

July 13, 1937.

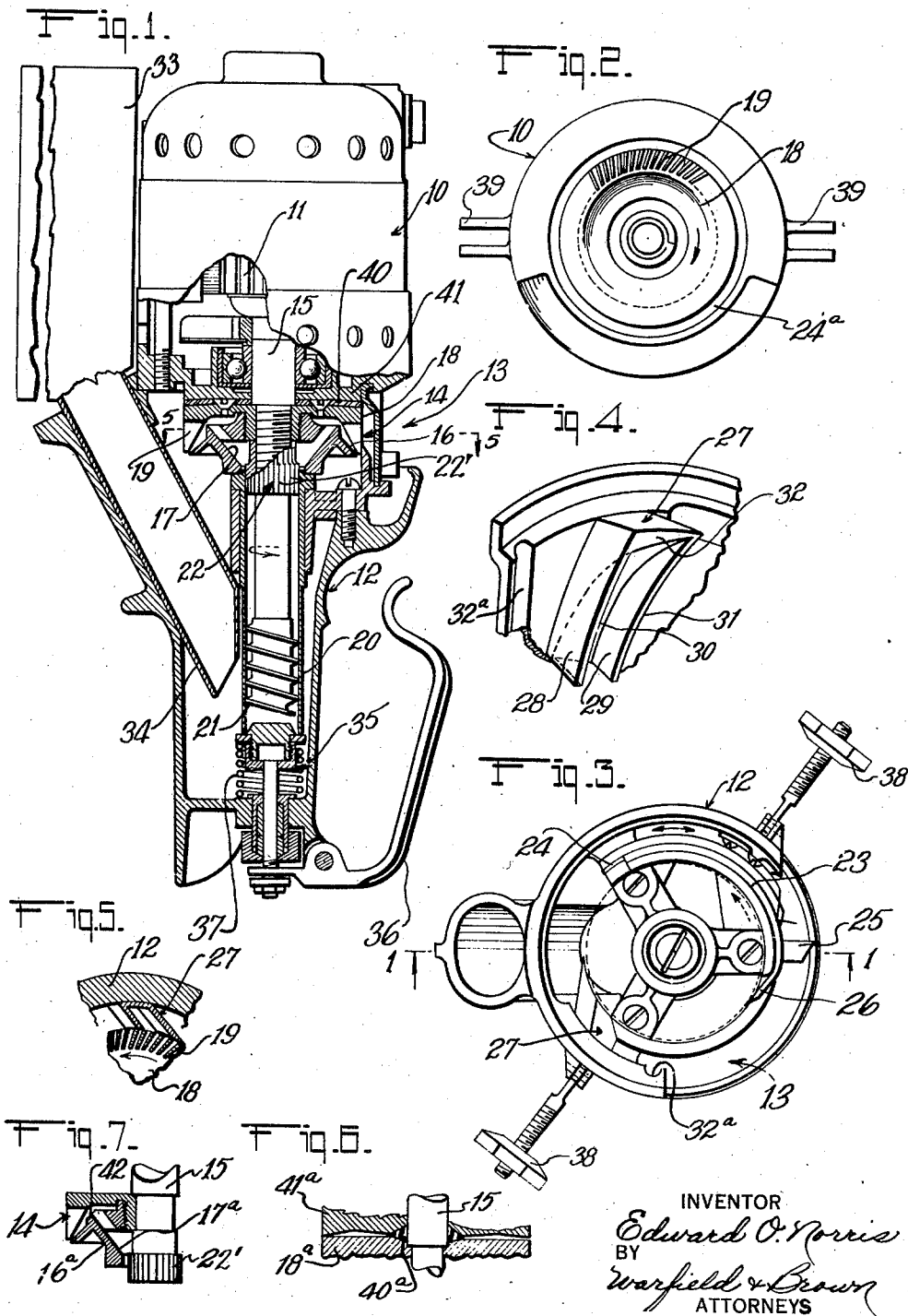
E. O. NORRIS

2,086,987

SPRAYING DEVICE

Filed Dec. 19, 1932

3 Sheets-Sheet 1



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SPRAYING DEVICE

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Fig. 8.

