No. 767,137. PATENTED AUG. 9, 1904.

F. E. CHAPMAN.

FLUID PRESSURE FIRE EXTINGUISHING SYSTEM.

APPLICATION FILED JAN. 30, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

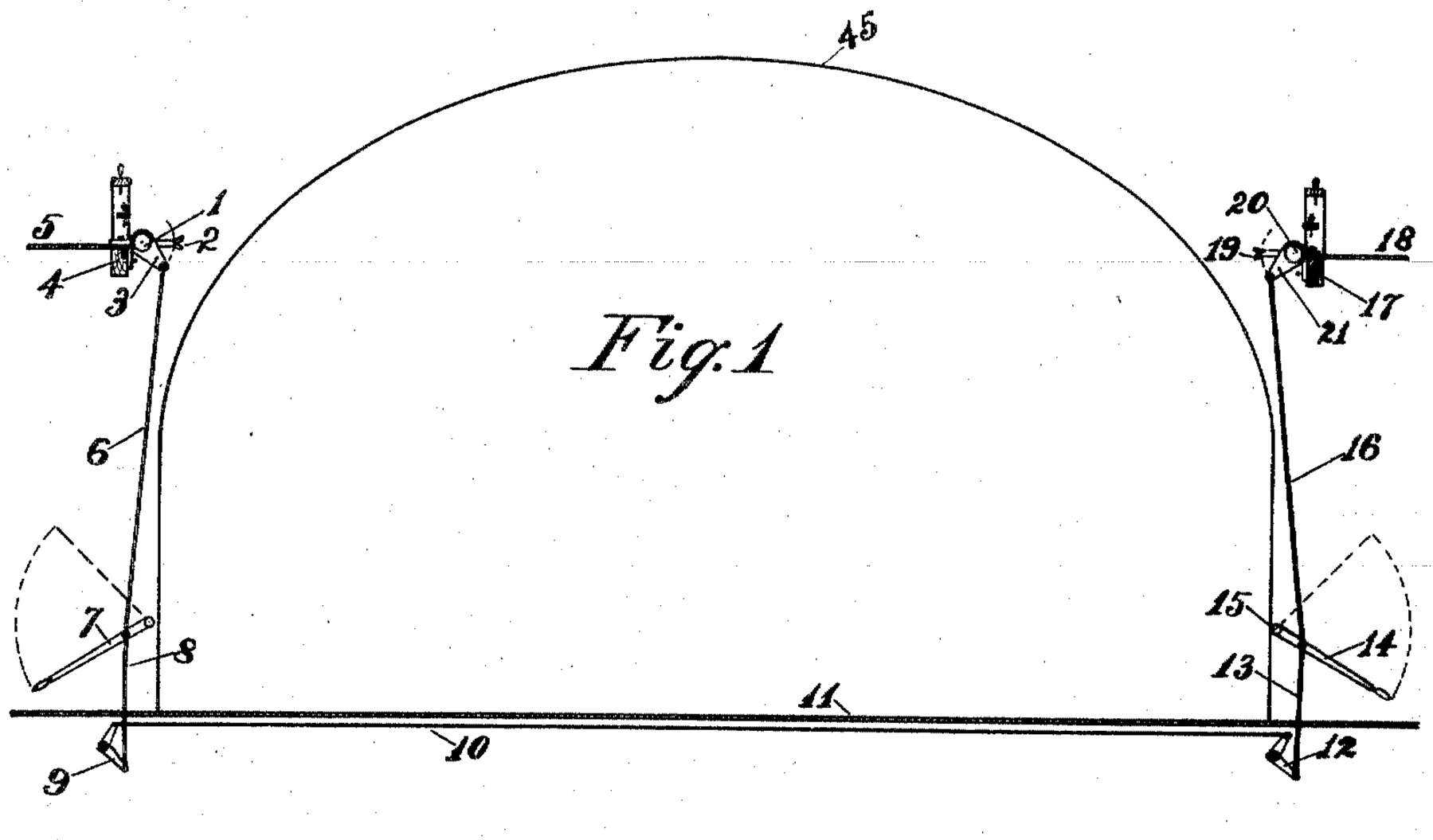


Fig. 1

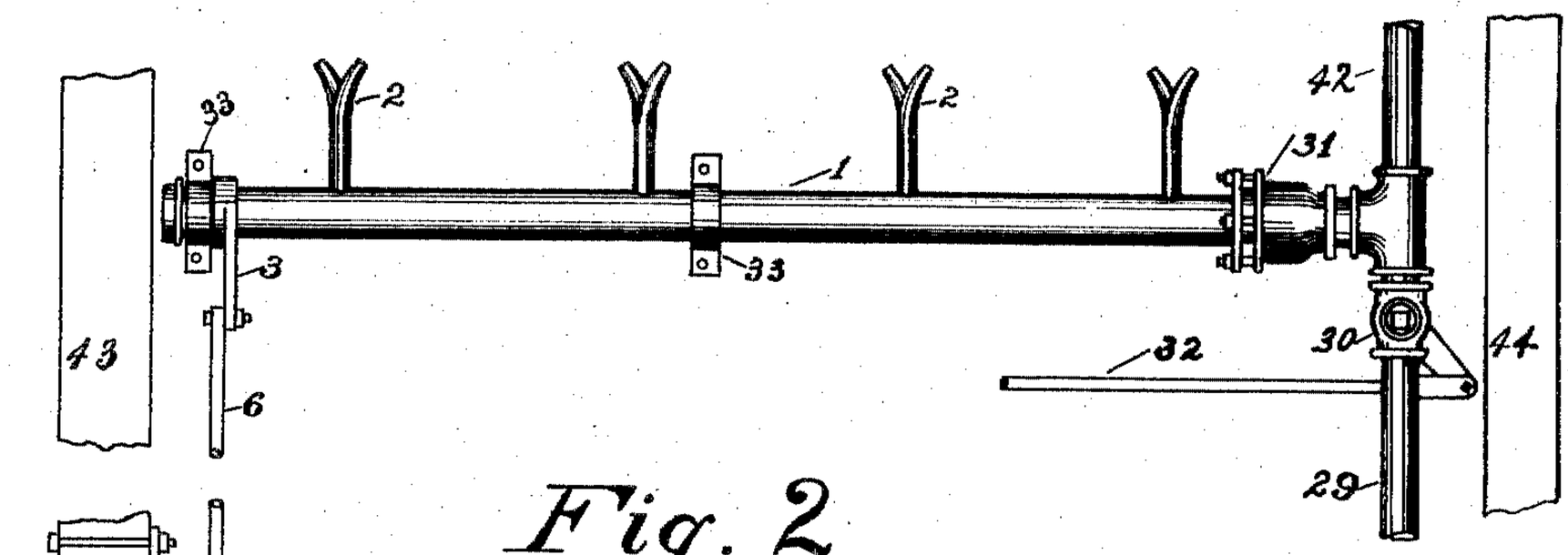
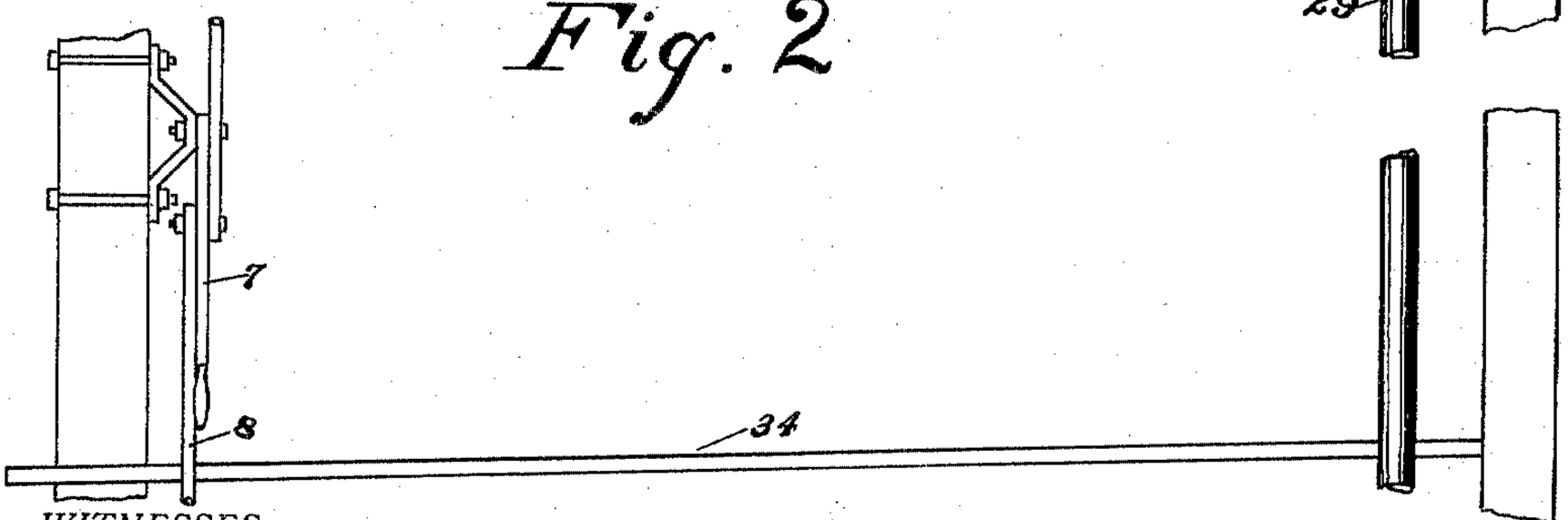


