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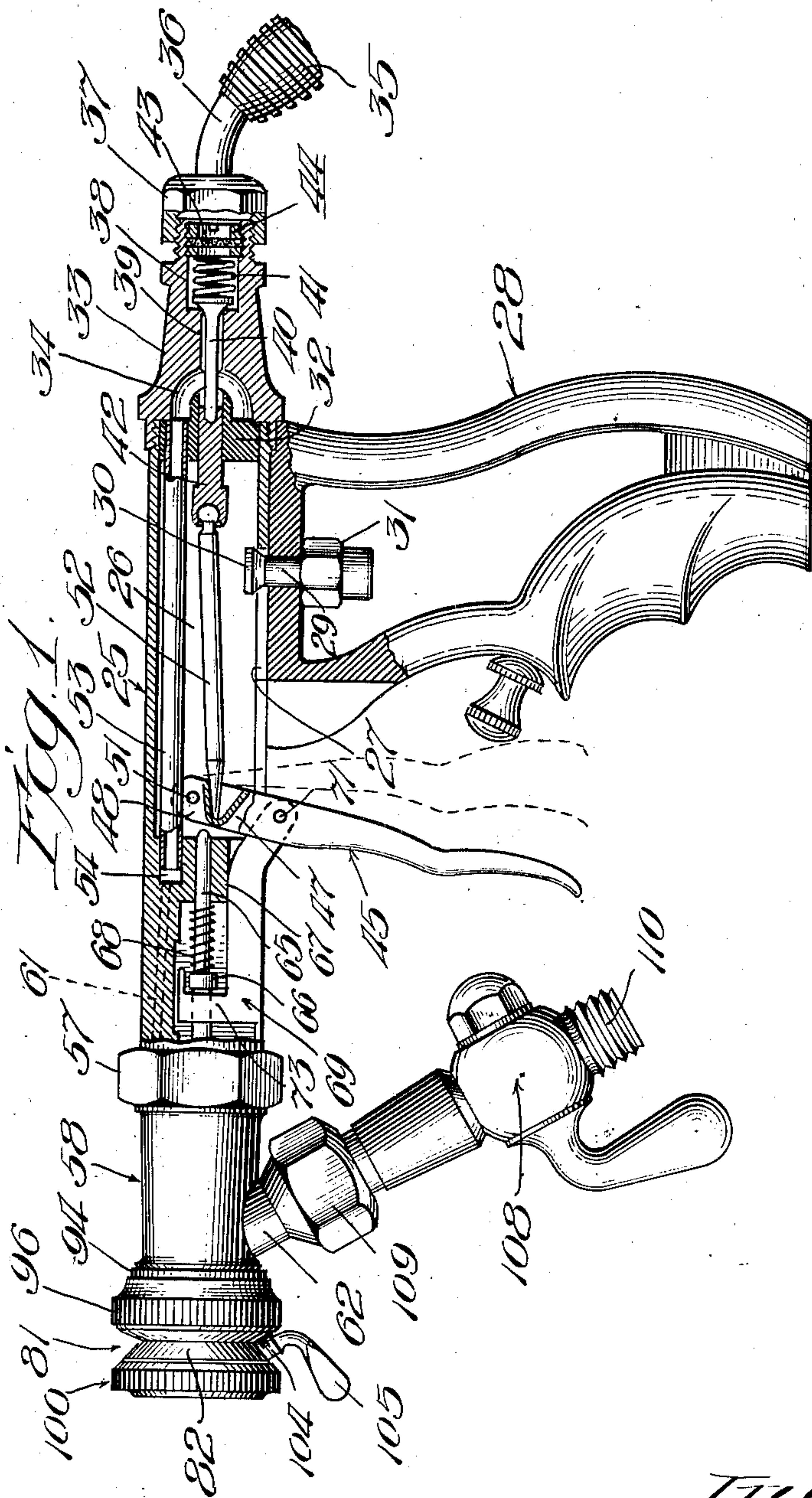
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1,777,650

AIR BRUSH AND THE LIKE

Filed Dec. 7, 1925

4 Sheets-Sheet 1



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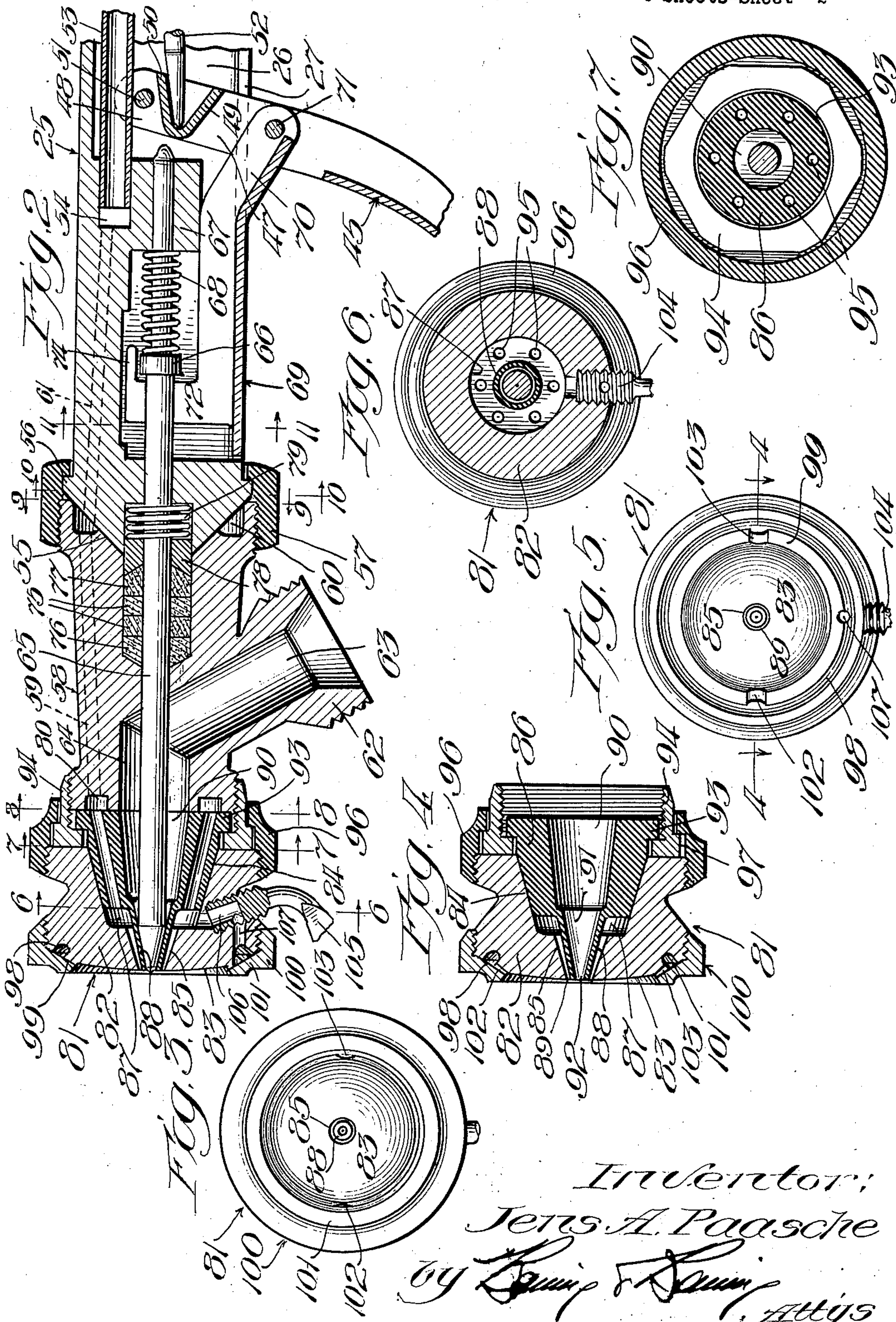
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4 Sheets-Sheet 2



