

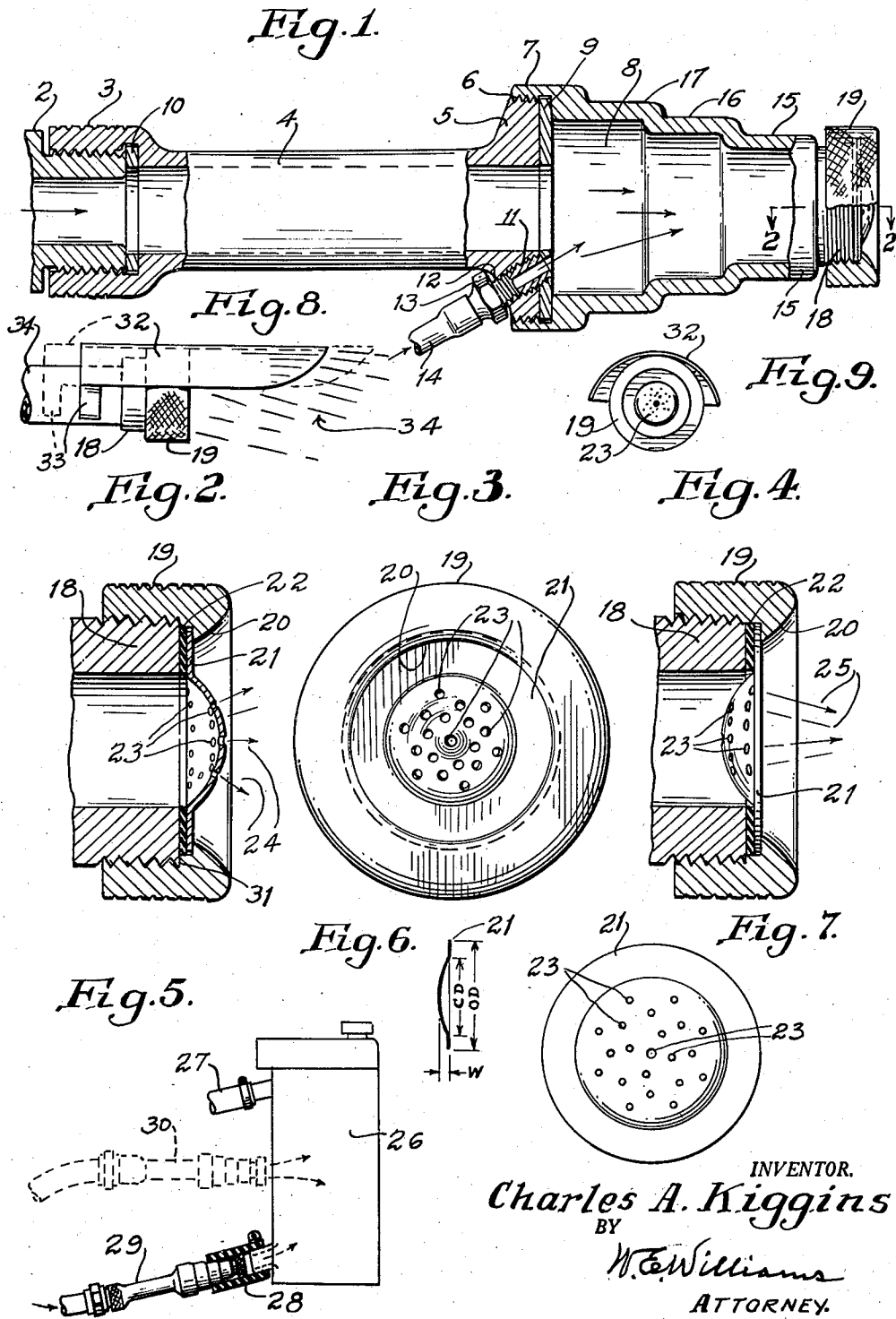
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FLUSHING GUN WITH CONVERTIBLE NOZZLE

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FLUSHING GUN WITH CONVERTIBLE NOZZLE

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2 Claims. (Cl. 299-140)

My invention relates to improvements in a flushing gun with convertible nozzle.

The primary purpose of my invention is to supply forceful pressure cleaning mixtures of air and water or other fluids and is useful for cleaning motor water cooling systems, cleaning automobile wheels and under the fenders of automobile bodies, garage floors, walls, car bodies, and also for extinguishing fires, sprinkling lawns and for many other purposes where forceful pressure and control of water, air, or both, and other fluids as desired.

My gun may be attached to a garden hose or to any suitable water supply under pressure and may at the same time be attached to a source of air supply under pressure or of any desired fluid which may be used with my gun.

The chief use of my invention is in locations where the ordinary garden hose is the connection to a water supply under pressure and the compressed air supply is provided by the air pumps and air pressure tanks which supply air for the inflation of pneumatic tires used in automobiles, and hence the gun is generally used at gasoline filling stations and garages.

The drawing and specification indicate the instrument as to its dimensions, threads and fittings to be those as to the water supply to correspond to what is found in the three quarter inch garden hose and the air supply pipes and fittings to be what are common for inflating tires.

