(No Model.) 4 Sheets—Sheet 1.

D. W. WEBSTER.

NOZZLE.

No. 563,630. Patented July 7, 1896.

Fig. 1

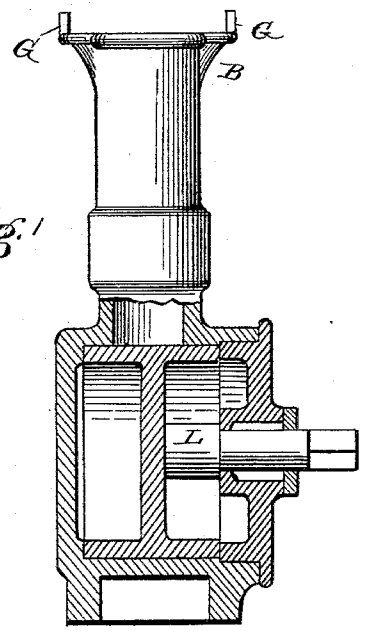
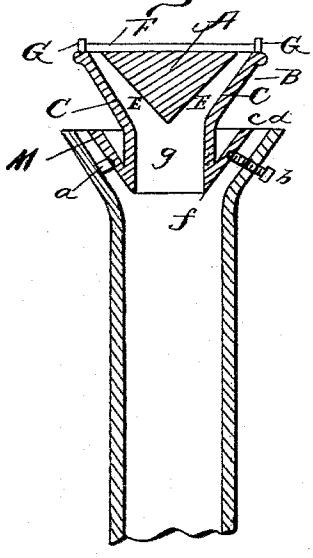


Fig. 9



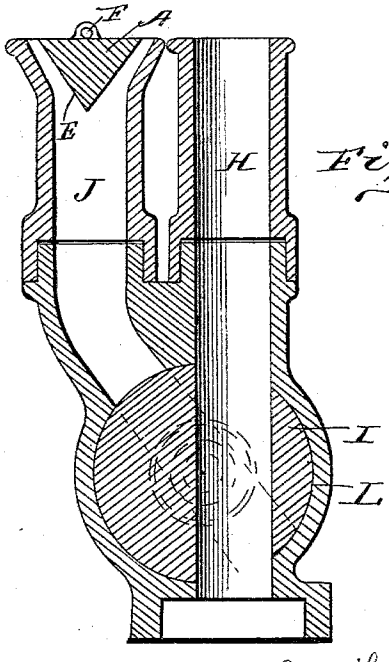


Fig. 2

Witnesses:
J. N. Fowler Jr.
Jos. Parker Camp

Dan'l W. Webster
Inventor
By Chas E. Barber
Attorney

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D. W. WEBSTER.

NOZZLE.

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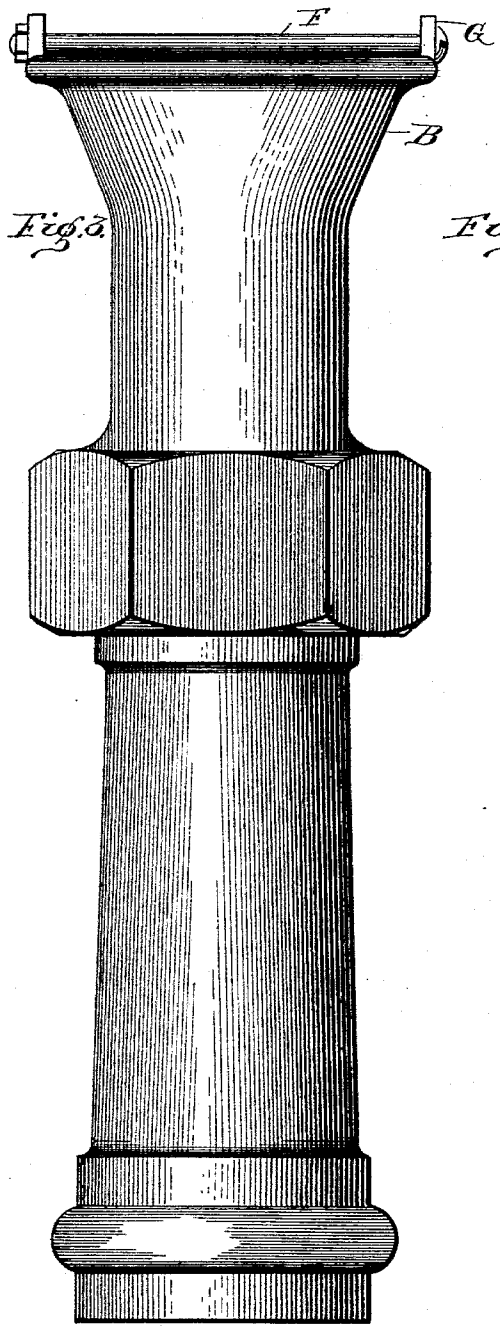