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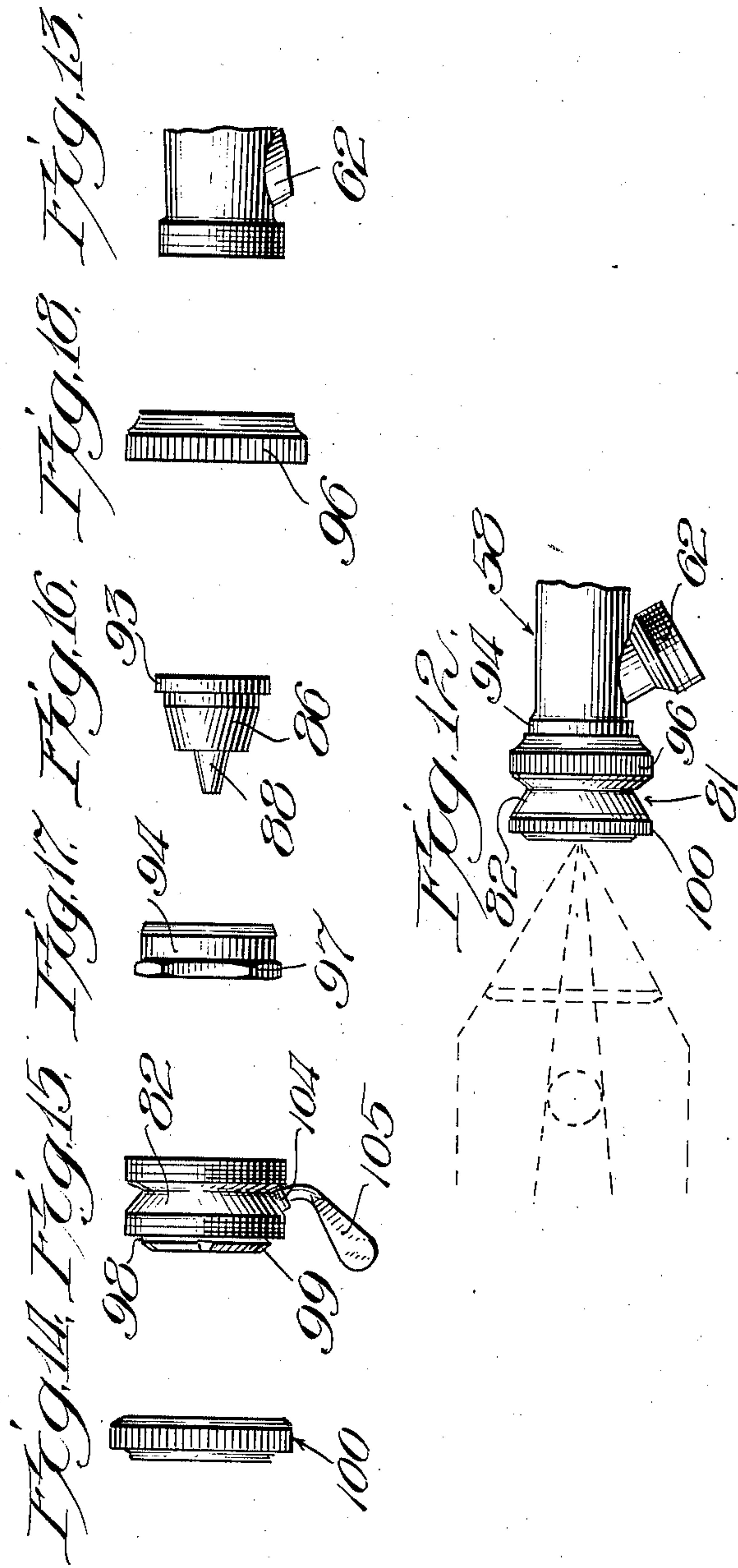
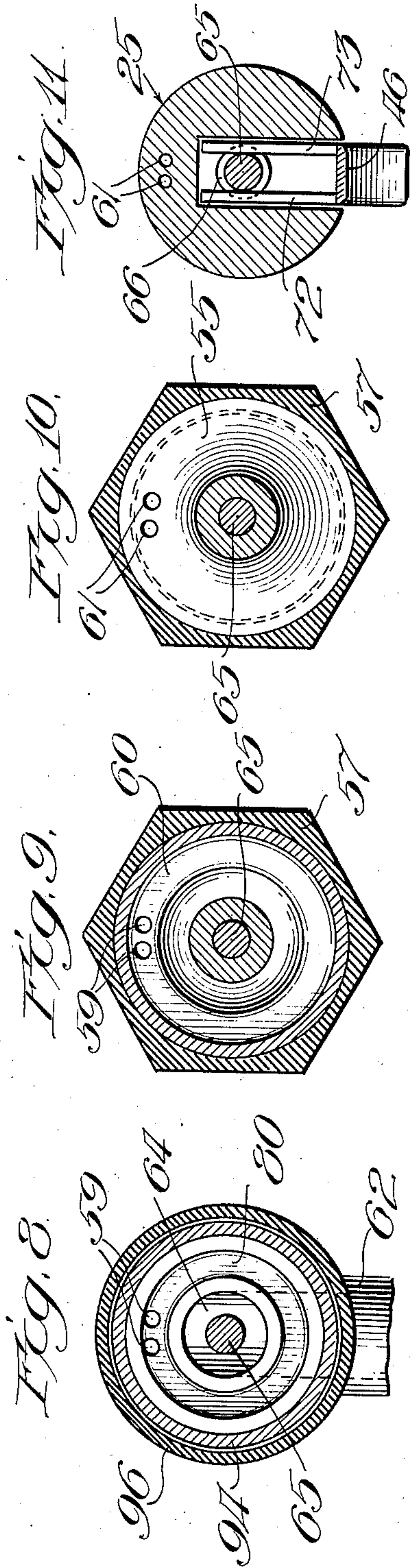
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AIR BRUSH AND THE LIKE

