

(No Model.)

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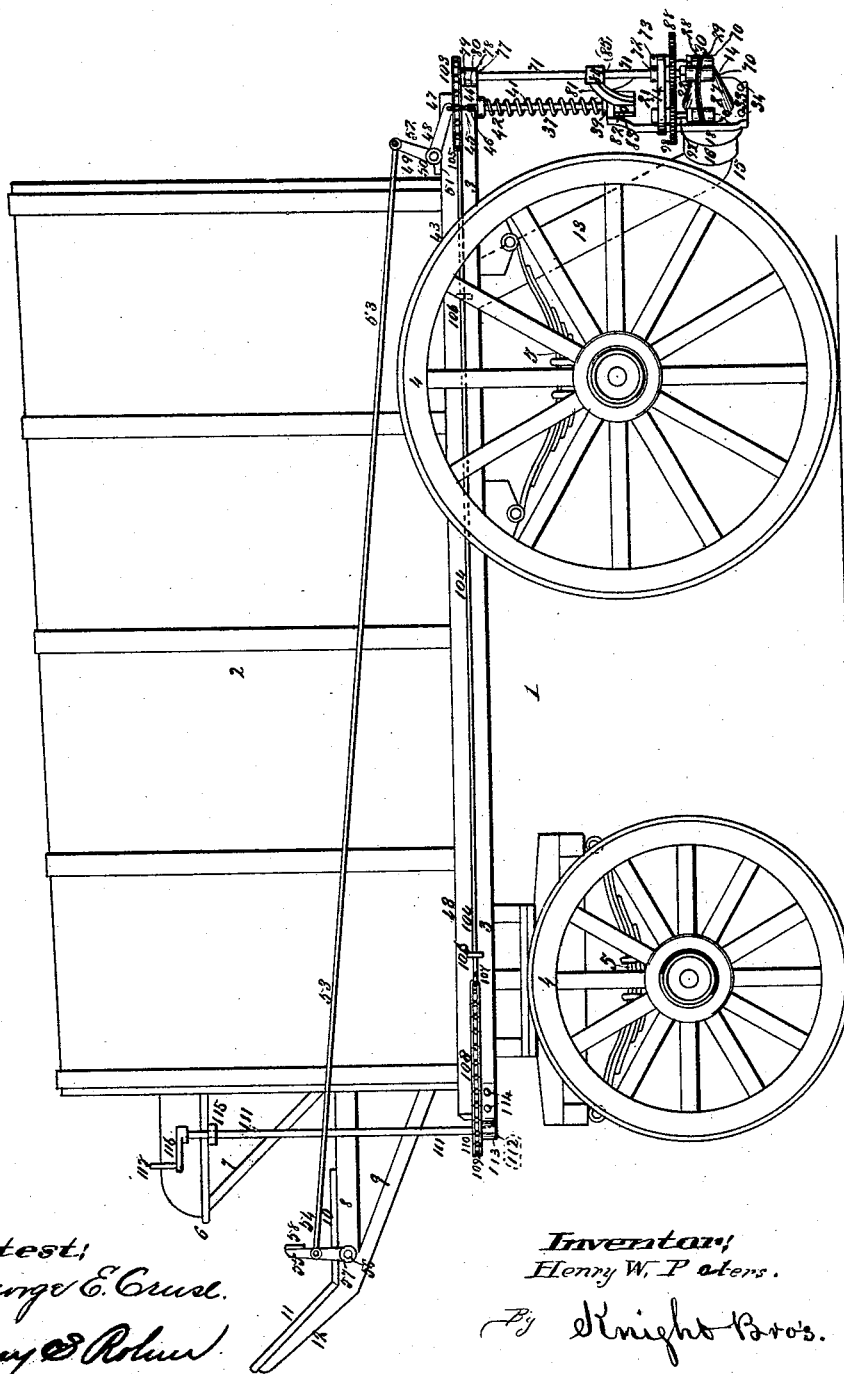
H. W. PETERS.

ADJUSTABLE FAN NOZZLE STREET SPRINKLER.

No. 455,723.

Patented July 7, 1891.

Fig. 1.



