No. 816,152. PATENTED MAR. 27, 1906.

W. F. CONRAN, JR.

STAND PIPE SYSTEM.

APPLICATION FILED JULY 23, 1903.

3 SHEETS—SHEET 1.

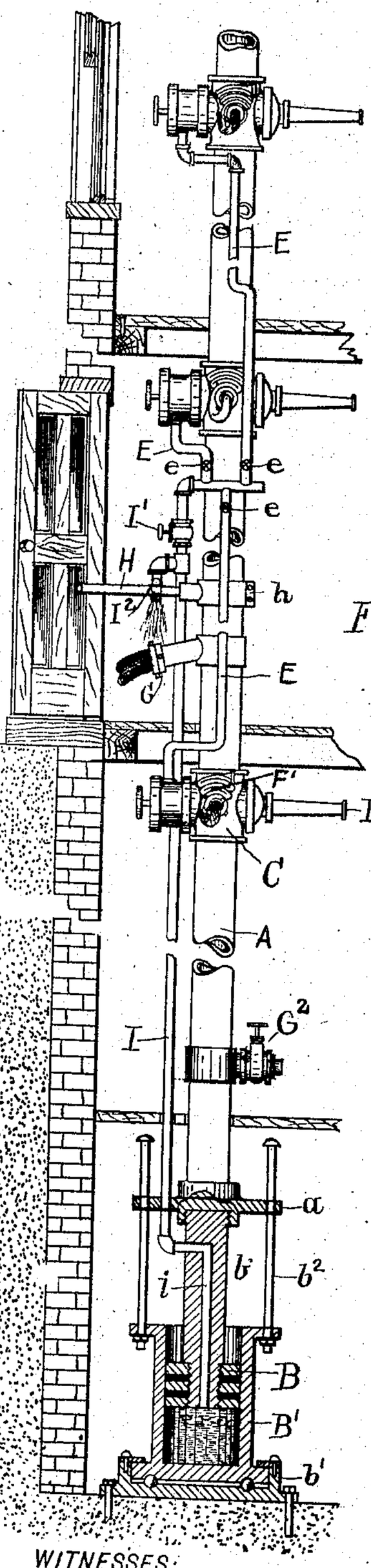
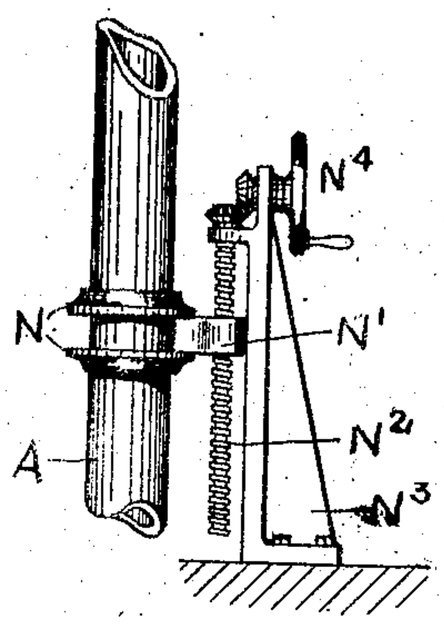


Fig. 1.

Fig. 6.