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4 Sheets-Sheet 3



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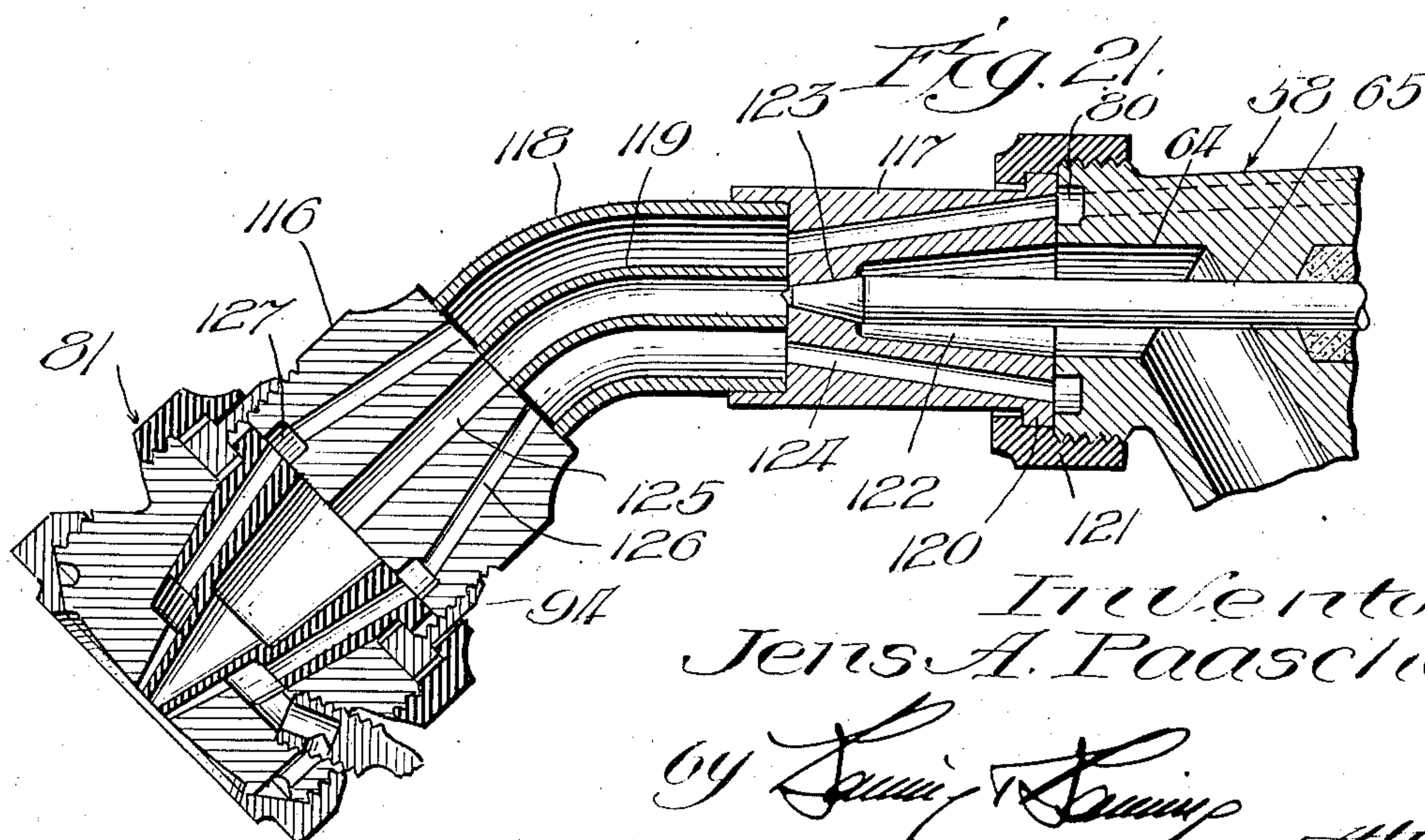
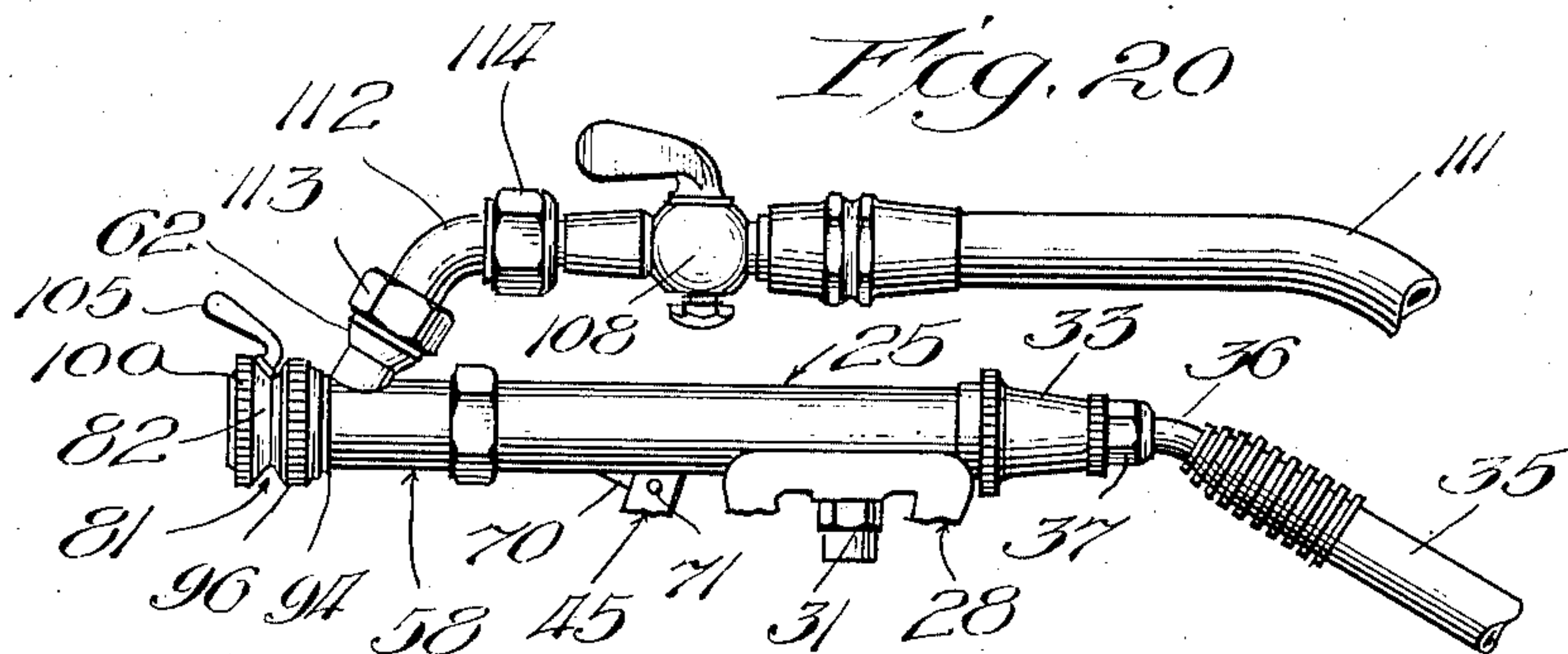
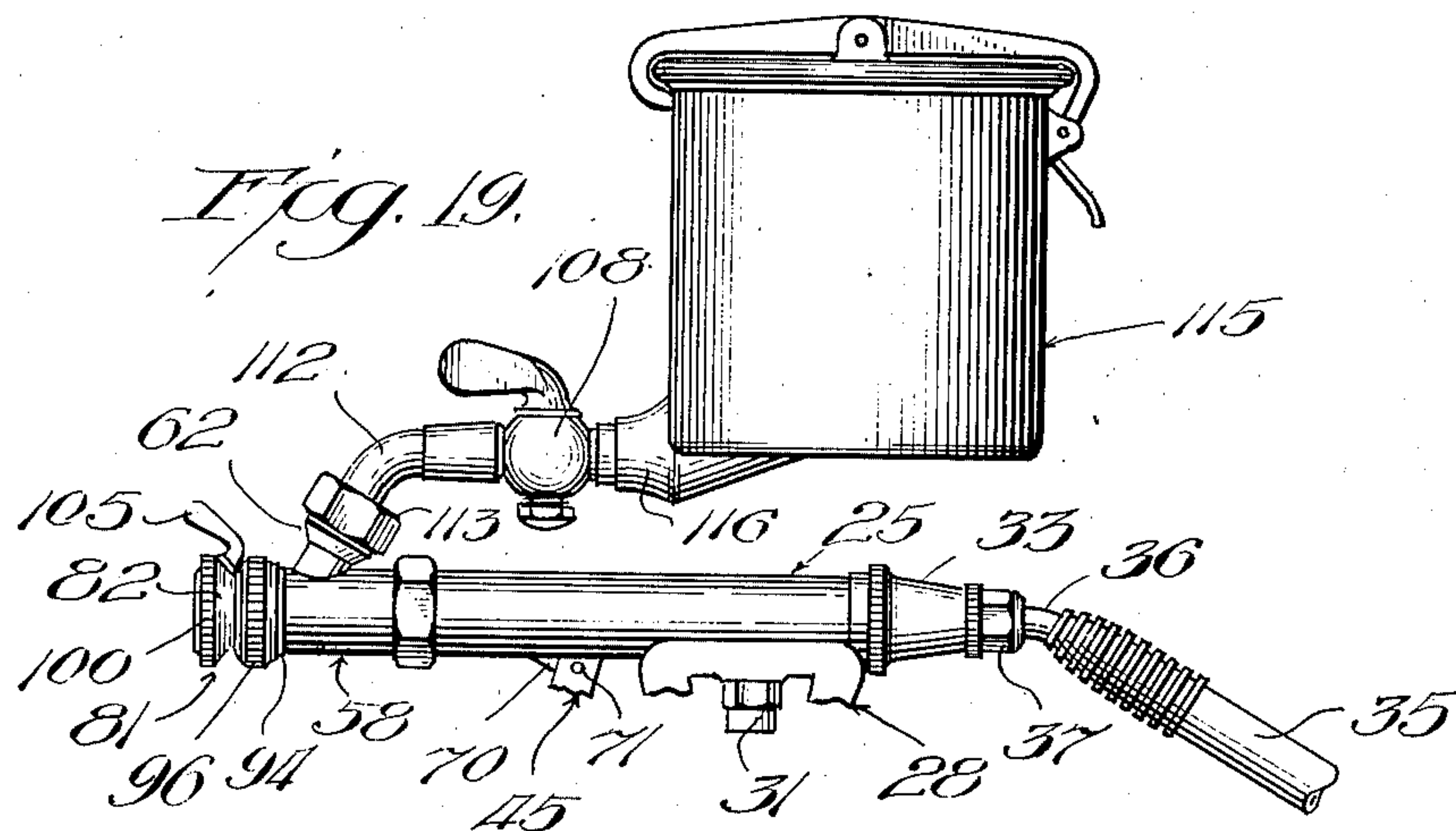
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AIR BRUSH AND THE LIKE

