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RAILWAY WATER COLUMN

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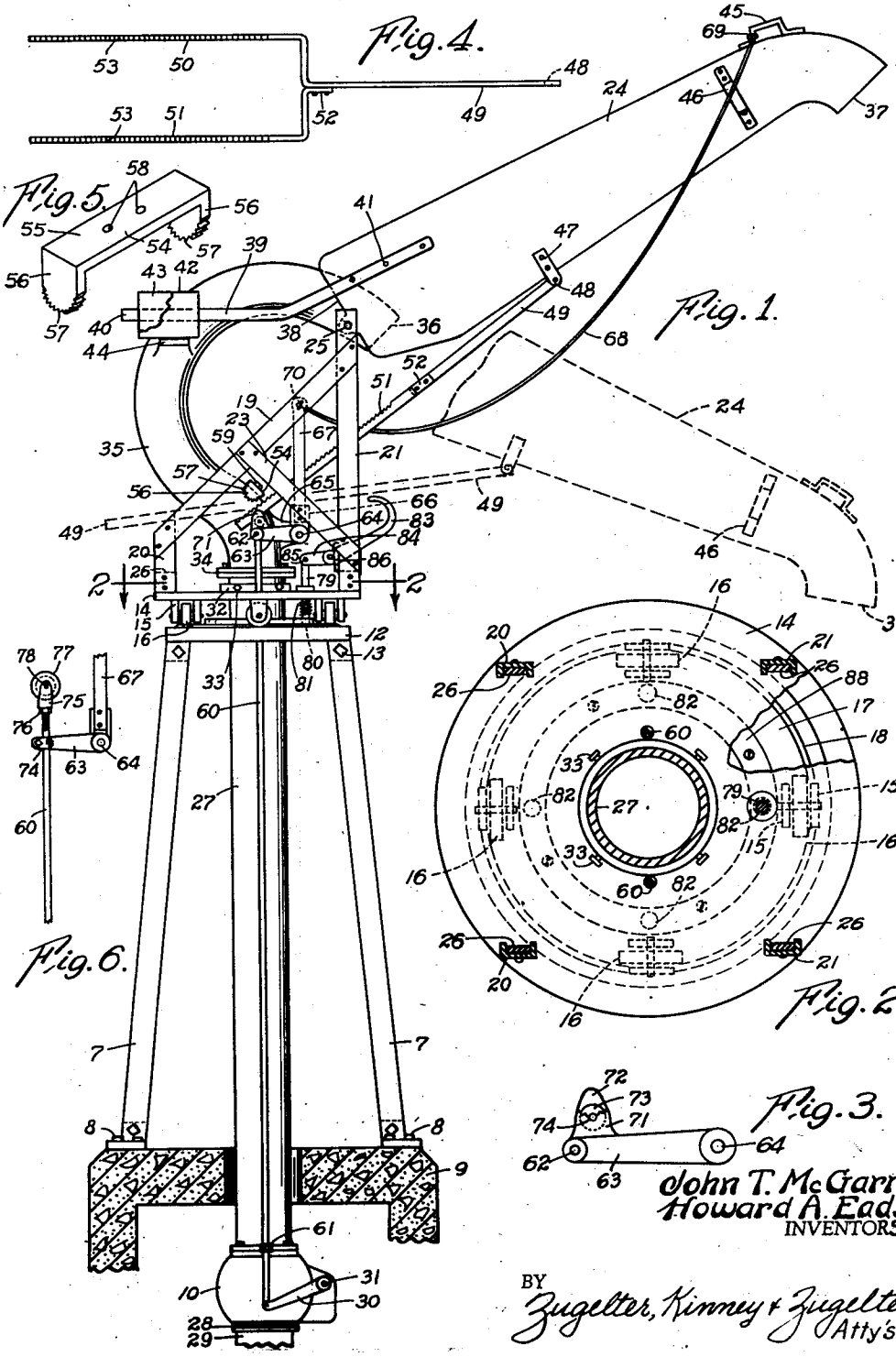


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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RAILWAY WATER COLUMN

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7 Claims. (Cl. 137—21)

This invention relates to a railway water column, the purpose of which is to serve boiler water to the reservoir or tank ordinarily carried by the locomotive tender.

One of the objects of the invention is to provide structural improvements in a water column, in the interests of simplicity, durability, safety, and reduction of costs in manufacture and maintenance.

Another object of the invention is to provide in a water column, novel means to facilitate and expedite normal usage of the device, in order to avoid unnecessary effort and delay in the running schedule of trains.