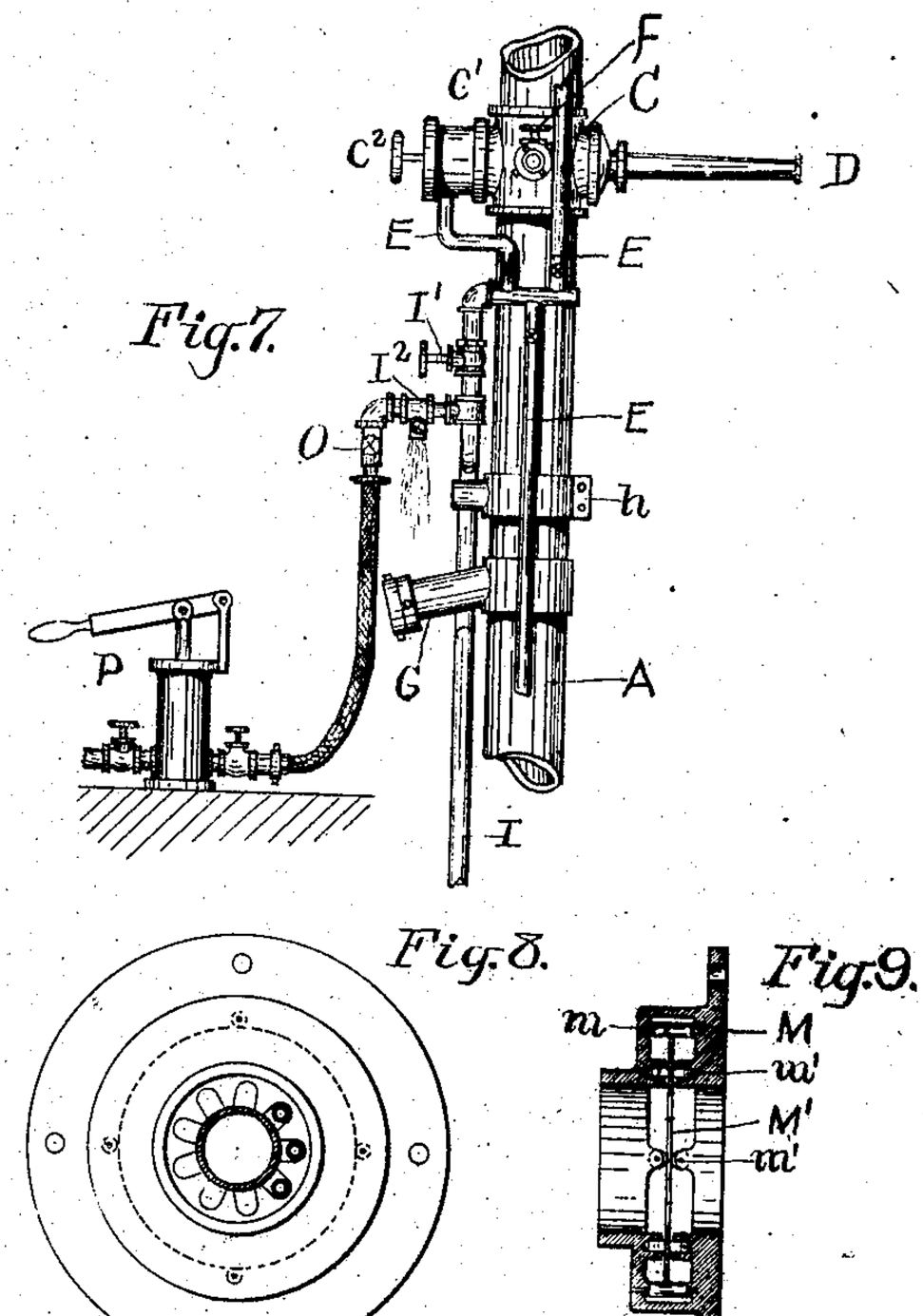


Fig. 7.

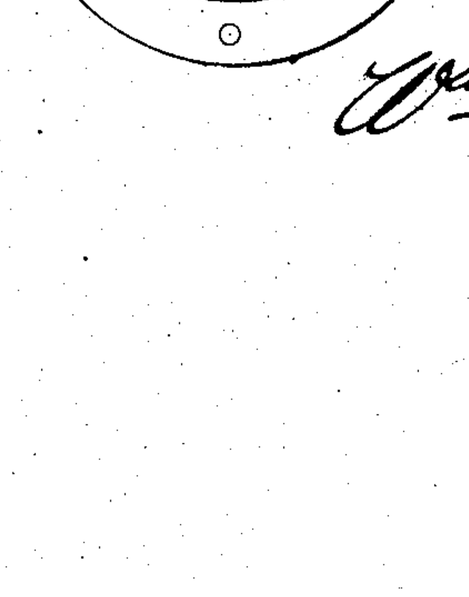


Fig. 8.

Fig. 9.

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3 SHEETS—SHEET 2.