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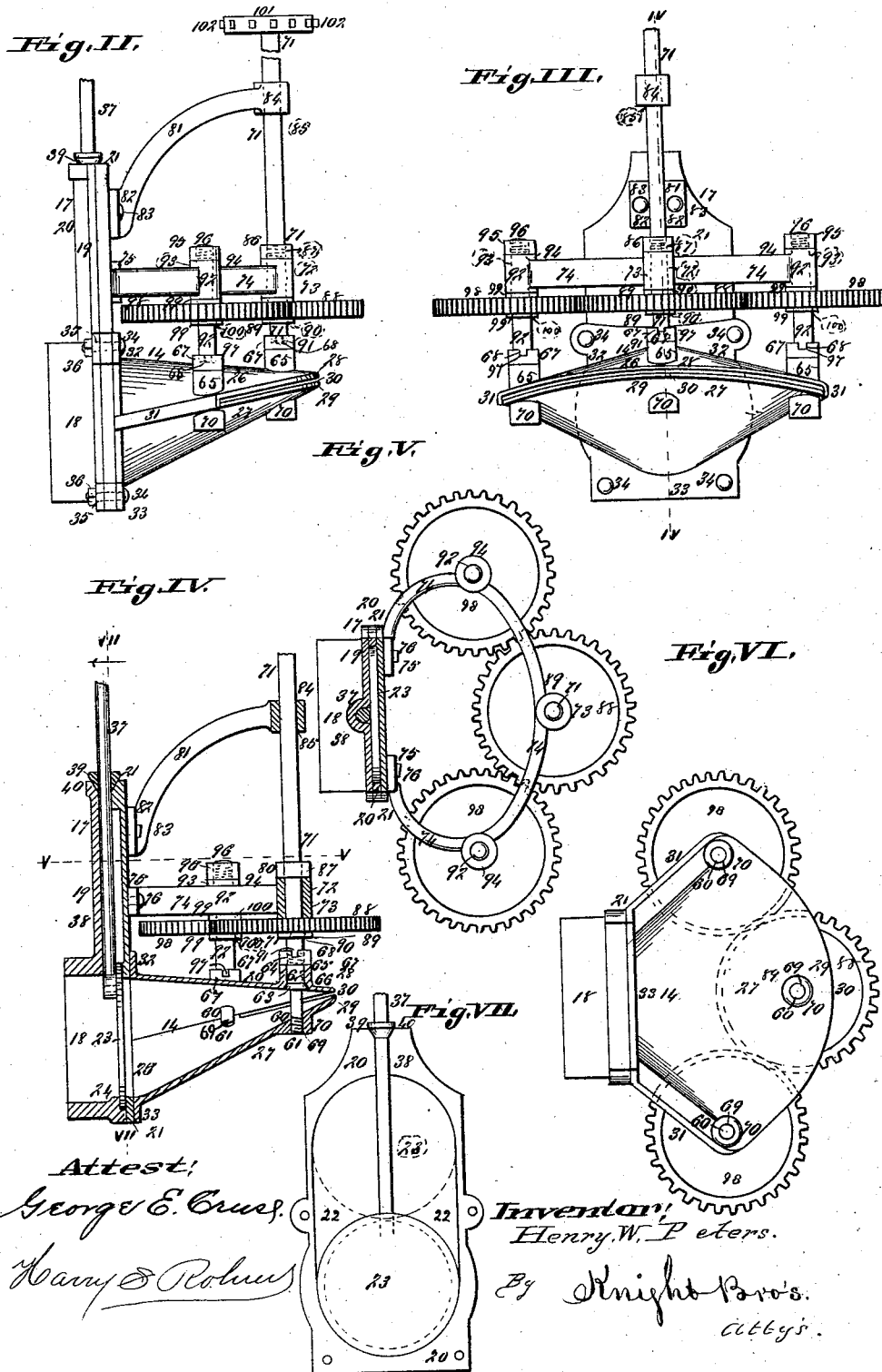
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2 Sheets—Sheet 2.

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Patented July 7, 1891.



UNITED STATES PATENT OFFICE.

HENRY W. PETERS, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
HERMANN H. HOLTMANN, OF SAME PLACE.

ADJUSTABLE FAN-NOZZLE STREET-SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 455,723, dated July 7, 1891.

Application filed January 24, 1891. Serial No. 378,947. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. PETERS, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Adjustable Fan-Nozzle Street-Sprinklers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This invention relates to a street-sprinkler with a fan-mouthed nozzle whose lips are adjustable to be opened or closed or held in any intermediate position by the turning of a hand-crank adjacent to the driver's seat, and
15 having drop-valves at its outlet-ports that are governed by treadles attached to the foot-board frame on which the driver rests his feet.

