Feb. 28, 1939. A. KRAUTZBERGER 2,149,181

SPRAY GUN FOR PAINTS AND THE LIKE

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Fig. 1.

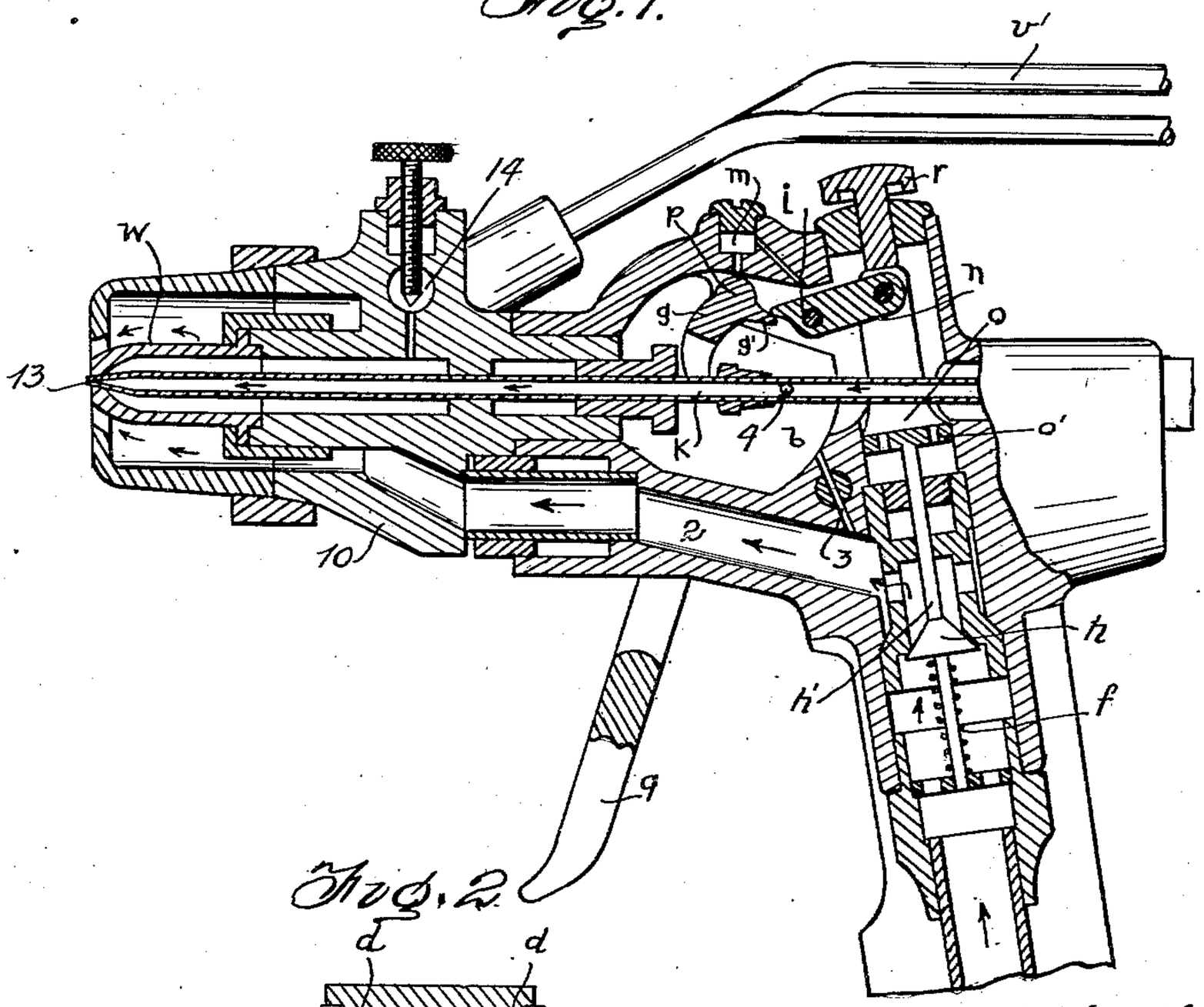


Fig. 2.