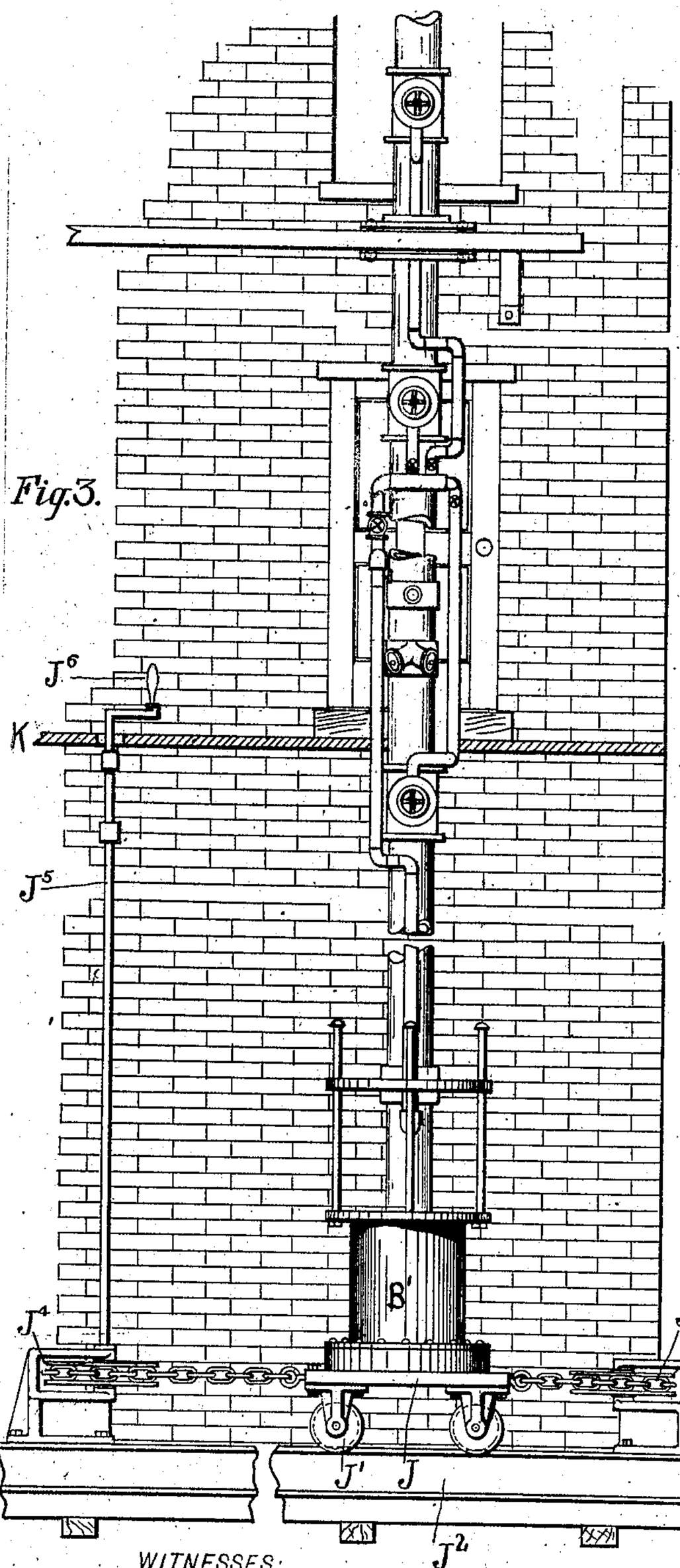

Fig. 3.

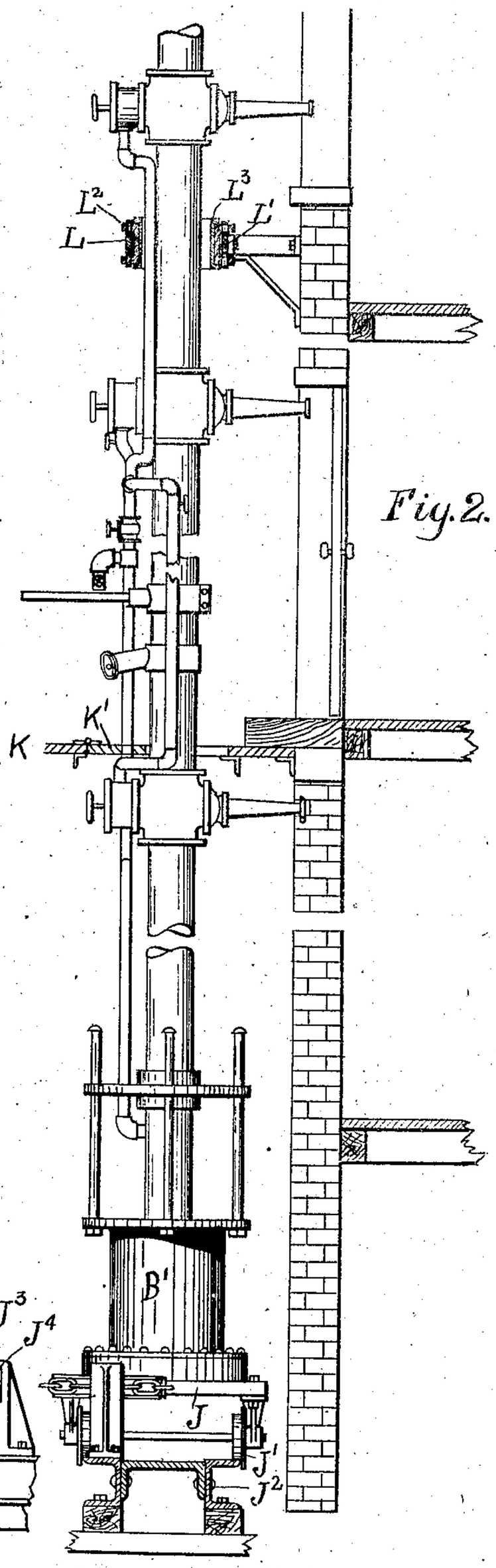

Fig. 2.

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3 SHEETS—SHEET 3.

Fig 4.