Figure I is a side elevation of the street-sprinkler with a general outside view of its
20 attached devices. Fig. II is an enlarged side view of the nozzle and its adjusting-gear. Fig. III is an enlarged front view of the same. Fig. IV is an enlarged vertical section taken
25 on line IV IV, Fig. III, and shows the operative means by which the vertical operative shafts adjust the opening of the mouths of the nozzle. Fig. V is an enlarged horizontal
30 section taken on line V V, Fig. IV, and shows the gear system. Fig. VI is an enlarged inverted bottom view of one of the nozzles and its operative gear, and shows the actuating-screws in their seats in the under jaw of the
35 nozzle and by which the jaws of said nozzle are adjusted to their open or closed or any intermediate position; and Fig. VII is an enlarged vertical section taken on line VII VII,
40 Fig. IV, and shows the spring drop-valve or flood-gate that opens and closes the sluiceway of the water-supply to each of the individual nozzles.

Referring to the drawings, 1 represents the wagon, and 2 the horizontal barrel-tank of the street-sprinkler.

45 3 is the platform-frame, and 43 are the skids secured on said platform on which said barrel-tank rests and is held from displacement, and 4 are the wheels on the surmounting springs 5 of which said platform is
50 mounted.

6 represents the driver's seat in front of the

barrel-tank, which seat is upheld by the brace-supports 7, and 8 is the platform foot-frame, which is upheld by the brace-supports 9, and on which platform is mounted the foot-board
55 10, the pressure tread-board 11 being secured to the upwardly-inclined arms 12, that surmount the frame 8.

13 represents the discharge-tubes, which hang pendent from the bottom of the barrel-tank, from which they project, preferably, at
60 about an angle of forty-five degrees both laterally and rearwardly. The top of said discharge-tubes have the usual water-tight collar attachments to the barrel-tank around
65 its open ports, through which the water passes freely into said tubes. There are preferably two of said discharge-tubes, but there may be either more or less, which is dependent on the number of fan-nozzles 14 that it is re-
70 quired to use. The lower end of the discharge-tubes are turned forward so as to constitute projecting feet 15, on which are fitted with water-tight joints the collar-shoes 16.

17 represents the sluice-gate frames, the
75 rear flange-collars 18 of which are integral with the vertical rear plates 19 of said frames, and said rear collar is secured with a water-tight joint, either by screw-threads or otherwise, on the collar-shoes 16 on the projecting
80 feet of the discharge-tubes.

20 represents the skeleton intermediate plates of said sluice-frames, and which intermediate plates, in conjunction with the afore-said vertical rear plates 19 and the vertical
85 front plates 21, inclose the valve-chambers 22, in which valve-chambers the vertical sliding drop-valves 23 work, said valves being of nearly the same diameter as the openings that constitute the valve-chambers with-
90 in said intermediate skeleton plates of the sluiceway-frames and between said rear plates 19 and front plates 21. The valves 23, when dropped in their cut-off or closed positions, rest in their recessed seats 24 and close
95 the ports 25, that are provided in the front plates 21, and through which ports, when the sliding valves are lifted, the water flows into the fan-nozzles. The fan-nozzles are constituted of the downwardly-inclined stationary
100 upper jaws 26 and the upwardly-inclined adjustable lower jaws 27, and which jaws are

furnished in front with corresponding registering bevel arc fan-lips, of which the upper ones 28 are stationary and the lower ones 29 are adjustable to open and close or partially close the mouths 30, as the case may be. The upper jaws 26 are also provided with overhung rear lips 31, that hang pendent over the lips of the lower jaws 27 at the sides of the jaws back of the fan-lips of the mouth. The said overhung side lips shut off the discharge of water from the sides of the jaws back of the fan-lips, while at the same time they allow the upper and lower jaws to be disconnected clear back to their integral attachment-flanges, respectively, 32 and 33. The said attachment-flanges, and with them the jaws, are firmly secured to the front plate of the sluice-gate frames by the bolts 34, that are seated in the perforations 35 in said flanges, and in said front, intermediate, and rear plates of the frame, and there are secured by the screw-nuts 36.