Fig. 3.

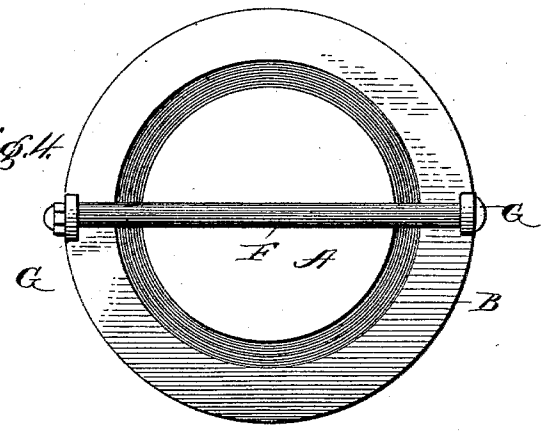

Fig. 4.

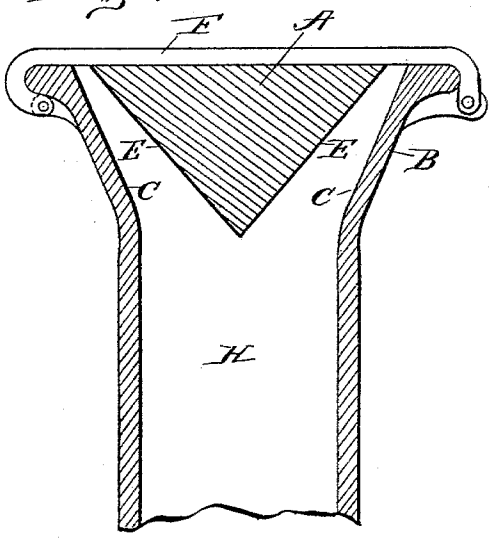

Fig. 11.

Witnesses:
J. M. Fowler Jr.
Jos. Parker Camp

Dan'l W. Webster
Inventor.
By Chas. E. Barber
Attorney.

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D. W. WEBSTER.

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Fig. 5.

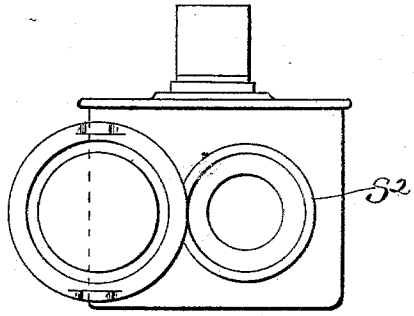


Fig. 6

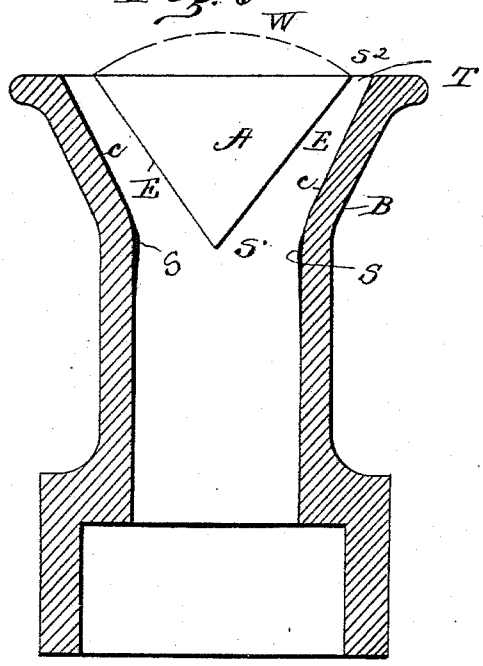


Fig. 7

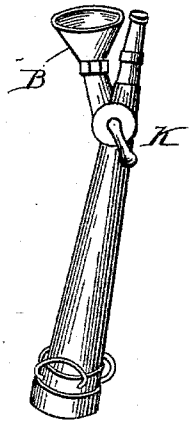


Fig. 8.