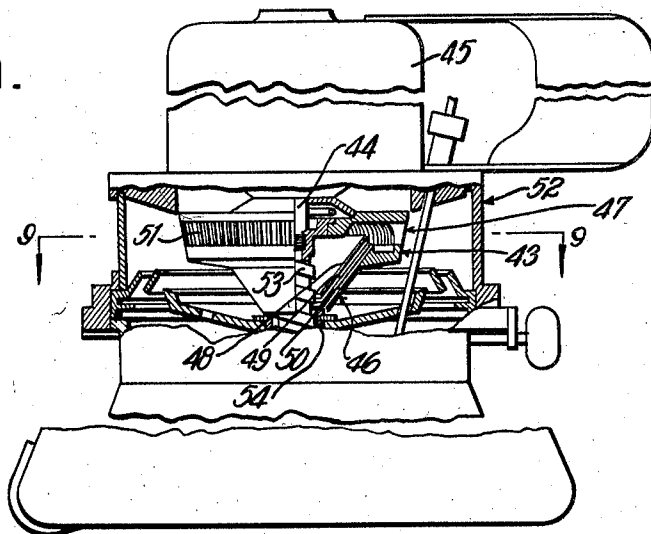


Fig. 11.

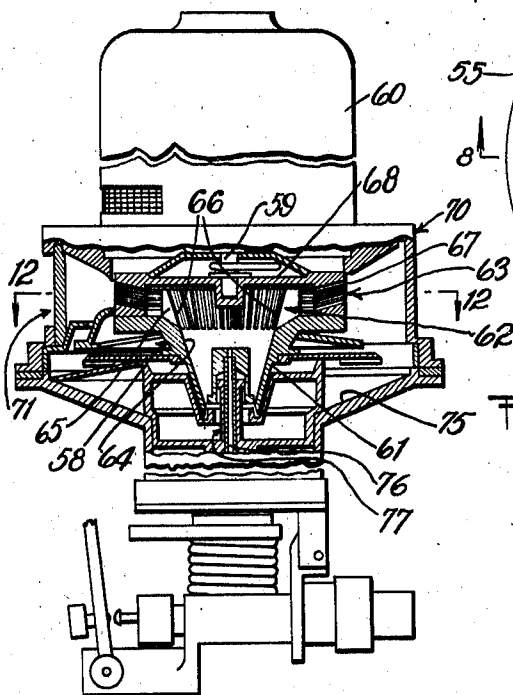


Fig. 9.

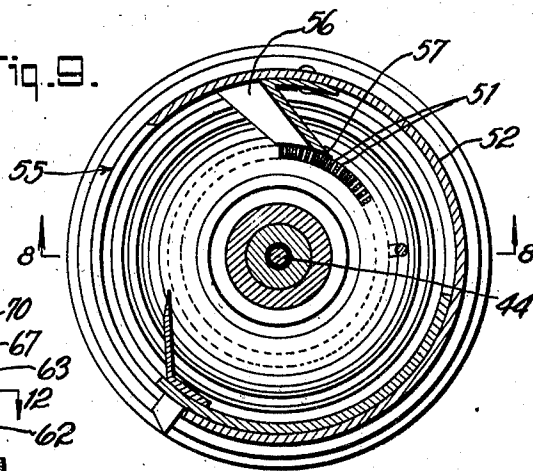
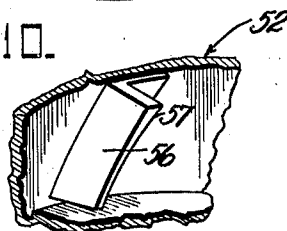


Fig. 10.



INVENTOR
Edward O. Norris
BY
Warfield & Brown
ATTORNEYS

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E. O. NORRIS

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Fig. 12.

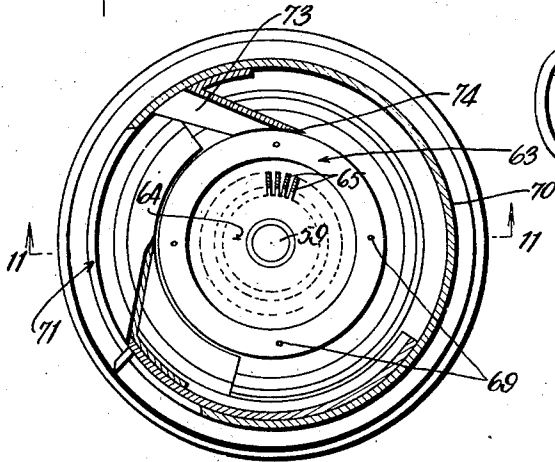


Fig. 15.

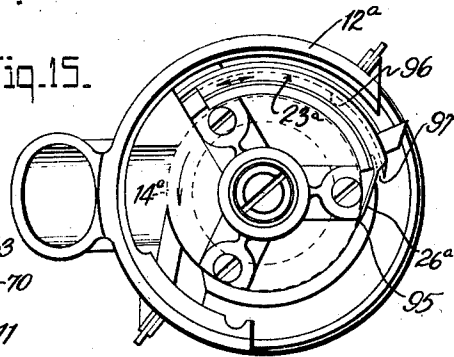


Fig. 13.