37 represents the actuating slide-valve stems, which stems are seated and work within the recesses 38, formed by the single central corrugations of the rear sluice-frame plates 19, and which stems are fast secured to the valves 23 that they operate. A fast bevel collar or swell 39 projects from said stem at just the height above said valve to help stay its downward drop when the valve is at closed port, at which time said bevel swell-collar rests in its bevel recessed seats 40, which are sunk into the upper edges of the rear and intermediate plates of the sluiceway-frames.

41 represents spiral push-springs that are mounted on said actuating-stems and push against said swell-collars at their lower ends and against the perforate buffer-washers 42, that are seated against the under side of the platform-frame 3. The said springs hold the slide-valves in their normal closed-port position.

Perforations 44 through the side bars of the platform-frames on line with the actuating-stems of the slide-valves provide free working scope for said stems and for the link-hooks 45, that engage in the perforate heads 46 of the stems and in the perforate lower arms 47 of the bell-crank levers 48, which bell-cranks have loose bearings on the journal-shaft 49, on which they are steadied by the washer 50, and which journal-shaft has box-bearings 51, secured on the skids that support the barrel-tank, and said journal-shaft reaches from side to side of the platform and journals both bell-cranks that on their respective sides of the platform operate the slide-valves that regulate the supply of water to their respective nozzles. The upper perforate arms 52 of the bell-crank levers are engaged by the lower hooks of the long actuating-rods 53, whose upper hooks engage in their center bearings 54 in the treadle-bars 55, which treadles are journal-mounted on the pivot-bolts 56, which bolts are secured in the

foot platform-frames 8, and said treadles are steadied on said pivot-bolts by the washers 57. Foot-boards 58, secured to the tops of the treadles, present footholds for the driver, by pressing against which with his feet, respectively, in against the treadles on either or both sides of said platform he is enabled to lift the slide-valves on either or both sides of the sprinkler and hold them lifted as long as his feet rest against the treadles, so as to provide a free flow of water to and through either one or both of the nozzles.

60 represents draw-screws of a special construction for the adjusted contraction and expansion of the mouths 30 of the fan-nozzles 14. I preferably use, as I have shown, three of said screws, one to the middle of the fan-shaped lips and the other two to the corners; but I do not confine myself to any special number. The said draw-screws and their several parts being of like construction are alike numbered and described. The said draw-screws are formed with screw-threaded lower ends 61, enlarged top portions 62, having bevel swell-collars 63 at the lower ends of said enlarged portions, and screw-threaded upper terminals 64. The upper ends of said screws are seated within the flange-sockets 65 in the roof of the mouths or upper lips and jaw of said nozzles before the attachment of the jaws to the sluice-gate frames, the bevel swell 63 in each case at the foot of the enlargement 62 of the screw fitting into the bevel entrance 66 from the roof of the mouth of the nozzle into the flange-socket 65. After the top of said draw-screw in each case has been so seated, as above stated, the screw-head 67 is screwed home on the screw-threaded upper end of said screw that projects above the flange-socket until said attachment screw-head rests on the upper edge of the flange-socket 65. The upper end of the threaded screw within the attached head is then slightly riveted, so as to re-enforce its hold on its screw-head. A slot 68 is then cut transversely across said screw-head, passing through both the screw-head and the upper end of the integral screw that said attachment end caps. The lower jaw of the nozzle is next coupled to the upper jaw by the insertion of the lower screw ends of the three draw-screws in the perforated screws 69, which are formed, respectively, within each of the swells 70, beneath the lower jaw. The screw-coupled jaws can then be secured to the front plate 21 of the sluice-gate frame, as described, by the screw-bolts 34.

71 represents vertical major screw-driver shafts, which have their lower journal-bearings 72 within the integral journal-box tubes 73 on the center projections of the horizontal are bearer-brackets 74, the perforate attachment-flanges 75 of which brackets are secured to the front plate 21 of the sluice-gate frame by the screw-bolt 76. The upper end of said screw-driver shafts have their jour-

nal-bearings 77 in the journal-boxes 78, whose perforate flanges 79 are secured to the rear end of the platform 3 by the screw-bolts 80.