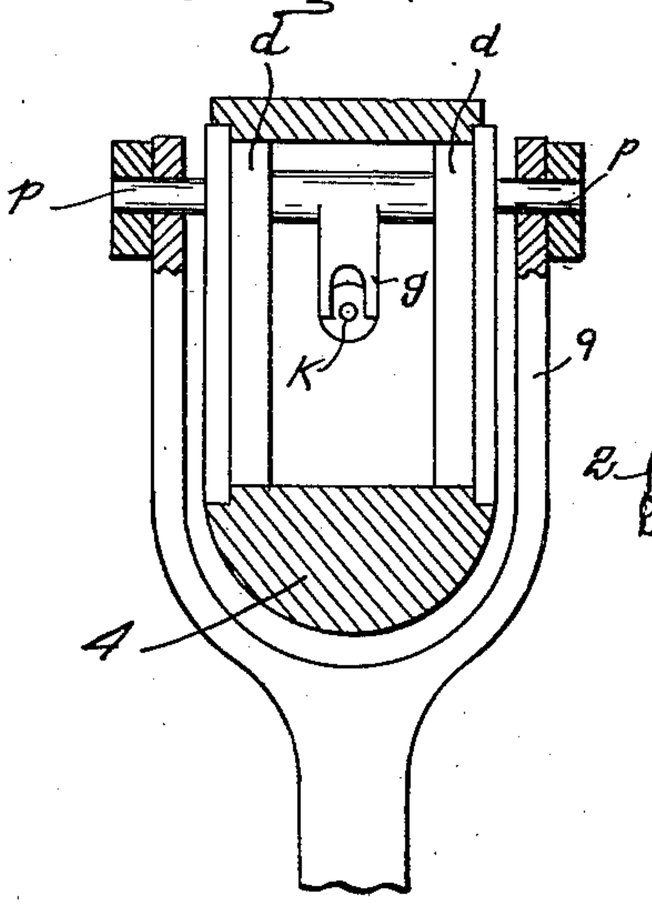
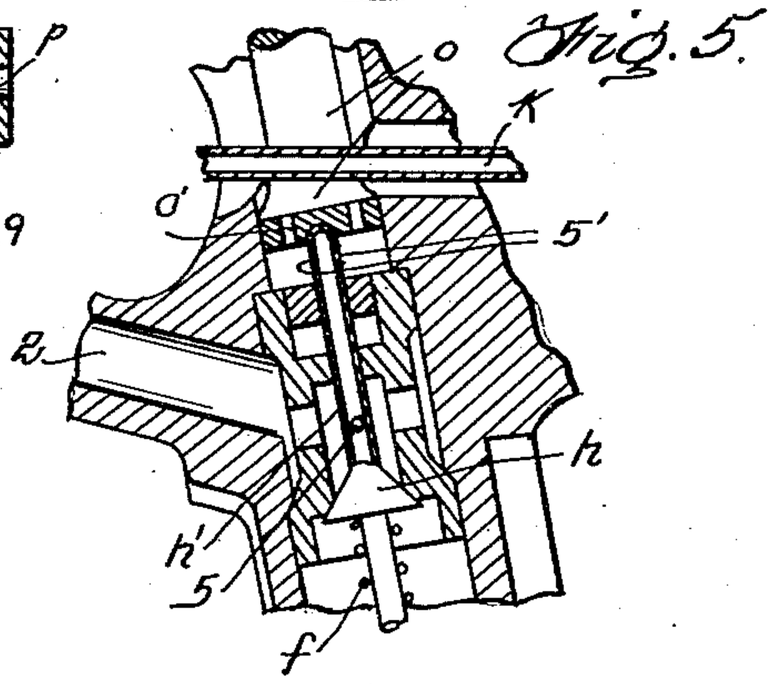


Fig. 5.



Inventor,
Albert Krautzberger,
By Frank A. Ackerman
Attorney.

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Fig. 3.

