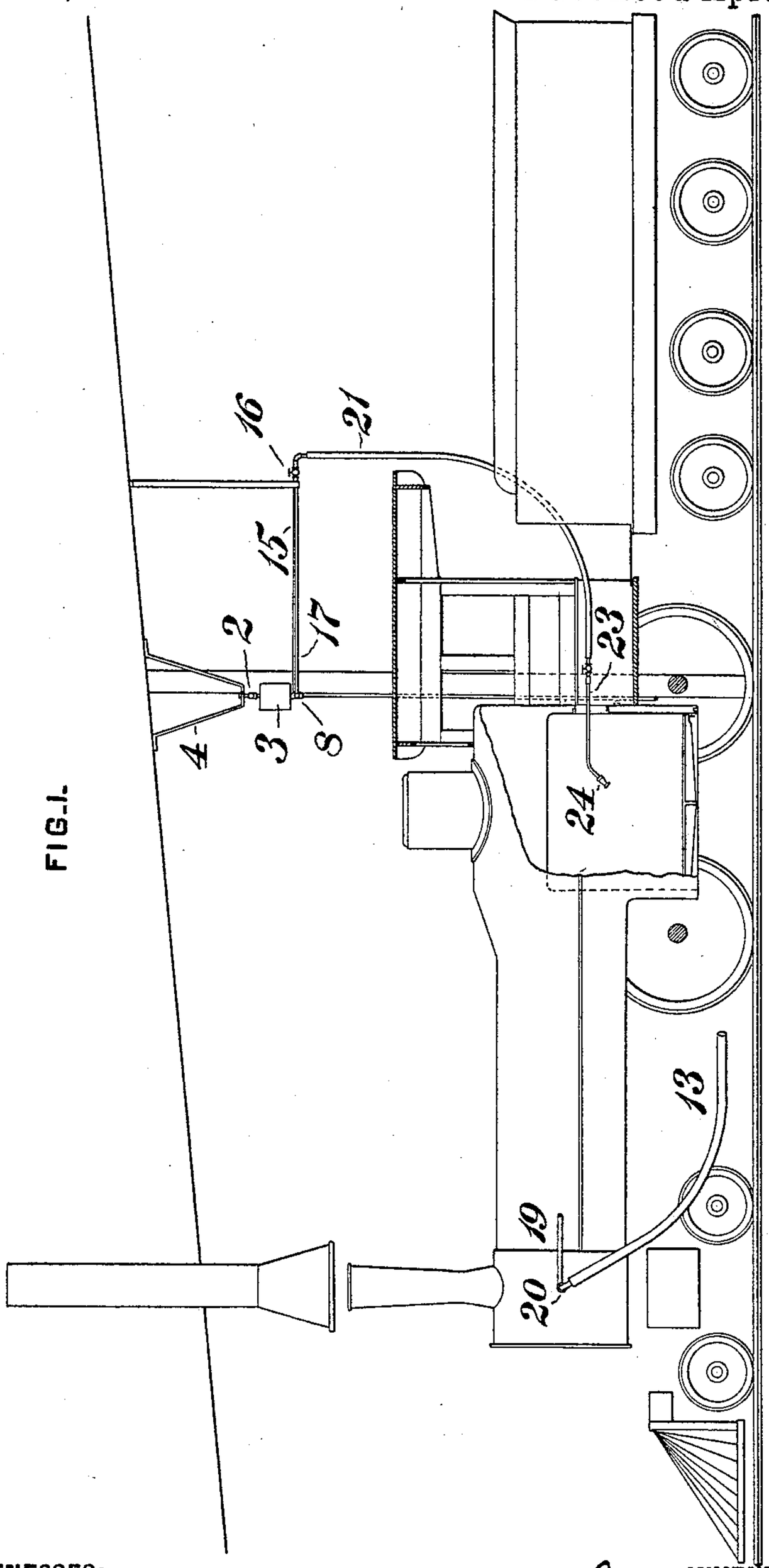
(No Model.) 2 Sheets—Sheet 1.

# J. McNAUGHTON.

## FLUID DISTRIBUTION APPARATUS.

No. 495,904. Patented Apr. 18, 1893.

FIG. 1.

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(No Model.) 2 Sheets—Sheet 2.

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## FLUID DISTRIBUTION APPARATUS.

No. 495,904. Patented Apr. 18, 1893.

FIG. 3.