Fig. 2



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NO MODEL. 2 SHEETS—SHEET 2.

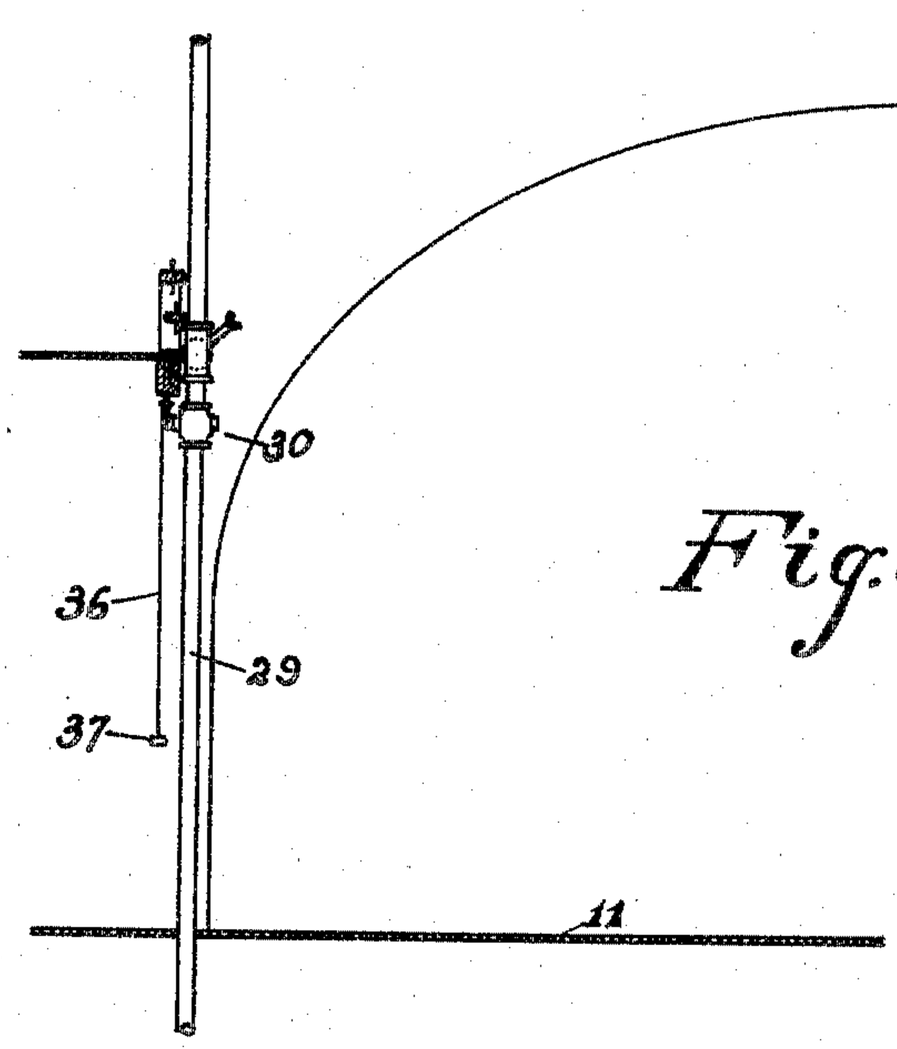
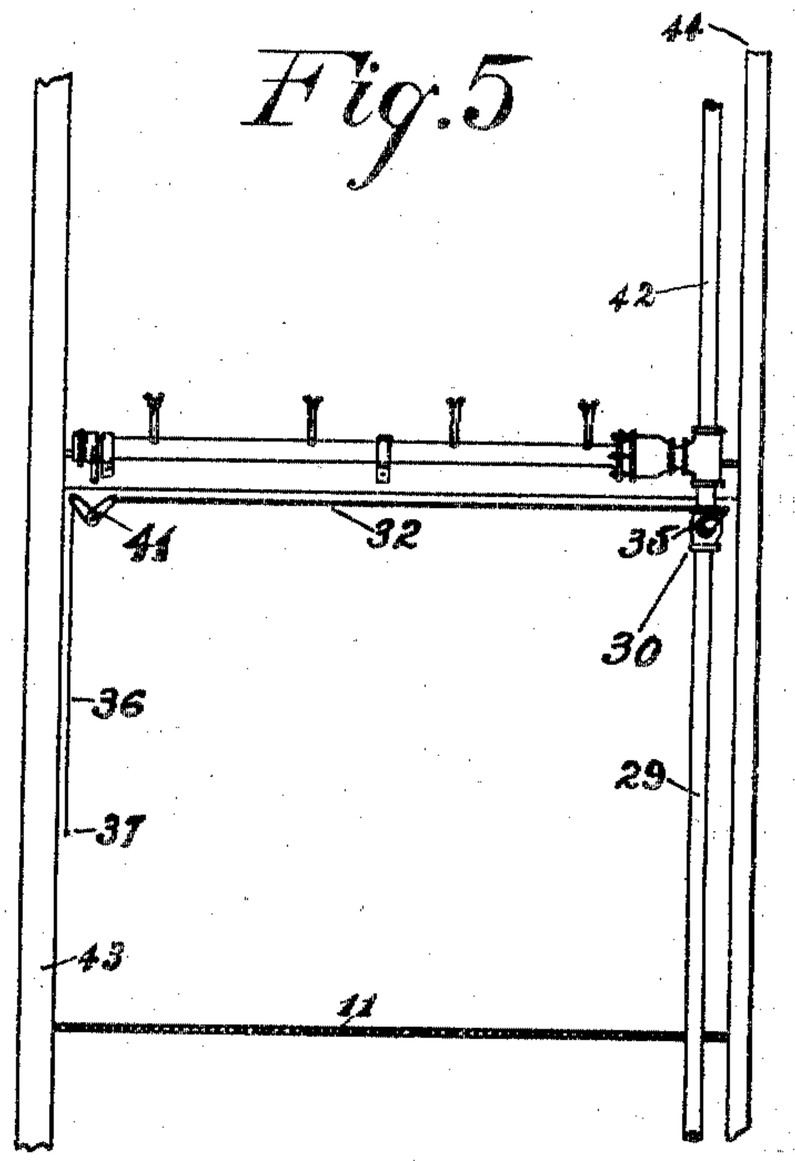