Filed Dec. 7, 1925

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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AIR BRUSH AND THE LIKE

Application filed December 7, 1925. Serial No. 73,861.

The present invention has to do with improvements in air brushes and the like. It has to do with improvements in air brushes for various classes of service, and the features of the present invention may be used in connection with large or small brushes, and also brushes intended for use with many different kinds and consistencies of material.

One object of the present invention is to provide an air brush having a multiple head unit of such construction that it can be very easily attached to the body member with which it is intended to be used. Also, to provide a construction such, that the head unit can be standardized and made in a large number of different styles, sizes and shapes for use in connection with a single construction of body member.

A further object is to provide a head unit which is so constructed that it will be absolutely floating or self-centering with respect to the plunger, so that when the fluid tip is set into place on the body member, it will be compelled to come into perfect alignment with the plunger, and without the necessity of any elaborate adjustments or special fittings by the person assembling the parts.

In connection with the foregoing, it is a further object to provide a head unit having a central tip orifice for the fluid, which orifice is controlled by the fluid valve plunger, together with an encircling annular orifice for the air. It will be understood that perfect operation of such a device requires that the central fluid valve plunger opening shall be perfectly registered with the tip of the fluid valve, so that as the fluid valve plunger is moved back and forth, the opening for the liquid shall be perfectly symmetrical all around the circle. It is also required that the annular air opening shall be perfectly symmetrical with respect to the fluid valve plunger opening, so that the air opening shall be of perfectly uniform size all around the circle and shall be perfectly concentric with respect to the needle and the tip opening.

It is an object of the invention to provide a tip unit of extremely simple form, but which is so arranged that it can be immediately set into place on the body of the air

brush by an unskilled user, but, nevertheless, with assurance that it will naturally be compelled to come into perfect alignment and registry to comply with the foregoing requirements.

Another feature of the invention relates to the provision of an air brush which is so arranged that the spray can be adjusted from a perfect cone to a perfect flat fan. In this connection, it is an object to provide an improved spray control by the use of crescent shaped side air orifices for shaping the round narrow air cone into a wide and perfectly even fan spray. Also, to provide means for easily regulating the volume of air delivered through these side orifices, thereby obtaining easy control from the widest to the narrowest spray.

Another feature of the invention relates to the provision of an air cap unit which can be turned around on the axis of the tip member so as to bring the side air discharge orifices into any desired plane with respect to the horizontal. This will make it possible to establish a flat fan spray on any selected plane with respect to the axis of the brush, and thus greatly facilitate the use of the device under the most varying conditions of service.

In connection with the foregoing, it is an object to provide a construction such that the air cap can thus be turned into any desired angular position without upsetting or affecting the adjustment of the tip elements. This will make it possible to secure perfect operation of the head unit in any position in which it is turned.

Another feature of the invention relates to the provision of a revolving fluid inlet connection in which the liquid supply discharge is brought into the body portion of the device substantially parallel to the fluid valve, the hose connection also being established by a broad angle instead of at right angles to the axis of the device. This will eliminate abrupt changes of direction of the liquid giving correspondingly improved control and delivery. This will also largely eliminate the tendency of the solid matter or pigment to pack into the sharp angle of the passage where it would soon interfere

with the free flow and operation of the device.

A further object in connection with the foregoing is to provide a fluid inlet connection which can be turned around the axis of the device into any desired position so as to make it possible to establish the liquid hose connection either at the bottom or top or either side of the device. By this means, the usefulness of the device will be greatly increased, since, in many cases, it is necessary to bring the liquid hose connection from a different position than in other cases. It will also make it possible to use the same device for a liquid supply either from a hose or cup; and also make it convenient to use either gravity or syphon feed from cups, as desired.