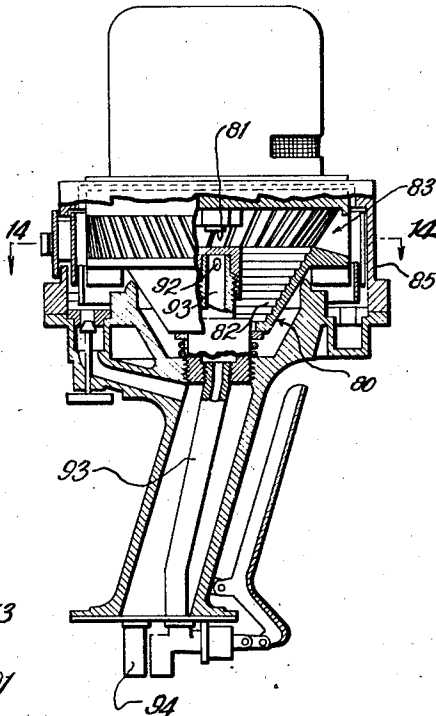
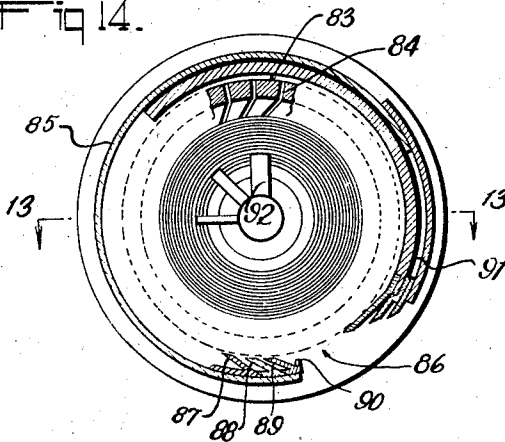


Fig. 14.



INVENTOR
Edward O. Norris
BY *Warfield & Brown*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,086,987

SPRAYING DEVICE

Edward O. Norris, Port Chester, N. Y., assignor
to The Norris Painting Machinery Corpora-
tion, Inc., New York, N. Y., a corporation of
New York

Application December 19, 1932, Serial No. 647,896

28 Claims. (Cl. 299—63)

This invention relates to spraying devices, and, more particularly, to devices for centrifugally spraying paint or other liquid on a surface.

The application is, in part, a continuation in part of my copending applications Serial No. 479,900, filed September 5, 1930, Serial No. 530,551, filed April 16, 1931, and Serial No. 544,360, filed June 15, 1931.

In general it is an object of the invention to provide a device of the character described which is simple and economical of construction, efficient and certain in operation, and which will effectively accomplish the purposes for which it is intended.

Another object is the provision of spraying means adapted for centrifugally applying a wide variety of liquids to surfaces.

Another object is the provision of means for applying liquid in a particularly well and uniformly divided form.

Another object is the provision of means for effectively cutting off unused portions of the spray.

Still another object is the provision of a portable spraying device of a particularly effective type.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a side view, partly in section along the line 1—1 of Fig. 3, of a portable spraying device embodying the invention;

Fig. 2 is a bottom view of the motor casing and the rotatable parts;

Fig. 3 is a top view of the device with the parts shown in Fig. 2 removed;

Fig. 4 is a perspective view of a portion of the interior of the device showing the means for preventing ejection of unused liquid;

Fig. 5 is a fragmentary sectional view along the line 5—5 in Fig. 1;

Fig. 6 is a detail sectional view showing a modified form of centrifugal seal;

Fig. 7 is a detail sectional view of a somewhat modified form of delivery cone;

Fig. 8 is a side view of a modified form of device shown partly in section along the line 8—8 in Fig. 9;

Fig. 9 is a horizontal section along the line 9—9 of Fig. 8;

Fig. 10 is a detail perspective view showing the cut-off element;

Fig. 11 is a side view partly in section along the line 11—11 in Fig. 12 of another modified form of device;

Fig. 12 is a horizontal sectional view along the line 12—12 of Fig. 11;

Fig. 13 is a side view partly in section along the line 13—13 of Fig. 14 showing another modified form of device;

Fig. 14 is a sectional view along the line 14—14 of Fig. 13; and

Fig. 15 is a view similar to Fig. 3 showing a modified form of forward defining means and gate arrangement.

It is of importance in the provision of centrifugal spraying devices that a maximum discharge of effectively subdivided particles be obtained for given speeds of rotation of the distributor.

It is also of importance in devices of the type under consideration that liquid discharged otherwise than generally toward the surface to be spread be confined, and likewise that fluid swirling in the space between the confining means and the distributor be effectively prevented from affecting the character of the supply.