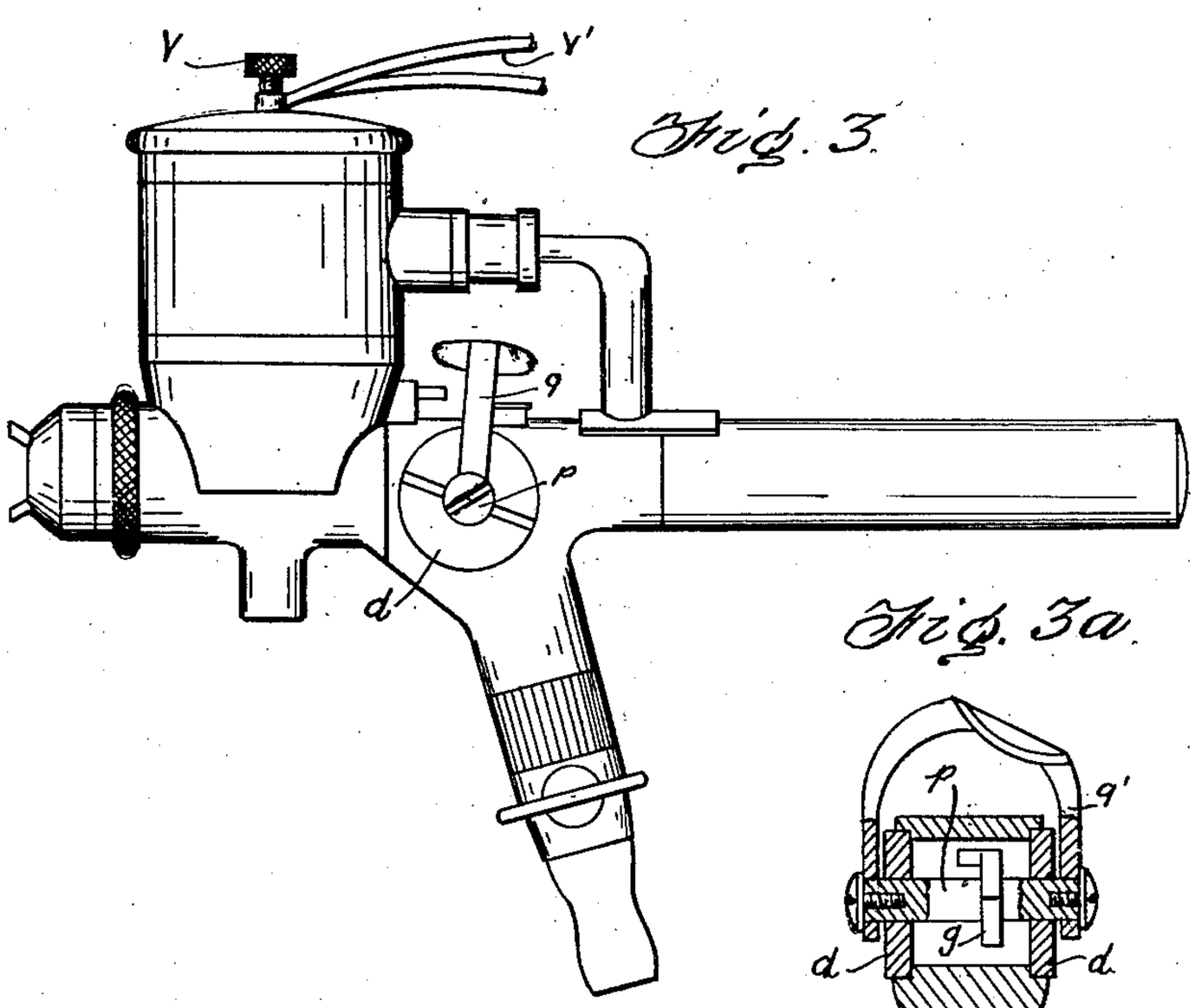


Fig. 3a.

