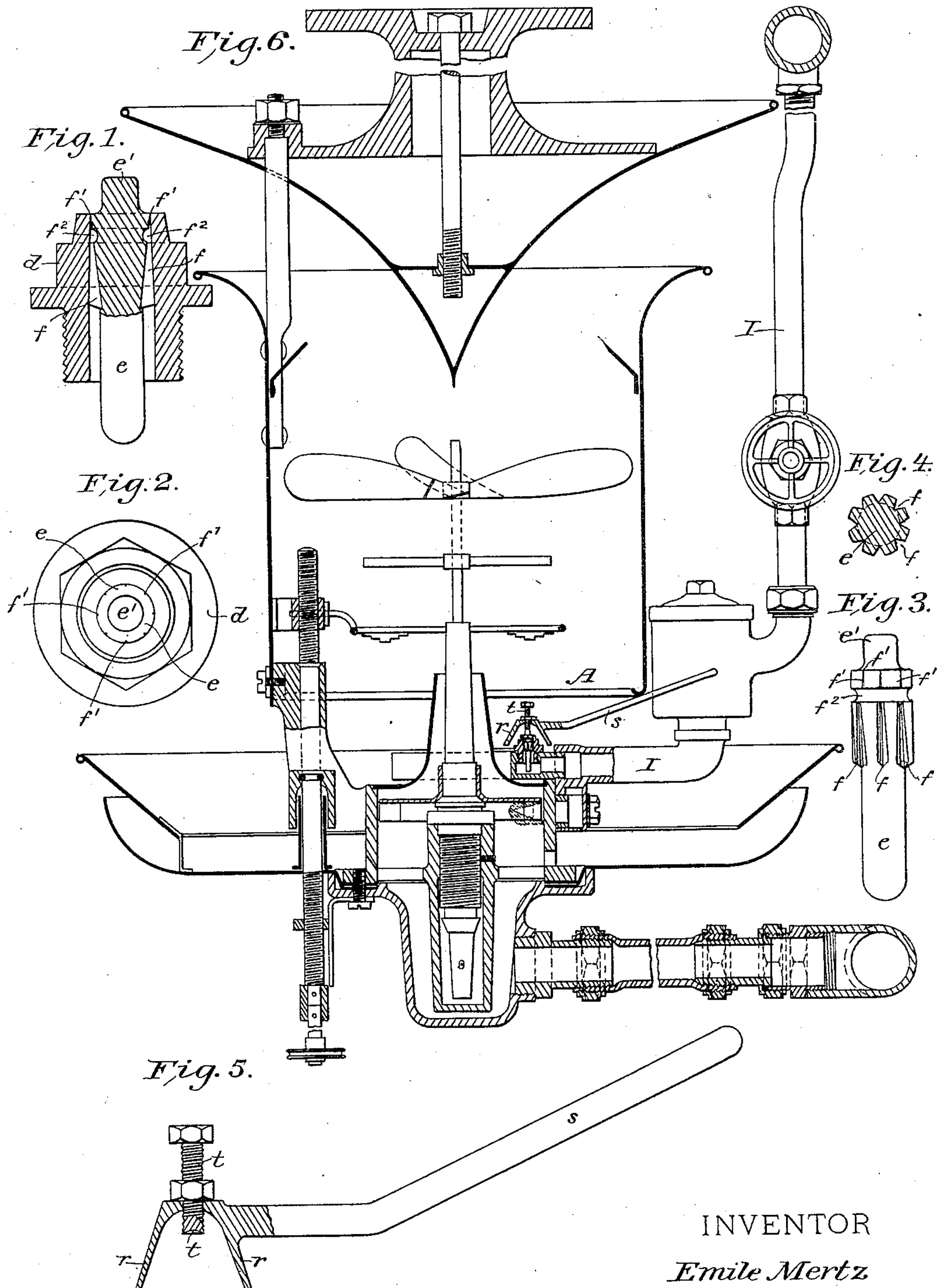


(No Model.)

E. MERTZ.  
SPRAYING NOZZLE.

No. 434,518.

Patented Aug. 19, 1890.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EMILE MERTZ, OF BASLE, SWITZERLAND.