A further feature of the invention relates to the provision of an improved arrangement of compression packing for the fluid plunger at the position where it should be sealed against liquid seepage. An object in this connection is to provide a very effective and satisfactory form of packing, and one which can be replaced or renewed from time to time in a very simple manner.

Another feature of the invention relates to the provision of a construction such that, if desired, head extension devices may be inserted between the front portion of the body and the spray head unit so as to place the spray head unit itself at a greater distance from the handle and trigger. In this connection, it is an object to provide a construction such that when a head extension device is used, the head unit will function properly and perfectly. A further object in connection with the foregoing is to provide head extension devices of curved or angular form, such that the direction of the spray may be different from the axial direction of the body itself. This will make it possible to hold the body member in the most convenient position for satisfactory manipulation, and, at the same time, insure a discharge of spray in the most satisfactory and effective direction for the work in hand.

Other objects are to generally improve the construction of the trigger and valve operating parts, as well as the other elements of the device. In this connection, one object is to so arrange these parts that they can be readily made from sheet metal stampings or by other approved manufacturing processes which permit of standardization and corresponding improvement of uniformity, complete interchangeability of all parts eliminating repairs, loss of time and costly shut downs, as well as reduction of cost of manufacture.

Other objects and uses of the invention will appear from a detailed description of the same, which consists in the features of

construction and combinations of parts hereinafter described and claimed.

In the drawings:

Figure 1 shows a side elevation of an air brush embodying the features of the present invention, the central portion of the body being shown in section;

Fig. 2 shows a longitudinal section through the front portion of the body member and head unit on enlarged scale as compared to Fig. 1;

Fig. 3 shows a front end view corresponding to Fig. 2;

Fig. 4 shows a longitudinal section through the head unit itself removed from the body member and at right angles to Fig. 2. Fig. 4 is also a section on the line 4—4 of Fig. 5, looking in the direction of the arrows;

Fig. 5 shows a view similar to that of Fig. 3, with the exception that the front ring has been removed;

Figs. 6, 7, 8, 9, 10 and 11 are cross sections on the lines 6—6, 7—7, 8—8, 9—9, 10—10 and 11—11, respectively, of Fig. 2, looking in the direction of the arrows;

Fig. 12 is a fragmentary view of the front end of the device on smaller scale than Fig. 1, and shows diagrammatically the general range of spray forms which may be produced;

Fig. 13 is a fragmentary front end view of the body member with the head unit removed;

Fig. 14 is a side view of the front ring of the head unit;

Fig. 15 is a side view of the body of the head unit with the ring and other parts removed;

Fig. 16 is a side view of the needle block of the head unit;

Fig. 17 is a side view of the union nut for the needle block;

Fig. 18 is a side view of the union nut for joining the body of the head unit to the union nut of Fig. 17;

Fig. 19 is a side elevation of an air brush embodying the features of the present invention on reduced scale, the handle and trigger being broken away, and shows how a liquid cup can be directly attached to the device;

Fig. 20 is a view similar to that of Fig. 19 showing how a liquid hose may be brought to the liquid connection from a position above the body itself; and

Fig. 21 shows a longitudinal section on enlarged scale through an extension device which is formed on a curve or angle.

The body member includes a cylindrical block 25, the rear portion of which is hollowed out to establish the chamber 26. This chamber is preferably open on its bottom side to establish a slotted opening 27. The handle 28 may be connected to the body 25 by means

of a nut 29 having an enlarged head 30 which can be slipped through the enlarged front end portion of the slot 27 and then worked backwards with respect to the body and finally locked by means of the nut 31.

The rear end of the open portion 26 is closed by a partition 32; and the rear cap 33 has its front end threaded onto the rear end of the body 25 and brought up close to the position of the partition 32. This rear cap 33 is provided with a front recess 34 which, together with the partition 32, establishes an air chamber.

An air hose 35 is connected to the rear end of the block 33 in any convenient manner, as by the nipple 36 and union nut 37. A small chamber 38 is formed in the rear end of the block 33 into which the compressed air is directly delivered. A passage 39 leads from the chamber 38 to the chamber 34 and is controlled by a valve 40 which is normally seated by a spring 41.

A block 42 is slidably extended through the partition 32, the rear end of said block having a socket to receive the front end of the valve stem 40. Preferably, a fine screen 43 is placed immediately in advance of the chamber 38, said screen being locked in place by one or more threaded rings 44, as illustrated in Fig. 1.

Within the front end of the chamber 26 there is pivotally mounted the trigger 45. This trigger is preferably made from a sheet metal stamping, for which purpose the lower portion 46 of the trigger is folded over into a U-shaped cross section, as evident from comparison of Figs. 1, 2 and 11. The upper portion of this sheet metal stamping is slotted, as shown at 47 and 48 in Fig. 2 in particular, the major portion of the metal cut out from these slotted openings being folded backwards, as shown at 49 and 50 to establish a backwardly facing V-shaped socket, as shown in Figs. 1 and 2. The upper end of the trigger is pivoted to the body member 25 by a cross pin 51. A link pin 52 has its front end seated into the V-shaped socket of the trigger, already referred to, and its rear end seated into a suitable ball socket in the front end of the block 42. Consequently, the backward movement of the trigger will control the air valve 40.

A tube 53 reaches from the chamber 34 forwards to a small chamber 54 in the upper portion of the front end of the block 25. This tube 53 is placed in the upper portion of the chambered opening 26. The tube also reaches between the bifurcations of the upper end of the trigger 45, as clearly shown in Fig. 1.

The extreme front end of the body member 25 is tapered on an angle of substantially 45° , as shown at 55 in Fig. 2. A shoulder 56 is formed immediately behind the tapered end 55 and is adapted to receive a union nut 57.

A block 58 has its rear end tapered to seat nicely against the tapered end 55 on which the block 58 is swivelly mounted. The union nut 57 holds the block 58 to the body member 25, but allows said block 58 to be turned with reasonable ease while maintaining a tight joint between the parts.

The block 58 is preferably provided with a pair of small longitudinally extending air passages 59 which terminate at their rear ends in an annular groove 60 of the block 58. Similarly, the body member 25 is preferably provided with a pair of small passages 61 reaching between the chamber 54, already referred to, and the front end of the body member 25. Consequently, air will be delivered through the passages 59 of the block 58, no matter what position said block may be turned into.

The block 58 is provided at one end with a nipple 62 to which the liquid hose or cup or other source of supply may be connected. This nipple preferably reaches backwards on an angle of 20° or 30° from the vertical, as clearly evident from Figs. 1, 2, 19 and 20.

The bore 63 of the nipple 62 communicates at its inner end with a longitudinal bore 64 reaching forwardly through the axial portion of the block 58 and delivering liquid to the head unit or extension in case one is used. A fluid valve plunger 65 is slidably mounted through the axial portion of the block 58 and also reaches into the front end portion of the body member 25. This plunger finds a bearing in the block 58 and also preferably two bearings in the body 25, so that it is amply supported.

The plunger is provided in its rear portion with a collar 66 which is in advance of the lug 67 which provides the rear end bearing for the plunger. A spring 68 is located between the collar and said lug and tends to throw the plunger forward to close the liquid supply.