Fig. 3

Fig. 5



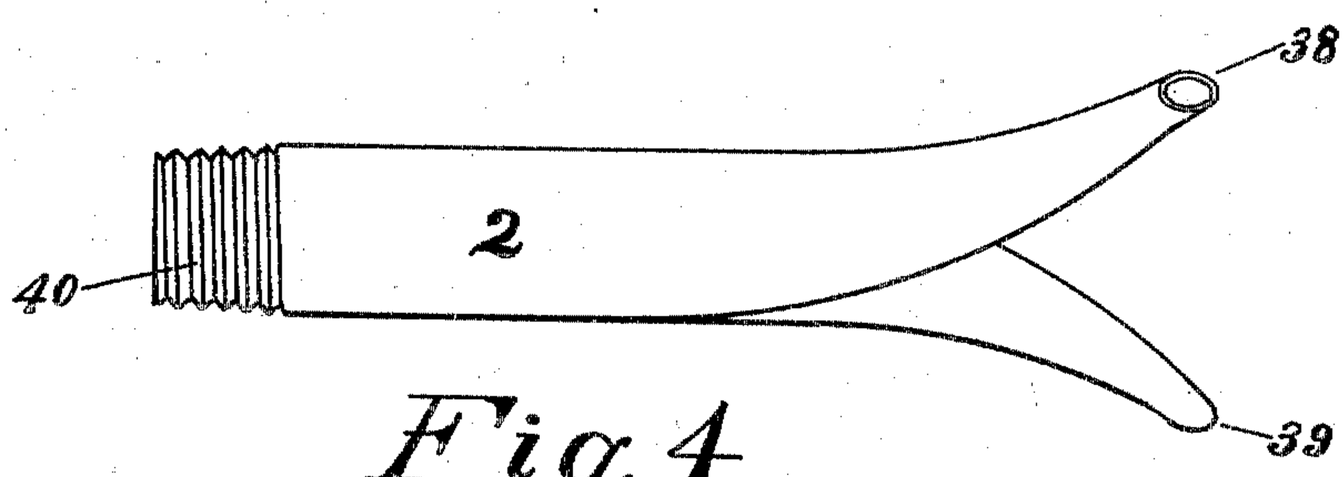


Fig. 4

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No. 767,137. Patented August 9, 1904.

UNITED STATES PATENT OFFICE.

FRANK E. CHAPMAN, OF CHICAGO, ILLINOIS.

FLUID-PRESSURE FIRE-EXTINGUISHING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 767,137, dated August 9, 1904.

Application filed January 30, 1904. Serial No. 191,384. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. CHAPMAN, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented a certain new, useful, and Improved Fluid-Pressure Fire-Extinguishing System, of which the following is a specification.

My invention relates to means and systems for extinguishing fires such as are often accidentally started in buildings, either public or private.

The invention has particular reference to means for discharging water or other fluid under pressure upon articles or parts of buildings that are exposed to a conflagration, and relates particularly to the stages of theaters the scenes, furniture, and fittings of which are usually composed of highly-inflammable material.

The appliances usually furnished for extinguishing fires starting on theater-stages consist of a stand-pipe and connecting hose ending in a nozzle for manual operation, and also special compounds are often furnished to be thrown upon the fire by those present at its inception. Because of the height and peculiar construction of theater-stages these devices are generally found to be ineffective when the emergency requiring their use arises, as a fire starting in the borders or scenery of a theater quickly ascends to a point where it cannot be reached by any of the ordinary appliances.

It has been sought to protect theaters by the employment of thermo-actuated sprinkler systems designed to discharge water from a number of fixed orifices or nozzles. These automatic sprinklers are only set into motion by the heat that is occasioned by the conflagration, and they cannot be depended upon to furnish water immediately upon the inception of the fire. The delay thus ensuing frequently defeats the object of their use, and, further, should the fire be eventually put out by an automatic sprinkler system the water-discharge continues indefinitely and in full volume, and it has frequently happened that the damage from water has exceeded the damage caused by the fire.

The object of my invention is to provide fire-extinguishing means particularly adapted for use in theaters and which shall be capable of operation the moment a fire is discovered.

Another object of my invention is to provide a water-spraying system that shall be capable of manual direction, whereby the water or other fluid may be projected upon any part of the stage or the scenery erected upon or hanging therein.

The particular object of my invention is to furnish a simple, cheap, and efficient system whereby fluid under pressure may be first transmitted to any desired point between the stage-floor and the ceiling above before it is discharged, and, secondly, may then be distributed freely to all parts of the scenery, woodwork, &c., in such volume that the upward spread of the fire may be immediately checked and the same extinguished before it has opportunity to pass beyond control and involve other portions of the building.

With these objects in view my invention consists in a fire-extinguishing system or apparatus by which one attendant—such as a fireman, electrician, or "gasman," as he is technically known—whose regular duties during each performance necessitate his presence constantly at one point on the stage may instantly direct a large number of streams of water or other fluid upon any portion of the stage, scenery, platforms, ceilings, &c., from points either on one or both sides of the stage and may, further, be able to control the quantity of water so thrown within certain predetermined limits, so that the damage by such water may be minimized.

Broadly considered, my invention consists in a fluid-pressure fire-extinguishing system comprising a fluid-main in combination with one or more distributing-pipes having nozzles and connected with said main and means for vibrating, rotating, or oscillating said distributing pipes or ducts to direct the streams of water or other fire-extinguishing fluid.