## SPRAYING-NOZZLE.

**SPECIFICATION** forming part of Letters Patent No. 434,518, dated August 19, 1890.

Original application filed November 24, 1888, Serial No. 291,749. Divided and this application filed March 8, 1890. Serial No. 343,216. (No model.) Patented in France September 11, 1888, No. 192,906; in Belgium September 17, 1888, No. 83,288; in England September 21, 1888, No. 13,666; in Italy December 6, 1888, No. 24,147/471, and in Austria-Hungary September 24, 1889, No. 14,001 and No. 31,120.

*To all whom it may concern:*

Be it known that I, Emile Mertz, a citizen of France, residing at Basle, Switzerland, have invented certain new and useful Improvements in Spraying-Nozzles, of which the following is a specification.

The present invention is a division of my application for Letters Patent of the United States for apparatus for moistening air, filed November 24, 1888, Serial No. 291,749, on which Letters Patent No. 424,652 were granted April 1, 1890; and this invention has also been patented in foreign countries, as follows: In France, No. 192,906, dated September 11, 1888, and certificate of addition dated November 4, 1889; in Belgium, No. 83,288, dated September 17, 1888; in Great Britain, No. 13,666, dated September 21, 1888; in Italy, No. 24,147/471, dated December 6, 1888, and in Austria-Hungary, Nos. 14,001 and 31,120, dated September 24, 1889.

The present application for patent has for its object the production of a spraying-nozzle which can be easily cleaned, and which is especially applicable for the atomizing of water for the purpose of moistening the air of spinning-rooms, malting-rooms, boats, the auditoriums of theaters, and similar places where the air is apt to be unduly dry, or to be filled with fine particles of dust. This improved spraying-nozzle is composed, essentially, of a water-discharging shell internally conical, in which is located a spraying-plug provided on its exterior with a number of longitudinally-extending tapering grooves or channels, each of which terminates in or communicates with a peripheral groove, which in turn communicates with minute capillary discharge conduits or orifices. These minute capillary conduits are formed by a saw-kerf or engraving-tool, so that they form with the enveloping-shell more minute openings than could be obtained by drilling. The plug thus provided with tapering grooves or channels with a peripheral groove, and with minute capillary discharge-orifices can, for the purpose of cleaning, be easily removed from the inclosing-shell by simply detaching the shell and then lifting the plug out therefrom, the cleaning being conveniently and simply

accomplished by means of a brush, whereby all the impurities collected in the grooves or orifices are removed. In addition, the said plug can be pressed down within the surrounding shell back from the mouth of the nozzle by simply pressing upon its upper terminal point, and in this manner there can be obtained an automatic cleansing of the grooves or channels and minute capillary orifices by reason of the passage through the nozzle of an increased volume of water under pressure while the plug is maintained pressed down within the shell back from the mouth of the nozzle. A special tool is provided for the purpose of pressing down the plug within the shell whenever a cleaning of the same is desired. This automatic cleansing of the channels and minute capillary orifices of the plug is greatly facilitated by the presence of the annular groove located between the tapering channels and the minute capillary orifices, in which groove the impurities will accumulate and be prevented from reaching the discharge capillary orifices at the mouth of the spraying-nozzle.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical section of the improved spraying-nozzle. Fig. 2 is a plan view thereof. Fig. 3 is a side view of the plug removed from the nozzle. Fig. 4 is a cross-section of the plug. Fig. 5 is a detail view of the tool for pressing down upon the plug for the purpose of effecting its automatic cleaning; and Fig. 6 is a vertical section of an air-moistening apparatus, such as is set forth in Letters Patent of the United States No. 424,652, granted to me April 1, 1890, showing how the tool is used in connection with the spraying-nozzle.

The air-moistening apparatus covered by my Letters Patent No. 424,652 (of which the present application is a division) is shown in Fig. 6, in order that the particular utility of the improved spraying-nozzle and the operation of the cleansing-tool may be clearly set forth. The subject-matter of said patent is shown in Fig. 6, and consists in the casing, through which a current of air is passed, a rotating arbor in said casing, a ventilating-



fan in said casing carried by said arbor, the spraying-nozzles beneath the fan, which direct jets of spray into the air-current, the adjustable atomizing-disks within the casing, located above the spraying-nozzle, and the rotary beater-arms above the atomizing-disks, all as shown in Fig. 6, and as described and claimed in the aforesaid Letters Patent.

