tends to turn the column to the position of extending at its arm portion parallel with the track. Should it in any case be deemed desirable to mount the antifriction-wheels on the stationary base, to engage an annular bearing-surface on the swinging column, the said bearing-surface may be provided, obviously, with upward-projecting diametrically-opposed cams, in order to bring about the operation described.

While the particular details shown and described and the particular manner in which they are co-operatively combined are the best known to me, my aforesaid objects are attainable with mechanism variously modified. Hence I do not wish to be understood as limiting my invention to the particular construction shown and described. The modifications suggested, and others, may be employed to carry out my purpose in the general manner described without departing from the spirit of my invention as defined by the claims.

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

1. In a stand-pipe, the combination of a lower stationary chamber communicating with the water-supply, a swinging column in pivotal relation to said chamber, and a double valve, for opening and cutting off the flow of water, exposed to pressure from the water-supply, to afford when closed a bearing for the column at which the latter rests upon and is supported by said pressure, the valve comprising an inner valve-member seating against an outer valve-member, an operating rod connected with the inner valve member and movable to engage the outer valve-member, the said rod and valve being upon the swinging-column, substantially as and for the purpose set forth.

2. In a stand-pipe, the combination of a lower stationary chamber, communicating with the water supply, and having a round bearing opening in its upper side, and an annular bearing on its upper inner surface about said opening, a swinging-column extending at

its lower end-portion through and vertically movable in said bearing-opening, a valve closing against the lower end-portion of the swinging-column and exposed to pressure from the water-supply to afford when closed a bearing for the column at which the latter rests upon and is supported by said pressure, an operating rod for opening the valve, the valve and rod being mounted in the swinging-column, and a bearing on the swinging-column engaging and moving against the said annular bearing in the chamber, substantially as and for the purpose set forth.

3. In a stand-pipe, the combination of a lower stationary chamber communicating with the water-supply and having a round bearing opening in its upper side and an annular bearing on its upper inner surface about said opening, a swinging column provided with a basket in the said chamber and extending through and vertically movable in said bearing opening, anti-friction bearings on the swinging-column engaging the said annular bearing in the said chamber, a valve seating upward against the lower end of the swinging column and exposed to pressure from the water-supply to afford when closed a bearing for the column at which the latter rests upon and is supported by said pressure, an operating rod for the valve, the rod and valve being mounted in the swinging-column, a dash-pot in the basket provided with a piston connected with said rod, all constructed to operate substantially as described.

4. In a stand-pipe, the combination of a lower stationary chamber communicating with the water-supply and having a round bearing opening in its upper side surrounded by a stuffing-box, a swinging-column extending at its lower end portion through and vertically movable in said stuffing-box and provided at its lower end in the chamber with a double valve which when closed affords a bearing for the column at which the latter rests upon and is supported by said pressure, the valve comprising an annular valve member *g* and a valve member *f* seating against the member *g*, a drainage opening in the swinging-column above said stuffing-box, a valve *h* for opening and closing said opening, an operating rod in the swinging-column rigidly secured to the valve *h* and valve member *f*, a stop on the rod operating in the downward movement thereof when the valve member *f* has been moved from its seat to engage and open the valve member *g*, the said parts being constructed and combined to operate substantially as and for the purpose set forth.

5. In a stand-pipe, the combination of a lower stationary chamber, communicating with the water-supply, and having a round opening in its upper side and a bearing on its inner side about said opening, a swinging-column extending at its lower end portion through and vertically movable in said bearing opening and having bearing means engaging and moving against the said bearing in the chamber, a valve closing against the lower end portion of the swinging column and exposed to pressure from the water-supply to afford when closed a bearing for the column at which the latter rests upon and is supported by the said pressure, and an operating rod for opening the valve, the valve and rod being mounted in the swinging-column, and the said bearings, between the column and chamber, comprising anti-friction wheels on the one part and a bearing on the other part formed with diametrically opposed cams, which permit the column to rise in the chamber under the force of the said water-supply pressure as it is turned to one position and causes it to descend against said force as it is turned to another position, substantially as and for the purpose set forth.

MOSES M. MOORE.

In presence of—
M. J. FROST,
J. W. DYRENFORTH.