81 represents intermediate journal bearer-brackets whose perforate flanges 82 are secured to the front plate of the sluice-gate frame by the screw-bolts 83. These upwardly and forwardly projecting bearer-brackets are provided at their upper forward ends with integral tube-box swells 84, that provide the intermediate journal-bearings 85 for the middle of said vertical major screw-driver shaft 71. Follower screw nuts or collars 86 engage on their screw-threaded seats 87 around the screw-driver shafts immediately above the journal-box tubes 73 of the horizontal bearer-brackets 74, on the top of which tube-swells said screw-nuts rest and work.

88 represent center gear-wheels, which are fast mounted on the major screw-driver shafts 71 in close proximity beneath the journal-box tubes 73, in which said shaft has its lower journal-bearings. The said gear-wheels may be rigidly secured to their seat on said driver-shaft by the screw collars or nuts 89, that are screw-seated on the threaded peripheries 90 on said driver-shafts on each side of said gear-wheels.

91 represents the driver lugs or tenons of said major driver-shafts, which lugs engage in the slots 68 of the draw-screws 60 to effect the turning of the same.

92 represents the minor screw-driver shafts, which have their single journal-bearings 93 within the integral intermediate box-tubes 94 on the horizontal arc bearer-brackets 74.

95 are the follower screw nuts or caps that are screw-seated on the upper screw ends 96 of said minor screw-driver shafts, whose lower ends are provided with the tenons or lugs 97, that engage in the slots 68 of the draw-screws beneath them.

98 represents side gear-wheels, which are fast mounted on said minor screw-driver shafts in registering line and having geared engagement with the center gear-wheels that are mounted on the major screw-driver shafts 71. The said side gear-wheels are fast secured to the minor driver-shafts that carry them in close proximity beneath the journaled box-tubes 92, as in the center gear-wheel to its major driver-shaft beneath its journal-box tube 73 by means of follower screw collars or nuts 99, which engage on their screw-threaded seats 100 around said minor screw-driver shafts 92. It will thus be seen that when said major screw-driver shafts are turned and turn their underlying screws either to expand or contract the jaws and lips of the fan-nozzles the center gear-wheels mounted on said major drive-shafts as they mesh into the side gear-wheels thereby command and turn the minor screw-driver shafts and the screws that they surmount, so as to simultaneously work on the corners of the mouth or lips as their forward coadjutary screws operate on the middle of said mouth to simultaneously regu-

late the expansion and contraction of all parts of the mouth of said nozzle.

I have shown in the vertical section, Fig. IV, the center draw or expansion and contraction screw 60 with a left-hand thread and the side screw, also 60, having the same general construction, located at the corners of the mouth with a right-hand thread, for it is evident that as the center gear-wheel on the major screw-driver shaft turns the side gear-wheels that are mounted on the minor screw-driver shafts that said side gear-wheels and the shafts on which they are mounted must of a necessity rotate simultaneously in a reverse direction to the gear that drives them, and consequently the actuating-screws that they drive must simultaneously move in opposite direction to effect the same simultaneous purpose.

101 represents sprocket-wheels that are fast mounted on the summit of the major screw-driver shafts, and 102 are the sprocket-teeth in the periphery of said wheel.

103 represents stretches of gearing-chain that engage with the sprocket-teeth of said wheel, and 104 are long-linked duplex connecting-rods, whose rear hooks 105 on each of the corresponding rods engage, respectively, in the terminal links of said stretch of gearing-chain. The said duplex rods 104 are seated and work in the staples or slotted lugs 106, which latter are secured in the side pieces of the platform-frame 3. The forward hooks 107 on said duplex rods engage, respectively, in the terminal links of the forward stretch of gearing-chain 108, the links of which latter chain engage with the sprocket-teeth 109 of the sprocket-wheel 110, which sprocket-wheel is fast mounted on the vertical operating-rod 111, the foot 112 of which rod works in the journal-box 113, which journal-box is secured to the platform 3 by the screw-bolts 114. The upper end of said operating-rods are seated and work in the perforate journal-lugs 115, the connecting-strap of which perforate journal-lugs is secured to the bottom of the driver's seat, and the said journal-lugs project from the sides of the seat, so as to locate the actuating ends of said rods in close proximity to the driver who operates them.

116 represents hand-cranks that are fast mounted on the tops of the operating-rods, and the handles 117, by which said cranks are turned, are thus convenient to the driver's hands, on each side of his seat, for the adjustment of the volume of the discharge from the mouths of the nozzles on either or both sides of the sprinkler.