A further object is to provide a water column possessing the stated advantages, with provision made also for an increased delivery rate of water to the tank of the locomotive tender, utilizing existing sources of water supply serving the water column.

Another object of the invention is to structurally improve a water column in such manner as to render harmless thereto the strains and vibrations that occur incident to delivery of water, so that satisfactory service may be expected for long periods of time, under all weather conditions, without the need for frequent servicing.

Another object is to provide in a water column of the improved type disclosed herein, means which are effective, safe, and durable, for locking the delivery spout against kick-up as the water valve is opened initially to serve the tender.

The foregoing and other objects are attained by the means described herein and disclosed in the accompanying drawing, in which:

Fig. 1 is an elevational view, partly in cross-section, showing a water column embodying the new features of construction that constitute the present invention.

Fig. 2 is an enlarged cross-sectional view taken on line 2—2 of Fig. 1, part being broken away in the interest of clarity of disclosure.

Fig. 3 is a view of an actuating lever that forms a detail of the invention.

Fig. 4 is a plan view of the lock bar for the delivery spout.

Fig. 5 is a perspective view of a clutch element for the lock bar, utilized in the improved structure.

Fig. 6 is a detail view of a modified form of valve rod and clutching assembly.

Like the water columns presently in use, the water column of this invention is adapted for placement alongside a railway track, in position for swinging movement of its delivery spout from a normally inoperative position in parallelism with the track to an operative position at right angles to and overhanging the track and in registry with the manhole of the water reservoir of a locomotive tender. In the inoperative position of the delivery spout, the structure preferably is locked against accidental swinging movement, as will be explained. In the operative position, the spout is to be locked against kick-up resulting from delivery of water thereto by the nozzle of the standpipe. The foregoing general statements will be amplified as the description proceeds.

In accordance with the teaching of the present disclosure, the water column includes a rigid tower consisting of three or more uprights 7 having their lower ends securely bolted or otherwise fixed as at 8 to the pit structure 9 which houses the main valve 10 controlling the flow of water through the apparatus. At the upper ends of the uprights, the rigid tower carries a top cap 12 which is fixed as a 13 to the uprights. The top cap furnishes a base upon which may rotate an elevated turntable indicated generally by the character 14. The top cap and the turntable are located well beyond the reach of workmen concerned with operation of the water column, and the elevation of the turntable may approximate the height of a locomotive tender in the vicinity of the water hole of its tank or reservoir.

As illustrated by Figs. 1 and 2, the turntable 14 may be of disc shape, if desired, although it is at once observable that the turntable may alternatively be of spider configuration. In this respect, the shape of the turntable is relatively immaterial except for the advantage inherent in the disc shape of turntable, of providing coverage for the cap of the tower to exclude the deposit of dirt and foreign matter from the track upon which the turntable is guided in its rotational movement. In this regard, attention is directed to the series of brackets 15 that support the axles of rollers 16 arranged radially of the turntable, and which rollers rest upon the track 17 of the top cap as the turntable is rotated to and from the operative and inoperative positions. In order that the turntable may always be centered relative to the top cap, suitable means may be provided for keeping the axis of rotation of the turntable coincidental with the center point of the top cap. Such means conveniently may consist of a guide in the form of a circular ring or rib 18 bounding either the outer or the inner limits of the track 17. The guide means 18 obviously

may be replaced with other forms of guides capable of accomplishing the purpose thereof.

Upon the turntable there is rigidly mounted a frame or truss-work indicated generally by the character 19, which is adapted to rotate with the turntable. This truss-work may consist of suitable pairs of uprights 20 and 21 properly braced as at 19 and 23, to provide a very substantial support for the water delivery spout 24. As indicated at 25, the spout is pivoted upon the truss-work for movement from the full line position to the dotted line position of the spout, as illustrated. The pivotal point 25 is duplicated at the rear side of the apparatus, so that the spout will be supported by two spaced uprights 21. The truss-work may be fixed to the turntable in any suitable manner, such as by providing integral upstanding lugs 26 on the turntable, which may be bolted, riveted or otherwise fixedly secured to the channel irons that constitute the pairs of uprights 20 and 21. This structure is illustrated clearly in Fig. 2.

Centrally of the turntable, a suitable clamping means is provided for the support of a long straight standpipe 27 that is fixed at its lower end to the valve 10, so that the standpipe and the valve may rotate in unison. At 28 is shown a swivel union which permits the valve to rotate relative to the supply pipe 29 while at the same time maintaining a water tight connection therewith. The valve and the swivel union are located within the pit, below the frost line, so as to avoid freezing of the valve during the winter season. The valve, shown in closed position, may be opened by lifting the valve lever 30 and rotating it about the shaft 31.