A latch 69 is slidably mounted in the lower portion of the body member 25. This latch is conveniently made in the form of a sheet metal stamping of U-shaped cross section, as will be particularly evident from Fig. 1. The rear end of this latch is preferably turned down, as shown at 70, so that it can be conveniently pinned to the trigger 45 by the pin 71 at a position below the socket for the front end of the air valve operating link 52. The front portion of the latch 69 is provided with a pair of side fingers 72 and 73 which engage the opposite sides of the collar 66. These fingers preferably have their upper ends hooked backwards, as shown at 74 in Fig. 2, so that the parts will not become too readily disengaged.

Within the co-operating end portions of the body member 25 and the block 58 are a pair of sockets within which may be placed a series of rings of packing material 75, as best shown in Fig. 2. These packing rings are

preferably made of chrome leather. Preferably a tapered ring 76 is placed at the front end, and another tapered block 77 at the back end of the series. A metal ring 78 having its front face conical in form sets against the rearmost block 77, so that when said block is forced forward, it tends to compress the packing rings more firmly against the plunger 65. A spring 79 is placed between the front end of the body 25 and the ring 78, so that when the block 58 is drawn into place by the union nut 57, said spring 79 is compressed and holds the packing rings under permanent compression. It is a relatively simple matter to remove the block 58 from the body 25 and either replace the packing rings or add another to the series, if desired.

Surrounding the position of the liquid passage 64 there is a channel 80 in the front face of the block 58. The air coming through the passage 59 is delivered into this channel. I have provided head units of a construction to cooperate with the liquid passage 64 and the air channel 80, said head units including the features referred to in the preamble of this case. The head unit is designated in its entirety by the numeral 81. It includes a circular body block 82, the front face 83 of which is preferably formed on a convex surface. This body block is provided with an inwardly reaching conical recess 84 on its back side which communicates at its front end with a tapered circular opening 85. This opening 85 is preferably formed with a taper of substantially 12° with respect to the axis of the device.

A cone block 86 is formed on a taper to seat perfectly within the recess 84, but the front end of this cone block terminates short of the end of the recess 84 so as to establish an air passage 87 between the parts, as indicated in Fig. 4.

The cone block 86 is also provided with a forwardly reaching cone tip 88 of slightly smaller size than the opening 85, already referred to, and the outside surface of the tip 88 is preferably on a smaller angle than the opening 85, for example, 8° with respect to the axis. There is thus left a fine annular passage 89 between the parts, the size of said passage tapering from back to front.

The cone block 86 is provided with a central passage 90 which terminates in a tapered front end 91, the extreme end of which establishes the liquid delivery opening 92, as clearly indicated in Fig. 4. This opening 92 is perfectly concentric with respect to the annular opening 89.

The cone block 86 is provided with an annular shoulder 93 which receives a union nut 94, said union nut threading onto the extreme front end of the block 58. The size of the union nut and shoulder are such that the cone block 86 may have a sufficient amount of lateral movement to make certain that it

will also come into exact alignment with the plunger 65. Consequently, when the cone block is set into place on the plunger and the union nut 94 is then threaded onto the end of the block 58, the cone block will come into and maintain exact alignment with the plunger. By tightening up the union nut 94, the cone block will be brought into firm engagement with the front end of the block 58, so that the continuity and tightness of the passages is insured.

In connection with the foregoing, the cone block is provided with a series of longitudinally extending passages 95, shown particularly in Figs. 2, 6 and 7. The rear ends of these passages register with the annular groove 80 and their front ends serve to deliver air at the annular passage 87 at the front end of the cone block. The liquid passage 90 of the cone block comes into direct registry with the liquid passage 64 of the block 58.

Before the union nut 94 is threaded into the block 58, another union nut 96 is set into place against a shoulder 97 on the union nut 94, as clearly shown in Fig. 4. The tip block 82 is provided with a tapered recess which is of exact size and taper to receive the taper of the cone block, as shown in Fig. 4, particularly; so that by threading the union nut 96 onto the rear end of the tip block 82, and drawing the parts firmly together the rear end of the tip block 82 will come to seat against the front end of the union nut 94 at the same time that the tapered recess of the tip block seats against the conical outside surface of the conical block. This is clearly indicated in Fig. 4. As a consequence, the tip block 82 is perfectly centered on the cone block 86, and at the same time, the tip block is permitted to turn about the central axis. The perfect centering of these parts ensures that the annular orifices 89 will be of exactly uniform width all around the circle.

From the above, it is evident that I have provided a construction such that the parts are perfectly centered with respect to the plunger, and also with respect to each other, so as to ensure perfect alignment without the necessity of any particular adjustments or care on the part of the user.

There is a groove 98 reaching around the front face of the tip block 82, and at the position of this groove the front face of the tip block is beveled backwardly, as shown at 99 in Fig. 2 in particular. A head fan guard 100 is threaded onto the front end of the tip block 82, having a flange 101 which overlies the groove 98 and encloses the same. The tip block 82 is also provided with a pair of diametrically opposite crescent shaped notches 102 and 103, as shown in Fig. 5, which communicate directly with the groove 98. Upon threading the fan guard 100 into place, the groove 98 is completely covered over, but

the two crescent notches 102 and 103 remain exposed, as indicated in Fig. 3, so as to establish the desired side air delivery for creation of the fan.

6 In connection with the foregoing, I wish to point out the fact particularly that the use of circular orifices for the creation of the fan is undesirable, since the air delivered through them does not properly contact and
10 balance with the conical delivery of air from the annular orifice 89. However, by cutting off the outside portion of each of the fan orifices 102 and 103, I am able to ensure a perfect and correct co-operation of the various air jets so as to insure the production of
15 a very perfect and properly controlled fan; each half of the center air cone harmonizes and balances perfectly with the two crescent shaped air streams released.

20 In order to deliver air to the groove 98 under control, I have provided a valve 104 having a handle 105 by which it can be turned. This valve is provided with a longitudinal passage 106 which delivers air under control
25 to the passage 107 leading directly to the groove 98, as clearly indicated in Fig. 2.

From the above it is evident that I have provided a head unit which can be turned around the longitudinal axis so as to bring
30 the fan into any angular position, while at the same time maintaining perfect axial alignment of the liquid and air orifices; and I also have made provision for controlling the shape of the fan or entirely closing the
35 fan orifices for any position of the head unit.

Any suitable means may be used for delivering liquid to the connection 62. For example, as illustrated in Fig. 1, a cock 108
40 may be directly attached to the connection 62 as by means of a union nut 109, the liquid supply hose in turn being attached to the nipple 110 at the other side of the cock. In such case, the liquid will be delivered to the passage 64 at the angle determined by the
45 direction of the passage 63.

Furthermore, the block 58 can be rotated so as to present the connection 62 at any desired position around the circle, and the liquid may be supplied to the connection 62
50 at any such position. Frequently, it will be desirable to bring the liquid hose 111 to the brush at a position above the air hose 35, as shown in Fig. 20. In such case, a curved nipple 112 is preferably attached directly to the connection 62 by the union nut 113, the
55 cock 108 being then attached to the other end of the nipple 112 by the union nut 114. In this way, the hose 111 may be brought in perfectly parallel to the body of the air
60 brush.

