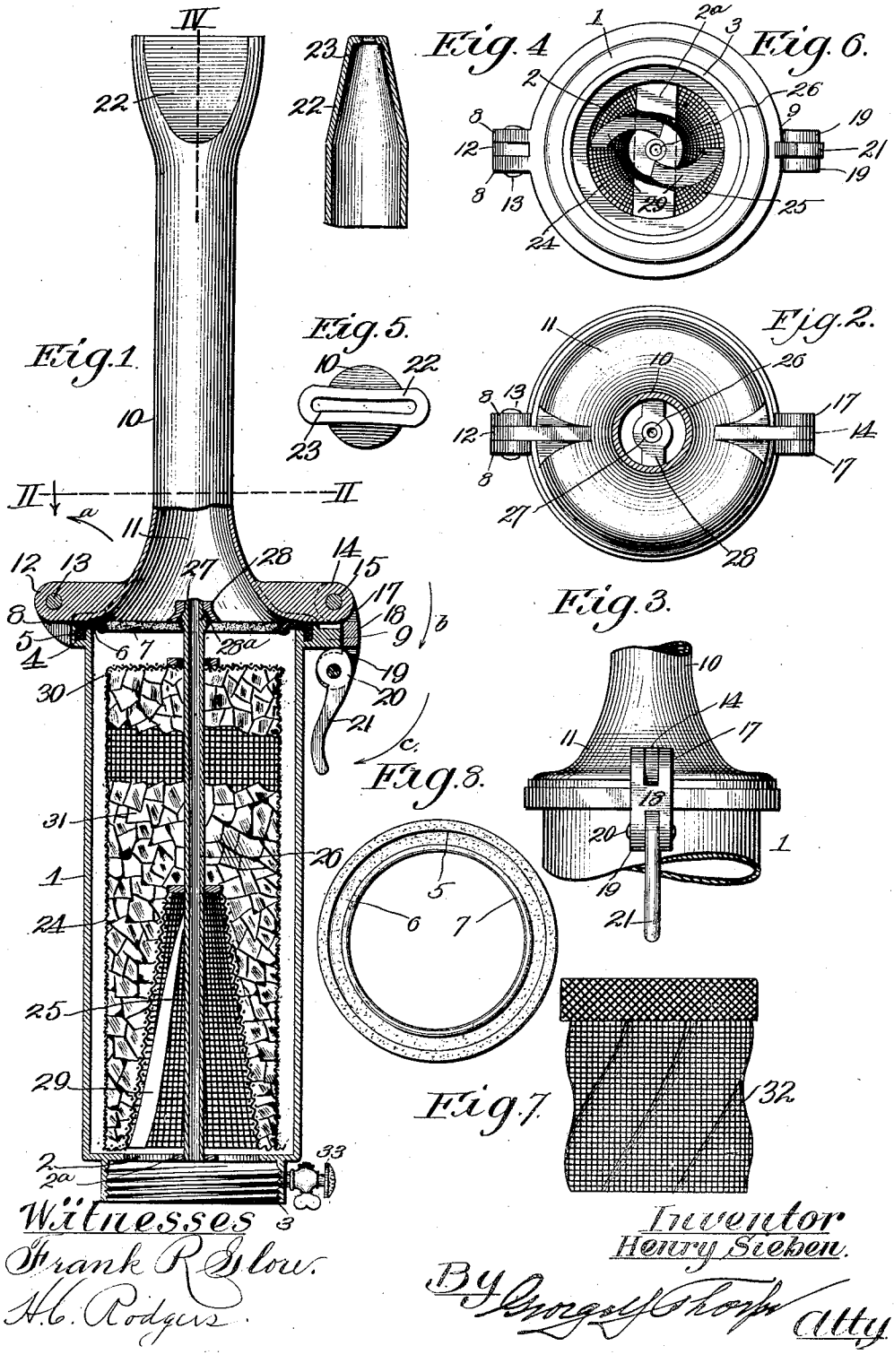
No. 887,856. PATENTED MAY 19, 1908.

H. SIEBEN.

CHEMICAL SPRAYING NOZZLE.

APPLICATION FILED MAY 14, 1906.



UNITED STATES PATENT OFFICE.

HENRY SIEBEN, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-FOURTH TO JAMES P. BATCHELOR, OF VALLEY FALLS, KANSAS, AND ONE-FOURTH TO GRANT BLAKE, OF KANSAS CITY, MISSOURI.

CHEMICAL-SPRAYING NOZZLE.

No. 887,856. Specification of Letters Patent. Patented May 19, 1908.

Application filed May 14, 1906. Serial No. 316,693.

To all whom it may concern:

Be it known that I, HENRY SIEBEN, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Chemical-Spraying Nozzles, of which the following is a specification.