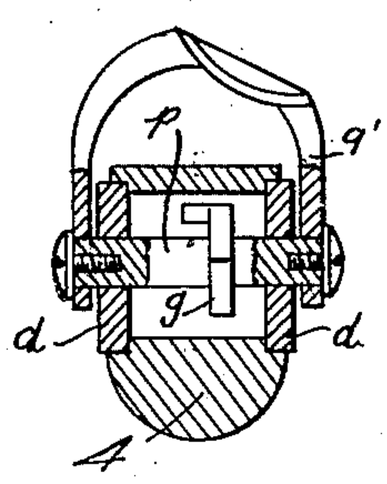
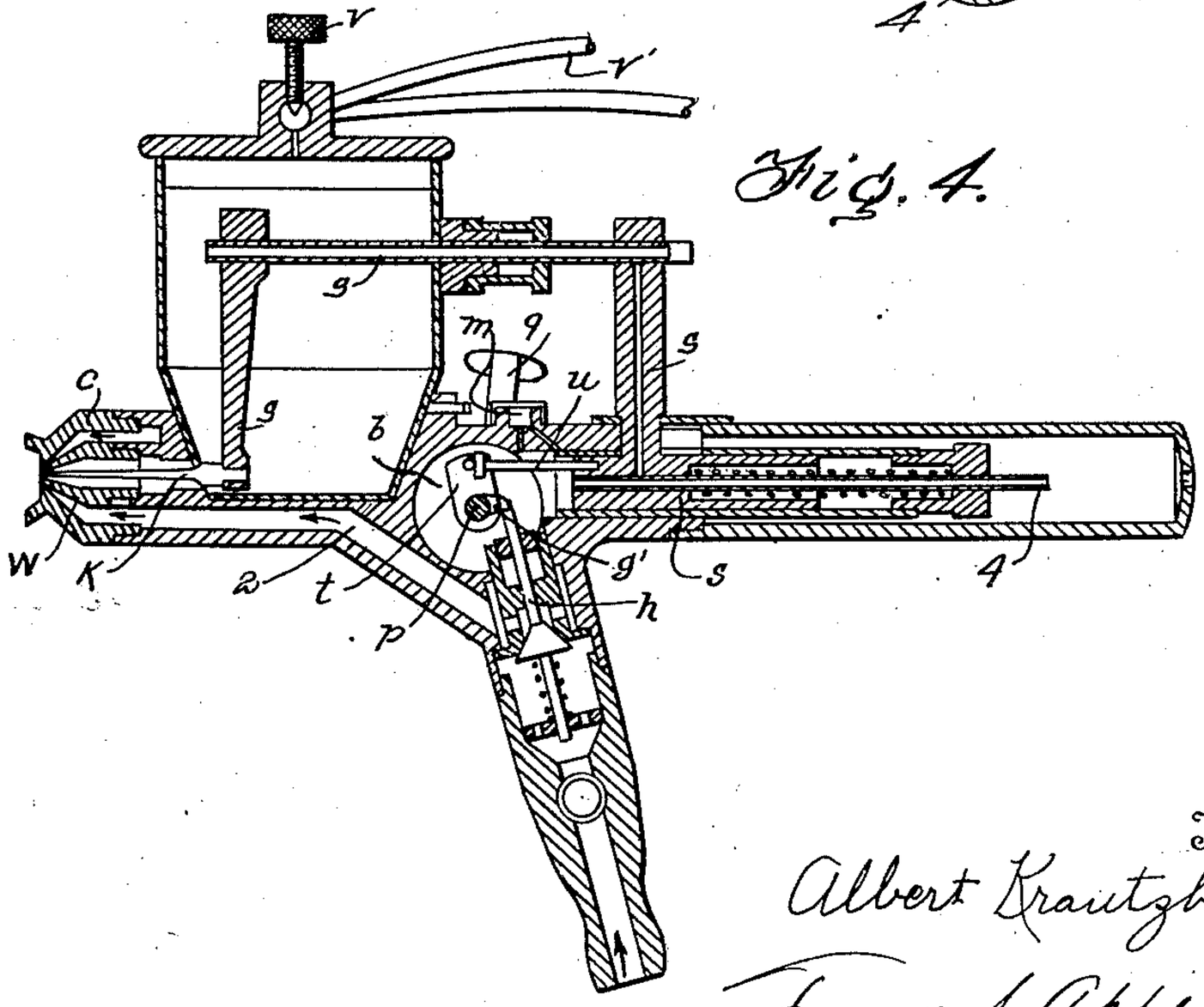


Fig. 4.



Inventor,
Albert Krautzberger,
By Frank S. Ahlemann,
Attorney.