With the foregoing and other ends in view, the present invention contemplates the provision of improved types of distributor members and improved types of cut-off means, as well as various improved features of construction adapted to be embodied in centrifugal devices for spraying liquids on a surface.

The invention finds a ready application in portable spraying devices, and various modified forms of the invention as embodied in portable spraying devices are exemplified.

The device exemplified in Figs. 1 to 5, inclusive, comprises an upper casing 10 surrounding a motor 11 and a lower casing 12 surrounding the working parts and formed with an ejection opening 13. In line with the ejection opening there is provided a centrifugal distributor 14 carried on the motor shaft 15, and comprising 50 an inner member 16 having a frusto-conical inner surface 17, and an outer member 18 comprising a plurality of generally transverse spaced elements 19 having downwardly and outwardly sloping inner edges and disposed at an angle to 55

the radius of the distributor. Liquid is carried upwardly from the chamber at the bottom of the casing 12 through a tube 20 by means of a rotary lifting element comprising screw threads 21 on the shaft 15, and is discharged on the conical surface 17 by a member 22 which, as will be seen, has a centrifugal action and is serrated to provide a multiplicity of edge portions 22' from which the liquid is discharged upon the conical surface 17. The liquid is carried up this surface by centrifugal action and is thrown from the upper circular edge of the member 17 upon the upper portion of the transverse members 19 and by centrifugal action spreads over these and is discharged from their outer surface. The members 19 act to change the course of the particles of liquid and assure the discharge of the same in an even and effective manner. Because of their height and shape, the liquid is spread over them and leaves their outer edge portions in a manner which provides a large extent of discharge area with respect to the diameter of the distributor. As will be seen the inner edge surfaces of the elements 19 slope outwardly and downwardly and the conical surface of the member 17 acts to discharge liquid against the upper and inner portions of these inner edge surfaces. The liquid which rides down these surfaces tends to spread over the forward surfaces of the members 19. If any liquid is carried all the way to the bottom of these surfaces it is readily discharged from their lower edges toward the chamber at the base of the casing. It is to be noted that the upper and lower ends of the members 19 are defined by planes perpendicular to the axis of the distributor, so that the liquid does not tend to gather adjacent such ends.

As much of the liquid as passes through the opening 13 forms the effective spray. Since the regulation of the size of this opening is desirable, there is provided a gate whereby the extent of the opening is controlled. The exemplified gate consists of an arcuate member 23 which is slidably seated within the casing in slots 24 and 24a so that it may readily be moved, as by means of a handle 25, across the opening. As will be seen, a closure member 26 carried by the gate extends in close proximity to the periphery of the distributor.

The casing 12 is arranged to return to the chamber at its bottom that portion of the liquid which is not ejected through the opening 13. To this end there is provided an egress-preventing unit 27, comprising members 28 and 29 extending downwardly and forwardly away from the distributor in the direction of rotation of the distributor and provided with cutting edges 30 and 31, respectively. As will be seen the presence of these cutting edges substantially eliminates any tendency of swirling or discharged liquid to build up against the rear ends of the members 28 and 29. These members are united by an upper member 32. It will thus be seen that liquid discharged from the distributor and not ejected through the opening, will be caught by the member 29 and deflected downwardly, and that air currents will be similarly deflected; and further, that material escaping the action of the member 29 or any liquid discharged between the members 29 and 28, will be caught by the member 28 and deflected downwardly. In order further to eliminate the building up of liquid at the rear of the discharge opening, the casing is provided with a vertical groove 32a immediately at the rear of the opening.

Liquid is maintained in the chamber at the bottom of the casing 12 by means of a reservoir 33 having an infeed neck 34 and preferably removable as a unit for replacement by a filled reservoir unit. As the liquid in the bottom of the casing 12 is used, air may enter the neck 34 and rise into the reservoir so as to permit more liquid to be delivered into the chamber at the base of the casing. The bottom of the tube 20 is closed by valve means 35 operated by a hand lever 36 against the pressure of a spring 37. The casing members 10 and 12 are held together by nut-equipped latch members 38 fitting between prongs 39.

In order to seal the space between the motor and the distributor, there is provided a flexible washer 40 seated against the concave surface of a member 41, so that a centrifugal seal is provided during rotation of the parts.

In instances where it is desirable that the liquid be discharged on a lower portion of the inner edge surfaces, and where it is likewise desirable that a larger space between the annular line of discharge and the inner edge surfaces be provided, a member such as the member 16 may be cut away, as for instance in the manner indicated at 42 in the member 16a shown in Fig. 7.