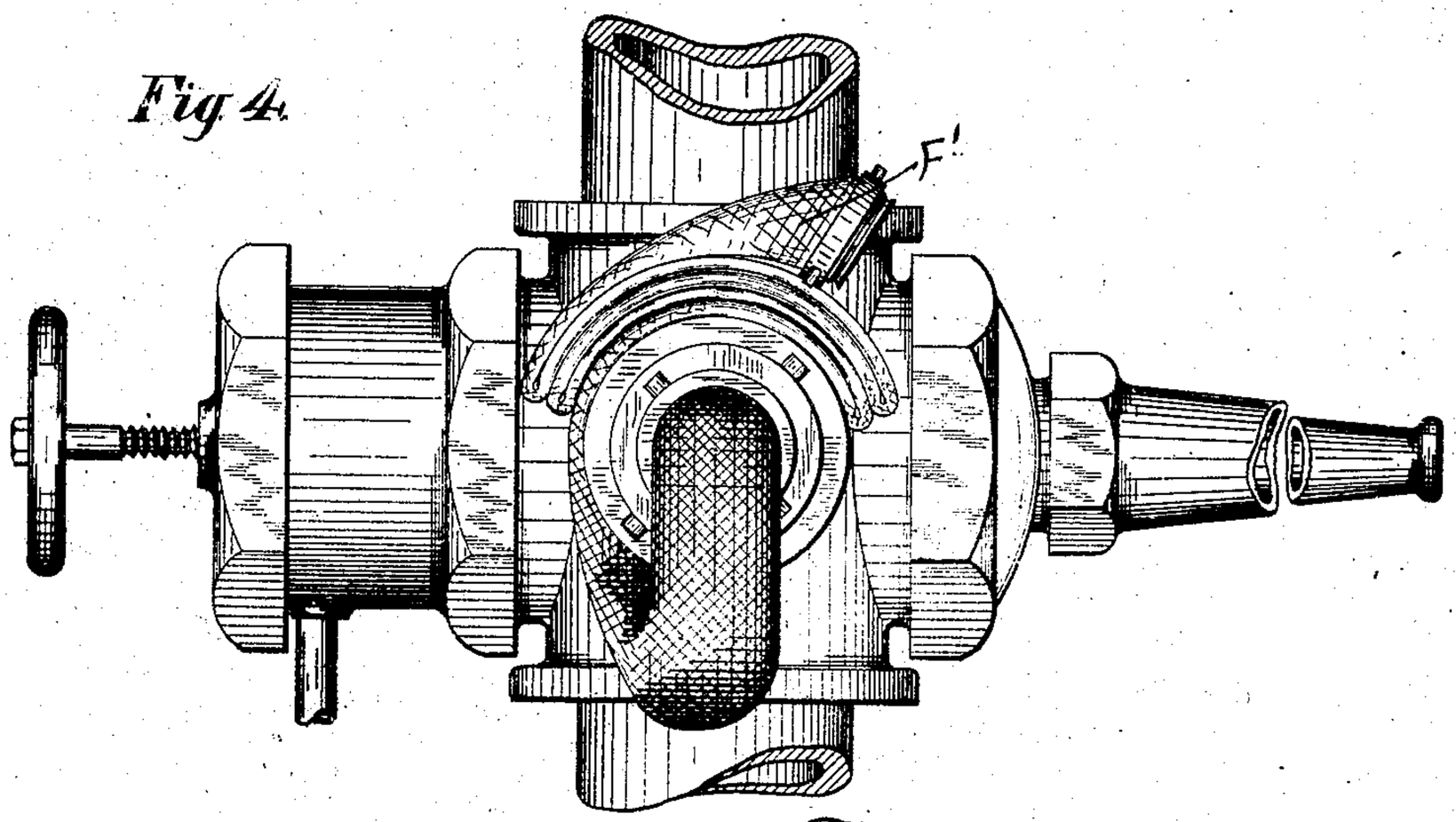
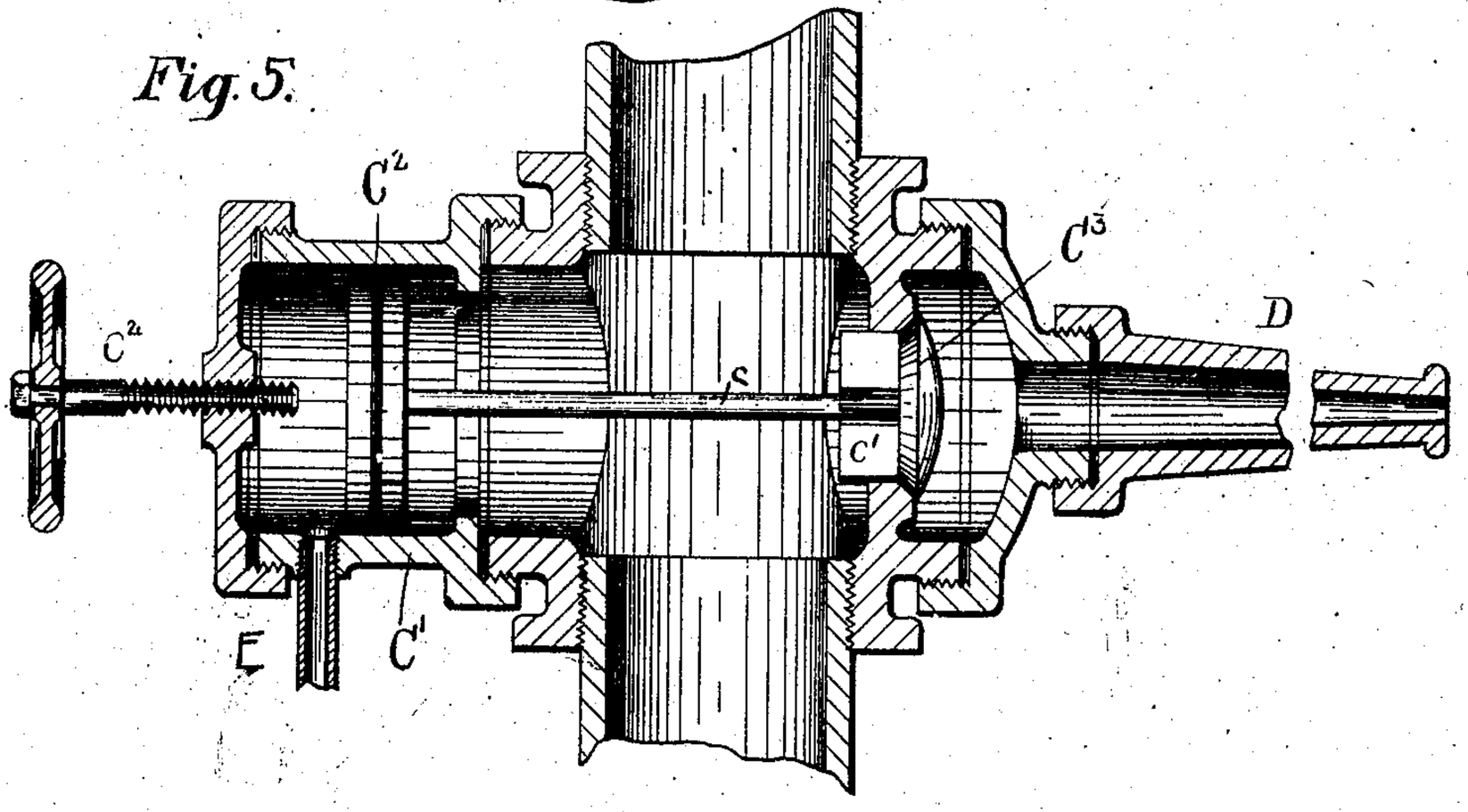