By attaching my gun to a garden hose connected to a water supply system and connecting an air hose to a source of air pressure and then turning both these connections open, my gun forms a blast of vapor similar to steam which penetrates, loosens up and removes dirt, scale and sludge from motor cooling systems. It forms a turbulent blast which stirs up and cleans out the scale, sediment and sludge from cooling systems or other spaces where such cleaning may be necessary or desired.

An object of my invention is to provide a gun of the class described and have the highest efficiency for the service as herein set forth.

A special object of my invention is to provide a convertible perforated nozzle plate having a peculiar meritorious shape and a special arrangement of perforations in the plate, which arrangement is adapted to provide a balance and highly efficient small streams which are highly effective as a spray for cleaning purposes.

Reference will be had to the accompanying drawing in which Fig. 1 shows my gun as a complete unit and the drawing is partly in section.

Fig. 2 is an enlarged sectional elevation through the discharge nozzle on line 2-2 of Fig. 1.

Fig. 3 is an enlarged front elevational section of the discharge nozzle looking toward the left from the right end of Fig. 1.

Fig. 4 is a similar view to that of Fig. 2 but with the perforated nozzle plate or disk reversed in direction from what is shown in Fig. 2.

Fig. 5 is a diagrammatical view indicating the side edge of an automobile radiator and indicating positions of applications of my gun as may be used in cleaning the cooling system of an automobile.

Fig. 6 is a vertical section through the perforated plate or disk nozzle piece drawn approximately to the actual size of such a disk when used with a gun with a hose of three quarters of an inch in size.

Fig. 7 is an enlarged elevation, or rather a plan, of what is shown in Fig. 6. This view, Fig. 7, shows the preferred and entirely new arrangement of the perforations of this nozzle plate which produces the greatest efficiency in the spray nozzle.

Fig. 8 is a side elevation of my gun nozzle in the absence of the mixing chamber 8 of Fig. 1.

Fig. 9 is a front end view of what is shown in Fig. 8. Numeral 2 in Fig. 1 indicates the male nozzle fitting of the three quarter inch or other desired size of a garden hose adapted to supply water under pressure to my gun at its end 3. This end 3 is knurled to assist in holding the body 4 of the gun from revolving while the hose is being attached.

The body 4 is enlarged at 5 and is provided with standard male pipe threads 6 on which there is screwed a female portion 7 of a mixing chamber 8. A suitable gasket is placed between the enlargement 5 of the body 4 and the mixing chamber 8. A gasket 10 is provided on the end 3 to which the garden hose connection 2 abuts for a tight closure of that joint.

In the enlarged portion 5 there is a female nipple 11 into which the nipple end 12 of an air pipe connection 13 is screwed as desired when the air hose 14 is used to supply air to the mixing chamber 8. When air connection 13 is not used a closure cap, not shown, is screwed on to the nipple 12 instead of the air hose connection 13.

The mixing chamber 8 is provided with a series of offset enlargement sections starting from the smallest one 15 at the nozzle end of the gun and stepping up at 16 and 17 for the pur-

pose of being fitted into various sizes of hose connections normally found in cooling systems.

The front nozzle end 15 is provided with the screw threaded end 18, herein indicated as being the male threaded end of a three quarter inch hose fitting.

A convertible nozzle ferrule 19 is screwed on to the screw threaded end 18. This ferrule is knurled on its outside to aid in having the ferrule screwed tightly home on the end 18.

The open side of this ferrule 19 is provided with a curved, ring lip flange 20, the inner edge of which clamps a perforated, reversible nozzle disk 21. A gasket 22 is clamped between the disk 21 and the nozzle end 18.

The seat 31 in the flange 20 for the disk 21 is smaller in diameter than the outside of the threads on the nozzle end 18. This seat 31 is slightly tapered to cause a tight fit of the disk 21 when clamped into the flange 20 of the ferrule 19.

The disk 21 has a concave central portion when in place as shown in Fig. 2, the concave side is the side which contacts the fluid coming from the body of the drum while in Fig. 4 the convex side of the disk 21 contacts the discharging fluid coming from the mixing chamber 8.

This curved central portion of the disk 21 is provided with a series of perforations 23 symmetrically arranged in the manner to balance on every side of a central perforation to form a balanced pressure on the curved portion of the disk 21.

When the disk 21 is in position of Fig. 2 the discharge as indicated by dotted lines 24, make a diverging stream of water, and when the disk is shown as in Fig. 4 there are converging lines of fluid discharge, as indicated by 25.

The diverging discharge, indicated by Fig. 2, scrapes as it were, the surfaces which the fluid contacts, as may take place in a more or less confined chamber, while the discharge which converges, as indicated by Fig. 4, makes a concentrated high pressure small area contact, which when directed on any surface digs in, as it were, to loosen any scale or sludge on the surface. Further, the concentrated discharge as shown by Fig. 4 makes a strong stream which is projected at a longer distance with more force than is the case of the discharge as indicated by Fig. 2.

In the case of the discharge as shown by Fig. 2, this may become a spray which together with an air flow coming in from air pressure by hose 14, really acts somewhat on a basis analogous to a steam spray.