In Fig. 6 there is shown a particularly effective form of centrifugal seal. In this construction members 18a and 41a corresponding to the members 18 and 41 are formed to provide outwardly converging surfaces adjacent the shaft 15 and there is fitted between these surfaces an annular, wedge-shaped leather washer member 40a. As will be seen, rotation will cause this washer member to crowd against the converging surfaces to form a seal which prevents ingress of liquid to the shaft 15 with particular effectiveness.

In Figs. 8, 9 and 10, there is exemplified a modified form of device wherein the inner distributor member comprises a plurality of delivery elements and wherein the generally transverse elements providing the outer distributor member are shaped differently from the corresponding elements shown in Fig. 1, and wherein a single cut-off element is utilized. In this form of construction, there is provided a distributor 43 carried on a shaft 44 which may be driven by a motor within a casing member 45. The distributor comprises an inner member 46 and an outer member 47, the inner member being formed to provide a plurality of frusto-conical surfaces 48, 49 and 50, providing at their upper ends circular edges adapted to discharge liquid on spaced planes. Outside of these circular edges, and intersecting said planes, the outer distributor element is formed to provide a plurality of generally transverse elements 51 which are spaced one from another and which are adapted to intercept liquid discharged from the surfaces 48, 49 and 50. In this form of construction the generally transverse elements are spaced from the circular edges and, as will be seen, are spaced a somewhat greater distance than is the case in Fig. 1. These elements are, in the present instance, provided with sloping inner surfaces which are curved, rather than straight as in Fig. 1. About the distributor there extends casing means 52, the lower portion of which provides a liquid supply reservoir from which paint or other liquid is centrally fed to the distributor by means of a screw 53 mounted on the shaft 44 and extending within a sleeve

54. Various details of construction will be found disclosed in my copending application, Serial No. 544,360 above mentioned. The casing is provided, at a portion of its periphery, with an ejection opening 55 in line with the slots between the elements 51, and an element forming part of the casing surrounds the remainder of the distributor. In order to prevent the air and liquid which swirls about the inside of this casing element from affecting the spray, there is provided a cut-off element or flange 56 mounted on the casing element and extending therefrom rearwardly and inwardly into close proximity at the periphery of the outer distributor element, and provided at its rear end with a cutting edge 57 whereby the tendency of liquid to build up against this rear end of the cut-off member is minimized. As will be seen the element 56 is inclined forwardly and downwardly and the device is arranged so that liquid not ejected will return to the reservoir at the bottom of the casing.

In accordance with the invention, there may also be provided a device wherein the liquid is discharged from substantially horizontal surfaces on the outer distributor member, instead of from generally vertical members. One form of device embodying these features is exemplified in Figs. 11 and 12. This device comprises a centrifugal distributor 58 mounted on a drive shaft 59 which may be driven by a motor within a casing member 60. The distributor comprises members 61, 62 and 63. The member 61 is provided with a frusto-conical delivery surface 64. The member 62 comprises a plurality of spaced transverse elements 65 having upwardly and outwardly sloping inner surfaces 66, which, as will be seen, are continuations of the surface 64. The member 63 is a ring surrounding the ring of elements 65 and spaced therefrom and is provided with a plurality of circular slits 67 disposed in line with the outer edges of the members 65. As will be seen, the members 62 and 63 may be considered as providing the outer distributor member and the member 61 as providing the inner distributor member, or the members 61 and 62 may be considered as providing the inner distributor member and the member 63 as providing the outer distributor member. In the present instance, the members 61 and 62 have their effective surfaces juxtaposed, and the elements 65 terminate short of an element 68 which provides the top of the distributor 58. The elements comprising the member 63 are held together in spaced relationship by pins 69. A casing 70 surrounds the distributor and is formed with an ejection opening 71. From a portion of the casing disposed rearwardly of the opening 71 there extends inwardly and rearwardly a cut-off member or flange 73 formed with a cutting edge 74. As will be seen and as is further disclosed in my above mentioned application, Serial No. 530,551, the material not discharged from the device is returned to a chamber 75 into which the lower portion of the member 61 extends, and new liquid is introduced through a bore 76 in a supply element 77.

As will be understood, various modified constructions may be utilized. For instance an outer distributor member comprising a ring of spaced generally transverse elements may have liquid delivered thereto by an inwardly spaced ring of suitably constructed spaced generally transverse elements and these inner elements may be constructed to effectively deliver films of liquid for reception by an outer ring of generally transverse

elements, the inner surface of which ring is substantially vertical. One such form of construction is exemplified in my copending application Serial No. 569,569, filed October 19, 1931, now Patent 2,064,125.