This invention relates to chemical spraying nozzles, and more especially to that type provided with a chamber containing a chemical in the water passage so that the water discharged through the nozzle may be impregnated by such chemical, and my object is to produce a nozzle of this character which can be charged and recharged when necessary, easily and expeditiously.

A further object is to produce a nozzle of this character from which the air in advance of the water, will be quickly expelled and thus avoid retarding the discharge of the water to any perceptible extent.

A still further object is to produce a nozzle of this character comprising a body member and a cap member so connected that the pressure of the water will cause the joint between to be reliably closed against leakage.

A still further object is to produce a cartridge of such character and arrangement that it will revolve under the pressure of the water and thus bring the chemical contents of such cartridge into more intimate relation with the water than if stationary, in order to more thoroughly impregnate the water with the fire-extinguishing, antiseptic, or other properties, as the case may be, of the chemical.

With these objects in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which—

Figure 1, is a view partly in central longitudinal section and partly in elevation, of a nozzle embodying my invention. Fig. 2, is a section taken on the line II of Fig. 1. Fig. 3, is a side elevation of a portion of the nozzle. Fig. 4, is a section on the dotted line IV of Fig. 1. Fig. 5, is a view of the front end of the nozzle. Fig. 6, is a view of the rear end of the nozzle, with the cartridge therein and the pet-cock omitted. Fig. 7, is a side view of a portion of a cartridge of modified construction. Fig. 8, is a plan of the gasket.

In the said drawing, 1 indicates a cylinder forming the body portion of the nozzle, and provided at its rear end with a central opening 2, a centrally apertured cross bar 2^a, and an internally threaded flange 3 surrounding said opening and projecting rearwardly therefrom. The front end of the cylinder is provided with a circular groove 4 containing a gasket 5 having an inwardly projecting flange 6 terminating at its inner margin in a rearwardly projecting bead 7. At one side the front end of the cylinder is provided with a pair of outwardly and forwardly projecting ears 8 and diametrically opposite said ears with an outwardly projecting arm 9.

10 indicates the cap-member of the nozzle, the same being of materially less diameter than the cylinder except at its rear end which flares at 11, to fit snugly down upon the gasket 5, and said flared end is provided with an outwardly projecting lug 12 fitting between ears 8 and pivoted thereto at 13, and a lug 14 pivotally connected at 15 to and between a pair of ears 17 of a link 18; said link having a similar pair of ears 19 at its opposite end between which is pivoted at 20, a cam lever 21, adapted when the cap-member is closed down upon the cylinder to engage the underside of arm 9 and clamp said cap-member and the cylinder firmly together.

The front end of the cap-member is widened and tapered at 22 and its extreme front end is flanged inward at 23 to provide a long narrow discharge orifice whereby the stream of water is discharged in fanlike form to have a wide range of action.

24 indicates a foraminous cartridge preferably of cylindrical form and adapted to be dropped into the cylinder from its front end. It is provided at its rear end with a circular forwardly tapering chamber 25 and has a rigid axial tube 26 journaled at one end in the aperture of bar 2^a, and of length to project into the cap-member. The front end of the tube is diametrically reduced at 27 and journaled in a rearwardly flared opening 28^a of a cross bar 28 cast with or otherwise secured in the flared end or mouth of said member.

29 indicates spiral blades secured in the tapered opening 25, and 30 a cap adapted to be slipped over the projecting front end of

the tube to close the front end of the cartridge and retain therein the chemical substance 31, which is preferably in the form of crystals.

Assuming that the cap-member is swung back in the direction indicated by the arrow *a*, on hinge or pivot 13, it will be apparent that the entire front end of the cylinder is unobstructed and that the person in charge can easily and quickly drop a cartridge down into said cylinder. The cap-member is then swung back to its original position, in which action it will be noticed the flaring mouth 28^a insures automatic reëngagement of bar 28 with the reduced end 27 of tube 26. As the cap-member reëngages the gasket the link is swung upon pivot or hinge-point 15 in the direction indicated by the arrow *b*, until the head of the cam lever 21 passes under arm 9, when said cam-lever in turn is pivotally operated as indicated by the arrow *c*, for the purpose of clamping the cap-member firmly down upon the gasket, and locking it in such position because the plane intersecting the axes of pivots 15 and 20 is inward of the point of contact between the head of the cam-lever and said arm 9. With the parts in the relation described, the passage of the water through the nozzle results, through its action on blades 29, in revolving the cartridge, the engagement of rod 26 with cross bar 28 resisting forward movement of the cartridge under the pressure imposed against its rear end. The water forces its way through the cartridge and also around it and a small column of water also passes through the tube 26, this column, however, rejoining and being impregnated by the main volume of the water as it is discharged from the front end of the nozzle containing the proper fire-extinguishing, antiseptic or other property of chemical employed, the character of the chemical depending of course on the use to which the nozzle is to be put.