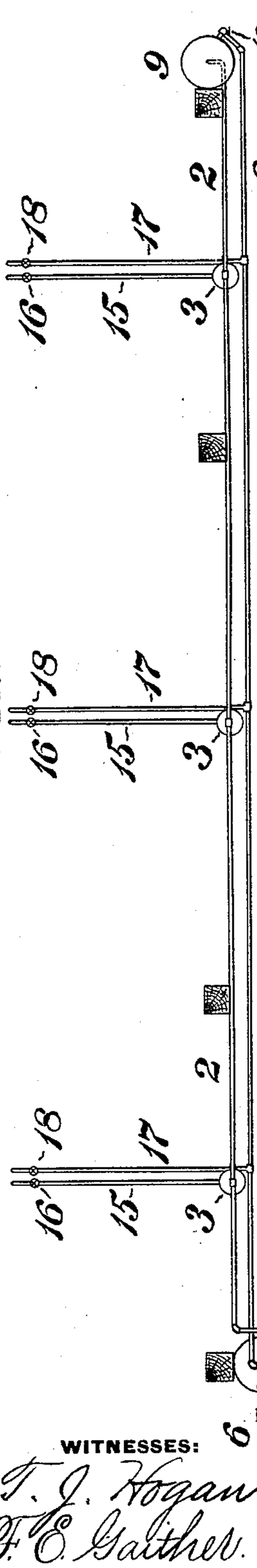


FIG. 2.




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# UNITED STATES PATENT OFFICE.

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## FLUID-DISTRIBUTION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 495,904, dated April 18, 1893.

Application filed October 28, 1892. Serial No. 450,226. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MCNAUGHTON, of Waukesha, in the county of Waukesha and State of Wisconsin, have invented a certain new and useful Improvement in a Fluid-Distribution Apparatus, of which improvement the following is a specification.

The object of my invention is to provide a simple and effective means for the supply and distribution of fluid to and from a storage receptacle or receptacles, in such manner that the supply may be effected in determined quantities; that any fluid in excess of such determined quantities shall be returned without waste, to the source of supply; and that the delivery of fluid from any selected storage receptacle of a series may be effected, either completely or partially as desired, without interference with or action upon the fluid in the other storage receptacles of the series.

To this end, my invention, generally stated, consists in certain novel combinations, embodying a main reservoir, one or more service or storage reservoirs located above said main reservoir, a valve controlled fluid service pipe connecting said main reservoir with the service reservoirs above the fluid level therein, a supply pressure pipe leading into the main reservoir, a service pressure pipe leading from the main reservoir, a pressure reservoir connected with the fluid service pipe and service pressure pipe, and valved delivery pipes leading from the service reservoirs and service pressure pipe respectively.

The improvement claimed is hereinafter fully set forth.

My invention is particularly designed for, and will be herein described as applied to practical service in kindling fires in locomotive engines by crude petroleum or other liquid fuel. The ordinary practice of kindling locomotive fires with wood is objectionable, not only on account of its slowness and expense, but also by reason of the inconvenience and annoyance involved by the storage of wood for kindling in the limited space available in a locomotive round house, and the considerable volume of smoke which is evolved. The employment of liquid fuel removes the objections above mentioned and effects a material saving of time and reduction of cost.

My invention has been found, in practical service, to provide for the convenient and economical use of liquid fuel, without liability to waste by carelessness on the part of the operator, and without involving any appreciable risk of fire or other objection.

In the accompanying drawings: Figure 1 is a partial end view of an apparatus for kindling locomotive engine fires, illustrating an application of my invention, the same being shown in position in a round house and connected to a locomotive engine; Fig. 2, a side view, and Fig. 3, a plan or top view of the same.

For the practice of my invention, I provide a main or supply reservoir 1, of such capacity as to contain a sufficient quantity of fluid, such as crude petroleum or other fuel oil, to fill the several members of a series of service or storage reservoirs 3, the capacity of each of which corresponds, as nearly as may be, with the quantity of fluid necessary to kindle a locomotive engine fire, which quantity is, consequently, a determined quantity, measured by the storage reservoir. The main reservoir 1 may be located in, or conveniently adjacent to, the round house in which the locomotives are placed during intervals between trips, and the service reservoirs 3, which should be located at a higher level than the main reservoir, may be supported by hangers 4, connected to the roof timbers or beams, one service reservoir being located in each engine stall of the round house, for the full utilization of the apparatus therein. A fluid service pipe 2, controlled by a suitable cock or valve 5, leads from the lower end of the main reservoir to the several service reservoirs 3, the discharge opening of said pipe to each service reservoir being located above the normal fluid level therein when charged, in order that oil supplied to the service reservoirs, by the service pipe 2, may be prevented from passing out of the same through said pipe. As shown in the drawings, this end is attained by locating the service pipe above the service reservoirs, but it will be obvious that it may, if preferred, be placed below them, and connected with them by pipes discharging into their upper ends, so as to equivalently attain the same result. A supply pressure pipe 6, controlled by a cock or valve 7, leads from an air compressor or a reservoir