The flooding or sprinkling devices described above are duplicated on each side of the sprinkler.

The operation of the invention is as follows: It is to be understood that the normal position of the slide or drop valves 23, that command the sluice-gateways, is dropped to closed port, which position they attain and

retain by the force of the push-springs 41 and by their own gravity, so as to prevent the flow of water except when the ports are opened by the action of the driver. When the driver presses against and pushes the treadle or treadles on each or both sides of his foot-platform in accordance with whether it is required to sprinkle from the one nozzle or both, then by means of the rods 53 and the bell-crank 48 the sliding valve or valves, as the case may be, are elevated on respectively one or both sides of the sprinkler and the flow of water to the fan nozzle or nozzles is in full force, and it can again be instantaneously shut off at any time when passing over a foot-crossing by lifting the driver's foot from the treadle or treadles, the flow being immediately again effected by forcing forward the treadles. In finishing up the sprinkling of a street there is sometimes a narrow strip that requires only the work of one nozzle to effect the sprinkling of the residue, in which case the driver lifts his foot from one of the treadles, and the valve in that side immediately closes. Now in some seasons of the year and in some conditions of the weather it is required to sprinkle more heavily than at other times. To effect this change and either to expand or contract, as the case may be, the mouths of the fan-nozzles, the driver by simply turning the crank-handles on each side of his seat turns the operating-rods 111, the sprocket-wheels 110 at their feet, which drives the endless combines of gear-chains and link-rods, the sprocket-wheels 101, the major and minor screw-driver shafts, the gear-wheels on said driver-shafts that, meshing together, make said shafts co-operative, and, lastly, the adjusting draw and withdrawal screws 60, which, as they are thus turned by the action of said hand-cranks, as previously described, either expand or contract the mouths of the fan-nozzles, respectively, as the case may be, according to whether the hand-cranks are turned to one side or the other. It is almost always, if not invariably, desirable to sprinkle heavier toward the summit of the street than toward its side gutters, for the self-evident fact that the sprinkled water tends to run from said summit toward said gutters. Now by means of the adjustable expanding and contracting lips of my fan-nozzles the driver is enabled without stopping or leaving his seat to adjust and readjust the opening of the mouths of the fan-nozzles on either side of the sprinkler independent of each other, so as to change at will the respective flow through the individual nozzles. The mouths of the nozzles can by the above specified expanding and contracting device be set, and each of said nozzles irrespective of the other be set to a full flow or to the lightest sprinkle or to any intermediate increased or decreased flow, and the lips will remain in the exact adjustment to which they have been screwed by the driver-shafts under the operation of the hand-cranks. The driver,

as soon as he has adjusted the opening of the mouths of said nozzles, can remove his hands from the hand-cranks by his seat, and he does not need to pay any further attention thereto until from any cause it is desired to abate or increase the flow from either nozzle.

The above-described means for the expansion and contraction of the lips of the fan-nozzles provides the means for the adjusting and readjusting the flow to suit the various conditions of the streets and formation of the road-bed, so that as the sprinkler passes over a granite, concrete, wood, or gravel road-bed, and from one to the other, requiring, respectively, either a light or heavy sprinkle, the lips of my fan-nozzles are easily adjusted without the stopping of the sprinkler and retain their adjustment. It will also be seen that the flow of water from the tank to the mouth of the fan-nozzle has no sudden buffer-stay on its way to the objective point of its discharge. The curved foot of the discharge-tubes switches the water around into the nozzle without much frictional loss, while the peculiar shape of the two jaws of the fan-nozzle, which incline, respectively, toward their meeting line from below and above, concentrates the force of the discharge toward that line that effects the carriage of the water-fan to a greater distance than could otherwise be accomplished.

I claim as my invention—

1. In a street-sprinkler, the combination of the upwardly-inclined under jaw of the fan-discharge nozzle, the downwardly-inclined upper jaw of said nozzle, and the actuating adjustable screws that expand and contract the mouth of said nozzle, substantially as and for the purpose set forth.

2. In a street-sprinkler, the combination of the sluice-gate frame, the adjustable slide-valve 23, that works within said frame, the upwardly-inclined lower jaw of the fan-nozzle, the downwardly-inclined upper jaw of said nozzle, the said jaws secured in respective registering positions to said sluice-frame, the actuating-screws 60, that effect the expansion or contraction of the mouth of said nozzle, and the screw-driver shafts that effect the turning of said screw for their functional purpose, substantially as and for the purpose set forth.