The fact that the cartridge fits loosely in the cylinder and also the provision of the tube 26, permits of a practically instantaneous escape of the air in the hose when the water is turned on so that the latter shall not be materially retarded by such air.

In lieu of the provision of the spiral blades 29 for effecting the rotation of the cartridge under the impact of the water passing through the nozzle, I may provide the cartridge with an external blade, the preferred method being to spirally groove the cylinder itself as shown at 32 in Fig. 7. By this arrangement the forcible ejection of the water against and around the cartridge will compel the latter to turn, the revolution of the cartridge in both cases serving to prevent the water from forcing direct passages through the contents of the cartridge and thus as the chemical gradually dissolves, escape in gradually increasing volume without impregnation. It is to be understood of course that I do not confine myself to a revolving cartridge as excellent effects in the way of impregnating the water can be obtained without such revolving movement. In either case, however, I prefer to employ the tube 26 or its equivalent as a means of effecting a quick ejection of the air from the hose to avoid materially retarding the ejectment of the water. I also contemplate the use of the gasket constructed substantially as shown because the pressure of the water against the underside of flange 6 and against the outer side of the depending bead 7 will press the flange and bead forwardly and outwardly into the flaring mouth of the cap-member and thus insure an absolutely water-tight joint between the same and the cylinder. I have found in practice that the heavy pressure of the water upon the flaring mouth and contracted discharge end of the cap-member results in leakage of water between the latter and the cylinder where the ordinary type of gasket is used because there is necessarily a certain amount of looseness in a joint locked by means of a link and cam-lever, and I have also found that for fire-hose this type of locking mechanism is essential because it permits the fireman to quickly and easily swing the cap-member from the end of the cylinder to permit of the removal of a spent cartridge and the insertion of a new one. To protect the fireman handling the hose in proximity to a fire from being scorched and burned, I provide the nozzle at the rear end of the cylinder with a pet-cock 33, through which water will escape in a spray or mist in front of the fireman, it being understood that the spray or mist will be sufficiently fine to avoid obstructing the fireman's view of the fire.

From the above description it will be apparent that I have produced a nozzle embodying the features of advantage enumerated as desirable in the statement of the object of the invention and I wish it to be understood that changes may be made in the detail construction, form, arrangement and proportion of the parts without departing from the principle of construction involved.

Having thus described the invention what I claim as new and desire to secure by Letters-Patent, is:—

1. The combination of a cylinder open at each end, a tubular cap-member secured to the front end of the cylinder and provided with a nozzle at its front end, a gasket clamped between the cylinder and cap and of smaller internal diameter than the former and provided at its inner margin with a rearwardly projecting bead 7, a cross bar at the rear end of the cap, provided with a rearwardly flared opening, a cartridge within the cylinder of diameter to slip through said gasket and a central rod secured rigidly to

and extending through the cartridge and fitting at its front end in the opening of the cross bar and provided with an enlargement engaging the flared portion of said opening to prevent forward movement of the cartridge in the cylinder.

2. The combination of a cylinder having open ends, a tubular cap member having a water-tight connection with the front end of the cylinder and provided with a nozzle and a perforated cross bar having a central opening, a cartridge fitting in the cylinder, and a rod rigid with and extending longitudinally through and projecting beyond the front end of the cartridge and fitting at such projecting end in the opening of said cross bar.

3. The combination of a cylinder having open ends, a cap-member removably closing the front end of the cylinder and provided with a cross bar having a bearing opening, a cartridge within the cylinder having an axial rod bearing at its front end in the opening of the cross bar, and means whereby the passage of water through the cylinder to the cap-member causes said cartridge to rotate.

4. The combination of a cylinder having open ends, a cap-member removably closing the front end of the cylinder and provided with a cross bar having a bearing opening, a cartridge within the cylinder having an axial rod bearing at its front end in the opening of the cross bar, and an apertured cross bar in the cylinder engaging the rear end of said axial rod.

5. The combination of a cylinder having open ends, a cap-member removably closing the front end of the cylinder and provided with a cross bar having a bearing opening, a cartridge within the cylinder having an axial rod bearing at its front end in the opening of the cross bar, an apertured cross bar in the cylinder engaging the rear end of said axial rod, and means whereby the passage of water through the cylinder to the cap-member causes the cartridge to rotate.

6. The combination with a cylinder, a cap-member removably closing its front end, a rod arranged axially of the cylinder and suitably journaled, and a cartridge rigidly secured to said rod and provided at its rear end with a recess equipped with a spirally extending inwardly projecting blade.

7. A foraminous cartridge provided with an axial tube and with a recess in its rear end surrounding said tube and with a spirally extending inwardly projecting blade in said recess.

In testimony whereof I affix my signature, in the presence of two witnesses.

HENRY SIEBEN.

Witnesses:
H. C. RODGERS,
G. Y. THORPE.