The means on the turntable, whereby the standpipe is fixed for rotation with the turntable, may comprise a boss or a ring 32 in fixed relationship to the turntable, said ring or boss being receptive of the standpipe and adapted for fixation thereto in any suitable manner such as by means of one or more set screws or the like 33 projecting through the boss or ring and contacting the standpipe. It will accordingly be understood that bodily rotation of the turntable, which carries with it the delivery spout 24, is accompanied by bodily rotation of the straight standpipe 27 and the valve 10.

At the location 34, a joint is made between the upper end of the standpipe and the lower end of a gooseneck conduit 35, the connection at the joint being fixed so as to enforce rotation of the gooseneck conduit with the standpipe 27. The major portion of the gooseneck conduit is circular and is formed on a large diameter such that water fed through it from the standpipe will encounter very little resistance to flow, and will leave the nozzle 36 of the gooseneck conduit at a rapid rate of discharge. The nozzle 36, as will be noted preferably directs the stream of water outwardly and downwardly at an angle corresponding to the angle at which the delivery spout is inclined when in the operative position suggested by the broken lines of Fig. 1.

With further reference to the gooseneck conduit, it should be appreciated that the nozzle end thereof preferably is at a minimum elevation, at least as low as the roof of the average railway freight car, so that advantage may be had of the greatest possible head of water obtainable from a storage tank or other source of supply feeding the pipe 29 within the pit. Since in the majority of railway water systems the water column is supplied from an elevated storage tank of great capacity, it is desirable to reduce the height of the gooseneck conduit as much as possible in order to secure a maximum pressure and flow of water at the nozzle 36.

In maintaining the minimum elevation of gooseneck conduit 35, provision is made for normally supporting the delivery spout in an upwardly inclined position as illustrated by full lines at 24 of Fig. 1 with the delivery end 37 of the spout elevated sufficiently to clear the railway car roofs and the buckboards of the largest locomotive tenders. Accordingly, the pivotal points 25 of the delivery spout preferably are placed at substantially the elevation of spout 36, and are so arranged that the receiving end 38 of the delivery spout will register with the nozzle whether the spout be elevated or lowered. The spout preferably is counterbalanced by springs or weights, as may be preferred, the means of the present disclosure being in the form of a pair of counterbalance arms 39 and 40 secured to opposite sides of the spout at the location 41 and extending rearwardly thereof in spaced parallelism, the free ends of the arms being provided with counterbalance weights 42 and 43 as shown. Either the weights or the arms may normally rest upon suitable stops or abutments extending from opposite sides of the gooseneck conduit, as indicated at 44. The stops or abutments extend outwardly in opposite directions from the gooseneck conduit and may be made integral therewith, or as separate parts, as may be desired. The weights preferably are shiftable along the counterbalance arms.

The characters 45 and 46 indicate hand holds near the delivery end of the spout, to be used at the convenience of the trainmen in directing the delivery end of the spout into the water hole of the locomotive tender. The hand holds 46 may be duplicated at the opposite side of the spout.

At the location 47, the spout may be provided with a bracket to which is pivoted, at the point 48, a locking bar 49 that is adapted to cooperate with mechanism supported by the turntable for locking the spout in various operative positions, such as the position indicated by broken lines at 24, whenever the valve 10 is opened. The locking bar, shown in detail by Fig. 4, may be of fork shape, thereby providing the spaced parallel portions 50 and 51 joined at 52, where the locking bar becomes a single extension for pivotal connection with the bracket 47. The spaced parallel portions 50 and 51 are developed into racks, by providing teeth 53 along corresponding edges thereof. These teeth are adapted to engage the complementary teeth of a clutch element indicated generally by the character 54 (Fig. 5), which clutch element may include a cross head 55 having downwardly turned ears 56 rounded at their free ends and provided with teeth 57 complementary to the teeth of the locking bars. The ears 56 of the clutch element are spaced apart a distance corresponding to the space between the parallel elements 50 and 51 of the locking bar, so that when the locking bar is placed in engagement with the clutch element, the teeth of both sections 50 and 51 will engage the teeth of both ears 56—56 of the clutch element. Bolt holes 58 may be provided in the clutch element or its cross bar, for the reception of bolts 59 which fixedly secure the clutch element to the gooseneck conduit 35 (see Fig. 1).