In some cases, it may be desired to use a gravity feed of liquid from a cup, such as 115 in Fig. 19. In such a case as this, the lower discharge connection 116 of the cup
65 may be attached directly to the connection 62,

but preferably a curved nipple, such as 112, is used in this case, the cock 108 being placed between the cup 115 and the nipple 112.

In some cases, it may be desirable to use a siphon feed of liquid. For this purpose, the block 58 may be turned around to bring the connection 62 to the bottom side and then the siphon cup may either be directly attached thereto or attached through the medium of a suitably shaped nipple.

75 The head unit is perfectly self centering owing to the relationship of the cone block 86 to the tip block 82. This self centering feature will be manifest when the head unit is directly attached to the air brush proper, as illustrated in Figs. 1, 2, 12, 19 and 20, but a suitable extension unit may, if desired,
80 be interposed between the body of the air brush and the head unit. In such case, the self centering quality of the head unit parts
85 will also be manifest.

The extension unit may either be straight or curved, and either short or long as desired. In my co-pending application for Letters Patent of the United States on air
90 brushes and the like, Serial No. 732,564, filed August 16, 1924, I have disclosed a construction of air brush in which provision is made for the use of one construction of head unit, and in said application I have also disclosed
95 a construction of extension unit. The latter, when used, serves to establish the proper continuity between the liquid and air passages of the body of the air brush with the liquid and air passages of the head unit. A
100 similar construction of extension unit may also be used in the present case.

However, in Fig. 21 of the present application I have also disclosed another form of extension unit, the same being curved on an
105 angle of substantially 45°. This extension unit includes the front and rear blocks 116 and 117, respectively, together with the concentric tubes 118 and 119 reaching between them. The block 117 has the end flange 120
110 which receives a union nut 121 of proper size and length to thread directly onto the front end of the body block 58, corresponding in this regard to the union nut 94 already referred to. The block 116 is externally
115 threaded of size and shape to receive the union nut 94 of the head unit 81.

The rear block 111 of the extension is provided with a central passage 122 which communicates directly with the liquid supply
120 passage 64 and terminates in a valve seat 123 at the proper position and of proper taper and size to receive the front end of the plunger 65. This valve seat 123 communicates with the central tube 119 of the ex-
125 tension unit, so that the liquid is delivered directly into said central tube.

The rear block 117 is also provided with a series of passages 124 which communicate at their rear ends with the annular channel

80 of the body 58, and at their front ends they communicate with the space between the inner and outer tubes 119 and 118, respectively.

The front block 116 is provided with a central passage 125 which communicates with the tube 119; and is also provided with a series of passages 126 communicating with the space between the tubes 119 and 118. The block 116 is also provided with a forwardly facing annular channel 147 which communicates with the passages 126 and into which the air is delivered. This channel 127 is of the same size as the channel 80 at the front end of the body block 58.

15 From the above it will appear that the head unit 81 may be set onto the front block 116 of the extension unit whereupon proper communication will be established with the air and liquid passages. The rear block is 20 itself so constructed that it properly co-operates with the plunger in order to control the delivery of liquid to the central passage of the extension unit.

25 While it is evident that many standard forms and sizes of multiple head may be used with a given air brush body, I wish to mention that in a given case there are provided five different sizes of head for use with 30 a single given body, and each of these head sizes is provided in each of three styles, giving fifteen different heads, any one of which may be interchangeably used with a single body.

35 While the particular extension unit illustrated is short and curved, nevertheless it will be evident that many other forms and shapes and sizes of extension unit may be used, or that in some cases two or more ex- 40 tension units may be connected up in series with each other so as to produce a very long unit or one having a multiplicity of bends. In either case, however, it will be evident that the extension unit has at one end a terminal 45 block or connection adapted to co-operate directly with the plunger and with the air passages of the body, and is provided at its front end with another block or connector adapted to directly attach to the head unit 50 so as to deliver the liquid and air properly thereto.

While I have herein shown and described only certain embodiments of the features of my present invention, still I do not intend to 55 limit myself to the same, except as I may do so in the claims.

I claim:

1. An air brush comprising in combination a main cylindrical body member terminating 60 at its front end in a conical seat, a front cylindrical body member in alignment with the main body member and having at its rear end a conical socket to engage the seat aforesaid while permitting relative rotation be- 65 tween the parts, there being concentric

aligned packing recesses in the adjacent ends of the two body members, a rearwardly reaching union nut on the front body member co-operating with an annular flange on the main body member to retain the parts together while permitting relative rotation between them, there being an axially extending liquid passage in the front portion of the front body member communicating with an outwardly and sidewise extending liquid supply connection, an annular passage between the co-operating ends of the two body members establishing an annular chamber between these parts, air passages in the main body member communicating with said chamber to deliver air thereto, a forwardly facing channel in the front end of the front body member, air passages in said body member establishing communication between the annular chamber and said channel for the delivery of air to the channel, a head unit on the front end of the front body member including a central liquid orifice in alignment with the liquid passage of the front body member and also including a surrounding annular air orifice communicating with the forwardly facing channel, a longitudinally extending plunger reaching concentrically through both body members, and working in conjunction with the liquid orifice to seal and control the same, valve mechanism in the main body member for controlling the delivery of air through the device, and common operating means for said air valve and for the plunger, substantially as described. 75 80 85 90 95 100

2. An air brush comprising in combination main and front cylindrical body members placed in axial alignment with each other, means for retaining said members in said alignment while permitting relative rotation 105 between them, an axially extending liquid supply passage in the front portion of the front body member together with a connection for delivering liquid thereto, means for delivering air to the position of the front end 110 of the front body member, an axially extending plunger reaching through both body members and through the liquid supply passage for controlling the delivery of liquid therethrough, there being companion axial 115 sockets in the companion faces of the two body members, packing rings within one of said sockets operative effectively to seal the plunger against seepage while permitting easy movement of said plunger, and a spring 120 pressed member in the socket of the other body member for compressing said packing, substantially as described.

3. An air brush comprising in combination a body member having a forwardly extend- 125 ing annular liquid supply passage in its front portion, together with a forwardly facing annular air channel in its front face surrounding said passage, suitable connections for the delivery of liquid and air to said passage and 130

said channel respectively, an axially extending plunger slidably mounted in said body member and working longitudinally through said liquid supply passage, and means for shifting said plunger longitudinally and for controlling the supply of air to the channel, together with a head unit comprising a central cone block having a longitudinally extending liquid passage adapted to align with the liquid supply passage of the body member and forming at its front end an inwardly facing tapered plunger seat to receive the front end of the plunger, and also having a series of longitudinally extending air passages adapted to communicate at their rear end with the air channel aforesaid, a flange on the rear end of the cone block, a union nut freely engaging said flange and being of a size to permit lateral adjustment between the parts, said union nut threading onto the front end of the body member to retain the cone block thereon, while permitting said cone block to initially align with the plunger, a circular head block rotatably mounted on the cone block and having a central air passage surrounding the extreme front end of the cone and receiving air from the air passages in the cone, means for retaining the head block on the cone while permitting rotation of the same thereon, a pair of diametrically opposite crescent shaped orifices in the head block for the delivery of air against the air delivered through the annular passage, passages in the head block for the delivery of air to said crescent shaped openings, and a valve in the head block for controlling the delivery of air through said passages, substantially as described.

