Jan. 19, 1937. S. BRAMSEN ET AL 2,068,161

MATERIAL DISCHARGE CONTROL VALVE FOR SPRAY GUNS

Original Filed Oct. 2, 1935

Fig. 1

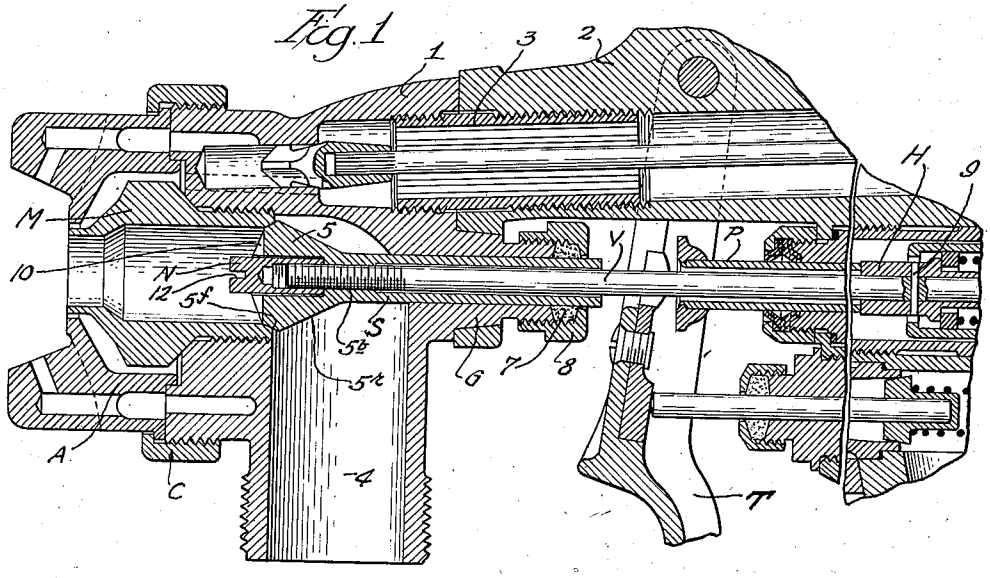


Fig. 2

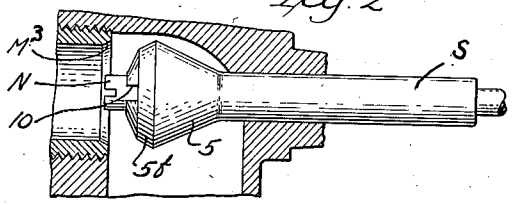


Fig. 3

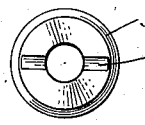


Fig. 8

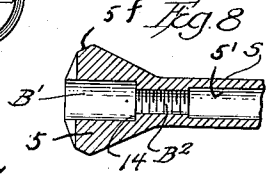


Fig. 4

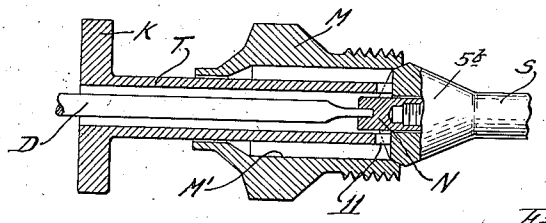


Fig. 7

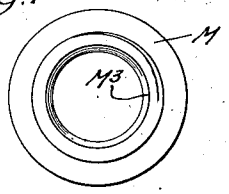


Fig. 6

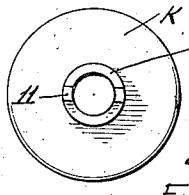
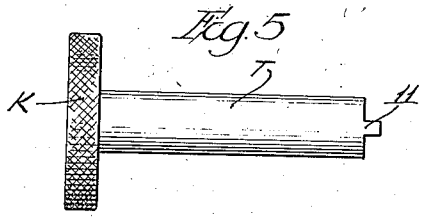


Fig. 5



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MATERIAL-DISCHARGE CONTROL VALVE FOR SPRAY GUNS

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Original application October 2, 1935, Serial No. 43,244. Divided and this application March 20, 1936, Serial No. 69,762

6 Claims. (Cl. 299—140.1)

This application is a division of our application #43,244, filed October 2, 1935 on a Spray gun, and relates to novel and advantageous constructions of a material-discharge control valve for spraying appliances, particularly adapted for use with material nozzles of relatively large bores such as are desirable for the spraying of asphalt and other viscous materials, and of the gun parts associated with such a valve.

In general, the objects of our invention are as follows:

(1) Providing a material nozzle and material valve assembly in which the flow through the material nozzle is controlled by the seating of the head of the material valve on the rear end of the material nozzle, and in which the said nozzle will afford a seat of large area for the said nozzle head.

(2) Disposing the material valve so that the flow of material will pass largely in front of the said valve head when the valve is fully opened, and also shaping a portion of the head for guiding material to flow readily over it.