As shown in Figs. 1, 2, 3, and 4, the improved spraying-nozzle is composed of a shell *d*, interiorly conical, (gradually contracting or converging toward its discharge,) within which is fitted a plug *e*, having a conical portion fitting the conical interior of the shell, in which conical portion are formed open grooves or channels *f f*. These channels are triangular in cross-section, (converging toward the axis of the plug,) as shown in Fig. 4. They extend longitudinally along the plug and taper outwardly toward the mouth of the nozzle. Near the upper end of the plug these channels all terminate in and communicate with a peripheral groove *f*<sup>2</sup>, formed in the plug, which in turn communicates with a series of minute capillary discharge-orifices *f'* *f'*. These channels and orifices are formed by a sawing, milling, or planing tool. The water being under pressure in the supply-pipe *I* (see Fig. 6) holds the plug upwardly, causing it to tightly seat within the shell, and escaping forcibly through the capillary orifices *f'* *f'* the water is discharged in the form of a group or bundle of very finely atomized jets or sprays. The impurities which are contained in the water traversing the spraying-nozzle collect in the annular groove *f*<sup>2</sup>, and in consequence do not penetrate readily into the capillary orifices, the groove constituting, as it were, a sediment-chamber.

The plug *e* can be removed from the inclosing-shell *d* by first unscrewing the shell, it being screwed into the supply-pipe, as shown. The channels, annular groove, and capillary orifices can then be easily cleaned by a brush. It is, however, rarely necessary to remove the plug for the purpose of cleaning, since the channels and orifices can be easily and readily cleansed by the escaping water passing through them by simply depressing the plug within the surrounding shell. The plug is not fastened to the shell, but is free to be moved downward against the pressure whenever the water-pressure is overbalanced, and when so depressed, owing to the conical shapes of the shell and plug, an annular discharge-passage for the water is formed, exceeding many times in area the combined area of all of the capillary orifices. Through this enlarged discharge-passage the collected impurities are easily and quickly discharged by the force of the escaping water. To enable the plug to be thus depressed, the special tool represented in Figs. 5 and 6 is employed. This tool consists of an inverted cup *r* at the end of a handle *s* and of a screw *t*, which enters centrally the base of the cup *r* and extends therethrough into the cup. In order to

use this tool to depress the plug *e* of one of the spraying-nozzles, the cup is placed over the mouth of the nozzle, so that the screw *t* may encounter the upper exposed surface of the plug. Then sufficient pressure applied to the handle depresses the movable plug. This tool is particularly designed to be used when the spraying-nozzles are employed in connection with an air-moistening apparatus, such as is set forth in the Letters Patent of the United States above referred to, and which is illustrated in Fig. 6. As there shown, each spraying-nozzle is located just beneath the lower rim of an air-casing *A* and considerably within the periphery thereof. The cleansing-tool hence enables the spraying-nozzles to be conveniently reached, and the inverted cup placed over the nozzle prevents the splash- ing of the water and the upward discharge of its increased volume within the casing *A*. The water under pressure, escaping from the tubular shell *d* when the plug is depressed, scours out all of the impurities collected in the tapering channels and capillary orifices, and thus accomplishes a rapid and thorough cleansing.

The screw *t* being adjustable in the inverted cup *r*, the cleaning-tool can readily be adapted to any variations in height to which the plug may project above the tubular shell *d*.

To facilitate the depression of the plug, it is provided with a terminal point *e'*, which projects outwardly beyond the casing *d*. With this point the cleansing-tool coacts when it is used to depress the plug.

In the foregoing description it will be noted that the words "lower," "upper," "vertical," "horizontal," "depressed," and similar words implying direction are used relatively only, and based on the assumption that the nozzle is employed (as it preferably is) to throw water upward. The improvements, however, are equally applicable to the nozzles, irrespective of the direction in which they throw the water.

I claim as my invention—

1. A spraying-nozzle consisting of a shell and a plug fitting therein, said plug having a peripheral groove *f*<sup>2</sup>, longitudinal grooves *f*, extending from the rear end of said plug and communicating with said peripheral groove, and minute discharge-orifices *f'* starting from said peripheral groove and extending outwardly to the mouth of the nozzle, substantially as set forth.

2. The cleansing-tool consisting of the inverted cup, the screw extending thereinto, and the handle, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EMILE MERTZ.

Witnesses:

GEORGE GIFFORD,  
CHAS. A. RICHTER.