There is exemplified in Figs. 13 and 14 still another form of construction wherein the effective surfaces of the inner and outer distributor members are juxtaposed. This device comprises a centrifugal distributor 80 mounted on a shaft 81 suitably driven, as by a motor. The distributor comprises an inner distributor member 82 and an outer distributor member 83. The member 83 is formed with a frusto-conical inner surface which, in the present instance, is stepped. The member 83 comprises a ring of spaced generally transverse elements 84 which, as will be seen, are disposed at an acute angle with the direction of rotation. The distributor is enclosed within a casing 85 provided with a discharge opening 86 from which cut-off members 87, 88 and 89 extend. A further cut-off member 90, the function of which is somewhat similar to the function of the groove 32a extends inwardly from the casing, but terminates short of the periphery of the distributor. A gate 91, which together with other details of the device, is disclosed in my said copending application, Serial No. 479,900, is provided for partially or wholly closing the opening 86. Liquid is fed to the conical inner surface of the member 82 from nozzle 92 supplied from an in-feed pipe 93, and undischarged liquid is drained through the casing and an outlet pipe 94.

Various features disclosed, but not claimed specifically herein, will be found claimed in various of the copending applications above enumerated.

It is to be understood that the terms "vertical", "horizontal", "upward", "downward" and the like, are used herein to describe positions of the elements in question when the axis of the device is vertical.

It is also to be understood that the term "conical" is used herein inclusively to refer to frusto-conical as well as pointed elements.

In Fig. 15 there is shown a casing 12a, a centrifugal distributor 14a, a member 26a, which, in the present instance, is part of a gate member 23a and is provided with a rearwardly extending cutting edge 95. The member 26a serves to define the forward edge of the spray. The body 96 of the gate is spaced outwardly of the member 26a to provide an entrance opening 97. As will be seen all liquid which builds up on the outside of the member 26a is conducted therefrom through the opening 97 into the space between the element 96 and the distributor.

Besides my copending application referred to above, reference is made to my copending applications, Serial Nos. 609,813, now Patent 2,063,048, filed May 7, 1932, and 700,307, filed November 29, 1933.

Certain subject matter disclosed but not claimed herein is claimed in certain of my copending applications mentioned herein.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein de-

scribed, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A spraying device comprising a centrifugal distributor, a member surrounding the distributor and formed with an opening through which liquid may be ejected, and means on said member and entirely disposed rearwardly of the rear edge of said opening for preventing the egress of fluid moving with the distributor between the distributor and said member, the said means being out of contact with the distributor.

2. A spraying device comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, and means on said surrounding member and entirely disposed rearwardly of the rear edge of said opening and extending rearwardly into proximity to, but out of contact with, the periphery of the distributor for preventing the egress of fluid moving with the distributor between the distributor and said surrounding member.

3. A spraying device comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, and flange means entirely disposed rearwardly of the rear edge of said opening and extending into close proximity with the periphery of the distributor for preventing egress of the fluid moving with the distributor between the distributor and said surrounding member, said flange means extending downwardly and forwardly and being provided with at least one rearwardly-extending cutting edge at a point at which said flange means are in proximity with the distributor.

4. A spraying device comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, flange means entirely disposed rearwardly of the rear edge of said opening and extending into close proximity with the periphery of the distributor for preventing egress of the fluid moving with the distributor between the distributor and said surrounding member, the said flange means extending downwardly and forwardly and being provided with at least one rearwardly-extending cutting edge at a point at which the said flange means are in proximity with the distributor, and means just at the rear of said opening for preventing the discharge of any liquid caught by the portion of said member beyond said flange means.

5. A spraying device comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, flange means entirely disposed rearwardly of the rear edge of said opening and extending into close proximity with the periphery of the distributor for preventing egress of the fluid moving with the distributor between the distributor and said surrounding member, the said flange means extending downwardly and forwardly and being provided with at least one rearwardly-extending cutting edge at a point at which the said flange means are in proximity with the distributor, and a vertical recess just at the rear of said opening for preventing the discharge of

any liquid caught by the portion of said member beyond said flange means.

6. A spraying device, comprising an inner centrifugal member having a frusto-conical inner surface, means to supply liquid to said surface, and an outer centrifugal member positioned to receive liquid from the wide edge of said surface and comprising a multiplicity of spaced revoluble elements the said elements being generally transverse to their path of rotation and having inner edge surfaces sloping with respect to the axis of rotation whereby liquid delivered to the revoluble elements will be spread out on their forward surfaces and discharged from the outer ends thereof, and means to discharge liquid upon the upper portions of said surfaces.