(3) Forming this valve head integral with a sleeve through which the main and small-diametered stem of the valve extends, which sleeve extends through the usual guide and stuffing box behind the material valve, so that the sleeve effectively increases the diameter of the slidably guided part of the valve to guide the latter more accurately and to reduce wear both on this guided valve part and on its guide.

(4) Providing simple means, accessible from the front of the gun, for fastening the said head and sleeve member of the valve to the valve stem, and constructing these fastening means so that the position of the said member can readily be adjusted longitudinally of the valve stem to vary the effective length of the valve.

(5) Arranging the said adjustment-permitting provisions so that the user of the gun can adjust the length of the valve, and even remove and replace the said head and sleeve member, by using simple tools which he can insert and operate from the front of the gun without disassembling any other parts of the spray gun.

Illustrative of our invention:

Fig. 1 is a central, longitudinal and vertical section through portions of a spray gun of the type disclosed in our said copending application #43,244, showing the here presented material valve in closure relation to a corresponding material nozzle.

Fig. 2 is a section similar to a portion of Fig. 1, with the material valve fully opened and shown in elevation.

Fig. 3 is a front view of the head and sleeve member of the material valve.

Fig. 4 is a sectional view allied to a portion of Fig. 1, showing the conjoint use of a tubular tool and a screwdriver during the adjusting of the effective length of the material nozzle.

Fig. 5 is a plan view of the tubular tool alone, and Fig. 6 is a rear elevation of the same.

Fig. 7 is a rear elevation of the material nozzle, showing the annular seat for the head of the material valve.

Fig. 8 is a central and longitudinal section through the head portion and the forward part of the sleeve member.

In the spray gun shown partially in Fig. 1, the frontal body part 1 is secured to the forward end of the main body part 2 by a nipple 3, and the said frontal body part has an elbow-like material passage 4, into the forward arm of which passage the rear end of the material nozzle M is threaded. This material nozzle has the rear end portion of its bore flaring rearwardly to afford an annular seat M^3 (Figs. 2 and 7) of large area, and the said nozzle desirably has its extreme end disposed not farther rearward than the most forward edge of the riser portion of the said elbow-like material passage 4.

As a rear end closure for the material nozzle M we provide a three-part valve including as its longest member a valve stem V, namely a rod of the usual small diameter of a needle valve for such a spray gun. Mounted on the forward part of this valve stem is a tubular member comprising a head 5 and a shank 5^1 extending rearwardly from the said head, the bore of which member has a diametrically contracted portion B^2 (Fig. 8) through which the forward end of the said stem is forwardly threaded.

The periphery of the said head includes a forwardly tapering annular portion 5*f* corresponding in taper to the said flaring seat M^3 on the material nozzle, and also includes a relatively much longer rearwardly tapering portion 5*r* reaching from the rear end of the said annular portion 5*f* to the forward end of the shank 5^1. Extending rearwardly into the forward end of the bore of the said tubular head and sleeve member is a cap-nut N, which is threaded upon the forward end portion of the valve stem V and which normally engages a forwardly facing annular shoulder 14 (Fig. 8) at the juncture of the forward portion B^1 of the bore of the tubular

head and stem member with the contracted bore portion B^2 (through which the stem is threaded) to latch the said member to the stem.

The shank S of the said member extends slidably through the usual guide-forming gun body part behind the riser portion of the material supply inlet which includes the said material passage 4, and thereafter through the usual packing 7 and the gland 8 which compresses that packing; so that the relatively large outside diameter of the said sleeve (in proportion to that of the valve stem V) greatly reduces the wear due to the sliding of the valve assembly in the said guide, and also aids in more accurately alining this valve assembly with the said guide.

For the gun assembly of our said copending application, the valve rod V extends rearwardly successively through a perforation in the trigger T of the gun, a tubular and slidably supported presser member P, and a presser-head H to which the valve rod is fastened by a cross-pin 9. Thus arranged, a retraction of the trigger acts through the said presser-member to move the presser-head rearwardly for retracting the valve to its open position of Fig. 2, in which position a large portion of the supplied material can flow freely in front of the valve head, while the rearwardly tapering head exterior 5*b* also guides other portions of the material over the largest-diametered part of that head. In practice, we preferably make the rearward and longest portion 5^1 of the bore of our headed valve member larger in diameter than the valve stem V, thereby permitting the said stem to flex somewhat within the said rearward bore portion, so as to avoid a cramping of the assembled parts in case the guide bore in the gun body part 6 does not aline exactly with the means employed for guiding the rear end portion of the valve.

To facilitate a longitudinal adjusting of the head and stem unit of the valve on the valve rod R, we desirably provide both the said head and the cap-nut N with frontal formations for engaging tools which may be inserted and operated through the bore of the material nozzle without even detaching either that nozzle or the associated air nozzle. For this purpose, the drawing shows the head of our valve as having a diametric frontal slot 10 adapted to be engaged by prongs 11 on the rear end of a tubular tool T (Fig. 5) having a knurled knob K at its forward end, and also shows the cap-nut N as having a diametric slot 12 in its forward end for receiving the tip of a screw-driver D inserted through the bore of the said tubular tool.