4. An air brush comprising in combination a body member having a forwardly extending annular liquid supply passage in its front portion, together with a forwardly facing annular air channel in its front face surrounding said passage, suitable connections for the delivery of liquid and air to said passage and said channel respectively, an axially extending plunger slidably mounted in said body member and working longitudinally through said liquid supply passage, and means for shifting said plunger longitudinally and for controlling the supply of air to the channel, together with a head unit comprising a central cone block having a central liquid passage adapted to align with the liquid supply passage of the body member and forming at its front end an inwardly facing tapered plunger seat to receive the front end of the plunger, and also having a series of longitudinally extending air passages adapted to communicate at their rear end with the air channel aforesaid, a flange on the rear end of the cone block, a union nut freely engaging said flange and being of a size to permit lateral adjustment between the parts, said union nut threading onto the

front end of the body member to retain the cone block thereon, while permitting said cone block to initially align with the plunger, a circular head block rotatably mounted on the cone block and having a central air passage surrounding the extreme front end of the cone and receiving air from the air passages in the cone, and means for retaining the head block on the cone while permitting rotation of the same thereon, substantially as described.

5. An air brush comprising in combination a body member having a forwardly extending annular liquid supply passage in its front portion, suitable connections for the delivery of liquid to said passage, an axially extending plunger slidably mounted in said body member and working longitudinally through said liquid supply passage, and means for shifting said plunger longitudinally, together with a head unit comprising a central cone block having a central liquid passage adapted to align with the liquid supply passage of the body member and forming at its front end an inwardly facing tapered plunger seat to receive the front end of the plunger, a flange on the rear end of the cone block, a union nut freely engaging said flange and being of a size to permit lateral adjustment between the parts, said union nut threading onto the front end of the body member to retain the cone block thereon, while permitting said cone block to initially align with the plunger, a circular head block mounted on the cone block and having a central air passage surrounding the extreme front end of the cone, and means for retaining the head block on the cone while permitting rotation of the same thereon, substantially as described.

6. As a new article of manufacture, a head unit comprising in combination a cone block having a longitudinally extending through passage terminating in a tapered seat of reduced size at its outer end and having an outwardly projecting annular flange at its inner end and having a tapered conical outside surface, a union nut engaging the front face of said flange and projecting backwardly thereon, a circular body block seated upon the outer tapered conical face of the cone block in air tight fashion and having at its front end an annular through passage surrounding the tip portion of the cone to establish a fine annular air delivery orifice concentric with the end of the through passage, there being a series of through passages in the cone block for the delivery of air to said passage, there being an annular forwardly facing channel in the front face of the body block, there being a pair of forwardly and inwardly extending crescent shaped recesses in communication therewith, a ring secured to the front end of the body block to close over said channel, and means for delivering air under

control to said channel, substantially as described.

7. As a new article of manufacture, a head unit comprising in combination a cone block having a longitudinally extending through passage terminating in a tapered seat of reduced size at its outer end and having a tapered conical outside surface, a circular body block seated upon the outer tapered conical face of the cone block in air tight fashion and having at its front end an annular through passage surrounding the tip portion of the cone to establish a fine annular air delivery orifice concentric with the end of the through passage, there being a series of through passages in the cone block for the delivery of air to said passage, there being an annular forwardly facing channel in the front face of the body block, there being a pair of forwardly and inwardly extending crescent shaped recesses in communication therewith, a ring secured to the front end of the body block to close said channel and enclose said crescent shaped recesses, and means for delivering air under control to said channel, substantially as described.

8. As a new article of manufacture, a head unit comprising in combination a cone block having a longitudinally extending through passage terminating in a tapered seat of reduced size at its outer end and having a tapered conical outside surface, a circular body block seated upon the outer tapered conical face of the cone block in air tight fashion and having at its front end an annular through passage surrounding the tip portion of the cone to establish a fine annular air delivery orifice concentric with the end of the through passage, means for delivering air to said passage, there being an annular forwardly facing channel in the front face of the body block, there being a pair of forwardly and inwardly extending diametrically opposite recesses in communication therewith, a ring secured to the front end of the body block to close over said channel, and means for delivering air under control to said channel, substantially as described.

9. As a new article of manufacture, a head unit comprising in combination a stationary cone block having a central through passage terminating at its outer end in a plunger seat, a body block rotatably and concentrically mounted thereon, means for retaining these parts in position while permitting such relative rotation, there being a through annular orifice in the rotatable member concentric with the plunger seat aforesaid, means for delivering air to said annular orifice for any rotated position of the outer member to insure delivery of a central cone of air through said orifice, there being a pair of forwardly and inwardly extending crescent shaped orifices diametrically opposite to each other in the front face of the outer member for the

delivery of air against the cone of air delivered through the annular orifice aforesaid, said crescent shaped orifices having their concave portions facing away from the axial center of the device, and means for delivering air to both of the crescent shaped orifices for any rotated position of the outer member, whereby the air jets delivered through the crescent shaped side orifices cooperate with the cone of air delivered through the central orifice to produce a perfectly balanced and distributed fan shaped brush of air, substantially as described.

10. As a new article of manufacture, a head unit having a central liquid delivery orifice and an annular concentric fine air supply orifice to deliver a central cone shaped air jet, there being a pair of diametrically opposite forwardly and inwardly extending crescent shaped air supply orifices at opposite sides of the annular orifice aforesaid, said crescent shaped orifices having their concave portions facing away from the axial center of the device, together with means for controlling the delivery of air to the crescent shaped orifice independent of the annular orifice, the air jets delivered through the crescent shaped side orifices impinging against the sides of the central cone of air to produce a balanced fan of air, substantially as described.

11. As a new article of manufacture, a head unit including a block having a central liquid supply orifice together with a concentric annular air supply orifice for the delivery of a central cone of air around the liquid supply orifice, there being a pair of diametrically opposite inwardly and forwardly extending crescent shaped orifices for air at opposite sides of the annular air supply orifice, said crescent shaped orifices having their concave portions facing away from the axial center of the device, the air delivered from said side orifices cooperating with the central cone to provide a balanced fan shaped jet of air, substantially as described.

12. As a new article of manufacture, a head unit including a circular head block having a central annular through air supply orifice for the delivery of a central cone of air, there being a forwardly facing annular channel around the peripheral portion of said block, and means for delivering air to said channel, there being a pair of diametrically opposite crescent shaped recesses in the head block extending inwardly and forwardly from said channel towards the annular orifice aforesaid, together with a ring on the head block sealing over the front portion of the annular channel and the front portion of the crescent shaped notches aforesaid, substantially as described.

13. An air brush including in combination a body member having at its rear end a longitudinally movable poppet valve for the control of air and having at its front end a longi-

itudinally movable plunger for the control of liquid, a trigger having its upper end pivotally connected to the body member and provided with a rearwardly facing V-shaped socket at a position below the pivotal mounting aforesaid, a link having its front end within said socket, a ball and socket connection between the rear end of the link and the air valve, an annular flange on the plunger, a bifurcated hook engaging the front face of said flange at the sides of the plunger, and a pivotal connection between said hook and the trigger, substantially as described.

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