7. A spraying device comprising a centrifugal distributor, a casing surrounding said distributor and providing an ejection opening, means providing a reception chamber within said casing below said opening, said distributor comprising a ring of generally transverse spaced elements formed with downwardly and outwardly sloping inner edge surface terminating at points from which liquid may be discharged toward said chamber, and means to discharge liquid upon the upper portions of said surfaces.

8. A centrifugal distributor for spraying devices comprising an inner distributor member providing an upwardly diverging conical surface for lifting and discharging liquid, means to supply liquid to said conical surface, and an outer distributor member providing a downwardly diverging conical surface and slotted to provide a ring of generally transverse spaced elements, said distributor members being so positioned that liquid will be discharged from the upper edge of the inner distributor member upon the upper portion of the outer distributor member.

9. A spraying device comprising a centrifugal distributor having a conical inner surface, a liquid reservoir beneath said distributor, screw means for conducting liquid from said reservoir to a point within the distributor, and centrifugal means comprising a shaft formed with a surface serrated to provide a multiplicity of substantially axial edges for discharging liquid upon said conical surface, said serrated surface being disposed within said conical surface.

10. A portable spraying device comprising a motor, a motor shaft, a centrifugal distributor mounted on said shaft, a casing surrounding said distributor and formed with an annular inclined surface the center of which falls in the axis of said shaft, and a flexible sealing member disposed about the shaft at the point where the casing extends between the motor and the distributor and arranged to be thrown against said inclined surface by centrifugal action due to the rotation of said shaft.

11. A spraying device comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, and means extending rearwardly, as defined, in relation to the direction of rotation, at a position at the rear of the forward end of said opening and provided with a cutting edge in proximity with the periphery of the distributor for defining the extent of the spray, an arcuate member disposed outwardly of and spaced from said defining means and extending forwardly thereof for collecting liquid built up on said defining means, said arcuate member and said de-

fining means being movable together to provide a gate.

12. A spraying device comprising a rotatable distributor adapted to centrifugally eject liquid at its periphery, a shaft for the distributor, a bearing for the shaft disposed axially of the distributor, a plate rotatable with the distributor and disposed between the distributor and said bearing, means including the rotatable plate to prevent passage of liquid from the interior of the distributor to the bearing, a casing for the bearing including a stationary plate disposed in proximity to the aforesaid plate, said stationary plate being formed with an outwardly-extending surface sloping toward the distributor, and a flexible member adapted to be centrifugally forced against said sloping surface by the rotation of the distributor to prevent liquid ejected by the distributor from working inwardly along said stationary plate to said shaft.

13. A centrifugal distributor comprising an outer rotary distributor member formed by a ring of generally transverse spaced elements defining substantially circular slits which elements have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, an inner rotary distributor member having a frusto-conical delivery surface arranged to discharge liquid directly on the inside of said ring, and means to cause liquid received by the inner edges of the generally transverse elements to be spread axially upon their forward surfaces.

14. A spraying device comprising a centrifugal distributor, means to limit the effective spray to the liquid ejected from a limited portion of the peripheral area of the distributor, a ring of generally transverse spaced elements defining circular slits which elements form a part of said distributor and which have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, said distributor being formed with an interiorly disposed conical surface arranged to discharge liquid directly from the wide edge of the cone upon the interior of said ring during the rotation of the distributor.

15. A centrifugal distributor comprising an outer rotary distributor member formed by a ring of generally transverse spaced elements defining substantially circular slits which elements have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, and an inner rotary distributor member having an upwardly enlarging frusto-conical discharge surface arranged to discharge liquid directly on the inside of said ring, said generally transverse elements being formed with sloping inner edge surfaces.

16. A centrifugal distributor comprising an outer rotary distributor member formed by a ring of generally transverse spaced elements defining substantially circular slits which elements have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, and an inner rotary distributor member arranged to discharge liquid directly on the inside of said ring, said generally transverse elements being formed with sloping inner edge surfaces, and said inner element having an upwardly expanding surface arranged to discharge liquid upon the inner portion of said edge surfaces.

17. A centrifugal distributor for spraying de-

vices, comprising a rotary ring of generally transverse spaced elements defining substantially circular slits which elements are provided with sloping inner edge surfaces and which have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, and a rotary inner member having a circular edge spaced inwardly from said ring and arranged to discharge liquid directly on an inner portion of the sloping edges of said generally transverse elements.

18. A spraying device comprising an inner centrifugal member having a frusto-conical inner surface, means extending within said surface and arranged to throw liquid directly against the same, and an outer centrifugal member comprising a ring of generally transverse spaced elements defining circular slits which elements are arranged to receive liquid discharged from said inner surface and which have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis.