3. In a street-sprinkler, the combination of the sluice-gate frame, the lower and upper sectional jaws of the fan-nozzle secured to said frame, the actuating-screws 60, by which the mouth of said jaw-nozzle is expanded and contracted, the journal-bearer brackets 74 and 81, secured to said sluice-gate frame, the box-journal tubes carried by said brackets, the major screw-driver shafts, and the minor screw-driver shafts journaled in said tubes and supported by said brackets, substantially as and for the purpose set forth.

4. In a street-sprinkler, the combination of the sluice-gate frame, the lower and upper sectional jaws of the fan-nozzle secured to

said frame, the actuating-screws 60, by which the mouth of said jaw-nozzle is expanded and contracted, the journal-bearer brackets 74 and 81, the box-journal tubes carried by said brackets, the major screw-driver shaft 71 and the minor screw-driver shaft 92, having bearings in said journal-tubes, the center gear-wheel 88, fast mounted on the major driver-shaft, and the side gear-wheels 98, fast mounted on the minor driver-shafts to effect a simultaneous rotation of the driver-shafts, substantially as and for the purpose set forth.

5. In a street-sprinkler, the upwardly-inclined lower jaw of the nozzle, the downwardly-inclined upper jaw of said nozzle, the centrally-protruding corresponding lower and upper lips of said jaws, the said jaws being arranged to open and close from their rear ends forward, and the overhung rear pendent side lips 31 of the cheeks of the upper jaw, the said pendent lip arranged to shut off the water-discharge from the cheeks of the nozzle where said discharge is not required and yet allow the free movement of the whole length of said jaws, substantially as and for the purpose set forth.

6. In a street-sprinkler, the combination of the upper and lower jaws of the nozzle, the flanged bevel-footed socket-tube 65, that surmounts said upper jaw of the nozzle, the protruding adjustable upper and lower fan-shaped lips of the mouth of said nozzle, and the actuating adjusting-screws 60, that effect the expansion and contraction of said lips, the said screws having enlarged upper portions 62, with bevel swell-collars 63, which enlarged portions and bevel-collars are housed and work in said flanged socket 65, and said screws having the attachable heads 67 and screw-threaded points that engage in the internally-screw-threaded swells 70, that are integral with the lower jaw, substantially as and for the purpose set forth.

7. In combination with a street-sprinkler wagon and tank, the fan-nozzle having individual upper and lower jaws, the fan-shaped

projecting lips of said jaws, the actuating-screws 60, that adjust the expansion and contraction of said lips, the major screw-driver shaft 71, the center gear-wheel mounted on said shaft, the minor screw-driver shafts 98, the side gear-wheels mounted on said shafts, the said driver-shafts arranged to turn the actuating-screws and the said gear-wheels to effect simultaneous action of said driver-shafts, the sprocket-wheel 101, that is fast mounted on the top of said major driver-shaft, the operating-rod 111, the sprocket-wheel 110, fast mounted on said operating-rod, the combined gear-chain and link-rods that operatively connect the sprocket-wheels 110 and 101, and the hand-crank 116, that operates said rod, sprocket, drive, and screw-driver shafts to rotate said actuating-screws and respectively expand and contract the lips of the fan-nozzle, substantially as and for the purpose set forth.

8. In combination with a street-sprinkler wagon and tank, the discharge-tube 13, the sluice-gate frame 17, provided with the sluice-port 25 and constructed with the rear plate 19, the front plate 21, and the intermediate skeleton plate 20, inclosed within which skeleton plate and said rear and front plates is provided the valve-chamber 22, the slide-valve 23, that works in said chamber, the vertical operating-stem 37, the spiral push-spring 41, that is mounted on said stem and forces said slide-valve to closed port in its normal position, the bell-crank lever 48, the link-hook 45, that connects said bell-crank to said stem, the actuating-rod 53, the treadle that by means of said coadjutary parts elevates said slide-valve to open port, the duplex-jaw nozzle with its concentrically-approaching lips, and the actuating-screws 60, that expand and contract the opening of said lips, substantially as and for the purpose set forth.

HENRY W. PETERS.

In presence of—

BENJN. A. KNIGHT,
SAML. KNIGHT.