Fig. 5.



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UNITED STATES PATENT OFFICE.

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STAND-PIPE SYSTEM.

No. 816,152. Specification of Letters Patent. Patented March 27, 1906.

Application filed July 23, 1903. Serial No. 166,695.

To all whom it may concern:

Be it known that I, WILLIAM F. CONRAN, Jr., a citizen of the United States, residing in the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Stand-Pipe Systems, of which the following is a specification.

Stand-pipes for buildings, and particularly factories and warehouses, as installed at the present time are fixed in position and supplied at each floor with a hand-operated valve to which a fire-hose of suitable length is coupled. In all these installations it is obvious that to make use of the stand-pipe to extinguish a fire on any floor it is necessary in nearly all cases to reach that particular floor, uncoil the hose, and open the valve, and then the nozzle of the hose must be held and the stream directed by persons on that floor. This in many instances is extremely dangerous, since the fire may extend to other floors and the stairways and cut off escape from the burning building. Aside from this it is also obvious that the hose after being coiled or folded for a long period becomes leaky and in many instances useless, so that the stand-pipe is thereby rendered entirely inoperative for directing a stream of water on a fire. It is also obvious that if a fire should start close to the stand-pipe or to the coil of hose the heat and flame may do considerable damage to both, and if the fire were not reached in time it would undoubtedly burn the hose and render it useless, if not wholly consumed by the flames. These disadvantages are overcome by my invention, the main object of which is to provide a stand-pipe which will be capable of rotary and vertical movement and which pipe is provided with a series of nozzles, one or more at each floor, each controllable from an operating-station located at a convenient place near the street and the stream from which nozzles may be directed to any point by rotating, raising, or lowering the stand-pipe through mechanism also controlled or operated at the operating-station.

Another feature of my invention is to place the stand-pipe on the exterior of the building and support it in such manner that it may be caused to travel along the building so that streams may be directed into a fire through windows nearest thereto. This arrangement has another and perhaps more important advantage in that streams may be directed into a fire across a street and through almost any desired windows, thus taking the place of the water-tower employed by fire-departments. This is very important, since stand-pipes can stand a much heavier pressure, and the danger to the men required to control the stream is largely, if not entirely, removed. Furthermore, in many narrow streets common in warehouse districts a water-tower cannot be safely used on account of its proximity to the burning building and consequent danger to the men from the effects of heat and smoke and danger of falling walls, and, further, the tower is too close to direct a stream into upper windows.