19. A spraying device comprising an inner centrifugal member having a delivery surface, means to supply liquid to said surface, and an outer centrifugal member positioned to receive liquid directly from the wide edge of said surface and comprising a multiplicity of spaced revoluble elements defining substantially circular slits which elements have inner edge surfaces sloping with respect to the axis of rotation and which have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, whereby liquid delivered to the revoluble elements will be spread out on their forward surfaces and discharged from said outer edge portions.

20. A spraying device comprising an inner centrifugal member having a frusto-conical inner surface, means to supply liquid to said surface, and an outer centrifugal member positioned to receive liquid directly from the wide edge of said surface and comprising a multiplicity of spaced revoluble elements defining substantially circular slits which elements have inner edge surfaces sloping with respect to the axis of rotation, and which have a greater radial extent than thickness and which have outer edge portions having an extent longitudinal of the distributor axis, whereby liquid delivered to the revoluble elements will be spread out on their forward surfaces and discharged from the axially-extended outer edge portions thereof.

21. A spraying device comprising a centrifugal distributor, a casing completely enclosing the distributor except for an ejection opening at one side of the device along a sector of the distributor, said casing being spaced from the periphery of the distributor, means to supply liquid to the interior of said distributor, and means carried by said casing and entirely disposed rearwardly of the rear edge of said opening for preventing egress of fluid moving with the distributor between the periphery of the distributor and the casing, the said means being in proximity to, but out of contact with, the said distributor.

22. A spraying device comprising a centrifugal distributor, a casing completely enclosing the distributor except for an ejection opening at one side of the device along a sector of the distributor, said casing being spaced from the periphery of the distributor, means to supply liq-

uid to the interior of said distributor, and means carried by said casing and disposed rearwardly of said opening for preventing egress of fluid moving with the distributor between the periphery of the distributor and the casing, said distributor comprising a ring of generally transverse rigidly spaced elements having a radial extent and having outer edge portions and inner edge portions, the outer edge portions being in substantially the same position longitudinally of the axis of the distributor as the inner edge portions, said egress-preventing means extending inwardly from said casing to the circle in which said outer edge portions move.

23. A spraying device comprising a centrifugal distributor, a casing completely enclosing the distributor except for an ejection opening at one side of the device along a sector of the distributor, said casing being spaced from the periphery of the distributor, means to supply liquid to the interior of said distributor, and means carried by said casing and disposed rearwardly of said opening for preventing egress of fluid moving with the distributor between the periphery of the distributor and the casing, said distributor comprising a plurality of spaced rigid surfaces extending generally outwardly from the interior of the distributor and having circumferential discharge edges, and said egress-preventing means extending inwardly from said casing to said edges.

24. A spraying device comprising a rotatable distributor adapted to centrifugally eject liquid at its periphery, a shaft for the distributor, a bearing for the shaft disposed axially of the distributor, a plate rotatable with the distributor and disposed between the distributor and said bearing, means including the rotatable plate to prevent passage of liquid from the interior of the distributor to the bearing, a casing for the bearing including a stationary plate disposed in proximity to the aforesaid plate, said stationary plate being formed at an outer portion thereof with an outwardly-extending surface sloping toward the distributor, and a disc-like member secured to the rotary plate at an inner portion and having a free outer portion adapted to be centrifugally forced against said sloping surface by the rotation of the distributor to prevent liquid ejected by the distributor from working inwardly along said stationary plate to said shaft.

25. A spraying device, comprising a centrifugal distributor, a member surrounding the distributor and formed with an opening through which liquid may be ejected, and means on said member disposed rearwardly of said opening for preventing the egress through said opening of substantially all material except that material which is thrown off from said distributor in a substantially straight line through said opening the said means being spaced away from the distributor.

26. A spraying device, comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, and means on said surrounding member and disposed rearwardly of said opening and extending rearwardly into proximity with the periphery of the distributor for preventing the egress through said opening of substantially all material except that material which is thrown off from said distributor in a substantially straight line through said opening, the said means being in proximity to, but spaced away from, the distributor.

27. A spraying device, comprising a centrifugal distributor, a member spaced from and surrounding the major portion of the distributor and formed with an opening through which liquid may be ejected, and a single flange disposed rearwardly of said opening and rearwardly extending into close proximity with the periphery of the distributor for preventing egress through said opening of substantially all material except that material which is thrown off from said distributor in a substantially straight line through said opening, the said flange being in proximity to, but spaced from, the said distributor.

28. A spraying device comprising a centrifugal distributor, means surrounding the distributor and formed with an opening through which liquid may be ejected and means extending from said surrounding means into proximity, but not into contact, with said distributor and entirely disposed rearwardly of the rear edge of said opening for preventing the egress of fluid moving with the distributor between the distributor and said surrounding means.

EDWARD O. NORRIS.