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UNITED STATES PATENT OFFICE

2,149,181

SPRAY GUN FOR PAINTS AND THE LIKE

Albert Krautzberger, Leipzig, Germany

Application February 18, 1936, Serial No. 64,554
In Germany February 21, 1935

3 Claims. (Cl. 299—140)

In spray guns used for paint, varnish, enamel and the like the liquid or semi-liquid substance dealt with, which I shall hereinafter generally refer to as the paint, is likely to penetrate to the mechanism whereby the paint valve and the compressed air valve are controlled, and this may cause corrosion or binding, rendering renewal or repair necessary in a comparatively short time. The adhesive substance settling on the moving parts causes friction which may very greatly increase the wear, and the wear is quite likely to proceed unevenly, so that the timing of the valve action controlling the paint supply and the air supply becomes inaccurate, with consequent deterioration of the work.

To prevent this I arrange the valve controlling mechanism in a closed chamber in the gun, and provide for admission of compressed air to that chamber, so that this air prevents entrance of paint through the passages in which the valve rods work.

Two examples of apparatus according to the invention are shown in the accompanying drawings.

Fig. 1 is a side view, partly in section and partly broken away, showing one form of construction,

Fig. 2 is a fragmentary transverse vertical section of Fig. 1,

Fig. 3 is a side view of the second form of construction,

Fig. 3*a* is a fragmentary, transverse vertical section of a detail thereof,

Fig. 4 is a longitudinal vertical section of the form of invention of Fig. 3, and

Fig. 5 is a fragmentary sectional view showing a modification of a detail.

Referring first to the construction shown in Figs. 1 and 2 of the drawings, there is a roughly cylindrical chamber *b* in the body 10 of the gun, closed at the sides by removable covers *d*, in which there are bearings for a spindle *p*. The ends of the spindle project from the covers *d*, so that they engage the limbs of a forked trigger *q* for actuating the spindle. The limbs are springy, so that they can be disengaged from the spindle *p*, and on removal of the covers the mechanism in the chamber can be taken out for cleaning, repair or renewal. Within the chamber *b* the spindle *p* has fixed thereto two fingers *g*, *g*^{1}. The finger *g* is forked to straddle the valve rod between collar members 11 and 12 fixed to the rod and thus movement of the finger *g* actuates a hollow valve rod *k*, and the finger *g*^{1} actuates a double armed lever *n* pivoted at *t*. To the lever *n* is connected a plunger *o* abutting against the stem *h*^{1} of the main air valve *h*, which is normally closed by a spring *f* but which can be opened by pulling the trigger *q* and thus causing the finger *g*^{1} to rotate the lever *n* and depress the plunger. It is obvious that movement of the stem *h*^{1} by the spring will rock the lever *n* which, in turn, will rock the fingers *g*^{1} and *g* and thus move the rod *k* to the left (Fig. 1) to valve closing position. The hollow rod *k* terminates in the usual frusto-conical valve portion 13 which fits in the usual nozzle *w*. The nozzle is supplied with paint thorugh a pipe *v*^{1} which communicates with the nozzle through a passage 14 controlled by a valve *v*. The plunger rod *o* abuts at the top against a screw *r*, which can be adjusted so that the spring *f* cannot fully close the valve *h*. In that case there is a constant flow of air through the gun when it is not in operation, to keep the passages clear and to keep it warm, if the air is heated. Adjustment of the screw *r* can also be made for the purpose of causing the air valve *h* to be opened before the paint valve is opened, instead of opening the two valves simultaneously, as may sometimes be desired. The air valve *h* can be opened before the paint valve 13 is opened by loosening the screw *r* slightly. This raises plunger *o*, depresses the nose of the lever *n* which in turn depresses the finger *g*^{1} and swings the finger *g* to the left (Fig. 1). This action forces the finger *g* against the left hand abutment on the rod *k* and provides play for the finger *g* when the trigger is pulled while at the same time not providing play as far as the opening of the air valve *h* is concerned. Thus, with the parts arranged as above, the air valve *h* will be opened slightly before the finger *g* engages the right hand abutment on the rod *k* and moves the latter to open the valve 13.