Except when the rack teeth of the locking bar

are placed in engagement with the teeth 57 of the clutching element, the delivery spout may be elevated and lowered freely and without interference from the clutch apparatus. The apparatus is so arranged, however, that the act of opening the supply valve 10 will in every instance result in elevating the locking bar and placing its teeth in engagement with the fixed teeth of the clutching element 54. To accomplish this, the exposed valve rods 60, located at opposite diameters of the standpipe exteriorly thereof, are arranged for longitudinal movement vertically beneath the toothed ears 56—56 of the stationary clutching element 54. These rods 60 are guided at their lower ends by supporting them in perforated extending lugs 61 carried by the standpipe flange, or by the body of the valve, while at the upper ends the rods are pivoted as at 62 to the free ends of a pair of crank arms 63 which are fixedly mounted upon a horizontal shaft 64 journaled in bracket 65 that may constitute an integral part of the gooseneck conduit as shown, or which may conceivably extend from the body of the turntable or its framework. It should be understood that the shaft 64 is sufficiently long to support two crank arms such as 63, one at each of its ends, in order that both of the valve rods may be actuated in unison to open and close the valve when the shaft 64 is rocked within its bearing means. In order to rock the shaft 64 as stated, one of the arms 63 may carry a socket or other suitable device 66 to which may be fixed an upstanding valve rod actuating lever 67 arranged for movement by the mere application of a pulling force to a cable, rope, or the like 68 having one of its ends fastened to the delivery spout near its delivery end, as at 69, and its other end fastened as at 70, to the free end of lever 67.

From the foregoing, it will readily be understood that a trainman, upon positioning the delivery end of the spout over the water hole of a locomotive tender, may pull the cord or cable 68 and thereby cause the lever 63 to elevate the valve rods 60, for opening the supply valve. As will now be explained, the act of pulling the cord or cable 68 to open the valve, will result also in locking the spout in the lowered operative position.

As illustrated by Figs. 1 and 3, the arm 63 may carry a pair of upwardly projecting lugs 71—72 which are spaced apart sufficiently to provide guides preventing lateral movement of the rack portions of the locking bar. Between said lugs or extensions, a roller 73 may be interposed, for rotation upon a shaft 74, said roller providing a frictionless seat against which the backs of the rack portions may rest at all times. The rollers 73 are located directly beneath the toothed ears 56 of the clutch element 54, so that the rack portions of the locking bar will be maintained always in the planes of said ears. Accordingly, when the valve rods 60 are lowered as illustrated by Fig. 1, the racks will travel over the rollers 73 of each of the opposed arms 63, without liability of the teeth of the racks to engage the teeth of the clutch member. However, should the cord or cable 68 be pulled while the discharge spout is in a lowered position, the arms 63 will be moved in clockwise direction at the shaft 64, to elevate the rollers 73 and thereby cause the teeth of the racks to engage the teeth of the clutch element. At the same time, the valve rods 60 will be similarly elevated, to open the supply valve 10. A forceful stream of water thereupon will be discharged at the nozzle 36 and will enter the spout 24, and this stream of water in striking the down-turned delivery end of the spout will have a tendency to produce an up-kick of the delivery end of the spout, which up-kick, if not promptly arrested might throw the attendant from his station at the water hole of the locomotive tender, with the possibility of inflicting serious injury on him. The possibility of such dangerous actions of the spout is effectively prevented by reason of the fact that the water supply valve may never be opened without simultaneously locking the spout against kick-up. The spout locking means just described is simple in construction and dependable in its operation, so that accidents of the character above mentioned need never occur in connection with water columns equipped with the safeguards herein described.

In Fig. 6 is illustrated a slightly different form of means for elevating the locking bar into clutching engagement with a clutching element such as 54. In this modification, the lever 63 has at its outer end a clamping portion 74 adapted for fixation to the valve rod 60 at a distance from the upper end of the rod. The upper end of the rod carries a bifurcated bracket or sheave 75 held to the threaded upper end of the rod by means of a lock nut 76, this being for the purpose of adjustment of a roller 77 toward and from the clutch element 54. The roller 77 may be mounted for rotation upon a shaft 78 carried by the spaced arms of the bracket or sheave. In the modified form, roller 77 may have spaced outer flanges between which the rack portion of a locking bar may rest and be guided positively toward the teeth of the clutching element. As will be understood, the upper end of each of the two valve rods at opposite diameters of the standpipe, would be equipped with the means of Fig. 6. Various other means of supporting and shifting the locking bar may be devised, based upon the suggestions of Figs. 1, 3 and 6.