It will be readily seen that by the use of my improved system the water may be brought to bear upon the fire without a dangerous loss of time at the incipiency thereof, that it may

be directed upon a given part of the stage instead of upon all parts of the same, that the quantity discharged may be regulated at will by one attendant from his usual post upon the stage, and that the entire discharge of water may be immediately checked whenever desired. These features constitute radical and important improvements upon the appliances in common use for the purpose in question.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a front elevation of the conventional theater-stage, showing the proscenium-arch and certain portions of the mechanism utilized in my invention. Fig. 2 is a side elevation of such a stage with other parts of my system used more especially in the discharge and distribution of the water. Fig. 3 is a front elevation of one side of the stage, showing certain parts used in the control of the volume of water discharged. Fig. 5 is a side view of the same, and Fig. 4 is an enlarged view of the preferred form of nozzle I utilize.

As shown in the drawings, a common type of stand-pipe 29 conveys the fluid under pressure from the source of supply, which may be either a force-pump conveniently located and drawing its supply from any suitable source, such as the city mains or the ordinary type of roof-tank, the elevation of which affords the desired pressure. If the normal pressure of the city mains is sufficient for the purpose, neither of the auxiliary devices mentioned is necessary to the successful operation of my improved system, and, as a matter of fact, the source of fluid-pressure supply and the means used to obtain the necessary pressure form no part of the present invention. The valve 30 in stand-pipe 29 serves to govern the admission of pressure to and the control of the volume of pressure used in distributing-pipe 1, and it will be understood that should a roof-tank be employed or the pressure be more conveniently brought from above pipe 1 the valve 30 will be placed in pipe 42, but will be operated in the same manner as when situated at the point shown in Fig. 2. Distributing-pipe 1 is mounted in the bearings 33 33 at one end and near its center and at its other end is adapted to be rotated in either direction in the expansion-joint 31. The nozzles 2 are mounted in pipe 1, and while I prefer to secure them in the same axial plane, as shown, they may be inserted at any point in the circumference of said pipe, and any desired number may be employed.

Referring to the mechanism shown in the left side of Fig. 1, which is practically a duplicate of that on the right side of the same figure, the rod 6 is operated longitudinally by handle 7 and at its upper end is secured in the end of the crank 3, which crank is fixed on or formed integral with distributing-pipe 1 and serves to turn said pipe through a predetermined arc. It is evident that the nozzles 2 may thus be caused to direct their streams over a wide expanse in describing such given arc. Their distribution of fluid-pressure is further enhanced by the forked ends employed and also by the curve of such forks, as will be hereinafter explained. The bearings 33 for distributing-pipes 1 and 20 are secured to the beams 4 and 17, shown in end section on opposite sides of the stage, Fig. 1, the preferred type of my improved system comprising duplicate pipes and nozzles for the more complete and thorough distribution of the water. As will be seen by reference to Fig. 1, both distributing-pipes 1 and 20 may be operated from either of the handles 7 and 14 through cranks 3 and 21, rods 6, 10, and 16, and bell-cranks 9 and 12, and while but one admission and governing valve 30 is shown it may of course be similarly operated from either side of the stage by a like scheme of levers and connections, and in the same manner any desired number of distributing-pipes 1 may be used and fed by connections with the stand-pipe 29.

The preferred form of nozzle used in my improved system is shown in Fig. 4, and it will be noted that the forks 38 and 39 not only curve outwardly from the axial line of the main portion 2 of the nozzle, but also bend away from an axial plane of pipe 1 projected on said line. As is shown at 38, the nozzle-openings are preferably oval in shape for the purpose of flattening the discharging stream and spraying the same. This type of discharge, taken in conjunction with the double-curved nozzle and the resulting curve of the spray, will be readily seen to furnish the ideal distribution of the water over any portion of the stage and its fittings toward which the nozzles may be directed.

The valve 30 in supply-pipe 29 is of the ordinary plug type and is operated through lug 35, connecting-rods 32 and 36, bell-crank 41, and handle 37, as will be understood by reference to Figs. 3 and 5.

The operation of this system is as follows: Should fire be discovered at any point on the stage, the employee always on duty when performances are going on at one side of the stage-floor 11 and immediately in rear of the proscenium-arch wall for the purpose of manipulating electric switches, gas-cocks, &c., opens valve 30 by pulling handle 37, thus admitting pressure to the various distributing pipes and nozzles, while at the same time by moving lever 7 he is enabled to direct the water toward that point of the stage where it will be calculated to not only extinguish the incipient blaze, but also to wet down all scenery, woodwork, or other combustible material located above or in the natural path of

the flames. Should more than one governing-valve 30 be employed, all are preferably operated from one location on the stage, so that water under pressure may be admitted only to those distributing-pipes from which the fire may be most readily reached in the judgment of the operator. Further, should the position of the operator become untenable by reason of falling sparks, brands, &c., he may of course leave the apparatus in full operation after adjusting the direction of distribution as the exigency may permit. If he is able to remain at his post, he may vary the quantity of water admitted to the distribution system by manipulation of valve 30 and also direct the pressure toward various points, as heretofore described.