of fluid under pressure, (which is not shown in the drawings,) to the upper end of the main reservoir 1, and a service pressure pipe 8, controlled by a valve 10, leads from the upper end of the main reservoir 1 to the upper end of a pressure reservoir 9, which is supported a little above the fluid service pipe 2. Blower service pipes 11, controlled by valves 12, lead from the service pressure pipe 8, between the main reservoir 1 and the valve 10, to points at a convenient distance from the floor for the attachment of flexible hose 13 to their lower ends, which are provided with suitable couplings for that purpose. The main reservoir 1 is provided with a pressure gage 14, to indicate the pressure therein when communication is established between the main reservoir and the air compressor or reservoir of fluid under pressure. Each service reservoir 3 is provided with an oil delivery pipe 15, governed by a cock or valve 16, and having an end coupling for the attachment of a flexible hose; and an air delivery pipe 17, governed by a cock or valve 18, and having an end coupling for the attachment of a flexible hose, leads from the service pressure pipe 8, adjacent to each service reservoir 3.

In the operation of the apparatus, the main reservoir is filled with the fuel oil which is to be used, and, in order to charge the several service reservoirs, the valves 10, 12, 16, and 18 are closed, and the valves 5 and 7 are opened. The air compressor being then started, if a compressor be employed, air flows into the main reservoir 1, through the supply pressure pipe 6, and forces the oil from the main reservoir through the fluid service pipe 2, into the several service reservoirs 3, the air which was contained therein being displaced, and passing into the pressure reservoir 9. A pressure of about thirty pounds to the square inch shown upon the gage 14, will indicate that the service reservoirs have been filled. The air pressure is then cut off by closing the valve 7, and any excess of oil which may have been forced into the pressure reservoir 9 with the displaced air, together with any oil remaining in the fluid service pipe 2, will be returned by gravity to the main reservoir 1. The service reservoirs being now charged, the valve 5 is closed and the apparatus is in readiness for use in kindling a locomotive fire or fires from any one or more of the service reservoirs 3. In this operation, about four hundred pounds of coal having been placed upon the grate of the engine, the flexible blower hose 13 is connected at one end with the coupling of the blower service pipe 11, of the stall in which the engine stands, and, at the other, with a T 20, on the blower pipe 19 of the engine, the connection being most conveniently made at a point on the outside of the smoke box. The valve 7 of the supply pressure pipe 6, and the valve 12 of the blower service pipe 11 which is connected to the blower pipe of the engine, are then opened, thereby forcing a current of air into the smoke box and creating an artificial draft. The flexible hose 21 and 22 are connected, respectively, to the oil delivery pipe 15 and the air delivery pipe 17, adjacent to the engine and are connected at their opposite ends to a pipe 23, having upon its outer end a burner or mixer 24, of any suitable and preferred construction, which is passed into the firebox of the engine and placed adjacent to the coal therein. The valves 16 and 18 of the pipes 15 and 17, are then opened, and the oil from the service reservoir 3 flows, by gravity, through the flexible hose 21, to the burner 24, and there combines with the jet of air under pressure from the pipe 8, thus forming a spray of mingled oil and air which is forced, by the pressure in the pipe 8 out of the openings of the burner or mixer 24. Being ignited, its flame is projected downwardly upon the coal in the firebox of the engine. The combustion at the burner openings continues until the flow of oil by gravity from the service reservoir 3 ceases, being in practice, for a period of about ten minutes, after which the fire will be found to be fully ignited, and the burner or mixer may be withdrawn from the firebox, and the blower hose 13 disconnected.

My improvement which is readily applicable, at very slight cost, in locomotive engine round houses, enables liquid fuel to be used for kindling, with economy, convenience and safety. The provision of a separate reservoir, of measured capacity, for each stall, and of means by which the return of any surplus or excess of oil to the main reservoir is insured, effectually prevents waste of oil due to carelessness of the operator, and reduces to the minimum the liability to danger from fire in the event of any injury to or derangement of the piping or valves of the system. The employment of fluid pressure for the delivery of the oil not only expedites its flow and increases the intensity of its flame, but also obviates the necessity for a large overhead supply tank or reservoir, and admits of the location of the main reservoir on or below the ground level, and wholly exterior to the round house, if such location is deemed desirable.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, in a fluid distribution apparatus for kindling locomotive engine fires, of means for supplying combustible fluid to a storage receptacle, of determined capacity, by the action of a fluid under pressure, means for thereafter discharging said combustible fluid therefrom by gravity, and means for coincidently with such discharge, forcing it into a fuel charged locomotive engine firebox, by the action of a fluid under pressure, substantially as set forth.

2. The combination, in a fluid distribution apparatus for kindling locomotive engine fires, of means for supplying combustible fluid to a storage receptacle, of determined capacity, by the action of a fluid under pressure,

means for thereafter discharging said determined quantity of combustible fluid by gravity, and means for, coincidently with such discharge, forcing it, commingled with a fluid under pressure, into a fuel charged locomotive engine firebox, by the action of a fluid under pressure, substantially as set forth.