In carrying my invention into effect I employ a stand-pipe which is movable vertically, either hydraulically or mechanically, and which is capable of rotary movement, such movement being imparted by suitable mechanism, but preferably by a long bar inserted into holes in a collar on the stand-pipe. I also employ valves at each floor, which are held normally closed by the water-pressure when connection is made with the stand-pipe and which valves are controlled from a common point, preferably hydraulically, so that any desired valve may be opened and a stream from the nozzle carried thereby directed to any point by a vertical or rotary movement of the stand-pipe or by imparting both movements simultaneously.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical elevation of part of an interior stand-pipe with the floors and front wall of a building in section; Fig. 2, a similar view of an exterior stand-pipe; Fig. 3, a front elevation of the apparatus of Fig. 2; Figs. 4 and 5, an elevation and vertical section, respectively, of the discharging valve and nozzle; Figs. 6 and 7, vertical elevations of modified arrangements for imparting the vertical movements to the stand-pipe; and Figs. 8 and 9, a plan and central section, respectively, of a floor-plate through which the stand-pipe and controlling mechanism or pipes pass.

Referring to the drawings, and particularly to Fig. 1, A represents the stand-pipe, screwed into a water-tight base-plate *a*, which is mounted at the top of stem *b* on a vertically-movable piston B. This piston

works in a cylinder B′, having a base mounted on ball or roller bearings in seat b', secured to the cellar-floor. Plate *a* has four or more holes for guide-rods b^2, projecting from the upper flange of cylinder B′, which rods and plate serve as guides for the piston. As shown, the stand-pipe is in an elevated position, water having been admitted to the piston-chamber, as hereinafter described, and to lower the pipe the water-pressure to the cylinder is first cut off and the water in the cylinder allowed to escape at the desired rate. Pipe A at each floor is provided with one or more valve-chambers C, having nozzles D screwed thereon. Each valve-chamber is provided with a piston-chamber C′, Fig. 5, within which works a piston C^2, having a stem *c*, at the opposite end of which is a valve C^3, provided with guide-flanges *c*′. This valve controls the flow of water to nozzle D. When the water rises in the stand-pipe, the pressure on piston C^2 overbalances the pressure on valve C^3 and the valve therefore is held to its seat. To open the valve, water is admitted to the chamber behind piston C^2 through a pipe E, and the pressure on the piston is then equalized, whereupon the pressure on the valve will open the same and permit the flow of water to the nozzle. For the purpose of testing the valve and also for the purpose of hand control, if desired, I provide a screw and hand-wheel c^2, which screw when moved against the piston will drive it forward and open the valve. I have also shown the valve-chamber C as provided with the usual hand-valve F, Fig. 7, to which the usual hose F′, Figs. 1 and 4, is coupled, so that the stand-pipe may be employed in conjunction with a hose-line when possible or for throwing a stream on a fire in an adjacent building. The pipes E extend to an operating-station, which may be located at any convenient and readily-accessible place in the building, but preferably in a compartment having a door opening into the street, as shown in Fig. 1. In this compartment the stand-pipe is provided with a T connection from which extends the control-pipes E, each of said pipes being provided with a normally closed hand-valve *e*. These valves are provided with ordinary discharge-ports, which are closed when valves *e* open communication between the stand-pipe and chambers C′, and when said valves are closed to cut off the pressure at the rear of pistons C^2 the discharge-ports of valves *e* stand open and discharge the water from control-pipes E. Within this compartment the stand-pipe is also provided with the usual two, three, or four way Siamese couplings G for the hose-lines from fire-engines which supply the water. In order that the stand-pipe may be operated without waiting for fire-engines for the water-supply, I provide a valve G^2, having a screw-threaded flange at the port for a hose-coupling, so that the stand-pipe may be connected with the water-pump of the building. From the foregoing it will be seen that when water is supplied to the stand-pipe a stream may be delivered from any one or more nozzles D by opening the proper valve or valves *e* to admit water to the rear of the operating-piston of the valve or valves C^3 it is desired to open, and when it is desired to shut off the flow of water from the nozzle it is only necessary to close the valve *e*, whereupon the pressure on the rear of piston C^2 is shut off and the pressure on the opposite side will overbalance the pressure on valve C^3 and effect its closure.

To rotate the stand-pipe, I preferably provide a collar *h*, having one or more sockets for a hand-bar H, whereby the pipe may be rotated. This rotation may be accomplished by rotating the cylinder and pipe on the roller-bearing above referred to or the guides b^2 might be dispensed with and cylinder B held stationary, in which case the pipe and piston would be rotated relative to the cylinder.