In addition to the drop-curtains at the front of the ordinary theater-stage a number of canvas drops are usually hung directly over the stage, extending completely across it between the front and rear walls 43 and 44 and are supported from a platform technically known as the "gridiron," which is generally constructed of a large number of wooden beams laid at right angles. These drop-curtains, together with other stage mechanism, are usually manipulated from two bridges or platforms, one on either side of the stage and at a considerable elevation above its flooring. These platforms are indicated at 5 and 18, Fig. 1, and their outer girders or beams offer a convenient point of support for the distribution-pipes, as shown. It will be readily seen that when the nozzles of the distribution-pipes so located are turned in the proper direction the water will be discharged across the stage from each side thereof and, provided a sufficient number of nozzles are used, will drive water between the hanging drops, spraying both sides thereof and thoroughly wetting the same in a very brief space of time. Water from such nozzles as may be directed toward the side walls in one position of the distributing-pipes will upon striking same be thrown off and fall upon the scenery and wooden bridges and gridiron, thus accomplishing the desired end. The practically perfect distribution of the water through the agency of the rotative distributing-pipes and the curved nozzles provided with oval orifices constitutes the most important feature of my invention, while the apparatus employed is cheap, simple, and may be operated from any convenient point on or off the stage.

While I have shown and described my invention as applied to a theater-stage, it is of course evident that it may be utilized in connection with the protection of any character of building or room to which it might be adapted. Further, I do not intend to limit myself to the illustrated positions of the spraying devices nor to the particular mechanism shown for transmitting manual power to the valves and distribution-pipes, as it is clear that any well-known method of power-transmission may be employed for the purpose without departing from the spirit of my invention.

Broadly speaking, my invention comprehends the means for the control and manipulation from one point of a large volume of water or other fluid under pressure discharged through a number of orifices and distributed at will over a great or small area, as fully set forth herein.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a fire-extinguishing system for theaters, a valved fluid-pressure pipe and a source of fluid-pressure, in combination with a distributing-pipe connected with the first-mentioned pipe, a row of nozzles upon said distributing-pipe and extending from end to end thereof, suitable bearings for said distributing-pipe, and means for partially rotating said distributing-pipe, substantially as described.

2. In a fluid-pressure fire-extinguishing system for theaters, a fluid-pressure pipe and a source of fluid-pressure, in combination with a distributing-pipe arranged above the stage and in valved connection with said fluid-pressure pipe, said distributing-pipe being provided with a plurality of nozzles for throwing streams upwardly and means for rotating said pipe to direct said streams across the stage, substantially as described.

3. In a fluid-pressure fire-extinguishing system for theaters, a fluid-pressure pipe and a source of fluid-pressure, in combination with a distributing-pipe rotatively connected with said fluid-pressure pipe, a suitable fluid-controlling valve, a plurality of nozzles extending laterally from said distributing-pipe and arranged at different points along the same, said nozzles being adapted to direct relatively divergent and conflicting streams across the theater-stage, substantially as described.

4. In a fluid-pressure fire-extinguishing system for theaters, a fluid-pressure pipe and a source of fluid-pressure, in combination with a distributing-pipe rotatively connected with said fluid-pressure pipe, a suitable fluid-controlling valve, a plurality of nozzles extending laterally from said distributing-pipe and arranged at different points along the same, said nozzles being adapted to direct relatively divergent and conflicting streams across the theater-stage, said distributing-pipe being revoluble and means for manually controlling the direction of the streams from said nozzles, substantially as described.

5. In a fluid-pressure fire-extinguishing system for theaters, a fluid-pressure pipe and source of fluid-pressure, in combination with a plurality of horizontal distributing-pipes in valved and rotative connection with said fluid-pressure pipe, said distributing-pipes being arranged at different points above the stage, means for rotating said distributing-pipes and each of said distributing-pipes being provided

with a longitudinal row of nozzles, substantially as described.