3. The combination, in a fluid distribution apparatus for kindling locomotive engine fires, of a series of independent storage receptacles of determined capacity, for the delivery of combustible fluid to locomotive fireboxes, means for supplying combustible fluid to each of said receptacles, by the action of a fluid under pressure, and means for independently discharging said receptacles, substantially as set forth.

4. The combination, in a fluid distribution apparatus for kindling locomotive engine fires, of means for supplying combustible fluid to each of a series of independent storage receptacles of determined capacity, by the action of a fluid under pressure, means for thereafter discharging the contents of any selected one or more of said receptacles by gravity, and means for, coincidently with such discharge, forcing the combustible fluid so discharged into a fuel charged locomotive engine firebox, or fireboxes, by the action of a fluid under pressure, substantially as set forth.

5. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a main or supply reservoir, one or more service reservoirs of substantially equal capacities located above the level of the main reservoir, a fluid service pipe connecting the main reservoir with the service reservoir or reservoirs, and a supply pressure pipe leading into the main reservoir, substantially as set forth.

6. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a main or supply reservoir, one or more service reservoirs of substantially equal capacities located above the level of the main reservoir, a fluid service pipe connecting the main reservoir with the service reservoir or reservoirs, a supply pressure pipe leading into the main reservoir, and a service pressure pipe leading from the main reservoir to a connection with the fluid service pipe, substantially as set forth.

7. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a main or supply reservoir, one or more service reservoirs of substantially equal capacities located above the level of the main reservoir, a fluid service pipe connecting the main reservoir with the service reservoir or reservoirs, a supply pressure pipe leading into the main reservoir, a pressure reservoir connected near its lower end to the fluid service pipe, and a service pressure pipe leading from the main reservoir to the pressure reservoir at or near the upper end thereof, substantially as set forth.

8. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a main or supply reservoir, one or more service reservoirs of substantially equal capacities located above the level of the main reservoir, a fluid service pipe connecting the main reservoir with the service reservoir or reservoirs, a supply pressure pipe leading into the main reservoir, a service pressure pipe leading from the main reservoir to a connection with the fluid service pipe, delivery pipes leading from the service reservoirs, and delivery pipes leading from the service pressure pipe, substantially as set forth.

9. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a main or supply reservoir, one or more service reservoirs of substantially equal capacities located above the level of the main reservoir, a valve controlled fluid service pipe connecting the main reservoir with the service reservoir or reservoirs, a valve controlled supply pressure pipe leading into the main reservoir, a valve controlled service pressure pipe leading from the main reservoir to a connection with the fluid service pipe, valve controlled delivery pipes leading from the service reservoirs, and valve controlled delivery pipes leading from the service pressure pipe, substantially as set forth.

10. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a main or supply reservoir, one or more service reservoirs located above the level of the main reservoir, a valve controlled fluid service pipe connecting the main reservoir with the service reservoir or reservoirs, a valve controlled supply pressure pipe leading into the main reservoir, a valve controlled service pressure pipe leading from the main reservoir to a connection with the fluid service pipe, valve controlled delivery pipes leading from the service reservoirs, valve controlled delivery pipes (one for each service reservoir) leading from the service pressure pipe, and supplemental or service delivery pipes (one for each service reservoir) leading from the service pressure pipe, substantially as set forth.

11. In a fluid distribution apparatus for kindling locomotive engine fires, the combination of a service reservoir, means, substantially as described, for feeding a fuel oil thereto by air under pressure, valved delivery pipes for the discharge of oil from the reservoir, and air under pressure, to a connection with a mixer or burner insertible in a locomotive firebox, and a valved delivery pipe for the discharge of air under pressure into a locomotive smokebox, substantially as set forth.

12. The combination, in a fluid distribution apparatus for kindling locomotive engine fires, of means for forcing a jet of combustible fluid, commingled with air under pressure

into a fuel charged locomotive firebox, and means for forcing a jet of air under pressure into the smoke box of the locomotive engine, to exert draft in the firebox, substantially as set forth.

13. In a fluid distribution apparatus, the combination of a main or supply reservoir, a supply pressure pipe leading thereinto, a fluid service pipe leading therefrom, a service pressure pipe connected with the supply pressure pipe, delivery pipes leading from the fluid service pipe and service pressure pipe respectively, and a supplemental or blower service delivery pipe leading from the service pressure pipe, substantially as set forth.

14. In a fluid distribution apparatus, the combination of a main or supply reservoir, a pipe leading thereinto for the supply of air under pressure, valved delivery pipes for the discharge of oil from the reservoir, and air under pressure, to a connection with a mixer or burner insertible in a locomotive firebox, and a valved delivery pipe for the discharge of air under pressure into a locomotive smoke-box, substantially as set forth.

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Witnesses:
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