When both of these tools are inserted into the material nozzle from the front and each interlocked with a corresponding part of our material valve, the user can readily grip the knob K of the tool T to hold the valve head against rotation while he loosens the cap-nut N by rotating the screwdriver D to a suitable extent. Then, by holding the screwdriver stationary and rotating the tubular tool, he can rotate the head and sleeve member of our valve to move that member longitudinally of the valve before latching it again in its adjusted position. Likewise, the user can readily use similar tools for entirely detaching the said head and sleeve member so that this member can be removed entirely from the gun, after detaching both the air nozzle and the material nozzle, for replacing the said member when worn or for substituting a similar member with a head of different diameter when spraying is to be done with a material nozzle of a different bore.

However, while we have heretofore described our invention in connection with a drawing illustrating certain desirable shapings of numerous parts, it should be obvious that many changes could be made without departing either from the spirit of our invention or from the appended claims, and also that our invention can be employed to equal advantage in spray appliances of other general construction than the here partly illustrated one.

We claim as our invention:

1. In a spray gun having a forwardly facing material nozzle, and having a longitudinally movable material valve controlling the said nozzle and slidably guided by a part of the body of the gun, a frontally adjustable material valve comprising: a tubular member having a forward head adapted to seat against a portion of the material nozzle to shut off the flow of material through that nozzle, the said member also having a shank coaxial with the said valve head portion and extending rearwardly from the said head through the said part of the gun body; a valve stem coaxial with the said tubular member, the said stem having its forward portion threaded through and forwardly beyond a part of the said member; and a locknut threaded upon the said projecting stem portion and normally in rearward engagement with a part of the tubular member.

2. A spray gun parts assembly as per claim 1, in which the head portion of the valve has frontal formations, adapted to be gripped by a tool inserted through the bore of the material nozzle to prevent rotation of the valve head during a tightening or loosening of the locknut.

3. In a spray gun having a forwardly facing material nozzle, and having a longitudinally movably material valve coaxial with and controlling the said nozzle and slidably guided by a gun body part behind the said nozzle, a frontally adjustable material valve comprising: a tubular member including in integral formation a head having a frontal portion adapted to engage the rear end of the said nozzle to shut off the flow of material into the said nozzle, and a shank of smaller outside diameter than the said head extending rearwardly from the said head portion slidably through the said portion of the gun body; a valve stem threaded forwardly through a portion of the bore of the tubular member, and a locknut threaded on forward end portion of the rod and normally in rearward engagement with a portion of the said tubular member.

4. In a spray gun having a forwardly facing material nozzle, and having a longitudinally movable material valve controlling the said nozzle and slidably guided by a portion of the body of the gun, a frontally adjustable material valve comprising: a tubular member including a frontal head adapted to seat against a portion of the material nozzle to shut off the flow of material through that nozzle, and an exteriorly cylindrical stem coaxial with but of smaller diameter than the said head and extending slidably rearwardly from the said head through the said portion of the gun body; the bore of the said tubular member having a diametrically contracted portion intermediate of the length of the said member, the juncture of the said contracted bore portion with the more forward part of the bore presenting a forwardly facing annular seat; a valve stem extending forwardly axially into the said member and threaded through the said smaller diam-

etered bore portion, and a locknut threaded upon the valve stem and normally bearing rearwardly against the said seat.

5. In a spray gun having a forwardly facing material nozzle, and having a longitudinally movable material valve controlling the said nozzle and slidably guided by a part of the body of the gun, a frontally adjustable material valve comprising: a tubular member including a frontal head adapted to seat against a portion of the material nozzle to shut off the flow of material through that nozzle, and also including a shank coaxial with the said head and extending rearwardly from the said head through the said portion of the gun body; the bore of the tubular member having a diametrically contracted portion of the length of the said member, the juncture of the said contracted bore portion with the more forward part of the bore presenting a forwardly facing annular seat; a valve stem extending forwardly axially into the said member and threaded through the said smaller diametered bore portion, and a locknut threaded upon the valve stem forwardly of the said seat and normally bearing rearwardly against the said seat.

6. In a spray gun having a forwardly facing material nozzle, and having a longitudinally movable material valve controlling the said nozzle and slidably guided by a part of the body of the gun, a frontally adjustable material-control valve comprising: a tubular member including a head having a frontal and forwardly tapering annular portion adapted to seat in the rear end of the bore of the said nozzle, and having a rearwardly tapering head portion adjacent to the said annular portion; the said member also including an exteriorly cylindrical shank extending rearwardly from the said head and slidably through the said gun body part; the said member having an axial bore including a diametrically contracted bore portion disposed forward of the midlength of the said member; a valve stem extending forwardly into the said axial bore and threaded through the said contracted bore portion, and a locknut threaded on the forward end of the valve stem and normally in rearward engagement with a portion of the said head; the valve stem being sufficiently smaller than the part of the said bore rearward of the said contracted bore portion, so as to permit the said stem to flex somewhat within the said rearward bore portion.

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