To raise and lower the stand-pipe, water is admitted to cylinder B′ through pipe I and port *i* in the piston-stem *b*. This pipe is coupled to the T connection and is provided with an inlet-valve I′ and an exhaust-valve I^2. When the stand-pipe is to be raised, valve I^2 is closed and valve I′ is opened. This permits the flow of water from the stand-pipe through pipe I to cylinder B′, and the pressure on piston B raises the pipe, and when the desired elevation is obtained valve I′ is closed. To lower the stand-pipe, valve I^2 is opened, whereupon the weight of the pipe will drive the water from the cylinder and the descent controlled by opening the valve I^2 to a greater or lesser extent. The stand-pipe may be caused to rise and fall continuously by alternately opening and closing valves I′ and I^2, and simultaneously with such movement the stand-pipe may be rotated. Thus a stream from a nozzle may be caused to sweep over almost the entire area of a loft.

At each floor of the building I provide a floor-cap M, having a perforated plate M′ working between vertical rollers *m* and horizontal rollers *m*′, as shown in Figs. 8 and 9. Plate M′ has a scalloped central opening for the stand-pipe, and the control-pipes E are placed in the scallops. These plates serve as guides for the stand-pipe and hold it against lateral movement, thus serving to maintain the pipe-sections in alinement. The stand-pipe and control-pipes are free to move vertically through the plates, and when the stand-pipe is rotated plates M′ will rotate in the caps M.

In Figs. 2 and 3 the same general arrangement is illustrated as applied to the exterior of a building, and similar parts are marked with the same reference-letters. In this

illustration the exterior stand-pipe is designed to be shifted along the building, and for this purpose cylinder B′ is mounted on a platform J, having wheels J′ running on tracks or girders J^2, secured to the cellar-floor along the wall of the building. The platform or truck has secured to it an endless chain J^3, running around a pair of sheaves J^4, one or both of which being provided with a driving-rod J^5 and a crank J^6, the latter projecting through an opening in the usual vault cover or grating K. The stand-pipe will normally stand at one end of the building, where an opening in the cover K is provided therefor. In order to permit the shifting of the stand-pipe, the vault-cover K is provided with hinged sections K′, Fig. 2, the full width of the building. To guide the stand-pipe and hold it in position, I provide guide-bars L and L′ at each story of the building, and between each pair of bars is a block L^2, having roller-bearings and a circular opening in which is a flanged block or collar L^3, free to rotate on said block L^2 and provided with passages for pipes A and E similar to those of plate M′ in Figs. 8 and 9. The stand-pipe A and control-pipes E pass freely through collar L^3 when moved vertically, and when the stand-pipe is rotated collar L^3 rotates on block L^2.

From the foregoing and by reference to Figs. 2 and 3 it will be seen that the stand-pipe may be moved along the building and a stream directed from any one or all of the nozzles into the windows or doors and that the pipe may be raised or lowered and rotated to cover a large area with each stream. It will also be seen that the pipe may be turned entirely around and the nozzles pointed across the street to throw a stream into a building on the opposite side of the street. By moving the pipe along a stream may be directed into any window, and since the floors of the opposite building might not be on the same level the vertical movement of the stand-pipe will permit the adjustment of the nozzles to the proper elevation for directing the streams into the windows.

In Figs. 6 and 7 are illustrated the modifications of the means for obtaining the vertical movement of the stand-pipe. In Fig. 6 the stand-pipe is provided with two flanges N, between which a block N′ is placed, said block having a screw-threaded hole in which works a screw N^2, which is journaled and held against longitudinal movement in a bearing on bracket N^3. At the upper end of screw N^2 is miter spur-gear which meshes with a similar gear on a hand-wheel N^4. By turning the hand-wheel screw N^2 is rotated and block N′ caused to travel along the thread thereof and which block through flanges N moves the pipe A up or down, according to the direction of rotation of the screw. The stand-pipe may be rotated by means such as above described, and in doing so flanges N and block N′ slide upon each other. It is evident that many modifications of this arrangement for imparting the vertical movement to the stand-pipe may be made.

In Fig. 7 the arrangement for obtaining the vertical movement of the stand-pipe is similar to that of Fig. 1, except that a hand-pump is shown for forcing water through pipe I into the cylinder B′. For this purpose the outlet I^2 is provided with an extension and valve O, to which a flexible connection is made from a hand-pump P. In operating this apparatus to elevate the stand-pipe valves I′ and I^2 are closed and valve O is opened, whereupon the pump is operated and water forced into cylinder B′. To lower the stand-pipe, valve O is closed and outlet-valve I^2 is opened. This arrangement of valves I′, I^2, and O is preferable to that of Fig. 1, because cylinder B′ may be supplied with water either from the stand-pipe through valve I′ or through the hand-pump and, further, because the hand-pump connection affords a convenient way for testing the stand-pipe from time to time.

It will be understood that my invention may be modified in many respects. For instance, the various valves illustrated might be altered, or the arrangement for operating the nozzle-valves might be altered, or other means for rotating or for imparting the vertical movement to the stand-pipe might be employed, all without departing from the spirit of my invention.