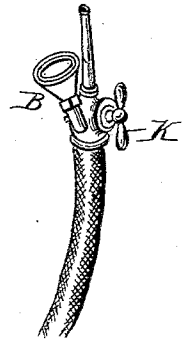


Fig. 10

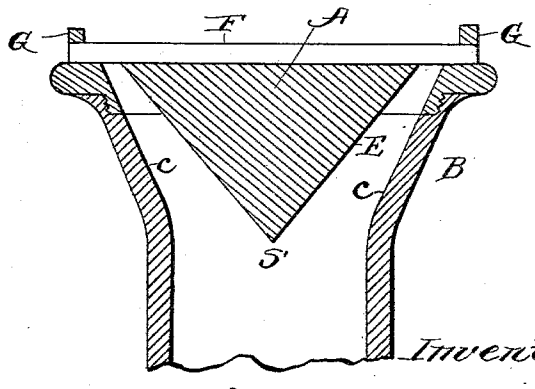
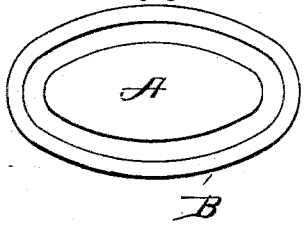


Fig. 13



Witnesses:
J. M. Fowler Jr.
Jos. Parker Camp

Inventor.
Dan'l W. Webster
By Chas. E. Barbers
Attorney

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D. W. WEBSTER.

NOZZLE.

No. 563,630. Patented July 7, 1896.

Fig. 12.

Witnesses:
J. McFowler Jr
Jos Parker Camp

Inventor
Dan'l W. Webster
By Chas E. Barbour
His Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DANIEL W. WEBSTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JOSEPH PARKER CAMP, TRUSTEE.

NOZZLE.

SPECIFICATION forming part of Letters Patent No. 563,630, dated July 7, 1896.

Application filed November 7, 1895. Serial No. 568,214. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. WEBSTER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Nozzles, of which the following is so full, clear, and exact a description as will enable those skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation with parts broken away, showing the cock in section. Fig. 2 is a transverse section of my device. Fig. 3 is a side elevation of the same. Fig. 4 is an end plan view of the same. Fig. 5 is a cross-section. Fig. 6 is a section of a part of the nozzle. Fig. 7 is a perspective view showing my nozzle attached to the large pipe-nozzle of the hose. Fig. 8 is a similar view of the same. Fig. 9 is a transverse section of a modified form of deflector. Fig. 10 is a modified form of fastening for the rod. Fig. 11 is also a modified form of fastening for the rod. Fig. 12 is a perspective view of the invention, showing a fireman throwing a stream of water in solid sheets upon the blaze. Fig. 13 shows a nozzle made in the form of an ellipse instead of circular.

The object of my invention is to provide a nozzle with a deflector by the use of which the water may be thrown from a hose-nozzle or from a hose into, over, or upon a fire by firemen standing behind the nozzle close up to the flame and heat and smoke without being affected by them or any of them so long as he keeps the spray and end of the nozzle between himself and the fire.

Another object of my invention is to provide a nozzle and spraying apparatus by the use of which lawns, gardens, lumber-yards, and other places which it is desired to wet evenly may be thoroughly sprinkled in the shortest possible time with the greatest uniformity and with the least expense of material and with the least expense of physical and mechanical force.

In carrying out my invention I provide a nozzle the peculiar construction of which, as will be hereinafter described, is such that accelerated flow is created, the result of which is to throw a spray as far as the solid stream would be thrown out of the same hose-pipe if the deflector were omitted from the nozzle. The result of this is that I obtain a spreading of the water in a solid sheet radially for about three feet in a straight line diagonally away from the front end of the hose and away from the line of the plane of its sides, making a solid wall of water between the firemen and the fire, which is a great desideratum in devices of this character.