When the valve *h* is open compressed air flows through a conduit 2 to the sprayer nozzle. From this conduit a small duct 3 leads to the chamber *b*, admitting compressed air to that chamber for the purpose of preventing entrance of paint, fumes or dirt. A valve in the duct 3 enables the air flow to the chamber *b* to be controlled. There may be another duct in part of the air valve. For instance, the stem of the valve *h* may be hollow and provided with an inlet opening 5 adjacent the head of the valve. Openings 5' may be provided in said stem adjacent the top thereof to permit the flow of air through the openings *o*' formed in the head of the plunger *o*. This modified structure is seen in Fig. 5.

Above the chamber *b* there is an oil cup *m* with lubricating ducts leading to suitable parts of the chamber. The compressed air in the chamber in

a constant state of agitation, ensures that the oil is carried to all the parts requiring lubrication.

The rod *k*, controlling the paint-valve *w*, is made hollow for the purpose of conducting a stream of air to the central orifice of the nozzle. Paint is fed to the valve *w* through a valve *v* and a conduit *v'* leading to a suitable source of supply (not shown). Within the chamber *b* the rod has a hole for admitting this air from the chamber to the bore in the rod.

The apparatus shown in Figs. 3, 3*a* and 4 is intended mainly for decorative work. The gun in this case also has a chamber *b* closed at the sides by circular covers *d* with a spindle *p* mounted centrally therein, but the spindle is rotated by means of a yoke *q'* (Fig. 3*a*) having a finger rest on top of the gun. Paint is supplied to a valve *w* through a valve *v* and conduit *v'* as in the first described form of the invention.

The spindle has a finger g^1 for opening the spring loaded air valve *h*, and a crank *t* for opening the paint valve *k*. The crank for this purpose actuates a rod *u* fixed to a spring loaded bracket *s*, to which the valve *k* is fixed.

If the paint is supplied under pressure there is risk that particles thereof may penetrate into the chamber *b* through the bearings of the valve mechanism. To prevent this I arrange, at the inlet into the chamber out of which the nozzle opens, a pressure reducing valve or equivalent device, reducing the pressure in that chamber to the moderate value required for emitting the paint. The presence of the valve 3 is important for the reason that it is meant to prevent the formation of too great a pressure in chamber *b*, since spraying is often done under pressure of 3 atmospheres or more and danger exists that the large covers *d* will not be able to resist the pressure and will be blown off, which will endanger the laborer and which is likely to injure him severely.

It is important also that the foul air be led from the chamber *b* to the rod *k*, which makes it also available to help the diffusion of the spraying material, thereby making use of the excess pressure from the chamber *b*.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In a spray gun for paint or the like, the combination of a nozzle, a valve controlling the emission of paint or the like from said nozzle, said valve including an elongated hollow stem, an air conduit leading to said nozzle, a valve controlling the admission of compressed air to said air conduit, a chamber in said gun, a portion of said hollow stem extending into said chamber and having an opening through a wall thereof, means in said chamber for normally actuating both of said valves simultaneously, one wall of said chamber being formed to provide a passage to said air conduit, and valve means in said passage for regulating the amount of compressed air admitted to said chamber through said passage.

2. In a spray gun for paint or the like, the combination of a nozzle, a valve controlling the emission of paint or the like from said nozzle, said valve including an elongated hollow stem, an air conduit leading to said nozzle, a valve controlling the admission of compressed air to said air conduit, a chamber in said gun, a portion of said hollow stem extending into said chamber and having an opening through a wall thereof, means in said chamber for normally actuating both of said valves simultaneously, one wall of said chamber being formed to provide a passage to said air conduit, valve means in said passage for regulating the amount of compressed air admitted to said chamber through said passage, and means associated with said valve actuating means and selectively operable to cause said valves to be actuated successively.

3. In a spray gun for paint or the like, the combination of a nozzle, a valve controlling the emission of paint or the like from said nozzle, said valve including an elongated hollow stem, an air conduit leading to said nozzle, a valve controlling the admission of compressed air to said air conduit, a chamber in said gun, a portion of said hollow stem extending into said chamber and having an opening through a wall thereof, means in said chamber for normally actuating both of said valves simultaneously, one wall of said chamber being formed to provide a passage to said air conduit, valve means in said passage for regulating the amount of compressed air admitted to said chamber through said passage, and means associated with said valve actuating means and selectively operable to cause said valves to be actuated successively, said last named means also being selectively operable to prevent the complete closing of said air valve.

ALBERT KRAUTZBERGER.