It is desirable that the turntable be held against rotation while the water column is in use, wherefore a suitable lock for the purpose may be incorporated in the structure. Such a lock is illustrated in Fig. 1 wherein the character 79 indicates a vertical reciprocal plunger having a lower end 80 to enter in one of a series of recesses or holes 82 (Fig. 2) provided in the top cap of the tower. The plunger may be urged toward the lower position by means of a spring 81, so that the plunger will be forced to drop into a depression 82 whenever the turntable is rotated to a predetermined position. A hook 83 having an extension 84 pivoted at 85 to the upper end of the plunger, serves as an actuator for the plunger. The hook 83 may be moved about its pivot 86 on the framework of the turntable, by means of any long bar or rod, such as a fireman's hook, which forms part of the equipment common to all locomotives. The various recesses 82 may be so located upon the top cap of the tower, as to receive the locking plunger 79 in both the operative and inoperative positions of the water column. While it is immaterial whether the recesses 82 be provided in the top cap or in a ring 88 fixed to the top cap, such a ring is illustrated as being satisfactorily operative for the purpose of stopping the plunger and providing a track upon which it may ride between successive recesses 82. The stop means for arresting rotational movement of the turntable, while not a necessary element of the ap-

paratus, is nevertheless a desirable and useful attachment as it not only precludes displacement of the spout from the region of the water hole, but it performs also to prevent accidental swinging of the discharge spout into the path of rolling stock that may be in transit along the railway tracks.

As stated in the introductory portion of the specifications, the structural improvements of the herein described water column are inducive to simplicity of manufacture and operation, to which may be added a substantial increase in durability and length of trouble free service. In the present structure, the major portion of all lateral strains and vibrations resulting from passage of water under high pressure through the gooseneck conduit and into the discharge spout, are effectively absorbed or distributed so as to prevent violent and harmful shaking and loosening of vital parts of the apparatus. As a direct result of the structural improvements incorporated in the present water column, its useful life is prolonged, with a substantial reduction in maintenance service.

It is to be understood that various modifications and changes in the structural details of the device may be made, within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. In a railway water column or the like, the combination of an apertured pit structure and a tower fixed in upstanding relationship to the pit structure and about the aperture thereof, a top cap on the tower including a circular track in a horizontal plane, a turntable above said cap, and roller means on the turntable to rest upon said circular track for support of the turntable during rotation of the latter, said turntable having a central opening, a standpipe extending vertically through said central opening and projecting downwardly into the aperture of the pit structure, a supply valve in the pit structure for control of fluid directed upwardly into the standpipe, means on the turntable to support the standpipe and enforce rotation of the standpipe with the turntable, a gooseneck conduit mounted for rotation with the turntable and having a nozzle for directing a flow of fluid from the standpipe downwardly and outwardly of the axis of rotation of the turntable, a frame upstanding upon the turntable in protective relationship substantially about the gooseneck conduit, a delivery spout having an outer delivery end and an inner receiving end, the latter end being receptive of fluid discharging from the nozzle of the gooseneck conduit, means on the turntable frame for supporting the inner receiving end of the delivery spout pivotally to guide the spout vertically along an arcuate path of movement from an upwardly inclined inoperative position to a downwardly iclined operative position, a vertical valve actuating rod supported by the turntable for reciprocatory movement to control the valve, and means associated with that portion of the rod which extends above the turntable, for effecting fixation of the spout upon movement of the rod in one direction of reciprocation.

2. In a railway water column or the like, the combination of an apertured pit structure and a tower fixed in upstanding relationship to the pit structure and about the aperture thereof, a supply valve within the pit structure beneath the aperture thereof, an upright standpipe having a lower end projected through the aperture aforesaid and having a fluid communicating relationship with the valve, said standpipe being surrounded by the tower substantially throughout the height of the standpipe, a rotatable turntable atop the tower and having a central opening accommodating the upper end of the standpipe, means securing the standpipe to the turntable for rotation therewith, a nozzle element fixed to the upper end of the standpipe and arranged to direct a stream of water laterally therefrom, an adjustable delivery spout pivoted upon the turntable and movable to guide the stream, and valve actuating means movable with the turntable, including an upright reciprocable valve rod extending along the standpipe exteriorly thereof, and through the aperture of the pit structure, said rod having an operating connection with the valve and being surrounded and protected by the tower throughout substantially the full height of the valve rod above the pit structure aperture, a depending brace on the delivery spout having a free end disposed in close proximity with the upper end of the valve rod, and means operative as the valve rod is reciprocated in opposite directions, to selectively clamp the brace between the valve rod end and a stationary part of the nozzle element.