The deflector consists of a conical body A, having a cutting-point at its inner extremity which splits the stream and located loosely within the outwardly-tapered nozzle B. The line of the inner wall C C of the nozzle is at an angle to the line E of the outer wall of the deflector A.

The deflector is held in position by a bar or rod F, which is extended through suitable bosses G at the outer end of the nozzle, and it may be screwed in, as shown in Fig. 4, or it may be fastened in as shown in the modifications in Figs. 10 and 11. The nozzle is provided with a straight uninterrupted waterway H, through which a solid stream may be thrown when the valve I is turned as shown in Fig. 2, and it has a side way J, provided with a deflector, and the water will pass through this way when the valve is turned, as shown in dotted lines in Fig. 2, as will be readily understood. I of course claim nothing on this well-known construction.

K K designate hand-levers for operating the cock L to throw the water either through the straightway nozzle or the tapered spreading nozzle, as may be desired.

Referring to the modification shown in Fig. 9, it will be observed that I provide the mouth of the nozzle with a supplemental deflector M, which is secured within the nozzle by a lug *a* on one side of the interior of the tapered nozzle and a set-screw *b*. Any number of lugs or set-screws may be provided for the purpose of holding the supplemental deflector in place. The lugs *a* may be dispensed with and screws used all around, or any other suitable means may be employed for holding the supplemental deflector in place. The supplemental deflector is provided with a flange which deflects the water away from

the nozzle in the solid wall from the point *d*. Above this flange *c* is a second flange *e*, and the lower end of the supplemental deflector ends in a sharp cutting point or edge *f*, which splits the stream of water, conducting a portion of it up through the conduit *g*, where it is again divided by the deflector A and deflected out from the flange *e* at the upper end of the deflector into another solid wall within the line of the wall of water which is thrown out from the edge of the flange *d* of the nozzle-mouth. These supplemental deflectors may be multiplied and more than two walls of water may be spread out radially, one within the line of the other successively.

This form of spraying device may be found necessary or at least desirable in extinguishing fire and in sprinkling lawns and piles of lumber where they are provided with these spraying devices located at predetermined points in buildings or in lumber-yards or other places where it is desired to provide means of extinguishing fire or for wetting an area to prevent fire from spreading should a fire occur on adjacent property. This device will be adapted especially for use upon roofs and sides and fronts of buildings to prevent fire spreading from one building to another.

From the foregoing it will be seen at a glance that I have provided a nozzle the use of which will suggest itself and the use of which has been proven by experiment to be very advantageous. I do not wish to be understood as limiting myself to the exact details of construction shown and described, as they may be varied at will and mechanical equivalents substituted therefor without departing from the spirit of my invention.

By referring to Fig. 6 the line S represents the smallest point of discharge of the solid stream, just beyond which is located the point S′ of the deflector.

In order to throw the water from the spraying-point S^2 as far as the solid stream would be thrown, I make the total area of the opening between the periphery of the deflector and the inner periphery of the mouth of the nozzle, which is represented by the letter T in Fig. 4, about four per cent. less than that of the smallest area of the solid stream represented at S. By placing the point of the cone just beyond the line S the water is sprayed after it leaves the point S. By having the deflector placed loosely in the nozzle-mouth it permits of its being forced to one side for the discharge of any solid foreign substance that may be in the water. It will also be noted by reference to Fig. 6 that there is a dotted line W over the deflector. The purpose of this line is to indicate that by making the top of the conical deflector convex I may conduct a portion of the water toward the center, as may be desired, when this device is used as a lawn-sprinkler.

Instead of making the circle complete, it may be elongated or be elliptical instead of circular in shape without departing from the spirit of my invention. (See Fig. 13.)

It is obvious that this device will be as useful in the distribution of air for the purposes of ventilation and for the purposes of modifying the temperature as for the distribution of water.

It is also obvious that any form which may be found useful or desirable may be used in the mouth of the nozzle in combination with my deflector without departing from the spirit and without in any way interfering with its usefulness.