What I claim is—

1. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for moving said pipe vertically to vary the striking-points of streams issuing from the nozzles.

2. In a stand-pipe system for buildings, the combination of a rotary stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

3. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for moving said pipe laterally to vary the striking-points of streams issuing from the nozzles.

4. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for moving said pipe vertically

and laterally to vary the striking-points of streams issuing from the nozzles.

5. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for moving said pipe vertically and also for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

6. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for moving said pipe laterally and also for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

7. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and means for moving said pipe vertically, laterally and also for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

8. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, and hydraulic means for moving said pipe vertically to vary the striking-points of streams issuing from the nozzles.

9. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, hydraulic means for moving said pipe vertically, and means for moving said pipe laterally, whereby by either of said movements the striking-points of streams issuing from the nozzles may be varied.

10. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, hydraulic means for moving said pipe vertically, and means for rotating said pipe, whereby by either of said movements the striking-points of streams issuing from the nozzles may be varied.

11. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for controlling said valves independently from a common point, hydraulic means for moving said pipe vertically, means for rotating said pipe, and means for moving said pipe laterally, whereby by either of said movements the striking-points of streams issuing from the nozzles may be varied.

12. In a stand-pipe system for buildings, the combination of a stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, and means for hydraulically controlling said valves independently from a common point.

13. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for hydraulically controlling said valves from a common point, and means for moving said pipe to vary the striking-points of streams issuing from the nozzles.

14. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for hydraulically controlling said valves independently from a common point, and means for moving said pipe vertically to vary the striking-points of streams issuing from the nozzles.

15. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for hydraulically controlling said valves independently from a common point, and means for moving said pipe laterally to vary the striking-points of streams issuing from the nozzles.

16. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valves carried by said pipe at several points, means for hydraulically controlling said valves independently from a common point, and means for moving said pipe vertically and laterally to vary the striking-points of streams issuing from the nozzles.

17. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for hydraulically controlling said valves independently from a common point, and means for moving said pipe vertically and also for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

18. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for hydraulically controlling said valves independently from a common point, and means for moving said pipe laterally and also for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

19. In a stand-pipe system for buildings, the combination of a movable stand-pipe, a nozzle and controlling-valve carried by said pipe at several points, means for hydraulically controlling said valves independently from a common point, and means for moving

said pipe vertically and laterally and also for rotating said pipe to vary the striking-points of streams issuing from the nozzles.

20. In a stand-pipe system, the combination of a stand-pipe, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

21. In a stand-pipe system, the combination of a movable stand-pipe, means for moving the same, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

22. In a stand-pipe system, the combination of a laterally-movable stand-pipe, means for moving the same, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station, and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

23. In a stand-pipe system, the combination of a vertically-movable stand-pipe, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station, and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

24. In a stand-pipe system, the combination of a rotary stand-pipe, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station, and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

25. In a stand-pipe system, the combination of a laterally-movable and rotary stand-pipe, means for moving and rotating the same, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station, and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

26. In a stand-pipe system, the combination of a vertically-movable and rotary stand-pipe, means for moving and rotating the same, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station, and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

27. In a stand-pipe system, the combination of a laterally and vertically movable and rotary stand-pipe, means for imparting lateral or vertical or rotary movement thereto, one or more discharge-valves, a piston connected with each valve, a control-pipe connected between the chamber of each piston and a branch from the stand-pipe located at an operating-station, and a valve in each control-pipe whereby said discharge-valves are controlled from the operating-station.

28. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, means for moving said pipe-line lengthwise, and means for holding said pipe-line in alinement.

29. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, means for moving said pipe-line lengthwise, means for rotating said pipe-line, and means for holding said pipe-line in alinement.

30. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, hydraulic means for moving said pipe-line lengthwise, and means for holding said pipe-line in alinement.

31. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, hydraulic means for moving said pipe-line lengthwise, means for rotating said pipe-line, and means for holding said pipe-line in alinement.

32. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, means for moving said pipe-line lengthwise, means for moving said pipe-line laterally, and means for holding said pipe-line in alinement.

33. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, means for moving said pipe-line lengthwise, means for moving said pipe-line laterally, means for rotating said pipe-line, and means for holding said pipe-line in alinement.

34. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length,

one or more water-supply connections, nozzles connected with said pipe-line at desired points, hydraulic means for moving said pipe-line lengthwise, means for moving said pipe-line laterally, and means for holding said pipe-line in alinement.

35. In a stand-pipe system for buildings, the combination of a pipe-line of fixed length, one or more water-supply connections, nozzles connected with said pipe-line at desired points, hydraulic means for moving said pipe-line lengthwise, means for moving said pipe-line laterally, means for rotating said pipe-line, and means for holding said pipe-line in alinement.

This specification signed and witnessed this 18th day of July, 1903.

WILLIAM F. CONRAN, JR.

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WM. BEZER.