6. In a fluid-pressure fire-extinguishing system for theaters, a fluid-pressure pipe and source of fluid-pressure, in combination with a plurality of horizontal distributing-pipes in valved and rotative connection with said fluid-pressure pipe, said distributing-pipes being arranged at different points above the stage, means for rotating said distributing-pipes and each of said distributing-pipes being provided with a longitudinal row of angularly-disposed nozzles, substantially as described.

7. The combination in a fire-extinguishing system, of a source of fluid-pressure, in combination with a plurality of horizontal distributing-pipes each provided with a row of nozzles or sprayers, suitable bearings for said pipes, and means distant from said pipes for rotating them to oscillate the nozzles thereof, substantially as described.

8. In a fluid-pressure fire-extinguishing system, a source of fluid-pressure, in combination with a plurality of distributing-pipes adapted for rotation and in valved connection with said source, means distant from said pipes for controlling the flow of fluid thereto, and means also distant therefrom for rotating said pipes one or all, substantially as described.

9. In a fluid-pressure fire-extinguishing system, a source of fluid-pressure, in combination with a plurality of distributing-pipes adapted for rotation and in valved connection with said source, means distant from said pipes for controlling the flow of fluid thereto, and means also distant therefrom for rotating said pipes, one or all, and each of said distributing-pipes being provided with a row of plural-opening nozzles, substantially as described.

10. In a fluid-pressure fire-extinguishing system, a rotative distributing-pipe, in combination with a plurality of nozzles therefor, each adapted to direct diverging streams therefrom, as and for the purpose set forth.

11. In a fluid-pressure fire-extinguishing system, a source of fluid-pressure, in combination with a plurality of horizontal distributing-pipes, rotatively connected with said source, means for rotating said pipes, valves for said pipes and each of said distributing-pipes being provided with a plurality of nozzles extending from its upper side, substantially as described.

12. In a fluid-pressure fire-extinguishing system, the combination of a source of fluid-supply with a plurality of distributing-pipes connected therewith and each provided with a plurality of sprayers and means for separately and simultaneously rotating said distributing-pipes, substantially as described.

13. In a fluid-pressure fire-extinguishing system, the combination of a fluid-pressure-supply pipe, with a distributing-pipe rotatively connected therewith and provided with a row of nozzles, and means for rotating said distributing-pipe and its nozzles through a predetermined arc, substantially as described.

14. In a fluid-pressure fire-extinguishing system, the combination of a supply-pipe, with a governing-valve in said pipe, a distributing-pipe provided with a row of discharge-openings, and means for imparting oscillating motion to said distributing-pipe, substantially as described.

15. In a fluid-pressure fire-extinguishing system, the combination of a fluid-pressure-supply pipe, with a distributing-pipe rotatively connected thereto, and a plurality of angular nozzles arranged in said distributing-pipe, for discharging fluid streams in various directions, substantially as described.

16. In a fluid-pressure fire-extinguishing system, the combination of a fluid-pressure-supply pipe, with a distributing-pipe connected therewith, a plurality of openings arranged in the same axial plane of said distributing-pipe, and nozzles secured in said openings and each having teats pointing in different directions, substantially as described.

17. In a fluid-pressure fire-extinguishing system, the combination of a supply-pipe, with a distributing-pipe connected therewith, and a plurality of double-curved nozzles secured in said distributing-pipe whereby the fluid-pressure is distributed over a wide area, substantially as described.

18. In a fluid-pressure fire-extinguishing system, the combination of a source of fluid-supply, with a plurality of distributing-pipes connected therewith, and means for simultaneously rotating said distributing-pipes, substantially as described.

19. In a fluid-pressure fire-extinguishing system, the combination of a supply-pipe, with distributing-pipes connected therewith and provided with cranks, one or more operating members, and connecting mechanism between the cranks and members whereby all distributing-pipes may be actuated by any of said members, substantially as described.

20. In a fluid-pressure fire-extinguishing system, the combination of a supply-pipe, with distributing-pipes connected therewith, a governing-valve located in the supply-pipe, and manually-operated devices located adjacent to each other whereby said valve may be opened and the distributing-pipes simultaneously rotated, substantially as described.

In testimony whereof I have hereunto set my hand, at New Orleans, Louisiana, this 25th day of January, A. D. 1904, in the presence of two witnesses.

FRANK E. CHAPMAN.

Witnesses:
W. H. CULBERTSON,
W. P. MAURICE.