One great merit of my invention is that the ferrule 19 may be easily released and the position of the disk 21 be reversed in the ferrule 19 from either the position of Fig. 2 or of Fig. 4, so that a user of my gun may immediately change the type of nozzle discharge with little loss of time, and without the use of any special arrangement or other mechanical means. The gun is easily handled by being grasped on the body portion 4.

Numeral 26 in Fig. 5 indicates a side view of an automobile radiator. There is a hose connection 27 at the top of the radiator and a like hose connection 28 is at the bottom of the radiator. In this connection 28 my gun is indicated by 29 in position to discharge a stream of fluid into the bottom of a radiator, and thereby reverse the common practice engaged in in flushing out a radiator.

My gun may be used to clean walls, floors and any desired surface to be cleaned. It may be used as indicated by dotted lines 30 in Fig. 5 to clear out the air passages of radiators, cleaning out dust, dirt, bugs or other foreign matter.

The perforations 23 in the disks 21 as shown in the Figures 2, 3 and 4, are arranged in relation to each other more or less as is the common practice heretofore. The perforations of my invention, in order to get the highest efficiency, is shown in the arrangement of the perforations in Fig. 7. In this Fig. 7 there are twenty one perforations, 8 in an outside circle and 8 in an inner circle and four in a central circle around a central perforation. The two eight circle perforations are located on radial lines twenty two and one half degrees apart, as between the outer and inner circle of eight holes each. The four holes of the central circle are ninety degrees apart and each one of them is positioned about midway between a pair of said radial lines.

Strange as it may seem my invention of this arrangement of the perforations as shown in Fig. 7 provide a more efficient stream than in the case of the same sort of perforations, or any other association of perforations, as shown in Fig. 3 or any other of the numerous number of perforations which I have tested out.

Another feature of value of my invention is the curved shape of my perforated disk nozzle. The shape of the bulge or curve of my disk 21 is enlarged and shown of greater depth relatively in the Figs. 2 and 4 than what I have invented and used, as indicated by Figs. 6 and 7.

The outline of a disk which is used in a nozzle ferrule 19 for a three quarter inch hose is shown substantially in this drawing, Fig. 6, full size in section measured in inches. The actual diameter as shown as OD in Fig. 6 of this disk is thirty one thirty seconds, and the diameter of the bulge CD is eleven sixteenths and the depth of the bulge W is fifty eight one thousandths. This is the ratio of sizes and shapes involved in Fig. 7, or any other size of corresponding efficiency, as shown by the shape of the disk 21 in Figs. 6 and 7.

My invention which resulted from my research with perforated nozzle disks, provides a gun of wider adaptation and better service than any other gun heretofore known by me.

The prime part of my invention relates to the nozzle disk and its mounting in the ferrule 19. These may be used on the male fitting on any hose as indicated in Figures 8 and 9 wherein 34 indicates the hose end on which there is secured the regular male fitting 18 on which there is screwed my ferrule 19 which holds in place my perforated disk 21.

In ordinary hosing work where a local confinement of the stream discharging from the hose is desired, I provide an adjustable shield 32 which deflects the stream 34 to prevent it from contacting areas which are not wished to be covered by the stream.

This shield 32 is held on the hose body by means of spring clamping fingers 33 whereby the shield is adjusted by slipping it along the hose to shorten or lengthen the projection of the shield beyond the end of the nozzle as indicated by dotted lines in Fig. 8.

What I claim is:

1. In an instrument of the class described, a hose connection at one end and a discharge nozzle at the other end, a curved perforated plate held in place by a ferrule on the discharge nozzle

zle, an enlarged mixing chamber in the body portion of the instrument, said mixing chamber being enlarged to a greater diameter than the discharge nozzle or the entrance of the hose connection, said mixing chamber composed of two parts 5 separable at its largest diameter and those parts screwed together, an air entrance pipe connected into the said mixing chamber at the location of the largest diameter of said chamber and aligned obliquely to discharge its stream of air in a direction 10 through the mixing chamber toward the discharge nozzle.

2. In an instrument of the class described, a tubular body provided with a channel shaped passage through the instrument for fluids, water 15 and the like, said tubular body being composed of two main sections screwed together at their central portions as relates to their length, one section being connected to a supply hose, the other being a mixing chamber at the front end 20 thereof, said chamber having sections varying in circular diameter, the smaller diameter section

being at the front end of the said instrument, an intake pipe opening to the said mixing chamber and arranged in an inclined position adapted to discharge the fluid stream in a direction through the said mixing chamber toward the discharge nozzle at the front end of the instrument, said mixing chamber shape at the nozzle and approximating the nozzle discharge and backward from the said nozzle being formed into a series of enlarged sections, the supply pipe from the hose connection entering the largest portion of the said mixing chamber, the said hose connection being smaller than the largest diameter of the said mixing chamber, a nozzle end at the front 15 end of the instrument, a flange ferrule screwed on to this nozzle end, a perforated disk clamped over the end of the discharge nozzle by means of the said flange ferrule, said perforated disk having a central portion forming a concave shape on one side and a convex shape on the other side.

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