3. In a railway water column or the like, the combination of a standpipe having upper and lower ends, a water control valve in fluid communicating relationship with the lower end of the standpipe, a nozzle at the upper end of the standpipe, and a hollow adjustable delivery spout supported to receive a stream of water from the nozzle and to direct said stream toward a receptacle, a locking bar carried by the delivery spout, a vertically reciprocable valve rod having at one end an operative connection with the valve to open and close the latter, said rod being disposed wholly exteriorly of and in parallelism with the standpipe, and substantially coextensive therewith, the opposite end of said valve rod having associated therewith a member to normally support the weight of the locking bar, and means to clutch and release the locking bar as the valve rod is vertically reciprocated in opposite directions.

4. In a railway water column or the like, the combination of a standpipe having upper and lower ends, a water control valve in fluid communicating relationship with the lower end of the standpipe, a nozzle at the upper end of the standpipe, and a hollow adjustable delivery spout supported to receive a stream of water from the nozzle and to direct said stream toward a receptacle, a locking bar carried by the delivery spout, a vertically reciprocable valve rod having at one end an operative connection with the valve to open and close the latter, said rod being disposed wholly exteriorly of and in parallelism with the standpipe, and substantially coextensive therewith, the opposite end of said valve rod having associated therewith a member to normally support the weight of the locking bar, and a clutching element for the locking bar, disposed for engagement and disengagement with the locking bar as the member supporting the weight of the locking bar is shifted by the valve rod toward and from the clutching element.

5. In a railway water column or the like, the combination of a standpipe having upper and lower ends, a water control valve in fluid communicating relationship with the lower end of the standpipe, a gooseneck conduit fixed at the up-

per end of the standpipe, and a hollow adjustable delivery spout supported to receive a stream of water from said conduit and to direct said stream toward a receptacle, a rigid fixed tower surrounding the standpipe in protective relationship thereabout, said tower including a top portion disposed at a substantial elevation approximating the height of the upper end of the standpipe where the latter meets the gooseneck conduit, a turntable rotatable upon the top portion of the tower, means on the turntable supporting the adjustable delivery spout for arcuate movement in a vertical plane, means fixing the upper end of the standpipe to the turntable for rotation therewith, and a vertically reciprocable valve rod disposed exteriorly of the standpipe along the full length of the latter, said valve rod having an operative connection with the valve at its lower end, means near the opposite end of the valve rod for imparting vertical movements thereto and operating said valve to open and closed positions, and means operating concurrently with movements of the valve rod, to lock the delivery spout against movements from an adjusted position.

6. In a railway water column or the like, the combination of a standpipe having upper and lower ends, a water control valve in fluid communicating relationship with the lower end of the standpipe, a nozzle at the upper end of the standpipe, and a hollow adjustable delivery spout supported to receive a stream of water from the nozzle and to direct said stream toward a receptacle, a locking bar pivotally mounted upon the delivery spout in depending relationship thereto and having a free end directed obliquely downwardly toward the standpipe axis, a vertically reciprocable valve rod having at one end an operative connection with the valve to open and close the latter, said rod being disposed wholly exteriorly of and in substantial parallelism with the standpipe, the opposite end of said valve rod having asscciated therewith a member to contact and move the locking bar about its pivotal mounting incident to reciprocation of the valve rod, and clutch means to grip and release the locking bar upon movement of the valve rod and the contact member in opposite directions with the valve rod.

7. In a railway water column or the like, the combination of a standpipe having upper and lower ends, a water control valve in fluid communicating relationship with the lower end of the standpipe, a nozzle at the upper end of the standpipe, and a hollow adjustable delivery spout supported to receive a stream of water from the nozzle and to direct said stream toward a receptacle, a locking bar pivotally mounted upon the delivery spout in depending relationship thereto and having a free end directed obliquely downwardly toward the standpipe axis, a vertically reciprocable valve rod having at one end an operative connection with the valve to open and close the latter, said rod being disposed wholly exteriorly of and in substantial parallelism with the standpipe, a contact member movable with the valve rod to impart slight rotation to the locking bar about its pivotal mounting to a locking position, a clutch member fixed relative to the standpipe nozzle in position to engage with and grip the locking bar when so moved to locking position by the contact member, and means controllable from the region of the delivery spout, to selectively reciprocate the valve rod for opening the valve and locking the locking bar to the clutch member unitarily.

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