It will be observed that I make the inner walls of the conduit and nozzle clear and unobstructed. I am aware that it is old to make strictured openings at the junction of the flaring mouth and the nozzle-body, and such construction I disclaim.

This device will be found also of great use on board ships, and especially men-of-war, as hot water can be turned on through the hose and nozzle, and it would be impossible for a man to come through it. As a matter of fact, cold water would cut a man in two out of this nozzle with the proper pressure on the water.

It is obvious that the deflector at the outer extremity of the opening through the hollow deflector may be omitted when it is desired to have both a shield for the fireman and a solid stream of water to play upon the fire without departing from the spirit of my invention.

Having described the objects, uses, and advantages of my device, what I believe to be new, and desire to secure by Letters Patent of the United States, and what I therefore claim, is—

1. An outwardly-flaring hose-nozzle; in combination with a conical deflector having an inner cutting-point, said deflector confined entirely within the nozzle and having its wall at an angle to the wall of the mouth, the cutting-point of the deflector located in the back of the flaring opening, said deflector constructed straight and continuous from its cutting-point to its base or outer end, substantially as described.

2. As an improvement in nozzles, the combination of an outwardly-tapered mouth provided with a conical hollow deflector having a flaring mouth and provided with a second deflector which first deflector splits the current of water as it passes out into the tapered mouth of the nozzle, spreading a portion of it radially from the mouth of the nozzle proper and conducting a portion of it to the mouth of the supplemental or second deflector located in the mouth of the original deflector, which is located in close proximity to the first or original deflector, making a second sheet or wall of water within the line of the first sheet or wall of water at the mouth of the nozzle, forming a triple wall of two sheets of water and a sheet of air between them, forming a shield or screen for the operator, substantially as described.

3. A hose-nozzle having an outwardly-flanged straight-walled mouth; in combination with a conical deflector located entirely within the mouth, the outer wall of which deflector is at an angle to the inner wall of the mouth of the nozzle.

4. A hose-nozzle having a clear and unobstructed interior back of the deflector, and having an outwardly-flaring, straight-walled mouth; in combination with a conical deflector, the outer wall of which is at an angle to the inner wall of the mouth of the nozzle, the front of the mouth and deflector in the same plane, as set forth.

5. A hose-nozzle, having an outwardly-flaring mouth; in combination with a conical deflector secured entirely within the mouth of the nozzle and to its wall by lugs or screws, the interior of the nozzle proper being clear and unobstructed back of the deflector, whose outer wall is at an angle to the inner wall of the flaring nozzle, substantially as described.

6. A double-mouthed hose-nozzle for firemen's use having water-outlets located in close proximity to each other, each provided with a deflector as described, whereby a double wall of water having an air wall between them may be thrown from the same nozzle in the same general direction as set forth.

7. A double-mouthed nozzle for firmen's use, a hollow deflector located in the first mouth and a second deflector located in the second mouth in close proximity to the first mouth and the first deflector as described, whereby a double wall of water having an air wall between them may be thrown from the same nozzle, the interior of the nozzle constructed entirely clear and unobstructed back of the deflectors, as set forth.

8. A double-mouthed nozzle for firemen's use, a hollow deflector located in the first mouth and a second deflector located in the second mouth in close proximity to the first mouth and the first deflector as described, whereby a double wall of water having an air wall between them may be thrown from the same nozzle, as set forth.

9. A hose-nozzle having an outwardly-flaring mouth; in combination with a flaring deflector secured within the mouth of the nozzle and to its wall by lugs or screws near the back of the mouth, the interior of the nozzle proper being entirely clear and unobstructed back of the cutting-point of the deflector, substantially as described.

10. A double-mouthed nozzle for firemen's use, a hollow deflector located in the first mouth and a second conical deflector located in the second mouth, in close proximity to the first mouth and the first deflector as described, whereby a double wall of water having an air wall between them may be thrown from the same nozzle, the interior of the nozzle constructed entirely clear and unobstructed back of the deflectors, as set forth.

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

DANIEL W. WEBSTER.

Witnesses:
DAVID E. MOORE,
CHAS. E. BARBER.